

COASTAL SERVICES

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LINKING PEOPLE, INFORMATION, AND TECHNOLOGY



COMMUNICATING CLIMATE CHANGE:

Reaching Out in Oregon and Maine

**Recovering from Ike and Becoming
More Resilient in Texas**

Driving Conservation along South Carolina's Coast



FROM THE DIRECTOR

Social science is showing us that the old model of communication no longer works. Gone are the days when coastal resource managers could share thoughtful and credible science and information and expect the public to make the “right” decisions.

We humans are complex and much goes into our decision-making process—past experiences, emotions, and personal values and attitudes. This is particularly true when we make choices concerning personal risks, such as flooding from sea level rise, increasing intensity of coastal storms, or many of the other impacts coastal areas will experience as a result of climate change.

Providing reliable data and information is still part of the communication process, but social science tools—such as focus groups and surveys—must be used to better understand the concerns, knowledge, motivations, and decision-making processes of targeted populations. Only then can managers find out what information targeted groups need, in what format they should receive it, from whom they will trust the message, and what their constraints are to action.

In this edition of *Coastal Services*, we look at a two-year effort by the Oregon and Maine Sea Grant programs to use social science to develop and test a model of public outreach about climate change.

These two very different states with significantly different anticipated climate change impacts are both getting an in-depth understanding of targeted groups to help move communities forward in climate change adaptation efforts. What they are learning about using social science to improve climate change communication could benefit coastal managers across the country.

The NOAA Coastal Services Center is also working to provide coastal managers with social science information and tools they can use to help improve risk communication.

For instance, the Coastal County Snapshots tool provides local officials with a quick look at a county’s demographics, infrastructure, and environment within the flood zone. Available on the Digital Coast website at www.csc.noaa.gov/digitalcoast/tools/snapshots/, one of the primary intents of these snapshots is to address vulnerabilities associated with individual coastal counties.

As always, NOAA and the Coastal Services Center are working hard to bring the tools, technology, and information that coastal managers need in these changing times. ❖



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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PRODUCTS AND SERVICES SUPPORT THE NO-REGRETS APPROACH TO CLIMATE CHANGE

On the East Coast, the colder-than-normal winter has left climate change skeptics feeling pretty smug. “No global warming here,” they say.

While those of us in coastal management and science professions have lived and breathed the climate change debate for many years, the average citizen sees the topic as just one of hundreds of perceived threats to their well-being along with traffic jams, national security, healthcare, even the price of pumpkins. In other words, when it comes to getting an issue in front of the public, get in line.

To make matters worse, controversy surrounding the science and causes of climate change, and uncertainty about what constitutes an appropriate response, have left most communities without a commitment to this issue, much less a strategy.

But things seem to be changing with the emergence of the no-regrets approach to climate change. Climate change response usually has two main components: “mitigation,” which focuses on reducing emissions

to reduce the amount and speed of climate change, and “adaptation,” which refers to making changes to reduce harm to communities and the planet. Citizens can be on the fence about climate change yet fully support the need to fight pollution and make communities more resilient. These approaches make good sense, regardless of the motivation behind them.

Products and services provided by the NOAA Coastal Services Center focus on the adaptation side of the equation. In business since 1994, the organization has historically helped coastal communities increase their resilience to coastal hazards such as tidal coastal flooding, tsunamis, and hurricanes. However, rising seas are raising the level of services and information required by the coastal resource management community.

“For several years, coastal communities seem to have been somewhat stuck,” says Mary Culver, who leads the coastal hazards working group at the NOAA

Coastal Services Center. “People knew something needed to be done, but the political will wasn’t there, nor was there agreement regarding the threat of climate change and what actions should be taken.

“That’s starting to change, as more people are realizing that most of the recommended actions just make good sense in terms of community protection,” she adds. “We are seeing more local and state governments beginning adaptation planning in earnest.”

The NOAA Coastal Services Center has many products and services useful for the adaptation planning process. These include workshops that help community leaders begin adaptation planning and visualization tools that help citizens “see” potential sea level predictions and impacts. ❖

For more information about the Center’s adaptation tools, e-mail Donna.Mccaskill@noaa.gov.

Recovering from Ike and Becoming More Resilient in Texas

Hurricane Ike hit Galveston, Texas, on September 13, 2008, becoming the third most destructive hurricane ever to make landfall in the U.S. Programs and projects implemented by Texas coastal resource managers are helping shoreline communities not only recover from the impacts of Ike but become more resilient to future storms and the effects of climate change, such as sea level rise.

