

# COASTAL SERVICES



VOLUME 15, ISSUE 1 • MARCH/APRIL 2012

LINKING PEOPLE, INFORMATION, AND TECHNOLOGY

## **ECOSYSTEM-BASED MANAGEMENT:**

**PUTTING THEORY INTO PRACTICE  
IN CALIFORNIA**

**NEW TOOLS HELP NEW JERSEY  
COMMUNITIES PREPARE FOR  
CLIMATE CHANGE**

**EXTRA EYES HELP SPOT THREATS  
TO HAWAII'S CORAL REEFS**

# TABLE OF CONTENTS

- 1 FROM THE DIRECTOR
- 2 **ECOSYSTEM-BASED MANAGEMENT:**  
PUTTING THEORY INTO  
PRACTICE IN CALIFORNIA
- 6 NEW TOOLS HELP NEW JERSEY  
COMMUNITIES PREPARE FOR  
CLIMATE CHANGE
- 8 EXTRA EYES HELP SPOT THREATS  
TO HAWAII'S CORAL REEFS
- 10 PRESERVING PREHISTORIC  
COASTAL HERITAGE IN FLORIDA
- 12 NEWS YOU CAN USE
- 13 END NOTE



Volume 15 | Issue 1 | March/April | 2012  
LINKING PEOPLE, INFORMATION, AND TECHNOLOGY

## National Oceanic and Atmospheric Administration

U.S. Secretary of Commerce  
John Bryson

Under Secretary of Commerce for Oceans and  
Atmosphere and Administrator, National Oceanic  
and Atmospheric Administration (NOAA)  
Dr. Jane Lubchenco

Assistant Administrator for Ocean Services and Coastal  
Zone Management, National Ocean Service  
David M. Kennedy

NOAA Coastal Services Center  
Director: Margaret A. Davidson  
Deputy Director: Jeff Payne

COASTAL GEOSPATIAL SERVICES  
Division Chief: Nicholas Schmidt

INTEGRATED INFORMATION SERVICES  
Division Chief: Tony LaVoi

MANAGEMENT AND BUDGET  
Division Chief: Paul Scholz

REGIONAL COASTAL SERVICES  
Division Chief: Rebecca Smyth

COASTAL MANAGEMENT SERVICES  
Division Chief: Ginger Hinchcliff  
Communications Director: Donna McCaskill  
Magazine Writer and Editor: Hanna Goss  
Contributing Writer: Kitty Fahey  
Copy Editor: Gerald Esch  
Designer: Frank Ruopoli

Back issues of *Coastal Services* can be viewed at  
[www.csc.noaa.gov/magazine](http://www.csc.noaa.gov/magazine)

To subscribe to *Coastal Services*, go to  
[www.csc.noaa.gov/magazine/subscribe.html](http://www.csc.noaa.gov/magazine/subscribe.html)

To suggest content for *Coastal Services*, contact Hanna Goss at  
(828) 246-0958 or [Hanna.Goss@noaa.gov](mailto:Hanna.Goss@noaa.gov)

For information about the NOAA Coastal Services Center:

Phone: (843) 740-1200  
Internet: [www.csc.noaa.gov](http://www.csc.noaa.gov)  
Twitter: [@coastalservice](https://twitter.com/coastalservice)  
Facebook: [www.facebook.com/NOAACoastalServices](https://www.facebook.com/NOAACoastalServices)

*Coastal Services* is produced bimonthly as a trade journal for coastal resource managers. Editorial content is unofficial and not authority for action. Views and opinions expressed may not reflect those of the Department of Commerce or NOAA. The mission of the NOAA Coastal Services Center is to support the environmental, social, and economic well being of the coast by linking people, information, and technology.

## FROM THE DIRECTOR

*Coastal Services* has a new look!

If you were wondering about the January/February edition of *Coastal Services*, we took that time off to redesign the magazine's layout. The result is a more readable publication with additional photographs, room for creative layouts, and a new feature showcasing useful maps and tools from the NOAA Coastal Services Center.

We would love to hear how you like the new layout, as well as what you think about the publication in general.

In this edition of the magazine we feature articles on how coastal resource managers are implementing ecosystem-based management in Humboldt Bay, California, and on two new tools developed in New Jersey that managers are using to help coastal communities evaluate and improve their resilience to sea level rise and other impacts to climate change.

Our writers also cover how Hawaii coastal managers have developed a volunteer network to help alert researchers to potential problems in the islands' extensive coral reefs, and how Florida archaeologists have worked to systematically map ancient at-risk archaeological sites in three protected coastal areas in the state.

