

# HABITAT HOTLINE *Atlantic*

2012 Annual Issue



## HEALTHY FISHERIES NEED HEALTHY HABITAT

### SPOTLIGHT ON OFFSHORE WIND PROJECTS: *OFFSHORE WIND IN MY BACKYARD?*

#### Introduction

On February 7, 2011, the Department of Energy and the Department of the Interior's Bureau of Ocean Energy Management (BOEM) released National Offshore Wind Strategy: Creating an Offshore Wind Industry in the United States. This strategic plan set a goal to deploy 10 gigawatts of offshore wind power capacity by 2020 and 54 gigawatts by 2030. This would generate enough electricity to power 2.8 million American homes by 2020 and 15.2 million homes by 2030. Offshore wind is a prevalent energy source in Europe, but no commercial wind facility has yet been built in U.S. waters.

Criteria for location, configuration, and spacing of wind turbines within a facility will vary among States. Coastal Marine Spatial Planning (CMSP) has and is being used to identify compatibilities and conflicts between human uses, natural resources, wind facility siting, and power transmission corridors. Social factors to consider are the distribution, timing, and intensity of commercial fisheries, recreational fisheries, commercial and recreational vessel traffic including eco-tourism, and both archaeological and cultural resources. Environmental factors to consider include offshore geology, physical oceanography, benthic habitats, coastal and wetland resources (including sensitive upland habitats), invertebrates and finfish, protected marine species, and birds.

The seafloor bottom type (rock or sediment) and bathymetry are critical in determining how the wind power facility will be constructed and the transmission cables deployed. Foundation placement should not be within 1,000 feet of hard bottom or other sensitive benthic habitat such *(continued on next page)*



Photo Credit: [http://www1.eere.energy.gov/wind/pdfs/national\\_offshore\\_wind\\_strategy](http://www1.eere.energy.gov/wind/pdfs/national_offshore_wind_strategy).

#### IN THIS ISSUE

##### Spotlight on Offshore Wind Projects

<i>Offshore Wind in My Backyard?</i> .....	1-2
<i>Current Atlantic States Offshore Wind Efforts</i> .....	4-5

##### Coming Soon...

<i>Harbor Deepening: Potential Habitat and Natural Resource Issues</i> .....	6
<i>Current Harbor Deepening Projects</i> .....	6

##### Coastal Eutrophication as a Driver of Salt Marsh Loss .....

7

##### The Northeast Aquatic Connectivity Project .....

8-9

##### Ocean Data Portals

<i>Northeast Regional Council (NROC)</i> .....	10
<i>Mid-Atlantic Regional Council on the Ocean (MARCO)</i> .....	10
<i>Governor's South Atlantic Alliance (GSAA)</i> .....	11

##### NOAA Habitat Blueprint .....

12

##### Atlantic Coast Fish Habitat Partnership Update .....

13

##### Updates from Around the Coast .....

14-23

# SPOTLIGHT ON OFFSHORE WIND PROJECTS

as shellfish beds and corals. This reduces the likelihood of altered currents or sediment deposition patterns. Survey tracks and data processing should be done in a manner to achieve a verified minimum mapping unit of 0.01 acres or smaller. Facilities within nearshore waters may require smaller minimum mapping units to adequately characterize seagrass, oyster reefs, coral patch reefs, and similar habitats.

Increased sedimentation and turbidity resulting from trenching and dredging for cable installation suffocates benthic communities. Increased noise from pile driving alters species migrations and behaviors. Turbine foundations and pilings alter water flow and function as artificial reefs. Ecologically, benthic species abundance and diversity are reduced, reef communities are established where they did not exist, and food webs are significantly altered. Ecological effects of heat generation and electromagnetic radiation from transmission cables are not fully understood.

Maps and inventories of existing habitats exist but are largely incomplete. Habitats such as sand, hard bottom, and both natural and artificial reefs have to be identified and mapped. Data on the distribution and abundance of associated invertebrate, shellfish, and finfish communities is lacking and needs to be documented. These communities include benthic, demersal, and pelagic species. Inclusion of essential fish habitats (EFHs) and marine protected areas (MPAs) on maps and inventories is necessary.

Mapping of critical habitats, including wetlands, shellfish beds, protected areas, uplands, and land use and change are essential. The potential for sea level rise impacts on the wind power facility's location should be considered. Habitat locations may shift into areas already used by wind facilities

and their power distribution system. Cable termini and transmission corridors should not pass through or cross salt marsh, submerged aquatic vegetation, or shellfish areas. Rather, directional drilling should be used to route all cables below these habitats.

The temporal and spatial distribution, abundance, movement and habitat use of protected marine species must be considered. Protected species include marine mammals, sea turtles, some fishes, and other species of concern. Increased vessel traffic to and from a wind facility along with rerouting of existing vessel traffic increases the potential for ship strikes. An integrated set of techniques should be used to monitor protected species: passive acoustic monitoring, aerial surveys, and shipboard observers. Passive acoustic monitoring is effective for large areas and species such as the right whale. Large wind facilities should be sited and configured to minimize encounters with marine mammals, migrating fish, and sea turtles. When data are limited, wind facilities that are mostly oriented parallel to the migration routes appear preferable to wind facilities with mostly perpendicular orientations. If sea turtle nesting beaches are nearby, the orientation with least impacts to migrating routes may be difficult to discern.



Photo Credit: <http://www.windenergyplanning.com>

Bird distribution, movement, abundance, and behavior near offshore wind facility locations should be evaluated. Migratory flyway locations and flight height must be considered. Species of concern are shorebirds, migratory seabirds, sea ducks, and passerines; some of which are threatened or endangered.

## DESIGN, CONSTRUCTION & OPERATION

**Turbine Installation:** Turbine installation creates a variety of loud noises which can cause injuries to a variety marine species such as permanent or temporary hearing loss,

barotraumas, and behavioral changes to communication, predation, predator avoidance, and navigation. The National Oceanic and Atmospheric Administration (NOAA) Fisheries Service uses conservative sound pressure thresholds while comprehensive guidance on sound characteristics are being developed. The interim guidelines are available at [www.nwr.noaa.gov/Marine-Mammals/MM-sound-thrshld.cfm](http://www.nwr.noaa.gov/Marine-Mammals/MM-sound-thrshld.cfm).

Sound intensity is affected by pile size and material, water depth, sediment type, and bottom topography. Vibratory hammers, drilled shaft, and press-in piling are preferred methods of pile installation. Impact pile driving should be avoided when possible. If used, it should be coupled with mitigation measures such as soft-starts, shut-downs, pile caps, bubble curtains, cushion blocks, and coffer dams. Alternate turbine support systems, such as pads buried into the sediment, can reduce noise.

**Electromagnetism:** Transmission cables that connect turbines to transformers, substations, and other turbines produce heat and electromagnetic fields that fish such as sharks and sea turtles may be able to detect. Buried cables will have less of an impact from emitted electromagnetic fields and heat than surface cables. European wind facilities install either a three-conductor AC cable system or a two-conductor bipolar DC transmission system to reduce electromagnetic fields.

**Cable Burying:** For environmental and safety reasons, transmission cables are often buried several feet under the seabed. Burial of cables reduces heating of the seafloor and protects the cables from bottom trawl nets and anchors, European standards require cables to be buried at least one meter deep; sometimes cables are buried up to 15 feet. Six feet is recommended. Cable depth and seabed characteristics, hard rock versus sand, are important factors in deciding whether to use hydro-plowing or dredging to bury cables.

A hydro-plow is a series of high pressure nozzles that are directed downward and backward. The downward and backward flow re-suspends sediments (fluidizing) within the trench. The cable can then settle into the trench under its own weight. Hydro-plowing is often the preferred method of cable installation by state and federal regulatory agencies.

Dredging has a much larger disturbance footprint than a hydro-plow. Sediment is removed from the seabed and deposited alongside the trench or in a different area.



*Offshore export cables*

*Photo Credit: <http://www.londonarray.com/the-project/offshore/cables/>*

Depending on the dredging method, trenches may be 50 feet wide plus an additional 30-feet per one foot of depth. The cable is lowered into the trench, which is often left to slowly refill through natural settling of the displaced sediments.

**Turbine Operation:** Environmental impacts caused by turbine operation are not fully understood and requires further research. Potential sources of impact are from operational noise, vibration, and discharges of coolants or lubricants during maintenance of cables, turbines, and transformers.

*For the full version of the Habitat Committee's report, "Offshore Wind in My Backyard?" please visit the Atlantic States Marine Fisheries Commission's website: [www.asmfc.org/publications/habitat/hms11OffshoreWindinMyBackyard\\_August2012.pdf](http://www.asmfc.org/publications/habitat/hms11OffshoreWindinMyBackyard_August2012.pdf).*

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# SPOTLIGHT ON OFFSHORE WIND PROJECTS

## CURRENT ATLANTIC STATES OFFSHORE WIND EFFORTS

### RHODE ISLAND

#### Wind Energy Planning: Rhode Island Ocean Special Area Management Plan (RI Ocean SAMP)

In July of 2010, Massachusetts (MA) and Rhode Island (RI) agreed to collaborate in the process to permit and develop offshore wind energy projects in a designated "area of mutual interest" (AMI) in federal waters. The AMI covers 400-square miles in RI Sound beginning 12 miles southwest of Martha's Vineyard and extending 20 miles westward toward Block Island. The Memorandum of Understanding states that the RI Ocean SAMP would serve as the planning and assessment guide to help identify the best locations for offshore wind energy project sites in the AMI, through a task force process. In October 2010, the RI Coastal Resources Management Council (CRMC) approved the RI Ocean SAMP, a national model for marine spatial planning and the first SAMP in the nation to zone offshore waters for future uses and preservation. The RI Ocean SAMP spans approximately 1,467 square miles over portions of Block Island Sound, RI Sound and the Atlantic Ocean. More information is available at <http://seagrant.gso.uri.edu/oceansamp/>. On December 6, 2011, the National Oceanic and Atmospheric Administration (NOAA) approved the RI CRMC's Geographic Location Description (GLD) as part of the RI Ocean SAMP. This approval will give CRMC an extended federal consistency review over federal waters. On June 13, 2012, the CRMC announced the RI Ocean SAMP Research Agenda. The research agenda identifies additional research that is needed in the Ocean SAMP area. The agenda was distributed to the Ocean SAMP stakeholder group and the public with a 60-day comment period.

#### Block Island Wind Farm Project

The Block Island Wind Farm project, one of two Rhode RI offshore wind farms being developed by Deepwater Wind, is on target to begin construction in 2013. The five turbine (30 megawatt) demonstration-scale offshore wind farm will be located in RI state waters roughly 3-miles southeast of Block Island and should supply the majority of Block Island's electricity needs with excess power being transported to the mainland. In July 2011, the RI Supreme Court upheld the Block Island Wind Farm power contract agreed to by the RI Public Utilities Commission. To date, Deepwater Wind has completed

the majority of their pre-construction surveys and has started the permitting process for the Block Island Wind Farm by submitting the required applications to the appropriate agencies.

