OCEAN SAMP RESEARCH PROJECTS

The following projects are being undertaken in support of the R.I. Ocean Special Area Management Plan, an effort to develop use zones for Rhode Island's offshore waters. With Rhode Island's stated goal of attaining energy from renewable sources, primarily offshore wind farms, some of these projects are directly applicable to wind farm development. All are intended to provide a better understanding of Rhode Island's offshore area, including its ecology, habitats, physical and cultural characteristics, and uses.

Some project descriptions are similar; this is because since the project began, additional funding sources have provided resources to continue projects or develop them further.

ECOLOGY

Spatial Distribution and Abundance and Flight Ecology of Marine and Coastal Birds off Coastal Rhode Island

Peter Paton, URI Department of Natural Resources Science
Scott McWilliams, URI Department of Natural Resources Science
David Mizrahi, New Jersey Audubon Society
Kim Peters, New Jersey Audubon Society

This study assesses the current spatial and temporal patterns of bird abundance in Rhode Island coastal waters. Researchers are compiling existing data and conducting land-based, sea-based, and radar surveys to determine current avian distribution and abundance, to assess diel (daily cycle) patterns of avian use, and to quantify flight ecology for birds and bats (i.e., flock size, flight elevation, and flight behavior). Researchers are also determining foraging and roosting sites for roseate terns, which are federally listed as an endangered species. GIS maps are being produced showing current and historic seasonal distribution and abundance for each bird species, spatially and temporally explicit flight pathways, and the distribution and abundance of roseate tern roost and foraging sites. In addition to these maps, a final report summarizing study findings is being developed.

Assessing Spatial Distribution and Abundance of Waterbirds in Ocean SAMP Study Area

Peter Paton, URI Department of Natural Resources Science
Scott McWilliams, URI Department of Natural Resources Science

This study is designed to assess the spatial distribution, abundance, and movement ecology (flight elevation of birds above water surface, movement dynamics of birds in offshore habitats) of water and land birds using the Ocean SAMP study area. This study uses a variety of techniques to meet research goals including conducting land-based point counts, systematic offshore transects, and systematic aerial surveys throughout the year. In addition, a series of systematic surveys designed to sample nearshore habitats for roseate terns, an endangered species, will be conducted from May through September. Researchers have also contracted with New Jersey Audubon Society to use radars to assess avian movement from Block Island. Additional funding provided by this grant will allow researchers to increase sampling efforts of the entire study area with more aerial surveys and boat-based surveys focusing on water birds throughout the annual cycle.

Spatial Distribution and Abundance of Birds in Offshore Waters, Including Detailed Studies of Roseate Tern Use of Offshore Waters
Peter Paton, URI Department of Natural Resources Science
Scott McWilliams, URI Department of Natural Resources Science

This study is designed to assess the spatial distribution, abundance, and movement ecology (flight elevation of birds above water surface, movement dynamics of birds in offshore habitats) of water and land birds using the Ocean SAMP study area. The originally funded project includes conducting land-based point counts, systematic offshore transects, and a series of systematic surveys designed to sample nearshore habitats for roseate terns, an endangered species, from May through September. Researchers have also contracted with New Jersey Audubon Society to use radars to assess avian movement from Block Island. This additional funding will allow researchers to increase sampling efforts in offshore waters with boat-based surveys focusing on water birds.

Ecosystems
Scott Nixon, URI Graduate School of Oceanography
Stephen Granger, URI Graduate School of Oceanography

This study is developing a fundamental knowledge base of the ecology of the Ocean SAMP area and integrates that knowledge into the formulation of the SAMP. Researchers are gathering data to measure and describe previously unstudied aspects of Rhode Island and Block Island Sounds, including the spatial and seasonal distribution of the phytoplankton that provide the energy for food chains, the rate at which these phytoplankton fix carbon and energy, and the supply and distribution of the inorganic nutrients that make this productivity possible. To do this, researchers are gathering phytoplankton chlorophyll, incident light, and vertical light attenuation data. They are using these and other datasets to estimate primary production and phytoplankton standing crops over an annual cycle, as well as the role of wind and tides in stimulating phytoplankton blooms. Researchers are developing a series of maps, datasets, and graphs, as well as a written assessment summarizing study findings.

