



NExUS Ongoing Projects and Activities Sun Jul 22 04:54:35 EDT 2018

Printing 102 of total 102 records.

Category: All

Sector: All

Area of Applicability: All

<b>Name</b>	A Comparative Assessment of Heat Health Warning Systems in Boston, New York
<b>Description</b>	Many cities in the United States have introduced heat health warning systems (HHWS) in order to reduce mortality and morbidity associated with heat waves. Some evidence suggests that existing HHWS, early warning combined with actions to assist vulnerable populations, are saving lives, but the evidence is insufficient to guide the design of effective HHWS. We will conduct a comparative assessment of the major HHWS in the highly urbanized northeast. We will compare detailed evidence about the institutional structures of the three HHWS in order to understand which components are effective in saving lives and why, and what other cities can learn about how to reduce mortality and morbidity from heat waves under different climatic and socio-economic conditions. We will analyze how effectively each HHWS is serving the needs of the most vulnerable groups and what are the lessons for making HHWS responsive to the needs of the most vulnerable.
<b>Category</b>	- Climate-change Specific Projects
<b>Sector</b>	- Public Health and Safety
<b>Focus Area</b>	- Changes in Extremes of Weather and Climate
<b>Region</b>	- Regional Or State -- New England -- Mid-Atlantic
<b>Status</b>	- Ongoing
<b>Timelines</b>	Date of completion, March 2013
<b>Lead Agencies</b>	NOAA Regional Integrated Sciences and Assessments (RISA)
<b>Contacts</b>	Malgosia Madajewicz, Columbia University, mm1174@columbia.edu

<b>Name</b>	A Handbook for Resource Managers to Understand and Utilize Sea-Level Rise and Coastal Wetland Models for Ecosystem Management under Future Conditions
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Description	Various sea-level rise and coastal wetland models of different designs and scales have been developed for predicting habitat and environmental change, but have not yet been synthesized to inform natural resource managers of each model's utility and limitations. Some models are accessible as online tools while others require more expert capacity to run for any given park, refuge, reserve, or regional application. This project aims to construct a handbook from training and feedback sessions with U.S. Fish and Wildlife Service (FWS) resource staff and other coastal managers (e.g. National Oceanic and Atmospheric Administration, U.S. National Park Service) across the pan-Gulf and South Atlantic states of the southeastern U.S. This handbook will contain published decision-support tools and simulation models for sea-level rise and climate change assessments to assist land and resource managers in making important decisions related to climate change.
Category	- Climate-change Specific Projects
Sector	- Natural Ecosystems
Focus Area	- Coasts and Climate Resilience (including sea-level rise)
Status	- Ongoing
Lead Agencies	U.S. Geological Survey
Contacts	Thomas W. Doyle, U.S. Geological Survey National Wetlands Research Center, doylet@usgs.gov

<b>Name</b>	A Research and Decision Support Framework to Evaluate Sea-Level Rise Impacts in the Northeastern U.S.
Description	Previous approaches to quantify coastal vulnerability to sea-level rise have had major shortcomings, including the possibility that their underlying assumptions are not uniformly valid. This project will conduct a study to distinguish the differing ways that coastal areas of the northeastern U.S. will respond to sea-level rise. This information will be used to develop a scientific research and decision-support program that addresses the cross-cutting and unique problems in these areas related to climate change and sea-level rise.
Category	- Climate-change Specific Projects
Focus Area	- Coasts and Climate Resilience (including sea-level rise)
Region	- Regional Or State -- New England -- Mid-Atlantic
Status	- Ongoing
Lead Agencies	U.S. Geological Survey, Woods Hole Coastal and Marine Science Center
Contacts	Robert Thieler, U.S. Geological Survey, Woods Hole Coastal and Marine Science Center, rthieler@usgs.gov,

<b>Name</b>	ACASA Expert Panel on Climate Change Adaptation
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Description	In December 2013, Atlantic Climate Adaptation Solutions Association (ACASA) created an Expert Panel on Climate Change Adaptation, made up of leading researchers in the physical and social sciences, to promote awareness, understanding, and integration of climate change adaptation research. The Panel will provide guidance to provincial and local governments in regards to adaptation strategies to address the impacts of climate change in communities and ecosystems. It offers peer-review of papers, reports and activities, and produces an annual communiqué to governments and the general public on the state of climate change adaptation science and policy.
Sector	- Cross Disciplinary
Status	- Ongoing

<b>Name</b>	Accurate Storm Surge Modeling: The Influence of Model Dimensionality, Freshwater, Tides, Stratification and Model Grid Area
Description	Detailed simulations, comparisons with observations, and model sensitivity experiments are presented for the August 2011 tropical cyclone Irene and a March 2010 nor'easter that affected the New York City (NYC) metropolitan area. To "dissect" the storm tides and examine the role of various physical processes in controlling total water elevation, a series of model experiments was performed where one process was omitted for each experiment, and results were studied for eight different tide stations.
Category	- Research
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	- Regional Or State -- Mid-Atlantic
Status	- Ongoing - Completed
Timelines	Date of completion, April 2012
Lead Agencies	NOAA Regional Integrated Sciences and Assessments
Contacts	Alan Blumberg, Stevens Institute of Technology, <a href="mailto:ablumber@stevens.edu">ablumber@stevens.edu</a>

<b>Name</b>	Advancing Regional and Local Capacity to Cope with Drought
Description	Actions include engaging with a range of stakeholders to determine their decision-support needs, prioritizing and initiating projects, developing ways to transfer tools and information to stakeholders, and identifying opportunities and regional activities through which NIDIS (National Integrated Drought Information System) can support those needs.

Sector	- Public Health and Safety - Infrastructure
Focus Area	- Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate
Region	- Regional Or State -- South East
Status	- Ongoing
Timelines	Date of Completion, 2012
Lead Agencies	NOAA Carolinas Integrated Sciences and Assessments (CISA)
Contacts	Kirstin Dow, kdow@sc.edu, Dan Tufford, tufford@sc.edu, Kirsten Lackstrom, LACKSTRO@mailbox.sc.edu, University of South Carolina Dept. of Geography, Climate Research Lab

<b>Name</b>	Assessing the Impacts of Climate Variability on Water Quality Conditions and Vibrio in North Carolina and South Carolina Estuaries
Description	This project integrates the investigators' work on watersheds, coastal adaptation, and drought and will investigate human health threats posed by the marine bacterium Vibrio in shellfish. The spread of Vibrio is believed to be associated with changing temperature and salinity conditions. Models in North and South Carolina will be developed to monitor and assess the potential for increased exposure to Vibrio bacterial hazards in the southeastern U.S. coastal water under changing salinity trends. Potential human health impacts make this work of value to both North and South Carolina Shellfish programs.
Category	- Climate-change Specific Projects - Monitoring
Sector	- Public Health and Safety
Focus Area	- Sustainability of Marine Ecosystems - Coasts and Climate Resilience (including sea-level rise)
Region	- Regional Or State -- South East
Status	- Ongoing
Lead Agencies	NOAA Carolinas Integrated Sciences and Assessments (CISA)
Contacts	Dan Tufford, University of South Carolina, tufford@sc.edu, Geoff Scott, NOAA National Centers for Coastal Ocean Science, geoff.scott@noaa.gov, Janet Moore, NOAA's Center for Coastal Environmental Health and Biomolecular Research, Janet.moore@noaa.gov

<b>Name</b>	Assessing the Risk of 100-year Freshwater Floods in the Lamprey River Watershed of New Hampshire Resulting from Changes in Climate and Land Use
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Description	his project will develop and refine a methodology for assessing flood risk associated with land use and climate change scenarios, implement the methodology for the Lamprey River watershed of Great Bay, NH, and demonstrate the use of associated products to support land use decision-making in coastal communities. The core analyses and outputs for this project will include maps at the watershed and municipality scale of the 100-year flood risk boundaries and river discharge at specific locations under selected scenarios. As a result, decision-makers and the public within the watershed will have access to new information regarding local flood risk, and they will be educated about how past and potential future land use patterns and climate change will influence the frequency and spatial extent of flooding.
Sector	<ul style="list-style-type: none"> <li>- Infrastructure</li> <li>- Managed Ecosystems</li> <li>- Natural Ecosystems</li> <li>- Economic Resources</li> </ul>
Focus Area	<ul style="list-style-type: none"> <li>- Coasts and Climate Resilience (including sea-level rise)</li> <li>- Climate Impacts on Water Resources</li> </ul>
Region	- Regional Or State -- New England
Lead Agencies	University of New Hampshire and Great Bay National Estuarine Research Reserve (NERR)
Contacts	Cameron Wake, UNH or Steve Miller, Great Bay NERR, Cameron.wake@unh.edu or steve.miller@wildlife.nh.gov

Name	Assessment of Landscape Changes in the North Atlantic Landscape Conservation Cooperative: Decision-Support Tools for Conservation
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Description	<p>The overall purpose of this project (known colloquially as the Designing Sustainable Landscapes project, or DSL for short) is to assess the capability of current and potential future landscapes within the extent of the North Atlantic Landscape Conservation Cooperative (NALCC) to provide integral ecosystems and suitable habitat for a suite of representative species, and provide guidance for strategic habitat conservation. To meet this goal, we are developing a Landscape Change, Assessment and Design (LCAD) model for the NALCC, as described in the documents below.</p> <p>Phase one of this project, which began in December 2010 and was completed June 2012, focused on developing the overall modeling framework for simulating landscape change and assessing the ecological consequences of those changes (i.e., landscape change and assessment), and piloting the model in three study landscapes: 1) Kennebec River watershed in Maine, 2) middle Connecticut River watershed in Massachusetts, New Hampshire and Vermont, and 3) combined Pocomoke and Nanticoke River watersheds in Maryland and Delaware.</p> <p>Phase two of this project, which began in July 2012 and will continue through June 2014, will focus on extending the landscape modeling to the entire Northeast (13 states), modeling an additional 20 representative species, expanding the ecological integrity assessment, coupling the landscape change model with a third party sea level rise model, improving the vegetation succession modeling, and developing an approach for integrating the results of the landscape change assessment into decision support for landscape design.</p> <p>This project website provides links to recent presentations, results of phase 1 including a report and accompanying data for each of the pilot watersheds, detailed working technical documentation, and an online manager survey to provide feedback.</p>
Category	<ul style="list-style-type: none"> <li>- Climate-change Specific Projects</li> <li>- Research</li> </ul>
Sector	<ul style="list-style-type: none"> <li>- Infrastructure</li> <li>- Natural Ecosystems</li> </ul>
Focus Area	<ul style="list-style-type: none"> <li>- Coasts and Climate Resilience (including sea-level rise)</li> <li>- Changes in Extremes of Weather and Climate</li> <li>- Conservation/ Restoration of Sensitive Species and Habitats</li> </ul>
Region	- Regional Or State -- New England -- Mid-Atlantic
Status	- Ongoing
Timelines	June 2014
Lead Agencies	Department of Environmental Conservation, University of Massachusetts
Contacts	Kevin McGarigal, Department of Environmental Conservation, University of Massachusetts, mcgarigalk@eco.umass.edu

Name	Barnegat Bay Partnership Climate Ready Estuary
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Description	<p>From the website: The Climate Ready Estuaries funding will enable the Barnegat Bay Partnership and its key partners to initiate climate change vulnerability assessments and adaptation planning. The initial steps will include the following:</p> <p>Establishment of a Climate Change Workgroup within the Barnegat Bay Partnership's Science and Technical Advisory Committee; The convening of a series of public "listening sessions" during the winter and spring of 2010; and Co-sponsoring a technical workshop "Preparing your Community in the Face of a Changing Climate: Starting the Dialogue, which took place on April 1, 2010. Development of a Needs Assessment and next steps in order to develop a Climate Ready Adaptation Strategy.</p> <p>Ultimately, these activities will enable the Barnegat Bay Partnership to develop a climate change adaptation strategy which informs local municipalities and the public about regional challenges and their potential solutions.</p>
Category	<ul style="list-style-type: none"> <li>- Climate-change Specific Projects</li> <li>- Research</li> </ul>
Sector	<ul style="list-style-type: none"> <li>- Public Health and Safety</li> <li>- Infrastructure</li> <li>- Managed Ecosystems</li> <li>- Natural Ecosystems</li> </ul>
Focus Area	<ul style="list-style-type: none"> <li>- Coasts and Climate Resilience (including sea-level rise)</li> <li>- Changes in Extremes of Weather and Climate</li> </ul>
Region	- Regional Or State -- Mid-Atlantic
Status	- Ongoing
Timelines	Started 2009
Lead Agencies	Barnegat Bay Partnership
Contacts	Martha Maxwell-Doyle, Barnegat Bay Partnership, mmdoyle@ocean.edu

<b>Name</b>	<b>Blackwater National Wildlife Refuge Maryland Audubon and The Conservation Fund Inland Migration Project</b>
Description	<p>Maryland Audubon and The Conservation Fund are working to develop a strategic assessment and comprehensive implementation strategy over a 100 year time horizon. The objective is to identify and map high priority, currently upland areas suitable for salt marsh migration and reestablishment. The strategy will also identify opportunities to increase resilience to sea level rise and slow the rate of loss to open water of current ecologically valuable marshes. Both the Assessment and Strategy will be developed based on a synthesis of available information and will result in implementation activities to both protect priority lands in the county as well as engage in restoration and management activities to conserve marshes.</p>
Sector	<ul style="list-style-type: none"> <li>- Natural Ecosystems</li> <li>- Biota</li> </ul>

Focus Area	- Coasts and Climate Resilience (including sea-level rise) - Conservation/ Restoration of Sensitive Species and Habitats
Region	- Regional Or State -- Mid-Atlantic
Status	- Ongoing
Lead Agencies	Maryland Audubon and The Conservation Fund
Contacts	David Curson, Maryland Audubon, dcurson@audubon.org

<b>Name</b>	Building Resilience to Storm Surges and Sea Level Rise - A Comparative Study of Coastal Zones in New York City and Boston
Description	Along the northeast urban corridor (NEUC), damage from flooding related to storm surges is one of the most certain impacts of climate change, making adaptation in coastal zones that are vulnerable to storm surges one of the highest priorities in the NEUC. This project is a collaboration between the CCRUN coastal team, the evaluation team, CIESIN, and various stakeholders to develop adaptation blueprints that specify decision and implementation processes for well-defined types of neighborhoods. The assessment of vulnerability will also include socioeconomic factors, land use, and infrastructure. specified conditions.
Category	- Climate-change Specific Projects
Sector	- Infrastructure
Focus Area	- Coasts and Climate Resilience (including sea-level rise)
Region	- Regional Or State
Status	- Ongoing
Timelines	Date of Completion, March 2014
Lead Agencies	NOAA Regional Integrated Sciences and Assessments
Contacts	Malgosia Madajewicz, Columbia University, malgosia@iri.columbia.edu

<b>Name</b>	Calcium Carbonate Measurements and Experiments (NOAA Fisheries)
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Description	This project provides operational and analytical support for research on Ocean Acidification (OA) conducted at the James J. Howard Marine Sciences Laboratory NOAA Fisheries Northeast Fisheries Science Center where studies focus on assessing the physiological effects on living marine resources and the resulting ecosystem impacts of these effects. The NOAA/NMFS/JJ Howard Marine Lab at Sandy Hook, NJ has designed and built a large scale flow through experimental system for exposing a variety of marine species at different life stages. The exposure system is customizable to a number of distinct variables, in different combinations. For example it has the ability to manipulate carbonate chemistry (pCO <sub>2</sub> ~300 - >4000ppm), temperature (2 - 25°C), salinity (0 - 33), flow rates, dissolved oxygen (0 - 10mg/l), as well as biogeochemicals like ammonium and sulfide. The experimental system was designed to support the most sensitive and susceptible life stages of benthic and pelagic, oceanic, coastal or estuarine species on shellfish, crustaceans, and finfish exposures. The system is continuously monitored by both automated instruments and discreet sampling. Initial trials of this system successfully accommodated a five pCO <sub>2</sub> by five temperature experimental design, as well as a three by three design, both in triplicate for summer flounder ( <i>Paralichthys dentatus</i> ) and winter flounder ( <i>Pseudopleuronectes americanus</i> ), as well as a pilot study on fiddler crabs ( <i>Uca pugnax</i> ). These trials utilized between 50 to 150 exposure containers with 50 to 400 eggs or larvae per container with additional capacity available. Throughout the trials, the system maintained distinct pCO <sub>2</sub> and pH values. Analytical measurements of treatment parameters were conducted to determine the pH and DIC produced by CO <sub>2</sub> addition to the lab seawater and determine the consistency of pH and DIC treatments.
Category	- Climate-change Specific Projects - Research
Sector	- Managed Ecosystems
Focus Area	- Sustainability of Marine Ecosystems
Region	- Regional Or State -- New England
Status	- Ongoing
Lead Agencies	NOAA Northeast Fisheries Science Center
Contacts	Daniel Wieczorek, Daniel.wieczorek@noaa.gov

