www.lacoast.gov

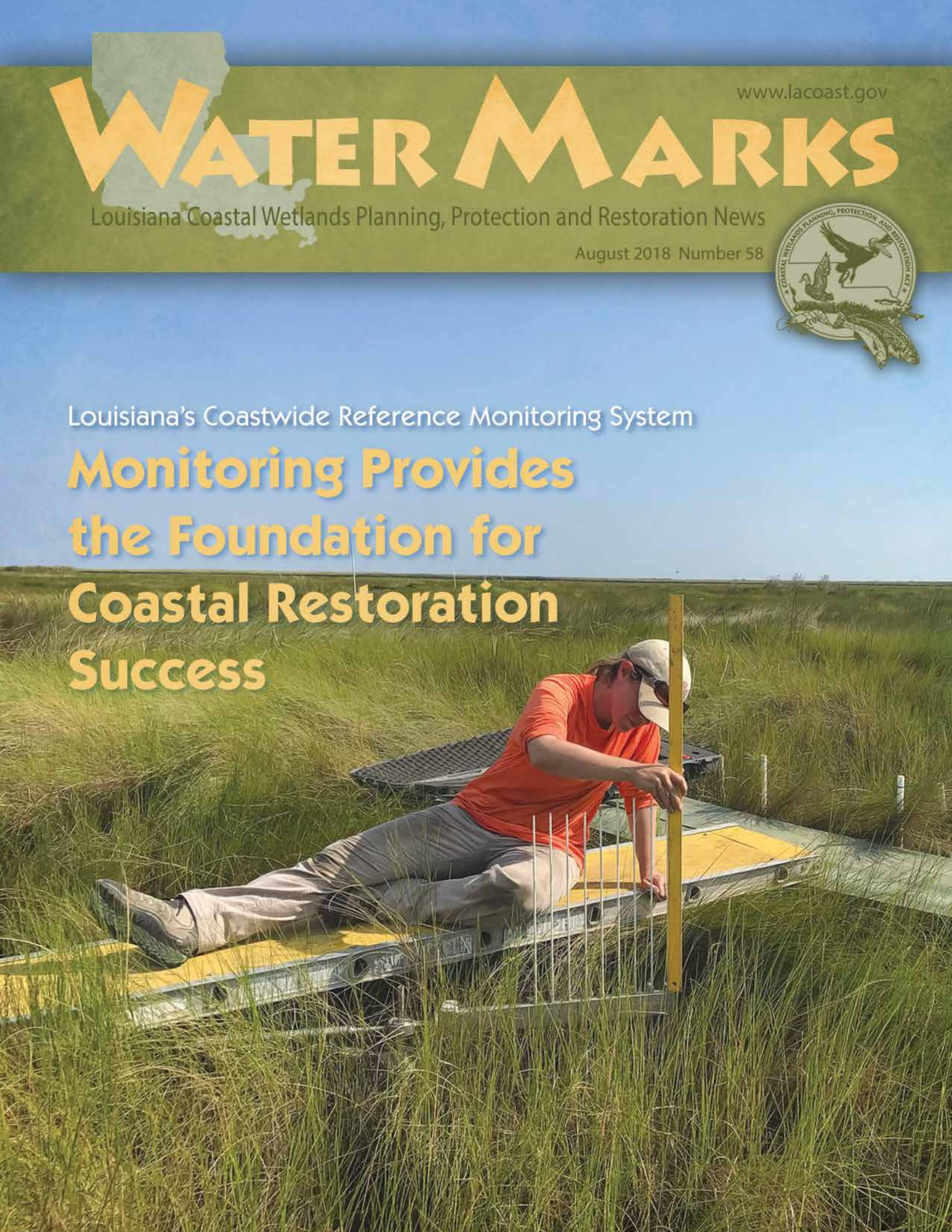
WATER MARKS

Louisiana Coastal Wetlands Planning, Protection and Restoration News

August 2018 Number 58

Louisiana's Coastwide Reference Monitoring System

Monitoring Provides the Foundation for Coastal Restoration Success



August 2018
Number 58

WaterMarks is published two times a year by the Louisiana Coastal Wetlands Conservation and Restoration Task Force to communicate news and issues of interest related to the Coastal Wetlands Planning, Protection and Restoration Act of 1990. This legislation funds wetlands restoration and enhancement projects nationwide, designating nearly $80 million annually for work in Louisiana. The state contributes 15 percent of total project costs.

***WaterMarks* Editor**
Amy Robertson
3737 Government Street
Alexandria, LA 71302
318-473-7762

Changing address? Please don't forget to let us know.

If you receive the print version of WaterMarks and would prefer to receive the digital version, please email lacoast@nwrccom.cr.usgs.gov

ABOUT THIS ISSUE'S COVER . . .

Using a Surface Elevation Table device, a scientist measures the elevation of the marsh surface at a site in Louisiana's wetlands to evaluate subsidence or land-building processes.