Last month, the Coastal Services Center hosted the Social Coast Forum, which was a surprising sellout. The conference exceeded our expected attendance early in the registration process and ended up with an extensive waiting list.

Interest in this conference is one indication that the coastal management community is really starting to delve into the people side of coastal management in a more formal way. We at the Coastal Services Center are hopeful that this is a harbinger of things to come.

With that in mind, Center staff members are planning an expanded product line that incorporates more social science data and services. The recently released economic data for the coasts and Great Lakes, ENOW, or Economics: National Ocean Watch, is a great example of the type of new Center product you can expect to see soon. Find it at [www.csc.noaa.gov/enow](http://www.csc.noaa.gov/enow).

As always, we would love to hear your comments and feedback on the Center, as well as its products and services. ❖

Margaret A. Davidson

# ECOSYSTEM-BASED MANAGEMENT:

## Putting Theory into Practice in California

While ecosystem-based management has been called out as a coastal resource management solution for addressing the combination of natural and human activities along our nation's shoreline, implementing it isn't always easy. In 2007, a multidisciplinary partnership formed in Humboldt Bay, California, with the intention of developing a "practical" way to implement ecosystem-based management in the region.

After an extensive planning process, the Humboldt Bay Initiative is moving forward with strategies that include creating a nonprofit organization to facilitate funding and partnership opportunities, and the implementation of climate change adaptation tools that communities around the country may be able to model. The initiative is also partnering with other ecosystem-based management projects on the West Coast to share ideas and information.

"When we started this, there was a wealth of scientific and policy papers encouraging ecosystem-based management, but nothing really practical for on-the-ground implementation," says Susan Schlosser, a California Sea Grant advisor. "Since then, we've built an ecosystem-based management framework, are moving ahead on two of six strategies on high-priority issues, and have developed recommendations for establishing and maintaining a Humboldt Bay Ecosystem database."

"Each year down the road is producing more fruits of the investment of working together in an ongoing manner," says Rebecca Price-Hall, the watershed coordinator for Trinidad to Humboldt Bay and the part-time coordinator for the project. "We've gone from having a 30-member team to now having an email list of over 150 people. While all those people aren't equally involved, it does illustrate the level of increased communication and coordination."

*"By working cooperatively, we've identified the issues that really matter to everybody."*

*Susan Schlosser, California Sea Grant*



### ALL IN THE TIMING

At the same time that ecosystem-based management was spotlighted by both the U.S. Commission on Ocean Policy and the Pew Oceans Commission as a solution to the combination of human activities on land, along the coasts, and in the ocean, two community-based plans for Humboldt Bay and its watershed were being completed.

“A number of us were involved in both community planning processes, and the coincidental timing of these big policy initiatives supporting ecosystem-based management made us think that maybe this was a way we could integrate and implement the local plan priorities,” Schlosser says.

Ecosystem-based management is defined in the U.S. Commission on Ocean Policy’s 2004 final report as managing ocean and coastal resources in a way that reflects “the relationship among all ecosystem components, including humans and nonhuman species and the environments in which they live.”

The report notes, “Applying this principle will require defining relevant geographic management areas based on ecosystem, rather than political boundaries.”

Humboldt Bay was an ideal location for the implementation of ecosystem-based management, Schlosser says,

because it has a definable ecosystem, and citizens living in the area are experienced with interactive programs requiring stakeholder participation in decision-making, have many existing networks, have a strong sense of place, and treasure their quality of life.

### PICKING THE TEAM

With a California Coastal Conservancy grant in hand, the first step toward implementing ecosystem-based management in Humboldt Bay was forming an advisory team in 2006 that included 22 scientists and coastal resource managers. The team also included representatives of local tribes, nonprofits, and businesses.

“We asked each person to commit to participating in the process for a year,” says Price-Hall. “We wanted people to come regularly so we weren’t starting each meeting explaining the same thing.”

Sea Grant’s Schlosser says she took on the coordinator role “because it seemed very appropriate with the many outreach needs. It was a way to put my arms around everything that I’d worked on for the past 15 years and would help bring everybody together.”

She adds, “I was also willing to do it.”

### STRATEGIZING

The advisory team took the two community plans for Humboldt Bay and its watershed and identified common issues that were a priority for both. “These were big issues, like estuarine

restoration and sediment dynamics. After about a year, we realized we needed bigger teams and a more strategic approach,” Schlosser says.

