THE MAGAZINE OF THE COASTAL & HEARTLAND NATIONAL ESTUARY PARTNERSHIP

HARBOR HAPPENINGS

Uniting Central and Southwest Florida to protect water and wildlife

Summer 2020: Volume 24, Issue 2

Water and Public Health

COVID-19 has created an unprecedented global public health crisis, with washing hands as one of the most effective means for protecting oneself — underscoring the continued connection between clean water and public health. The need to restore water quality, water supply and more natural freshwater flows throughout Central and Southwest Florida is more urgent than ever. Learn what CHNEP is doing, and what you can do, to protect this precious life-sustaining resource.

Executive Director Update

Jennifer Hecker

As I wash my hands for what seems like the thousandth time, I am yet again impressed on the importance of water. Never has it been more true that water is indeed life, and that its condition is tied to our health and wellbeing. We were not long ago suffering from the public health impacts of harmful algae blooms in our waterways. Now we use clean water daily in another public health crisis.

When COVID-19 hit, we had a whirlwind of public events scheduled — including our triennial 2020 Watershed Summit. We had to pivot quickly to move it forward, adapting it to a virtual symposium. Our staff moved to remote working with daily team Zoom meetings. We also quickly converted our various committee meetings to online only. It has been a crash course in the latest technologies, but has enabled us to continue to do our work virtually uninterrupted. Many of our contractors are able to continue their field work on CHNEP projects as well.

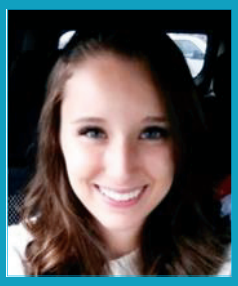
However, this crisis brings new challenges to our collective efforts, with an economic recession and budget cuts that reduce funding for critical water and other natural resource initiatives. It is imperative that the public be informed and engaged, to make sure that the progress made in getting vital water projects off the ground is not halted. Join our efforts by subscribing, signing up to volunteer, or donating at CHNEP.org.

Wishing you safety and good health,

Jennifer Hecker

Welcome to Our New Conservation Associates!

The CHNEP has been pleased the past few years to have the capacity to hire and train new environmental professionals as part of our Conservation Associate paid internship program. These rising senior or college graduates join us to gain real-world experience as full-time members of the CHNEP staff. Immediately preceding COVID, two new interns started with us.



Chelsea Bojewski graduated from the University of Florida with a BS in Integrative Biology & Wildlife Ecology and Conservation. From a young age, she has had a passion for making positive change for the environment and the wildlife within it. Chelsea shares that "Working at CHNEP has been a special and positive learning experience for me that will add to the valuable knowledge needed to reach my goals."

Ellie Noll received her BS in Wildlife Biology and worked as an animal caretaker and educator for 4 years. She then became interested in a career in conservation, so obtained a MS in Conservation Technology. "I applied with CHNEP to gain hands-on experience and have been learning a lot about how projects are funded and managed from beginning to end" Ellie explains, adding that she is really enjoying having the opportunity to help protect and restore wildlife habitat.

CHNEP calendars will be available through subscription only going forward, if you have not already done so, please go to CHNEP.org to "subscribe" today. Not only will you receive our magazines, but also next year's calendar, mailed right to your home free of charge!

Conservation Grants

December 1st is the Winter application deadline for CHNEP Conservation Grants up to $3,000 each! This funding is designed to support community organizations and citizens who wish to undertake activities that implement environmental education or natural resource protection activities outlined in the *Comprehensive Conservation & Management Plan* (chnep.org/our-plan). For more information about how to apply, go to chnep.org/conservation-grants.

New informational resource:
Harmful Algae Bloom Dashboard

The CHNEP recently provided technical assistance and support for the funding to develop a new tool to quantify the economic impacts of harmful algae blooms (HABs), especially red tide. This interactive resource was based on extensive economic data collected from periods of prior harmful algae bloom events in Southwest Florida, and is now publicly available.

