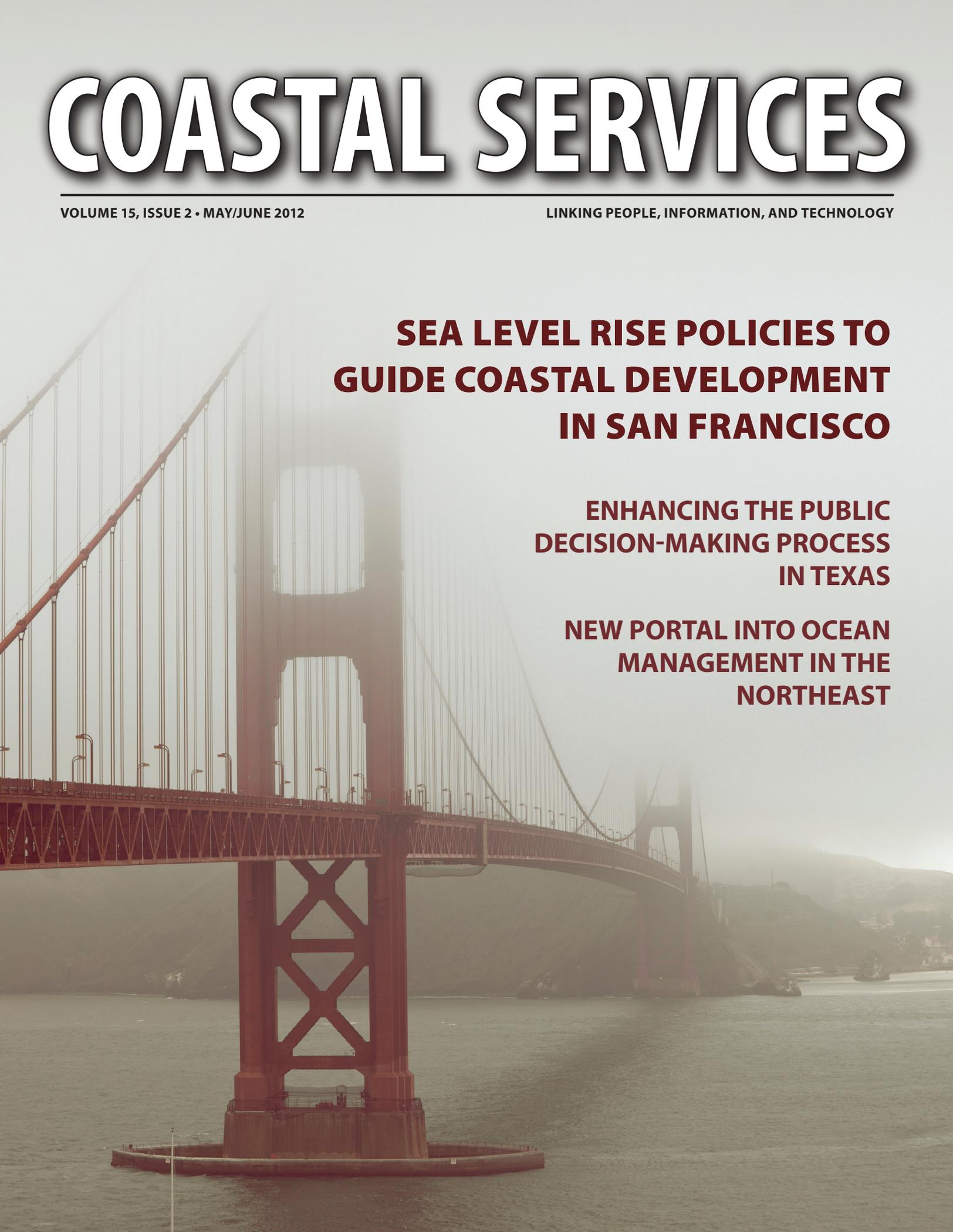


COASTAL SERVICES



VOLUME 15, ISSUE 2 • MAY/JUNE 2012

LINKING PEOPLE, INFORMATION, AND TECHNOLOGY

SEA LEVEL RISE POLICIES TO GUIDE COASTAL DEVELOPMENT IN SAN FRANCISCO

**ENHANCING THE PUBLIC
DECISION-MAKING PROCESS
IN TEXAS**

**NEW PORTAL INTO OCEAN
MANAGEMENT IN THE
NORTHEAST**

TABLE OF CONTENTS

- 1 FROM THE DIRECTOR
- 2 SEA LEVEL RISE POLICIES TO GUIDE COASTAL DEVELOPMENT IN SAN FRANCISCO
- 6 NEW TOOLS ARE ENHANCING THE PUBLIC DECISION-MAKING PROCESS IN TEXAS
- 8 WETLANDS RESTORATION IN HAWAII IS FULFILLING A COMMUNITY VISION
- 10 NEW PORTAL INTO OCEAN MANAGEMENT IN THE NORTHEAST
- 12 NEWS YOU CAN USE
- 13 END NOTE



Volume 15 | Issue 2 | May/June | 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
Acting Director: Jeff Payne
Acting Deputy Director: Nicholas Schmidt

COASTAL GEOSPATIAL SERVICES
Acting Division Chief: Hamilton Smillie

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

To subscribe to *Coastal Services*, go to
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

For information about the NOAA Coastal Services Center:

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

How do you turn controversy about climate change science into an opportunity to create progressive new sea level rise policies? The cover story of this edition of *Coastal Services* looks at how coastal resource managers in San Francisco turned controversy into an educational, outreach, and collaborative opportunity.

For three years the San Francisco Bay Conservation and Development Commission worked with residents, local governments, and the business and nonprofit communities to address the identified challenges of sea level rise in the region.

On October 6, 2011, the commission voted unanimously to amend the San Francisco Bay Plan to more broadly address climate change adaptation, with a specific focus on sea level rise.

Read the article to learn the steps the commission went through and what the new policies mean for the near- and long-term growth of the City by the Bay.

Here at NOAA's National Ocean Service, we are also embracing an opportunity. This is the opportunity to better integrate coastal management. It's not clear, yet, what this will look like, but the focus is on determining the best way the Coastal Services Center and the Office of Ocean and Coastal Resource Management (OCRM) can bring even better products and services to a larger coastal management community.

