

# HARBOR HAPPENINGS

Working together to protect the natural environment from Venice to Bonita Springs to Winter Haven

## Shorebirds

While people enjoy our beaches, for some birds they are critical habitat. Several species of shorebirds and seabirds nest on coastal beaches. Habitat loss and degradation has largely restricted many of these species to beaches protected as parks or preserves. Since environmental conditions on beaches are already harsh and unpredictable, these birds are particularly sensitive to human disturbance. The centerfold poster provides information on these birds and things we can do to protect them.

*Snowy plovers. Photo by Miguel Hnatow taken on Sanibel.*

Spring 2013: Volume 17, Issue 1



# Program update

by Dr. Lisa B. Beever, CHNEP

The Charlotte Harbor National Estuary Program (CHNEP) is firing on all pistons. From local partnerships to regional and federal partnerships, the CHNEP is making a difference.

The *Comprehensive Conservation and Management Plan (CCMP) Update 2013*, our guiding document, is adopted. It is also time to reflect on our partner accomplishments during the last five years. Following are highlights of just six out of hundreds of partner accomplishments:

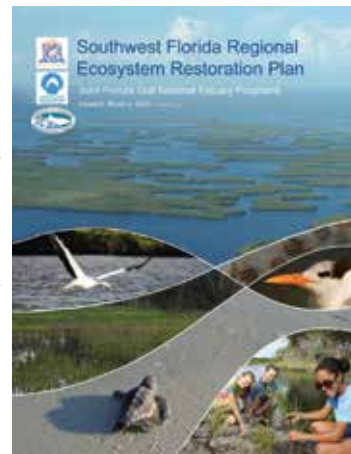
- Completed map of 1950s-era benthic resources (organisms that live at the bottom of the water) and a detailed map of Charlotte County and Eastern Manatee County's Pre-Development Vegetation from 1840 General Land Office Survey notes. Coupled with additional pre-development vegetation mapping by our partners, we now have a better understanding of our natural world.
- With a better understanding of the nature of the Charlotte Harbor estuaries and watershed, seagrass and water clarity targets were set.
- Completed a seven-county Charlotte Harbor watershed report after compiling new research for area pollutant loads (pollutants present in an environment).
- Armed with seagrass targets and pollutant load data, worked with the Tampa Bay Estuary Program (TBEP) and Sarasota Bay Estuary Program (SBEP) to recommend estuarine numeric nutrient criteria

(lists nutrients such as phosphorus and nitrogen and the amount to be allowed). Recommendations were incorporated directly into the Florida Department of Environmental Protection's rule and approved by the U.S. Environmental Protection Administration.

- Urban fertilizer ordinances tailored to southwest Florida conditions were adopted by every coastal city and county. Coupled with implementation of agricultural best management practices and government-sponsored restoration projects, we are certain we will meet our estuarine numeric nutrient criteria.
- Launched the CHNEP Water Atlas ([www.wateratlas.org](http://www.wateratlas.org)), a one-stop-shop for information, news, events, maps, data and analysis concerning water. The water atlas allows us to see recently acquired water quality data in the context of our recommended numeric nutrient criteria, follow-up on acute sources of nutrient pollution and assist in finding partners already solving the problems.

You can probably see how one accomplishment leads to another. This is the power of partnerships.

We have built upon our CCMP update and our success with numeric nutrient criteria recommendations. The CHNEP is working with the TBEP and the SBEP to prepare a Southwest Florida Regional Ecosystem



Restoration Plan. This restoration plan covers the area from Levy County to Collier County to attract Gulf of Mexico-wide RESTORE Act funding to southwest Florida. The source of RE-

STORE Act funding is Clean Water Act fines from the Deepwater Horizon disaster.

Beginning last autumn, the three NEPs called for restoration projects from governments and nonprofit organizations. Requests to support 280 projects for a total of \$3 billion were received. The management committees of the three NEPs have jointly identified 126 priority projects. We have also categorized the projects according to the goals and major actions of the Gulf of Mexico Ecosystem Restoration Strategy. The strategy currently serves as the draft Gulf-wide Restoration Plan. Therefore, we believe our southwest Florida plan has a good chance at incorporation into the Gulf-wide plan.

We are monitoring sequestration talks in Congress. However, decrease in potential federal resources has not slowed us down. I want to thank the thousands of people that have made the NEP model work. In doing so, we are improving our beautiful estuaries and watershed.



## CHNEP Friends

PO Box 2245, Fort Myers FL 33902-2245

[www.CHNEPfriends.org](http://www.CHNEPfriends.org)

The CHNEP enjoys the assistance of the 501(c)3 not-for-profit known as the Friends of Charlotte Harbor Estuary (aka CHNEP Friends).



## Charlotte Harbor National Estuary Program

1926 Victoria Ave., Fort Myers FL 33901-3414

239/338-2556 • Toll-Free 866/835-5785

Fax 239/338-2560 • [www.CHNEP.org](http://www.CHNEP.org)

The CHNEP is a partnership that protects the natural environment from Venice to Bonita Springs to Winter Haven.

Dr. Lisa B. Beever, Director • [lbeeve@swfrpc.org](mailto:lbeeve@swfrpc.org) | ext 235

Liz Donley, Contracts & Grants Mgr • [ldonley@swfrpc.org](mailto:ldonley@swfrpc.org) | ext 234

Maran Hilgendorf, Communications Mgr • [mhilgendorf@swfrpc.org](mailto:mhilgendorf@swfrpc.org) | ext 240

Judy Ott, Program Scientist • [jott@swfrpc.org](mailto:jott@swfrpc.org) | ext 230

## Harbor Happenings Spring 2013: Volume 17, Issue 1

The CHNEP publishes this free quarterly magazine in cooperation with the CHNEP Friends to provide information about the environmental "happenings" in the CHNEP study area. News items, photographs and letters are welcome and may be submitted to the editor by mail or email. Deadlines are February 1, May 1, August 1 and November 1. The magazine is typically distributed in January, April, July and September.

The views expressed herein are those of the authors and do not necessarily reflect the views of the CHNEP Friends or CHNEP or its cooperating agencies and associations. The mention of trade names or commercial products does not constitute, in any way, an endorsement or recommendation for use.

**Request a free subscription by contacting the editor.**

**EDITOR/DESIGNER:** Maran Hilgendorf, [mhilgendorf@swfrpc.org](mailto:mhilgendorf@swfrpc.org)

**CONTRIBUTORS:** Naomi Avissar, Jim Beever, Lisa Beever, Paul Brooke, Missy L. Christie, Amy Clifton, Kevin T. Edwards, Eva Furner, Linda Gallo, Jim Glenn, Whitney Gray, David Green, Maran Hilgendorf, Miguel Hnatow, Jacob Kalena, Doug MacGregor, Don Parsons, Jack M. Payne, Divya Ravinder, John Ryan, David C. Scott, Linda Soderquist, Nancy Stoner, Janice Sylvain, Terry A. Tattar, Mike Wessel







From left: Judy Ott with CHNEP, Jon Iglehart with FDEP, Nancy Stoner with EPA, Kim Stoner (seated), Melynda Brown and Heather Stafford with Charlotte Harbor Aquatic Preserves, Tom Palmer with The Ledger, Lisa Beever with CHNEP and Don McCormick with CHNEP Policy Committee. Photo by Maran Hilgendorf.