The Block Island Wind Farm will be the predecessor to the larger 150-200 turbine Deepwater Wind Energy Center (DWECC), touted as the nation's first 900-1,200 MW-scale offshore regional energy center. The DWECC would be located within the Wind Energy Area (WEA) identified by the U.S. Bureau of Ocean Energy Management (BOEM) in federal waters offshore the coast of RI and MA, with most turbines located more than 20 miles from the mainland. An Environmental Assessment (EA) for this WEA was released on July 2, 2012 with a 30-day public comment period. BOEM will continue with the next steps in the commercial wind leasing process for the offshore RI and MA WEA.

### DELAWARE

#### Proposed Wind Farm Study Site

The University of Delaware proposes to construct 7-8 tower bases and transmission lines 3-5 nm offshore. The University would then contract with manufacturers who want to field test their units to quantify generating capacity under "real world" conditions. The proposed site would be immediately adjacent to a permitted artificial reef, and there is concern about acoustical impacts on fish.

### VIRGINIA

#### Plans Suspended for Industrial-Scale Wind Turbine in Chesapeake Bay

What could have been the first in-water installation of an industrial scale wind turbine in the US in the Virginia portion of the Chesapeake Bay has been suspended by Gamesa Energy USA. The Virginia Marine Resources Commission (VMRC) had voted unanimously to approve the proposed construction of a 479-foot tall, five megawatt wind turbine generator prototype in the lower Chesapeake Bay, three miles off the Eastern Shore town of Cape Charles at its March 27, 2012 meeting. The construction of the prototype turbine was scheduled for completion in late 2013. Without a mature offshore wind market in the United States, Gamesa announced its plans to postpone the project on May 7, 2012. The application and supporting information considered for the review of the permit application can be viewed on the VMRC web site at: <http://mrc.virginia.gov/Notices/2012/Gamesa%20Project%20Description%20Feb%202012.pdf>. The information and issues addressed in the documentation should serve as an example of the appropriate information for any future similar projects in Virginia state waters.

### SOUTH CAROLINA

#### Evaluating Wind Energy Development

The State of South Carolina established a formal Renewable Energy Task Force with BOEM to evaluate wind energy



*Fishing Boat Wind Farm*

Photo credit: Mattias Rust/<http://www.iucn.org>

*continued on page 5*

## Offshore Wind Energy Related Links

### Federal agencies involved in siting wind facilities:

Bureau of Ocean Energy Management (BOEM)  
<http://ocsenergy.anl.gov/guide/wind/index.cfm>

Department of Energy (DOE)  
<http://www.windpoweringamerica.gov/>

U.S. Fish and Wildlife Service (FWS)  
<http://www.fws.gov/midwest/wind/resources/index.html>

Multipurpose Marine Cadastre  
<http://www.marinecadastre.gov/default.aspx>

### State Agencies involved in siting wind facilities:

NH-UNH Center for Ocean Renewal Energy  
<http://www.unh.edu/core>

MA Clean Energy Center  
<http://www.masscec.com/>

MA Office of Coastal Zone Management  
<http://www.mass.gov/czm/>

MD Department of Natural Resources Coastal Atlas  
<http://dnr.maryland.gov/ccp/coastalatlus/>

MD Energy Administration  
<http://energy.maryland.gov/wind.html>

ME State Planning Office  
<http://www.maine.gov/spo>

NJ Offshore Wind Studies  
<http://www.nj.gov/dep/dsr/ocean-wind/>

NY State Department of Environmental Conservation  
<http://www.dec.ny.gov/energy/40966.html>

RI Coastal Resources Management Council  
<http://www.crmc.ri.gov/>

SC Department of Natural Resources GIS Data Resources  
<http://www.dnr.sc.gov/GIS/gisenergy.html>

SC Energy Office  
<http://www.energy.sc.gov/index.aspx?m=6&t=85>

VA Marine Resources Commission  
[http://leg2.state.va.us/dls/h&s/docs.nsf/By+Year/SD102010/\\$file/SD10.pdf](http://leg2.state.va.us/dls/h&s/docs.nsf/By+Year/SD102010/$file/SD10.pdf)

VA Offshore Wind Development Authority  
<http://wind.jmu.edu/offshore/vowda/index.html>

### Other groups involved in siting wind facilities

American Wind Energy Association  
<http://www.awea.org/learnabout/offshore/wildlife.cfm>

Clemson University Restoration Institute  
[http://www.clemson.edu/restoration/focus\\_areas/renewable\\_energy/wind/](http://www.clemson.edu/restoration/focus_areas/renewable_energy/wind/)

Collaborative Offshore Wind Research Into the Environment (COWIRE)  
<http://www.subacoustech.com/information/downloads/reports/544R0308.pdf>

Georgia Wind Working Group  
<http://www.gawwg.org/>

Integrated Ocean Observing System (IOOS) Data Catalog and Asset Viewer  
<http://www.ioos.gov/catalog/>

Mid-Atlantic Regional Council on the Ocean (MARCO) Data Portal  
[http://www.midatlanticocean.org/map\\_portal.html](http://www.midatlanticocean.org/map_portal.html)

National Wildlife Federation  
<http://www.nwf.org/global-warming/policy-solutions/renewable-energy/offshore-wind.aspx>

North America Offshore Wind Project  
<http://offshorewind.net/>

Northeast Ocean Data Portal  
<http://northeastoceandata.org/>

Offshore Wind NC  
<http://offshorewindnc.org/resources/>

Offshore Wind Energy Europe  
<http://www.offshorewindenergy.org/>

University of North Carolina Energy Services  
<http://www.climate.unc.edu/coastal-wind>

U.S. Offshore Wind Collaborative  
<http://www.usowc.org/>

### Current Atlantic States Offshore Wind Efforts *continued from page 4*

development in the coastal waters of the state. Two meetings have occurred with Task Force members to establish Task Force activities and learn more about activities and findings related to a similar Task Force involving BOEM and the State of North Carolina. Prior to establishment of this Task Force, the South Carolina Energy Office had completed several efforts to evaluate and expedite wind energy exploration, including funding a comprehensive GIS analysis of the state's coastal and offshore habitats, biological resources, and coastal uses that was conducted by the SC Department of Natural Resources. Over 70 GIS data layers and a complete report are now available for downloading at <http://www.dnr.sc.gov/GIS/gisenergy.html>.

# COMING SOON...

## HARBOR DEEPENING: POTENTIAL HABITAT AND NATURAL RESOURCE ISSUES

In 2013, the ASMFC's Habitat Committee will release a habitat management series document entitled "Harbor Deepening: Potential Habitat and Natural Resource Issues". Upgrades of the Panama Canal and locks that will allow passage of ships with drafts of 50 feet or greater are approaching completion. This will have major implications in terms of economic drivers to our ports and harbors. Many ports along the Atlantic coast have already been deepened or are proposing to deepen their navigation infrastructure to accommodate these ships. While not geographically specific, this document is designed to aid habitat managers in their overall evaluations of harbor deepening projects and assessments of specific water quality and physical alterations. Direct and indirect impacts on habitats and associated biological resources will be identified. Examples will be provided of potentially effective mitigation strategies to reduce both long and short-term impacts to natural resources. Sources of more detailed information about ongoing or planned harbor dredging projects will be provided, as well as useful references relating to natural resource impacts. Please check the Commission's website ([www.asmf.org/publications/habitat/](http://www.asmf.org/publications/habitat/)) in Spring 2013 for the release of this next installment in the Habitat Management Series.

## CURRENT HARBOR DEEPENING PROJECTS MARYLAND

In Maryland's Baltimore Port, the berthing and turning basin area at Seagirt Marine Terminal has already been expanded to accommodate larger container vessels. The Port Administration is exploring the use of the Coke Point area at Sparrows Point as a disposal site for sediments dredged from inside the North Point to Rock Point line. This sediment has been legally classified as contaminated and must be placed in a confined disposal area if placed outside of the Port. The Port Administration's plan involves an upland cell and open water fill area that would eventually become a marine terminal. Also being studied is the possibility of over dredging a section of the existing channel to obtain clean sandy material located below the channel. This sandy material could then be used within the Port to



*Example of a deep-draft container ship entering a port. Photo Credit: Douglas Clarke, USACOE*

cap contaminated sediments. The over dredged section of the channel would be refilled with dredge material from the annual maintenance dredging activity in the Baltimore Port. The Port Administration estimates that the entire cycle of over dredging a section of channel and refilling it back to grade would take about 18-24 months.

## SOUTH CAROLINA

The U.S. Army Corps of Engineers (USACOE), Charleston District, has initiated intensive planning and feasibility studies to deepen Charleston Harbor channels to accommodate post-Panamax vessels. The feasibility study for the project, which is known as Post 45, began in May 2011 and has received financial commitments for cost sharing from the State Ports Authority. As part of President Obama's "We Can't Wait" initiative, the District plans to complete the feasibility study for Post 45 within four years at a cost of \$15 million or less. Both state and federal agencies concerned with protecting the natural resources and sensitive habitats in the Charleston Harbor estuary are working closely with the Corps to ensure that long term adverse impacts do not occur. The Savannah River deepening project has met with several legal challenges involving the South Carolina Savannah River Maritime Commission and multiple environmental groups due to numerous environmental quality concerns. Among these concerns are an extension of the salt water into valuable tidal freshwater wetlands of the Savannah National Wildlife Refuge, further depletion of dissolve oxygen in the upper reaches of the project to the extent that it will require mechanical respirators to avoid hypoxic conditions, and release of toxic cadmium and other pollutants.

## FLORIDA

Port deepening projects for the ports of Miami, Port Everglades (Ft. Lauderdale), Palm Beach and Jacksonville are in the project engineering and design, draft EIS, state and federal permit review, or NEPA document review phases of development. The Port of Miami is farthest along in this process with a state permit issued by the Florida Department of Environmental Protection. Marine habitat resources, including large areas of coral reef, seagrass and hard bottom will be adversely affected, and mitigation efforts and options are being assessed and implemented by state and federal resource managers. For more information about the Port of Miami project, please visit: <http://www.saj.usace.army.mil/Media/FactSheets/tabid/6073/Article/3855/miami-harbor-phase-iii-dredging-project.aspx>.

# SALT MARSH LOSS

## Coastal Eutrophication as a Driver of Salt Marsh Loss

Deegan, L., D.S. Johnson, R.S. Warren, B.J. Peterson, J.W. Fleeger, S. Fagherazzi, and W.M. Wollheim. 2012. *Coastal Eutrophication as a Driver of Salt Marsh Loss*. *Nature*. 490: 388-392.