Photo credit: Jeremy Dunn

WATERMARKS

Louisiana Coastal Wetlands Planning, Protection and Restoration News

August 2018 Number 58

CONTENTS

Jeremy Dunn

For more information about Louisiana's coastal wetlands and the efforts planned and under way to ensure their survival, check out these sites on the World Wide Web:

www.lacoast.gov
www.coastal.la.gov
www.btnep.org
www.crcl.org

twitter.com/CWPPRA

cwppra blog at cwppra.wordpress.com (USGS)

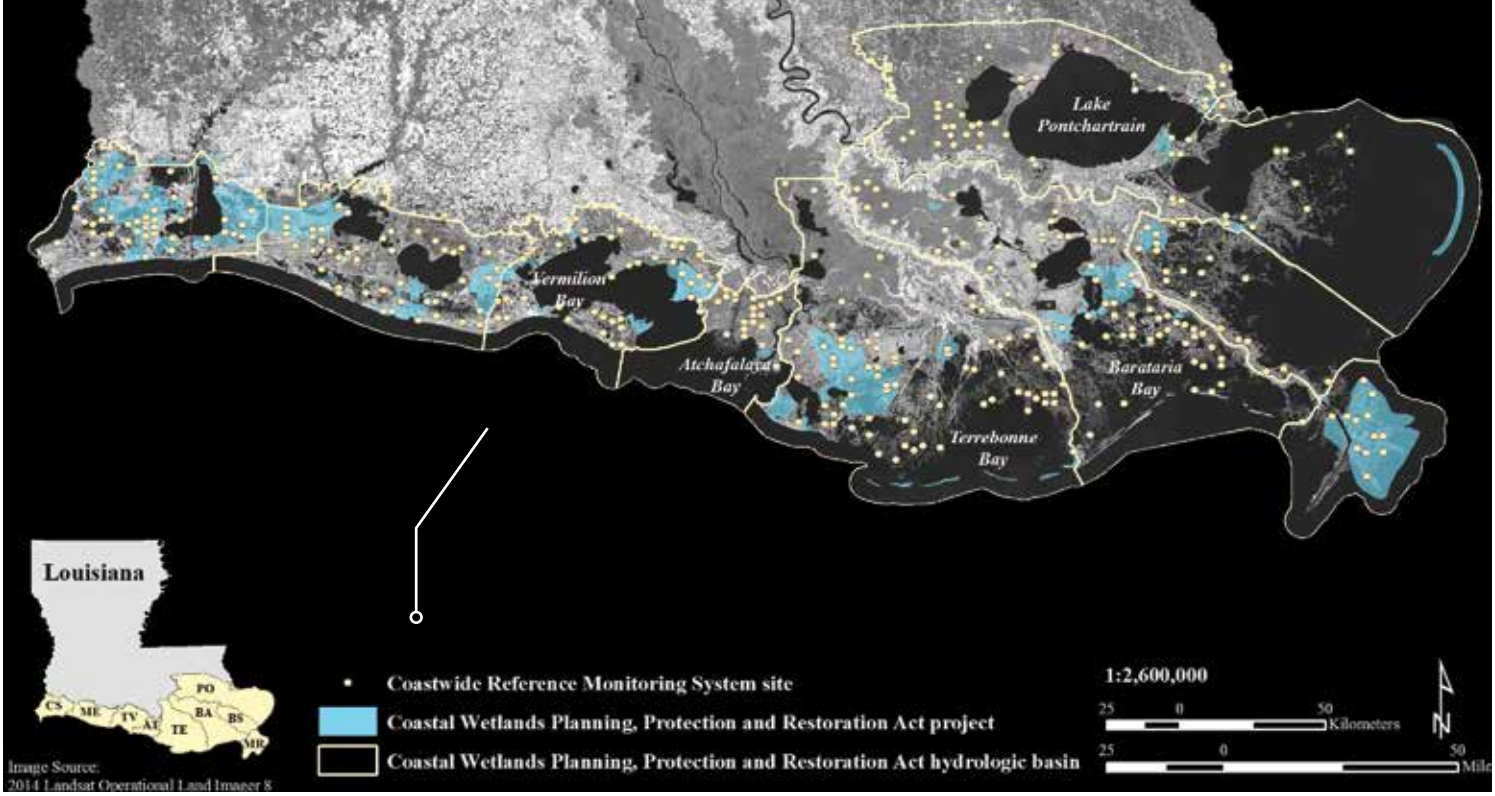
Like CWPPRA on Facebook at facebook.com/CWPPRA

Subscribe

To receive *WaterMarks*, e-mail lacoast@nwrccom.cr.usgs.gov

Moving? The post office will not forward *WaterMarks*. To continue delivery, send your change of address to lacoast@nwrccom.cr.usgs.gov

For current meetings, events, and other news concerning Louisiana's coastal wetlands, subscribe to the CWPPRA Newsflash, our e-mail newsletter, at **https://www.lacoast.gov/new/News/Newsflash.aspx (USGS)**