## Celebrating the 25th Anniversary of the National Estuary Program, Up Close and Personal

Nancy Stoner, Acting Assistant Administrator, U.S. EPA Office of Water

Last year not only marked the 40<sup>th</sup> anniversary of the Clean Water Act but also the 25<sup>th</sup> anniversary of the establishment of the National Estuary Program, an EPA place-based program to protect and restore the water quality and ecological integrity of estuaries of national significance. Although there have been challenges along the way, we have made significant progress in making our waters fishable and swimmable. The collaborative, partnership-driven and non-regulatory efforts at the 28 National Estuary Program sites across the country have had a special role in implementing the Clean Water Act.

For decades, even before the enactment of the Clean Water Act, Americans have made great strides in protecting the environment and clean water because of governments, groups and individuals working together. The National Estuary Programs have been incredible models of this approach as they have established trust at the local level by promoting a close working relationship among a wide range of partners, and the programs are often recognized as an unbiased broker to achieve commonsense conservation goals.

During my time here at EPA, I've been fortunate enough to see some of this remarkable work in person through a number of visits to National Estuary Program sites, and last December I got a first-hand look at all the great things that are happening at the Charlotte Harbor National Estuary.

I accompanied state and local officials on a boat tour around the Harbor's Matlacha and Pine islands, just a few miles west of Fort Myers. Charlotte Harbor is a popular destination for bird and wildlife watching, and now I understand why. We saw bald eagles, osprey, manatees, egrets, herons and brown and white pelicans. I was equally impressed with the wide variety of programs our partners have under way, which include efforts to preserve and protect mangroves, aquatic preserves, seagrasses and wetlands.

Most of these programs are on track to achieve their goals, all while population and development in the watershed are on the rise—a sign that protecting the environment and growing the economy can

complement one another. Some challenges still remain in the Charlotte Harbor area, such as stormwater discharges, nutrient pollution and pathogens affecting water quality, but the strength of the partnerships I witnessed last month made me confident that these issues can be addressed collaboratively and with sustainable outcomes.

Charlotte Harbor was designated an “estuary of national significance” in 1995. The Charlotte Harbor National Estuary Program (CHNEP) uses a collaborative decision-making process to protect estuaries and their watersheds from Venice to Bonita Springs to Winter Haven. The partnership of citizens, elected officials, resource managers and commercial and recreational resource users are working to improve the water quality and ecological integrity of the CHNEP study area. A cooperative decision-making process is used by the CHNEP to address diverse resource management concerns in the 4,700-square-mile study area.

CHNEP activities are guided by the *Comprehensive Conservation Management Plan*. This plan was first adopted in 2000. It was updated and adopted again in 2008 and 2013. The plans are available as PDF files from [www.CHNEP.org/CCMP.html](http://www.CHNEP.org/CCMP.html).



**Join us.** The Charlotte Harbor National Estuary Program (CHNEP) is a partnership working to protect the natural environment of Florida from Venice to Bonita Springs to Winter Haven. The CHNEP offers programs to help its partners in their efforts to protect the natural environment and to fulfill the CHNEP management plan. The CHNEP is pleased to invite you to . . .

## CHNEP Environmental Education

Friday, Sept. 6, 2013

Mote Marine Laboratory (1600 Ken Thompson Parkway, Sarasota)

The CHNEP is holding its next environmental education program for everyone with an interest in environmental education in southwest Florida. This program is an opportunity to network, collaborate, brainstorm and learn from many experts. Sessions cover Manatee County's little free libraries, incorporating new media into environmental education, embracing the digital frontier, National Weather Service Weather-Ready Nation, Florida's environmental literacy plan and more. To learn more and to register (by Aug. 30) for this free workshop, go to [www.CHNEP-enved9-6-13.eventbrite.com](http://www.CHNEP-enved9-6-13.eventbrite.com).

## CHNEP Conservation Lands Workshop

Thursday, Sept. 26, 2013

Charlotte Harbor Event & Conference Center (75 Taylor Rd., Punta Gorda)

The CHNEP is holding the second annual workshop for everyone interested in conservation lands. Thanks to Mosaic, CF Industries, Charlotte County and Charlotte Harbor Event & Conference Center for sponsoring this workshop. To learn more and to register (by Sept. 19) for this free workshop, go to [www.CHNEPConservationLands2013.eventbrite.com](http://www.CHNEPConservationLands2013.eventbrite.com).

The keynote speaker is Dr. William J. Mitsch, a prize-winning wetland scientist with an international reputation in ecological engineering and wetland ecology. He has conducted studies at wetlands around the world to measure carbon dioxide accumulated from the atmosphere and stored in the soil—a natural process known as carbon sequestration. He holds the Juliet C. Sproul Chair for Southwest Florida Habitat Restoration and Management at FGCU and is director of its Everglades Wetland Research Park. Mitsch joined FGCU in October after 27 years at The Ohio State University where he was Distinguished Professor of Environment, Natural Resources and Ecological Engineering. He is the co-winner of the 2004 Stockholm Water Prize for lifetime achievements in the management and conservation of lakes and wetlands.

*Amelia, a first-grade student at The Sanibel School, loves wildlife and nature. While at "Ding" Darling Days, she learned about estuaries from the CHNEP and then received her own binoculars. Photo by Linda Gallo.*



## Project Design and Evaluation Training

Tuesday-Wednesday, Dec. 10–11, 2013

Venice Community Center (326 Nokomis Ave. S.)

The CHNEP is pleased to host this instructor-led course that provides resource management professionals with the knowledge, skills and tools to design and implement projects that have measurable impacts on the target populations they want to reach. This interactive curriculum can help participants increase the effectiveness of their projects by applying instructional design theory to the project's design. Instructional design allows participants to adapt and "adjust as you go" as they evaluate the success of their projects. It also helps build in accountability, reveal assumptions, create a targeted effort, think strategically and better articulate the impacts of the project on the issue. The training is offered through the generosity of NOAA Coastal Services Center, who is teaching the course, and Sarasota County, who is providing the facility.

Visit [www.chnep-pde.eventbrite.com](http://www.chnep-pde.eventbrite.com) to register and pay the \$40 registration fee. Refreshments and lunches will be provided. If you wish to attend but are unable to pay the fee, please contact [mhilgendorf@swfrpc.org](mailto:mhilgendorf@swfrpc.org).

