

COASTAL SERVICES

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LINKING PEOPLE, INFORMATION, AND TECHNOLOGY

INTEGRATING CLIMATE CHANGE ADAPTATION AND HAZARD MITIGATION IN DELAWARE

Getting Climate Smart in American Samoa

**Using a Smartphone Application
to Explore Indiana's Coast**



From the Director

Until recently, there has only been talk about the need to integrate hazard mitigation planning with climate change adaptation. Talk has turned to action in Delaware, where the first-ever community action plan that successfully combines the two planning processes was adopted by the City of Lewes on August 15.

The cover story of this edition of *Coastal Services* looks at how Delaware Sea Grant and ICLEI – Local Governments for Sustainability USA helped the City of Lewes create its *Hazard Mitigation and Climate Adaptation Action Plan*.

One of the lessons that came out of the project was how effective it is to use natural hazards to start a conversation about climate change with a community.

Understanding the history of hurricane landfalls is an important step toward assessing a coastal community's vulnerability. A helpful tool is the recently updated NOAA Historical Hurricane Tracks mapping application, which can easily generate customized maps based on more than 150 years of global hurricane data.

Historical Hurricane Tracks allows users to search by place name, storm name or year, or latitude and longitude points. The search results

generate a map showing the track of the storm or storms accompanied by a table of related information.

The tool, which can be viewed at www.csc.noaa.gov/hurricanes/, was developed by the NOAA Coastal Services Center in partnership with the National Hurricane Center and the National Climatic Data Center.

Other articles in this edition of *Coastal Services* look at how coastal resource managers in American Samoa are taking advantage of a new NOAA Climate-Smart Sanctuary planning process, and a technical primer on “rolling easements” that was recently published by the U.S. Environmental Protection Agency's Climate Ready Estuaries program to get managers thinking about options for addressing sea level rise.

You can also read about how managers in Indiana are using a smartphone application to provide coastal information to younger audiences.

As always, we hope you find the articles in this edition of *Coastal Services* interesting and informative. ❖



Margaret A. Davidson

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.



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News and Notes

Write Plainly for Maximum Impact

“A government by the people and for the people should also be understood by the people.”

Noel Brinkerhoff, writer and political journalist

In October 2010, President Obama signed into law the Plain Writing Act of 2010 (Public Law 111-274), which directs federal agencies to communicate in concise prose that “avoids jargon, redundancy, ambiguity, and obscurity.”

Those of us who have read and written federal government prose for years might need a little refresher course on what “plain writing” looks like. Surrounded every workday by mind-bending sentences and an alphabet soup of acronyms, we sometimes forget the power—and rewards—of issuing simple, clear statements.

Here are a few tips to get us back in the habit of communicating with crystal clarity.

Use a dynamic, active voice – Compose active sentences as often as you are able. These sentences emphasize and join the subject

and verb for a message that is clear, direct, and brief.

“The agency issued a beach advisory on Wednesday.”

Active sentences also clearly assign responsibility to an actor (“the agency issued”), providing the accountability and transparency your readers expect.

Passive sentences de-emphasize and separate the subject and verb, creating lengthier messages that are less direct.

“A beach advisory was issued on Wednesday by the agency.”

The worst passive-sentence offenders—consider the infamous “mistakes were made”—are likely to leave your readers with the impression that you are shifting responsibility and accountability. So include your “actor” in each sentence, even when describing complex projects. Subject phrases like, “local coastal officials,” or “members of the county’s disaster-reduction committee” can work.

Keep your terms simple and straightforward – An anonymous wit has described “bureaucratese” as the practice of “using big words to express little ideas.” Try to avoid slipping into bureaucratese and choose simpler messages instead.

Bureaucratese: “Upon receipt of this memo dated September 25, please be herewith informed that our fishing license policy will be effectuated immediately.”

Better: “Our new fishing license policy takes effect on September 25.”

If you must use technical or little-known terms, explain – If you have any doubt about whether your audience knows a term, include a brief, lay-friendly definition.

Example: “Local waterfront areas are changing because of coastal inundation (a condition in which normally dry land is covered with water).”

Avoid acronyms whenever possible and use full, spelled-out terms. Even the full name of a program and agency can leave constituents with questions, so provide a thumbnail description.

