



NExUS Reports and Tools (Data, Products and Services) Wed Oct 18 20:01:41 EDT 2017

Printing 447 of total 447 records.

Data: All

Products: All

Services: All

Scientific Discipline: All

Sector: All

Area of Applicability: All

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| Name | |
| Type | |
| Sector | |
| Focus Area | |
| Region | |

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| Name | |
| Type | |
| Sector | |
| Focus Area | |
| Region | |

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| Name | 2012 DOT Climate Adaptation Plan |
| Description | "The Adaptation Plan was prepared under Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance, and Council on Environmental Quality Implementing instructions, and lays out concrete steps the Department will take to fully integrate considerations of climate change and variability in DOT policies, programs and operations. Potential climate impacts can influence DOT's strategic goals of safety, state of good repair and environmental sustainability, and are therefore of particular interest to the Department. The DOT Climate Adaptation Plan reflects DOT's commitments for Fiscal Years 2012 and 2013 and other DOT accomplishments." |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Public Health and Safety - Infrastructure - Economic Resources |

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| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate |
| Region | <ul style="list-style-type: none"> - National - Regional Or State -- New England -- Mid-Atlantic -- Central - - Great Lakes -- South East |
| Lead Agencies | Department of Transportation |

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| Name | 3D Visualization of Sea Level Rise: Illustrating the Potential to Exacerbate Storm Damage in Falmouth, Massachusetts |
| Description | <p>Woods Hole Sea Grant worked with Applied Science Associates to generate three dimensional simulations of sea level rise and flood event inundation in an effort to enhance hazard mitigation planning, emergency response, and public awareness. Specifically, this project visualizes various levels of sea level rise and/or storm surge flooding, in Falmouth on Cape Cod. The Geographic Information Systems (GIS) based flooding simulations incorporate the highest currently available MassGIS (DEM), local LIDAR datasets, and 3D measurements. The team utilized sophisticated inundation analysis and modeling tools as well as knowledge and expertise in mapping and analyzing flood potential from storms and sea level rise. Storm surge level was extracted from the National Hurricane Center's SLOSH (Sea, Lake and Overland Surges from Hurricanes) model. The MOM (Maximum of Maximum Envelope of Water) results were used for the chosen hurricane category. Using the MOM results ensures that the worst case storm surge at every location along the coastline is being considered. The SLOSH model outputs provide a spatially varying depiction of storm surge flooding along the coast. The team made use of a custom processing tool to propagate these variable results inland onto the elevation data.</p> <p>The images represent multiple sea level changes both with and without storm surge (Category 2 Hurricane) flooding and allow users to leverage the Google Earth framework for navigation to areas of interest.</p> |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Viewers and Web-based Tools |
| Sector | - Infrastructure |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- New England |
| Lead Agencies | Woods Hole Sea Grant |
| Contacts | Woods Hole Sea Grant, seagrant@whoi.edu |

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| Name | A Bayesian Network to Predict Vulnerability to Sea-Level Rise: Data Report |
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| Description | During the 21st century, sea-level rise is projected to have a wide range of effects on coastal environments, development, and infrastructure. Consequently, there has been an increased focus on developing modeling or other analytical approaches to evaluate potential impacts to inform coastal management. This report provides the data that were used to develop and evaluate the performance of a Bayesian network designed to predict long-term shoreline change due to sea-level rise. The data include local rates of relative sea-level rise, wave height, tide range, geomorphic classification, coastal slope, and shoreline-change rate compiled as part of the U.S. Geological Survey Coastal Vulnerability Index for the U.S. Atlantic coast. In this project, the Bayesian network is used to define relationships among driving forces, geologic constraints, and coastal responses. Using this information, the Bayesian network is used to make probabilistic predictions of shoreline change in response to different future sea-level-rise scenarios. |
| Type | - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Infrastructure - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - National |
| Lead Agencies | Robert Thieler, USGS, rthieler@usgs.gov |

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| Name | A Case Study of Coastal Aquifers near Richibucto, New Brunswick: saline groundwater occurrence and potential impacts of climate change of seawater intrusion (NB 2012) |
| Description | A case study was conducted between 2010 and 2012 to investigate saline groundwater occurrence and the potential impacts of future climate change and sea-level rise on seawater intrusion into sandstone aquifers near the Town of Richibucto in eastern New Brunswick. The focus of the study was on water supplies obtained from municipal production wells. A three-dimensional numerical model of density-dependent groundwater flow coupled with solute transport was developed for the Richibucto region and this was then used to investigate the effect of future climate change and sea level on the distribution of groundwater salinity within the sandstone aquifers. The results from the numerical modelling investigation indicated that climate change (i.e., changes in groundwater recharge), sea level rise, and increased pumping were all significant to some extent in the context of lateral seawater intrusion in shallow to intermediate depth aquifers similar to those of the Richibucto region. However, sea-level rise had the least significant effect of the three factors considered. |
| Type | - DATA: In situ Observations |
| Sector | - Infrastructure |
| Focus Area | - Climate Impacts on Water Resources |

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| Region | |
| Lead Agencies | Atlantic Canada Adaptation Solutions Association University of New Brunswick -- Departments of Earth Sciences and Civil Engineering New Brunswick Department of Environment |
| Contacts | New Brunswick Department of Environment env-info@gnb.ca |

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| Name | A Coastal Areas Protection Policy for New Brunswick (2002) |
| Description | <p>The goals of the project were to forecast likely climate changes, anticipate their physical impacts in relation to sustainable management and community resilience, and identify potential adaptation strategies. This involved rigorous scientific research into how the coastal area has changed in past years and making predictions about how it will change over the next 100 years. Using very precise surveying methods, some members of the research team constructed flood-risk maps to identify the extent of flooding for water levels in 10 cm increments, up to four metres above mean sea level. Other members of the team collaborated with local industry, government and community members to obtain an understanding of priorities and local capacity to adapt to accelerated changes.</p> <p>This document, seeks to inform New Brunswickers about the Government's plans for protecting the province's coastal areas--covering what is important to protect in our coastal areas and why, and explaining how future development and activity will be governed using established zones based on environmental sensitivity. The Coastal Areas Protection Policy is designed to manage our land-based coastal resources through sustainable development to ensure a balance between growth and environmental integrity. The policy establishes minimum standards for the management and sustain-able development of coastal lands in unincorporated areas of the province. Municipal governments would be required to manage growth and development on coastal lands in a fashion consistent with the needs and aspirations of each community. The policy aims to protect local coastal features such as beaches, dunes, and coastal marshes, while maintaining a commitment to manage the development of coastal areas provincially.</p> |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Other - PRODUCTS: Regulatory/ Policy Guidance |
| Sector | <ul style="list-style-type: none"> - Infrastructure - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - International |
| Lead Agencies | New Brunswick Department of Environment and Local Government--Sustainable Planning Branch |

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| Description | In this article a framework for assessing climate change impacts on water and watershed systems to support management decision-making is presented. The framework addresses three issues complicating assessments of climate change impacts--linkages across spatial scales, linkages across temporal scales, and linkages across scientific and management disciplines. A major theme underlying the framework is that, due to current limitations in modeling capabilities, assessing and responding to climate change should be approached from the perspective of risk assessment and management rather than as a prediction problem. The framework is based generally on ecological risk assessment and similar approaches. A second theme underlying the framework is the need for close collaboration among climate scientists, scientists interested in assessing impacts, and resource managers and decision makers. A case study illustrating an application of the framework is also presented that provides a specific, practical example of how the framework was used to assess the impacts of climate change on water quality in a Mid-Atlantic, U.S., watershed. |
| Type | - PRODUCTS: Other |
| Sector | - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Economic Resources - Recreation and Tourism |
| Focus Area | - Climate Impacts on Water Resources |
| Region | - National - Regional Or State -- Mid-Atlantic |
| Lead Agencies | EPA Office of Research and Development |
| Contacts | Thomas Johnson, US EPA, johnson.thomas@epa.gov |

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| Name | A Framework for Categorizing the Relative Vulnerability of Threatened and Endangered Species to Climate Change |
| Description | The framework presented in this report may be used to categorize the relative vulnerability of species to climate change. There are four modules that compose this framework. These modules walk the user through a systematic process for (1) categorizing a species' baseline vulnerability to extinction or major population reduction, (2) categorizing a species' vulnerability to future climate change, (3) developing a matrix that gives an overall score of the species' vulnerability to non-climate and climate change stressors, and (4) qualitatively determining the uncertainty in the estimate of a species' vulnerability. |

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| Type | <ul style="list-style-type: none"> - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Training and Capacity Building - PRODUCTS: Management Guidance (i.e. structured decision making) - PRODUCTS: Regulatory/ Policy Guidance |
| Sector | - Biota |
| Focus Area | - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - National |
| Lead Agencies | EPA |

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| Name | A Guide For Tribal Leaders on U.S. Climate Change Programs |
| Description | This guide summarizes key U.S. government programs addressing climate change, opportunities for tribal engagement and contacts for each agency. In addition to its immediate value to tribes and their partners, this information will provide important groundwork for research on understanding and improving the tribal consultation processes in the context of climate change. |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Engagement - PRODUCTS: Training and Capacity Building |
| Sector | <ul style="list-style-type: none"> - Social and Cultural Resources - Recreation and Tourism - Cross Disciplinary - Other |
| Focus Area | |
| Region | - National |
| Lead Agencies | Tribal Climate Change Project, University of Oregon Environmental Studies Program and the USDA Forest Service Pacific Northwest Research Station |
| Contacts | Kathy Lynn at kathy@uoregon.edu |

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| Name | A Human Health Perspective on Climate Change |
| Description | "A Human Health Perspective on Climate Change"- A Report released on 4/22/10 outlining the Research Needs on the Human Health Effects of Climate Change published by Environmental Health Perspectives and the National Institute of Environmental Health Sciences. The purpose of this paper is to identify research needs for all aspects of the research-to-decision making pathway that will help us understand and mitigate the health effects of climate changes as well as ensure that we choose the healthiest and most efficient approaches to climate change adaptation. |
| Type | |

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| Sector | - Public Health and Safety - Cross Disciplinary - Other |
| Focus Area | |
| Region | - International - National |
| Lead Agencies | Environmental Health Perspectives |

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| Name | A Method to Assess Climate-Relevant Decisions: Application in the Chesapeake Bay |
| Description | The goal of this study is to formalize an approach to inventory and analyze management decisions in order to produce useful information targeted toward effective adaptation to climate change. We began by: (1) selecting a study area and compiling a list of key decisions (2) developing criteria for evaluating the climate-relevance of decisions; (3) applying the criteria to select decisions that are potentially sensitive to climate change; (4) soliciting expert judgment regarding those selections (and refine the selections accordingly); and (5) testing alternative weighting schemes for prioritizing decisions most in need of decision support or additional research based on the selected attributes. |
| Type | - PRODUCTS: Training and Capacity Building - PRODUCTS: Management Guidance (i.e. structured decision making) |
| Sector | |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | EPA |

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| Name | A New Era for Conservation: Review of Climate Change Adaptation Literature |
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| Description | From the Executive Summary: This literature review summarizes recent science on climate change adaptation in the context of natural resource management and fish and wildlife conservation. The review was prepared as a background contribution to the Adaptation 2009 conference being held February 2009 in Washington, DC, under the auspices of the National Council on Science and the Environment (NCSE) and National Wildlife Federation (NWF). The review starts with an overview of the concept of climate change adaptation, including overarching principles and barriers experienced to date in adaptation planning and implementation. We then provide specific examples of adaptation strategies for four broad habitat types: (1) forests; (2) grasslands and shrublands; (3) freshwater systems; and (4) coasts and estuaries. |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Other |
| Sector | - Managed Ecosystems - Natural Ecosystems - Biota |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - National |
| Lead Agencies | National Wildlife Federation |
| Contacts | Patty Glick, NWF, glick@nwf.org |

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| Name | A Sea Level Rise Response Strategy for the State of Maryland |
| Description | Sea level rise rates along Maryland's coastline are nearly twice those of the global average. Sea level has risen approximately one foot in the last century and is expected to rise another 2 - 3 feet by the year 2100. Sea level rise impacts coastal areas by exacerbating coastal flooding, influencing shoreline erosion, and submerging tidal wetlands and other low-lying lands. Such impacts pose a significant threat to the steep cliffs, wetlands and marshes, tidal estuaries, and sandy beaches, and barrier islands that comprise Maryland's coastal environment. Recognizing the need to begin planning for sea level rise, a NOAA Coastal Management Fellow with Maryland's Coastal Program developed a Sea Level Rise Response Strategy for the State of Maryland. The strategy sets forth the policy and implementation framework for reducing the State's overall vulnerability to sea level rise in the coming years. |

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| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Engagement - PRODUCTS: Regulatory/ Policy Guidance |
| Sector | - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Maryland Department of Natural Resources |
| Contacts | Zoe Johnson, Maryland Department of Natural Resources, ZJohnson@dnr.state.md.us |

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| Name | Achieving Hazard-Resilient Coastal and Waterfront Smart Growth: Coastal and Waterfront Smart Growth and Hazard Mitigation Roundtable Report |
| Description | The National Oceanic and Atmospheric Administration (NOAA) and the U.S. Environmental Protection Agency(EPA) have released “Achieving Hazard-Resilient Coastal & Waterfront Smart Growth: Coastal and Waterfront Smart Growth and Hazard Mitigation Roundtable Report.” The report presents an overview of a 2011 meeting where experts from the fields of smart growth, hazard mitigation, climate change adaptation, and coastal management shared ideas on how coastal and waterfront communities could improve quality of life, use land and other resources efficiently, and create environmentally and economically sustainable neighborhoods while minimizing risks from natural hazards related to coastal and waterfront flooding. NOAA and EPA partnered with the state Sea Grant College Programs of Rhode Island, Texas, and Hawai'i to organize the roundtable. |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Training and Capacity Building |
| Sector | |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - National - Regional Or State |
| Lead Agencies | EPA and NOAA |

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| Name | Adaptation Planning for the National Estuary Program |
| Description | This document describes five critical elements of adaptation planning, and provides examples of these elements and suggestions for additional resources. These elements should be incorporated into the National Estuary Program (NEP) estuaries' adaptation plans to obtain recognition as a Climate Ready Estuary (CRE). The five elements were developed for the NEPs, but they may be helpful to other coastal communities when they are starting to plan for adapting to climate change. These elements will be revised as needed. |
| Type | - PRODUCTS: Training and Capacity Building |

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| Sector | <ul style="list-style-type: none"> - Infrastructure - Managed Ecosystems - Natural Ecosystems - Social and Cultural Resources - Economic Resources |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate |
| Region | <ul style="list-style-type: none"> - National |
| Lead Agencies | U.S. Environmental Protection Agency, Climate Ready Estuaries |

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| Name | Adaptation to Climate Change in the Northeast United States: Opportunities, Processes, Constraints |
| Description | <p>Abstract: Scientific evidence accumulating over the past decade documents that climate change impacts are already being experienced in the US Northeast. Policy-makers and resource managers must now prepare for the impacts from climate change and support implementing such plans on the ground. In this paper we argue that climate change challenges the region to maintain its economic viability, but also holds some opportunities that may enhance economic development, human well-being, and social justice. To face these challenges and seize these opportunities effectively we must better understand adaptation capacities, opportunities and constraints, the social processes of adaptation, approaches for engaging critical players and the broader public in informed debate, decision-making, and conscious interventions in the adaptation process. This paper offers a preliminary qualitative assessment, in which we emphasize the need for (1) assessing the feasibility and side effects of technological adaptation options, (2) increasing available resources and improving equitable access to them, (3) increasing institutional flexibility, fit, cooperation and decision-making authority, (4) using and enhancing human and social capital, (5) improving access to insurance and other risk-spreading mechanisms, and (6) linking scientific information more effectively to decision-makers while engaging the public. Throughout, we explore these issues through illustrative sectoral examples. We conclude with a number of principles that may guide the preparation of future adaptation plans for the Northeast.</p> |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Social and Cultural Resources - Economic Resources |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate |

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| Region | - Regional Or State -- New England -- Mid-Atlantic |
| Contacts | Susan Moser, Susanne Moser Research & Consulting, promundi@susannemoser.com |

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| Name | Adaptation Tool Kit: Sea-Level Rise and Coastal Land Use How Governments Can Use Land-Use Practices to Adapt to Sea-Level Rise |
| Description | Description: This Tool Kit describes 18 different land-use tools that can be used to preemptively respond to the threats posed by SLR (see Table 1 on the next page). This Tool Kit focuses on land-use tools that could be used to adapt to impacts to the built environment (public and private coastal development and infrastructure). In order to devise a comprehensive strategy, governments will need to determine which tools to employ given their unique socio-economic and political contexts. To this end, we also provide policymakers with a framework for decision making. We analyze each tool by (1) the type of power exercised to implement it (planning, regulatory, spending, or tax and market-based tools); (2) the policy objective that it facilitates (protection, accommodation, planned retreat, or preservation); and (3) the type of existing or potential land uses that the tool can be used to adapt (critical infrastructure, existing development, developable lands, and undevelopable lands). Finally, we provide a top-level analysis of the trade-offs between tools—the economic, environmental, and social costs and benefits, and the legal and administrative feasibility of implementing each tool. |
| Type | - PRODUCTS: Training and Capacity Building |
| Sector | - Infrastructure - Natural Ecosystems - Social and Cultural Resources - Economic Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - National |
| Lead Agencies | Georgetown Climate Center |
| Contacts | Jessica Grannis, Georgetown University, jcg68@law.georgetown.edu |

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| Name | Adaptation: An Issue Brief for Business |
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| Description | <p>Adaptation: An Issue Brief for Business A World Business Council Report on Climate Adaptation. The Intergovernmental Panel on Climate Change (IPCC)</p> <p>Fourth Assessment Report, 1 Climate Change 2007: Synthesis Report, forecasts that climate change will have significant impacts on populations and environments around the world. Furthermore, it is likely that in the absence of concerted efforts to mitigate greenhouse emissions, climate change will have negative effects on business and global markets. It will likely lead to a change in existing business models and current risk management structures.</p> <p>This publication is focused on providing an overview of adaptation from a business perspective. It describes potential impacts of climate changes, risks and opportunities for business, and why business should consider adaptation planning and measures. It summarizes intergovernmental efforts to promote adaptation in vulnerable regions and highlights areas in which business could have a role in promoting adaptation, both at community and global levels.</p> |
| Type | |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Economic Resources - Recreation and Tourism - Cross Disciplinary |
| Focus Area | |
| Region | <ul style="list-style-type: none"> - International - National - Regional Or State |
| Lead Agencies | World Business Council |

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| Name | Adapting Atlantic Canadian Fisheries to Climate Change (2013) |
| Description | Developed in the context of the Ecology Action Centre Climate Change Adaptation Project in Cheticamp, Cape Breton, this 8-page working document was created to encourage the fishing community to discuss and exchange information on how climate change may impact the industry and how some are adapting to this change. |
| Type | - PRODUCTS: Engagement |
| Sector | <ul style="list-style-type: none"> - Managed Ecosystems - Economic Resources |
| Focus Area | - Sustainability of Marine Ecosystems |
| Region | |

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| Lead Agencies | Ecology Action Centre Canada's Rural Partnership |
| Contacts | www.climatefishblog.com |

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| Name | Adapting to a Changing Climate in Nova Scotia: Vulnerability Assessment and Adaptation Options (2005) |
| Description | This report identifies Nova Scotia's vulnerabilities to climate change and priorities for climate adaptation, laying the groundwork for a climate change action plan (see the subsequent plan at http://www2.gnb.ca/content/dam/gnb/Departments/env/pdf/Climate-Climatiques/ClimateChange%20AdaptationStrategyAtlanticCanada.pdf). |
| Type | |
| Sector | - Managed Ecosystems - Social and Cultural Resources - Economic Resources |
| Focus Area | |
| Region | |
| Lead Agencies | Nova Scotia Department of Energy Nova Scotia Department of Environment and Labour |

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| Name | Adapting to Climate Change: A Planning Guide for State Coastal Managers |
| Description | The Planning Guide for State Coastal Managers was developed in response to a request from state coastal managers to NOAA to develop guidance for adaptation in the coastal zone. The goal of this document is to help state coastal managers be organized and have the tools available to address climate change impacts in the coastal zone. To do this, this guidance document provides steps to developing and implementing an adaptation plan from forming a planning team to implementing the actions in the plan. The document includes chapters on climate impacts, planning process, vulnerability assessment, adaptation strategy, plan implementation and maintenance. It includes appendices on funding sources, federal laws and executive orders, and regional climate summaries. |
| Type | - PRODUCTS: Training and Capacity Building - PRODUCTS: Management Guidance (i.e. structured decision making) |
| Sector | - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Recreation and Tourism |

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|---------------|---|
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | <ul style="list-style-type: none"> - National - Regional Or State -- New England -- Mid-Atlantic -- Great Lakes -- South East |
| Lead Agencies | NOAA Office of Ocean and Coastal Resource Management |

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| Name | Adapting to Climate Change: An Introduction for Canadian Municipalities (2010) |
| Description | This guide, an updated and expanded version of a 2006 booklet by the Canadian Climate Impacts and Adaptation Research Network, provides background on the need for climate change adaptation, key ingredients for adaptation planning, and case studies that illustrate how municipal decision-makers and staff can put in place climate change adaptation measures. |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Training and Capacity Building |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Cross Disciplinary |
| Focus Area | |
| Region | |
| Lead Agencies | Public Works and Government Services Canada PWGSA) |
| Contacts | droitdauteur@pwgsc-tpsgc.gc.ca. |

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| Name | Adapting to Coastal Climate Change: A Guidebook for Development Planners |
| Description | Adapting to Coastal Climate Change: A Guidebook for Development Planners, provides a detailed treatment of climate concerns and adaptation options in coastal areas. The document is both a tool and a link to other resources for assessing vulnerability, developing and implementing adaptation, and integrating options into programs, plans, and projects. |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Training and Capacity Building |
| Sector | <ul style="list-style-type: none"> - Infrastructure - Natural Ecosystems - Economic Resources - Recreation and Tourism |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) |
| Region | <ul style="list-style-type: none"> - National |
| Lead Agencies | Climate Frontlines, USAID |

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| Contacts | Richard Volk (Water team) or John Furlow (Climate Program), climatechange@USAID.gov or Pam Rubinoff, URI Coastal Resources Center, climatechange@crc.uri.edu |
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| Name | Advanced Circulation Model for Oceanic, Coastal, and Estuarine Waters |
| Description | The Advanced Circulation Model for Oceanic, Coastal, and Estuarine Waters (ADCIRC) is a hydrodynamic model, which means it projects the motion of water. It can be used to model (in two or three dimensions) tide and wind driven circulation, to project storm surge and flooding, and for other applications. The model can also be used to predict wave height and run-up, particularly when seamless bathymetric and topographic data are available |
| Type | - PRODUCTS: Other |
| Sector | |
| Focus Area | |
| Region | - National |
| Lead Agencies | NOAA |

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| Name | Advancing Statewide Climate Change Adaptation Strategies: Lessons from State and Local Governments Addressing the Impacts of Climate Change |
| Description | Advancing Statewide Climate Change Adaptation Strategies: Lessons from State and Local Governments Addressing the Impacts of Climate Change compares and draws lessons from the comprehensive climate change adaptation efforts conducted by Alaska, California, Florida, Maryland, New Hampshire, Oregon, and Virginia. The study systematically compares the climate change adaptation documents, evaluating the breadth of contents within each plan such as the climate change impacts included, the resource-based sectors addressed, and the specific plan elements. In addition to what the documents include, the study identifies the specific courses of action chosen by states to pursue future adaptation. |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Other |
| Sector | - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Social and Cultural Resources - Economic Resources - Recreation and Tourism - Cross Disciplinary |
| Focus Area | |

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| Region | - National - Regional Or State -- New England -- Mid-Atlantic |
| Lead Agencies | The Center for Climate Action |

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| Name | Agricultural Adaptation Strategy for the Tantramar Region (2011) |
| Description | A study funded by the New Brunswick Regional Adaptation Collaborative (RAC) for the Sackville area examined flood risk areas and possible adaptation and mitigation options, including a section on agricultural production. Much of the agricultural land in the Tantramar region is in low-lying dyked land in the direct path of storm surges and sealevel rise. The report includes flood risk maps indicating agricultural land that would be affected by storm events, and additional map scenarios. |
| Type | |
| Sector | - Managed Ecosystems |
| Focus Area | |
| Region | |
| Lead Agencies | Atlantic Canada Adaptation Solutions Association |
| Contacts | Climate Change Secretariat, New Brunswick Department of the Environment env-info@gnb.ca |

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| Name | America's Climate Choices |
| Description | As part of its most comprehensive study of climate change to date, the National Research Council issued three reports emphasizing why the U.S. should act now to reduce greenhouse gas emissions and develop a national strategy to adapt to the inevitable impacts of climate change. The reports are part of a Congressionally-requested suite of five studies known as America's Climate Choices. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Economic Resources - Recreation and Tourism - Cross Disciplinary |
| Focus Area | - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |

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| Region | - International |
| Lead Agencies | National Research Council |

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| Name | An Evaluation of Flood Risk to Infrastructure across the Chignecto Isthmus |
| Description | With sea-level rise (SLR) estimates of 1 to 5 m predicted for the Chignecto Isthmus by 2100, and more intense storms another likely consequence of climate change, Nova Scotia Transportation and Infrastructure Renewal (NSTIR) has real concerns for protecting the significant public infrastructure that it has to manage. Flood modeling using a new high-resolution digital elevation model (Lidar-DEM) of the Isthmus terrain between the upper Bay of Fundy and the Northumberland Strait clearly shows (1) critically low segments within agricultural dykes in NS and NB that would flood during storm surges that coincide with high tides,(2) dyke overtopping at these low areas and flooding of portions of the Canadian National Railway and Trans-Canada Highways(delays in inter-provincial and international trade with a value of \$50 million per day), (3) extensive flooding of local roads and protected dykelands, and (4) salt water damage to agricultural lands and the many non-agricultural, public and private assets (with more than ten times the value of agricultural assets according to recent estimates from NS Agriculture). |
| Type | |
| Sector | - Infrastructure - Economic Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | |
| Lead Agencies | Atlantic Climate Adaptation Solutions Association Nova Scotia Department of Transportation and Infrastructure Renewal (NSTIR) |

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| Name | An Introduction to Climate Change: A Canadian Perspective (2005) |
| Description | Chapters 1 to 4 of the report summarize our current scientific understanding of climate change and its global impact. The data in these chapters have been derived primarily from the reports of the Intergovernmental Panel on Climate Change (particularly the third assessment report released in 2001) and key scientific papers published in the international peer reviewed literature in recent years. The Panel's reports represent the most recent and comprehensive assessments of the issue by the international scientific community. Chapter 5 examines the many possible impacts of a warmer climate on Canada. Much of the information in this chapter is derived from related national assessments. In conclusion, Chapter 6 examines what must be and is being done to respond to this important issue. |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Engagement |

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| Sector | - Managed Ecosystems - Natural Ecosystems |
| Focus Area | - Changes in Extremes of Weather and Climate |
| Region | |
| Lead Agencies | Environment Canada |

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| Name | Analytical Modeling of Saltwater Intrusion: Tests from NS and the Eastern US |
| Description | Abstract: Need has arisen to develop a simple method to assess the risk of seawater intrusion (SWI) for the purpose of managing fresh groundwater resources in coastal areas. An investigation was completed to assess the ability of the two-dimensional analytical solution from Strack (1976) to evaluate the risk of saltwater intrusion to a pumping well under a variety of aquifer conditions in Nova Scotia and the eastern United States. Strack's solution provides a simple, physically based method of comparing the relative risk of SWI based on the relationship between aquifer properties, but is not reliable for predicting saltwater intrusion in pumping wells |
| Type | |
| Sector | - Infrastructure |
| Focus Area | - Climate Impacts on Water Resources |
| Region | |
| Lead Agencies | Nova Scotia Department of Natural Resources Francis St. Xavier University |

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| Name | Annual & seasonal animation model (in development) |
| Description | The goals of CCCSN are: - Support climate change impact and adaptation research in Canada and other countries; - Support stakeholders requiring scenario information for decision-making and policy development; - Provide access to the work of AIRS, an Environment Canada research group under the auspices of the Atmospheric Science and Technology Directorate; and - Provide access to Canadian research on the development of scenarios and adaptation research. |
| Type | - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Viewers and Web-based Tools |
| Sector | |
| Focus Area | |
| Region | |
| Lead Agencies | Environment Canada Canadian Climate Change Scenarios Network |

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| Name | Annual floods in New England (USA) and Atlantic Canada: synoptic climatology and generating mechanisms |
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| Description | From the Abstract: New England and Atlantic Canada are characterized by mixed flood regimes that reflect different storm types, antecedent land surface conditions, and flood seasonality. Mixed flood regimes are known to complicate flood risk analyses, yet the synoptic climatology and precipitation mechanisms that generate annual floods in this region have not been described in detail. We analyzed a set of long-term annual flood records at climate-sensitive stream gauges across the region and classified the synoptic climatology of each annual flood, quantitatively describing the precipitation mechanisms, and characterize flood seasonality. We find that annual floods here are dominantly generated by Great Lakes-sourced storms and Coastal lows, known locally as 'nor'easters.' Great Lakes storms tend to be associated with lower magnitude annual floods (<75th percentile) and Coastal lows are more clearly associated with higher magnitude events (>75th percentile). Tropical cyclones account for few of all annual floods, including extreme events, despite causing some of the region's largest and most destructive floods. Late winter/early spring is when the greatest number of annual floods occur region wide, and rainfall is the dominant flood-producing mechanism. Rainfall in combination with snowmelt is also important. Both mechanisms are expected to be impacted by projected regional climate change. We find little evidence for associations between flood-producing synoptic storm types or precipitation mechanisms and large-scale atmospheric circulation indices or time periods, despite upward trends in New England annual flood magnitudes. To more completely investigate such associations, partial duration flood series that include more floods than just the largest of each year, and their associated synoptic climatologies and precipitation mechanisms, should be analyzed. |
| Type | - DATA: In situ Observations |
| Sector | - Cross Disciplinary |
| Focus Area | - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate |
| Region | - Regional Or State -- New England |

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| Name | Anticipatory Planning for Sea-Level Rise Along the Coast of Maine |
| Description | Anticipatory Planning for Sea-Level Rise Along the Coast of Maine constitutes Maine's first systematic assessment of its vulnerability to a change in shoreline position as a result of accelerated sea-level rise associated with global climate change. The report was prepared as a State-University cooperative project by the Marine Law Institute of the University of Maine School of Law, the Maine Geological Survey, and the Maine State Planning Office (EPA funded report). |

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| Type | <ul style="list-style-type: none"> - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Engagement - PRODUCTS: Viewers and Web-based Tools - PRODUCTS: Management Guidance (i.e. structured decision making) - PRODUCTS: Regulatory/ Policy Guidance |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- New England |
| Lead Agencies | Marine Law Institute of the University of Maine School of Law, the Maine Geological Survey, and the Maine State Planning Office |

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| Name | An Adaptation Portfolio for the United States Coastal and Marine Environment |
| Description | This paper describes a portfolio of adaptation policies. Adaptation policies are defined as "the actions taken to enhance the resilience of human and natural systems to the effects of climate change and variability for marine and coastal environments within the United States and its territories." For each policy, the paper includes questions related to the applicability of the policy to specific locations and scales, timing, and other questions related to implementing policies. The paper also includes information on climate impacts to coasts and marine ecosystems. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Managed Ecosystems - Natural Ecosystems - Biota |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - National |
| Lead Agencies | Resources for the Future |
| Contacts | David Kling, Department of Agricultural and Natural Resource Economics, University of California, Davis; kling@primal.ucdavis.edu |

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| Name | Application of Ecological and Economic Models of the Impacts of Sea-Level Rise to the Delaware Estuary |
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| Description | The report describes a new approach to climate adaptation planning that draws from the assessment of natural resource damages associated with oil spills and other episodic events. The analytic framework couples the wetland change modeling in SLAMM (Sea Level Affecting Marshes Model) with traditional damage assessment methods via habitat equivalency analysis (HEA). The report estimates gains and losses in the ecological service flows provided by coastal habitats as well as the type and size of projects necessary to maintain current wetland services. Potentially, these projects can be either restoration of degraded habitats or preventative measures taken to avoid future loss. The framework in the report can be used for identifying and valuing the cost of efforts to address potential changes in wetlands habitats |
| Type | - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | U.S. Environmental Protection Agency and Partnership for the Delaware Estuary |
| Contacts | Partnership for the Delaware Estuary, Info@DelawareEstuary.org, 302-655-4990 |

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| Name | Application of the Sea Level Rise Affecting Marsh Model (SLAMM) Using High Resolution Data At Prime Hook National Wildlife Refuge |
| Description | Prime Hook NWR is in the process of updating its Comprehensive Conservation Plan. Part of the refuge are coastal impoundments that are threatened by sea-level rise and storms. As a part of this update, the Refuge is integrating climate change into its management alternatives. To do so, the NWR is using the Sea-Level Rise Affecting Marshes Model. The Delaware Coastal Programs assisted the Refuge in using the model to predict the land cover changes due to sea level rise. This report includes a description of the model, the results of the modeled scenarios, and an explanation of the deviations from a similar modeling effort done for the region. |
| Type | - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Other |
| Sector | - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | U.S. Fish and Wildlife Agency |
| Contacts | Robert W. Scarborough, Ph.D., DNREC, DSWC, Delaware Coastal Programs, Bob.Scarborough@state.de.us |

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| Name | Application of the Sea-Level Affecting Marshes Model (SLAMM 5.1) to Target Rock National Wildlife Refuge |
| Description | The Sea-Level Rise Affecting Marshes Model (SLAMM) was applied to Target Rock National Wildlife Refuge (NWR) in an effort to address the potential effects of sea level rise on United States national wildlife refuges. Most Region 8 NWRs were analyzed. This analysis was done to help with development of the NWF's comprehensive conservation plan and other |
| Type | - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | U.S. Fish and Wildlife Agency |
| Contacts | Brian Czech, Conservation Biologist, U. S. Fish and Wildlife Service, National Wildlife Refuge System, Brian_Czech@fws.gov |

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| Name | Applying the NatureServe Climate Change Vulnerability Assessment to Natural Heritage Resources in Virginia |
| Description | Zoologists and Botanists at the Virginia Department of Conservation and Recreation – Division of Natural Heritage identified 40 species (20 plant species and 20 animal) to assess for their predicted responses to climate change stressors using NatureServe's Climate Change Vulnerability Index. This tool consists of a programmed in a Microsoft Excel workbook; uses downscaled climate predictions provided by the Climate Wizard; requires knowledge about current distribution and natural history of the species being assessed; predicts whether a species will decline, remain stable, or increase in numbers or distribution within an assessment area; identifies key factors associated with vulnerability for assessed species; and is complementary to NatureServe Conservation Status Ranks (assessment factors do not overlap). The Index uses a scoring system that integrates a species' predicted exposure to climate change within an assessment area and three sets of factors associated with climate change sensitivity, each supported by published studies: 1) indirect exposure to climate change, 2) species specific factors (including dispersal ability, temperature and precipitation sensitivity, physical habitat specificity, interspecific interactions, and genetic factors), and 3) documented response to climate change. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Biota |
| Focus Area | - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |

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| Lead Agencies | Virginia Department of Conservation and Recreation – Division of Natural Heritage |
| Contacts | Anne Chazal, Virginia Department of Conservation and Recreation, anne.chazal@dcr.virginia.gov |

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| Name | Aquatic Ecosystems, Water Quality, and Global Change: Challenges of Conducting Multi-stressor Global Change Vulnerability Assessments |
| Description | This report investigates the issues and challenges associated with identifying, calculating, and mapping indicators of the relative vulnerability of water quality and aquatic ecosystems, across the United States, to the potential impacts of global change. Using a large set of environmental indicators drawn from the scientific and management literature, this final report explores the conceptual and practical challenges associated with using such indicators to assess how the resilience of ecosystems and human systems may vary as a function of existing stresses and maladaptations. The focus is on aquatic systems, including marine and coastal. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Managed Ecosystems - Natural Ecosystems - Biota |
| Focus Area | - Sustainability of Marine Ecosystems - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - National |
| Lead Agencies | U.S. Environmental Protection Agency, Global Change Research Program |
| Contacts | Chris Weaver, U.S. Environmental Protection Agency, weaver.chris@epa.gov |

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| Name | ARTificial Intelligence for Ecosystem Services (ARIES) |
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| Description | ARIES was designed to make land use policy and environmental decisions easier and more effective by helping users map and quantify environmental assets and the factors that influence their value. ARIES allows users to model and quantify the impacts of landscape feature changes on the provision of ecosystem services, thereby allowing the evaluation and comparison of alternative scenarios for climate change, land use, or land cover scenarios and policies for addressing them. Modeling the flow of ecosystem services from their source to use locations allows critical pathways (and their intersections) to be identified that are necessary for one or more services to travel across time and space. This information can be used to establish sensible and sustainable policies for governing land development, habitat protection, and ecosystem restoration efforts. ARIES can be used in any geographical area to explicitly map the linkages between ecosystems that provide services and particular groups of human beneficiaries. Additionally, the ARIES platform fills a void in current methodologies for quantifying ecosystem services through its use of semantic modeling and the inclusion of Bayesian and artificial intelligence techniques |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Viewers and Web-based Tools |
| Sector | |
| Focus Area | |
| Region | <ul style="list-style-type: none"> - National - Regional Or State -- New England -- Mid-Atlantic -- Central - - Great Lakes -- South East |
| Lead Agencies | The ARIES Consortium |
| Contacts | info@ariesonline.org |

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| Name | Assessing Future Risk: Quantifying the Effects of Sea Level Rise on Storm Surge Risk for the Southern Shores of Long Island, New York |
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| Description | <p>Abstract: Sea level rise threatens to increase the impacts of future storms and hurricanes on coastal communities. However, many coastal hazard mitigation plans do not consider sea level rise when assessing storm surge risk. Here we apply a GIS-based approach to quantify potential changes in storm surge risk due to sea level rise on Long Island, New York. We demonstrate a method for combining hazard exposure and community vulnerability to spatially characterize risk for both present and future sea level conditions using commonly available national data sets. Our results show that sea level rise will likely increase risk in many coastal areas and will potentially create risk where it was not before. We find that even modest and probable sea level rise (.5 m by 2080) vastly increases the numbers of people (47% increase) and property loss (73% increase) impacted by storm surge. In addition, the resulting maps of hazard exposure and community vulnerability provide a clear and useful example of the visual representation of the spatial distribution of the components of risk that can be helpful for developing targeted hazard mitigation and climate change adaptation strategies. Our results suggest that coastal agencies tasked with managing storm surge risk must consider the effects of sea level rise if they are to ensure safe and sustainable coastal communities in the future.</p> |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Infrastructure - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | The Nature Conservancy |
| Contacts | Christine Shepard, The Nature Conservancy, University of California - Santa Cruz, cshepard@tnc.org |

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| Name | Assessing the Impact of Saltwater Intrusion in the Carolinas under Future Climatic and Sea Level Conditions |
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| Description | From the Executive Summary: "The goal of this research is to support coastal decision-makers in North Carolina and South Carolina by providing information about potential future precipitation and sea level conditions under increased climate variability and by examining how industries, community water and sewer districts, and coastal resource managers might adapt to future changes in the freshwater supply. To this end, scientists from the Carolinas Integrated Sciences and Assessments (CISA), United States Geological Survey (USGS) South Carolina Water Science Center, and Advanced Data Mining International (ADMi) investigated the threat of saltwater intrusion in the Yadkin-Pee Dee River (YPDR) basin under conditions influenced by ongoing and future climatic change, with an emphasis on changes in the frequency and duration of saltwater intrusion events with increasing sea levels. In addition, project leaders enhanced a decision support system (DSS) that is relevant and user-friendly to incorporate planning for future coastal climate change. Of central focus in this study was the ever-present need to address how humans will respond to ongoing and future changes in our environment, particularly under climatic regimes that may not have been felt by present society." |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Training and Capacity Building |
| Sector | - Public Health and Safety - Infrastructure - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources |
| Region | - Regional Or State -- South East |
| Lead Agencies | Carolinas Integrated Sciences (CISA) and Assessments and South Carolina Sea Grant Consortium |

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| Name | Assessing the Vulnerability of Key Habitats in New York: A Foundation for Climate Adaptation Planning (2013) |
| Description | Recognizing that climate change is already affecting ecological systems in New York, the National Wildlife Federation (NWF) in cooperation with New York's Division of Fish, Wildlife and Marine Resources (DFWMR) conducted a statewide habitat vulnerability assessment in an effort to evaluate the vulnerability of New York's primary habitats. The assessment focused on upland systems that together cover 65 to 70% of the total land area in New York. The assessment was focused on addressing a series of important questions about vulnerability: which habitats are likely to be most vulnerable; to what extent will non-climate stressors contribute to their vulnerability; and for which habitats might it be most feasible, operationally and economically, to reduce these vulnerabilities? This report includes a comprehensive evaluation of the impacts of climate change on a suite of macro-level New York habitats, and an overview of adaptation strategies that serve to increase the adaptive capacity and/or resiliency of several target species and habitats. |

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| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Management Guidance (i.e. structured decision making) - PRODUCTS: Regulatory/ Policy Guidance |
| Sector | - Natural Ecosystems - Biota |
| Focus Area | - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | National Wildlife Federation, New York State Department of Environmental Conservation |

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| Name | Assessing Vulnerability and Risk of Climate Change Effects on Transportation Infrastructure – Hampton Roads Virginia Pilot |
| Description | This report results from one of the Federal Highway Administration's 2011-2012 climate change impact pilot projects. Hampton Roads, VA, is highly vulnerable to sea level rise impacts, and was chosen as a site to test the conceptual framework developed by FHWA; the framework helps assess these risks and establish priorities for long-term transportation planning. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Infrastructure |
| Focus Area | - Changes in Extremes of Weather and Climate |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | VDOT, UVA, Center for Transportation Studies, Virginia Center for Transportation Innovation & Research (VCTIR), Hampton Roads Planning District Commission (HRPDC), Hampton Roads Transportation Planning Organization |
| Contacts | Rebecca Lupes, U.S. DOT, rebecca.lupes@dot.gov |

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| Name | Assessment of Infrastructure Relevant to the Fishing and Aquaculture Industries |
| Description | This report describes the social and economic value of infrastructure relevant to Nova Scotia's fishery and aquaculture industries (valued at the time of writing at more than \$500 million); an inventory of infrastructure relevant to the fishery and aquaculture industries and climate change risks and vulnerabilities of this infrastructure; means of assessing that vulnerability and an inventory of specific approaches that can be used consistently as a tool by Nova Scotia's DFA to address that vulnerability. |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Training and Capacity Building |
| Sector | - Managed Ecosystems - Economic Resources |

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| Focus Area | - Sustainability of Marine Ecosystems |
| Region | |
| Lead Agencies | Atlantic Climate Adaptation Solutions Association Nova Scotia Department of Fisheries & Aquaculture |

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| Name | Assessment of Intraseasonal to Interannual Climate Prediction and Predictability |
| Description | International Research Institute for Climate & Society 2010 Report "Assessment of Intraseasonal to Interannual Climate Prediction and Predictability". Intraseasonal to interannual (ISI) climate forecasts make up the middle ground between what you might think of as a classic weather forecast — one that typically looks out over the next several days — and global climate change simulations that look at trends in long-term climate out to the end of the 21st century. More specifically, ISI forecasts focus on weekly, monthly, seasonal, and annual timescales. These timescales are important for planning in sectors like water resource management, agriculture, and energy. |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Hindcasts (climatologies, models) - PRODUCTS: Forecasts and outlooks (monthly to annual, models) - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) |
| Sector | |
| Focus Area | |
| Region | <ul style="list-style-type: none"> - International - National - Regional Or State |
| Lead Agencies | International Research Institute for Climate & Society 2010 Report |

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| Name | Assessment of LIDAR for Simulating Existing and Potential Future Marsh Conditions in Casco Bay |
| Description | "For this project, the Maine Geological Society (MGS) simulated the impacts of sea level rise on tidal inundation levels, and also used tidal elevations as proxies for existing coastal wetland boundaries. These tidal elevations were calculated by MGS using NOAA NOS Tide Charts (NOS, 2009a), and benchmark data sheets for Portland, Maine (NOS, 2009b). LIDAR raster data was used to create simulations of both existing marsh conditions, and potential future marsh conditions after sea level rise. Analysis was done for Cousins River, Yarmouth; BAcK Cove, Portland; and Thomas Bay, Brunswick. " |

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| Type | - DATA: Depth and Elevation Data - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Maps (Imagery, geo-referenced data) |
| Sector | - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- New England |
| Lead Agencies | Casco Bay Estuary Partnership and Maine Geological Survey |
| Contacts | Peter A. Slovinsky, Coastal Geologist, Stephen M. Dickson, Marine Geologist |

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| Name | Assessment of the Impacts of Global Change on Regional U.S. Air Quality: A Synthesis of Climate Change Impacts on Ground-Level Ozone |
| Description | EPA report on the potential impacts of climate change on regional U.S. air quality was prepared by EPA ORD's Global Change Research Program entitled "Assessment of the Impacts of Global Change on Regional U.S. Air Quality: A Synthesis of Climate Change Impacts on Ground-Level Ozone." Report concludes CC could make U.S. air quality management more difficult, and therefore future air quality management decisions should begin to account for the impacts of CC. |
| Type | |
| Sector | |
| Focus Area | |
| Region | - Regional Or State -- New England |
| Lead Agencies | EPA ORD's Global Change Research Program |
| Contacts | Cynthia Greene, Anne McWilliams |

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| Name | Atlantis Ecosystem Model |
| Description | Current fishery management decisions are based on tactical models (short-term decision-making) that typically omit climate, oceanography, nutrient availability, food web interactions, and other aspects of ecology. Atlantis was developed as a full ecosystem simulation model that incorporates these factors in a spatially explicit way. The model is intended for use as a strategic planning tool (long-term decision-making) that can complement annual cycles of stock assessment and policy decisions by allowing users to test management policies and assessment methods against representations of complex ecosystems. Atlantis is primarily used in fishery applications where it allows users to identify tradeoffs between and among species, fishing gear types, management goals, and the direct and indirect effects of different management policies. Atlantis can also address issues related to marine habitat, nutrients, and biodiversity. |
| Type | - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Viewers and Web-based Tools |

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| Sector | - Managed Ecosystems - Economic Resources |
| Focus Area | - Sustainability of Marine Ecosystems - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - International - National - Regional Or State -- New England -- Mid-Atlantic -- Central - - Great Lakes -- South East |
| Lead Agencies | CSIRO |
| Contacts | Beth Fulton, beth.fulton@csiro.au |

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| Name | Best Management Practices for Climate Change Adaptation in Dykelands: Recommendations for Fundy ACAS Sites |
| Description | This project sought to assess the vulnerability of dykes under provincial jurisdiction in the Upper Bay of Fundy to climate change impacts and provide mitigation and management recommendations for the future. It includes: <ul style="list-style-type: none"> - An analysis of best practices using information from Nova Scotia, New Brunswick and British Columbia; - GIS assessment of individual dyke vulnerability with the Fundy ACAS communities; - Determination of new critical elevations and associated engineering modifications; - An assessment of current and potential future management practices (e.g. maintenance of foreshore, placement of armour rock, creek modifications); and - Recommendations of mitigation strategies and recommendations of coastal engineering practices to protect existing foreshore marsh. |
| Type | |
| Sector | - Infrastructure - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - International |
| Lead Agencies | Atlantic Canada Adaptation Solutions Association St. Mary's University |

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| Name | BioMap2: Conserving the Biodiversity of Massachusetts in a Changing World |
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| Description | <p>To capture all the elements of biodiversity, BioMap2 approaches the conservation of Massachusetts' biological resources at multiple scales. Thus, BioMap2 combines hundreds of individual pieces of geospatial data about the state's species, ecosystems, and landscapes.</p> <p>These elements of biodiversity falls into one of two complementary categories, Core Habitat and Critical Natural Landscape. Core Habitat identifies key areas to ensure the long-term persistence of species of conservation concern, exemplary natural communities, and intact ecosystems across the Commonwealth. The specific subcomponents of Core Habitat are: Species of Conservation Concern; Priority Natural Communities; Forest Core ; Aquatic Core; Wetland Core; and Vernal Pool Core. Critical Natural Landscape identifies larger landscape areas that are better able to support ecological processes, disturbances, and wide-ranging species. The specific subcomponents of Critical Natural Landscape are: Landscape Blocks; Foraging Habitat for Tern Species; Upland Buffers of Wetland Core; Upland Buffers of Aquatic Core; and Upland Habitat to Support Coastal Adaptation. BioMap2 Core Habitat and Critical Natural Landscape overlap in many locations. Together, Core Habitat and Critical Natural Landscape identify 2.1 million acres that are key to the protection of our state's biodiversity.</p> <p>The two elements of the BioMap2 protection strategy have a varied interplay across the Commonwealth. At times, the elements that drive the focused delineation of Core Habitat are nested within a buffer of Critical Natural Landscape. In other locations, Core Habitat or Critical Natural Landscape stands alone, taking the lead in identifying locations that warrant protection for specific elements of biodiversity or for the protection of larger ecological functions.</p> |
| Type | - PRODUCTS: Viewers and Web-based Tools |
| Sector | <ul style="list-style-type: none"> - Managed Ecosystems - Natural Ecosystems - Biota |
| Focus Area | - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- New England |
| Lead Agencies | Massachusetts Division of Fish and Wildlife |
| Contacts | natural.heritage@state.ma.us |

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| Name | BLACK CARBON: A Science/Policy Primer |
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| Description | Over the last decade, a growing body of evidence indicates that soot and smoke from incomplete combustion are major contributors to climate change. Black carbon, a soot component, is a potent climate driver that absorbs sunlight in the atmosphere, changes rainfall patterns, and when deposited on snow and ice, accelerates melting. In addition, soot can cause direct effects on health and agriculture. Climate and other effects of soot are magnified in broad regions where the strongest source emissions occur, but transported soot is also a major concern in the Arctic. The short atmospheric lifetime of soot particles also means that emissions reductions produce nearly immediate results, in contrast to most greenhouse gases (GHGs). |
| Type | |
| Sector | - Public Health and Safety |
| Focus Area | - Changes in Extremes of Weather and Climate |
| Region | - National |
| Lead Agencies | PEW Center on Global Climate Change |

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| Name | Bombay Hook Hydrology/ Sediment Movement Study |
| Description | <p>From the September 2011 Compendium: Coastal areas and natural resources are particularly vulnerable to climate change, especially with respect to accelerated sea level rise, shoreline erosion, increased storm frequency and intensity, changes in rainfall, and related flooding among other potential impacts. Investigation of such impacts, specifically marsh depletion and increased mudflats at Bombay Hook, will be conducted to determine patterns of sediment flux in or out of the depleted marsh area. Data collection will involve conducting river transects within the Leipsic River using the Acoustic Doppler Current Profiler (ADCP) and associated software to collect and process tide and current data. Water quality will also be monitored, specifically total sediment solids (TSS) to aid in determining sediment fluxes in or out of the depleted marsh area.</p> <p>This study will result in a written report that includes a summary of results; discussion of data analysis and statistical procedures. Results will be used to predict future changes in marsh depletion and to help determine marsh management techniques to counteract these impacts affecting the tidal marshes at Bombay Hook.</p> |
| Type | - DATA: Surveys and Preliminary Assessments |
| Sector | - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | DNREC Delaware Coastal Programs, US Fish and Wildlife Service |

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| Name | Broad-scale Climate Influences on Cod (<i>Gadus morhua</i>) Recruitment on Georges Bank |
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| Description | Published in 2011 in ICES Journal of Marine Science. Summarized from the abstract: The North Atlantic Oscillation (NAO) and Atlantic Multidecadal Oscillation (AMO) (indices of atmospheric variability and long-term sea surface temperature, respectively) were used to develop a model examining climate influences on Georges Bank cod recruitment. A simple Cushing-type model was developed, and then expanded to include climate influences. The resulting auto-regressive-integrative-moving average (ARIMA) type model (ARIMAX) produced reliable forecasts, and it is recommended that it be implemented in short term prediction for Georges Bank cod assessments and forecasts, as well as management strategies. |
| Type | - PRODUCTS: Hindcasts (climatologies, models) - PRODUCTS: Forecasts and outlooks (monthly to annual, models) |
| Sector | - Managed Ecosystems |
| Focus Area | - Sustainability of Marine Ecosystems |
| Region | - Regional Or State -- New England |
| Lead Agencies | Federal Research Institute for Rural Areas, Institute for Sea Fisheries; NOAA NMFS (National Marine Fisheries Service) |