## CHNEP Meetings and Events

The CHNEP partnership is guided by its Management Conference of four committees. The Policy Committee establishes general policies and goals for the Program and executes ultimate authority in program administration. The Management Committee develops and reviews work plans, funding requests, work products and other activities. The Citizens Advisory Committee (CAC) provides a mechanism for citizen input and helps develop and promote public information and education programs. The Technical Advisory Committee (TAC) is the scientific and technical voice of the program.

All meetings are open, but the public is encouraged to join the Citizens Advisory Committee. Membership is open to all who are interested in protecting the natural environment bounded by Venice, Estero Bay and Winter Haven.

These dates are tentative. Confirm dates and obtain locations and agendas at [www.CHNEP.org](http://www.CHNEP.org). Additional meetings and events are also posted on this website, as are grant deadlines.

<b>CHNEP 2014 Calendar entries due</b>	<b>July 15</b>
Technical Advisory Committee (TAC)	July 25
<b>CHNEP 2014 Calendar entry selection</b>	<b>August</b>
Management Committee	August 2
Citizens Advisory Committee (CAC)	August 7
Policy Committee	August 19
<b>Public Outreach Grant applications due</b>	<b>September 4</b>
<b>Environmental Education Network</b>	<b>September 6</b>
<b>Conservation Land Conference</b>	<b>September 26</b>
Technical Advisory Committee (TAC)	October 10
Citizens Advisory Committee (CAC)	October 16
Management Committee	November 1
Policy Committee	November 15
<b>Charlotte Harbor Nature Festival</b>	<b>November 23</b>



## CHNEP Calendars: Images now sought for 10th calendar!



The CHNEP is now working on its tenth calendar! Thanks to the generosity of many, the first nine calendars depict the beauty and diversity of the natural environment of southwest Florida and they have helped many better understand that environment.

### You can have your artwork published.

Have you captured an image of the beauty of the native, natural environment? The image could have been captured today or 50

years ago in any medium (photography, oil, illustration, etc.) within the CHNEP study area (see map). Whether you are young or old, professional or amateur, you may submit up to three (3) digitized entries for consideration by the people within the region for inclusion in the CHNEP 2014 calendar.

**To enter, complete the release form and submit your images by 5 P.M., July 15, 2013. There is no fee to enter images.**

There are two ways to submit a release form: (1) Complete the online form at [www.surveymonkey.com/s/CHNEP2014calendar](http://www.surveymonkey.com/s/CHNEP2014calendar). If you can, please complete this online form. This form does not allow you to transmit images. (2) Mail a completed printed form, which is available in the 2013 calendar and on the website. This release form allows the CHNEP to use the entries in the calendar and other materials.

There are two ways to submit your images: (1) Email your images to [mhilgendorf@swfrc.org](mailto:mhilgendorf@swfrc.org) with “2014 calendar” in the subject line. (2) Burn your images to a CD and mail to: CHNEP Calendar Art Contest, 1926 Victoria Ave., Fort Myers, FL 33901-3414. Please write your name and “2014” on the face of the CD.

**You can help select images for the calendar.** In August, please go online to select images you would like included.

**The calendar will be mailed** free to every person who is a *Harbor Happenings* subscriber by Sept. 13, 2013. It will also be available for pick up at nature centers, libraries and other locations in the CHNEP study area.

The calendars are made possible because of donors, sponsors and the CHNEP’s financial partners. All who provide \$100 or more by August 1 will be acknowledged in the 2014 calendar.

More guidance is posted at [www.CHNEP.org/calendars.html](http://www.CHNEP.org/calendars.html) and can be found in the 2013 calendar.



The CHNEP study area includes Charlotte, DeSoto, Hardee and Lee counties and portions of Highlands, Manatee, Polk and Sarasota counties.

### Ten years of images:

We’d like to celebrate the first 10 calendars by sharing the images in other ways—but always acknowledging those who created them. One idea is to create a service such as the U.S. Department of the Interior’s America’s Great Outdoors Tumblr program (<http://americasgreatoutdoors.tumblr.com/>). Let us know if you’d value a similar outreach effort for our own amazing images of southwest Florida.

## What do you recommend? (See pg. 16)

The CHNEP is implementing changes to better serve you and to manage costs. Changes include:

- Those who have been receiving mailings since before 2009 will receive a special edition of the summer issue (the next issue) instructing them to renew their subscription to continue receiving *Harbor Happenings* and the calendar. Renewals can be done at any time after July 1 but the renewal must be received by Sept. 13 to receive the 2014 calendar in the mail. The special edition of the summer issue will only be sent to those who will be required to renew their subscription. (We’re not yet certain, but eventually we expect subscribers will be asked to renew their subscriptions every two or three years.)
- The online subscription form will allow subscribers to provide multiple addresses and indicate which issues they want sent where.
- While each issue will continue to be available as a PDF file from [www.CHNEP.org](http://www.CHNEP.org), we will also be able to provide it by email. However, the calendar will *only* be mailed to those who receive the magazine through the mail. The calendar will continue to be available for pick up at libraries, nature centers and other locations.

The most productive ways of reaching audiences in southwest Florida through social media are still being considered. Please email your recommendations to [mhilgendorf@swfrc.org](mailto:mhilgendorf@swfrc.org). If you prefer, mail your recommendations to: CHNEP Outreach, 1926 Victoria Ave., Fort Myers, FL 33901-3414. We’d like your recommendations on how best to communicate with you, but also we would appreciate samples you admire of how others handled this, as well as software programs you know might be helpful.

The CHNEP hopes to implement changes to reach more people in ways they prefer—all while maintaining costs. *Thank you* for your time and guidance.



## Alligator versus Crocodile

The response to the CHNEP-commissioned Estuaries of Southwest Florida poster included in the last issue of *Harbor Happenings* has been very positive. Some people, though, have asked why crocodiles were included and not alligators. It's true that alligators are much more common in southwest Florida, but it is crocodiles that prefer estuaries.

Alligators and crocodiles belong to a group of reptiles called crocodylians. Crocodylians are the largest of the living reptiles and have the most complex behavior. They are considered by many to be "living fossils" because they lived 200 million years ago.

Both species are ectothermic—they control their body temperature by basking in the sun or moving to areas with warmer or cooler air or water temperatures. SOURCE: <http://myfwc.com/wildlifehabitats/>



### American Crocodiles *Crocodylus acutus*

Photo by Don Parsons, [www.natureinmypocket.com](http://www.natureinmypocket.com).

The American crocodile is listed as an endangered species by the United States and the state of Florida. Despite protection efforts, the population of the crocodile in south Florida has remained small.

American crocodiles are a shy and reclusive species. They prefer coastal, brackish and saltwater habitats and are grayish-green in color. Crocodiles have more tapered, triangular-shaped snouts, and the fourth tooth on either side of the lower jaw is exposed when the mouth is shut. The back and tail of a young crocodile is marked with dark crossbands.

