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## PFOA destruction 6

Researchers from Rice University and China's Tsinghua University demonstrated that boron nitride catalyzes the complete degradation of perfluorooctanoic acid and GenX chemicals to inorganic compounds after a few hours' exposure to ultraviolet light.

## Red tide economics 7

A new study will examine the economic impact of the red tide bloom that lasted from October, 2017, through February, 2019—the longest lasting red tide on record during the last century.

## Health of Biscayne Bay 8

Miami-Dade County officials continue to wrestle with the quality of water and ecosystems in Biscayne Bay, home to a dozen threatened or endangered species and a key economic driver in the region. The bay's health has been a concern for decades with little done to improve it.

## PFAS Action Plan? 9

Since its debut, EPA's PFAS Action Plan has been cited as proof of the agency's "unwavering commitment to public health and the environment" under the Trump administration. But, truth is, almost all of the "action," outside of several new analytical methodologies, has resulted from the efforts of state and local governments, and utilities—not EPA.

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### Got a story lead?

Got an idea for a story? Like to submit a column for consideration? Let us know. And don't forget to fill us in on your organization's new people and programs, projects and technologies—anything of interest to environmental professionals in Florida. Send to P.O. Box 2175, Goldenrod, FL 32733. Call us at (407) 671-7777; fax us at (321) 972-8937, or email [mreast@enviro-net.com](mailto:mreast@enviro-net.com).

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Photo by Raychel Rabon, University of Florida/IFAS

Eban Bean, a University of Florida/IFAS assistant professor of agricultural and biological engineering, uses "GatorByte" to test water quality in a stream in Gainesville. See story on Page 13.

## PRP among first state programs to suffer budget stress from economic slowdown

By ROY LAUGHLIN

The following message appeared on the Florida Department of Environmental Protection Petroleum Restoration Program's announcements page in late September, signaling PRP to be one of the first state programs to announce changes due to the COVID-19 economic downturn:

"The Department (of Environmental Protection) values and appreciates our working relationship and recognizes the important role you serve in the Petroleum Restoration Program. Considering present circumstances, the state is experiencing a decline in revenue to the Inland Protection Trust Fund. *Given the decline in the revenue to this fund, we are pausing future obligations* (emphasis added) and prioritizing continued operation of remediation systems,

well abandonment for site closure, securing sites and safety issues. We are working with the Governor's Office and Legislature to monitor this situation and, as it evolves, we will communicate any changes with you."

A temporary pause due to the summer reduction in revenue is understandable, but a long-term freeze does not appear to be justified.

Many believe the reduction in PRP encumbrances since August 19 has already balanced the Inland Protection Trust Fund revenue decline, and the program should resume operations promptly before further costly industry impacts are incurred.

Receipts from Florida's IPTF fund the petroleum cleanup program. The IPTF receives its revenue from a \$1-per-barrel tax on petroleum fuels, primarily gasoline, diesel fuel, and avia-

tion fuel, consumed in Florida.

Since 2013, DEP has received an average of \$208.9 million of the IPTF's total receipts, which have averaged \$231.9 million during that time.

FY 2019-2020 total IPTF revenues were over \$236.2 million and \$214.6 million was transferred to DEP. During those same years, the department budgeted \$110 - \$128 million for the PRP, with average funding over those years of \$118.875 million.

For the second half of the fiscal year ending on June 30, 2020, IPTF experienced an 8.92 percent decrease in funding from taxes on all categories of petroleum fuel. The low point in May was due to the pandemic.

IPTF revenues are now recovering.

The average monthly total over the last seven years was \$19.3 million. IPTF receipts have increased every month since May—\$13.2 million, \$15.4 million and \$17.7 million in May, June and July, respectively. Total pollutant taxes climbed to \$20.3 million in August.

This upward trend in IPTF revenues should continue to increase as Florida returns to business as usual. On Sept. 25, Gov. Ron DeSantis issued an executive order removing the remaining COVID-19 restrictions on businesses in Florida as the state enters its final phase of reopening.

In the 2020 state budget, PRP appropriations were \$115 million for the 2020-2021 fiscal year. \$4.5 million was carried over from 2019-2020 making \$119.5 million funds available for PRP this fiscal year, which is already lower than 2019-2020 PRP productivity.

In 2019-2020, PRP net encumbrances were \$128.4 million, or \$10.7 million per month, based on a \$110 million appropriation and \$21.5 million carry-over from 2018-2019.

## DEP begins BMAP revisions for northern Indian River Lagoon

By ROY LAUGHLIN

With recurring basin management action planning for the Indian River's southern segments concluding, Florida Department of Environmental Protection program officials and scientists began a similar effort for the northern IRL segment.

The northern segment stretches from Turnbull Hammock south to roughly the mouth of Eau Gallie River, including the Banana River.

The northern segment has been experiencing ecological decline since the mid-1960s when municipal wastewater treatment plants began discharging effluent into the lagoon.

Several massive drainage projects to divert stormwater from west of the Coastal Ridge to the lagoon added to the northern IRL's early excess nutrient problems.

Dredged causeway construction played a significant additional role in reducing water circulation.

In most of the Indian River's northern segment, the extensive, dense seagrass beds disappeared between 1970 and 1990. No persistent significant seagrass recovery has occurred in the northern segment since and it is now classified as "impaired."

In August, DEP conducted its first planning webinar, kicking off an update to the northern IRL's basin management action plan.

In 2013, the state of Florida adopted BMAPs as one of two water quality management strategies to meet Clean Water Act requirements. BMAP use is now required for all impaired waters of the state.

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# Compliance with EPA reporting requirements continues during pandemic

## Staff report

During the COVID-19 lockdown and the following few months, the vast majority of permitted industries and facilities required to submit monitoring and discharge data to the U.S. Environmental Protection Agency continued to do so.

Just 352 facilities nationwide invoked the EPA's emergency order and did not report discharges or monitoring data required under the Clean Water Act.

On March 26, Susan Bodine, assistant administrator for EPA's Office of Enforcement

and Compliance Assurance, issued an emergency order that suspended requirements for monitoring and reporting for about 49,600 facilities nationwide with Clean Water Act discharge permits.

The 352 facilities that did not provide the required reports comprised just one-sixth of one percent of all permittees required to do so.

Under the emergency order, permit holders were still bound by their permit allowances. Although unclear at the outset, EPA did expect to receive reports as required under permit.

The agency subsequently provided guidance that directed reports under permits without monitoring data to use a COVID-19 exception code. The 352 permittees mentioned above were those that submitted with the exception code.

When first issued, the emergency order included no conclusion date. The EPA subsequently issued an ending date of August 31.

Many environmental advocacy organizations criticized the blanket exception. They wanted the EPA, at minimum, to maintain sampling and monitoring requirements on emission sources in sensitive habitats.

Advocates also urged the agency not to exempt permittees with a history of permit violations or credible accusations of a violation.

At least one company in that category, Houston's Citation Oil and Gas Corp., filed reports with the COVID-19 exemption.

Ironically, the week before the EPA COVID-19 emergency order, Citation agreed to pay \$115,000 in civil penalties. The EPA charged the company with regulatory violations associated with oil spills.

This information comes from a list of companies supplied to *The Hill* by EPA.

**EPA relaxes CCR deadline.** At the end of July, EPA finalized revisions to the 2015 Coal Combustion Residuals rule.

The most significant change involved increasing the time coal-burning power plants have to meet deadlines for closing unlined ash pits and ash ponds.

It also allowed for the use of less expensive technologies for handling and impounding coal combustion residuals. Both of the changes are less stringent than those in the initial 2015 rule.

Some coal plants, particularly those with closure plans in progress, are exempt from the deadlines imposed on operating plants as are coal plants converting to natural gas by 2028.

The rule will affect about 75 of the 914 power plants in the country still burning coal. Under the 2015 rule, about 100 plants were affected.

Plant closures, planned closures and natural gas fuel conversions are the primary reason for the reduced numbers of affected plants.

Nonexempt power plants must now comply with the more stringent CCR stor-

age requirements by 2025 or 2028.

The 2015 rule had corresponding deadlines of 2018 and 2023. Power plants under certain conditions may stretch the timelines into the mid-2030s to comply with these 2020 CCR revisions.

Coal impoundments may contain residuals from two power generation waste streams: the ash wash from the bottom of the furnaces and the smokestack scrubber ash.

Scrubber ash contains some of the most toxic elements found in coal ash including mercury, arsenic and acid-forming sulfur and nitrogen oxides.

The new rule allows utilities to discharge up to 10 percent of the bottom ash water, with each decision to be made on a case-by-case basis.

Release of ash water increases a coal ash impoundment's useful life. The 2015 rule did not allow any release of ash water.

In 2015, EPA estimated that coal-burning power plants were responsible for 30 percent of all the U.S.' toxic water pollutant discharges. The agency estimated those toxic wastes contaminated fisheries and water supplies used by 2.7 million people.

The EPA said these changes in the rule would reduce coal ash residuals pollution by an additional one million pounds annually.

However, critics claim that those estimates depend upon voluntary additional pollution control measures by utilities. Consequently, the rule's revisions may allow hundreds of pounds of additional highly toxic wastewater to be released into rivers, ponds and other waterbodies.

The rule revision seems to have been formulated without careful consideration of increased water contamination.

The rule specifically excepts the Tennessee Valley Authority's Cumberland City coal-burning plant. According to EPA, the plant produces a million more gallons of process water per day than any other U.S. coal-burning plant and accounts for as much as a sixth of the wastewater released from cleaning out coal plant flues.

This rule revision, therefore, legalized releases from the largest single coal combustion residual discharger in the country.

The EPA revised the date for taking unlined service impoundments that "failed the aquifer location restriction" out of service to April 11, 2021. Utilities now have more time to use unlined impoundments before they must begin to remove the ash to prevent aquifer contamination.

Surprisingly, the EPA tightened up one stipulation in the revised rule. Clay-lined service impoundments are no longer considered lined surface impoundments that meet the requirements for coal ash residual storage.

These impoundments must either be upgraded or closed on the protracted schedule in the revised rule.

The Obama administration wrote the 2015 rule to meet court-mandated changes in coal combustion residual storage to comply primarily with stipulations in the Clean Water Act. Rule revision is still bound to those judgments and consent agreements.

The revised rule was finalized on July 29. It will likely not be subject to the Congressional Review Act, depending on how many days Congress is in session between now and the end of the year. These revisions may be in effect into the foreseeable future.

**Funding for farm-focused projects.** EPA announced the availability of funding for "farmer-led, farm-focused projects" that will improve water quality in the Gulf of Mexico.



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## UF, Fight for Zero begin contamination study in Brevard

### Staff report

The University of Florida and environmental advocacy group Fight For Zero are partnering on a study of contaminants including per- and polyfluoroalkyl substances in Brevard County.

Fight For Zero strives to improve the quality of life for Floridians by working toward zero pollution in water, air and soil.

Fight For Zero's tracking identified five PFAS sites in Brevard County, including Kennedy Space Center, Cape Canaveral Air Force Station and Patrick Air Force Base, which they said represents the third most PFAS-contaminated sites in the country.

A cancer cluster has been identified in the Patrick AFB vicinity.

The partnership includes environmental health and engineering specialists working in cooperation with members of the community. The study, funded by the U.S. Environmental Protection Agency, will be county-wide.

Eric Coker, PhD, a University of Florida team member, assistant professor and environmental epidemiologist, noted that people in the community are literally part of the team.

Among the project's goals is EPA's desire to build population resiliency in light of natural disaster. The team will assess change to the environment resulting from climate change and how vulnerable populations might be impacted by the existing contaminated sites in the county.