Name	Characterizing Thermal Neighborhoods for Climate Health Impacts
Description	A city's urban heat island can be subdivided into physically defined neighborhoods that respond differently to large scale environmental forcing. The observed bias from the modeled temperature would be similar throughout a thermal neighborhood, but vary between neighborhoods. Our objective is to use neighborhood-scale field campaign data to develop model output statistics to downscale model forecasts of temperature and humidity.
Category	- Research

Sector	- Public Health and Safety - Infrastructure
Focus Area	- Changes in Extremes of Weather and Climate
Region	- Regional Or State
Status	- Ongoing
Timelines	Date of Completion, April 2016
Lead Agencies	NOAA Regional Integrated Sciences and Assessments
Contacts	Reza Khanbilvardi, The City College of New York/CUNY, Khanbilvardi@ccny.cuny.edu

<b>Name</b>	Climate Change Adaptation and Hazard Mitigation Planning in Coastal New Hampshire
Description	NH coastal municipalities are confronted by a challenging set of land use and hazard management concerns that include extreme weather events, storm surges, flooding, coastal erosion, and loss of key coastal habitats. These issues are exacerbated by changes in climate that result in an increase in the frequency and intensity of storms and an increasing rate of sea level rise. These effects are compounded by development through increasing stormwater runoff and flooding. Effective preparedness will allow coastal communities to adapt and thrive with minimal economic, social, and environmental impacts.
Category	- Research
Sector	- Public Health and Safety - Infrastructure - Economic Resources
Focus Area	- Changes in Extremes of Weather and Climate
Region	- Regional Or State -- New England
Status	- Ongoing
Timelines	March 2012

<b>Name</b>	Climate Information for Water Harvesting and Re-use Strategies in Philadelphia
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Description	Climate change is expected to alter urban climatological conditions throughout the CCRUN (Consortium for Climate Risk in the Urban Northeast) study area (Massachusetts, Rhode Island, Connecticut, New York, New Jersey, and Pennsylvania). This research effort investigates the impact of changes to precipitation and temperature on the hydrology of urban spaces and the terrestrial and aquatic ecosystems connected to them directly or indirectly through infrastructure. Specifically, we are investigating relationships between climatological conditions and water/wastewater/stormwater infrastructure, with a focus on a) impacts of climate conditions on water and wastewater treatment plant performance, b) how varying levels of climatically impacted infrastructure performance relate to various indicators of public health and c) the use of various green infrastructure (GI) strategies as a climate change adaptation strategy (through its role in reducing the energy and GHG emissions associated with less stormwater and enhanced urban evapotranspiration).
Category	- Climate-change Specific Projects - Research
Sector	- Public Health and Safety - Infrastructure
Focus Area	- Climate Impacts on Water Resources
Region	- Regional Or State
Status	- Ongoing
Timelines	Date of Completion, September 2015
Lead Agencies	NOAA Regional Integrated Sciences and Assessments
Contacts	Franco Montalto, Drexel University, fam26@drexel.edu

<b>Name</b>	<b>Climate Trends and Variations Bulletins</b>
Description	These seasonal bulletins produced by Environment Canada summarize recent climate data and presents it in a historical context. Each edition examines national temperature and precipitation trends, and then highlights interesting regional temperature information.
Status	- Ongoing
Timelines	ongoing
Lead Agencies	Environment Canada

<b>Name</b>	<b>Climate Variability and Change as Simulated over the Northeast</b>
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Description	The CCRUN (Consortium for Climate Risk in the Urban Northeast) climate team, through its work with urban stakeholders, focused on intense precipitation events, extreme heat, and extreme cold, as climate metrics that influence for example the water sector, infrastructure, and human health. The team has evaluated 6 Regional Climate Models that contributed to the North American Regional Climate Change Assessment Program (NARCCAP). Initial work explored how well the regional climate models are able to reproduce historical mean climate and climate extremes in the Northeast, when receiving the best available historical data at the model boundaries. Next the team assessed regional climate model performance over the historical period when driven by global climate models. Finally, projected changes in mean climate and extremes for the middle of the 21st century under the A2 emissions scenario were explored.
Category	- Research
Sector	- Public Health and Safety - Infrastructure
Focus Area	- Changes in Extremes of Weather and Climate
Region	- Regional Or State
Status	- Ongoing
Timelines	Date of Completion, April 2013
Lead Agencies	NOAA Regional Integrated Sciences and Assessments
Contacts	Radley Horton, Associate Research Scientist, Center for Climate Systems Research, Columbia University, rh142@columbia.edu

<b>Name</b>	Coastal Acidification Nutrient Enrichment Surveys
Description	The Coastal Acidification Nutrient Enrichment Surveys are oceanographic surveys which collect baseline data on carbon chemistry and pH in coastal waters to look for change overtime.
Category	- Monitoring - Research
Sector	- Managed Ecosystems - Natural Ecosystems
Focus Area	- Climate Impacts on Water Resources
Region	- Regional Or State -- New England
Status	- Ongoing
Lead Agencies	EPA
Contacts	Matt Liebman, 617-918-1626

<b>Name</b>	Coastal Flood Risk Assessment for the Urban Northeastern Corridor, Today and with Future Sea Levels
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Description	The Northeastern U.S. urban corridor of New York City, Philadelphia and Boston is threatened today by coastal storms, and climate change is likely to increase this threat due to predicted changes such as sea level rise. The primary objective of the project is to produce probabilistic risk assessments for the present, the 2050s and the 2080s, using stakeholder- defined metrics for urban watersheds. Major innovations beyond other prior studies include (a) the use of a highly detailed, extensively validated ocean model to provide probabilistic, yet accurate forecasts; and (b) inclusion of rainfall and storm surge based flooding in one combined modeling system.
Category	- Research
Sector	- Public Health and Safety - Infrastructure - Natural Ecosystems
Focus Area	- Changes in Extremes of Weather and Climate
Region	- Regional Or State -- Mid-Atlantic
Status	- Ongoing
Timelines	Date of Completion, September 2015
Lead Agencies	NOAA Regional Integrated Sciences and Assessments
Contacts	Alan Blumberg, Stevens institute of Technology, <a href="mailto:ablumber@stevens.edu">ablumber@stevens.edu</a>

<b>Name</b>	Coastal Wetland Dynamics and Wildlife Populations: Modeling the Effects of Sea Level Rise and Landscape Change
Description	Climate change (i.e., global warming) and the resulting rise in sea level have prompted international concern about changes in coastal ecosystems. As a result, there is a pressing need to understand how sea level rise may affect coastal marshes and a variety of associated obligate vertebrate species. This project will address aspects of the U.S. Fish and Wildlife Service's (FWS) Strategic Habitat Conservation (SHC) initiative by linking landscape [marsh] response to sea level rise with habitat relationship models for a variety of wildlife species. First, we intend to develop hierarchical models of animal survey data that assess the importance of local biophysical factors with respect to animal distribution and abundance. These models will then be linked to outputs from models simulating the response of intertidal wetland complexes in the northeast to predicted sea level rise. We will also evaluate the uncertainty surrounding predictions from "downscaled" projections, and whether available data on species habitat relationships are sufficient for meaningful predictions of future species-habitat relationships. Anticipated products will allow the Service and its partners to strategically plan future conservation efforts and sustain populations of priority species.
Category	- Climate-change Specific Projects - Research

Sector	- Natural Ecosystems - Biota
Focus Area	- Coasts and Climate Resilience (including sea-level rise) - Conservation/ Restoration of Sensitive Species and Habitats
Region	- Regional Or State -- New England -- Mid-Atlantic
Status	- Ongoing
Lead Agencies	USGS Patuxent Wildlife Research Center
Contacts	Allan O'Connell, Research Wildlife Biologist, U.S. Geological Survey, <a href="mailto:aoconnell@usgs.gov">aoconnell@usgs.gov</a> ; Glenn Guntenspergen, Research Ecologist, U.S. Geological Survey, <a href="mailto:Glenn_Guntenspergen@usgs.gov">Glenn_Guntenspergen@usgs.gov</a>

<b>Name</b>	<b>Collaborative Development of Climate Information for the Connecticut River Basin using Shared Vision Forecasting</b>
Description	The spread of technical information and practices is often lost in communication when transferred between a source and the end users. This research seeks to use Shared Vision Forecasting and the diffusion of innovations framework to promote the adoption of forecasting techniques. Through a series of workshops with water managers in the Connecticut River Basin, this research will establish a climate knowledge network and an information baseline of the current use of climate information and forecasting in water management decision-making. Better understanding of how managers adopt new forecast techniques and climate data will provide the feedback needed to improve forecasting and climate information.
Category	- Research
Sector	- Infrastructure
Focus Area	- Climate Impacts on Water Resources
Region	- Regional Or State -- New England
Status	- Ongoing
Timelines	Date of Completion, December 2012
Lead Agencies	NOAA Regional Integrated Sciences and Assessments
Contacts	Casey Brown, University of Massachusetts Amherst, <a href="mailto:cbrown@ecs.umass.edu">cbrown@ecs.umass.edu</a>

<b>Name</b>	<b>Community Climate Adaptation and Resilience Projects</b>
Description	The purpose of these projects is to work with coastal communities to facilitate climate resilience and adaptation planning and to identify infrastructure vulnerabilities and adaptation options for current climatic events as well as expected future risks associated with climate change (e.g., increased tidal flooding frequency under sea level rise).
Category	- Climate-change Specific Projects

Sector	- Infrastructure - Natural Ecosystems
Focus Area	- Coasts and Climate Resilience (including sea-level rise)
Region	- Regional Or State -- South East
Lead Agencies	NOAA Carolinas Integrated Sciences and Assessments (CISA)
Contacts	Jessica Whitehead, N.C. Sea Grant/S.C. Sea Grant/NOAA Carolina Integrated Sciences and Assessments, jessica.whitehead@scseagrant.org, Kirstin Dow, University of South Carolina, KDow@sc.edu, Greg Carbone, University of South Carolina, greg.carbone@sc.edu

<b>Name</b>	<b>Community Energy Challenge</b>
Description	The community Energy Challenge aims to help 193 New England communities reduce energy use and thus reduce greenhouse gas emissions from municipal buildings.
Sector	- Infrastructure - Social and Cultural Resources - Recreation and Tourism
Region	- Regional Or State -- New England
Status	- Ongoing
Lead Agencies	EPA
Contacts	Linda Darveau, Jason Turgeon, Cynthia Veit

<b>Name</b>	<b>Conservation Planning for Tidal Marsh Migration Due to Sea Level Rise</b>
Description	The goal of this project is to enable communities, conservation entities, and state and federal agencies to plan for the preservation of those areas of Maine's coastal landscape where tidal marshes are likely to migrate in the event of sea level rise. The geographic area covered by the project extends from the southernmost extent of Maine's coast, including Kittery and the Piscataqua River (York County), to the Kennebec River estuary and Georgetown (Sagadahoc County) in the mid-coast region. The project area is roughly one-quarter of the state's mainland coast, and it correlates to the area for which FEMA LiDAR data (2006) was available at the time of the project's inception. This area includes 61% of the state's tidal marsh acreage, as well as a majority of the state's most intensely developed coastal areas.
Category	- Climate-change Specific Projects - Research
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

Status	- Ongoing
Lead Agencies	Maine Natural Areas Program and Maine Geological Survey
Contacts	Don Cameron, Botanist/Ecologist, Maine Natural Areas Program, Don.S.Cameron@maine.gov

<b>Name</b>	<b>Course: Adapting to Severe Weather and a Changing Climate</b>
Description	To support local governments in adapting their infrastructure plans and strengthening asset management, FCM and the Canadian Standards Association (CSA) have developed a convenient e-learning course to help municipal staff and service providers learn about adapting critical infrastructure to severe weather and a changing climate.
Sector	- Infrastructure
Focus Area	- Changes in Extremes of Weather and Climate
Region	- International - National - Regional Or State
Status	- Ongoing
Timelines	ongoing
Lead Agencies	Federation of Canadian Municipalities
Contacts	Devin Causley dcausley@fcm.ca

<b>Name</b>	<b>Delaware Coastal Impoundment Accretion Rate Study</b>
Description	From the Delaware SLR Initiative Compendium: This study will provide information to coastal managers regarding marsh susceptibility to sea level rise under different marsh management scenarios and under different sea level rise scenarios. A long-term comparison of the wetland elevation and sedimentation conditions between the impounded marsh and the “natural” marsh will enable a detailed analysis and comparison of the potential long-term growth conditions and highlight the potential implications for impoundment management that could affect the sustainability of the interior wetlands. This information will allow marsh managers to understand the potential outcomes of sea level rise and adapt their management techniques. Correlating longterm wetland sedimentation rates to current wetland elevation will enable a detailed analysis of the potential sedimentation deficits that exist within the impoundments, as compared to the reference wetlands. The elevation and sedimentation gradients between the reference and impounded wetlands can be used to calculate potential future elevation trajectories under different sea-level rise and management scenarios.
Category	- Research
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; UD College of Earth, Ocean and Environment; Primehook National Wildlife Refuge (US Fish and Wildlife Service); and DNREC Division of Fish and Wildlife
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<b>Name</b>	<b>Delaware River Streamflow Reconstruction Using Tree Rings</b>
Description	Using Hierarchical Bayesian Statistical techniques for understanding and modeling the hydrologic systems is one of the emerging areas of research. Given their ability to explicitly quantify the process model and parameter uncertainty through each estimation stage, Bayesian methods can be employed to better represent model and estimation uncertainties and indeed to find ways to reduce them by appropriate shrinking across spatial instances. In this project, we developed various Hierarchical Bayesian statistical techniques for reconstructing Delaware River flows using paleoclimatic information such as tree rings. This analysis will serve as the necessary building block for simulating water system operation and to provide a more objective evaluation of operating rules for reservoir systems consider changing conditions. The reconstructions also provided insights in to the probability of severe sustained droughts in this region.
Category	- Research
Sector	- Infrastructure - Managed Ecosystems - Natural Ecosystems
Focus Area	- Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate
Region	- Regional Or State
Lead Agencies	NOAA Regional Integrated Sciences and Assessments
Contacts	Upmanu Lall, Columbia University, ula2@columbia.edu

<b>Name</b>	<b>Delaware Sediment Elevation Tables</b>
Description	From the Delaware SLR Compendium 2011: Sediment elevation tables (SETs) provide a nondestructive method for making highly accurate and precise measurements of sediment elevation in intertidal and sub-tidal wetlands over long periods of time, relative to a fixed subsurface datum. Data collected using SETs can be used to determine both the influence of a single meteorological event on sediment surface elevation and a long-term trend in elevation change. This information will help increase our understanding of sedimentation rates in different marshes, sea level rise effects in these marshes, and potential management techniques. This study will result in a written report that includes a summary of results, discussion of data analysis and statistical procedures. Results can then be used to determine both the influence of a single meteorological event on sediment surface elevation and a long-term trend (i.e. decades) in elevation change, as well as make predictions for future elevation changes in our local marshes.
Category	- Monitoring