This information is beneficial in helping to assess the potential economic impacts of future HAB events, in order to justify investments in HAB avoidance or mitigation measures such as reducing nutrient pollution. The Dashboard user can select different categories to view including overall impact by county or differentiated based on type of economic activity (fishing, property values, restaurants).

Learn more in our fact sheet available at: chnep.org/chnep-fact-sheets. The HAB Economic Dashboard tool can be directly accessed online: datavisual.balmoralgroup.us/GOMA-HABecon.

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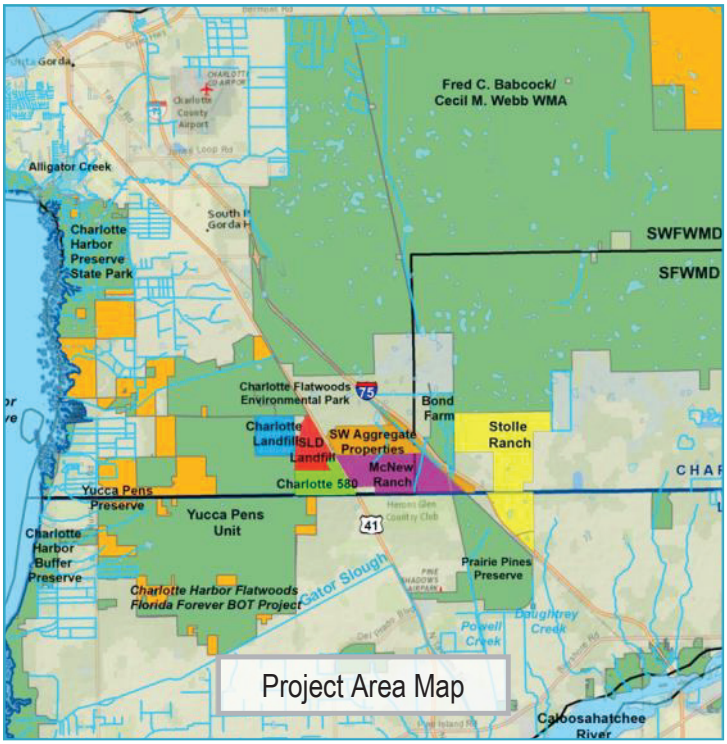
Getting the Water Right

Harmful algae blooms and other water quality problems are often influenced to one degree or another by salinity (the saltiness of water), which can be unnaturally altered when flow is diverted, causing too much or too little freshwater into a downstream waterway or waterbody. In such cases, seagrasses and oysters can become sick and die as salinity goes outside their natural tolerance range. Pollutant concentrations can also increase with less dilution. Therefore, a big factor in "getting the water right" is restoring more natural amounts of freshwater to the rights areas at the right times of year to more closely mimic nature.

In south Charlotte and north Lee Counties, freshwater flows have been diverted by farms, roads, ditches and other man-made changes to the landscape. As a result, the historic sheet flow from the Babcock-Webb Wildlife Management Area (WMA) through the Yucca Pens WMA down to the tidal creeks and into the Charlotte Harbor and Caloosahatchee estuaries has been disrupted. Too much water is impounded upstream, and too little freshwater is making its way to downstream wetlands, waterways, and estuaries.



Project Area Map

In response to this problem, a multi-agency effort with many CHNEP member entities including the Florida Department of Environmental Protection, the Southwest and South Florida Water Management districts, Florida Fish and Wildlife Conservation Commission, the Florida Department of Transportation, Lee and Charlotte Counties, City of Cape Coral, and others was initiated approximately two decades ago.

The Charlotte Harbor Flatwoods Initiative (CHFI) stakeholder group worked to identify the steps and resources needed to create and implement a restoration plan. As a result, a project was developed to gather the necessary data and perform sophisticated modeling to understand how much water was needed, and where and how to move the water safely to those areas in a manner that maintained flood protection while enhancing environmental protection.

