NExUS Ongoing Projects and Activities Mon Feb 18 13:30:10 EST 2019

Name	Patterns of Energy Flow and Utilization on Georges Bank

Description	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: (1) the microbial food web, (2) consideration of new and recycled primary production, (3) spatial heterogeneity of primary and secondary production on Georges Bank, (4) changes in biomass and production at higher trophic levels, and (5) the effects of environmental forcing on production processes. 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: (1) the cold 1960s characterized by abundant groundfish stocks fished by distant water fleets; (2) the 1970s, characterized by "average" water temperatures, increased domestic fishing effort and depletion of groundfish stocks; (3) the 1980s, characterized by "average" water temperatures, overfishing of groundfish stocks, and increases in elasmobranchs; and (4) the "average" temperature, lower salinity 1990s, characterized by reduced fishing mortality, rebuilding of groundfish stocks, and increases in elasmobranchs and pelagic fish. 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.
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
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