A project team of 44 people completed a lengthy formal strategic planning process using funds from the David and Lucile Packard Foundation and California Sea Grant. When the plan was completed in 2009, the result was six priority management strategies that were developed by identifying ecosystem-based “targets” and threats to those targets.

“It felt worthwhile to go through the more extensive strategic planning process,” Price-Hall says. “In the end, we had a much more comprehensive plan.”

Since then, significant progress has been made in two of the strategic areas—creating a nonprofit organization to facilitate funding and partnership opportunities, and coordinating the response to coastal climate change.

### FIRST PRIORITY

The first strategy the group took on was a proactive, coordinated response to impacts resulting from climate change, such as habitat and species changes, hydrological changes, and shifts in land use, Schlosser says.

All the data and local tools available related to area impacts were collected and synthesized, and the project team was able to start targeting research projects to fill in gaps. It also began disseminating the information in a series of community workshops.

Concurrently, the project team began working with the Ecosystem-Based Management Tools Network and the NOAA Coastal Services Center



to target tools that could be used as part of a demonstration project.

“We got a small grant from the Campbell Foundation to help them start devising plans for specific actions to prepare for adapting to rising sea levels and other climate impacts coming down the line,” says John Rozum, a NatureServe contractor working as the ecosystem-based management tools training coordinator hosted by the Coastal Services Center. “We hope to take the lessons learned here and apply them to other areas.”

### ITS OWN ENTITY

The group has also recently formed the Coastal Ecosystems Institute

of Northern California, a nonprofit organization to attract and manage funding for large collaborative projects.

“One of the things we identified in our first year of work,” Schlosser says, “was that we needed some kind of entity that could serve this large, multidisciplinary group of agencies, businesses, academics, and tribes because none of the existing entities were set up to administer anything like that.”

### REACHING OUT

In 2007, members of the Humboldt Bay Initiative advisory team also began meeting and sharing information with what became the West Coast Ecosystem-Based Management Network,

a partnership of six community-based initiatives focused on the successful implementation of ecosystem-based management along the coasts of Washington, Oregon, and California.

“We learn from each other in the network, which is immensely helpful,” Schlosser says.

Other strategies the initiative is moving forward on include a coordinated response to invasive species, addressing water quality issues, and promoting sustainable development.

### GAINING MOMENTUM

While it has been time-consuming and at times challenging, Schlosser says there is no denying the management momentum gained by taking on an ecosystem-based management approach.

“By working cooperatively, we’ve identified the issues that really matter to everybody. In the end, we’re getting down to the foundational question, ‘What do we need to know to do these things?’ That’s what’s united us in continuing the conversations.”

She adds, “I’m very happy that it’s turned out to have value, and it’s very satisfying that people want to advance this concept of ecosystem-based management and get these projects done.” ❖

*For more information on the Humboldt Bay Initiative, go to <http://ca-sgep.ucsd.edu/focus-areas/healthy-coastal-marine-ecosystems/humboldt-bay-ebm>. You may also contact Susan Schlosser at (707) 443-8369 or [sschlosser@ucsd.edu](mailto:sschlosser@ucsd.edu), or Rebecca Price-Hall at (707) 499-6454 or [rpricehall@trinidad.ca.gov](mailto:rpricehall@trinidad.ca.gov). To learn more about the climate change tools being used in Humboldt Bay, contact John Rozum at (510) 251-8319 or [john.rozum@noaa.gov](mailto:john.rozum@noaa.gov). For more information on the West Coast Ecosystem-Based Management Network go to [www.westcoastebm.org](http://www.westcoastebm.org).*

# New Tools Help New Jersey Communities Prepare for Climate Change

*“Our goal wasn’t to tell them what to do. It was to give them information and tools that they could use to be responsive to what’s happening.”*

*Dorina Frizzera, New Jersey Coastal Management Office*

Many New Jersey coastal communities are facing challenges from inundation and other hazards related to climate change, but how prepared are they to respond? To help communities find out and improve their resilience to these natural hazards, state coastal resource managers recently piloted two new tools to help officials assess local vulnerabilities and evaluate existing planning strategies.

The tools developed by New Jersey’s Coastal Management Office are the Coastal Community Vulnerability Assessment Protocol, which uses detailed and current mapping to illustrate the potential scenarios for coastal inundation, or flooding, and “Getting to Resilience,” a questionnaire to help coastal communities figure out what they’re doing well and how they can improve.

Piloting the tools revealed that the three targeted communities were already taking positive steps to become resilient but still had opportunities for improvement.