Salt marshes have been disintegrating and dying over the past two decades along the U.S. Eastern seaboard and other highly developed coastlines, without anyone fully understanding why. This Fall in the journal *Nature*, MBL Ecosystems Center scientist Linda Deegan and colleagues report that nutrients, such as nitrogen and phosphorus from septic and sewer systems and lawn fertilizers, can cause salt-marsh loss. The following is the abstract of the study, "Coastal eutrophication as a driver of salt marsh loss":

Salt marshes are highly productive coastal wetlands that provide important ecosystem services such as storm protection for coastal cities, nutrient removal and carbon sequestration. Despite protective measures, however, worldwide losses of these ecosystems have accelerated in recent decades. Here we present data from a nine-year whole-ecosystem nutrient-enrichment experiment. Our study demonstrates that nutrient enrichment, a global problem for coastal ecosystems, can be a driver of salt marsh loss. We show that nutrient levels commonly associated with coastal eutrophication increased above-ground leaf biomass, decreased the dense, below-ground biomass of bank-stabilizing roots, and increased microbial decomposition of organic matter. Alterations in



*Healthy salt marsh creeks at Plum Island Estuary, Massachusetts, are lined with lush, smooth cordgrass. The plant's below-ground roots and above-ground leaves build and maintain salt marshes.*  
Photo Credit: David S. Johnson, Marine Biological Laboratory (MBL)

these key ecosystem properties reduced geomorphic stability, resulting in creek-bank collapse with significant areas of creek-bank marsh converted to unvegetated mud. This pattern of marsh loss parallels observations for anthropogenically nutrient-enriched marshes worldwide, with creek-edge and bay-edge marsh evolving into mudflats and wider creeks. Our work suggests that current nutrient loading rates to many coastal ecosystems have overwhelmed the capacity of marshes to remove nitrogen without deleterious effects. Projected increases in nitrogen flux to the coast, related to increased fertilizer use required to feed an expanding human population, may rapidly result in a coastal landscape with less marsh, which would reduce the capacity of coastal regions to provide important ecological and economic services.

For the full report, please visit: <http://www.nature.com/nature/journal/v490/n7420/full/nature11533.html>.

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*Slumping Salt Marsh at Plum Island*  
Photo Credit: Kate Morkeski, MBL

# NORTHEAST AQUATIC CONNECTIVITY PROJECT

*This article is a contribution from Erik Martin and Colin Apse of The Nature Conservancy, Eastern Freshwater Program.*

The fragmentation of river habitats through dams and poorly designed culverts is one of the primary threats to abundance and diversity of aquatic species in the United States. North American freshwater fish and mussels are two of the most imperiled species groups in the world, and habitat loss is the leading factor in their decline. River habitat fragmentation directly impacts species life cycles - anadromous fish, such as Atlantic salmon, are unable to reach preferred freshwater spawning habitats from the sea; resident fish such as brook trout are unable to reach thermal refuges; and freshwater mussels' host fish are unable to connect isolated breeding populations with dwindling intact habitats.

The Northeast Aquatic Connectivity project (<http://rcngrants.org/content/northeast-aquatic-connectivity>) assessed dams for their impacts on aquatic connectivity and the potential ecological benefit of their removal or mitigation via fish passage. This information, in combination with site specific information on social, economic, and feasibility factors, can be used to help state agencies, federal agencies, NGOs, and local communities move from an opportunistic approach to fish passage projects to an ecological benefits approach.

The project was guided by a Workgroup composed of biologists, managers, and other fish passage professionals from across the study area (Maine to Virginia) and beyond. In addition to representation from each state's department of fish and wildlife, the Workgroup included members from federal agencies (e.g., USACOE, United States Fish and Wildlife Service (USFWS), NOAA), non-profit organizations (e.g., The Nature Conservancy, Trout Unlimited, American Rivers), academia (e.g., Virginia Commonwealth University), and Canadian provincial agencies. This group of experts provided strategic guidance at key decision points, helped gather data for their respective areas of expertise, and provided critical feedback on draft products. Staff from The Nature Conservancy's Eastern Division carried out the work under the direction of the Workgroup.

As a foundation, dam data was compiled from a variety of sources including the National Inventory of Dams, state agencies, topographic maps, aerial photos, and expert

knowledge. The dam data was spatially aligned with the 1:100,000 scale National Hydrography Database (NHDPlus) and thoroughly reviewed through a painstaking process. Several other datasets were used to attribute the dams with meaningful network, watershed, and ecological information. These datasets included land cover and impervious surface data (National Land Cover Database), diadromous fish data from multiple sources, rare species & fish richness data from Nature Serve, and Eastern Brook Trout Joint Venture (EBTJV) data, among others. These datasets were used to create a host of metrics in a GIS format for each dam in the study area. For example, impervious surface data was used to calculate the percent impervious surface in the watershed of each dam, and was also used to calculate the percent impervious surface in the Active River Area (riparian buffer) of a dam's upstream and downstream connected river network. The net result of the metric calculations was a table where each row represents a dam and each column is a metric that describes information about the dam's biological or habitat context. Over 60 metrics were calculated ranging from the number of stream miles that would be opened by a fish passage project at any given dam, to the number of anadromous fish species with current habitat downstream of each dam, to the presence of rare crayfish in a dam's connected network.

Depending on the objectives of the person planning a fish passage project, not all of these metrics are of equal importance. For example, if one is looking to prioritize dams for fish passage projects to benefit anadromous fish, the number of upstream habitat miles opened by a dam's removal would be of much more significance than the presence of a rare crayfish species. Or, if one is looking for fish passage projects to benefit a resident species, like brook trout, the dam's location in an EBTJV healthy watershed would be of greater importance than the number of diadromous species found downstream of a dam. Thus, relative weights are applied to each metric for a given prioritization scenario.

Two "default" sets of weights were chosen by the project Workgroup through an iterative process for anadromous fish and resident fish scenarios. Additionally, a custom analysis tool was developed to allow users to create their own prioritizations for a given geography (state, watershed, etc.) and using their own metric weights. For example, a fisheries

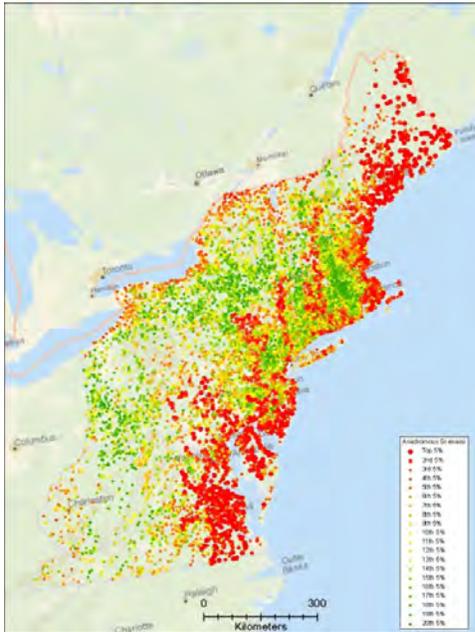


Figure 1. Dams colored by anadromous fish scenario results. Red dams have the greatest potential benefit for anadromous fish species if removed or bypassed.

for example, to help acquire and target funding, develop watershed plans, and communicate with dam owners and the public.

The Northeast Aquatic Connectivity project led to the Chesapeake Fish Passage Prioritization project (CFPPP), which followed the same conceptual model. The CFPPP, however, incorporated several improvements including a web map and custom prioritization tool. See the tool at [http://maps.tnc.org/EROF\\_ChesapeakeFPP](http://maps.tnc.org/EROF_ChesapeakeFPP).

Most recently, The Nature Conservancy and the Southeast Aquatic Resources Partnership (SARP) were funded by the South Atlantic Landscape Conservation Cooperative (SALCC) to conduct a similar analysis from southern Virginia to the Gulf Coast. This two year project will commence in January 2013, and will engage state and federal agencies, NGOs, and academics in the Southeast. At the end of the South Atlantic Aquatic Connectivity Assessment, TNC intends to re-run the Northeast Aquatic Connectivity analysis, merge the two together and develop a web map and tool that will cover the entire eastern seaboard. Thus in the coming years, one can expect increasing geographic scope and sophistication in the tools available for fish passage prioritization.

manager working with American shad in Maryland could develop a prioritization of potential projects that would have the most benefit to that species in their state or watershed of interest.

The raw results are a sequential list of dams ordered by their potential ecological benefit if removed or bypassed. Yet, the precision with which a GIS can calculate these metrics is not necessarily indicative of meaningful ecological differences, so the results are binned into five percent tiers for presentation (see maps).

It is critical to note that the results are intended to be a screening level tool, developed with the best available data, to help inform the decision making process. The results do not include social and economic factors, or ecological metrics lacking regional data, and therefore are not a replacement for local information.

In addition to helping fisheries managers plan passage projects, the results and tool are currently being used,

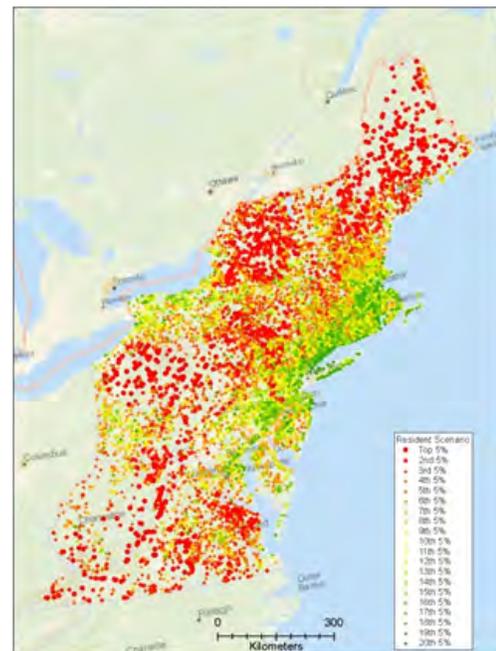


Figure 2. Dams colored by resident fish scenario results. Red dams have the greatest potential benefit for resident fish species if removed or bypassed.