“Ike drove home the need for us to be better prepared.”

*Jim Weatherford,
Texas General Land Office*

“Hurricane Ike will likely go down in history as the most costly and destructive storm ever to hit Texas,” says Jim Weatherford, senior administrator for the Hazard Mitigation Program at the Texas General Land Office (GLO). “We really didn’t have a solid plan of attack to deal with a storm like Ike. . . We learned that planning is extremely important, especially now with the upcoming issue of sea level rise.”

As soon as staff members from the Texas GLO—which also is the lead agency for the Texas Coastal Management Program—could get access to the beach after Ike, work began to re-establish the landward boundary of the public beach, clean up debris on the beach and in state-

owned waters, and help communities identify potential hazard mitigation projects, including the buyout of more than 800 homes destroyed or damaged during the storm.

Longer-term efforts to make the coast more resilient include instigating the biggest coastal protection effort in the state’s history and assisting coastal communities with updating their local and regional hazard mitigation action plans.

GLO staff members have also developed websites to help coastal property owners and communities with recovery and hazard mitigation efforts and are working with regional partners to share adaptation strategies and lessons learned.

“The time to start planning for something like sea level rise is now,” Weatherford advises. “Don’t wait until you are seeing water coming up to the houses.”

History Repeating

It had been more than 100 years since Texas experienced a hurricane the magnitude of Ike. “The last time something like this happened was in 1900,” Weatherford says. “Ironically, Ike took the same path as that storm, came in at the same time, and had almost the exact same storm surge. It was like a repeat of history.”

Hurricane Ike roared across Galveston Island and Bolivar Peninsula and into eastern Texas between 2 and 3 a.m. with sustained winds of 110 mph, a storm surge of about 20 feet, and widespread

coastal flooding. It left behind more than \$29 billion in damages.

Weatherford was representing GLO in the state emergency operations center when the storm hit. “Bolivar received the worst damage,” he recalls. “They were hit by the northeast quadrant of the storm, which is historically where you find the maximum storm surge. Bolivar was completely underwater. In the small community of Gilchrist, there was one structure left standing.”

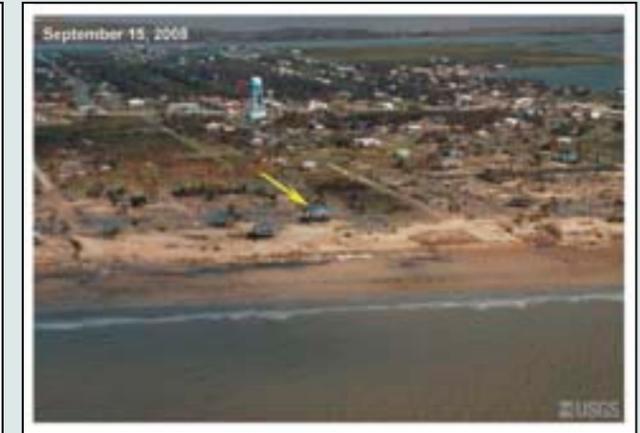
Altering the Landscape

After the storm, it took several weeks for GLO staff members to get to the beaches because all the access roads and a ferry landing were washed away. “The storm took out houses, infrastructure, and septic systems,” Weatherford says. “It removed the dunes, vegetation, and the root systems for the vegetation. It completely altered the landscape.”

Before the storm, the natural line of vegetation determined the landward boundary of the public beach, which is specified in the Texas Open Beaches Act. With so much of the natural vegetation destroyed, the GLO and local governments couldn’t make decisions about permitting or determining the extent of the public beach easement.

Speeding Assistance

To speed reconstruction, Jerry Patterson, commissioner of the Texas GLO, established a line at 4.5 feet above sea level as a



Oblique aerial photography of Bolivar Peninsula, Texas, before and after landfall of Hurricane Ike. Yellow arrows identify the same house in each image. In addition to the loss of houses, the evidence of inundation includes eroded dunes and sand deposited well inland.

temporary permitting line for local governments and the GLO to use for emergency permitting and rebuilding. Additionally, this 4.5-foot line was used as a guide for debris cleanup for the beach system and state waters.

“There was an extensive amount of debris in Galveston Bay,” Weatherford says. “There was debris out as far as you could see—cars, boats, everything was in the bay. It took almost a year to clean that up.”