“There was nothing regulatory about this,” says Dorina Frizzera, environmental scientist for the coastal management office. “It was an attempt to allow communities to engage and characterize themselves and what they’re doing.”

## FOLLOWING PROTOCOL

The Coastal Community Vulnerability Assessment Protocol is a geographic information system (GIS)-based analysis that uses mapped data and the application of models to help land-use planners, hazard mitigation planners, emergency

managers, and other local decision makers with identifying their communities’ vulnerabilities.

By applying the methods defined in the protocol to the pilot communities, Frizzera says areas were identified where built infrastructure, sensitive natural resources, and special needs populations overlapped with areas of potential inundation from sea level rise or storm surge.

The “Getting to Resilience” questionnaire was developed as a tool to help coastal communities build capacity for resilience to coastal hazards and sea level rise.

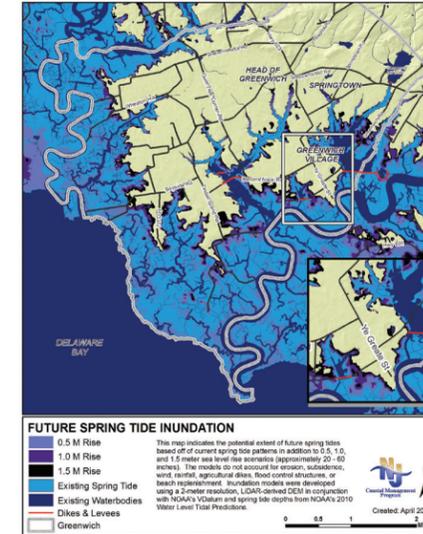
During the pilot project, the survey was used to highlight positive actions already underway and to identify opportunities to improve local resilience through planning, public outreach, mitigation, and response mechanisms.

## CHANGING FOCUS

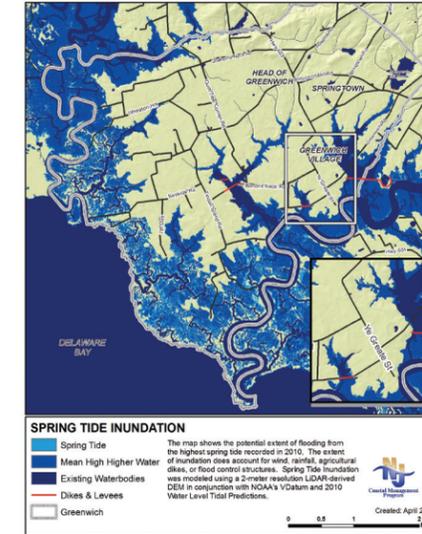
“We developed these tools to address coastal hazards, knowing that climate change was occurring in the state but that few people were talking about it,” Frizzera says.

While the coastal program intended that the tools address wetland loss from sea level rise—one of the more significant impacts from climate change in Delaware Bay—the project focus shifted to looking at coastal hazards and climate change from a planning perspective, she says.

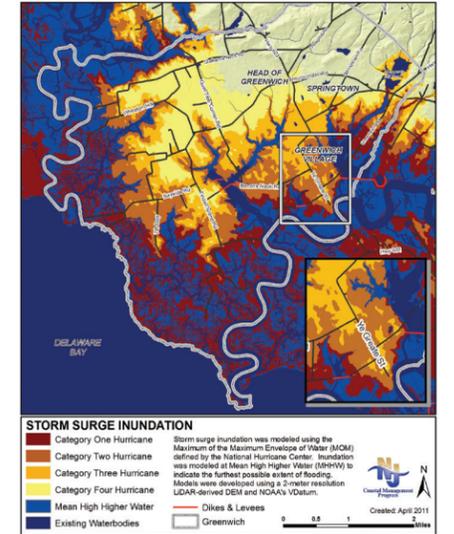
Part of the reason for the shift, Frizzera explains, was a lack of staffing. Without staff members to implement the project, the coastal program



The potential impact of inundation from future spring tides with sea level rise.



Potential inundation from the highest spring tide recorded in 2010.



Potential storm surge inundation.

MAPS COURTESY OF NEW JERSEY COASTAL MANAGEMENT OFFICE

turned to the Coastal Management Fellowship program, which was established by the NOAA Coastal Services Center to provide on-the-job education and training opportunities for postgraduate students while providing project assistance to state coastal zone management programs.