US Geological Survey

Monitoring is the bedrock of good science

Without CRMS, Coastal Restoration Success Is a Roll of the Dice

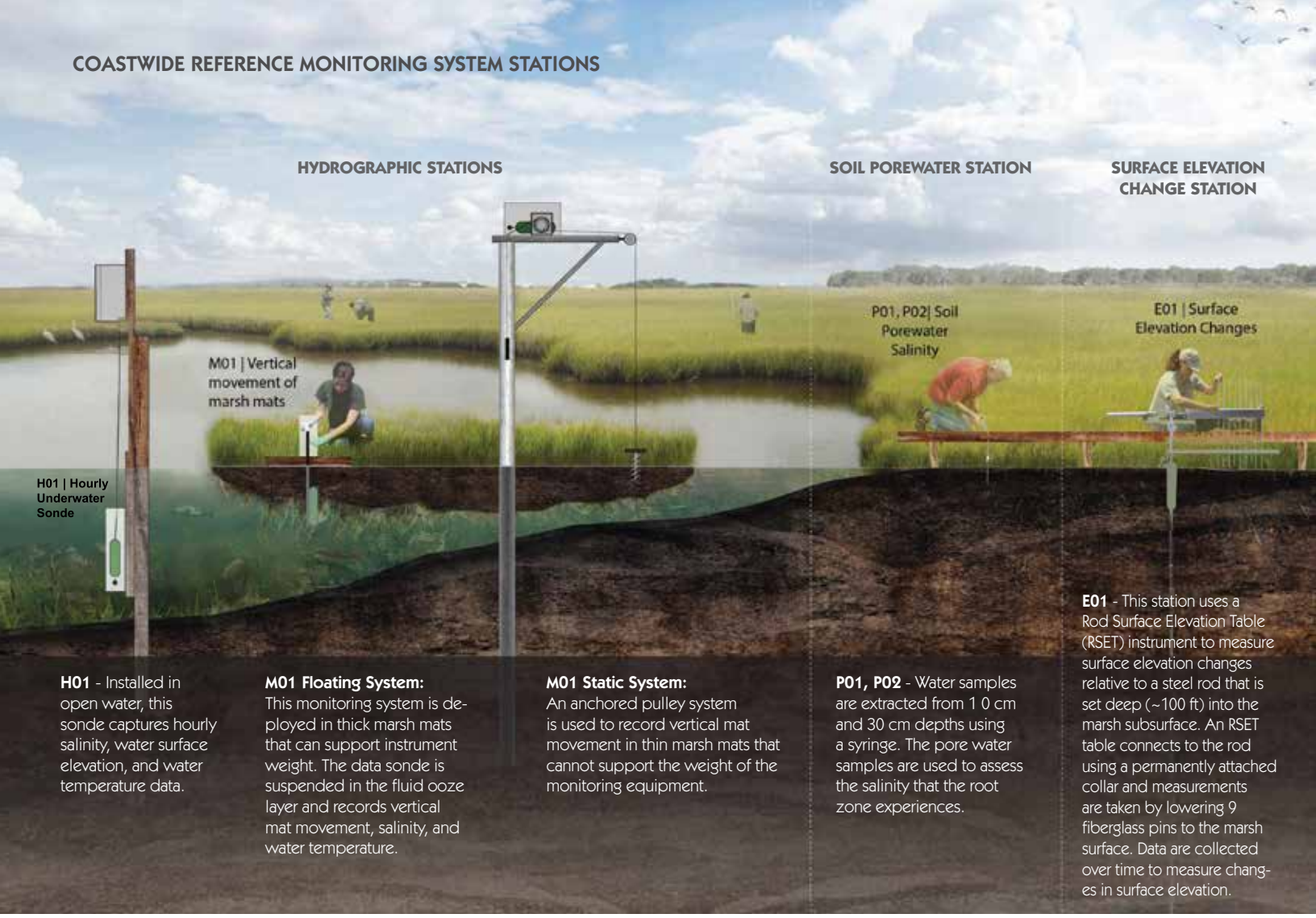
If you don't know where you started, it's hard to figure out how far you've come. Civic planners and coastal scientists need to know: How much land is Louisiana losing, and where? Are causes of land loss the same throughout the coast? How are other wetland conditions changing? Are marsh waters becoming more saline? Are marshes inundated more frequently? And perhaps most urgently, are the efforts to protect and restore the coastal environment effective?

Up until 2003 and the creation of the Coastwide Reference Monitoring System (CRMS), facts that would provide answers to these questions were hard to come by and often sketchy at best. Today, however, CRMS collects detailed information about wetland conditions at 391 sites across Louisiana's coastal region. Put in place through the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA), the program uses sophisticated instruments and standard methodologies to gather a wide array of data. The types of data include

- pedologic (pertaining to soils; i.e., surface elevation, vertical accretion, soil bulk density, percentage of organic material)
- spatial (i.e., percentages of water surface and land cover)
- hydrologic (i.e., water salinity, depth and temperature)
- vegetative (i.e., species' cover and height)

Because CRMS' sites are located both within and outside of CWPPRA project boundaries, scientists can compare data from restored

Peppering the coastal landscape, hundreds of CRMS' sites provide data that describe conditions both inside and outside of CWPPRA project areas. Scientists use the data to determine the efficacy of restoration projects, the impacts of natural events, long-term ecological trends and the current condition of Louisiana's coast.



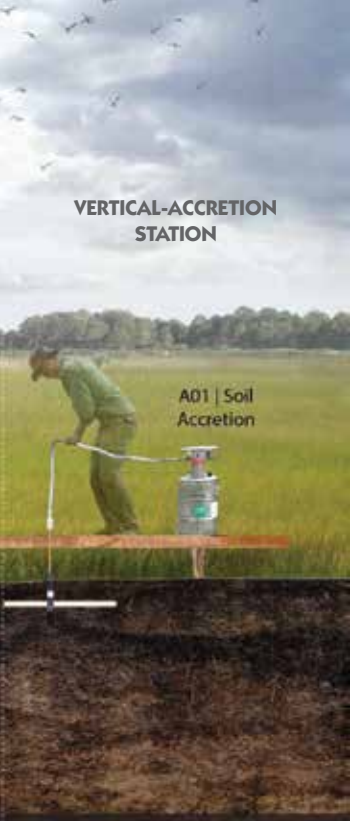
and unrestored areas to determine the success of a specific project in producing environmental change. For example, if a project's goal was to increase emergent vegetation and the data show no overall increase in emergent vegetation outside of the project but a spike of abundance within it, scientists would attribute the change to the project and look carefully at its techniques for application at other sites.