To fully explore this opportunity, Margaret Davidson has been appointed acting director for OCRM, and I am stepping in as acting director for the Coastal Services Center. Within OCRM, John King is continuing his duties as acting deputy director for the next five months, and Nicholas Schmidt will serve for the next four months as the acting deputy of the Coastal Services Center.

Throughout the decision-making process, we will share progress reports with you.

One of the best ways to stay informed about the Coastal Services Center and its services is to follow us on social media. Find us on Twitter [@coastalservice](https://twitter.com/coastalservice) and on Facebook at www.facebook.com/NOAACoastalServices.

We will also be soliciting your ideas and feedback as we work through this process.

These are exciting times for the coastal management community and NOAA. Both Margaret and I firmly believe that by working together in a broader and more cohesive way, we will find the best solutions. ❖

Jeff Payne, Acting Director



Sea Level Rise Policies to Guide Coastal Development in SAN FRANCISCO



“While mitigating climate change by reducing greenhouse gas emissions is essential, adapting to climate change and its impacts is unavoidable.”

*Steve Goldbeck,
San Francisco Bay Conservation and Development Commission*

Managing the threats from sea level rise to San Francisco Bay and development along its shoreline has been identified as one of the major challenges the region will face in the 21st century. After a three-year initiative, area coastal managers recently approved policies to address climate change, with a specific focus on sea level rise.

“This is a framework for selecting adaptation strategies to address key vulnerabilities and risks at various scales and time frames,” says Steve Goldbeck, acting executive director for the San Francisco Bay Conservation and Development Commission.

On October 6, 2011, after three years, three proposed language changes, a lengthy public comment period,

and 35 public hearings, meetings, and workshops, the commission voted unanimously to amend the San Francisco Bay Plan to more broadly address climate change adaptation.

In the near term, the amendment means the commission can require applicants to develop resilient designs and adaptation strategies when planning shoreline areas or designing larger shoreline projects within its limited jurisdiction.

Ultimately, Goldbeck says, effective adaptation will require strategies that integrate climate mitigation and adaptation efforts regionally. To do this, the commission is helping facilitate a collaborative process to develop a regional strategy to address sea level rise and other adaptation challenges in the Bay Area.