# OCEAN DATA PORTALS

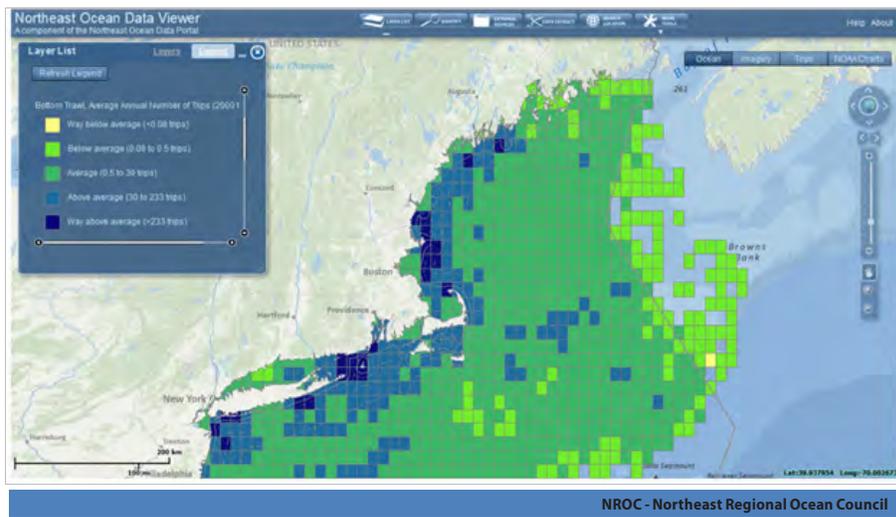
## NORTHEAST REGIONAL OCEAN COUNCIL (NROC)

*This article is a contribution by John Weber, Ocean Planning Director for the Northeast Regional Ocean Council.*

The Northeast Regional Ocean Council (NROC) is a partnership of state and federal agencies, convened by New England's Governors in 2005, and are developing specific data and science products in support of ocean planning in New England. NROC is developing information and spatial data related to natural resources and current existing uses such as fishing, boating, energy development including renewable energy and related infrastructure, commerce related to ports and shipping, and aquaculture, as well as new uses.

Simultaneously with efforts to engage other stakeholders, NROC has a project underway to gather data on existing uses, the NROC Fisheries Mapping Project. The main purpose of the project is to convene a series of conversations in fall 2012/ winter 2013 with the commercial fishing and party/charter industries, fisheries scientists, and managers to aid NROC in developing a series of maps characterizing spatial patterns of fishing activity in the Northeast. NROC's belief is that fishing industry involvement with this project is vital for its success. The project will use existing data sources such as vessel trip report (VTR) and vessel monitoring system (VMS) derived information, and recognizing that there are gaps in these data sources, the project will also provide suggestions for needed future mapping to more fully characterize the wide variety of commercial fishing activities in New England. Results of this project will be hosted on the Northeast Ocean Data Portal ([www.northeastoceandata.org](http://www.northeastoceandata.org)), an online, publically-accessible source of ocean use and resource data.

A second NROC project relates to the various marine habitat classification and mapping efforts underway in New England. Recognizing the significant amount of federal and state interest in mapping and classifying habitat for various marine resource management purposes, NROC will be convening a workshop in early to mid-2013 to bring together scientists and managers to discuss the potential for collaboration between



the different habitat mapping and classification activities underway in New England. The outcomes of this workshop will then help inform potential future work to advance habitat classification.

Both of these projects are in the portfolio of work that NROC has begun to identify opportunities for enhanced ocean use- and resource management. For more information on these NROC projects, please contact John Weber ([jweber@northeastoceancouncil.org](mailto:jweber@northeastoceancouncil.org)) or Nick Napoli ([nnapoli@northeastoceancouncil.org](mailto:nnapoli@northeastoceancouncil.org)).

## MID-ATLANTIC REGIONAL COUNCIL ON THE OCEAN (MARCO)

In 2009, the Governors of New York, New Jersey, Delaware, Maryland and Virginia signed an agreement to form the Mid-Atlantic Regional Council on the Ocean (MARCO) to advance regional approaches to maintain and improve the health of ocean and coastal resources that contribute to the high quality of life and economic vitality of the Mid-Atlantic region.

MARCO recently launched an upgraded ocean data portal (<http://portal.midatlanticocean.org/portal/>) to support multi-use, regional-scale ocean planning in the Mid-Atlantic. The MARCO Portal provides the ability to display, query and download regionally relevant data through an intuitive easy to use interface, putting essential data and state-of-the art mapping and visualization technology into the hands of the agencies and ocean resource users engaged in ocean decision

making and planning processes. The MARCO Ocean Data Portal is organized around seven focus-area themes relevant to planning in the Mid-Atlantic -- Fishing, Renewable Energy, Maritime Industry, Marine Life, Security, Recreation, and Administrative.

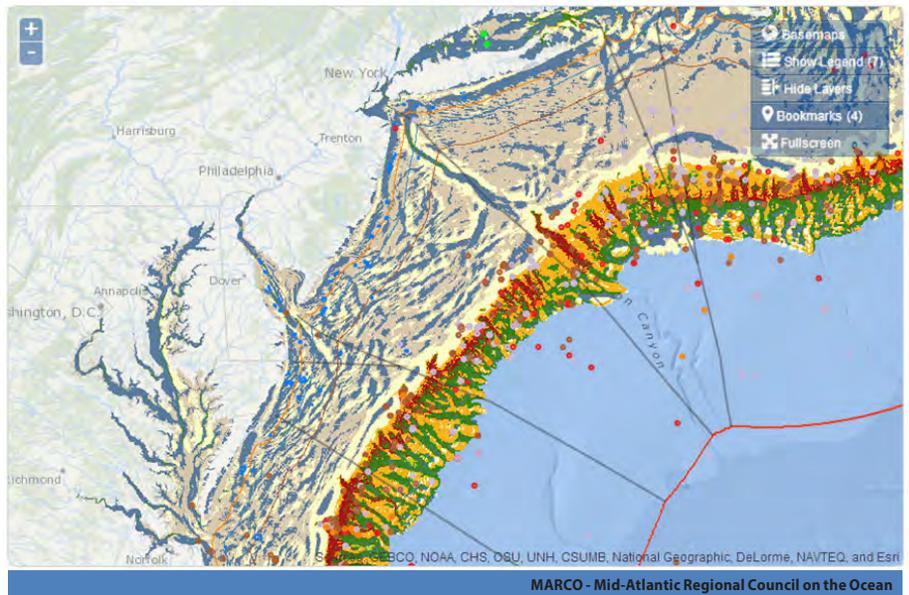
The themes include initial regional scale map data layers and the MARCO Portal project team is continuing to assemble available data to fill identified gaps on marine habitat, marine life and human uses. Ongoing work includes collaboration with state agencies to conduct participatory GIS workshops to create the Mid-Atlantic region's first draft of comprehensive recreational ocean-use maps. In the future, additional data will be added to round out the collection to help resource managers and regional planners to make well informed management and policy decisions.

The MARCO Portal project team is currently scheduling and holding meetings with state and federal agency staff and diverse ocean resource users in all five Mid-Atlantic states to review and improve the portal's spatial data and to get advice on optimizing the user interface and developing additional features for analysis, reporting, and communications. In essence, the team is asking a simple, two-part question of stakeholders: "what places in the ocean are important to you, and why?"

Whether reviewing existing information or contributing new data to fill critical gaps, habitat stakeholders' participation in the MARCO Portal project will help set the stage for future management decisions that balance diverse goals and provide lasting benefits for the Mid-Atlantic region and beyond. Please contribute your ideas and ocean knowledge online and in person to help build this important resource: <http://portal.midatlanticocean.org/portal/>

## GOVERNOR'S SOUTH ATLANTIC ALLIANCE (GSAA)

The Governor's South Atlantic Alliance is the newest of the three regional ocean data portal associations along the east coast. Established in 2009, the Alliance is led by the



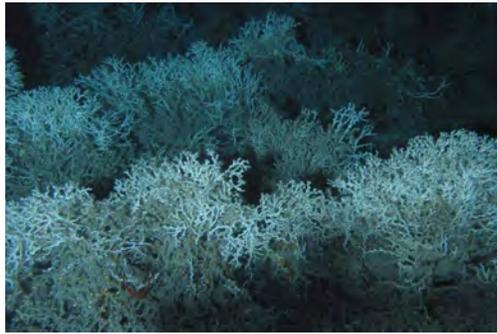
four southeastern states in partnership with three federal co-lead agencies (National Oceanographic and Atmospheric Administration (NOAA), Environmental Protection Agency (EPA), and USGS), but other GSAA partners include additional federal agencies, academia, non-profits, private industry, and other regional organizations. The mission of the Alliance is to "significantly increase regional collaboration among the South Atlantic states, with federal agency partners and other stakeholders, to sustain and enhance the environmental (coastal/marine), natural resources, economic, public safety, social, and national defense missions of the respective states and the South Atlantic region." The Alliance established an Action Plan in 2010 and an Implementation Plan in 2011 (available at <http://www.southatlanticalliance.org>) that are focused on four priority issues: Healthy Ecosystems, Working Waterfronts, Clean Coastal and Ocean Waters, and Disaster Resilient Communities. Through grants from NOAA, the Alliance has obtained funding necessary for administrative and programmatic activities, which includes development of a Regional Information Management System (RIMS) as part of one initiative being led by the Southeast Coastal Ocean Observing Regional Association (SECOORA). The RIMS team is now in the design and development phase of the GSAA Data Portal that initially will be populated with selected data layers useful to sediment management and habitat conservation. The Alliance recently held its Second Annual Meeting in Charleston, SC in September 2012, where updates and future activities of the Alliance were discussed.

# NOAA HABITAT BLUEPRINT

The Habitat Blueprint provides a forward-looking framework for NOAA to think and act strategically across programs and with partner organizations to address the growing challenge of coastal and marine habitat loss and degradation. The Habitat Blueprint has a three-pronged approach: establishing habitat focus areas to prioritize long-term habitat science and conservation efforts, implementing a systematic and strategic approach to habitat science to inform effective decision-making, and strengthening policy and legislation at the national level to enhance our ability to achieve meaningful habitat conservation. The next step for the NOAA Habitat Blueprint is to identify regionally-relevant habitat focus areas across the United States. The process by which the NOAA Line Offices and partners will come together to jointly identify these focus areas is being tested in the Southwestern US and is expected to occur in other regions during 2013.

As a precursor to this NOAA-wide effort and as a test of the Habitat Blueprint's components, NOAA Fisheries was directed in the fall of 2011 to initiate a set of projects to explore new collaborative approaches for habitat science and conservation. For example, in the Northeast, NOAA Fisheries is working with the New England and Mid-Atlantic Fishery Management Councils to develop and implement a deep sea coral conservation strategy for the Northeast continental shelf and submarine canyons, and that strategy will integrate habitat protection, fisheries management, and research into a comprehensive conservation strategy for a remarkable complex and fragile ecosystem that provides habitat for a diversity of other organisms, including many commercially important species. In the Southeast, NOAA Fisheries is working with the NOAA National Ocean Service and local partners to identify and prioritize the restoration of over 100 tidal creeks within Charleston Harbor. The prioritization criteria integrate new information on the fishery support characteristics of tidal creek ecosystems with human health concerns, and the results will streamline planning of large-scale coastal construction projects, such as harbor deepening.

As we end overfishing and rebuild the fishery stocks and economies, we must look forward to ensure healthy habitats



*The coral, *Lophelia pertusa*, is fairly cosmopolitan, occurring not only along the southeastern U.S. continental slope, but also in the Gulf of Mexico, off Nova Scotia, in the northeastern Atlantic Ocean, the South Atlantic Ocean, the Mediterranean Sea, the Indian Ocean, and in parts of the Pacific Ocean over a depth range of 50 to 2,170 m.*

*Photo credit: John Reed  
Harbor Branch Oceanographic Institute*

support sustainable fisheries, protected resources, and coastal communities. The NOAA Habitat Blueprint provides a basis for NOAA to advance the understanding of habitat's contribution to ecosystems and to integrate habitat science and conservation into its management efforts. More information about the NOAA Habitat Blueprint is available at [www.habitat.noaa.gov/habitatblueprint/](http://www.habitat.noaa.gov/habitatblueprint/).



