

## NERACOOS Strategic Priorities, 2011-2016<sup>1</sup>

### Ocean and Coastal Ecosystem Health:

- Ecosystem Monitoring and Modeling System supporting **OCEH-5 Ecosystem Based Management** and **OCEH-4 Climate Change Impacts**
  - Create an Integrated Regional Sentinel Monitoring Program from the Canadian Maritimes to the New York Bight and Long Island Sound that includes current efforts. Key partners include but are not limited to OOI, MWRA, SBNMS, NMFS, NERRs, LISS, Estuaries Programs, and AZMP. Standardization of protocols and quality assurance where possible together with repeated sampling at fixed locations is important to allow regional scale comparisons. A variety of sampling platforms will be used as applicable (remote sensing, moorings, gliders, drifters, research vessels, ships of opportunity, etc.). Elements include;
    - Water column properties including physical, biogeochemical, and pelagic community structure and species richness (also includes settling plates at moorings for invasive species and water quality measurements – see below),
    - Benthic properties including community structure, species richness, and habitat characterization with surficial sediment composition, and
    - Online environmental event reporting tool for fish kills, algae blooms, sudden wetland dieback, invasive species, etc.
  - Create a Regional Model Interoperability System to enable intercomparison & integration within the region for driving scaled ecosystem models.
  - Create an Integrated Water Quality Observing System in the northeast by including and expanding current efforts as a contribution to the National Water Quality Monitoring Network supporting **OCEH-5 Ecosystem Based Management**, **OCEH-4 Climate Change Impacts**, **OCEH-8 Regional Nutrient Loading To Coastal Waters From Land And Air Sources**, and **OCEH-9 Bio-regional (web-based indicators)/Ecosystem States tool (BEST)**. Key aspects include;
    - CO2 (pH) sensors in collaboration with NOAA-PMEL to support national monitoring of ocean acidification,
    - Install and maintain the existing and future nutrient sensors on buoys,
    - Increase near-shore and estuarine monitoring capacity, and
    - Provide support for the deployment of existing ESP sensors.
  - Support Hydrological River Discharge and Water Quality modeling and forecast efforts.
- Develop an integrated observation and forecasting tool for beach and shellfish water quality to complement existing monitoring for **OCEH-7 Regional Healthy Beaches and Shellfish**.

---

<sup>1</sup> These priorities were developed by the NEACOOS Strategic Planning and Implementation (SPI) Team with input from Working Groups. The **XXX-X** codes and following text in italics correspond to product templates developed by **The New England-Canadian Maritime Collaboration and Planning Initiative** through a series of meeting in May and June 2010.

- Create a Northeast Atlas / Ocean Data Portal primarily in support of **OCEH-6** *Create a data management distributed portal/network* and **OCEH-9** *Bio-regional (web-based indicators)/Ecosystem States tool (BEST)* but would support others as well as Coastal and Marine Spatial Planning.

## Ocean Energy Planning and Management

- Create a Northeast Atlas / Ocean Data Portal supporting **OEPM-4** *Create an atlas of the spatial extent and intensity of consumptive and non-consumptive human uses of the ocean* and **OEPM-6** *Identify areas compatible with renewable energy*. Specific to OEPM this would include;
  - Regional scale integration of data products that may have previously been available sub-regionally including;
    - Vessel tracking information from AIS and VMS and automated statistical fields from these, and
  - Historical statistical analyses of observations and model (NECOFS) runs for identifying resource potential.
- Ecosystem Monitoring and Modeling System in support of **OEPM-2** *Monitoring the effects of ocean energy facilities on the surrounding environment* and **OEPM-5** *Develop protocols for environmental assessment, monitoring and mitigation*. Specific to OEPM this would entail;
  - Standardized regional monitoring efforts so that monitoring at facilities (pre-construction, operation and post-operation) can be compared with non-impacted areas, and
  - Integration of facilities monitoring and access to facilities for monitoring.

## Coastal Hazards Resiliency

- Continue Development of the Regional Hazards Forecasting and Hindcasting System in support of **CHR-3** *Coastal Storm Impact Forecasting*, **CHR-4** *Shoreline Erosion Hindcasting and Forecasting* and **CHR-5** *Integrating Climate Change Forecasts into Coastal Hazards Resiliency* by
  - Completing and evaluating regional and sub-regional surge models (LIS, Saco ME, Scituate MA), incorporating additional parameters such as waves and river flooding where possible,
  - Develop a seamless integration between current NECOFS WRF model (for non-hurricane activity) to the NOAA NHC model (during an extra-tropical storm event) then back to WRF,
  - Improve online distribution methods of NECOFS forecast fields for WFO (GRIB1/2) and public (both NetCDF and graphical displays on NERACOOS websites). This would include addition of “virtual tide stations” and “virtual wave buoys”,
  - Integrating the latest digital geospatial information (LIDAR and digital aerial photography) into web-based mapping applications,
  - Expanding current capacity including Splash-over and Street Level Inundation Forecasting to other locations within the region,
  - Review shoreline hindcasting and forecasting models and develop a recommendation for a regional approach as well as support the data required to evaluate and improve such models by providing regional Storm Reporter tools, and
  - Support Hydrological River Discharge and Water Quality modeling and forecast efforts.
- Increase Sea Level observations in region in support of **CHR-3** *Coastal Storm Impact Forecasting* by
  - Filling tide gage gaps with lower cost technology such as deployed at Scituate, MA.