Crocodiles can sometimes be seen with their mouths open, or "gaping," to help regulate their body temperature.

Male crocodiles rarely exceed 14 feet and breeding females are 8.2 to 12.8 feet long. Courtship occurs in late January and February and peaks six to eight weeks before nesting. Females build mounds or holes and deposit 20 to 60 eggs in late June or early July. Hatching occurs in late July or early August. Because eggs can't survive flooding for more than 12 hours, they must be elevated on well-drained sites that are near high salinity water (80% seawater or 29 ppt).



### American Alligator *Alligator mississippiensis*

Photo by Jacob Kalena.

American alligators live in the southeast United States in freshwater lakes, slow-moving rivers, associated wetlands and sometimes brackish water habitats. They are darkly colored and have broad snouts. The tail of a young alligator is marked with bright yellow stripes and blotches. They are most active when temperatures are between 82° to 92°F. Nearly all alligators become sexually mature by the time they reach 7 feet in length. It may take a female 10–15

years and a male 8–12 years to reach these lengths. Courtship begins in early April and mating occurs in May or June. Females build a mound nest and deposit 32 to 46 eggs in late June or early July. Hatching occurs in late August or early September. Only an estimated 15 will emerge as hatchlings. Only five are estimated to live to one year. Only four are expected to reach maturity (6 feet in length). Their average life span is 50 years.





John Ryan with Sarasota County Environmental Utilities explains the value of estuaries for the natural environment, for people's health, for developed infrastructure and for the business community. This interview was held at Venice Inlet.

## CHNEP Citizens Academy: An exciting new way to learn

So many people have expressed a desire to learn more about southwest Florida's amazing natural environment. The CHNEP is now developing a multimedia Citizens Academy to help provide a solution. This will be a free e-learning website that will, among other things, include videos of experts to either help explain difficult issues or to encourage people to continue learning and doing more. The Academy is anticipated to be self-paced and available on the learner's schedule. The Academy may also include printed documents, social media and workshops.

The first phase will be completed by October and will include information on some of the basics of why the natural environment of southwest Florida is so different than what is found elsewhere. Experts on weather, climate change, aquifers, estuaries, watersheds, wetlands, water, conservation lands, environmental literacy and more have generously agreed to be interviewed for these videos. Other experts provide inspiration and motivation.

It's our hope that the CHNEP Citizens Academy will continue to expand to cover additional aspects of the natural environment. Please send any suggestions for other topics you think should be covered, resources you value and similar sites that should be incorporated as part of this Citizens Academy to [mhilgendorf@swfrpc.org](mailto:mhilgendorf@swfrpc.org).

This project will help citizens be more informed and empowered to protect the natural environment of southwest Florida — and more connected to the CHNEP.

## Do you have a song to share about our natural environment? Entries sought for CHNEP Song Contest

It doesn't take much prompting for people to recall *Suwannee River*, the official state song of Florida since 1935. The state's official anthem was designated in 2008—*Florida, Where the Sawgrass Meets the Sky*—after a contest that received 243 submissions.

Have you written and performed a song that captures the beauty or issues of the natural environment of southwest Florida (as defined by the CHNEP)? The CHNEP would like you to submit your songs for use on the CHNEP Citizens Academy and elsewhere. Prizes up to \$600 will be awarded.

The rules are simple. Each person may submit up to three entries by Aug. 1, 2013, either electronically to [mhilgendorf@swfrpc.org](mailto:mhilgendorf@swfrpc.org) or by mail to: CHNEP Songs, 1926 Victoria Ave., Fort Myers FL 33901-3414.

There is no fee to enter. This contest is open to amateur and professional songwriters of any age. You retain ownership of the songs submitted. By entering this contest, you are allowing the CHNEP to use the songs in its

materials and at events and allow others to perform your song for CHNEP purposes. You will be asked to perform at select events.

The songs must be original but can be of any genre and must be two to ten minutes long. An entry consists of a (1) digitized audio performance, (2) a lyric sheet or sheet music and (3) an entry form available at [www.CHNEP.org/songs.html](http://www.CHNEP.org/songs.html). A music video may be submitted but is not required to participate. The song writer can have others perform the song. There is no requirement as to when the song was written or recorded.

The winning entries will be selected by the CHNEP Citizens Advisory Committee in August. Submissions are judged on lyrics, likeability, creativity, originality, melody and arrangement. Production/recording quality and vocal ability may also be considered.

The CHNEP will email all entrants to confirm their entry was received and to announce the entries selected for recognition. Get your foot tapping!



**Least terns** are small yellow-billed birds with white “foreheads.” They nest in colonies on beaches and frequently nest on rooftops as well. *Photo by Eva Furner.*



**Wilson's plovers** have thicker beaks than other plovers. They may pretend to be injured in an attempt to lead you away from their nest. *Photo by Missy L. Christie.*



Snowy plovers. Photo by Miguel Hnatow.

## Share the Beach with Beach-Nesting Birds Their survival depends on you!

The snowy plover, Wilson's plover, American oystercatcher, black skimmer and least tern lay their eggs and hatch their young on beaches and spoil islands. Loss and degradation of habitat are major threats to the shorebirds' survival, with their nesting areas becoming fewer and more fragmented. Because of their declining numbers in Florida and habitat loss, these beach-nesting birds qualify for listing as state-threatened species. It is a violation of state and federal laws to harass or take any endangered or threatened birds, their eggs or young.

**Each nest is critical.** Populations of beach-nesting birds are declining because of significant modification and disturbance of beaches due to human activities. The fate of each delicate nest is truly critical to the survival of these birds. By being a responsible beach-user, you can help beach-nesting birds and their young survive.

**Disturbance threatens survival.** When birds are chased or disturbed, they use energy they need to reserve for nesting and migration. Many shorebirds and seabirds nest on the open beach where they lay eggs in shallow scrapes in the sand. The nests





**American oystercatchers** have long red beaks that they use to dig for prey. They often return to the same nesting area each year. *Photo by Jim Glenn.*



**Black skimmers** nest in colonies. Their large orange and black beaks are used to skim the water's surface for prey. *Photo by Eva Furner.*



**Snowy plovers** are small, pale birds with short beaks. Snowy plover chicks begin to forage on their own just hours after hatching. *Photo by Paul Brooke.*

are so well camouflaged that they can be accidentally trampled by unsuspecting beachgoers. When beach-nesting birds are forced to fly or run from their nests, their eggs and chicks are left vulnerable to the elements and to predators. Disturbances that cause birds to take flight or leave their young may threaten their survival.