## NOAA FISHERIES NORTHEAST REGION UPDATE

NOAA Fisheries Northeast Regional Office and the NOAA Chesapeake Bay Program are working with partners in Maryland and Virginia to characterize habitats in Chesapeake Bay. The goal is to identify and prioritize fishery habitats for protection and restoration.

NOAA Fisheries Northeast Regional Office is involved in the planning stages of the Northeast Corridor High Speed Rail Initiative in order to improve rail service between Washington, DC and Boston, MA. This initiative may result in a number of activities that may affect habitat including bridge and tunnel waterway crossings and coastal wetland impacts.

NOAA Fisheries Northeast Regional Office is involved in Bureau of Ocean Energy Management Offshore Renewable Energy Task Forces in ME, MA, RI, NY, NJ, DE, MD, and VA. The purpose of these task forces is to identify issues and alternatives relative to the siting of offshore wind facilities, regarding fish habitat, protected resources and potential impact to fishing activities.

NOAA Fisheries is currently involved in a range of FERC hydropower and hydrokinetic activities throughout the northeast region. Concerns include impacts to fishery resources as well as upstream and downstream fish passage.

# ATLANTIC COASTAL FISH HABITAT PARTNERSHIP UPDATE



*Conservation mooring*  
Photo Credit: T. Evans, 2010

Earlier this year, the Atlantic Coastal Fish Habitat Partnership endorsed three project proposals. The first, led jointly by The Nature Conservancy and the Southeast Aquatic Resources Partnership, is to develop a spatially explicit estimate of small (and large) barriers in the South Atlantic Landscape Conservation Cooperative and use them to conduct an assessment of aquatic connectivity. The second endorsed proposed effort is among six partners in Florida to cap approximately 30,000 cubic yards of muck sediments at the main source of sedimentation in the Lake Worth Lagoon and enhance/restore 20.16 acres of ACFHP Subregional Priority Habitats, including 19.83 acres of seagrass and 0.33 acre of mangrove wetlands. An outreach project led by The Sea Research Foundation, Inc. for the Alewife Outreach, Research, and Education project in Connecticut was the third endorsement from ACFHP. For more information on these projects and how to seek ACFHP endorsement please visit: <http://www.atlanticfishhabitat.org/endorsedProjects.cfm>.

This year, USFWS announced that three project proposals submitted to the Atlantic Coastal Fish Habitat Partnership (ACFHP) were approved to receive FY2012 funding. These included:

1) a project led by the James River Assoc-

This past fall, the Partnership bestowed the first Melissa Laser Fish Habitat Conservation Award upon Dr. R. Wilson Laney of the U.S. Fish and Wildlife Service for his exemplarily work in furthering the conservation, protection, restoration, and enhancement of habitat for native Atlantic coastal, estuarine-dependent, and diadromous fishes. For more information on this award and nomination instructions, please visit: [www.atlanticfishhabitat.org/awards.cfm](http://www.atlanticfishhabitat.org/awards.cfm). For more information about ACFHP, please contact Emily Greene, ACFHP Coordinator at [egreene@asmfc.org](mailto:egreene@asmfc.org)



*Wilson Laney (USFWS, center) recipient of the 2012 Melissa Laser Fish Habitat Conservation Award at the Atlantic States Marine Fisheries Commission's Annual Meeting in Philadelphia, PA. Also pictured, Chris Powell (left), ACFHP Chair, and Jake Kritzer (right), Environmental Defense Fund and ASMFC Habitat Committee.*

*Photo Credit: T. Berger, ASMFC*

Also this past fall, the Atlantic Coastal Fish Habitat Partnership Steering Committee approved its 2012-2013 Implementation Plan, which is a subset of the 2012-2016 ACFHP Conservation Strategic Plan. It contains a set of objectives and strategic actions and related tasks that can be accomplished over the course of a two-year period. The achievement of each task is lead by an individual(s) within the Partnership with the help of a team and additional partners. To view the five-year Strategic Plan or the two-year Implementation Plan, please visit: <http://www.atlanticfishhabitat.org/publications.cfm>.

# UPDATES FROM AROUND THE COAST

## MAINE

### Dredge Projects

Maine's Department of Marine Resources (ME DMR) is in consultation with the U.S. Army Corps of Engineers and state and federal regulators on several proposed navigational improvement projects in Maine. These include: 1) maintenance dredging of Portland Harbor which would involve the removal of approximately 600,000 cubic yards of soft sediments and 1,500 yds of rock with open water disposal. Portland Harbor was unexpectedly found to be an important lobster nursery area prior to the last dredge in 1998-99. Lobster (likely to be predominantly juveniles as was the case previously) will be trapped and relocated prior to dredging as was previously done in 1998-99; 2) maintenance and enlargement dredging of the Piscataqua River (ME/NH border river) upper turning basin which would involve the removal of approximately 700,000 yds of "clean" sand and 30,000 yds of blasted rock. The Corps in consultation with the EPA and NOAA has identified a potential ocean disposal site east of Portsmouth Harbor between Isles of Shoals and Boon Island; however several coastal municipalities have expressed interest in receiving the material or a portion of the material for beneficial use. These include potential beach nourishment at Wells and Kittery (Foster Beach), and use of the rock to provide wave protection for Pepperrell Cove, Kittery and as shoreline protection at Wood Island, Kittery. Other Corps dredge projects that are permitted, but awaiting funding include the navigational project in the Royal River, Yarmouth, and at Beals Harbor/Pig Island Gut. Other projects that the Corps is developing information for environmental review include navigational projects in the Scarborough and Saco Rivers, and York, Biddeford and Searsport harbors. ME DMR will be involved in the supply of resource information and review of permit applications.

### Fish Passage Restoration

**Penobscot River Drainage** - The Penobscot River still has the nation's largest run of Atlantic salmon, which are listed as endangered under the Endangered Species Act. The Great Works Dam, the second, lower-most hydroelectric project and parts of a remnant structure on the Penobscot River were removed this summer. Passage of Atlantic salmon past the former site was confirmed. The project is part of the Penobscot River Restoration Project. Next up, is the removal of the Veazie Dam, the lowest dam on the river. The

removal is expected to commence in July of 2013. Black Bear Hydro will build a fish lift at the Milford Dam, which will then be the first barrier to migrating fish. Farther upriver, a bypass will be built around the Howland Dam. When this restoration project is completed, Atlantic salmon, shad, alewives and other species will have improved access to more than 1,000 miles of river. Over 3,000 salmon returned to the river in 2011, the largest run in 25 years, but historic runs were most likely 20 times that size.

**Pushaw Lake** - The construction of a Denil fishway and new release gate structure at the outlet dam on Pushaw Lake in Hudson, Maine was completed. This project will allow alewives to access both Pushaw and Little Pushaw Lakes which total approximately 5,500 surface acres of historical alewife spawning habitat, and should support a run of well over 1 million adult alewives annually. This three year project was a collaborative effort between Maine DMR, the Atlantic Salmon Federation, USFWS, and NOAA Fisheries. In anticipation of the completion of this project, Maine DMR began stocking gravid adult alewives in the lakes in spring of 2012.

**Mattamiscontis Lake** - Maine DMR partnered with the Penobscot Indian Nation, United States Department of Agriculture (USDA) - Natural Resources Conservation Service (NRCS), USFWS, and NOAA Fisheries to improve fish passage at the outlet of Mattamiscontis Lake in support of the restoration of anadromous alewives. At roughly 1,000 acres, Mattamiscontis Lake should produce an annual run of nearly a quarter million alewives each spring. A remnant rock-crib dam was removed and replaced with six rock weirs, which will provide safe passage for migrating adult and juvenile alewives. The construction portion of this project was funded by the NRCS.

**Davis and Holbrook Ponds** - Over the past two years Maine DMR has been collaborating with the Atlantic Salmon Federation and USFWS on a proposal to provide fish passage into these ponds (the two are connected by a thoroughfare) located in central Maine near Bangor. Fish passage was restored to the pond immediately downstream of these waters (Chemo Pond) and Maine DMR has been stocking alewives in the system since 2010. This fall the owners of the outlet dam approved moving forward with the fishway project and ME DMR is optimistic that construction will be completed in



2013. Restoring fish passage to Davis and Holbrook Ponds should result in an annual run of nearly 200,000 alewives.

**Soudabscook Stream** – Maine DMR, USFWS, and the Atlantic Salmon Federation are proposing to install fish passage at a ledge falls below Etna Pond (360 acres) in Carmel, Maine. Historically several mills operated at this site, and the falls were altered over time and currently block the upstream passage of most migratory fish. Agency staff have surveyed the site and collected water flow and elevation data that USFWS engineers will use to develop a conceptual design for fish passage. Construction is tentatively scheduled for 2013.

**Roaring Brook** – Maine DMR partnered with the NRCS to remove a remnant log drive dam in a tributary to the West Branch Pleasant River. The removal increased access to 12.4 km of Atlantic salmon habitat and reduced the backwatered area.

**Downeast, Flanders Stream** – Upstream access on Flanders Stream in Sullivan, Maine was improved for alewife, blueback herring, American eel, sea lamprey, brook trout, and other native resident fish. This project replaced an old corrugated metal pipe fitted with a Denil fishway with an open bottomed arched culvert with four internal concrete baffles and series of eight rock weirs to create a natural rock ramp fishway was installed.

### Seafloor Mapping Survey

July 3 through 9, 2012, the EPA Ocean Survey Vessel Bold conducted a benthic mapping research cruise offshore of mid-coast Maine, under the direction of EPA Chief Scientist Matt Liebman and Principal Investigators Matthew Nixon of the Maine Coastal Program, Stephen Dickson of the Department of Conservation, Maine Geological Survey, and Carl Wilson of the Maine DMR. Additional scientists from the Maine Geological Survey, University of Maine, University of New Hampshire, and the Biodiversity Research Institute of Gorham, Maine collaborated in a multidisciplinary effort that included multibeam bathymetric mapping as well as seabird and marine mammal observations. The area investigated with grab samples represented conditions over about nine square nautical miles across a section of the Gulf of Maine sea floor that is about 500 feet deep. The seafloor is predominantly

sandy mud containing nearly 60 percent of its weight in water and 10 percent of its weight in organic matter. Side-scan sonar images show boulders ranging in size from a few feet to tens of feet in diameter are scattered across this muddy bottom. Sonar images also detected bottom trawl marks, some new and some perhaps old, from fishing activity. These data, combined with processed side-scan sonar mosaic maps, will be critical to geologically mapping a new area of Maine's inner continental shelf. For more information, please visit: <http://www.maine.gov/doc/nrimc/mgs/site.htm>.

