

Towards a strategic research portfolio for Maine Sea Grant

Maine Sea Grant College Program Strategic Plan 2006-2010: Setting the Course: from Discovery to Action (MSG)

Crosscutting Issues:

- Community-based Natural Resource Management
- Planning for the Future of Coastal Communities
- Sustainable Seafood
- Stewardship Through Citizen Science

NOAA National Sea Grant College Program Strategic Plan 2009-2013: Meeting the Challenge (NSGCP)

National Focus Areas:

- Healthy coastal ecosystems
- Sustainable coastal development
- Safe and sustainable seafood supply
- Hazard resilience in coastal communities

Specific examples of research questions that Maine Sea Grant is interested in funding:

Healthy Coastal Ecosystems (NSGCP) and Community-Based Natural Resource Management (MSG)

What ecosystem processes govern habitat degradation and restoration?

- Study linkages between estuaries and nearshore waters to identify their role in the health of fisheries and coastal ecosystems.
- Conduct studies of food web ecology of coastal habitats (marsh, eelgrass, macroalgae, soft sediments) to inform ecosystem-based approaches to fisheries management.
- Determine effects of habitat restoration, such as dam removal.
- Determine impacts of ocean-related energy projects, e.g. impacts of pumping water from the bottom and then dumping it back for thermal projects.

What are the nearshore circulation patterns in individual bays?

- Track the movement of harmful organisms and/or materials so managers can anticipate potential harm to public health and local economies.
- Investigate sand circulation patterns and net loss or deposits of sand.

What are the local and regional ecological responses to global climate change and how can these responses guide management?

- Differentiate current climate change impacts on salt marsh submersion versus long-term, cyclic, ecosystem change.
- Inventory sites in Maine that provide evidence of current or ancient sea level change.

Sustainable Coastal Development (NSGCP) and Planning for the Future of Coastal Communities (MSG)

What are the changes and trends in public access to the coast?

- Expand to all Maine municipalities the current inventory of coastal access points (public and private holdings currently used by the public for both commercial and recreational purposes).
- Determine the fair market value paid to willing sellers for intertidal recreational access easements in Maine and assess the potential of Maine coastal property owners holding key access points who would be willing sellers of these easements. Determine the capacity of the Maine state government to pay willing sellers for these easements.
- Design metrics or benchmarks to define success in preserving working waterfront?

How sustainable are current community planning and development efforts?

- Identify a model of Low Impact Development (LID) tailored to building on coastal or estuarine waterfront lots.
- Identify the barriers to successful municipal engagement with citizens and a wide cross-section of the public in community planning efforts.
- Quantify the value of public participation in community planning efforts. Compare results between municipalities that met their statutory requirement for public hearing vs. those designing and implementing comprehensive public participation processes. What was the outcome of the planning process in each case and the related economic and social impact of the two approaches?

Safe and Sustainable Seafood Supply (NSGCP) and Sustainable Seafood (MSG)

What is the future of fisheries and aquaculture in Maine?

- Analyze the strengths, weaknesses, opportunities, and threats for commercial fishermen of all types to be involved in shellfish aquaculture.
- Evaluate movement of, and predation on, sea scallops of various sizes in natural and reseeded beds in nearshore waters (to make local reseeded efforts more effective).
- Analyze technical or management changes that help harvesters/producers cope with high energy costs.
- Determine whether public acceptance/support of aquaculture in Maine has changed since 1995. How and why do different regions of the state differ in their perception of aquaculture (function of income, traditional uses, etc.)?

How will climate change impact marine species and how can these impacts guide management?

- Study ocean acidification and effects on commercial species (lobster, clams) in GOM.

- Follow-up on Island Institute lobster-climate change report (science to test fishermen's observations).
- Quantify benefits of local seafood/carbon footprint of the seafood industry: compare Maine versus imported seafood sales and consumption patterns.

What is the relationship between water quality and seafood harvests?

- Determine how many days are required for a shellfish growing area to return to acceptable levels of bacteria following rainfall-related closures.
- Investigate how mercury transport in estuarine food webs affects commercial species.

Hazard Resilience in Coastal Communities (NSGCP)

What areas and sectors of Maine are vulnerable to coastal hazards?

- Produce sea-level rise inundation maps for the entire coastal region of Maine.
- Inventory salt marsh and coastal wetland vulnerability to sea-level rise, and evaluate relative risk (are they blocked from migrating due to roads, development, etc?) Include evaluation of infrastructure such as dams and tidal restrictions/culverts.

How can coastal managers adapt and prepare for coastal hazards?

- Compare the effectiveness (in reducing property loss and improving public safety) of Maine's sand dune rules to states where climate change is not a factor in development rules.
- Identify key hazard mitigation strategies for selected coastal stakeholders, then identify the barriers to their use, and strategies for their promotion among these target audiences.
- Test and demonstrate "soft alternatives" to erosion mitigation. Produce a series of soft best management practices (BMPs) tailored specifically for Maine's sand and bluff environments.
- Inventory and compare coastal communities where hazard mitigation plans were in place and have been thoroughly tested by a significant natural coastal hazard. Which communities fared the best and why?