

Florida Specifier

Practical Information For Environmental Professionals

Single Copy Price: \$5

October/November 2021

Volume 43, Number 5

Red tide treatment 6

Scientists have successfully tested clay flocculation as a red tide bloom reduction treatment in the lab. They plan to move forward with small-scale field experiments soon.

Kissimmee restoration 7

The U.S. Army Corps of Engineers and SFWMD recently announced the completion of the Kissimmee River Restoration Project, a critical piece of Everglades restoration and the largest project of its kind in the world. Project completion marked a shift in Everglades restoration work from construction to operations.

Piney Point update 9

In the months since the breach of a gypstack impoundment at Piney Point and the subsequent release of wastewater containing an estimated 200 tons of nitrogen and 100 tons of phosphorus, researchers and advocacy groups have closely monitored impacts on water quality in the lower Tampa Bay and surrounding waters.

The heat is on 11

According to a recent report from the Union of Concerned Scientists, outdoor workers face severe risks from extreme heat that will increasingly threaten their health and livelihoods as climate change produces dangerously hot days more frequently. In response, Florida environmental firms are implementing policies and practices that address the effects of heat on outdoor workers.

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Got a story lead?

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Sugarcane field burning to receive closer scrutiny in NASA-supported study

By ROY LAUGHLIN

The effects of sugarcane field burning on the health of agricultural and other outdoor workers and residents near the Everglades Agricultural Area is frequently discussed, but until recently received only perfunctory regulatory or public health attention.

However, the lack of attention to the negative health impacts of cane harvest fires could change in a big way in the coming years.

This summer, the National Aeronautics and Space Administration funded a research program to study the smoke production and dispersion of short-term agricultural fires in Florida sugarcane fields and Kansas pasture land prairies.

Sheryl Magzamen, PhD, an associate professor of epidemiology at Colorado State University, is the principal investigator.

The research team includes public health, public outreach and epidemiologists at five other institutions including NASA.

Burning sugarcane during the winter and spring months to remove its leaves before harvesting is a long-established practice.

Almost all of Florida's cane production occurs in three counties around Lake Okeechobee.

Two companies, U.S. Sugar Corp. and Florida Crystals Corp., dominate sugarcane production on about 410,000 acres in the EAA.

Almost all of that acreage is subject to burning that lasts only a few hours at most and occurs most often during the winter months.

Investigative journalists at *ProPublica* and *The Palm Beach Post* extensively researched sugarcane burning's smoke and soot release, and published their findings earlier this year. Their work raised some eyebrows regarding the practice.

The smoke released by sugarcane burning includes a large fraction of tiny soot particles—particulate matter, 2.5 µm, or PM2.5.

These tiny particles pass through the lung's bronchial tubes into the smallest pockets of the lungs, the alveoli.

When the PM2.5 burden in the lungs is excessive, respiratory problems result, especially as a comorbidity syndrome.

In addition, breathing the tiny particles is a frequent cause of asthma in sensitive people.

The U.S. Environmental Protection Agency began regulating human exposure to PM2.5 particles from agricultural burning in the 1990s.

The Clean Air Act gave the agency the authority to regulate these smoke particles.

The exposure regulation is based on a 24-hour average particle concentration as measured by a specific type of air quality monitoring device.

Based on the EPA protocols, the EAA's air quality ranking seems quite paradoxical.

The EAA's sole air quality monitor

in Belle Glade indicates excellent air quality—even though, on many winter and spring days, the hazy smoke from cane fields is widely visible during daylight hours across the EAA.

Public health personnel in the area tell a vastly different story from regula-

tory authorities regarding the incidence of lung problems indicative of poor air quality.

People throughout the EAA exposed

CANE
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Photo courtesy of Universal Engineering Sciences Creative Services Group

Carly Boston, left, and Joe Rommel from Universal Engineering Sciences gauge a monitoring well during a site assessment on a Deltona property that operates a wastewater treatment plant. The assessment was conducted to investigate a reported release from the plant. Changes coming to ASTM environment site assessment standards will be addressed at FRC 2021. See story below.

FRC 2021 preview: FRC returns after COVID-19 year with mix of traditional talks, content evolution

By ROY LAUGHLIN

The Florida Remediation Conference returns to the Rosen Centre Hotel in Orlando for its 26th year on Nov. 17-19 after the COVID-19 gap year of 2020.

FRC 2021 will continue its focus on scientific, technological and regulatory influences on soil and groundwater cleanup, but with an evolution of content that includes a poster session and the co-located 9th International Symposium and Exhibition on the Redevelopment of Manufactured Gas Plant Sites.

After a pre-conference workshop on Risk Assessment and Community Involvement on Wednesday, Nov. 17, the FRC conference formally kicks off with its Opening Session on Nov. 18.

Steve Hilfiker, president of Environmental Risk Management Inc. in Fort Myers and a leading authority on Florida's petroleum cleanup program, will moderate the session that features regulatory updates from both national and state perspectives.

Randall Chaffins, director of the

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EPA addresses HABs with new nutrient criteria for recreational waters

Staff report

Harmful algal blooms are a ubiquitous summertime phenomenon in surface water across the country.

Human activities, including agricultural fertilization, have increased the extent, persistence and number of species that cause the blooms that can interfere with recreational uses, taint drinking water supplies for humans and livestock, and adversely affect wildlife.

To date, the U.S. Environmental Protection Agency's actions have pertained primarily to cyanobacteria blooms in freshwater lakes, reservoirs, streams, rivers and wetlands.

Recently, EPA published its Final Technical Support Document: Implementing the 2019 Recommended Recreational Water Quality Criteria or Swimming Advisories for Microcystins and Cylindrospermopsin.

The agency set standards at 8 µg/L for microcystins and 15 µg/L for cylindrospermopsin. Applying the standards in response to HABs spans a range of responses from strict water quality criteria to "soft" swimming advisories.

The EPA noted that their new standards are based on the responses of children to

these two toxins.

HAB occurrence is highly correlated with high nutrient concentrations in surface waters. In August, EPA published revised recommended ambient water quality criteria for primary phytoplankton nutrients under the Clean Water Act, the first update of these criteria in 20 years.

The EPA also released its Final Recommended Nutrient Criteria for Lakes and Reservoirs, a web-based tool with information and tracking of HABs, and a technical support document to aid implementation of certain HAB criteria.

The new tool is based on statistical stressor-response relationships derived from data collected from 1,800 lakes nationwide and developed into a national model.

The agency's model to determine nutrient criteria allows users to incorporate local data.

This flexibility enables state, tribes and local authorities to implement custom HAB response strategies related to nutrient standards.

The HAB and nutrient standards are

voluntary. States, tribes and local governments may implement more stringent standards under the Clean Water Act.

If states, local governments or tribes have existing EPA-approved criteria or total maximum daily load targets, they are not required to use the new models to immediately create replacements.

In addition, EPA released a new nationwide GIS database tool that displays information about HABs. Symbols are color-coded to indicate whether the data includes warnings, notes of occurrence or other conditions describing HABs.

EPA releases Draft Contaminant Candidate List 5. This summer, EPA proposed 66 individual chemicals, 12 microbes and three chemical groups in its Draft Contaminant Candidate List 5.

The three chemical groups are perfluoroalkyl substances, cyanotoxins and disinfection byproducts.

The PFAS group, which now numbers about three dozen chemicals, does not in-

clude perfluorooctanoic acid or perfluorooctanoic sulfonate. These two PFAS are already the subject of national primary drinking water standards development.

The Safe Drinking Water Act requires the agency to follow a five-year cycle for identifying potential drinking water contaminants. Eligible substances are those known or anticipated to occur in public drinking water systems, but are not currently subject to EPA regulation.

Public health protection is the primary reason for the EPA's five-year evaluation cycle.

The EPA developed its CCL 5 using new protocols that allowed it to rapidly screen a larger number of contaminants that in the past, and prioritize data related to drinking water exposure.

Contaminants with "the potential for the greatest public health concern" are most likely to land on the lists.

For the current list, the agency incorporated more sophisticated considerations for sensitive populations among children.

EPA noted that, although this list is supported by extensive documentation, it will continue to collect research on the listed contaminants before making any final regulatory moves.

The final CCL 5 is expected to be released in July, 2022. Following its release, EPA will conduct further deliberations to determine whether or not to regulate contaminants on the list.

Agency officials noted that listing a substance on the CCL does not create or impose regulatory burdens on public water systems or state, local or tribal governments.

CCL 5 has been in development since 2018 when EPA requested public input to nominate chemicals, microbes or other materials. That process resulted in 89 nominations which are the basis for the current list.

Frack well impacts. Using public water quality data obtained from compliance measurements, a trio of data scientists discovered statistically significant increases of four elements in streams and other surface waters near fracking wells in the U.S., including bromide, chloride, strontium and barium.

These four elements are those most commonly elevated in the flowback water from fracking operations. Flowback is the fluid that returns to the surface through the well pipes.

The highest chloride levels in surface waters adjacent to fracking wells were found during the early phases of oil and gas production. The amount of flowback decreases with the age of the wells.

Proximity to fracking wells was also consistently correlated with higher salt levels at a given station. The highest salt concentrations found in surface waters occurred at sampling sites closest to the fracked wells into strata with high salinity fluids.

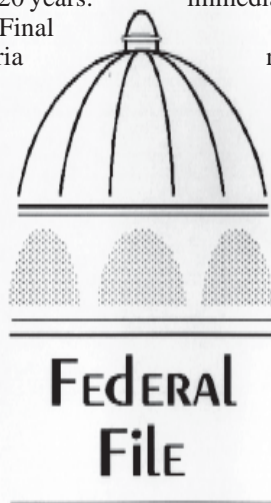
In some locations, the researchers noted, fracking wells caused no measured increase in levels of the four elements of interest.

The researchers analyzed 61,000 surface water measurements taken between 2006 and 2016. The water samples were taken near 46,000 hydraulic fracturing wells spread across 408 watersheds.

The increases of the four elements are small—but statistically significant. The report noted that the sampling occurred within 10 miles of many wells but not necessarily at the closest point to the wells.

Dilutions in streams and creeks can be significant over short distances, leading the researchers to suggest that the level of elements could be greater than the diluted concentration they measured suggests.

The three researchers, all economists, used water quality databases, including EPA's. Their primary interest was to determine how mandatory disclosure rules established in 2010 for fracking fluid com-



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Coal ash cleanup nearing completion at Crystal River Energy Complex

Staff report

Duke Energy Corp. is completing efforts to prevent groundwater contamination from the long-term storage of coal combustion residuals, also known as coal ash, at its Crystal River Energy Complex in Citrus County.

Duke has owned the 4,730-acre complex since 2012 when it merged with Progress Energy Florida.

Plant operations began at the site in 1966. At its peak, CREC supported four coal-fired steam units and a now-retired nuclear power plant.

Coal ash generated by the coal-fired units has been stored in a 100-acre designated ash storage and disposal area since 1982. Only about five percent of the area is lined.

The storage and disposal area is bordered by unlined drainage ditches to the east, south and north, and by an integrated unlined stormwater pond on the southwest.

Analysis of groundwater samples collected from CREC monitoring wells indicated that contaminants in excess of groundwater protection standards were present in more than half the locations sampled.