## You can help. While enjoying the beach, take these simple steps:

- **Keep your distance.** If birds become agitated or leave their nests, you are too close. A general rule is to stay at least 300 feet from a nest.
- **Respect posted areas.** Avoid posted nesting and nesting areas and use designated walkways.
- **Never intentionally force birds to fly.**
- **Keep pets away from nesting areas.** Even well-behaved pets can be perceived as a threat to birds and will disturb them. If you take pets to the beach, keep them leashed and away from nesting areas. Dogs are prohibited within the Critical Wildlife Areas, even in areas open to pedestrians.
- **Keep the beach clean.**
- **Do not feed wildlife.**
- **Spread the word.** If you see people disturbing nesting birds, gently remind them how their actions may hurt birds' survival. If they continue to disturb nesting birds, please call and report their activities to FWC's Wildlife Alert hotline at 888/404-FWCC (3922).



- **Volunteer** with your local shorebird partnership. Visit [FlShorebirdAlliance.org](http://FlShorebirdAlliance.org) to learn more and get involved.

REPRINTED in part from Florida Fish and Wildlife Conservation Commission (FWC) material with assistance from Amy Clifton and Naomi Avissar.

Photographs of birds were submitted to CHNEP for its calendars. Other photographs provided by FWC.

**B**irds may try driving you away by calling out loudly and dive-bombing you. Some species may present to have a broken wing (see photo above) to lure your attention away from a nest. When adult birds are actively defending their nests and chicks in these ways, they can't protect eggs and chicks from the hot sun. The defensive actions may also attract the attention of predators such as herons or crows. As you leave, please keep a close eye on the ground for eggs or chicks that may be hidden in your path.



## A 25-year look back at major 1988 black mangrove die-off on Cape Haze

Terry A. Tattar, University of Massachusetts, and David C. Scott, Marine Forest Research Inc.

Recent findings of shoreline position changes in Charlotte Harbor (see Spring and Fall 2012 issues of *Harbor Happenings*) would suggest that black mangrove (*Avicennia germinans*) forests are especially at risk for die-off from flooding events associated with rising sea levels. Black mangroves typically occupy the upper reaches of the mangrove forest where the tide levels only cover their root systems for short intervals each day. If their aerial roots, known as pneumatophores, are inundated for extended periods from a flooding event, the root system of the black mangrove tree will not receive the needed oxygen to survive.



ABOVE: David Scott measures the salinity of substrate pore water.

BELOW: Aerial view of the mangrove die-off on Cape Haze in 2002. The gray trunks of dead black mangroves are trees that had been completely inundated.



We have followed a die-off of nearly 30 acres on the Cape Haze peninsula in Charlotte County that occurred after record high sea levels were recorded from Hurricane Keith in November 1988. Aerial photographs taken before Hurricane Keith showed a normal, healthy coastal mangrove community on the Cape Haze peninsula, with the inland sections of the forest dominated by black mangroves. After extensive coastal flooding following Keith, a large kidney-shaped die-off of the interior mangrove forest appeared in 1989 aerial photographs. The Cape Haze mangrove die-off was unique, due to its size. In contrast to many other black mangrove die-offs in southwest Florida, it was not caused by human activity. It seemed like an ideal site to conduct a long-term research study to follow the recovery process of a black mangrove die-off.

In 2000, we established a 50-meter transect grid of observation sites over the entire die-off area. We found that almost the entire die-off area remained inundated for most of the year. However, during the spring dry season, the die-off area can briefly dry out, resulting in a fractured substrate of spongy mangrove peat. Once the living mangrove cover was lost, the underlying peat substrate had shrunk and subsided, resulting in a depression over the area that had previously been a black mangrove forest. In 2000, the recovery process had begun only on the margins of the die-off where seedlings of red mangroves (*Rhizophora mangle*) could become established in the shallow sections of the die-off. Since 2000, we have monitored the growth and spread of the red mangroves, which have progressively advanced into the die-off. In areas of the die-off that were not continually flooded, saltwort (*Batis maritima*) ground cover has become

established and a mixture of red mangrove and black mangrove seedlings are growing. However, many of the surviving black mangrove trees on the perimeter of the die-off exhibit sparse foliage and crown dieback.

Our study is still ongoing and we predict that, although the recovery of the Cape Haze die-off is progressing slowly, it will eventually result in a mangrove forest over the die-off area. However, the composition of the new mangrove forest will likely be much different than what existed before Hurricane Keith. Red mangroves will be the main component of the new mangrove forest. As sea level rise causes shorelines to continue to move inland in southwest Florida, the black mangrove forests will be at increasing risk from an increasing frequency of storm flooding. One only has to look at the eastern shoreline of Charlotte Harbor to see mangrove islands that are awash at most high tides and are dominated by red mangroves.





## Salt marshes of the CHNEP region

James (Jim) Beever, Southwest Florida Regional Planning Council

Most land use and land cover maps of the CHNEP region show salt marsh as one type. This hides the biodiversity and functions of different salt marshes.

For the first time, from 2010 to 2012, the extent and nature of salt marshes and the adaptation of salt marshes to climate change in the CHNEP study region were studied. *The Climate Change Vulnerability Assessment and Adaptation Opportunities for Salt Marsh Types in Southwest Florida* report includes the results of an inventory of types and areal extent of salt marsh types.

The CHNEP subtropical climate supports a diverse community of both tropical and temperate flora, creating different salt marsh communities than those typically found in southeast Atlantic and northern Gulf of Mexico. South Florida salt marsh vegetation is often intermixed with mangroves.

Based upon tidal and landscape position, there are two major types of salt marsh in the CHNEP. High marshes cover 10,457.56 acres (70.4%) and fringing marshes cover 4,398.54 acres (29.6%).

While five types of salt marsh in Florida are recognized in literature, this study and field work identified 12 types of salt marsh in the CHNEP region of southwest Florida, which include (1) smooth cord grass, (2) marsh dominated by black needlerush, (3) marsh dominated by leather fern, (4) marsh dominated by salt-marsh bulrush, (5) high salt marsh-mangrove transition with a black mangrove shrub layer, (6) high marsh algal marsh lacking vascular plants, (7) high marsh saltern (salt pan, salinas, white zone), (8) high marsh dominated by succulents, including glasswort and saltwort, (9) high marsh mixed vegetation herbaceous, (10) high marsh dominated by salt grasses, key grass, knot grass, (11) high marsh with a

*Saltern high marsh flanked by shrub black mangrove. Cape Haze, Charlotte Harbor Preserve State Park. Photo by Whitney Gray, March 8, 2012.*

shrub layer of buttonwood, saltbush and marsh elder, and (12) a special type of high marsh found on barrier islands dominated by Baker's cord grass and leather fern.

The classic zonation of low and high marsh are confused by the wide range of occurrence of salt marsh species, such as black needlerush, that range over 3 1/2 feet of relative elevation of sea level, essentially spanning the full range of low to highest marsh.

The Fall 2012 issue of *Harbor Happenings* provides more information about the findings in this study. The report is available as a PDF file from [www.CHNEP.org](http://www.CHNEP.org).