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| Name | Building a Resilient Coast: Maine Confronts Climate Change |
| Description | Working together, Maine and Oregon Sea Grant Programs created the documentary video, Building a Resilient Coast. The video's five segments provide coastal property owners and municipalities to the opportunity to hear and see what their neighbors, municipal officials and climate experts say about storm events, coastal flooding and erosion; what these events may mean for them, and what they can do about it. The video is available online or on DVD through Maine Sea Grant. The video was created as part of a larger project where Maine Sea Grant and Maine Cooperative Extension with funding from NOAA conducted a study over 2007 and 2008 to survey and conduct focus groups of property owners, municipal officials, and recreationists to determine barriers and benefits that coastal property owners and municipal officials face in taking action to prepare for impacts from coastal storms, flooding, and erosion. |
| Type | - PRODUCTS: Other - PRODUCTS: Engagement - PRODUCTS: Education - PRODUCTS: Training and Capacity Building |
| Sector | - Infrastructure - Social and Cultural Resources - Economic Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate |
| Region | - Regional Or State -- New England |

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| Lead Agencies | Maine Sea Grant |
| Contacts | Kristen Grant, Marine Extension Associate, Maine Sea Grant, 207.646.1555 x115, kngrant@maine.edu |

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| Name | Building Adaptive and Resilient Communities Tool |
| Description | The Building Adaptive & Resilient Communities (BARC) online tool offers municipal adaptation and resilience information and data for communities using ICLEI's municipal adaptation methodology. With a username/password, municipal users have access to Milestone One of the Tool, allowing them to set the context for an adaptation plan. The Tool helps set up the fundamental building blocks of a significant municipal adaptation effort. |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Engagement - PRODUCTS: Training and Capacity Building |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Cross Disciplinary |
| Focus Area | |
| Region | - International |
| Lead Agencies | ICLEI Canada: Local Governments for Sustainability |

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| Name | Building Human Resilience: The Role of Public Health Preparedness and Response as an Adaptation to Climate Change |
| Description | <p>Global climate change will increase the probability of extreme weather events, including heatwaves, drought, wildfire, cyclones, and heavy precipitation that could cause floods and landslides. Such events create significant public health needs that can exceed local capacity to respond, resulting in excess morbidity or mortality and in the declaration of disasters. Human vulnerability to any disaster is a complex phenomenon with social, economic, health, and cultural dimensions. Vulnerability to natural disasters has two sides: the degree of exposure to dangerous hazards (susceptibility) and the capacity to cope with or recover from disaster consequences (resilience). Vulnerability reduction programs reduce susceptibility and increase resilience. Susceptibility to disasters is reduced largely by prevention and mitigation of emergencies. Emergency preparedness and response and recovery activities--including those that address climate change--increase disaster resilience. Because adaptation must occur at the community level, local public health agencies are uniquely placed to build human resilience to climate-related disasters. This article discusses the role of public health in reducing human vulnerability to climate change within the context of select examples for emergency preparedness and response.</p> |
| Type | - PRODUCTS: Engagement |

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| Sector | - Public Health and Safety - Infrastructure |
| Focus Area | |
| Region | - National - Regional Or State |
| Lead Agencies | National Center for Environmental Health, Agency for Toxic Substances and Disease Registry, CDC |

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| Name | Buzzards Bay Comprehensive Conservation and Management Plan (CCMP) |
| Description | <p>From the website: The Buzzards Bay NEP has updated our landmark 1991 Buzzards Bay Comprehensive Conservation and Management Plan (CCMP), to reflect the progress achieved since that plan was finalized, the many tasks still not completed, as well as new challenges. The updated plan includes new, updated, and reaffirmed goals, objectives, and management solutions to meet the environmental needs for Buzzards Bay and its surrounding watershed into the next decade. The original plan was approved by EPA in 1992.</p> <p>The updated Buzzards Bay watershed management plan is meant to be a blueprint to continue to help guide municipalities and watershed partners in their ongoing efforts to protect and restore water quality and living resources in the bay and surrounding watershed. We believe the update of the Buzzards Bay CCMP is also an excellent opportunity for municipalities to advance local priorities, and to request new measures or support from the state and federal government. While the Buzzards Bay watershed plan is not a regulatory document, the contents of the updated plan will help guide state and federal grants, technical assistance, and policy changes that will affect Buzzards Bay communities for years to come. For these reasons, the review of the new plan warrants the attention of local officials and the public.</p> |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Social and Cultural Resources - Economic Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate |
| Region | - Regional Or State -- New England |
| Lead Agencies | Buzzards Bay National Estuary Program |

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| Name | Canada in a Changing Climate: Sector Perspectives on Impacts and Adaptation |
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| Description | This report provides an up-to-date picture of what climate change means for Canada in a range of sectors, including natural resources, food production, industry, biodiversity, health and infrastructure. It includes an overview of Canada's changing climate and an analysis of adaptation science. Report development involved over 90 authors, 115 expert reviewers and synthesizes over 1500 recent publications. Please follow the link below to access the assessment, which is downloadable by chapter or full report: |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Engagement - PRODUCTS: Training and Capacity Building |
| Sector | - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Cross Disciplinary |
| Focus Area | |
| Region | - National |
| Lead Agencies | Natural Resources Canada |
| Contacts | NRCan Media Relations, Resource6582@NRCan-RNCan.gc.ca |

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| Name | Canadian Communities' Guidebook for Adaptation to Climate Change (2008) |
| Description | Building on the experience Environment Canada's Adaptation and Impacts Research Division (AIRD) has had working with decision-makers on climate and sustainability projects, this guide provides a process linked to on-going planning cycles to help planners, decision-makers, local practitioners and investors reduce climate change impacts and decrease greenhouse gas emissions while advancing sustainable development. |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Training and Capacity Building |
| Sector | - Infrastructure - Cross Disciplinary |
| Focus Area | |
| Region | |
| Lead Agencies | Environment Canada |
| Contacts | Don MacIver, Director Adaptation and Impacts Research Division, Environment Canada don.maciver@ec.gc.ca |

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| Description | A four-page summary containing a Canadian Institute of Planners (CIP) declaration (citing the scientific basis for CIP climate-related policy); a statement of the institute's goals and objectives regarding climate change policy; and policy directives. |
| Type | - PRODUCTS: Other - PRODUCTS: Engagement |
| Sector | - Public Health and Safety - Infrastructure - Cross Disciplinary |
| Focus Area | |
| Region | |
| Lead Agencies | Canadian Institute of Planners |

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| Name | Capacity for Climate Change Adaptation in New Brunswick Municipalities |
| Description | <p>This research project sought to determine current state of concern and knowledge related to climate change in New Brunswick municipalities. A survey (completed by 39 percent of 104 municipalities) inquired about existence of plans and resources; experienced effects of climate change; capacity for adaptation action; and what resources/capacity are needed to cope with climatic changes.</p> <p>While many municipal respondents have seen first-hand effects and recognize climate change is real, most were not overly concerned about most of the impacts of climate change events (although some did express concern over impacts to water. Overall, there was a lack of formal adaptation planning (with most municipal plans not identifying strategies for climate change adaptation). Some of this absence appears related to lack of resources (staff, time, finances). Municipalities stated that climate adaptation planning is, and should be, a collaborative process involving local government, planning commissions, and provincial and federal governments.</p> |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Management Guidance (i.e. structured decision making) |
| Sector | - Public Health and Safety - Infrastructure - Social and Cultural Resources - Economic Resources - Cross Disciplinary |
| Focus Area | |
| Region | |
| Lead Agencies | Rural and Small Town Programme, Mount Allison University Funded by the Environmental Trust Fund |
| Contacts | Rural and Small Town Programme, www.mta.ca/rstp |

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| Name | Casco Bay Workshop on Land Trusts and Climate Change Adaptation Report |
| Description | The workshop on land trusts and climate change adaptation was hosted by the Casco Bay Estuary Partnership (CBEP) for the Climate Ready Estuaries (CRE) Program on November 18, 2010, in Portland, Maine. Fourteen participants attended this workshop, along with CBEP and ICF staff. Workshop participants were associated with several land trusts from across maine and regional organization such as Beginning with Habitat, Manomet Center for Conservation Sciences, Maine Geological Survey, Maine Coast Heritage Trust, and the Maine Land Trust Network. Land trusts at the workshop included Portland Trails (Land Trust for Portland), Portland North Land Trust Collaborative, Western Foothills Land Trust, Loon Echo Land Trust, Harpswell Heritage Land Trust, and Brunswick Topsham Land Trust. The objectives of the workshop were: ""(1) examine the potential impacts of climate change on land trusts; (2) foster discussion that will assist land trusts in incorporating climate change considerations into the planning process; and (3) gather information from the meeting to support a report to the wider Maine land trust community with findings on climate adaptation issues of concern to land trusts, information needs to support land trust climate adaptation planning, and tools to support planning efforts (flow charts, critical questions, ecological goals). |
| Type | - PRODUCTS: Other |
| Sector | - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- New England |
| Lead Agencies | Casco Bay Estuary Partnership |

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| Name | Catalyzing Low Carbon Development? The Clean Technology Fund |
| Description | World Resources Institute Paper "Catalyzing Low Carbon Development? The Clean Technology Fund" This working paper summarizes key innovations and challenges associated with the Clean Technology Fund. It analyzes the first set of clean technology investment plans from Egypt, Mexico, and Turkey, and makes the case for greater emphasis on institutional capacity and governance in measuring program results. |
| Type | |
| Sector | - Public Health and Safety - Infrastructure - Social and Cultural Resources |
| Focus Area | |

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| Region | - International - National |
| Lead Agencies | World Resources Institute |
| Contacts | SMITA NAKHOODA |

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| Name | Century-Scale Series of Annual Precipitation Over the Contiguous United States and Southern Canada |
| Description | Century-Scale Series of Annual Precipitation Over the Contiguous United States and Southern Canada, in CDIAC, Trends '93. The century-long time series of Groisman and Easterling (1994) represent unbiased estimates of annual precipitation amount over the US and S. Canada. |
| Type | - DATA: Observing Systems - PRODUCTS: Hindcasts (climatologies, models) |
| Sector | |
| Focus Area | |
| Region | - International - National - Regional Or State |
| Lead Agencies | NASA-- GCMD |

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| Name | Changing Climate, Changing Communities: Municipal Climate Adaptation Guide and Workbook |
| Description | This guide offers a five-milestone methodology that local governments use in Canada's Partners for Climate Protection (PCP) program. The guide offers a holistic process municipalities can use to investigate climate change impacts and devise specific strategies. |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Training and Capacity Building |
| Sector | - Public Health and Safety - Infrastructure - Economic Resources - Cross Disciplinary |
| Focus Area | |
| Region | |
| Lead Agencies | ICLEI Canada (Local Governments for Sustainability) |

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| Name | Changing spatial distribution of fish stocks in relation to climate and population size on the Northeast United States continental shelf |
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| Description | From the Abstract: We analyzed temporal trends from 1968 to 2007 in the mean center of biomass, mean depth, mean temperature of occurrence, and area occupied in each of 36 fish stocks. Temporal trends in distribution were compared to time series of both local- and large-scale environmental variables, as well as estimates of survey abundance. Many stocks spanning several taxonomic groups, life-history strategies, and rates of fishing exhibited a poleward shift in their center of biomass, most with a simultaneous increase in depth, and a few with a concomitant expansion of their northern range. However, distributional changes were highly dependent on the biogeography of each species. |
| Type | - DATA: In situ Observations - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Managed Ecosystems |
| Focus Area | - Sustainability of Marine Ecosystems - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- New England -- Mid-Atlantic -- South East |
| Lead Agencies | NOAA Northeast Fisheries Science Center |
| Contacts | Jonathan Hare, NOAA NMFS, jon.hare@noaa.gov |

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| Name | Characteristics of the April 2007 Flood at 10 Streamflow-Gaging Stations in Massachusetts |
| Description | This report indicates that a significant increase in the magnitude of floods of a given return interval (e.g., the 100-yr flood) has likely taken place in parts of the Commonwealth over the past several decades. "Characteristics of the April 2007 Flood at 10 Streamflow-Gaging Stations in Massachusetts," (SIR 2009–5068) by Phillip J. Zarriello and Carl S. Carlson. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Public Health and Safety - Infrastructure |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State |
| Lead Agencies | USGS/FEMA |

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| Name | Climate Adaptation Knowledge Exchange (CAKE) |
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| Description | "Climate Adaptation Knowledge Exchange" (CAKE) is a joint project of Island Press and EcoAdapt. It is aimed at building a shared knowledge base for managing natural systems in the face of rapid climate change. CAKE brings together EcoAdapt's recognized leadership in developing the concepts and practices of climate adaptation with Island Press's 27 years as the leading publisher of solutions-based environmental information to offer the most valuable, up-to-date, and authoritative materials on the subject. Just as importantly, it is intended to help build an innovative community of practice. It helps users to get beyond the limitations of their time and the unwieldy thicket of books, papers and articles. |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Hindcasts (climatologies, models) - PRODUCTS: Forecasts and outlooks (monthly to annual, models) - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Recreation and Tourism |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | <ul style="list-style-type: none"> - National - Regional Or State |
| Lead Agencies | Island Press and EcoAdapt |

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| Name | Climate Adaptation Library |
| Description | Climate Adaptation Library developed by Florida Institute of Technology. >650 PDF reports/articles on climate impacts/adaptation; 13 regions; Indexed Google search engine to support topical or geographic searches; Seven languages currently represented, with more pending; A billboard for climate webinars in English and Spanish. |
| Type | - PRODUCTS: Education |

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| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Economic Resources - Recreation and Tourism - Cross Disciplinary - Other |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | <ul style="list-style-type: none"> - National - Regional Or State |
| Lead Agencies | Florida Institute of Technology |

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| Name | Climate Change & Tourism: Impacts and Adaptation for Coastal Communities in Nova Scotia (2012) |
| Description | This two-page factsheet directed toward tourism businesses describes ways that rural and coastal communities may be vulnerable to climate change impacts and opportunities tourism businesses have to prepare for these changes. It outlines benefits of adapting and provides specific measures to consider in response to common threats such as droughts and increased food costs. |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Engagement |
| Sector | <ul style="list-style-type: none"> - Infrastructure - Recreation and Tourism |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources |
| Region | |
| Lead Agencies | Ecology Action Centre Canada's Rural Partnership |
| Contacts | Cheticamp@ecologyaction.ca |

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| Name | Climate Change Adaptation and Canadian Infrastructure (2013) |
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| Description | This report summarizes current literature dealing with the challenge of adapting to climate change in Canada, with a particular focus on the country's infrastructure. Published with support from the Cement Association of Canada, the report is intended to serve as a stimulus for further discussion around planned adaptation to climate change in Canada, with a particular focus on ensuring the viability of critical built infrastructure. The report explores climate impacts and risks to key infrastructure by region and by type. It also introduces a number of key policy, regulatory and financial tools for consideration. |
| Type | |
| Sector | - Infrastructure |
| Focus Area | |
| Region | |
| Lead Agencies | International Institute for Sustainable Development |
| Contacts | www.iisd.org |

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| Name | Climate Change Adaptation Measures for Greater Moncton (2011) |
| Description | The Greater Moncton area is a highly urbanized location with three municipalities that periodically experience both coastal and freshwater flooding in extreme precipitation events. This report seeks to provide the Greater Moncton area with a flood risk assessment based on climate change predictions and recommendations concerning vulnerable infrastructure, adaptation measures and governance structures. |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Training and Capacity Building |
| Sector | - Infrastructure - Cross Disciplinary |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate |
| Region | |
| Lead Agencies | Atlantic Canada Adaptation Solutions Association New Brunswick Department of Environment |
| Contacts | Climate Change Secretariat, New Brunswick Department of the Environment env-info@gnb.ca |

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|-------------|--|
| Name | Climate Change Adaptation Planning: A Handbook for Small Canadian Communities (2011) |
| Description | The purpose of this handbook is to help small Canadian communities to prepare and implement a Climate Change Adaptation Plan (CCAP). While relevant to communities at all scales, it focuses particularly on small Canadian communities that lack in-house planning resources, helping community planners take planning steps and strategic actions. It outlines a six-step process to facilitate community understanding of climate change adaptation planning. |

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| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Training and Capacity Building |
| Sector | - Public Health and Safety - Infrastructure - Managed Ecosystems - Social and Cultural Resources - Economic Resources - Cross Disciplinary |
| Focus Area | |
| Region | |
| Lead Agencies | Natural Resources Canada/Canadian Institute of Planners |

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|-------------|---|
| Name | Climate Change Adaptation Report: Strategic Federal Planning Could Help Government Officials Make More Informed Decisions |
| Description | GAO was asked to examine (1) what actions federal, state, local, and international authorities are taking to adapt to a changing climate; (2) the challenges that federal, state, and local officials face in their efforts to adapt; and (3) actions that Congress and federal agencies could take to help address these challenges. GAO also discusses its prior work on similarly complex, interdisciplinary issues. This report is based on analysis of studies, site visits to areas pursuing adaptation efforts, and responses to a Web-based questionnaire sent to federal, state, and local officials. |
| Type | - PRODUCTS: Management Guidance (i.e. structured decision making) - PRODUCTS: Regulatory/ Policy Guidance |
| Sector | - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Economic Resources - Recreation and Tourism - Cross Disciplinary |
| Focus Area | - Sustainability of Marine Ecosystems - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - National - Regional Or State -- Mid-Atlantic |

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| Lead Agencies | Government Accountability Office |
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| Name | Climate Change Adaptation Strategy for Atlantic Canada (2008) |
| Description | This document outlines the Council of Atlantic Environment Ministers' Commitment to Climate Change Adaptation and means for collaborative work on this issue. This publication includes shared principles and goals, anticipated results and actions, and the proposed structure/governance a Regional Adaptation Collaborative (RAC) among the Atlantic Provinces. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Cross Disciplinary |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - International |

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|---------------|--|
| Name | Climate Change and Biodiversity in Maine: Vulnerability of Habitats and Priority Species (2013) |
| Description | Climate change will affect Maine's ecosystems and biodiversity in many ways. This document summarizes a climate change vulnerability assessment of Maine's wildlife Species of Greatest Conservation Need (SGCN), state-listed Threatened or Endangered plant species, and Key Habitats of the Maine Comprehensive Wildlife Conservation Strategy (ME CWCS). The goals of this assessment were to complete a vulnerability assessment of species and habitats, highlight the relationship between species and vulnerability and 21 ME CWCS Key Habitats, provide information to Maine natural resource managers and policy makers that will help focus conservation action, and facilitate incorporation of climate change information into an upcoming revision of the ME CWCS. The assessment involved over one-hundred biologists assessing the vulnerability of 442 species, and multiple habitat types. |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Engagement - PRODUCTS: Management Guidance (i.e. structured decision making) - PRODUCTS: Regulatory/ Policy Guidance |
| Sector | - Natural Ecosystems - Biota |
| Focus Area | - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- New England |
| Lead Agencies | Manomet Center for Conservation Sciences |

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| Name | Climate Change and Cold Water Fish Habitat in the Northeast: A Vulnerability Assessment (2012) |
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| Description | This analysis attempts to estimate the likely vulnerability of riverine habitat for cold water fish to future climate change in the Northeastern Association of Fish and Wildlife Agencies (NEAFWA) Region. The cold water fish community in this area comprises a number of species, but primarily salmonids, including brook, brown, and rainbow trout, all of which are restricted to waters that are consistently cold (<20oC) and well-oxygenated. The report evaluates potential vulnerability using a formal organizational framework that assumes the vulnerabilities of a species are a function of three main components - their exposure, sensitivity, and adaptive capacity. Throughout their analyses, the authors identify and discuss the major uncertainties that effect vulnerability projections and suggest further work that could reduce such uncertainties. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Natural Ecosystems - Biota |
| Focus Area | - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- New England -- Mid-Atlantic |
| Lead Agencies | Manomet Center for Conservation Sciences, National Wildlife Federation |

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| Name | Climate Change and Conservation: A Primer for Assessing Impacts and Advancing Ecosystembased Adaptation in The Nature Conservancy |
| Description | From the Executive Summary: This primer is intended to provide all Conservancy staff with an introduction to climate impacts and ecosystembased adaptation, a review of basic definitions, updates on new conservation planning approaches that incorporate adaptation, tools and resources to assist in impact analyses and strategy identification, an overview of ecosystembased adaptation in the policy arena, and summary information on adaptation approaches. |
| Type | - PRODUCTS: Training and Capacity Building |
| Sector | - Managed Ecosystems - Natural Ecosystems - Biota |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - National |
| Lead Agencies | The Nature Conservancy |

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| Name | Climate Change and its Effects on Ecosystems, Habitats and Biota |
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| Description | The State of the Gulf of Maine Report is a group of papers providing background information about the Gulf of Maine environment and issue papers discussing challenges identified by the Gulf of Maine Council as high priority. One of two theme papers discussing Climate Change impacts in the report, "Climate Change and its Effects on Ecosystems, Habitats and Biota" presents a discussion of driving forces, current trends, impacts and actions occurring in the Gulf of Maine. Papers included in the report will be updated periodically. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Managed Ecosystems - Natural Ecosystems |
| Focus Area | - Sustainability of Marine Ecosystems - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- New England |
| Lead Agencies | Gulf of Maine Council on the Marine Environment, NOAA |

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| Name | Climate Change and Its Effects on Humans |
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| Description | <p>Accelerated climate change is anticipated to have wide-ranging effects on the future sustainability of the Earth due to adverse ecological, social and economic impacts (Stern 2006; McMullen and Jabbour 2009). The driving force is an increase in the Earth's temperature as a result of human activities (e.g., release of greenhouse gases and changes in landscape characteristics).</p> <p>The Intergovernmental Panel on Climate Change (IPCC) projects a global mean temperature increase of 1.1°C to 6.4°C by 2100, which is likely to affect storms and floods, and lead to a rise in sea level due to the thermal expansion of the oceans and the melting of ice sheets and glaciers (IPCC 2007a). Recent research reports estimate a global sea level rise of between 50 cm and 190 cm from 1990 to 2100 (see Vermeer and Rahmstorf 2009). There are several parts of the Gulf of Maine coast line that are classified as highly sensitive to the impacts of sea level rise because of risks associated with storm events. The physical extent of climate-related impacts will vary depending on regional and local situations (Burtis 2006).</p> <p>Coastal communities in the Gulf of Maine will be impacted in numerous ways, including: health and well-being of communities (e.g., injury, mortality, migration, crime and security); access to services; design and placement of structures (e.g., buildings, bridges, and utilities); cost of living; loss of livelihoods, and the cumulative magnitude of climate change impacts (see Figure 1). Climate change mitigation and adaptation are becoming increasingly important to community management and there are numerous ongoing federal, provincial/state, county,</p> |
| Type | |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Economic Resources - Recreation and Tourism - Cross Disciplinary |
| Focus Area | <ul style="list-style-type: none"> - Sustainability of Marine Ecosystems - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |

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| Region | - International - Regional Or State -- New England |
| Lead Agencies | Gulf of Maine Council |

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| Name | Climate Change and Massachusetts Fish and Wildlife: Volume 2 Habitat and Vulnerability |
| Description | This report is the second product that is part of project carried out by Manomet Center for Conservation Sciences and the Massachusetts Division of Fish and Wildlife to help advance adaptation planning in the state related to the State Wildlife Action Plan. This project was funded by the Wildlife Conservation Society/Doris Duke. This report includes the results of a vulnerability assessment of fish and wildlife and their habitats to climate change. The questions answered in this report include: How do the SWAP-targeted fish and wildlife habitats rank in terms of their likely comparative vulnerabilities to climate change?; How will the representation of these habitats in Massachusetts be altered by a changing climate?; Which vertebrate Species in Greatest Need of Conservation are likely to be most vulnerable to climate change?; and What degree of confidence can be assigned to the above predictions? An expert panel was formed to answer these questions and conduct the assessment and 20 habitats were analyzed. Species of Greatest Conservation Need were also assessed. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Managed Ecosystems - Natural Ecosystems - Biota |
| Focus Area | |
| Region | - Regional Or State -- New England |
| Lead Agencies | Massachusetts Division of Fish and Wildlife, Manomet Center for Conservation Sciences |
| Contacts | John O'Leary, Massachusetts Division of Fish and Wildlife, john.oleary@state.ma.us |

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| Name | Climate Change and Sea Level Rise Information Exchange (Mid-Atlantic Regional Council on the Ocean - MARCO) |
| Description | This white paper profiles current information related to what each state in MARCO (Virginia, Maryland, Delaware, New Jersey, and New York) is undertaking or planning related to climate change and sea-level rise. The paper also includes information on barriers to implementation and what is important for successful climate change adaptation implementation. It also includes links and contact information where available. |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Other |

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| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota |
| Focus Area | <ul style="list-style-type: none"> - Sustainability of Marine Ecosystems - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Mid-Atlantic Regional Council on the Ocean |

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| Name | Climate Change and Shoreline Protection |
| Description | <p>Coastal flooding, erosion, salt marsh migration, sedimentation, and storm damage are all common coastal hazards in Atlantic Canada. Many coastal communities face difficult decisions about protecting infrastructure and residences in the face of sea-level rise and storm surge. What should they abandon? What should they protect? Where will they retreat? What is needed is pro-active or anticipatory adaptive strategies for living with the effects of climate change. This reports focuses on ways to:</p> <ul style="list-style-type: none"> • Consider climate change in coastal management planning; • Adopt strategies (such as retreat) to moderate harm caused by coastal hazards;and • Develop and adopt standards to guide the construction of infrastructure that can handle increasingly severe coastal hazards. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Infrastructure - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | |
| Lead Agencies | Atlantic Climate Adaptation Solutions Association Natural Resources Canada |
| Contacts | Prince Edward Island Department of Environment, Labour and Justice eotaylor@gov.pe.ca |

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| Name | Climate Change and the Chesapeake Bay: State-of-the-Science Review and Recommendations |
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| Description | Excerpt from Executive Summary: The U.S. EPA's Chesapeake Bay Program charged the Scientific and Technical Advisory Committee (STAC) with reviewing the current understanding of climate change impacts on the tidal Chesapeake Bay and identifying critical knowledge gaps and research priorities. This report addresses that charge and provides the basis for incorporating climate change considerations into resource management decisions...The report begins with a summary of knowledge gaps and their implications for the Bay Program in Section I. Section II offers a detailed review of the relevant scientific literature and research. The report concludes with the recommendation to develop and implement a research coordination and support program that addresses the critical issues raised throughout the document. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Chesapeake Bay Program Science and Technical Advisory Committee |
| Contacts | Chris Pyke, U.S. Green Building Council, cpyke@usgbc.org |

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| Name | Climate Change and the Delaware Estuary |
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| Description | The Delaware Estuary watershed and its natural resources will face a variety of challenges with climate change. Due to the many unique features of the Estuary, some aspects of changing climate may not be as severe here as in nearby watersheds and estuaries, whereas other changes may be more important. Since 2008, the Partnership for the Delaware Estuary has engaged experts from throughout the region to conduct an assessment of the vulnerabilities and adaptation options for three key resources of the Delaware Estuary: tidal wetlands, drinking water, and bivalve shellfish. These provide three case studies – a habitat case study, a human/water use case study, and a living resource case study – for looking at climate change impacts and how best to adapt to them here in the Delaware Estuary. These case studies represent the very first step in an adaptation planning process, the goal of which is to ensure the resiliency of this vast and valuable system as climate changes. For all three case studies, the top concerns among experts are the vulnerabilities of key resources to sea level rise and salinity changes, and flooding and precipitation effects. Whereas, many estuaries around the world are concerned with sealevel rise, the vulnerability to salinity rise in the Delaware Estuary is somewhat unique, and especially notable because this system has the world’s largest freshwater tidal prism. Adaptation actions are outlined for each resource as well. |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Engagement |
| Sector | - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Recreation and Tourism |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Partnership for the Delaware Estuary |
| Contacts | Danielle Kreeger, Partnership for the Delaware Estuary, DKreeger@Delaware Estuary.org. |

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| Name | Climate Change Impacts in New Hampshire on Natural Resources and Economy |
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| Description | New Hampshire's social and economic health is predicated in part upon the health of its lakes and rivers, oceans and beaches, mountains, scenic towns, and natural areas. Natural features and aesthetic beauty contribute significantly to New Hampshire's fiber. Global climate change will affect the climate of New Hampshire. Doubling CO2 from pre-industrial levels is predicted to raise global average temperatures between 1.8 F and 6.3 F. Parts of New Hampshire could experience even slightly warmer trends. Higher temperatures may increase extreme events, and we may experience periods of winter thaw followed by intense cold; spring and summer drought; and summer heat stress. |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Engagement - PRODUCTS: Education |
| Sector | - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Economic Resources - Recreation and Tourism - Cross Disciplinary |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- New England |
| Lead Agencies | NH DES |

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| Name | Climate Change in the American Mind: Americans' Climate Change Beliefs, Attitudes, Policy Preferences, and Actions |
| Description | Yale research report, "Climate Change in the American Mind: Americans' Climate Change Beliefs, Attitudes, Policy Preferences, and Actions." The report is based on a nationally representative survey of more than 2,000 Americans conducted in October and November. In short, the study found that even in the midst of the growing economic crisis, over 90 percent of Americans said that the United States should act to reduce global warming, including 34 percent who said the U.S. should make a large-scale effort, even if it has large economic costs. |
| Type | |
| Sector | - Cross Disciplinary |
| Focus Area | |
| Region | - National |
| Lead Agencies | Yale University |

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| Name | Climate Change in the Casco Bay Watershed: Past, Present, and Future |
| Description | From the report: This report describes how the climate of Casco Bay watershed in Maine has changed over the past century and how the future climate of the region is likely to be affected by climate change. To generate future projections for Portland, Farmington, and Lewiston, simulated temperature and precipitation from four climate models were fitted to local, long-term weather observations. Two future scenarios were used for estimated carbon emissions. For the lower emissions scenario, conservation practices and development of renewable energy reduce emissions below those of today by 2100. In the higher emissions scenario, fossil fuels are assumed to remain a primary energy resource, and emissions grow four times the amount of today by 2100. The scenarios describe climate in terms of temperature and precipitation for three future periods: the near-term, 2010-2039, mid-century, 2040-2069, and end-of-century, 2070-2099. All changes are relative to a historical baseline, 1970-1999. " |
| Type | - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Other |
| Sector | |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- New England |
| Lead Agencies | Casco Bay Estuary Partnership |

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| Name | Climate Change in the Piscataqua/Great Bay Region: Past, Present, and Future |
| Description | This report is a detailed assessment of climate change for coastal New Hampshire that describes how the region's climate has changed over the past century, and how climate may change over the course of this century based on different global greenhouse gas emission scenarios. The impacts of our changing climate are already affecting coastal communities. This report provides decision-relevant information on a regional scale to individual, municipal, regional, and state decision-makers. The information compiled in the climate assessment provides the foundation for developing local adaptation plans to a changing climate and this project will disseminate this information to seacoast municipalities. Adaptation can help reduce the vulnerability of both natural and social systems to climate change and variability, and can assist with preparing for and coping with negative impacts. Adapting to a changing climate requires both data and information at a spatial and temporal scale that is relevant to decision making. The information compiled in this climate change assessment report, combined with the NHCAW training programs, will provide the foundation for developing local adaptation planning to a changing climate. |
| Type | - PRODUCTS: Plans, Assessments, Studies |

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| Sector | |
| Focus Area | - Climate Impacts on Water Resources |
| Region | - Regional Or State -- New England |
| Lead Agencies | Carbon Solutions New England, Great Bay NERR, University of New Hampshire |
| Contacts | Steve Miller, Great Bay NERR, steve.miller@wildlife.nh.gov ; Cameron Wake, UNH, Cameron.wake@unh.edu |

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| Name | Climate Change Indicators in the United States, 2nd Edition |
| Description | <p>From the Report: Climate Change Indicators in the United States, 2012, presents 26 indicators to help readers better understand observed trends related to the causes and effects of climate change. This document updates a report published by EPA in 2010. Various government agencies, academic institutions, and other organizations contributed data critical to the development of this report. EPA also received feedback from a diverse group of scientists, researchers, and communications experts in the public and private sectors. This feedback helped to inform the content and new features of this 2012 report. All of the indicators in this report are based on data that have been collected and compiled according to protocols accepted by the scientific community. The indicators were chosen using a standard set of criteria that considered usefulness, objectivity, data quality, transparency, ability to meaningfully communicate, and relevance to climate change. In addition, the report was peer-reviewed by independent technical experts.</p> <p>Climate Change Indicators in the United States, 2012, is written with the primary goal of informing readers' understanding of climate change. In addition to presenting climate change observations and trends in the United States and globally, this report highlights the far-reaching significance of these changes and their possible consequences for people, the environment, and society.</p> <p>This report is also designed to be useful for scientists, analysts, decision-makers, educators, and others who can use climate change indicators as a tool for:</p> <ul style="list-style-type: none"> • Assessing trends in environmental quality, factors that influence the environment, and effects on ecosystems and society. • Effectively supporting science-based decisionmaking and communication. • Evaluating existing and future climate-related policies and programs. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Natural Ecosystems - Social and Cultural Resources |

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| Focus Area | <ul style="list-style-type: none"> - Sustainability of Marine Ecosystems - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | <ul style="list-style-type: none"> - International - National |
| Lead Agencies | U.S. EPA, Office of Atmospheric Programs, Climate Change Division |
| Contacts | climateindicators@epa.gov |

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| Name | Climate Change Planning: Case Studies from Canadian Communities (2012) |
| Description | Canadian Institute of Planners “Policy on Climate Change” has a directive for the organization to engage in “developing and disseminating best-practice recommendations for climate change mitigation and adaptation planning”. ¹ This compilation of climate change planning case studies helps fulfill this objective and presents 10 projects for the use of planners across Canada and elsewhere. One of the projects highlights at-risk infrastructure in the Tantramar dykelands of New Brunswick. |
| Type | |
| Sector | - Infrastructure |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | |
| Lead Agencies | Canadian Institute of Planners Natural Resources Canada |

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| Name | Climate Change Scenarios New Brunswick Municipalities: Final Report (2009) |
| Description | This report presents the results of a project involving seven New Brunswick municipalities (Saint John, Moncton, Dieppe, Miramichi, Bathurst, Campbellton and Edmunston) that sought to develop Climate Change Adaptation Strategies. Each strategy sought to “identify adaptation solutions and use local knowledge to develop and integrate solutions to climate change impacts that provide value to New Brunswick communities.” The project was modeled after a successful approach previously used in Fredericton. |
| Type | |
| Sector | <ul style="list-style-type: none"> - Infrastructure - Natural Ecosystems - Economic Resources - Cross Disciplinary |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - International |

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| Lead Agencies | New Brunswick Department of Environment/Environment Canada |
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| Name | Climate Change Science Initiative 2008-2012: Final Report |
| Description | As noted in the Department's five-year plan, the goal of Climate Change Science Initiative was to establish a program that would maintain core expertise and allow the development of national and international partnerships. Research was aligned with three major themes w: 1) understanding the role of oceans in regional climate, 2) assessing impacts of climate change on ecosystem composition, structure and function, and 3) investigating emerging issues that could impact ecosystem health. Initial prediction and scenario projects for the CCSI focused on downscaling climate change scenarios for ocean-ice variability in the three basins (Atlantic, Pacific and Arctic,) and on emerging issues wsuch as hypoxia and ocean acidification. |
| Type | - PRODUCTS: Forecasts and outlooks (monthly to annual, models) |
| Sector | - Managed Ecosystems - Natural Ecosystems |
| Focus Area | - Sustainability of Marine Ecosystems |
| Region | |
| Lead Agencies | Fisheries and Oceans Canada |

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| Name | Climate Change Science Initiative Final Report 2008-2012 (2012) |
| Description | The Climate Change Science Initiative (CCSI) was implemented as a pilot program by Fisheries and Oceans Canada, (DFO) acknowledgingthe importance of climate model development in predicting climate change's impacts on Canadian waters (both marine and fresh), as well as the value of models in understanding those impacts at the ecosystem level. It acknowledged that there are emerging issues related to climate change that have not been adequately researched, reflected in the three thematic areas under which projects were developed: climate change predictions and scenarios; ecosystem impacts and vulnerabilities; andemerging issues such as hypoxia and acidification |
| Type | |
| Sector | - Managed Ecosystems - Natural Ecosystems |
| Focus Area | - Sustainability of Marine Ecosystems - Coasts and Climate Resilience (including sea-level rise) |
| Region | |
| Lead Agencies | Fisheries and Oceans Canada |

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| Name | Climate Change Threatens Health |
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| Description | Climate change is one of the most serious public health threats facing the nation, but few people are aware of how it can affect them. Children, the elderly, and communities living in poverty are among the most vulnerable. Click on a state on the map for more information on climate-health threats, actions being taken to prepare communities, and what you can do. |
| Type | - PRODUCTS: Engagement - PRODUCTS: Education |
| Sector | - Public Health and Safety - Infrastructure |
| Focus Area | |
| Region | - National - Regional Or State |
| Lead Agencies | NRDC |

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| Name | Climate Change Vulnerability and Risk Assessment of New Jersey's Transportation Infrastructure |
| Description | From the Executive Summary: In 2010, a partnership of New Jersey state agencies and Metropolitan Planning Organizations(the "New Jersey Partnership") was awarded a grant from the Federal Highway Administration(FHWA) to conduct a Vulnerability and Risk Assessment of transportation infrastructure from the impacts of climate change. The primary objective of this project is to pilot FHWA's Vulnerability and Risk Assessment Conceptual Model using New Jersey as a case study, providing feedback for the advancement of the Conceptual Model as well as develop a greater awareness and understanding of the potential effects of climate change on transportation infrastructure in New Jersey. Based on the feedback received through this and the four other pilot projects funded across the United States, FHWA will revise and finalize the Conceptual Model for application nationwide. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Infrastructure |
| Focus Area | - Changes in Extremes of Weather and Climate |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | The North Jersey Transportation Planning Authority (NJTPA) |
| Contacts | Jeffrey Perlman, New Jersey Transportation Planning Authority, jperlman@njtpa.org |

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| Name | Climate Change Vulnerability Assessment of Species of Concern in West Virginia |
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| Description | This project assessed and ranked the relative climate change vulnerability of 185 animal and plant species in West Virginia. Most species were selected based on their status as Species of Greatest Conservation Need within the West Virginia Wildlife Conservation Action Plan. More than half of the taxa assessed were scored as vulnerable to climate change. Based on the results of the assessment and review of current literature, management recommendations were developed for consideration in the next revision of the West Virginia Wildlife Conservation Action Plan. |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Management Guidance (i.e. structured decision making) |
| Sector | - Natural Ecosystems - Biota |
| Focus Area | - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Central |
| Lead Agencies | West Virginia Division of Natural Resources |

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| Name | Climate Change Vulnerability Assessment of Species of Concern in West Virginia. |
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| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Natural Ecosystems - Biota |
| Focus Area | - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Central |
| Lead Agencies | West Virginia Division of Natural Resources |
| Contacts | Elizabeth Byers, West Virginia Division of Natural Resources, elizabeth.a.byers@wv.gov |

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| Name | Climate Change Vulnerability Index (CCVI) |
| Description | The NatureServe Climate Change Vulnerability Index can help identify plant and animal species that are particularly vulnerable to the effects of climate change. Using the Index, you apply readily available information about a species' natural history, distribution and landscape circumstances to predict whether it will likely suffer a range contraction, population reductions, or both during the coming years. You can use the Index as part of a variety of analyses, including assessing the relative risk of species listed in State Wildlife Action Plans or part of any assessment of the vulnerability of species to climate change. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Biota |
| Focus Area | - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - National |
| Lead Agencies | NatureServe |
| Contacts | Bruce Young, NatureServe, bruce_young@natureserve.org |

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| Name | Climate Change Wildlife and Wildlands: A Toolkit for Formal and Informal Educators |
| Description | The Toolkit Resources section of the Climate Change, Wildlife and Wildlands Toolkit for Formal and Informal Educators provides a dynamic list of the top resources developed and recommended by the partner agencies. Please check back regularly as this list will continue to grow. |
| Type | - PRODUCTS: Education - PRODUCTS: Training and Capacity Building |
| Sector | - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources |

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| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | <ul style="list-style-type: none"> - International - National |
| Lead Agencies | United States Global Change Research Program |

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| Name | Climate Communications and Behavior Change: A Guide for Practitioners |
| Description | April 2010 "Climate Communications and Behavior Change: A Guide for Practitioners" from the Social Capital Project, which part of the Climate Leadership Initiative. Tips on how to frame and deliver communication and outreach efforts in ways that motivate changes in thinking and behavior. The guide also offers detailed advice on how to frame global warming communications and promote behavior change in ways that resonate with different audiences. |
| Type | |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Social and Cultural Resources - Economic Resources - Recreation and Tourism - Cross Disciplinary |
| Focus Area | |
| Region | - National |
| Lead Agencies | Social Capital Project |

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| Name | Climate Impacts on U.S. Living Marine Resources: National Marine Fisheries Service Concerns, Activities and Needs |
| Description | Climate Impacts on U.S. Living Marine Resources was released by NOAA National Marine Fisheries Service in 2008, as an enhancement of NMFS Strategic Plan for Fisheries Research (NMFS, 2007). Climate Impacts on U.S. Living Marine Resources discusses climate impacts on coastal environments, and presents regional chapter discussions. Each chapter identifies regional climate issues facing fisheries, outlines ongoing NMFS actions, and identifies outstanding needs for climate information. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Managed Ecosystems |
| Focus Area | - Sustainability of Marine Ecosystems |

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| Region | - Regional Or State -- New England -- Mid-Atlantic -- South East |
| Lead Agencies | NOAA National Marine Fisheries Service |

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| Name | Climate Ready Estuaries Lessons Learned |
| Description | EPA's Climate Ready Estuaries (CRE) provides targeted assistance to National Estuary Programs (NEPs) to plan for climate change. In its first years, CRE partners have successfully completed vulnerability assessments, engaged stakeholders, identified climate change indicators, and initiated adaptation planning efforts. This compilation presents best practices and lessons learned that are taken from the CRE annual progress report for 2010. The varied experiences of CRE partners around the country can guide other communities or organizations that are planning responses for climate change impacts. |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Hindcasts (climatologies, models) - PRODUCTS: Forecasts and outlooks (monthly to annual, models) - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Economic Resources - Recreation and Tourism |
| Focus Area | <ul style="list-style-type: none"> - Sustainability of Marine Ecosystems - Coasts and Climate Resilience (including sea-level rise) - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | <ul style="list-style-type: none"> - National - Regional Or State -- New England -- Mid-Atlantic -- Central - - Great Lakes -- South East |
| Lead Agencies | EPA: Climate Ready Estuaries |
| Contacts | Mel Cote |

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| Name | Climate Ready Great Lakes |
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| Description | Climate Ready Great Lakes is a project built to assist with climate change adaptation in the Great Lakes region. Divided into three modules, the project provides presentations, as well as supplemental evaluations and worksheets to assist users with understanding regional climate impacts, adaptation planning, and finding available resources and tools. Additional information provided includes an annotated bibliography, information about funding sources, a review climate related legislation and executive orders, and a training manual. |
| Type | - PRODUCTS: Training and Capacity Building |
| Sector | - Infrastructure - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources |
| Region | - Regional Or State -- Mid-Atlantic -- Great Lakes |
| Lead Agencies | Great Lakes Sea Grant Network, the NOAA Great Lakes Regional Collaboration Team |
| Contacts | Rochelle Sturtevant, Regional Sea Grant Extension Educator, Rochelle.Sturtevant@noaa.gov |

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| Name | Climate Ready Water Utilities Toolbox |
| Description | The Climate Ready Water Utilities Toolbox provides a searchable database for water utilities to identify relevant climate change-related impacts and target resources for responding to those challenges, including: Current federal, state, and association activities related to climate change impacts on water resources and utilities; Grant programs that could support climate-related actions by utilities and municipalities; Publications and reports; Tools and models, workshops and seminars. Resources searchable by utility type and size, region, water resources, climate change impacts, and climate response strategies. |
| Type | - PRODUCTS: Training and Capacity Building - PRODUCTS: Viewers and Web-based Tools |
| Sector | - Public Health and Safety - Infrastructure |
| Focus Area | - Climate Impacts on Water Resources |
| Region | - Regional Or State -- New England -- Mid-Atlantic -- Central - - Great Lakes -- South East - Local/City |
| Lead Agencies | EPA |
| Contacts | Jackie LeClair |

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| Name | Climate researchers now predict the planet will warm by 6.3 degrees Fahrenheit by the end of the century |
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| Description | Climate researchers now predict the planet will warm by 6.3 degrees Fahrenheit by the end of the century even if the world's leaders fulfill their most ambitious climate pledges, a much faster and broader scale of change than forecast just two years ago, according to a report released on Dec 10, 2009 by the United Nations Environment Program. |
| Type | |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Economic Resources - Recreation and Tourism - Cross Disciplinary |
| Focus Area | |
| Region | <ul style="list-style-type: none"> - International - National |
| Lead Agencies | United Nations Environment Program |

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| Name | Climate Science 2008: Major New Discoveries. |
| Description | July 2009, World Resources Institute (WRI) released its annual review of climate science: Climate Science 2008: Major New Discoveries. This annual WRI review highlights the latest major research and innovations in climate change science and technology. It presents a timely synthesis of current understanding of global warming at a critically important time for the United States and the world. |
| Type | |
| Sector | |
| Focus Area | |
| Region | <ul style="list-style-type: none"> - International - National |
| Lead Agencies | World Resources Institute (WRI) |
| Contacts | Kelly Levin and Dennis Tirpak, 202.729.7600 |

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| Name | Climate Sensitivity of the National Estuarine Research Reserve System |
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| Description | <p>From the Executive Summary: This report examines some of the factors that make estuaries and the communities dependent on estuarine resources susceptible to climate change. The work is focused in the National Estuarine Research Reserve System (NERRS) a collection of 28 reserves located around the U.S. and Puerto Rico, which are managed as a partnership between the National Oceanic and Atmospheric Administration (NOAA) and the coastal states for long-term research, ecosystem monitoring, education, and coastal stewardship. The NERRS is uniquely positioned to assess climate change impacts in the nation's estuaries because the system is composed of a diverse set of managed coastal ecosystems encompassing different biogeographic regions and estuarine types that are exposed to various gradients of human- and climate-related stressors.</p> <p>The study 1) analyzes and synthesizes available information and data that describe the physical, ecological and socio-demographic attributes of the reserves, 2) identifies the dominant stressors that impact reserves and examines reserve ecological resiliency, and 3) categorizes reserves based on their potential sensitivities to climate hazards/variables, ecological resiliency, projected changes in temperature, and projected sea level rise.</p> |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Managed Ecosystems - Natural Ecosystems - Economic Resources |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- New England -- Mid-Atlantic -- Great Lakes -- South East |
| Lead Agencies | NOAA National Estuarine Research Reserve System NERRS |
| Contacts | Dwight Trueblood, NOAA Estuarine Research Division, dwight.trueblood@noaa.gov |

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| Name | Climate Variability and Coastal Community Resilience: Testing a National Model of State-based Outreach |
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| Description | The Maine Sea Grant College Program, in partnership with the Oregon Sea Grant College Program, conducted a two-year NOAA-funded project: 1) to study how climate variability and coastal hazards may be affecting Maine and Oregon's coastal regions and how these impacts relate to coastal development in the two states; 2) to encourage and facilitate collaboration among and between decision makers and coastal property owners to determine and implement appropriate responses to climate variability on short and longer timescales; 3) to discover the barriers that targeted groups in the states have to taking action to prepare for or mitigate the effects of climate change; and 4) to develop educational and informational materials and strategies concerning n these topics. The ultimate goal of the project is to have definitive actions that result in coastal communities being more resilient to climate variability. In Maine this included a survey and focus groups of property owners, municipal officials, and recreationists to determine "barriers and benefits that coastal property owners and municipal officials face in taking action to prepare for impacts from coastal storms, flooding, and erosion." This report summarizes the results of this project and the surveys and focus groups. The project also resulted in a documentary and a website. |
| Type | - PRODUCTS: Other - PRODUCTS: Engagement - PRODUCTS: Education |
| Sector | - Infrastructure - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- New England |
| Lead Agencies | Maine Sea Grant |
| Contacts | Kristen Grant, Marine Extension Associate, Maine Sea Grant, 207.646.1555 x115, kngrant@maine.edu |

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| Name | Climate Wizard |
| Description | New CC tool from the Nature Conservancy. The outputs of the site are color coded maps of climate change over a specific area. It allows one home in on a particular area, like Lake Champlain, and there are several cells that cover the lake. One can pick a GCM scenario (there are several to choose from) and pick the version (hi, med, low) of the intensity of the change. As for variables, it's temperature and precipitation, month by month or season by season, and there are two periods of projections along with the current situation as modeled (for a base line). One can pick the projected temperature and precipitation or the change that the projection represents from the baseline. |

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| Type | <ul style="list-style-type: none"> - PRODUCTS: Forecasts and outlooks (monthly to annual, models) - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Viewers and Web-based Tools |
| Sector | |
| Focus Area | - Changes in Extremes of Weather and Climate |
| Region | - National |
| Lead Agencies | Nature Conservancy |

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| Name | ClimateChange Science and Policy: What Do We Know? What Should We Do |
| Description | The problem is that the world is getting most of the energy its economies need in ways that are wrecking the climate its environment needs. |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Engagement - PRODUCTS: Education - PRODUCTS: Training and Capacity Building - PRODUCTS: Management Guidance (i.e. structured decision making) - PRODUCTS: Regulatory/ Policy Guidance |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure |
| Focus Area | |
| Region | - National |
| Lead Agencies | John P. Holdren, Assistant to the President for Science and Technology and Director, Office of Science and Technology Policy Executive Office of the President of the United States |

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| Name | COastal Adaptation to Sea level rise Tool (COAST) |
| Description | COastal Adaptation to Sea level rise Tool (COAST) is an approach to assess the costs and benefits of adapting to sea-level rise scenarios developed by the New England Environmental Finance Center. This approach focuses on the cost of damage from sea-level rise and storm surges. This approach uses GIS and incorporates various sources of existing data, including U.S. Army Corps depth-damage functions, NOAA's Sea, Lake, and Overland Surges from Hurricanes (SLOSH), and other flood methods as well as sea-level rise scenarios, property values, and infrastructure costs. This tool is primarily meant for municipal planners, but is freely available to all users. Please see the entry under Maine for more information on it being used at a project level. |

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| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Viewers and Web-based Tools |
| Sector | - Infrastructure |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State |
| Lead Agencies | New England Environmental Finance Center (EFC) at the Muskie School of Public Service, University of Southern Maine |
| Contacts | Sam Merrill, smerrill@usm.maine.edu (207) 228-8596 |

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| Name | Coastal Change Hazards: Hurricanes and Extreme Storms |
| Description | This website provides access to information on research that focuses on understanding the magnitude and variability of the impacts of hurricanes and extreme storms on the sandy beaches of the United States. The overall objective is to improve the capability to predict coastal change that results from severe storms. Such a capability will support management of coastal infrastructure, resources, and safety |
| Type | - PRODUCTS: Viewers and Web-based Tools |
| Sector | - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Social and Cultural Resources |
| Focus Area | - Changes in Extremes of Weather and Climate |
| Region | - National |
| Lead Agencies | U.S. Geological Survey |
| Contacts | Robert Thieler, USGS, rthieler@usgs.gov, (508) 457-2350 |

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| Name | Coastal Dead Zones and Global Climate Change Ramifications of Climate Change for Chesapeake Bay Hypoxia |
| Description | This report is part of a larger report entitled Regional Impacts of Climate Change: Four Case Studies in the United States. This case study looks at how hypoxia in the Chesapeake Bay is affected by climate variability and projected climate change and what this may mean in terms of obstacles to existing ecosystem restoration. The case study uses past observations to determine the various impacts climate may have on hypoxia and what the results are for the ecosystem. Using this information, the case study includes a projection of how climate change is likely to affect hypoxia, and how climate change will affect attainment of restoration goals. |
| Type | - PRODUCTS: Other |
| Sector | - Natural Ecosystems - Biota |

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| Focus Area | - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Pew Center on Global Climate Change, University of Maryland Center for Environmental Science |
| Contacts | Donald F. Boesch, University of Maryland Center for Environmental Studies, boesch@umces.edu |