Restoration Funding Obtained

After many years of seeking funding for this project, the CHNEP in collaboration with the South Florida Water Management District (who coordinates the CHFI - the larger hydrological restoration effort that this project will support) submitted a proposal to fund the work from monies collected in association with the BP oil spill that are designated for Gulf of Mexico restoration. As a result of the strong broad support for this effort, the CHNEP was awarded this funding through the Florida Department of Environmental Protection, the first Deepwater Horizon NRDA (Natural Resource Damage Assessment) award in Southwest Florida.

The CHNEP is a regional governmental entity and is uniquely positioned to administer these funds to procure services for and project manage the work, due to it crossing multiple water management districts and counties. Some lands needed for restoration have already been purchased by the state on the east side of I-75 to store and redirect flows through the Yucca Pens WMA and into the Gulf of Mexico.

Project Begins

The CHNEP flow restoration planning project began recently, and despite COVID, is proceeding on-time. To date, existing groundwater monitoring wells, stream flow stations, and rainfall gages have been surveyed. Water monitoring devices have been installed to determine which areas are above or below optimum hydroperiods (how long water sits on land) across the entire project area and to provide data necessary to properly calibrate a model of the area; including 24 new groundwater monitoring wells with data loggers, 3 rain gages, and 8 data loggers needed to collect data at existing Babcock Webb manual staff gages. This will capture where water is currently, so it can be compared to information about how water flowed naturally historically for a better understanding of how to restore the current landscape.

One of the groundwater monitoring wells installed to measure water levels in a conservation area.

Installing the groundwater monitoring wells was no easy feat as the Contractor encountered solid rock a few feet deep at the final well location, so a temporary well was installed until the area is dry enough for drilling a permanent deeper well. Monitoring and flow gages are now collecting data at all identified monitoring locations.

Additionally, several freshwater and one tidal stream flow gage were installed. The Contractor has also completed the very time consuming task of gathering existing data being

collected by multiple entities over many years. All of this information will be utilized in the forthcoming modeling.

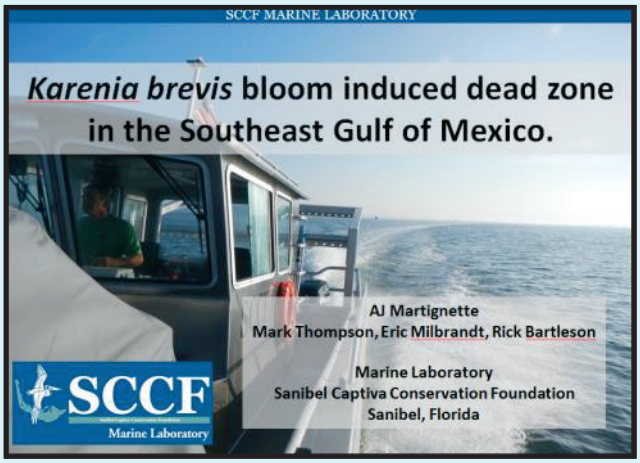
It is anticipated that this project will be completed in 2022, with vetted restoration projects and plans ready to be implemented immediately thereafter.

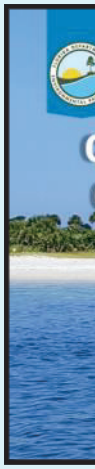
Anticipated Restoration Project Benefits