*Herbaceous high marsh with saltern and shrub black mangrove in the background. Estero Bay Buffer Preserve State Park. Photo by Whitney Gray, Feb. 21, 2012.*



# “A Journey Down the Corkscrew Watershed” Interactive Smartphone-Ready GIS Map

David Patrick James Green, Florida Gulf Coast University Department of Marine and Ecological Sciences

Imagine if student projects had more value than just a letter grade! In today’s classroom, not only is this possible, but it is vital for our students and for the surrounding communities. Students need real-world experiences to enhance their skills, and community partners need all the help they can get to complete projects during these days of budget cuts and shortfalls. Now, more than ever, environmental education needs its community and the community needs environmental education. Students at Florida Gulf Coast University are creating a smartphone-ready GIS (geographic information systems) map of the Corkscrew watershed for their service-learning projects. Courses are being redesigned to follow the Science Education for New Civic Engagements and Responsibilities

(SENCER—[www.sencer.net](http://www.sencer.net)) approach to pedagogy, the science and art of education. SENCER-ized courses connect academic content to students’ daily lives by embedding civic engagement opportunities into the course expectations. “Environmental Biology: Ecosystems of Southwest Florida” is a popular general education class for nonscience majors that features experiential learning, field excursions and integrated lab sessions. In this class, students across multiple semesters have been creating an interactive map of a local watershed for public use that showcases nature trails, site features, educational videos and ecological data.

Some classes focus on a “Guiding Question” that everything the students do in the course relates to: *How can tomorrow’s generations of all inhabitants in southwest Florida continue to benefit from the natural goods and services a healthy coastal watershed provides by better understanding our role as citizens today?*

Students must understand:

- A working definition of environmental sustainability.
- The ecology of a coastal watershed and human benefits/influences.
- The importance of civic engagement.
- The connectedness of these main concepts with their daily lives and decisions.

During “Journey Down the Corkscrew Watershed” classroom sessions, students follow the path of water by visiting trails at CREW Land and Water Trust, Corkscrew Swamp Sanctuary, Bonita Nature Place and Barefoot Beach Preserve. Students relate civic engagement opportunities to both the “Guiding Question” and to course content, while simultaneously giving back to the same organizations that already provided so much to them!

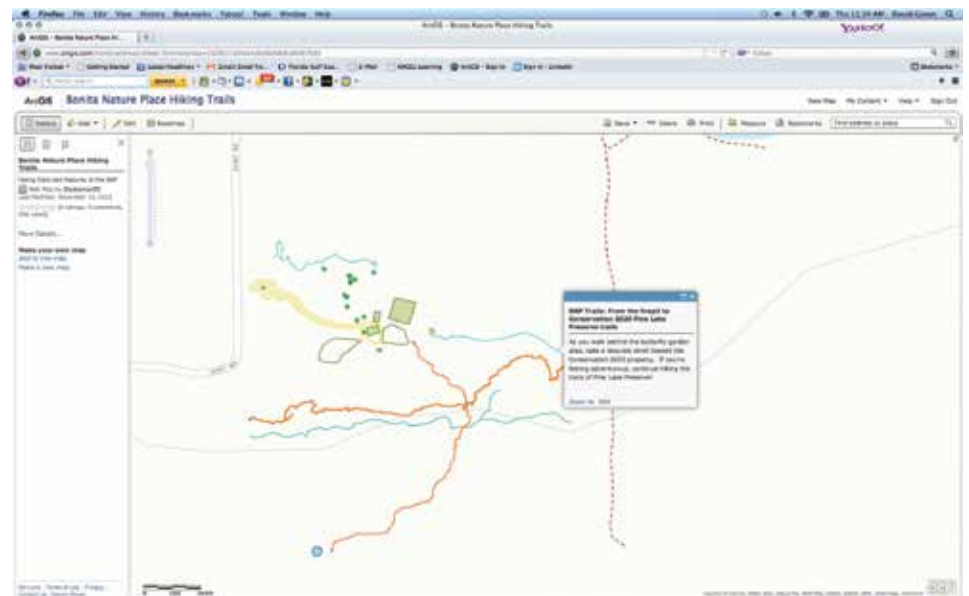
With a prototype interactive map already created, this project is now ready to scale-up to a regional level, and more community partners are sought. Future goals of the overall project include adding more sites by growing regional partnerships, adding improved datasets for public visualization and creating opportunities for citizen science/observations. If your organization is interested in connecting with student service-learning projects and adding to the interactive map, the following projects can be completed:

- Ground truth with handheld GPS units.
- Create educational content and videos.
- Assist with field data collections.
- Add your information to our interactive map.
- Perform service projects that benefit your organization.

Please contact David Green ([dgreen@fgcu.edu](mailto:dgreen@fgcu.edu)) for more information.



ABOVE: Students conduct service-learning projects in the field and in the GIS facility at Florida Gulf Coast University. RIGHT: This screenshot of the interactive map shows how layers become available and visible for public use. This information is also smartphone-accessible for easy viewing.





## CHNEP recognizes students for their research presented at local science fairs

The Charlotte Harbor National Estuary Program presented its third year of science fair awards. Students from grades 6 to 12 design a learning experience in an area of personal interest — one that allows for innovation, just as scientists do in the real world.

The CHNEP recognizes students whose science fair projects help implement the CHNEP *Comprehensive Conservation and Management Plan*, a 20-year plan to protect the environment from Venice to Bonita Springs to Winter Haven. This plan identifies four problems that affect the health of the environment: water quality degradation, hydrologic alterations, habitat loss and stewardship.

The students must reside in Charlotte, DeSoto, Hardee, Lee, Manatee, Polk or Sarasota counties. These students participate in one of five local science fairs. Students recognized receive a \$100 cash award and are invited to submit an article for the CHNEP website.

Divya Ravinder, freshman at IB at Bartow High School, was selected to receive recognition from CHNEP for *Simply ecoLogical*. She researched ways to create an economical, natural and indigenous filter to significantly reduce the nitrogen and phosphorus content, increase the dissolved oxygen content and reduce the fecal coliforms from industrial wastewater.

In the first phase, industrial wastewater was passed through each of three filters and all of their combinations. Samples of the control and filtered wastewater were subject to various tests for organic nutrients. The combination of rocks and sand, coal and salt and loadstone were found to significantly reduce nitrogen and phosphorus content from the industrial wastewater.

In the second phase, the filtered wastewater was aerated. One method involved sending the filtered wastewater through a fountain, creating a thin film of water. The other method involved using a blower to blow air directly into the filtered wastewater. The U.S. EPA standards for dissolved oxygen in water bodies (no less than 5.0 mg/L) were met by both aeration methods. However, the blower aeration method was quicker, more effective and raised the dissolved oxygen content closer to the saturation point at that temperature.

In the 2012-13 school year, the CHNEP recognized six students (or teams) for the work presented at each of five science fairs held within the CHNEP study area. Because of the student population, two awards were made at the Edison science fair.