Duke's cleanup plan included removing more than 20,000 cubic yards of waste materials and creating impermeable barriers to protect groundwater.

As the cleanup effort approaches its end, Duke officials continue to confirm that there has been no contamination of drinking water supplies.

Environmental activists ask Jax to stop transporting coal ash. St. Johns Riverkeeper, the Northeast Florida Sierra Club and Surfrider Foundation's First Coast Chapter launched a petition calling for the Jacksonville City Council and Jax Mayor Lenny Curry to stop accepting toxic coal ash from Puerto Rico or any other community.

The petition came on the heels of the grounding of the barge Bridgeport off the coast of Atlantic Beach.

The Bridgeport was hauling coal ash from an AES Corp. coal-fired power plant in Puerto Rico to Georgia when the grounding occurred.

Estimates indicated greater than 9,000 tons of coal ash spilled from the barge that remained in place from March until late June this year.

Coal ash contaminants include mercury, cadmium, lead, selenium and arsenic.

Puerto Rico banned the landfilling of coal ash in 2017. AES subsequently landfilled the coal ash in Osceola County until residents there succeeded in having it banned from the landfill in 2019.

Now, coal ash-laden barges travel roughly 18 miles up the St. Johns River to the Keystone Terminal where it is offloaded and then transported to a landfill in Folkston, GA.

"Utilities must be required to take responsibility for their own waste and should not be allowed to put other communities at risk with their pollution, especially those who had nothing to do with producing it," said Lisa Rinaman, the St. Johns Riverkeeper.

The petition is available on the St. Johns Riverkeeper website.

Manatee county moves forward with well. Manatee County's plan to drill a 3,500-foot-deep injection well to dispose of wastewater from the Piney Point phosphate facility's treatment impoundments is moving forward.

The injection well was approved by the county commission earlier this year and \$10 million has been allocated for the anticipated \$15 million project.

The cost of final mitigation and closure of the facility is currently estimated at \$200 million.

The county hopes to convert the site to public use for recreation and commerce at some point in the future.

The Piney Point facility has been shuttered since 2001.

There have been a number of warnings about the instability of the property over the years. But inadequate measures were undertaken by the owners, and regulators had to step in more than once.

While the human threat has been averted for the time being, the damage to the environment has yet to be determined.

Tampa all in on renewable energy. City commissioners in Tampa recently voted to convert city operations to 100 percent renewable energy by 2035.

The city committed to achieving zero carbon emissions in the same time frame.

Tampa joined 180 cities nationwide including 11 Florida municipalities that committed to implementing green energy.

The city's "Ready for 100" resolution is part of a Sierra Club campaign that advocates for an equitable and affordable energy system powered by 100 percent clean, renewable energy by the year 2050.

Tampa's resolution had to consider Florida state laws that allow utilities to determine their sources of energy, restrict the implementation of bans on traditional fueling stations, and disallow mandates for the installation of electrical charging stations.

OUC to purchase Osceola power plant. The Orlando Utilities Commission Board approved action to negotiate an anticipated \$100 million deal for purchasing the idle 510-megawatt natural gas-fired power plant in Osceola County.

The plant is equipped with three turbines that can turn on and off quickly. Tra-

ditional larger turbines require more fuel and take hours to power up.

With the addition of the Osceola site, OUC would be able to power up in minutes and maintain grid stability in the event its solar operations are disrupted.

Purchase of the Osceola plant also allows for the retirement of OUC's oldest coal-fired power plant, Stanton Unit 1, located at the Stanton Energy Center in East Orange County.

Santa Fe River land preserved. The Alachua Conservation Trust won the bidding to purchase 200 acres of land along the Santa Fe River in Columbia County.

The trust marginally outbid a development group from Jacksonville.

ACT named the parcel Little Awesome Preserve.

The \$1.9 million purchase will protect the land and its features unique to the nearby Siphon Creek Cave System from development.

Little Awesome Preserve is located across the river from the Suwannee River Water Management District's Santa Fe Springs Conservation Area.

The preserve includes more than a mile of river frontage near Ginnie Springs and includes the Little Awesome Siphon, Camp Spring and Myrtle's Fissure Karst features.

The Siphon Creek Cave System is internationally recognized by cave divers and includes over 20,000 feet of cave passages.

ACT is also working with the Suwannee River Water Management and the Florida Department of Environmental Protection to purchase an additional 165 acres of land including Sawdust Spring near the preserve.

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The Florida Specifier (ISSN 0740-1973), founded in 1979, is published every other month for \$24.95 per year (\$49.95 for three years) by DRADDS LLC, 2901 1st Ave. N., Suite 202, St. Petersburg, FL 33713. Subscription refunds are not provided.

Standard postage paid at Orlando, FL 32862. **POSTMASTER:** Send address changes to the FLORIDA SPECIFIER, P.O. Box 2175, Goldenrod, FL 32733.

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IFAS study looks for ways to improve nutrient retention in stormwater ponds

Staff report

Constructed stormwater ponds are ubiquitous across the state. Their primary purpose is to control stormwater runoff and retain dissolved and particulate nutrients, preventing nutrient enrichment in surface waters.

However, the consensus opinion is that they are much better at controlling stormwater flows than consistently reducing nutrient inputs into surface waters.

A new research effort by scientists at the University of Florida's Institute of Food and Agricultural Sciences will study the effectiveness of plant buffers along pond margins to improve their retention of phosphorus and nitrogen.

Basil Iannone, PhD, assistant professor in the School of Forest Resources and Conservation at IFAS, said the plantings will include primarily native species, but will include some non-native, non-invasive species.

The species will be planted on marsh banks and in swales on pond margins.

According to Iannone, this effort is a follow-on to a 2018 study done by Michelle Atkinson, an environmental horticulture agent with the IFAS Extension in Manatee County.

That 2018 study was undertaken at Lakewood Ranch, a planned community in southeastern Manatee, where stormwater ponds have experienced more than their fair share of algae blooms, fish kills and odor problems.

Atkinson's team planted vegetation around six stormwater ponds and compared their nutrient retention characteristics with control ponds lacking the vegetation.

The results indicated that vegetating the banks achieved a 20 percent reduction in phosphorus releases. However, there was no difference in nitrogen fluxes between planted and unplanted ponds.

The current planting is occurring in a different area.

In late August, landscaping plants were placed around ponds near the Bradenton Area Convention Center, Greenbrook Park and University Community Park.

Researchers placed plants along 75 percent of the banks of stormwater ponds in the areas.

Planting a larger proportion of margin than Atkinson's 2018 study is expected to provide more nutrient retention.

In the project's next phase, researchers will measure both how quickly and how much nitrogen and phosphorus are retained by the planted vegetation around the ponds' banks.

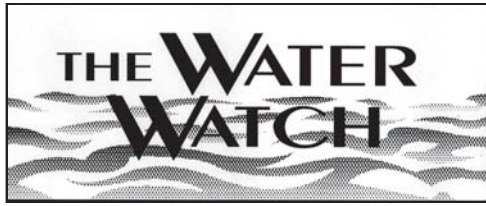
Iannone noted that it could be just as effective to leave an unmowed margin

around ponds, but some people complain it looks messy. For that reason, this study also involves a public engagement component to assess citizen's views

about retention pond maintenance and plantings around their margins.

Funds for the new study came from the U.S. Environmental Protection Agency, which provided \$197,000 in grant funding over four years.

Positive results will support a model across Florida of planting the banks of stormwater ponds to reduce erosion and improve nitrogen and phosphorus retention.



In-situ microplankton identification. Scientists at The Water School at Florida Gulf Coast University think that a submersible microscope-camera and artificial intelligence-capable image recognition software could become a critical new tool for algal bloom and water quality surveillance.

They recently developed a prototype microscope camera was dubbed "Sylvia" in honor of Sylvia Earle, the famous oceanographer who pioneered the National Oceanic and Atmospheric Administration's adoption of remotely operated and small manned submersibles for oceanographic research.

FGCU's research is in its pilot phase. Researchers are using Sylvia to create a library of microalgae images to train recognition software.

The working prototype is a dry lab instrument. In the future, researchers hope to develop a submersible microscope that could provide a near real-time census of microalgae in the field.

Ultimately, the researchers could use one or an array of underwater Sylvia microscopes for the surveillance of red tide and other harmful algae in freshwater and marine habitats.

Biscayne Bay study. A recent report from a team of researchers at Florida International University added dissolved organic matter, or DOM, to the list of water contaminants carried into freshwater and estuarine environments from human activities.

The team examined the transport of DOM from the Miami-Dade County area into Biscayne Bay. The transport occurred through drainage canals, creeks and rivers.

Weather cycles were a dominant controlling factor. In South Florida, maximum DOM transfer to Biscayne Bay occurred during the rainy season and high tides of the late summer and early fall.

Microbial activity was also a significant factor in DOM transfer. "Urban-derived organic matter," a term used by the researchers, was easily broken down by microbes.

That breakdown subsequently chaperoned the breakdown of other less easily degraded organic matter.

The result was that organic matter that initially resembled humic acids were converted to organic matter resembling proteins. The chemical change created DOM that was more biologically available.

The researchers found elevated E. coli and enterococci concentrations, ostensibly from wastewater contributions to groundwater from septic tanks, and leaking and overflowing sewers.

The microbes associated with human sources, researchers said, contributed substantially to overall DOM bioavailability.

"Our results provide new evidence of an urban priming effect in which labile autochthonous DOM from anthropogenic sources facilitates microbial degradation of DOM that is driven by seasonal differences in stormwater runoff and tides," they wrote in the abstract of their published paper.

The influence of more bioavailable DOM could significantly affect coastal ecosystems because DOM breakdown yields the energy necessary for nutrient assimilation, for example, the conversion of NOx to ammonia by bacteria.

This study involved research at three U.S. cities, one of which was Miami.

Researchers at the Florida International University CREST Center For Aquatic Chemistry and Environment were co-authors of the recent article in *JGR: Biogeosciences* describing their findings.

Lake Jesup pilot study underway. Lake Jesup in Seminole County is the site of the most recent demonstration/pilot project of AECOM's dissolved air flotation technology to remove suspended sediments and very small microplankton from

WATCH Continued on Page 5



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WATCH
From Page 4

natural waters.

One purpose of the pilot study is to allow St. Johns River Water Management District scientists to evaluate the process' potential use as a full-scale system in the lake.

Lake Jesup is Seminole County's largest lake system. Its 150-square-mile watershed includes 11 cities with much of the area urbanized.

The SJRWMD designated the relatively shallow and poorly flushed lake as a priority basin about 20 years ago.

The district developed a phosphorus TMDL for the lake then, but poor water quality and low water clarity remain below targets.

This work is supported by a \$1.65 million grant from the Innovative Technology program at the Florida Department of Environmental Protection.

Over the past two years, AECOM demonstrated the technology in Lee County, on Munson Lake near Tallahassee, and on barges in Lake Okeechobee.

Stuart stormwater project. The city of Stuart in Martin County approved the installation of a new baffle box to trap nutrients and sediments before stormwater carries it into Poppleton Creek.

The creek drains into the St. Lucie River and then to the Indian River Lagoon. The baffle box will be installed between Southeast Tressler Drive and Fernhill Memorial Gardens & Mausoleum.