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| Name | Coastal Dykelands in the Tantramar Area: Impacts of Climate Change on Dyke Erosion and Flood Risk (2011) |
| Description | This report set out to model vulnerable sections of the Tantramar dykes using information obtained by remote sensing and ground survey; and to assess the infrastructure at risk in the Tantramar region due to climate-induced sea-level rise. Flood highwater marks were mapped using recent estimates calculated as part of a regional climate change adaptation initiative. The average height of the dykes in the Tantramar region is 8.6 m, which is lower than even the least severe prediction based on the current 1:10 year sea-level estimate of 8.9 ± 0.1 m. Transportation infrastructure is also affected under this scenario. The report identifies sections of dyke exhibiting unusually high levels of erosion, and present maps and empirical evidence confirming that vegetated sections further from the Bay of Fundy (and its tidal water courses) are less vulnerable. |
| Type | |
| Sector | - Public Health and Safety - Infrastructure |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | |
| Lead Agencies | Atlantic Canada Adaptation Solutions Association |
| Contacts | Climate Change Secretariat, New Brunswick Department of the Environment env-info@gnb.ca |

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| Name | Coastal Flooding and Erosion Forecast |
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| Description | An empirical relationship exists between storm tide, waves and coastal flooding or splash-over damage (NWS coastal flood study). Knowing this relationship will help predict when flooding and splash-over events (such as beach erosion) might occur based on forecast water level (tide height) and wave height data. Working with the National Weather Service in Gray, Maine, NERACCOOS and modelers in the Northeast region, a working prototype was developed using a water level model (NECOFS/FVCOM) and wave model (Wave Watch 3). This prototype is currently working for Hampton, New Hampshire and Scituate, Massachusetts locations. We hope to expand to other regions depending on need. For more information on how to read the nomogram, click here . This product could be used by emergency managers, coastal homeowners and other users with interest and concern about beach erosion from large-wave storms. During the Patriot's Day Storm, there were four high-tide cycles in which the water level was near or above flood stage and the waves were greater than 20' in height. This combination caused the tremendous amounts of coastal damage seen during the storm. The Coastal Flooding and Erosion Forecast System actually predicted days in advance of the Patriot's Day Storm that there was a high likelihood of this damage occurring. This capacity is extremely important to coastal property owners and emergency responders, resulting in dollars and lives saved. |
| Type | - PRODUCTS: Forecasts and outlooks (monthly to annual, models) |
| Sector | - Public Health and Safety - Infrastructure |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources |
| Region | - Regional Or State -- New England |
| Lead Agencies | Piscataqua Region Estuary Partnership (PREP) |
| Contacts | Derek Sowers, Piscataqua Region Estuary Partnership (Derek.sowers@unh.edu) |

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| Name | Coastal Habitat Conservation for the Mid-Atlantic |
| Description | This web page includes information compiled and distributed as well as workshop materials for a June 2010 workshop entitled: Coastal Habitat Conservation in a Changing Climate: Information Resources for the Mid-Atlantic Region. |
| Type | - PRODUCTS: Training and Capacity Building |
| Sector | |
| Focus Area | |
| Region | |
| Lead Agencies | NOAA Coastal Services Center |

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| Name | Coastal Hazards Resiliency Tools Project (Maine) |
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| Description | This website provides information targeted to local communities. It includes links to PowerPoint presentations with information on issues such as possible policy and regulatory responses to sea-level rise, improving storm hazard resiliency, and developing municipal hazard resiliency tools and responses. The site also includes model zoning and ordinance language. |
| Type | - PRODUCTS: Engagement - PRODUCTS: Education - PRODUCTS: Training and Capacity Building |
| Sector | - Public Health and Safety - Infrastructure - Natural Ecosystems - Economic Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate |
| Region | - Regional Or State -- New England |
| Lead Agencies | Southern Maine Regional Planning Commission |
| Contacts | Jonathan T. Lockman, Southern Maine Regional Planning Commission, jlockman@smrpc.org, |

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| Name | Coastal Impacts, Adaptation, and Vulnerabilities: A Technical Input to the 2013 National Climate Assessment |
| Description | From the Executive Summary: This report, one of a series of technical inputs for the third NCA conducted under the auspices of the U.S. Global Change Research Program, examines the known effects and relationships of climate change variables on the coasts of the U.S.. It describes the impacts on natural and human systems, including several major sectors of the U.S. economy, and the progress and challenges to planning and implementing adaptation options. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Infrastructure - Managed Ecosystems - Natural Ecosystems - Economic Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - National |
| Lead Agencies | USGS and NOAA |
| Contacts | Virginia Burkett, USGS, virginia_burkett@usgs.gov Margaret Davidson, NOAA, margaret.davidson@noaa.gov |

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| Name | Coastal Land Conservation in Maryland: Targeting Tools and Techniques for Sea Level Rise Adaptation and Response (Website and tools) |
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| Description | The purpose of the project was to develop new conservation criteria to identify coastal habitats that may help Maryland proactively adapt to sea level rise and increased storm events associated with climate change. Climate change targeting criteria resulting from this project will be used to review land acquisition projects, such as Coastal Estuarine and Land Conservation Program (CELCP), and will be added to the State's current land conservation targeting program, "GreenPrint." |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Viewers and Web-based Tools |
| Sector | - Natural Ecosystems |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Maryland Department of Natural Resources, Chesapeake and Coastal Program |

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| Name | Coastal Marine Ecological Classification Standard |
| Description | Use this database to browse the CMECS classification and to get definitions for individual CMECS Units. This database contains the units that were published in the Coastal and Marine Ecological Classification Standard. |
| Type | <ul style="list-style-type: none"> - DATA: Observing Systems - DATA: Depth and Elevation Data - PRODUCTS: Hindcasts (climatologies, models) - PRODUCTS: Forecasts and outlooks (monthly to annual, models) - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Viewers and Web-based Tools |
| Sector | - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - National |

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| Name | Coastal Resilience: New York and Connecticut |
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| Description | <p>Coastal Resilience was developed to help practitioners and stakeholders understand how they can make informed decisions about marine and coastal conservation, land protection, and coastal development, and implement ecosystem-based adaptation strategies. Coastal Resilience helps users visualize future conditions so they can design, build, and discuss alternative future scenarios that address sea level rise, storm surge, social and ecological vulnerability, and conservation priorities.</p> <p>The Coastal Resilience project delivers geospatial information on coastal ecosystems, socioeconomics, community vulnerability, and coastal hazards (including sea level rise and storm surge) via an internet mapping application that is a data viewer, data discovery tool, and a future scenario mapper. Coastal Resilience also includes a summary tool for calculating economic and ecological loss in specific geographies within the study area given different future scenarios. Coastal Resilience provides decision support to local decision-makers who are conducting their own comprehensive or post-storm redevelopment plans, and serves as an educational tool to inform stakeholders on the risks of sea level rise and storm surge.</p> |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Viewers and Web-based Tools |
| Sector | |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | <ul style="list-style-type: none"> - National - Regional Or State |
| Lead Agencies | Long Island Sound Study, The Nature Conservancy |

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| Name | Coastal Sea-Level Change Societal Challenge Needs Assessment Report |
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| Description | <p>From the Executive Summary: NOAA has focused its efforts on four climate-related challenges to society. These challenges represent a spectrum of local and national needs for which NOAA can develop and deliver services, and provide information, that can help inform effective adaptation actions and other climate-sensitive decisions. The four societal challenges, as defined in “A Climate Service in NOAA: Connecting Climate Science to Decision Making – Vision and Strategic Framework,” are</p> <ol style="list-style-type: none"> 1. Climate Impacts on Water Resources Providing coordinated and authoritative information systems to guide water resource managers. 2. Coasts and Climate Resilience Understanding physical processes driving sea-level rise and coastal inundation, and providing best available information to decision makers on sea-level change impacts and adaptive management strategies. 3. Sustainability of Marine Ecosystems Improving understanding of, and information about, the impacts of climate on ocean physical, chemical, and biological properties critical to managing large marine ecosystems. 4. Changes in Extremes of Weather and Climate Developing and delivering information to prepare for and adapt to climate and weather extremes, including droughts, floods, heat waves, and cold snaps. <p>This needs assessment will focus on challenge 2 on the resilience of coasts to the impacts of sea-level change. The term sea-level change acknowledges that while global or eustatic sea levels are rising, local levels, or relative sea levels in certain places, may be rising or falling.</p> <p>The results of the literature review on the challenge of coastal sea-level change, presented in this document, represent a snapshot of gaps in data, information, and services as captured in 55 documents, presentations, and publications. This synthesis of findings highlights the needs of coastal decision makers for resources that can assist them in making informed decisions about the risks and impacts of sea-level change. The results of this report are intended to provide NOAA with current information on the needs of coastal decision makers in order to guide its development of trainings, engagement efforts, decision-support tools, and applications.</p> |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Other - PRODUCTS: Training and Capacity Building |
| Sector | <ul style="list-style-type: none"> - Natural Ecosystems - Social and Cultural Resources |
| Focus Area | <ul style="list-style-type: none"> - Sustainability of Marine Ecosystems - Coasts and Climate Resilience (including sea-level rise) |
| Region | <ul style="list-style-type: none"> - National |

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| Lead Agencies | NOAA Sea Grant |
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| Name | Coastal Sensitivity to Sea-Level Rise: A Focus on the Mid-Atlantic Region, Synthesis and Assessment Product 4.1 |
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| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Recreation and Tourism |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | U.S. Climate Change Science Program |

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| Name | Coastal Vulnerability Assessment of Assateague Island National Seashore to Sea-Level Rise |
| Description | Abstract: A coastal vulnerability index (CVI) was used to map relative vulnerability of the coast to future sea-level rise within Assateague Island National Seashore in Maryland and Virginia. The CVI ranks the following in terms of their physical contribution to sea-level rise-related coastal change: geomorphology, regional coastal slope, rate of relative sea-level rise, shoreline change rates, mean tidal range and mean wave height. Rankings for each variable were combined and an index value calculated for 1-minute grid cells covering the park. The CVI highlights those regions where the physical effects of sea-level rise might be the greatest. This approach combines the coastal system's susceptibility to change with its natural ability to adapt to changing environmental conditions, yielding a quantitative, although relative, measure of the park's natural vulnerability to the effects of sea-level rise. The CVI provides an objective technique for evaluation and long-term planning by scientists and park managers. Assateague Island consists of stable and washover dominated portions of barrier beach backed by wetland and marsh. The areas within Assateague that are likely to be most vulnerable to sea-level rise are those with the highest occurrence of overwash and the highest rates of shoreline change. |
| Type | - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | U.S. Geological Survey |
| Contacts | E. Robert Thieler, U.S. Geological Survey, rthieler@usgs.gov |

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| Name | Coastal Vulnerability to Sea-Level Rise: A Preliminary Database for the U.S. Atlantic, Pacific and Gulf of Mexico Coasts |
| Description | This website provides access to the data files used in USGS's Coastal Vulnerability Index and the information used for the regional assessments, including the National Assessment of Coastal Vulnerability to Sea-Level Rise: Preliminary Results for the U.S. Atlantic Coast. |
| Type | - PRODUCTS: Viewers and Web-based Tools |
| Sector | |
| Focus Area | |
| Region | - Regional Or State -- New England -- Mid-Atlantic |
| Lead Agencies | USGS |
| Contacts | Robert Thieler, USGS, rthieler@usgs.gov, (508) 457-2350 |

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| Name | Combined Heat and Power: Effective Energy Solutions for a Sustainable Future |
| Description | Oak Ridge Dec 2008 Report: "Combined Heat and Power: Effective Energy Solutions for a Sustainable Future" describes the 4 areas where CHP adds value: reducing CO2 emissions; efficiency & creating green-collar jobs; national deployability; infrastructure modernization, improved energy security. |
| Type | - PRODUCTS: Training and Capacity Building |
| Sector | |
| Focus Area | |
| Region | - National - Regional Or State |
| Lead Agencies | Oak Ridge Institute for Science and Education |
| Contacts | John Moskal |

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| Name | Common large-scale responses to climate and fishing across Northwest Atlantic ecosystems |
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| Description | Abstract: "Investigating whether there were common biological responses to climate and fishing across seven Northwest Atlantic ecosystems, a minimum/maximum autocorrelation factor analysis of biological indicators for each region revealed a common primary multivariate trend of a rapid change during the 1980s and early 1990s. There was a strong common pattern in the biological indicators responsible for the primary multivariate temporal trend in the five more northerly regions: an increase in the abundance of phytoplankton, an increase in biomass at mid-trophic levels, and a decline in predatory groundfish size. The common associations between patterns and drivers were fishing indices and the Atlantic Multidecadal Oscillation, but all associations weakened when co-varying drivers were held constant. The results are consistent with known long-term effects of intense fishing, such as a decline in average fish size and changes in species composition. Less fishing pressure has allowed some regions to recover to former predatory biomass levels since the late 1990s, but the bulk of the biomass consists of fewer species. However, fishing was not the only driver, and a more mechanistic understanding of how the climate affects lower trophic levels is needed to contextualize climate effects in heavily fished ecosystems. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Managed Ecosystems - Natural Ecosystems - Biota |
| Focus Area | - Sustainability of Marine Ecosystems - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- New England -- Mid-Atlantic |
| Lead Agencies | Publication, ICES Journal of Marine Science |
| Contacts | Nancy L. Shackell, Alida Bundy, Fisheries and Oceans, Bedford Institute of Oceanography, NS, Canada; Janet A. Nye, Jason S. Link, National Marine Fisheries Service, Northeast Fisheries Science Center |

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| Name | Community Resilience in Coastal Virginia |
| Description | Through this project the University of Virginia Institute for Environmental Negotiation works with coastal partners and coastal planning districts to host regional workshops and listening sessions to help coastal communities prepare to deal with sea-level rise. |
| Type | - PRODUCTS: Engagement |
| Sector | - Public Health and Safety - Infrastructure - Natural Ecosystems - Economic Resources |
| Focus Area | |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | University of Virginia Insitute for Environmental Negotiation |

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| Contacts | Melissa Keywood, University of Virginia Institute of Environmental Negotiation, mkeywood@virginia.edu |
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| Name | Comprehensive Strategy for Reducing Maryland's Vulnerability to Climate Change Phase I: Sea-level rise and coastal storms |
| Description | This document represents the first phase of Maryland's Comprehensive Strategy for Reducing Maryland's Vulnerability to Climate Change. The report focuses specifically on sea-level rise and coastal storms. The Phase I Strategy is a key component of the Maryland Climate Action Plan, detailing the actions necessary to protect Maryland's future economic well-being, environmental heritage and public safety in the face of climate change and sea level rise. This report lays out the specific priority policy recommendations of the ARWG to address short-and long-term adaptation and response measures, planning and policy integration, education and outreach, performance measurement, and, where necessary, new legislation and/or modifications to existing laws. Implementation of the Strategy is currently underway. The full Climate Action Plan (available on the Internet at http://www.mde.state.md.us/Air/climatechange). |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Economic Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Maryland Commission on Climate Change Adaptation and Response Working Group |
| Contacts | Zoe Johnson, Maryland Department of Natural Resources, ZJohnson@dnr.state.md.us |

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| Name | Comprehensive Strategy for Reducing Maryland's Vulnerability to Climate Change Phase II: Building societal economic and ecological resilience |
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| Description | <p>"The Maryland Commission on Climate Change released its Phase II Strategy for Reducing Maryland's Vulnerability to Climate Change on January 24, 2011. The report outlines strategies to reduce the impacts of climate change, including sea level rise, increased temperature and changes in precipitation within the following sectors: Human Health; Agriculture; Forest and Terrestrial Ecosystems; Bay and Aquatic Environments; Water Resources; and Population Growth and Infrastructure.</p> <p>Developed in accordance with Governor O'Malley's Executive Order, more than 80 experts collaborated and held several larger stakeholder meetings to create the Phase II Strategy. Along with its companion, the Phase I Strategy for Sea Level Rise and Coastal Storms (2008), the Phase II Strategy is a key component of Maryland's Climate Action Plan. State agencies will use both strategies to guide and prioritize state-level activities with respect to both climate science and adaptation policy."</p> |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Economic Resources |
| Focus Area | <ul style="list-style-type: none"> - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Maryland Commission on Climate Change |
| Contacts | Zoe Johnson, Maryland DNR, ZJohnson@dnr.md.state.us |

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| Name | Confronting Climate Change in the U.S. Northeast: Science, Impacts, and Solutions |
| Description | <p>From the report: The Northeast Climate Impacts Assessment (NECIA) is a collaborative effort between the Union of Concerned Scientists (UCS) and a team of independent experts to develop and communicate a new assessment of climate change and associated impacts on key climate-sensitive sectors in the northeastern United States. The goal of the assessment is to combine state-of-the-art analyses with effective outreach to provide opinion leaders, policy makers, and the public with the best available science upon which to base informed choices about climate-change mitigation and adaptation. Note: The report includes a chapter on marine impacts and a chapter on coastal impacts.</p> |
| Type | - PRODUCTS: Plans, Assessments, Studies |

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| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Economic Resources - Recreation and Tourism |
| Focus Area | <ul style="list-style-type: none"> - Sustainability of Marine Ecosystems - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- New England -- Mid-Atlantic |
| Lead Agencies | Union of Concerned Scientists, Northeast Climate Impacts Assessment (NECIA) Synthesis Team |

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| Name | Confronting Climate Change: An Early Analysis of Water and Wastewater Adaptation Costs Through 2050 |
| Description | <p>The effects of climate change are already impacting our water and wastewater utilities-- those entities entrusted with supplying our communities, our industries, and our natural environment with essential water management services.</p> <p>Water is the most important natural resource necessary for stable economic growth, as well as for human and environmental health. Our nation's water and wastewater infrastructure enables our prosperity by delivering clean water to our homes and industries and by transporting wastewater for treatment. Our increasing understanding of wastewater suggests that significant adaptation measures will continue protecting public health and environment.</p> |
| Type | |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure |
| Focus Area | - Climate Impacts on Water Resources |
| Region | <ul style="list-style-type: none"> - National - Regional Or State - Local/City - Other/Problem Focused |
| Lead Agencies | CH2M Hill, Association of Metropolitan Water Agencies |

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| Name | Connecticut Adaptation Resource Toolkit (CART) |
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| Description | <p>The Connecticut Adaptation Resource Toolkit (CART) was developed by the Connecticut Department of Energy and Environmental Protection (CT DEEP) and ICLEI-Local Governments for Sustainability USA (ICLEI USA) and with funding from the US Environmental Protection Agency's (EPA) Climate Ready Estuaries through the Long Island Sound Study, a national estuary program.</p> <p>CART was developed to help local government staff, committee members and active participants in Connecticut have instant access to climate change adaptation resources thereby enabling them to easily and meaningfully benefit their communities. Too often individuals or communities want to minimize future risks and costs, but they do not know where to start or how to continue. CART is a one stop shopping website for ideas and methods on local climate change adaptation planning and action.</p> |
| Type | - PRODUCTS: Training and Capacity Building |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Social and Cultural Resources - Economic Resources - Recreation and Tourism - Cross Disciplinary |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources |
| Region | <ul style="list-style-type: none"> - Regional Or State -- New England - Local/City |
| Lead Agencies | Connecticut Department of Energy and Environmental Protection |

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| Name | Connecticut Coastal Hazards Viewer |
| Description | <p>The Connecticut Coastal Hazards Viewer is an online mapping tool designed to allow users access to several pertinent suites of data for coastal Connecticut. Presented here are data representing sea level rise, high-resolution coastal elevation, hurricane storm surge, coastal erosion, and environmental observations such as tides, water quality, waves and currents. The tool includes: sea level rise visualization data for coastal areas on Long Island Sound, Coastal Digital Elevation model using bare earth LiDAR data for all of Connecticut's shoreline, hurricane surge inundation data, erosion susceptibility data, and LIS Environmental Observations Data.</p> |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Viewers and Web-based Tools |

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| Sector | <ul style="list-style-type: none"> - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate |
| Region | - Regional Or State -- New England |
| Lead Agencies | Department of Energy and Environmental Protection |

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| Name | Conserving Freshwater and Coastal Resources in a Changing Climate |
| Description | From the Introduction: This report provides a primer on climate change issues to help individuals and organizations in the eastern United States begin to factor in climate change into their freshwater and coastal conservation efforts. First, it provides an overview of the expected effects of climate change on aquatic ecosystems in mid-Atlantic and northeast regions, including the coastal states from Virginia to Maine and from Ohio east. Second, this report provides a brief overview of the most relevant technological and policy tools available for analyzing and adapting to these impacts. Finally, this report makes a series of recommendations to conservation organizations and policy makers on how to more effectively undertake conservation that anticipates changes in climate and the changes in ecosystems. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Managed Ecosystems - Natural Ecosystems - Biota |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- New England -- Mid-Atlantic -- Great Lakes |
| Lead Agencies | The Nature Conservancy |

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| Name | Conserving Virginia's Fish and Wildlife for the Future: Preparing for a Changing Climate |
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| Description | This strategy was developed to provide initial guidance on actions Virginia's conservation community can implement immediately to enhance the conservation of wildlife and habitats in the face of climate change while more comprehensive adaptation strategies are developed. This effort to identify initial climate change adaptation strategies was initiated by the Virginia Department of Game and Inland Fisheries (DGIF), the National Wildlife Federation (NWF), and the Virginia Conservation Network (VCN). This document is a compendium to Virginia's Wildlife Action Plan, an existing document created to focus conservation efforts on preventing species from becoming endangered. Strategies included in the document relate to coastal habitats. |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Other |
| Sector | - Natural Ecosystems - Biota |
| Focus Area | - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Virginia Department of Game and Inland Fisheries, National Wildlife Federation, and Virginia Conservation Network |
| Contacts | Chris Burkett, Wildlife Action Plan Coordinator, Virginia Department of Game and Inland Fisheries, chris.burkett@dgif.virginia.gov |

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| Name | Costing Climate Impacts and Adaptation: A Canadian Study on Coastal Zones (2010) |
| Description | The economic impacts in this report include damage to dwellings, agricultural land and buildings, and forests in Canada's coastal areas. It presents them by province and territory, and for the nation as a whole, cumulatively and annually, using 30-year averages centered on 2025, 2055 and 2085. It considers four possible scenarios, based on the environmental and economic policy choices made: "business as usual," or a "rapid stabilization" of the climate; a "world-markets" orientation, or a more modest "local stewardship" economy. Then we overlay the potential impact of two adaptation measures on these scenarios—retreating from the most-exposed coastal areas, and curtailing development on land expected to become highly vulnerable as sea levels rise and storms increase. Finally, it analyzes the distributional impact of damages, by province and territory, income level, and visible-minority status. It also considers the effects of coastal flooding on freshwater reserves, but does not quantify their economic value. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Economic Resources |
| Focus Area | |
| Region | |
| Lead Agencies | National Round Table on the Environment and Economy Stockholm Environment Institute |

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| Name | CREAT: Climate Resilience Evaluation and Awareness Tool |
| Description | EPA has developed CREAT, a software tool to assist drinking water and wastewater utility owners and operators in understanding potential climate change threats and in assessing the related risks at their individual utilities. CREAT provides users with access to the most recent national assessment of climate change impacts for use in considering how these changes will impact utility operations and missions. |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Viewers and Web-based Tools - PRODUCTS: Management Guidance (i.e. structured decision making) |
| Sector | - Infrastructure |
| Focus Area | - Climate Impacts on Water Resources |
| Region | <ul style="list-style-type: none"> - National - Regional Or State -- Mid-Atlantic -- Central -- Great Lakes -- South East - Local/City |
| Lead Agencies | EPA |
| Contacts | Curt Baranowski, Baranowski.Curt@epa.gov |

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| Name | Creating a Change in Climate through Local Action (Partners for Climate Protection)(2012) |
| Description | A 10-page summary of actions municipalities can take to cut Greenhouse Gas (GHG) emissions, with case studies and quotes from municipal officials. It outlines the Partners for Climate Protection "Five Milestone Framework" used by many Canadian municipalities to cut GHGs and reduce energy consumption. |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Training and Capacity Building |
| Sector | <ul style="list-style-type: none"> - Infrastructure - Economic Resources - Cross Disciplinary |
| Focus Area | |
| Region | |
| Contacts | Partners for Climate Protection secretariat, pcp@fcm.ca |

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| Name | Cross Border Indicators of Climate Change over the Past Century: Northeastern United States and Canadian Maritime Region (2006) |
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| Description | This study seeks to create a core of information on climate change indicators in the Gulf of Maine region using the longest consistently available and most recent sets of data in constructing the analysis. Indicators include average temperature (1900-2002); average annual precipitation (1900-2002); extreme precipitation events (1950-2002); snowfall and days with snow cover on ground (1970-2002); sea-level rise (1856-2003); timing of high spring flow; lake and river ice; hurricanes making landfall; growing season and sea surface temperature. |
| Type | - DATA: Indicator Based Research - PRODUCTS: Hindcasts (climatologies, models) |
| Sector | - Infrastructure - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate |
| Region | - International |
| Lead Agencies | Gulf of Maine Council on the Marine Environment in cooperation with Environment Canada and Clean Air-Cool Planet |
| Contacts | Cameron Wake, Ph.D., cameron.wake@unh.edu |

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| Name | Currents of Change: Environmental Status and Trends of the Narragansett Bay Region Final Technical Draft |
| Type | |
| Sector | |
| Focus Area | |
| Region | |
| Lead Agencies | Narragansett Bay Estuary Program |

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| Name | Cusk (Brosme brosme) and Climate Change: Assessing the Threat to a Candidate Marine Fish Species Under the US Endangered Species Act |
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| Description | Abstract: "In the Northwest Atlantic Ocean cusk (Brosme brosme) has declined dramatically primarily as a result of fishing activities. These declines have lead to concern about its status, which has prompted reviews under the U.S. Endangered Species Act (ESA) and the Canadian Species at Risk Act (SARA). Changes in distribution and abundance of number of marine fish in the Northwest Atlantic have been linked to climate variability and change, suggesting that both fishing and climate may affect the future status of cusk. Our goal was to evaluate potential effects of climate change on Northwest Atlantic cusk distribution. Coupling a species niche model with the output from an ensemble of climate models, we projected cusk distribution in the future. Our results indicate cusk habitat in the region will shrink and fragment, which is a result of a spatial mismatch between high complexity seafloor habitat and suitable temperature. The importance of habitat patch connectivity for cusk is poorly understood, so the population-level consequences of climate-related habitat fragmentation are uncertain. More broadly, climate change may reduce appropriate thermal habitat and increase habitat fragmentation for other cold water species in the region; thereby, increasing the potential for regional overexploitation and extirpation." |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Managed Ecosystems - Natural Ecosystems |
| Focus Area | - Sustainability of Marine Ecosystems |
| Region | - National - Regional Or State -- New England -- Mid-Atlantic |
| Lead Agencies | NOAA National Marine Fisheries Service (NMFS), EPA, NOAA Earth System Research Laboratory, University of Connecticut, NOAA Geophysical Fluid Dynamics Laboratory |
| Contacts | Jon Hare, NOAA NMFS, jon.hare@noaa.gov |

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| Name | Data Basin |
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| Description | <p>Data Basin is a free, online system that connects users with spatial datasets, tools, and expertise. Individuals and organization can explore and download a vast library of datasets, upload their own data, create and publish analysis, utilize working groups, and produce customized maps that can be easily shared. The building blocks of Data Basin are:</p> <p>Datasets: A dataset is a spatially explicit file, currently Arcshape and ArcGrid files. These can be biological, physical, socioeconomic, (and soon to be imagery) that can be uploaded, downloaded or visualized.</p> <p>Maps: Maps are visualized datasets created with easy-to-use tools in Data Basin. Maps, customized by users, can be kept private, shared with groups, or published for everyone. Users can critique maps with provided drawing and commenting tools.</p> <p>Galleries: Galleries are meaningful collections of datasets and/or maps created by Data Basin users. Users and organizations can publish galleries (including studies, atlases and books) that others can easily find and use.</p> <p>People: People are members of the Data Basin community. Users can search profiles to find data providers, potential collaborators or interested audiences.</p> <p>Groups: Groups are user-defined subset of Data Basin users collaborating around a specific topic or issues. Group members can share, analyze, and discuss datasets and maps. Data Basin allows for private (closed) and public (by request) groups.</p> <p>Centers: Centers are topics or geographies of special interest to Data Basin users. Users can find specific datasets, maps, galleries, people, groups, and analytical tools under each center.</p> <p>My Workspace: My workspace provides a private area for accessing Data Basin. Users can easily organize content they contributed or found in the system. Users can create and edit personal profiles; manage their account; track creation of datasets, maps, and galleries; and, manage their group activity.</p> |
| Type | - PRODUCTS: Viewers and Web-based Tools |
| Sector | |
| Focus Area | |
| Region | <ul style="list-style-type: none"> - International - National - Regional Or State |
| Contacts | James R. Strittholt , Ph.D., Executive Director, Landscape Ecologist, Conservation Biology Institute, stritt@consbio.org |

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| Name | Data.gov |
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| Description | This is the National Ocean Council's portal for data, information, and tools to support people engaged in planning for the future of the ocean, our coasts, and the Great Lakes. Our goal is to be a one-stop hub to support planners and to provide useful information to the public. |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Engagement - PRODUCTS: Education - PRODUCTS: Training and Capacity Building - PRODUCTS: Viewers and Web-based Tools - PRODUCTS: Management Guidance (i.e. structured decision making) |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Economic Resources - Cross Disciplinary |
| Focus Area | |
| Region | <ul style="list-style-type: none"> - National - Regional Or State -- New England -- Mid-Atlantic -- Central - - Great Lakes -- South East |
| Lead Agencies | National Ocean Council |

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| Name | Degrees of Change: Climate Warming and the Stakes for Canada (2010) |
| Description | <p>From ecosystems to human health to water resources to communities and infrastructure and more, this report demonstrates just how pervasive and pernicious climate change could be.</p> <p>Both risks and potential opportunities — as we currently know them — are presented. A diagram maps impacts in eight key areas: ice, snow and sea; ecosystems, water resources, human health, communities and infrastructure, resource industries, service industries, and security and trade.</p> |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Engagement |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Natural Ecosystems - Social and Cultural Resources - Economic Resources |
| Focus Area | |
| Region | |

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| Lead Agencies | National Round Table on the Environment and Economy |
| Contacts | admin@nrtee-trnee.ca |

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| Name | Delaware Elevation Data from LiDAR |
| Description | Elevation contours (vector data) derived from the recent LIDAR projects are available per county for Kent and Sussex and county subsets for New Castle. These date sets were too large to be attached to their metadata entries within the DataMIL Metadata Catalog. New Castle was divided into three regions because the densely packed contours caused the file size to go beyond the 2 GB limit of shapefiles/dbf. These divisions were made to align with the tile boundaries of the aerial imagery products. |
| Type | - DATA: Depth and Elevation Data |
| Sector | |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Office of State Planning Coordination |

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| Name | Delaware Residents' Opinions on Climate Change and Sea Level Rise |
| Description | From the Executive Summary: This study was conducted for the Delaware Department of Natural Resources and Environmental Control (DNREC) to determine Delaware residents' opinions on climate change and sea level rise. The study entailed a telephone survey of Delaware residents ages 18 years and older. |
| Type | - PRODUCTS: Other |
| Sector | - Other |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Delaware Department of Natural Resources and Environmental Control; Responsive Management |

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| Name | Delaware Sea-Level Rise Initiative |
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| Description | <p>To help assess, prepare for and minimize the potential impacts of sea level rise, the Delaware Coastal Programs Section of the Delaware Department of Natural Resources and Environmental Control is leading a multi-year Sea Level Rise Initiative. The goal of the Sea Level Rise Initiative is to reduce Delaware's future vulnerability to the effects of sea level rise. This will be accomplished by: providing scientific and technical support for decision-making, implementing on-the-ground project in partnership with stakeholders, providing educational and outreach opportunities for stakeholders and the public, improving existing policies and management practices and/or developing new policies and management practices where necessary.</p> <p>The Sea Level Rise Initiative is designed to be iterative and will grow and change as new data, outreach and policy needs are identified. Part of this initiative is developing a Sea-Level Rise Adaptation Plan. The Initiative website includes all relevant activities as does the 2011 Compendium.</p> |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Engagement |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Economic Resources |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Delaware Coastal Management Program |

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| Name | Delaware Sea-Level Rise Initiative Compendium September 2011 |
| Description | <p>This document provides an overview of the projects initiated under Delaware's Sea-Level Rise Initiative, relating to data and modeling, hazard planning, monitoring, outreach and education, etc. The projects described in the compendium all have been initiated under the Sea Level Rise Initiative to help to build partnerships and capacity, increase resiliency, increase public knowledge of and support for actions to reduce our vulnerability and make decisions based upon the best available science.</p> |
| Type | - PRODUCTS: Other |

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| Sector | <ul style="list-style-type: none"> - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Delaware Department of Natural Resources and Environmental Conservation |
| Contacts | Delaware Coastal Programs, 302-739-9283 |

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| Name | Delaware Sea-Level Rise Inundation Maps |
| Description | <p>Scientists from Delaware Coastal Programs used a model to develop maps to show the possible impacts of inundation based on various Sea Level Rise scenarios for Delaware's waterways and the land that surrounds them (watersheds). These maps reflect the filling of these watersheds at constant elevations also referred to as "Bath Tub" modeling. In other words, the maps show the water levels rising in the watersheds similar to the "filling of a bathtub". These maps represent a constant, watershed based, water level and do not include any changes in water level due to the distance from tidal forcing, downstream flow, or other factors which could possibly change water levels. There are various uses for these maps including: assessing and planning land use and zoning ordinances to protect community resources while guiding new development; developing emergency management plans to prepare for natural disasters like nor'easters or tropical storms; determining impacts to the economy such as changes to the business and tourism sectors; conserving wildlife, wetlands, beaches, and other natural resources; protecting recreational areas like fishing spots, boating areas, parks, and cultural heritage locations; developing future plans for infrastructure like roads, fire departments, schools, sewer systems, drinking water, etc.; managing agriculture practices to conserve working farm lands and protect irrigation sources; and planning for coastal community resiliency by determining hazards and vulnerabilities.</p> |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Maps (Imagery, geo-referenced data) |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Social and Cultural Resources - Economic Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic |

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| Lead Agencies | Delaware Coastal Programs |
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| Name | Delaware Tidal Marsh Vulnerability Index |
| Description | <p>The purpose of the Marsh Vulnerability Index (MVI) is to develop a health index for <i>Spartina alterniflora</i> in salt marshes. Real-Time Kinematic GPS was used to attain elevation data for <i>S. alterniflora</i> to determine the elevational growth range. LiDAR was used during project design to ensure a representative elevation range was sampled. The MVI classifies healthy, degrading, and severely degrading short-form <i>Spartina alterniflora</i> marsh regions .</p> <p>The MVI will be essential for evaluating wetland vulnerability to sea-level rise on a watershed or statewide basis, while also enabling the strategic placement of monitoring resources to enhance efforts to understand the future evolution and migration potential of Delaware's tidal wetlands, as well as promoting conservation and restoration. MVI classification optimizes the monitoring efforts and resources to the highest levels possible, so the broadest extent of Delaware's tidal wetlands may be evaluated and managed. The MVI also classifies healthy and degrading short-form <i>Spartina alterniflora</i> marshes based on a correlation between degrading marshes and low elevations. With success, the MVI can be used in Mid-Atlantic States for regional comparison and planning.</p> |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Delaware Department of Natural Resources and Environmental Conservation |
| Contacts | Gabrielle C. Lyons, Delaware Coastal Programs, Department of Natural Resources & Environmental Control, gabrielle.lyons@state.de.us |

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| Name | Detailed Methodology for Mapping Sea-Level Rise Marsh Migration |
| Description | This document describes the mapping process used by the NOAA Coastal Services Center to map potential impacts to marsh environments due to sea level rise for the Sea Level Rise and Coastal Flooding Impacts viewer. Generally, this process can be described as a modified bathtub approach that attempts to account for local/regional tidal variability. |
| Type | - PRODUCTS: Training and Capacity Building |
| Sector | - Natural Ecosystems |
| Focus Area | |
| Region | - National |
| Lead Agencies | NOAA, Coastal Services Center |

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| Name | Developing Climate Change Capacity at the Municipal Level in Nova Scotia (2012) |
| Description | This booklet describes a suite of projects Service Nova Scotia and Municipal Relations (SNSMR) undertook under Atlantic Canada Adaptation Solutions (ACAS) to enhance the capacity of Nova Scotia municipalities to develop Municipal Climate Change Action Plans (MCCAPs). The first project involved development of a Municipal Climate Change Action Plan Guidebook (see separate database listing) that offers step-by-step guidance on development of MCCAPs. The second, a Municipal Mentor Project, engaged three mentors to assist municipalities through initial steps in developing their MCCAPs. The third generated the MCCAP Assistant, a document that complements the MCCAP Guidebook. The final project was a Municipal Participation ACAS Conference. |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Training and Capacity Building |
| Sector | - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Cross Disciplinary |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - International |
| Lead Agencies | Atlantic Climate Adaptation Solutions Service Nova Scotia and Municipal Relations |

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| Name | Digital Coast |
| Description | The basic premise of the site is the understanding that data alone are not enough. People need the associated tools, training, and information that turn data into information capable of making a difference. The NOAA Coastal Services Center built the prototype in 2008 and then reached out to potential users to provide feedback and guide the development of the site. These project partners, whose organizations eventually formed the Digital Coast Partnership, let the Center know what issues were most important, what type of content they would find most helpful, and the primary barriers they needed addressed. The partnership list is extensive including federal, state, county, NGO, academic, and professional partners. The website contains coastal datasets related to topics such as benthic, hydrography, land cover, imagery, elevation (LiDAR), etc. It also includes tools that support coastal decision-making around issues such as adaptation, land use planning, coastal hazards, water quality, economy, etc. It also includes trainings on similar topics. Finally, the site provides information on approaches related to climate adaptation, sea-level rise planning, renewable resources, etc. |
| Type | - PRODUCTS: Viewers and Web-based Tools |

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| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Economic Resources - Recreation and Tourism - Cross Disciplinary |
| Focus Area | |
| Region | - National |
| Lead Agencies | NOAA Coastal Services Center |

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| Name | Digital Coast Data Access Viewer |
| Description | This is one of the many tools available on NOAA's Digital Coastal website. This tool allows the user to search the Digital Coast tool for the location/ area/ region the user would like to view. Types of data available include: bathymetry, LiDAR, benthic cover, sea-level rise, aerial photography and much more. The data available will depend on location. |
| Type | - PRODUCTS: Viewers and Web-based Tools |
| Sector | |
| Focus Area | <ul style="list-style-type: none"> - Sustainability of Marine Ecosystems - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | <ul style="list-style-type: none"> - National - Regional Or State |
| Lead Agencies | NOAA Coastal Services Center, Digital Coast |

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| Name | Digital Coast's Conserving Coastal Wetlands for Sea-Level Rise Adaptation |
| Description | Digital Coast's Conserving Coastal Wetlands for Sea-Level Rise Adaptation tool helps users understand why coastal wetlands are valuable and how they can help in coping with sea level rise; identify what spatial data, tools, and techniques can help identify vulnerable wetlands and those that could increase resilience to sea level rise; prioritize the spatial data, tools, and techniques that can help prioritize existing or potential future wetland areas for protection; engage stakeholder support for strategies; and discover how are others incorporating sea level rise information into conservation and other planning efforts. The application provides guidance and links to many different resources and webpages. |

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| Type | - PRODUCTS: Training and Capacity Building - PRODUCTS: Viewers and Web-based Tools |
| Sector | - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - National - Regional Or State |
| Lead Agencies | NOAA, Coastal Services Center |

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| Name | Draft National Ocean Policy Implementation Plan |
| Description | From the Plan: The National Ocean Policy was established by Executive Order 13547 on July 19, 2010. This Implementation Plan lays out the framework for achieving the vision and charge of the National Ocean Policy to address the primary threats to the nations ocean, coasts, and Great Lakes. This document describes the steps the federal government will take to adress these threats, and it focuses on nine priority objectives: EcosystemBased Management; Inform Decisions and Improve Understanding; Observations, Mapping, and Infrastructure; Coordinate and Support; Regional Ecosystem Protection and Restoration; Resiliency and Adaptation to Climate Change and Ocean Acidification; Water Quality and Sustainable Practices on Land; Changing Conditions in the Arctic; and Coastal and Marine Spatial Planning. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Managed Ecosystems - Natural Ecosystems |
| Focus Area | |
| Region | - National |
| Lead Agencies | National Ocean Council |

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| Name | East Coast Sea-Level Rise Maps |
| Description | Clean Air Cool Planet has recently completed a pilot project in which it commissioned state-of-the-art coastal vulnerability maps showing how the range of sea level rise predictions up to 2100 would impact coastal communities and infrastructure in eight cities on the Eastern seaboard and several more on the US Gulf coast. The maps online show projected sea-level rise for the Chesapeake Bay Region and the cities of Hampton, NH; Miami, FL; Norfolk, VA; Philadelphia, PA; Portland, ME; Tampa-St. Petersburg, FL; and Wilmington, NC. |
| Type | - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Viewers and Web-based Tools |
| Sector | |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |

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|---------------|---|
| Region | - Regional Or State -- New England -- Mid-Atlantic -- South East |
| Lead Agencies | Clean Air Cool Planet |
| Contacts | General Contact Information: info@cleanair-coolplanet.org; 603.422.6464 |

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| Name | Economic & Greenhouse Gas Impacts of the New 2009 Fuel Economy (CAFE) Standards in New England |
| Description | June 2009 Carbon Solutions New England report titled "Economic & Greenhouse Gas Impacts of the New 2009 Fuel Economy (CAFE) Standards in New England". The results show that the New England region would see a net economic benefit of \$10 billion by 2025 under the new fuel economy standards announced by President Barack Obama in May. The money would come from fuel savings and reinvestment back into the local and regional economy. The new fuel economy standards would also save 10 billion gallons of gasoline and avoid 88 million metric tons of CO2 emissions by 2025. The report also details the savings by states in 6 separate state fact sheets. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Social and Cultural Resources - Economic Resources - Recreation and Tourism |
| Focus Area | |
| Region | - National - Regional Or State -- New England |
| Lead Agencies | Carbon Solutions New England |

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| Name | Economic Evaluation of Climate Change Impacts on New Brunswick-Nova Scotia Transport Corridor (2012) |
| Description | This report examines four climate change impacts (sea level rise; precipitation changes; temperature increases; and extreme weather events) on the New Brunswick/Nova Scotia Transport Corridor that is a part of a system of major ports, international airports, key border crossings, and road and rail connections between Atlantic Canada and North America's major markets. Expected economic loss to the NB/NS Transportation Corridor from climate change impacts is \$8.97 million per year (including \$5 million in lost assets associated with transportation infrastructure; \$1 million in lost value added by transportation; \$0.647 million in lost travel time; and \$2.27 million in increased costs from transportation accidents). |
| Type | |
| Sector | - Infrastructure - Economic Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | |

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| Lead Agencies | Atlantic Canada Adaptation Solutions Association |
| Contacts | Climate Change Secretariat, New Brunswick Department of the Environment env-info@gnb.ca |

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| Name | Economic Vulnerability and Adaptation to Climate Hazards and Climate Change: Building Resilience in the Barnegat Bay Region |
| Description | <p>From the Executive Summary: This study identifies key economic vulnerabilities to climate change and options for adaptation in the Barnegat Bay region of New Jersey. Like many coastal watershed regions of the United States, the Barnegat Bay region already faces significant pressures as the result of population growth, new residential and commercial development, loss of wetlands and natural areas for residential and commercial uses, intensification of land use in the watershed, and other factors. The region is also subject to climate risks and hazards that are typical of coastal zones in the middle Atlantic including sea level changes and extreme storm events, nor'easters, and hurricanes. Climate change is anticipated to add to the stresses within the region by altering temperature and precipitation patterns, increasing the likelihood of extreme precipitation events, and accelerating rates of sea level rise.</p> <p>This study draws on stakeholder knowledge of the region, including understanding of existing development stresses, in order to identify critical economic vulnerabilities to climate change and to identify feasible options for adaptation. The study pays particular attention to key economic assets and activities that may be at risk from climate change, as well as vulnerable populations. The study also considers the implications of climate change for emergency management and hazard mitigation. The broader goal of the study is to provide stakeholder-based information about economic risks and vulnerabilities in the Barnegat Bay region that will contribute to efforts to build long-term resilience to climate-related hazards and climate change.</p> |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Infrastructure - Economic Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - National - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Rutgers University, Barnegat Bay Partnership, EPA Climate Ready Estuaries |
| Contacts | Robin Leichenko, Rutgers Department of Geography, rleichen@rci.rutgers.edu |

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| Name | Ecosystem Advisory for the Northeast Shelf Large Marine Ecosystem |
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| Description | Produced since 2006 by NOAA NEFSC, the Ecosystem Advisory is a report of ecosystem conditions on the Northeast Shelf released twice a year. Included are data related to ecosystem variables (plankton blooms, sea surface temperature), long term temperature trends, and species specific habitat information. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Managed Ecosystems |
| Focus Area | - Sustainability of Marine Ecosystems - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- New England |
| Lead Agencies | NOAA National Marine Fisheries Service/Northeast Fisheries Science Center |
| Contacts | Kevin Friedland, Kevin.Friedland@noaa.gov |

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| Name | EcoSystem Indicator Partnership Climate Change Fact Sheet |
| Description | The Ecosystem Indicator Partnership (ESIP) is a committee of the Gulf of Maine Council on the Marine Environment. ESIP is developing indicators for the Gulf of Maine and integrating regional data for a new Web-based reporting system for marine ecosystem monitoring. Activities of ESIP initially center on convening regional practitioners in six indicator areas: coastal development, contaminants and pathogens, eutrophication, aquatic habitat, fisheries and aquaculture, and climate change. |
| Type | - PRODUCTS: Engagement - PRODUCTS: Education |
| Sector | |
| Focus Area | - Sustainability of Marine Ecosystems - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- New England |
| Lead Agencies | Gulf of Maine Council |

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| Name | Effects of Climate Change on Aquatic Invasive Species and Implications for Management and Research |
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| Description | Abstract: Global change stressors, including climate change and variability and changes in land use, are major drivers of ecosystem alterations. Invasive species, which are non-native species that cause environmental or economic damages or human-health impacts, also contribute to ecosystem changes. The interactions between stressors and invasive species, although not well understood, may exacerbate the impacts of climate change on ecosystems, and likewise, climate change may enable further invasions. This report reviews available literature on climate-change effects on aquatic invasive species (AIS) and examines state-level AIS management activities. Data on management activities came from publicly available information, was analyzed with respect to climate-change effects, and was reviewed by managers. This report also analyzes state and regional AIS management plans to determine their capacity to incorporate information on changing conditions generally, and climate change specifically. Although there is no mandate that directs states to consider climate change in AIS management plans, state managers can consider predicted effects of climate change on prevention, control, and eradication in order to manage natural resources effectively under changing climatic conditions. Further scientific research and data collection are needed in order to equip managers with the tools and information necessary to conduct effective AIS management in the face of climate change. NOTE: The report includes coastal species. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota |
| Focus Area | - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - National |
| Lead Agencies | Environmental Protection Agency, Environmental Law Institute |
| Contacts | Britta Bierwagen, Environmental Protection Agency, bierwagen.britta@epa.gov |

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| Name | Effects of Projected Sea Level Rise on Piping Plover (<i>Charadrius melodus</i>) Nesting Habitat in Rhode Island |
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| Description | <p>Abstract: Accelerated sea level rise (SLR) is expected to greatly alter vulnerable habitats along the Atlantic coast in the coming century. Low-elevation sandy beaches, important nesting habitat for the continued recovery of the federally threatened piping plover (<i>Charadrius melodus</i>), are especially vulnerable to slr. Coastal Rhode Island, despite dense development, has been an increasingly productive area for piping plover during the last two decades, adding significantly to the species' recovery in New England. Understanding to what extent these low-lying piping plover nesting beaches can retreat landward is key for prioritizing long-term habitat conservation and management actions. This research examines habitat change in response to slr under stationary and migration habitat responses and whether development blocks habitat migration for five important piping plover nesting beaches in Rhode Island. For the stationary model, all the study beaches (East Beach Watch Hill, Quonochontaug, Ninigret, Green Hill, and Trustom Pond) lose plover habitat under all slr projections (i.e., 0.5, 1, 1.5 m), with lower lying beaches experiencing greater loss. Total habitat loss ranges from 5% (0.5 m) to 23% (1.5 m) in the 100- year study timeframe. At the highest slr level, East Beach loses 48% of current habitat, while Green Hill Beach loses 1% of current habitat. For the migration model, habitat on all five beaches expands under the lowest slr scenario (0.5 m). Habitat continues to expand for four of the beaches at the mid-range slr scenario (1 m). At the highest slr scenario (1.5 m), habitat continues to expand for two beaches and contracts for three beaches. For the migration model, development blocks the creation of 6.6 to 8.4 ha of habitat on four beaches. However, the majority of piping plover habitat will migrate inland if unconstrained by additional development or shoreline protection structures. East Beach shows the greatest habitat migration potential and Green Hill Beach the least. To manage for preservation of habitat, overwash processes should be encouraged and development limited on East Beach, Quonochontaug Beach, Ninigret Beach, Trustom Pond (Moonstone Beach), and the center of Green Hill Beach. This study provides beach-specific input for land management decisions affecting piping plover habitat preservation for the municipalities of Westerly, Quonochontaug, Charlestown, Green Hill, and South Kingstown and the United States Fish and Wildlife Service, Rhode Island National Wildlife Refuge Complex. In addition, these impending beach configuration changes present an opportunity for increased cooperation among coastal zone managers, wildlife managers, coastal residents, and businesses to engage in land management practices that provide ecological, economic, and recreational benefits to local communities by preserving beach habitat.</p> |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Natural Ecosystems - Biota |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- New England |
| Lead Agencies | Antioch University New England |
| Contacts | Sally Ann Sims, Antioch University New England |

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| Name | Emergence time scales for detection of anthropogenic climate change in US tropical cyclone loss data |
| Description | Research Paper: Emergence time scales for detection of anthropogenic climate change in US tropical cyclone loss data. The researchers also warn environmentalists and policymakers against making claims that damage from Hurricane Katrina and other storms are rising from carbon dioxide emissions. Insurance companies that promote climate change as a reason for rising prices could also lose credibility. |
| Type | |
| Sector | - Economic Resources |
| Focus Area | |
| Region | - International - National |
| Lead Agencies | Environmental Research Letters |

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| Name | Environment Canada Climate Change Science and Research-Data Model Outputs |
| Description | The Canadian Centre for Climate Modelling and Analysis has developed a number of climate models. Data from these climate models are available for downloading with a username and password. |
| Type | - DATA: Satellite Remote Observations - PRODUCTS: Forecasts and outlooks (monthly to annual, models) |
| Sector | - Cross Disciplinary |
| Focus Area | |
| Region | |
| Lead Agencies | Environment Canada Canadian Centre for Climate Modelling and Analysis |
| Contacts | cccma_info@ec.gc.ca |

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| Name | Environment Canada Visualization (Maps and Graphs) |
| Description | <p>The goals of Canadian Climate Change Scenarios Network are:</p> <ul style="list-style-type: none"> - Support climate change impact and adaptation research in Canada and other countries; - Support stakeholders requiring scenario information for decision making and policy development; - Provide access to the work of AIRS, an Environment Canada research group under the auspices of the Atmospheric Science and Technology Directorate; and - Provide access to Canadian research on the development of scenarios and adaptation research. <p>Its visualization website includes scenario maps, scatterplots, timeseries, bioclimate profiles and a localizer, as well as static seasonal/annual maps.</p> |

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| Type | <ul style="list-style-type: none"> - DATA: Satellite Remote Observations - DATA: Observing Systems - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Viewers and Web-based Tools |
| Sector | - Natural Ecosystems |
| Focus Area | |
| Region | |
| Lead Agencies | Environment Canada Canadian Climate Change Scenarios Network |
| Contacts | Environment Canada Adaptation and Impacts Research Section |

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| Name | EOS Earth Data |
| Description | University of New Hampshire's free EOS Earth Data is a library of earth science data, which includes climate change resources. |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Engagement - PRODUCTS: Education |
| Sector | - Cross Disciplinary |
| Focus Area | |
| Region | - Regional Or State -- New England |
| Lead Agencies | University of New Hampshire |

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| Name | Estimated Inventory Guide |
| Description | This brief flyer serves as a reference tool for municipalities going through FCM's Five-Milestone framework to cut greenhouse gas emissions and save energy. A precursor to Milestone One, this guide helps estimate the distribution of emissions among sectors like buildings, transportation, and industry, and helps municipalities identify greatest opportunities for reductions. |
| Type | - PRODUCTS: Training and Capacity Building |
| Sector | <ul style="list-style-type: none"> - Infrastructure - Economic Resources - Cross Disciplinary |
| Focus Area | |
| Region | |
| Lead Agencies | Federation of Canadian Municipalities: Partners for Climate Protection |
| Contacts | communities@fcm.ca |