- Better understand the Regional effects of Climate Change through a Northeast IPCC to allow **CHR-5** *Integrating Climate Change Forecasts into Coastal Hazards Resiliency* by,
  - Developing a region-wide consensus scenarios of climate change indicators including Sea Level Rise, Surge, Storm Frequency, Precipitation and Temperature
  - Harnessing local knowledge for downscaling forecasts and develop increased understanding of uncertainties, and
  - Sharing results through a portal.

## Marine Operations

- Continue delivery of Real-time Ocean Conditions and Forecasts to Mariners by maintaining and enhancing current observational and modeling capacity.
- Promote Harbor safety by providing real-time access to Automated Information System (AIS) data
  - Increase AIS receiver capacity to fill regional data gaps
- Make the NERACOOS region 'Response Ready' (USCG and NOAA/OR&R/ERD key partners) by ensuring NERACOOS information is readily accessible and of value to rapid response efforts. NERACOOS will
  - Continue integration of NERACOOS information into response agency tools – USGS SAROPS EDS and NOAA ERMA (including surface currents from HFR and NECOFS),
  - Develop rapid response observational capability, and
  - Develop operational high resolution models for at risk locations (oil – Portsmouth NH, Portland ME, and St John's, NS).

## Cross Cutting Themes – Coastal and Marine Spatial Planning and Climate Change

NROC's efforts in **Coastal and Marine Spatial Planning** will be supported by a number of the efforts mentioned above. Specifically;

- the Northeast Atlas / Ocean Data Portal which will allow discovery, display, download, and analysis of geospatial and time-series information, and
- the Ecosystem Monitoring and Modeling System which will allow for adaptive management.

Similarly, the region's efforts to understand, mitigate, and adapt to the effects of **Climate Change** will be supported by a number of efforts mentioned above. Specifically;

- the Northeast Atlas / Ocean Data Portal which will allow discovery, display, download, and analysis of geospatial and time-series information,
- the Ecosystem Monitoring and Modeling System which will document and interpret change in the biological, physical and biogeochemical environments including species shifts and ocean acidification,
- the Regional Hazards Forecasting and Hindcasting System which will provide hazards focused climate change analyses, and
- a Better understanding of the Regional effects of Climate Change through a Northeast IPCC to develop a regional consensus for climate change scenarios and indicators.

## Data Management and Communications

- Continue the design and implementation of a robust and standards based regional Data Management and Communications (DMAC) capacity including hardware, software and personnel that will:
  - Ensure that all data from NERACOOS supported observing and modeling activities are delivered through IOOS recommended standards and services,
  - Provide end users with access to real time and historical data through formats and services that support their needs,
  - Ensure that all NERACOOS data products are discoverable and accessible,
  - Support the cost effective and scalable development of products for all priority areas,
  - Ensure all partners aggregated real-time observations and regional model outputs are archived with NOAA's National Oceanographic Data Center,
  - Ensure that all data and products have essential metadata regarding information sources and quality,
  - Ensure that all NERACOOS data services are registered, cataloged and monitored,
  - Develop and implement performance measures and usage statistics, and
  - Ensure all partners and data management activities become IOOS certified.

## Education and Outreach

- Develop a coordinated outreach and communication strategy that supports **OCEH-10 Coordinated ecosystem health communication strategy for New England/Canadian Maritimes** and **CHR-2 Coordinated Coastal Hazards messaging, training and outreach**. For this
  - NERACOOS Outreach and Communication staff and scientists will work directly with;
    - The 13 regional partner organizations including NEOSEC,
    - NEOSEC partners to enhance and implement ocean observing educational capacity to address Ocean Literacy,
    - National partners by continuing its participation with the NFRA Education and Outreach Committee (EOC), and
    - Increase public understanding of Climate Change as directed in the ICOOS Act (2009).

## Performance and Evaluation

- Develop operational metrics for the observing and modeling assets.
- Develop a comprehensive framework for economic performance evaluation.
  - Augment the framework by collecting data (surveys, interviews, focus groups) from partners and users to assess the value of the NERACOOS products and services.
  - Identify a small set of potential new investments/assets for economic analysis, and estimate the expected increase in economic value associated with each.
  - Select one potential investment for OSSE assessment and detailed benefit assessment.
- Implement Performance and Evaluation metrics distributed by the NOAA IOOS Program Office.