The city has already installed 36 baffle boxes to protect the St. Lucie River and Indian River Lagoon.

The Poppleton Creek baffle box will retain about 48 pounds of nitrogen and phosphorus annually, preventing it from being released to the creek.

The Indian River Lagoon National Estuary Program contributed \$80,000 toward the work. Stuart's stormwater enterprise fund will cover the remaining \$110,000.

Brooksville sewer system upgrades continue. The Brooksville City Council unanimously approved the fourth phase of their sewer rehabilitation effort.

The new work will rehab system components to prevent inflow and infiltration by groundwater, preventing overflows and backups.

Reducing I&I will also help reduce the amount of wastewater entering the city's William S. Smith Water Reclamation Facility.

Phase 4 is expected to cost \$3.6 million. The Florida Department of Environmental Protection's Clean Water State Revolving Fund Program provided a loan to cover the costs.

The SRF will forgive 80 percent of the loan. The city is responsible for the remaining 20 percent, approximately \$720,000.

Separately, the city signed an agreement with DEP for legislative funding to cover half of their portion, leaving the city with a balance of just \$360,000 to pay.

Century, Escambia County sign WWTP agreement. This summer, Escambia County and the city of Century signed an interlocal agreement that will result in improvements to the city's wastewater treatment plant.

Century's wastewater plant will be the subject of extensive maintenance repairs, including rebuilding its water clarifier, pump and controls replacement, and filter repair.

In addition, its wastewater collection system is slated for the rehabilitation of nine sewage lift stations and the master lift station at the state-run Century Correctional Institution.

Escambia County will provide \$450,000 for the wastewater infrastructure project.

The interlocal agreement involved a change of funding for the work. Originally, RESTORE funding provided by the Deepwater Horizon oil spill settlement was appropriated for the project.

However, county officials decided to use local option sales tax money instead in order to meet the matching fund require-

ments of the Florida Department of Environmental Protection's state revolving fund.

DeBary septic-to-sewer conversion. In early August, the DeBary City Council approved its Gemini Springs Wastewater Treatment Feasibility Analysis Report.

The feasibility report recommended a decades-long phased septic-to-sewer conversion involving a total of 2,300 septic tanks. In addition, the plan called for the construction of a vacuum sewer system over a 20-year period. The current cost estimate is \$50 million.

The consulting firm of Jones Edmunds & Associates Inc. prepared the report for Volusia County's Water Resources and Utilities Department, and the city government.

The primary purpose of the conversion effort is to reduce nitrogen levels in the groundwater feeding Gemini Springs, designated as an Outstanding Florida Spring in the 2016 Florida Springs and Aquifer Protection Act.

Currently, nitrogen loading to Gemini Springs is 20,496 pounds annually. About 46 percent comes from fertilizers, and septic systems account for about 41 percent.

According to DEP calculations, more than 14,000 pounds of nitrogen need to be removed from the groundwater feeding Gemini Springs by 2038 in order to meet the Outstanding Florida Springs water quality targets.

DeBary residents will face a connection fee to the sewage system of approximately \$5,000.

City officials are hoping to obtain grant funding to help defray the \$50 million cost of construction. Construction will begin as soon as DEP approves the plan.

Engineering and design, the first component of the effort, will require up to 18 months. Groundbreaking for the project could occur in 2023.

Crystal River septic-to-sewer. Elsewhere, the city of Crystal River initiated a \$1.6 million septic-to-sewer project for its Indian Waters neighborhood.

The goal is to reduce nutrient pollution in Crystal River springs. Septic tanks account for about 42 percent of the nitrogen entering the springs.

The original plan for the conversion dates back to 2015. At that time, the cost to each of the 100 residences affected would have been about \$10,000.

The city council determined that price to be too high and shelved the plan.

This year, the city and DEP negotiated a construction plan that included \$500,000 from DEP and an additional \$500,000 from the city, along with the \$900,000 budgeted initially.

While the exact cost of the project is now being calculated, city officials hope the conversion effort could be complete by as early as next summer.

Freeport wastewater upgrades. The city of Freeport in Walton County plans to spend \$13 million for septic and sewer improvement upgrades along its Highway 331 corridor.

The city developed a master plan for the project that has already garnered \$1 million from the Florida Legislature.

The Highway 331 corridor costs are about \$6 million. Walton County has agreed to partner with Freeport on those

upgrades.

Within Freeport, four separate projects are planned. One of those will be along the McDaniels Fish Camp Road.

Freeport recently finished a \$3.5 million project to upgrade its wastewater collection system force mains.

Final section of Old Tamiami Trail removed. In August, contractors for the South Florida Water Management District completed removal of the final six-mile stretch of Old Tamiami Trail spanning

WATCH
Continued on Page 13

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Clay flocculation could be one answer to controlling red tide blooms

By ROY LAUGHLIN

Collaborative research between scientists at the University of Central Florida, Mote Marine Laboratory and Aquarium, and Woods Hole Oceanographic Institution is showing substantial progress in the lab with positive results from a red tide bloom reduction treatment.

Scientists at the three institutions are testing clay flocculation in lab experiments and plan to proceed to small-scale field experiments soon.

Spraying an aqueous suspension of a modified clay, kaolinite clay-polyaluminum chloride, on red tide cultures in labs and on blooms in canals in Southwest Florida has removed red tide cells and their toxins from seawater.

The clay treatment had minimal impact on three representative macrofauna species including crabs, shrimp and fish.

The clay particles bind to red tide dinoflagellates, *Karenia brevis*, and suspended sediments to form a floc.

Accreting floc particles become heavier than water and sink to the bottom. Binding to clay also lyses red tide cells.

The modified clay also binds to and reduces the brevetoxin concentrations in the water.

Preliminary results of the experiments appear promising for application to wild red tide blooms.

The binding process is primarily caused by electrostatic attraction between ions on the clay-polyaluminum particles and functional groups of opposite charge on cells, suspended organic and inorganic matter, plant nutrients and brevetoxin.

Clay flocculation occurs non-specifically between complementary molecules within the envelope of compatible charge and size.

To treat a large bloom, potentially tons of clay would be dispersed over acres of surface waters.

Researchers are also studying the effects of the floc on nontarget organisms. They want to experimentally demonstrate that the relatively small amount of clay applied does not smother or otherwise adversely affect infauna or macrofauna.

So far, bioassays in small microcosms indicate that blue crabs, shrimp eggs and fish are not detrimentally affected by the transient floc formed during the treatments.

Also, the brevetoxin sequestered in the floc is unavailable to fish in the water column or bottom-dwelling organisms. The clay-polyaluminum binds the toxin so tightly that it is not bioavailable.

According to a Woods Hole web page, the researchers will focus on what the treatment is intended to do as well as any side effects in the field applications.

This includes how the treatment removes co-occurring algal species, bacte-

ria and zooplankton; the amount of clay deposited on the bottom; changes in nutrient concentration; toxicity concentrations in the water and in the sediment where the floc settles; benthic diversity of bottom sediments that accumulate floc; and changes in water and sediment chemistry such as oxygen concentration and other eutrophication indicators.

Researchers expect some ecological and water chemistry changes as a result of the kaolinite clay treatment.

In justifying the potential for some level of undesirable ecological effect, the researchers cited red tide bloom's creation of "dead zones" in the Gulf following a heavy bloom because it is remarkably destructive for fish and invertebrate populations.

The decay of dead organisms wreaks havoc on nutrient fluxes and eutrophication processes.

The researchers intend to show that clay flocculation will not become a cure that is worse than the disease.

They have a reasonable expectation based on laboratory experiments that the kaolinite clay flocculation will be effective, at least in some circumstances.

It has been used for over a century in manufacturing operations, wastewater treatment and elsewhere to remove suspended particles and dissolved charged molecules from solution.

More to the point, it has effectively removed nuisance algae in natural waters.

For almost two decades, the technique has been used by the Chinese to quell harmful algae blooms in their nearshore waters.

In South Korea, clay application controls *Cochlodinium polykrikoides* blooms in fish mariculture ponds.

The successful use of clay flocculants by the Chinese and Koreans without excessive undesirable side effects led investigators to conclude that "the time has come for a careful assessment of this mitigation technology for use in the U.S."

In the ongoing Florida studies, researchers are testing a blend of kaolinite and polyaluminum chloride because they expect the polyaluminum chloride to significantly increase red tide cells' adhesion.

The goal is to show that kaolinite is safe and effective when sprayed on red tide blooms in the environment, from canals to the open gulf.

Specifically, the investigators are planning to closely look at how flocculation affects the *K. brevis* bloom cycle.

For example, if flocculation provides a short-term reduction in red tide cells but later promotes a subsequent proliferation of cells from the sediments where the flocculent fell, the treatment might not be an improvement over the long term.

The application process for small areas such as canals or large areas such as acres of ocean surface during a red tide bloom is well-characterized.

To treat water, kaolinite-polyaluminum chloride is mixed with water to form a slurry that can be applied with a pressure sprayer over the surface of a red tide bloom.

Flocculation begins at the air-water interface and continues as the flocculent particles sink through the water column.

Kristy Lewis, PhD, an assistant professor in the Department of Biology at UCF's College of Sciences, and Don Anderson, PhD, a senior scientist at Woods Hole who received a \$250,000 grant, are the study's co-principal investigators.

UCF graduate student Victoria Roberts and scientists at Mote Marine Lab are partners in the research.

This research effort is among 25 projects funded by the state of Florida to mitigate harmful algal blooms in Florida.

Pending the completion of field studies and the indication of no significant adverse effects, the research could help end an era when marine resources and ecosystems were sacrificed to red tide blooms because no effective control capability existed.

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Florida Audubon releases first of two annual State of the 'Glades reports

By **BLANCHE HARDY, PG**

Florida Audubon recently released the first of its two annual "State of the Everglades" reports.

This year's first report contains updates and news on projects underway throughout the Everglades restoration area.

Beth Alvi, director of policy at Florida Audubon, said the report highlights the progress on Everglades' restoration efforts including water storage projects, the removal of Tamiami Trail roadbed, the restoration in the Corkscrew Swamp Sanctuary and more.

"After a century of human impacts, we are improving water flow south and habitat for Florida's birds, other wildlife and people," she said.

Audubon's Corkscrew Swamp Sanctuary in Naples has experienced extremely dry conditions since 2000.

Scientists, policy staff and Audubon's modeling team are crafting scenarios to reduce drainage and retain more water within the sanctuary.

Flood control canals installed downstream of the sanctuary were cited in the

Kissimmee River restoration complete

By **BLANCHE HARDY, PG**

The U.S. Army Corps of Engineers and the South Florida Water Management District recently conducted a ceremony to commemorate the completion of the Kissimmee River Restoration Project, a critical piece of Everglades restoration and the largest project of its kind in the world.

"The conclusion of the Kissimmee River Restoration project is a historic milestone for Everglades restoration," said Kelly Cox, JD, MPS, director of Everglades policy for Audubon Florida.

Cox said project completion marked a shift in Everglades restoration projects across the state from construction to operations.

The agencies and their partners and cosponsors oversaw the restoration of 40 square miles of river and floodplain, and returned almost 25,000 acres to wetlands.

Audubon Florida noted that the river's two-mile-wide floodplain and wetland habitats of river channel now support at least 159 bird species, 66 of which are considered wetland-dependent during some portion of their life cycles.