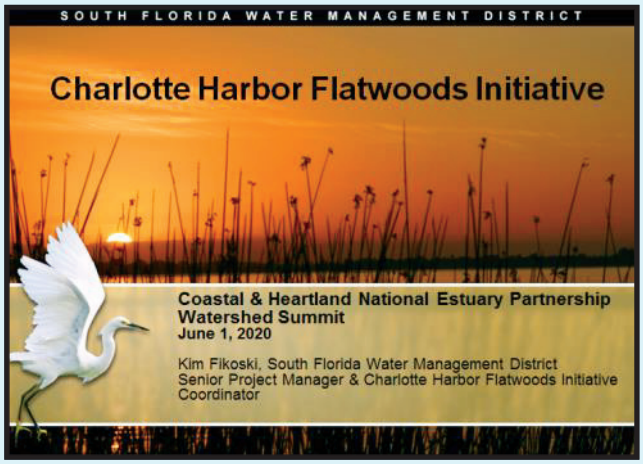
Tidal creeks are primary nursery areas for fisheries, providing food and habitat to numerous species of fish and shellfish including snook, redfish, tarpon and oysters. However, they are not nearly as productive when they do not have appropriate freshwater flows. More natural flows improves water quality and our fisheries, helping all forms of aquatic life.

Rehydrating wetlands increases freshwater retention which replenishes groundwater aquifers used for drinking water and provides base flow in dry season to downstream rivers, canals, and coastal waters when they need added freshwater flows. Keeping wetlands wet and water levels high in the dry season also lowers the risk and severity of damaging wildfires.

For detailed information on this project including data collected and project reports, you can visit: chnep.wateratlas.usf.edu/charlotte-harbor-flatwoods-initiative.