The 4.5-foot line was used as the public beach boundary until August 2009 when the GLO completed an extensive shoreline assessment to re-establish the boundary line. The new boundary is 200 feet from mean low water.

Maps showing the new boundary were made available to the public online at TexasBeachAccess.org.

More Resilient

Efforts to make the coast more resilient to future storms include removing more than 800 homes that

were destroyed or damaged during the storm from the Texas coast using about \$130 million awarded to the state by the Federal Emergency Management Agency (FEMA) Hazard Mitigation Grant Program. According to FEMA, the buyout is the single largest mitigation project ever funded for this region.

With GLO staff support and \$10 million in state matching funds, local governments are purchasing the properties at pre-storm fair market value from willing homeowners. The properties will be converted to open space in perpetuity, ensuring that homes are not rebuilt in high-hazard areas.

Another agency initiative is undertaking the biggest coastal protection effort in the state’s history, which consists of beach nourishment projects, dune rebuilding and restoration, estuarine habitat restoration, revetment repair and construction, and updating critical erosion rates. GLO staff members are also helping communities amend

and update their local and regional hazard mitigation action plans to meet the goals under the Texas Coastal Management Program.

Weatherford is also working with regional partners in the Gulf of Mexico Alliance to share adaptation ideas and information. The idea to create a website to serve as a clearinghouse for all five Gulf states became part of the StormSmart Coasts network, which can be viewed at <http://stormsmartcoasts.org>.

“Ike drove home the need for us to be better prepared,” Weatherford says. “I wish we’d started sooner.” ❖

For more information about the Texas coastline after Ike, go to TexasBeachAccess.org. For more information on Texas’ hazard mitigation efforts, go to www.glo.state.tx.us/coastal/hazmit/ or contact Jim Weatherford at (512) 463-2572, or Jim.Weatherford@glo.state.tx.us. To view the Texas StormSmart Coasts website, go to <http://tx.stormsmartcoasts.org>.



COMMUNICATING CLIMATE CHANGE:

Using Social Science to Reach Out in Oregon and Maine

As coastal resource managers strive to help communities plan for and adapt to the coming impacts of climate change, many are struggling with the question of how to educate the public in a way that will motivate them to act. In order to better target information and program support, managers in Oregon and Maine are using social science to better understand the concerns, knowledge, motivations, and decision-making processes of specific populations.

“I believe that research into public understanding and perceptions of the climate issue must guide public communication.”

Joe Cone, Oregon Sea Grant

Climate Variability and Coastal Community Resilience: Developing and Testing a National Model of State-Based Outreach is a two-year effort by the Oregon and Maine Sea Grant programs that aims to develop and test a model of public outreach about climate change that may ultimately be valuable to coastal managers around the country.

“I believe that research into public understanding and perceptions of the climate issue must guide public communication,” says Joe Cone, the project leader and assistant director of Oregon Sea Grant and head of its communications team. “This project shows how coastal communities can benefit from an approach to climate engagement and communication that’s based on specific behavioral, decision, and learning research.”

While the efforts in Oregon and Maine are parallel, the states have significant differences in anticipated climate change impacts and in the communities and economic interests that will most likely be affected. As a result, there are differences in each state’s target populations, project goals, and resulting outreach strategies.

What is the same in both efforts and carries over for other coastal managers is the focus on getting an in-depth understanding of targeted groups to improve climate change communication.

“The intended users of our climate change assistance are at the center of the project,” Cone says. “Using a behavioral decision-making approach, we conducted interviews, focus groups, and surveys to understand both their needs and, importantly, their constraints, and developed strategies and specific interventions based on what we learned.”

For instance, multi-part videos were developed for both states that specifically address the concerns and decisions that the target populations were concerned about making, and the information is presented by sources they trust, Cone says.

In Maine, a five-year outreach plan was developed that focuses on filling in information gaps identified by focus groups and in surveys, such as the creation of a hazard mitigation guide and interactive website.

In Oregon, Cone says, two target communities were identified in the survey process, and Sea Grant is “helping them make progress on planning for climate change by explicitly introducing learning—both about climate change and their diverse values—into the group decision-making process.”

“We learned that we can no longer assume that we know everything about our audiences and know what they need,” says Kristen Grant, marine extension associate for Maine Sea Grant and the University of Maine Cooperative Extension. “We have to understand their needs, interests, and barriers to action.”

