

**Annotated Agenda**  
MAFAC Meeting, Silver Spring, Maryland  
October 13-15, 2015

## **Coastal Resiliency**

### **Objective/Purpose (Introduction of new topic)**

Climate preparedness and resilience is a key priority of the Obama Administration, the Department of Commerce, and NOAA. NOAA's priority is to build the nation's resilience to changing climate and other stressors to coastal ecosystems and communities. NOAA Fisheries science, monitoring, modeling capabilities, and management programs have significant roles in advancing resilience themes. Likewise, many partners are also working to advance resiliency.

The purpose of the presentations in this session is to provide an overview of the work that is underway, to enhance MAFAC's understanding and the discussion of how NOAA Fisheries can better connect our resource management and habitat conservation programs to support the social and economic resilience needs of fishing communities.

### **Background/Synopsis of Presentations**

#### **Literature Review of Fishery Management Approaches in a Changing Climate**

**Wendy Morrison, PhD**  
Fisheries Ecologist, ERT Inc. Contractor  
to the Domestic Fisheries Division

Climate variability and change may affect marine fisheries by altering: (1) ecosystem productivity or fish abundance, (2) distribution of fish stocks and fishermen, (3) interactions with non-target species and bycatch rates and levels, and (4) habitat use and/or availability (e.g., shifting nursery grounds). Managers may not be aware of the tools available to respond to or plan for environmental change. We conducted a literature review to compile a list of options for managing fisheries in a changing climate. We divide the management options into five main categories: 1) reactive management options, 2) proactive management options that increase resilience of species, 3) proactive management options that increase resilience of the ecosystems, 4) proactive management options that increase resilience of fishing businesses, and 5) recommended practices that improve management's ability to be successful in a changing climate. Given the uncertainties associated with climate change, managers can either work to reduce uncertainty, or they can embrace the uncertainty and adapt management options that will be robust to the given uncertainties. The list of management alternatives provided here is not comprehensive, since new options should emerge as management across the globe grapples with this issue.

#### **Assessing the Vulnerability of Marine Fish and Shellfish Species to a Changing Climate**

Climate change is already affecting fishery resources and the communities that depend on them. Climate change and multidecadal variability have been implicated in the shifting distributions, abundances, and phenology of fish and shellfish species in many marine ecosystems. These impacts are expected to intensify in the future, increasing the need to understand which species may be most vulnerable to climate-related environmental change. We have developed a vulnerability assessment that uses expert elicitation methods to quantify a species' exposure and sensitivity to expected climate change. Vulnerability, as used here, refers to a reduction in a species' productivity and or abundance associated with a changing climate, and includes both climate change and multidecadal climate variability. This methodology uses a vulnerability assessment framework, which is applicable across multiple species and provides a relative rank of vulnerability to climate change and variability, as well as information about why a species may or may not be vulnerable. The results can help fishery managers

and researchers identify highly vulnerable species and more effectively target research and assessment resources on species of highest concern.

**Fishing Community Vulnerability and Resilience to changing climate and management decisions**

**Lisa Colburn, PhD**  
Social Scientist  
Northeast Fisheries Science Center

Evidence of changing climatic conditions will affect the ability of communities to harvest fish and will require an adaptive response on the part of policy makers and fishery managers. NOAA Fisheries established a set of national social indicators of fishing community vulnerability and resilience to evaluate the impacts of changes in fishery management regimes for the US. These indicators enhance the analytical capabilities within NOAA Fisheries for conducting fisheries social impact assessments and informing ecosystem-based fishery management. Building on the existing Community Social Vulnerability Indicators (CSVIs), new measures of climate change vulnerability were developed. These new indicators assess the impact of sea level rise on critical commercial and recreational fishing infrastructure and the dependence of communities on species identified as vulnerable to the effects of climate change. Integration of CSVIs and the new climate change vulnerability indices highlight community needs for unique solutions in order to adapt to environmental and social changes and maintain their well-being.

**Habitat Conservation in Support of Coastal and Community Resiliency**

**Pat Montanio**  
Director, Office of Habitat Conservation

The quality and quantity of available habitat are critical to supporting living marine resources and the communities that depend on them. Habitat conservation and restoration is essential to NOAA Fisheries' mission of ensuring productive and sustainable fisheries and fishing communities and recovering and preserving protected species. This work has many other beneficial effects and is one cornerstone for improving and building coastal resiliency. Conserving and restoring habitat also helps communities be more ecologically and economically resilient to severe events—such as drought, hurricanes, and storm surges, and other changing conditions as a result of climate change.