Sector	- Natural Ecosystems
Focus Area	- Coasts and Climate Resilience (including sea-level rise)
Region	- Regional Or State -- Mid-Atlantic
Status	- Ongoing
Lead Agencies	DNREC Delaware Coastal Programs, DNREC Watershed Assessment, US Fish and Wildlife Service (Coastal Delaware Refuge Complex), Center for the Inland Bays

Name	Development of Coastal Zone Management Tools and Strategies for Coastal Ecosystems Adaptation to Climate Change and Sea Level Rise
Description	"Rhode Island's Coastal Resource Management Council (CRMC) and its partners have formed a team to study potential impacts to coastal wetland ecosystems from sea level rise and the landward movement of coastal wetlands in Rhode Island's 21 coastal communities. Coastal wetlands and abutting upland areas will be identified using recent LiDAR elevation data, existing digital Geographic Information System (GIS) data, and the Sea Level Affecting Marsh Model (SLAMM). The modeling will use sea level rise projections of 0.3, 1.0 and 1.5 meters to show short- and long-term scenarios projected for Rhode Island. The resulting outcomes will lead to revisions to Rhode Island coastal program policies and standards, new climate change adaptation strategies, and new standards for coastal buffer zones and coastal wetland restoration projects. Another potential tool is the establishment of rolling easements in order to protect these critical areas. The project will create a publicly accessible web-based mapping tool to help local and state planners and policy makers analyze potential community and ecosystem impacts from sea level rise. In addition, the research team will hold workshops to provide outreach education to coastal communities to assist in local community planning efforts. The Rhode Island project meets NOAA's Next Generation Strategic Plan objectives – improving the tools and methods for assessing the susceptibility of coastal ecosystems to climate change, and using findings to inform decision-makers. Because many coastal states are faced with the same dilemma, this project and the lessons learned from it will be widely used and transferable to other states in the country, to assist in their efforts to protect and restore coastal wetlands nationwide."
Category	- Climate-change Specific Projects - Research
Sector	- Infrastructure - Natural Ecosystems
Focus Area	- Coasts and Climate Resilience (including sea-level rise)
Region	- Regional Or State -- New England
Status	- Ongoing
Timelines	2012-2014

Lead Agencies	Rhode Island Coastal Resource Management Council, Rhode Island Sea Grant, The Nature Conservancy, and the Narragansett Bay National Estuarine Research Reserve
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<b>Name</b>	Does the Phenology of Plankton Blooms Affect the Recruitment of Spring Spawning Fishes on the Northeast Shelf?
Description	<p>From the project proposal: Objectives:</p> <ol style="list-style-type: none"> <li>1. Develop indices of phytoplankton bloom timing, intensity, duration, and areal extent for the U.S. Northeast Shelf Ecosystem. Investigate compound indices using temperature data associated with bloom conditions.</li> <li>2. Evaluate the temporal and spatial resolution needed to characterize regional blooms.</li> <li>3. Compare several algorithms/methods used to quantify bloom dynamics</li> <li>4. Combine bloom indices with stock trend data from assessments to develop descriptive and predictive models.</li> <li>5. Develop system production indices for integrated ecosystem assessments.</li> </ol> <p>Benefits</p> <p>These data and analyses will help forward the goal of the agency to provide advice on fisheries using an ecosystem management approach. Mechanistic explanations of recruitment for species and stock groups will be useful to Fishery Management Councils in evaluating past management practices and preparing the fisheries for anticipated changes that will affect their regulation and strategies of capitalization and employment. Understanding better the effects of environment on size-at-age and the cascading effects on reproduction, may be used to adapt advice and management measures to protect spawning fish and thus insure the highest possible reproductive output of the stock. Advice on catch and effort levels will benefit from improved model fits that will reduce the risks associated with measures aimed at rebuilding depleted resources and protecting endangered species, especially those affected by fisheries interactions.</p>
Category	- Climate-change Specific Projects
Sector	- Managed Ecosystems - Natural Ecosystems
Focus Area	- Sustainability of Marine Ecosystems
Region	- National - Regional Or State -- New England
Status	- Ongoing
Lead Agencies	NOAA National Marine Fisheries Service (NMFS)
Contacts	Jon Hare, NMFS, Narragansett Laboratory, Jon.Hare@noaa.gov

<b>Name</b>	Drought Sensitivity Testing
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Description	The State Climate Office of North Carolina is partnering with CISA to test the sensitivity of the DDIT with a variety of new data sets. These include high-resolution data sets not currently used, long-lead forecast information, and radar-based precipitation estimates. Activities include: providing access to surface and ground water data sets to enhance the spatial resolution and range of the DDIT's drought indicators, developing methods to operationalize the DDIT's use of long-lead forecast data, and using research on radar-based SPI estimates to evaluate the methods and if appropriate make radar-based SPI available for the DDIT.
Category	- Research
Sector	- Public Health and Safety - Infrastructure - Natural Ecosystems
Focus Area	- Climate Impacts on Water Resources
Region	- Regional Or State -- South East
Status	- Ongoing
Lead Agencies	NOAA Carolinas Integrated Sciences and Assessments (CISA)
Contacts	Ryan Boyles, Director and State Climatologist, North Carolina State Climate Office, rdboyles@ncsu.edu

<b>Name</b>	Energy efficiency and renewable energy in State Implementation Plans
Description	The mission of this project is for EPA to provide guidance to states for incorporating emission reductions from energy efficiency and clean energy into State Implementation Plans (SIPs).
Sector	- Infrastructure
Region	- National - Regional Or State -- New England
Status	- Ongoing
Lead Agencies	EPA
Contacts	Cynthia Greene, Dave Conroy, John Moskal, Robert Mcconnell

<b>Name</b>	Evaluating Reservoir Operations and the Impacts of Climate Change in the Connecticut River Basin
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Description	The Connecticut River Basin is the principal water source for communities in portions of Vermont, New Hampshire, central Massachusetts and central Connecticut, with over 70 major dams and reservoirs in operation to help control the water supply. This project will provide The Nature Conservancy, the US Army Corps of Engineers and other stakeholders with climate-informed guidance for current and future dam operations, and illustrate the potential trade-offs between policies that optimize one or more of services provided by the systems' operations. Downscaled data from climate model projections, fed into hydrology models, is used to construct informed streamflow forecasts; these in turn support a reservoir management model that enhances the biological community supported by the river, and existing infrastructural services including flood control, water supply, recreation and hydropower generation. This project also involves the development of decision support tools to guide river operations and to facilitate stakeholder involvement. Workshops are held to gather information about stakeholder requirements for the basin, such as ecological flow targets and dam operations
Category	- Climate-change Specific Projects
Sector	- Public Health and Safety - Infrastructure
Focus Area	- Climate Impacts on Water Resources - Conservation/ Restoration of Sensitive Species and Habitats
Region	- Regional Or State -- New England
Status	- Ongoing
Timelines	Date of Completion, April 2013
Lead Agencies	NOAA Regional Integrated Sciences and Assessments
Contacts	Richard Palmer, Department of Civil and Environmental Engineering, University of Massachusetts Amherst, palmer@ecs.umass.edu

Name	Evaluating the Vulnerabilities of Ecological Resources to Climate Change in the Northeast
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Description	<p>In a project extending from Maine to the Virginias, the Northeastern Association of Fish and Wildlife Agencies (NEAFWA), Manomet Center for Conservation Sciences (Manomet), and the National Wildlife Federation (NWF) are collaborating with other major northeastern stakeholders, including federal agencies and nonprofit organizations, to protect fish and wildlife and their habitats from climate change. Specifically, Manomet, NWF, and NEAFWA have embarked on a three-year effort to evaluate the vulnerabilities of the northeast's key habitats and species, and to help increase the capabilities of state fish and wildlife agencies to respond to these challenges. This regional effort is the first of its kind in the country and is an essential step toward the implementation of effective "climate-smart" conservation of ecosystems.</p> <p>Climate change is already impacting ecological resources in North America, including fish and wildlife and their habitats. These effects will become more serious and widespread as the climate continues to change, and will pose major conservation and management challenges. The overarching goal of the project is to provide vulnerability and adaptation information that will help the northeastern states to plan their conservation of fish and wildlife under a changing climate. The results will be an essential step forward in effective regional climate change conservation planning. This project has five specific objectives:</p> <ol style="list-style-type: none"> <li>1. To quantify the vulnerabilities to climate change of fish and wildlife and their habitats across the region and thereby identify those habitats and species that are likely to be more or less vulnerable, and how these vulnerabilities vary spatially.</li> <li>2. To project how these habitats and species will change their status and distributions under climate change.</li> <li>3. To identify potential adaptation options (including the mitigation of non-climate stressors) that can be used to safeguard vulnerable habitats and species.</li> <li>4. To identify monitoring strategies that will help track the onset of climate change and the success, or otherwise, of adaptation actions.</li> <li>5. To work with states to increase their institutional knowledge and capabilities to respond to climate change through educational and planning workshops and other events.</li> </ol>
Category	- Climate-change Specific Projects
Sector	- Natural Ecosystems
Focus Area	<ul style="list-style-type: none"> <li>- Coasts and Climate Resilience (including sea-level rise)</li> <li>- Changes in Extremes of Weather and Climate</li> <li>- Conservation/ Restoration of Sensitive Species and Habitats</li> </ul>
Region	- Regional Or State -- New England -- Mid-Atlantic
Status	- Ongoing
Timelines	Started 2010/ Will be completed December 2012

Lead Agencies	Manomet Center for Conservation Sciences; National Wildlife Federation, Northeast Association of Fish and Wildlife Agencies
Contacts	Hector Galbraith, Manomet Center for Conservation Sciences; George Gay, National Wildlife Federation, ggay@nwf.org

<b>Name</b>	Forecast Effects of Sea level Rise on Habitat of Piping Plovers and Identify Responsive Conservation Strategies
Description	Sea level rise and associated changes in storm magnitude and frequency are major issues of concern associated with climate change in the North Atlantic LCC. Piping plovers ( <i>Charadrius melodus</i> ) respond rapidly to change and depend on these low-lying coastal areas throughout their life cycle, making them excellent indicators of climate change effects. This project will develop predictions of how piping plover breeding habitat will change as a result of sea level rise and altered storminess, using a coupled risk-assessment model. The first portion of the model assesses changes to coastal geomorphology using dynamic sea level rise predictions and is linked to the second portion of the model that assesses plover habitat selection. The first task will utilize the vast data sets documenting plover habitat preference for, and utilization of, topographic, hydrodynamic, and vegetation regimes. This task will develop a plover model that is quantitatively tied to measurable physical variables including elevation, slope, frequency of inundation and overwash, and amount of vegetation. Future scenarios will be modeled in order to analyze the efficacy of existing and alternate conservation strategies against plausible sea level and other future climate variables.
Category	- Climate-change Specific Projects - Research
Sector	- Natural Ecosystems - Biota
Focus Area	- Coasts and Climate Resilience (including sea-level rise) - Conservation/ Restoration of Sensitive Species and Habitats
Region	- Regional Or State
Status	- Ongoing
Timelines	Start Date 2010; End Date December 2013
Lead Agencies	Virginia Tech; North Atlantic Landscape Conservation Cooperative
Contacts	Sarah Karpanty, Assistant Professor, Virginia Tech, karpanty@vt.edu

<b>Name</b>	Forecasting Chesapeake Bay Fishery Resources
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Description	This project involves development of a model to forecast striped bass recruitment in the Chesapeake Bay, and incorporating these forecasts into management. The model addresses three goals of Executive Order 13508: 1. Provide habitat research to protect and restore Chesapeake Bay living resources and water quality 2. Respond to climate change in the Chesapeake Bay watershed and 3. Strengthen science and decision support for ecosystem management in the Chesapeake Bay and its watershed. Next steps include expanding the model to include all of the Chesapeake Bay, integrating findings into the Atlantic States Marine Fisheries Commission stock assessment, continued evaluation of the use of downscaled climate models, and expansion using this forecasting model as a prototype.
Category	- Climate-change Specific Projects
Sector	- Managed Ecosystems
Focus Area	- Sustainability of Marine Ecosystems
Region	- Regional Or State -- Mid-Atlantic
Status	- Ongoing
Timelines	2009-2014
Lead Agencies	NOAA National Centers for Coastal Ocean Science (NCCOS), Center for Coastal Environmental Health and Biomolecular Research
Contacts	Bob Wood, Director, Cooperative Oxford Laboratory, bob.wood@noaa.gov

<b>Name</b>	<b>Grant to Help University New Hampshire Study Climate Change on Roads, Bridges</b>
Description	As our climate changes, will roadways built to withstand New England winters hold up to increasingly normal Maryland-like summers? If sea levels rise, will ships still be able to pass under bridges? How will the bridges themselves survive more powerful storms? A National Science Foundation grant led by researchers from the University of New Hampshire hopes to jumpstart our ability to answer these questions by bridging the knowledge gap between climate scientists, who understand where the Earth's climate is headed in the future, and the civil engineers and transportation officials who help build those roads and bridges today. The four-year grant, through the NSF's Science, Engineering and Education for Sustainability (SEES) – Research Coordination Networks (RCN) program, is for \$750,000.
Category	- Climate-change Specific Projects
Sector	- Public Health and Safety - Infrastructure
Region	- Regional Or State -- New England
Status	- Ongoing - Planned
Lead Agencies	Nstional Science Foundation, University of New Hampshire
Contacts	Jennifer Jacobs, Univesity of New Hampshire, Jennifer.jacobs@unh.edu

<b>Name</b>	Heat-Related Mortality Risks in the Urban Northeast Under a Changing Climate
<b>Description</b>	The aim of this work is to quantify the exposure- response relationships linking daily temperature and death counts at the urban scale in each of the three project cities: NY, Boston, and Philadelphia. This relationship will be applied to future projections of daily temperatures to assess potential future risks under different scenarios of climate change. Vulnerability indicators will also be developed for the cities of interest and then tested to determine whether mortality impacts vary in association with these indicators. This project builds on preliminary work done for Manhattan in the ClimAid project.
<b>Category</b>	- Climate-change Specific Projects - Research
<b>Sector</b>	- Public Health and Safety
<b>Focus Area</b>	- Changes in Extremes of Weather and Climate
<b>Region</b>	- Regional Or State
<b>Status</b>	- Ongoing
<b>Timelines</b>	Date of Completion, April 2013
<b>Lead Agencies</b>	NOAA Regional Integrated Sciences and Assessments
<b>Contacts</b>	Patrick Kinney, Columbia University, plk3@columbia.edu

<b>Name</b>	High-resolution mapping for Atlantic Canada
<b>Description</b>	Post-doctoral fellows are compiling compiling 5-10 km grids for particular climate variables
<b>Category</b>	- Research
<b>Status</b>	- Planned
<b>Timelines</b>	Completion expected by 2015
<b>Lead Agencies</b>	UPEI Climate Research Lab

<b>Name</b>	Hydro- Meteorological Conditions Associated with Extreme Flooding in the Northeast United States Rivers
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Description	Extreme floods have historically wreaked havoc in both populated and unpopulated areas of the Northeast United States, especially between late winter and mid-spring. During this transition period, intense frontal rainfall can combine with seasonal snowmelt and dramatically increase flooding potential throughout the region. This project analyzes daily streamflow data from Northeast U.S. rivers to identify an ensemble of extreme of flooding events and the hydro-meteorological conditions that precede them. The climatology of the conditions leading to these extreme floods is determined by averaging key meteorological variables over all the identified events to determine what is common to all the events. Addressed is whether or not such conditions can be predicted at longer lead times than those associated with weather forecasting.
Category	- Research
Sector	- Public Health and Safety
Focus Area	- Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate
Region	- Regional Or State
Status	- Ongoing
Timelines	Date of Completion, March 2013
Lead Agencies	NOAA Regional Integrated Sciences and Assessments
Contacts	Yochanan Kushnir, Lamont-Doherty Earth Observatory, Columbia University, kushnir@ldeo.columbia.edu