Science of Changing Behavior

Coastal managers may believe that if they provide the “public” with information about climate change and its impacts—sea level rise or



Vulnerable homes along the shoreline in Neskowin, Oregon, one of Oregon Sea Grant’s target communities, and the stone riprap that is intended to protect them.

increasing intensities of coastal storms, for instance—that people will take appropriate actions, such as elevating their homes.

Social scientists, however, are finding that providing reliable data and information is only part of the communication process. For example, two people in the same situation who are given the same information may make drastically different decisions. What scientists recognize is that human behavior is extremely complex and that this is particularly true when choices are made concerning personal risks, such as evacuating for a hurricane.

The social sciences are probing the practices, processes, and effects that influence attitude, decision-making, and behavior change. This body of research, Cone says, is critical to communicating climate change.

Know Your Target

The key to any social science-based communications or outreach effort is to be very specific about your target audience. Cone, however,

prefers the term “target population” because, he says, “the term ‘audience’ prejudices the nature of your relationship and your thinking. It has the connotation that whoever you want to talk to is waiting for you to provide them information.”

In 2007, with funding from the NOAA Climate Program Office, Oregon and Maine worked with teams of scientists, faculty, educators, coastal managers, and committees of stakeholders to design focus groups, interviews, and surveys for targeted populations to determine their attitudes, knowledge, and concerns about climate change.

In Oregon, the target population was coastal decision makers, such as city managers, county planners, state agency personnel, private developers, bankers, and realtors. In Maine, both coastal property owners and elected and appointed municipal officials were target groups.

Survey Says

Conducted in 2008, the project surveys are believed to be the largest studies to date to focus on U.S.

coastal state populations and the challenge of adapting to the expected effects of coastal climate change, Cone says.

Among the insights from the surveys was that coastal managers in both states should be using terms other than “climate change.”

“We’re using the terms ‘climate variability,’ ‘flooding,’ and ‘accelerated erosion’ to get around the politics of ‘climate change,’” says Kathleen Leyden, director of the Maine Coastal Program and a project partner. “Our audience is already seeing the impacts of climate variability, such as an increase in intensity of storms and more frequent flooding from 100-year storms, but they may not identify these events as symptoms of climate change.”

The surveys in both states also showed that coastal officials and owners of coastal property don’t need to be persuaded that climate change is happening. They believe that both government and individuals should begin taking action now to adapt to expected effects, but questions remain about who should be doing what. A lack of information about risks and resources were barriers to action.

In Oregon, 300 coastal decision makers responded to the survey, and in Maine, 548 property owners and 55 coastal municipal officials took the surveys. Focus groups and interviews were also conducted in both states.

Filling in Gaps

Both Oregon and Maine have analyzed the survey and focus group data and are using the

Continued

information to move forward with helping their target groups prepare for climate change.

Major outreach products for both states are videos that were tailored to address the needs and concerns of the target audiences.

“The DVD has been unbelievably well received,” says Grant. A users’ guide that accompanies Maine’s documentary has been used to facilitate a series of discussion groups, and the video was shown on Maine public television.

Maine also has developed a five-year outreach plan that focuses on filling in information gaps identified by respondents. To help get them the information and resources they need, a coastal hazard mitigation guide is almost complete, an interactive website is under development, and a series of workshops will be held for coastal property owners and municipal officials.

A Learning Process

In a series of workshops with two target communities, Oregon Sea Grant is using concept mapping and influence diagramming, techniques drawn from learning research and risk analysis, to help local participants visualize their collective understanding of the effects of climate change, assess their associated risks, and display their preferences for responding.

“That shared understanding then enriches their decision-making,” Cone says.

“The success of preparing for climate change,” he says, “will include local knowledge, informed participation, and a way to update that knowledge and participation

over the long span of attention that climate change is likely to require. Rather than assuming that we’ll do it once and be done, we assume that adaptive management likely will be a means and community resilience a desired end—and neither adaptive management nor resilience planning are trivial pursuits.”

“We’re depending on Sea Grant to bring this set of tools into the equation,” says Bob Bailey, manager of the Oregon Coastal Management Program. “The information they are providing from the surveys about what is going on out there in the real world will carry over into other issues and efforts we’re undertaking.”