Spatial and Seasonal Distribution of Phytoplankton, Primary Production, and Flux of Organic Matter to Benthic Habitats in Rhode Island and Block Island Sounds
Scott Nixon, URI Graduate School of Oceanography
Stephen Granger, URI Graduate School of Oceanography
Candace Oviatt, URI Graduate School of Oceanography

Researchers are obtaining the first measurements of the biological energy supporting the food chains of the Rhode Island and Block Island Sounds ecosystem. This information is critical to assessing the carrying capacity and fisheries productivity of this habitat. Researchers are working with lobstermen and fishermen in the area to obtain samples of surface water throughout the sounds as well as vertical profiles of light attenuation. This data will be analyzed to estimate phytoplankton chlorophyll throughout the sounds on an almost daily basis. Researchers will also measure phytoplankton productivity and light relationships to estimate organic matter production in surface waters throughout the ecosystem. The flux or deposition of this organic matter to the bottom communities will be measured to quantify the coupling between autotrophic production on the surface water and benthic biomass and metabolism.

FISHING

Commercial and Recreational Fisheries Usage Maps
David Beutel, University of Rhode Island/Rhode Island Sea Grant

This study is evaluating the commercial and recreational fishing uses of the Ocean SAMP area. The researchers hold regular informational meetings with Rhode Island commercial and recreational fishing associations about the Ocean SAMP. The researchers work with commercial and recreational fishing association members, as well as with unaffiliated fishers, to delineate on nautical charts current fisheries usage areas within the SAMP boundary. Using this input, the researchers are developing updated commercial and recreational fisheries usage maps for the SAMP area. In addition, researchers are preparing descriptions of commercial and recreational fishing activities within the study area. These maps and related documentation are being used to identify potential challenges in managing SAMP area uses and resources. This study is developing an updated commercial fisheries usage map, an updated recreational fisheries usage map, and descriptions of fishing activities within the SAMP area.

Refined Assessment of Fisheries Activity
Jennifer McCann and Tiffany Smythe, URI Coastal Resources Center/Rhode Island Sea Grant
Christopher Damon, URI Environmental Data Center
David Beutel, RI Coastal Resources Management Council

This study refines the initial assessment of fishing activity that was conducted during year 1 of the Ocean SAMP. The purpose of this assessment is to refine the Ocean SAMP area fisheries usage maps with new data layers based on state and federal fisheries monitoring data. Data will be obtained from the R.I. Department of Environmental Management (DEM) and the National Marine Fisheries Service (NMFS) to map fisheries activity within the SAMP area over the past 10 years (1999–present). Datasets include DEM logbook data and NMFS fisheries observer data, vessel trip report (VTR) data, and vessel monitoring systems (VMS) data. Using these datasets, the study team will create GIS data layers and maps showing the locations of fishing activity within the SAMP area separated out by gear type, targeted species, and other attributes. These data layers and maps will then be used to refine and corroborate the year 1 Ocean SAMP fisheries usage maps, which were created through meetings and interviews with fishermen. These data layers and maps will also be used to enhance the SAMP fisheries chapter and to inform the development of the SAMP zoning map for Rhode Island's offshore waters.

WILDLIFE & HABITATS

Mapping and Characterizing Fish Habitat in Rhode Island's Transitional Seas
Jeremy Collie, URI Graduate School of Oceanography
John King, URI Graduate School of Oceanography
Sheldon Pratt, URI Graduate School of Oceanography

The purpose of this study is to develop a better understanding of the fishery ecosystem dynamics of Rhode Island's transitional sea (Block Island and Rhode Island Sounds). Specifically, this effort will classify and map fisheries habitats, based on benthic characteristics and site-specific fisheries data, and assess the functional importance of fish habitat in providing shelter and food for demersal fish species. Existing bottom sediment composition maps and other datasets will be compiled, and surveys of additional representative areas will be conducted using side scan sonar and bathymetry and

ground-truthed using underwater video, still images, and benthic grabs to determine grain size and benthic community structure. Using these maps and surveys, 30 sampling stations will be selected to provide informative spatial contrasts in benthic habitats. Bottom photos will be analyzed for habitat characteristics and community structure, and trawl surveys will be conducted at these sampling stations to understand fish species composition, length-frequency distributions, weights, and diet composition of the principal species. Associations between fish species composition and habitat type will then be evaluated.