### NEW HAMPSHIRE Fish Passage Restoration

**Cocheco River** - The Gonic Sawmill Dam (river mile 15.4) and the Gonic Dam (river mile 15.7) are the third and fourth dams on the mainstem of the Cocheco River. With funding from NHDES Dam Bureau and USFWS Partners for Wildlife Program, the City of Rochester is pursuing design and engineering for the removal of these two dams. The Gonic Sawmill Dam and an adjacent 8.3 acre parcel are abandoned property. The design process is on hold until ownership can be resolved. The NHDES Coastal Program is providing lead coordination and contract administration for this project.

**Bellamy River** - Sawyer Mill Dams. With funding from the Gulf of Maine Council, a private dam owner is pursuing removal of these two dams (the lower most on the river system). The contracting for feasibility and preliminary design is currently underway. NHDES Coastal Program is providing technical assistance and contract administration for this project.

**Lamprey River** - Macallen Dam. With funding from NOAA/CLF partnership, the Town of Newmarket is pursuing a feasibility study for the removal of this head-of-tide dam. NHDES Coastal Program is providing technical assistance.

**Exeter River** - Great Dam. The feasibility study for the removal of the Great Dam (head of tide) is scheduled to be complete by December 31, 2012.

**Winnicut River** - The construction part of the restoration project was completed in 2011 and evaluation of the restored habitat and fish passage are currently being conducted.

# UPDATES FROM AROUND THE COAST

## MASSACHUSETTS

### Seagrass Restoration

Massachusetts Division of Marine Fisheries (MA DMF) is in the second year of an eelgrass restoration project in Boston Harbor and Salem Sound. Last spring, MA DMF hosted two shore side volunteer events, successfully planting one half acres of eelgrass across two locations over a two day period. Project staff also planted an additional acre of eelgrass this past summer, and is currently in the process of identifying addition locations suitable for eelgrass planting through a site selection process that examines test plots planted at several locations in Salem Sound and Boston Harbor.

### Shellfish Planting Guidelines

In January 2012, MA DMF published a guidance document to help the public understand the various state and federal laws, regulations, and policies concerning shellfish planting entitled Shellfish Planting Guidelines. Shellfish planting is conducted to enhance natural shellfish resources, to maintain commercial and recreational fisheries, to restore historic populations, to mitigate for adversely impacted resources, to commercially produce shellfish by private aquaculture, or for ecological services. MA DMF wants to balance the interest in shellfish restoration with the important goals of safeguarding human health, protecting wild shellfish stocks, enabling opportunities for commercial and recreational shellfishing, and fostering development of shellfish aquaculture in Massachusetts. The document is available on the Marine Fisheries website at: [http://www.mass.gov/dfwele/dmf/programsandprojects/shellfish\\_planting\\_guidelines\\_121611.pdf](http://www.mass.gov/dfwele/dmf/programsandprojects/shellfish_planting_guidelines_121611.pdf).

### Coastal Habitat Mapping

In August, MA DMF's Fisheries Habitat Project participated in a seven-day oceanographic survey aboard the EPA Ocean Survey Vessel Bold. This was the third year of the survey, which to date has collected seafloor data from the Commonwealth waters from Hull to Salisbury, Massachusetts Bay, Buzzard's Bay, Vineyard Sound, south of Martha's Vineyard and Nantucket, and southern Cape Cod Bay. The survey is a unique partnership that also includes participants from the Massachusetts Office of Coastal Zone Management, Massachusetts Department of Environmental Protection, Massachusetts Bays Program, Massachusetts Department of Transportation Highway Division, USGS, and EPA. The survey teams collected sediment samples and organisms, and

took underwater videos and still photos of the seafloor and its marine life. The results aid in the ground-truthing of seafloor sediment and habitat maps created in the 2009 Massachusetts Ocean Management Plan and assist state agencies in siting and permitting of ocean uses. For more information about the Massachusetts Ocean Management Plan, please visit: [www.mass.gov/eea/ocean-coastal-management/mass-ocean-plan/](http://www.mass.gov/eea/ocean-coastal-management/mass-ocean-plan/)

### Coastal Habitat Restoration

In December 2012, the MA In-lieu Fee (ILF) Program will disburse its first round of funds for restoration projects addressing coastal habitat impacts resulting from coastal alteration projects permitted under the Army Corp of Engineers General Permit (Cat II). The ILF Program has accrued over \$190,000.00 since December 2008. Projects will be selected from applicants responding to a RFR (Request for Response) posting in September. The deadline to submit proposals is October 31st. Proposals will be reviewed and ranked by a committee comprised of restoration professionals and members of the ILF Program Interagency Review Team (IRT) who will then submit project recommendations to the Corp for final funding approval.

### Identifying and Prioritizing Restoration Opportunities

MA DMF hosted two stakeholder workshops as part of a project entitled Identifying and Prioritizing Restoration Opportunities for Coastal Aquatic Habitats in the Mass Bays Region, funded by the Mass Bays Research and Planning Grant Program. Representatives from government agencies, non-profit organizations, and watershed groups within the Mass Bay region attended the workshops and provided input on restoration priorities in their communities. The goals of the project are to 1) identify and prioritize coastal habitat restoration options in order to facilitate appropriate decision-making when selecting restoration projects and 2) develop a sustainable methodology for assessing and selecting priority restoration sites on a larger, regional scale. MA DMF presented an analysis of current restoration project inventories and related coastal alteration impacts by habitat types to identify restoration priority gaps, and solicited input from stakeholders on a restoration project ranking methodology developed for this project. This work will help to inform restoration programs and become a useful tool for resource managers in the region.

## RHODE ISLAND

### Oyster Substrate Enhancement

As part of a cooperative restoration project between RI Department of Environmental Management Fish and Wildlife (RI F&W) and The Nature Conservancy (TNC) cultch was placed at three locations in Ninigret Pond during the summer of 2012. One objective of this project is to evaluate whether substrate enhancement via the placement of cultch is a viable method for oyster habitat restoration in RI coastal ponds. RI F&W and TNC are considering larger scale reef building activities for habitat and substrate enhancement in the coastal ponds and potentially Narragansett Bay.

### Monitoring and Management of Artificial Reefs

In 2007, RI Department of Environmental Management in partnership with the RI Department of Transportation created two inshore artificial reef sites by recycling the concrete slabs from the Old Jamestown Bridge (closed in 1992). Construction of Gooseberry Island reef and Sheep Point reef located 1.5 miles south and 1.1 miles east of Newport, respectively, was completed in August 2007. Since their completion, RI F&W has been monitoring the inshore reefs using multibeam bathymetric surveys and SCUBA to document the colonization and succession of invertebrate and finfish species. Monitoring was completed in fall of 2011 and RI F&W has initiated the development of an Artificial Reef Plan for the state.

## NEW YORK

### Seafloor Mapping Pilot

Phase I (pilot) of a project titled “Seafloor Mapping of Long Island Sound” is currently underway in the mid-Sound area of Stratford Shoal, extending from New York, on the North shore of Long Island, to the Connecticut shoreline. Funding is from a June 2004 settlement between Connecticut, New York, Long Island Power Authority, Northeast Utilities, and the Cross Sound Cable Company over the adverse impacts to Long Island Sound from non-compliance with permits for a variety of energy-related infrastructure projects. The fund was created for the purpose of mapping the benthic environment of Long Island Sound and will provide valuable information for preserving and protecting the coastal and estuarine environments and water quality of Long Island Sound. Partners in the research effort include the states of New York

and Connecticut, EPA, NOAA, and area universities from New York and Connecticut. This collaborative work will focus on the collection of high resolution geophysical data for the seafloor of Long Island Sound within the territorial waters of the States of Connecticut and New York. Surveys for a pilot project are currently underway and are further planned for long-term seafloor mapping of Long Island Sound habitats over the next several years. For more information on the Long Island Sound Seafloor Mapping Pilot, please visit: [http://longislandsoundstudy.net/research-monitoring/seafloor-mapping/?doing\\_wp\\_cron=1347991250.0713949203491210937500](http://longislandsoundstudy.net/research-monitoring/seafloor-mapping/?doing_wp_cron=1347991250.0713949203491210937500)

### Sentinel Monitoring for Climate Change

The Long Island Sound Study has developed a document on a strategy for monitoring for climate change impacts titled, “Sentinel Monitoring for Climate Change in the Long Island Sound Estuarine and Coastal Ecosystems of New York and Connecticut, Volume 1 (2011).” Based on the recommendations of that strategy, the Study has also selected a contractor to begin monitoring impacts specific to coastal forests, shrublands, grasslands, salt marshes, and various bird species in Long Island Sound in both New York and Connecticut. For more information, please visit: <http://longislandsoundstudy.net/research-monitoring/sentinel-monitoring/>

### Hudson River Sustainable Shorelines

The Hudson River Sustainable Shorelines Project aims to develop science-based recommendations for shore zone management that preserve or enhance natural benefits while meeting engineering needs. Along the Hudson River Estuary’s 300 miles of shoreline, communities are experiencing increased flooding from changing rainfall patterns and greater inundation from rising waters. Pressure is growing to alter shorelines to hold back the waters and control erosion, and community leaders, regulators, landowners, and funders are faced with important decisions about investments in shoreline infrastructure. These decisions will affect community waterfront use and determine the future of vital near-shore river habitats. The Hudson River National Estuarine Research Reserve, with the involvement of many partners, launched the Sustainable Shorelines Project in 2008 to provide science-based information about the engineering, economic, and ecological tradeoffs among

# UPDATES FROM AROUND THE COAST

shoreline management options, given likely future conditions. New work is focusing on how aspects of structures that can be manipulated, such as the roughness of the substrate used, and the vegetative cover, to increase ecological benefits. The project will also increase our understanding of how physical forces are reshaping shorelines, develop innovative shoreline demonstration sites, and integrate project results into a decision support tool. Local government officials, shoreline experts and consultants, shoreline land owners, policy-makers, regulators, engineers, and others shape and guide the project by participating in advisory committees, focus groups, surveys, and case studies. Project findings are being used to make decisions about community waterfronts, regulatory and land use policies, shoreline development and long-term plans that will allow important natural shore zone areas to exist into the future. To find out more about the project, the findings, and those involved, please visit: <http://www.hrner.org/hudson-river-sustainable-shorelines/>