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| Name | Evidence for Changing Flood Risk in New England Since the Late 20th Century |
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| Description | Abstract: Long-term flow records for watersheds with minimal human influence have shown trends in recent decades toward increasing streamflow at regional and national scales, especially for low flow quantiles like the annual minimum and annual median flows. Trends for high flow quantiles are less clear, despite recent research showing increased precipitation in the conterminous United States over the last century that has been brought about primarily by an increased frequency and intensity of events in the upper 10th percentile of the daily precipitation distribution – particularly in the Northeast. This study investigates trends in 28 long-term annual flood series for New England watersheds with dominantly natural streamflow. The flood series are an average of 75 years in length and are continuous through 2006. Twenty-five series show upward trends via the nonparametric Mann-Kendall test, 40% (10) of which are statistically significant ($p < 0.1$). Moreover, an average standardized departures series for 23 of the study gages indicates that increasing flood magnitudes in New England occurred as a step change around 1970. The timing of this is broadly synchronous with a phase change in the low frequency variability of the North Atlantic Oscillation, a prominent upper atmospheric circulation pattern that is known to effect climate variability along the United States east coast. Identifiable hydroclimatic shifts should be considered when the affected flow records are used for flood frequency analyses. Special treatment of the flood series can improve the analyses and provide better estimates of flood magnitudes and frequencies under the prevailing hydroclimatic condition. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate |
| Region | - Regional Or State -- New England |
| Lead Agencies | NOAA |
| Contacts | Mathias Collins, NOAA, mathias.collins@noaa.gov |

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| Name | Facing Our Future: Adapting to Connecticut's Changing Climate |
| Description | The Connecticut Department of Environment Protection has developed a series of initial climate adaptation fact sheets, Facing Our Future, that detail current observations and provide some cursory recommendations for alternative approaches to foster adaptation at the local and regional level. These fact sheets address overlapping technical areas or categories: biodiversity and habitat, fisheries, forestry, infrastructure, natural coastal shoreline environment, outdoor recreation, water resources, and wildlife. |
| Type | - PRODUCTS: Other |

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| Sector | <ul style="list-style-type: none"> - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- New England |
| Lead Agencies | Department of Energy and Environmental Protection |

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| Name | Federal Highway Administration Climate Change Adaptation Peer Exchanges: Comprehensive Report. The Role of State Departments of Transportation and Metropolitan Planning Organizations in Climate Change Adaptation |
| Description | In 2011 and 2012, FHWA held three peer exchanges with state DOTs and MPOS to identify and establish a network for reducing vulnerability of transportation infrastructure to climate change. In May 2012, the New England workshop was held in Cambridge, MA; the report summarizes workshop outcomes, focusing on best practices and strategies for overcoming common challenges, needs, and recommendations. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Infrastructure |
| Focus Area | - Changes in Extremes of Weather and Climate |
| Region | - Regional Or State -- New England |
| Lead Agencies | Federal Highway Administration, ICF international |
| Contacts | Ellen Mecray, NOAA Regional Climate Services Director, Eastern Region (workshop participant); ellen.l.mecray@noaa.gov |

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| Name | Federal Highway Administration's Transportation, Climate Change & Extreme Weather Vulnerability Assessment Webinar Series, May-June 2013 |
| Description | A four part webinar series produced by the Federal Highway Administration addressing vulnerability assessment of transportation infrastructure, climate change, and extreme events. Sessions are recorded and will be made available here: http://www.fhwa.dot.gov/environment/climate_change/adaptation/webinars/ |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Engagement - PRODUCTS: Training and Capacity Building |
| Sector | - Infrastructure |

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| Focus Area | <ul style="list-style-type: none"> - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate |
| Region | <ul style="list-style-type: none"> - National - Regional Or State -- New England -- Mid-Atlantic -- Central - - Great Lakes -- South East |
| Lead Agencies | U.S. DOT Federal Highway Administration |

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| Name | Final Report: A Climate Change Action Plan (Virginia) |
| Description | Virginia's Climate Change Action Plan was initiated by Executive Order by then Governor Tim Kaine. It was developed by a diverse Commission comprised of more than 40 citizens of the Commonwealth, including scientists, economists, environmental advocates, and representatives from the energy, transportation, building, and manufacturing sectors. The Commission also included local government representatives and state lawmakers. The Action Plan includes an outline of impacts and recommendations related to natural resources and the coastal environment. Examples include a recommendation to acquire LiDAR data for the state, to develop a state sea-level rise plan, and that the Virginia Institute of Marine Science should assess the vulnerability of coastal and marine living resource restoration efforts to climate change, particularly those for oysters and submerged aquatic vegetation, to climate change and recommend specific steps to increase the likelihood of success under changing conditions. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Recreation and Tourism |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Governor's Commission on Climate Change, Virginia Department of Environmental Quality |
| Contacts | Paul Jasinski, Chesapeake Environmental Communications, paula@chesapeake.com |

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| Name | Flood Frequency Estimates for New England River Restoration Projects: Considering Climate Change in Project Design |
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| Description | From the report: Flood frequency estimates are used to quantify the magnitude and frequency of relatively rare or extreme river discharges. Such estimates are necessary to design many river restoration projects. For projects that include constructing new infrastructure or retrofitting existing infrastructure flood frequency estimates are required to size the infrastructure to withstand floods of specified magnitudes (e.g., events expected to recur every 100 years). For projects where infrastructure is being removed and a natural channel restored (e.g., a dam removal) flood frequency estimates are also useful because stream channel geometry, process, and habitat are very closely linked with the magnitude of comparatively frequent flood events—those with recurrence intervals between 1 and 5 years. Thus, flood frequency estimates are necessary to understand how channel changes will affect stream biota and adjacent floodplain landowners. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources |
| Region | - Regional Or State -- New England |
| Lead Agencies | NOAA Fisheries Service |
| Contacts | Mathias Collins, NOAA, mathias.collins@noaa.gov |

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| Name | Flood-related mapping information for New Brunswick |
| Description | GeoNB is the Province of New Brunswick's gateway to geographic information and related value-added applications. Its primary goals of GeoNB are to <ul style="list-style-type: none"> - Provide users with easy access to geographic data, value-added applications and maps; - Reduce duplication and costs through collaboration and the sharing of geographic data and infrastructure; and - Promote the use of geographic data and maps. The site includes a catalog of data; map products and applications. |
| Type | - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Viewers and Web-based Tools |
| Sector | - Infrastructure - Managed Ecosystems - Natural Ecosystems |

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| Focus Area | |
| Region | |
| Lead Agencies | Government of New Brunswick |
| Contacts | geonb@snb.ca |

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| Name | Forecasting Economic Damages from Storm Surge Flooding: A Case Study in the Tantramar Region of NB (2012) |
| Description | <p>Subject to strong tidal forces, the Tantramar region of New Brunswick relies on an approximately 33-km dyke system to protect the Town of Sackville, an interprovincial railway and highway, and surrounding agricultural lands. Ssea-level estimates for an 8.9m, 1-in-10 yr. storm surge could overtop approximately 90 percent of the existing dyke system and temporarily inundate 20 percent of Sackville.</p> <p>Using climate-change scenarios and known assets-at-risk, this project sought to characterize the existing (or baseline) potential damages associated with storm-surge flooding; determine how potential damages could change with increased sea-level rise ; and demonstrate how adaptation scenarios can be analyzed for their effectiveness in reducing exposure to flood damages. Dyke top-up was found to provide immediate protection, but become ineffective long-term given forecasted climate trends. Relocation of infrastructure out of high-risk areas provided significant long-term reductions in expected annual damage.</p> |
| Type | |
| Sector | <ul style="list-style-type: none"> - Infrastructure - Economic Resources - Cross Disciplinary |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | |
| Lead Agencies | Atlantic Canada Adaptation Solutions Association New Brunswick Department of Environment |
| Contacts | Climate Change Secretariat, New Brunswick Department of the Environment env-info@gnb.ca |

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| Name | Freshwater Biological Traits Database |
| Description | <p>The Freshwater Biological Traits Database currently contains traits data for 3,857 North American macroinvertebrate taxa, and includes habitat, life history, mobility, morphology and ecological trait data. These data were compiled for a project on climate change effects on river and stream ecosystems. The traits data were gathered from multiple sources, which are listed on the web site under, "Data Source". Data gathering efforts focused on data that were published or otherwise well-documented by trustworthy sources, accessible, appropriate for the regions being studied, in a standardized format that could be analyzed or easily converted to a format that could be analyzed, and ecologically relevant to the gradients being considered.</p> |

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| Type | |
| Sector | |
| Focus Area | - Climate Impacts on Water Resources - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - National |
| Lead Agencies | EPA |
| Contacts | Britta Bierwagen, U.S. EPA, bierwagen.britta@epa.gov |

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| Name | Future Sea-Level Rise and the New Jersey Coast: Assessing Potential Impacts and Opportunities |
| Description | This study projects the future impacts to New Jersey from sea-level rise. The authors project future sea level rise based on historical measurements and global scenarios, and apply them to digital elevation models to demonstrate the vulnerability of New Jersey's coast. The authors estimate that 1 to 3 % of New Jersey's land area will be affected by inundation and 6.5 to over 9 % by episodic coastal flooding over the next century. Possible impacts to natural systems and socioeconomic impacts are also summarized. A range of adaptation and mitigation options for the coastal area are also outlined. The report suggests that where possible a gradual withdrawal of development from some areas of the New Jersey coast may be the optimum management strategy for protecting natural ecosystems. |
| Type | - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Woodrow Wilson School of Public and International Affairs Princeton University |

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| Name | Gateway National Recreation Area: Long-term Resource Management Under a Changing Climate |
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| Description | This report was written to help inform the development of the Gateway National Recreation Area's General Management Plan to include climate change adaptation strategies as well as to inform the public. The report includes: a summary of climate change science, including local projections relevant for planning at Gateway; an assessment on how climate change impacts will affect Gateway's natural and cultural resources; an overview of Gateway's guiding policies and how or whether these policies address adaptation to climate change; and recommendations for a climate change adaptation strategy within the 2009 General Management Plan. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Infrastructure - Natural Ecosystems - Biota - Social and Cultural Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | National Park Service |

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| Name | Getting to Carbon Neutral: A Guide for Canadian Municipalities |
| Description | This report offers Canadian municipalities a menu of options for greenhouse gas emission reductions, allowing them to choose actions that are both feasible and strategic for their situation. Part I reiterates the value and process of carbon inventorying and identifies significant urban sources of greenhouse gas (GHG) emissions. Part II offers best practice strategies for GHG reductions and provides Estimation Guidelines—equations that quantify the approximate emission reductions that could be achieved from implementing these activities, and offers diverse case studies. Part III compares different strategies, considering costs and benefits of GHG abatement, and includes a Top Ten list of actions with the greatest potential impact on GHG emissions. |
| Type | - PRODUCTS: Training and Capacity Building |
| Sector | - Infrastructure - Economic Resources - Cross Disciplinary |
| Focus Area | |
| Region | |
| Lead Agencies | Toronto and Region Conservation University of Toronto--Sustainable Infrastructure Group |
| Contacts | Christopher Kennedy, christopher.kennedy@utoronto.ca |

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| Description | <p>The Federal Highway Administration's (FHWA) Office of Planning sponsored a 1.5 day peer exchange in Atlanta, Georgia focusing on the use of geographic information systems (GIS) to support transportation related climate change decisions. The Atlanta Regional Commission hosted the peer exchange. Participants included staff from the Maine Geological Survey, Maryland State Highway Administration (MDSHA), New England Environmental Finance Center, Sacramento Area Council of Governments (SACOG), Southern Maine Regional Planning Commission, Washington Department of Transportation (WSDOT), FHWA Headquarters, and the Volpe National Transportation Systems Center (Volpe Center).</p> <p>The purpose of the peer exchange was to allow participants to:</p> <p>Share their knowledge and experiences with each other; Discuss lessons learned and challenges; and Identify ways to improve agencies' abilities to develop and manage GIS/climate change applications, share geospatial data, and support public outreach through GIS technologies. This report provides overviews of the presentations given at the peer exchange and the associated questions and answers. It concludes with a summary of the roundtable discussions.</p> |
| Type | <ul style="list-style-type: none"> - DATA: Depth and Elevation Data - DATA: Other - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Maps (Imagery, geo-referenced data) |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Recreation and Tourism |
| Focus Area | |
| Region | <ul style="list-style-type: none"> - National - Regional Or State -- New England -- Mid-Atlantic |
| Lead Agencies | Department of Transportation |

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| Name | Global Climate Change Impacts in the United States |
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| Description | <p>The report summarizes the science and the impacts of climate change on the United States, now and in the future. It focuses on climate change impacts in different regions of the U.S. and on various aspects of society and the economy such as energy, water, agriculture, and health. It's also a report written in plain language, with the goal of better informing public and private decision making at all levels.</p> <p>In addition to discussing the impacts of climate change in the U.S., the report also highlights the choices we face in response to human-induced climate change. It is clear that impacts in the United States are already occurring and are projected to increase in the future, particularly if the concentration of heat-trapping greenhouse gases in the atmosphere continues to rise. So, choices about how we manage greenhouse gas emissions will have far-reaching consequences for climate change impacts. Similarly, there are choices to be made about adaptation strategies that can help to reduce or avoid some of the undesirable impacts of climate change. This report provides many of the scientific underpinnings for effective decisions to be made – at the national and at the regional level.</p> |
| Type | |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Economic Resources - Recreation and Tourism |
| Focus Area | |
| Region | - National |
| Lead Agencies | Global Change Research Program |

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| Name | Global Sea Level Rise Scenarios for the United States National Climate Assessment |
| Description | From the Executive Summary: "The US Congress recognizes the need to consider future trends in the Global Change Research Act (USGCRA), which calls for a National Climate Assessment (NCA) every four years. This report provides a synthesis of the scientific literature on global SLR at the request of a federal advisory committee charged with developing the next NCA. This report also provides a set of four global mean SLR scenarios to describe future conditions for the purpose of assessing potential vulnerabilities and impacts." |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Plans, Assessments, Studies |

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| Sector | - Infrastructure - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - National |
| Lead Agencies | NOAA |

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| Name | Goddard Space Flight Center- Climate Essentials |
| Description | NASA has released a new multimedia climate change "resource reel" showcasing free downloadable videos, data visualizations, animations, and still images that illustrate key climate change concepts and discoveries. The reel is divided into key topics such as ocean, atmosphere, and the sun. It also contains a search function that offers access to NASA's larger multimedia archive. |
| Type | - PRODUCTS: Hindcasts (climatologies, models) - PRODUCTS: Forecasts and outlooks (monthly to annual, models) - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Maps (Imagery, geo-referenced data) |
| Sector | |
| Focus Area | - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate |
| Region | - International - National - Regional Or State |
| Lead Agencies | NASA |

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| Name | Green House Gas Reporting Data/Agency launches electronic GHG reporting tool |
| Description | U.S. Environmental Protection Agency is launching a new tool to allow 28 industrial sectors to submit their 2010 greenhouse gas (GHG) pollution data electronically. Prior to being finalized, more than 1,000 stakeholders, including industry associations, states and NGOs tested the electronic GHG Reporting Tool (e-GGRT) to ensure clarity and user-friendliness. The data collected with e-GGRT will provide the public with important information about the nation's largest stationary sources of greenhouse gas pollution. Industries and businesses can also use the data to help find ways to decrease carbon pollution, increase efficiency and save money |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Training and Capacity Building |

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| Sector | - Public Health and Safety - Infrastructure |
| Focus Area | |
| Region | - National - Regional Or State -- New England -- Mid-Atlantic -- Central - - Great Lakes -- South East |
| Lead Agencies | EPA |
| Contacts | Cathy Milbourn milbourn.cathy@epa.gov (202) 564-7849 (202) 564-4355 |

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| Name | Greenhouse Gases and the American Lifestyle: Understanding Interstate Differences in Emissions |
| Description | This report analyzes interstate variation in per capita emissions, seeking to explain why some states have much lower emissions than others. Some of the differences are based on objective factors beyond anyone's control: for instance, the coldest states have high heating needs, while the hottest states use a lot of air conditioning. Other differences may be based on policies and measures that have lowered emissions in some states, and could be replicated in others. Identifying the causes of interstate differences in emissions may also help clarify the potential regional impacts of policies, such as a cap and trade system, which put a price on carbon emissions. |
| Type | - PRODUCTS: Viewers and Web-based Tools - PRODUCTS: Management Guidance (i.e. structured decision making) - PRODUCTS: Regulatory/ Policy Guidance |
| Sector | |
| Focus Area | |
| Region | - Regional Or State -- New England -- Mid-Atlantic -- Central - - Great Lakes -- South East |
| Lead Agencies | Ecotrust, Economics for Equity and the Environment, Stockholm Environment Institute Report |

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| Name | Guide to Considering Climate Change in Environmental Assessments in Nova Scotia (2011) |
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| Description | Many projects that trigger Project Registration and an associated Environmental Assessment (EA) in Nova Scotia can have relatively long life spans (from 20 to 100+ years). Highway infrastructure, mine tailings facilities, and energy infrastructure are examples of projects that will affect the environment and project viability—both physical (direct impacts such as sealevel rise) and financial (such as insurance premiums and maintenance). Considering climate change at the time of Project Registration, in the EA, and early in the decision-making process may avoid future costs. This guide is designed to support the more detailed Guide to Considering Climate Change in Project Development in Nova Scotia, demonstrating how and where to incorporate climate change in a project's EA. |
| Type | - PRODUCTS: Training and Capacity Building |
| Sector | - Infrastructure - Cross Disciplinary |
| Focus Area | - Climate Impacts on Water Resources |
| Region | - International |
| Lead Agencies | Nova Scotia Environment |

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| Name | Guide to Considering Climate Change in Project Development in Nova Scotia (2011) |
| Description | This guide helps guide project developers as they assess its carbon footprint; review options to reduce greenhouse gas emissions; gauge impacts the project may have on carbon sinks; identify whether or not potential hazards from climate change could affect the Project; and identify possible adaptation options. |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Training and Capacity Building - PRODUCTS: Management Guidance (i.e. structured decision making) |
| Sector | - Infrastructure - Cross Disciplinary |
| Focus Area | |
| Region | - International |
| Lead Agencies | Nova Scotia Environment |

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| Name | Habitat Conservation for Climate Adaptation: Initial Lessons from the Field |
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| Description | The report focuses on a Maryland-specific effort to identify conservation and management actions that would help Maryland increase coastal resiliency. The project involved developing a spatial analysis tool to help evaluate and rank parcels for acquisition incorporating climate change information. Maryland Department of Natural Resources worked with NOAA to identify project considerations for ecosystem/ conservation based adaptation planning that would apply and be useful for other states and entities. |
| Type | - PRODUCTS: Other - PRODUCTS: Management Guidance (i.e. structured decision making) |
| Sector | - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | NOAA Coastal Services Center |
| Contacts | NOAA Coastal Services Center, (843) 740-1200 |

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| Name | Heat Alert and Response Systems to Protect Health: Best Practices Guidebook (2012) |
| Description | This guidebook provides an overview of health risks from extreme heat and offers evidence-based strategies for alerting health authorities and the public when hazardous conditions arise. It is intended for use by policymakers, planners and service providers involved in protecting citizens from extreme heat events. The guidebook is designed to help develop interventions tailored to the needs of a specific community. |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Training and Capacity Building |
| Sector | - Public Health and Safety |
| Focus Area | |
| Region | |
| Lead Agencies | Health Canada: Water, Air and Climate Change Bureau |
| Contacts | Health Canada, nfo@hc-sc.gc.ca |

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| Name | Hotspot of Accelerated Sea-Level Rise on the Atlantic Coast of North America |
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| Description | Abstract: Climate warming does not force sea-level rise (SLR) at the same rate everywhere. Rather, there are spatial variations of SLR superimposed on a global average rise. These variations are forced by dynamic processes, arising from circulation and variations in temperature and/or salinity, and by static equilibrium processes, arising from mass redistributions changing gravity and the Earth's rotation and shape. These sea-level variations form unique spatial patterns, yet there are very few observations verifying predicted patterns or fingerprints. Here, we present evidence of recently accelerated SLR in a unique 1,000-km-long hotspot on the highly populated North American Atlantic coast north of Cape Hatteras and show that it is consistent with a modelled fingerprint of dynamic SLR. Between 1950–1979 and 1980–2009, SLR rate increases in this northeast hotspot were ~ 3–4 times higher than the global average. Modelled dynamic plus steric SLR by 2100 at New York City ranges with Intergovernmental Panel on Climate Change scenario from 36 to 51cm (ref. 3); lower emission scenarios project 24–36cm (ref. 7). Extrapolations from data herein range from 20 to 29cm. SLR superimposed on storm surge, wave run-up and set-up will increase the vulnerability of coastal cities to flooding, and beaches and wetlands to deterioration. |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Infrastructure - Managed Ecosystems - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- New England -- Mid-Atlantic -- South East |

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| Name | Hydroclimatic flood trends in the northeastern United States and linkages with large-scale atmospheric circulation patterns |
| Description | Many stream gauges (selected for long record lengths and climate sensitivity) in the Mid-Atlantic show evidence for step increases in flood magnitude and/or frequency around 1970. In New England, researchers found evidence for lagged positive relationships between the winter North Atlantic Oscillation phase and flood magnitude and frequency. Results suggest hydroclimatic changes in regional flood response that are related to a combination of factors, including cyclic atmospheric variability and secular trends related to climate warming affecting both antecedent conditions and event-scale processes. |
| Type | <ul style="list-style-type: none"> - DATA: In situ Observations - PRODUCTS: Plans, Assessments, Studies |
| Sector | |
| Focus Area | - Changes in Extremes of Weather and Climate |

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| Region | - Regional Or State -- New England -- Mid-Atlantic |
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| Name | Identifying Coastal Habitats at Risk from Climate Change Impacts in the Gulf of Maine |
| Description | Identifying Coastal Habitats at Risk from Climate Change Impacts in the Gulf of Maine This report was prepared by the Gulf of Maine Council on the Marine Environment's Climate Change Network. The purpose of this document is to identify what research has been carried out in relation to climate change and its effects on the GoM coast. The research primarily includes studies on habitats and climate change and includes information on geology, topography, and watersheds. The focus is to bring together the available information in publications and maps and to begin to identify where gaps may exist. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Economic Resources - Recreation and Tourism |
| Focus Area | <ul style="list-style-type: none"> - Sustainability of Marine Ecosystems - Coasts and Climate Resilience (including sea-level rise) - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- New England |
| Lead Agencies | Gulf of Maine Council |
| Contacts | Regina Lyons |

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| Name | Identifying Species in Pennsylvania Potentially Vulnerable to Climate Change |
| Description | The Pennsylvania Natural Heritage Program set out to fill the need of identifying which species in the state are vulnerable to climate change. The goals of the project were to 1) compile a priority list of species occurring in Pennsylvania that are likely vulnerable to climate change and 2) examine the climate change vulnerability of species included in the priority list. The overall objective was to not only identify climate change vulnerable species but to also examine the abiotic factors and life history characteristics that contribute to their increased vulnerability. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Natural Ecosystems - Biota |

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| Focus Area | - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Pennsylvania Natural Heritage Program |

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| Name | Identifying the Possible Effects of Climate Change on Invasive Species in the Gulf of Maine – a Background Report |
| Description | Identifying the Possible Effects of Climate Change on Invasive Species in the Gulf of Maine – a Background Report The purpose of this document is to identify available research on climate change and the effect this may have on invasive species in the Gulf of Maine. The research primarily includes studies on invasive species, habitats, oceanography, and the indicators of climate change. The focus is to bring together the available information in publications and maps and to begin to identify where gaps may exist. Recommendations for further work are subsequently suggested. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Managed Ecosystems - Natural Ecosystems - Biota |
| Focus Area | - Sustainability of Marine Ecosystems - Coasts and Climate Resilience (including sea-level rise) - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- New England |
| Lead Agencies | Gulf of Maine Council |

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| Name | Impacts of Climate Change on Biodiversity, Ecosystems, and Ecosystem Services: Technical Input to the 2013 National Climate Assessment. |
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| Description | <p>Executive Summary: Ecosystems, and the biodiversity and services they support, are intrinsically dependent on climate. During the twentieth century, climate change has had documented impacts on ecological systems, and impacts are expected to increase as climate change continues and perhaps even accelerates. This technical input to the National Climate Assessment synthesizes our scientific understanding of the way climate change is affecting biodiversity, ecosystems, ecosystem services, and what strategies might be employed to decrease current and future risks. Building on past assessments of how climate change and other stressors are affecting ecosystems in the United States and around the world, we approach the subject from several different perspectives. First, we review the observed and projected impacts on biodiversity, with a focus on genes, species, and assemblages of species. Next, we examine how climate change is affecting ecosystem structural elements—such as biomass, architecture, and heterogeneity—and functions—specifically, as related to the fluxes of energy and matter. People experience climate change impacts on biodiversity and ecosystems as changes in ecosystem services; people depend on ecosystems for resources that are harvested, their role in regulating the movement of materials and disturbances, and their recreational, cultural, and aesthetic value. Thus, we review newly emerging research to determine how human activities and a changing climate are likely to alter the delivery of these ecosystem services.</p> <p>This technical input also examines two cross-cutting topics. First, we recognize that climate change is happening against the backdrop of a wide range of other environmental and anthropogenic stressors, many of which have caused dramatic ecosystem degradation already. This broader range of stressors interacts with climate change, and complicates our abilities to predict and manage the impacts on biodiversity, ecosystems, and the services they support. The second cross-cutting topic is the rapidly advancing field of climate adaptation, where there has been significant progress in developing the conceptual framework, planning approaches, and strategies for safeguarding biodiversity and other ecological resources. At the same time, ecosystem-based adaptation is becoming more prominent as a way to utilize ecosystem services to help human systems adapt to climate change.</p> <p>In this summary, we present key findings of the technical input, focusing on themes that can be found throughout the report. Thus, this summary takes a more integrated look at the question of how climate change is affecting our ecological resources, the implications for humans, and possible response strategies. This integrated approach better reflects the impacts of climate in the real world, where changes in ecosystem structure or function will alter the viability of different species and the efficacy of ecosystem services. Likewise, adaptation to climate change will simultaneously address a range of conservation goals. Case studies are used to illustrate this complete picture throughout the report; a snapshot of one case study, 2011 Las Conchas, New Mexico Fire, is included in this summary.</p> |
| Type | - PRODUCTS: Plans, Assessments, Studies |

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| Sector | <ul style="list-style-type: none"> - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Economic Resources |
| Focus Area | <ul style="list-style-type: none"> - Sustainability of Marine Ecosystems - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State |
| Lead Agencies | U.S. Global Change Research Program |

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| Name | Impacts of Future Sea Level Rise on the Coastal Floodplain |
| Description | From the Report: The purpose of this project was to model a static 2-foot rise in sea level for an area of the Rachel Carson National Wildlife Refuge that is covered by Light Detection and Ranging (LIDAR) data flown in 2004 for the NOAA Coastal Services Center (NOAA, 2004). The Maine Geological Survey (MGS) also simulated a static 1 ft and 3 ft rise in sea level for the study area, and evaluated potential impacts on marsh habitat and flooding. |
| Type | <ul style="list-style-type: none"> - DATA: Depth and Elevation Data - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Maps (Imagery, geo-referenced data) |
| Sector | - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- New England |
| Lead Agencies | Maine Geological Survey |
| Contacts | Peter A. Slovinsky, Maine Geological Survey, Peter.A.Slovinsky@maine.gov |

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| Name | Implementing the National Water Program Strategy: Reponse to Climate Change Progress Report for 2008 |
| Description | A report on progress in implementing the OW Climate Strategy in 2008. April 2010 two fact sheets issued 1) EPA Regional and Large Aquatic Ecosystem Programs Highlights of Progress 2007-2009; 2) EPA Office of Water Highlights of Progress 2007-2009. EPA National Water Program Strategy has released an update to its Response to Climate Change Strategy. This 2010-2011 Update describes the Key Actions that are continuing to be implemented over the next two years. |

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| Type | - PRODUCTS: Management Guidance (i.e. structured decision making) - PRODUCTS: Regulatory/ Policy Guidance |
| Sector | - Public Health and Safety - Infrastructure |
| Focus Area | - Climate Impacts on Water Resources |
| Region | |
| Lead Agencies | EPA National Water Program |
| Contacts | Regina Lyons |

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| Name | Incorporating Sea Level Change Scenarios at the Local Level |
| Type | - PRODUCTS: Engagement - PRODUCTS: Management Guidance (i.e. structured decision making) |
| Sector | - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Social and Cultural Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate |
| Region | - Regional Or State |
| Lead Agencies | NOAA, Coastal Services Center |

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| Name | Increased Frequency of Low-Magnitude Floods in New England |
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| Description | <p>Abstract: Recent studies document increasing precipitation and streamflow in the northeastern United States throughout the 20th and early 21st Centuries. Annual peak discharges have increased over this period on many New England rivers with dominantly natural streamflow – especially for smaller, more frequent floods. To better investigate high-frequency floods (<5-year recurrence interval), we analyze the partial duration flood series for 23 New England rivers selected for minimal human impact. The study rivers have continuous records through 2006 and an average period of record of 71 years. Twenty-two of the 23 rivers show increasing trends in peaks over threshold per water year (POTWY) – a direct measure of flood frequency – using the MannKendall trend test. Ten of these trends had $p < 0.1$. Seventeen rivers show positive trends in flood magnitude, six of which had $p < 0.1$. We also investigate a potential hydroclimatic shift in the region around 1970. Twenty-two of the 23 rivers show increased POTWY in the post-1970 period when comparing pre- and post-1970 records using the Wilcoxon rank-sum test. More than half of these increases have $p < 0.1$, indicating a shift in flow regime toward more frequent flooding. Region wide, we found a median increase of one flood per year for the post-1970 period. Because frequent floods are important channel-forming flows, these results have implications for channel and floodplain morphology, aquatic habitat, and restoration.</p> |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Natural Ecosystems |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate |
| Region | - Regional Or State -- New England |
| Lead Agencies | NOAA |
| Contacts | Mathias Collins, NOAA, mathias.collins@noaa.gov |

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| Name | Informing an Effective Response to Climate Change |
| Description | "Informing an Effective Response to Climate Change," the newest panel report from the America's Climate Choices suite of studies, demonstrates that demand for information to support climate-related decisions has grown as people, organizations, and governments have moved ahead with plans and actions to reduce greenhouse gas emissions and to adapt to the impacts of climate change. |
| Type | - PRODUCTS: Engagement |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Social and Cultural Resources - Economic Resources - Recreation and Tourism - Cross Disciplinary |
| Focus Area | |

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| Region | - National |
| Lead Agencies | America's Climate Choices |

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| Name | Informing Decisions in a Changing Climate |
| Description | Informing Decisions in a Changing Climate examines the growing need for climate-related decision support--that is, organized efforts to produce, disseminate, and facilitate the use of data and information in order to improve the quality and efficacy of climate-related decisions. Drawing on evidence from past efforts to organize science for improved decision making, it develops guidance for government agencies and other institutions that will provide or use information for coping with climate change. This volume provides critical analysis of interest to agencies at every level, as well as private organizations that will have to cope with the world's changing climate. |
| Type | - PRODUCTS: Management Guidance (i.e. structured decision making) |
| Sector | |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate |
| Region | - Regional Or State -- New England |
| Lead Agencies | National Research Council. Panel on Strategies and Methods for Climate-Related Decision Support |

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| Name | Informing Decisions in a Changing Climate |
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| Description | <p>From NAP Website: Everyone--government agencies, private organizations, and individuals--is facing a changing climate: an environment in which it is no longer prudent to follow routines based on past climatic averages. State and local agencies in particular, as well as the federal government, need to consider what they will have to do differently if the 100-year flood arrives every decade or so, if the protected areas for threatened species are no longer habitable, or if a region can expect more frequent and more severe wildfires, hurricanes, droughts, water shortages, or other extreme environmental events. Both conceptually and practically, people and organizations will have to adjust what may be life-long assumptions to meet the potential consequences of climate change. How and where should bridges be built? What zoning rules may need to be changed? How can targets for reduced carbon emissions be met? These and myriad other questions will need to be answered in the coming years and decades.</p> <p>Informing Decisions in a Changing Climate examines the growing need for climate-related decision support--that is, organized efforts to produce, disseminate, and facilitate the use of data and information in order to improve the quality and efficacy of climate-related decisions. Drawing on evidence from past efforts to organize science for improved decision making, it develops guidance for government agencies and other institutions that will provide or use information for coping with climate change. This volume provides critical analysis of interest to agencies at every level, as well as private organizations that will have to cope with the world's changing climate.</p> |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Training and Capacity Building - PRODUCTS: Management Guidance (i.e. structured decision making) |
| Sector | |
| Focus Area | |
| Region | - National |
| Lead Agencies | National Research Council |

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| Name | Infrastructure and Resilience: Forging a National Strategy for Reconstruction and Growth |
| Description | <p>From the report: The Center for American Progress has worked over several years to support the efforts of President Clinton in leading the charge to forge a national commitment to work with cities as they lead the modernization of U.S. infrastructure and prepare for a host of new challenges introduced by a changing climate. In support of both of these efforts, we offer here a proposal for accelerating federal efforts to support communities as the nation rebuilds its infrastructure.</p> |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Regulatory/ Policy Guidance |
| Sector | - Infrastructure |
| Focus Area | - Changes in Extremes of Weather and Climate |

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| Region | - National - Regional Or State -- New England -- Mid-Atlantic -- Central - - Great Lakes -- South East |
| Lead Agencies | Center for American Progress |

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| Name | Integrated River and Coastal Hydrodynamic Flood Risk Mapping (2012) |
| Description | This project demonstrates how integration of coastal tidal-surge models with watershed river run-off Coastal tidal-surge models and watershed river run-off models must be integrated to accurately model flood risk for communities located along estuaries. It was confirmed that the discharge of the river during significant rainfall-runoff flooding events is influenced by the tide in the downstream estuary. To accurately model the flooding, the interaction between river discharge and the water level within the estuary must be taken into account. Models that simulate this interaction require accurate terrestrial and bathymetric topography. Lidar was found to provide sufficient detail to generate high-resolution surface models representing floodplains and terrestrial areas. Low cost sonar surveys were found to be extremely useful for providing bathymetric data in shallow areas which fell outside Canadian Hydrographic Services nautical chart soundings. The integration of these data sources provided sufficient topographic information to interpolate a seamless surface DEM, which could be used for accurate rainfall-runoff and hydrodynamic modeling. These integrated models have been shown to produce accurate flood simulation results. models more accurately represents the flood risk for communities located along estuaries. |
| Type | - DATA: Depth and Elevation Data |
| Sector | - Infrastructure |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | |
| Lead Agencies | Atlantic Climate Adaptation Solutions Association Nova Scotia Department of Environment Climate Change Directorate Nova Scotia Community College Centre of Geographic Sciences |

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| Name | Integrated Science Strategy for Ocean Acidification Monitoring, Research, and Impacts Assessment |
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| Description | <p>From the product description: "The ocean has absorbed a significant portion of all human-made carbon dioxide emissions. This benefits human society by moderating the rate of climate change, but also causes unprecedented changes to ocean chemistry. Carbon dioxide taken up by the ocean decreases the pH of the water and leads to a suite of chemical changes collectively known as ocean acidification. The long term consequences of ocean acidification are not known, but are expected to result in changes to many ecosystems and the services they provide to society. Ocean Acidification: A National Strategy to Meet the Challenges of a Changing Ocean reviews the current state of knowledge, explores gaps in understanding, and identifies several key findings.</p> <p>Like climate change, ocean acidification is a growing global problem that will intensify with continued CO2 emissions and has the potential to change marine ecosystems and affect benefits to society. The federal government has taken positive initial steps by developing a national ocean acidification program, but more information is needed to fully understand and address the threat that ocean acidification may pose to marine ecosystems and the services they provide. In addition, a global observation network of chemical and biological sensors is needed to monitor changes in ocean conditions attributable to acidification."</p> |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Managed Ecosystems - Natural Ecosystems - Biota |
| Focus Area | - Sustainability of Marine Ecosystems |
| Region | <ul style="list-style-type: none"> - National - Regional Or State -- New England -- Mid-Atlantic -- South East |
| Lead Agencies | National Research Council |

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| Name | Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007 |
| Description | <p>April 2009, EPA released the national greenhouse gas inventory, indicating that overall emissions during 2007 increased by 1.4 percent from the 2006. The "Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007", is the latest annual report submitted by the United States to the Secretariat of the United Nations Framework Convention on Climate Change, which sets an overall framework for governments internationally to address climate change.</p> |
| Type | - PRODUCTS: Other |
| Sector | - Natural Ecosystems |
| Focus Area | |
| Region | <ul style="list-style-type: none"> - International - National - Regional Or State |

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| Lead Agencies | EPA |
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| Name | Juice From Concentrate: Reducing Emissions with Concentrating Solar Thermal Power |
| Description | Juice From Concentrate: Reducing Emissions with Concentrating Solar Thermal Power. This report examines Concentrating Solar Thermal power (CST), a renewable energy resource that presents policy-makers and investors with a significant potential for reducing carbon dioxide emissions from the power sector. |
| Type | |
| Sector | - Infrastructure |
| Focus Area | |
| Region | - National - Regional Or State |
| Lead Agencies | World Resources Institute |

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| Name | Knowledge of Climate Change Across Global Warming's Six Americas |
| Description | Knowledge of Climate Change Across Global Warming's Six Americas report includes results from a national study of what the American public understands about how the climate system works, and the causes, impacts and potential solutions to global warming. Prior research has identified six distinct audiences within the American public (the Alarmed, Concerned, Cautious, Disengaged, Doubtful, Dismissive) that each respond to global warming in very different ways. This report describes how knowledge of climate change varies across these different groups. |
| Type | |
| Sector | - Cross Disciplinary |
| Focus Area | |
| Region | - National |
| Lead Agencies | Yale Project on Climate Change and Communication |
| Contacts | Anthony Leiserowitz, Yale University, Anothony.leiserowitz@yale.edu Nicholas Smith, Yale University, nicholas.smith@yale.edu |

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| Name | Lessons Learned from Delaware LiDAR |
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| Description | <p>This report outlines lessons-learned from acquiring LiDAR data in Delaware. The report notes that using a collaborative approach to obtain lidar data makes sense as that decreases agency costs while meeting multiple needs. However, not all data will fit everyone's needs.</p> <p>The statewide lidar coverage came from two separate collection projects implemented two years apart. When the projects were proposed, few in the state were familiar with the LiDAR or had the capacity to work with such large data sets. Understanding what initial users want to do with the data provides only part of the information needed. Understanding potential data uses and the requirements of the end user helps ensure that the data stay valuable by meeting present and future needs.</p> <p>The availability of statewide LiDAR data in Delaware was delayed because project participants had to integrate non-standardized data sets and formats. Based on lessons learned from the two projects, future LiDAR collection project in Delaware will begin by identifying common end user goals. In addition, the following measures will be taken:</p> <ul style="list-style-type: none"> • Data specifications and formats will be standardized • The end user's technical capacity will be considered • All deliverables will be described adequately to ensure complete delivery • End users will review the contracts before their final acceptance |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Other - PRODUCTS: Training and Capacity Building |
| Sector | - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Delaware Coastal Programs |
| Contacts | Bob Scarborough, Delaware Coastal Programs, Bob.Scarborough@state.de.us |

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| Name | LiDAR Data Collected in Marshes: Its Error and Application for Sea Level Rise Modeling |
| Description | This paper analyzes the accuracy, corrective techniques, and associated use of LiDAR data in coastal settings. The paper specifically focuses on marshes in sea-level rise studies, focusing primarily on a habitat migration model, Sea Level Affecting Marshes Model, or SLAMM, as it is one of the most commonly used models. |
| Type | - PRODUCTS: Other |
| Sector | - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - National |
| Lead Agencies | NOAA Coastal Services Center |

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| Description | This report deals with the construction of flood risk maps using LIDAR and detailed 1-2 m bare earth elevation model to support communities that are vulnerable to coastal flooding from storm surges and long term sea-level rise. Each ACAS municipality (Lunenburg, Oxford-Yarmouth, Amherst, Cumberland, Wolfville, Windsor) received various GIS layers including the high resolution (ca. 1 m) lidar derived digital surface model and elevation model as well as the different flood layers. Presentations were made to transfer the results and technology and explain how the maps were generated and how to use them. This report is the summary document to be used in association with those GIS data files. |
| Type | - DATA: Depth and Elevation Data - PRODUCTS: Maps (Imagery, geo-referenced data) |
| Sector | - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | |
| Lead Agencies | Atlantic Climate Adaptation Solutions Nova Scotia Department of Environment Climate Change Directorate |

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| Name | Limits on the Adaptability of Coastal Marshes to Rising Sea Level |
| Description | Abstract: Assumptions of a static landscape inspire predictions that about half of the world's coastal wetlands will submerge during this century in response to sealevel acceleration. In contrast, we use simulations from five numerical models to quantify the conditions under which ecogeomorphic feedbacks allow coastal wetlands to adapt to projected changes in sea level. In contrast to previous sealevel assessments, we find that nonlinear feedbacks among inundation, plant growth, organic matter accretion, and sediment deposition, allow marshes to survive conservative projections of sealevel rise where suspended sediment concentrations are greater than 20 mg/L. Under scenarios of more rapid sealevel rise (e.g., those that include ice sheet melting), marshes will likely submerge near the end of the 21st century. Our results emphasize that in areas of rapid geomorphic change, predicting the response of ecosystems to climate change requires consideration of the ability of biological processes to modify their physical environment. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - National |
| Contacts | Matthew Kirwan, Research Assistant Professor, University of Virginia, mlk4n@virginia.edu |

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| Description | This document discusses responsibilities of municipal officials in relation to climate change, and outlines a framework for taking action (in areas such as land use, infrastructure, buildings, water/sewerage, transportation, waste management, and emergency services). The guide includes potential planning measures, and suggestions for funding sources. |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Training and Capacity Building - PRODUCTS: Regulatory/ Policy Guidance |
| Sector | - Public Health and Safety - Infrastructure - Social and Cultural Resources - Economic Resources - Cross Disciplinary |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - International |
| Lead Agencies | Atlantic Climate Adaptation Solutions Association in cooperation with New Brunswick Department of Environment |
| Contacts | Margaret Tusz-King (author) |

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| Name | Local Strategies for Addressing Climate Change |
| Description | This document contains articles that were in earlier issues of the National Oceanic and Atmospheric Administration's (NOAA) Coastal Services Center publication Coastal Services. The purpose of the document is to put examples of existing tools, programs, and projects that are already in place to consider if they could help address climate change impacts. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Public Health and Safety - Infrastructure - Natural Ecosystems |
| Focus Area | |
| Region | - Regional Or State -- New England -- Mid-Atlantic |
| Lead Agencies | NOAA Coastal Services Center |

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| Name | Local Strategies for Addressing Climate Change Volume 2 |
| Description | This is the second publication of the National Oceanic and Atmospheric Administration (NOAA) Coastal Services Center that is focused on what coastal resource managers around the country are already doing to address the impacts of climate change. All articles first appeared in Coastal Services, a national trade journal for coastal resource managers published by the NOAA Coastal Services Center. |
| Type | - PRODUCTS: Management Guidance (i.e. structured decision making) |

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| Sector | - Public Health and Safety - Infrastructure - Natural Ecosystems |
| Focus Area | |
| Region | - Regional Or State -- Mid-Atlantic -- South East |
| Lead Agencies | NOAA Coastal Services Center |

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| Name | Maine Property Owner's Guide to Managing Flooding, Erosion and Other Coastal Hazards |
| Description | This Guide was created by Maine Sea Grant to help coastal property owners and municipal officials identify features and different types of hazards on the Maine coast, and evaluate potential responses and actions. This guide is an outcome of the project, Coastal Community Resilience: Developing and Testing a Model of State-based Outreach. First a user selects the type of coast they have on their property. The user then can select various options to deal with coastal hazards and learn more about each approach. |
| Type | - PRODUCTS: Education - PRODUCTS: Training and Capacity Building - PRODUCTS: Viewers and Web-based Tools |
| Sector | - Infrastructure - Natural Ecosystems |
| Focus Area | |
| Region | - Regional Or State -- New England |
| Contacts | Kristen Grant, Maine Sea Grant, kngrant@maine.edu |

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| Name | Maine Sea-Level Rise Simulation |
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| Description | <p>From Project Document: The Maine Natural Areas Program and the Maine Geological Service have been working on an SLR simulation. The objective of the project is to identify areas of the landscape where tidal marshes can migrate or expand under several SLR scenarios, and to provide that information to relevant public and private planning and conservation organizations. Thus far the project is only addressing south coastal Maine, as that is the portion of the coast for which LiDAR data was available when we started. We will eventually expand the project coast wide as LiDAR for the remainder of the coast has recently become available. Our SLR simulation is a simple bathtub model and does not attempt to address any of the dynamic processes affecting the development of tidal marshes. At this point we are not attempting to predict where marshes might be lost or where whole new systems might form, rather just where existing marshes might migrate or expand to.</p> <p>Steps in the project completed to date:</p> <ul style="list-style-type: none"> - all tidal marshes greater than 5 acres excluding isolated fringing marsh have been mapped in GIS using ortho photography - ground truthing of LiDAR accuracy in and adjacent to marshes was completed across the range of the project - ground truthing of vegetation was completed in a subset of remotely mapped marshes across the range of the project - GIS simulations for 1 meter and 0.6 meters highest annual tide (HAT) of SLR that identify undeveloped areas of the landscape where existing marshes might migrate or expand to have also been completed (see attached map for sample of results). <p>Steps remaining include analysis of the results, formatting the data for external use, and sharing the data with potential users.</p> |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Maps (Imagery, geo-referenced data) |
| Sector | - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- New England |
| Lead Agencies | Maine Natural Areas Program and Maine Geological Service |
| Contacts | Don Cameron, Maine Natural Areas Program, 207-287-8041; Don.S.Cameron@maine.gov |

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| Name | Maine's Climate Future: An Initial Assessment |
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| Description | The Earth's atmosphere is experiencing unprecedented changes that are modifying the global climate, with consequences for all regions and societies. Discussions have begun on how to reduce and eventually eliminate the rapid and accelerating additions of carbon dioxide, other greenhouse gases, and other pollutants to the world's atmosphere and oceans. These efforts are vitally important and urgent for Maine and the rest of the world. This report considers past change over geologic time, recent evidence of accelerated rates of change, and the implications of continued climate change in Maine during the 21st century as a result of greenhouse gas emissions and their associated pollutants. Even if a coordinated response succeeds in eliminating excess greenhouse gas emissions by the end of the century, something that appears highly unlikely today, climate change will continue because the elevated levels of carbon dioxide (CO2) can persist in the atmosphere for thousands of years to come. It includes a section on the Gulf of Maine as well as other sectors that relate to the coastal environment. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Social and Cultural Resources - Economic Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate |
| Region | - Regional Or State -- New England |
| Lead Agencies | University of Maine, Climate Change Institute |
| Contacts | George Jacobson, Climate Change Institute, jacobson@maine.edu |

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| Name | Major Tipping Points in the Earth's Climate System and Consequences for the Insurance Sector |
| Description | World Wildlife Fund and insurer Allianz's report on major tipping points warns that sea-level rise could dramatically increase risks to buildings, transportation infrastructure and other assets exposed to severe storm surges in coastal US. The study estimates that current assets at risk to a 1-in-100-year storm surge amount to \$1.4 trillion. A mid-century global sea level rise of 0.5 meters (20 inches), with an additional 0.15 meter (6 inches) localized rise along the northeast U.S. coast, could jeopardize assets worth close to \$7.4 trillion. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Public Health and Safety - Infrastructure |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |

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| Region | - National - Regional Or State |
| Lead Agencies | World Wildlife Fund & Allianz |

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| Name | Manager's Guide to Refuge Vulnerability Assessment and Alternatives: Overview and Practical Considerations |
| Description | From the Report: This guide introduces and summarizes a comprehensive approach for assessing refuge vulnerability and developing adaptation strategies and alternatives, known as the "RVAA." It provides practical considerations for National Wildlife Refuge and other land managers interested in scoping and initiating such a project. It also serves as an introduction to the Technical Guide for Assessing Vulnerability for Refuges and Landscapes and Developing Alternatives for Management. |
| Type | - PRODUCTS: Training and Capacity Building - PRODUCTS: Management Guidance (i.e. structured decision making) |
| Sector | - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - National - Regional Or State |
| Lead Agencies | U.S. Fish and Wildlife Service, NatureServe |
| Contacts | Patrick Crist, NatureServe, |

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| Name | Managing Coastal Watersheds to Address Climate Change: Vulnerability Assessment and Adaptation Options for the Middle Patuxent Subwatershed of the Chesapeake Bay |
| Description | The purpose of this project and report is to help NOAA and its partners set the stage for addressing climate change impacts in the Chesapeake Bay, focusing on how to integrate climate change into coastal restoration and conservation activities. To do this, NWF worked with NOAA, a panel, and technical experts to identify climate change impacts for the Middle Patuxent subwatershed and developed options for adapting restoration and conservation practices to address those impacts. This report focuses on describing the vulnerability of the Middle Patuxent subwatershed and a selection of species, habitats, and conservation and restoration project types to climate change as well as providing a suite of potential adaptation options to address those vulnerabilities. |

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| Type | <ul style="list-style-type: none"> - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Training and Capacity Building - PRODUCTS: Management Guidance (i.e. structured decision making) - PRODUCTS: Regulatory/ Policy Guidance |
| Sector | <ul style="list-style-type: none"> - Natural Ecosystems - Biota |
| Focus Area | <ul style="list-style-type: none"> - Climate Impacts on Water Resources - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | National Wildlife Federation, NOAA |

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| Name | Managing Risk - Helping Cities in Massachusetts Adapt to Climate Change |
| Description | The document features reports prepared by interns at the Massachusetts Institute of Technology (MIT) as part of the Massachusetts Climate Change Adaptation Project. Some students are part of the MIT-USGS Science Impact Collaborative (MUSIC). Their work is linked to the new Science, Decisions and Policy Program of the US Geological Survey which emphasizes ecosystem services, adaptive management; resilience, vulnerability and risk; along with the science of science policy. These students are trained to help groups with conflicting views have productive conversations. Ultimately, the goal was to enable governmental, corporate and civil society groups to engage in collaborative environmental management. |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Management Guidance (i.e. structured decision making) - PRODUCTS: Regulatory/ Policy Guidance |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Social and Cultural Resources - Economic Resources - Recreation and Tourism - Cross Disciplinary |
| Focus Area | |
| Region | - Regional Or State -- New England |
| Lead Agencies | MIT-USGS Science Impact Collaborative |

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| Name | Maple Syrup 2012 |
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| Description | The 2012 maple syrup season in New England was considered too warm. A series of heat waves in March ended the season for many, and resulted in a significant drop in maple syrup production. An exception was Maine, where temperatures were cool enough in top-producing Somerset County to prolong the season until the middle of April. Respondents across New England reported weather conditions at 90 percent too warm, 8 percent favorable, and 2 percent too cold. Mild winter temperatures got the 2012 season off to an unusually early start and many maple producers were caught off guard for the first sap runs in January and February. March temperatures were highly volatile with a historic heat wave that brought summer-like temperatures in the 70s and 80s across New England. The heat wave forced early budding of maple trees, marking the end of the maple syrup season. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Managed Ecosystems - Economic Resources |
| Focus Area | - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- New England |
| Lead Agencies | USDA, National Agriculture Statistics Service, New England Field Service |
| Contacts | Garry Keough, 603-224-9639 |

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| Name | Mapping Assets Vulnerable to Sea Level Rise North Kingstown, Rhode Island |
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| Description | The Rhode Island Sea Grant College Program (RISG) program worked with partners from the Rhode Island Coastal Resources Management Council (CRMC), the Statewide Planning Program, The Nature Conservancy (TNC), the Rhode Island Emergency Management Agency (RIEMA), the University of Rhode Island Environmental Data Center (URI-EDC), and other institutions, to advance issues related to understanding climate change impacts related to sea level rise, flooding and erosion, and the associated economic, social and environmental implications for the state's 21 coastal communities. Much has been done related to these issues in terms of science synthesis, policy development, and outreach. From this work, the need for a more detailed analysis of vulnerable assets, adaptation strategies and implementation techniques that can be applied in Rhode Island's coastal communities was identified. The key obstacle has been the lack of digital elevation data for coastal Rhode Island and the lack of availability of this information. This project collected and synthesized the best available digital elevation data for coastal Rhode Island as of 2010, resulting in a series of map and data products that resource managers and decision makers can use to assess vulnerability to projected sea level rise. The high resolution topography and bathymetry data can be used for many other applications as well. This collaborative project included a participatory process to ensure that the products are suited for state and municipal agencies and resource managers in the state. In addition to statewide products, a pilot project was implemented with the Town of North Kingstown to demonstrate the use of these tools for local planning and action to address sea level rise and increased inundation expected in the future. |
| Type | - DATA: Depth and Elevation Data |
| Sector | - Infrastructure |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- New England |
| Lead Agencies | Rhode Island Sea Grant College Program; University of Rhode Island Environmental Data Center |
| Contacts | Pam Rubinoff, URI Coastal Resources Center/ RI Sea Grant, rubi@crc.uri.edu |