Coker said the project is intended to identify exposure pathways for PFAS contaminants, to characterize the range and concentration of PFAS contaminants in the county before and after flooding events including identifying the extent of contaminant migration, and to identify the range of media containing contamination including biologic media.

**New tool in solar generation efficiency.** University of Central Florida engineering students are helping the Orlando Utilities Commission improve the reliability of its solar generation facilities.

UCF students developed Skycam, a camera-equipped observation device that allows engineers to predict cloud cover events approaching the utility's solar arrays.

Sporadic bands of clouds result in variations in solar power output. By predicting upcoming cloud cover impacts, OUC can compensate for the resulting dips in solar power output by activating backups such as battery storage units to cover the loss of solar generation capacity.

OUC is currently using Skycam at its existing solar operations and plans to add additional units in the future.

The water and power utility is engaged in expanding its renewable energy capacity and Skycam will be among the tools they use to help assure current and future solar power reliability.

**Mangrove preservation in Naples.** Stephanie Malloy, the city of Naples' Natural Resources Division manager, recently proposed a two-part solution for the protection of mangroves within the city's jurisdiction.

The plan includes seeking delegation of authority from the state of Florida to manage mangrove trimming and preservation, and requesting that the governor implement more stringent permitting criteria.

Malloy noted that Naples has lost a significant number of mangroves in recent years. According to city staff, the mangroves are being removed in favor of masonry sea walls that hinder the establishment and growth of mangroves.

Mangroves are an important part of Florida's native shoreline, helping mitigate the impact of sea level rise, and acting as wind and wave storm buffers.

The tropical native plant also traps and helps circulate organic materials and nutrients in the coastal ecosystem.

They are vital resource in the marine

animal food chain and provide physical habitat and nursery grounds for a wide variety of marine organisms important to recreation and commercial fishing.

Mangrove loss is a significant issue across the state. The Florida Department of Environmental Protection estimates roughly 469,000 acres of mangrove forests contribute to the overall health of the state's southern coastal zone.

DEP's mangrove protection program is coordinated by Submerged Lands and Environmental Resources staff in Tallahassee.

DEP interprets and provides guidance on the statutory language, oversees local governments that have been delegated to implement the program, and reviews applications requesting designation as a professional mangrove trimmer.

If successful, Naples will become the eighth delegated local government with the authority to implement the Mangrove Trimming and Preservation Act under the state's program.

Once delegation is approved, the city can require more stringent mangrove protection criteria.

**DEP sea level rise grants.** DEP's Florida Resilient Coastlines Program announced the award of roughly \$2.3 million in grant funding for resilience initiatives to address the impacts of sea level rise in 30 coastal communities in 17 counties.

The grants are specifically designed to assist local governments in preparing for the effects of rising sea levels, including coastal flooding, erosion and ecosystem changes.

Funding will be available in fiscal year 2020-2021.

"Florida continues to lead the nation

in resiliency and preparedness," said DEP Secretary Noah Valenstein. "These grants help balance the needs of our resources while protecting residents' homes and livelihoods in coastal communities."

Grants were awarded in the categories of resilience planning and resilience implementation.

Resilience planning grants provide financial assistance in promoting resilience planning, including complying with the "Peril of Flood" statute that helps to ensure coasts recover and move forward faster after natural disasters hit.

Coastal communities are required to include a coastal management element in their comprehensive plan that assesses the current and future effects of flooding from sea level rise, storm surge, precipitation and other sources.

Resilience implementation grants assist coastal communities in implementing their adaptation and resilience plans and support nature-based options for erosion and flood control, including coral reef and mangrove restoration, elevating public structures and projects specifically included in existing adaptation/resilience plans.

The grant application cycle for fiscal year 2021-2022 began Aug. 1, 2020, and closes Oct. 9, 2020. Information is available on the state's FRCP Resilience Grants web page.

**Lido Beach renourishment.** The city of Sarasota's Lido Beach Hurricane and Shoreline Damage Reduction project is nearing the halfway mark.

The project is one of the largest beach renourishment projects in the state. It will

## Florida Notes

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# Canal construction of Everglades Agricultural Area reservoir underway

## Staff report

In late August, another phase of accelerated construction of the long-awaited Everglades Agricultural Area reservoir and stormwater treatment area began with a series of explosions.

Two tons of explosives were detonated to break up limestone, marking the initial construction activity for canals that will link the EAA reservoir to its stormwater treatment area.

The blasts displaced 10,000 cubic yards of limestone, the first step of constructing canals that will eventually be able to move

3,000 cubic feet of water per second into the STA.

Upon exiting the STA, the treated low-nutrient surface water will flow towards Everglades National Park.

Late last April, EAA reservoir construction began after receiving all the necessary permits.

The U.S. Army Corps of Engineers is the lead agency for the reservoir component.

The state of Florida, operating through the South Florida Water Management District, will construct the STA and associated canals.

According to a recent water management district news release, officials expect to complete STA construction in 2023.

The corps plans to complete the EAA reservoir in 2028.

**Cocoa Beach wastewater upgrade.** In August, the city of Cocoa Beach announced the completion of important wastewater treatment plant upgrades.

The city installed new filters and associated equipment to remove nitrogen and phosphorus from wastewater sludge.

The low nutrient wastewater will be available for landscaping irrigation and other water reuse.

The project is expected to reduce nutrients by an estimated 1,201 pounds of phosphorus and 3,603 pounds of nitrogen.

The ultimate goal of the nutrient removal effort is to reduce algal blooms in the Banana River, a portion of the Indian River Lagoon that has experienced severe algal blooms over the past decade.

The recently completed work was a 2019 cost-share project between Cocoa Beach and the St. Johns River Water Management District, contributing \$5.1 million and \$1.5 million, respectively.

The announcement of project completion provided an opportunity for the district to make perhaps this year's final offer of substantial funding for Indian River Lagoon cost-share projects.

The Florida Legislature under the 2020 Clean Waterways Act appropriated \$25 million for projects that benefit the Indian River Lagoon.

Both the South Florida Water Management District and the St. Johns River Water Management District received a portion of that appropriation.

The deadline for proposal submission was Aug. 21. It may not be long before several additional nutrient removal projects are underway along the Indian River Lagoon.

**St. Pete reclamation facility upgrade.** The city of St. Petersburg's Northwest Reclamation Facility, built in 1957 and upgraded several times since, treats up to 20 million gallons of wastewater a day.

The city is proposing to upgrade the plant, one of three currently in operation, with renovation and replacement of aging equipment, and construction of a new pumping station and two 7.5-million-gallon reject water storage tanks.

The storage tanks, which will be 200 feet in diameter and 50 feet high, will store water that has passed through the wastewater treatment plant process, but has not been sufficiently treated and disinfected for distribution through the city's water reuse system.

Building an additional 50 million gallons of storage capacity will markedly expand the plant's capacity to store wastewater before it would have to dump the

excess water into nearby creeks that flow into Tampa Bay during high rainfall events.

It will also provide additional reuse water supplies for local landscape

irrigation and other applications.

The city announced plans to upgrade the plant in early August and began virtual public meetings to discuss them with the public.

St. Pete has a history of wastewater treatment plant violations. In 2015-2016, flooding rain events caused significant overflows at St. Pete's other major wastewater treatment plant, the Southwest Water Reclamation Facility.

Under a subsequent consent agreement with the Florida Department of Environmental Protection, the frequency and chronic nature of the city's wastewater treatment plant overflows have generally abated.

**Palm Coast utility system upgrades.**

The city of Palm Coast in Flagler County embarked on the next stage of a countywide utility management effort by including construction plans in its annual budgeting exercise.

City officials are looking at all aspects of Palm Coast's water utilities, from stormwater management to potable water supply.

All are slated for upgrades and long-term maintenance in the coming year.

The stormwater system projects include beginning the design phase of the golf course bypass in the stormwater system's E Section and design of drainage improvements in the stormwater system's K Section.

The city hired a diving company to conduct underwater pipe inspections. Based on the results of those inspections, pipes will be rated and added to the city's long-term work plan.

The city prioritized the installation of generators at its wastewater pump stations. The Federal Emergency Management Agency is collaborating with these generator additions.

Efforts are underway to add generators to 30 pump stations. Most were completed, but 10 generator additions were delayed by the COVID-19 lockdown.

Once those 10 sites are finished, an additional five more generators will be installed at wastewater pump stations still lacking them.

The generators supply electricity to keep the pump stations operating during power outages.

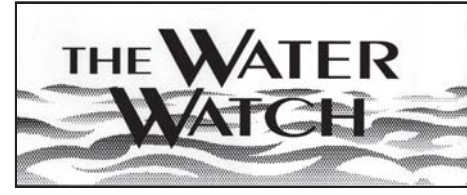
Palm Coast's Water Treatment Plant No. 1 will receive a new filtration system to improve the potable water's color, taste and odor.

These improvements will cost over \$1 million and are expected to be complete by 2022.

Water Treatment Plant No. 2 is the subject of an ongoing design and expansion plan. WTP No. 2 is slated for the construction of three new source water wells at an estimated cost of \$1.8 million.

In addition, the city's potable water distribution system on Old Kings Road will get a \$250,000 make-over next year. The water main upgrade is occurring in conjunction with Old Kings Road's widening to four lanes.

The city also budgeted to continue its



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radio-enabled metering program. Already, 75 percent of its customers have radio-enabled meters. The phased meter replacement program will continue next year.

One advantage of radio metering is that it provides rapid notification of marked changes in water flows, such as during a burst pipe or leaking system. It's an advantage for both homeowners as well as the utility.

Despite the pandemic's impact on economic activity, city officials announced they expect a six percent increase in operating costs and revenues for the Utilities Department in the coming fiscal year.

That expectation, plus the need to continue maintenance and ongoing programs, is the primary driving force behind the ambitious utility system upgrades.

**Polk wellfield plans receive funding boost.** The Polk Regional Water Cooperative and South Florida Water Management District received a significant financial boost when DEP provided \$2.4 million in funding for two Lower Floridan Aquifer wellfield projects in Polk County.

The two wellfield projects involve drilling multiple wells into the deep, brackish part of the Floridan Aquifer—the Lower Floridan Aquifer—in both western and southwestern Polk County.

The brackish water there must be treated by reverse osmosis. Consequently, these projects are part of PRWC's portfolio of alternative water projects.

Both of the wellfield projects have been in the planning stages for several years. The recent funding will push the projects toward completion over the next several years.

Polk County's southwestern Lower Floridan Aquifer wellfield project will stretch approximately 10 miles along the south side of Highway 60. Up to 15 wells may be drilled into the Lower Floridan Aquifer.

The wellfield has already been permitted to do deliver up to 30 million gallons of source water per day.

The western Polk Lower Floridan Aquifer is slated for up to 19 wells within or near Lakeland's city limits.

Although this region will include more wells than the southwest LFA facility, it will deliver about half as much water daily, just 15 million gallons per day of source water.

So far, the PRWC board has approved \$20 million in funding for these projects.

The board plans to spend up to \$65 million to develop sufficient alternative water supplies to support Polk County's expected growth.

**Nutrient inputs to Tampa Bay.** Local governments around Tampa Bay got a free ride for decades when stormwater runoff, and wastewater and stormwater system overflows discharged nutrients and other contaminants into Tampa Bay.

But after two years of flooding events in 2015 and 2016, DEP finally stepped up to force local governments to upgrade their stormwater management and discharge systems or face significant fines.

DEP issued a series of consent agreements that included the cities of St. Petersburg, Largo and Gulfport, and Sarasota County.

The local governments agreed to upgrade their wastewater collection systems and improve stormwater management.