<b>Name</b>	Implementation of a Drought Mapping Tool in the Eastern United States
Description	The Carolinas Dynamic Drought Index Tool (DDIT) provides a prototype that allows the display of multiple drought indices for different time scales and across user-specified regions. Project goals include expanding the coverage of the tool from the Carolinas to the states served by the Northeast and Southeast Regional Climate Centers, integrating the tool with the stable, near-real time Applied Climate Information System (ACIS) database, and adjusting the interface and functionality of the tool to ongoing user response.
Category	- Monitoring
Sector	- Public Health and Safety - Infrastructure
Focus Area	- Climate Impacts on Water Resources - Changes in Extremes of Weather and Climate
Region	- Regional Or State -- South East
Status	- Completed
Lead Agencies	NOAA Regional Integrated Sciences and Assessments
Contacts	Greg Carbone - greg.carbone@sc.edu, Jinyoung Rhee - rheej@sc.edu, Kirsten Dow - kdow@sc.edu, University of South Carolina

<b>Name</b>	Integrated Water Management Optimization Tool
Description	Abt Associates under contract with EPA/ORD is developing a model to better integrate water supply, waste water, and stormwater "operation" under climate change scenarios.
Category	- Project retrofitted to address climate change
Sector	- Public Health and Safety - Infrastructure
Region	- National - Regional Or State -- New England
Status	- Ongoing
Lead Agencies	EPA ORD, EPA R1
Contacts	Ralph Abele, 617-918-1629

<b>Name</b>	Integrating Regional Downscaling and Hydrologic Models
Description	Stakeholders have expressed interest in the development of climate scenarios for water planning. To this end, CISA (Carolinas Integrated Sciences and Assessments) is using dynamical and statistical downscaling to assess the regional impacts of climate variability and change in the southeast. We are exploring the effects climate-related changes may have on water quality, particularly on dissolved oxygen. Our downscaling efforts center around two data sets: regional climate model (RCM) output from the North American Regional Climate Change Assessment Program (NARCCAP) and statistically downscaled data from the Department of Interior/United States Geological Survey (DOI/USGS).
Category	- Climate-change Specific Projects
Sector	- Public Health and Safety - Infrastructure
Focus Area	- Climate Impacts on Water Resources
Region	- Regional Or State -- South East
Status	- Ongoing
Lead Agencies	NOAA Carolinas Integrated Sciences and Assessments (CISA)/US Geological Survey South Carolina Water Science Center
Contacts	Greg Carbone, University of South Carolina, greg.carbone@sc.edu

<b>Name</b>	Integration and Synthesis of the Georges Bank Broad-Scale Survey Results
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Description	<p>Project Summary: The GLOBEC NW Atlantic/Georges Bank study identified the pelagic early life stages of cod (<i>Gadus morhua</i>) and haddock (<i>Melanogrammus aeglefinus</i>) and the copepod zooplankton, <i>Calanus finmarchicus</i> and <i>Pseudocalanus</i> spp. as target organisms (GLOBEC, 1992) for an extensive and intensive effort to understand the underlying physical and biological processes that control the population dynamics of key populations of marine animals in space and time. Over a six year period, broad-scale surveys of the Georges Bank and adjacent waters were conducted to collect samples for cohort and survivorship analysis of the target fish and zooplankton populations. These surveys included the collection of data on hydrography, acoustics, phytoplankton chlorophyll, competitors, and predators, as well as the target species, in order to provide a description of the biological and physical environment in which the target species resided. More than 30 surveys of the Bank were conducted between January and June/July over the period June 1994 to June 1999.</p> <p>Phase IV of the US GLOBEC Georges Bank program will synthesize the results from the program's earlier phases to provide an integrated understanding of the population dynamics of key, target species and evaluate how a varying climate may influence these populations. Our intent in this proposal is to capitalize on the very comprehensive broad-scale survey data sets that now exist to address two overarching questions:</p> <ol style="list-style-type: none"> <li>1) What controls inter-annual variability in the abundance of the target species on Georges Bank (e.g., bottom up or top down biological processes, or physical advective processes)?</li> <li>2) How are these processes likely to be influenced by climate variability?</li> </ol> <p>Under this proposal, a team of principal investigators will bring together the broad-scale data sets for integrative studies. Most of the analyses to date have been done on an individual or project basis and an integrative approach is needed now. Two general methods of analysis will be used to identify and investigate these patterns and relationships: statistical analysis and inverse modeling using the adjoint method of data assimilation.</p> <p>The broad-scale data sets represent a unique opportunity to explore the spatial and temporal patterns and relationships between the various measured biological and physical fields as they relate to the population dynamics of the target organisms. These results will provide a fundamental foundation for a complete interdisciplinary synthesis involving all components of the GLOBEC Georges Bank program.</p>
Category	- Climate-change Specific Projects
Sector	<ul style="list-style-type: none"> <li>- Managed Ecosystems</li> <li>- Natural Ecosystems</li> <li>- Biota</li> </ul>
Focus Area	- Sustainability of Marine Ecosystems
Region	- Regional Or State -- New England

Status	- Ongoing
Lead Agencies	NOAA National Marine Fisheries Service (NMFS), Woods Hole Oceanographic Institution, University of New Hampshire, San Francisco State University, University of Rhode Island, University of Maine
Contacts	NOAA Center for Sponsored Coastal Ocean Research, coastalocean@noaa.gov

<b>Name</b>	Investigation of the Effects of Sea Level Rise on Sea Turtle, Shorebird, Seabird, and Beach Mouse Nesting Distributions within the South Atlantic Landscape Conservation Cooperative Region
Description	Links long-term survey data for four species of sea turtle, three species of shorebird, five species of seabird, and two beach mouse species to maps of coastal sea level rise vulnerability to understand the effects of sea level rise on population viability and socioeconomic resources. The coastal study areas include nesting beaches from North Carolina south to Melbourne, Florida.
Category	- Research
Sector	- Natural Ecosystems - Biota
Focus Area	- Coasts and Climate Resilience (including sea-level rise) - Conservation/ Restoration of Sensitive Species and Habitats
Region	- Regional Or State -- South East
Status	- Ongoing
Timelines	Will be completed in 2013
Lead Agencies	University of Central Florida, Department of Biology; South Atlantic Landscape Conservation Cooperative
Contacts	Betsy Von Holle, University of Central Florida, Department of Biology, vonholle@ucf.edu

<b>Name</b>	Living Shoreline Project at the Edwin B Forsythe National Wildlife Refuge
Description	The JC NERR, in partnership with Rutgers' Haskins Shellfish Lab and Rutgers' Institute of Marine and Coastal Science's Sandy Hook Lab, have been providing technical assistance and scientific guidance for a living shoreline project along a 150 foot portion of the Refuge's 7-mile Wildlife Drive. This project is to be modeled after the Partnership of the Delaware's living shoreline projects as presented at the Climate Change technical Workshop. The project's goal will be to slow the erosion of the marsh, but the project's objectives will include utilizing volunteers, partners and the public in a hands on stewardship activity, raising the awareness of eroding shorelines and to educate Refuge visitors about the impacts of climate change, specifically sea level rise. Planning for this project begins on May 11, 2010. As of late-spring, both the NJ Land Use Regulations Department and the Army Corps of Engineers have given the permits needed. The installation and planting will commence in spring 2012.

Category	- Climate-change Specific Projects
Sector	- Natural Ecosystems
Focus Area	- Coasts and Climate Resilience (including sea-level rise)
Region	- Regional Or State -- Mid-Atlantic
Status	- Ongoing
Lead Agencies	JC NERR, Rutgers' Haskins Shellfish Lab and Rutgers' Institute of Marine and Coastal Science's Sandy Hook Lab

<b>Name</b>	<b>Lower Cape Fear Watershed Study</b>
Description	Using the Lower Cape Fear watershed and its subwatersheds as a study area, this project aims to assess water availability and use over time, under different scenarios, at several temporal and spatial scales. This project will involve documenting past, current, and potential future patterns of water availability (i.e., supply) and past, current, and potential future patterns of demand, by land use and by sector and will incorporate various climate change scenarios.
Category	- Climate-change Specific Projects - Research
Sector	- Infrastructure - Natural Ecosystems
Focus Area	- Climate Impacts on Water Resources
Region	- Regional Or State -- South East
Status	- Ongoing
Lead Agencies	NOAA Carolinas Integrated Sciences and Assessments (CISA)
Contacts	Burrell Montz, East Carolina University, montzb@ecu.edu

<b>Name</b>	<b>Major research project on coastal infrastructure and adaptation planning</b>
Sector	- Infrastructure
Status	- Planned
Timelines	Expected completion: December 2015
Lead Agencies	UPEI Climate Lab

<b>Name</b>	<b>major research project on economic costs of adaptation and non-action</b>
Sector	- Economic Resources - Cross Disciplinary
Status	- Planned
Timelines	Expected completion: December 2015

<b>Name</b>	Mapping of At Risk Waste Water and Drinking Water Assets
<b>Description</b>	Identification and mapping (GIS)of waste water infrastructure and drinking water assets at risk of flooding
<b>Category</b>	- Climate-change Specific Projects - Project retrofitted to address climate change
<b>Sector</b>	- Infrastructure
<b>Focus Area</b>	- Climate Impacts on Water Resources
<b>Region</b>	- Regional Or State -- New England
<b>Status</b>	- Ongoing
<b>Lead Agencies</b>	EPA R1
<b>Contacts</b>	Marcel Belaval, belaval.marcel@epa.gov

<b>Name</b>	Mapping the Distribution, Abundance and Risk Assessment of Marine Birds in the Northwest Atlantic: Phase 1
<b>Description</b>	This project will develop a series of maps depicting the distribution, abundance and areas of high, medium and low risk to marine birds from offshore activities (e.g., energy development) in the northwestern Atlantic Ocean. There are numerous efforts underway to identify marine habitats of importance to marine birds in the offshore environments of the eastern U.S. Many of these efforts are gathering similar types of information (i.e., baseline data) but are focusing on different regions and using different technologies. This project will bring together a unique partnership to pull together data from a variety of sources, including ships of opportunity, aerial surveys, species-specific telemetry studies, and the historic (from the 1970s to present) marine bird database (Atlantic Seabird Compendium) maintained by the U.S. Geological Survey (USGS). These data will be used to model distribution and abundance patterns of many species or species groups of seabirds and then combine them with species risk assessments to create a spatially explicit risk surface. The resulting “best bird map” can be used for informing decisions about siting offshore activities such as wind turbine installations, marine spatial planning efforts, or other uses requiring maps of seabird distributions such as identifying marine protected areas. The goal of this effort is to document and predict areas of frequent use and aggregations of birds and the relative risk to marine birds within these areas. The resulting risk surface can be used to inform offshore energy development and, more generally, marine spatial planning efforts about the importance of the pelagic habitats to marine birds.
<b>Category</b>	- Climate-change Specific Projects - Research
<b>Sector</b>	- Infrastructure - Natural Ecosystems - Biota

Region	- Regional Or State -- New England -- Mid-Atlantic
Status	- Ongoing
Timelines	Start Date 2011; End Date December 2013
Lead Agencies	U.S. Fish and Wildlife Service, North Atlantic Landscape Conservation Cooperative, and Northwestern Atlantic Marine Bird Conservation Cooperative
Contacts	Tim Jones, Science Coordinator, Atlantic Coast Joint Venture, Tim_Jones@fws.gov

<b>Name</b>	<b>Maryland State Wildlife Action Plan Update</b>
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.
Sector	- Natural Ecosystems - Biota
Focus Area	- Conservation/ Restoration of Sensitive Species and Habitats
Region	- Regional Or State -- Mid-Atlantic
Status	- Ongoing - Completed
Lead Agencies	Maryland DNR Division of Wildlife and Heritage
Contacts	Dana Limpert, dlimpert@dnr.state.md.us

<b>Name</b>	<b>Mitigating Shoreline Erosion along the Hudson River Estuary's Sheltered Coasts</b>
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Description	This project has several components including evaluating and comparing ecological functions of six types of natural and engineered shoreline present in the Hudson Estuary, conducting an engineering analysis to evaluate selected shore protection measures, and characterizing the short- and long-term costs of different shoreline hardening, vegetating approaches, and land use management measures used to control erosion characterizing legal framework and identify legal and regulatory opportunities for enhancing shoreline protection, and involving stakeholders. A key component also addresses climate change, specifically the project is developing more accurate regional projections of climate impacts. This involves collecting LiDAR data for the New York Shoreline and initiating a conversation on adaptation entitled Shoreline and Habitat Adaptation Dialog.
Category	- Research
Sector	- Infrastructure - Natural Ecosystems
Focus Area	- Coasts and Climate Resilience (including sea-level rise)
Region	- Regional Or State -- Mid-Atlantic
Status	- Ongoing
Timelines	Start 2008
Lead Agencies	Hudon River National Estuarine Research Reserve
Contacts	Betsy Blair, Hudson River NERR (HRNERR)

<b>Name</b>	<b>Modeling of the Winyah Bay Watersheds</b>
Description	We use EPA's BASINS Hydrologic Simulation Program-Fortran (HSPF) model to address hydroclimatological variability in the Winyah Bay watershed. We have calibrated HSPF simulation models for the Yadkin Pee-Dee (from the NC mountains to the SC coast), Waccamaw, and Black Rivers at the 8-digit HUC level so that local variability within each watershed can be adequately addressed. This basin-wide approach to hydrological modeling appeals to a range of stakeholders, including water managers, natural resource managers (e.g. National Wildlife Refuges, state parks), Riverkeepers, citizen-advocates, Native American peoples, and state and national regulatory agency staff.
Category	- Research
Sector	- Infrastructure
Focus Area	- Climate Impacts on Water Resources
Status	- Ongoing
Lead Agencies	NOAA Carolinas Integrated Sciences and Assessments (CISA)
Contacts	Dan Tufford, CISA, c/o Climate Research Lab, USC Dept. of Geography, Columbia, SC 29208

<b>Name</b>	<b>Narragansett Bay Estuary Program Transportation Workplan</b>
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Description	Narragansett Bay Estuary Program is involved in a transportation-related work plan. RI and MA signed-on to an 11-state initiative that recognizes the role of land-use and transportation in climate change and pledges to develop a three-year "work plan" by fall 2010 outlining how the region can cut vehicle GHGs. That will be followed by long-term policy proposals that could be implemented by state agencies or legislatures, with the goal of reducing driving and increasing the density of commercial and residential housing hubs.
Sector	- Infrastructure
Region	- Regional Or State -- New England
Status	- Planned
Lead Agencies	Narragansett Bay Estuary Program
Contacts	Margherita Pryor

<b>Name</b>	<b>Navigating from Concern to Action Using the NOAA Roadmap in New Hampshire's Small Coastal Communities</b>
Description	The purpose of this project is to help a small NH coastal community (Newfields) with a volunteer-board government move climate preparedness from concern to action by using the NOAA Roadmap for Adapting to Coastal Risks (NOAA Roadmap). The Roadmap is a communitydriven process, and will capitalize on existing and emerging partnerships, data, information, expertise and engagement. The NOAA Roadmap project will expand capacity in Newfields to respond to climate preparedness through (1) increased knowledge about vulnerabilities of community assets (2) awareness of climate adaptation options. The NOAA Roadmap process will also help to implement community-driven actions that facilitate integrating climate adaptation strategies into their existing plans, policies and practices. It is planned to collaborate with NH CAW in this project. Following this pilot project to adapt the NOAA Roadmap for a small NH coastal watershed community, the NH Natural Resources Outreach Coalition (NROC) and the NH Coastal Adaptation Workgroup (CAW) will seek to transfer the process to other small NH coastal watershed communities.
Sector	<ul style="list-style-type: none"> <li>- Public Health and Safety</li> <li>- Infrastructure</li> <li>- Managed Ecosystems</li> <li>- Natural Ecosystems</li> <li>- Economic Resources</li> <li>- Recreation and Tourism</li> </ul>
Focus Area	- Coasts and Climate Resilience (including sea-level rise)
Region	- Regional Or State -- New England
Status	- Ongoing
Lead Agencies	UNH
Contacts	Amanda Stone, UNH Extension or Chris Keeley, UNH (Amanda.stone@unh.edu or chris.keeley@unh.edu)