RISING WATER

Climate change has the potential to dramatically impact the economy, environment, and quality of life in the nine-county San Francisco Bay Area, which is home to about seven million people.

While efforts are already underway in the area and state to reduce greenhouse gas emissions to mitigate climate change, Goldbeck notes that sea levels in San Francisco Bay have risen nearly eight inches over the past century, and scientists agree that the rate of area sea level rise is accelerating.

While exact future increases in sea level rise are uncertain, the commission’s most recent report summarizing the latest scientific research on climate change shows that 330 square miles of low-lying land around the Bay may be vulnerable to sea level rise over the next century.

This means that flooding threatens the long-term viability of neighborhoods, job centers, transportation, water and wastewater infrastructure, schools, fire stations, and vital ecosystem services.

“We found that over a quarter million bay residences could be inundated, as well as a good chunk of Silicon Valley, which is home to Google and



King tides along the San Francisco waterfront.

PHOTO BY HEIDI NUTTERS AND COURTESY OF SAN FRANCISCO BAY CONSERVATION AND DEVELOPMENT COMMISSION

other Internet giants," Goldbeck says. "The Pacific Institute for Research and Evaluation estimated that we could be facing \$60 billion just in replacement values for infrastructure, displaced residents, goods and services—and that would be a gross underestimation of the actual impact. These are real, potential impacts."

He adds, "While mitigating climate change by reducing greenhouse gas emissions is essential, adapting to climate change and its impacts is unavoidable."

ONE OF THE FIRST

The amendment to the Bay Plan is really an update to the commission's existing sea level rise policies, which were adopted in 1989, Goldbeck says. The Bay Conservation and Development Commission was one of the first public agencies in the country to address the

issue of sea level rise when making permit decisions and providing policy advice to local governments.

"Back 20 years ago when the idea of sea level rise driven by climate change came onto our radar screen, we realized we needed to assess it and come up with strategies," Goldbeck says. "At that time, we went through the process of looking at what the threat was, and there was a whole lot of uncertainty."

He adds, "Today, there's still uncertainty, but it's hugely different because the science is so much improved and we're already seeing impacts from sea level rise. These new policies

bring us to where we are today, which is a better understanding of what we face and better information on adaptation strategies."

FEELING VULNERABLE

In 2009, the commission released its regional sea level rise vulnerability assessment. In addition to providing extensive background information on the most current scientific research



on climate change, the report contained maps depicting the low-lying areas around the Bay that could be vulnerable to future flooding from sea level rise and storm surge.

Along with the background report, the staff provided a preliminary recommendation on proposed Bay Plan amendments to address climate change.

With the assessment in hand, the commission began an effort to help prepare the region for the changes to the shorelines of the Bay and the related impacts.

"We started going out and talking to people in the region about it," Goldbeck says. "The maps showed hundreds of square miles of inundation and caught people's attention. It was also very controversial."

PUBLIC PROCESS

The commission held its first public hearing on the preliminary staff recommendation on May 7, 2009. To respond to requests for more time for public review and input, the commission held three more public hearings and three public workshops, and kept the public comment period open for three months.

After two more staff recommendations, public outreach and comment periods were held to address the public concerns. The staff worked with local governments, business interests, and

environmental organizations to further refine the amendment language.

In all, beginning in April 2009, the commission held 35 public hearings, workshops, and meetings before approving the amendment on October 6, 2011.

POSITIVE CONTROVERSY

"When we first put this out, we'd done a lot of work on it and made ourselves very knowledgeable about what the state of the science was," Goldbeck says. "What we didn't realize was that everyone else wasn't as focused on this as we were and didn't have the same level of understanding. It was hard for them to grasp what we were saying about it and what we wanted to do about it, and it raised a lot of concerns."

He adds, "Ultimately, we were able to use that controversy as a positive thing. It brought attention to the subject, and we were able to use that to teach what the issues are and why there's a need for response. Before, people weren't paying attention at all. By the end, we were all smarter on the topic."

"At the end of the day," he says, "it was broadly supported."

CASE BY CASE

The policies direct the commission to continue to evaluate each project on a case-by-case basis. However, the

policies in the San Francisco Bay Plan that generally discourage building in shoreline areas that are vulnerable to current or future flooding have been modified. The new policies encourage development in suitable low-lying areas provided that flood risks are addressed, and encourage habitat preservation and enhancement in suitable areas.