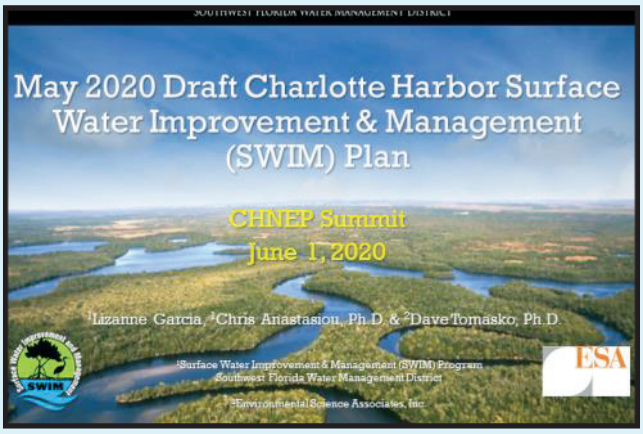


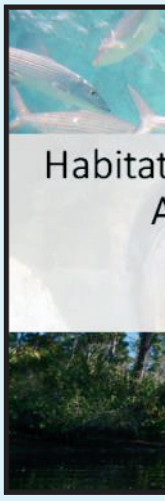


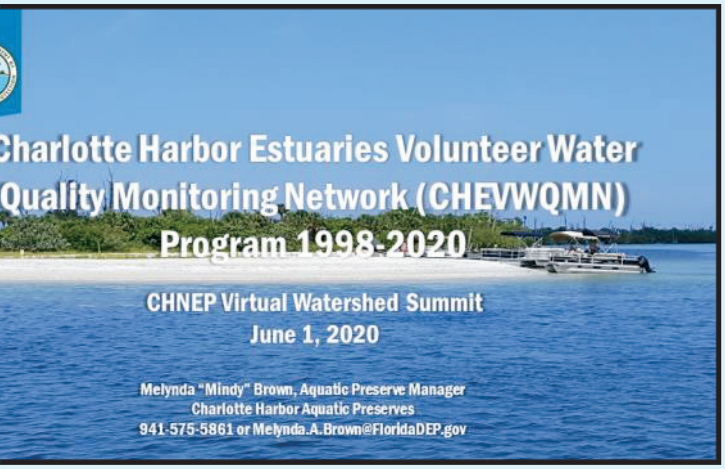
2020 CHNEP WATE

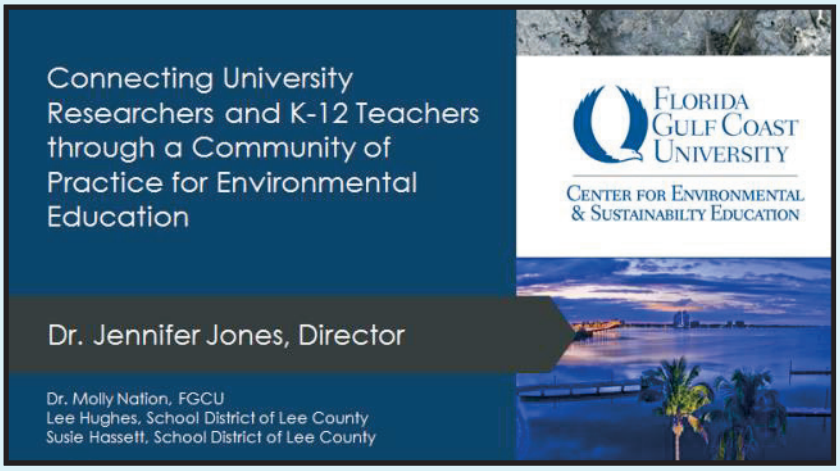
At the beginning of June, CHNEP once again had the pleasure of organizing and hosting the triennial Watershed Summit, where local scientists, natural resource managers and environmental professionals in the CHNEP area shared their latest research and restoration information with each other and the public. Although the Summit was held virtually due to the COVID-19 pandemic, attendance was fantastic with more than 250 participants each session and over 30 presenters!

The Summit was held in four sessions over two days and was focused on the four priority actions in the CHNEP Comprehensive Conservation and Management Plan: Water Quality Improvement, Hydrological Restoration, Fish, Wildlife & Habitat Protection, and Public Engagement. Presenters consisted of representatives from various local agencies including the Florida Fish & Wildlife Conservation Commission, both South and Southwest







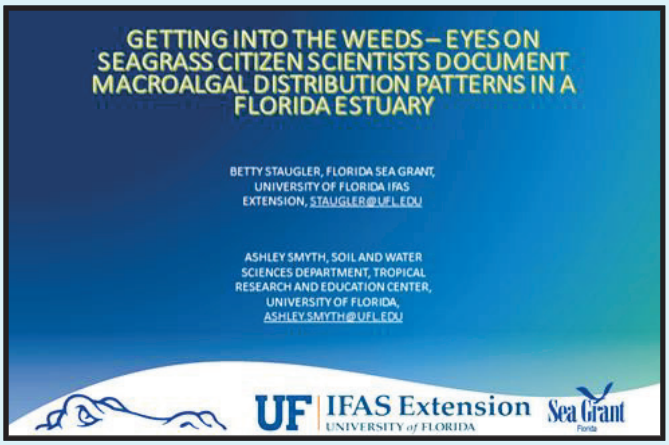


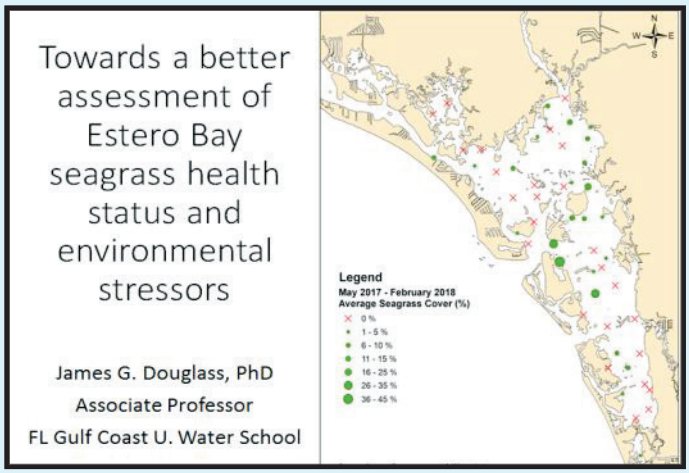
ERSHED SUMMIT

Florida Water Management Districts, as well as numerous non-profit environmental organizations and local colleges and universities.

This year's Summit featured presentations on topics such as red tide, local hydrological restoration projects, smalltooth sawfish movements, seagrass monitoring, student research on oyster larvae, and much more! To view videos of the presentations or read the Summit Proceedings which include abstract presentation descriptions and contact information from each of the presenters, go to https://www.chnep.org/watershed-summit.