<b>Name</b>	New Brunswick Climate Change Indicators
<b>Description</b>	The New Brunswick Climate Change Indicators website provides local information to help New Brunswickers better understand how the climate is changing. Indicators include temperature, extreme rainfall, sea level, coastal erosion, coastal storms, sea ice, river ice, home heating, home cooling, snow season and agricultural crops.
<b>Status</b>	- Ongoing
<b>Timelines</b>	ongoing
<b>Lead Agencies</b>	New Brunswick Environment & Local Government

<b>Name</b>	New Brunswick Climate Futures
<b>Description</b>	<p>The New Brunswick Climate Futures system lets users explore how the climate is expected to change under different greenhouse emission scenarios to the year 2100. The information is presented in the form of maps, which are accompanied by supporting explanatory text. In addition, access is provided to the raw data, enabling users to explore the results further according to their needs. Results are available for 29 different variables, and show, for example, that by the 2080s, mean temperatures are predicted to increase by around 3-3.5 degrees C. This will mean that northern areas of the province will have a temperature climate similar to that in southern New Brunswick today, while southern areas will become as warm as it is currently is in parts of southern Ontario.</p> <p>Data types include seasonal mean temperatures, annual cooling/heating/growing days, days with specified maximum temperatures, and annual snow and rain days. The site offers the data in map format, raw data and PDF format.</p>
<b>Category</b>	- Climate-change Specific Projects
<b>Status</b>	- Ongoing
<b>Lead Agencies</b>	Atlantic Climate Adaptation Solutions Association

<b>Name</b>	New Brunswick Flood History Database
<b>Description</b>	This system contains records of flood events in New Brunswick from 1696 to the present. The database has been compiled from multiple sources and is currently maintained by the Department of Environment and Local Government. Each record contains descriptive information on each flood, plus information on causes, magnitude, the areas affected, and (if applicable) the nature and cost of damages. The database is fully searchable and some records include photos and other supporting information.
<b>Category</b>	- Research
<b>Sector</b>	<ul style="list-style-type: none"> <li>- Infrastructure</li> <li>- Economic Resources</li> </ul>

Status	- Ongoing
Timelines	ngoing
Lead Agencies	New Brunswick Environment & Local Government

<b>Name</b>	New Brunswick Riverwatch
Description	The River Watch program and website provides awareness of potential flood risks and encourages residents to be prepared for flooding events. Coordinated by the New Brunswick Emergency Measures Organization in conjunction with provincial, federal and state agencies, the program involves monitoring and flow forecasting in the St. John River Basin. The site includes information on snow surveys, flood preparedness, historic water levels and flood photos and more.
Category	- Monitoring
Sector	- Public Health and Safety - Infrastructure
Status	- Ongoing
Timelines	Ongoing.

<b>Name</b>	New Brunswick Water Quantity Information: Rainfall, Snowfall, Stream Flow and Groundwater
Description	The Sciences and Reporting Branch of the Department of Environment prepares a monthly summary of water levels in the province based on precipitation and stream flow data for the previous 6 months. These summaries provide information on amount of rain and snow fall (precipitation); volume of water flowing in rivers and streams (stream flow); and water levels in selected wells used to keep track of groundwater and compare current data to long-term averages.  An outlook offers regional water-level information and a precipitation forecast (and notes, when warranted, the need for water conservation). Information for a given month is normally updated by the middle of the following month.
Category	- Monitoring
Sector	- Public Health and Safety - Infrastructure
Status	- Ongoing
Timelines	Ongoing
Lead Agencies	New Brunswick Environment & Local Government

<b>Name</b>	New England Climate Adaptation Project
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Description	The Massachusetts Institute of Technology Science Impact Collaborative (MIT SIC) is working with the National Estuarine Research Reserve System (NERRS) and the Consensus Building Institute (CBI) to test an innovative way to help coastal communities understand and prepare for the potential impacts of climate change. With a grant from the NERRS Science Collaborative (NSC), we are collaborating with four at-risk New England towns—Barnstable, MA; Cranston, RI; Dover, NH; and Wells, ME—to assess local climate change risks, identify key challenges and opportunities for adaptation, and test the use of role-play simulations as a means to educate the public about climate change threats and to help communities explore ways of decreasing their vulnerability and enhancing their resilience to climate change impacts. We anticipate that this project will provide valuable insights into techniques for engaging communities in public learning, risk management, and collaborative decision-making. We also hope that communities in New England and elsewhere will be able to build on what we learn as they prepare for climate change.
Category	- Climate-change Specific Projects
Sector	- Public Health and Safety - Infrastructure
Focus Area	- Coasts and Climate Resilience (including sea-level rise)
Region	- Regional Or State -- New England
Status	- Ongoing
Timelines	Fall 2012-Spring 2013
Lead Agencies	Massachusetts Institute of Technology, NOAA National Estuarine Research Reserve System (NERRS) Science Collaborative
Contacts	Danya Rumore, Massachusetts Institute of Technology Science Impact Collaborative, drumore@mit.edu

Name	Northeast Regional Coastal and Marine Ecological Classification Standard
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Description	This project will integrate NOAA and NatureServe's Coastal and Marine Ecological Classification Standard (CMECS) and the Nature Conservancy and NatureServe's Northeast Regional Habitat Classification System (NRHCS) in order to extend the latter system to estuarine and marine environments from Maine to Virginia. Several commonalities already exist between the two schemes; namely each has a multi-scale hierarchical framework, relies on structural environmental features, and seeks to convey physical-biological linkages. Making CMECS and NRHCS compatible will bring appropriate specificity to the application of the national CMECS standard to the region. Coordination will take place between state, academic, and non-profit partners and existing ocean partnerships (NROC and MARCO) to identify and cross-walk existing state marine classification systems. The scalability of this classification will be examined by conducting pilot mapping projects at three different scales relevant to planning and conservation efforts. At the smallest scale (1:5,000,000), the classification will be applied to the Nature Conservancy's 2010 Northwest Atlantic Marine Assessment. An intermediate-scale classification (1:250,000) will utilize datasets assembled for marine spatial planning efforts in Rhode Island, Massachusetts, and adjacent federal waters. Finally, estuary-specific, high-resolution information for Boston Harbor (1:5,000 scale) will be classified. These pilots will allow assessment of the ability of CMECS to convey consistent ecological data across relevant scales. Workshops and phone meetings will happen in the first year followed by the pilot efforts in the second year.
Category	- Research
Sector	- Natural Ecosystems
Focus Area	- Conservation/ Restoration of Sensitive Species and Habitats
Region	- Regional Or State -- New England -- Mid-Atlantic
Status	- Ongoing
Timelines	End Date December 31, 2013
Lead Agencies	The Nature Conservancy
Contacts	Mark Anderson, Director of Science, The Nature Conservancy

<b>Name</b>	<b>Nova Scotia Climate Change Adaptation Fund</b>
Description	Created in 2009, the Climate Change Adaptation Fund program supports efforts by communities to understand the vulnerability they are facing, and their actions to prepare for and adapt to the impacts of climate change. Details on funding, evaluation, timeline and past projects are listed on the Fund's website.
Sector	- Cross Disciplinary
Status	- Ongoing
Timelines	ongoing
Lead Agencies	Nova Scotia Environment
Contacts	adaptationfund@gov.ns.ca.

Name	Ocean Acidification - Effects of Ocean Acidification on <i>Emiliana huxleyi</i> and <i>Calanus finmarchicus</i> ; Insights Into the Oceanic Alkalinity and Biological Carbon Pumps
Description	From the project abstract available at nsf.gov: The overall goal of this research is to parameterize how changes in pCO <sub>2</sub> levels could alter the biological and alkalinity pumps of the world ocean. Specifically, the direct and indirect effects of ocean acidification will be examined within a simple, controlled predator/prey system containing a single prey phytoplankton species (the coccolithophore, <i>Emiliana huxleyi</i> ) and a single predator (the oceanic metazoan grazer, <i>Calanus finmarchicus</i> ). The experiments are designed to elucidate both direct effects (i.e. effects of ocean acidification on the individual organisms only) and interactive effects (i.e. effects on the combined predator/prey system). Interactive experiments with phytoplankton prey and zooplankton predator are a critical starting point for predicting the overall impact of ocean acidification in marine ecosystems. To meet these goals, a state-of-the-art facility will be constructed with growth chambers that are calibrated and have highly-controlled pH and alkalinity levels. The strength of this approach lies in meticulous calibration and redundant measurements that will be made to ensure that conditions within the chambers are well described and tightly monitored for DIC levels. Growth and calcification rates in coccolithophores and the developmental rates, morphological and behavioral effects on copepods will be measured. The PIC and POC in the algae and the excreted fecal pellets will be monitored for changes in the PIC/POC ratio, a key parameter for modeling feedback mechanisms for rising pCO <sub>2</sub> levels. In addition, <sup>14</sup> C experiments are planned to measure calcification rates in coccolithophores and dissolution rates as a result of grazing. These key experiments will verify closure in the mass balance of PIC, allowing the determination of actual dissolution rates of PIC within the guts of copepod grazers.
Sector	- Natural Ecosystems - Biota
Focus Area	- Sustainability of Marine Ecosystems
Region	- Regional Or State -- New England -- Mid-Atlantic
Status	- Ongoing
Timelines	2012-2015 (estimated)
Lead Agencies	National Science Foundation (NSF) Division of Ocean Sciences (OCE) and Directorate for Geosciences (GEO); Bigelow Laboratory for Ocean Sciences, East Boothbay, ME
Contacts	William Balch, <a href="mailto:bbalch@bigelow.org">bbalch@bigelow.org</a> (Principal Investigator), Bigelow Laboratory for Ocean Sciences

Name	Ocean Acidification and Sea Scallops: Predicting Impacts of Climate Change
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Description	From the project description: "This project supports development of an integrated assessment model for sea scallops which incorporates ocean acidification trends and which will enable comparison of potential outcomes based on different choices. The model will connect biogeochemical, population, and economic information to create an integrated assessment model. The biogeochemical component will provide environmental data including ocean acidification trends that will feed into the population component in order to predict sea scallop harvest quantities. Sea scallop harvest quantities will drive the regional economic component in which scallop fishing and coastal zone policy decisions will affect the population and biogeochemical information. The integrated assessment model will be modular so that each component can be refined or replaced as new data and components become available. As a web-based interactive tool, the model will enhance decisions by providing managers with visual displays of outcomes based on different choices affecting scallop harvests, environmental conditions, and socioeconomic conditions."
Category	- Climate-change Specific Projects
Sector	- Managed Ecosystems
Focus Area	- Sustainability of Marine Ecosystems
Region	- Regional Or State -- New England -- Mid-Atlantic
Status	- Ongoing
Timelines	2012-2015
Lead Agencies	NOAA National Centers for Coastal Ocean Science (NCCOS) Regional Ecosystem Prediction Program (REPP), NOAA Ocean Acidification Program
Contacts	Elizabeth Turner, NOAA, elizabeth.turner@noaa.gov; Sarah Cooley, Woods Hole Oceanographic Institute, scooley@whoi.edu

Name	Ocean Acidification, Hypoxia and Warming: Experimental Investigations into Compounded Effects of Global Change on Benthic Foraminifera
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Description	Excerpted from project summary at nsf.gov: This research, led by a scientist from the Woods Hole Oceanographic Institution, studies the compounded effects of ocean acidification, hypoxia, and warming on an assemblage of benthic foraminifera collected from the continental shelf off New England. Foraminifera are an ideal organism for this work because they (1) are relatively small, allowing experimentation on statistically significant populations; (2) have both calcareous and non-calcareous representatives; (3) are relatively short-lived so experiments include a major portion of their life cycle; (4) include aerobes and anaerobes; and (5) provide a fossil record allowing comparisons across time. Laboratory culturing experiments will be used to determine the response of benthic foraminifera, in terms of survival and growth, to co-varying parameters of pH and oxygen, and to explore the influence of increased temperature on these responses. The researchers will examine the relative effects of higher pCO <sub>2</sub> , lower [O <sub>2</sub> ], and higher temperature (T) on both calcareous and non-calcareous benthic foraminifera. In addition, they will examine the pre-Industrial benthic foraminiferal assemblage at the field site, and will compare that assemblage to those produced in the experiments under pre-Industrial (lower than current day) and elevated pCO <sub>2</sub> levels.
Sector	<ul style="list-style-type: none"> <li>- Managed Ecosystems</li> <li>- Natural Ecosystems</li> <li>- Biota</li> </ul>
Focus Area	- Sustainability of Marine Ecosystems
Region	<ul style="list-style-type: none"> <li>- National</li> <li>- Regional Or State -- New England -- Mid-Atlantic -- South East</li> </ul>
Status	- Ongoing
Timelines	2012-1015 (estimated)
Lead Agencies	National Science Foundation (NSF) Division of Ocean Sciences (OCE), Directorate for Geosciences (GEO); Woods Hole Oceanographic Institution, Woods Hole, MA
Contacts	Joan Bernhard, jbernhard@whoi.edu (Principal Investigator), WHOI

Name	Ocean Acidification: The Influence of Ocean Acidification and Rising Temperature on Phytoplankton Proteome Composition
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Description	From the project summary available at nwf.gov: In this project, a research team at the Woods Hole Oceanographic Institution will investigate physiological mechanisms set into motion by the environmental stimuli associated with ocean acidification by quantifying changes in the proteome of four marine phytoplankton species: the abundant cyanobacteria <i>Synechococcus</i> and <i>Prochlorococcus</i> , the key nitrogen fixing cyanobacterium <i>Crocosphaera</i> , and an Antarctic diatom <i>Nitzschia</i> sp., in response to ocean acidification. In recent years, the team has adapted and developed quantitative proteomic capabilities for marine microbes using liquid chromatography mass spectrometry systems. The approach has become virtually routine and could be applied to a variety of problems related to ocean acidification. In addition, because of the climatic link between ocean acidification and global warming, the synergistic influences of increasing temperature will also be studied.
Category	- Climate-change Specific Projects
Sector	- Natural Ecosystems - Biota
Focus Area	- Sustainability of Marine Ecosystems
Region	- Regional Or State -- New England -- Mid-Atlantic -- South East
Status	- Ongoing
Timelines	2012-2015 (estimated)
Lead Agencies	National Science Foundations (NSF), Division of Ocean Sciences (OCE), Directorate for Geosciences (GEO); Woods Hole Oceanographic Institute, Woods Hole, MA
Contacts	Mak Saito (Principal Investigator), Woods Hole Oceanographic Institute, msaito@whoi.edu

Name	Otolith Condition and Growth of Juvenile Scup, <i>Stenotomus chrysops</i> , and Embryonic and Larval Development in the Black Sea Bass ( <i>Centropristis striata</i> spp.)
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Description	<p>This study explores the effects of elevated levels of CO<sub>2</sub> on scup (<i>Stenotomus chrysops</i>), and the black sea bass (<i>Centropristis striata</i> spp.), two important marine fish that are caught both recreationally and commercially in the eastern US. Scientists at NOAA's Milford Laboratory at Northeast Fisheries Science Center are examining the otoliths of scup, a structure in the inner ear that is comprised in part of aragonite, one of two forms of calcium carbonate. Because otoliths are comprised of a carbonate mineral, their formation (via calcification) can be directly affected by changes in the ocean's carbonate chemistry, or ocean acidification. Otoliths are linked to a fish's sensory ability and thus, if altered by changes in pCO<sub>2</sub>, could affect the feeding behavior of scup, and could potentially impact the fishery and food web dynamics.</p> <p>The scup study examined structural abnormalities, asymmetries, size and mass of the otoliths as a function of pCO<sub>2</sub> levels (900, 1,500, and 2,200 ppm). Additionally somatic growth (i.e. length and weight) in young-of-the-year fish was analyzed due to the potential reduction in growth caused by a possible increase in energy required to maintain otolith growth at increased pCO<sub>2</sub> concentrations. Results showed no significant difference in the mass, or size of the otoliths and no asymmetries were detected in any of the otoliths from any of the treatments. Results also indicated no significant difference in the length of scup as a function of CO<sub>2</sub> levels, although the weight of the fish increased with increased pCO<sub>2</sub> concentration.</p> <p>Also, all of the scup were subjected to x-ray analysis to determine if there were any skeletal or calcification anomalies. Preliminary findings indicate greater than normal deposition of calcium in the vertebrae in a few fish exposed to increased levels of CO<sub>2</sub>.</p> <p>Additionally, this year black sea bass embryo and larval development will be examined experimentally to determine the sensitivity of different early-life stages to ocean acidification. This is crucial information to understand the impacts of changing ocean chemistry on future fish stocks.</p>
Category	- Climate-change Specific Projects
Sector	- Managed Ecosystems
Focus Area	- Sustainability of Marine Ecosystems
Region	- Regional Or State -- New England
Status	- Ongoing
Lead Agencies	NOAA Northeast Fisheries Science Center
Contacts	Dean Perry, dean.perry@noaa.gov