“All the potential fellows were terrific,” Frizzera recalls, “except none of them had the wetlands background we were looking for.” Instead, they morphed the project to fit the fellow candidate of their choice, Leigh Wood, who had a planning background.

As a result, “we began focusing on the impacts to coastal communities behind the marsh,” Frizzera says.

## CREATING THE TOOLS

Wood, who is now the Coastal Training Program coordinator at North Inlet-Winyah Bay National Estuarine Research

Reserve in Georgetown, South Carolina, says to create New Jersey’s tools, she first did an extensive literature review and studied existing tools from around the country, including tools from the Coastal Services Center and Sea Grant offices.

Frizzera says they developed a mapping protocol that looked at geographic, environmental, and social vulnerability, and started collecting data, such as from an extensive tide gauge network, historical aerial mapping, tracking records of hurricanes and other major storms, more current lidar, soils information, and the U.S. Census Report. “We started piecing the information together and thinking about how we could apply the information to assist local governments in their planning and management.”

They also reached out to the New Jersey Sea Grant Consortium, Monmouth University Urban Coast Institute, and Stevens Institute

of Technology for assistance in piloting the tools developed.

After piloting the methods, Wood compiled all the information into two documents that local governments could follow to not only identify physical vulnerability to inundation, but also to improve resilience. “A lot of the tools out there typically do one or the other, but not both,” she says.

“The biggest challenge,” Wood notes, “was packaging the information in a format that would be easily accessible and understandable to local government staff members and officials. I wanted anybody who picked it up to know what resources were needed to do the mapping, and identify vulnerable infrastructure or resources.”

## FACILITATED DIALOGUE

To see if the tools would be effective at the local level, the research partners continued on page 11

## Extra Eyes Help Spot Threats to Hawaii's Coral Reefs

Left unchecked, coral disease can spread at an alarming rate, potentially devastating entire coral colonies. The consequences of major coral disease events can include lost tourism revenue, communities left more vulnerable to coastal storms, and less seafood for people to eat.

To ensure a rapid response to coral bleaching and disease and other threats, coastal resource managers in Hawaii have developed a volunteer network to help alert researchers to potential problems in the islands' extensive reefs.

The Eyes of the Reef Network was developed three years ago to increase public awareness and engage communities in the monitoring and reporting of coral bleaching and disease, marine invasive species, and outbreaks of the crown-of-thorn sea star, which is a large sea star that preys on coral polyps and can cause widespread reef destruction.

The network has attracted coral reef enthusiasts from throughout Hawaii to monitor and report on the conditions of reefs they visit regularly. "The more we know about coral reef threats and how they spread, the better we'll be at making recommendations to decrease mortality," says Greta Aeby, an assistant researcher at the Hawaii Institute of Marine Biology and the founder and coordinator of Eyes of the Reef.

### VITALLY IMPORTANT

Reef die-off or collapse is caused when ecosystem stressors such as pollution, poor land-use practices, or impacts from climate change affect a reef's delicate ecosystem balance. Reef fish feed on the crab and shrimp that live in the coral, so reef damage or collapse can have devastating effects up and down the marine food chain.



*"The more we know about coral reef threats and how they spread, the better we'll be at making recommendations to decrease mortality."*

*Greta Aeby, Hawaii Institute of Marine Biology*

The health of coral reefs is also essential for the livelihoods of many Hawaiians, both through tourism and commercial fishing. Coral reefs protect coastal infrastructure, tourist beaches, and communities from storm damage, erosion, and flooding because they absorb wave energy from the ocean.

Both Hawaii and other U.S. economies significantly benefit from coral reefs. A recent study commissioned by the NOAA Coastal Ocean Program found the average annual benefits from the Hawaiian coral reefs to be \$385 million. About 45 million tourists visit U.S. coral reefs every year, generating \$17 billion in income, and U.S. reefs generate \$247 million from commercial fishing. About 85 percent of the potential reef area of the U.S. is within the Hawaiian Archipelago.

In addition, coral reefs have traditionally played an important spiritual and cultural role in Hawaii.

### FOLLOWING PROTOCOL

Because Hawaii's reefs cover such a vast area—2.1 million acres of potential reef area in the Northwestern Hawaiian Islands and 410,000 acres around the Main Hawaiian Islands—researchers can personally monitor just a small fraction.

"It's important to locate outbreaks of coral disease and other threats early on, so

*Montipora white syndrome causes progressive coral reef tissue loss.*

PHOTO BY GRETA AEBY AND COURTESY OF HAWAII INSTITUTE OF MARINE BIOLOGY

action can be taken to minimize the damage, which can be surprisingly rapid and virulent," Aeby says.