Marine Mammal and Sea Turtle Analysis for the Rhode Island Ocean SAMP

Robert Kenney, URI Graduate School of Oceanography
Kathleen Vigness-Raposa, URI Ocean Engineering

This study is using existing data to perform detailed analyses and mapping of the spatial and temporal distributions and relative abundances of the 30-plus species of marine mammals and four species of sea turtles known to occur in Rhode Island coastal waters or nearby. Using all available sighting and stranding data, the researchers are creating GIS maps showing the seasonal occurrence of each species. The researchers are addressing potential bias in the raw data by quantifying and analyzing sightings per unit effort (SPUE), which corrects sighting frequencies for differences in survey effort. The SPUE data is being used to create more refined GIS maps showing seasonal relative abundances for all species with sufficient sightings. Researchers are developing a background paper that includes an account for each marine mammal and sea turtle species present. Each account includes all of the GIS maps produced for that species.

RECREATION & TOURISM

Marine Recreation Use and Impact Study

Jennifer McCann, URI Coastal Resources Center/RI Sea Grant
Tiffany Smythe, URI Coastal Resources Center/RI Sea Grant
Chris Damon, URI Environmental Data Center

This study is analyzing and mapping all marine recreational uses within the SAMP area. Recreational uses included in the analysis are recreational boating, yacht racing, diving, and wildlife tours. Baseline data is being collected from charter boat captains, regatta organizers, dive boat captains and groups, and whale watching vessel captains on the location, timing, and relative frequency of each type of activity. Data collected is being synthesized into the SAMP recreation and tourism chapter. In addition, multiple GIS data layers are being created showing the distribution of each type of recreational use throughout the SAMP area. These maps and the related data are being used to identify and address potential challenges in managing SAMP area recreational uses and development.

CULTURAL & HISTORIC RESOURCES

Inventory of Significant Historic Properties, Archaeological Sites, Tribal Areas of Traditional Cultural and Religious Importance, and Recreational Areas

Jennifer McCann, URI Coastal Resources Center/Rhode Island Sea Grant
Teresa Crean, URI Coastal Resources Center/Rhode Island Sea Grant

Researchers are documenting significant historic properties, archaeological sites, tribal areas of traditional cultural and religious importance, and recreational areas that are within or adjacent to the SAMP study area. They are identifying relevant properties using existing data from the R.I. Geographic Information System, verifying these sites with the R.I. State Historical Preservation and Heritage Commission, and are producing a map and listing of properties that are listed in the National Register of Historic Places or are eligible for inclusion. Researchers are also documenting available definitions or evaluation criteria related to potential adverse visual impacts as defined in federal regulations.

Regional Subsurface Geology, Surficial Sediment, Benthic Habitat Distribution, and Cultural Resources

(See description under Physical Environment)

INFRASTRUCTURE

Rhode Island Wind Farm Structures/Foundations Study: Support Structures and Foundations for Offshore Wind Turbines

Sau-Lon James Hu, URI Ocean Engineering
Christopher D.P. Baxter, URI Ocean/Civil Engineering

This study analyzes the various technologies, relevant parameters, and costs associated with the support structures and foundations for offshore wind turbines. First, the researchers will perform a detailed assessment of the technology used for offshore wind turbine support structures and foundations. This will include a literature review with a focus on learning from the implementation of those technologies in areas such as the United Kingdom, Germany, and Denmark. Next, researchers will identify and evaluate important environmental parameters (such as water depth, wave height and period, and depth to bedrock) that govern the selection of which technology should be used in a given location. Finally, researchers will estimate the relative costs of the different technologies based on known site conditions in Rhode Island coastal waters, and will identify the systems to be recommended for the proposed sites. This study will conclude with a final report as well as GIS maps illustrating study findings.

MARINE TRANSPORTATION

Engineering Studies in Support of the Rhode Island Ocean SAMP

(See Description under “Physical Environment”)

PHYSICAL ENVIRONMENT

Engineering Studies in Support of the Rhode Island Ocean SAMP

Malcolm L. Spaulding, URI Ocean Engineering
Stephan Grilli, URI Ocean Engineering
Annette Grilli, URI Ocean Engineering

This study is divided into three separate components: (1) wave and storm surge characterization for Rhode Island coastal waters; (2) marine transportation paths based on Automatic Identification System (AIS) data, and (3) Phase II/revised wind farm site screening analysis. The wave and storm surge characterization includes analysis of wind data to assess Rhode Island's wind resources and to estimate wave and storm surge conditions at potential alternate energy development sites. The analysis of marine transportation paths includes spatial and temporal analysis of AIS data showing commercial ship traffic patterns, and comparing this data with U.S. Coast Guard-regulated marine transport areas and routine ferry transportation corridors. The Phase II/revised wind farm site screening analysis includes a detailed review of the Phase I site screening analysis employed in the 2007 RI Winds study and a new Phase II/refined site screening analysis based on data collected as part of the Ocean SAMP, resulting in a list of sites for potential energy development. Researchers are preparing final reports as well as Geographic Information Systems (GIS) maps showing study findings.