**Thomas Alva Edison Kiwanis Science and Engineering Fair** (includes students in Lee and Charlotte counties)

Amanda Podlasek, junior at Canterbury High: *Where Can Citizens Place Settling Communities That Is Most Effective in Helping Prevent the Effects of Red Tide* (*Karenia brevis*)?

Emma Wynekoop and Jessica Castillo, juniors at Canterbury High: *The relationship Between Nitrate and Nitrite Concentrations and Escherichia coli bacteriophage (E. Coli) Abundance in Environmental Salt Water Conditions*

**Lockheed Martin Manatee Regional Science and Engineering Fair**

Kendall Machee, freshman at Manatee High, for *Phytoremediation using Water Hyacinths*

**Sarasota County Regional Science, Engineering and Technology Fair**

Zelda Blowers and Courtney Dust, seniors at Sarasota High School, for *Restoration of Marine Habitats Through Light Dispersion Methods to Counteract Dock Shading*

**Polk County Regional Science and Engineering Fair**

Divya Ravinder, freshman at IB at Bartow High School, for *Simply ecoLogical*

**Heartland Regional Science and Engineering Fair** (includes students in Hardee and DeSoto counties)

Meagan Shivers, sophomore at Hardee Senior High School, for *The Effects of Biological Additives on Petroleum Remediation Product Powder*

Visit [www.CHNEP.org](http://www.CHNEP.org) to learn more about these students and their projects.



The third phase focused on introducing a new economical, natural and eco-friendly filter to reduce fecal coliform. Turmeric, cinnamon and cloves were chosen. The results showed that cinnamon reduced the fecal coliform colonies the most; but overall, turmeric was most effective in reducing nitrogen, phosphorus and suspended solids, in addition to fecal coliforms.

The information learned from this experiment protects water bodies by increasing the dissolved oxygen content, thereby preventing the formation of new dead zones and possibly reversing existing ones.



## Floridians value water resources, want to conserve

“People in Florida are very interested in conserving water and in maintaining its quality so that it will always be available for life-sustaining uses,” said Alexa Lamm with the University of Florida. “And they’re willing to make sacrifices to make it happen,” according to the results of a University of Florida Institute of Food and Agricultural Sciences water survey.

The survey of some 469 Floridians found that when respondents were asked to assign levels of importance to 16 water-related topics such as “plentiful water for cities” and “clean groundwater,” residents rated having “clean drinking water” most important.

The survey respondents were selected as a demographically representative sample of adult Floridians in the December 2012 survey by the Center for Public Issues Education, or PIE Center. Besides the PIE Center, the UF Water Institute and IFAS’ Center for Landscape Conservation and Ecology helped in the survey’s development.

The survey is the first of what PIE Center officials hope will be four such public opinion

surveys a year, covering topics such as Florida residents’ experience with endangered and invasive species and their perceptions of organic and non-organic foods.

Officials with the PIE Center, part of UF’s Institute of Food and Agricultural Sciences, plan to repeat the surveys each year so that changes in public sentiment can be tracked over time. “Water is, without a doubt, one

of our state’s most critical issues,” said Jack Payne with UF. “As such, IFAS is going to focus a great deal of our research and outreach efforts into trying to ensure that our water resources are preserved and protected. The PIE Center water survey is a giant step in that effort.”

The water survey and results can be found at [www.piecenter.com/water/](http://www.piecenter.com/water/).

The survey produced a number of noteworthy results, among them:

- After clean drinking water (93%), the survey respondents listed having clean beaches (90%), oceans, bays/estuaries (89%), lakes and rivers (89%) as highly or extremely important, followed by plentiful water for industry and commerce (80.5%) and plentiful water for household landscapes (61%).
- Roughly 40% of respondents reported having had a negative water-quality experience, such as poor-quality drinking water, closed beaches, springs, rivers or lakes, and catching fish deemed unfit for human consumption.
- Just over 65% reported willingness to use recycled wastewater for lawn or landscape irrigation (though few said it was an option available to them); nearly 53% said they have low-flow showerheads, nearly 52% have water-efficient toilets, 33% said they use drought-tolerant plants in their gardens, and nearly 19% use rain barrels to collect water for gardening and yard use.

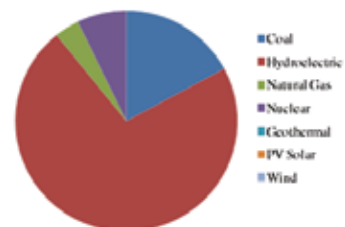
## Hidden uses of water

### It takes water to produce electricity.

Looked at together, the Water Footprint of Electricity in this country is 42 gallons of water—used, withdrawn, consumed and polluted—for every kilowatt hour generated, based on the available published water-use information in 2009. An average U.S. household’s monthly energy use (weighted by cooling technology and fuel mix) requires 39,829 gallons of water, or five times more than the direct residential water use of that same household.

The U.S. Geological Survey reports that 53% of all fresh, surface water withdrawn from the environment for human use in 2005 went to operating our electrical grid. Water behind dams is not included in USGS numbers. The electrical energy used requires massive withdrawals of water from our rivers, lakes and aquifers to cool down nuclear, coal and natural gas power plants. Some of this water is evaporated while the majority is warmed up—causing thermal pollution—killing aquatic life, increasing toxic algal blooms and decreasing the sustainability of our water supplies.

Total U.S. Gallons/MWh



SOURCE: *The Burning Our Rivers: The Water Footprint of Electricity* published by The River Network ([www.rivernetwork.org](http://www.rivernetwork.org)).

## Safely dispose of or secure hazardous materials

The Atlantic hurricane season officially runs June 1 to Nov. 30. High winds can cause damage to buildings, including sheds and garages, and high-rising water can carry hazardous chemicals away, causing environmental damage.

Before a tropical storm or hurricane impacts the area, Floridians should take steps to protect the environment, ensure public safety and limit liability by making certain hazardous materials aren't allowed to seep into the environment.

Storing hazardous materials out of low-lying areas, away from windows and on secured shelving can limit the likelihood of spillage. These materials should be stored in accordance with manufacturer's directions as well as state or federal regulations.

Dispose of excess or expired hazardous material according to manufacturer's guidelines on the container or at a county household hazardous waste facility. Visit [www.dep.state.fl.us](http://www.dep.state.fl.us) to find a facility near you and for waste disposal information.

**Attention to hazardous materials before a storm arrives can help protect your family, property and Florida's environment after the storm passes.**



# Trends in Water Quality Reflect Both Natural and Human Influences

Mike Wessel, Janicki Environmental, Inc. Without good water quality, the health of the entire natural environment suffers. Without monitoring and analysis, how would we know?