Example: “The U.S. Integrated Ocean Observing System helps us collect, deliver, and use ocean information to protect the environment and enhance safety and the economy.” ❖

For more tips and tools on producing clear, concise communication, visit www.plainlanguage.gov.

Getting Climate Smart in American Samoa

South Pacific islands are particularly vulnerable to the impacts of climate change. Coastal resource managers in American Samoa are taking advantage of a new Climate-Smart Sanctuary planning process to ensure that the island territory is prepared.

“We’re moving ahead,” says Emily Gaskin, policy analyst for Fagatele Bay National Marine Sanctuary. “In spite of some uncertainty, we recognized that we needed to go ahead and begin the planning process.”

The Climate-Smart Sanctuary Initiative was developed by the NOAA National Marine Sanctuary System to help national marine sanctuaries and other marine protected areas plan for, adapt to, and manage for impacts associated with climate change.

Using the Climate-Smart process, Fagatele Bay has recently completed two planning documents—a climate impacts report and a climate action plan—that will not only help the sanctuary and American Samoa adapt to climate change impacts, but may also be models that could help other Pacific island nations and territories plan and respond.

Seeing Impacts

Fagatele Bay is nestled within an eroded volcanic crater on the southern coast of Tutuila, American Samoa. It is the smallest and most remote of the national marine sanctuaries, but its coral reefs may have the highest marine life diversity in the sanctuary system.

The bay’s habitats are home to a variety of tropical fish, invertebrates, and algae. Surveys show that the sanctuary provides habitat for at least 2,700 species, including 271 species of fish and 200 species of coral.

Gaskin notes that coral bleaching is already occurring in American Samoa. Bleaching frequency and intensity will increase with rising sea temperatures fueled by climate change.

On September 29, 2009, an earthquake-generated tsunami caused substantial damage and loss of life on American Samoa and surrounding islands. While the tsunami was not linked to climate change, Gaskin says that it demonstrated the islands’ vulnerability to extreme hazard events, such as storm surge from hurricanes, which could be exacerbated by climate change.

Getting Climate Smart

The Climate-Smart Sanctuary Initiative is being developed as a way to organize and implement a climate action plan at each of the nation’s 14 national marine sanctuaries.

Being piloted in the Gulf of the Farallones National Marine Sanctuary in San Francisco Bay, the Climate-Smart Sanctuary certification process includes creating a climate impacts report and climate change action plan, obtaining advisory-council and other public input, conducting training for staff members and partners, and greening operations.

Public Input

Eager to begin the Climate-Smart planning process, Fagatele Bay hosted a climate workshop in 2010 to encourage the sharing of planning experiences among participating coastal managers and community members. The workshop resulted in managers and community leaders working together to begin to develop an adaptation planning framework as a model for addressing areas in American Samoa that are vulnerable to the impacts of climate change.

Earlier this year, sanctuary staff members collaborated with the American Samoa government to host a climate change summit to build local capacity, establish local and regional partnerships, and engage local residents in the adaptation planning process. Summit participants also established the Territorial Climate Change Adaptation Advisory Group to implement the adaptation planning framework.

Identifying Impacts

Working with island and regional scientists, Fagatele Bay recently completed a climate impacts report to identify and synthesize potential climate impacts in American Samoa and the region over the next 50 years, Gaskin says.

With few climate change studies that discuss sanctuary and surrounding waters, Gaskin says the report became much more regional in scope than originally intended. The report found that

“This document was the first of its kind to come out anywhere in the territory.”

Emily Gaskin,
Fagatele Bay National
Marine Sanctuary

climate change may have significant consequences for area coral reef ecosystems, coastal communities, and maritime heritage resources relevant to the sanctuary.

The key physical drivers in the region include climate variability (including extreme events), sea surface warming, ocean acidification, and sea level rise.

“This document was the first of its kind to come out anywhere in the territory,” Gaskin says. “Some climate science on the islands has been done, but this was the first document that attempted to synthesize the information. We believe it will be valuable for planning, not just for us but for other agencies in the territory.”