CHNEP extends a special thank you to the 2020 Watershed Summit sponsors: WGCU Public Media and the Florida Section of the American Water Resources Association, as well as the US Environmental Protection agency who underwrites all CHNEP events. We look forward to our next Watershed Summit in 2023!



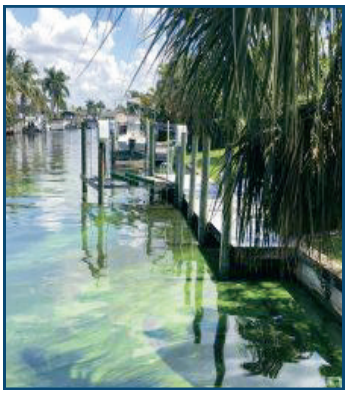


The Human Health Effects of Toxic Algae

University of Miami's Dr. Larry Brand presented his research on harmful algal blooms to CHNEP committees, as well as to the public of Punta Gorda recently. Brand, a professor of Marine Biology and Ecology at the Rosenstiel School of Marine and Atmospheric Science, is considered an expert on the subject. In 2007, he published research that directly links long-term surges in red tide severity to human activity. Harmful blooms such as cyanobacteria and red tide are not specific to Florida, but are surfacing all over the world. With the global population booming, both agricultural and industrial runoff and urban wastewater and stormwater runoff are increasing. Runoff often carries excess nitrogen and phosphorus, aka nutrient pollution into downstream waters. Additionally, parts of Florida have phosphorus-rich sediments. When too much nutrient pollution accumulates in waterways, it disrupts the natural balance, contributing to conditions for harmful algal blooms to thrive.

FL Gulf Coast Red Tide Bloom. Image courtesy of P. Schmidt, Charlotte Sun.

So how do these harmful algal blooms impact your health? Red tides are caused by a microscopic organism called *Karenia brevis*, which releases a potent neurotoxin called brevetoxin. This toxin is not only in the water but can become airborne through wave action, causing mass die-offs of aquatic species as well as an increase in many respiratory issues in humans. If people ingest unregulated shellfish during a bloom, they face the chance of contracting neurotoxic shellfish poisoning or gastrointestinal disorders. Short- term effects felt immediately upon inhalation include irritation of the eyes, nose, throat, and lungs. During past documented blooms, there were recorded increases in bronchitis, asthma, and pneumonia. Brevetoxin also weakens the immune system and has been identified as a DNA mutagen (physical or chemical agent that changes genetic material incl. DNA).



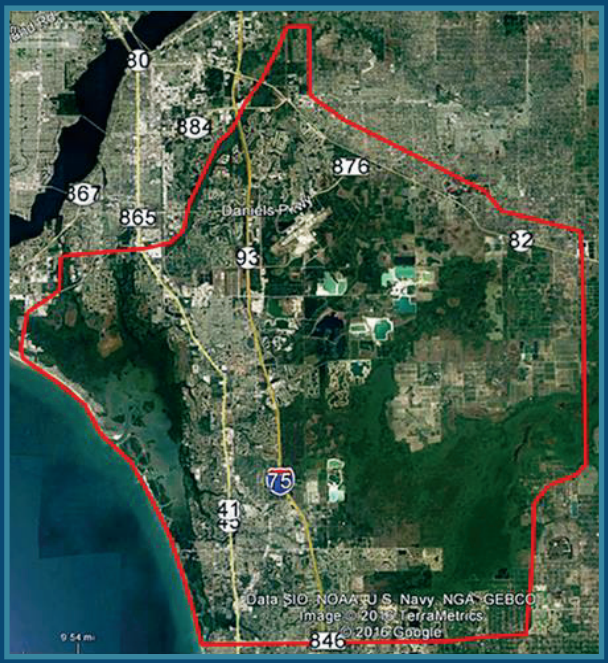
Cyanobacteria in SW FL.
Image courtesy of
Dr. Mike Parsons, FGCU.