CRMS' sites are located in all types of ecosystems throughout the coast, providing multiple reference points to compare over time and across distances. For instance, researchers might select data to analyze salinity levels before and after a storm, or to compare freshwater marshes inside a project area with those outside of it, or to compare all freshwater marshes across the coast, or to study all restoration projects in a basin, or to look at all projects of one kind (e.g., hydrologic restoration) in the region. As well as determining project effectiveness, data identify locations in need of restoration, conditions to address, and restoration techniques most likely to be successful under a certain suite of circumstances. The scope of the CRMS network allows scientists and engineers to discern large, landscape-scale trends as well as determine conditions at specific sites.

CRMS is the bedrock of coastal knowledge

Initially the purpose of CRMS was to collect the information needed to answer fundamental questions about CWPPRA projects:

- Is the restoration program reducing coastal wetland loss?



A01- Soil accretion, or land building, data are collected by measuring soil that accumulates above a feldspar marker horizon that has been previously placed on the marsh surface. A specialized cryogenic coring device is used to ensure accurate readings of the feldspar location within the core.

Coastal Sustainability Studio, Louisiana State University

- Does the restoration program sustain a diversity of vegetation types within basins?
- Is the restoration program effective in reducing major stressors (e.g., flooding regime, salinity, elevation change)?

Because of its spatial and temporal reach, CRMS is valuable not just to CWPPRA specialists, but to restoration scientists and planners of state and parish projects, to researchers and academicians, to landowners and managers, to advocates and politicians. Anyone curious about conditions in Louisiana's coastal region can access CRMS' data; it is free and publicly available at www.lacoast.gov/crms. Information is summarized in maps, charts, tables, graphs and report cards.

"The site gives us the elements necessary to educate people about what we're doing to restore the coast," says Brett McMann, an engineer who works for the Dutch private consulting firm Arcadis US. "It has numerous data collection tools that quickly and easily show site locations, landscape characteristics, hydrologic data and a host of other information that help us model coastal processes. We use the results to educate politicians and other decision-makers about conditions along our coast. The information that CRMS collects is the bedrock of knowledge for reengineering Louisiana's coast to survive in the future." WM

How do scientists know if coastal wetlands will disappear?

In natural systems, wetlands are generally able to keep pace with sea-level changes through sediment deposition and decomposition of organic matter. If not, the wetlands could be lost.

One way to estimate a wetland's vulnerability to loss is through a technique known as the "surface elevation table-marker horizon" (SET-MH). At CRMS' sites, the build-up of sediment and changes in relative elevation can be measured in millimeters. The first tool, the surface elevation table, comprises a series of pins attached to a benchmark. It can measure the same point on the soil surface repeatedly to show decreases or increases in elevation over time. To measure surface accretion, or the build-up of material, researchers deposit a white clay on the soil surface. When they return to the site, they can take a soil core sample and measure how much sediment has been deposited above the white line, thus determining vertical accretion. By analyzing the SET-MH data, scientists can gauge whether or not CRMS sites are keeping pace with sea-level changes.

With the highest rate of coastal wetland loss in the Gulf of Mexico, Louisiana has the most comprehensive monitoring system in the world. CRMS was created to monitor the effectiveness of individual restoration projects and the influence of projects on the entire coastal landscape. In addition to SET-MH data, CRMS sites provide data on vegetation, land change, soil characteristics, and hydrology.

Jeremy Dunn

Coring into the earth, a scientist removes a sample of soil to test its characteristics. Such soil cores are analyzed every ten years while land accretion is measured each spring and fall.

CWPPRA

CRMS DATA DOCUMENT A DIVERSE COASTLINE

One Coast with Myriad Conditions and Multiple Trends

All coasts are an interface of land and water, but that may be the only universal element among them. With different physical, biological and geological attributes and land-use histories, each area of Louisiana's coastal zone has a unique ecological identity.

Louisiana's coast can be divided roughly into eastern and western sections, with Vermilion Bay, west of the Atchafalaya River, serving as the dividing line between them. The Mississippi River dominates the eastern deltaic region; abandoned sandy ridges, or cheniers, characterize the west. While the two regions often share similar threats, such as erosion, sediment deprivation and saltwater intrusion, aspects such as substrates, soil composition, drainage patterns and vegetative communities are different.

For example, subsidence occurs in both eastern and western coastal areas. Land loss caused by land sinking and drowning has been well documented in the southeastern, deltaic region, but a recent analysis of data from the Coastwide Reference Monitoring System (CRMS) suggests that subsidence could actually become a more acute problem in the southwestern part of the state, the Chenier Plain.

Krista Jankowski is a coastal resources scientist supervisor with Louisiana's Coastal Protection and Restoration Authority. As a graduate student in earth and environmental sciences at Tulane University, Krista was interested in looking for trends in surface elevation change and shallow subsidence across Louisiana's coast. "To collect a sufficient amount of data for analysis would have been time- and cost-prohibitive," says Jankowski. "CRMS' robust data set and public availability made the project feasible. Its

Rocks make an effective barrier to shoreline erosion, but some Louisiana soils are too soft to bear their weight. In such circumstances scientists and engineers must find other methods and materials that are compatible with wetland conditions. Known as an incubator for innovative approaches to coastal restoration, CWPPRA has fostered the development and tested the effectiveness of various inventive means to preserve Louisiana's coast.

spatial scale and density of site locations is unmatched anywhere in the world. That it uses a transparent methodology and records multiple measurements at regular intervals qualify its use for scholarly research."