Name	Overcoming the obstacles and capitalizing on the incentives for climate change adaptation in coastal environmental justice communities
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Description	This project engages residents in environmental justice groups along the eastern shore of the Chesapeake Bay and Boston Metropolitan Area's coastal communities to inform about climate change impacts and present adaptation strategies. The initial research phase identified obstacles to adaptation within the study groups. Phase 2 will focus on facilitating collaborative learning between local, state and federal agencies to create protocol for engaging diverse stakeholder groups in adaptation planning.
Category	- Climate-change Specific Projects - Research
Sector	- Public Health and Safety
Focus Area	- Coasts and Climate Resilience (including sea-level rise)
Region	- Regional Or State -- New England -- Mid-Atlantic
Status	- Ongoing
Timelines	2011/2013
Lead Agencies	NOAA Climate Program Office, Climate and Societal Interactions (CSI)
Contacts	Ellen Douglas, ellen.douglas@umb.edu, Jack Wiggins, jack.wiggin@umb.edu, University of Massachusetts, Boston

Name	Patterns of Energy Flow and Utilization on Georges Bank
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Description	<p>From the project summary: The overall objective of the research is to provide a broad ecosystem context for interpretation of the population dynamics of the Georges Bank GLOBEC target species. The proposed research will synthesize key aspects of production and energy flow, based on US-GLOBEC studies in the Northwest Atlantic, and augment the US-GLOBEC data with information from other sources on production processes at the lower and upper levels of the food web. The primary objectives are to examine several alternate model outcomes of GLOBEC and GLOBEC-related studies that will help to address a number of outstanding issues and to reexamine patterns of energy flow on Georges Bank. The proposed research will enhance and expand the findings of previous investigations, with explicit consideration of factors not addressed in earlier models of this system including:</p> <ol style="list-style-type: none"> <li>(1) the microbial food web,</li> <li>(2) consideration of new and recycled primary production,</li> <li>(3) spatial heterogeneity of primary and secondary production on Georges Bank,</li> <li>(4) changes in biomass and production at higher trophic levels, and</li> <li>(5) the effects of environmental forcing on production processes.</li> </ol> <p>Incorporation of these elements into the modeling effort will permit a more detailed understanding of production processes on the Bank. The first four elements will help provide the broader ecosystem context, while the last provides the link to one of the US-GLOBEC program's principal themes, climate change. The latter will be addressed by comparing several different decadal-scale time periods that reflect differing environmental and fish community regimes:</p> <ol style="list-style-type: none"> <li>(1) the cold 1960s characterized by abundant groundfish stocks fished by distant water fleets;</li> <li>(2) the 1970s, characterized by "average" water temperatures, increased domestic fishing effort and depletion of groundfish stocks;</li> <li>(3) the 1980s, characterized by "average" water temperatures, overfishing of groundfish stocks, and increases in elasmobranchs; and</li> <li>(4) the "average" temperature, lower salinity 1990s, characterized by reduced fishing mortality, rebuilding of groundfish stocks, and increases in elasmobranchs and pelagic fish.</li> </ol> <p>Because of large-scale changes in the fish community structure as a result of over-exploitation, a full understanding of the population dynamics of the target species cannot be attained without consideration of changes in other ecosystem components. Individual model networks will be formulated initially to represent each of the above periods. Subsequently, dynamic modeling will be developed to describe the transformations or shifts between these regimes.</p>
Category	- Research
Sector	- Natural Ecosystems
Focus Area	- Sustainability of Marine Ecosystems
Region	- Regional Or State -- New England
Status	- Completed

Lead Agencies	NOAA National Marine Fisheries Services (NMFS), Woods Hole Oceanographic Institution, University of Massachusetts Dartmouth, University of Rhode Island, Bigelow Laboratory for Ocean Sciences
Contacts	NOAA Center for Sponsored Coastal Ocean Research, coastalocean@noaa.gov

<b>Name</b>	Phase IV Support for the Scientific Investigators' Synthesis Symposia
Description	Project Description: The U.S. GLOBEC (GLOBal ocean ECosystems dynamics) research program on Georges Bank, which was initiated in 1994, conducted a three-phase broad-scale and process-oriented field study for a six year period ending in December 1999. During the same period, modeling and retrospective/synthesis analyses were also taking place. The field program has now been completed and many scientific papers describing the results of specific experiments and events have been published. However, a directed effort now is needed to enable investigators who participated in the program and other investigators to collectively bring about an integration and synthesis of the data sets in order to reach a new level of understanding about the physical and biological processes controlling the abundance of target species in the Georges Bank region and more generally of their predators and prey. Phase IV of the US GLOBEC Georges Bank program is thus focused on the synthesis of the results from the program's earlier phases. Each year a series of related workshops will be held to focus on a particular step in the synthesis. Each workshop will focus on a specific topic with a set of specific objectives. At the end of each year a symposium will be held to present the products of these integrated analyses. The last year of the synthesis will be dedicated to the production of a book that will present the overall results of the program and address the original programmatic goals articulated in the Implementation Plan (GLOBEC Report 6).
Category	- Climate-change Specific Projects
Sector	- Managed Ecosystems - Natural Ecosystems - Biota
Focus Area	- Sustainability of Marine Ecosystems
Region	- National - Regional Or State -- New England -- Mid-Atlantic
Status	- Ongoing
Lead Agencies	Woods Hole Oceanographic Institution
Contacts	NOAA Center for Sponsored Coastal Ocean Research, coastalocean@noaa.gov

<b>Name</b>	Planning for climate vulnerability in the Urban Northeast: A review of state and local-level planning and the use of climate risk and vulnerability methodologies and tools
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Description	The state and city governments in the study area of the urban Northeast are at different stages of developing plans to address climate change. Critically, these plans draw upon a diverse set of understandings and meanings for what constitutes risk and vulnerability. The governments' reports and policy documents illustrate a range of approaches to assessing, quantifying and addressing climate related risks and the most vulnerable populations. This paper provides a comparative analysis of the conceptual and practical approaches of the states and cities to climate risk and vulnerability. The analysis draws on publicly available documents from Connecticut, Massachusetts, New Jersey, New York, Pennsylvania and Rhode Island. In order to fill some of the gaps identified in integrating climate vulnerability into planning, the paper also briefly explores the landscape of tools for and approaches to assessing climate vulnerability and risk, and the resources available to help planners integrate these factors into policy and action.
Category	- Climate-change Specific Projects
Sector	- Cross Disciplinary
Region	- Regional Or State
Status	- Ongoing
Timelines	2012
Lead Agencies	NOAA Climate Program Office, Climate and Societal Interactions (CSI)
Contacts	Shiv Someshwar, The International Research Institute for Climate and Society (IRI), Columbia University, someshwar@iri.columbia.edu

<b>Name</b>	<b>Portsmouth Coastal Resilience Initiative</b>
Description	This project will utilize consulting services to supplement City staff hours to provide an inventory, analysis and recommendations that will be easily integrated into the Master Plan update process (scheduled to start in July 2012), the building code, and the City's capital improvement plan. This project will explore various climate change scenarios to understand the City's future vulnerabilities to and the consequences of climate change. A Risk Management plan will be developed to address different climate change risks and to incorporate low and high cost responses over the short and long term. Public outreach will include use of the City's website to publish information about climate change as well as solicit input from the public to be used as the basis for the community process that will be part of the Master Plan update. Neither the concept of climate adaptation nor the options for responding to potential coastal risks from climate change are widely understood in the general populace. This process will enable the City to undertake focused outreach around climate adaptation, without encumbering the Master Plan process.
Sector	- Public Health and Safety - Infrastructure - Natural Ecosystems - Economic Resources

Focus Area	- Coasts and Climate Resilience (including sea-level rise)
Region	- Regional Or State -- New England - Local/City
Status	- Ongoing
Timelines	July 2002
Lead Agencies	City of Portsmouth New Hampshire
Contacts	Peter Britz, Environmental Planner, City of Portsmouth, NH plbritz@cityofportsmouth.com

<b>Name</b>	Predicting Impacts of Ocean Acidification on Northeast US Shellfish
Description	From project description: "Two shellfish species are being studied: hard clams ( <i>Mercenaria mercenaria</i> ) and bay scallops ( <i>Argopecten irradians</i> ). These species are selected because they are commercially valuable, are especially vulnerable to ocean acidification, have different life histories, and show different sensitivities to ocean acidification. Population models will consider the survival, growth and reproduction of each species under various ocean acidification conditions. Field surveys will be performed to measure ocean chemistry at different sites within Rhode Island and New York estuaries. This data will be combined with 100-yr carbon emission scenarios to assess impacts of ocean acidification. By modeling two species with contrasting life histories and ocean acidification susceptibilities combined with comprehensive mapping of water chemistry in estuaries, the resulting predictions will enhance development of adaptation and management plans for these and other bivalve fisheries, provide guidance on sustainable harvest levels, and identify regions of estuaries that are most vulnerable to extremes in acidification. All information will be disseminated to regional shellfish and water quality managers through a workshop format.
Sector	- Managed Ecosystems
Focus Area	- Sustainability of Marine Ecosystems
Region	- Regional Or State -- New England -- Mid-Atlantic
Status	- Ongoing
Timelines	2012-2015
Lead Agencies	NOAA National Centers for Coastal Ocean Science (NCCOS) Regional Ecosystem Prediction Program (REPP), NOAA Ocean Acidification Program
Contacts	Elizabeth Turner, NOAA, elizabeth.turner@noaa.gov,

<b>Name</b>	Prime Hook National Wildlife Refuge Salinity/ Nutrient/ Sediment/ Water Level Study
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Description	From the Delaware Sea-Level Rise Compendium 2011: Investigation of sea-level rise and other climate change impacts, specifically salinity changes, nutrient inputs and sediment transport within the coastal impoundments at Prime Hook, is being conducted to determine the consequences of management practices and natural events. Data collection will involve installing monitoring equipment to measure salinity and water level, and conducting salinity transects within the impoundments. Water quality will also be monitored, specifically total sediment solids (TSS) and nitrogen/phosphorus compounds to aid in determining sediment and nutrient fluxes in and out of the impoundments. This study will result in installation of real-time monitoring network; written reports that include summary of results; discussion of data analysis and statistical procedures. Results will be used to quantify current conditions in the impoundments and predict future changes of future management techniques.
Category	- Monitoring
Sector	- Managed Ecosystems
Focus Area	- Coasts and Climate Resilience (including sea-level rise)
Region	- Regional Or State -- Mid-Atlantic
Status	- Ongoing
Lead Agencies	Delaware Coastal Programs; U.S. Fish and Wildlife Service

<b>Name</b>	Promoting Climate Change Awareness and Adaptive planning in Atlantic Fisheries Communities Using Participatory Vulnerability Analysis, Mapping, and Systems Dynamic Modeling
Description	Multiple climate change induced stressors will impact marine fishing, a significant economic and cultural resource for the US Atlantic coast. Fisheries managers and local stakeholders will need to understand how these stressors produce impacts, and how they might be mitigated. Research funded by the NOAA Climate Program Office will investigate impacts of climate change on fishing communities and economies, and develop preliminary tools to support decision makers addressing these challenges. Research will take place in South Carolina, Massachusetts, and Maine.
Category	- Climate-change Specific Projects
Sector	- Managed Ecosystems
Focus Area	- Sustainability of Marine Ecosystems
Region	- Regional Or State -- New England -- South East
Status	- Ongoing
Timelines	2012/2014
Lead Agencies	NOAA Climate Program Office
Contacts	Esperanza Stancioff, U of ME Coop. Ext./Sea Grant, esp@umext.maine.edu, Jessica C. Whitehead, S. C./N. C. Sea Grant, jess.whitehead@seagrants.org, Seth P. Tuler, sptuler@seri-us.org, Thomas Webler, twebler@seri-us.org, Social & Env. Res. Institute

<b>Name</b>	Protecting Delaware's Coastal Impoundments from Sea Level Rise
<b>Description</b>	Delaware Division of Fish and Wildlife (DFW) employed a formal Structured Decision-Making process to reconsider and re-evaluate its management objectives for coastal impoundments in light of climate change and sea-level rise.. DFW is developing two climate-smart projects that will address the effects of sea-level on coastal impoundments. One project will repair a dyke in a coastal impoundment and restore a tidal wetland buffer on the seaward side of the impoundment. This project will help DFW maintain the impoundment in the short-term while enabling staff to monitor the effects of sea-level rise on the impoundment and plan longer-term management options. The second pilot project will create an upland impoundment as an alternative for an existing coastal impoundment that might need to be abandoned if sea levels continue to rise. These projects are also part of a broader strategy to prolong the life of DFW coastal impoundments or replace their associated functions, and directly supports an America's Great Outdoors initiative, the Delaware Bayshore Initiative.
<b>Category</b>	- Climate-change Specific Projects
<b>Sector</b>	- Natural Ecosystems - Biota
<b>Focus Area</b>	- Coasts and Climate Resilience (including sea-level rise)
<b>Region</b>	- Regional Or State
<b>Status</b>	- Ongoing - Planned
<b>Lead Agencies</b>	Delaware Division of Fish and Wildlife
<b>Contacts</b>	Karen Bennett, Program Manager, Natural Heritage, karen.bennett@state.de.us

<b>Name</b>	Reducing Mortality from Heat Waves in the Urban Northeast
<b>Description</b>	Although heat heath warning systems are an important city-level adaptation measure, assessing and improving their effectiveness is difficult due the ambiguity associated with attributing heat-related deaths, the lack of clearly outlined structure, information flow, decision making processes, and interactions among the various stakeholders and communities before and during heat wave events (WHO). Thus, in the context of CCRUN, the heath team will perform interviews with key stakeholders in each city in order to characterize the type of triggers used to issue a warning, participating agencies, as well as and the interventions implemented as a part of the heat response strategy. In this process, we will also communicate the findings from our research to stakeholders and develop tools that may be used by stakeholders involved in the response to extreme heat.
<b>Category</b>	- Research
<b>Sector</b>	- Public Health and Safety

Focus Area	- Changes in Extremes of Weather and Climate
Region	- Regional Or State
Status	- Ongoing
Lead Agencies	NOAA Regional Integrated Sciences and Assessments (RISA)
Contacts	Patrick Kinney, Director, Columbia Climate and Health Program , Professor of Environmental Health Sciences, plk3@columbia.edu