Bailey adds, “This is a capacity that all coastal states could benefit from. It’s really important for coastal managers to accommodate social science.” ❖

For more information on *Climate Variability and Coastal Community Resilience: Developing and Testing a National Model of State-Based Outreach*, contact Joe Cone at (541) 737-0756, or joe.cone@oregonstate.edu. You may also contact Kristen Grant at (207) 646-1555, ext. 115, or kngrant@maine.edu, Esperanza Stancioff at (207) 832-0343, or esp@umext.maine.edu, or Kathleen Leyden at (207) 287-3144, or Kathleen.Leyden@maine.gov.

FOR MORE INFORMATION

To learn more about *Climate Variability and Coastal Community Resilience: Developing and Testing a National Model of State-Based Outreach* and about the use of social science in hazards and climate change communication, go to

Maine’s *Building a Resilient Coast* documentary, www.seagrant.umaine.edu/extension/coastal-community-resilience

Maine’s technical report on “Climate Variability and Coastal Community Resilience: Developing and Testing a National Model of State-Based Outreach,” www.seagrant.umaine.edu/program/SARPdocs/SARP_tech_report_4-23_final_draft.pdf

Oregon Sea Grant climate webpage, <http://seagrant.oregonstate.edu/themes/climate/>

Oregon Coast Climate Change videos, <http://seagrant.oregonstate.edu/research/ClimateChange/oregon-video.html>

“An Analysis of a Survey of Oregon Coast Decision Makers Regarding Climate Change,” <http://seagrant.oregonstate.edu/sgps/onlinepubs/s09001.pdf>

NOAA Coastal Services Center social science publications, www.csc.noaa.gov/publications.html

Driving Conservation along South Carolina’s Coast

Highways and tourists may not be the first things that coastal resource managers think of when contemplating conservation strategies, but when the U.S. Department of Transportation made a 17-mile stretch of South Carolina highway a national scenic byway last October, it was a significant step toward preserving the natural and rural character of Edisto Island. It is also expected to generate jobs and environmentally friendly tourism for the area.

“This puts us on the map.”

Bud Skidmore, Edisto Island Open Land Trust

“This seals the importance of Edisto’s value as a national tourist destination,” says Marian Brailsford, executive director of the Edisto Island Open Land Trust, which spearheaded efforts to get the scenic byway designation. “It confirms what locals and faithful visitors have known for decades—that Edisto is a special place worthy of protection.”

National scenic byways are considered exceptional roads through areas that exemplify regional characteristics and possess distinctive cultural, historic, natural, and other qualities. South Carolina Scenic Highway 174—now known officially as the Edisto Island National Scenic Byway—runs through pristine marshes, across

winding creeks, and past farms and locally owned businesses.

“This puts us in the same league as the Florida Keys Scenic Highway, the Blue Ridge Parkway, and the Selma to Montgomery March Byway,” says Bud Skidmore, a member of the Edisto Island Open Land Trust. “This puts us on the map.”

Recognizing a Byway

While there are no additional regulations that come with national scenic byway designation, the program was established by the U.S. Department of Transportation, Federal Highway Administration, as a grassroots collaborative effort to help recognize, preserve, and enhance selected roads throughout the United States.

According to the program website, roads are recognized as national scenic byways by demonstrating they possess at least one of six qualities—archaeological, cultural, historic, natural, recreational, and scenic.

Since 1996, the program has designated 2,832 routes in all 50 states, as well as Puerto Rico and the District of Columbia. The Edisto Island National Scenic Byway was one of 42 roads recognized in 2009.

Part of the Strategy

For the past 12 years, the Edisto Island Open Land Trust has been working to preserve the rural landscape of Edisto Island, which is about 35 miles south of Charleston, Brailsford says. In 2003, as part of its overall conservation



Edisto Island National Scenic Byway is helping preserve the area’s rural character.

strategy, the land trust set the goal of getting Highway 174 designated as a national scenic byway.

“We have historic farmland and plantation lands all along Highway 174,” she explains. “We recognized that if we could conserve that corridor, it would set the pace for the rest of the island.”

The potential for ecotourism is also expected to help with conservation efforts, says Skidmore. “We’re inviting people to our island who value the birds, land, and water. To be successful, it has to be self-sustaining.”

Reaching Out

Edisto’s road to scenic byway designation was long and arduous, Brailsford says. It took three years for the land trust to get grant monies to pay for the project, and then another three years to complete the designation requirements.

The primary requirement was developing a corridor management plan that “looks in-depth at the intrinsic value of the corridor, the natural resources, historic resources, recreational opportunities, and what makes it culturally special,” she says.