## Jamaica Bay Marsh Island Restoration

Jamaica Bay is a designated Significant Coastal Fish & Wildlife Habitat Area and the largest tidal wetland complex in the New York City metropolitan area. The Bay is immensely valuable to fish and wildlife and to the human environment. The New York State Department of Environmental Conservation (NYSDEC) mapping analysis has shown that over 2,000 acres (>50% of available acreage) of the bay's vegetated marsh island habitat disappeared between 1924 and 1999, and that the rate of marsh loss has been increasing over time, and estimated that marsh island habitat could vanish by 2024 if no action is taken by the natural resource community. In response, NYSDEC developed a series of strategic recommendations, including conducting marsh restoration (see <http://www.dec.ny.gov/lands/5489.html>). Fellow stakeholder agencies including USACE, National Park Service (NPS), The Port Authority of New York & New Jersey (PANYNJ), and the City of New York (NYC) developed a program to begin restoring marsh island habitats. NYSDEC, as regulatory agency, directed some projects for mitigation and acted as cost share partner for marsh island projects and committed over \$5 million to the effort. In 2003, the NPS constructed a 2-acre pilot project at Big Egg Marsh. This led to a 43 acre project at Elders Point Marsh - East, which was completed in 2007, and another 40 acres constructed at Elders Point Marsh - West completed in 2010. Another 47

acres of marsh were restored at Yellow Bar Hassock in 2012. The next project will take place at two adjoining islands, Black Wall Marsh and Rulers Bar where ~35 acres of marsh is to be restored beginning in September 2012. For more information, please visit: <http://www.nan.usace.army.mil/Media/NewsReleases/tabid/3948/Article/4223/army-corps-offers-update-on-marsh-islands-restoration-in-jamaica-bay-new-york.aspx>

## NEW JERSEY Barnegat Bay Initiative

Since late 2010, New Jersey Governor Chris Christie has continued to make progress on a comprehensive action plan to address the health of Barnegat Bay. The ecological health of Barnegat Bay is in decline, threatening the economic health of the region. The Christie Administration has made addressing the degradation of Barnegat Bay as one of its top environmental priorities. Input gained from extensive stakeholder involvement complemented the scientific data and research conducted by the New Jersey Department of Environmental Protection (NJ DEP) and other researchers has provided the basis for the Administration's action plan for Barnegat Bay. Highlights of the plan include: a negotiated agreement with Exelon Corporation to cease electric generation operations at the Oyster Creek Generating Station within nine years, funding numerous stormwater mitigations projects, new rules reducing nutrient pollution from fertilizers and standards for post-construction soil restoration, land acquisition, special or sensitive area plans, shellfish enhancement, increased water quality standards and reducing the impacts of personal watercrafts on sensitive habitats.

**Restoration Efforts to Repair Storm-Damaged Oyster Beds**  
Several organizations launched an experimental restoration project in July 2012 in an attempt to repair storm-damaged oyster beds off of Salem County, NJ. Floods resulting from several consecutive storms in 2011, including Hurricane Irene and Tropical Storm Lee, devastated oysters on the northernmost beds of Delaware Bay. These beds comprised about 35 percent of the oysters supporting the NJ's Delaware Bay oyster fishery. The impacts were worse than any other storm in almost 60 years, killing about half of the oysters on these beds. The project was a partnership between the NJ Division of Fish and Wildlife, the NJ Chapter of the Nature Conservancy, the Partnership for the Delaware Estuary



and Rutgers University. This ‘replanting’ program involves strategically placing shells along the Cape Shore region in the lower Bay, where natural recruitment is high, but few survive unless relocated to lower salinities. These newly recruited oysters are being transplanted to the storm-damaged beds, where the attached oysters can grow over time under reduced predator and disease pressures. This program is presently at a pilot scale to monitor and assess how the oyster survive under significant salinity changes as they are moved from areas of approximately 22 parts per thousand (ppt) to areas that regularly see salinities of less than 7 ppt.

### **Barnegat Bay Shellfish Restoration**

As part of the Department’s efforts in Barnegat Bay, NJ Division Fish and Wildlife (NJ DFW) staff coordinated the planting 1.5 million hard clam seed to enhance 28 acres of shellfish habitat in the Sedge Island Marine Conservation Zone near Island Beach State Park. This hard clam seeding effort was the largest in recent years and confirms the NJ DFW’s commitment to shellfish enhancement in Barnegat Bay. NJ DFW staff will also be coordinating the planting of 1.5 million oyster seed and shell plantings on a former oyster bed as well as the planting of another 1.5 million hard clam seed on numerous sites throughout the Bay.

### **Delaware River Main Channel Deepening**

The Delaware River Main Channel Deepening project continues and involves significant dredging efforts within the existing 40-foot Delaware River Federal Navigation Channel to deepen it to 45 feet along a 100+ mile distance through the Delaware Bay including widening efforts at a number of channel bends. The first section deepened was completed in September 2010, the second phase completed in January 2012, the latter involved the dredging of a 4-mile section of the River. In 2012, the State of Pennsylvania provided an additional \$15 million to maintain the project, which was then followed this summer by an approximate \$31 million in federal project funding.

Shellfish and Submerged Aquatic Vegetation Surveys (SAVs)  
The NJ DFW conducted a stock assessment survey of shellfish, particularly hard clams, in Little Egg Harbor Bay (LEHB). The survey was conducted to gather baseline data in conjunction with the Governor’s initiative to restore

Barnegat Bay. A total of 196 locations were sampled using a hydraulic clam dredge. Hard clams and other shellfish species of economic value were counted and measured. In addition, SAV collected in the dredge was identified and documented. The sites sampled were the same as those evaluated in similar studies conducted in 1987 and 2001. This consistency allows for comparisons among the years to identify population trends. The information collected will enable biologists to estimate the number of hard clams present, to identify sensitive areas for future coastal development projects, and to identify areas suitable for ‘restoration and enhancement’ efforts. A full benthic sampling of shellfish and SAV within Barnegat Bay (north of LEHB) began in May 2012 and is currently ongoing (355 locations scheduled for sampling).

### **Aquaculture Development Zones Established in Delaware Bay**

NJ DFW staff teamed with those of other state governmental agencies as well as leaders in New Jersey’s shellfish aquaculture industry and academia to establish Aquaculture Development Zones (ADZs) in the lower section of Delaware Bay. The goal of creating ADZs was to help facilitate expansion and innovation within the industry by designating areas specifically for aquaculture involving the use of enclosures (i.e., structure such as racks and cages). Staff navigated a lengthy user-conflict and permitting process with both state and federal agencies, centering primarily on horseshoe crab and shorebird issues and impacts. The primary objective of this program was to concentrate the structures in specific areas to minimize user conflicts and to allow for the management and enforcement of best management practices, including environmental access windows associated with threatened and endangered species. The Division applied for and received the necessary state and federal permits for operation in an effort to streamline the process for industry. This improvement allowed prospective leaseholders to bypass a previously lengthy and complicated process that had been deemed an impediment to aquaculture development. Three ADZs encompassing 1,151 acres were established in the lower Delaware Bay. The fourth, a 51-acre intertidal (exposed at low tide) ADZ was located in the area adjacent to the mouth of Green Creek in Cape May County. Extremely popular, this intertidal area has gained the most interest among the industry with all lots being leased.



# UPDATES FROM AROUND THE COAST

## PENNSYLVANIA

### Darby Creek Dam Removals

Construction has started on four fish passage projects (remnant pier removal and three dam removals) in the lower portion of Darby Creek, tributary to the lower Delaware River in PA. Construction phase of the project has begun and two dams (Kent Park and Unnamed “Septa” Dams) along with the remnant bridge (Colwyn) piers have been removed. Construction will continue to remove the Darby Borough Dam and associated instream and riparian restoration will be completed. Project will restore unobstructed migratory and resident fish passage in the lower 9.7 miles of Darby Creek, Delaware County, PA.

### Lehigh River Fish Passage Feasibility Project

The Lehigh River Passage Feasibility Project is scheduled to be complete December 2012 and is looking at the engineering feasibility of improving fish passage at Easton (RM 0.0) and Chain (RM 3.0) Dams on the lower Lehigh River. Full and partial dam removal options are being explored in an attempt to improve fish passage of diadromous species as well as provide passage for resident species. The options are aimed at meeting American shad restoration goals since these goals are not being met with the current fish passage facilities that are being operated. An approximate cost will be generated for the various options and will provide the necessary information to determine whether any of the options are practical from an engineering and cost perspective.

## DELAWARE

### Aquaculture in Delaware’s Coastal Bays

Delaware’s legislature terminated all existing shellfish leases in Indian River and Rehoboth Bays in the late 1970s, just as aquaculture was gaining a foothold in surrounding mid-Atlantic states. These leases were not productive after the MSX (Multinucleated Sphere Unknown) parasite decimated oyster populations in the 1950s. Since the late 1970s all bay bottom has been public, managed by Delaware’s Division of Fish and Wildlife, as a Public Trust Resource for commercial and recreational clambers and fishermen. A recently completed bay-wide clam survey has shown that current management of the hard clam resource has successfully

sustained this population at levels identical to the 1970s. Recently, the Center for the Inland Bays (a local estuary program) has been advocating legal changes to allow leasing in these bays for oyster (native) tray culture and hard clam bottom culture. The latter would transfer a publicly owned resource to private ownership and would further reduce recreational clam bottom. Access was lost to about 40 percent of the shore zone clam habitat in the 1990s due to marina related closures. Delaware coastal bays are among the most heavily used by tourists in the country. Discussions continue to determine whether aquaculture is in the public interest and is compatible with existing uses, including habitat considerations.

### Wave Action Desalinization Barge

A group is seeking a permit for a floating barge installation and will use wave energy to create fresh water from ocean water. They have addressed impingement/entrainment concerns by using the bottom as a sand filter for intake water. The barge will create over one million gallons of fresh water per day. The project will need to monitor volume and salinity of discharge water to avoid any impacts to the stenohaline benthos near the site.

## MARYLAND

### Conowingo Dam, Susquehanna River

The Conowingo Dam Final License Agreement was submitted to Federal Energy Regulatory Commission (FERC) on August 31, 2012. Settlement negotiations will be initiated in October and are expected to be completed by June 2013. Results from five studies conducted in 2012 are due at the end of September 2012 for review. One of the studies involved telemetry of American shad. These five studies had been postponed in 2011 due to high spring flows. Efficiency estimates are being developed for the East Fish Lift and are expected to have significant impacts on improving fish passage at Conowingo Dam.

### Fish Habitat Management

MD DNR Fisheries Service has developed and implemented impervious surface reference points that provide a basis for managing fisheries at different levels of land development. Impervious surface reference points (ISRP) represent the functional relationships between a watershed’s area covered in



impervious cover (paved surfaces, buildings, and compacted soils) and habitat quality (water quality, physical structure, etc) or a species response (habitat occupation, abundance, distribution, mortality, recruitment success, growth, etc). The ISRP are a habitat-based version of biological reference points (BRP). ISRP are quantitative, habitat-based reference points based on impervious surface for estuarine watersheds. They are envisioned as a basis for strategies for managing fisheries in increasingly urbanizing coastal watersheds and for communicating the limits of fisheries resources to withstand development-related habitat changes to stakeholders and agencies involved in land-use planning. MD DNR Fisheries Service has already applied these reference points to resident species and are in the process of being applied to anadromous species.