Though progress has been made, the nutrient contamination situation is not completely resolved.

For example, the city of Largo exceeded its nitrogen discharge levels every month of 2020 through June.

This occurred even though the original consent agreement had been revised multiple times.

The latest revision set an October, 2022, deadline for Largo officials to achieve reduced nitrogen input levels.

Recently, local environmental advocacy groups including the Suncoast Waterkeeper, Tampa Bay Waterkeeper and Our Children's Earth Foundation stepped up pressure on local governments to clean

up their discharges to the bay.

The groups filed suit in federal court against the city of Largo to end its releases of nutrient-contaminated water into old Tampa Bay.

This is the second lawsuit the group has filed. The court rejected the first suit on procedural grounds.

The advocacy coalition acknowledged Largo's efforts to date, which include spending over \$80 million over the past 10 years, but hoped the lawsuit would apply pressure for more effective efforts to reduce nutrient inputs.

A lawyer for the city noted that wastewater discharges to a retention pond in Feather Sound, a point of contention in the lawsuit, is not a discharge to "navigable waters" and therefore not subject to the federal Clean Water Act.

Apparently, the point the lawyer wished to make is that if the discharge does not violate federal law, then it cannot be a source of contamination that violates state law—an interesting point of view.

In a letter, the city's attorney also noted that, for a number of the alleged violations, the city has already paid regulatory fines and therefore a lawsuit is unnecessary.

**Project aims to reduce ocean plastic debris.** Researchers at Eckerd College in Tampa and the University of North Florida in Jacksonville embarked on a research program that examines students' awareness of single-use plastic consumption and the effectiveness of efforts to reduce single-use plastic use among college students.

The project's goal is to identify and improve effective behavioral modification techniques.

Eckerd College initiated a similar project to reduce single-use plastic at its St. Petersburg campus in 2018.

The current collaboration with UNF's Environmental Center expands on the Eckerd College disposable plastic use reduction program.

The investigators will question UNF students about their attitudes and habits, and encourage behavioral changes regarding the use and disposal of single-use plastics.

The current project includes multiple week-long "plastic reduction challenges" attempting to increase the accountability and commitment of students through the use of a smartphone app.

After completing a series of student outreach efforts, researchers at the two educational institutions will analyze data generated by the app's entries and from surveys filled out by participants to learn more about how effectively such efforts modified single-use plastic behavior.

The National Oceanic and Atmospheric Administration's Marine Debris Program provided \$150,000 to support this joint project.

Single-use plastics are well documented to be a major source of plastic debris in the ocean, a growing threat that affects species diversity, including many endangered pelagic species.

Plastic debris, from microplastics to small pieces, has repeatedly been shown to accumulate through food chains, sometimes even to the point of causing death through intestinal blockage in upper trophic level organisms.

The plastic that accumulates most densely in central ocean gyres of the Atlantic and Pacific oceans turns out to be far more than an aesthetic problem.

This project aims to help reduce it by changing attitudes that can change the behaviors that generates the floating trash.

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# Researchers demonstrate PFOA photocatalytic destruction using boron nitride

By ROY LAUGHLIN

A group of collaborating researchers at Rice University and China's School of Environment at Tsinghua University, demonstrated that boron nitride, or BN, catalyzes the complete degradation of perfluorooctanoic acid and GenX chemicals to inorganic compounds after a few hours' exposure to ultraviolet light of 254 nanometer wavelength.

The complete destruction of octanoic compounds occurred within four hours in aqueous solution, showing photooxidation to be a promising advanced oxidation process for PFOA destruction.

The team, headed by Michael Wong, PhD, professor and chair of the Department of Chemical and Biomolecular Engineering at Rice University, included a succinct review of perfluoro compound photooxidation in the research paper.

The group's focus was initially on titanium dioxide, or TiO<sub>2</sub>, a compound that has a wide electron bandgap that captures a broad spectrum of light energy and has demonstrated photocatalytic ability.

Based on prior research and experience, the team did not expect BN to be a photocatalyst capable of degrading PFOA.

They assumed the ultraviolet light they were using had too narrow a wavelength to activate BN's electron bandgap. For that

reason, BN is considered to be an insulator.

Noting that other researchers had reported evidence for photocatalytic water splitting useful in photocatalytic treatment, they decided to combine TiO<sub>2</sub> and BN, process the mixture in a ball mill and use the resulting powder in PFOA degradation experiments.

With an introduction that would lead the reader to expect BN to have little influence, the Results section of the research paper began with a twist in the first line: "PFOA concentrations unexpectedly decreased with irradiation time using BN."

The perplexingly unexpected observation became the subject of nearly a year's worth of additional experiments to conclusively demonstrate that the discovery of PFOA degradation was accurate.

The researchers consistently observed nearly complete PFOA destruction with just four hours of exposure to ultraviolet light in the presence of BN.

A switch to a similar PFAS, the six-carbon compound trademarked as GenX, showed similar BN-catalyzed chemical degradation upon exposure to UV light.

GenX degraded more slowly, however, with only 20 percent degradation in four hours.

The validation experiments demonstrated the generation of oxygen and hy-

droxyl radicals that degraded the long-chain PFAS by stepwise decarboxylation/defluorination over BN. The TiO<sub>2</sub> played a role because it degraded shorter chain products more quickly than BN.

PFOA degradation led the researchers to further consideration BN's role, demonstrated to be essential for the observed degradation.

The BN's UV absorbance at 245 nm Raman spectra indicated edge defects due to B or N vacancies in its crystalline structure. The researchers noted that the initial batch of BN powder "as received, was relatively defective." They increased crystal defects through ball milling.

In another twist, the researchers described one boron nitride lot they purchased that had no catalytic activity. Cor-

respondingly, its Raman spectroscopy showed it lacked the signature of crystal defects of the other two lots that had photocatalytic defects.

Wong's group continues to explore the boundaries of BN's effectiveness as a photocatalyst for PFOA destruction and to look for other PFOA treatment methods to more effectively adsorb PFOA from water.

In the meantime, they have made what is a most unexpected and possibly valuable discovery of a rapid photocatalytic treatment method.

Their paper is worth a read as it is not often that a scientific paper begins with an experimental paradox followed by an entertaining account of the subsequent experiments to sleuth the mysteries of unexpected behavior.

## FPL announces plans for hydrogen pilot project at its Okeechobee power plant

By BLANCHE HARDY, PG

In late July, Rebecca Kujawa, executive vice president and chief financial officer of NextEra Energy Inc., announced a groundbreaking plan for the utility's green future during a company conference call.

Toward the goal of achieving an emis-

sions-free future, Kujawa shared the company's excitement about the long-term potential of hydrogen power, announcing plans for a hydrogen pilot project.

The planned \$65 million, 20-megawatt electrolysis system will be installed at Florida Power & Light Co.'s Okeechobee facility.

Florida Power & Light Co. is the principal subsidiary of Juno Beach-based NextEra Energy Inc.

Solar energy will be used to produce the hydrogen that will fire one of the three gas turbines at the FPL Okeechobee Clean Energy Center.

The utility pilot project requires approval from the Florida Public Service Commission. If the project proceeds as planned, it could be online as early as 2023.

"FPL has a long-track record of driving change and challenging the status quo to consistently deliver customers America's best energy value—electricity that's the cleanest, most reliable and affordable in the country," said Bill Orlove, APR, manager of public affairs and media relations at FPL.

Hydrogen is most frequently associated with green vehicle technology but has increasing application as a broader range fuel in the context of power generation with renewable sources.

But currently, hydrogen is predominately generated from fossil fuel sources, which results in CO<sub>2</sub> emissions.

"Hydrogen will be produced through electrolysis, which uses electricity to split water into its two elements: hydrogen and oxygen," Orlove said. "If the electrolysis process is powered by renewable energy (in this case solar), then this 'green hydrogen' is produced with no carbon emissions."

The hydrogen will be compressed and stored on-site. When needed, it will be blended with natural gas, creating cleaner energy that can be distributed across the power grid.

Hydrogen enables solar, wind and battery sources to be more flexible and resilient. Solar- or wind-generated energy can be used to fuel hydrogen production during peak operation periods and hydrogen can be used as an alternative fuel to augment these generation methods during down times.

Hydrogen has an advantage over battery supply because it can act as a viable independent or mixed component fuel source over a longer time frame.

"We believe that the project is a complement to our ongoing solar and battery storage development efforts, and highlights FPL's continued innovative approach to further enhance the diversity of its clean energy solutions available for customers," said Kujawa.

FPL plans to continue evaluation of other potential hydrogen power applications.

NextEra Energy claims to be the world's largest generator of solar and wind renewable energy. It's worth noting that FPL has closed all of its coal-powered plants in Florida.



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# Joint UCF-USF study to characterize economic effects of red tide

By ROY LAUGHLIN

A research study on red tide's economic effects entitled "Estimating Economic Losses and Impacts of Florida Red Tide" could become a seminal example of data-based determinations of economic impacts at its intersection of environmental impingement on humans and the public perception of it.

This study will examine the economic impact of the 17-month-long red tide bloom lasting from October, 2017, through February, 2019—the longest lasting red tide on record over the last century.

The red tide influenced almost all of Florida's Gulf Coast at different times.

To determine the economic impacts, the investigators will statistically analyze the Florida Department of Transportation database of monthly sales tax receipts by economic sector.

Since 1995, FDOT has tracked sales tax receipts for goods and services in 80 economic sector categories. Those include, for example, hotel accommodations, liquor sales, entertainment venues and restaurant sales.

Sergio Alvarez, PhD, assistant professor in the Department of Tourism, Events & Attractions at the Rosen College of Hospitality Management at the University of Central Florida, explained that he will aggregate the 80 categories into a smaller number of more general categories.

Likely categories will include tourism; the "blue economy," which would include tax receipts related to sports and commercial fishing, swimming or surfing; and construction.

By combining the 80 categories into fewer, more general groups, the researchers hope to reduce "noise" in the temporal tax receipt data arising from especially low-dollar categories that can vary greatly over short time intervals.

A second goal is to exclude or minimize the statistical influence of economic activities that may be primarily affected by factors outside the region of red tide influence, for example, gasoline prices.

The researchers will use the Florida Fish and Wildlife Conservation Commission's extensive water quality databases for red tide blooms and the organisms' brevetoxin concentration in water.

Alvarez noted this data is quite variable in its geographical coverage, temporal coverage, number of samples taken and the non-normal distribution of toxin measurements in it.

He will be meeting with colleagues at the Ecological Society of America's annual meeting to discuss with other researchers how they have handled analyzing ecological data sets with these characteristics.

Characterization of economic influence for predictive models, a key goal of this project, will be heavily dependent upon correlations between the two empirical data sets.

One goal is to accurately predict the economic effects of red tide that are lagging, with characteristics of the bloom that can be measured in real-time.

Another component of the research will go beyond an examination of quantitatively measurable influences of people's economic choices during a red tide bloom.

"We are trying to identify what types and prevalence of discourse or messaging may be correlated with high and low economic impacts, either above or below what would be expected given the observed concentration of (red tide)," Alvarez said. "We want to identify messages that could be used in a communications plan designed to counteract the negative impacts of harmful algae blooms by inducing people to change their behavior."

The team will gather and quantitatively analyze Twitter comments made during the 2017-2019 bloom period to identify comments about its effects and influence on perceptions and attitudes.

The inclusion of social networking's influence on the empirical data in this study may provide some of the most significant insights for predicting the economic reflec-

tion of human behavioral response to adverse environmental events.

Alvarez noted that the study could show that red tide, tourism and local economic activity were not deeply influenced by social media posts. The hypothesis is, however, that public perceptions are magnified, minimized or perhaps even distorted by social media posts even when objective data clearly illustrates the focus of red tide on the economy and the magnitude of the influence.