The new policies also call for the formulation of a regional sea level rise adaptation strategy to protect critical shoreline development and natural ecosystems.

"Over the long term," Goldbeck says, "we call for policies to be integrated in a regional strategy for sea level rise that should be coordinated by the Joint Policy Committee, composed of our and three other regional agencies, and including local governments, environmental interest groups, and economic interest groups. That's what we have to do today."

He adds, "It's been a lot of hard work, but it's been very satisfying. We look forward to trying to determine how we're going to live with a rising Bay and still have a prospering regional economy and resilient wetlands and natural areas. We think we really can live with the Bay as it changes. And that's the challenge that we face." ❖

For more information on the San Francisco Bay Plan amendment and new sea level rise policies, contact Steve Goldbeck at (415) 352-3611 or steveg@bcdca.gov. To read the resolution and learn more, visit www.bcdca.gov/proposed_bay_plan/bp_amend_1-08.shtml.

New Tools Are Enhancing the Public Decision-Making Process in Texas

"It's just like using a pen and paper to engage the full power of GIS."

Steven Mikulencak,
Texas Coastal Watershed Program

The Houston-Galveston region of coastal Texas could grow by well over 3 million people in the next 25 years. Coastal resource managers in the state are harnessing new technology to enable residents and local officials to easily see the impacts of different development and climate scenarios.

"Simply, this is putting tools of sustainability into the hands of citizens," says John Jacob, professor and extension specialist with Texas Sea Grant and Texas AgriLife Extension Service, and director of the Texas Coastal Watershed Program. "These tools help facilitate participatory democracy and enable nonexpert citizens to engage complex data sets in new and meaningful ways."

One of the tools developed by the Texas Coastal Watershed Program is the Coastal CHARM (Community Health and Resource Management) model, which is built on CommunityViz, a modeling software plugin for ArcGIS software. The model allows users to quickly test a variety of possible futures.

The second tool is the "weTable," which uses Wii gaming technology to transform an ordinary tabletop into an interactive computer interface. This affordable participation tool allows teams to collaboratively explore and use computer-based data and programs, such as CHARM, in a workshop setting.

The Texas Coastal Watershed Program piloted the weTable and Coastal CHARM tools at a



The interactive weTable lets workshop participants interact with coastal data using a "light pen" instead of a mouse.

PHOTOS COURTESY OF TEXAS COASTAL WATERSHED PROGRAM

workshop funded by the Sea Grant Coastal Community Climate Adaptation Initiative.

"These tools have the ability to shift public meetings and workshops from contested narratives about the science of coastal change to a self-evaluation of how prepared communities are," says Steven Mikulencak, program coordinator for the Texas Coastal Watershed Program.

PULLING BACK THE CURTAIN

While most planners have access to GIS and robust data that are used to model future development scenarios, it's often challenging to present that

information in meaningful ways during public meetings, Mikulencak says.

"It's usually only the expert planners that look at the intersection of multiple parameters and can see what the implications are for a development in terms of flooding and storm surge, for example," he says.

The weTable and CHARM tools "really open up a community conversation," Jacob says. "It's pulling back the curtain on planning and allowing people to see all the ramifications. It takes away the implied message to 'trust us, it's too complex for you.'"

CHANGING SCENARIOS

While coastal resource managers and planners have been working with GIS a long time, new tools in CommunityViz are making it easier to "play with scenarios," Jacob says. "You can really look at what happens when you put a type of development in a certain location and what that will do to runoff or water consumption or storm surge damage, etc. You can play with the assumptions and factors and make changes on the fly."

He adds, "We were aware of the CommunityViz software potential and wanted to do something with the projected population growth scenario related to climate change."

WIDE SPECTRUM

The new Coastal CHARM model is built to display a wide spectrum of coastal



The Coastal CHARM model is built to display a wide spectrum of coastal data in a user-friendly way.

natural resource and demographic data in a user-friendly framework.

Using previously developed data sets associated with the Texas Coastal Community Planning Atlas, the CommunityViz interface instantly calculates impacts of various development and climate-change scenarios on community resilience and natural resources.

"People could stand around a computer and look at a screen and try to do that, but the weTable makes that process interactive," Mikulencak says.