Characterizing Physical Oceanography of the Rhode Island Coastal Ocean

Dan Codiga, URI Graduate School of Oceanography
Dave Ullman, URI Graduate School of Oceanography

This study characterizes the physical oceanography of Rhode Island's coastal waters. The researchers are summarizing the sparse existing observations, and describing representative hydrodynamic model simulations that have been demonstrated to capture observations while providing additional spatial coverage. Annual-mean and seasonal-mean currents, non-tidal current variations due wind forcing and estuarine outflow, tidal currents, and the structure of annual- and seasonal-mean temperature, salinity, density, and density stratification are being described. Using estimates of extreme winds provided by other researchers, extreme currents are being estimated. Researchers are preparing a final report as well as GIS maps illustrating the study findings.

Air Quality and Meteorology Studies in Support of the Rhode Island Ocean SAMP

John Merrill, URI Graduate School of Oceanography
Brian Heikes, URI Graduate School of Oceanography

This study is analyzing meteorological and air quality data for Rhode Island coastal waters and nearby areas. The researchers are using climatological data to analyze prevailing winds, storm occurrence, and precipitation distributions. Using these data sets, they are determining the intensity, duration, and frequency of fog and other obstructions to visibility for mariners, as well as the probability of icing conditions in offshore areas. Researchers are also using weather-balloon and ozone-vertical-profile data to characterize the meteorological environment in the context of air pollution outbreaks. Finally, researchers are compiling and summarizing applicable Environmental Protection Agency air pollution regulations and nonattainment data, in order to consider potential beneficial reductions in pollutants. Researchers are preparing a final report as well as a series of figures and tables showing study findings.

Sediment, Benthic Habitat Distribution, and Cultural Resources

John W. King, URI Graduate School of Oceanography
Rob Pockalny, URI Graduate School of Oceanography
Sheldon Pratt, URI Graduate School of Oceanography
Jon Boothroyd, URI Department of Geology
Rod Mather, URI Department of History
John Jensen, URI Department of History

This study is reviewing the sediment, benthic habitat, and cultural resources of the prospective wind farm sites. Researchers are conducting coarse resolution geophysical, geological, biological surveys and ground-truthing studies of prospective sites. They are developing GIS data layers of regional subsurface geology, geologic habitat, and biological habitat. Next, researchers are using historic, archaeological, and environmental data to identify and assess the potential for submerged historic and prehistoric archaeological sites and properties within the study area. They are augmenting these cultural assessments using existing and newly-acquired geophysical survey data. Researchers are preparing a final report summarizing the study findings, as well as GIS data layers and geological, biological, and archaeological supporting information for the GIS data.

Regional Subsurface Geology, Surficial Sediment, Benthic Habitat Distribution, and Cultural Resources

John King, URI Graduate School of Oceanography
Rob Pockalny, Sheldon Pratt, and Sam DeBow, URI Graduate School of Oceanography
Jon Boothroyd, URI Geosciences Department
Rod Mather, URI History Department

This study is divided into two major components: (1) seabed and sub-seabed characterization in state waters adjacent to Block Island; and (2) seabed and sub-seabed characterization in federal waters at a site that will be determined by the SAMP management team. The study objectives for the site in state waters are to determine the deep sub-bottom stratigraphy (analysis of rock strata) using a powerful sub-bottom profiler, to complete detailed archaeology studies, and to groundtruth studies that were done near proposed wind turbine sites. GIS maps are being developed showing the data for sub-bottom geology, archaeological sites and their interpretation, and a detailed analysis of proposed turbine sites. For the federal water site, researchers are determining bottom and sub-bottom characteristics of an area or areas approximately 50 to 60 square miles in size within federal waters identified by the SAMP screening process. Researchers are identifying archaeology targets using literature and survey data for future detailed studies, and will determine habitat types in the study area. GIS maps are being developed showing bathymetry, sediment type, biological habitat, sub-bottom geology, and archaeology targets for future detailed studies.