Our guiding framework for habitat conservation work tiers from the recently released NOAA National Habitat Policy. This Policy institutionalizes the NOAA Habitat Blueprint principles which MAFAC has heard about in the past. The Blueprint leverages external partnerships and resources to improve habitat conditions for marine, coastal, and riverine resources and coastal communities. NOAA's recognition of habitat conservation as an important tool for achieving our mission is also made clear in our internal habitat conservation strategic planning efforts.

Last fall, you heard that NOAA Fisheries and the National Ocean Service each received \$5M for resilience-related grants. The NOAA Fisheries grants are focused on implementing on-the-ground habitat restoration to build coastal ecosystem resilience recognizing that healthy ecosystems support coastal economies (fishing, tourism) and protect and buffer communities from extreme events. In addition to these grants, NMFS is enhancing coastal resilience through specific habitat conservation efforts. These include targeted restoration, Fishery Management Council pilot efforts, living shorelines guidance, and ongoing interagency coordination to address coastal wetlands loss and include climate mitigation in habitat valuation efforts.

**Sea Grant Efforts on Coastal and Community Resiliency**

**Nikola Garber, PhD**  
Acting Director  
National Sea Grant College Program

As one of its four focus areas, Sea Grant's work in support of resilient communities and economies is focused on helping communities and individuals understand the risks associated with living, working, and doing business along the coast; building community capacity to prepare for, and respond to hazardous events; and helping communities respond effectively when events occur. Sea Grant supports over 300

projects around the nation with a federal grant investment of \$15.9 million, supplemented with an additional \$7.9 million in non-federal matching funding bringing the total investment to more than \$23.9 million. These grants support research, planning, and outreach projects that help coastal communities be more resilient to a range of natural hazards, water quality challenges, severe weather, energy needs, and the effects of climate change. The funding is to support four main priorities: 1) Develop coastal storm mapping and modeling tools to predict coastal flooding and erosion, as well as research into long-term impacts of these storms; 2) Develop ecosystem modeling tools to help coastal communities forecast harmful algal blooms and bacterial outbreaks, enabling community preparedness and resilience; 3) Research to improve community understanding of ocean acidification and other climate change-related effects on coastal communities, economies, fisheries and ecosystems; and 4) Research to how best to take into account community values for coastal ecosystems during planning and development of renewable energy projects.

Sea Grant takes a multi-faceted approach to outreach through programs of education, extension, and communication. Specialists in each of these areas translate research into usable information and products for many audiences, ensuring that scientific information is delivered to those who need it, and in ways that are relevant. Sea Grant experts implement national priorities at the local level, while also identifying citizens' needs in order to inform state and national research agendas. This two-way flow of services and information ensures that Sea Grant solutions meet demonstrated needs, help support businesses, and enable policy makers to make balanced, well-informed decisions.

**Investigating climate change impacts on Atlantic fish stock distributions and potential harvest re-allocations**

**Patrick Campfield**  
Director of Fisheries Science  
Atlantic States Marine Fisheries Commission

Pat Campfield, Director of Fisheries Science, Atlantic States Marine Fisheries Commission, will provide an overview of the Commission's investigation of potential stock distribution and productivity shifts, and development of fishery harvest re-allocation options among the states. The Commission used a multi-phase approach consisting of 1) analyses of NEFSC trawl survey data to detect changes in a subset of Atlantic finfish stocks, 2) a survey of constituents to solicit feedback on re-allocation options, and 3) refinement of preferred options by the groups responsible for assessing and managing each stock. In the investigation, the Commission relied on collaboration with NOAA Fisheries scientists and analytical tools to evaluate climate-induced changes in fish stocks.

**Climate Change and Implications for the Management and Resilience of Fisheries**

**Rick Robins**  
Chair  
Mid-Atlantic Fishery Management Council

Rick Robins, chairman of the Mid-Atlantic Fishery Management Council, will provide an overview of the Council's integrated approach to climate change and its implications for the management and resilience of the Council's managed fisheries. The Council's approach to the issue began with its visioning and strategic planning process, and has included scientific and management workshops to address the complex management and governance issues associated with shifts in fisheries associated with climate change. The Council is engaged with outside partners in ongoing efforts to develop climate velocity models at scales useful for regional management and is working to incorporate climate change considerations in its Ecosystem Approaches to Fisheries Management (EAFM) guidance document.