The recovery of the restored natural system greatly exceeded all expectations.

Many species of ducks and wading birds that were no longer present during pre-construction surveys, such as the ring-necked duck, American avocet and black-necked stilt, have returned.

"Birds are resilient," noted Julie Hill-Gabriel, JD, vice president of water conservation at the National Audubon Society. "They flocked back to the restored areas faster than we had hoped. If you build it, they will come!"

She said that success with such large-scale improvement projects holds benefits for both birds and people, and is an important water resources investment for now and into the future.

The Kissimmee River once stretched 103 miles in Central Florida from the Orlando area to Lake Okeechobee.

The river basin forms the headwaters of Lake O and the Everglades, and includes the Kissimmee chain of lakes, their tributary streams and associated marshes, and the Kissimmee River and floodplain.

The restoration effort corrected the damaging alterations made within the river-floodplain ecosystem that were meant to address impacts from flooding in the Kissimmee Basin.

Between 1962 and 1971, the corps channeled the winding river, creating a massive 30-foot-deep, 300-foot-wide, 56-

report as one cause of the low springtime water levels observed over the last two decades.

The lower water levels have led to adverse impacts such as wood stork nesting failures, reduced water recharge, increased probability of catastrophic wildfire, reduced downstream water quality and an increased potential for red tide events.

"Witnessing the impacts on this world-class wetland, and especially the decline of our treasured wood stork colony, has been heartbreaking," said Shawn Clem, PhD, director of research at the sanctuary.

The Audubon team is working in conjunction with government agencies and private partners on a variety of solutions including engineered water retention projects, acquisition and restoration of additional wetlands and rulemaking to strengthen wetland protection and management.

Florida Bay's roseate spoonbill population is receiving special attention. The team is using satellites and cameras to develop a better understanding of the species' ecology.

Audubon's Everglades Science Center recently installed trail cameras and are using cellular transmitters to observe spoonbills with minimal disturbance to the nesting birds.

The report characterized spoonbills as

the "canary in the coal mine" for their dependence on the healthy hydrologic condition of the Everglades.

Spoonbills were observed using different habitats for foraging while nesting, such as ponds inside the bay keys, rather than the previously preferred mangrove mainland wetlands. A new spoonbill colony was discovered, and new flight patterns were observed.

Elsewhere, removal of a six-mile segment of Old Tamiami Trail roadbed was completed. The elevated roadbed acted as a dam, blocking the flow of surface water south into Everglades National Park.

The altered flow regime damaged wildlife habitat and contributed to flooding in the Central Everglades.

Lack of water storage capacity in the 2.6-million-acre Lake Okeechobee Watershed continues to be an issue. The watershed is flat, drains swiftly and accounts for 90 percent of the water that flows into Lake Okeechobee.

Audubon supports establishing additional capacity to slow and clean water on its way to the lake.

The report noted that, during the most recent wet season, Lake Okeechobee rose 5.5 feet, to a high of 16.45 feet in November, 2020.

Phase II of the South Florida Water Management District's Lake Okeechobee

Watershed Construction Project is anticipated to add 900,000 acre-feet of additional water storage to help better manage lake levels during storms and to reduce discharges to the Caloosahatchee and St. Lucie rivers and estuaries.

Better control of the watershed is critical to minimizing future algae blooms in the estuaries.


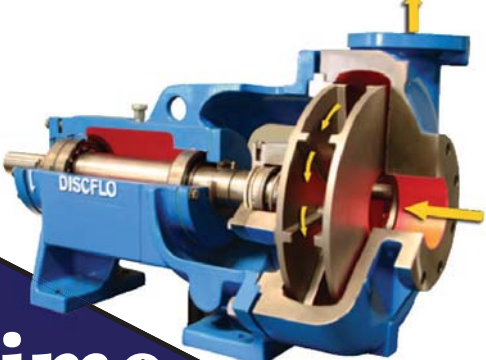
SFWMD is also pursuing a means for improving the quality of surface water moving south through the western Everglades.

The district and its partners are investigating measures to prevent urban and agricultural stormwater from polluting new flows from the Picayune Strand Restoration Project into Rookery Bay, Collier Seminole State Park and the Ten Thousand Islands National Wildlife Refuge.

Audubon strongly advocates a parallel effort to work with farmers, Collier County officials and area landowners to reduce nutrient levels at their source, which would allow the downstream projects to be more effective and economical on less land.

On a bright note, Audubon announced that Publix Super Markets Inc. awarded a \$2 million Corkscrew Swamp Sanctuary grant to restore wetlands in the Everglades.

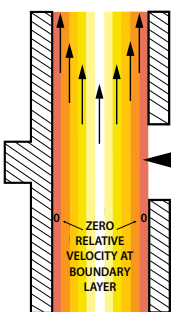
The grant included \$1.2 million to support 500 acres of marsh and prairie restoration at Corkscrew Swamp Sanctuary.





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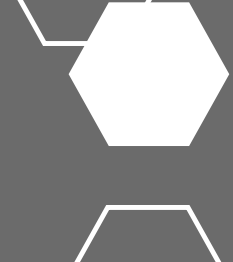
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KISSIMMEE
Continued on Page 16

Work underway on new Volusia County stormwater treatment plant

By ROY LAUGHLIN

This summer, Volusia County broke ground on a high-capacity stormwater treatment facility that will remove nitrogen and phosphorus from runoff conveyed by the Gabordy Canal to Mosquito Lagoon.

The primary sources of excess nutrients from the urban watershed are septic tanks and turfgrass fertilizers.

Project construction is expected to be complete by the end of the year.

The treatment system is an above-ground lagoon, 360 feet long by 180 feet wide. A high-capacity synthetic nutrient sorbent, Bold & Gold, will handle the nutrient removal.

The water will be pumped from Gabordy Canal to the top of the treatment lagoon and then percolate by gravity through the filtration media, which absorbs

both nitrogen and phosphate nutrients.

A system of pipes will collect the treated water and direct it into a typical excavated pond.

From there, the water will percolate back to Gabordy Canal, finally exiting the canal into the Mosquito Lagoon.

Ben Bartlett, Volusia County's public works director, said the new facility, called the Gabordy Canal Stormwater Treatment Facility, will supply baseload treatment for its drainage basin's stormwater.

The treatment facility will operate throughout the year, even when flows are minimal due to lack of rain.

The engineered nutrient sorbent, Bold & Gold, is the key component of the facility's enhanced nutrient removal capability.

The media is supplied in eight custom formulas providing different filtration rates for specific uses.

According to the manufacturers, this biosorption-activated media strongly sorbs phosphorus, nitrogen, suspended solids and pathogens.

The manufacturers noted that the chemical conditions that create nutrient retention capabilities in Bold & Gold depend on microorganisms.

The system remains aerobic, a redox status that promotes phosphate binding to clays and denitrification of NOx.

Tire crumb is the carbon source for the microbes performing denitrification. Filtration retains suspended solids.

Researchers at the Stormwater Management Academy at the University of Central Florida developed the Bold & Gold technology about a decade ago and conveyed a manufacturing license to Apopka-based Environmental Conservation Solutions.

The product has been used in baffle boxes and similar stormwater treatment vaults for many years.

Bartlett noted that the Bold & Gold blend planned for the Gabordy Canal facility is the most recently developed blend, one that is expected to enhance the performance and life of the system.

In 2019, Volusia County entered into a Reasonable Assurance Plan with the Florida Department of Environmental Protection to reduce nutrient loading into Mosquito Lagoon in an effort to improve seagrass beds there.

The agreement focused on nutrient input reductions to foster seagrass bed recovery.

The plan called for a 15 percent reduction of nitrogen inputs and a 12 percent reduction of phosphorus by 2034.

The Volusia County RAP includes a total of 13 projects that will reduce nutrient inputs to the troubled lagoon.

Four of the 13 are broadly characterized as large-scale stormwater/base flow

nutrient reduction projects.

Of the four, Bartlett said the Gabordy Canal facility received the highest priority ranking for improving the lagoon's water quality.

The canal drains one of the largest basins in the county, one that is now predominantly urbanized.

The new facility is expected to remove up to 5,700 pounds of nitrogen and 1,100 pounds of phosphorus per year.

Mosquito Lagoon's annual total nitrogen and phosphorus budgets are 328,130 pounds and 25,373 pounds, respectively.

The new stormwater treatment facility will remove 1.7 percent of the total nitrogen and 4.3 percent of the total phosphorus entering the system annually.

Bartlett noted that Bold & Gold has a 20-year use lifetime and said the system will be actively maintained to regenerate the sorbent's retention performance.

The county utilities department will analyze treated water samples taken regularly for a measurement-based performance evaluation of nutrient reduction by the system.

The state's Blue-Green Algae Task Force strongly endorses regular testing of water quality at nutrient removal facilities to ensure the systems are operating as originally planned.

Volusia County officials intend to "trust, but verify" the performance of the Gabordy Canal facility from the start.

The treatment facility will cost \$3 million. The St. Johns River Water Management District will pay the lion's share of the construction costs, \$1.9 million. Volusia County will cover \$742,216.

Additional funding for the water quality improvement project will come from the Florida Department of Environmental Protection, which will contribute \$300,700, and the Indian River Lagoon Council, which will chip in \$99,980.



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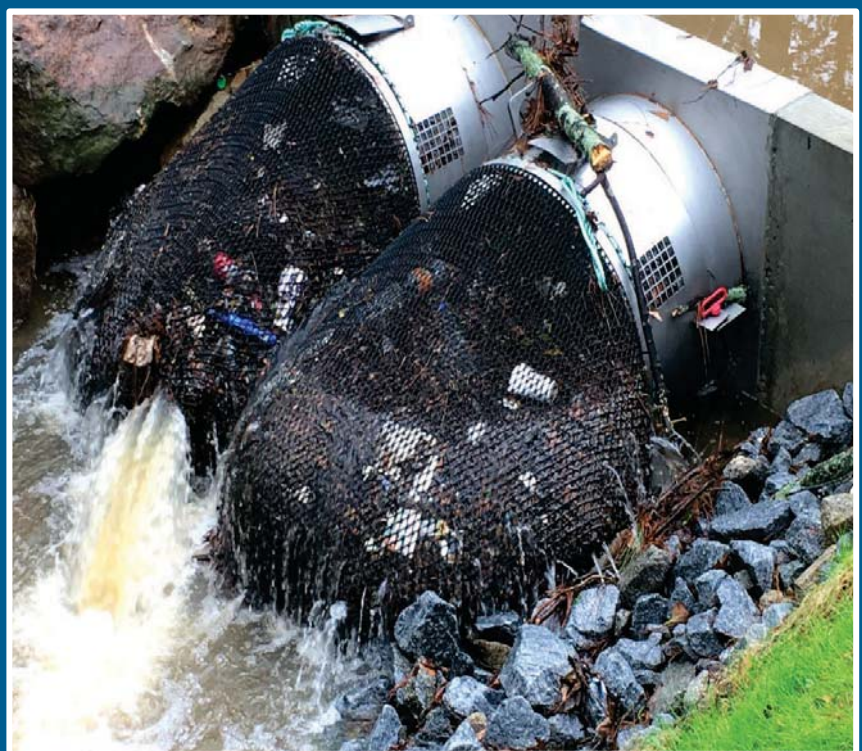
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Piney Point wastewater releases trigger unnatural ecological experiment in nearby bays

By ROY LAUGHLIN

What happens to a shallow subtropical estuary when a year's worth of nitrogen in its most bioavailable chemical form, ammonia, is dumped into it over just 10 days?