Equally concerning are blue/green algal blooms caused by cyanobacteria typically found in freshwaters. Many people focus on red tide due to its immediate detrimental effects. However, Brand's research implies that there is another more elusive public health threat. Cyanobacteria blooms can release a neurotoxin called microcystin. Microcystin causes animal and human deaths, gastrointestinal disorders, and long- term liver damage. It's also classified as a tumor promotor being linked to liver and colorectal cancer. Another deadly cyanobacterial neurotoxin released is called beta-Methylamino-L-alanine (BMAA). BMAA has been linked to neurodegenerative diseases such as Alzheimer's, Parkinson's, and ALS/Lou Gehrig's disease. These devastating consequences tend not to become apparent until decades after exposure to cyanobacteria.

It is critical we develop viable methods and progressive policies to reduce the input of excessive nutrients in our waters, not only for our environment but for the short-term and long-term health of our citizens. To watch Professor Larry Brand's presentation and other informational videos from regional environmental experts, you can go to the **CHNEP YouTube channel** at https://www.youtube.com/watch?v=nOvvNsCto04.

South Lee County Watershed Restoration

As discussed earlier in this issue, hydrology (how much and where water flows) affects water quality, flooding, wetlands, and aquatic habitat resources such as oysters and seagrasses. Therefore, restoring hydrological flows to a more natural state is a part of getting the water right to protect people and wildlife. For these reasons, the CHNEP has been working with partners for years to address some significant hydrological alteration challenges in the South Lee County watershed.



The South Lee County Watershed Restoration Project Area

Ditching, draining, development in floodplains and wetlands, as well as building berms and impediments such as roadways have changed the direction and amounts of flow to many tributaries into Estero Bay — the state's first aquatic preserve. Additionally, some of Southwest Florida's most severe flooding occurs in this watershed in the Bonita Springs area. Therefore, restoration will need to be a delicate balance of preserving or improving flood protection for existing communities, while also improving environmental conditions.

Flooding in Bonita Springs after Hurricane Irma.

Lee County, the City of Bonita Springs and the Village of Estero have undertaken stormwater modeling to identify measures to reduce flooding and protect communities in the face of sea level rise and more frequent intense rainfall events arising from climate change. Recently, Audubon of Southwest Florida with the financial support of the Big Cypress Basin of the South Florida Water Management District, began a project to specifically assess how hydrological alteration is impacting the Corkscrew Swamp Sanctuary in northern Collier County.

The CHNEP is kicking off a new project to assist this collective effort, it will provide additional hydrological modeling that will identify the natural system needs throughout the South Lee County and Estero Bay watershed - such as rehydrating wetlands or restoring sufficient flow to tidal creeks deprived of adequate freshwater. The CHNEP South Lee County Watershed Initiative project will also model future conditions scenarios including climate change projections to identify specific restoration projects and measures that will effectively balance flood protection and environmental restoration into the future.

The project overseen by the CHNEP is being underwritten by funding from the U.S. Environmental Protection Agency and the South Florida Water Management District. It is expected to start early fall of this year and be completed by October 2021.

Cyanobacteria Rapid Response Project

Cyanobacteria (aka blue-green algae) has recently been recorded in Lake Okeechobee and the Caloosahatchee River. While the most effective way to curb harmful algae blooms is to prevent more nutrient pollution entering our waters, we also need tools to address the pollution and harmful algae already there.

CHNEP has been working with partners including Florida Gulf Coast University and Sea & Shoreline to test the use of an open-cell foam technology known as AquaFlex® (pictured above) to absorb excess nutrients along with Cyanobacteria and the toxin it produces. It has proved effective in lab analysis and CHNEP is working to initiate a large-scale field pilot study of this technology.

This project will deploy AquaFlex® into a Caloosahatchee cyanobacteria bloom, research scientists will then test the level of nutrient and algae removal as well as overall water and air quality effects.