To get more eyes on the reef, the Hawaii Division of Aquatic Resources and the multi-partner Climate Change and Marine Disease Local Action Strategy developed the network as the first tier of a rapid response protocol. The network is implemented through the nonprofit organization Reef Check Hawaii.

Local businesses and scientists are actively involved in the network, as are agencies and organizations at the local, state, and federal levels.

### RAPID RESPONSE

Aeby has had great success attracting volunteers to help with the Eyes of the Reef Network by giving short presentations at places where people are already excited about coral reefs, such as local dive shops, meetings for snorkeling enthusiasts or tourism operators, and events for coral researchers and marine biology students.

Network volunteers take on a variety of tasks. Some help to develop the brochures, websites, and training materials. Others coordinate activities on the Big Island, Kauai, and Maui, and they offer free training where community members learn to identify different corals and varying threats. Documents for monitoring and reporting changes can be downloaded from the network website.

When reports of significant damage come in, the network's trained primary responders investigate and photograph the alleged problem.

"Scientists need this data so we can distinguish temporary coral bleaching, like the type that happens in springtime when waters warm up, from the permanent changes we need to worry about," notes Aeby.

### CRISIS RESPONSE

The Eyes of the Reef Network's effectiveness was highlighted in Oahu's Kaneohe Bay in 2010 when Bob Tangaro, a network member and a boat driver at the Hawaii Institute of Marine Biology, discovered a severe

outbreak of acute *Montipora* white syndrome, a disease that causes significant tissue loss in reef corals.

He alerted Aeby, and Hawaii's multiagency rapid response team was called in to track the location and spread of the disease. At the same time, network members were asked to visit reefs in other locations to see whether the outbreak was spreading.

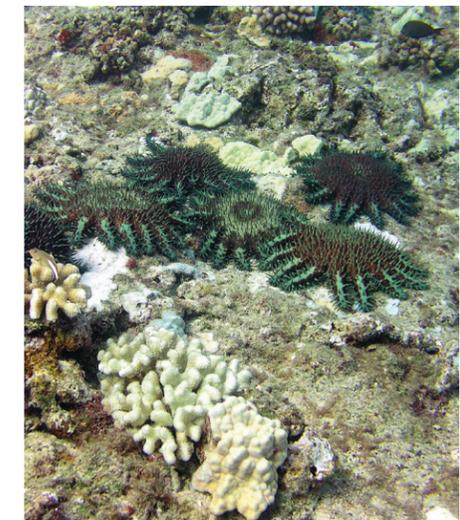
Unfortunately, another outbreak of acute *Montipora* white syndrome occurred in Kaneohe Bay in December 2011, where hundreds of coral colonies were damaged.

### WISH LIST

The rapid growth and success of the network has brought inevitable challenges and growing pains. "The nature of volunteering is that people are able to do it in fits and starts, so progress is slower than it would be if paid workers devoted their time," says Aeby.

Her goal is to locate funding for a part-time employee who could ease the administrative load and pursue grant opportunities.

Aeby also plans to expand outreach to middle school and high school students. "Sometimes the kids think the coral can be treated just like rocks, because they haven't been told anything different. I'd like to help them understand the fragile nature of reefs and the importance of protecting them." ❖



Crown-of-thorn sea stars prey on coral polyps.

PHOTO BY JEAN KENYON AND COURTESY OF NOAA FISHERIES CORAL REEF ECOSYSTEM DIVISION

For more information on the Eyes of the Reef Network, go to [www.reefcheckhawaii.org/eyesofthereef.htm](http://www.reefcheckhawaii.org/eyesofthereef.htm). You may also contact Greta Aeby at (808) 236-7437 or [greta@hawaii.edu](mailto:greta@hawaii.edu).

## Preserving Prehistoric Coastal Heritage in Florida



An ancient shell cup found at the Charlotte Harbor Preserve State Park.

PHOTO COURTESY OF FLORIDA BUREAU OF ARCHAEOLOGICAL RESEARCH

Humans have used Florida's coastal areas for thousands of years, but many of the remaining archaeological sites are seriously threatened by natural and human forces. To better protect and preserve these cultural resources, state archaeologists have worked to systematically map significant, at-risk archaeological sites in three locations.

"This is the best way to deal with the issue of threatened cultural resources in coastal areas," says Mary Glowacki, chief and state archaeologist for Florida Department of State's Bureau of Archaeological Research. "The cost of trying to stabilize these sites is a huge investment of time and money, and is essentially unaffordable for land managers to do. One thing we can do is to go ahead and record these sites as best we can."