Since late March, that has been the million-dollar question after a mothballed Piney Point gypsum stack impoundment near Port Manatee began to fail and state authorities released its wastewater to prevent a structural collapse.

Over those 10 days in late March, Florida Department of Environmental Protection officials orchestrated a controlled release of about 205 million gallons of acidic gypstack wastewater that contained two primary plant nutrients: ammonia and ammonia phosphate.

Tampa Bay and Sarasota Bay, a few miles south of the release's outfall at the port, became the focal points of intense surveillance monitoring for any adverse impacts of such a massive nutrient input in such a short period of time.

The monitoring effort was not wasted.

In the ensuing four months, a cadre of researchers and the environmental advocacy groups Suncoast Waterkeeper and Tampa Bay Waterkeeper identified the ammonia addition as the primary factor evident in a cascade of algae blooms that terminated with the most severe red tide bloom in Tampa Bay since 1971 and the most remarkable efflorescence of *Lyngbya*, a blue-green alga, in Sarasota Bay.

The 10-day release added an estimated 200 tons of nitrogen and an estimated 100 tons of phosphorus into lower Tampa Bay near its broad boundary with the Gulf of Mexico.

Aside from the total amount of nitrogen involved, its chemical form—ammonia—is the most easily assimilated by plants from microalgae to macrophytes.

Most of the area's usual nitrogen input comes from aerosol deposition as nitrate. While still an effective phytoplankton nutrient, NOx does not spark phytoplankton blooms as efficiently as does ammonia.

Another important ecological difference between Piney Point's nitrogen inputs and naturally occurring inputs is that most of the aerosol nitrogen deposition to the two bays occurs throughout the year with a peak rate during the rainy season.

Thus, Piney Point's nutrient release is unique in terms of quantity, chemical form and seasonality. It does not mimic the natural nutrient cycles for nitrogen or phosphorus.

News accounts in early April, including daily updates from DEP, reported a rosy picture of only sporadic red tide associated fish kills in Gulf waters off Pinellas, Hillsborough, Manatee and Sarasota counties.

The story presented was that Piney Point's nutrients had been sucked offshore by currents and waves. In fact, an elevated nitrogen and phosphorus signal in water samples was ephemeral at best where it was observed at sampling stations closest to Port Manatee.

Because the elevated signals were so short-lived and diffuse in analyzed water samples, scientists at the Tampa Bay and Sarasota Bay National Estuary Programs turned to modeling to help understand nutrient dispersal around the outfall.

Current modeling by Robert Weisberg, PhD, a professor specializing in physical oceanography at the University of South Florida, showed that currents likely carried nutrients from the spill throughout most of Tampa Bay, with the lower bay bearing the brunt of the dispersal.

In addition, Sarasota Bay, with its northern inlet a few miles south of Piney Point, received a nutrient-laden plume from Piney Point's outfall at Port Manatee.

A biological signal of the fate of Piney Point's fugitive nutrients became obvious during May and June.

"The flow did not really leave the bay at all," said Ed Sherwood, executive di-

rector of the Tampa Bay National Estuary Program. "Most of it went into (Tampa) Bay."

Sherwood said that the nutrients were not dispersed. Instead, they have been recycled through algae blooms since April.

The undesirable outcome was increased microalgae growth, including some harmful algae blooms in both Sarasota and Tampa bays.

Sarasota Bay experienced a more obvious bloom than the planktonic macroalgae blooms in Tampa Bay.

The cyanobacteria *Lyngbya* grew explosively in Sarasota Bay. When healthy, it forms a gossamer network of strands that covers the bottom, including the seagrass beds there.

When *Lyngbya* dies and decays, its rotting biomass forms white "rafts" buoyed by decomposition gasses. Currents and wind-driven waves pushed the floating *Lyngbya* rafts throughout Sarasota Bay. The rafts covered hundreds of acres in shallow waters where it was stranded.

Its decomposition deprives the water and its organisms of oxygen. Even dead and without toxins, *Lyngbya* kills what its rafts cover and smother.

In nearshore waters off Sarasota Bay, blooms from another cyanobacterium, *Trichodesmium*, resulted from Piney Point nutrients.

David Tomasko, PhD, executive director of the Sarasota Bay National Estuary Program, noted a paradox with the *Lyngbya* bloom in Sarasota Bay following the Piney Point release.

His scientists determined that the *Lyngbya* bloom required as much as 800 tons of nitrogen to produce its estimated biomass last spring—four times the total nitrogen released from Piney Point.

He said that the phosphorus releases may have played a role in the massive bloom, but that's not certain. What is certain is that the bloom was temporally associated with the Piney Point releases.

From the time of Piney Point's initial release in late March, the promotion of red tide blooms was a primary concern.

During the first month, red tide blooms were reported only sporadically offshore of Pinellas and Hillsborough counties with some associated fish kills.

But in May and June, Tampa Bay and northern Sarasota Bay experienced significant red tide blooms.

Tampa Bay experienced the most extensive red tide, with blooms off of Pinellas and Hillsborough counties on the eastern side of Tampa Bay.

Sherwood pointed out that this was the

most extensive red tide bloom in Tampa Bay since 1970. At least 1,450 tons of fish died in the bay.

Red tide on the Gulf side of Pinellas County killed a larger tonnage of fish, perhaps 2,000 tons.

Piney Point's nutrients triggered and supported the recent red tide bloom in Tampa Bay. Still, the bloom was more aerially extensive and long-lived because of a rare coincidence of two other environmental factors—unusual warmth and high salinity.

First, last winter was notably warmer and dryer in terms of less rainfall, almost nonexistent for 10 weeks, and prolonged extreme low humidity in April and May.

The seasonally uncommon warm, clear, high salinity water that resulted in Tampa Bay was optimum for red tide blooms.

The Piney Point release completed the ingredient list needed for the ensuing historic red tide bloom and fish kills.

By late June, as the wet season fostered lowered salinities, the red tide in Tampa

PINEY
Continued on Page 14



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SFWMD's novel approach to STAs now underway north of the Everglades

By ROY LAUGHLIN

The South Florida Water Management District is heading in a new direction with stormwater treatment areas it's building as part of the Everglades restoration effort.

The district has contracted with private landowners north of Lake Okeechobee to build, operate and maintain an STA complex on a 2,700-acre tract there.

The STA's location, hybrid design, ownership and leasing options reflect a novel departure from the treatment areas the district now owns and operates.

A complex of multiple cells will treat surface water from the Taylor Creek/Nubbins Slough and the Kissimmee River

watershed before it enters Lake Okeechobee.

The treatment cells will include subareas of engineered marsh that have enhanced phosphorus sequestration capabilities.

Most significantly, the STAs, sited on former cattle ranches north of and adjacent to Lake Okeechobee, will be built and operated under a pay-for-performance contract for as long as a decade.

At the end of the decade, the district may either continue the contract or buy the facility outright.

The planned STAs will remove nutrients from the S-154 and S-154C basins and secondarily from the S-133 basin.

The S-154 basin, according to the

district's water monitoring data, contains the second-highest total phosphorus load levels in the Taylor Creek/Nubbins Slough watershed.

The S-154C basin has the highest load per unit area in the subbasin.

Thus, this project is an ambitious attempt to clean up nutrient releases from the two subbasins contributing the most phosphorus to Lake Okeechobee.

Earlier this year, the district issued an RFP, received two responses and selected a proposal submitted by Ecosystem Investment Partners LLC.

EIP is a private equity firm established in 2007 that provides investment capital for large regional ecological restoration and conservation projects, according to the company website.

In this case, the company negotiated with the district for a pay-for-performance contract that is expected to deliver an effective, large-scale restoration project.

In the past, the SFWMD has built STAs on its own property south and east of Lake Okeechobee.

This project is a combination of standard STA design with the addition of a "phosphorus elimination system," or PES, supplied by Sustainable Water Infrastructure Group LLC.

Last summer, SWIG installed a pilot system at a Clay County wastewater treatment plant.

The treatment system is a lined artificial treatment marsh. The engineered marsh includes a substantial system of sprinklers that control water inflow.

Buried water-collecting pipes are placed just above the impoundment liner.

Water pumps with sensors and computers to control water flow enhance top to bottom water circulation and, SWIG said, significantly increase nutrient removal by soil and aquatic plants.

The soil in the PES treatment cell is the system's secret sauce. It is primarily natural wetland soil that's blended with "water plant residuals," a slurry of chemicals used to treat raw source water at drinking water plants to remove suspended solids and other substances.

The spent "wastewater residual," which still retains significant phosphorus binding capability, is blended with soil to produce an engineered soil used in the system.

That soil, after placement in the marsh impoundment, is planted with emergent wetland vegetation.

The nutrients in the system's water are monitored at inflow and outfall to determine when nutrient concentrations have declined to the treatment target level due to assimilation by plants and sediment.

At that point, the treated water is released, in this case to Lake Okeechobee, and more water is added for treatment. Under most circumstances, the water's residence time is less than a day.

The proposed PES will comprise only 10 acres of the entire available STA acreage.

Earlier this year, Ecosystem Infrastructure Partners purchased two cattle ranches adjacent to Lake Okeechobee, the Rio Rancho and Fernandez Family Trust properties.

The total combined area of the two ranches is 3,350 acres.

Although some areas on project property may not be used for STA construction because they are protected natural wetlands, the number of acres converted to traditional STAs with emergent and submerged aquatic vegetation is expected to be over 3,000 acres.

EIP's conceptual proposal called for the construction of at least four STAs plus several phosphorus elimination systems to service them.

Upon conclusion of contract details, construction of the STA could begin by next year with an expected completion time of two years.

EIP will operate the project for up to seven years. Their level of compensation will be based on the amount of phosphorus removed.

An EIP technical representative said that based on information available from 20 years of operating STAs in the Everglades by the district, the company expects to remove 13-15 metric tons of phosphorus per year.

Under the most optimized conditions, that could increase to 26 metric tons of phosphorus per year. The wetlands will also remove nitrogen, but predictions of how much were not available.

The contract approved by the SFWMD Governing Board will span a 10-year period with a price not to exceed \$300 million.

In its first year, which ended in September, the district board appropriated \$12 million to support project negotiation, planning and design.

The amount of money needed for the construction phase in the next budget year will be substantially higher.

The SFWMD will provide project oversight, but the funding will be provided from the Florida Department of Environmental Protection's budget.

The minutes of the SFWMD board meeting stipulated that any payments in the future will depend upon the availability of funding.

In addition, at the end of the five-year operational period, it is expected that the project facility and title to the land will be transferred to the district at their sole discretion.

This project, if completed, will be the first STA treatment effort located north of Lake Okeechobee and the first of perhaps several within the Kissimmee River watershed.

New Lakeside Ranch pump station complete

Staff report

The final component of the Lakeside Ranch Stormwater Treatment Area Project, the S-191A Pump Station, is complete.

The Lakeside Ranch STA and S-191A Pump Station are key components of the Northern Everglades and Estuaries Protection Program.