Florida's red tide occurrence and duration have increased dramatically. Since

1995, red tide blooms have occurred almost every year, and in five of those years, blooms occurred at some location, large or small, during the entire year. This was not the case before 1990.

The authors noted that red tide is now chronic rather than episodic. Its economic influence is persistent on regional economies along Florida's Gulf Coast.

With that aspect of red tide blooms in mind in mind, the National Oceanic and Atmospheric Administration awarded \$227,000 in early July to conduct the study. As the study proceeds, the investiga-

tors will create a publicly available Internet database available through a web browser to provide access to the data and results of its analysis.

The investigators intend to provide graphical summaries of the results to make them more accessible to non-experts and to the public that may not be familiar with statistical table interpretation.

If this study only identifies usefully predictive relationships between intensity/duration of red tide and its economic influence on Florida's Gulf Coast counties, it could become a standard reference.

## Flagler Beach seeks funding for wastewater improvements

By BLANCHE HARDY, PG

The Flagler Beach City Commission approved pursuing a Florida Department of Environmental Protection loan to replace the \$900,000 state loan that failed to be funded in this year's legislative budget process.

The funding is needed to correct deficiencies in the city's aging wastewater treatment plant.

Fred Griffith, Flagler Beach's public works director, said the city is planning to apply for a state revolving loan in order to fund the improvements.

They also intend to apply for grants through the St. Johns River Water Management district and possibly other funding sources.

"Conklin Porter and Holmes is currently working for us to that end," he said. "The design is anticipated to be completed prior to calendar year 2020, and be under construction sometime in 2021."

The city previously initiated a series of utility rate increases over five years to address water and wastewater infrastructure maintenance including retrofit of pump stations and replacement of deteriorating pipelines, including a 12.5 percent rate in-

crease in October, 2019.

The city is reluctant to consider tax increases or other funding increases this year due to the burden many residents now face as a result of the coronavirus pandemic.

The improvements are needed to upgrade the plant's antiquated concrete tankage, as well as equipment, pipes, valves and sludge drying beds, Griffith said.

The wastewater treatment plant was constructed in 1987.

The proposed improvements will ben-

**FLAGLER**  
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# Miami-Dade officials continue to wrestle with Biscayne Bay pollution

By **BLANCHE HARDY, PG**

An August Miami-Dade Board of County Commissioners meeting opened with a series of citizen reports that morphed into another discussion about the quality of water and ecosystems in Biscayne Bay.

The reports were introduced by Commissioner Daniella Levine Cava and Commissioner Rebeca Sosa. Sosa was instrumental in the creation of the Biscayne Bay Task Force in February, 2019.

Rachel Silverstein, PhD, the Miami Waterkeeper, delivered a presentation on the critical environmental and economic importance of Biscayne Bay. The bay is home to a dozen threatened or endangered species and is a vital economic driver of the region.

Silverstein provided photographic documentation of a recent fish and wildlife kill in northern Biscayne Bay and reported on the associated algal blooms that started in late August.

Fish kills are “not normal ... especially not for Biscayne Bay,” Silverstein said. “It is unprecedented in our region to have a fish kill of this size and severity. Why did this happen? One word: pollution.”

She explained that fish kills and algal blooms are the result of excess nutrients entering the bay through stormwater, fertilizer runoff, and septic tank and sewer system leaks.

The excess nutrients drive increased algae and bacteria growth that consume the oxygen previously available to fish and wildlife, which then suffocate. The excess nutrients also kill seagrass.

The Riverkeeper noted that more than 80 percent of the seagrass in the northern bay has died over the past few years.

One of the most disturbing points she made is the length of time the nutrient loading problem has been known and reported on over the years—with the same recommendations repeated again and again.

She displayed a *LOOK* magazine cover from 1949 detailing the problems of sep-

tic tank pollution in Miami.

Her presentation called out a 1970 federal government study of sewage and septic tanks in Dade County, now Miami-Dade County, resulting in a \$500 million grant to build three sewage treatment plants and convert septic tanks to central sewage. The plants were built but septic tanks remain.

“The number one thing concluded from that study is that the septic tanks are a public health hazard,” she said.

Last August, a grand jury said Biscayne Bay had reached a tipping point. NOAA warned the county and state that nutrients entering Biscayne Bay signaled a shift in water quality that could permanently damage the bay.

There are over 100,000 septic tanks in Miami-Dade of which more than 50,000 are already compromised, according to a county report in 2018.

The Riverkeeper said the situation is both “an environmental and public health crisis,” and recommended the commission act now to stop sewage leaks, eliminate septic tanks, enact the fertilizer ordinance under consideration, and improve the storage and treatment of stormwater runoff.

At the same meeting, Irela Bague, chair of the county’s Biscayne Bay Task Force, introduced the task force’s final report and recommendations for the bay.

“It is clear to everyone that the health of Biscayne Bay is in a state of emergency and at a tipping point towards irreversible ecological collapse,” she said.

“Every couple of decades, we gather a

group of experts to develop recommendations and plans. But these good faith attempts have been implemented too slowly and often have been abandoned,” she said. “The difference this time is that we must act now, and we must act together.”

The task force recommended creating an overarching governing and administrative structure to implement recommendations under seven policy themes: water quality, governance, infrastructure, watershed habitat restoration and natural infrastructure, marine debris, education and outreach, and funding.

Bague said that the task force’s recommendations include some policies that can be immediately enacted and others that will take more time.

She highlighted the infrastructure recommendation because it will lower nutrient levels in the bay while concurrently stimulating the economy and put people to work.

“This report is an urgent and final call to make Biscayne Bay and the protection of the Biscayne Aquifer a county and state priority,” Bague said in closing.

Among the sticking points with moving forward are several long-awaited reports on current studies including the overdue Biscayne Bay Report Card.

Commissioners pressed to have the reports available before their next meeting.

While most of the commissioners made supporting statements, some noted the financial burden to homeowners as a sticking point for septic-to-sewer conversion.

## Corps releases new Lake Okeechobee watershed restoration project reports

By **BLANCHE HARDY, PG**

The U.S. Army Corps of Engineers, Jacksonville District, released its Lake Okeechobee Watershed Restoration Project Final Integrated Project Implementation Report and environmental impact statement in August.

The report details actions proposed for the Lake Okeechobee Watershed Restoration Project, which includes Okeechobee, Highlands, Hendry, Lee, Glades, Martin and St. Lucie counties and the Seminole Tribe of Florida’s Brighton Reservation.

The report’s recommended plan is intended to increase water storage capacity in the watershed including the four major drainage basins of Fisheating Creek, Indian Prairie, Taylor Creek/Nubbin Slough, and portions of the Lower Kissimmee.

The proposed projects cover approximately 920,000 acres.

The plan is aimed at improving lake

water levels; the quantity, timing and distribution of water to the northern estuaries; water supply for existing lake service area users; and restoring wetlands within the project area.

In cooperation with the South Florida Water Management District, the corps developed strategies to reduce high-volume freshwater releases from Lake Okeechobee by redirecting flows to an above-ground wetland attenuation feature, or WAF, and aquifer storage and recovery wells with a combined storage volume of approximately 448,000 acre-feet per year.

Earlier this summer, corps and district scientists conducted an aquifer storage and recovery well technical workshop that included an independent scientific peer review panel.

The workshop included previously

**LOWRP**  
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# EPA PFAS Action Plan shows little progress, relies on state efforts

By ROY LAUGHLIN

In February, 2019, U.S. Environmental Protection Agency Administrator Andrew Wheeler announced the agency's per- and polyfluoroalkyl substances "action plan."

Since its first announcement, the agency has billed it as the agency's "first multi-media, multi-program, national research, management and risk communication plan to address a challenge like PFAS."

Since its debut, this program seems to have been first among EPA's top talking points, cited as proof of the agency's "unwavering commitment to public health and the environment" under the Trump administration.

This summer, EPA Region 4, along with the agency's national headquarters, provided a summary of progress made to date on their PFAS Action Plan.

This article reviews the agency plan's status in light of the Trump administration's disquieting habit of taking credit for more than is due.

The EPA Region 4 press release made a particular point of its partnerships with eight southeastern states and six native-American tribes to accomplish the specific goals of its PFAS plan in the region.

"EPA Region 4 has formed partnerships with states, tribes and local communities to address local PFAS challenges across the Southeast," the release touts.

However, almost all of the activity outside of chemical analysis methodology occurred primarily due to the efforts of state and local governments, and utilities.

Chemical analysis method development is an EPA responsibility. And it is the only success to date that the agency can rightfully claim for addressing PFAS.

In November, 2018, EPA released Method 537.1, followed in December by Method 533. These two methods provide validated methods for measuring 29 PFAS with carbon chain lengths of four - 12, inclusive.

Environmental labs following these methods can confidently produce concentration data for these compounds in drinking water to low parts per trillion levels.

The agency also committed to approving EPA Method 8327 by Sept. 30, 2020. The agency released the rule for public comment in June, so by the time readers see this, the new analytical method may already be in use at environmental labs.

## Support of state efforts

The EPA has assisted primarily the states of Alabama and North Carolina with the measurement of PFAS in water.

In North Carolina, the EPA assisted with PFAS measurement in water samples taken in 2016 and 2017.

The EPA also conducted similar sample measurements for the Cape Fear River near Wilmington, NC.

Their assistance helped Wilmington's water treatment plants develop effective water filtration techniques to remove PFAS from river water destined for their drinking water system.

The EPA also sampled residential drinking water wells near the Chemours GenX plant, some of which proved to be contaminated.

At the Chemours chemical synthesis plant in Fayetteville, the EPA worked with North Carolina authorities to identify PFOA chemicals in air emissions and measure their concentration as part of an effort to completely understand potential routes of human exposure in support of developing a comprehensive human exposure risk model.

In an unrelated case in Region 4, Alabama's Weiss Lake was contaminated by PFAS released by carpet mills along the Conasauga River in Georgia. The Coosa River, into which the Conasauga River flows, carried the chemical contamination to the lake.

Consequently, a water treatment plant in the city of Centre, AL, installed a \$1.6 million treatment system to remove PFAS.

In 2017, Centre's Water and Sewer

Board sued 3M, DuPont and the carpet mills that released the PFAS for damages and recovery of costs.

That case has apparently grown into a federal lawsuit with multiple plaintiffs including several cities in Florida.

These are two of the earliest and most well-characterized instances of EPA assistance to local utilities and health agencies, primarily by EPA's Region 4 environmental laboratory in Athens, GA, to characterize potable water contamination.

## Enforcement action?

The EPA said in its summary that it has continued to take enforcement action against entities that violate federal environmental laws and regulations pertaining to PFAS.

But a substantial portion of the EPA Region 4 summary describes enforcement actions that were, in fact, taken by states. EPA's direct involvement—if it exists at all—is obscure.

Alabama used the court system and both North Carolina and Alabama took administrative actions.

Alabama also undertook enforcement action against the 3M plant in Decatur, AL, and North Carolina took enforcement action against the Chemours chemical plant in Fayetteville.

The Region 4 summary noted that en-

forcement actions were aimed at reducing PFAS contamination at the manufacturing sites that contaminated water.

That statement characterized North Carolina Department of Environmental Quality administrative actions, not EPA actions, to clean up Chemours' contaminated materials generated by plant cleanup, some of it illegally sent to landfills not permitted for such wastes.

In Region 4, the agency's enforcement strategy seems to be to leave it to states and local governments to independently pursue court cases for damages, and to draft and impose administrative orders. Meanwhile, companies continue with business as usual.