Continued on Page 9

Putting “Beach Watch Online” in California

For 16 years, volunteers have collected shoreline data along the central California coast that have proven invaluable not only to resource managers and researchers, but to emergency managers responding to oil spills. Now the data they have collected on wildlife can be quickly and easily queried online.

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“Making our data more readily available could help coastal managers access and use the data in new and innovative ways.”

Shannon Lyday, Farallones Marine Sanctuary Association

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“Making our data more readily available could help coastal managers access and use the data in new and innovative ways,” says Shannon Lyday, ecosystem monitoring manager for the Farallones Marine Sanctuary Association, the nonprofit partner of the Gulf of the Farallones National Marine Sanctuary. “It will also help focus emergency efforts during oil spills so the most vulnerable wildlife can be protected.”

“Beach Watch Online” is an Internet portal to information on wildlife collected at 41 outer coast beaches in the Gulf of the Farallones and Monterey Bay National Marine Sanctuaries off San Francisco. Trained Beach Watch volunteers have been

collecting data every month since September 1993.

“The program started in response to the threat of oil spills in the sanctuary,” Lyday says. After the *Exxon Valdez* spilled an estimated 10.8 million gallons of oil in 1989, sanctuary managers realized the importance of collecting baseline data to determine what was normal before a spill.”

Beach Watch volunteers count live birds and marine mammals, document dead vertebrates, record human and dog activities, and collect data on oil and tarball abundance and distribution, vegetation and algae wrack, invertebrates, and stream and lagoon status.

In November 2007, Beach Watch data were provided to emergency managers when the container ship *Cosco Busan* struck a tower of the San Francisco-Oakland Bay Bridge and spilled 53,500 gallons of bunker fuel into San Francisco Bay.

“There was a lag time for staff to collect the data and distribute it,” notes Lyday. “That was when we had the idea of an online system that resource managers could use to access data during an emergency event.”

After receiving foundation funding, database programmers were hired to create an online system that allows users to query all 16 years of the Beach Watch data set on live birds and marine mammals, as well as dead vertebrates, which can be filtered and viewed in summaries and graphs.



Data about California sea lions and other wildlife are now available online.

To view the data, users have to provide their names and e-mail addresses. Since going online in December 2009, more than 200 people have logged on to use the system.

Because the data are quality checked and controlled by the staff, the online data have a lag time of 30 to 60 days, Lyday says. If real-time data are needed—such as in the event of an oil spill—an administrative password can be provided, which grants access to current data.

“We have completed what we’re calling phase one,” Lyday says. “In the future, we will have the entire data set online so people can access all the different types of data that Beach Watch volunteers collect.” ❖

To view Beach Watch Online, go to www.farallones.org and click the Beach Watch Online link in the left-hand column. For more information, you may contact Shannon Lyday at (415) 561-6625, ext. 302, or slyday@farallones.org.

Continued from Page 7

To fulfill this requirement, the land trust partnered with Clemson University to conduct the necessary research and the NOAA Coastal Services Center to help land trust members use GPS devices to map the locations of important cultural and historical features.

“We also needed all the community to climb on board,” Brailsford says.

Coming to Consensus

Skidmore worked to pull together a coalition of stakeholders that included community leaders, state and county agency staff members, business owners, and representatives from churches and property owners’ associations to help develop the management plan.

“We had to step back and really look at what we value, what we want to be, what the threats are, and how we want to respond,” Skidmore says. “There was really a consensus here. People want to remain rural. They want clean water and air. They want their grandchildren to go crabbing and fishing, and do the types of things that are traditional here.”

A nonprofit organization was created during the process, which will implement the management plan.

“Basically, the national scenic byway designation has two major benefits,” Brailsford says. “It brings credibility and prestige, and it will increase tourist dollars and open funding doors.”

She adds, “It’s already opening doors for us. We’re very hopeful that good things will come.” ❖

For more information on designation as a national scenic byway, visit www.byways.org/explore/. For more information about Edisto’s experience, contact Marian Brailsford at (843) 869-9004, or eiolt@bellsouth.net, or Bud Skidmore at (843) 327-4007, or emskidmore@bellsouth.net.

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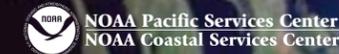


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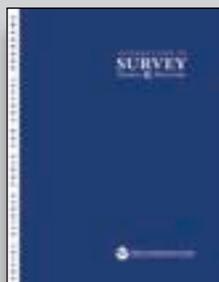
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