The STA is located in Martin County, and the S-191A Pump Station that supports it is located in Okeechobee County.

The project was completed in three phases. Over 1,700 acres of natural wetlands were created in the first two phases, capable of treating stormwater runoff from the S-191 Basin.

The STA is expected to remove approximately 16 tons of phosphorus each year that would otherwise end up in Lake Okeechobee.

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Florida environmental industry adjusts to climate change impacts

By ROY LAUGHLIN

Hardly a day goes by when the news does not report on climate change effects on a species or ecosystem. Most of the reporting focuses on property risks such as forest fires in residential neighborhoods, sea level rise or destructive weather events.

But what about humans as organisms in the environment?

According to a recent report from the Union of Concerned Scientists, "(o)utdoor workers face severe risks from extreme heat—risks that will increasingly threaten the health and livelihood of tens of millions of outdoor workers in the U.S. as climate change makes dangerously hot days more frequent and intense."

Unfortunately, climate change warming will not leave humans unscathed.

Workers in the agricultural, construction and transportation sectors comprise the majority of the 32 million Americans likely to be routinely exposed to high temperatures for at least several hours a day while on the job, the report estimated.

Excess heat exposure begins at temperatures, by definition, at a threshold of 95 degrees Fahrenheit. When the heat equivalent, the combination of temperature plus relative humidity, makes it "feels like" 100°F, the Centers for Disease Control and Prevention recommends humans adjust their outdoor activities to avoid heatstroke and heat stress.

At heat index temperatures above 108°F, the CDC recommends that outdoor work be halted or rescheduled to protect worker health.

Many environmental professionals including well drillers, contractors, engineers, surveyors, inspectors, environmental samplers and other technicians involved with these activities work some or most of the time outdoors throughout the year.

Their numbers may seem like a small sliver of the work force among the 32 million that work outdoors, but they represent a significant proportion of Florida's environmental professional industry.

The good news is that Florida environmental firms generally have policies and practices that address avoiding the effects of Florida heat while working outdoors.

Florida heat

During the first 20 years of the 21st century in Florida, heat days above 100°F ranged from one to 14 days. The UCS report said that by the mid-21st century, with no effective reduction in the rate of global warming, that number of days will increase three to four times.

Virtually all peninsular counties will experience 30-54 unsafe worker days a year, an increase from the current one or two weeks up to one or two months.

A small number of counties along Florida's Atlantic coast from Brevard County north and across the Panhandle will experience a smaller increase of heat days from 14 to 30 per year.

Because of its latitude and peninsula landform blanketed with high humidity oceanic air, Florida has always experienced a higher heat index temperature than other regions in the southern U.S.

The contribution of latent heat in water vapor is significant. Up to seven times more heat energy exists in Florida's atmosphere as water vapor than is correlated with temperature alone.

Local regulation

The state of Florida has no enforceable heat standards to protect outdoor workers. That responsibility now lies with local governments like Miami-Dade County.

Jane Gilbert was appointed as Miami-Dade's first chief heat officer this year to advise and propose policy to city leaders. However, she has no regulatory authority.

When the heat index is expected to reach 100°F, the National Weather Service issues heat advisories in South Florida and heat warnings when the index reaches 113°F.

Gilbert would like to see the temperature thresholds lowered to better advise outdoor workers of temperatures that will cause heat-related illness.

If the NWS changes its effective temperature risk reporting due to Miami-Dade's endorsement, the new thresholds could play a future role in a state-wide standard.

Policies, procedures

Over the past two decades, Florida companies have adjusted their safety protocols in response to high heat indexes and lightning storms, a dangerous side effect of heat.

"In the past 20 years, Geosyntec has enhanced corporate policies concerning health and safety to take into account heat and lightning safety," said Jim Langenbach, PE, senior principal environmental engineer with Geosyntec Consultants Inc. in Titusville. "Heat stress is a serious worker health concern. We're mitigating against (it)."

Their mitigation effort includes planning some projects to account for the likelihood of high temperatures and the possibility of lightning. During the warmer months, workers monitor mobile apps for timely warnings of approaching storms.

Langenbach said that staff occasionally schedule early morning starts to fieldwork to avoid working through the heat of the day or to avoid expected thunderstorms that are usually prevalent between noon and sundown.

Nick Albergo, PE, DEE, a senior advisor with GHD in Tampa, echoed several of Langenbach's comments.

Some of GHD's outdoor employees operate geotechnical drill rigs, one of the most physically demanding types of outdoor work environmental professionals do.

Albergo said that his company has a set of safety protocols that include heat mitigation.

He noted that, for many contractors, a good safety record is an essential prerequisite for obtaining work. Companies with outdoors workers thus have a strong financial incentive to protect their workers from heat and lightning.

Albergo said that dutiful companies take it seriously.

Employers in the environmental industry have plenty of help with developing safety and mitigation protocols for their workers.

Both the National Institute of Occupational Safety and Health and the Occupational Safety and Health Administration provide recommendations for heat safety and plans to protect workers' health while working in extreme heat.

The UCS report recommended additional actions by regulatory agencies to ensure that new regulations consider the additive influence of ozone and other air pollutants that may accompany increasing

temperatures.

The group also wants to develop recommendations for "detecting and preventing heat-related illnesses, tailored to specific sectors, workforce populations and regions," and recording "the health impacts of heatwaves on workers in real-time, then using those findings to inform its recommendations on how to limit future adverse health outcomes."

The UCS report also encouraged the use of heat-protective clothing, wearable heat sensors and heat assessment tools, and suggested a shift to working during the cooler times of the day.

Albergo said that current practices

where field staff begins work at dawn, perhaps a couple of hours before office staff arrive, work advantageously.

However, he said that a scenario where field staff worked most of their shifts at night would not allow sufficient schedule overlap with office personnel.

Further, he noted that activities such as drilling require daylight, conditions generally true for much of the work done in the environmental enterprise.

Meenakshi Jerath, coordinator of research programs at the Disaster Risk Re-

HEAT
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Employment Opportunities Available

Sugar producers sue corps over proposed Everglades restoration efforts

By **BLANCHE HARDY, PG**

Florida Crystals Corp., U.S. Sugar Corp. and the Sugar Cane Growers Cooperative of Florida filed suit in federal court opposing the U.S. Army Corps of Engineers' 10,500-acre Everglades Agricultural Area Reservoir Project and the accompanying 6,500-acre wetlands stormwater treatment area being built by the South Florida Water Management District.

The organizations claimed that the

stormwater treatment area will require water during the dry season, potentially impacting the amount of water available for sugarcane crops.

They requested that the project be sent back to the corps for a additional environmental impact analysis.

The new reservoir and stormwater treatment area are expected to mitigate harmful surface water discharges from Lake Okeechobee to the estuaries on Florida's east and west coasts.

The current discharge of nutrient-laden

flow from the lake results in frequent harmful algal blooms that decimate marine wildlife and can close Florida beaches.

The Environmental Working Group Corp. estimated that communities across the country have spent more than \$1 billion dealing with outbreaks of HABs since 2010.

The current planned Everglades improvements would raise the surface water level to both sufficiently supply the water needed by the growers and maintain the necessary ecological water budget.

Corps officials said they are committed to balancing the supply of water in a manner that addresses the needs of all parties involved and have developed a new management plan to do just that.

"Everglades restoration is a partnership between the district and the U.S. Army Corps of Engineers," said Sean Cooley, director of the Office of Communications at the SFWMD.

Cooley said that it's critical that the

corps remain focused on building projects for the benefit of both people and the environment.

"The corps should not get distracted nor delay any construction of the EAA Reservoir Project or any other Everglades restoration features," he added.

The sugar groups use the existing system water for irrigation and want the corps to adhere to "the savings clause" in the Comprehensive Everglades Restoration Plan authorized by Congress in 2000. They contend that the clause guarantees their water allocation will not be reduced.

Among the issues expressed in the lawsuit are questions regarding the validity of the computer models used for the project.

The sugar groups also questioned the use of a lower lake level baseline to protect the vulnerable Herbert Hoover Dike in the 2008 management plan, and contend the higher baseline used to determine water distribution before the approval of CERP should have been used.

tors are less accurate, but that the EPA does not regulate based on short-term measurements.

When these short-term air monitors are used in studies, the agency employs an algorithm to convert measurements to a corresponding 24-hour average that's consistent with the certified sampling device's measurements.

The investigation revealed that none of the six major sugarcane producing nations, including the U.S., rigorously or even languidly enforce standards to protect agricultural workers or their families from PM2.5 in agricultural fire smoke.

And in the U.S., exposure standards are generally laxer than in other countries that burn cane fields.

There are currently no EPA regulatory standards for shorter PM2.5 exposures, such as the hour or so of sometimes choking smoke that farmers and residents must endure during field burning before harvest.

Many researchers believe that EPA's standards are demonstrably unprotective of the most sensitive individuals in a community where burning occurs.

EAA health providers agree with that assessment.

In the new study, researchers intend to install 35 monitors on residential properties and take short-term measurements when sugarcane burning occurs.

In addition to compiling that data, public health researchers will interview community residents to determine what respiratory problems occur due to smoke exposure, how frequently they experience respiratory problems and the per capita rate of adverse experiences attributable to the smoke.

Florida enjoys a good reputation for its air quality. A modicum of that public perception may result from public relations efforts funded by the sugar industry as well as loopholes in the regulation of short-term, high-intensity exposure to PM2.5 in agricultural areas.

For its part, the sugar companies claim that their burning practices comply with existing laws, which is hard to prove based on data from a single compromised monitor for three counties that produce a daily average that drastically lowers the true PM2.5 that exists when fires burn.

The NASA-funded study may lead to the eventual modification of protective EPA short-term PM2.5 exposure standards..

In Florida, the DEP would enforce those standards. However, there may be an impediment to any future DEP enforcement.

In its 2021 session, the Florida Legislature passed Senate Bill 88, the "right to farm" bill, that expressly limited residents near agricultural operations to sue for relief from PM2.5 in smoke, along with other nuisance results farming.

If and when EPA passes protective short-term PM2.5 standards, many EAA residents hope it will clear the air and reduce the incidence of human health issues related to PM2.5 exposure there.



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WATCH
From Page 5

Shark River Slough.

The project's conclusion marked a significant step in restoring water flow to northern Everglades National Park.

The Tamiami Trail was built in the 1920s as a causeway. Dredges and draglines piled dirt from trenches along either side of the right of way to raise the roadbed a few feet above the water level of the Everglades.

But even with a number of culverts, the road functioned like a levee, reducing water flow between water conservation areas north of it and the Everglades National Park to its south.

Removing this stretch of the old roadbed is the final component of road changes that will increase water flow into the park.

With the causeway gone, water managers expect an additional 220 billion gal-

FEDFILE
From Page 2

ponents affect water quality.

This initial study demonstrated contamination from flowback fluids. Analysis of the data to indicate rule compliance will be published next.

The researchers noted that fracking fluid's influence on surface water quality could be better determined by more frequently taking water samples from surface waters nearest fracked wells and using strategically designed sampling locations more broadly. In some cases, a single site was sampled in a watershed the size of a county.

Even with these limitations, this study was described as the first to show a statistically significant correlation between four elements in fracking fluid and an increase of those elements in surface waters adjacent to frack wells.