TABLE TALK

The weTable configuration works by projecting a computer screen onto a table surface. Participants interact with the computer data on the table using a "light pen," much like using a computer mouse, Mikulencak says.

The pen tip's location on the table is detected by a Nintendo Wii remote that then sends a signal to a connecting laptop using a Bluetooth connection. This allows the participants at the table to control the computer, open files, move windows, and run programs. Participants can hand over control of the tabletop interface to other participants as easily as handing over a marker.

"What makes this different," Mikulencak says, "is it basically makes the technology so transparent people don't even know it's there. Citizens don't have to be technophiles or have a lot of knowledge. It's just like using a pen and paper to engage the full power of GIS."

TEST DRIVE

To pilot the weTable-CHARM model, a daylong resilience workshop was held.

continued on page 11

Wetlands Restoration in Hawaii Is Fulfilling a Community Vision

“Seeing the land transform from being fallow and overrun with invasive species to this productive taro cultivation is amazing and inspiring.”

Melissa Iwamoto,
former planner with the Hawaii Coastal Zone Management Program

Decades ago, hundreds of acres of wetlands and adjacent uplands on the windward side of Oahu in Hawaii held plentiful natural fisheries and traditional Hawaiian crops, but changes in agriculture and factors such as runoff, invasive species, and sedimentation led to the area’s ecological decline. Now a community project that is supported by coastal resource managers is restoring more than 400 acres, strengthening the community’s traditional agricultural economy and improving nearshore water quality.

In addition, the restoration project is taking into consideration the anticipated impacts of climate change, such as sea level rise and more intense storms.

“This project shows that the vision of a community—in this case to bring the ecosystem back to being productive and healthy—is something we can support by providing funding and helping to build capacity,” says Leo Asuncion, planning program manager for Hawaii’s Coastal Zone Management Program.

The agency provided start-up funding and assistance to the Heeia Wetlands Restoration Project, which over time will restore natural wetland flows, eradicate invasive species, cultivate sustainable medicinal and food plants such as taro and breadfruit, decrease

sediment at the ocean shoreline, and educate the community on traditional Hawaiian agricultural knowledge.

The project is not only a potential model for other communities in the state, but is also being looked at by managers in other islands who are searching for ideas on how to restore wetland ecology and return to sustainable agricultural practices.

COMMUNITY-LED

At one time, a part of the Heeia wetlands known as *Hoi* featured abundant taro crops and naturally healthy fish ponds. But agricultural changes that began in the mid-1800s—cattle grazing and the planting of rice, sugarcane, and pineapple—took a heavier toll on the area’s ecology. Increased runoff, invasive species, and sedimentation occurred, worsened by heavier rainfall in recent decades.

Community stakeholders concerned about these changes consulted extensively with local *kupuna* (elders) and the broader community to gain a vision for restoring the wetland. Then they approached the Hawaii Coastal Program with a funding proposal (see “Restoration Partners”). The funding award, provided through a cooperative agreement between the coastal program



Taro collected on a recent harvest day.

PHOTOS BY SEAN MARRS AND COURTESY OF PACIFIC ISLANDS OCEAN OBSERVING SYSTEM

and NOAA, enabled the community and its partners to complete a 2010-2015 strategic restoration plan for Hoi.

In the two years since the restoration began, the Hoi community is already starting to see its first “fruits.” The clearing and cultivation work performed by volunteers is now yielding taro, a starchy tuber and traditional foodstuff that can be baked, boiled, or pounded into *poi*, a venerated Hawaiian dish. The harvest is being sold from a portable structure at present. Future plans include establishing a permanent community center and commercial kitchen, as well as re-establishing a poi mill on the site of the former mill.

LAND-SEA LINKAGES

The community’s proposal for the wetlands restoration project “rose to the top,” according to Asuncion, because it aligned so

well with the state’s Ocean Resources Management Plan. That plan emphasizes a collaborative, place-based management approach to natural and cultural resource management, favors community stewardship, and recognizes the connection between land and sea.

Melissa Iwamoto, an outreach and program coordinator for the Pacific Islands Ocean Observing System, was lead planner for the Hawaii Coastal Program’s Community-Based Resource Management project when the Heeia project broke ground. She says, “Seeing the land transform from being fallow and overrun with invasive species to this productive taro cultivation is amazing and inspiring.”