How did this strategy work for the Chemours plant? In court filings, Chemours estimated a cost of \$200 million to clean up environmental damage around its Fayetteville plant.

But the corporation filed a corrective action plan in which it said it could not afford to remove contaminants from all 70 square miles around its Fayetteville plant.

## Still no formal PFAS standards

The EPA's failure to proceed beyond its non-enforceable 70 parts per trillion health advisory for octanoic perfluoro compounds in drinking water is the agency's most egregious failure to support

state governments in protecting the health of their residents and the environment.

Federal agencies completed a comprehensive risk assessment for PFAS in 2017, usually the first step in establishing enforceable drinking water standards. Then EPA Administrator Scott Pruitt's suppression of that report's public release was the final incompetent action of his tenure as EPA administrator and led to his replacement in July, 2018, by Andrew Wheeler.

Though the risk assessment has still not been released, competent reports noted that it proposed a drinking water standard of less than five parts per trillion for perfluorooctanoic compounds.

Even with the persistent promise of an assertive PFAS Action Plan, the agency has not released a health assessment, claiming that additional research is needed.

This has left states in the dubious position of having to establish their own standard that can be easily set aside in court until the EPA sets a standard under Clean Water Act authority.

In terms of supporting states' regulatory efforts, the agency has failed to complete the single most significant effort that it alone is responsible for.

**PFAS**  
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## We strongly endorse Biden-Harris ticket to reverse impacts of Trumpism and restore environmental stewardship, standards

A *Specifier* opinion

Donald Trump and his inept administration have experienced more than three and a half years of epic failures. The U.S. Senate, primarily due to Mitch McConnell's complicity with Trump, abandoned its oversight responsibility to rein in the administration's political, ethical, moral and legal turpitude. It is way past time for a change.

This is a plea to our readers' rational judgement and American values to take seriously the importance and value of regaining some level of environmental stewardship when voting in the November election. It is an appeal to the duty of citizenship and the norms of American democratic standards.

It is also advice to industry professionals whose livelihoods depend on the financial strength of Florida's environmental enterprise. The consequences of inappropriate choices in the coming elections, particularly the presidential choice, will be magnified by the economic malaise caused by COVID-19.

These are times in which we need leadership—from our elected officials.

First and foremost, we must dump Trump, the poster boy of American graft and corruption. The Russian oligarchs, whose election interference helped to land Trump where he is today, now seem to control him for reasons we hope to discover one day.

The joke that passes for the Trump presidency has lacked any semblance of policy success or grand plan. And it has had a pernicious influence on politics at all levels of government across the country. It has featured a parade of mistakes punctuated by a series of "whim of the week" spectacles that have kept the public and other branches of federal and state governments in a constant state of chaos.

Trump and his sycophants have systematically dismantled our country's environmental stewardship agencies, the rules they work by and the standards they formerly sought to achieve.

We have chronicled the administration's aggressive neutering of almost 100 environmental rules and standards, providing polluters, profiteers and scofflaws carte blanche to operate as if it were the 19th century again.

In a period of time when science should inform our decisions, Trump's blatantly anti-science approach to environmental protection has had a destructive influence on all federal government data and science agencies.

For example, one of now-disgraced former EPA Administrator Scott Pruitt's first actions was to bar research scientists who had received EPA funding from serving on agency technical and advisory committees. Pruitt suggested the knowledge that scientists obtained with EPA support would bias their scientific deliberations. The idea is inane. In fact, Pruitt could not cite a single case of unethical bias by members of scientific advisory committees in the 50-year history of the agency.

EPA's sterling reputation for science in the public interest was clearly damaged by this move. Worse yet, the press had no difficulty outing the deeply tainted professional records of most of the new committee appointees.

In place of academic researchers, Pruitt filled EPA advisory and technical oversight committees with pro-industry scientists, consultants and lobbyists who worked for special interests in the regulated community. The result has, predictably, been disastrous. For example, the EPA has never passed so many pesticide approvals in such a short time. Their fast-tracked decisions are explained away with glib assertions that, in use, these dangerous chemicals do not pose a human health risk.

During his administration, Trump has made his political donors rich by sales on the cheap of land and mining rights, and low-cost licenses for resource use. For example, changes to the federal Waters of the United States rule were as much about transferring wetlands use to private hands as it was about water quality.

In Florida, there is a clear move toward private water

utilities and bottled water providers who make huge profits on the back of the public's water supply while the environment around the sources dries up. The Florida Springs Council has spent decades documenting this and yet Florida governors and legislators continue to ignore science and public sentiment. This has to stop.

The Trump administration's much-ballyhooped economy glided along on the economic recovery path that the Obama administration began. An economically destructive tax law that benefitted the wealthy and global corporations at the expense of the working class and main street businesses lifted up the U.S. economy for a couple of years before the stock market's reversals in 2019 showed Trump's tax plan to be a failure.

Business owners who believe Trump is sincere in promising to promote their best interests need to examine the fate of business owners that were his primary supporters in the last election. Those include people in farming and agriculture, fossil energy including oil and coal, and heavy industries of the Midwest including steel and aluminum, automobiles and manufacturing.

For reasons known only to himself, Trump promised more coal jobs, while virtually ignoring the vast potential of jobs in renewable energy. As coal has continued its steady decline, related jobs in coal transportation have vanished along with jobs in coal mining regions.

Trump's environmental rules rollback, along with preferential tax benefits, gave the oil and gas industry everything they ever wanted. But drilling and extraction jobs are also vanishing with the glut of oil on the global market. And American consumers still pay higher prices than they should.

Then there are the farmers, perhaps the largest group of Trump supporters by occupation. Farmers spent almost three decades working with bipartisan agriculture industry supporters to develop reliable overseas food commod-

ity and biofuel markets. The Chinese came to dominate these markets but U.S. farmers prospered immensely. So did farm credit lenders, heavy equipment manufacturers and sellers, and the related transportation industry.

Their spokespeople gloated in 2017 that farmers had put Trump in office and farmers planned to collect on what Trump promised them. But when Trump began his trade war with China, that country quickly found other sources of agricultural commodities, drying up U.S. markets across the country.

The Trump administration has had to provide almost \$30 billion and counting to bail out farmers. Farmers are losing their livelihoods—and their self-respect along with it. Non-farming businesses in America's rural communities now find themselves in a financial bind with no end in sight.

The Trump administration's nonresponse to the COVID-19 pandemic has deepened and broadened this year's economic collapse, with no clear end in sight. According to our reporting, Florida's environmental industries and practitioners seem to have escaped the worst effects of the pandemic and business downturn, so far.

But Florida's environmental professionals need a better plan than what is now being offered to meet the challenges of the years ahead.

Joe Biden and Kamala Harris are capable and prepared to provide that plan. It should be obvious to anyone with a pulse that Trump is incapable of creating a plan of any kind on any issue—the pandemic, healthcare, social justice, police reform ... the list goes on.

For that reason, we strongly endorse the Biden-Harris ticket—the ticket we believe is best prepared to help rebuild the economy, effectively implement public health measures against COVID-19, restore environmental standards and stewardship, and rebuild bridges with global partners to effectively address the challenges ahead.

### Can small farmers and environmental advocates be allies?

By ROY LAUGHLIN

Recently, a report by the American Farmland Trust proposed a set of policy priorities to prevent the loss of productive farmland across the country due to the "disruptions of development."

The report provided a state-by-state analysis and report card ranking, listing Florida among the top 12 states for impingement on agriculture due to the loss of agricultural land to poorly planned real estate development.

Between 2001 and 2016, almost 300,000 acres of agricultural land was lost to development or compromised by adjacent development that interfered with agricultural practices.

The 300,000-acre loss represents a significant portion of the estimated two million acres of Florida's remaining prime agricultural land.

But this figure does not accurately represent a net loss because Florida's agricultural interests are migrating from the southern peninsula of the state to its northwestern region.

Agricultural activity is certainly being displaced—but not necessarily reduced completely.

In Florida, agriculture's primary product is food intended for human consumption, mostly high-value winter fruits and vegetables.

Landscape and ornamental plants, another high-value agricultural product, are a smaller component of the state's agricultural industry. But this component is notable because plant nurseries are typically closer to urban areas than crop and vegetable fields, and grazing land.

American Farmland Trust noted that 46 percent of agricultural land affected or restricted by development is close to large urban areas that sprawl across multiple counties.

Lori Sallett, AFT's media relations director, noted that many Florida cities were founded close to where agriculture was important.

Since post-Civil War settlement, Florida's farmers have always grown shipping-dependent commodity crops. Many Florida cities, including Jacksonville, Tampa and Miami, were founded at the intersection of well established transportation routes, especially waterways.

Through most of the 20th century, commodity winter crops and fruit were grown primarily by farmers owning less than 200 acres.

The transition from small, family-held farms to large corporate farms started during the Great Depression, as bankrupt farms provided opportunities for corporate entities to purchase large tracts of land.

The AFT report argued that the remaining small farmers of today still face existential difficulties maintaining their rural agricultural lifestyle and the economic opportunity that it provided for generations.

For the nation as a whole, AFT proposed a state-by-state tailored array of beneficial policies for small farmers and rural communities that would allow them to survive and prosper at a scale consistent with their efforts.

"Committed state action is an essential response to the loss of all farmland and ranch land," noted the report. "Pursuing multiple approaches and linking them together is the most effective path."

Florida ranked in the second quartile of states, having taken some action to protect farmland, according to the Agricultural Land Protection Scorecard presented in the report.

But, last year's M-CORES highway construction legislation could be one of the biggest risks to what remains of Florida's rural, non-corporate agriculture.

The law proposed to build three new toll roads from Florida's rural western coast lands through the Panhandle over the next 20 years, providing easy access to an area that is now mostly rural and agricultural.

Many small and family farmers left South Florida for this area since the mid-1990s. Much more than in the second half of the 20th century, this region is becoming an area for cold-resistant winter vegetables, cattle forage and dairy operations.

While these are not always environmentally friendly agricultural operations, farmers there have received state aid to assist them with becoming more water efficient and implementing best management practices to reduce nutrient runoff.

Many of these farmers have used new production techniques that significantly reduce the impact of their agricultural activities on water resources and habitat.

#### The Florida plan

Florida is not a Johnny-come-lately to agricultural land protection. State Agriculture Sec. Doyle Connor, who held that office from 1961 to 1991, was an early and persistent advocate for protecting rural farmland.

In the 1960s, his editorials in the *Florida Farmers Market Bulletin* repeatedly lamented the aggregate farmland lost from highway construction alone.

The number of programs Florida has implemented to protect agriculture may be less relevant than the persistent and effective advocacy efforts to protect farmers and farming resources.

If one could criticize Connor's campaign to protect Florida's agriculture against destructive development practices, it would be because he was too successful in allowing farmers carve-outs, especially from environmental stewardship programs.

The programs Connor advocated applied equally to small farmers and the largest corporate interests. Corpo-

AFT  
Continued on Page 13

**Florida  
Specifier**

P.O. Box 2175  
Goldenrod, FL 32733

**Michael R. Eastman**  
Publisher/Editor

The *Florida Specifier* welcomes columns, articles and letters to the editor on any subject or issue pertinent to the environmental, regulatory and technical areas the newspaper covers. We reserve the right to edit all submissions for newspaper style and publish submissions on a space-available basis only. The opinions expressed on this page are those of the authors.

# Calendar

## October

OCT. 10 – Meeting: FGWA Quarterly Membership Meeting, Key West, FL. Presented by the Florida Ground Water Association. Call (850) 205-5641 or visit [www.fgwa.org](http://www.fgwa.org).