Petition to regulate lead in aircraft fuel. Although the use of lead additives in automotive fuels generally ended a quarter of a century ago, lead in aviation fuel for piston-engine aircraft received an exemption.

In 2021, 170,000 aircraft using 20,000 airports in the U.S. use leaded fuel. That use accounted for 70 percent of the lead released to the atmosphere.

The highest lead omissions occur in just five states: California, Florida, Arizona, Washington and Colorado.

In late August, Earthjustice and the County of Santa Clara, CA, petitioned the EPA to regulate lead pollution from aircraft, noting that more than 360,000 children under the age of five live near at least one of the airports where piston-engine aircraft use leaded fuel.

Earthjustice cited multiple studies showing that children living near airports have higher lead levels in their blood than the general population.

For example, Santa Clara County released a peer-reviewed study documenting elevated blood lead levels among thousands of children living near a San Francisco Bay general aviation airport.

Children living downwind of the airport had blood lead levels similar to those measured in children from Flint, MI, during the recent drinking water contamination incident there.

Earthjustice's recent activity is not the first time that advocacy groups petitioned the EPA to reduce or eliminate lead emissions from aviation fuel additives. Friends of the Earth asked the agency to file an endangerment finding for aviation fuels in 2006.

By 2012, the EPA proposed an endangerment finding to be released by 2015. That finding has not yet been released.

This time, 39 organizations and individuals signed a letter to EPA endorsing the need for lead restrictions in aviation fuels.

Navigable water rule decision. In late August, Judge Rosemary Marquez of the U.S. District Court for the District of Arizona ruled against the Trump Administration's 2020 Navigable Waters Protection Rule, the most recent version of the more widely recognized Waters of the U.S. Rule.

lons of water per year to flow through Shark River Slough into Everglades National Park.

In addition, the work will decrease the amount of water sent down the St. Lucie and Caloosahatchee rivers to prevent Lake Okeechobee overflows.

When the Tamiami Trail was built in the 1920s, it was the first overland link south of Lake Okeechobee for Florida's Atlantic and Gulf coasts.

At that time, it was hailed as a construction marvel. But over time, its detrimental effect on water flow to the Everglades became increasingly apparent.

For decades, Tamiami Trail construction has been considered more of an environmental disaster than a necessary infrastructure project.

Its removal was a vital component of the 1995 Comprehensive Everglades Restoration Plan.

In her opinion, Marquez found that the NWPR weakens clean water protections and is therefore inconsistent with the Clean Water Act.

"The Agencies published the NWPR notwithstanding feedback from the EPA Science Advisory Board that the NWPR conflicts with established science, disregards key aspect of the 2015 Connectivity Report and weakens protection of the nation's water in contravention of the CWA's objectives," she wrote in her opinion.

The judge also criticized substantial errors in the rule.

"The concerns identified by Plaintiffs and the Agency Defendants are not mere procedural errors or problems that could be remedied through further explanation," she wrote. "Rather, they involve fundamental, substantive flaws that cannot be cured without revising or replacing the NWPR's definition of 'Waters of the United States.'"

The court's decision is binding nationwide. It formally returned the federal government's authority to regulate surface water quality and quantity to the 1968 WOTUS rule pending its replacement.

The judge's ruling requires EPA to complete another round of rulemaking on an appropriate replacement. That replacement will almost certainly have to include protection for wetlands, some seasonal streams and other water sources, and for major tributaries and waterbodies that the Trump administration's NWPR rule omitted.

Draft method for PFAS in eight media. The EPA released a draft method for laboratory measurement of 40 PFAS compounds in wastewater, surface water, groundwater, soil, biosolids, sediment, landfill leachate and fish tissue.

Until this draft rule release, the agency had released a validated method for only drinking water.

In its announcement in early September, EPA said that draft method 1633 was "a single-laboratory validated method ... With the support of the agency's Council on PFAS, EPA and DoD will continue to collaborate to complete a multi-laboratory validation study of the method in 2022."

The EPA developed the new method in collaboration with the U.S. Department of Defense.

"(D)raft method 1633 complements existing validated methods to test for PFAS in drinking water and non-potable water," noted the agency. "The draft method may now be used for analyses related to National Pollutant Discharge Elimination System permits."

The method contains all the quality control procedures required by the Clean Water Act and the EPA recommended its use on individual permits. It will fully meet CWA compliance monitoring when EPA promulgates it through rulemaking.

"This new testing method advances the science and our understanding of PFAS in the environment, so we can better protect people from exposure," said EPA Administrator Michael Regan. "This illustrates the progress we can make when working with federal partners in an all-of-government approach."

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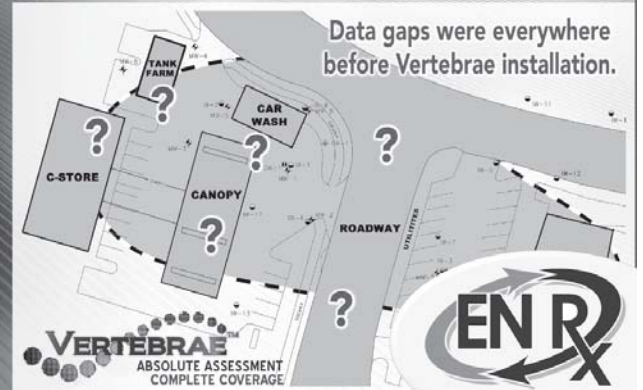
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FGS, NWFWMMD partner on dye trace study at Lake Jackson

By BLANCHE HARDY, PG

The Florida Geological Survey and the Northwest Florida Water Management District are cooperatively performing a dye trace study at Lake Jackson near Tallahassee.

The agencies will introduce a non-toxic fluorescent dye into Porter Hole Sink in the south-central portion of the lake.

Porter Hole Sink is currently exposed on the dry lakebed as the result of a periodic dry down event. The water in the lake has drained into the subsurface leaving the lakebed exposed.

During a dry down, a lake can vanish over a relatively short period of time leaving only residual small pools of water and rivulet channels draining into the subsurface.

This year's Lake Jackson dry down began in June and occurred again in July.

FGS and water management district geologists introduced 52.5 pounds of bright green fluorescein dye powder into the sink to study where the water in Lake Jackson travels once it drains into the underlying Upper Floridan Aquifer.

"One of the goals of this dye trace is to confirm the results of a previous dye trace that revealed there may be a connection between Lake Jackson and Wakulla Springs," said Guy Means, PG, acting FGS director and state geologist.

"Confirming this connection will help resource managers develop more informed strategies for managing our water resources," he added.

The scientists are monitoring 26 locations for the dye, including Wakulla Springs, 20 miles south of Lake Jackson.

Hundreds of water samples are expected to be collected. The sites will be monitored until dye is detected.

Charcoal packets that absorb dye from the groundwater were deployed in area springs, sinkholes and wells. If dye is de-

tected, geologists will know that water from Lake Jackson has traveled past the point where the sample was collected.

Alexandra Kuchta, press secretary at the Florida Department of Environmental Protection, cautioned that it may be weeks or months before the results of the dye trace study are known.

Lake Jackson occupies a closed, 42-square-mile drainage basin with no significant inflowing water, such as a creek or river.

Precipitation and stormwater runoff fill the lake and the accumulated water leaves the lake through lakebed sinkholes, evapotranspiration and downward seepage.

The basin was formed by the dissolution of the underlying limestone over geologic time and the subsequent collapse of the overlying sediments.

Lake Jackson, like many Karst lakes, contains sinkholes through which the lake's water can drain. Lime Sink, in the northern portion of the lake, and Porter Hole Sink are two of the larger Lake Jackson sinkholes.

Long term seepage of the lake's water through the lakebed has perforated the subsurface limestone with millions of tiny holes.

When a sufficient volume of water enters the system to overcome drainage and subsurface seepage, the lake retains its open water.

When drought conditions allow the volume of water discharged through the lakebed to exceed the volume entering the lake, a dry down occurs.

The water slowly returns once the volume entering the system exceeds the volume leaving.

The first recorded dry down of Lake Jackson occurred in 1829. Periodic dry downs of the lake have been recorded on several occasions and undoubtedly numerous dry downs occurred before records were kept.

increased levels of grass coverage and density since the late 1970s.

Dense algal blooms act like shade that initiates a slow loss of seagrass. Other eutrophication factors are linked to slow recovery of seagrass after a bloom-related die-off.

Over the past six years, however, Tampa Bay's seagrass recovery has leveled out. In the 2021 seagrass census, seagrass coverage declined, primarily due to some seagrass loss in Old Tampa Bay.

The six-year seagrass recovery hiatus correlates with a recent interval of high nutrient concentrations measured in Tampa Bay's water.

Sarasota Bay has experienced a different scenario, but one with similar ecological consequences.

In 2018, a dense red tide event killed seagrass beds and their fish populations—an estimated 10 million fish in the northern part of the Sarasota Bay near Santa Ana Sound.

The seagrass has not completely recovered there, nor have fish populations dependent on the seagrass ecosystem.

Tomasko said there is insufficient experience to predict how the eutrophication events in 2021 will affect recovery or prevent it from happening at all.

But detrimental effects on seagrass beds will likely be evident for multiple years to come in both bays affected by the Piney Point releases.

Despite the uncertainty of the level of damage done to the seagrass ecosystems and the animals that depend on them, Tomasko made one observation with certainty: "Piney Point is probably the worse things to happen to our waters in 50 years."

Editor's note: The websites of the two national estuary programs mentioned here continue to provide updated data. In addition, in the coming weeks, the Sarasota Bay NEP is expected to post the next update of its long-term nutrient monitoring results.

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Bay waned, and by the end of July, red tide was largely absent from most of Tampa and Sarasota bays.

"We can't stop red tide," said Tomasko. "But we can stop it from getting worse."

The ability to keep it within bounds depends on keeping nutrients out of the water it grows in. Piney Point illustrated that adding a lot of nutrients results in a lot of red tide.

As of early September, DEP contractors had released more water from the Piney Point facility to counteract the rainfall addition, but not from the gypstack cell.

Instead, the water was released from two other impoundments with "mixed" seawater and stormwater runoff. Sherwood said its nutrient loadings to Tampa Bay account for tens of pounds, not tons, of nutrients per week.

DEP contractors are now treating gypstack water to remove nutrients. The treated water is then trucked or piped to a wastewater treatment plant in Manatee County.

By early September, DEP reported approximately 1,645,300 gallons of nutrient-depleted gypstack water were trucked to Manatee County's Southeast Water Reclamation facility. In addition, an additional 589,152 gallons was piped to the facility.

As a result, DEP estimated that about 200 tons of total nitrogen and 150 tons of total phosphorus were removed from the gypstack cell's water.

The big deal about the release

According to the directors of the two national estuary programs involved, the problem with the massive release is that it acutely challenged local community efforts to reduce nutrient inputs that destroy seagrass beds.

Seagrass bed restoration has been a notable success story in Tampa Bay with

FRC

From Page 1

Superfund and Emergency Management Division at the U.S. Environmental Protection Agency's Region 4 Office, was invited to provide an update on remediation activities at the federal level.

At the state level, Natasha Lampkin, FCCM, FCCN, program administrator in the Florida Department of Environmental Protection's Petroleum Restoration Program in its Division of Waste Management, will provide updates to the PRP and other remediation programs.