If proven effective, the hope is that this can be easily stored and deployed by local governments as soon as cyanobacteria is observed, to help stem its future growth and spread.

Bringing it Home

Practical Tips for Personal Action

In the rainy season, nutrient pollution from fertilizer often washes off our landscaped areas before it has had a chance to be absorbed and used by plants. It goes into ditches, canals, rivers and then out to our lakes or coastal waters, causing serious water quality problems.

Just as fertilizer grows plants in our yards, it grows algae in our waterways, contributing to harmful algae outbreaks such as cyanobacteria and red tide blooms. These algae, when overabundant, can lower the dissolved oxygen in water to levels too low to support some forms of aquatic life, causing fish kills and other types of damaging effects.

This is why many areas have passed ordinances to ban the application of fertilizer during the summer months. Because rain naturally carries nutrients and there are other natural sources of nutrient this type of year like the Sub-Saharan dust, plants don't need fertilization right now. In fact, using Florida-friendly plants that are well adapted to Florida's climate and soils can eliminate the need to fertilize and irrigate year round.

CHNEP member City of Cape Coral's notice

To learn more about Florida-friendly landscaping on the web visit: ffl.ifas.ufl.edu.

To learn more about fertilizer restrictions in your community, google the name of your county and "fertilizer ordinance". Lee County and Sanibel ordinances, as well as good general information and videos about fertilizer's impact on water resources can be found online at: fertilizesmart.com.

Consider Becoming a CHNEP Volunteer!

Many citizens are asking what they can do to get involved in a positive way. Prior to the COVID-19 pandemic, CHNEP offered free monthly volunteer events for citizens to give back with activities that protect our area's waterways and wildlife. We conducted several of these events at the start of the year, in February volunteers gathered at Ponce de Leon park to participate in the Trash Tackle (see photo above). Despite the chilly morning, they disposed of loads of litter before it managed to enter our waterways. Regular clean-ups like these are critical to decrease the 1.4 billion tons of trash that's projected to enter our oceans each year.

We also hosted a Horseshoe Crab Training event where volunteers learned how to properly tag horseshoe crabs to participate in upcoming surveys where they will record valuable data for the national database used to estimate the species' population numbers (photo right). These are just two of the many great events we had in recent months, which also included tabling at outreach events such as the Swamp Cabbage Festival, the Chalo Nitka Festival, and the Pelican Landing Eco-Fair.

With the COVID crisis continuing, our in-person volunteer events continue to be on hold. Until we are able to restart them, we will be sending notices to those signed up on our CHNEP Volunteer mailing list with information on how they can help monitor water quality, measure seagrass growth and other natural resource protection activities that can be done safely and independently. To sign up, please visit chnep.org/get-involved.

326 W. Marion Avenue
Punta Gorda, FL 33950-4417

WHETHER YOU LIVE INLAND OR ALONG THE COAST, HERE ARE 10 WAYS TO HELP OUR OCEAN

at home | around town | on the water

1. **Conserve Water** Use less water so excess runoff and wastewater will not flow into the ocean.
2. **Reduce pollutants** Choose nontoxic chemicals and dispose of all chemicals properly.
3. **Reduce waste** Cut down on what you throw away.
4. **Shop wisely** Choose sustainable seafood. Buy less plastic and bring a reusable bag.
5. **Reduce vehicle pollution** Use fuel efficient vehicles, carpool or ride a bike.
6. **Use less energy** Choose energy efficient light bulbs and don't overset your thermostat.
7. **Fish responsibly** Follow "catch and release" practices and keep more fish alive.
8. **Practice safe boating** Anchor in sandy areas far from coral and sea grasses. Adhere to "no wake" zones.
9. **Respect habitat** Healthy habitat and survival go hand in hand. Treat with care.

anywhere, anytime

10 **Volunteer** Volunteer for cleanups at the beach and in your community. You can get involved in protecting your watershed too!

oceanservice.noaa.gov