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| Name | Mapping Coastal Inundation Primer |
| Description | From the introduction: This document provides some basic information about mapping coastal inundation and provides examples of short-term inundation events (storm surge) and longer-term climate-induced events (sea level rise). It is not a step-by-step method for creating an inundation map but, more accurately, provides guidance on methods to use, ways to determine which data to use, and resources that could be helpful. |
| Type | - PRODUCTS: Training and Capacity Building |

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| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Social and Cultural Resources |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate |
| Region | - Regional Or State -- New England -- Mid-Atlantic -- South East |
| Lead Agencies | NOAA Coastal Services Center |

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| Name | Mapping the Distribution, Abundance and Risk Assessment of Marine Birds in the Northwest Atlantic: Phase 1 |
| Description | This project will look at the impacts of offshore development such as energy development on shore birds in the northwestern part of the Atlantic Ocean. The project will produce maps that identify distribution, abundance, and areas of risk (high, medium, and low) for the marine birds. The maps and the project can help inform offshore siting decisions. |
| Type | - PRODUCTS: Viewers and Web-based Tools |
| Sector | <ul style="list-style-type: none"> - Infrastructure - Natural Ecosystems - Biota |
| Focus Area | |
| Region | - Regional Or State -- New England -- Mid-Atlantic |
| Lead Agencies | U.S. Fish and Wildlife Service |
| Contacts | Tim Jones, Science Coordinator, Atlantic Coast Joint Venture, Tel: 301-497-5674. Email: Tim_Jones@fws.gov |

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| Name | Marsh Analysis and Planning Tool Incorporating Tides and Elevations (MAPTITE) |
| Description | MAPTITE is an ArcGIS extension being developed by staff in NOAA's National Ocean Service (NCCOS, NGS, and CO-OPS) to identify suitable locations for planting new marsh plants during coastal wetland restoration. MAPTITE produces models of restoration area elevations, based on a combination of a digital elevation model (DEM) derived from GPS observations, local tide station data, and vegetation information. By delineating targeted planting areas and providing point data that can be uploaded to GPS receivers for those areas, MAPTITE creates the data files that will allow users to accurately position specific species in suitable habitat. |
| Type | - PRODUCTS: Viewers and Web-based Tools |
| Sector | - Natural Ecosystems |
| Focus Area | |

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| Region | - National |
| Lead Agencies | NOAA's National Ocean Service (NCCOS, NGS, and CO-OPS) |
| Contacts | Ken Buja,NOAA, Ken.Buja@noaa.gov |

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| Name | Marshes on the Move |
| Description | This report was written as a tool for coastal resource managers and decision-makers that need to plan for and address impacts of sea-level rise on wetlands, using models and their outputs that they did not design themselves. The document includes a description of common model assumptions, parameters, and uncertainties as well as provides a guide on the right question to ask the model experts, understanding real world implications of the models, and incorporating model results into management decisions and initiatives. |
| Type | - PRODUCTS: Training and Capacity Building |
| Sector | - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - National |
| Lead Agencies | The Nature Conservancy and NOAA Coastal Services Center |
| Contacts | TNC Global Marine Team; marine@tnc.org |

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| Name | Maryland Coast Smart |
| Description | Through Maryland's CoastSmart Communities Initiative, the Chesapeake and Coastal Program is helping local communities identify and implement strategies to protect life and property vulnerable to coastal hazards and climate change. From hands-on training and planning tools to financial resources, the Chesapeake & Coastal Program is ensuring that local communities have the tools that they need to identify and take the necessary actions to become ready, adaptive and resilient to the impacts of climate change. In partnership with the National Ocean and Atmospheric Administration (NOAA), the Chesapeake & Coastal Program provides financial assistance to local communities for coastal hazards and sea-level rise response planning. Funding has been used to assist local communities invest in computer models, implement land use plans and establish development codes and ordinances. The Chesapeake & Coastal Program develops and provides technical tools and skill-building opportunities to local communities on how to implement climate change and sea level rise measures into local policies and programs. |
| Type | - PRODUCTS: Engagement - PRODUCTS: Training and Capacity Building - PRODUCTS: Viewers and Web-based Tools |

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| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Social and Cultural Resources - Economic Resources - Other |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Maryland Department of Natural Resources Chesapeake and Coastal Program |
| Contacts | Kate Skaggs, Maryland Coast Smart, kaskaggs@dnr.state.md.us |

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| Name | Maryland Coastal Atlas |
| Description | The Coastal Atlas is the result of a collaborative effort among the Maryland Department of Natural Resources, the Maryland Energy Administration, Towson University, the University of Maryland, The Nature Conservancy and the National Oceanic and Atmospheric Administration. The data available through the Coastal Atlas includes physical characteristics, human uses and ecological resources. Through the Coastal Atlas, users are able to visualize, query, map, and analyze available data to better manage our marine and estuarine resources. The tools currently available, and those that will be continually developed for the Coastal Atlas, are designed to support better decision-making by transforming available data into information tailored for specific issues. |
| Type | <ul style="list-style-type: none"> - DATA: Depth and Elevation Data - DATA: Data Stewardship and Provisions - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Training and Capacity Building - PRODUCTS: Viewers and Web-based Tools |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources |
| Focus Area | <ul style="list-style-type: none"> - Sustainability of Marine Ecosystems - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |

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| Lead Agencies | Maryland Department of Natural Resources |
| Contacts | Chris Cortina, Chesapeake & Coastal Service, Maryland Department of Natural Resources, ccortina@dnr.state.md.us |

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| Name | Maryland Department of Natural Resources Policy: Building Resilience to Climate Change |
| Description | The purpose of the policy is to provide direction and guidance to the Maryland Department of Natural Resources, which has the primary role within the state of managing natural resources and understanding vulnerability to climate change, on investments in and management of land acquisition, resources, and assets in the face of climate change. |
| Type | - PRODUCTS: Management Guidance (i.e. structured decision making) |
| Sector | |
| Focus Area | |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Maryland Department of Natural Resources |
| Contacts | Zoe Johnson, Maryland Department of Natural Resources, ZJohnson@dnr.state.md.us |

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| Name | Maryland LiDAR |
| Description | The Department of Natural Resources, in cooperation with several MSGIC affiliates, is collecting and distributing several LIDAR-derived elevation data products. If interested in obtaining any of the data collected by DNR (as shown on the map), please contact Dave Foreman (410-260-8761). LIDAR produced by a county must be obtained from that county. |
| Type | - DATA: Depth and Elevation Data |
| Sector | |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Maryland Department of Natural Resources |

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| Name | Maryland State Wildlife Action Plan Update |
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| Description | The Maryland Division of Wildlife and Heritage completed NatureServe's Climate Change Vulnerability Index (CCVI) for all Species of Greatest Conservation Need in the Action Plan. Heritage also ran the G1 to G3 plants in the state through the CCVI. In addition, they used Manomet's (Hector Galbraith's) non-coastal habitat vulnerability assessment model for its ecological communities. Both processes and results were peer-reviewed. For the coastal species and habitats, Heritage is assessing Tier 1 and Tier 2 sites in the Action Plan and looking at where the sites fall in terms of a range of sea-level rise scenarios (0-2, 2-5, 5-10 feet). This helps determine which sites and species located there might be influenced by sea-level rise. This information will be used in the update of the Wildlife Action Plan due to U.S. Fish and Wildlife Service in 2015; however, the approach taken to integrate this information has not yet been determined. |
| Type | |
| Sector | - Natural Ecosystems - Biota |
| Focus Area | - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Maryland Department of Natural Resources, Division of Wildlife and Heritage |
| Contacts | Dana Limpert, Maryland Department of Natural Resources, dlimpert@dnr.state.md.us |

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| Name | Maryland's Living Shoreline Initiative |
| Description | Maryland's Living Shoreline Initiative includes a tool in the Coastal Atlas called the Shoreline Management tool and involves training workshops for contractors, local managers and private landowners on implementing "living shoreline" protection practices to minimize shoreline erosion and protect upland properties. Topics covered have included: site visits and determining if a living shoreline is appropriate, state and county permits, working with a contractor, financial assistance for projects, and more. To date, workshops for private landowners have been conducted in partnership with Worcester, Kent, Somerset, St. Mary's, Charles and Calvert Counties. |
| Type | - PRODUCTS: Training and Capacity Building |
| Sector | - Infrastructure - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Maryland Department of Natural Resources |
| Contacts | Zoe Johnson, Maryland Department of Natural Resources, ZJohnson@dnr.state.md.us |

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| Name | Massachusetts Climate Change Adaptation Report |
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| Description | The Massachusetts Legislature passed the Global Warming Solutions Act and it was signed in 2008. It directed the secretary of Energy and Environmental Affairs (EEA) to convene an advisory committee to develop a report, analyzing adaptation strategies for projected climate changes. This report is by the Massachusetts Climate Change Adaptation Advisory Committee, and it is organized into two parts. Part I includes an overview of the observed and predicted changes to Massachusetts' climate and their anticipated impacts, key findings, a set of guiding principles, and key adaptation strategies, cutting across multiple sectors. The second part of the report is organized into five sections, including coastal zone and oceans as well as natural resources and habitat, key infrastructure, human health and welfare, and local economy and government. Each section includes a description of the vulnerabilities to climate change and adaptation strategies that could help increase resilience and preparedness. The coastal section focuses on the open ocean, bays, estuaries, salt marshes and tidal flats. This section outlines vulnerabilities and adaptation strategies relating to land protection, policy, management and restoration, and monitoring. The report also includes a section specific to wetlands, including coastal wetlands. Vulnerabilities relate to changes in temperature and precipitation, and adaptation strategies are identified relating to land protection, policy, management and restoration, and monitoring. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Economic Resources - Recreation and Tourism |
| Focus Area | <ul style="list-style-type: none"> - Sustainability of Marine Ecosystems - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- New England |
| Lead Agencies | Executive Office of Energy and Environmental Affairs and the Adaptation Advisory Committee |
| Contacts | Vandana Rao, Asst. Director for Water Policy Executive Office of Energy and Environmental Affairs, vandana.rao@state.ma.us |

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| Name | Massachusetts Ocean Resource Information System |
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| Description | MORIS, the Massachusetts Ocean Resource Information System, is an online mapping tool created by the Massachusetts Office of Coastal Zone Management (CZM), the Massachusetts Office of Geographic Information (MassGIS), SeaPlan, Applied Science Associates (ASA), Charlton Galvarino, and PeopleGIS. MORIS can be used to search and display spatial data pertaining to the Massachusetts coastal zone. Users can interactively view various data layers (e.g., tide gauge stations, marine protected areas, access points, eelgrass beds, etc.) over a backdrop of aerial photographs, political boundaries, natural resources, human uses, bathymetry, or other data including Google base maps. Users can quickly create and share maps and download the actual data for use in a Geographic Information System (GIS). While designed for coastal management professionals, MORIS can be used by anyone interested in these data and maps. It includes elevation information, but it does not include sea-level rise projections. |
| Type | <ul style="list-style-type: none"> - DATA: Other - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Viewers and Web-based Tools |
| Sector | <ul style="list-style-type: none"> - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources |
| Focus Area | |
| Region | - Regional Or State -- New England |
| Lead Agencies | Massachusetts Office of Coastal Zone Management Program |
| Contacts | Daniel Sampson, Massachusetts Office of Coastal Zone Management daniel.sampson@state.ma.us |

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| Name | MassGIS Data - LiDAR Terrain Data |
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| Description | <p>MassGIS has processed and released LiDAR (Light Detection And Ranging) terrain data for 17 delivery areas in Massachusetts. Available data consist of “bare-earth” Digital Elevation Model (DEM) tiles that can be downloaded for free, and classified LAS files that can be ordered for small areas on DVD or larger areas on a user supplied hard drive.</p> <p>These seventeen datasets cover most of eastern Massachusetts, as well as portions of Hampden County. The data can be used for emergency response, drainage studies and hydrologic / floodplain modeling, development suitability analysis and infrastructure planning, identification of structures and other man-made features, habitat classification, vegetation mapping and many other purposes. Each dataset represents a distinct data acquisition project with unique characteristics. Acquisition dates range from 2002 to 2011 and a variety of agencies and/or partnerships sponsored these missions – details can be found in the project specific metadata. Differences include the instruments used to acquire the data, processing software, accuracy, point spacing, format, projection, tiling schemes, and availability of derivative products such as contours and breaklines. Point and raster data are available for each project area. The point data are in ASCII text files storing XYZ coordinates, binary LAS files, or bare-earth TINs. The rasters are GeoTiffs. The horizontal datum for all data is NAD83; the vertical datum is NAVD88.</p> |
| Type | - DATA: Depth and Elevation Data |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- New England |
| Lead Agencies | Massachusetts Office of Geographic Information |

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| Name | Mid-Atlantic Regional Council on the Ocean (MARCO) Portal |
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| Description | The MARCO Mapping and Planning Portal is an online tool that allows state, federal, and local decision-makers and the public to visualize, query, map, and analyze ocean and coastal data in the Mid-Atlantic region. The five MARCO states agreed to work together to develop a regional, web-based portal as part of their 2009 action plan. In response to this need, the Virginia Coastal Zone Management Program provided funding (through their CZM Award from the National Oceanic and Atmospheric Administration- NOAA) for creation of this prototype mapping and planning portal for the Mid-Atlantic region. The portal was developed by a team of representatives from each of the Mid-Atlantic States, NOAA, and The Nature Conservancy. The portal includes map data layers grouped into five broad categories: Administrative (e.g. official boundaries) Biological (e.g. seafloor habitats) Geophysical (e.g. water depth, sediments) Human Uses (e.g. fishing, shipping) Decision Support (e.g. overlays of various uses and natural features). The portal includes a sea-level rise vulnerability layer based on the coastal vulnerability index under the Geophysical category. |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Viewers and Web-based Tools |
| Sector | - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota |
| Focus Area | - Sustainability of Marine Ecosystems - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | MARCO, Mid-Atlantic States, The Nature Conservancy (TNC) |

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| Name | Modal Primer on Greenhouse Gas and Energy Issues for the Transportation Industry |
| Description | Modal Primer on GHG and Energy Issues for the Transportation Industry (TRB Transportation Research Circular E-C143)/ The primer is designed to provide transportation decision makers with an inclusive, educated, and objective overview of the current state of the transportation industry from a GHG and energy standpoint. |
| Type | |
| Sector | - Infrastructure |
| Focus Area | |
| Region | - National |
| Lead Agencies | Transportation Research Circular |

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| Name | Model Standard of Practice for Climate Change Planning |
| Description | <p>The Canadian Institute of Planners (CIP) Model Standards of Practice for Climate Change Planning is designed to help planners move from recognition of the challenges of climate change—and their professional responsibility to address it—to effective action on both climate change mitigation and adaptation. It includes two elements:</p> <ul style="list-style-type: none"> • A statement that establishes principles of responsible professional practice for addressing climate change. • A framework to serve as a model to planners as they consider climate change in their professional practice. |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Engagement - PRODUCTS: Training and Capacity Building |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure |
| Focus Area | |
| Region | |
| Lead Agencies | Canadian Institute of Planners Natural Resources Canada |

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| Name | Modeling Sea Level Rise Impacts on Storm Surges Along US Coasts |
| Description | <p>Abstract: Sound policies for protecting coastal communities and assets require good information about vulnerability to flooding. Here, we investigate the influence of sea level rise on expected storm surge-driven water levels and their frequencies along the contiguous United States. We use model output for global temperature changes, a semi-empirical model of global sea level rise, and long-term records from 55 nationally distributed tidal gauges to develop sea level rise projections at each gauge location. We employ more detailed records over the period 1979–2008 from the same gauges to elicit historic patterns of extreme high water events, and combine these statistics with anticipated relative sea level rise to project changing local extremes through 2050. We find that substantial changes in the frequency of what are now considered extreme water levels may occur even at locations with relatively slow local sea level rise, when the difference in height between presently common and rare water levels is small. We estimate that, by mid-century, some locations may experience high water levels annually that would qualify today as ‘century’ (i.e., having a chance of occurrence of 1% annually) extremes. Today’s century levels become ‘decade’ (having a chance of 10% annually) or more frequent events at about a third of the study gauges, and the majority of locations see substantially higher frequency of previously rare storm-driven water heights in the future. These results add support to the need for policy approaches that consider the non-stationarity of extreme events when evaluating risks of adverse climate impacts.</p> |

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| Type | <ul style="list-style-type: none"> - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Plans, Assessments, Studies |
| Sector | |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- New England -- Mid-Atlantic -- South East |
| Lead Agencies | Climate Central |
| Contacts | Claudia Tebaldi, Climate Central, ctebaldi@climatecentral.org |

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| Name | Multi-Scale Water Infrastructure Characterization and Adaptation to Climate and Socioeconomic Changes: A National Assessment |
| Description | The U.S. Environmental Protection Agency's (EPA) multiscale infrastructure assessment project supports both water resource adaptation to climate change and the rehabilitation of the nation's aging water infrastructure by providing tools, scientific data and information to program offices and regions. Active involvement and participation of stakeholders in this project by EPA offices and regions, other federal agencies and departments, academic institutions, and the water industry and its associations will make the EPA's assessment process more efficient and effective. |
| Type | |
| Sector | - Infrastructure |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - National |
| Lead Agencies | EPA |

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| Name | Municipal Climate Change Action Plan Guidebook:Canada-Nova Scotia Agreement on the Transfer of Federal Gas Tax Funds (2011) |
| Description | This guide provides a six-step planning framework designed to help Nova Scotia municipalities prepare Municipal Climate Change Action Plans (MCCAP) that reduce greenhouse gas emissions and identify priorities for climate change adaptation. |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Training and Capacity Building |
| Sector | <ul style="list-style-type: none"> - Infrastructure - Social and Cultural Resources - Economic Resources - Cross Disciplinary |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |

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| Region | - International |
| Lead Agencies | Service Nova Scotia and Municipal Relations Canada-Nova Scotia Infrastructure Secretariat |
| Contacts | Rene Frigault, Planning and Development Officer, Federal Gas Tax Fund frigaurj@gov.ns.ca |

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| Name | Municipal Resources for Adapting to Climate Change (2009) |
| Description | The purpose of this 19-page summary is to provide information to municipal officials about municipal adaptation initiatives and to provide resources for municipal officials who wish to undertake adaptation planning. It lists Canadian communities with adaptation programs underway (as of 2009), along with some international examples, and includes links to organizations that offer support in adaptation planning. |
| Type | - PRODUCTS: Other - PRODUCTS: Training and Capacity Building |
| Sector | - Infrastructure |
| Focus Area | |
| Region | - International |
| Lead Agencies | ICLEI-Canada (Local Governments for Sustainability) Federation of Canadian Municipalities--Partners for Climate Protection |
| Contacts | FCM's Partners for Climate Protection, pcp@fcm.ca |

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| Name | Municipal Risk Assessment Tool |
| Description | In early 2010, the Insurance Bureau of Canada retained Dillon Consulting Limited and Tesera Systems Inc. to support design and development of the Municipal Risk Assessment Tool (MRAT). MRAT helps predict where vulnerabilities in systems could prompt costly sewer backup damage to homes and businesses. MRAT provides a visual representation of sewer backflow risk zones, helping municipalities to identify their greatest sewer and stormwater vulnerabilities. |
| Type | - PRODUCTS: Engagement - PRODUCTS: Viewers and Web-based Tools |
| Sector | - Infrastructure |
| Focus Area | |
| Region | - International |
| Lead Agencies | Insurance Bureau of Canada Tesera Systems Inc. Dillon Consulting Inc. |
| Contacts | Helen Lialias Media Relations Officer, Insurance Bureau of Canada hlialias@ibc.ca |

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| Description | The Narragansett Bay National Estuarine Research Reserve has been monitoring salt marsh structural parameters for 10 years. More recently, the Reserve entered into a 3year project with 4 additional reserves to conduct coordinated salt marsh monitoring at a national scale. This marsh monitoring component will set up Reserve marshes as longterm reference sites that can be used to 1) evaluate how natural salt marshes are changing over time in response to the large scale effects of global climate change and sealevel rise, and 2) evaluate the ecological changes at restoring marshes around Narragansett Bay as they recover from tidal restrictions. This program will enable scientists and managers to assess how these marshes are changing over time in response to climate change, restoration, and other natural and anthropogenic stressors. |
| Type | |
| Sector | - Natural Ecosystems |
| Focus Area | |
| Region | - Regional Or State -- New England |
| Lead Agencies | Narragansett Bay National Estuarine Research Reserve |

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| Name | National Assessment of Coastal Vulnerability to Sea-level Rise, Coastal Vulberability Index (CVI) |
| Description | The Coastal Vulnerability Index is designed to determine relative risks from future sea-level rise on the Atlantic, Pacific, and Gulf Coasts. The CVI quantifies the relative risk that physical changes will take place from sea-level rise based on various factors, including tidal range, wave height, coastal slope, shoreline change, geomorphology, and historical rate of relative sea-level rise. The approach combines vulnerability from sea-level rise and the systems ability to naturally adapt. |
| Type | <ul style="list-style-type: none"> - DATA: Surveys and Preliminary Assessments - DATA: Depth and Elevation Data - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Viewers and Web-based Tools |
| Sector | <ul style="list-style-type: none"> - Infrastructure - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | <ul style="list-style-type: none"> - National - Regional Or State -- New England -- Mid-Atlantic -- South East |
| Lead Agencies | USGS Coastal and Marine Geology Program's National Assessment |
| Contacts | Robert Thieler, USGS, rthieler@usgs.gov |

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| Description | <p>The USGS Coastal and Marine Geology Program (CMGP) National Assessment of Shoreline Change Web Mapping Application provides a national map view of short- and long-term shoreline change evaluations, and historical and modern shorelines. This map includes data layers compiled in support of the U.S. Geological Survey's (USGS) National Assessment of Shoreline Change Program.</p> <p>The default map view shows the long-term shoreline change rate within the continental U.S. Within the Web Mapping Application, data layers have been grouped within category headings. Clicking the appropriate data folder will expand or collapse the folder allowing the individual data layers to be displayed. Data layers may be "turned-off or on" by selecting the visible button beside the layer name. The map view will automatically update.</p> |
| Type | <ul style="list-style-type: none"> - DATA: Data Stewardship and Provisions - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Viewers and Web-based Tools |
| Sector | |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- New England -- Mid-Atlantic |
| Lead Agencies | USGS Coastal and Marine Geology Program (CMGP) |
| Contacts | jomalley@usgs.gov |

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| Name | National Assessment of Shoreline Change: Historical Shoreline Change along the New England and Mid-Atlantic Coasts |
| Description | <p>Beach erosion is a chronic problem along most open-ocean shores of the United States. As coastal populations continue to grow, and community infrastructures are threatened by erosion, there is increased demand for accurate information regarding past and present shoreline changes. There is also need for a comprehensive analysis of shoreline movement that is regionally consistent. To meet these national needs, the Coastal and Marine Geology Program of the U.S. Geological Survey (USGS) is conducting an analysis of historical shoreline changes along open-ocean sandy shores of the conterminous United States and parts of Alaska and Hawaii. A primary goal of this work is to develop standardized methods for mapping and analyzing shoreline movement so that internally consistent updates can periodically be made to record shoreline erosion and accretion. This report on the New England and Mid-Atlantic coasts is the fifth in a series of reports on historical shoreline change. This report, like the earlier reports, summarizes the methods of analysis, interprets the results, provides explanations regarding long-term and short-term trends and rates of change, and describes how different coastal communities are responding to coastal erosion.</p> |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | |
| Focus Area | |
| Region | - Regional Or State -- New England -- Mid-Atlantic |

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| Lead Agencies | USGS |
| Contacts | Robert Thieler, USGS, rthieler@usgs.gov |

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| Name | National Climate Assessment Draft Report |
| Description | From the Introduction: This National Climate Assessment collects, integrates, and assesses observations and research from around the country, helping to show what is actually happening and what it means for peoples' lives, livelihoods, and future. This report includes analyses of impacts on seven selected sectors: human health, water, energy, transportation, agriculture, forests, and ecosystems and biodiversity. This report additionally focuses on the interactions among several sectors at the national level. It also assesses key impacts on the regions of the U.S.: Northeast, Southeast and Caribbean, Midwest, Great Plains, Southwest, Northwest, Alaska and the Arctic, Hawai'i and the Pacific Islands; as well as coastal areas, oceans, and marine resources. Finally, this report is the first to explicitly assess the current state of adaptation, mitigation, and decision support activities. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota |
| Focus Area | - Sustainability of Marine Ecosystems - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - National |
| Lead Agencies | National Climate Assessment and Development Advisory Committee |

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| Name | National Water Program 2012 Strategy: Response to Climate Change |
| Description | "This document sets out long-term goals and specific actions that are EPA's contributions to national efforts to prepare for, and build resilience to, the impacts of a changing climate on water resources. The EPA National Water Program looks forward to working with state, tribal, and local governments, as well as other partners to implement actions that address climate change challenges in key areas. The Strategy focuses on protecting water infrastructure, coastal and ocean waters, watersheds and wetlands, and water quality." |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Regulatory/ Policy Guidance |

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| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources |
| Region | - National |
| Lead Agencies | U.S. EPA |

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| Name | National Wildlife Refuges And Sea-Level Rise Lessons from the Front Lines |
| Description | <p>From the report: From July 11 to 14, 2011, more than a thousand people convened in Madison, Wisconsin, for Conserving the Future: Wildlife Refuges and the Next Generation, a conference called to discuss what lies ahead for the National Wildlife Refuge System—the network of public lands and waters set aside to protect America’s fish, wildlife and plants. The conference, the largest gathering on refuges and conservation in more than a decade, drew members of the U.S. Fish and Wildlife Service, the agency responsible for the refuge system, other federal agency employees, representatives of state wildlife agencies that assist with refuge planning and management, staffers from nonprofit conservation and outdoor recreation groups and interested citizens and journalists. Among the featured presentations was “Refuges, Neighbors and Sea-level Rise,” a workshop organized and led by Noah Matson of Defenders of Wildlife and Mike Bryant and Lou Hinds of the U.S. Fish and Wildlife Service. This report is based on the presentations and discussions of that workshop. (The agenda, vision statement, archives, supporting documents and other materials from the conference are available at: http://americaswildlife.org.)</p> |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Recreation and Tourism |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic -- South East |
| Lead Agencies | Defenders of Wildlife |
| Contacts | Noah Matson, Defenders of Wildlife, nmatson@defenders.org |

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| Name | NEURISA: Northeast LiDAR Project |
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| Description | Funded in part by the American Recovery and Reinvestment Act (ARRA) of 2009, as well as, direct funding from other federal, state and local entities, Photo Science is contracted by the United States Geological Survey (USGS) to collect and process LiDAR data for more than 8,000 square miles of the coastal zone and inland areas spanning six Northeastern states, including Maine, New Hampshire, Massachusetts, Connecticut, Rhode Island, and New York. Photo Science is tasked to provide project management, LiDAR data collection and processing, control surveys, product development, and quality control services. This project will not only help stimulate the U.S. economy and provide for more accurate floodplain mapping in the region, but will also represent the start of a regional LiDAR collection program that will be used as a test case for a national elevation program. The webinar features the USGS and Photo Science staff providing a technical overview of the project approach, specifications, deliverables and schedule as well as discuss the potential applications served by this high resolution elevation data set. The Maine Office of GIS will also provide background on the formation of the coalition of state and local agencies that banded together to secure the ARRA funding grant and move the project ahead with the USGS. |
| Type | <ul style="list-style-type: none"> - DATA: Depth and Elevation Data - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Viewers and Web-based Tools |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- New England |
| Lead Agencies | NEURISA |

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| Name | New Brunswick Climate Change Action Plan 2007-2012 |
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| Description | <p>The Climate Change Action Plan includes a series of actions to reduce as well as prevent greenhouse gas (GHG) emissions, to adapt to climate-change impacts, and to use partnerships and communication to engage our communities to be instruments of change. Actions to reduce GHG include:</p> <ul style="list-style-type: none"> • Providing practical solutions to help New Brunswickers use energy more efficiently, make better energy choices, manage energy expenses and lessen the impact of energy use on the environment; • Significantly increasing the percentage of GHG-free electricity generation; • Adopting a public transportation strategy that significantly reduces GHG emissions from this sector; • Building upon waste-reduction and waste-diversion activities, such as by improving recycling and composting systems, and reducing landfill gas emissions; • Making government operations more energy-efficient and environmentally sustainable; • Using project assessment reviews and other environmental approval processes to minimize emissions; • Undertaking environmentally focused research and development that will assist New Brunswick industries in the development of climate-friendly technologies and approaches; and • Regulating ozone-depleting replacement substances that also pose significant GHG risks. <p>Adaptation actions include:</p> <ul style="list-style-type: none"> • Undertaking a provincial risk assessment to identify both the public sector and the private sector development risks and adaptation needs, with particular focus on coastal areas and inland waters of the province; and • Climate-proofing our development decisions at all levels of government through the use of an enhanced provincial planning policy and related strategies, with special emphasis on coastal regions. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Natural Ecosystems - Cross Disciplinary |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate |
| Region | - International |
| Lead Agencies | New Brunswick Department of Environment |
| Contacts | Communications and Educational Services, info-elg-egl@gnb.ca |

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| Name | New England Climate Change Impacts |
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| Description | New England Climate Change Impacts website at UMass: This website is an interdisciplinary effort to provide news and information about research, events, and workshops at UMass Amherst, the Five Colleges, and around New England related to climate change impacts in our region. It includes an extensive research bibliography and page of links to other climate efforts. |
| Type | - PRODUCTS: Engagement - PRODUCTS: Training and Capacity Building - PRODUCTS: Management Guidance (i.e. structured decision making) |
| Sector | - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota |
| Focus Area | |
| Region | - Regional Or State -- New England |
| Lead Agencies | UMass, Northeast Climate Science Center |

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| Name | New England Governors/Eastern Canadian Premiers Climate Change Action Plan (2001) |
| Description | The NEG/ECP Climate Change Action Plan states that it seeks to address aspects of global warming within the region's control to influence. It includes a comprehensive and coordinated regional plan for reducing greenhouse gases; a commitment to reach specified reduction targets for the region as a whole; a commitment from each state and provincial jurisdiction to carry on its own planning for climate change gas reductions and disclose progress and share case studies; a plan for climate adaptation of the region's economic resource base and physical infrastructure; and a public education and outreach effort. |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Management Guidance (i.e. structured decision making) |
| Sector | - Infrastructure |
| Focus Area | |
| Region | - Regional Or State -- New England |
| Lead Agencies | New England Governors/Eastern Canadian Premiers |
| Contacts | Council of Atlantic Premiers, info@cap-cpma.ca Coalition of Northeastern Governors, coneg@sso.org |

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| Name | New Hampshire Climate Action Plan: A Plan for New Hampshire's Energy, Environmental and Economic Development Future |
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| Description | <p>From the Executive Summary: Over the course of a year, through a process that engaged over 125 stakeholders and received input from over 200 citizens, the 29 members of Governor John Lynch's Climate Change Policy Task Force developed this Climate Action Plan which is aimed at achieving the greatest feasible reductions in greenhouse gas emissions while also providing the greatest possible long-term economic benefits to the citizens of New Hampshire. The most significant reductions in both emissions and costs will come from substantially increasing energy efficiency in all sectors of our economy, continuing to increase sources of renewable energy, and designing our communities to reduce our reliance on automobiles for transportation. In essence, a response to climate change and our economic future are inextricably tied to how we produce our energy and how much energy we use. Future economic growth in New Hampshire as well as mitigation of, and adaptation to, a changing climate will depend on how quickly we transition to a new way of living that is based on a far more diversified energy mix, more efficient use of energy, and development of our communities in ways that strengthen neighborhoods and urban centers, preserve rural areas, and retain New Hampshire's quality of life.</p> |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure |
| Focus Area | |
| Region | - Regional Or State -- New England |
| Lead Agencies | New Hampshire Department of Environmental Services, New Hampshire Climate Change Policy Task Force |

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| Name | New Jersey Climate Adaptation Directory |
| Description | <p>The directory brings together geographic data, tools, guidance, model policies and ordinances, and case studies focused on evaluating vulnerabilities and developing adaptation plans. The resources included are aimed at professionals in a range of fields, including infrastructure, public health/emergency management, hazard mitigation, natural resources, and economic development. The directory can be used throughout the state - in coastal or landlocked areas, at urban or rural densities, and in built or natural environments.</p> <p>The directory is available to all practitioners, researchers, and interested individuals.</p> |
| Type | - PRODUCTS: Viewers and Web-based Tools |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Social and Cultural Resources - Economic Resources |

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| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Regional Plan Association (NJ, NY, CT), Clean Air-Cool Planet, and the Clean Air-Cool Planet Fellowship Program |
| Contacts | Emily Kilroy, Regional Plan Association, ekilroy@rpa.org |

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| Name | New Jersey Coastal Community Vulnerability and Resilience Assessment Pilot |
| Description | <p>The report focuses on two tools: the Coastal Community Vulnerability Assessment Protocol (CCVAP) and a resilience assessment. The CCVAP is a GIS-based tool that was developed to help land use planners, hazard mitigation planners, emergency managers, and other local decision-makers to identify vulnerability to coastal hazards and sea-level rise at the community level. The CCVAP outlines the needed steps to identify vulnerable land areas under present and future inundation scenarios geospatially. Using these inundation scenarios (0.5 meters, 1.0 meters, and 1.5 meters), coastal decision-makers now have a greater ability determine the potential inundation threats to built infrastructure, sensitive natural resources, and special needs populations. The resilience assessment is a facilitated questionnaire. It is a non-regulatory tool that is meant to help local decision-makers collaboratively identify planning, mitigation, and adaptation opportunities to reduce vulnerability to coastal storms and sea level rise, building capacity for coastal community resilience. It provides a starting point for a dialogue among various decision-makers, helping to spawn creative thinking and collaboration on ways to become more resilient for existing and future generations. The questionnaire highlights the importance of local plan integration and consistency with municipal building codes and ordinances, and it identifies the importance of localized hazard assessments and the need to link them to planning, outreach, mitigation, response, and recovery. The report also discusses the Coastal Vulnerability Index.</p> |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Viewers and Web-based Tools |
| Sector | <ul style="list-style-type: none"> - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Economic Resources |

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| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Office of Coastal Management, New Jersey Department of Environmental Protection Greenwich Township, Cumberland County, NJ |
| Contacts | Dorina Frizzera, NJ DEP, dorina.frizzera@dep.state.nj.us |

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| Name | New Jersey Coastal Vulnerability Index |
| Description | "Inundation mapping is important to understand hazard risks; however, it is also valuable to understand additional issues such as erosion, historic shoreline change, and past flood events. This information can assist a community in understanding where hazards may be more likely to occur. To help determine where high hazard areas are within a community or the coastal zone, the New Jersey Coastal Management Office developed a geospatial, composite overlay model or a coastal vulnerability index. The model includes six geospatial inputs, including storm surge inundation scenarios, low slopes, flood prone areas, poorly drained soils, erosion prone areas, and geomorphology. By incorporating sea level rise scenarios into storm surge models, the Coastal Management Office could visually demonstrate how climate change may shift high hazard areas further inland overtime. This coastal vulnerability assessment may be useful in identifying locations for the investment of mitigation assistance. It may also identify where engineering and adaptation actions to address climate change may be extremely difficult or ineffective. " |
| Type | - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Maps (Imagery, geo-referenced data) |
| Sector | - Infrastructure - Managed Ecosystems - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | New Jersey Department of Environmental Protection, Coastal Management Office |
| Contacts | Dorina Frizzera, NJ DEP, dorina.frizzera@dep.state.nj.us |

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| Name | New Jersey LiDAR |
| Description | Coastal LiDAR data is available for New Jersey through the U.S. Army Corps as well as county specific data from USGS. All the data is available on NOAA's Digital Coast. |

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| Type | - DATA: Depth and Elevation Data |
| Sector | |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic |

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| Name | New Jersey State Wildlife Action Plan Update |
| Description | The New Jersey Wildlife Action Plan (Plan) continues to be revised and refined for clarification and enhancement to ensure necessary conservation objectives are not overlooked. The New Jersey Department of Fish and Wildlife has been working with Rutgers University's Edward J. Bloustein School of Planning and Public Policy on a vulnerability assessment for the habitats in the Plan. The effort has been to assess the vulnerability of a sampling of the State's habitats to the effects of climate change. The process used a variety of proven metrics to rank habitats' susceptibility to anticipated stressors, such as increased temperature, more severe storm events, and sea level rise. The resulting ranking will be used to inform decision makers' actions, including an upcoming revision to the State's Wildlife Action Plan (WAP). |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Managed Ecosystems - Natural Ecosystems - Biota |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | New Jersey Department of Environmental Protection, Division of Fish and Wildlife |
| Contacts | Kris Schantz, New Jersey Department of Environmental Protection, kschantz.ensp@embarqmail.com |

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| Name | New Jersey's Coastal Community Vulnerability Assessment and Mapping Protocol |
| Description | The document is intended as a guide for entities interested in assessing their vulnerability to coastal hazards. It first explains basic definitions and relevant concepts on hazards that face coastal areas. The document then explains the Assessment Tools developed by the New Jersey Office of Coastal Management. Using a "Cookbook" format, the Coastal Community Vulnerability and Mapping Protocol introduces publicly available data and walks the user through the steps to create a Coastal Vulnerability Index (CVI) for their area of interest. Vulnerability can be assessed by overlaying built environment, natural environment, and social vulnerability data over the CVI. |
| Type | - PRODUCTS: Training and Capacity Building |

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| Sector | <ul style="list-style-type: none"> - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Economic Resources |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Office of Coastal Management, New Jersey Department of Environmental Protection |
| Contacts | Dorina Frizzera, NJ DEP, dorina.frizzera@dep.state.nj.us |

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| Name | New Jersey's Green Acres and Blue Acres Program |
| Description | This program is designed "to achieve, in partnership with others, a system of interconnected open spaces, whose protection will preserve and enhance New Jersey's natural environment and its historic, scenic, and recreational resources for public use and enjoyment." A new aspect of the program is the Blue Acres program where properties (including structures) that have been damaged by, or may be prone to incurring damage caused by, storms or storm-related flooding, or that may buffer or protect other lands from such damage, are eligible for acquisition. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Managed Ecosystems - Natural Ecosystems |
| Focus Area | - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | New Jersey Department of Environmental Protection |
| Contacts | Martha Sullivan Sapp, New Jersey Department of Environmental Protection, Martha.Sapp@dep.state.nj.us |

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| Name | New Mapping Tool and Techniques For Visualizing Sea Level Rise And Coastal Flooding Impacts |
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| Description | <p>Abstract: It is one thing to have a discussion or write about a one- or two-foot rise in the ocean surface and potential impacts to a local community; it is another to show someone a map highlighting the areas that would potentially be impacted. The ability to visualize the potential depth and inland extent of water gives us a better understanding of the corresponding impacts and consequences. Mapping sea level changes in a geographic information system (GIS) gives the user the ability to overlay the potentially impacted areas with other data such as critical infrastructure, roads, ecologically sensitive areas, demographics, and economics. Providing maps on the Web via Internet mapping technologies enables the user to have an interactive experience that truly brings out the “visual” part of the map definition. Over the past several years, the lessons learned from investigating pilot sea level change mapping applications have led to the development of a next-generation sea level rise and coastal flooding viewer. In addition, new mapping techniques have been developed to use high-resolution data sources to show flooding impacts on local public infrastructure, mapping confidence, flooding frequency, marsh impacts, and social and economic impacts from potential inundation. This paper will provide a brief history of previous sea level change visualization pilot projects, detailed discussion of new methods, current status of new tool development and outputs, and future plans for expanding to the rest of the U.S.</p> |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Viewers and Web-based Tools |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Economic Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- New England -- Mid-Atlantic |
| Lead Agencies | NOAA Coastal Services Center |

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| Name | New York City Climate Change Assessment and Action Plan |
| Description | This report summarizes the NYC Department of Environmental Protection's efforts to address climate change impacts on water utilities (drinking water, storm water, and wastewater treatment plants). The report also outlines a comprehensive adaptation plan with strategies to address the impacts of climate change. |
| Type | - PRODUCTS: Plans, Assessments, Studies |

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| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Natural Ecosystems - Social and Cultural Resources - Economic Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | New York City Department of Environmental Protection, Climate Program |

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| Name | New York City Climate Risk Information |
| Description | <p>From the Executive Summary: Climate change poses a range of hazards to New York City and its infrastructure. These changes suggest a need for the City to rethink the way it operates and adapts to its evolving environment. To respond to these changes and accomplish the goals outlined in PlaNYC, the City's comprehensive sustainability plan, Mayor Michael Bloomberg, with funding from the Rockefeller Foundation, convened the New York City Panel on Climate Change (NPCC) in August 2008. The NPCC, which consists of leading climate change and impact scientists, academics, and private sector practitioners, was charged with advising the Mayor and the New York City Climate Change Adaptation Task Force (the "Task Force") on issues related to climate change and adaptation as it relates to infrastructure. This document, one of three in a series of workbooks to be produced for the Task Force, provides climate change projections for New York City and identifies some of the potential risks to the City's critical infrastructure posed by climate change.</p> |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure |
| Focus Area | |
| Region | <ul style="list-style-type: none"> - Regional Or State -- Mid-Atlantic - Local/City |
| Lead Agencies | New York City Panel on Climate Change |

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| Name | New York Sea-Level Rise Projections |
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| Description | The State Sea Level Rise Task Force, charged by the Legislature with developing recommendations for adapting to sea level rise, adopted the sea level rise projections in the table below for two regions of New York State. Although these projections have not been officially adopted by the Legislature or any New York State agency for regulatory purposes, DEC considers them the best available projections for planning purposes. |
| Type | - DATA: Other - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) |
| Sector | |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | New York Department of Environmental Conservation |
| Contacts | Office of Climate Change, climatechange@gw.dec.state.ny.us |

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| Name | New York State Climate Action Plan Interim Report |
| Description | The New York Climate Action Plan Interim Report focuses on reducing greenhouse gases and impacts to various sectors. It also includes a chapter on adaptation that addresses natural resource adaptation and coastal impacts. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Social and Cultural Resources - Economic Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | New York State Climate Action Council, New York State Energy Research & Development Authority |

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| Name | New York Wildlife Climate Change Alliance |
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| Description | The Wildlife Climate Change Alliance, a coalition of state agency and nongovernmental organizations, was formed in 2009 to facilitate integration of climate change adaptation into natural resource management. The coalition sponsored a series of initial workshops that were meant to build capacity for climate change adaptation planning. The first workshop was entitled, "Safeguarding New York's Wildlife and Natural Systems in a Changing Climate." It provided a basic understanding of current climate change science and legislation, already occurring fish, wildlife and natural system adaptations, and how the New York Department of Environmental Conservation can work collaboratively with its conservation partners to respond to future adaptation needs. |
| Type | - PRODUCTS: Engagement |
| Sector | - Natural Ecosystems - Biota |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |

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| Name | New York State Sea Level Rise Task Force Report to the Legislature |
| Description | In 2007, the New York State Legislature created the Sea Level Rise Task Force and charged it with preparing a report that addresses sea-level rise impacts to coastal communities that includes recommendations for an action plan to help those communities and natural resources from sea-level rise. The legislature directed the Task Force to "evaluate ways of protecting New York's remaining coastal ecosystems and natural habitats, and increasing coastal community resilience in the face of sea level rise, applying the best available science as to sea level rise and its anticipated impacts." The Task Force, with public input, has considered and researched the complex issues related to sea-level rise in the state, but a cost and benefit analysis of potential adaptation strategies to sea-level rise was beyond the scope of this report. The conclusions and recommendations in this report are an important first step in increasing the resilience of New York's coastal communities, and they will need to be further assessed to determine site-specific applicability and how they will affect economic development, greenhouse gas mitigation effort, the environment, etc. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Economic Resources - Recreation and Tourism |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |

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| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | New York State Sea Level Rise Task Force |

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| Name | NOAA Center for Operational Oceanographic Products and Services (CO-OPS) |
| Description | CO-OPS provides the national infrastructure, science, and technical expertise to monitor, assess, and distribute tide, current, water level, and other coastal oceanographic products and services that support NOAA's mission of environmental stewardship and environmental assessment and prediction. CO-OPS provides operationally sound observations and monitoring capabilities coupled with operational Nowcast Forecast modeling. |
| Type | - PRODUCTS: Maps (Imagery, geo-referenced data) |
| Sector | - Infrastructure - Managed Ecosystems - Natural Ecosystems - Economic Resources |
| Focus Area | - Sustainability of Marine Ecosystems - Coasts and Climate Resilience (including sea-level rise) |
| Region | - National |
| Lead Agencies | NOAA's National Ocean Service |

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| Name | NOAA Climate.gov Web Portal |
| Description | The NOAA Climate.gov Web Portal is designed to connect the public, as well as scientists and decision makers with climate related science and services. This user friendly platform presents 4 distinct resources to provide different types of information generated by NOAA and its partners: 1) "ClimateWatch magazine" is a popular online magazine that engages readers with a variety of climate related topics 2) "Data and Services" connect scientists and managers with climate data 3) "Understanding Climate" translates climate information into formats useful for decision making, resource management, and other non-science applications 4) "Education" provides tools for incorporate climate science into curricula. |
| Type | - PRODUCTS: Engagement - PRODUCTS: Education - PRODUCTS: Training and Capacity Building - PRODUCTS: Viewers and Web-based Tools |
| Sector | - Cross Disciplinary |
| Focus Area | |
| Region | - Regional Or State -- New England -- Mid-Atlantic -- Central - - Great Lakes -- South East |
| Lead Agencies | NOAA |

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| Contacts | Contact information is available here: http://www.climate.gov/faq.html |
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| Name | NOAA Coastal Services Center's Coastal Climate Adaptation Website |
| Description | NOAA Coastal Services Center's Coastal Climate Adaptation Website focuses on adaptation-related resources, such as local and state plans, new policies, case studies, risk and vulnerability assessments, and decision-support tools. The Web site provides one location for access to numerous resources for states and communities to address climate change impacts and develop their own plans. The site is also building a community of practice on coastal climate adaptation via a forum where users can suggest new resources, engage in dialog on the issues, and submit comments and questions, providing a mechanism for climate and coastal management communities to engage on the topic. |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Education - PRODUCTS: Training and Capacity Building - PRODUCTS: Viewers and Web-based Tools |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Natural Ecosystems - Biota |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | <ul style="list-style-type: none"> - National - Regional Or State |
| Lead Agencies | NOAA Coastal Services Center |

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| Name | NOAA Digital Coast's Coastal Change Analysis Program Regional Land Cover |
| Description | The Coastal Change Analysis Program (C-CAP) produces a nationally standardized database of land cover and land change information for the coastal regions of the U.S. C-CAP products provide inventories of coastal intertidal areas, wetlands, and adjacent uplands with the goal of monitoring these habitats by updating the land cover maps every five years. C-CAP products are developed using multiple dates of remotely sensed imagery and consist of raster-based land cover maps for each date of analysis, as well as a file that highlights what changes have occurred between these dates and where the changes were located. |
| Type | - PRODUCTS: Viewers and Web-based Tools |
| Sector | <ul style="list-style-type: none"> - Managed Ecosystems - Natural Ecosystems |
| Focus Area | |
| Region | - National |
| Lead Agencies | NOAA Coastal Services Center |

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| Contacts | nos.csc.ccap@noaa.gov |
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| Name | NOAA Extreme Weather Information Sheets |
| Description | NOAA's National Coastal Data Development Center (NCDDC) produces the NOAA Extreme Weather Information Sheets (NEWIS). Published each year for the Atlantic hurricane season, the NOAA Extreme Weather Information Sheets provide critical information for contacting government officials and monitoring information resources. The laminated and waterproof NOAA Extreme Weather Information Sheets are an ideal reference in the home, automobile, or boat. NOAA Extreme Weather Information Sheets provide residents with a "one-stop" ready reference containing phone numbers and Web site information residents can use during potentially life-threatening weather emergencies. |
| Type | - PRODUCTS: Engagement |
| Sector | - Public Health and Safety - Economic Resources |
| Focus Area | - Changes in Extremes of Weather and Climate |
| Region | - National |
| Lead Agencies | NOAA National Coastal Climate Data Development Center |
| Contacts | NCDDC@noaa.gov, 866.732.2382 |

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| Name | NOAA National Climatic Data Center |
| Description | NCDC is the world's largest active archive of weather data. Our mission is to provide access and stewardship to National resource of global climate and weather related data and information, and assess and monitor climate variation and change. This effort requires the acquisition, quality control, processing, summarization, dissemination, and preservation of a vast array of climatological data generated by the national and international meteorological services. The NCDC mission is global in nature and provides the U.S. climate representative to the World Meteorological Organization, the World Data Center System, and other international scientific programs. NCDC also operates the World Data Center for Meteorology, Asheville. |
| Type | - DATA: In situ Observations - DATA: Satellite Remote Observations - DATA: Observing Systems - DATA: Data Stewardship and Provisions |
| Sector | |
| Focus Area | - Changes in Extremes of Weather and Climate |
| Region | - National - Regional Or State -- New England -- Mid-Atlantic -- Central - - Great Lakes -- South East |
| Lead Agencies | NOAA |

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| Name | NOAA Tides and Currents website |
| Description | NOAA's website Tides and Currents connects users with products developed by Center for Operational Oceanographic Products and Services (CO-OPS). Definitions of relevant terms are provided, as are links to related program information, educational resources, and descriptions of regional partnerships. With historical data extending back 200 years, CO-OPS provides an important climate resource for the Eastern region through its network of tide and water level stations. |
| Type | <ul style="list-style-type: none"> - DATA: In situ Observations - DATA: Observing Systems - DATA: Data Stewardship and Provisions - PRODUCTS: Forecasts and outlooks (monthly to annual, models) - PRODUCTS: Maps (Imagery, geo-referenced data) |
| Sector | <ul style="list-style-type: none"> - Managed Ecosystems - Natural Ecosystems |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate |
| Region | - Regional Or State -- New England -- Mid-Atlantic -- Great Lakes -- South East |
| Lead Agencies | NOAA Center for Operational Oceanographic Products and Services (CO-OPS) |
| Contacts | Contact information for specific products available here: http://tidesandcurrents.noaa.gov/contact.html |

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| Name | NOAA's State of the Coast |
| Description | Our nation's coastal ecosystems are vital to our economy and quality of life; however, the health of these resources is in decline. Explore this site to gain a deeper appreciation of the connections among healthy coastal ecosystems, a robust U.S. economy, a safe population, and a sustainable quality of life for coastal residents... and the consequent need to better understand, manage, and protect our nation's coastal resources. |
| Type | |

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| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Economic Resources - Recreation and Tourism - Cross Disciplinary |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | <ul style="list-style-type: none"> - National - Regional Or State |
| Lead Agencies | NOAA |

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| Name | NODC Ocean Acidification Scientific Data Stewardship (OADS) |
| Description | The National Oceanographic Data Center (NODC) provides a gateway to Ocean Acidification data through its data stewardship program. In addition to the chemical, bio-oceanographic, and physical data provided by NODC, the program will provide coordinated data and access to the broader ocean acidification community, as well as manage related projects. |
| Type | <ul style="list-style-type: none"> - DATA: In situ Observations - DATA: Observing Systems - PRODUCTS: Training and Capacity Building - PRODUCTS: Viewers and Web-based Tools |
| Sector | <ul style="list-style-type: none"> - Managed Ecosystems - Natural Ecosystems - Biota |
| Focus Area | - Sustainability of Marine Ecosystems |
| Region | <ul style="list-style-type: none"> - National - Regional Or State -- New England -- Mid-Atlantic -- South East |
| Lead Agencies | NOAA National Oceanographic Data Center (NODC) |

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| Name | North American Regional Climate Change Assessment Program (NARCCAP) |
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| Description | The North American Regional Climate Change Assessment Program (NARCCAP) is an international program to produce high resolution climate change simulations in order to investigate uncertainties in regional scale projections of future climate and generate climate change scenarios for use in impacts research. NARCCAP modelers are running a set of regional climate models (RCMs) driven by a set of atmosphere-ocean general circulation models (AOGCMs) over a domain covering the conterminous United States and most of Canada. Registration as a NARCCAP user is required in order to access data. |
| Type | - PRODUCTS: Forecasts and outlooks (monthly to annual, models) |
| Sector | |
| Focus Area | |
| Region | - International - National |
| Lead Agencies | The National Science Foundation (NSF), Department of Energy (DOE), the National Oceanic and Atmospheric Administration (NOAA), and the Canadian consortium OURANOS are providing initial funding for the program. |
| Contacts | (303) 497-8139 , narccap@ucar.edu |