Jankowski analyzed CRMS' data to identify the sites along Louisiana's coast that are most vulnerable to subsidence and sea-level rise. She expected to see that sites in the Mississippi Delta are at greatest risk because of its thick layers of ancient, squishy sediment. The thickness makes the sediment layers heavy, so one might expect it to weigh on and rapidly compact subsurface material, causing the land to sink, or subside. "Delta sites are sinking," says Jankowski, "but the subsidence caused by soils compacting is countered by sediment accretion, vegetation growth and root production. These factors combine to offset some subsidence and increase surface elevations."

In contrast, in the western part of the coast the layers of recently deposited sediment are thinner. Less weight reduces the rate of soil compaction, and subsidence happens more slowly. But the hydrologic and ecological conditions in the west are different from those in the delta; the southwestern landscape is highly managed with structures and levees that prevent tidal exchange and the benefits associated with it, including sediment deposition and drainage. Presently, marshes in the Chenier Plain are flooded frequently and surface elevation is gained more slowly than on the deltaic plain, thus increasing the southwest coast's vulnerability to sea-level rise.

Looking at the coast through the lens of CRMS

Coastal scientists like Jankowski use CRMS' data to determine changes that result from restoration projects or that follow natural events such as droughts and storms. They document conditions not only at specific sites but also over large geographic areas to identify regional

Richie Brink

Forested wetlands, freshwater marsh, brackish marsh, saltwater marsh, tidal mudflats, barrier island dunes – Louisiana's coastal region is a kaleidoscope of different ecosystems. The distribution of CRMS' sites throughout the wetlands provides the information analysts need to discern the effects of restoration projects and perceive trends in ecological changes.

trends. "CRMS shows in depth what was here before, what has changed in the landscape, what has changed in the water – CRMS captures the range of dynamic ecological conditions all across coastal Louisiana," says Laurie Cormier, program coordinator and coastal zone manager in Calcasieu Parish. "From east to west the land is different. Restoration techniques effective in one locale may not work so well someplace else." For instance, shoreline erosion is caused by various agents and protecting shorelines may require diverse approaches. "Soils in the western part of the Chenier Plain can support big rocks, but in the eastern part the ground is soupier, more like chocolate milk. Big rocks would sink, so we look for different methods and different materials to halt shoreline erosion there. CRMS' data capture the effect of shoreline protection on the landscape, showing if a project has slowed erosion."

"CRMS provides a baseline that captures the way that the coast is shifting," says Leigh Anne Sharp, a coastal science manager with Louisiana's Coastal Protection and Restoration Authority. "We've seen individual CRMS sites change in interesting and meaningful ways. Some sites that were attached to land when the project began are now floating. Other sites that were floating, notably in the Davis Pond outfall area, are now attached; a restoration project designed to move fresh water has conveyed enough sediment to join buoyant, vegetated mats to marsh. Because we have a record of factors that led to this result, we can apply them to constructing projects with that intended outcome."

As the state of Louisiana plans major projects – and major expenditures – to protect and restore its coast, knowing ecological conditions and agents of their change improves planning and execution. "We cannot assume the entire coast, or prevalent trends within it, are the same everywhere," says Sharp. "The coastwide monitoring system provides the information we use to match strategies to specific sites, fine-tuning projects and maximizing the desired benefits." WM

Richie Blink

Measuring MR-GO's reach

"We suspected the Mississippi River – Gulf Outlet (MR-GO), a 76-mile-long shipping channel built in the mid-20th century to increase maritime traffic to New Orleans, was responsible for widespread ecological changes in the Pontchartrain Basin, but with data from CRMS sites we were able to determine just how far-reaching the damage was," says Theryn Henkel, assistant director for the coastal sustainability program at the Lake Pontchartrain Basin Foundation (LPBF). "CRMS' stations came on line in 2007 and 2008, before MR-GO was closed in 2009. Our best guess was that saltwater intrusion through MR-GO had affected about 600,000 acres. By comparing salinity levels before and after the closure we saw that more than a million acres had been affected. CRMS took a lot of the guesswork out of evaluating ecological changes." Without CRMS, Henkel says, "it would have been nearly impossible to supply the man-hours needed to cover the impact of MR-GO."

The foundation continues to watch CRMS' data to spot trends in the basin. "The combination of CRMS' spatial and temporal coverages is invaluable," Henkel says. "CRMS shows us where land is accreting or subsiding and where water is freshening. Even if a site isn't presently suitable for a project, we can flag it for future consideration if data show it's moving toward conditions favorable for restoration."

From restoration specialists to curious citizens – CRMS' website welcomes everyone

Trove of Data Unlocks Wetland Secrets and Foretells the Coast's Future

The data that the Coastwide Reference Monitoring System (CRMS) collects at nearly 400 sites across Louisiana's coast capture the wetlands' vital signs: water levels, salinity concentrations, marsh elevations, land-water ratios, measures of accretion or subsidence, vegetative composition – information that scientists, engineers and other interested parties need to determine site characteristics, to compare conditions over time and across locations and to detect changes. "CRMS gives us a picture of the wetlands that we could not get any other way," says Whitney Broussard, senior scientist at the consulting firm JESCO, Inc. "The system lays the foundation for observing and understanding the ecology of our coastal zone."

Publicly available online (https://lacoast.gov/crms2/), CRMS' data is a trove of information used to answer many questions about Louisiana's coast and its future.