OCT. 12-16 – Course: Backflow Prevention Assembly Tester Training and Certification, Sprinkler Fire Protection Systems, Inc., Davie, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

OCT. 12-16 – Course: Backflow Prevention Assembly Tester Training and Certification, University of Florida TREEO, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570.

OCT. 12-16 – Course: Wastewater Class A Certification Review, TREEO Virtual Learning. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

OCT. 13 – Webinar: Florida Stormwater Regulations Update. Presented by Florida Engineering Society. Call (850) 224-7121 or visit [www.fleng.org](http://www.fleng.org).

OCT. 14-15 – Conference: 2020 Virtual Annual Conference: Creating a Resilient Florida. Presented by Florida Local Environmental Resource Agencies. Call (850) 701-4797 or visit [www.flera.org](http://www.flera.org).

OCT. 15-16 – Course: Backflow Prevention Recertification, Bayfront Plumbing Inc., Pensacola, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

OCT. 17-18 – Course: Backflow Prevention Recertification, Tri County Air Conditioning, Venice, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

OCT. 19 – Course: Water Distribution System Pipes and Valves, TREEO Virtual Learning. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

OCT. 19-23 – Course: Asbestos: Contractor/Supervisor, University of Florida TREEO, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

OCT. 19-21 – Course: Backflow Prevention Assembly Repair and Maintenance Training and Certification, University of Florida TREEO, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

OCT. 19-23 – Course: Backflow Prevention Assembly Tester Training and Certification, Bayfront Plumbing Inc., Pensacola, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570.

OCT. 19-23 – Course: Backflow Prevention Assembly Tester Training and Certification, City of Altamonte Springs, Altamonte Springs, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

OCT. 20-21 – Course: Backflow Prevention Recertification, Tri-County Apprenticeship Academy, Fort Myers, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

OCT. 22-23 – Conference: FSEA 2020 Fall Virtual Conference. Presented by the Florida Society of Environmental Analysts. Call (941) 748-5700 or visit [www.fsea.net](http://www.fsea.net).

OCT. 24-25 – Course: Backflow Prevention Recertification, CW Wood Plumbing Company, Jacksonville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

OCT. 26-30 – Course: Wastewater Class B Certification Review, TREEO Virtual Learning. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

OCT. 26-29 – Course: Backflow Prevention Assembly Tester Training and Certification,

CW Wood Plumbing Company, Jacksonville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

OCT. 28-30 – Course: Respiratory Protection, University of Florida TREEO, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570.

OCT. 30-31 – Backflow Prevention Recertification, CW Wood Plumbing Company, Jacksonville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

OCT. 31 – NOV. 1 – Course: Backflow Prevention Recertification, D.W. Waters Career Center, Tampa, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

## November

NOV. 2-6 – Course: Backflow Prevention Assembly Tester and Certification, Destin Water Users Inc., Destin, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

NOV. 2-6 – Course: Backflow Prevention Assembly Repair and Maintenance Training and Certification, Reedy Creek Energy Services, Orlando, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

NOV. 4-6 – Course: Backflow Prevention Assembly Repair and Maintenance Training and Certification, Sprinkler Fire Protection Systems, Inc., Davie, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

NOV. 4 – Course: Asbestos Refresher: Inspector, University of Florida TREEO, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

NOV. 4 – Course: Asbestos Refresher: Management Planner, University of Florida TREEO, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

NOV. 5-6 – Course: Backflow Prevention Recertification, University of Florida TREEO, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

NOV. 5 – Course: Asbestos Refresher: Contractor/Supervisor, University of Florida TREEO, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

NOV. 6-7 – Course: Backflow Prevention Assembly Repair and Maintenance Training and Certification, Tri County Air Conditioning, Venice, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

NOV. 7-15 – Course: Backflow Prevention Assembly Tester Training and Certification, Two Consecutive Sat-Sun, 11/7-8, & 11/14-15, D.W. Waters Career Center, Tampa, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

NOV. 7-8 – Course: Backflow Prevention Recertification, Bennett Contracting, Bradenton, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

NOV. 9-10 – Course: Backflow Prevention Recertification, Destin Water Users, Inc., Destin, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

NOV. 9-12 – Conference: 2020 Virtual Annual Water Resources Conference. Presented by the American Water Resources Association. Call (540) 687-8390 or visit [www.awra.org](http://www.awra.org).

NOV. 11-14 – Course: Backflow Prevention Assembly Tester Training and Certification, Tri County Air Conditioning, Venice, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

NOV. 16-17 – Refresher Training Course for Experienced Solid Waste Operators – 16 Hours University of Florida TREEO, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).



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**Initial Training for Operators of Landfills and Waste Processing Facilities**

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**Refresher Training Course for Experienced Solid Waste Operators - 8 Hours**

Nov. 16, 2020 | Gainesville, FL

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Nov. 17, 2020 | Gainesville, FL

**Refresher Training Course for Experienced Solid Waste Operators - 4 Hours**

Nov. 17, 2020 | Gainesville, FL

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Dec. 7-11, 2020 | Gainesville, FL

**24-Hour OSHA HAZWOPER Training Course**

Dec. 9-11, 2020 | Gainesville, FL

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**Activated Sludge Process Control & Troubleshooting**

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Dec. 7-11, 2020 | Pensacola, FL

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Nov. 4-6, 2020 | Davie, FL

Nov. 6-7, 2020 | Venice, FL

**Backflow Prevention Recertification**

Dec. 3-4, 2020 | Pensacola, FL

Dec. 4-5, 2020 | Fort Myers, FL

Dec. 5-6, 2020 | Tampa, FL

Dec. 10-11, 2020 | Destin, FL

Dec. 11-12, 2020 | Venice, FL

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# New Lake Okeechobee research seeks to predict microcystis bloom dynamics

By ROY LAUGHLIN

A multidisciplinary research team recently launched a multifaceted study of Lake Okeechobee's blue-green algae blooms.

The study will focus on nutrient dynamics and environmental conditions responsible for the now-annual blooms of microcystis aeruginosa in the lake.

Plenty of cyanobacteria studies have already been completed in Florida, but this one focuses on sources of nutrients from both runoff entering the lake and "internal loading."

Internal loading, sometimes referred to as "legacy nutrients," are nutrients stored by biological and chemical processes in Lake Okeechobee sediments.

Under certain conditions such as anoxia, they release large amounts of phosphorus and sometimes ammonia and other nitrogen nutrients. Intense algal blooms predictably follow.

The study, "Harmful Algal Bloom Assessment of Lake Okeechobee," or HALO, relies on intensive persistent monitoring and the use of remotely operated sensing

platforms to measure nutrient concentrations and dynamics that lead to a bloom.

Especially important to investigators is collecting nutrient and water chemistry observations before increasing algae density indicates the early stages of a bloom.

Florida has a sophisticated surveillance system that relies on analysis for changes in chlorophyll-a, the change of water color indicating an algae bloom, to find algal blooms early in their evolution.

HALO will attempt to provide data for the immediately preceding step in Lake Okeechobee's harmful algae blooms: how nutrient availability sets off prolific cyanobacteria growth.

"We are excited to apply novel perspectives from a diverse team with a uniquely innovative toolbox," said Jordan Beckler, PhD, assistant research professor at Harbor Branch Oceanographic Institute and HALO's principal investigator. "These include advanced techniques for monitoring nutrient dynamics and sediments, satellite remote sensing, an autonomous surface vehicle, fixed location water quality, underwater holographic microscopes, and even models based on natural processes

and artificial intelligence."

Beckler has been involved for years with remotely operated mobile platforms. A year and a half ago, he and Washington-based Navocean demonstrated the effective data-gathering ability of a robotic cutter-rigged sailboat in Lake Okeechobee and the Banana River.

For this project, Analytical Instruments Systems will provide an innovative lake-bottom benthic lander package that will be routinely deployed to obtain measurements of legacy nutrient fluxes.

One component of the study is to establish and maintain a web-based platform that will make research data available to the Florida Department of Environmental Protection and the public.

The portal will be designed by the operators of the Gulf Coast Ocean Observ-

ing System and Florida Gulf Coast University, both partners in the project.

Microcystis aeruginosa blooms in Lake Okeechobee have been an annual occurrence for the past decade.

Cyanobacteria produce and release their toxin, microcystin, in times of stress. Exposure to microcystin has been linked to skin irritation, respiratory distress, liver damage and liver cancer in humans and other vertebrates.

Microcystis blooms are not only a Lake Okeechobee problem. Its blooms are relatively frequent in the St. Johns River but have not covered as much area or persisted as long as the recent blooms in Lake Okeechobee.

This research will address one of the major recommendations made by the state's Blue-Green Algae Task Force.

## LAGOON From Page 1

The northern segment's impairment is due to high nutrient concentrations that caused excessive phytoplankton and periphyton growth—the first step in seagrass decline.

Clinging algae covered the leaves of the rooted seagrass, shading it to the point that it declined almost completely by the early 1990s.

As nutrient concentrations continued to increase, the northern lagoon progressed to an ecosystem where planktonic microalgae dominated primary productivity.

The major 2011 microalgal and cyanobacteria bloom persisted for most of the year throughout the northern segment and reduced seagrass density and areal occurrence to their lowest levels ever and left sediments throughout the northern segment in a chemically reduced state that seagrasses fail to grow in.

Florida's environmental agencies have been orchestrating recovery efforts to promote seagrass restoration since 1975 when the IRL aquatic preserves were established under the Florida Aquatic Preserve Act.

In 1987, the state's Surface Water Improvement and Management Act was passed, followed by additional programs in 1990, 2000 and 2007 with the Indian River Lagoon Aquatic Preserve System Management Plan.

For purposes of planning, DEP noted that the verified impairment of mainstream segments occurred in 2007, based on a 1999-2006 assessment period.

The impairment was driven by high chlorophyll-a concentrations in water, an index of planktonic algae occurrence, and by low dissolved oxygen, an indication of

community metabolism over photosynthesis.

These two conditions are in addition to benthic seagrass loss.

The effort to lower nutrient concentrations by reducing inflows from land sources provides an inferred solution that will allow or set a prerequisite for seagrass recovery.

The northern IRL has been under a BMAP since 2013. Its Zone A has been under a nitrogen reduction plan since then that called for a 98,681-pound reduction in nitrogen inputs. Projects in the first five years produced a calculated 32,000-pound nitrogen reduction.

Deteriorating conditions in this zone and the rest of the northern IRL suggest that much more is required.

The effort now being developed implements a BMAP plan and includes recently enacted requirements of the Clean Waterways Act passed by the 2020 Florida Legislature. Under the planning process, the BMAP targets incorporate, or are formulated to meet, restoration targets.

The resulting nutrient total maximum daily load allowance will affect both point and non-point sources and will incorporate a margin of safety, which in this case is 10 percent below a target level established in the planning process.

The target will be established by data gathering for the waterbody being considered, statistical analysis and computer modeling.

After Florida approves the TMDL by rule, the final implementation step will be U.S. Environmental Protection Agency approval.

The planning process includes two other important technical components: projects and monitoring.

Projects such as stormwater treatment or retention will be needed to meet the TMDL and monitoring will be required to evaluate water quality and track progress.

In the northern segment, the need for more water quality data to be obtained through additional measurement was specifically noted during the webinar. The planning process' completion will fill in the details of where and what to monitor, and how often.