Planning Ahead

The information in the impacts report was used to update the sanctuary’s draft management plan (DMP), which is used to guide the management of the sanctuary over the next 5 to 10 years. The plan serves as a nonregulatory policy framework for addressing the issues facing the sanctuary.

The DMP includes specific action plans designed to directly



Rising sea temperatures will increase coral bleaching in American Samoa.

address high-priority management issues. Included in the updated DMP is a climate change action plan, which identifies four strategies and a wide variety of related management tools and activities that sanctuary staff members will use to address the issues identified in the climate impacts report.

The strategies in the plan include reducing vulnerability and increasing education, outreach, and research, Gaskin says.

“As far as we are aware,” she says, “no other management plan in the sanctuary system currently includes climate impacts.”

Starting Place

The climate impacts report was released at the end of August. The climate change action plan was released to the public this fall. Gaskin says that while both documents are important for moving the region forward in planning for climate change, they are also a starting place.

“Our plan now is to share it with as many local communities as possible and work with them to identify community actions that are plausible and are things they want to incorporate,” Gaskin says. Sanctuary staff members will also continue to work with local and regional climate scientists to gather information on the potential impacts of climate change.

She adds, “We are moving forward. Our efforts will continue to evolve as we identify more specific information. And we are continuing our overall efforts to be one of the first to get certified as a Climate-Smart Sanctuary.” ❖

To view the Fagatele Bay National Marine Sanctuary’s climate change impacts report and the climate change action plan, go to <http://sanctuaries.noaa.gov/science/conservation/welcome.html>. For more information, contact Emily Gaskin at (684) 633-5155, ext. 271, or Emily.Gaskin@noaa.gov.



Integrating Climate Change Adaptation and Hazard Mitigation in Delaware

Integrating hazard mitigation planning with its focus on past events with climate change adaptation and its attention to what might happen in the future has been a topic of discussion for many coastal resource managers. A recently completed pilot project in the City of Lewes, Delaware, resulted in the first-ever community action plan that successfully combines the two planning processes.

“We knew the integration needed to happen, but nobody had done it,” says Missy Stults, former climate director for ICLEI – Local Governments for Sustainability USA. “What this project showed us is that it’s feasible and really wasn’t that challenging to do. But it was a practical and tangible thing that needed to be demonstrated.”

ICLEI and Delaware Sea Grant worked in collaboration with city officials and staff members, citizens, and state, regional, and federal representatives to create the *City of Lewes Hazard Mitigation and Climate Adaptation Action Plan*. The plan was unanimously adopted by the Lewes City Council on August 15.

“The result is the city has a win-win, no-regrets strategy that will prepare them for their future flood risk no matter what the cause,” says Wendy Carey, coastal processes and coastal hazards specialist with Delaware Sea Grant College Program’s Marine Advisory Service.

Vulnerability

The City of Lewes is a small but thriving bayfront community that features walkable commercial and historic districts bordered by tidal

wetlands, tidal creeks and tributaries, sandy beaches, and agricultural lands. It is also transected by a man-made waterway. Being close to so much water makes the city highly vulnerable to many natural hazards, including coastal storms, flooding, and high winds.

In the past, the city has been severely impacted by a number of major coastal storms. The most damaging of these storms was the March 1962 Ash Wednesday storm that produced a record high tide of 9.5 feet. More recently, storms in 2008 and 2009 also caused extensive flooding of low-lying coastal areas, including roads serving as evacuation routes.

Because of its vulnerability, the city was an early adopter of the National Flood Insurance Program and was the first city in

“The result is the city has a win-win, no-regrets strategy that will prepare them for their future flood risk no matter what the cause.”

Wendy Carey,
Delaware Sea Grant

Delaware—and one of only 200 cities nationwide—selected to participate in the Federal Emergency Management Agency (FEMA) Project Impact initiative. The city has established an ongoing hazard mitigation program that is managed by the Lewes Mitigation Planning Team.

Making the Climate Connection

After receiving funding as part of NOAA’s National Sea Grant climate change adaptation initiative and the University of Delaware’s Sustainable Coastal Communities initiative, Delaware Sea Grant partnered with ICLEI to facilitate a highly participatory process that would enable Lewes officials and staff members to come up with their own plan.