<b>Name</b>	<b>Resource Finfish Species and Ecosystem Impacts</b>
Description	<p>This project examines the impacts of high CO2 and acidity of marine waters on fish. These experiments will help build a foundation of knowledge regarding which species, lifestages, and performance measures might be most vulnerable to ocean acidification (OA), and when in the future such effects can be expected.</p> <p>During FY12, two OA experiments were performed on two species of concern to the NE USA, the summer flounder and the winter flounder. These experiments tested the effects of elevated CO2 concentrations on early lifestages of summer flounder and the combined effects of CO2 and water temperature on winter flounder. Embryos and larvae of the flounder were subjected to three constant levels of CO2 and associated pH that ranged from local ambient (775 ppm, pH 7.82), to 2.4 x ambient CO2 (1,860 ppm, pH 7.44), and 6x ambient CO2 (4,717 ppm, pH 7.06). These experiments are being conducted in controlled environments at NOAA's Howard Marine Laboratory, Northeast Fisheries Science Center using parents of known history, and maintaining sibling groups in separate replicated rearing environments. Further details about this experiment are in Chambers et al. (2013 Biogeoscience, in review).</p>
Category	- Climate-change Specific Projects - Research
Sector	- Managed Ecosystems
Focus Area	- Sustainability of Marine Ecosystems
Region	- Regional Or State -- New England
Status	- Ongoing
Lead Agencies	NOAA Northeast Fisheries Science Center
Contacts	Chris Chambers, chris.chambers@noaa.gov

<b>Name</b>	<b>Restoring Freshwater Systems in Massachusetts, Red Brook</b>
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Description	With the help of many partners including the Massachusetts Division of Ecological Restoration, Massachusetts Department of Fish and Game, Manomet Center for Conservation Sciences and A.D. Makepeace (among others), NWF is testing climate-smart restoration projects for freshwater systems. In Wareham MA, this partnership is restoring a cold-water fed cranberry bog to a trout stream with a functioning riparian system. The project has also created a monitoring program to record changes in the wetlands and stream that may result from climate change. With this monitoring data, partners will be able to make informed management decisions for the site as the climate continues to change.
Category	- Climate-change Specific Projects
Sector	- Natural Ecosystems - Biota
Focus Area	- Coasts and Climate Resilience (including sea-level rise) - Conservation/ Restoration of Sensitive Species and Habitats
Region	- Regional Or State -- New England
Status	- Ongoing
Lead Agencies	Massachusetts Division of Fish and Wildlife, Manomet Center for Conservation Sciences, and National Wildlife Federation
Contacts	Chris Hilke, Adaptation Manager, National Wildlife Federation, hilkec@nwf.org

<b>Name</b>	<b>Rolling Easements</b>
Description	This document presents an alternative vision, in which future development of some low-lying coastal lands is based on the premise that eventually the land must give way to the rising sea. We provide a primer on more than a dozen approaches for ensuring that wetlands and beaches can migrate inland, as people remove buildings, roads, and other structures from land as it becomes submerged. Collectively, these approaches are known as rolling easements.
Category	- Climate-change Specific Projects
Sector	- Infrastructure - Cross Disciplinary
Focus Area	- Coasts and Climate Resilience (including sea-level rise)
Region	- National
Status	- Ongoing
Lead Agencies	EPA: Climate Ready Estuaries
Contacts	Michael Craghan, craghan.michael@epa.gov

<b>Name</b>	<b>Saltmarsh Habitat and Avian Research Program</b>
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Description	<p>The Saltmarsh Habitat &amp; Avian Research Program (SHARP) was founded by a group of academic, governmental, and non-profit collaborators to provide critical information for the conservation of tidal-marsh birds.</p> <p>The goal in the short term is to provide information for all the New England and Mid-Atlantic states (see figure to the right, or see the high resolution spatial data for our survey locations or demographic study sites) to protect areas that are important for the long-term conservation of tidal marsh birds. Over the next several years our program will provide a consistent platform for monitoring the health of North America's tidal-marsh bird community in the face of anticipated sea-level rise and upland/watershed development.</p> <p>The specific objectives of the initiative are to: 1) Produce population estimates for tidal marsh birds, 2) Provide estimates of population change in these species over the past two decades, 3) Model geographic variation in the reproduction and survival of our six focal species (listed below), 4) Provide the ten states in the region with a detailed description of their responsibility for conservation, 5) Identify the most critical areas for the long-term preservation of the tidal marsh bird community, and 6) Build on an existing working group of local, state, and NGO stakeholders to implement the findings of this project throughout the region.</p>
Category	<ul style="list-style-type: none"> <li>- Climate-change Specific Projects</li> <li>- Research</li> </ul>
Sector	<ul style="list-style-type: none"> <li>- Natural Ecosystems</li> <li>- Biota</li> </ul>
Focus Area	<ul style="list-style-type: none"> <li>- Coasts and Climate Resilience (including sea-level rise)</li> <li>- Conservation/ Restoration of Sensitive Species and Habitats</li> </ul>
Region	- Regional Or State -- New England -- Mid-Atlantic
Status	- Ongoing
Timelines	Started 2012
Lead Agencies	Maine Department of Inland Fisheries & Wildlife, University of Connecticut, University of Maine, University of Delaware
Contacts	Tom Hodgman, Maine Department of Inland Fish and Wildlife, tom.hodgman@maine.gov; W. Gregory Shriver, Assistant Professor, Department of Entomology and Wildlife Ecology, University of Delaware, gshriver@udel.edu

Name	Sentinel Monitoring for Climate Change in the Long Island Sound Estuarine and Coastal Ecosystems of New York and Connecticut
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Description	<p>The Sentinel Monitoring for Climate Change in Long Island Sound Program is a multidisciplinary scientific approach to provide early warning of climate change impacts to Long Island Sound ecosystems, species and processes to facilitate appropriate and timely management decisions and adaptation responses. These warnings will be based on assessments of climate related changes to a set of indicators/sentinels recommended by our technical advisory work groups. The Program has a monitoring strategy and workplan as well as information on the indicators being used. This is a collaborative program and includes funding from the EPA Climate Ready Estuaries Program.</p> <p>Goals include:  1) to collect and synthesize data that will indicate how Long Island Sound is changing  2) provide scientists and managers with the information necessary to prioritize climate change impacts and mitigate and determine appropriate adaptation strategies for these impacts to the LIS ecosystem.</p>
Category	- Monitoring
Sector	<ul style="list-style-type: none"> <li>- Managed Ecosystems</li> <li>- Natural Ecosystems</li> <li>- Biota</li> </ul>
Focus Area	<ul style="list-style-type: none"> <li>- Sustainability of Marine Ecosystems</li> <li>- Coasts and Climate Resilience (including sea-level rise)</li> <li>- Changes in Extremes of Weather and Climate</li> <li>- Conservation/ Restoration of Sensitive Species and Habitats</li> </ul>
Region	- Regional Or State -- New England -- Mid-Atlantic
Status	- Ongoing
Lead Agencies	EPA Long Island Sound Office, National Oceanic and Atmospheric Administration, New York Department of Environmental Conservation, Connecticut Department of Energy and Environmental Protection, New York Sea Grant and Connecticut Sea Grant

Name	Shoreline Habitat Types and Erosion Rates on Marine Corps Base Camp Lejeune
Description	<p>From project description: This project "mapped the entire estuarine shorelines within Camp Lejeune. Next steps include preparation of shoreline management plan for the base that will present all the data on shoreline habitat type, stabilization structures, and erosion rates in narrative and GIS formats. The plan will also describe the distribution of marsh habitats and recommend areas for restoration and other soft erosion control methods, as well as identify splash points that may require more structural approaches to erosion control. The plan will also estimate long-term shoreline erosion rates as an aid to land-use planning and identify low-lying areas that are particularly susceptible to sea level increase and storm surge events. We will work with the USACE on developing approaches to minimize the loss of sediment from salt marsh habitat via commercial and recreational boating and AIWW maintenance dredging."</p>

Sector	- Infrastructure - Natural Ecosystems
Focus Area	- Coasts and Climate Resilience (including sea-level rise)
Region	- Regional Or State -- South East
Timelines	2007-2012
Lead Agencies	NOAA/NCCOS, Center for Coastal Fisheries and Habitat Research
Contacts	Carolyn Currin, Microbiologist, Carolyn.Currin@noaa.gov

<b>Name</b>	Space-Time Properties of Extratropical Storms Along the US Northeastern Seaboard - Present and Future
Description	Extratropical storms are associated with well-defined circulation patterns that affect the location of coastal impacts and their intensity. Using newly available reanalyses of weather data of the past century and more, we will generate robust estimates of probabilities by frequency, spatial extent, track, and intensity of storms that affect the Northeast coast and close by inland regions and determine trends and variability patterns. In particular we will explore the possibility of creating information that is conditional on large-scale circulation states such as those related to the El Niño/Southern Oscillation and the North Atlantic Oscillation phenomena.
Category	- Climate-change Specific Projects
Sector	- Public Health and Safety - Infrastructure
Focus Area	- Coasts and Climate Resilience (including sea-level rise) - Changes in Extremes of Weather and Climate
Region	- Regional Or State
Status	- Ongoing
Lead Agencies	Consortium for Climate Risk in the Urban Northeast (CCRUN)
Contacts	Yochanan Kushnir, Columbia University Lamont Doherty Earth Observatory, kushnir@ldeo.columbia.edu

<b>Name</b>	Stimulate Innovation and Increase the Pace of Municipal Responses to a Changing Climate in the Coastal Zone of The Northeast and Bay of Fundy
Description	Coastal environments are threatened by climate change impacts, and will need to adapt land use laws, infrastructure (e.g., roads, wastewater treatment, public facilities, etc.), policies, and programs to changing conditions. Building on results of a climate change needs assessment completed for the area between Bay of Fundy and Long Island Sound, this work is comprised of three components: research, hands-on technical assistance and communication/outreach. The goal is to provide technical assistance for adaptation work occurring at the municipal level, and facilitate communication between municipal teams, government agency staff, scientists and non-profits.

Category	- Climate-change Specific Projects
Sector	- Infrastructure
Focus Area	- Coasts and Climate Resilience (including sea-level rise)
Region	- Regional Or State -- New England -- Mid-Atlantic
Timelines	2011
Lead Agencies	NOAA Climate Program Office, Coastal and Oceans Climate Applications (COCA) Program
Contacts	Wes Shaw, Storm Smart Coast Network, <a href="http://www.stormsmart.org">http://www.stormsmart.org</a> , Jennifer Andrews, Clean Air - Cool Planet, <a href="http://www.cleanair-coolplanet.org">http://www.cleanair-coolplanet.org</a>

<b>Name</b>	<b>Stormwater Runoff in Coastal Watersheds: Predicting Impacts of Development and Climate Change</b>
Description	From project description: "NCCOS developed a stormwater runoff modeling system (SWARM) that quantifies runoff volumes and rates using climate change and development scenarios. We based SWARM on the runoff curve number method and unit hydrograph algorithms of the US Department of Agriculture, Natural Resources Conservation Services (NRCS). We validated SWARM using US Geological Survey discharge and rain data, and validation results support the appropriateness of our modeling system for southeastern coastal watersheds. We are building a user-friendly tool for use by research scientists, resource managers, decision makers, and others. SWARM also can be applied to other regions by recalibrating parameters and modifying calculation templates. Key applications of SWARM are: comparing runoff among watersheds representing different environmental settings (e.g., levels of development, soil types, a range of sizes, topography); evaluating and illustrating (singularly or in combination) effects of primary drivers of runoff amount and flashiness including development level, soil type, antecedent runoff conditions, rainfall amount; predict runoff under a range of development scenarios within a watershed; integrate effects of urbanization and projected climate change scenarios."
Category	- Climate-change Specific Projects
Sector	- Infrastructure - Natural Ecosystems
Focus Area	- Coasts and Climate Resilience (including sea-level rise) - Climate Impacts on Water Resources
Region	- Regional Or State -- South East
Status	- Ongoing
Timelines	2007-ongoing
Lead Agencies	NOAA/NCCOS, Center for Human Health Risk
Contacts	Anne Blair, Research Coordinator, <a href="mailto:anne.blair@noaa.gov">anne.blair@noaa.gov</a>

Description	SRPC will assist the town of Durham with developing a climate adaptation chapter for its Hazard Mitigation Plan. The SRPC will also assist the town of Newmarket in preparing an update of the Future Land Use Chapters of the Newmarket Master Plan. The Future Land Use chapter will focus on climate adaptation and resiliency and will identify community vulnerabilities and establish goals to project coastal infrastructure and resources. In addition, SRPC will collect and assemble community datasets for the communities of Dover, Durham, Madbury, and Rollinsford in support of the FEMA Risk Map Project, which aims to provide communities with more accurate flood maps to help them better understand foodplain risk and its potential impacts.
Sector	<ul style="list-style-type: none"> <li>- Public Health and Safety</li> <li>- Infrastructure</li> <li>- Managed Ecosystems</li> <li>- Economic Resources</li> </ul>
Focus Area	- Conservation/ Restoration of Sensitive Species and Habitats
Region	- Regional Or State -- New England
Lead Agencies	Strafford Regional Planning Commission
Contacts	Cynthia Copeland, Kyle Pimmel, Strafford Regional Planning Commission (cjc@strafford.org or kpimental@strafford.org)

Name	Support for Status Assessment and Conservation Action Plan for the Eastern Black Rail across the Northeast Region
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Description	<p>The eastern Black Rail (<i>Laterallus jamaicensis jamaicensis</i>) is the most endangered bird in the Northeast region of the U.S. and along the Atlantic Coast. Populations have declined by 85% in the Northeast since 1992 and have reached dangerously low levels. Black Rails now breed in only a dozen or fewer locations per state within its breeding range. It is unlikely that Black Rails will persist in the Northeast without timely and appropriate conservation actions. Funds from this grant will be used to partially support the creation of a Status Assessment and Conservation Action Plan for the Black Rail across the Northeast planning region. Specifically, the funds will partially support a project facilitator that will provide the value-added synthesis for information resources gathered, facilitate the collection of information from an established consortium of agencies, biologists, academic institutions, and land managers of the Eastern Black Rail Conservation and Management Working Group and to construct the action items needed for a successful conservation campaign. The funds will also support a workshop for members of the working group and other interested persons to take an active part in creating the documents. Final products include a Status Assessment report, Conservation Action Plan report, and associated geo-referenced databases on status, distribution, and spatially explicit conservation priorities. We feel that these products are the necessary steps to secure the future of a declining Black Rail population within the coastal portions New York, New Jersey, Delaware, Maryland, and Virginia.</p> <p>We envision the project work in two distinct phases. Phase 1 includes the completion of a Status Assessment document and associated geo-referenced databases used for support of the assessment. Phase 2 is the completion of a Conservation Action Plan that synthesizes information gathered from Phase 1 into meaningful conservation approaches to halt and reverse population declines of Black Rails. A workshop for each Phase is planned for Northeastern work group members and other interested persons. We envision this project will take two years from initiation to complete. Phase 1 is estimated to be finished in one year and Phase 2 one additional year. We are already undertaking this effort without a primary funding source so the initial framework for interagency communication, document outlines, and database structures are already being developed. We will orchestrate a Black Rail status assessment workshop within the first quarter of the Phase 1 funding cycle. The Conservation Action Plan of Phase 2 will be completed within one year and only begin after Phase 1 is completed.</p>
Category	- Climate-change Specific Projects
Sector	<ul style="list-style-type: none"> <li>- Natural Ecosystems</li> <li>- Biota</li> </ul>
Focus Area	<ul style="list-style-type: none"> <li>- Coasts and Climate Resilience (including sea-level rise)</li> <li>- Conservation/ Restoration of Sensitive Species and Habitats</li> </ul>
Region	- Regional Or State -- Mid-Atlantic
Status	- Ongoing
Lead Agencies	Center for Conservation Biology, College of William and Mary and Virginia; Northeast Association of Fish and Wildlife Agencies

Contacts	Michael D. Wilson, Senior Biologist, Center for Conservation Biology, College of William and Mary and Virginia Commonwealth University, mdwils@uvm.edu
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<b>Name</b>	Supporting Improved Natural Resource Planning through Climate Workshops
Description	"CISA is assisting the SC DNR State Climatology Office in hosting workshops about climate and its impacts on South Carolina's natural resources. These workshops are intended to engage DNR staff and stakeholders, including non-governmental organizations, local government leaders, elected officials, corporate landowners, and utility representatives. The goal is to discuss how climate information can lead to improved natural resource planning and decisions and how species and ecosystems in South Carolina are affected by climate.
Category	- Climate-change Specific Projects
Sector	- Managed Ecosystems - Natural Ecosystems - Biota
Focus Area	- Conservation/ Restoration of Sensitive Species and Habitats
Region	- Regional Or State -- South East
Contacts	Hope Mizzell, Ivetta Abramyan