The area being restored is very close to the ocean shoreline—roughly the distance of a football field. The restoration partners are very interested in seeing how the project might impact the watershed, ocean resources, and the ocean shoreline. Representatives from other islands are looking at this project with interest as well, and it’s helping them generate similar project ideas.

The varieties of taro chosen for cultivation are the most salt-tolerant, an important factor as sea level rise changes wetland salinity. Also, the taro fields are expected to retain extra water to recharge the aquifer and to lessen sediment runoff. The reduced runoff will benefit adjacent coral reefs.

SPENDING TIME UP FRONT

While not always easy, Asuncion says, community-proposed projects are valuable. The first step in supporting a community’s restoration project is to “look for the community vision. In every community, there are people who can give you the historical and cultural background you need to help them articulate their vision and build capacity.”

A series of 10 capacity-building workshops were critical in building on that vision, helping organizations and community members navigate through government reporting requirements and learn how to seek extra funds and in-kind donations. “Tasks coastal managers are familiar with, like writing applications for funding, can be very laborious for community members who have never done them before. But if you are patient and spend the necessary time, it will be worth all your effort in the end.” ❖

For more information on the Heeia Wetlands Restoration Project, contact Leo Asuncion at leo.asuncion@dbedt.hawaii.gov or (808) 587-2846. You can also learn more by visiting www.kakooiwi.org.

Restoration Partners

In 2010, Kakoo Oihi acquired a 38-year lease on the property from the Hawaii Community Development Authority, guaranteeing that this project will continue to grow over decades. In addition, dozens of partners and volunteers from the community, regulatory agencies, and the research community have joined the effort, adding to both restoration funding and in-kind donations.

The major partners of the Heeia Wetlands Restoration Project are the Hawaii Coastal Zone Management Program, Hawaii Community Development Authority, Koolaupoko Hawaiian Civic Club, The Nature Conservancy, and the community-based nonprofit organization Kakoo Oihi.



Community members prepare the land for taro planting.

New Portal into Ocean Management in the Northeast

The portal enables state, federal, and local decision makers to visualize, query, map, and analyze data for ocean planning in the region.

A new decision-support and information system is available for coastal resource managers and others involved in ocean planning from the Gulf of Maine to Long Island Sound. The Internet portal builds on existing efforts in the Northeast and provides access to data, interactive maps, tools, and other information needed for decision-making.

"The portal isn't meant to be one big database," says Daniel Martin, senior software architect for IMSG working at the NOAA Coastal Services Center. "We've gone after higher priority data products, and where we needed to, we collected, integrated, and linked to existing data from across the whole region."

The Northeast Ocean Data Portal features an easy-to-use interactive map of data on human uses, environmental features, and political and administrative boundaries, as well as provides access to interactive and static maps, atlases, and models for coastal and marine spatial planning.

The portal enables state, federal, and local decision makers to visualize, query, map, and analyze data for ocean planning in the region. The

data are also available to the public and can be viewed online and downloaded for use in GIS platforms.

The site was funded and developed by the Northeast Regional Ocean Council's Northeast Ocean Data Portal Working Group. Core members of the group included SeaPlan, The Nature Conservancy, Northeastern Regional Association of Coastal and Ocean Observing Systems (NERACOOS), NOAA Coastal Services Center, Gulf of Maine Research Institute, and Applied Science Associates.

"The initial idea for this was the recognition of a couple things," says John Weber, ocean planning director of the Northeast Regional Ocean Council (NROC). "The first thing is that ocean planning is data dependent, and just acquiring existing data is very time consuming. The other thing was that we knew the National Ocean Policy was coming out and the first thing we would need is the architecture to support the data end of that."

The U.S. National Ocean Policy of 2010 calls for regional-scale coastal and marine spatial planning (CMSP)

supported by a robust data management system containing coastal and marine scientific data sets and products. CMSP is a collaborative process that depends on access to a wide range of data on environmental, socioeconomic, and regulatory parameters. However, many of these data have been inaccessible and scattered among different providers.

The Northeast Ocean Data Portal Working Group strove to "bring data and information into one place to support regional projects," says Nick Napoli, group chair, who during the writing of this story was transitioning from his position as director of marine planning for SeaPlan to the Northeast Regional Ocean Council.

Since the launch of the data portal in June 2011, Napoli says the working group's efforts have focused on continued advancement of NROC-identified priorities, including the integration of key data sets and the development of functionality to access, visualize, and analyze those data.