CRMS delivers facts for research and restoration

Although coastal Louisiana is in a state of constant flux, understanding current conditions is pivotal in planning for changes – either the inevitable, natural ones such as subsidence and sea-level rise or the intentional, managed ones such as marsh creation and river diversions. "We use CRMS pretty much on all projects, whether to learn about the present environment or to predict the effects of our actions or to monitor their results," says Ron Boustany, a natural resources specialist with the Natural Resources Conservation Service who has worked on numerous projects conducted under the Coastal Wetlands Planning,

Publicly accessible, the CRMS web site makes the data that CRMS collects easily available to all. Users can locate every CRMS site on an interactive map and select layer options to view the geographic scope, time frame and wetland characteristics they wish to examine. Data is also presented in charts and graphs that make the history of conditions quick to visualize.

Protection and Restoration Act (CWPPRA). "For example, in a project like the Cameron Creole Freshwater Introduction, CRMS showed us the site's long-range ecological conditions, such as salinities and water levels. We then determined how the project could change these factors over time and chose design options to produce the results we wanted."

Determining elevations

Because the coastal environment is constantly responding to a complex interplay of forces, designing restoration projects that will stand up to the test of time is like working a jigsaw puzzle with shape-shifting pieces. Designing lasting marsh at the elevation appropriate for desired vegetation and built on ground that sinks in locations exposed to wind, tides and storms is a fundamental challenge.

"Marsh sites are periodically wet and periodically dry," says Brett McMann, an engineer with the private consulting firm Arcadis US. "Our task is to place material in a project today so that the site is still a thriving marsh under future conditions of subsidence and sea-level rise. CRMS gives us an enormous amount of data on past and present mean water levels that we plug into different predictive scenarios. We can then calculate how high to build new marsh so that it likely remains viable into the future. Then after construction, we use CRMS' salinity data to select the vegetation appropriate to the marsh type we've created."

Linking vegetation to conditions

Most approaches to coastal restoration rely on plants taking root and delivering their customary ecological services – stabilizing the soil, adding organic material to build elevation, providing nutrients to the food chain and habitat to wetland creatures. Knowing the conditions under which different vegetative communities thrive is essential to successful plantings and, by extension, to successful restoration projects.

Mike Osland is a research ecologist at the U.S. Geological Survey. "Because flooding is an important driver of change in coastal wetlands," he says, "we analyze hydrologic data to link the timing, depth and duration of inundations to changes in vegetation. For particular plant communities, there are elevation 'sweet spots,' where vegetation stays wet an optimal amount of time. By pairing CRMS' data on inundation with a desired vegetation regime we can figure out how high to build new marsh to encourage the plant community we want to flourish there. Inundation records also show us thresholds beyond which certain kinds of vegetation cannot survive, signaling a change in marsh type or conversion of marsh to open water. CRMS' data accords us the ability to anticipate shifts in plant communities, predict wetland loss and evaluate potential sites for restoration."

Before joining a private firm, Broussard was a researcher at the University of Louisiana at Lafayette, where he helped develop the vegetation model in the state of Louisiana's Master Plan for a Sustainable Coast (Coastal Master Plan). "We analyzed CRMS' data to describe variability in salt tolerances among different coastal species," he says. "We used the information to predict how species will respond to changes in flooding and salinity. The model is key to the Coastal Master Plan, and CRMS' data were key to developing the model."

Setting the scene for forested wetlands

Louisiana's coastal region comprises zones with different ecologies supporting different communities of plants, fish and wildlife. Knowing current conditions in a project area and understanding how project actions will change them, scientists select sites where restoration techniques will encourage a desired ecosystem.

Successful restoration of forested swamps relies on knowing the salinity of both water and soil in a project area. The Lake Pontchar-

CWPPRA

train Basin Foundation (LPBF) obtained salinity data from CRMS to identify potential sites for swamp restoration along the Maurepas Land Bridge, a critical landscape feature that provides nearby communities with natural protection against storm surge. "CRMS allows us to see trajectories of conditions changing over time and to pinpoint sites for restoration," says Theryn Henkel, assistant director of the coastal sustainability program at LPBF.

Once LPBF plants trees in a selected site, the organization keeps an eye on CRMS' water-level data. "We can check a nearby CRMS site to see how often an area is flooded," says Henkel. "This gives us a heads-up about probable conditions in our sites that may affect the survival and growth rate of trees."

Discerning landscape trends

Restoration does not attempt to return Louisiana's coast to some golden age of the past. Rather, it aims to create a coast that is environmentally sustainable and that continues to deliver ecosystem services upon which human society depends. The trick, of course, is to select actions today that will address future challenges and endure.