High Resolution Screening Analysis for Block Island Site

Malcolm Spaulding, URI Ocean Engineering
Annette Grilli, URI Ocean Engineering

This study is applying the screening tools developed during the first year of the SAMP to the area south and southeast of Block Island in order to determine the appropriate sites for a wind farm in this area. This high-resolution screening analysis includes data from the high-resolution meteorological model providing a revised wind field and seabed data from geophysical surveys. It includes improved

engineering-based values for the Technology Type within the TDI analysis and PCCA framework. The Ecosystem Services Value Index is being applied to the site to assist in screening (See "Tools").

High Resolution Modeling of Meteorological, Hydrodynamic, Wave, and Sediment Processes in the SAMP Study Area

Stephan Grilli, URI Ocean Engineering
J. Harris, URI Ocean Engineering
D. Steube, ASA

Researchers are using high-resolution meteorological, hydrodynamic, wave and sediment suspension, and numerical models to the SAMP study area to accurately characterize and map wind fields, hydrodynamic fields, and potential for sediment suspension from bottom velocity of combined waves and current. These maps will provide information that is key to the development of the offshore wind farms proposed in the Ocean SAMP area.

Buoy-Based Oceanographic and Meteorological Observations: Block Island and Deep Water Sites

Malcolm Spaulding, URI Ocean Engineering
Dan Codiga, URI Graduate School of Oceanography
David Ullman, URI Graduate School of Oceanography
Neal Pettigrew, University of Maine

Researchers are deploying two fully instrumented buoys, one off the southern coast of Block Island and the second near Cox's Ledge. The buoys are collecting data for one year, and the data is being analyzed for additional insight into the circulation, waves, and meteorology of both sites. The data is also being used to validate the model in a related study to predict hydrodynamics, wind, and waves.

Mooring Deployments and Vessel-Based Surveys to Characterize Currents and Hydrography

Dan Codiga, URI Graduate School of Oceanography
David Ullman, URI Graduate School of Oceanography

This project is designed to enhance understanding of the physical oceanography of the SAMP area by building on buoy-based sampling with fieldwork including mooring deployments and vessel-based surveys examining the horizontal and vertical structure of currents and hydrography. Researchers are deploying buoys and conducting surveys focused on key portions of the seasonal cycle – from late summer to early fall and from late winter to early spring. Researchers are analyzing currents, salinity, temperature, and surface-wave conditions. This information is important to the planning process for offshore energy production structures.

Rhode Island Wind Farm Siting Study: Acoustic Noise and Electromagnetic Effects

James H. Miller, URI Ocean Engineering/Graduate School of Oceanography
Gopu Potty, URI Ocean Engineering
Kathleen Vigness-Raposa, URI Ocean Engineering

This study analyzes the noise and electromagnetic field conditions associated with offshore wind structures, and assesses the potential impact of these conditions on marine mammals, turtles, and other living marine resources. Researchers will collect and analyze acoustic data at the candidate locations in

order to perform a detailed analysis of the present atmospheric and underwater noise conditions in these locations. They will then build and implement a noise-prediction model for the wind farm during construction and operation phases. Researchers will also collect and analyze electromagnetic field data at the candidate locations to assess present conditions and predict future increases due to the wind farm and associated cabling. Finally, researchers will quantify the potential effects of the added noise and electromagnetic exposure on marine mammals, turtles, and other native animals. This study will result in a final report and GIS maps illustrating study findings.

Acoustic Noise and Electromagnetic Effects

James H. Miller and Gopu Potty, URI Ocean Engineering
Kathleen Vigness-Raposa, URI Ocean Engineering

Researchers are accelerating efforts to quantify the underwater acoustic noise environment in the state waters southwest of Block Island in the summer. They are also conducting a set of year-long noise measurements using the Passive Acoustic Listener (PAL) systems in the site east of Block Island in federal waters in conjunction with the two GOMOOS meteorological stations being deployed in Block Island Sound. The data from these two acoustic systems will be complementary to the measurements already collected in October and November 2008 south and southeast of Block Island. Automated Information System (AIS) data will be collected during the acoustic data collection efforts providing ship identification, location, course, and speed. In addition, researchers are building and deploying an underwater magnetometer to address the fishermen's concern about underwater electromagnetic effects on fish and lobsters. The feedback received at the Ocean SAMP stakeholders meeting made clear the importance of these measurements. That system is being towed across the Jamestown power cables and that data is being compared to the ambient measurements at the Ocean SAMP sites.