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|---------------|---|
| Name | North American Regional Climate Change Assessment Program (NARCCAP) |
| Description | The North American Regional Climate Change Assessment Program (NARCCAP) is an international program to produce high resolution climate change simulations in order to investigate uncertainties in regional scale projections of future climate and generate climate change scenarios for use in impacts research. NARCCAP modelers are running a set of regional climate models (RCMs) driven by a set of atmosphere-ocean general circulation models (AOGCMs) over a domain covering the conterminous United States and most of Canada. Registration as a NARCCAP user is required in order to access data. |
| Type | - PRODUCTS: Forecasts and outlooks (monthly to annual, models) |
| Sector | |
| Focus Area | |
| Region | - International - National |
| Lead Agencies | NSF, DOE, NOAA, and the Canadian consortium OURANOS are providing initial funding |
| Contacts | (303) 497-8139 , narccap@ucar.edu |

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| Name | Nova Scotia Department of Agriculture Marshlands Atlas |
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| Description | The Nova Scotia Department of Agriculture undertook a project to create an updated GIS inventory of the dykes and flood control structures it maintains around the Bay of Fundy, specifically around the Cumberland Basin and the Southern Bight of the Minas Basin. To introduce historical maps into the GIS environment, forty-two hand drawn historical marsh plans of the Hants, Kings and Cumberland County area were digitally scanned and georeferenced. Lidar data, satellite imagery and aerial photography were also added. As a tool for climate change adaptation the Marshlands Atlas provides important data on current and potential critical dyke elevations as well as information about the dimensions of aboiteaux, these data are crucial for modelling future flood events. |
| Type | - DATA: Depth and Elevation Data - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Viewers and Web-based Tools |
| Sector | - Infrastructure - Managed Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | |
| Lead Agencies | Atlantic Climate Adaptation Solutions Association Nova Scotia Department of Agriculture St. Mary's University |

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| Name | Ocean Acidification - A website hosted by the Ocean Carbon and Biogeochemistry Program |
| Description | This informational website is maintained by the Ocean Carbon and Biogeochemistry Program (Woods Hole Oceanographic Institution) with support from NASA, NOAA, and NSF. Along with basic educational information, the site provides a database of news, publication, events, as well as funding and data resources related to Ocean Acidification research. |
| Type | - PRODUCTS: Engagement - PRODUCTS: Education - PRODUCTS: Viewers and Web-based Tools |
| Sector | - Managed Ecosystems - Natural Ecosystems - Biota |
| Focus Area | - Sustainability of Marine Ecosystems |
| Region | - Regional Or State -- New England -- Mid-Atlantic -- South East |
| Lead Agencies | NASA, NOAA, NSF |
| Contacts | Contact information for the Ocean Carbon and Biogeochemistry Project office is available here: http://www.us-ocb.org/contact.html |

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| Description | Excess carbon dioxide accumulates in the atmosphere, but also in ocean water, increasing ocean acidity, changing marine chemistry, and impacting marine organisms in various ways. This report, requested by congress, reviews current research, identifies outstanding research gaps, and provides guidance to the national ocean acidification research program. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Managed Ecosystems - Natural Ecosystems |
| Focus Area | - Sustainability of Marine Ecosystems - Coasts and Climate Resilience (including sea-level rise) |
| Region | - National - Regional Or State -- New England -- Mid-Atlantic -- South East |
| Lead Agencies | National Research Council |

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| Name | Ocean Health Index |
| Description | Ocean Health Index: The Index is the first comprehensive, annual assessment of the benefits that a healthy ocean provides through 10 goals, which emphasize the human-ocean relationship. The analysis, which was led by Dr. Ben Halpern and engaged 65 scientists and experts, was just released online in Nature . The paper reports that the overall global score is 60 out of a sustainable state scored at 100, indicating that this relationship is out of balance and unsustainable. Country-specific and goal-specific scores as well as a wealth of information on ocean health are provided at www.oceanhealthindex.org . |
| Type | - PRODUCTS: Engagement - PRODUCTS: Education - PRODUCTS: Training and Capacity Building - PRODUCTS: Viewers and Web-based Tools |
| Sector | |
| Focus Area | - Sustainability of Marine Ecosystems - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - International - National - Regional Or State |
| Lead Agencies | Ocean Health Index |

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| Name | Paying the Price: Economic Impacts of Climate Change on Canada (2011) |
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| Description | <p>Having highlighted some of the likely physical impacts of warming temperatures and changing precipitation patterns from climate change in Canada in our second report, Degrees of Change, we undertook new analysis to assess the economic costs in this companion report, Paying the Price. This report represents the first time a national analysis of this kind, using various climate and growth scenarios, has been conducted to calculate how the economic costs of climate change stack up over time. This is necessary research that allows Canadians to appreciate just how pervasive and pernicious climate change can be. It shows the uncertainty of estimating economic impacts of climate change and increases our understanding of how to assess climate risk and our own willingness to accept — or not — the probability of more damages for future generations. It then identifies how adaptation measures can reduce those costs, saving money and lives.</p> <p>Recommendations from the report include:</p> <p>1)The Government of Canada invest in growing our country's expertise in the economics of climate change impacts and adaptation so we have our own Canadian-focused, relevant data and analysis for public and private-sector decision makers.</p> <p>2)The Government of Canada cost out and model climate impacts to inform internal decisions about adapting policies and operations to climate change and allocating scarce resources to programs that help Canadians adapt.</p> <p>3) Governments at all levels continue investing in generating and disseminating research to inform adaptation decision-making at the sectoral, regional, and community level. This research should, as a matter of routine, incorporate economic analysis of the costs and benefits of options to adapt to climate impacts because the current data is insufficient for decision makers and is not readily or consistently available.</p> <p>4) The Government of Canada forge a new data- and analysis-sharing partnership with universities, the private sector, governments, and other expert bodies to leverage unique and available nongovernmental resources for climate change adaptation.</p> |
| Type | - PRODUCTS: Training and Capacity Building |
| Sector | - Managed Ecosystems - Economic Resources |
| Focus Area | |
| Region | |
| Lead Agencies | National Round Table on the Environment and Economy |
| Contacts | admin@nrtee-trnee.ca |

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| Name | Pennsylvania Climate Impact Assessment: Report to the Department of Environmental Protection |
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| Description | From the executive Summary: This assessment was sponsored by the Pennsylvania Department of Environmental Protection (DEP) which, pursuant to the Pennsylvania Climate Change Act, Act 70 of 2008, is required to develop a report on the potential impacts of global climate change on Pennsylvania's climate, human health, the economy and the management of economic risk, forests, wildlife, fisheries, recreation, agriculture and tourism. Act 70 also requires DEP to report on opportunities, and barriers to their realization, created by the need for alternative sources of energy, climate-related technologies, services and strategies, carbon sequestration technologies, capture and utilization of fugitive greenhouse gas emissions, and other mitigation strategies. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota |
| Focus Area | - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Environment and Natural Resources Institute, Pennsylvania State University |

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| Name | Perspective on Climate Change Planning: Benchmarking Canadian Institute of Planners Members (2012) |
| Description | This report represents the conclusion of the benchmarking and focus group process. It reviews the benchmarking surveys of 2008, 2009, 2011 and 2012. Also, the outcome of the seven focus groups, while presented in a report in 2011, is included in this report to allow for a comprehensive analysis. Together, the four benchmarking surveys and the seven focus groups establish the current benchmark (March 2012) for Canadian Institute of Planners (CIP) members on various aspects of climate change understanding, climate change tools and climate change planning. The report also reflects the change in opinions of CIP members about climate change over the four-year survey period. In total, more than 4,800 CIP members participated in the four benchmarking surveys. This permits a very accurate analysis of members' changing attitudes and opinions on climate change and tools that support climate change planning. It also allows CIP to determine an accurate benchmark. |
| Type | - PRODUCTS: Engagement |
| Sector | - Social and Cultural Resources |

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| Focus Area | |
| Region | |
| Lead Agencies | Canadian Institute of Planners |
| Contacts | www.cip-icu.ca |

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| Name | PIEVC (Public Infrastructure Engineering Vulnerability Committee) Engineering Protocol |
| Description | Part 1 of this Protocol provides background, overview and guidance around the planning and execution of an infrastructure engineering vulnerability assessment. It includes information and advice on acquiring and assessing climate information needed to assess current and future climate for use in the assessment process. Part 2 provides a detailed five-step procedure and worksheets. |
| Type | - PRODUCTS: Engagement - PRODUCTS: Training and Capacity Building |
| Sector | - Infrastructure |
| Focus Area | |
| Region | |
| Lead Agencies | Canadian Council of Professional Engineers |
| Contacts | David Lapp, FEC, P.Eng. Manager, Professional Practice Engineers Canada info@pievc.ca |

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| Name | Piping Plover (<i>Charadrius Melodius</i>) Conservation on the Barrier Islands of New York: Habitat Quality and Implications in a Changing Climate |
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| Description | <p>Abstract: Habitat loss is the leading cause of species extinction. Protecting and managing habitat quality is vital to an organism's persistence, and essential to endangered species recovery. We conducted an investigation of habitat quality and potential impacts from climate change to piping plovers (<i>Charadrius melodus</i>) breeding on the barrier island ecosystem of New York, during 2003-2005. Our first step in this analysis was to examine the relationship between two common measures of habitat quality: density and productivity (Chapter 1). We used both central and limiting tendency data analysis to find that density significantly limited productivity across many spatial scales, especially broader scales.</p> <p>Our analysis of plover habitat quality (Chapter 2) focused on 1) identifying the spatial scaling of plovers to their environment; 2) determining the relative importance of four aspects of the environment (land cover, predation, management, and disturbance); and 3) determining the key environmental variables that influence productivity. We found that plover habitat selection occurred within a narrow range of spatial scales that was unique to each environmental variable. Further, we found that management and predation variables influenced population-level productivity relatively more than land cover and disturbance. Environmental variables with a significant positive influence on habitat quality were land management units, plover conservation educational signs, and symbolic string fencing erected around plover nesting areas. We found a significant negative relationship among density of people on ocean beaches, herring gull density, and land cover degradation.</p> <p>To quantify possible impact to plover habitat from future climate change (Chapter 3), we examined the extent of habitat change resulting from different estimates of sea level rise (SLR) and storminess over the next 100 years. We found that the particular SLR estimate, habitat response, and storm type used to model climate changes influenced the amount of potential habitat available. Importantly, we observed synergy between SLR and storms resulting in the increasing impact of SLR and storms on plover habitat over the next 100 years. Finally, we found that coastal development contributed considerably to habitat loss when combined with climate changes.</p> <p>Our findings raise concerns regarding current plover recovery goals and management strategies. Density-dependent productivity may threaten the goal of a joint increase in both plover population and productivity. We advocate density monitoring and allocation of alternative nesting areas to provide the relief of possible high-density limitations. Based on our analysis of habitat selection and climate change threats, we call for a shift in management focus away from known breeding areas, towards ecosystem processes. Long-term conservation of piping plover habitat quality is more likely through protecting and promoting natural barrier island dynamics (i.e., overwash and migration) and minimizing human development on the barrier islands of New York State.</p> |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Natural Ecosystems - Biota |

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| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | University of Massachusetts - Amherst |
| Contacts | Jennifer Ruth Seavey, University of Massachusetts - Amherst, jseavey@email.smith.edu |

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| Name | Place-based Decision Support System to Assess Vulnerability of New Jersey's Coast to Sea Level Rise |
| Description | The project is a collaboration between the Jacques Cousteau National Estuarine Research Reserve (JC NERR) and Rutgers University Center for Remote Sensing & Spatial Analysis (CRSSA). CRSSA is responsible for the technical aspects, while JC NERR is responsible for the collaborative, evaluation/assessment and knowledge dissemination portions of the project. In summary, the proposed project has three main outcomes: 1) serve as a demonstration project as to the feasibility and utility of enhanced GIS/LiDAR-based assessment of coastal infrastructure and habitat vulnerability to sea level rise; and 2) develop a suite internet-accessible geospatial and database visualization and analysis tools that will facilitate the dissemination of this information; and 3) promote enhanced preparedness and land use planning decisions in the face of continued sea level rise. The first step in this project is to conduct a needs assessment of our intended users to (1) identify their current level and source of information regarding sea level rise and climate change impacts to New Jersey's bay and ocean front , (2) identify parameters that are most important to their decision-making (http://www.jcnerr.org/Needs%20Assessment%20Final%20report.pdf), (3) determine their level of comfort with online mapping and decision support tools (http://www.jcnerr.org/Usability%20Testing.final%20report.pdf), (4) determine the best structure for querying and interacting with the CV10 DSS, (5) determine what would enable or prevent them from using such a product. |
| Type | - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Viewers and Web-based Tools |
| Sector | - Infrastructure - Managed Ecosystems - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Jacques Cousteau National Estuarine Research Reserve |

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| Name | Planners Energy & Climate Database |
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| Description | The American Planning Association & the Environmental and Energy Study Institute have a new Planners Energy & Climate Database, to help planners, policymakers, etc., find energy and climate info. The database touches upon energy efficiency, renewable energy, GHG emissions, and tools to prepare for the impacts of climate change. |
| Type | - PRODUCTS: Engagement - PRODUCTS: Training and Capacity Building |
| Sector | - Infrastructure - Cross Disciplinary |
| Focus Area | |
| Region | - National - Regional Or State |
| Lead Agencies | The American Planning Association & the Environmental and Energy Study Institute |

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| Name | Planning Along the Hudson for Warming and Animal Connectivity (PATHWAY) |
| Description | This three-year (2008-2011) project, funded by State Wildlife Grants with match funding from the Hudson River Estuary Program and Cornell University, seeks to determine the current and potential future habitat connectivity for 25 Species of Greatest Conservation Need in the Hudson Valley. Using advanced modeling techniques in a Geographic Information System, we will use climatic, geological, and land cover data to determine how connected the landscape is for these 25 species, under current climatic conditions and with potential future changes in climate. Results from this project will be used to determine priority locations for conservation in the Hudson Valley. |
| Type | - PRODUCTS: Other |
| Sector | - Natural Ecosystems - Biota |
| Focus Area | |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | New York Department of Environmental Conservation, Natural Heritage Program |
| Contacts | Matt Schlesinger at 518-402-8939 |

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| Name | Planning for Sea Level Rise in the Northeast: Considerations for the Implementation of Tidal Wetland Habitat Restoration Projects |
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| Description | "From the Executive Summary: This document presents the results of a workshop held by the Northeast Region of the NOAA Restoration Center in September 2010 to develop suggested guidance for NOAA Restoration staff and partners on how to assess and incorporate sea level rise impacts into site-specific tidal wetland restoration planning and design. NOAA is currently field-testing the methods detailed in this workshop report and, based on the results of those efforts, will develop and issue guidance for use by the NOAA Restoration Center, its project partners, and other interested parties in the design and implementation of tidal wetland restoration projects in the Northeast region." |
| Type | - PRODUCTS: Training and Capacity Building |
| Sector | - Infrastructure - Managed Ecosystems - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- New England -- Mid-Atlantic |
| Lead Agencies | NOAA Restoration Center, Northeast Region |
| Contacts | Helen McMillan, NOAA, Helen.McMillan@NOAA.gov |

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| Name | Potential Effects of Climate Change of New Brunswick Freshwater and Terrestrial Ecosystems |
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| Description | <p>The research objectives of the project are to gather a macro-level view of how climate change will affect ecosystems by 2050 and 2100; identify select species of flora and fauna that will decline or benefit as a direct or indirect result of climate change; summarize potential mitigation and adaptation responses at the individual, community, and government levels; and assess the degree of consensus or divergence of opinion among natural resource managers and scholars regarding the medium and long-term impacts of climate change.</p> <p>At the macro-level, the success of individuals of northern-adapted trees species such as balsam fir and white spruce may decline, eventually leading to stand-level decline, and potentially population reduction in the province. Southern-adapted species such as red spruce and red oak will likely improve under the climate conditions and increase their distribution across New Brunswick. Decreased snow levels will not only affect the success of lynx as predators and be out-competed by bobcat, but decrease their range within the province. Deer, however, will thrive under warming temperatures and reduced snow levels. Two cold-water salmonid fish species, Atlantic salmon and brook trout, are also predicted to decline in NB waters as a result of direct and indirect climatic changes. Warm-water fish populations currently in the province will likely grow and increase their range.</p> <p>Nearly all experts agreed that addressing the actual cause of global warming is key, rather than only acting upon its effects and influences. Experts have cited various ways individuals may employ adaptive and mitigating action; however, most emphasis was placed on governmental response. Nearly all experts advocated that changing policy for forestry practices and wildlife management in the face of climate change is crucial.</p> |
| Type | |
| Sector | - Biota |
| Focus Area | - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | |
| Lead Agencies | University of New Brunswick |
| Contacts | Climate Change Secretariat, New Brunswick Department of the Environment env-info@gnb.ca |

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| Name | Potential for Shoreline Changes Due to Sea-Level Rise Along the U.S. Mid-Atlantic Region |
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| Description | <p>Abstract: Sea-level rise over the next century is expected to contribute significantly to physical changes along open-ocean shorelines. Predicting the form and magnitude of coastal changes is important for understanding the impacts to humans and the environment. Presently, the ability to predict coastal changes is limited by the scientific understanding of the many variables and processes involved in coastal change, and the lack of consensus regarding the validity of existing conceptual, analytical, or numerical models. In order to assess potential future coastal changes in the mid-Atlantic U.S. for the U.S. Climate Change Science Program (CCSP), a workshop was convened by the U.S. Geological Survey. Assessments of future coastal change were made by a committee of coastal scientists with extensive professional experience in the mid-Atlantic region. Thirteen scientists convened for a two-day meeting to exchange information and develop a consensus opinion on potential future coastal changes for the mid-Atlantic coast in response to sealevel rise. Using criteria defined in past work, the mid-Atlantic coast was divided into four geomorphic compartments: spits, headlands, wave-dominated barriers, and mixed-energy barriers. A range of potential coastal responses was identified for each compartment based on four sea-level rise scenarios. The four scenarios were based on the assumptions that: a) the long-term sea-level rise rate observed over the 20th century would persist over the 21st century, b) the 20th century rate would increase by 2 mm/yr, c) the 20th century rate would increase by 7 mm/yr, or d) sea-level would rise by 2 m over the next few hundred years. Potential responses to these sea-level rise scenarios depend on the landforms that occur within a region and include increased likelihood for erosion and shoreline retreat for all coastal types, increased likelihood for erosion, overwash and inlet breaching for barrier islands, as well as the possibility of a threshold state (e.g., dramatic change in barrier evolution, such as segmentation or disintegration) for some barrier island systems. The likelihood of the potential coastal responses is expressed using standard terminology employed in climate change assessments (e.g., as used by the Intergovernmental Panel on Climate Change and CCSP). This assessment was based on the coastal geomorphology in its present condition and does not consider any coastal protection that might be undertaken in the future. The committee recognized that a variety of erosion mitigation measures have been implemented along developed portions of the coast and these are very likely to be applied in the future. It was also acknowledged that economics, political will, and other factors can drive decisions to implement these measures, and that such decisions cannot be predicted with confidence. The results of this assessment are depicted graphically on maps of the study area.</p> |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Natural Ecosystems |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) |
| Region | <ul style="list-style-type: none"> - Regional Or State -- Mid-Atlantic |
| Lead Agencies | U.S. Geological Survey |
| Contacts | Robert Thieler, USGS, rthieler@usgs.gov |

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| Name | Potential Impacts of Global Sea-level Rise on Canadian Coasts (1998) |
| Description | This study examines four coastal areas in Canada in terms of sea-level rise impacts, one of which is the Bay of Fundy. It reviews past and future sea-level trends, and talks about potential threats from storm surge as sea levels rise. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Infrastructure - Natural Ecosystems |
| Focus Area | |
| Region | |
| Lead Agencies | Geological Survey of Canada Bedford Institute of Oceanography Published in The Canadian Geographer |

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| Name | Practical Guidance for Coastal Climate-Smart Conservation Projects in the Northeast Case Examples for Coastal Impoundments and Living Shorelines |
| Description | The National Wildlife Federation (NWF) worked with the Northeast region's conservation community on planning for climate change and conducting climate change vulnerability analyses as well as helping plan and implement on-the-ground projects that take climate change into consideration. This document is part of a project designed to generate climate-smart guidance for restoration and management projects to safeguard fish, wildlife, and their habitats from the impacts of climate change. This coastal climate-smart guidance is an initial step to provide wildlife and natural resource managers practical tools for ensuring that current and future projects are maximizing benefits to ecosystems and critical species. NWF convened an expert panel to develop a process for defining climate-smart conservation for the coastal system and to provide climate-smart options that natural resource managers could consider when planning and implementing projects. The panel selected two project types in the coastal environment on which to focus: coastal impoundments and living shorelines. The coastal impoundment information was based significantly on the efforts of Delaware DFW to plan for sea-level rise and implement pilot adaptation projects to address sea-level rise impacts on their coastal impoundments. |
| Type | - PRODUCTS: Other - PRODUCTS: Training and Capacity Building |
| Sector | - Managed Ecosystems - Natural Ecosystems - Biota |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | National Wildlife Federation |

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| Contacts | Austin Kane, Science and Policy Manager, National Wildlife Federation, kanea@nwf.org |
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| Name | Preliminary Review of Adaptation Options for Climate-Sensitive Ecosystems and Resources Final Report, Synthesis and Assessment Product 4.4 |
| Description | The SAP 4.4 has been prepared by a team of experts from academia, governmental and nongovernmental organizations, and the private sector in response to the mandate of the U.S. Climate Change Science Program's Strategic Plan (2003). This report examines (1) the combined effects on ecosystems of climate changes and non-climate stressors, and consequent implications for achieving specific management goals; (2) adaptation approaches that reduce the risk of negative impacts on management goals; and (3) ways to overcome barriers or take advantage of opportunities to improve the likelihood of successful adaptation implementation. Through the provision of this information, the desired outcome of this report is an enhanced adaptive capacity to respond to future changes in climate. The report includes a section on National Estuaries and Marine Protected Areas. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Managed Ecosystems - Natural Ecosystems |
| Focus Area | - Sustainability of Marine Ecosystems - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate |
| Region | - National |
| Lead Agencies | U.S. Climate Change Science Program And the Subcommittee on Global Change Research |
| Contacts | Susan Julius, Environmental Protection Agency, julius.susan@epa.gov |

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| Name | Preparedness for Climate Change: A Survey of ACAS Communities (NS 2012) |
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| Description | <p>The overall goal of this study was to gather benchmark measures related to attitudes toward and experience with climate change in Nova Scotia overall, and within specific communities that have been identified as being at high risk of adverse effects of climate change: Halifax Regional Municipality, Yarmouth County, Hants/Kings Counties, and Cumberland County. More specifically, this study sought to: assess public opinion regarding the veracity of climate change; identify how residents have changed their behavior because of concern about climate change; evaluate the perceived risk to residents' property as a result of flooding or land erosion; identify those Nova Scotians who have personally experienced weather-related property damage; and evaluate personal and community preparedness to deal with the consequences of climate change.</p> <p>When asked which of various organizations citizens trust most to deal with climate change, residents identify volunteer community groups more often than any single level of government, although in combination the three levels of government have the highest combined level of trust. This trust in volunteer groups indicates that the provincial government should be working closely with these groups in its efforts to address public preparedness for climate change.</p> <p>In terms of evaluating four potential priorities for dealing with climate change, protection of groundwater resources ranks as number one, followed by improved emergency response for weather-related emergencies and upgrading infrastructure. Reviewing land-use patterns and plans to accommodate climate change ranks last, but is still identified by a large proportion of residents.</p> |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Public Health and Safety |
| Focus Area | |
| Region | |
| Lead Agencies | Nova Scotia Environment, Climate Change Directorate |

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| Name | Preparing for a Changing Climate: The Potential Consequences of Climate Variability and Change. MidAtlantic Overview and Foundations |
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| Description | <p>From the Overview Report: This report summarizes the methods, findings and recommendations from the first 18 months of the Mid-Atlantic Regional Assessment (MARA) of potential impacts from increased climate variability and change. The MARA examines both beneficial and damaging impacts, accounting for how people and ecosystems are likely to respond to these changes. This overview is intended for use by federal, state and local elected officials and by people in their role as citizens, employees, and members of the community. It also gives regional texture intended to complement the national overview report being prepared by the National Assessment Synthesis Team (NAST).</p> <p>From the Foundation Report: This Foundations report documents the methods, findings and recommendations from the first two years of the Mid-Atlantic Regional Assessment (MARA) of potential impacts from increased climate variability and change. The MARA examines both beneficial and damaging impacts, accounting for how people and ecosystems are likely to respond to these changes. The Foundations report provides details that back up the summary presented in Preparing for a Changing Climate–The Potential Consequences of Climate Variability and Change: MidAtlantic Overview (Fisher et al. 2000). It is intended as a companion to the Overview, with more depth for use by officials elected at the federal, state and local level and by people in their role as citizens, business employees, and members of community or other organizations. It also gives additional regional texture to complement the reports prepared by the National Assessment Synthesis Team.</p> |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Managed Ecosystems - Natural Ecosystems - Social and Cultural Resources - Economic Resources |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | MidAtlantic Regional Assessment (MARA) Team, Pennsylvania State University |

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| Name | Preparing for Climate 2100 |
| Description | This website includes a list of presentations/PDFs from talks given as part of a climate change conference, Preparing for Climate 2100: Tools and Strategies for New Brunswick Communities, held in Fredericton NB November 14-16, 2012. |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Engagement - PRODUCTS: Education - PRODUCTS: Training and Capacity Building |

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| Sector | - Cross Disciplinary |
| Focus Area | |
| Region | |
| Lead Agencies | Atlantic Climate Adaptation Solutions Association |

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| Name | Preparing for the Changing Climate: A Northeast-Focused Needs Assessment |
| Description | <p>Executive Summary: In the Northeast, the impacts of a changing climate are clearly evident and well-documented. Leaders in the region recognize the need to be proactive in adapting to such changes, but do not yet have the resources and tools they require to do so successfully. This report presents a snapshot of the needs of local, regional and state governments in undertaking such climate preparedness efforts. The goal is to target assistance effectively, and to help our partners in this effort—policy-makers, NGOs and others—do the same.</p> <p>The research was conducted in 2010 and early 2011 and involved extensive individual interviews as well as an online survey distributed to more than 200 communities. The responses, which were well distributed throughout the region, indicate the following:</p> <p>Northeast communities are concerned about climate change impacts.</p> <ul style="list-style-type: none"> • Over half who responded are already doing some form of climate preparedness planning. • Another third are concerned, but are unsure what steps to take or lack capacity. • Sea-level rise, increased precipitation, floodplain changes, and public welfare and health are the impacts of greatest concern. In order to progress, they need technical, communications, and financial assistance. • The technical need most often ranked as a top priority (by 35 percent of respondents) is help with infrastructure vulnerability assessments. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Social and Cultural Resources - Economic Resources |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate |
| Region | - Regional Or State -- New England |
| Lead Agencies | Clean Air Cool Planet |

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| Name | Preparing for Tomorrow's High Tide: A Progress Report of the Delaware Sea-Level Rise Advisory Committee |
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| Description | This document was developed by the Delaware Sea-Level Rise Advisory Committee to help engage Delaware's citizens in sea-level rise planning. It contains information about sea-level rise and Delaware's Sea-Level Rise Advisory Committee. It also contains preliminary findings concerning the potential impacts of sea-level rise based upon scenarios developed by the Delaware Department of Natural Resources and Environmental Control. |
| Type | - PRODUCTS: Other |
| Sector | - Infrastructure - Managed Ecosystems - Natural Ecosystems - Social and Cultural Resources - Economic Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Delaware Sea-level Rise Advisory Committee |
| Contacts | Susan Love, Delaware Coastal Programs, susan.love@de.state.us |

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| Name | Preparing for Tomorrow's High Tide: Sea Level Rise Vulnerability Assessment for the State of Delaware |
| Description | <p>From the Executive Summary: This document and its appendices provides an exhaustive accounting of resources vulnerable to sea level rise of up to 1.5 meters in Delaware. It includes background information, a description of the process used to assess vulnerability, exposure assessment tables, and risk assessments for 79 resources. A comprehensive set of vulnerability maps and information on how to use them is also included as the Mapping Appendix. The vulnerabilities and risk assessment described in this document should be considered as a starting point for more detailed localized or resource-based assessments and as a starting point for prioritizing adaptation strategies.</p> <p>This document is the first of its kind to provide detailed estimates of numbers or acres of resources at risk from sea level rise at a state level. It represents a significant accomplishment and positions the state well to develop and implement specific adaptation strategies for resources most important to Delaware's continued sense of community, economic well-being, and natural resource diversity.</p> |
| Type | - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Plans, Assessments, Studies |

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| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Economic Resources - Recreation and Tourism |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Delaware's Sea-Level Rise Advisory Committee |
| Contacts | Susan E. Love, Delaware Coastal Programs, Susan.Love@state.de.us |

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| Name | Programmatic Framework for Considering Climate Change Impacts in Coastal Habitat Restoration, Land Acquisition, and Facility Development Investments |
| Description | <p>From the Executive Summary: This document, the "Programmatic Framework for Considering Climate Change Impacts in Coastal Habitat Restoration, Land Acquisition, and Facility Development Investments," (hereafter the Framework) is the first deliverable in this multi-phased project to develop and implement the Climate Investment Guidance. The project phases are identified in Figure 1.</p> <p>The Framework provides a systematic approach to institutionalize the consideration of the impacts of climate change into program decision-making for a subset of coastal investments.</p> <p>The Framework addresses these coastal investments:</p> <ul style="list-style-type: none"> • Coastal land acquisition; • Coastal facility development projects; and • Coastal habitat restoration |
| Type | - PRODUCTS: Management Guidance (i.e. structured decision making) |
| Sector | |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - National |
| Lead Agencies | NOAA |
| Contacts | Roger Griffis, NOAA, Roger.Griffis@noaa.gov |

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| Name | Projecting Range Limits with Coupled Thermal Tolerance - Climate Change Models: An Example Based on Gray Snapper (<i>Lutjanus griseus</i>) along the U.S. East Coast |
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| Description | Scientists from the National Oceanic and Atmospheric Administration and University of North Florida examined thermal factors of range limits for gray snapper using field observations and laboratory experiments. This thermal factor (juvenile mortality during winter) was then combined with IPCC general circulation models to predict changes in species range under various climate scenarios. Results indicate that gray snapper distribution will shift northward under all scenarios. Authors indicate that refining these range predictions will involve addressing uncertainty associated with the thermal tolerance variable, and identify improvements of these types of biological parameters as a major research need. |
| Type | - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) |
| Sector | - Managed Ecosystems - Natural Ecosystems |
| Focus Area | - Sustainability of Marine Ecosystems - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- New England -- Mid-Atlantic -- South East |
| Lead Agencies | NOAA Northeast Fishery Science Center (NEFSC), University of Florida |
| Contacts | Jon Hare, NOAA NEFSC, Jon.Hare@noaa.gov |

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| Name | Providing Coastal Information in a Changing Climate |
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| Description | <p>The Interim Report of the Interagency Ocean Policy Task Force (September 2009) calls for strengthening the nation's capacity to observe the nation's oceans, coastal waters and Great Lakes. IOOS®, established by law in March of 2009 and referred to in the statute as the Integrated Coastal Ocean Observing System, provides the framework for developing such a system. The Act establishes a federal-regional partnership for understanding the unique characteristics of the nation's diverse regions, integrating existing information from federal and non-federal sources, and expanding the observation network to fill critical gaps. IOOS® is a partnership of 17 Federal agencies and 11 Regional Associations for Coastal Ocean Observing (RAs). The need for more comprehensive and higher resolution data and information about our coasts and Great Lakes has never been greater. Climate change, ocean acidification, declining fish stocks, expanding dead zones, and the increasing and sometimes conflicting uses of our coastal waters for food, transportation, energy, mineral resources and recreation require an expanded network of observations, enhanced analyses and understanding, and improved predictive and forecasting capabilities.</p> |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Hindcasts (climatologies, models) - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Maps (Imagery, geo-referenced data) |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems |
| Focus Area | <ul style="list-style-type: none"> - Sustainability of Marine Ecosystems - Coasts and Climate Resilience (including sea-level rise) |
| Region | <ul style="list-style-type: none"> - National - Regional Or State |
| Lead Agencies | National Federation of Regional Associations For Coastal and Ocean Observing |

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| Name | Psychology and Global Climate Change: Addressing a Multi-faceted Phenomenon and Set of Challenges |
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| Description | Psychology and Global Climate Change: Addressing a Multi-faceted Phenomenon and Set of Challenges. The task force's report reviews a wide range of research and practice relevant to climate change, including work in environmental and conservation psychology, studies of human responses to natural and technological disasters, efforts to encourage environmentally responsible behavior, and research on the psychosocial impacts of climate change. |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Engagement - PRODUCTS: Education - PRODUCTS: Other |
| Sector | - Cross Disciplinary |
| Focus Area | |
| Region | - National |
| Lead Agencies | American Psychological Association |

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| Name | Quantifying Effects of Climate Change on the Snowmelt-Dominated Groundwater Resources of Northern New England |
| Description | Recent U.S. Geological Survey (USGS) climate studies in New England have shown substantial evidence of hydrologic changes during the last 100 years, including trends toward earlier snowmelt runoff, decreasing occurrence of river ice, and decreasing winter snowpack. These studies are being expanded to include investigation of trends in groundwater levels and fluctuations. Groundwater is an important drinking-water source throughout northern New England (Maine, New Hampshire, and Vermont). The USGS is currently investigating whether or not groundwater recharge from snowmelt and precipitation exhibits historical trends. In addition to trend-testing, groundwater resources also will be analyzed by relating groundwater-level changes to the large year-to-year variability in weather conditions. |
| Type | |
| Sector | - Infrastructure - Managed Ecosystems |
| Focus Area | - Climate Impacts on Water Resources |
| Region | - Regional Or State -- New England |
| Lead Agencies | USGS |

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| Name | Real-Time Assessment and Monitoring of Inland and Coastal Flooding Events for Atlantic Canada (NB 2012) |
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| Description | The purpose of this research project was to develop flood-monitoring guidelines for Atlantic Canada that for real-time assessment and monitoring of inland and coastal flooding events; improve the systematic gathering of information on flood events as they occur; facilitate improved flood management by land managers and public safety officials; and engage the public in monitoring these events. The primary purpose of the analysis and forecasting process is to provide timely and accurate early flood warnings. |
| Type | - PRODUCTS: Forecasts and outlooks (monthly to annual, models) - PRODUCTS: Training and Capacity Building |
| Sector | - Infrastructure |
| Focus Area | |
| Region | |
| Lead Agencies | Atlantic Climate Adaptation Solutions Association New Brunswick Department of Environment |
| Contacts | Climate Change Secretariat, New Brunswick Department of the Environment env-info@gnb.ca |

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| Name | Recurrent Flooding Study for Tidewater Virginia (SJR 76, 2012) |
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| Description | <p>The Virginia General Assembly requested that in conducting its study, the Virginia Institute of Marine Science</p> <ul style="list-style-type: none"> - review and develop a comprehensive list of ideas and examples of strategies used in similar settings around the United States and the world; - convene a stakeholder advisory panel for the purpose of discussing and assessing the feasibility of employing these strategies in Tidewater and Eastern Shore Virginia; and offer specific recommendations for the detailed investigation of preferred options for adapting to relative sea-level rise. <p>The study was undertaken with the collaboration and assistance of Old Dominion University, the Hampton Roads Planning District Commission, Wetlands Watch, the University of Virginia Institute for Environmental Negotiation, the William and Mary Coastal Policy Clinic, and relevant state agencies. Data and analyses were collected from multiple local, state, and federal agencies, as well as NGOs and regional authorities. This Recurrent Flooding Study addresses all localities in Virginia's coastal zone. It documents flooding risks based on available records of past road and infrastructure inundation as well as potential flooding risks based on the best available topographic information. It assesses future risk based on projections for sea level rise from the National Climate Assessment program modified to incorporate factors specific to Virginia's coastal zone. The study also inventories adaptation options from regional, national, and international sources. Options include planning, management, and engineering strategies that merit particular consideration for application in Virginia.</p> |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Infrastructure - Natural Ecosystems - Economic Resources - Recreation and Tourism - Cross Disciplinary |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Virginia Institute of Marine Science, |
| Contacts | Molly Mitchell, Virginia Institute of Marine Science, molly@vims.edu |

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| Name | Reducing GHG Emission in the US Using Existing Authorities & State Action |
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| Description | As the U.S. Congress has struggled to pass comprehensive climate change legislation, observers in the United States and abroad have asked what greenhouse gas emissions reductions are possible under existing federal laws and through state action. Can the U.S. meet the Obama Administration's Copenhagen commitment to reduce greenhouse gas emissions in the range of 17 percent below 2005 levels by 2020 using the regulatory tools already available to federal agencies, together with announced actions at the state level? Even if congressional action is ultimately necessary to put the U.S. on a long-term low-carbon path and aid in the transition to a lowcarbon economy, can federal agencies and state governments get the U.S. started down that path? To help answer these and related questions, the World Resources Institute (WRI) presents this analysis of potential reductions under existing federal authorities and announced state actions through 2030. |
| Type | - PRODUCTS: Management Guidance (i.e. structured decision making) - PRODUCTS: Regulatory/ Policy Guidance |
| Sector | - Infrastructure - Economic Resources |
| Focus Area | |
| Region | - National |
| Lead Agencies | World Resources Institute |

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| Name | Reducing GHG Emissions through Land and Materials Management |
| Description | EPA Releases Report on Reducing GHG Emissions through Land and Materials Management - report that finds significant potential to reduce the country's greenhouse gas emissions through materials management (e.g., recycling and waste prevention) and land management (e.g., brownfield redevelopment, land restoration, and smart growth). This document offers a new perspective on opportunities to reduce greenhouse gas emissions. The report, "Opportunities to Reduce Greenhouse Gas Emissions through Materials and Land Management Practices," finds that 42 percent of U.S. greenhouse gas emissions are influenced by materials management policies. |
| Type | |
| Sector | - Public Health and Safety - Infrastructure - Cross Disciplinary |
| Focus Area | |
| Region | - National - Regional Or State -- New England |
| Lead Agencies | EPA |
| Contacts | Jeri Weiss |

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| Name | Refuge Vulnerability Assessment and Alternatives Technical Guide |
| Description | From the Report: This Refuge Vulnerability Assessment and Alternatives (RVAA) Technical Guide provides the step-by-step details for conducting vulnerability assessments for refuges and their supporting landscapes and to develop strategies and alternatives for management in the face of current and future drivers of change. A companion document, Manager's Guide to Refuge Vulnerability Assessment and Alternatives: Overview and Practical Considerations (Manager's Guide) provides the introduction to the RVAA process and guidance for managers to understand and plan the work. |
| Type | - PRODUCTS: Training and Capacity Building |
| Sector | - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Recreation and Tourism |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - National |
| Lead Agencies | NatureServe and U.S. Fish and Wildlife Agency |
| Contacts | Patrick Crist, NatureServe, patrick_crist@natureserve.org |

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| Name | Regional Climate Change Effects: Useful Information for Transportation Agencies |
| Description | Highways and Climate Change "Regional Climate Change Effects: Useful Information for Transportation agencies" Provides transportation community (highway engineers, planners, NEPA practitioners) with digestible, transparent, regional information on projected CC effects that are most relevant to the U.S. highway system. This information is designed to inform assessments of the risks and vulnerabilities facing the current transportation system, and can inform planning and project development activities. |
| Type | |
| Sector | - Infrastructure |
| Focus Area | |
| Region | - National |
| Lead Agencies | Federal Highway Administration |

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| Description | On June 29 and 30, 2010, a workshop sponsored by the New York Bight Regional Ocean Science Council was held. The workshop participants focused on the regional-scale projects to address adaptation to climate change. The workshop was attended by approximately 60 individuals representing federal and state agencies in the New England and New York Bight area as well as several non-governmental organizations actively engaged with climate adaptation. This document is the summary report. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Infrastructure - Managed Ecosystems - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate |
| Region | - Regional Or State -- New England -- Mid-Atlantic |
| Lead Agencies | Regional Ocean Science Council, New York Bight Sea Grant |
| Contacts | Ellen Mecray, Regional Climate Services Director, Eastern Region, Ellen.L.Mecray@noaa.gov |

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| Name | Regional Climate Trends and Scenarios for the U.S. National Climate Assessment |
| Description | <p>This document is one of series of regional climate descriptions designed to provide input that can be used in the development of the National Climate Assessment (NCA). There are nine reports in this series, one each for eight regions defined by the NCA, and one for the contiguous U.S. The eight NCA regions are the Northeast, Southeast, Midwest, Great Plains, Northwest, Southwest, Alaska, and Hawaii/Pacific Islands. While the datasets and simulations in these regional climate documents are not, by themselves, new (they have been previously published in various sources), these documents represent a more complete and targeted synthesis of historical and emission-dependent future climate conditions around the specific regions of the NCA.</p> <p>There are two components of these descriptions. One component is a description of the historical climate conditions in the region. The other component is a description of the climate conditions associated with two future pathways of greenhouse gas emissions based on IPCC emission scenarios.</p> |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Other |
| Sector | |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate |

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| Region | - National - Regional Or State -- New England -- Mid-Atlantic -- Central - - Great Lakes -- South East |
| Lead Agencies | NOAA National Environmental Satellite, Data, and Information Services. |
| Contacts | Dr. Kenneth E. Kunkel, NOAA National Climate Data Center, ken.kunkel@noaa.gov |

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| Name | Regional report – Hydrographic Conditions on the Northeast United States Continental Shelf in 2011 |
| Description | International Council for Exploration of the Sea (ICES) is a global organization for enhanced ocean sustainability comprised of nearly 4000 scientists and 150 working groups, including the Working Group on Oceanic Hydrography (WGOH). "Regional report – Hydrographic Conditions on the Northeast United States Continental Shelf in 2011," is a chapter from the ICES Report of the Working Group on Oceanic Hydrography (WGOH). Included is an introductory section on hydrography of the Northeast United States (NEUS) Continental Shelf. Also described are results of 11 surveys of the NEUS shelf (5 of which covered the entire shelf) completed by NOAA's Northeast Fisheries Science Center (NEFSC) during 2011. Annual reports are available at http://www.ices.dk/Pages/default.aspx . |
| Type | - DATA: In situ Observations - DATA: Observing Systems - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Natural Ecosystems |
| Focus Area | - Sustainability of Marine Ecosystems |
| Region | - Regional Or State -- New England -- Mid-Atlantic |
| Lead Agencies | NOAA's Northeast Fisheries Science Center (NEFSC) |
| Contacts | Paula Fratantoni, Research Oceanographer, paula.fratantoni@noaa.gov |

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| Name | regulations of greenhouse gas emissions by the EPA will increase poverty among African Americans |
| Description | Affordable Power Alliance released a report on March 30 saying regulations of greenhouse gas emissions by the EPA will increase poverty among African Americans by 20% and among Hispanics by 22%. |
| Type | |
| Sector | - Infrastructure - Economic Resources - Cross Disciplinary |
| Focus Area | |
| Region | - National - Regional Or State |

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| Lead Agencies | Affordable Power Alliance |
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| Name | Regulatory Response to Sea Level Rise and Storm Surge Inundation City of Annapolis, Maryland |
| Description | This report reviews sea level rise projections impacting Annapolis area, describes potential impacts of sea level rise, summarizes potential municipal responses to the increased flooding risks, and provides recommendations on revisions that should be considered to the City's code. This report does not include specific draft code language. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic - Local/City |
| Lead Agencies | City of Annapolis, Maryland |

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| Name | Report, American Clean Energy and Security Act of 2009[H.R. 2454] |
| Description | The American Clean Energy and Security Act of 2009 ("ACES" or the "Act") discussion draft was released on March 31st by Rep. Waxman (Chairman, Energy & Commerce) and Rep. Markey (Chairman, Subcommittee on Energy & Environment) ¹ . ACES sets forth an ambitious and comprehensive reform of U.S. climate and energy policy. The Act would build the foundation of a sustainable and efficient economy that will power our nation's future and create millions of energy efficiency and clean energy jobs. The following document provides: (1) a brief summary of the Act; (2) initial ENE (Environment Northeast) reactions and suggestions; and (3) detailed section-by-section summaries. In addition to this document, ENE is preparing a separate explanation and analysis of the differences and similarities between cap and trade, cap and dividend, and carbon taxes. |
| Type | - PRODUCTS: Education |
| Sector | - Public Health and Safety - Infrastructure - Social and Cultural Resources - Economic Resources |
| Focus Area | |
| Region | - National |
| Lead Agencies | Environment Northeast |

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| Description | This report focuses on the impacts of climate change on coastal environment and property. It outlines principles important to coastal resiliency, and it outlines climate change adaptation strategies for the coast. It is meant to advise federal, state, and local leaders as well as leaders in the private sector. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Infrastructure - Managed Ecosystems - Natural Ecosystems - Social and Cultural Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - National |
| Lead Agencies | Heinz Center and Ceres |
| Contacts | Sharlene Leurig, Ceres leurig@ceres.org); Christophe A. G. Tulou, Heinz Center, tulou@heinzctr.org) |

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| Name | Resource Vulnerability Assessment and Strategies for Management Options for the Eastern Shore of Virginia and Fisherman Island National Wildlife Refuge |
| Description | This vulnerability assessment examined potential effects of current and expected stressors on the stated objectives of the 2004 Comprehensive Conservation Plan (CCP) for the refuges. This assessment provided a pilot to support a larger project focused on developing a handbook for integrating Climate Change Adaptation into CCP revisions at National Wildlife Refuges. In this assessment, potential implications of salt- water inundation and habitat loss from SLR and increased storm surge elevations, as well as change in ecosystem/habitat composition due to changes in land use and land cover (i.e. conversion from natural conditions) were modeled to estimate responses by priority resources. Focus was placed on biological and infrastructure resources of critical importance. Biological resources included rare species populations and mapped habitat of known importance for migratory bird species and monarch butterflies, while infrastructure resources included structures and infrastructure necessary for the recreational and educational missions of the Refuge Complex (e.g. kiosks, roadways, visitor center). Spatial input data were most accessible and accurate for the Refuge Complex proper, and modeling outputs were most informative there as well. However, the study area included the entirety of the Virginia Eastern Shore (i.e. supporting landscape). Using NatureServe Vista, an ArcGIS extension Decision Support Tool, scenarios were modeled for timesteps of 2025, 2050, 2075 and 2100. Outputs included tabular and map summaries of predicted changes in available habitat for priority biological and infrastructure resources. |
| Type | - PRODUCTS: Plans, Assessments, Studies |

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| Sector | <ul style="list-style-type: none"> - Infrastructure - Natural Ecosystems - Biota - Social and Cultural Resources - Recreation and Tourism |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | NatureServe, Virginia Department of Conservation and Recreation – Division of Natural Heritage and |
| Contacts | Patrick Crist, NatureServe, patrick_crist@natureserve.org |

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| Name | Responding to Climate Change in New York State: The Climaid Integrated Assessment for Effective Climate Change Adaptation in New York State (Technical Report) |
| Description | The ClimAID assessment report includes information on on climate change impacts and adaptation for eight sectors in New York State, including the coastal zone. The other sectors are: water resources, ecosystems, agriculture, energy, transportation, telecommunications, and public health. Observed climate trends and future climate projections were developed for seven regions in the state. For each sector, climate risks, vulnerabilities, and adaptation strategies are identified. Equity, environmental justice, and economics are themes that run across all sectors. Case studies were developed that look at specific vulnerabilities and potential adaptation strategies for the eight sectors. These case studies also identify specific monitoring needs. Stakeholders participated in the development of the assessment in an effort to ensure the report would be applicable and useful to decision-makers in the state. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Economic Resources - Recreation and Tourism |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | NYSERDA (New York State Energy Research and Development Authority) |

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| Name | Responding to Climate Change in the Chesapeake Bay Watershed A Draft Report Fulfilling Section 202(d) of Executive Order 13508 |
| Description | From the Executive Summary: This report responds to Section 202d of Executive Order 13508 (EO) which charges Federal agencies to make recommendations to "...assess the impacts of a changing climate on the Chesapeake Bay and develop a strategy for adapting natural resource programs and public infrastructure to the impacts of a changing climate on water quality and living resources of the Chesapeake Bay watershed." Section 601 of the EO directs the Secretaries of Commerce and Interior to organize and conduct research and scientific assessments to evaluate the impacts of climate change in future years and to support development of a strategy to adapt to climate change impacts on the Chesapeake Bay watershed. This report provides an overview of some of the anticipated impacts of climate change on Bay resources, and examples of existing federal programs that could collaborate on adaptive responses. The report is divided into six major parts: Executive Summary, Background, Overview of Impacts, Adaptive Actions, Technical Needs, and Climate Change Strategies. |
| Type | - PRODUCTS: Other |
| Sector | - Infrastructure - Natural Ecosystems - Biota |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | NOAA and USGS Chesapeake Bay Program Office |
| Contacts | Peter Claggett, SGS Chesapeake Bay Program Office, pclagget@chesapeakebay.net |

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| Name | Responding to Climate Change: Working Together to Conserve Land, Wildlife and Habitat |
| Description | This report, compiled by Manomet Center for Conservation Sciences (Manomet), shares information about climate change and its impacts to wildlife presented at the conference and includes resources and contact information for each of the sponsors. A DVD of conference presentation highlights has been included with this report, and is also available at www.climateandwildlife.org . |
| Type | - PRODUCTS: Engagement |

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| Sector | - Managed Ecosystems - Natural Ecosystems - Biota |
| Focus Area | - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- New England |
| Lead Agencies | Manomet Center for Conservation Sciences |
| Contacts | Hector Galbraith, National Wildlife Federation, GalbraithH@nwf.org |

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| Name | Restore-Adapt-Mitigate: Responding to Climate Change Through Coastal Habitat Restoration |
| Description | From the Executive Summary: The purpose of this report is to educate habitat restoration professionals, policy makers, and the public on the impacts climate change will have on coastal habitats and the possible role habitat restoration could play in mitigating those impacts. This is the first report that clearly demonstrates the opportunity to link the interconnectedness between coastal habitat restoration and adaptation and mitigation strategies related to reducing climate change impacts. They are not exclusive of each other, and if designed and managed correctly, can share mutual benefits. Much of this report is focused on policies and programs based in the United States, but many of the concepts, ideas and recommendations translate easily to other locales. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - National |
| Lead Agencies | Restore America's Estuaries |

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| Name | Restructuring Federal Climate Research to Meet the Challenges of Climate Change |
| Description | Committee on Strategic Advice on the U.S. Climate Change Science Program a unit of the National Research Council of the National Academies. National Research Council report "Restructuring Federal Climate Research to Meet the Challenges of Climate Change". Policy decisions are already being made to limit or adapt to climate change and its impacts, but there is a need for greater integration between science and decision making. This book proposes six priorities for restructuring the United States' climate change research program to develop a more robust knowledge base and support informed responses. |
| Type | - PRODUCTS: Management Guidance (i.e. structured decision making) |

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| Sector | |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - National - Regional Or State |
| Lead Agencies | National Research Council |

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| Name | Rhode Island Coastal Resources Management Program Regulations |
| Description | The Rhode Island Coastal Resources Management Program updated its regulations in 2008 to include a section on addressing sea-level rise and climate change under its section on authorities and procedures. The regulation language includes definitions, findings, and policies. The policies include a review the policies, plans and regulations to proactively plan for and adapt to climate change and sea level rise and the integration of climate change and sea level rise scenarios into its operations to prepare Rhode Island for these new, evolving conditions and make our coastal areas more resilient. The policies also state that the Council's sea level rise policies are based upon the CRMC's legislative mandate to preserve, protect, and where possible, restore the coastal resources of the state through comprehensive and coordinated long-range planning. Finally, the policy outlines that it is the Council's policy to accommodate a base rate of expected 3 to 5 foot rise in sea level by 2100 in the siting, design, and implementation of public and private coastal activities and to insure proactive stewardship of coastal ecosystems under these changing conditions. It additionally allows for updating these values. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | |
| Focus Area | - Climate Impacts on Water Resources |
| Region | - Regional Or State -- New England |
| Lead Agencies | Rhode Island Coastal Resources Management Program |