“From the beginning, it was our intent to integrate hazard mitigation planning with climate change adaptation, but we didn’t know if it would work,” says Stults, who is now a sustainability analyst with Summit Energy in Louisville, Kentucky.

Hazard mitigation planning is a common planning procedure undertaken by thousands of communities across the country. The process is structured so that communities plan for future hazards based on historic hazard information and impacts.

“Climate change adaptation,” explains Daniella Hirschfeld, an ICLEI program officer for climate adaptation, “is a long-term view of the future impacts of climate change to a community and focuses on understanding not only the expected impacts, but a community’s ability to address them.”

Stults notes, “Hazard mitigation is very important and there’s a lot of value in looking at past events, but we know with climate change that we can’t use the past to project what

the future will be like. For example, the flood that a community used to experience every 100 years may now be the 20-year flood.”

Integrating Processes

Beginning in July 2010, Delaware Sea Grant, ICLEI, and the city began working together to create an integrated planning approach that pulled from two different processes—ICLEI’s Climate Resilient Communities planning framework and FEMA’s natural hazard mitigation planning framework. “How we did that was to have FEMA at the table,” Stults says.

Sea Grant and ICLEI pulled together regional climate and hazard information, organized and facilitated four public workshops aimed at getting input at each

Continued on Page 9

RESULTS

Six actions were recommended that Lewes could implement to integrate its hazard mitigation and climate adaptation efforts. These actions fall within three primary categories:

- Knowledge building, which includes gaining a better understanding of evacuation route vulnerability and continuing with updated education and outreach programs;
- Incentives, specifically, improvement of the city’s participation in the Community Rating System to reduce citizens’ flood insurance premiums; and
- Planning and regulatory recommendations.

The recommended actions had significant overlap with the Lewes Mitigation Planning Team’s current priorities. An implementation plan will help the city apply the recommendations.

Priming Coastal Managers to Think about Rolling Easements as an Option for Sea Level Rise

As sea levels rise, many coastal resource managers will face decisions about which waterfront areas to protect and which wetlands, beaches, and barrier islands to allow to migrate inland. A technical primer was recently published to introduce managers to more than a dozen approaches to implementing “rolling easements,” which allow nature to take its course.

“This publication provides a summary of the tools that could be adopted and their possible rationales, to help encourage a thorough consideration of the many available options for responding to rising sea level,” says the document’s author, James G. Titus, who is the project manager for sea level rise in the Climate Change Division of the U.S. Environmental Protection Agency (EPA).

Rolling Easements, which was recently published by the EPA’s Climate Ready Estuaries program, discusses what rolling easements can accomplish, legal approaches for creating them, advantages and disadvantages, where to apply them, and how to manage them.

“If we don’t want to be locked into holding back the sea everywhere,” Titus says, “we have to first decide where it makes sense to protect the land from the rising sea, and where we give the land back to nature. The next step is to look at all the options for making sure we actually do give land back to the rising sea—and that’s where rolling easements fit in.”

Inundation

In many coastal areas, rising sea levels are already inundating low-lying lands, eroding beaches, and exacerbating coastal flooding. As sea level continues to rise over the next century, these problems will worsen and more areas will be affected.

Governments and landowners often try to keep the sea from inundating developed areas by adding sand to eroding beaches or erecting dikes, seawalls, revetments, and other shore protection structures.

In undeveloped areas, however, landowners have generally allowed wetlands, beaches, and barrier islands to migrate inland as they adjust naturally to rising water levels.

It is primarily on undeveloped lands where development is possible and on barrier islands where beach nourishment is not economically justified that coastal managers may want to look at the options outlined in *Rolling Easements*, Titus says.

“Defending every coastal property from the rising sea would prevent wetlands from migrating inland, expose large numbers of people to the hazard of living below sea level, and often cost more than what the property being protected is worth,” he says.

By Definition

By its broadest definition, Titus says, rolling easements are any institutional arrangement that takes away the landowner’s

expectation of holding back the sea and “provides the assurance that the shore or public access along the shore can migrate inland instead of being squeezed between an advancing sea and a fixed property line or physical structure.”

In some cases, a rolling easement would require the removal of pre-existing structures seaward of a specific migrating line.