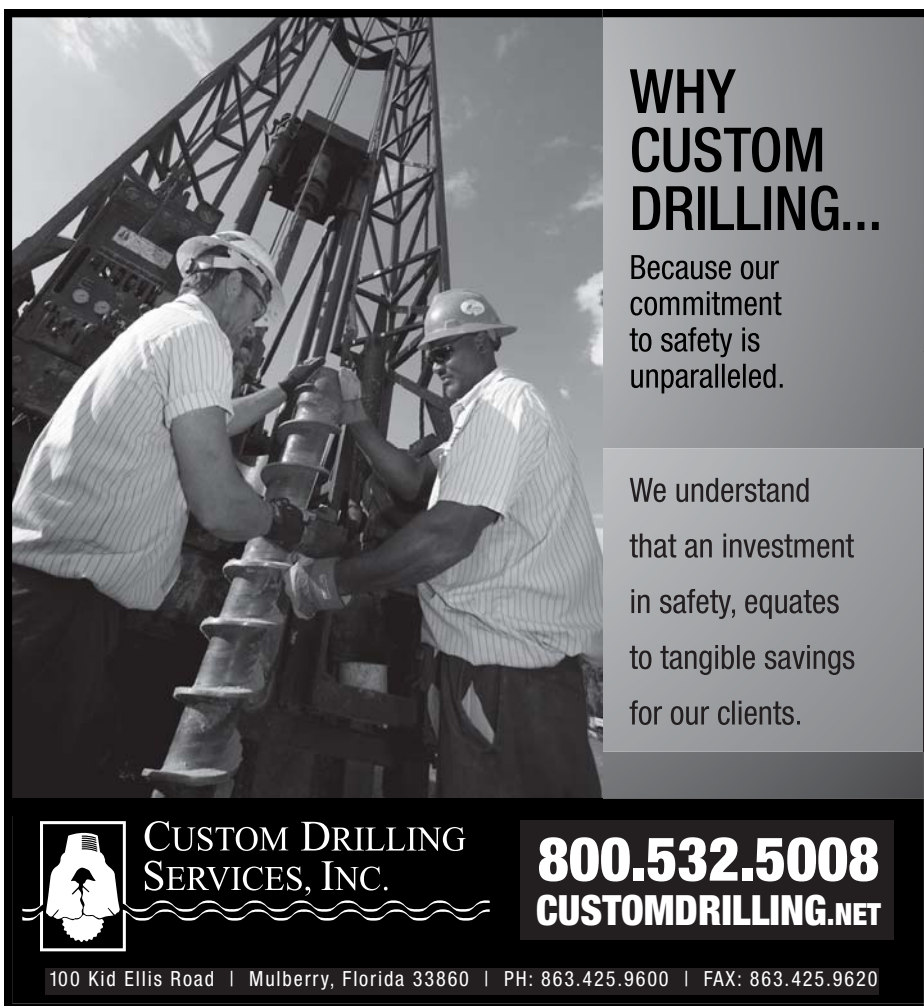
Administrative actions in the updated planning for the northern Indian River include the implementation timeline and the process of adaptive management.

Like the Outstanding Florida Springs protection procedures, BMAP plans are area-specific and adopt a less stringent target than the data analysis yields for protection at a specified level. An automatic 10 percent reduction in target values is a margin of error.

The Florida Springs Council has criticized this practice, noting it sets targets that continue impairment even if at a lower level.

The BMAP planning process will continue through the end of 2020. Given the uncertainty that has dogged all public gatherings during the year, readers interested in public meetings and deadlines should contact DEP for the latest information.

Contact Stacy Cecil at Stacy.Cecil@FloridaDEP.gov, or Theodore Saltos, at Theodore.Saltos@FloridaDEP.gov.



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# New sensor buoy from UF/IFAS detects water quality less expensively

By BRAD BUCK

A new water quality sensor called "GatorByte" might help resource managers monitor water quality over space and time—all for as little as \$1,500.

Such sensors are typically mounted at a single location and provide data about water quality only at that location.

GatorByte can be used to map water quality at different places in a waterbody. Or it can monitor water quality at different times in that waterbody.

Eban Bean, PhD, PE, a University of Florida/IFAS assistant professor of agricultural and biological engineering, is de-

veloping the device with help from Piyush Agade, a doctoral student in agricultural and biological engineering.

"We can put these devices into the top of a watershed and allow stormwater flow to carry the GatorByte buoys downstream and essentially map the water quality in an urban watershed," Bean said. "At the end of the storm, we can then go to the bottom of the watershed and pick up the units for the next deployment."

The system aims to be as flexible and serviceable as possible, even for users with limited experience with programming and electronics. They have incorporated GPS and cellular communication into it to make tracking and recovering the unit possible.

## Farmland ownership

A growing problem that illustrates the divergence between agriculture and conservation by farmers is the lack of ownership of the land they cultivate.

This problem, according to a recent National Public Radio report, is that American farmers lease about half the land in current production. The owners of the leased property, a diverse group, are the ones that have to decide to put some of their holdings into conservation easements, not the farmers.

When property owners lease out their agricultural land, there's no incentive for easements. The area leased is the basis for the price they receive.

Farmers who rent land typically have short-term contracts of one year or perhaps a few years—too brief for any incentive to indulge in the time and effort needed for conservation.

The NPR report included an interview with Steve Bruere, president of Peoples Co. in Des Moines, IA. The company manages, buys and sells farmland.

Bruere estimated that 10-15 percent of large farmland tracts are not profitable, based on the crops grown on them. His company recommends that farmers cut their losses by abandoning those tracts for crop production.

The land may be impaired because of erosion, or persistent flooding and water-logging. Those are areas that are ripe for being returned to prairies or woodlands.

Such conversion, especially for potential wetlands, is particularly appropriate for Florida.

Farmers who own their land often do stop tilling their unprofitable tracts. Rental landlords need to be convinced as well, according to the NPR report.

Florida has a significant number of investor agricultural farmland owners. The state of Florida is another notable lessor.

Florida's public and private sector landowners could set aside their more unproductive agricultural land for water conservation or habitat for endangered species while still maintaining and improving prospects for farmers in rural communities.

Policies that favor small-scale agriculture, family farming and rural communities can have correlated beneficial environmental benefits, as AFT's report suggests.

It is clear that these policies must be written and implemented specifically to do both with opportunities for non-corporate and absentee landlord farms to benefit.

One of the specific ingredients should be the exclusion of corporate entities from taking advantage of tax and other benefits. The developing national economic disaster makes this need dire.

According to one report, venture capitalists have at least \$257 billion ready to purchase properties from economically-distressed owners. It is now too late for federal policies to help, but AFT's focus on state policies could be a key.

To help, Florida policies to protect farmers while promoting environmental conservation must be directed toward the appropriate entities to achieve the desired environmental benefits.

The report, Farms Under Threat: The State of the States, is available on-line at <https://farmland.org/project/farms-under-threat>.

In their preliminary experiments, UF/IFAS scientists monitored four basic indicators of water quality: temperature, pH, dissolved oxygen and conductivity. In the future, they plan to incorporate sensors for other things that impact water quality, such as nitrate, ammonia and turbidity.

Data is sent to the cloud using a cellular signal. On-board data storage is also available where there is no cell signal.

"Using water-quality and location data, we hope to allow water resource manag-

ers to quickly locate sources of pollution, or at least identify areas that need further investigation," Agade noted.

Bean and Agade tested GatorByte at Hogtown Creek and Lake Wauberg in Gainesville. Next, they'd like to test the device in a place like the Suwannee River.

Researchers said GatorByte can likely be used to monitor water quality around the state and across the country.

Brad Buck is a public relations specialist with UF/IFAS in Plant City.

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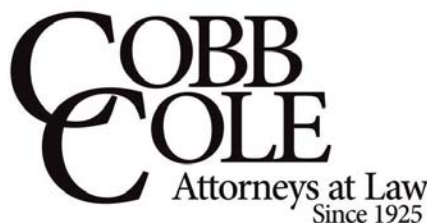


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### PRP

From Page 1

DEP paused purchase orders since the week of Aug. 19, 2020, resulting in a substantial and growing backlog of work. This explains why August numbers were down. And September numbers are expected to be much lower than August. For the two months combined, PRP is projected to spend \$9.2 million.

In the 14 months prior to September, 2020, net encumbrances averaged over \$10.4 million per month. The PRP was operating well then and it will continue to do so once the pause is lifted.

These tallies come from PRP's monthly dashboard reports, accessed in late September.

The \$110 million budgets of the past two completed fiscal years have been the lowest of any other years except FY 2015-2016, also \$110 million, and are below the average of the last seven years of funding.

It's a bit of a mystery why the PRP, which has been operating consistently and has seen its funding levels essentially static for the past seven years, would be among the first to announce further reductions due to the present economic conditions. The IPTF receipts exceed the \$119.5 million appropriated to the PRP.

PRP contractors and subcontractors we spoke with were concerned with the move to "pause future obligations," particularly due to the impact on their clients, their businesses and the added program costs to

### NOTES

From Page 3

move over 700,000 cubic yards of sand from Big Pass to over a mile and a half of Lido Beach.

The roughly \$12.7 million restoration project is predominately federally funded, but augmented by both state and local dollars.

The project is managed through the U.S. Army Corps of Engineers, Jacksonville District, and is intended to protect upland structures and restore beach habitat.

Lido Beach is home to a large portion of the state's black skimmer population and is a turtle nesting and habitat area.

Sarasota has a long history of working with the federal government on shoreline restoration. The city requested assistance with this project over a decade ago.

**Key Largo to add more solar.** The board of the Key Largo Wastewater Treatment District recently approved the allocation of approximately \$2.2 million for the installation of additional solar power generation capacity for their facilities.

Funding includes an allocation from the Florida Department of Environmental Protection's Stewardship Program.

The wastewater district installed 334 solar panels on the roof and over the chlorine contact basins at its main plant last year. The initial array provided shade to reduce chlorine evaporation and help lower electricity costs.

New projects under discussion include installing new solar panels on the main treatment plant roof, on the roof of the administration building in conjunction with the installation of a Tesla backup system, on the roof of five vacuum stations and along a retention field at the main power plant.

**Duke adding 30 MW of battery storage.** Duke Energy will add 30 megawatts of battery storage capacity in Florida to improve the efficiency and reliability of the electrical grid.

The new battery facilities will be located at three existing sites including the installation of 18 MW at the Lake Placid Solar Plant in Highlands County, 2.5 MW at Johns Hopkins Middle School in Pinellas County and 8.25 MW near Gainesville in Alachua County.

The Johns Hopkins Middle School site will also receive a one MW solar photovoltaic array.

The batteries will provide power during blackouts and will otherwise augment current resources. Duke anticipates completing installation by the end of 2021.

reassess each paused site in the future.

Florida Statutes section 376.3071(2) provides the legislative intent and purpose of the IPTF and PRP: (a) It is the intent of the Legislature to establish the IPTF to serve as a repository for funds which will enable the department to respond *without delay* (emphasis added) to incidents of inland contamination related to the storage of petroleum and petroleum products in order to protect the public health, safety, and welfare and to minimize environmental damage.

The IPTF was established to ensure timely response and program continuity. The trust fund has generated an average of more than \$231 million over the last eight years. Annual IPTF transfers to DEP have exceeded \$200 million annually and PRP encumbrances averaged around \$119 million.

In theory, there should be more than enough funding in the trust fund to use for their intended purpose. The low encumbrance activity so far this fiscal year should roughly match the percentage reduction in IPTF numbers over the same period. With the upward trend in IPTF revenue, an average of \$19 million per month for FY 2020-2021 is a reasonable forecast. This would be \$228 million for the year.

Last fiscal year, IPTF generated \$236 million, including the low numbers in May

### PRP

Continued on Page 16

The utility plans to operate 700 MW of solar panels and 50 MW of battery storage at an investment of \$1 billion through 2033.