POLICY & GOVERNANCE

State Policy and the Rhode Island Ocean SAMP

Kenneth Payne, URI College of Environment and Life Sciences

This study provides a means for the contextual integration of the Ocean SAMP in executive branch planning and decision-making processes in Rhode Island. The researcher is both informing the SAMP development regarding intergovernmental and interagency matters, and working to create a favorable context beyond the Coastal Resources Management Council for recognition and use of the Ocean SAMP. To do this, the researcher is reviewing State Guide Plan elements and other relevant plans and regulatory regimes to identify issues that may have a potential bearing on the preparation of the Ocean SAMP. The researcher is also making revisions to State Guide Plan Element 781, Rhode Island Energy Plan 2002, to facilitate consistency with the analysis being done on the SAMP. In addition, the researcher is offering guidance throughout the process of writing the official SAMP document. This study will conclude with a written report summarizing study findings.

Legal Aspects of the Ocean SAMP

Brian Goldman, R.I. CRMC Legal Counsel
Susan Farady, Roger Williams University School of Law/Rhode Island Sea Grant Legal Program

This study is analyzing legal and regulatory issues relating to the siting of marine renewable energy projects within the Ocean SAMP area. Researchers are conducting legal research at the local, state, national, and international levels to draft a regulatory framework for siting projects within the SAMP

boundary. Researchers are distributing this information to members of the legal community, members of the marine renewable energy community, and constituents of the Rhode Island Sea Grant Legal Program/Roger Williams University School of Law Marine Affairs Institute. Much of this information is being shared through Sea Grant Legal Program's 2008 Marine Law Symposium, A Viable Marine Renewable Energy Industry: Solutions to Legal, Economic, and Policy Challenges. This study is generating a Marine Law Symposium Proceedings document as well as a set of draft regulatory standards for guiding development and protecting ocean resources in the SAMP area as part of the Rhode Island Coastal Resources Management Plan.

TOOLS

Ecological Service Value Index (ESVI) for the RI Ocean Special Area Management Plan: Model Development and Mapping

Annette Grilli, URI Ocean Engineering
Deborah French McCay, Applied Science Associates

The goal of the preliminary site screening analysis of the RI Ocean SAMP is to establish areas that are suitable for renewable energy development within Rhode Island coastal waters. Tier I of the analysis assessed the physical constraints of various areas including energy resource availability, exclusions, and technology type. The outcome of Tier I is the "Technical Development Index" (TDI) reflecting these issues. Tier II of the analysis assesses use conflicts and collaborations, as well as natural resource uses and values. An "Ecological Services Value Index" (ESVI) analogous to the TDI is to be developed, which will be a composite measure of ecological service values, such that it can be used to compare the impact of potential wind farm sites on natural resources. The ESVI will be a relative index, based on combinations of individual indices of usage by and of the various natural resources of concern in the area. The ecological analysis will include mapping of habitat values, as well as usage by birds, bats, marine mammals, sea turtles, and fisheries resources. To quantify distributions and relative densities of specific species groups of concern in Rhode Island waters, researchers will develop a wildlife movement (migration and behavior) model (WildMap) based on life history information and available observational data. The model will be supported and ground-truthed by presence/absence, abundance, frequency and spatial observational data, such as that being developed by other researchers involved in the SAMP. For fisheries utilization and other human uses, spatial and statistical data will be incorporated into the overall ESVI.

Geospatial Data Support for a Revised Wind Farm Site Screening Analysis (Phase II)

Peter August, URI Department of Natural Resources Science
Charles LaBash, URI Department of Natural Resources Science
Christopher Damon, URI Department of Natural Resources Science

This project will provides mapping support for the analytical, visualization, outreach, and communication needs of the Ocean SAMP assessment process. The researchers are consolidating all relevant and available geospatial data and metadata, converting them to a common geography, and making the data accessible over the Internet. They are also taking the new data emerging from the SAMP process and creating new maps and other cartographic and analytic products. All of these materials are available online via the www.narrbay.org web portal.