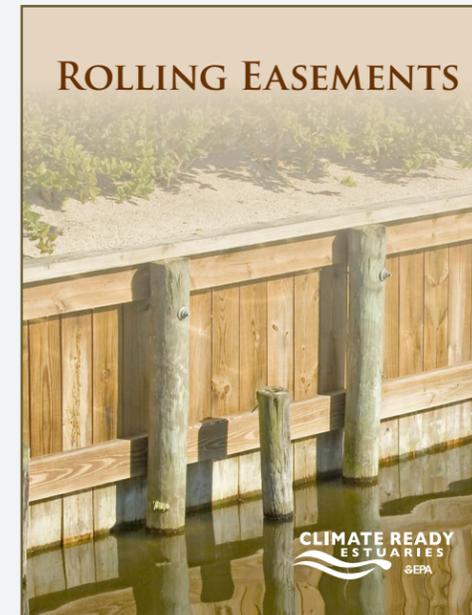
Titus says rolling easements make no effort to restrict land use but prevent shore protection of some coastal lands, either through regulation or by owners voluntarily transferring any rights to hold back the sea to a person, organization, or agency that will allow nature to take its course.

Although the regulatory approach is the more common way to prevent shore protection, Titus says the nonregulatory, or “property rights,” option of having private land trusts, government agencies, and even private citizens obtain rolling easements from property owners may sometimes work better.

“An owner who has voluntarily engaged in the creation of the rolling easement is more likely to perceive the arrangement as fair than a landowner subjected to government regulation,” he says.

Options and Approaches

The primer examines different options for managing sea level rise, looks at 14 different legal approaches to rolling easements,



“It’s not designed to persuade people to not hold back the sea. We’re just trying to provide options to help people decide what is most appropriate for their specific situation.”

James G. Titus,
U.S. Environmental
Protection Agency

and differentiates opportunities for legislatures, regulators, land trusts, developers, and individual landowners.

Options for every shoreline environment from wetlands to barrier islands are addressed, as are the different objectives that using rolling easements as a management tool could achieve. The document also explains the varying public and private property rights along the shore.

Regulations and Property Rights

Specific regulatory options are examined in the primer, including local zoning that restricts shore protection, as well as state coastal or wetland program regulations that prohibit shore protection or require removal of structures standing on the beach or in the wetlands.

Regulations can also take the form of permit conditions that

require public access in return for various types of building permits.

A number of “property rights” approaches are addressed, including affirmative easements that provide the public with the right to walk along the dry beach even if the beach migrates inland, conservation easements that prevent landowners from building shore protection structures or elevating the grades of their land, and restrictive covenants that bind property owners into an agreement to avoid shore protection and allow public access along the shore to migrate inland.

Chapters look at some of the issues a land trust may face in managing a rolling easement and discuss practical issues that may arise with any type of rolling easement.

Knowing Where

“Before we seriously consider rolling easements, we have to

have decided that retreat is the way we want to go for a particular area, rather than holding back the sea,” Titus says. “When we talk about rolling easements, we are not talking about Manhattan or Miami, or the places where most people live. Those areas are sure to be protected. But we may be talking about some land nearby.”

He adds, “I hope this primer can help people consider the full range of options for anticipating the consequences of rising sea level. It’s not designed to persuade people to not hold back the sea. We’re just trying to provide options to help people decide what is most appropriate for their specific situation.” ❖

To view *Rolling Easements*, go to www.epa.gov/cre/downloads/rollingeasementsprimer.pdf. For more information, contact James Titus at (202) 343-9307 or jtitus@risingsea.net.

Exploring Indiana's Coastal Trail Using a Smartphone Application



The sand dunes, wetlands, native prairie, and oak barrens found along Indiana's Lake Michigan shoreline are a magnet for tourists. Yet finding a way to reach the many different audiences attracted by the shoreline's beauty and diversity can be a challenge, particularly as younger audiences turn away from hard-copy information and toward newer electronic media venues like Facebook and smartphone applications.

To address that challenge, a smartphone application has been developed that provides information on dozens of natural, cultural, and historic sites and activities in northwestern Indiana's coastal region.

"Our premise is, 'Let's look at everyone's needs and develop a holistic approach to marketing,'" says Christine Livingston, marketing director of Indiana Dunes Tourism. "Many people still love the hard-copy guides and they will always be needed, but the smartphone app enables us to target a younger group that wants information on their phones."