<b>Name</b>	Temperature, Ozone, and Mortality in the Tri-State Region
Description	Air pollution and heat stress are current public health concerns in urban areas, and these hazards are expected to be influenced by a changing climate. While environmental exposure data are rich in time, they are sparse in space. This limits health effects analysis, as well as our ability to understand fine-scale spatial variability in these exposure-disease relationships. In this project, we use fine-scale climate and air quality models, in conjunction with monitoring data, to enhance our ability to analyze health effects.
Category	- Research
Sector	- Public Health and Safety
Focus Area	- Changes in Extremes of Weather and Climate
Region	- Regional Or State
Status	- Ongoing
Lead Agencies	NOAA/Regional Integrated Sciences and Assessments
Contacts	Patrick Kinney

<b>Name</b>	The Carolinas Coastal Climate Outreach Initiative (CCCOI)
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Description	"The primary goals of the CCCOI are to: <ul style="list-style-type: none"> <li>• Develop the capacity of NC/SC Sea Grant to inform and educate coastal decision-makers of the implications of climate variability and change for major coastal issues.</li> <li>• Provide tailored, decision-relevant information on (a) the implications of climate variability and change and (b) adaptation strategies that increase resilience to those impacts to coastal decision-makers, ranging from residents to government officials to business people.</li> <li>• Increase the capacity of the Sea Grant network, on a regional and national scale, to target and support relevant research and deliver directed outreach programs on the impacts of climate variability, climate change, and adaptation strategies for coastal stakeholders.</li> <li>• Evaluate and review enhancements in Sea Grant climate education and outreach capacity and approaches.</li> </ul> "
Category	- Climate-change Specific Projects
Sector	- Natural Ecosystems
Focus Area	- Sustainability of Marine Ecosystems - Coasts and Climate Resilience (including sea-level rise)
Region	- Regional Or State -- South East
Contacts	Jessica Whitehead, Greg Carbone, Kirstin Dow, Dan Tufford

<b>Name</b>	The Climate Change chapter of the Special Area Management Plan (offshore windfarm south of Block Island)
Description	The Special Area Management Plan being drafted to prepare the way toward development of a new offshore wind farm south of Block Island. Spring 2010 - A formal public comment period has opened for the "climate change" chapter, as well as two others on "Existing Statutes, Regulations and Policies" and "Ecology of the Ocean SAMP Region." All three chapters were produced by coastal experts at the University of Rhode Island and its Coastal Resources Center.
Sector	- Infrastructure
Region	- Regional Or State -- New England
Status	- Ongoing - Planned
Lead Agencies	University of Rhode Island and its Coastal Resources Center

<b>Name</b>	The Mid-Atlantic Cold Pool and Stock Assessments: Developing Environmental Indices at the Range Limit of Species
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Description	<p>Summarized from proposal: The project builds on existing research documenting the cold pool (a Mid-Atlantic area of cooler winter water) as an important factor in determining the southern range for a number of cold- temperate species. Objectives include development of environmental indicators for integration into stock assessments for 2 important resource species, yellowtail flounder and Atlantic surfclam. Deliverables:</p> <ul style="list-style-type: none"> <li>• Indices of cold pool dynamics designed for inclusion into the yellowtail flounder and Atlantic surfclam stock assessments.</li> <li>• Attendance of oceanographers and ecologists at stock assessment meetings.</li> <li>• Environmental indices for inclusion in the NEFSC Ecosystem Status Report (EAP 2009).</li> <li>• Peer-reviewed publications describing long term trends in cold pool dynamics and how these trends relate to changes in the productivity of commercially important species.</li> </ul> <p>This projects is funded by NOAA National Marine Fisheries Service cross-cutting program, Fisheries and the Environment (FATE).</p>
Sector	- Managed Ecosystems
Focus Area	- Sustainability of Marine Ecosystems
Region	- Regional Or State -- Mid-Atlantic
Status	- Ongoing
Lead Agencies	NOAA National Marine Fisheries Service, Woods Hole Oceanographic Institution
Contacts	Jon Hare, Program Manager, NOAA NMFS Oceanography Branch, Jon.Hare@noaa.gov

Name	The Physical Oceanography of Georges Bank and Its Impact on Biology
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Description	<p>Project Summary: This research project has three primary objectives that all serve the broader GLOBEC NWA synthesis effort. First, we seek to more fairly understand the physical dynamics and interactions of several specific processes (e.g., those associated with the seasonal evolution of stratification on the Bank, the crucial flow field over the Northeast Peak, and cross-frontal exchange within the tidal mixing and northern flank fronts) that are thought to play critical roles in zooplankton and fish recruitment. Second, we propose to combine these observationally based process synthesis studies into model-based studies to provide our best descriptions of the Bank's physical environment and its variability on time scales from minutes to monthly to seasonal for the GLOBEC field years. These model studies will use the finite-volume coastal circulation model (FVCOM) developed by C. Chen for coupled physical/biological studies. The model solutions, generated by hindcast and data assimilation approaches, will be used to define and quantify key physical mechanisms and physical/biological interactions on the Bank. Third, we want to provide other Phase IV investigators with as complete a description and understanding of the basic physical processes affecting their observations as possible. The work has two long-term goals: (a) to refine and quantify the new physical paradigm and the physical/biological interactions that impact the target species, and (b) to develop with Franks, Chen et al. the FVCOM coupled physical/biological model system to understand the coupled physical/biological system on the Bank, including why one year might differ from another biologically. These goals are clearly related, since the proposed data synthesis work will guide model evaluation and refinement, and the model simulations (both process and seasonal prognostic) will provide process understanding and realistic property and flow fields that are essential for quantitative biological modeling.</p>
Category	<ul style="list-style-type: none"> <li>- Climate-change Specific Projects</li> <li>- Research</li> </ul>
Sector	<ul style="list-style-type: none"> <li>- Managed Ecosystems</li> <li>- Natural Ecosystems</li> <li>- Biota</li> </ul>
Focus Area	<ul style="list-style-type: none"> <li>- Sustainability of Marine Ecosystems</li> </ul>
Region	<ul style="list-style-type: none"> <li>- Regional Or State -- New England</li> </ul>
Status	<ul style="list-style-type: none"> <li>- Ongoing</li> </ul>
Lead Agencies	NOAA Center for Sponsored Coastal Ocean Research (CSCOR), National Science Foundation, Woods Hole Oceanographic Institution
Contacts	NOAA Center for Sponsored Coastal Ocean Research, coastalocean@noaa.gov

Name	Tidal front mixing and exchange on Georges Bank: Controls on the production of phytoplankton, zooplankton and larval fishes
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Description	<p>From Project Description: Georges Bank supports a rich fishery because: (1) large portions of the bank are shallow enough that light-limitation of phytoplankton is usually not important; (2) deep waters rich in inorganic nutrients are available for mixing onto the bank; and (3) the Bank's clockwise circulation can retain the planktonic stages of important fish species. The tidally mixed front (TMF) is central to the productivity of Georges Bank through the processes of nutrient injection in the north and retention of larvae on the south flank. These two regions are connected by a circulation pathway along the front in which nutrients lead to phytoplankton and zooplankton growth, creating a donut-shaped region of high production surrounding the crest. We suggest that the productivity of this pathway is the result of northern edge nutrient injections and is susceptible to climatic influences on nutrient supply in that region.</p> <p>The overall objective of this proposal is to understand the processes within the TMF that sustain the biological productivity of Georges Bank and the success of the target species, cod and haddock. This requires that we understand how mixing and circulation within the TMF supply new nutrients, support primary production, and retain larvae. GLOBEC dye tracer experiments have for the first time measured directly the near-bottom Lagrangian circulation and mixing in the TMF. Results show that vertical mixing in the front, and the on-bank flow through the base of the TMF, are dynamically connected. Our study examines the 3-dimensional dynamics of the TMF based on these measurements. Models will help us assess how the strength of the across- and along-isobath circulation sets time and space scales compatible with the development of cod and haddock larvae. This project will consist of a mix of data analysis and modeling activities. First, dye dispersion data and simple shear dispersion models will be used to understand the link between cross-bank flow and vertical mixing. Second, a finite-volume coastal ocean model (FVCOM) will be used to calculate the temporal and spatial structure of nutrient flux into the TMF, contrasting northern and southern flank inputs. A coupled FVCOM-NPZ (nutrient-phytoplankton-zooplankton) model will be used to test the following hypotheses: (i) Nutrient injections in the north are advected around the crest of the bank and lead to a plume of elevated phytoplankton and zooplankton production. (ii) The plume enriches the area of larval entrainment on the south flank. If the above statements are true, then production in the plume, can be altered by the nutrient content of source waters in the Northeast Channel of the Gulf of Maine, and these changes will affect the feeding environment of larval cod and haddock. Finally, models incorporating the measured 3-D flow and turbulence fields will be used to examine spatial patterns of larval retention and define the kinds of environmental transitions that larvae experience during this process.</p>
Category	<ul style="list-style-type: none"> <li>- Climate-change Specific Projects</li> <li>- Research</li> </ul>
Sector	<ul style="list-style-type: none"> <li>- Managed Ecosystems</li> <li>- Natural Ecosystems</li> </ul>
Focus Area	<ul style="list-style-type: none"> <li>- Sustainability of Marine Ecosystems</li> </ul>
Region	<ul style="list-style-type: none"> <li>- Regional Or State -- New England</li> </ul>

Status	- Ongoing
Lead Agencies	NOAA National Marine Fisheries Service (NMFS), Columbia University, University of Maine, University of Massachusetts Dartmouth, Bigelow Laboratory for Ocean Sciences
Contacts	NOAA Center for Sponsored Coastal Ocean Research, coastalocean@noaa.gov

<b>Name</b>	Time-series and Underway Assessments of OA (Ocean Acidification) and Carbon System Properties in Coastal Waters - Gulf of Maine
Description	This NOAA supported project collects information from monitoring sites along the East coast through partner institutions: coastal MS, Gulf of Mexico (USM, UGA), Gray's Reef/South Atlantic Bight (UGA), and Gulf of Maine (UNH). Objectives of this project support overall implementation of the Ocean Acidification Program. Project goals include furthering understanding of the relationship between pH and environmental forcings.
Category	- Climate-change Specific Projects - Monitoring
Sector	- Natural Ecosystems
Focus Area	- Sustainability of Marine Ecosystems
Region	- Regional Or State -- New England
Status	- Ongoing
Lead Agencies	NOAA Ocean Acidification Program (OAP), National Oceanographic Data Center (NODC), NASA, Northern Gulf Institute
Contacts	Joe Salisbury, University of New Hampshire, joe.salisbury@unh.edu

<b>Name</b>	Vulnerability Assessment of Virginia's Species of Greatest Conservation Need
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Description	<p>The Department of Game and Inland Fisheries, National Wildlife Federation, and Conservation Management Institute as well as a climatologist/modeler at Kutztown University in Pennsylvania have been working to conduct a species vulnerability assessment for a selection of Species of Greatest Conservation Need from the Virginia Wildlife Action Plan. This project is funded with State Wildlife Grant dollars and generous support from the Doris Duke Charitable Foundation. It is designed to address one of the Data and Modeling Needs that was identified within our 2009 climate change adaptation strategy (page 19; <a href="http://www.bewildvirginia.org/climate-change/">http://www.bewildvirginia.org/climate-change/</a>). The project has two main research components:</p> <p>1. Develop a regional climate model that can help inform wildlife management decisions and; 2. Assess how the predicted changes are likely to impact species and habitats associated with Virginia's Wildlife Action Plan.</p> <p>For the first component, a climatologist conducted a dynamic downscaling of the continental-scale climate models developed by the IPCC. This allowed for about 45 different climate variables and increased the geographic resolution from 100 sq. km. to 10 sq. km. The models include almost all of West Virginia, all of Virginia, all of Maryland, and all of Delaware. Models were generated using the B1 and the A1FI green house gas emission scenarios and outputs were generated for the year 2060 (50 years from our start date) and the year 2095 (near the end of the IPCC model run). For the second component, the climate change data was used to determine potential range shifts of a selection of Species of Greatest Conservation Need based on the climate variables most significant to a species survival. All outputs are spatially explicit and depict potential species shifts based solely on climate variables at 2050 and 2095.</p>
Category	- Research
Sector	- Natural Ecosystems - Biota
Focus Area	- Changes in Extremes of Weather and Climate - Conservation/ Restoration of Sensitive Species and Habitats
Region	- Regional Or State -- Mid-Atlantic
Status	- Ongoing
Timelines	Start August 2009
Lead Agencies	Department of Game and Inland Fisheries, National Wildlife Federation, Conservation Management Institute
Contacts	Chris Burkett, Department of Game and Inland Fisheries, <a href="mailto:chris.burkett@dgif.virginia.gov">chris.burkett@dgif.virginia.gov</a>

Name	Water Sustainability and the Environment under a Changing Climate: Promoting Adaptive Management in the Delaware River Basin
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Description	The Delaware water release policies are constrained by the dictates of two US Supreme Court Decrees (1931 and 1954) and the need for unanimity among four states: New York, New Jersey, Pennsylvania, and Delaware -- and New York City. Coordination of their activities and the operation under the existing decrees is provided by the Delaware River Basin Commission (DRBC). While much progress on improving the release rules has been made since 2006, we have identified a number of unresolved issues which deserve analytic attention, and for which we are confident that quantitatively based recommendations can be generated and offered for consideration to the stakeholders by the Delaware River Basin Commission.
Sector	- Infrastructure - Managed Ecosystems - Economic Resources
Focus Area	- Climate Impacts on Water Resources
Region	- Regional Or State -- Mid-Atlantic
Status	- Ongoing
Timelines	Completion 2015
Lead Agencies	NOAA Regional Integrated Sciences & Assessments (RISA) Consortium for Climate Risk in the Urban Northeast (CCRUN)
Contacts	Upmanu Lall, Director, Columbia Water Center, Columbia University, ula2@columbia.edu

Name	Zooplankton Population Dynamics on Georges Bank: Model and Data Synthesis
Description	<p>Project description: "This work will gain a mechanistic understanding of the influences of climate variation on the population dynamics and production of target zooplankton species on Georges Bank (<i>Calanus finmarchicus</i>, <i>Pseudocalanus moultoni</i>, <i>P. newmani</i>, and <i>Oithona similis</i>) through its effects on advective transport, temperature, food availability, and predator fields. Using data analysis and models as tools, results acquired during the first three phases of GLOBEC will be incorporated into a new synthesis of the physical and biological processes regulating zooplankton abundance on the Bank. Physical models will be forced with measured daily, interannually variable data, and coupled to biological models synthesizing the detailed observations collected during the GLOBEC program.</p> <p>Specific issues to be investigated include: wind control of the advective supply of the target zooplankton species to Georges Bank during January-April; interannual and/or event-level variations in the advective flux of <i>Calanus finmarchicus</i> to Gulf of Maine basin diapausing populations during June-April; interannual and/or event-level variations in advective losses of copepods from Georges Bank and bank subregions; the influence of stratification on the planktonic ecosystem, and how this affects the population dynamics of the target zooplankton species through food and predation. As a link to Phase IV synthesis studies on target ichthyoplankton, our investigation will provide mechanistic insight into the factors determining production of copepod prey for larval cod and haddock on the Bank."</p>

Category	- Climate-change Specific Projects - Research
Sector	- Managed Ecosystems - Natural Ecosystems - Biota
Focus Area	- Sustainability of Marine Ecosystems - Coasts and Climate Resilience (including sea-level rise)
Region	- Regional Or State -- New England
Status	- Ongoing
Lead Agencies	NOAA Center for Sponsored Coastal Ocean Research (CSCOR), National Science Foundation, Scripps Institution of Oceanography, University of New Hampshire, University of Massachusetts, University of Rhode Island, University of Washington
Contacts	NOAA Center for Sponsored Coastal Ocean Research, coastalocean@noaa.gov