The CHNEP is a data-rich environment and a core objective of the CHNEP is to translate the data collected by numerous agencies throughout the watersheds and in the estuaries into actions aimed at protection and restoration. The CHNEP contracted with Janicki Environmental to compile datasets on water quality, rainfall and streamflow throughout the CHNEP and conduct trend analyses to evaluate changes in these important indicators of ecosystem health. The data was obtained from partners throughout the study area with active monitoring programs.

The purpose of the report was to compile data for this extensive area, describe time series trends of these important indicators of environmental condition and report that information in an easily accessible format that can be effectively used by natural resource managers and others as a screening level tool to investigate water quality trends over an expansive area for further investigation since these trends can be due to either natural and human factors. The trends do not constitute direct causal inference with respect to the causes of reported trends. The results support science-based decision-making to identify areas where water quality conditions have improved and identify areas where actions may be necessary to ameliorate degrading conditions such as habitat restoration.

Rainfall analyses results indicated that, over the long-term period of record, there were no significant trends in rainfall. Rainfall varied largely from year to year and in a relatively predictable fashion within each year but without systematic increases or decreases at the CHNEP basin scale. Shorter term trends in rainfall were evident and these trends were likely artifacts of more short-term variations in rainfall associated with natural climatic cycles such as El Niño/La Niña phases, or multi-decadal oscillations in the weather governing climatological patterns.

Stream flow trend analyses indicated that statistically significant trends were prevalent for certain stream flow parameters in many rivers and streams throughout the CHNEP study area. Stream flow changes have occurred in terms of magnitude of flows as well as timing and volume of flows as described by the 32 aspects of the Index of Hydrologic Alteration (IHA). For example, the annual

1 day and 30 day flow maxima in the Estero Bay and Cape Coral area appeared to be increasing, coincident with decreases in the number of low flow pulses.

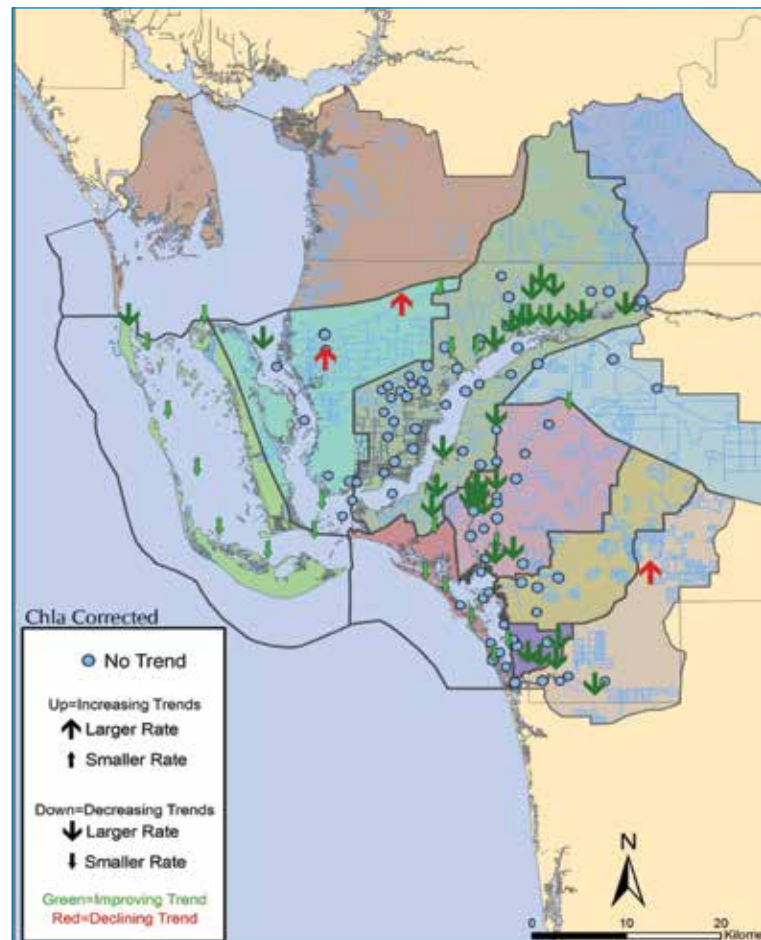
Surface water quality trends were reported by region. In the Myakka River region trends were mostly stable with isolated improving trends in total phosphorus and color. There were a few degrading trends in chlorophyll in the Lower Myakka River basin that were correlated with small increases over time in total kjeldahl nitrogen and increases in bottom salinity. In the Peace River region, there were several stations with increasing salinity and pH trends in the Coastal Lower Peace sub-basin and despite some degrading trends in total kjeldahl nitrogen and total nitrogen, chlorophyll trends were mostly stable. In the Southern Coast region most parameters were stable over time; however, there were a few improving trends including the light attenuation parameter Kd that was found to be improving in the upper segments of

Charlotte Harbor including East Wall, West Wall, and the tidal portions of the Peace and Myakka rivers. This corresponded with improvements in total kjeldahl nitrogen and total nitrogen trends in the same area. There was consistent evidence of improving trends in chlorophyll in the watershed despite some evidence of increasing trends in nitrogen for many of the same stations. Trends in total phosphorus depended largely on which side of the Caloosahatchee River the station was located with improving trends south of the river and degrading trends north of the river.

Together, these results present a great deal of information regarding trends in water quality in the CHNEP basin support-

ing the aims of the CHNEP's *Comprehensive Conservation and Management Plan*. The results of this project aid the CHNEP in promoting the effective long-term management of estuaries whose ecological integrity is potentially at risk due to pollution, development or overuse. The report and appendices can be found on [www.chnep.org](http://www.chnep.org).

The figure below is one of many in the report. It shows trends in chlorophyll *a* in the southern portion of the study area. Chlorophyll *a* is the green pigment found in plants and algae. It tells us how much algae is in the water. Algae are small plant-like organisms that float in the water and use sunlight to grow. Too much algae can cause problems. As algae die, bacteria eat them. This can lower the oxygen in the water since bacteria need oxygen to grow. If there is no oxygen, some of the animals and plants in the water can die. Some algae are poisonous to fish, shellfish and even humans. SOURCE: [www.unc.edu](http://www.unc.edu).



Not receiving *Harbor Happenings* in the mail? Request a free subscription. Visit the website at [www.CHNEP.org](http://www.CHNEP.org) for details.  
Please let us know of any address corrections by sending an email to [mhilgendorf@swfrcp.org](mailto:mhilgendorf@swfrcp.org).

## What do you recommend?

Thank you to those who let us know that you wish the CHNEP to continue publishing *Harbor Happenings* as a free quarterly magazine. Since 1997, the magazine has provided information on the environmental “happenings” in southwest Florida as a tool to educate, inform and motivate. Based on your guidance, the quarterly magazine will continue. See page 5 for changes the CHNEP will implement to better serve you and to manage costs.

As the fishermen looked around they realized their careless actions were having serious consequences... Naturally, they were fit to be tied.