The app was developed by a coastal partnership led by Indiana Dunes Tourism, the agency for tourism marketing, planning, and development in Porter County, Indiana. Funding and information for the app was provided by the Lake Michigan Coastal Program. Other partners included local, state, and national park officials, as well as area businesses, stakeholders, organizations, and academic institutions.

"One of the challenging things about developing an app," Livingston says, "is that it's not a one-time expense. The more features added, the more complicated the maintenance and troubleshooting can become. So any coastal programs considering app development need to think about how they can get ongoing funding."

She notes that the app has generated a lot of excitement among digital-media users since it was developed one year ago as part of the Beyond the Beach Discovery Trail, a non-linear trail that connects natural, cultural, and historic assets. Users of the "trail" can receive information five different ways: via a printed trail guide and map, website, blog, Facebook page, and now, the phone app.

Sites along the trail are all shown and GPS-enabled with voice-over descriptions and a search feature that allows users to customize their trail experiences. For instance, an app user can search for trails

"Both our agency and Indiana Dunes Tourism are constantly telling the story of the coastal region and all it has to offer. This app helps us do that."

*Jenny Orsburn,
Lake Michigan Coastal Program*

alphabetically or by choosing the closest one.

Indiana's SmartTrail app is part of the Great American SmartTrails app and is available at no charge from the online iTunes store at <http://itunes.apple.com/us/app/great-american-smartrails/id398473998?mt=8>.

"We were so glad to play a part in making the SmartTrail app available," says Jenny Orsburn, a program specialist with the Lake Michigan Coastal Program. "Both our agency and Indiana Dunes Tourism are constantly telling the story of the coastal region and all it has to offer. This app helps us do that." ❖

To learn more about the Beyond the Beach Discovery Trail, go to www.beyondthebeachdiscoverytrail.com or call Christine Livingston at (219) 926-2255 or christine@indianadunes.com. For more information on the coastal program's role, contact Jenny Orsburn at (219) 983-9912 or jorsburn@dnr.in.gov.

Continued from Page 5

phase of the project, and drafted all the project documents. The city ensured the participation of its elected officials and staff, and informed relevant stakeholders of events, including citizens and regional and state partners.

The biggest challenge, Hirschfeld says, was incorporating the different terminology used in hazard mitigation and climate adaptation. "It isn't prohibitive, but you have to clearly define which terms you are using."

Step Forward

"This wasn't a silver bullet," Stults says, "but it was a huge step forward in preparing communities for climate change."

Lewes Mayor Jim Ford says he is "very happy" with the process and report. "In Lewes, we try to be progressive in our thinking and conservative in our actions. But where planning for hazards is concerned, I don't think we need to be too concerned about moving cautiously. We need to be ready and prepared prior to the bell ringing. I don't want to be out there figuring this out as we're going along."

Stults adds, "Every community faces hazards. Approaching climate change planning this way is a conversation starter. No mayor is going to be upset with protecting their town's citizens and economic vitality from hazards." ❖

To view the City of Lewes Hazard Mitigation and Climate Adaptation Action Plan, go to www.icleiusa.org/lewesmeeting/. You may also contact Daniella Hirschfeld at (617) 960-3420, ext. 215, or daniella.hirschfeld@iclei.org, or Wendy Carey at (302) 645-4258 or wcarey@udel.edu.

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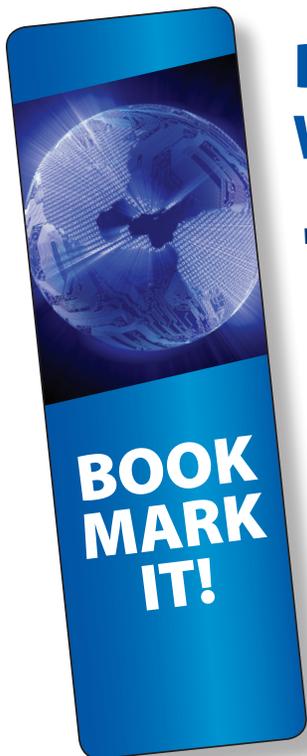
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