### Fish Passage

MD DNR Fisheries Service in partnership with American Rivers, NOAA, and the Friends of Patapsco State Park are moving ahead with the removal design for the Bloede Dam on the Patapsco River, Maryland. Additional sediment borings have been taken to supplement seismic data. An advisory committee comprised of public stakeholders has been convened to develop alternatives and cost estimates for how to memorialize the dam's historic significance. Dam removal is currently scheduled for 2013.

### VIRGINIA General Permit for Living Shoreline Projects

Virginia Marine Resources Commission (VMRC) is currently developing a general permit for living shoreline projects. During the 2011

session of the General Assembly, legislation was adopted that established living shorelines as the preferred method for shoreline stabilization in the Commonwealth. The legislation defined living shorelines as a shoreline management practice that provides erosion control and water quality benefits; protects, restores or enhances natural shoreline habitat; and maintains coastal processes through the strategic placement of plants, stone, sand fill, and other structural and organic



Photo Credit: VIMS-CCRM Living Shoreline <http://ccrm.vims.edu/livingshorelines/index.html>



Photo Credit: VIMS-CCRM Living Shoreline <http://ccrm.vims.edu/livingshorelines/index.html>

materials. The legislation also directed the VMRC to begin development of a general permit with the assistance of Virginia Institute of Marine Science (VIMS), the Virginia Department of Conservation and Recreation and others.

VMRC is currently working with stakeholders and an Ad Hoc advisory panel to identify the appropriate elements to be included in the general permit and develop a draft for consideration. Although various types of living shoreline projects have been permitted and used in Virginia for some time the legislation and general permit are intended to further advance the use of this type of shoreline stabilization. For more information on living shorelines in Virginia, please visit the VIMS web site at <http://ccrm.vims.edu/livingshorelines/>

### NORTH CAROLINA

#### Mapping North Carolina's Estuarine Shoreline

The NC Division of Coastal Management (NC DCM) has completed a project to create the first ever continuous digital map of more than 12,000 miles of estuarine shoreline in North Carolina. The map is the result of a partnership between the state agency and East Carolina University. Among its findings, the project identified the mileage of shoreline types such as a marsh or a swamp forest and the number of shoreline structures such as piers and bulkheads along estuarine waterways. Estuarine shorelines are found along the coast's broad network of brackish sounds, marshes, rivers and creeks. Estuaries are a unique and important part of coastal life – a transitional area where fresh and salt water mix. From broad, shallow sounds like the Albemarle and Pamlico, to narrow bodies of water such as Core and Masonboro sounds, North Carolina has 2.2 million acres of estuarine waters. These shallow sounds, rivers, and creeks make up one of the largest estuarine systems in the United States.

Using the most recently available aerial photography for each county, the estuarine shoreline for all 20 coastal counties has been digitized and is now available to view on the NC DCM website: <http://ims.ncdenr.org/Website/ncshore/viewer.htm>.

# UPDATES FROM AROUND THE COAST

NC DCM staff and East Carolina University will continue working together to conduct a more in-depth analysis of the shoreline data, including calculating the length of the five distinct shoreline types and the different types of modified shorelines. They will also work to identify regional shoreline development trends and analyze the distribution of various coastal structures.

## Shad in the Classroom

Shad in the Classroom is a collaborative project that provides students with an understanding of the science process, inspiration for careers in science, and a desire to protect our waterways, particularly in the Albemarle-Pamlico National Estuary Program (APNEP) region. This effort is a collaboration led by the US FWS and the North Carolina Museum of Natural Sciences, with substantial financial support from APNEP. Other contributing partners include Partnership for the Sounds, NC State University, the NC Wildlife Resources Commission, the NC Division of Water Quality and the NC Chapter of American Fisheries. This project allows students to gain hands-on experience raising American shad from egg to releasable fry, builds an understanding of the life history of shad and an appreciation for the natural world.

North Carolina's rivers in the APNEP region and their floodplain habitat are important spawning grounds for anadromous fish, including the American shad. American shad populations are well below historic levels. Factors affecting the decline of American shad in its historical range include dam construction, overfishing, and water pollution. Shad no longer exist in areas where they used to thrive, and they are an important food source for many species both in the coastal and estuarine systems. A fisheries management plan is in place that seeks to restore American shad populations to sustainable levels. Shad in the Classroom is an important outreach tool for raising students' and communities' consciousness on American shad and its management in the APNEP region.

Shad in the Classroom has three major components. First, elementary school classrooms are equipped with the materials to raise shad, which include aquariums and shad eggs. Next, teachers are provided with training to facilitate the program, which includes a one day training on the process of raising

shad and an overnight canoe workshop on the Roanoke River to learn about the estuarine ecosystem. Finally, teachers are provided with multimedia presentations and high definition movies to complement instruction. For more information, please visit: <http://naturalsciences.org/education/for-educators/shad>

## Coastal Habitat Protection Plan

In spite of the difficult economic times, significant progress in improving and protecting coastal habitats continues as agencies move forward with the recommendations found in North Carolina's Coastal Habitat Protection Plan (CHPP). Of significant interest and accomplishment over the past year was the completion of the Strategic Habitat Area 2 (SHA2) analysis and its adoption by the NC Marine Fisheries Commission. This area encompasses the Pamlico Sound and its main tributaries. For more details on the analysis, please visit: [http://portal.ncdenr.org/c/document\\_library/get\\_file?uuid=e11da87f-629f-4fac-a40a-cc965c0150a1&groupId=38337](http://portal.ncdenr.org/c/document_library/get_file?uuid=e11da87f-629f-4fac-a40a-cc965c0150a1&groupId=38337)

Also of significant note, NC DMF was able to maintain the Oyster Sanctuary Program even through the tough economic times. Partnerships with organizations outside of state government were instrumental in maintaining this program. These partnerships attest to the importance of maintaining this very significant habitat and resource. The 2011-2012 CHPP Annual Report can be accessed through the One North Carolina Naturally website under Progress Updates located at: <http://www.onencnaturally.org/>

## SOUTH CAROLINA Beach Modification

Several beach modification projects have either been given permits to proceed, or the permits are under consideration. These include an extensive sand scraping project on the Isle of Palms to move sand from one section of the beach to an erosional area, an inlet modification project at Capt. Sam's Inlet between Kiawah Island and Seabrook Island to reduce erosional problems on Seabrook Island, and construction of a terminal groin on Folly Beach to reduce erosional problems on the south end of that island where a state park is located. All of these projects have potential to impact important overwintering grounds of the piping plover or a significant bird rookery just southwest of Folly Island.



Existing “DRH” offshore artificial reef site; 130 pallet balls deployed.  
Photo Credit: January Murray, Georgia Department of Natural Resources (GA DNR)

## GEORGIA Offshore Artificial Reef Program

Public interest in the offshore artificial reef program resulted in a total donation of 485 tons of concrete power poles. The David R. Hobbs (DRH) offshore artificial reef site was identified for reef enhancement and 130 balls were deployed to enhance this existing site. Program divers inspected the site immediately after the deployment and found many great barracuda, *Sphyrna barracuda*, occupying these materials. In order to help ascertain the long-term structural integrity and performance of deployed materials, all (19) offshore reef sites were surveyed via on-site inspections, monitoring, and photo/video/inventory records were obtained by program divers. Significant fish assemblages and invertebrate communities were associated with all observed materials and structures. On-site inspections were annually conducted via side scan sonar and aerial surveys at all of Georgia’s 17 inshore artificial reef sites.

## Oyster Reef Restoration

Oyster reef restoration was conducted at Cobb and Jointer Creeks sites (Glynn County) located in St. Andrews Sound within one of the state’s public oyster picking areas. This restoration project was permitted, planned, developed, and partnered with the University of Georgia. The Cobb Creek site incorporated roughly 7,200 sq ft. (0.165 acre) measuring 1,200 feet by 6 feet and the total footprint of the Jointer Creek site included roughly 11,100 sq ft. (0.254 acre) measuring 1,200 feet by 6 feet; 250 feet by 6 feet; 400 feet by 6 feet respectively. The entire development of both sites included 18,300 sq ft (0.42 acres) where 200 pallets were deployed with a total of 3,000 bags of shell (15 bags per pallet), 200 oyster gabions, and 200 oak limb bundles. To maximize efficiency and save money, the oyster reef restoration project at Cobb and Jointer Creeks used helicopters to deploy 3,000 bags of shell (on 200 pallets) with a combined weight of more than 18 tons and 200 gabions (loose recycled oyster shell placed on wooden pallets). Two helicopters transported a total of 80 loads in 9 hours over

a two day period. In addition to providing bank stabilization, essential fish habitat, and improved water quality, these sites are excellent locations for education and outreach projects showing casing restoration of shellfish in Georgia’s estuarine waters. Outreach projects included three “bagging events” in which 40 volunteers filled 675 shell bags used in deployments. An approximate total of 970 bushels of oyster shells were collected in FY2012 from local oyster roasts and restaurants and this material will be used in future restoration projects.

## FLORIDA Brown Algal Bloom

A persistent brown algae bloom on the back of a 2011 phytoplankton bloom continues in the northern Indian River Lagoon causing widespread water column discoloration, focal fish kills, fish population redistribution, and negatively affecting seagrass habitat. Seagrass systems have been affected from the Mosquito Lagoon to Vero Beach, and in some areas where historically dense, are all but absent. The organism causing this superbloom is a pelagophyte, which blooms and causes the water to turn murky brown, and prevents sunlight from reaching seagrass. State agencies and university researchers are monitoring the bloom. The expected duration of the event cannot be determined, as the conditions causing it are not well understood.



Upper Mosquito Lagoon & upper portion of Indian River Lagoon: persistent brown algae blooms since spring 2012 and subsequent seagrass loss. Photo Credit: Lori Morris, St. Johns Water Management District.

## Generating Electricity from the Gulf Stream

A technology-based pilot project assessing the feasibility of the development of the Gulf Stream to generate electricity off the coast of southeast Florida is being conducted by Florida Atlantic University (FAU). FAU continues to seek permits in coordination with the Department of Energy and Florida state agencies for technology testing in federal waters. Issues of concern for this project include impingement and entrainment effects of large fields of kinetic current-tapping turbines on pelagic fish and invertebrates and anchoring damage to deep benthic habitats.

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### HABITAT PROGRAM MISSION

*To work through the Commission, in cooperation with appropriate agencies and organizations, to enhance and cooperatively manage vital fish habitat for conservation, restoration, and protection, and to support the cooperative management of Commission managed species.*

### HABITAT PROGRAM VISION

*Protected, revitalized habitat for all Atlantic coastal fish species or successful habitat restoration well in progress by 2015.*

### REPRODUCTIONS

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*Banner photo by Mary Hollinger, NOAA*

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