"I feel good about where we are, but I also recognize there's so much more to do," Napoli says. ❖



continued from page 7

"We spent a full day prepping the workshop and testing all the equipment to make sure the setup was just right," Mikulencak says.

The result was five tables of five to seven people each, plus facilitators, that were easily able to engage with the data to try out different planning scenarios.

In addition to each group being able to create a scenario, the CHARM model also enabled the comparison of all five scenarios, along with prepared scenarios showing "business as usual" and compact urban development. "That really enriches the conversation," Mikulencak says.

OFF THE SHELF

To set up a weTable, coastal managers use equipment that they probably already have—a laptop computer and projector, Mikulencak says. The rest of the equipment totals less than \$200.

By researching different types of equipment and testing them before putting them to public use "we've done a lot of the heavy lifting for other managers, Mikulencak says.

Other Sea Grant programs around the country are already developing their own CHARM models to use with weTables.

"These are ideal tools," Jacob says, "for use in community projects where participants use data and maps to help define planning priorities and strategies."

He adds, "This is really a key part of participatory democracy, in which we're putting decision-making tools into people's hands. That's why it's so powerful." ❖

For more information on the weTable or Coastal CHARM model, contact John Jacob at (281) 218-0565 or jjacob@tamu.edu, or Steven Mikulencak at smikulencak@tamu.edu. You can also point your browser to www.urban-nature.org, where you will find a weTable technical "how-to" factsheet.

Love Your Wetlands
with products from the NOAA Coastal Services Center.

Make Your Wetlands Data More Visual. Graphs and charts help data come alive. Use Coastal County Snapshots to get your county's wetlands data into a user friendly format. www.csc.noaa.gov/snapshots

Use Wetlands as a Buffer against Sea Level Rise. It's a good idea. We show you how. www.csc.noaa.gov/digitalcoast/wetlands

Understand Wetland Modeling. Get the most out of this useful planning tool by reading "Marshes on the Move." <http://go.usa.gov/RTY>

May is National Wetlands Month. Love a Wetland Today.

 **NOAA Coastal Services Center**
LINKING PEOPLE, INFORMATION, AND TECHNOLOGY

These products and more are provided by NOAA's Digital Coast.
www.csc.noaa.gov/digitalcoast

NEWS YOU CAN USE

FROM THE NOAA COASTAL SERVICES CENTER

THE COASTAL ZONE MANAGEMENT ACT: CELEBRATING 40 YEARS OF ENHANCING OUR COASTS AND OUR LIVES

The Coastal Zone Management Act (CZMA) was established by Congress on October 27, 1972, to preserve, protect, develop, enhance, and restore the nation's coastal resources. This landmark act has proven to be one of America's best tools to safeguard our coastal resources. NOAA's Office of Ocean and Coastal Resource Management (OCRM) is spearheading efforts to celebrate the 40th Anniversary of the Coastal Zone Management Act this year.

Under CZMA authority, NOAA and state partners work together to balance environmental conservation and economic development, ensuring that future generations have access to, and enjoyment of, our nation's nearly 100,000 miles of shoreline.

Over the past 40 years, this partnership has greatly reduced the environmental impacts on local coastal development, resolved significant conflicts among coastal users, and provided critical assistance to local governments in coastal planning.

Under CZMA, NOAA's Office of Ocean and Coastal Resource Management has provided 35 coastal states and territories with over \$1 billion in federal funds and technical assistance to address critical coastal issues. In addition, more than 1.3 million acres of coastal habitat was preserved by establishing a national system of 28 estuarine research reserves.

Working with partners, OCRM's efforts have benefited all Americans by helping to create effective regulations and projects to promote smart economic development, safer waterways, increased public access, and the protection of critical habitat.

America's coastal regions are economic engines that produce three-fifths of the nation's gross domestic product and provide for more than 60 million U.S. jobs, with 3 million of those jobs linked directly to the resources of the oceans and Great Lakes. Now more than ever, we need to carry this important message far and wide to key stakeholders as we meet the growing challenges of climate change, sea level rise, habitat loss, pollution, and increased development.