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| Name | Rhode Island LiDAR |
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| Description | Detailed elevation data were collected with airborne LiDAR technology for the entire area of Rhode Island between April 22 and May 6, 2011. Rhode Island's data collection was a component of the larger Northeast LiDAR Project. Basic specifications for the data acquisition: 1) 1 meter nominal pulse spacing 2) National Spatial Standard for Spatial Data Accuracy (NSSDA) Fundamental Vertical Accuracy (FVA) 29.4cm @ 95% confidence, based on 15cm RMSEz in open terrain land cover. 3) Horizontal coordinate system: NAD83 UTM Zone 19 North, meters 4) Vertical reference: NAVD88 (GEOID99), meters 5) No tidal coordination 6) Meet or exceed standards defined in version 12 of the USGS National Geospatial Program Base Lidar Specification (PDF). |
| Type | - DATA: Depth and Elevation Data |
| Sector | |
| Focus Area | |
| Region | |

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| Name | Rhode Island Sea-Level Rise Map |
| Description | Using Google Earth, this tool allows the user to view an overlay of 5 feet of sea-level rise in Rhode Island. Areas which are now above sea level, but which will be inundated by a five foot rise, are shown in blue. The edges of the blue coverages are fuzzy, because the state's elevational (land height) data do not allow precise mapping of the boundaries. |
| Type | - PRODUCTS: Viewers and Web-based Tools |
| Sector | |
| Focus Area | - Sustainability of Marine Ecosystems |
| Region | |
| Lead Agencies | Narragansett Bay Estuary Program |

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| Name | Rising to the Urgent Challenge Strategic Plan for Responding to Accelerating Climate Change |
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| Description | From the Executive Overview: The Strategic Plan's primary purposes are to (1) lay out our vision for accomplishing our mission to "work with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people" in the face of accelerating climate change; and (2) provide direction for our own organization and its employees, defining our role within the context of the Department of the Interior and the larger conservation community. In this plan, we express our commitment to our vision through strategic goals and objectives that we believe must be accomplished to sustain fish and wildlife nationally and internationally. In an appended 5-year action Plan for Implementing the Climate Change Strategic Plan, we identify specific actions that will lead to the accomplishment of our goals and objectives. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Natural Ecosystems - Biota |
| Focus Area | - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - National |
| Lead Agencies | U.S. Fish and Wildlife Service |

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| Name | Rising Waters: Helping Hudson Communities Adapt to Climate Change |
| Description | <p>From TNC's website: The Rising Waters project, a multi-stakeholder scenario development process, brought together a diverse group of over 160 Hudson Valley participants to consider the likely impacts of climate change on the Hudson Valley through 2030, and forward recommendations to improve the capacity of the Valley to withstand and adapt to the expected changes...By highlighting the most important future impacts of climate change and what should be done to improve preparedness, the Rising Waters project seeks to identify what can be done to strengthen the capacity of the Valley's natural systems and human communities to adapt to the expected impacts.</p> <p>The report lays out four plausible scenarios based on different levels and kinds of societal response to climate change, and provides a method for evaluation of the choices facing communities and the region. This approach provides a framework for local governments, communities, individuals, conservation practitioners, transportation officials, emergency responders and others to work collaboratively and pro-actively to increase their preparedness and adaptive capacity to climate change.</p> |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Other |

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| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Natural Ecosystems - Social and Cultural Resources |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | The Nature Conservancy |
| Contacts | Ellen Weiss, The Nature Conservancy, eweiss@tnc.org |

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| Name | River Herring Climate Change Workshop Report. Report to the National Marine Fisheries Service, Northeast Regional Office |
| Description | In 2011, the National Resources Defense Council petitioned to have river herring (alewife and blueback herring, collectively) listed as a threatened species under ESA. River herring are anadromous, and thus susceptible to marine and inland impacts; they are considered an important prey species for atlantic cod, striped bass, and flounder. It was concluded that a series of workshops and assessments were necessary to determine the health of river herring populations. NOAA invited expert presenters and the public to a series of workshops in 2012, one of which discussed climate change impacts, as well as identified data gaps and research needs; workshop proceedings were compiled into a report. For more information about NOAA NMFS activities related to river herring, visit: http://www.nero.noaa.gov/prot_res/CandidateSpeciesProgram/RiverHerringSOC.htm . |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Managed Ecosystems - Natural Ecosystems - Biota |
| Focus Area | <ul style="list-style-type: none"> - Sustainability of Marine Ecosystems - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- New England -- Mid-Atlantic -- South East |
| Lead Agencies | NOAA NMFS (National Marine Fisheries Service) |

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| Name | River Risk Flood Study of Nappan River Incorporating Climate Change (2012) |
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| Description | The purpose of this ACAS project was to construct a model to simulate river flooding events, estimate the impacts of possible increased rainfall in the future under climate change, and to evaluate various adaptation strategies. This study has implications for many estuaries in the province that have control structures (aboiteau) at their mouth. The problems of siltation, restricted drainage, and the prevention of river discharge during high tide events, make this issue of flooding upstream of these structures more problematic. The potential for flooding is expected to increase under future climate change projections with increased sea-level rise and increased short duration rainfall, as well as possible increased storm intensity and frequency. This ACAS project has demonstrated how a complex drainage system can be modelled and various adaptations measures to flooding be tested and evaluated. Decision makers can make use of these model results to evaluate the potential costs of adaptations to flood risk problems presently and in the future. |
| Type | - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) |
| Sector | - Infrastructure |
| Focus Area | - Climate Impacts on Water Resources |
| Region | |
| Lead Agencies | Atlantic Climate Adaptation Solutions Association Nova Scotia Department of Environment Climate Change Directorate Nova Scotia Community College Centre of Geographic Sciences |

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| Name | Scanning the Conservation Horizon: A Guide to Climate Change Vulnerability Assessment |
| Description | National Wildlife Federation: Scanning the Conservation Horizon: A Guide to Climate Change Vulnerability Assessment is the product of an expert workgroup consisting of leading scientists from federal and state agencies, non-profit organizations, and universities. The peer-reviewed guide is designed to help conservation professionals and natural resource managers craft effective strategies to prepare for and cope with the effects of rapid climate change on the nation's fish, wildlife, and natural habitat |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Managed Ecosystems - Natural Ecosystems - Social and Cultural Resources - Recreation and Tourism |
| Focus Area | - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - National - Regional Or State |

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| Lead Agencies | National Wildlife Federation |
| Contacts | Naomi Edelson, National Wildlife Federation, edelsonn@nwf.org |

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| Name | Scenarios and Guidance for Adaptation to Climate Change and Sea-Level Rise--Nova Scotia and PEI Municipalities |
| Description | This document provides numbers for climate and sea-level rise scenarios relevant to Nova Scotia and Prince Edward Island communities along with guidance on how to correctly use those data. |
| Type | - PRODUCTS: Training and Capacity Building |
| Sector | - Natural Ecosystems - Cross Disciplinary |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - International |

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| Name | Sea Level Rise and Coastal Flooding Impacts Viewer |
| Description | Being able to visualize potential impacts from sea level rise is a powerful teaching and planning tool, and the Sea Level Rise Viewer brings this capability to coastal communities. A slider bar is used to show how various levels of sea level rise will impact coastal communities. Completed areas include Mississippi, Alabama, Texas, Florida, and Georgia, with additional coastal counties to be added in the near future. Visuals and the accompanying data and information cover sea level rise inundation, uncertainty, flood frequency, marsh impacts, and socioeconomics. The Mid-Atlantic will be available in the Fall of 2012, and New England should be completed in 2013. |
| Type | - DATA: Depth and Elevation Data - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Viewers and Web-based Tools |
| Sector | |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - National - Regional Or State |
| Lead Agencies | NOAA Coastal Services Center, on Digital Coast |

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| Name | Sea Level Rise and Flooding--What They Mean for New Brunswick's Coastal Communities (2012) |
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| Description | Based on the 2011 report Sea-Level Rise Estimates for New Brunswick Municipalities Le Goulet, Saint John, Richibucto, Sackville, Shippagan, Caraquet, this educational guidebook provides an overview for the public on sea-level rise impacts in New Brunswick communities, potential impacts of storm surge, and means of municipal response. |
| Type | - PRODUCTS: Training and Capacity Building - PRODUCTS: Management Guidance (i.e. structured decision making) |
| Sector | - Infrastructure - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - International |
| Lead Agencies | Atlantic Climate Adaptation Solutions Association |

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| Name | Sea Level Rise and Storm Surge Adaptation Analysis via COAST (COastal Adaptation to Sea level rise Tool) |
| Description | In Portland, Maine and Hampton/Seabrook New Hampshire, climate change adaptation processes are underway. In both locations COAST (COastal Adaptation to Sea level rise Tool) is being used to enhance these efforts. The Environmental Finance Center conducted a study using their COAST tool, which helps communities evaluate costs and benefits of adaptation actions municipalities might undertake in response to threats of sea level rise and storm surge over the next century. The study evaluated potential lost real estate values in the Bayside portion of Portland, under different sea level rise, storm surge, and adaptation scenarios. Through 3D visualizations, tallies of expected damages, and a presentation describing these results, the EFC is encouraging interested stakeholders in Portland to become involved in a larger, upcoming adaptation planning process for the city. |
| Type | - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Engagement - PRODUCTS: Training and Capacity Building - PRODUCTS: Viewers and Web-based Tools |
| Sector | - Public Health and Safety - Infrastructure - Social and Cultural Resources - Economic Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate |
| Region | - Regional Or State -- New England |

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| Lead Agencies | New England Environmental Finance Center (EFC) at the Muskie School of Public Service, University of Southern Maine |
| Contacts | Sam Merrill, smerrill@usm.maine.edu (207) 228-8596 |

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| Name | Sea Level Rise Impacts for Wilmington, Delaware (Map) |
| Description | This map shows potential flooding, or inundation, caused by sea level rise. Use the slider bar to view the extent. The map illustrates the scale of potential flooding, not the exact location, and does not account for erosion, subsidence, or future construction. Water levels are shown as they would appear during an average high tide (mean high water). Rising sea levels will cause daily high tides to reach farther inland. |
| Type | - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Viewers and Web-based Tools |
| Sector | |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | NOAA Coastal Services Center, the U.S. Geological Survey, and the Delaware Department of Natural Resources |

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| Name | Sea Level Rise Response Strategy, Worcester County, Maryland |
| Description | Following development of the Worcester County Sea Level Rise Inundation Model (2006) that depicts both the impact of gradual sea level rise inundation over time, as well as impacts associated with increased storm surge from episodic flood events, the County adopted its 2006 Comprehensive Plan. This Plan called for the development of a Sea Level Rise Response Strategy. This SLR Strategy outlines projected sea-level rise impacts, potential response options, and priorities for response. |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Training and Capacity Building |
| Sector | - Public Health and Safety - Infrastructure - Managed Ecosystems - Economic Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic - Local/City |
| Lead Agencies | Worcester County |

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| Name | Sea Level Rise Strategic Plan Anne Arundel County |
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| Description | This Sea Level Rise Strategic Plan is the outcome of a study that Anne Arundel County and the Maryland Department of Natural Resources (DNR) partnered on through the Coastal Communities Initiative Program to conduct a study of potential sea level rise impacts and develop adaptation strategies. The project included four major components: 1) a vulnerability assessment to identify potential areas impacted by sea level rise and develop inventories of resources at risk; 2) development of a framework for interagency strategic planning; 3) development of a strategic plan; and 4) public outreach and education to promote public awareness of sea level rise issues. The Plan summarizes the State's recent research and planning efforts related to sea level rise; discusses the key findings from the vulnerability assessment and other planning analysis; identifies the major planning issues for Anne Arundel County as related to sea level rise; and recommends future actions to protect resources and minimize impacts. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Social and Cultural Resources - Economic Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic - Local/City |
| Lead Agencies | Anne Arundel County, Office of Planning and Zoning |

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| Name | Sea, Lake, and Overland Surges from Hurricanes (SLOSH) |
| Description | The Sea, Lake and Overland Surges from Hurricanes (SLOSH) model is a computerized numerical model developed by the National Weather Service (NWS) to estimate storm surge heights resulting from historical, hypothetical, or predicted hurricanes by taking into account the atmospheric pressure, size, forward speed, and track data. These parameters are used to create a model of the wind field which drives the storm surge. The SLOSH model consists of a set of physics equations which are applied to a specific locale's shoreline, incorporating the unique bay and river configurations, water depths, bridges, roads, levees and other physical features. |
| Type | - DATA: Surveys and Preliminary Assessments - DATA: Other - PRODUCTS: Viewers and Web-based Tools |
| Sector | |
| Focus Area | - Changes in Extremes of Weather and Climate |
| Region | - National |
| Lead Agencies | National Weather Service, National Hurricane Center |

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| Name | Sea-Level Change Considerations for Civil Works Programs |
| Description | This circular provides United States Army Corps of Engineers (USACE) guidance for incorporating the direct and indirect physical effects of projected future sea-level change across the project life cycle in managing, planning, engineering, designing, constructing, operating, and maintaining USACE projects and systems of projects. Recent climate research by the Intergovernmental Panel on Climate Change (IPCC) predicts continued or accelerated global warming for the 21st Century and possibly beyond, which will cause a continued or accelerated rise in global mean sea-level. Impacts to coastal and estuarine zones caused by sea-level change must be considered in all phases of Civil Works programs. |
| Type | - PRODUCTS: Regulatory/ Policy Guidance |
| Sector | - Infrastructure |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - National |
| Lead Agencies | U.S. Army Corps of Engineers |

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| Name | Sea-Level Rise Affecting Marshes Model |
| Description | The Sea Level Affecting Marshes Model (SLAMM) simulates the dominant processes involved in wetland conversions and shoreline modifications during long-term sea level rise. Map distributions of wetlands are predicted under conditions of accelerated sea level rise, and results are summarized in tabular and graphical form. |
| Type | - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Viewers and Web-based Tools |
| Sector | - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - National |
| Lead Agencies | Warren Pinnacle Consulting, Inc. |
| Contacts | Jonathan Clough, Warren Pinnacle Consulting, Inc., jclough@warrenpinnacle.com |

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| Name | Sea-Level Rise and Coastal Habitats in the Chesapeake Bay Region |
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| Description | Changes in tidal marsh area and habitat type in response to sea-level rise were modeled using the Sea Level Affecting Marshes Model (SLAMM) that simulates the dominant processes involved in wetland conversions and shoreline modifications during long-term sea level rise (Park et al. 1989; www.warrenpinnacle.com/prof/SLAMM). For this report, SLAMM 5.0 model was applied to the entire Chesapeake Bay region and Delaware bay, a study area comprising slightly over seven million hectares. The study area was broken into 30 meter by 30 meter cells for this application. This report provides coastal resource managers and other relevant decision-makers with much needed information about local impacts of sea-level rise on the Chesapeake Bay's coastal habitats to help them assess the risks and identify reasonable steps to manage those risks. Ultimately, the appropriate response strategies will vary for different areas, and site-specific studies may be warranted to supplement these findings by identify factors that have not effectively characterized by the model or are uncertain. However, the results of this analysis can be used to inform a number of important decisions regarding coastal restoration and management. |
| Type | - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | National Wildlife Federation |
| Contacts | Patty Glick, National Wildlife Federation, glick@nwf.org |

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| Name | Sea-level Rise and Flooding Estimates for New Brunswick Coastal Sections (2012) |
| Description | In this research project focused on coastal areas of southeastern New Brunswick, LIDAR mapping was used to display flood zones help conduct analyses of socio-economic impacts. The estimates of global sea-level rise were used, in conjunction with the best estimates of local vertical motion (crustal subsidence) to calculate total sea-level rise estimates over the next century for the coastlines of New Brunswick of 0.9 to 1.05 metres. These estimates were then combined with documented storm-surge return period climatology to develop flooding scenarios for future milestones of 2025, 2055, 2085 and 2100. The flooding levels reached at the height of the January 21, 2000 along the southeast coastline of New Brunswick (then close to a 1 in 100-year event), could statistically occur every year. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Infrastructure |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | |
| Lead Agencies | Atlantic Canada Adaptation Solutions Association New Brunswick Department of Environment |

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| Contacts | Climate Change Secretariat, New Brunswick Department of the Environment env-info@gnb.ca |
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| Name | Sea-level Rise Estimates for New Brunswick Municipalities: Le Goulet, Saint John, Richibucto, Sackville, Shippagan, Caraquet 2011 |
| Description | Recent estimates of global sea-level rise were used, in conjunction with the best estimates of local vertical motion (crustal subsidence) to come up with total sea-level rise estimates over the next century for the New Brunswick municipalities of Saint John, Moncton, Sackville, Richibucto, Caraquet, Shippagan and Le Goulet. Anticipated changes for 2100 factoring in both sea-level rise and vertical motion ranged from 90-100 cms. for all seven communities (with 38 cms. variability). Total change by 2025 ranged from 10-13 cms. (with 3 cms. variability). |
| Type | |
| Sector | - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - International |
| Lead Agencies | Atlantic Climate Adaptation Solutions Association |
| Contacts | New Brunswick Department of Environment--Climate Change Secretariat, env-info@gnb.ca |

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| Name | Sea-level Rise Hazards and Decision Support |
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| Description | <p>This project brings together scientists from the disciplines of geology, hydrology, geography, biology, and ecology to address the effects of sea-level rise (SLR) on the Nation's coasts. The project synthesizes information on coastal environments and uncertainties in knowledge of coastal processes into a Bayesian statistical analysis framework. The Bayesian approach allows researchers to evaluate the probability of a number of sea-level rise impacts, and provides information that can be used for decision making.</p> <p>The Bayesian statistical framework is ideal for using data sets derived from historical or modern observations such as long-term shoreline change or wetland accretion/elevation trends. This information can be combined with model simulations and used to define the relationships between key variables in coastal environments. A Bayesian Network provides a means of integrating these data to evaluate competing hypotheses regarding the relationships between forcing factors (e.g., rate of SLR, suspended sediment concentration, elevation change), and responses (e.g., shoreline change, wetland vertical accretion, water table change). This framework allows scientists to make probabilistic predictions of the future state of coastal environments for outcomes such as shoreline change, wetland survival, and changes in the depth to groundwater. The predictions also have estimates of outcome uncertainty that can be expressed as both numbers (e.g., 90%) and words (e.g., very likely). The ability to communicate SLR impacts in terms of a probabilistic prediction can improve scientists' ability to support decision making and evaluate specific management questions about alternatives for addressing SLR. This information can also identify research needed to improve predictive skill.</p> |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Training and Capacity Building - PRODUCTS: Viewers and Web-based Tools - PRODUCTS: Management Guidance (i.e. structured decision making) |
| Sector | - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - National |
| Lead Agencies | U.S. Geological Survey |
| Contacts | Robert Thieler, USGS, rthieler@usgs.gov, (508) 457-2350 |

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| Name | Sea-Level Rise Rectification Program |
| Description | <p>The Sea-Level Rise Rectification Program (SLRRP) is a software program designed to generate a suite of future sea level projections from various Global Circulation Models (GCM) and emissions scenario options. The model allows users to select a region-based tide station, GCM model, and emissions scenario to generate a graph and output file of future sea level change. SLRRP also shows the inundation process and period for which sea level will overtop a given landscape feature or elevation under a future changing climate.</p> |

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| Type | - DATA: Other - PRODUCTS: Viewers and Web-based Tools |
| Sector | |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - National |
| Lead Agencies | NOAA |

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| Name | Sea-level Rise, Storm Surges and Extreme Precipitation in Coastal New Hampshire: Analysis of Past and Projected Future Trends |
| Description | This document is the Science and Technical Advisory Panel's report to the Coastal Risks and Hazards Commission (Commission). It outlines the projected impacts we will likely experience in the next few decades and out into the end of the century and recommends a number of assumptions and projections for the Commission to use. It is intended to specifically advise the Commission which will in turn develop specific recommendations to assist in planning and preparation for the changing climatic conditions |
| Type | - PRODUCTS: Hindcasts (climatologies, models) - PRODUCTS: Forecasts and outlooks (monthly to annual, models) - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) |
| Sector | - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate |
| Region | |
| Lead Agencies | New Hampshire Coastal Risks and Hazards Commission Science and Technical Advisory Panel |

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| Name | Sea-Level Rise: Technical Guidance for Dorchester County |
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| Description | This technical guidance outlines the impacts sea-level rise is projected to have in Dorchester county and provides a description of impacts to various sectors, including public health and safety, infrastructure, managed systems, and natural systems. Four distinct planning strategies (Vulnerability and Impact Assessment; Long-Range and Comprehensive Planning; Codes, Regulations and Development Standards; and Public Education and Outreach) were outlined in the 2008 A Sea Level Response Strategy for the State of Maryland, and these same categories are addressed in this document. The guidance and discussion is provided to illustrate specific local implications of sea level rise. The author purposely wrote the guidance to focus on necessary changes at the local level. This guidance is presented in a manner intended to allow readers to understand how sea level rise may affect him or her in their daily lives, and to provide educators, planners, engineers, and elected officials a clear picture of the challenges facing them. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Economic Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | <ul style="list-style-type: none"> - Regional Or State -- Mid-Atlantic - Local/City |
| Lead Agencies | Maryland Department of Natural Resources Coastal Zone Management Division |

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| Name | Sentinel Sites Program Guidance for Understanding Climate Change Impacts |
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| Description | <p>From the Report: The impacts of a changing climate on coastal areas will be expressed across a diverse suite of ecosystem variables (e.g., changes in air, water and soil temperatures; water chemistry; the quantity, timing and intensity of precipitation; the intensity of storm events; and changes in sea level and water levels in the Great Lakes). This document describes a general approach for establishing a NERRS Sentinel Sites Program to understand climate change impacts, as well as the context of the NERRS Sentinel Sites Program in relationship to a larger NOAA Sentinel Site Program. The specific goal of this document is to provide guidance for the NERRS and NERRS partners to establish Sentinel Sites for understanding the impacts of sea level/lake level change and inundation on coastal habitats. It also contributes to the NERRS System-wide Monitoring Program (SWMP) as a SWMP Application Module. Although the initial focus of the NERRS Sentinel Sites Program will be on changes in marsh, mangrove, and submerged aquatic vegetation responses related to changes in sea level/lake level and inundation, we anticipate that in the future other documents would be developed to provide guidance for NERRS Sentinel Sites that are established to address the effects of other climate-related stressors on coastal habitat.</p> |
| Type | - PRODUCTS: Training and Capacity Building |
| Sector | - Natural Ecosystems |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - National |
| Lead Agencies | NOAA, National Estuarine Research Reserve System |

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| Name | Some Anticipated Consequences of Global Warming: Implications for the Nature of Massachusetts |
| Description | <p>The goal of this document is to describe climate change by outlining some of the changes already taking place in Massachusetts as well as identify the risk climate change presents to the future natural resources in the state. The report focuses on projected impacts of climate change on natural communities, using examples from Mass Audubon and protected lands throughout the state. The impact on cultural resources and natural history is also described. Much of the information is synthesized from two key peer reviewed sources: the IPCC's Fourth Assessment Report (IPCC 2007) and the Northeast Climate Impact Assessment's 2007 report (Frumhoff et al. 2007). Sections include: Changes in the Massachusetts climate, Terrestrial ecosystems, Freshwater ecosystems, Coastal and near-shore marine ecosystems, Birds and their habitats, and Pathogens and Pests.</p> |
| Type | - PRODUCTS: Plans, Assessments, Studies |

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| Sector | - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources |
| Focus Area | |
| Region | - Regional Or State -- New England |
| Lead Agencies | Mass Audubon |
| Contacts | Robert Buchsbaum, Mass Audubon |

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| Name | Somerset County, Maryland: Rising Sea Level Guidance |
| Description | Somerset County obtained a grant from the Maryland Department of Natural Resources to assess the County's vulnerability to sea level rise and to review and develop workable revisions to the County's plans, development codes, and regulations to mitigate the identified impacts. The effects anticipated under various sea level rise scenarios include those associated with coastal storm flooding, both intensity and frequency, and those associated with more gradual changes in groundwater levels and drainage. The vulnerability assessment describes some of the associated problems that may occur, with particular emphasis on the effects related to coastal flooding. The recommendations address suggested modifications to the County's planning and regulatory mechanism, including the Floodplain Management Ordinance/Building Code, Zoning Ordinance, Subdivision Regulations, Comprehensive Plan, and Hazard Mitigation Plan. |
| Type | - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Management Guidance (i.e. structured decision making) |
| Sector | - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Economic Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate |
| Region | - Regional Or State -- Mid-Atlantic - Local/City |
| Lead Agencies | Somerset County |

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| Name | Spatially Explicit Mapping of Hurricane Risk in New England 2010 |
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| Description | Recent Spatially Explicit Mapping of Hurricane Risk in New England 2010. Hurricanes are one of the major natural disturbances affecting human livelihoods in coastal zones worldwide. Assessing hurricane risk is an important step toward mitigating the impact of tropical storms on human life and property. This study uses NOAA's historical tropical cyclone database (HURDAT or 'best-track'), geographic information systems, and kernel smoothing techniques to generate spatially explicit hurricane risk maps for New England. |
| Type | |
| Sector | - Public Health and Safety |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate |
| Region | - Regional Or State -- New England |
| Lead Agencies | Yale School of Forestry and Environmental Studies |

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| Name | Spring 2011 U.S. Climate Extremes |
| Description | The spring (March-May) of 2011, particularly April, brought extreme weather and climate events to many parts of the United States. Tornadoes, flooding, drought, and wildfires ravaged many parts of the country during the period, and each of these extremes broke long-standing records and have been compared to the 'worst such cases' in history. While similar extremes have occurred throughout modern American history, never before have they occurred in a single month. According to the Storm Prediction Center (SPC), there were 751 tornadoes during April alone, and the confirmed number of tornadoes surpassed the all-time monthly record of 542 tornadoes set in May 2003. Record rainfall along the Ohio River Valley, punctuated with snowmelt across the upper Midwest, caused record flooding along the mid and lower Mississippi River, with water levels surpassing the historic floods of 1927 and 1937. Above-normal precipitation and vegetative growth during 2010, followed by dry and windy conditions the first five months of 2011, created ideal wildfire conditions across the Southern Plains where millions of acres of land burned. According to the U.S. Drought Monitor (USDM), the same region experienced Extreme-to-Exceptional [D3-D4] drought following consecutive months that were record to near-record dry. |
| Type | - PRODUCTS: Hindcasts (climatologies, models) - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Viewers and Web-based Tools |
| Sector | |
| Focus Area | - Changes in Extremes of Weather and Climate |
| Region | - National - Regional Or State -- New England -- Mid-Atlantic -- Central - - Great Lakes -- South East |
| Lead Agencies | NOAA, National Climatic Data Center |

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| Name | State Bioenergy Primer: Information and Resources for States on Issues |
| Description | EPA is pleased to release the new State Bioenergy Primer: Information and Resources for States on Issues, Opportunities, and Options for Advancing Bioenergy. Provides basic information and resources for all biomass fuel and technology types in a concise format useful for state decision makers - covering biopower, bioheat, biofuels, and bioproducts. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Infrastructure |
| Focus Area | |
| Region | - National - Regional Or State -- New England |
| Lead Agencies | EPA |

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| Name | State of the Climate in 2011 |
| Description | <p>Large-scale climate patterns influenced temperature and weather patterns around the globe in 2011. In particular, a moderate-to-strong La Niña at the beginning of the year dissipated during boreal spring but reemerged during fall. The phenomenon contributed to historical droughts in East Africa, the southern United States, and northern Mexico, as well the wettest two-year period (2010–11) on record for Australia, particularly remarkable as this follows a decade-long dry period. Precipitation patterns in South America were also influenced by La Niña. Heavy rain in Rio de Janeiro in January triggered the country's worst floods and landslides in Brazil's history.</p> <p>The 2011 combined average temperature across global land and ocean surfaces was the coolest since 2008, but was also among the 15 warmest years on record and above the 1981–2010 average. The global sea surface temperature cooled by 0.1°C from 2010 to 2011, associated with cooling influences of La Niña. Global integrals of upper ocean heat content for 2011 were higher than for all prior years, demonstrating the Earth's dominant role of the oceans in the Earth's energy budget. In the upper atmosphere, tropical stratospheric temperatures were anomalously warm, while polar temperatures were anomalously cold. This led to large springtime stratospheric ozone reductions in polar latitudes in both hemispheres. Ozone concentrations in the Arctic stratosphere during March were the lowest for that period since satellite records began in 1979. An extensive, deep, and persistent ozone hole over the Antarctic in September indicates that the recovery to pre-1980 conditions is proceeding very slowly.</p> |

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| Type | <ul style="list-style-type: none"> - PRODUCTS: Hindcasts (climatologies, models) - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Engagement - PRODUCTS: Education - PRODUCTS: Training and Capacity Building |
| Sector | |
| Focus Area | - Changes in Extremes of Weather and Climate |
| Region | <ul style="list-style-type: none"> - International - National |
| Lead Agencies | NOAA- American Metoerological Center |

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| Name | State of the Gulf of Maine Report Climate Change and Its Effects on Ecosystems, Habitats and Biota (2010) |
| Description | This paper examines the effects of climate change on marine and intertidal ecosystems and habitats bordering the Gulf of Maine (along the coasts of Massachusetts, New Hampshire, Maine, New Brunswick and Nova Scotia). It examines driving forces (population growth, anthropogenic climate change, changes in sea temperature and salinity, ocean acidification, sea level rise, and storm events); trends in hydrographic processes, thermal habitats and primary productivity; shifts in spatial distribution; changes in community assemblages; increased acidification and changes in timing of ecosystem events. One table summarizes impacts on coastal ecosystems and another summarizes indicators. |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Education |
| Sector | <ul style="list-style-type: none"> - Natural Ecosystems - Biota |
| Focus Area | <ul style="list-style-type: none"> - Sustainability of Marine Ecosystems - Coasts and Climate Resilience (including sea-level rise) |
| Region | |
| Lead Agencies | Gulf of Maine Council on the Marine Environment |
| Contacts | Heather Breeze Heather.Breeze@dfo-mpo.gc.ca |

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| Name | State of the Gulf of Maine Report Theme paper: Climate Change and its Effects on Humans (2010) |
| Description | This paper examines climate impacts on communities in the Gulf of Maine watershed (Massachusetts, New Hampshire, Maine, New Brunswick, Nova Scotia), examining driving forces and pressures; trends in areas such as weather patterns, sea level, and storms/storm surge; sociological and economic impacts and actions/responses. |
| Type | - PRODUCTS: Education |

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| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Social and Cultural Resources - Economic Resources - Cross Disciplinary |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | |
| Lead Agencies | Gulf of Maine Council on the Marine Environment |
| Contacts | Heather Breeze Heather.Breeze@dfo-mpo.gc.ca |

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| Name | State of the U.S. Ocean and Coastal Economies 2009 |
| Description | This nation's coasts and oceans contribute much to the United States economy. For the past ten years, the National Ocean Economics Program (NOEP) has compiled time-series data that track economic activities, demographics, natural resource production, non-market values, and federal expenditures in the U.S. coastal zone both on land and in the water. In June 2009, NOEP released its first national level report of the U.S. ocean and coastal economies. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Economic Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | <ul style="list-style-type: none"> - National - Regional Or State |
| Lead Agencies | National Ocean Economics Program (NOEP) |

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| Name | StormSmart Coast |
| Description | StormSmart Coasts is a resource for coastal decision makers looking for the latest and best information on how to protect their communities from weather and climate hazards |
| Type | - PRODUCTS: Management Guidance (i.e. structured decision making) |
| Sector | <ul style="list-style-type: none"> - Managed Ecosystems - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | <ul style="list-style-type: none"> - National - Regional Or State |

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| Name | StormSmart Communities Massachusetts |
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| Description | Storm Smart Coasts is an online tool designed to help decision-makers address impacts from storms, flooding, sea-level rise, and climate change in coastal communities. It is a resource that is a network of state and local sites that gives coastal decision makers place to find and share the best resilience-related resources available, and the website provides collaboration tools. Federal sponsors include the EPA and the NOAA Coastal Services Center and the Northeast Regional Ocean Council is also a sponsor. States involved include Massachusetts, New Hampshire, and Rhode Island. New York, Connecticut, and Delaware will soon be a part of the network. The Massachusetts services include information on planning for storm events and hazards, including mitigation information, regulatory information, infrastructure services, emergency services etc. The site also includes information related to events during and after a storm. A new tool called Coastal Community Health And Resource Management (CHARM) is also on the Massachusetts site. |
| Type | - PRODUCTS: Engagement - PRODUCTS: Training and Capacity Building - PRODUCTS: Viewers and Web-based Tools |
| Sector | - Public Health and Safety - Infrastructure - Social and Cultural Resources - Economic Resources - Recreation and Tourism |
| Focus Area | - Changes in Extremes of Weather and Climate |
| Region | - Regional Or State -- New England |
| Lead Agencies | NOAA, EPA, and Northeast Regional Ocean Council |
| Contacts | Wesley Shaw, Lead Developer, wes@blueurchin.com |

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| Name | StormSmart Communities Rhode Island |
| Description | Storm Smart Communities is an online tool designed to help decision-makers address impacts from storms, flooding, sea-level rise, and climate change in coastal communities. It is a resource that is a network of state and local sites that gives coastal decision makers place to find and share the best resilience-related resources available, and the website provides collaboration tools. Federal sponsors include the EPA and the NOAA Coastal Services Center and the Northeast Regional Ocean Council is also a sponsor. States involved include Massachusetts, New Hampshire, and Rhode Island. New York, Connecticut, and Delaware will soon be a part of the network. The Rhode Island services include information on planning for storm events and hazards, including mitigation information, regulatory information, infrastructure services, emergency services etc. The site also includes information related to events during and after a storm. |

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| Type | - PRODUCTS: Engagement - PRODUCTS: Training and Capacity Building - PRODUCTS: Viewers and Web-based Tools |
| Sector | - Public Health and Safety - Infrastructure - Social and Cultural Resources - Economic Resources |
| Focus Area | - Changes in Extremes of Weather and Climate |
| Region | - Regional Or State -- New England |
| Lead Agencies | NOAA, EPA, and Northeast Regional Ocean Council |
| Contacts | Wesley Shaw, Lead Developer, wes@blueurchin.com. |

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| Name | Stream Water Temperature Modelling under Climate Change Scenarios (2013) |
| Description | Stream water temperature is a very important parameter when assessing water quality and aquatic ecosystem dynamics. The present study deals with the modelling of stream water temperatures under climate change scenarios by means of polynomial neural networks (PNN) to relate air and water temperatures in Little Southwest Miramichi River (LSWM), a river in New Brunswick. The study predicts an increase in stream water temperature of between 2.1°C to 3.7°C at the end of this century. |
| Type | - PRODUCTS: Forecasts and outlooks (monthly to annual, models) |
| Sector | - Natural Ecosystems - Biota |
| Focus Area | - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | |
| Lead Agencies | Department of Fisheries & Ocean New Brunswick Environmental Trust Fund University of Moncton |

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| Name | Strengthening the Scientific Understanding of Climate Change Impacts on Freshwater Resources of the United States |
| Description | This report responds to the requirements of Section 9506 of the Omnibus Public Lands Act [Public Law (PL) 111–11; Appendix A] calling for a report to Congress that describes the impacts of global climate change on freshwater resources of the United States, and identifies key actions to improve the Nation’s capacity to detect and predict changes in freshwater resources that are likely to result from a changing climate. The steps described in the report are intended to help decision-makers and water resource managers by facilitating improvements in observational data, data acquisition, and modeling capabilities. |

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| Type | <ul style="list-style-type: none"> - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Training and Capacity Building - PRODUCTS: Viewers and Web-based Tools - PRODUCTS: Management Guidance (i.e. structured decision making) - PRODUCTS: Regulatory/ Policy Guidance |
| Sector | <ul style="list-style-type: none"> - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Recreation and Tourism |
| Focus Area | - Climate Impacts on Water Resources |
| Region | - National |
| Lead Agencies | USGS |

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| Name | Summary of Coastal Program Initiatives that Address Sea-Level Rise as a Result of Global Climate Change |
| Description | This report includes results of a review of state coastal programs that have incorporated or are planning to incorporate sea-level rise into their planning and regulatory processes or are engaging in efforts related to climate change, sea-level rise, or coastal hazards. The first part of the report Climate Change Initiatives includes policies and efforts related to addressing the impacts of climate change and sea level rise. The second part of the report Coastal Hazard Initiatives includes policies and efforts related to coastal hazard mitigation. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Natural Ecosystems |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate |
| Region | - Regional Or State -- New England -- Mid-Atlantic -- Great Lakes -- South East |
| Lead Agencies | Rhode Island Sea Grant/Coastal Resources Center University of Rhode Island |
| Contacts | Pam Rubinoff, Rhode Island Sea Grant, rubi@crc.uri.edu |

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| Name | Summary of Potential Climate Change Impacts, Vulnerabilities, and Adaptation Strategies in the Metropolitan Washington Region |
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| Description | This document is a synopsis of lessons learned from the Metropolitan Washington Council of Governments' climate adaptation planning initiatives from 2010-2012. |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Engagement - PRODUCTS: Training and Capacity Building - PRODUCTS: Management Guidance (i.e. structured decision making) - PRODUCTS: Regulatory/ Policy Guidance |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Economic Resources - Recreation and Tourism |
| Focus Area | |
| Region | |
| Lead Agencies | Metropolitan Washington Council of Governments |

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| Name | Surging Seas Sea Level Analysis |
| Description | Search or navigate the surging seas interactive map tool to see maps of areas below different amounts of sea level rise and flooding, down to neighborhood scale, matched with area timelines of risk. The tool also provides statistics of population, homes and land affected by city, county and state, plus links to factsheets, data downloads, action plans, embeddable widgets, and more. |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Viewers and Web-based Tools |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate |
| Region | - Regional Or State -- Mid-Atlantic -- South East |
| Lead Agencies | Climate Central |

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| Name | Surging Seas: Sea Level Rise, Storms and Global Warming's Threat to the US Coast |
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| Description | <p>From the Executive Summary: This report and its associated materials, based on two just-published peer-reviewed studies, is the first major national analysis of sea level rise in 20 years, and the first one ever to include:</p> <ul style="list-style-type: none"> - Estimates of land, population and housing at risk; - Evaluations of every low-lying coastal town, city, county and state in the contiguous US; - Localized timelines of storm surge threats integrating local sea level rise projections; and - A freely available interactive map and data to download online (see SurgingSeas.org). <p>Summaries of these findings at a state-by-state level are available in fact sheets at SurgingSeas.org/factsheets. The original peer-reviewed studies can be found via SurgingSeas.org/papers. All findings reflect best estimates from the research; actual values may vary. This report focuses on new research and analysis, not recommendations; but it is clear from the findings here that in order to avoid the worst impacts, the United States must work to slow sea level rise by reducing emissions of heat-trapping gases, and work to diminish the remaining danger by preparing for higher seas in coastal cities and counties everywhere. SurgingSeas.org/plans lists a selection of existing resources, plans and efforts to prepare, from local to national levels.</p> |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Social and Cultural Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - National |
| Lead Agencies | Climate Central |
| Contacts | Benjamin Strauss, Climate Central, bstrauss@climatecentral.org |

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| Name | Survey of State Initiatives for Conservation of Coastal Habitats from Sea-Level Rise |
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| Description | From the Preface: This survey seeks to summarize the actions that states have taken to protect essential habitats, such as wetlands and estuaries, from the anticipated rise in sea levels caused by anthropomorphic climate change. This is an overlap of two areas: policies addressing sea level rise as a result of climate change, and conservation policies. The intersection of these two policy areas can be neglected. Policies on sea level rise often focus only on protecting human development, and conservation policies often do not incorporate a dynamic coastline...This is an attempt to comprehensively summarize how each coastal state is addressing this issue. The focus is not on a theoretical summary of adaptation options, but summarizing what has actually been done (both in creating policy and implementing it). The primary purpose is to serve as a reference for the Rhode Island Coastal Resources Management Council (CRMC) as it plans its own sea level rise policy, but it can hopefully be similarly relevant for other states. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Infrastructure - Managed Ecosystems - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- New England -- Mid-Atlantic -- South East |
| Lead Agencies | Rhode Island Coastal Resources Management Council |
| Contacts | Pam Rubinoff, Rhode Island Sea Grant, rubi@crc.uri.edu |

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| Name | Synthesis of Adaptation Options for Coastal Areas |
| Description | From the Introduction: This guide provides a brief introduction to key physical impacts of climate change on estuaries and a review of on the-ground adaptation options available to coastal managers to reduce their systems' vulnerability to climate change impacts. Reducing the emissions of greenhouse gases, referred to as "mitigation," is a necessary component of the overall response to climate change, and can help avoid, reduce, or delay future impacts. however, this guide focuses on climate change adaptation for estuaries and coastal areas because: 1) estuaries are highly and uniquely vulnerable to climate change, 2) adaptation will be necessary to address impacts resulting from warming which is already unavoidable due to past and current emissions, and 3) adaptation can help reduce the long-term costs associated with climate change. For more information on how communities and individuals can reduce greenhouse gas emissions, please visit ePA's Climate Change Website (http://www.epa.gov/climatechange/wycd/index.html). |
| Type | - PRODUCTS: Training and Capacity Building |
| Sector | - Natural Ecosystems |

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| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate |
| Region | - National |
| Lead Agencies | U.S. EPA Climate Ready Estuaries |

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| Name | Tantramar Dykelands Risk and Vulnerability Assessment Project: Water Level Reports (2011) |
| Description | This research project sought to historical and current water levels at the Tantramar Dam station in the upper Bay of Fundy, seeking to establish a relationship between observed water levels and predicted tide levels. The study was not completed due to lack of review by the Canadian Hydrographic Service. |
| Type | - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) |
| Sector | - Infrastructure |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | |
| Lead Agencies | Atlantic Canada Adaptation Solutions Association New Brunswick Department of Environment |
| Contacts | Climate Change Secretariat, New Brunswick Department of the Environment env-info@gnb.ca |

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| Name | Tantramar, New Brunswick Region Climate Change Adaptation Toolkit |
| Description | The toolkit--intended for the communities of Sackville, Port Elgin, Dorchester and Memramcook in the Tantramar region of New Brunswick--helps decision-makers and citizens understand what is being done to adapt to current and predicted changes and what they can do. The toolkit includes resources for more information and support. |
| Type | - PRODUCTS: Engagement - PRODUCTS: Viewers and Web-based Tools |
| Sector | - Public Health and Safety - Infrastructure - Managed Ecosystems - Economic Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | |
| Lead Agencies | EOS Eco-Energy Inc. Atlantic Climate Adaptation Solutions Association |

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| Description | This document was developed to provide technical guidance to agencies, practitioners, and coastal decision-makers that want to use and/or collect geospatial data for sea level change assessments and mapping products. The amount of information on sea-level rise can be difficult to navigate; thus, this document seeks to clarify existing data and information. The document provides guidance on how to understand and apply this information to analysis and planning applications and directs readers to specific resources for various applications. This document compiles the most up-to-date and useful information from NOAA and other entities to provide access to a wide range of potential solutions to help with planning for sea level change. |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Training and Capacity Building |
| Sector | |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - National |
| Lead Agencies | NOAA, Coastal Services Center |

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| Name | Technologies for Climate Change Adaptation– The Water Sector |
| Description | This guidebook, Technologies for Climate Change Adaptation—The Water Sector, has been made available by the UNEP Risoe Centre and will help both developed and developing countries understand means of increasing resilience to the uncertain effects of future climate change. This and other guidebooks from Technology Needs Assessment (TNA) Project are available at tech-action.org |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Engagement - PRODUCTS: Education - PRODUCTS: Training and Capacity Building |
| Sector | - Public Health and Safety - Infrastructure - Economic Resources - Cross Disciplinary |
| Focus Area | |
| Region | - International |
| Lead Agencies | The Water Institute at the University of North Carolina at Chapel Hill, UNEP Risø Centre |
| Contacts | Risø DTU National Laboratory for Sustainable Energy, Phone +45 4677 5129 |

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| Name | Terrapin Nesting Habitat and Sea-Level Rise |
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| Description | Somerset county has good mapping data of terrapin nesting habitat, and Maryland Division of Wildlife and Heritage is using the Sea-Level Affecting Marshes Model data developed as a part of Maryland's Coastal Atlas to see where good nesting habitat might change because of sea-level rise. The Division also used the SLAMM results to look at where future nesting areas might be located and whether there was development nearby or if they could be protected. SLAMM predicts a decrease of sandy areas with sea-level rise, but one conclusion is that Poplar Island restoration has resulted in an increase in terrapin sandy beach habitat. Thus, this shows that if the Division can stay out ahead of sea-level rise they might be able to restore or create terrapin habitat that will not be affected by sea-level rise. |
| Type | |
| Sector | - Natural Ecosystems - Biota |
| Focus Area | - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Maryland Division of Wildlife and Heritage |
| Contacts | Dana Limpert, Biodiversity Analyst, Maryland Division of Wildlife and Heritage, dlimpert@dnr.state.md.gov |

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| Name | The 80 Percent Challenge: A Survey of Climate Change Opinion and Action in Massachusetts |
| Description | This report, made possible with generous support from the Barr Foundation, represents the first in-depth look at how Massachusetts residents perceive the problem posed by global warming, as well as their willingness to embrace efforts to address this unprecedented challenge. |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Engagement - PRODUCTS: Education |
| Sector | - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Economic Resources - Recreation and Tourism - Cross Disciplinary |
| Focus Area | |
| Region | - Regional Or State -- New England |
| Lead Agencies | MassInc |

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| Description | The Climate Change Topic Hub is a peer-reviewed, information-packed online resource geared toward small- to medium-sized businesses and industrial sectors that offers an extensive list of pollution prevention opportunities involving process modification, material substitution, and new technology. Additionally, it provides over 100 topic-related electronic tools, websites, and reference articles. It includes the contact information for over 20 agencies, nonprofits, partnerships, and programs that offer expertise in climate change. |
| Type | - PRODUCTS: Education |
| Sector | |
| Focus Area | |
| Region | - National |
| Lead Agencies | Pacific Northwest Pollution Prevention Resource Center |

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| Name | The Eastern Shore of Virginia: Strategies for Adapting to Climate Change |
| Description | The Nature Conservancy launched a climate change adaptation project for the Eastern Shore of Virginia to more specifically characterize the current understanding of potential ecological effects due to climate change through an expert workshop, literature review and assessment of resource vulnerability using LiDAR (Light Detection and Ranging) data. In addition, the Conservancy, in collaboration with partners and the local community, set out to use this understanding to inform the identification of strategic actions that would enhance resilience and facilitate adaptation of this globally important and productive coastal area upon which local communities and wildlife depend. To accomplish the latter, the Conservancy hosted the Eastern Shore Climate Change Adaptation Strategies Workshop in August 2010. Out of the workshop, participants agreed on five primary adaptation strategies for the Eastern Shore and identified opportunities to implement these strategies. This product describes the five adaptation strategies: local adaptation planning, shoreline management plans, restoration and protection of natural systems, groundwater management, and education and outreach. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | The Nature Conservancy Virginia |
| Contacts | Gwynn Crichton, Senior Conservation Program Manager, The Nature Conservancy, gcrichton@tnc.org |

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| Name | The Economic Cost of Sea Level Rise to Three Chesapeake Bay Communities |
| Description | From the Introduction: This report is an economic analysis of a pilot impact assessment performed in three lowlying Maryland communities: Shadyside in Anne Arundel County; Piney Point and St. George's Island in St. Mary's County; and Upper and Middle Hooper Islands in Dorchester County. This analysis, which is based on a geographic information system developed to examine these communities' vulnerability to an increase in sea level, presents alternate scenarios of 2- versus 3- foot increases over the next 100 years. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Public Health and Safety - Natural Ecosystems - Economic Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | NOAA, Maryland Department of Natural Resources, Towson University Center for Geographic Information Sciences |

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| Name | The Effects of Sea-level Rise on Maine (web tool) |
| Description | <p>The Natural Resources Council of Maine (NRCM) released one of the most complete depictions ever done of the potential impacts on Maine's coastline from rising sea levels due to global warming. Using the latest available science, NRCM's analysis shows that coastal businesses, homes, wildlife habitat, transportation systems, and some of the state's most treasured places are highly vulnerable to sea-level rise.</p> <p>NRCM calculated impacts for the entire coast, and selected several key areas to undertake detailed mapping using satellite images including, Portland, Kennebunkport, Old Orchard Beach, Scarborough, Bath, Georgetown, Mount Desert Island and the Cranberry Isles. We found at least 20 high risk cities and towns that stand to lose 20 to 30 percent of their land area, their municipal infrastructure, miles of highways, and millions of dollars of property.</p> |
| Type | - PRODUCTS: Viewers and Web-based Tools |
| Sector | - Infrastructure - Managed Ecosystems - Natural Ecosystems - Economic Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- New England |
| Lead Agencies | Natural Resources Council of Maine |

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| Contacts | Natural Resources Council of Maine, nrcm@nrcm.org |
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| Name | The Faces of Climate Change Adaptation: The Need for Proactive Protection of the Nation's Coasts |
| Description | To understand the impacts of climate changes on the nation's coastal states, it is important to look at the specific impacts across the states. Similarly, it is useful to look at specific examples of coastal adaptation to understand how states can adapt more generally. This report looks at impacts in three states: Florida, Ohio, and Texas, and at adaptation efforts in Maryland, Massachusetts, and California. This report also discusses how other states can learn from what these states have been doing to address climate change as well as discusses what is needed to undertake these types of actions such as federal funding. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Social and Cultural Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- New England -- Mid-Atlantic -- Great Lakes |
| Lead Agencies | Coastal States Organization |

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| Name | The Federal Highway Administration's Climate Change and Extreme Weather Vulnerability Assessment Framework |
| Description | From the Executive Summary: The Federal Highway Administration's (FHWA's) Climate Change and Extreme Weather Vulnerability Assessment Framework is a guide for transportation agencies interested in assessing their vulnerability to climate change and extreme weather events. It gives an overview of key steps in conducting vulnerability assessments and uses in-practice examples to demonstrate a variety of ways to gather and process information. The framework is comprised of three key steps: defining study objectives and scope; assessing vulnerability; and incorporating results into decision making. |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Training and Capacity Building |
| Sector | - Infrastructure |
| Focus Area | - Changes in Extremes of Weather and Climate |

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| Region | - National - Regional Or State -- New England -- Mid-Atlantic -- Central - - Great Lakes -- South East |
| Lead Agencies | Federal Highway Administration, Department of Transportation |
| Contacts | Rebecca Lupes, rebecca.lupes@dot.gov, Department of Transportation |

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| Name | The Impacts of Climate Change on Connecticut Agriculture, Infrastructure, Natural Resources and Public Health: A Report by the Adaptation Subcommittee to the Governor's Steering Committee on Climate Change |
| Description | Executive Summary: "In accordance with Section 7 of Public Act No. 08-98, An Act Concerning Connecticut Global Warming Solutions, the Governor's Steering Committee (GSC) on Climate Change established an Adaptation Subcommittee. The GSC charged the Adaptation Subcommittee with evaluating, the projected impact of climate change in the state on: (1) Infrastructure, including, but not limited to, buildings, roads, railroads, airports, dams, reservoirs, and sewage treatment and water filtration facilities; (2) natural resources and ecological habitats, including, but not limited to, coastal and inland wetlands, forests and rivers; (3) public health; and (4) agriculture. This assessment effort is to be followed by a report due in mid-2010 that also contains the results of the above impacts assessment and, ...recommendations for changes to existing state and municipal programs, laws or regulations to enable municipalities and natural habitats to adapt to harmful climate change impacts and to mitigate such impacts." |
| Type | - PRODUCTS: Other |
| Sector | - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- New England |
| Lead Agencies | Governor's Steering Committee on Climate Change, Adaptation Subcommittee |

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| Name | The Life and Death of Salt Marshes in Response to Anthropogenic Disturbance of Sediment Supply |
| Type | - PRODUCTS: Plans, Assessments, Studies |

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| Sector | - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - National |
| Lead Agencies | School of GeoSciences, University of Edinburgh, Edinburgh |
| Contacts | Simon M. Mudd |

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| Name | The Management of Natural Coastal Carbon Sinks |
| Description | This report from the International Union for Conservation of Nature and Natural Resources (IUCN) focuses on managing blue carbon in the face of climate change. |
| Type | |
| Sector | - Natural Ecosystems |
| Focus Area | - Sustainability of Marine Ecosystems - Coasts and Climate Resilience (including sea-level rise) - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - International - National |
| Lead Agencies | International Union for Conservation of Nature and Natural Resources (IUCN) |