As a result of the mapping project, the state now has an atlas of the most significant archaeological sites in Charlotte Harbor Preserve State Park in southwestern Florida, Big Bend Wildlife Management Area in north-central Florida, and Aucilla Wildlife Management Area in the northwestern part of the state.

The atlases will be useful for resource managers and law enforcement staff members who monitor and protect the sites, archaeologists reconstructing the region's cultural history, and scientists assessing shoreline erosion and inventorying natural resources, Glowacki says.

Creating the maps was important, she says, because ancient cultural resources in Florida's coastal areas are gradually eroding from the effects of hurricanes and

***"The maps and atlases provide a blueprint of current site conditions and, for the first time, a systematic means to monitor site changes."***

*Mary Glowacki, Florida Bureau of Archaeological Research*

tropical storms, subsidence, tidal scouring, vandalism and looting, animals, and loss of native vegetation.

With funding from the Florida Coastal Management Program, the state's Public Lands Archaeology program began systematically mapping the physical features of areas with a concentration of important archaeological sites that are being threatened.

Glowacki and Bureau of Archaeological Research staff members selected the sites to be surveyed, accompanied the contracted surveying team to ensure proper site recording, and compiled existing maps and site information to include in the atlases. For the Big Bend atlas, a botanist also provided an inventory of plants associated with the sites to give managers information to reconstruct the native ecosystem.

"We tried to stick to the same process in each area," she says.

The Public Lands Archaeology program composed the text and designed the atlases and a brochure. The atlases include a computer jump drive holding all the digital files to make the data computer-accessible.

"The maps and atlases provide a blueprint of current site conditions and, for the first time, a systematic means to monitor site changes," says Glowacki. They also provide a foundation for preservation, restoration, and protection activities.

She adds, "It was a good investment. We produced a nice, solid tangible product that is contributing to the goals and objectives of the organizations involved. Doing something similar would be very doable for any group that has the time and resources." ❖

For more information on Florida's archaeological site mapping, contact Mary Glowacki at (850) 245-6319 or [Mary.Glowacki@dos.myflorida.com](mailto:Mary.Glowacki@dos.myflorida.com).

continued from page 7

used funding from the National Sea Grant Coastal Communities Climate Adaptation Initiative to conduct demonstration projects in Little Silver, Oceanport, and Greenwich, New Jersey.

"This was conceived as a facilitated dialogue with all of the folks responsible for implementing local plans," Frizzera says. "The goal was to help them characterize their existing plans and to identify opportunities for sharing ideas and information."

"One of the nice things about the whole process," says Jon Miller, a research associate professor at Stevens and a coastal processes specialist for New Jersey Sea Grant, "was the communication and sense of synergy" that was developed between the different decision makers, planning boards, engineers, and emergency officials involved in each project.

Frizzera adds, "Our goal wasn't to tell them what to do. It was to give them information and tools that they could use to be responsive to what's happening."

### OPPORTUNITIES

The pilot communities were found to already be taking positive measures to become resilient, but they still had opportunities for improvement. For example, communities needed outreach tools to educate residents and visitors on emergency preparedness, evacuation procedures, and storm protection measures for homes and businesses.

"That these communities were willing to not only participate, but to move forward is huge," Miller says. "Now it'll be easier to convince other communities to take part in a similar exercise." ❖

For more information on the Coastal Community Vulnerability Assessment Protocol and the "Getting to Resilience" questionnaire, contact Dorina Frizzera at (609) 777-3251 or [dorina.frizzera@dep.state.nj.us](mailto:dorina.frizzera@dep.state.nj.us). You may also contact Leigh Wood at (843) 904-9034 or [Leigh.Wood@belle.baruch.sc.edu](mailto:Leigh.Wood@belle.baruch.sc.edu), or Jon Miller at (201) 216-8591 or [jmiller@stevens.edu](mailto:jmiller@stevens.edu).

## OCEAN AND GREAT LAKES ECONOMIC DATA GROW ON TREES.

**NOT EXACTLY.** But with Economics: National Ocean Watch (ENOW), these data are becoming easier to get. And use.



First-time users: The ENOW Data Explorer provides super easy graphs and charts focused on local, regional, and national data. Visit [www.csc.noaa.gov/enow/explorer](http://www.csc.noaa.gov/enow/explorer).