Rounding out the opening session are two familiar FRC faces, former FRC Chair Nick Albergo, PE, DEE, a senior advisor at GHD Services in Tampa, and Michael Goldstein, managing shareholder at The Goldstein Environmental Law Firm PA in Coral Gables and one of the top brown-field experts in the country.

Albergo will discuss the status of ASTM International's widely-used Phase I Environmental Assessment protocols.

"There will be an ASTM Phase I Environmental Assessment update by the end of this year because the current standards have sunset provisions every seven years," said Albergo.

"This happens to be a year for re-balanced approval of the standard Phase I assessments, so there are a number of updates including additions to terms, definitions and additional directives on how to do a Phase I," he said. "The most important is new content, including self-directed cleanups and emerging contaminants."

Goldstein will deliver his usual insightful thoughts on the continuing evolution of brownfield redevelopment efforts across the country and in the state.

Case studies have always been among the conference's most robust presentations. This year, they form the skeleton of the program, giving it both form and strength.

Thursday morning's first technical session includes four case studies on in-situ site cleanup.

Three of the talks will describe hydrocarbon- and chlorinated hydrocarbon-contaminated site cleanup. The case studies make clear that in-situ chemical oxidation remains a preferred approach for such sites.

The fourth talk will present a method to immobilize arsenic, a naturally-occurring soil contaminant throughout Florida.

On Thursday afternoon, three additional case studies will follow the Day One Luncheon.

First, Daniel Leigh, PG, CHG, technology applications manager at Evonik Active Oxygens LLC, will describe how the application of reductive reagents can remediate metals and chlorinated organics when hydrogen sulfide is part of the biogeochemical pathways in the treatment zone.

In contrast, Doug Rogers, PE, a senior project engineer in the Tampa office of Aptim Environmental & Infrastructure LLC and longtime FRC participant, will describe an in-situ oxidation treatment process that successfully treated a site contaminated with tetrachloroethylene.

Rounding out the session, Todd Kafka, PG, senior principal hydrogeologist with Geosyntec Consultants Inc. in Tampa, will describe how a former railway yard with arsenic contamination was prepared for brownfield redevelopment in Lakeland.

The key factor driving the project, Kafka said, were the visions of a former city employee and a developer who teamed up to convert the contaminated site near downtown into a park.

The late afternoon session on Thursday will update PFAS developments from a national perspective and includes two case studies of successful PFAS cleanup.

Day Two

Michael Goldstein will moderate the talks in the first session on Day Two, Making Redevelopment Happen!—a complex effort whose final success depends on much more than environmental cleanup.

At the PFAS Forum in April last year, Goldstein noted the difficulty, in some cases, of getting insurance for sites that are or could be contaminated by PFAS.

The occurrence of PFAS and additional factors can make insurance more difficult

to obtain than many in the industry feel it should be.

Patricia Mills, owner of Mills Environmental Insurance Services in Suwanee, GA, will address this issue and others in her presentation.

"Basically, insurance will close the deal for the lender so they know the loan is protected," Mills said. "The prior owner has security, too."

FRC/MGD 2021 Schedule At A Glance	
Wednesday, Nov. 17	Pre-Conference Workshop: <i>Risk Assessment and Community Involvement</i> 11th Annual FRC Charity Golf Tournament
Thursday, Nov. 18	FRC/MGD Day One Technical Sessions and Exhibits 8:00 am - 5:00 pm
Friday, Nov. 19	FRC/MGD Day Two Technical Sessions and Exhibits Talks: 8:00 am - Noon; Exhibits: 8:00 am - 10:30 am

In another talk, Christian Wells, PhD, a professor of anthropology and director of the Center for Brownfields Research & Redevelopment at the University of South Florida, will introduce a useful online tool for brownfield redevelopment efforts, the Florida Brownfields Redevelopment Atlas.

"The atlas is an online discovery tool to help communities, local governments, businesses and others learn about changes to brownfields once redevelopment begins," Wells said. "It also helps identify

which properties might be best suited for redevelopment.

"The atlas is unique because it combines information from the U.S. Census, the U.S. EPA's EJSCREEN tool, all the information available from the Florida Department of Environmental Protection, and a whole lot more," he added.

The tool also includes historical aerial photos and new LiDAR data for most ma-

yor metropolitan areas, information about housing stock, numbers of households receiving federal assistance, and even data on COVID-19 infection rates, he noted.

The FRC's wrap-up session late Friday morning includes a talk on strategies for moving from active remediation to site closure from Ryan Tuttle, PG, a project geologist with Geosyntec Consultants Inc. in Tampa.

"My presentation provides a pathway to closure through collaborative communication and concurrence with DEP on

potential data gaps, plume stability analysis and the proposed site institutional controls to meet risk management options closure requirements," Tuttle said.

"The collaborative communication with DEP ensures that RMO requirements are met, and this assists in facilitating approval of the no further action proposal for a site," he said.

In addition to the technical presentations, FRC brings together over 90 companies and their representatives in the exhibit hall to answer questions about their products and services.

For many participants, FRC provides their best opportunity of the year to renew friendships and form new ones.

In conjunction with the conference, the annual FRC Charity Golf Tournament is back for its 11th year.

The tournament is scheduled for Wednesday, Nov. 17, at the nearby Rosen Shingle Creek Golf Course. Tee time is 12:00 noon.

Over the past 10 years, the FRC charity event, which includes an online silent auction this year, has raised over \$230,000 for its charities.

The Southern Waste Information eXchange in Tallahassee produces the FRC and MGP conferences, and both are open to all registrants. Attendees can participate in person or virtually.

Complete information is available at <https://floridaremediationconference.org/> and <https://mgpsymposium.com/>.



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| Aestus, LLC | Green Rock Strategies, LLC |
| AirLogics, LLC | Groundwater Protection |
| Alpha-Omega Training and Compliance, Inc. | Hepaco, LLC |
| Aptim Environmental & Infrastructure | Hull's Environmental Service, Inc. |
| AquaBlok, Ltd. | Hydroseeding Solutions, LLC |
| AST Environmental, Inc. | Innovative Environmental Technologies |
| ASTM | International Society of Technical & Env Professionals, Inc. |
| Blackhawk Technology | J5 GBL, LLC |
| Blackline Safety | Johnson Screens |
| Blaine Tech Services, Inc. | JRW Bioremediation, LLC |
| Brownfield Science & Technology, Inc. | Lewis Environmental |
| Burns & McDonnell | LMS Manufacturing |
| Carbon Service & Equipment Co. | Mechanik Nuccio Hearne & Wester, PA |
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| Cascade Drilling and Remediation Services | Mills Environmental Insurance Services, LLC |
| CG Thermal, LLC | Moran Environmental Recovery, LLC |
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| Florida Brownfields Association, Inc. | Walker-Hill Environmental, Inc. |
| Florida Specifier | Waste Connections |

For complete information about participating in FRC 2021, visit floridaremediationconference.org

EPA Region 4 announces first P2 award program

Staff report

The U.S. Environmental Protection Agency's Region 4 Office recently announced a new Pollution Prevention Award Program to recognize organizations in its eight southeastern states and their tribal lands for demonstrated leadership in innovative P2 practices.

"EPA's Pollution Prevention Award Program will recognize organizations that have taken the initiative to prevent pollution at the source," said Acting Region 4 Administrator John Blevins.

P2 is defined as any practice that reduces environmental releases of hazardous substances, pollutants or contami-

nants prior to entering a waste stream for recycling, treatment or disposal.

EPA's P2 program is voluntary and encourages stakeholders to seek innovative ways to prevent pollution from entering waste streams through a competitive grant process and the provision of technical assistance to businesses.

This is an annual, non-monetary awards program. Those interested in applying or nominating an organization to be considered for an award should submit a complete application describing their P2 efforts, activities, cost savings and the replicability of their approach.

Application deadline is Oct. 19, 2021.

HEAT

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duction Program at the Extreme Events Institute at Florida International University, is now engaged in research analyzing questionnaire responses to determine the effects that current heat levels have on outside workers exposed to Florida's climate.

NOTES

From Page 3

Company news. Geosyntec Consultants Inc. recently acquired coastal and water resources engineering and consulting firm Applied Technology and Management Inc. ATM will operate as ATM, a Geosyntec Company.

The acquisition allows Geosyntec to expand on the services provided by ATM experts in the U.S. and Dubai to create solutions for coastal and inland resiliency and adaptation challenges.

Likewise, Geosyntec's professional depth allows ATM staff and clients to meet their needs utilizing a broader range of expertise.

Hamilton appointed DEP secretary. Florida Department of Environmental Protection Interim Secretary Emile D. "Shawn" Hamilton was formally appointed as secretary of the department in early September.

Hamilton had been interim secretary since June, 2021. He previously served the department as deputy secretary of land and

To date, she has collected more than 125 responses in her research and more than 70 percent of respondents report that they have become overheated to the point that they could not work the next day.

The same number reported that extreme heat exposure reduced the quality of their work product.

recreation, overseeing Florida's 12 million acres of public lands, and prior to that was the director of the Northwest District office of DEP from January, 2011, through February, 2020.

The appointment was challenged by Agriculture and Consumer Affairs Commissioner and Florida Cabinet Member Nikki Fried, a gubernatorial contender.

She noted that Gov. Ron DeSantis lacks the legal authority to make the appointment.

"State law is very clear," Fried said. "It requires the unanimous approval of the Cabinet, in addition to confirmation by the Florida Senate."

Fried said that she has met and interviewed Hamilton and believes he is well qualified for the job. However, she would like to see the governor comply with state law regarding his appointment.

Shortelle out, Register in at St. Johns district. In mid-September, the St. Johns River Water Management District Governing Board appointed Michael Register, PE, as their new executive director.

Register has been with the district since 1990. During that time, he worked in environmental resource permitting, consumptive use permitting, water supply planning, engineering and environmental sciences.

Ann Shortelle, PhD, served as the district's executive director for the past six years. The press release issued by the district did not include information about her future plans.

Valenstein joins The Water School at FGCU. Former DEP Secretary Noah Valenstein joined Florida Gulf Coast University as its first presidential fellow in water policy at The Water School.

In keeping with another of his former roles as Florida's chief resilience officer, Valenstein will work with Mike Savarese to advance and support the Southwest Florida Regional Resiliency Compact, a FGCU-facilitated effort to create synergy around climate change between Southwest Florida counties and municipalities.

KISSIMMEE

From Page 7

mile-long canal that drained roughly 50,000 acres of the Kissimmee's floodplain wetlands.

The work was successful at moving water south—but had disastrous effects on the floodplain's ecosystem.

The effort to restore the river began in 1999.

Phase 1 construction was completed in 2001 in the lower river basin and Phase 4 restored continuous water flows to approximately 19 of 44 miles of the Kissim-

mee River in 2010.

Final Phases 2 and 3 included backfilling the canal and restoring flow to an additional nine miles of the river.

As a result of the restoration, Lake Kissimmee is expected to rise one and a half feet allowing the additionally stored water to replenish the river during the dry season and rehydrate 20 square miles of dried marshes.

The restoration project restored seasonal flooding within the river's traditional floodplain and will allow the river to meander and replicate its natural path.

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