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| Name | The National Fish, Wildlife and Plants Climate Adaptation Strategy |
| Description | "From the Preface: This National Fish, Wildlife and Plants Climate Adaptation Strategy (hereafter Strategy) is a call to action—a framework for effective steps that can be taken, or at least initiated, over the next five to ten years in the context of the changes to our climate that are currently projected by the end of the century. It is designed to be a key part of the nation's larger response to a changing climate, and to guide responsible actions by natural resource managers and other decision makers at all levels of government. The Strategy was produced by federal, state, and tribal representatives and has been coordinated with a variety of other climate change adaptation efforts at national, state, and tribal levels. Chapter 2: Impacts of Climate Change on Fish, Wildlife and Plants contains information related to climate and the coastal environment. There is also supporting material for each ecosystem covered in the strategy including coastal ecosystems. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Managed Ecosystems - Natural Ecosystems - Biota |

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| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | |
| Lead Agencies | FWS, NOAA, Association of Fish and Wildlife Agencies (representing the states) and Great Lakes Indian Fish and Wildlife Commission |

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| Name | The Nature Conservancy's Coastal Resilience Tool |
| Description | The Coastal Resilience tool provides a framework to help make decisions related to reducing ecological and socio-economic impacts from coastal hazards. There are four key steps the tool includes: raise awareness, assess risk, identify choices, and take action. The tool walks the user through all steps. The coastal resilience tool helps the user make decisions by helping them identify vulnerable ecological and human communities and enabling adaptation strategies. The tool includes an online mapping application. Community engagement in the process is also a key element. |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Engagement - PRODUCTS: Training and Capacity Building - PRODUCTS: Viewers and Web-based Tools |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Economic Resources |
| Focus Area | <ul style="list-style-type: none"> - Sustainability of Marine Ecosystems - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- New England -- Mid-Atlantic |
| Lead Agencies | The Nature Conservancy, NOAA |
| Contacts | Zach Ferdaña, The Nature Conservancy, zferdana@tnc.org |

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| Name | The Nature Conservancy's Knowledge Base for Climate Change Adaptation |
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| Description | <p>This site supports a very active and growing community of practice of Conservancy staff and partners and is freely available to the public.</p> <p>The Global Climate Change Adaptation team at the Nature Conservancy manages this site in partnership with Charles Chester of Brandeis University. He is a lecturer in Environmental Studies, with expertise in international environmental policy. This site is produced with generous and indispensable help from volunteers from The Nature Conservancy of Washington.</p> <p>The site is a work in progress and is continuously being updated and improved.</p> <p>The Nature Conservancy is working to develop climate change adaptation strategies that work in real places, and to advocate for ecosystem-based adaptation and resilience strategies that can help sustain communities in this time of global change.</p> <p>This site is meant to be a place where we gather input, share products and ideas, and communicate about our efforts to draw together scientific research and innovative conservation projects to iteratively test, refine and summarize promising methods and best practices. Includes a coastal and marine habitats tab.</p> |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Training and Capacity Building - PRODUCTS: Viewers and Web-based Tools - PRODUCTS: Other |
| Sector | |
| Focus Area | <ul style="list-style-type: none"> - Sustainability of Marine Ecosystems - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | <ul style="list-style-type: none"> - International - National - Regional Or State |
| Lead Agencies | The Nature Conservancy |
| Contacts | NaturePeopleFuture@tnc.org |

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| Name | The New England Governors' Renewable Energy Blueprint |
| Description | <p>Sep 15, 2009 - ISO New England Inc. released the results of a study evaluating renewable resource potential in the region and beyond, as well as the economic and environmental impacts of that development. The New England Governors' Renewable Energy Blueprint found that significant amounts of potential wind resources could be added to New England's system provided appropriate transmission expansion is in place. The report also found that offshore wind resource integration offers the most cost-effective use of new and existing transmission and that annual wholesale electric energy prices will be generally lower with the addition of renewable resources that have low or no fuel costs, such as wind energy.</p> |
| Type | |
| Sector | - Infrastructure |
| Focus Area | |

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| Region | - Regional Or State -- New England |
| Lead Agencies | ISO New England Inc. |

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| Name | The Potential Impacts of Climate Change on the MidAtlantic Region |
| Description | <p>Abstract: This paper assesses the potential impacts of climate change on the mid-Atlantic coastal (MAC) region of the United States. In order of increasing uncertainty, it is projected that sea level, temperature and streamflow will increase in the MAC region in response to higher levels of atmospheric CO₂. A case study for Delaware based on digital elevation models suggests that, by the end of the 21st century, 1.6% of its land area and 21% of its wetlands will be lost to an encroaching sea. Sea-level rise will also result in higher storm surges, causing 100 yr floods to occur 3 or 4 times more frequently by the end of the 21st century. Increased accretion in coastal wetlands, however, which may occur in response to increases in CO₂, temperature, and streamflow, could mitigate some of the flooding effect of sea-level rise. Warming alone will result in northward displacements of some mobile estuarine species and will exacerbate the already low summer oxygen levels in mid-Atlantic estuaries because of increased oxygen demand and decreased oxygen solubility. Streamflow increases could substantially degrade water quality, with significant negative consequences for submerged aquatic vegetation and birds. Though climate change may have some positive impacts on the MAC region, such as increased coastal tourism due to warming and some ecological benefits from less-frequent harsh winters, most impacts are expected to be negative. Policies designed to minimize adverse ecological impacts of human activities on coastal ecosystems in the mid-Atlantic, such as decreases in nutrient loading of watersheds, could help mitigate some of the risks associated with future climate variability and change in this region.</p> |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Natural Ecosystems |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Pennsylvania State University, University of Maryland Center for Environmental Science, y, George Mason University, Rutgers University, Delaware Center for the Inland Bays, Boston University, and EPA. |
| Contacts | Raymond Najjar, najjar@essc.psu.edu |

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| Name | The Protective Role of Coastal Marshes: A Systematic Review and Meta-analysis |
| Description | <p>Abstract: Background: Salt marshes lie between many human communities and the coast and have been presumed to protect these communities from coastal hazards by providing important ecosystem services. However, previous characterizations of these ecosystem services have typically been based on a small number of historical studies, and the consistency and extent to which marshes provide these services has not been investigated. Here, we review the current evidence for the specific processes of wave attenuation, shoreline stabilization and floodwater attenuation to determine if and under what conditions salt marshes offer these coastal protection services.</p> <p>Methodology/Principal Findings: We conducted a thorough search and synthesis of the literature with reference to these processes. Seventy-five publications met our selection criteria, and we conducted meta-analyses for publications with sufficient data available for quantitative analysis. We found that combined across all studies (n = 7), salt marsh vegetation had a significant positive effect on wave attenuation as measured by reductions in wave height per unit distance across marsh vegetation. Salt marsh vegetation also had a significant positive effect on shoreline stabilization as measured by accretion, lateral erosion reduction, and marsh surface elevation change (n = 30). Salt marsh characteristics that were positively correlated to both wave attenuation and shoreline stabilization were vegetation density, biomass production, and marsh size. Although we could not find studies quantitatively evaluating floodwater attenuation within salt marshes, there are several studies noting the negative effects of wetland alteration on water quantity regulation within coastal areas.</p> <p>Conclusions/Significance: Our results show that salt marshes have value for coastal hazard mitigation and climate change adaptation. Because we do not yet fully understand the magnitude of this value, we propose that decision makers employ natural systems to maximize the benefits and ecosystem services provided by salt marshes and exercise caution when making decisions that erode these services.</p> |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate |
| Region | - National |
| Contacts | Christine Shepard, The Nature Conservancy, University of California - Santa Cruz, cshepard@tnc.org |

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| Name | The Risk Analysis and Management for Critical Asset Protection (RAMCAP) |
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| Description | The American Water Works Association (AWWA) and American Society of Mechanical Engineers Innovative Technologies Institute, LLC (ASME-ITI) announced recently the development of the first risk and resilience management standard designed specifically for water utilities. The J100 standard, created in response to 9/11, Hurricane Katrina and other recent disasters, will be released July 1, 2010. The Risk Analysis and Management for Critical Asset Protection (RAMCAP) method is designed to help water and wastewater utilities identify potential threats to U.S. water infrastructure and prepare for or mitigate damage. |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Training and Capacity Building |
| Sector | - Public Health and Safety - Infrastructure |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources |
| Region | - National |
| Lead Agencies | The American Water Works Association (AWWA) and American Society of Mechanical Engineers Innovative Technologies Institute, LLC |

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| Name | The Role of Coastal Zone Management Programs in Adaptation to Climate Change - Second Annual Report of the Coastal States Organization's Climate Change Work Group |
| Description | Executive Summary: The Coastal States Organization's (CSO) Climate Change Work Group prepared this second annual report to further explore the current and future roles of state coastal zone management programs in addressing climate change. The accomplishments of the work group this year include the following: Testimony before Congressional committees, federal agencies and other coastal conferences to inform these groups of the role of state coastal zone management programs in addressing climate change; Completion of a survey to further delineate not only the unmet needs of coastal states in regard to climate change planning and data, but an attempt to quantify the cost of those unmet needs; Providing an information exchange among coastal states and territories; and Working to identify the various coastal groups working on climate change initiatives to reduce redundancy. The Final Report of the 2007 CSO Climate Change Work Group remains the most comprehensive assessment of the various states' coastal program's climate change initiatives as well as the statement of national policy needs. The 2007 report is attached as Appendix B to this 2008 report. |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Education |

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| Sector | <ul style="list-style-type: none"> - Infrastructure - Managed Ecosystems - Natural Ecosystems - Social and Cultural Resources - Economic Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - National |
| Lead Agencies | Coastal States Organization |

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| Name | The State of Marine and Coastal Adaptation in North America: A Synthesis of Emerging Ideas |
| Description | <p>Excerpt from Executive Summary: The intent of this report is to provide a brief overview of key climate change impacts on the natural and built environments in marine and coastal North America and a review of adaptation options available to and in use by marine and coastal managers. This report presents the results of EcoAdapt's efforts to survey, inventory, and assess adaptation projects from different regions, jurisdictions, and scales throughout North America's marine and coastal environments.</p> <p>First, we provide a summary of climate changes and impacts, including temperature changes, sea level rise, precipitation changes, air and water circulation changes, and changes in ocean chemistry, on the marine and coastal environments of the United States, Canada, and Mexico.</p> <p>Second, we provide a summary of commonly used adaptation approaches and examples from our inventory of projects. We separate the examples, representing diverse activities, sectors, and targeted climate impacts, into four broad categories: 1. Natural Resource Management and Conservation, 2. Capacity Building, 3. Infrastructure, Planning, and Development, and 4. Governance and Policy. Adaptation examples are presented and organized by the following geographic regions:</p> <p>Arctic Canada (Yukon, Northwest Territories, Nunavut), Eastern Canada and Northeast USA (New Brunswick, Newfoundland and Labrador, Nova Scotia, Ontario, Prince Edward Island, Quebec; Maine, Connecticut, Massachusetts, New Hampshire, Rhode Island), MidAtlantic USA (Delaware, Maryland, New Jersey, New York, Pennsylvania, District of Columbia, Virginia), Southeast/Gulf USA (North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas), Gulf of Mexico and Yucatan Peninsula – Mexico (Tamaulipas, Veracruz, Tabasco, Campeche, Yucatan, Quintana Roo), Alaska and British Columbia, Pacific States USA (Washington, Oregon, California, Hawaii), Baja Peninsula and Pacific Coast – Mexico (Baja California, Baja California Sur, Sonora, Sinaloa, Nayarit, Jalisco, Colima, Michoacan, Guerrero, Oaxaca, Chiapas), Nationwide USA, Nationwide Canada, and Nationwide Mexico. Finally, the report concludes with a discussion of the common barriers and trends uncovered by the inventory of adaptation projects.</p> |
| Type | - PRODUCTS: Plans, Assessments, Studies |

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| Sector | <ul style="list-style-type: none"> - Infrastructure - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources |
| Focus Area | <ul style="list-style-type: none"> - Sustainability of Marine Ecosystems - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- New England -- Mid-Atlantic -- South East |
| Lead Agencies | EcoAdapt |
| Contacts | Jennie Hoffman, EcoAdapt, Jennie@EcoAdapt.org |

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| Name | The Vulnerabilities of Fish and Wildlife Habitats in the Northeast to Climate Change |
| Description | In order to provide vulnerability information that will help the northeastern states plan their conservation of fish and wildlife under a changing climate, it is necessary to develop and apply a habitat vulnerability assessment model consistently across the region and within the individual states. This report describes how this predictive model was developed and the results that were obtained when the model was applied to major northeastern habitat types. The remainder of the report summarizes current scientific understanding about how the climate in the Northeast region is projected to change over the rest of this century, how the NEAFWA Habitat Vulnerability Model was developed, how habitats were selected for analysis, and the results of applying the model to major habitat types in the Northeast. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Natural Ecosystems - Biota |
| Focus Area | - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- New England -- Mid-Atlantic |
| Lead Agencies | Manomet Center for Conservation Sciences, National Wildlife Federation |

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| Name | The Vulnerability of Energy Infrastructure to Environmental Change |
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| Description | July 2009 paper from Chatham House and DOE's Global Energy & Environment Strategic Ecosystem (GlobalEESE) titled 'The Vulnerability of Energy Infrastructure to Environmental Change'. Findings Much energy infrastructure lies in areas that are predicted to become increasingly physically unstable; as a result of scheduled decommissioning, revised environmental standards, stimulus spending and new development, there is likely to be substantial investment in new energy infrastructure; it is critical that new and existing infrastructure be designed or retrofitted for changing environmental conditions. |
| Type | |
| Sector | - Infrastructure |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - National - Regional Or State |
| Lead Agencies | Chatham House and DOE's Global Energy & Environment Strategic Ecosystem (GlobalEESE) |

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| Name | The Yale Mapping Framework for Integrating Climate Adaptatin and Landscape Conservation Planning |
| Description | Recognizing a need for clarity within this field, the Yale School of Forestry & Environmental Studies convened a working group of the nation's leading conservation biologists, modelers, and policymakers to develop guidance for integrating climate-change adaptation strategies into the context of natural-resource planning and policymaking. The product of this working group—The Yale Framework—assists conservation planners in selecting the assessment and modeling strategies that are most relevant to their specific needs. Rather than supplanting existing techniques, the Yale Framework provides simplified and flexible advice on models and data, and presents a list of commonly used datasets that can be helpful to planners. The Framework also provides a structured menu of options that assist resource managers in determining the best possible approach to conservation, as opposed to offering a prescriptive approach to natural resource management. The Yale Mapping Framework has been built using the Data Basin platform. Data Basin makes it simple to find reliable data and make compelling visualizations. Planners can locate datasets, combine multiple layers together in a visualization session, and then share maps with their colleagues. With the Data Basin data and tools, planners have everything they need to make their assessments. |
| Type | - PRODUCTS: Training and Capacity Building - PRODUCTS: Viewers and Web-based Tools - PRODUCTS: Management Guidance (i.e. structured decision making) |
| Sector | - Natural Ecosystems - Biota |
| Focus Area | - Conservation/ Restoration of Sensitive Species and Habitats |

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| Region | - National |
| Lead Agencies | Yale University, School of Forestry & Environmental Studies |
| Contacts | Dr. Oswald Schmitz, Oastler Professor of Population and Community Ecology |

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| Name | Thirsty for Answers: Preparing for the Water-related Impacts of Climate Change in American Cities |
| Description | Cities across the United States should anticipate significant water-related vulnerabilities based on current carbon emission trends because of climate change, ranging from water shortages to more intense storms and floods to sea level rise. To help cities become more resilient to the rising threats of climate change, NRDC reviewed more than 75 scientific studies and other reports to summarize the water-related vulnerabilities in 12 cities across the United States. Although there may still be some uncertainty about what particular impacts threaten cities and how quickly or severely they might occur, action at the local level is the most effective method of reducing, mitigating, and preventing the negative effects of water-related climate change outlined in this fact sheet. NRDC urges cities to prepare for coming challenges relating to water resources. Fortunately, there are steps cities are already taking to become more resilient. |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Engagement - PRODUCTS: Education - PRODUCTS: Training and Capacity Building |
| Sector | - Infrastructure |
| Focus Area | - Climate Impacts on Water Resources |
| Region | - National |
| Lead Agencies | National Resource Defense Council (NRDC) |

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| Name | Thresholds of Climate Change in Ecosystems |
| Description | The report provides an overview of what is known about ecological thresholds and where they are likely to occur. It also identifies those areas where research is most needed to improve knowledge and understand the uncertainties regarding them. The report suggests a suite of potential actions that land and resource managers could use to improve the likelihood of success for the resources they manage, even under conditions of incomplete understanding of what drives thresholds of change and when changes will occur. These reports are intended to help the CCSP develop future program research priorities. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Managed Ecosystems - Natural Ecosystems |

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| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State |
| Lead Agencies | USGS |

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| Name | Tidally Adjusted Estimates of Topographic Vulnerability to Sea Level Rise and Flooding for the Contiguous United States |
| Description | Abstract: Because sea level could rise 1 m or more during the next century, it is important to understand what land, communities and assets may be most at risk from increased flooding and eventual submersion. Employing a recent high-resolution edition of the National Elevation Dataset and using VDatum, a newly available tidal model covering the contiguous US, together with data from the 2010 Census, we quantify low-lying coastal land, housing and population relative to local mean high tide levels, which range from 0 to 3 m in elevation (North American Vertical Datum of 1988). Previous work at regional to national scales has sometimes equated elevation with the amount of sea level rise, leading to underestimated risk anywhere where the mean high tide elevation exceeds 0 m, and compromising comparisons across regions with different tidal levels. Using our tidally adjusted approach, we estimate the contiguous US population living on land within 1 m of high tide to be 3.7 million. In 544 municipalities and 38 counties, we find that over 10% of the population lives below this line; all told, some 2150 towns and cities have some degree of exposure. At the state level, Florida, Louisiana, California, New York and New Jersey have the largest sub-meter populations. We assess topographic susceptibility of land, housing and population to sea level rise for all coastal states, counties and municipalities, from 0 to 6 m above mean high tide, and find important threat levels for widely distributed communities of every size. We estimate that over 22.9 million Americans live on land within 6 m of local mean high tide. |
| Type | - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Public Health and Safety - Infrastructure |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- New England -- Mid-Atlantic -- South East |
| Lead Agencies | Climate Central |
| Contacts | Benjamin Strauss, Climate Central, bstrauss@climatecentral.org |

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| Name | Timeseries Climate Information (interactive search) |
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| Description | The goals of Canadian Climate Change Scenarios Network are: - Support climate change impact and adaptation research in Canada and other countries; - Support stakeholders requiring scenario information for decision making and policy development; - Provide access to the work of AIRS, an Environment Canada research group under the auspices of the Atmospheric Science and Technology Directorate; and - Provide access to Canadian research on the development of scenarios and adaptation research. |
| Type | - PRODUCTS: Viewers and Web-based Tools |
| Sector | |
| Focus Area | |
| Region | |
| Lead Agencies | Environment Canada Canadian Climate Change Scenarios Network |

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| Name | Tool to Assess Coastal Vulnerability of Macrotidal Environments |
| Description | In collaboration with the Atlantic Climate Adaptation Solutions (ACASA) project, the overall purpose of this research was to develop a tool which determines the vulnerability of a macrotidal coastal environment, such as those found in the Bay of Fundy, to the increased risk of storm surges associated with climate change, based on several physical and anthropogenic parameters. The variables used in this analysis are: freeboard, observed erodibility, coastal slope, width of foreshore, the presence of anthropogenic or natural protection, the presence of vegetation and coastline exposure (fetch length, dominant wind direction, and significant wave height) and morphological resilience. The results of the analysis, which highlight areas of concern in regards to the risk of storm surge, allow for coastal managers and other stake holders, to make informed decisions for adaptation solutions. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | |
| Lead Agencies | Atlantic Climate Adaptation Solutions Association St. Mary's University (thesis) |

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| Name | Tools for Coastal Climate Adaptation Planning: A guide for selecting tools to assist with ecosystem-based climate planning |
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| Description | <p>From NatureServe.org: The purpose of Tools for Coastal Climate Adaptation Planning is to provide the information necessary for coastal natural resource managers and community planners to select appropriate tools for their projects. This guide focuses on spatially explicit solutions for climate-related planning. It provides detailed information on a set of key tools that either alone or used in conjunction with other tools can facilitate multi-sector climate adaptation planning (i.e. climate adaptation planning that incorporates elements of ecosystem health and social wellbeing) and describes the utility and role of tools in relevant planning processes.</p> <p>This guide is targeted at practitioners and decision makers involved in coastal zone management, natural resource management, protected area and habitat management, watershed management, conservation, and local planning in the coastal United States including the Great Lakes. The information and tools in this guide are also highly applicable to many inland and international regions.</p> |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Infrastructure - Managed Ecosystems - Natural Ecosystems - Social and Cultural Resources - Economic Resources |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | <ul style="list-style-type: none"> - National - Regional Or State -- New England -- Mid-Atlantic -- South East |
| Lead Agencies | EBM Tools Network |
| Contacts | John S. Rozum, NOAA, john.rozum@noaa.gov; Sarah D. Carr, NatureServe, Sarah_Carr@natureserve.org |

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| Name | Toward a Greener Future: Nova Scotia's Climate Change Action Plan (2009) |
| Description | This plan has two main goals: reducing the province's contribution to climate change by reducing our greenhouse gas (GHG) emissions and preparing for climate changes that are already inevitable. Nova Scotia aims to reduce GHG emissions by at least 10 per cent from 1990 levels by 2020 (through a focus on electricity and transportation). The plan includes nine actions devoted to adaptation, starting with the creation of an Adaptation Fund for research and development. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Infrastructure - Cross Disciplinary |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate |

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| Region | - International |
| Lead Agencies | Nova Scotia Environment |
| Contacts | climatechange@gov.ns.ca |

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| Name | Transportation and Climate Change Clearinghouse |
| Description | <p>DOT's Transportation and Climate Change Clearinghouse is designed as a one-stop source of information on transportation and climate change issues. It includes information on greenhouse gas (GHG) inventories, analytic methods and tools, GHG reduction strategies, potential impacts of climate change on transportation infrastructure, and approaches for integrating climate change considerations into transportation decision making.</p> <p>EPA's Transportation and Climate Tools, Analysis, and Publications (12/27/2010) site provides information about measuring greenhouse gas emissions from transportation, the contribution of transportation sources to total emissions of greenhouse gases, and solutions for reducing emissions from transportation.</p> <p>Transportation Comparable Emissions Database (CEDB) (12/27/2010) enables comparison of the potential emissions associated with moving passengers and freight via various transportation modes. The CEDB comprises emissions data for a wide range of vehicles across all modes. This data can be used as input to emissions models to calculate inventories and health and climate impacts.</p> |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Engagement - PRODUCTS: Training and Capacity Building |
| Sector | - Infrastructure |
| Focus Area | |
| Region | <ul style="list-style-type: none"> - National - Regional Or State -- New England -- Mid-Atlantic -- Central - - Great Lakes -- South East |
| Lead Agencies | DOT |

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| Name | Trends in Extreme Precipitation Events for the Northeastern United States 1948-2007 |
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| Description | A number of features are included in this website to make it compatible with the NWS analysis for the Middle Atlantic region and to enhance its usability. The design of the site and its products have been reviewed by stakeholders with the U.S. Natural Resource Conservation Service (NRCS), various state agencies, and private engineering consulting firms. The site includes estimates of extreme rainfall for various durations (from 5 minutes to 10 days) and recurrence intervals (1 year to 500 years). These data are interpolated to a 30-second grid. Confidence intervals for these values are also included as are the partial duration rainfall series used in their computation. Regional extreme rainfall maps and graphic products are also available. Precipitation distribution curves can be generated for each grid either directly or from the USDA NRCS Win TR-20 software, eliminating the need to use a static Type II or Type III curve. |
| Type | |
| Sector | - Infrastructure |
| Focus Area | - Changes in Extremes of Weather and Climate |
| Region | - Regional Or State -- New England -- Mid-Atlantic |
| Lead Agencies | Cornell University |

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| Name | Tribes & Climate Change (website) |
| Description | <p>From the homepage: "On this website we provide information and resources tailored to helping Native people gain a better understanding of climate change and its impacts on their communities. Here you'll find basic climate-change information; profiles of tribes in diverse regions of the U.S., including Alaska, who are coping with climate change impacts; audio files of elders discussing the issue from traditional perspectives; and resources and contacts you can use to develop climate change mitigation and adaptation strategies. Soon we'll also provide an open forum where you can share your ideas and views on climate change with others."</p> <p>Profiles are provided for the the following tribes in the Northeast US: Passamaquoddy Tribe, Saint Regis Mohawk Tribe, Tuscarora Nation</p> |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Engagement - PRODUCTS: Viewers and Web-based Tools |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Social and Cultural Resources - Recreation and Tourism - Cross Disciplinary |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |

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| Region | - National - Regional Or State -- New England -- Mid-Atlantic -- Central - - Great Lakes -- South East |
| Lead Agencies | The Institute for Tribal Environmental Professionals (ITEP) |
| Contacts | Contact information provided here: http://www4.nau.edu/tribalclimatechange/contacts.asp |

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| Name | U.S. DOT Federal Highway Administration Climate Change Resilience Pilots |
| Description | "FHWA is partnering with State Departments of Transportation (DOTs), Metropolitan Planning Organizations (MPOs), and Federal Land Management Agencies (FLMAs) to pilot approaches to conduct climate change and extreme weather vulnerability assessments of transportation infrastructure and to analyze options for adapting and improving resiliency. This pilot program is being jointly sponsored by the FHWA Office of Environment, Planning and Realty, and the Office of Infrastructure." 5 pilot studies were completed in 2011, and the 2013-2014 program includes 19 projects, 5 of which take place in states within NOAA's Eastern Region: Massachusetts, Maine, Connecticut, New York, and Maryland. |
| Type | - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Training and Capacity Building |
| Sector | - Infrastructure |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate |
| Region | - National - Regional Or State -- New England -- Mid-Atlantic |
| Lead Agencies | U.S. DOT, state DOTs, MPO's, FLMAs |
| Contacts | Sustainable Transport and Climate Change Team: http://www.fhwa.dot.gov/environment/climate_change/contacts/ |

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| Name | U.S. Environmental Protection Agency Climate Change Factsheets |
| Description | April 2010 EPA HQ posted four two-page fact sheets on climate change based on recent scientific data and findings. These documents may be useful to state and local governments looking for public outreach materials on climate change. |
| Type | - PRODUCTS: Engagement - PRODUCTS: Education |
| Sector | |
| Focus Area | |

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| Region | - National |
| Lead Agencies | EPA |

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| Name | U.S. Fish and Wildlife Service Sea-Level Rise Affecting Marshes Model (SLAMM) Web-based Application |
| Description | <p>The Sea Level Affecting Marshes Model (SLAMM)-View is a web browser-based application that displays map pairs of the same area, each at different sea levels. The strength of this tool is its ability to visually show the modeling of sea level rise predictions, allowing people to see the impacts in a more intuitive way.</p> <p>It provides tools for improved understanding of results from research projects that use Version 2.0. SLAMM-View was designed for a user-friendly, workflow-based approach to assess impacts of sea-level rise on coastal areas with both visualization and analysis functionality. SLAMM-View provides simultaneous comparison between both current and future conditions out to the year 2100, and among different sea-level rise scenarios (e.g., 0.4 meter vs. 1 meter), using interactive maps and tabular reporting capabilities. The model simulations include 5 main processes that affect wetland fate under sea-level rise: inundation, erosion, overwash, saturation, and salinity.</p> <p>To date, SLAMM-View provides access to SLAMM simulation results for the entire coastlines of 5 states, and partial coverage of an additional 4 states.</p> |
| Type | <ul style="list-style-type: none"> - DATA: In situ Observations - DATA: Depth and Elevation Data - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Viewers and Web-based Tools |
| Sector | - Natural Ecosystems |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- New England -- Mid-Atlantic -- South East |
| Lead Agencies | U.S. Fish and Wildlife Service |

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| Name | UN Local Government Self-Assessment Tool for Disaster Resilience |
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| Description | The United Nations Office for Disaster Risk Reduction has published a Local Government Self-Assessment Tool for Disaster Resilience to <ul style="list-style-type: none"> • Help local governments engage with different stakeholders to map and understand existing gaps and challenges in disaster risk reduction in their city or locality. • Set a baseline and develop status reports for cities and municipalities that have committed to the Making Cities Resilient Campaign and its Ten Essentials • Complement information gathered through the national Hyogo Framework for Action (HFA) monitoring system by providing local-level information. Cities can chose to share their results with national HFA focal points as part of the national reporting process. |
| Type | - PRODUCTS: Engagement - PRODUCTS: Training and Capacity Building |
| Sector | - Infrastructure - Natural Ecosystems - Social and Cultural Resources - Economic Resources - Cross Disciplinary |
| Focus Area | |
| Region | - International |
| Lead Agencies | United Nations Office of Disaster Risk Reduction |

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| Name | Unlocking Energy Efficiency in the US Economy |
| Description | July 2009 new report by McKinsey & Company "Unlocking Energy Efficiency in the US Economy" a detailed analysis of the magnitude of the efficiency potential in non-transportation uses of energy, a thorough assessment of the barriers that impede the capture of greater efficiency, and an outline of the practical solutions available to unlock the potential. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Infrastructure |
| Focus Area | |
| Region | - National - Regional Or State |
| Lead Agencies | McKinsey & Company |

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| Name | Updating Maryland's Sea-level Rise Projections |
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| Description | From the Introduction: On December 28, 2012, Governor Martin O'Malley issued an executive order on Climate Change and "Coast Smart" Construction that requires State agencies consider the risk of coastal flooding and sea-level rise to capital projects and to site and design such projects to avoid or minimize associated impacts. In addition, Section 7 of the order directs: "The Scientific and Technical Working Group shall review the sea-level rise projections in the Maryland Climate Action Plan (2008) and shall provide within 180 day of the effective date of this Executive Order, updated projections based on an assessment of the latest climate change science and federal guidance." This present report responds to the directive through interpretation of recent scientific results to produce projections useful for sea-level rise adaptation in Maryland. |
| Type | - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) |
| Sector | - Infrastructure - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |

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| Name | USGS Center for LIDAR Information Coordination and Knowledge (CLICK) |
| Description | The goal of CLICK is to facilitate data access, user coordination and education of lidar remote sensing for scientific needs. |
| Type | - DATA: Depth and Elevation Data - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Viewers and Web-based Tools |
| Sector | - Public Health and Safety - Infrastructure - Managed Ecosystems - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - National - Regional Or State |
| Lead Agencies | USGS |

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| Name | USGS Coastal Change Hazards |
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| Description | A website that focuses on hurricanes, tsunamis, sea-level rise, shoreline erosion, wetland destruction, and other issues relevant to coastal zone management and disaster preparedness. It includes a digital library, field data catalog, map server, bibliography, and more. |
| Type | - DATA: Other - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Public Health and Safety - Infrastructure - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate |
| Region | - National |
| Lead Agencies | U.S. Geological Survey |
| Contacts | Robert Thieler, USGS, rthieler@usgs.gov, (508) 457-2350 |

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| Name | USGS Science for the Nation's Changing Coasts: Shoreline Change Research Fact Sheet |
| Description | The demands of increasing human population in the coastal zone create competition with coastal habitat preservation and with recreational and commercial uses of the coast and nearshore waters. As climate changes over the coming century, these problems facing coastal communities will likely worsen. Good management and policy decision-making require baseline information on the rates, trends, and scientific understanding of the processes of coastal change on a regional to national scale. To address this need, the U.S. Geological Survey is engaged in a research project of national scope to measure, report, and interpret historical shoreline change along open-ocean coasts of the United States. One of the primary goals of this project is to understand shoreline change hazards using methods that are comparable from one area of the country to another and that will allow for future, repeatable analyses of shoreline movement, coastal erosion, and land loss. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Natural Ecosystems |
| Focus Area | |
| Region | - National |
| Lead Agencies | USGS |
| Contacts | Robert Thieler, USGS, rthieler@usgs.gov, (508) 457-2350 |

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| Name | Using GIS and Simulation Modeling to Assess the Impact of Sea Level Rise on Coastal Salt Marshes |
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| Description | <p>Executive Summary: Tidal salt marshes provide critical functions for marine and terrestrial ecosystems including the filtration of pollutants in runoff, nursery habitat for marine organisms, and protecting adjacent uplands from storm impacts. In New England, existing salt marshes developed over the last 3000-4000 years in congruence with a post-glacial decline in the rate of relative sea level rise from about 2.5 mm/yr to 1 mm/yr. Recent studies indicate that the rate has increased again to about 2.4 mm/yr and that associated changes in vegetation zones have occurred in marshes along the southern coast of New England. This acceleration of sea level rise forecasts significant changes to the coastal environment in Southern Rhode Island, creating challenges for the long-term viability of land restoration and conservation projects.</p> <p>My project used geographic information systems and a Sea Level Affecting Marsh Model (SLAMM) to predict alterations to coastal wetlands in Charlestown and Westerly, RI. Into the model I input a Digital Elevation Model built with high resolution elevation data derived from Light Detection and Ranging (LIDAR) technology and detailed coastal wetland maps to enhance the effectiveness of the model in predicting the site specific effects of accelerated sea level rise. In addition, I used geospatial land use data to analyze the relative impact of human development on projected salt marsh migration.</p> <p>Model simulations project a minimum of a 44% reduction in net salt marsh habitat by 2100 with 1 m of global sea level rise when all dry land is subject to inundation. The model projects a reduction of 65% under 2 m of sea level rise and a similar land protection strategy. A qualitative analysis of the model-generated maps shows that almost all salt marsh existing in 1999 will be gone by 2075 in all sea level rise predictions tested and that the salt marsh habitat existing in 2100 will develop in areas that are currently freshwater wetland or dry land. Additional analysis of the changes within each pond identified specific locations projected to support salt marsh development over the next century.</p> <p>These results could prove highly beneficial to land managers as they prepare for the effects of accelerated sea level rise in the coastal zone and for coastal ecologists interested in determining the long term viability of habitat restoration projects.</p> |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Plans, Assessments, Studies |
| Sector | <ul style="list-style-type: none"> - Natural Ecosystems |
| Focus Area | <ul style="list-style-type: none"> - Coasts and Climate Resilience (including sea-level rise) - Conservation/ Restoration of Sensitive Species and Habitats |

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| Region | - Regional Or State -- New England |
| Lead Agencies | University of Rhode Island, Kingston |
| Contacts | Robert Hancock, Masters Student, University of Rhode Island, Kingston |

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| Name | Using SLAMM 6.0.1 to Model Likely Paths for Salt Marsh Migration in North Kingstown, Rhode Island in Response to Sea Level Rise |
| Description | From the Introduction: These map atlases and Geographic Information System (GIS) data are the result of a modeling exercise to show the most likely locations of future salt (tidal) marsh habitat given a one, three and five foot sea level rise (SLR.) The Sea Level Affecting Marshes Model (SLAMM) was used with the most current wetland and elevation data to produce these projections. The modeling for this project was done using the Sea Level Affecting Marsh Model (SLAMM) version 6.0.1. Model input data were processed with ESRI ArcMap 10 GIS software. ArcMap was also used to combine and display the model outputs. |
| Type | - PRODUCTS: Maps (Imagery, geo-referenced data) |
| Sector | |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- New England |
| Lead Agencies | The Nature Conservancy Rhode Island |
| Contacts | Kevin Ruddock |

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| Name | Vermont VTrans Climate Change Action Plan |
| Description | This 2008 report describes Vtrans' actions developed in response to the Vermont's Governor's Commission on Climate Change (GCCC) GHG emission reduction goals. The three major focus areas outlined in the report are 1) Reducing GHG emissions from the transportation sector, 2) Protecting Vermont's transportation infrastructure from the effects of climate change, and 3) Reducing Vtrans' operational impacts on climate change. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Public Health and Safety - Infrastructure - Economic Resources |
| Focus Area | - Changes in Extremes of Weather and Climate |
| Region | - Regional Or State -- New England |
| Lead Agencies | Vermont Agency of Transportation |

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| Name | Vermont's GHG Emissions Inventory Update |
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| Description | Sep 2010 VT Agency of Natural Resources released the latest edition of Vermont's GHG Emissions Inventory Update. The update covers the period 1990-2008 (the previous report [September 2007] covered the period 1990-2005, with projected emissions through 2030). |
| Type | - PRODUCTS: Other - PRODUCTS: Education |
| Sector | - Infrastructure |
| Focus Area | |
| Region | - Regional Or State -- New England |
| Lead Agencies | VT Agency of Natural Resources |

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| Name | Virginia Coastal Zone Management Program Climate Change Adaptation Efforts |
| Description | The Virginia CZM Program is taking steps to help prepare for the predicted effects of climate change, especially sea-level rise on Virginia's coastal resources. With Virginia CZM coordination and funding support, three of Virginia's coastal planning district commissions (PDC) are assessing and mapping the potential impacts of sea-level rise and severe storm events to both developed and natural areas. Hampton Roads PDC, Middle Peninsula PDC and the Northern Virginia Regional Commission are now moving toward policy development that will establish a framework for local response to these issues. The three PDCs reports and other materials are available on the Virginia CZM website. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Infrastructure - Natural Ecosystems - Biota |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Virginia Department of Environmental Quality, Coastal Zone Management Program |
| Contacts | Beth Polak, Coastal Planner, Virginia CZM Program, Elizabeth.Polak@deq.virginia.gov |

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| Name | Virginia Coastal Zone Management Program's Coastal GEMS |
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| Description | Coastal GEMS is a gateway to Virginia's coastal resource data and maps; coastal laws and policies; facts on coastal resource values; and direct links to collaborating agencies responsible for current data. A growing inventory of water and land based natural resources, conservation planning tools, and planning examples are included that can help us to protect Virginia's coastal ecosystems. It is a tool to promote community involvement and environmental education. Virginia Coastal GEMS fosters stronger understanding of how activities on the land and in the water affect each other. Virginia Coastal GEMS is helping create a stronger link between local land use plans and state and federal water use policies. It includes: water features, shoreline features, land features, wildlife features, recreational features, conservation planning tools, and conservation planning examples. |
| Type | - PRODUCTS: Viewers and Web-based Tools |
| Sector | - Managed Ecosystems - Natural Ecosystems - Biota - Social and Cultural Resources - Recreation and Tourism |
| Focus Area | |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Virginia Coastal Zone Management Program |
| Contacts | Nick Meade, Virginia Coastal Zone Management Program, nick.meade@deq.virginia.gov |

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| Name | Virginia Institute of Marine Science's Climate Change Database Clearinghouse |
| Description | This clearinghouse assembles an online bibliography of available datasets that are described and documented by category or class. The website provides unlimited access to the latest data files, metadata and data originators to support development of predictive scenarios of climate change impact. |
| Type | - PRODUCTS: Viewers and Web-based Tools |
| Sector | - Managed Ecosystems - Natural Ecosystems - Biota |
| Focus Area | - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Virginia Institute of Marine Science, Center for Coastal Resources Management |

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| Name | Virginia's Climate Modeling and Species Vulnerability Assessment: How Climate Data Can Inform Management and Conservation |
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| Description | NWF, VDGIF, and CMI partnered on a project to downscale climate data for Virginia and conduct a vulnerability assessment of a selection of species of greatest conservation need (SGCN) from Virginia's Wildlife Action Plan. This report includes a summary of the findings from the modeling effort and assessment as well as highlights management concerns and implications based on the assessment results. The information developed through this project and included in this document will help inform the update of Virginia' Wildlife Action Plan by 2015 (as required by Congress). This climate data-driven vulnerability assessment will allow for integration of climate change into the updated version of the Action Plan at multiple levels, including revision of SGCN list, consideration of priorities, and development of conservation actions, among others. By bringing together multiple voices and partners, the information and recommendations in this report provide a feasible and effective way of working together to address climate change to conserve the wildlife and habitats of Virginia. |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Projections (intra-annual to multi-decadal, including SLR and model down-scaling) - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Plans, Assessments, Studies - PRODUCTS: Management Guidance (i.e. structured decision making) |
| Sector | <ul style="list-style-type: none"> - Managed Ecosystems - Natural Ecosystems - Biota |
| Focus Area | <ul style="list-style-type: none"> - Climate Impacts on Water Resources - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | National Wildlife Federation (NWF), Virginia Department of Game and Inland Fisheries (VDGIF), Conservation Management Institute (CMI) at Virginia Tech, Kutztown University |

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| Name | Visualizations and their Role in Communicating the Risk of Coastal Flooding: a Tantramar Case Study |
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| Description | The chief question posed by this study is whether it is possible to communicate coastal flood risk in a way that appeals to the widest range of people's personalities but is, at the same time, constructive, and less likely to push people into maladaptive positions (e.g., fatalism, anti-social behaviour. This study assesses public awareness about the link between climate change and elevated risk of regional dyke failure; measures how different multimedia visualizations influence public risk perception; and provides general recommendations for development of flood-risk communication strategies in coastal zones. Among 157 focus group participants, 81 percent of respondents felt that the problem of climate change was considerable or severe yet only 35 percent considered themselves at personal risk due to flooding. While geovisually-enhanced communication strategies, involving 3D flood animations and web-based GIS maps, were no more effective at raising risk awareness than a non-enhanced communication package, qualitative responses suggested that the geovisualizations had greater emotional impact ("shock"), and contributed disproportionately to an expressed desire to become politically and socially active around the issue. |
| Type | - PRODUCTS: Maps (Imagery, geo-referenced data) |
| Sector | - Infrastructure - Natural Ecosystems - Cross Disciplinary |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | |
| Lead Agencies | Atlantic Canada Adaptation Solutions Association New Brunswick Department of Environment |
| Contacts | Climate Change Secretariat, New Brunswick Department of the Environment env-info@gnb.ca |

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| Name | Visualizing Sea-Level Rise |
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| Description | <p>The project is interested in exploring ways in which the visualization of sea-level rise can assist decision makers as part of adaptation planning for sea-level rise and climate change. The research questions were:</p> <ol style="list-style-type: none"> 1. Does a particular visualization technique lead to a better understanding of future sea-level rise scenarios? and; 2. Are there any particular visualisation techniques decision-makers and planners believe are more appropriate for public viewing? <p>There were six different visualization techniques used, three of these are consider static visualization, which were mapping sea-level rise, showing the vertical dimensions of sea-level rise against a diagrammatic rendering of a building, and photo simulation. Three interactive simulations were generated, including an interactive computer display, a model with inserts that could be removed which show the different extents of sea level rise, and a three-dimensional model that could be flooded with water.</p> <p>Data analysis resulted in the following conclusions. Representations that seem real, such as the photo-simulations were often ranked higher than other visualizations. The visualizations that require physical manipulation are the most engaging and enhance the learning experience for all audiences. A range of visualization material is beneficial, because the range of visualizations were complementary rather than repetitive and can help appeal to different demographics.</p> |
| Type | <ul style="list-style-type: none"> - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Viewers and Web-based Tools |
| Sector | - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | |
| Lead Agencies | <p>Atlantic Climate Adaptation Solutions Association Dalhousie University Nova Scotia Department of Environment--Climate Change Directorate</p> |

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| Name | Voluntary Guidance for States to Incorporate Climate Change into State Wildlife Action Plans and Other Management Plans |
| Description | <p>From the Executive Summary: The Climate Change Wildlife Action Plan Guidance Document provides voluntary guidance for state fish and wildlife agencies wanting to better incorporate the impacts of climate change on wildlife and their habitats into Wildlife Action Plans. The approaches and techniques described in this document will also be useful in modifying other wildlife plans (e.g. big game/upland game/migratory bird plans, joint venture implementation plans, national fish habitat action plan, etc.) to address climate change. The document provides an overview of the information currently available on climate change, tools that can be used to plan for and implement climate change adaptation, voluntary guidance and case studies</p> |

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| Type | - PRODUCTS: Training and Capacity Building - PRODUCTS: Management Guidance (i.e. structured decision making) |
| Sector | - Managed Ecosystems - Natural Ecosystems - Biota |
| Focus Area | - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - National |
| Lead Agencies | Association of Fish and Wildlife Agencies |
| Contacts | Mark Humpert, Association of Fish and Wildlife Agencies, mhumpert@fishwildlife.org |

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| Name | Voluntary Step-by-Step Guide for Considering Potential Climate Change Effects on Coastal and Estuarine Land Conservation Projects |
| Description | The Voluntary Step-by-Step Guide for Considering Potential Climate Change Effects on Coastal and Estuarine Land Conservation Projects is a guide that is part of NOAA's multi-phased effort to more systematically consider climate change impacts in the implementation of programmatic activities including restoration, land acquisition, and facilities development. This new document addresses recommendations in the Programmatic Framework for Considering Climate Change Impacts in Coastal Habitat Restoration, Land Acquisition, and Facility Development Investments, developed and released by OCRM and National Marine Fisheries Service Office of Habitat Conservation in 2010. The guide provides a clear approach for coastal management partners to consider how climate impacts might affect conservation projects and how to incorporate climate change consideration into planning processes. Though it focuses on the implementation of OCRM's Coastal and Estuarine Land Conservation Program, the methodology described has broad application for conservation planning and land acquisition in a changing climate. |
| Type | - PRODUCTS: Training and Capacity Building |
| Sector | - Managed Ecosystems - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - National |
| Lead Agencies | NOAA, Office of Ocean and Coastal Resource Management, Coastal and Estuarine Land Conservation Program |
| Contacts | Kim Penn, NOAA, Kim.Penn@noaa.gov |

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| Description | Abstract: The Massachusetts Bays Program (MBP) and the Environmental Protection Agency (EPA) collaborated on an ecological vulnerability assessment, using a novel methodology based on expert judgment, to inform adaptation planning under EPA's Climate Ready Estuaries Program. An expert elicitation-type exercise was created to systematically elicit judgments from experts in a workshop setting regarding climate change effects on two key ecosystem processes within salt marsh systems: sediment retention and community interactions. Specific workshop objectives were to assess (1) the relative influences of physical and ecological variables that regulate each process, (2) their relative sensitivities under current and future climate change scenarios, (3) the degree of confidence about these relationships, and (4) implications for management. For each process, an influence diagram was developed identifying key process variables and their interrelationships (influences). Using a coding scheme, each expert characterized the type and degree of each influence to indicate its nature and sensitivity under current and future climate change scenarios. The experts also discussed the relative impact of certain influences on the endpoints. This report demonstrates how particular pathways in such diagrams can be linked to management options and examined in the context of planning documents to identify opportunities for 'mainstreaming' adaptation into strategic planning. |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Natural Ecosystems - Biota - Other |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- New England |
| Lead Agencies | Massachusetts Bays Program and the Environmental Protection Agency Climate Ready Estuaries Program |
| Contacts | Jordan M. West, EPA, 703-347-8584, west.jordan@epa.gov |

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| Name | Vulnerability of At-Risk Species to Climate Change in New York |
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| Description | From the Executive Summary: Vulnerability assessments are rapidly becoming an essential tool in climate change adaptation planning. As states revise their Wildlife Action Plans, the need to integrate climate change considerations drives the adoption of vulnerability assessments as critical components. To help meet this need for New York, we calculated the relative vulnerability of 119 of New York's Species of Greatest Conservation Need (SGCN) using NatureServe's Climate Change Vulnerability Index (CCVI)...The primary factors that drove our assessments included genetic variation, phenological responses, natural and anthropogenic barriers to dispersal, and restriction to specific geological features. Vulnerability was only weakly associated with conservation status. Species at the southern edge of their range in New York might become extirpated from the state. Our results agreed broadly with those from Pennsylvania and West Virginia. Additional species in need of assessment include plants, crayfish, cave obligates, and functional or habitat groups of species. Our assessment makes several key points: 1) aquatic and terrestrial habitat connectivity must be maintained and restored, 2) for some species, stressors other than climate change are more limiting to their viability; 3) for some species, climate change will likely result in their extirpation no matter what management actions are taken; and 4) long-term monitoring is vital to detecting changes in New York's wildlife populations." |
| Type | - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Managed Ecosystems - Natural Ecosystems - Biota |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) - Conservation/ Restoration of Sensitive Species and Habitats |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | New York Natural Heritage Program |
| Contacts | Tracey Tomajer, New York State Department of Environmental Conservation, tmtomaje@gw.dec.state.ny.us |

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| Name | Vulnerability of New Jersey's Coastal Habitats to Sea Level Rise (Rutgers) |
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| Description | This report is provides details on the geographic information system-based approach used to identify vulnerable development and where this development is constricting the natural dynamics of coastline migration. This study was part of a broader assessment of New Jersey's coastal environmental resources conducted by the Walton Center for Remote Sensing & Spatial Analysis (CRSSA) of Rutgers University and the American Littoral Society. This report expands on Cooper et al., 2005. "The primary objectives of this work is to examine six specific issues related to coastal vulnerability and future adaptability: to map near shore development; to map the land use/land cover that is vulnerable to tidal surge inundation and flooding; to map the distance from coastal waters to the first developed obstruction (i.e. how far removed is existing development from the surging coastal waters); to map the degree of shoreline alteration due to coastal protection structures; to map where coastal beach and dune habitats are relatively undisturbed; and delineate those portions of our coastal wetland complex that are free to retreat inland as part of the natural landward migration process (i.e., where are coastal wetlands bordered by undeveloped vs. developed uplands). " |
| Type | - PRODUCTS: Maps (Imagery, geo-referenced data) - PRODUCTS: Plans, Assessments, Studies |
| Sector | - Infrastructure - Natural Ecosystems |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Rutgers Center for Remote Sensing and Spatial Analysis |
| Contacts | Rick Lathrop, Director, Center for Remote Sensing and Spatial Analysis (CRSSA), lathrop@crssa.rutgers.edu |

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| Name | Vulnerability of Nova Scotia's Coastal Groundwater Supplies to Climate Change |
| Description | Approximately 50 percent of Nova Scotians rely on groundwater for their drinking water supply, including 40 percent who depend on private wells. In other similar settings, rising sea levels and changes in precipitation have raised concerns about the sustainability of coastal groundwater supplies. Assessment of hydrogeological conditions were undertaken at field sites in Wolfville and Pugwash, two areas where groundwater salinity has been an issue in the past... This study was unable to find strong evidence of saltwater intrusion in either field site. Both field investigations were planned with a typical simple model of saltwater intrusion in mind, indicating that these simple models are not sufficient to characterize these problems. In particular, the presence of significant groundwater flow towards the coast and associated offshore discharge and overlying low permeability zones appear to be important factors that result in diminished saltwater intrusion. |
| Type | |
| Sector | - Infrastructure |
| Focus Area | - Climate Impacts on Water Resources |

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| Region | |
| Lead Agencies | Atlantic Climate Adaptation Solutions Association St. Francis Xavier University |

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| Name | Vulnerability of Shallow Tidal Water Habitats in Virginia to Climate Change |
| Type | - DATA: Depth and Elevation Data - PRODUCTS: Maps (Imagery, geo-referenced data) |
| Sector | - Natural Ecosystems - Biota |
| Focus Area | - Coasts and Climate Resilience (including sea-level rise) |
| Region | - Regional Or State -- Mid-Atlantic |
| Lead Agencies | Center for Coastal Resources Management, Virginia Institute of Marine Science |

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| Name | Water and Climate Bibliography |
| Description | Pacific Institute Launches the Water and Climate Bibliography which is a comprehensive database of scientific literature pertaining to climate change and freshwater resources worldwide. The current version contains more than 4,300 entries. The goal is to provide a valuable resource for the academic community, policymakers, and individuals interested in the science and policy of climate change and water resources. |
| Type | - PRODUCTS: Education |
| Sector | - Infrastructure |
| Focus Area | |
| Region | - International - National |
| Lead Agencies | Pacific Institute |

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| Name | Water Scarcity and Climate Change: Growing Risks for Businesses and Investors |
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| Description | <p>Water is crucial for the economy. Virtually every industry from agriculture, electric power and industrial manufacturing to beverage, apparel, and tourism relies on it to grow and ultimately sustain their business.</p> <p>Yet water is becoming scarcer globally and every indication is that it will become even more so in the future. Decreasing availability, declining quality, and growing demand for water are creating significant challenges to businesses and investors who have traditionally taken clean, reliable and inexpensive water for granted. These problems are already causing decreases in companies' water allotments, shifts toward full-cost water pricing, more stringent water quality regulations, growing community opposition, and increased public scrutiny of corporate water practices.</p> <p>This Ceres/Pacific Institute report concludes that climate change will exacerbate these water risks, especially as the world population grows by 50 million a year.</p> |
| Type | |
| Sector | <ul style="list-style-type: none"> - Public Health and Safety - Infrastructure |
| Focus Area | <ul style="list-style-type: none"> - Climate Impacts on Water Resources |
| Region | <ul style="list-style-type: none"> - International - National - Regional Or State |
| Lead Agencies | CERES, Pacific Institute |