**ENOW**  
[www.csc.noaa.gov/enow](http://www.csc.noaa.gov/enow)

## Coastal Organizations: Your Training Needs Are Covered.



## PROMISE.

Training from the NOAA Coastal Services Center

Many courses are available. Some are delivered at a location of your choosing; others are delivered online. All involve very little cost. Call us at (843) 740-1167 or visit our website to learn more.

[www.csc.noaa.gov/training](http://www.csc.noaa.gov/training)

## NEWS YOU CAN USE

FROM THE NOAA COASTAL SERVICES CENTER



### SELLING THE ECONOMIC BENEFITS OF HAZARD RESILIENCE

Coastal communities that carry out well-developed hazard mitigation and resilience plans will likely gain an economic edge over less-prepared communities. Consider these findings from an independent study of the Federal Emergency Management Agency's Hazard Mitigation Grant Program:

- Every dollar spent on hazard mitigation saves society an estimated four dollars in the long term.
- When mitigation efforts are directed specifically at wind and flooding hazards, society receives a five-dollar rate of return for every dollar spent.
- The largest return on investment occurs when mitigation projects focus on reducing business interruption from the loss of utilities.

It may seem impossibly difficult to convince your coastal community that seeds of resilience planted today will bring an economic harvest later. But you can break down this goal into manageable steps with the help of the NOAA Coastal Services Center products described here.

#### COMMUNICATING THE MESSAGE AND IDENTIFYING AIMS

Familiarize yourself with economic terms and methods with the guide *Introduction to Economics for Coastal Managers*. Learn how to increase community buy-in with the publication *Introduction to Stakeholder Participation*. Learn to establish realistic resilience goals and gauge economic and other outcomes with the training Project Design and Delivery.

#### PROVIDING ACCESSIBLE FACTS AND TOOLS

Introduce your audience to the Coastal County Snapshots tool for instant facts on local hazard vulnerabilities. Share the Economics: National Ocean Watch website, where easy-to-grasp statistics show how ocean or Great Lakes resources contribute to each local economy. Help stakeholders picture the potential effects of local coastal changes such as flooding and sea level rise with CanVis, and encourage them to take the Web-based training.

#### SEEKING CONSENSUS AND TAKING ACTION

Take the Public Issues and Conflict Management training, which will help you design, conduct, and control meetings in public forums. Add the Introducing Green Infrastructure for Coastal Resilience training to understand the ecological, economic, and societal benefits of green infrastructure. And encourage planners, officials, and managers to take the Web-based training Roadmap for Adapting to Coastal Risk, which will help them work together on identifying risks and crafting adaptation strategies.

*These products and services can be found on the Center's Digital Coast website at [www.csc.noaa.gov/digitalcoast](http://www.csc.noaa.gov/digitalcoast). If you need assistance, contact the Center at [csc.info@noaa.gov](mailto:csc.info@noaa.gov).*

## BENTHIC HABITATS OF REDFISH BAY, TEXAS



Redfish Bay is a rich and diverse shallow-water estuary. Airborne, multispectral imagery was used to map the many benthic habitats found in Redfish Bay, including seagrass meadows, oyster reefs, mangroves, and algal communities. These data are one of the primary data sets used by the state's seagrass and shellfish monitoring program. This image shows the close proximity of these sensitive habitats to busy port and navigational facilities.

*For more information, or to access other benthic cover data sets available through the Digital Coast website, visit [www.csc.noaa.gov/benthic](http://www.csc.noaa.gov/benthic).*



## NOAA Coastal Services Center

LINKING PEOPLE, INFORMATION, AND TECHNOLOGY

2234 South Hobson Avenue  
Charleston, South Carolina 29405-2413  
(843) 740-1200  
[www.csc.noaa.gov](http://www.csc.noaa.gov)

Regional Offices:  
NOAA Pacific Services Center,  
NOAA Gulf Coast Services Center, and  
Offices in the Great Lakes, Mid-Atlantic,  
Northeast, and West Coast

10% total recovered fiber/all post-consumer fiber. This recycled paper meets EPA and FTC guidelines for recycled coated paper.

PRST STD  
Postage & Fees Paid  
NOAA Coastal  
Services Center  
Permit No. 25



# To make better land use decisions

*Start with your local data and natural resource management goals. Pour these into the Habitat Priority Planner, mix well, and develop the maps and reports your audience needs to make the right decisions. Visit our website for a taste test.*

**Use the Habitat Priority Planner**  
[www.csc.noaa.gov/hpp](http://www.csc.noaa.gov/hpp)