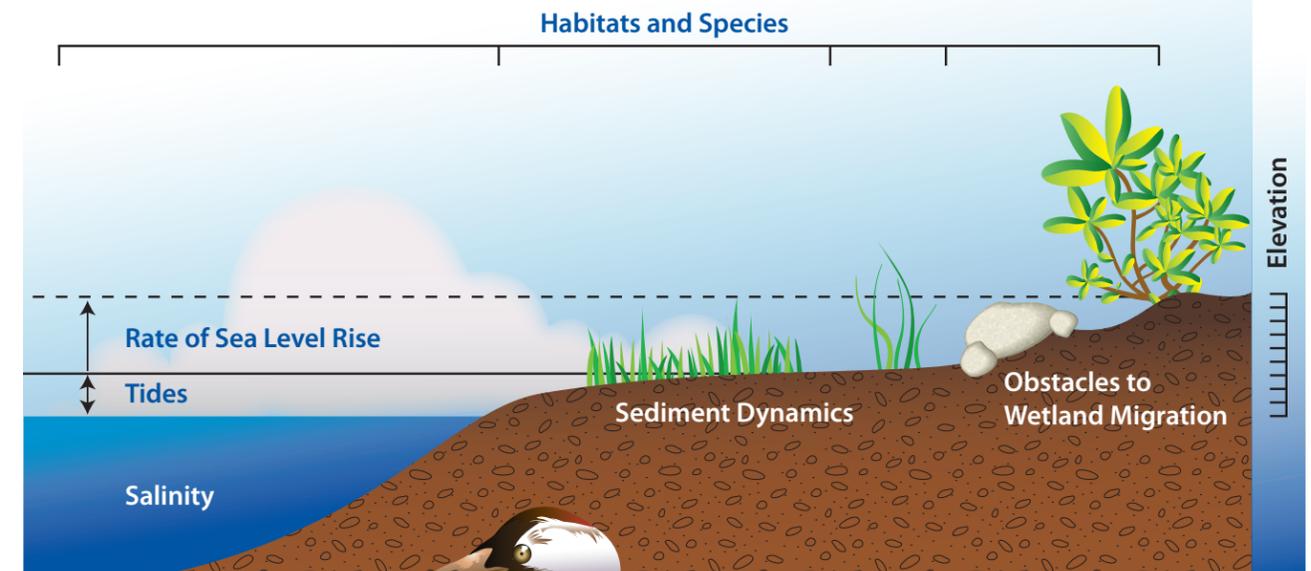
NOAA's coastal management efforts, under the CZMA, are vital to the economic and environmental prosperity of the U.S. and the American people whose lives depend on healthy coasts and estuaries. ❖

For more information on the CZMA 40th anniversary, visit <http://coastalmanagement.noaa.gov>.

SEA LEVEL RISE AND COASTAL WETLANDS

Models are powerful planning tools, but projections don't provide final answers and should be tempered with local and expert knowledge. Understanding the components used to create the model helps users better understand and use the results.

Conceptual Diagram



Key Components to Consider When Modeling Sea Level Rise Impacts on Coastal Wetlands.

Rate of sea level rise: The amount and rate of sea level rise is important.

Tides: Tides greatly influence the extent and persistence of coastal wetlands.

Salinity: Changes in salinity levels impact wetland health and function.

Elevation: This is one of the most important data components for modeling wetlands and sea level change.

Sediment dynamics: Sedimentation rates that match or exceed sea level rise rates can protect wetlands, up to a point.

Habitats: Land cover data and habitat change rules are needed to model changes in wetland habitats from sea level rise impacts.

Other: A big category that includes major storms, human behavior, and shifting climate patterns, to name a few, may not be well represented in models.

These factors are often better addressed in the management process.

Want more help? The Nature Conservancy and NOAA have published "Marshes on the Move," a manager's guide to understanding models that depict sea level rise and the impact on coastal wetlands. Get your copy at <http://go.usa.gov/RTY>.





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

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



COASTAL GEOTOOLS

SAVE THE DATE

Coastal GeoTools 2013

Here you'll see new technologies and applications, and learn from peers how the best and brightest are addressing today's coastal issues using geospatial data and tools. Look for the Call for Abstracts in August 2012!



@CoastalService, #CoastalGeoTools



www.facebook.com/NOAACoastalServices

March 25 to 28, 2013

Myrtle Beach, South Carolina

<http://geotools.csc.noaa.gov>