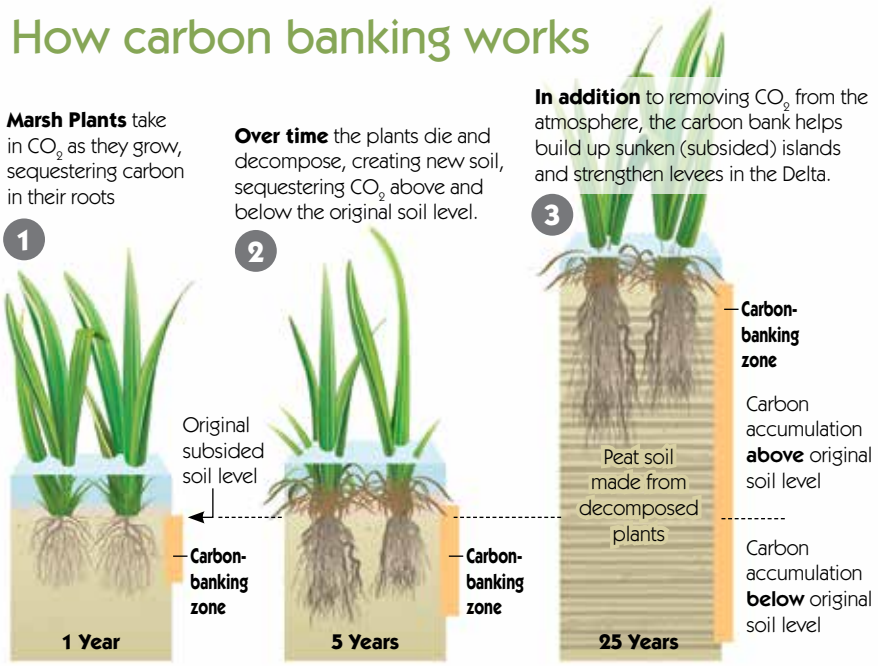
Melissa Baustian, a coastal ecologist at The Water Institute of the Gulf, studies coastal processes and habitats. Recently she used CRMS' data to look at four marsh types, fresh to saline, to investigate how marshes might respond to sea-level rise. "Our wetlands depend on the addition of organic matter to keep up with rising seas," she says. "We know saltwater marshes do not accumulate as much decomposed organic matter in the short term as less saline marshes do, and we know rising seas will increase our coastal salt-marsh acreage. Figuring out the likely consequences of sea-level rise helps us choose restoration projects, perhaps favoring those that add more fresh water into the system to sustain less saline marsh types."

Knowing the prevalent conditions in an area directs revegetation efforts to places where the survival and growth of chosen plants are most likely. Protective barriers around the trunks of young saplings reduce loss to herbivory and boost the chances that these new residents will flourish in the Des Allemands Swamp project area.

Preparing for climate change

As well as aiding land accretion, marsh plants sequester carbon. "Marshes are threatened by rising seas, which are caused by increased carbon in the atmosphere," says Baustian. "But marsh

How carbon banking works



adapted from U.S. Geological Survey's California Water Science Center

plants absorb atmospheric carbon and store it in the soil. Protecting marshes and creating new ones are ways that we can combat climate change."

A student at the University of Louisiana at Lafayette, Erik Yando looked at the effect of climate change on coastal systems, particularly at the boundary between salt marshes and tropical mangrove swamps. "As temperatures warm, we can expect mangrove habitats to expand northward," says Yando, "but we don't know what factors are likely to slow or encourage their expansion. Using CRMS' data collected near my research site, I determined the frequency and depth of flooding and figured out mangroves' tolerance for elevation and water inundation. Already some projects in Louisiana's bird's foot delta are planting mangroves; this information can improve the success of such efforts."

CRMS saves time, money – and sweat!

While restoration specialists use CRMS to design projects intended to change wetland characteristics, other scientists are using the network as an extension of their eyes and ears into the wetlands as they exist today. Instead of tramping through the marshes, researchers can look at CRMS' data and hone in on areas of particular interest to them.

Locating plants hidden from the eye

As a graduate student at Louisiana State University, Kristin DeMarco predicted the occurrence of submerged aquatic vegetation (SAV) based on environmental conditions. "SAV is a strong indicator of ecosystem health, but it isn't outwardly visible and sampling every location for SAV is impossible," says DeMarco. "Using CRMS' daily records of salinity, temperature and water levels, we matched conditions to the presence or absence of particular plants. By identifying the circumstances under which SAV flourishes,

Scientists can screen CRMS' data to locate the conditions that a particular species of plant or animal favors, thereby restricting the search for that species to areas of its likely occurrence. This extension of "eyes and ears" into the marsh is a boon to researchers, saving them time, effort – and money.

Richie Blink

we could map probable occurrences of SAV and predict how restoration processes such as river diversions would affect that vegetative community."

Finding rare birds

"The black rail is an elusive bird," says Erik Johnson, director of bird conservation for Audubon Louisiana, "with only 13 confirmed records of its occurrence in Louisiana prior to our search." So when the U.S. Fish and Wildlife Service asked for the organization's help in tallying the state's black rail population to determine its eligibility for listing as an endangered species, the idea of surveying hundreds of thousands of acres in hopes of locating the secretive birds was daunting.

"However, we knew the kinds of habitat these birds favor – high, salty marsh or prairie," says Johnson. "We looked for similar habitat conditions among CRMS' data and narrowed down the list of likely locations. Surveying 30 sites, we found eight occurrences of the birds. Using CRMS to identify potential sites saved time and money and made our work much easier."

Keeping an eye on a fishy intruder

Matching ecological conditions to species' ability to thrive reduces costly guesses. The presence of Tilapia in waters near Port Sulphur in Plaquemines Parish, Louisiana has aroused fear that the invasive fish will penetrate into adjacent marshes and disrupt native fish communities. Tilapia, however, are vulnerable to cold. Using CRMS' records of water temperatures, scientists can concentrate their control efforts in the areas most hospitable to the invasive species. Fisheries managers can check ongoing records to observe any spike in temperature that would move the boundaries of survivability for the intruders and adjust their actions accordingly.

CRMS validates predictions

Restoration focuses on the future, implementing projects that will preserve and protect Louisiana's coastal environment for years to come. CRMS' data is essential to reliable modeling of likely future conditions and the results of restoration actions.

Scientists and engineers use CRMS' data to develop and train models for investigating scenarios such as

- future coastal conditions
- probable results of various restoration strategies
- movement of water, sediment and salinity
- diversions' effects on adjacent wetlands
- changes in vegetation under different inundation regimes
- resiliency following natural and environmental disasters

CRMS' data was fundamental in developing Louisiana's Coastal Master Plan. "We used models to identify the best suite of projects for building and maintaining wetlands and for providing the greatest reduction of risk," says Eric White, a research engineer at The

Erik I. Johnson/Audubon Louisiana.