**Bay County WTE facility closing.** Bay County will close its waste-to-energy plant in Panama City operated by Engen LLC.

The plant is expected to shut down operations next year.

Waste currently incinerated at the plant will be diverted to the county's Steelfield Road Landfill, which currently accepts ash generated by the plant.

Waste materials recycling, which was suspended in 2018 and diverted to the incinerator, may be reinstated after the plant's closure.

The county estimated that closing the WTE plant will reduce tipping fees by \$15 from \$50 to \$35 per ton.

Consideration was given to the age of the plant that opened in 1986 and has become increasingly expensive to operate within environmental regulatory standards and limited processing capacity.

**People news.** Sandra Guzmán, a precision irrigation scientist with expertise in artificial intelligence for water management, was recently named a 2020 Outstanding Young Extension Worker by the Florida Section of American Society of Agricultural and Biological Engineers.

Guzmán is one of 12 scientists who conduct research at the University of Florida Institute of Food and Agricultural Sciences' Indian River Research and Education Center in Fort Pierce.

The award recognizes young engineers for their contributions to the development of extension-related programs and leadership character.

Orlando-based Universal Engineering Sciences LLC announced the hiring of Greg Kinton as corporate director of facilities. Kinton will work from UES' Virginia office while serving the consulting firm's 24-office system from Miami to the District of Columbia.

Kinton has experience in property condition assessments, failure analysis, accessibility surveys, water intrusion evaluations, forensic evaluations, special testing and project quality assurance.

**Company news.** Carbonworks USA LLC announced the opening a new service facility in Roanoke, VA, to better serve clients in the South and Mid-Atlantic regions of the country.

Ervin Gladden was named as regional manager. He can be reached at (540) 537-4697 or [egladden@carbonworks-usa.com](mailto:egladden@carbonworks-usa.com).

**FEDFILE**  
From Page 2

Projects anywhere within the Gulf of Mexico watershed in the continental U.S. are eligible. The funding is intended for water quality improvement, habitat improvement, resiliency enhancement and education projects.

The Gulf of Mexico watershed includes land in states bordering the Gulf of Mexico, states such as Georgia that are adjacent to states bordering the Gulf, and states within the Mississippi River drainage basin. Multiple EPA regions are therefore involved in this effort.

The EPA is accepting proposals for studies that may use one or more of the following methods: surveys, studies, research, investigation, experimentation, education, training and demonstrations. They all must focus on state nutrient reduction strategies or regional resource management documents.

Eligible applicants include state agencies, recognized tribes and tribal consortia, local governments, nonprofit organizations, interstate agencies, and colleges and universities.

EPA expects to provide approximately \$10 million to fund up to a dozen assistance agreements. Individual grants are expected to range from \$250,000 to \$1 million with a typical project period of three years.

Applications are due no later than Oct. 16, 2020. Additional information is available at <https://www.epa.gov/gulfmexico>.

**U.S. particulate air pollution levels fall.** Academic researchers studying fine particulate particles in ambient air—those less than 2.5 microns—concluded that the concentration of this class of lung-damaging air contaminants fell nationwide by 70 percent between 1981 and 2016.

Nevertheless, the geographical pattern of high particulate and low particulate areas has not changed.

According to researchers, neighborhoods, areas and regions that were at the top of the particulate contamination list are still there, even though with lower particulate levels.

The significant nationwide drop in PM 2.5 concentrations in ambient air is directly attributable to the 1963 Clean Air Act, the first federal legislation aimed at reducing air pollution.

The CAA and the new technology adoption it fostered have reduced PM 2.5 primarily by reducing particulates in automobile exhaust and through the conversion of coal-fired power plants to cleaner fuels.

The study's authors used census data and air monitoring data from approximately 8.6 million grid cells drawn in U.S. census tracts from 1981 to 2016.

Each of those tracts include data for a few thousand people or less. Like the PM 2.5 particles that are the subject of the study, the study itself is a finely-granular assessment.

The study showed that despite overall progress, the communities with the highest PM 2.5 levels in 2016 were those that have persistently experienced the highest levels in prior decades back to 1981.

These are disadvantaged communities, primarily inhabited by people of color, close to industrial areas and power plants, or near roads with high vehicular traffic loads.

PM 2.5 particulates penetrate to the smallest compartments of the lungs to cause or aggravate respiratory disease.

The Clean Air Act requires periodic review of air quality standards to determine if changes are needed to improve human health. The most recent review was delayed, but it finally began in 2019 and concluded earlier this year.

Many researchers urge further decreases in acceptable PM 2.5 levels. The Trump administration, however, concluded that current regulations are sufficient.

The study described here was completed and published in July, a few months too late to inform the agency's recently concluded review and recommendations for PM 2.5 air quality standards.

That may not have mattered, however, because the review panel was headed by a former consultant for the regulated community and vocal critic of the EPA's air quality regulations.

The message is clear, however, that the low hanging fruit on the tree of improved public health should focus on reducing PM 2.5 contamination in specific geographical areas and communities where they have persistently been highest.

**Section 404 permitting assumption.** In early September, Gov. Ron DeSantis'

## FDOH continues research on aerosol exposure to cyanobacteria toxins

### Staff report

The Florida Department of Health expects to continue funding studies of human exposure to cyanotoxins, including exposure to toxic aerosols in air.

Last year, FDOH funded four research teams to investigate the possibility of human exposure and health effects of residents in areas with cyanobacteria blooms.

One of the teams mechanically sampled aerosols and analyzed them for cyanotoxin presence and concentration, particularly microcystin, a cyanotoxin of widespread occurrence in South Florida.

Michael Parsons, PhD, professor of marine science and director of the Coastal

office sent the EPA a formal request to assume administration of Section 404 permitting and included the required documentation to support the transfer of authority.

Section 404 permitting refers to Section 404 of the Clean Water Act, a section that governs the issuance of permits to regulate the discharge of dredged or fill materials into waters of the U.S., including wetlands such as marshes and mangrove swamps.

The Clean Water Act by default delegates dredge and fill permitting to the U.S.

Watershed Institute and the Vester Marine & Environmental Science Research Field Station at Florida Gulf Coast University, was the principal investigator on that project.

The collaborative project between Florida Atlantic University and FGCU aimed to obtain information from both mechanical aerosol sampling and human subject blood samples.

Parsons explained that just as the collaborating research groups began sampling air and human subjects in March, the COVID-19 lockdown began, reducing access to laboratory materials and reagents for his work with air samplers. Contact with human subjects was also suspended.

Army Corps of Engineers.

States may assume permitting authority for certain waters by requesting a transfer and demonstrating that they have the requisite permitting, enforcement and administration capability in place to adequately enforce the law.

As of the first week of September, EPA Region 4 acknowledged receipt of the state's request and deemed it to be complete to meet the requirements of the transfer petition process.

EPA has until Dec. 17, 2020, to evaluate the merits of the application.

The groups continued their work under a contract extension this summer and submitted their final report in September.

Parsons said that FDOH has requested proposals from interested researchers for a second wave of grant funding of human exposure and responses to algal toxins, including exposure to aerosols.

He hopes to receive a continuation grant to allow him and his FGCU team to continue the research interrupted by the pandemic lockdown and to extend it based on the findings they have made to date.

First year research results have been submitted to FDOH in a final report and should be available from the department soon.

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## LOWRP

From Page 8

completed ASR project review summaries, a review of related research and studies, and a review of the Lake Okeechobee Watershed Restoration Project.

The corps' recommended plan will restore approximately 4,800 acres of wetlands along the Kissimmee River channel and provide recreational facilities at multiple sites in the WAF and within the wetland restoration sites.

Details include a flow-through WAF, 80 ASR wells, and the Paradise Run and Kissimmee River Center wetland restoration sites.

The majority of the LOWRP features are located within the Indian Prairie sub-basin, although aquifer storage and recovery wells are proposed throughout the

project area.

Federally listed terrestrial wildlife species in the planning area include the Florida grasshopper sparrow, northern crested caracara, Florida bonneted bat, Everglades snail kite, wood stork, eastern indigo snake, West Indian manatee, Florida panther, gopher tortoise, Florida scrub jay and red-cockaded woodpecker.

Several Florida-listed species also inhabit the area.

The corps hopes to improve flexibility in the timing and distribution of surface water releases in Lake Okeechobee, in the northern estuaries, and throughout the Lake Okeechobee watershed through the creation of additional water storage areas north of the lake.

The creation and restoration of wetlands and the installation and operation of

the ASR wells will allow water to be stored during wet weather, reducing damaging high lake stages, and then released into the lake during dry weather to reduce the impacts of low stages within the system.

The proposed storage increases the

## FLAGLER

From Page 7

enefit the city's utility customers.

State revolving funds are made available through several programs. The Clean Water State Revolving Fund Program is a source for low-interest loans to local governments to plan, design and build or upgrade wastewater, stormwater and non-point source pollution prevention projects.

Low interest loans and grants may be available for small communities based on

amount of time that the lake stage levels are within the ecologically preferred stage envelope, according to corps officials.

The plan will allow for a 30 percent reduction in total flows from Lake Okeechobee to the northern estuaries.

their economic standing.

DEP's Small Community Wastewater Construction Grants Program helps small communities construct wastewater treatment facilities.

The applying community must be a municipality, county or authority with a total population of 10,000 or less and have a per capita income less than the state of Florida average.

Flagler Beach has a current population of less than 5,000. Depending on current PCI data, the city may be eligible to apply.

## PFAS

From Page 9

It is critical for EPA to release a competent risk assessment for human exposure to PFAS as expeditiously as possible, whether the agency itself intends to enforce it or chooses to turn enforcement over to the states.

With this notable inaction, EPA can claim to be doing little more than tailgating while states play the game of PFAS cleanup and public health protection.

This critical report is in no way in-

tended to criticize EPA Region 4 technical staff, most specifically its scientists. In fact, EPA scientists were instrumental in 2016-2017, in demonstrating the extent of Chemours' Cape Fear watershed contamination.

On the ground, EPA Region 4 staffers have been active. But on the policy and enforcement front, the agency has lagged, considerably diminishing the "action" part of the agency's PFAS Action Plan.

Perhaps the situation at high levels of the EPA will change in January, 2021.

## PRP

From Page 14

and June. With the backlogged purchase orders approaching \$8 million, many believe that the PRP pause to date has already achieved the appropriate adjustment.

This should justify resuming operations now with minimal damage to the PRP program and the environment. If a reevaluation is done in January, the wasteful costs associated with the forced "start/stop/start again" process would be eliminated.

The DEP's prioritization of "continued

operation of remediation systems, well abandonment for site closure, securing sites and safety issues" will not keep program contractors and their subs busy for long.

Contractors have some ongoing work, but most of the PRP projects that business managers have been anticipating appears to be on hold for an unknown period of time. The pause could lead to a shortage of equipment and personnel when the program ramps back up to finish its statutory obligations.

According to the August, 2020, PRP dashboard, there are 19,435 eligible sites in the program. Work on 11,435 sites has been completed, 6,127 are still active and 1,902 are waiting for attention. So, there is still quite a bit of work to be done.

This pause has been, and will continue to be, costly to everyone involved—taxpayers, site owners, local programs, lenders, property owners, contractors, subcontractors and other stakeholders.

A longer-term picture of the PRP's budget status may become clearer in October when state agencies submit budget documents showing their final tallies for last year's spending, and proposed budgets for the 2021 legislature's consideration.

That "Schedule 1" submission will provide a more explicit indication of what state budget planners expect Florida's financial status to be.

Unless IPTF revenues are diverted to other budget areas—a move that contradicts the intent of the law—there should be sufficient funding to resume PRP operations as normal in the very near future.

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