Currently under consideration for listing as an endangered species, black rails are seldom seen in Louisiana. But researchers used CRMS' data to identify 30 places with habitat the birds favor, and field biologists recorded eight occurrences of the rare birds in their survey.

A vibrant, sustainable coast not only provides habitat for iconic fish and wildlife but ensures natural protection from storms and hurricanes, continued viability of natural resources, and preservation of the wonder and beauty of Louisiana's wetlands.

Water Institute of the Gulf. "We verified model results by comparing them with CRMS' data collected in the field. If they matched, we could be confident in our predictions."

Identifying relationships in CRMS' data, Broussard, White and other scientists built a vegetation model tracking more than 30 species of plants. "Each species is related to water fluctuations and salinity levels during the growing season," White says. "As a result, we can simulate what kind of vegetation may be present under different combinations of future conditions and restoration scenarios. The volume of CRMS' data, the fact that data have been collected over years in the same locations and using the same techniques, build confidence in our answers."

CRMS verifies CWPPRA's results

CRMS gives scientists and engineers evidence of the results of restoration activities. Early CWPPRA projects were monitored by pairing a project area to a comparable reference area and comparing conditions. The practice soon encountered difficulties: Locating reference areas became increasingly difficult, sufficient data were rarely collected prior to a project's construction, and relationships between project areas and the larger coastal landscape were indiscernible.

CRMS was established in 2003 to collect ecological information across the coast, both within and without project boundaries. In addition to developing a broad data base of spatial and temporal conditions in the wetlands, the program was designed to answer key questions about the effectiveness of CWPPRA's restoration projects. "Today," Boustany says, "just about every CWPPRA project relies on CRMS for monitoring. And with more than a decade of collections, we are starting to get enough long-term data to tease out the noise – meaningless, random variations – and begin to understand what is really going on."

"By predicting where loss is likely to occur, CRMS helps us select restoration projects," says Osland, "and by providing a baseline against which to measure ecological changes, CRMS indicates the success of our efforts."

"CRMS is extremely valuable, improving our models and keeping research costs down," says Baustian. "Without CRMS, how would we know if our restoration efforts are moving in the right direction?" WM

WaterMarks Interview with David Richard

Trained as a biologist, David Richard has spent his entire career in coastal wetlands. Presently he serves as the executive vice president of Stream Property, a large, private landowner in Louisiana, and Stream Wetland Services, a concern specializing in mitigation to compensate for wetland loss or natural resource damage.

WATERMARKS: How do you use CRMS in your capacity as a property manager?

RICHARD: CRMS gives me all kinds of information – salinity levels, vegetation, inundation – about the lands I manage, and I use CRMS' data to make management decisions. For instance, our properties are subject to influences that occur outside our boundaries, like saltwater intrusion that infiltrates through shipping channels and other waterways. Checking CRMS' salinity data from sites on or near our properties, I may decide to close a hydrologic structure to prevent saltwater from entering the marshes, or I may leave it open to promote drainage.

CRMS shows the causes of changes in the marsh and the direction of long-term trends. It shows us where the problems are and provides the hard facts to justify restoring an area. We used to rely on decadal maps to show the need for restoration, but CRMS is much more detailed, much more accurate. Based on information from CRMS, I've suggested dozens of marsh restoration projects, funded both publicly and privately. And after project installation, the system delivers the data that prove a project's effectiveness.

WATERMARKS: Do other businesses in your industry use CRMS?

RICHARD: Absolutely. CRMS shows deteriorating conditions in areas that haven't been restored; we use the data to plan and implement projects. Land managers, managers of publicly or privately funded restoration projects – they all depend on CRMS to make operational decisions.

WATERMARKS: What would it mean to your work if you could no longer access CRMS' data?

RICHARD: It would be a tragedy. I've worked in coastal restoration my entire career and I recognize the need for data to verify our work, to verify our efforts. CRMS does that. Losing CRMS would force us to take a step back. We see what that would look like by observing other coastal states that don't have a similar network and have no baseline information. They have to depend on other methods with less precision, with less coverage, to get intelligence about ecological conditions. Louisiana is much more data-rich than its neighboring states.

I don't know if the public recognizes the enormous asset the system is. Sure, the public derives benefits from the projects and from management decisions that rely on CRMS' data, but people may not realize how readily available the information is to everybody in a user-friendly format. Individuals can consult it to keep up with local conditions or to find out, say, to see where the best fishing conditions are located. But most importantly, the data that CRMS provides are critical for the long-term health of coastal Louisiana.

Keeping an eye on CRMS' data, operators of both public and private, complex and simple, water control structures know when to open or close them in response to changing conditions.

WATERMARKS

Louisiana Coastal Wetlands Planning, Protection and Restoration News

August 2018 Number 58

DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P.O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

OFFICIAL BUSINESS

PRESORTED
FIRST-CLASS MAIL
U.S. POSTAGE PAID
NEW ORLEANS, LA
PERMIT NO. 80

Unintended Benefits of Louisiana's Coastwide Refrence Monitoring System – The World's largest Wetland Monitoring System

Sarai Piazza, USGS, Wetland and Aquatic Research Center, Baton Rouge, Louisiana

Leigh Anne Sharp and William Boshart, Coastal Protection and Restoration Authority of Louisiana