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After initially recommending denial of the Sleepy Creek Ranch consumptive use permit application, St. Johns River Water Management District staff reversed course and recommended approval of the cattle operation's request for more water—lots more.

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Researchers recently published a study that estimated the value of carbon stored in the Everglades' mangrove ecosystems. For the more than 144,000 acres of mangroves in Everglades National Park, the total value of carbon storage ranges between \$2 billion and \$3.4 billion.

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Coastal regions of the state are facing a shortage of sand for beach replenishment projects. But a solution may be on the way in the form of a study of the potential for using foreign sand to enhance shorelines and protect coastal areas from hurricanes.

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Manatee County developers resubmitted plans for a real estate project that includes what would be Florida's smallest mitigation bank.

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Got a story lead?

Got an idea for a story? Like to submit a column for consideration? Fire when ready. 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 (407) 671-7757, or email mreast@enviro-net.com.

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FDOT to handle environmental highway reviews

By ROY LAUGHLIN

As 2017 opens, the Florida Department of Transportation takes over the management of National Environmental Policy Act reviews for federally-funded highway projects from the Federal Highway Administration.

FDOT officials said cost savings, expected to be about \$22 million annually, are the primary reason for the change. The department said its review process will take 25 percent less time than when FHWA was involved.

Florida's new agreement is not unique. Several other states have similar agreements, including Texas, Ohio and California.

The hand-off of federal review responsibilities for transportation projects in Florida began in 2001. The state signed an agreement to develop an Efficient Transportation Decision Making process.

The agreement involved at least 11 federal agencies, plus eight state and local agencies. That agreement setup Florida's early review procedure of certain transportation projects to consider their potential environmental impacts. It linked project planning with NEPA.

The ETDM process improved transportation decision making and made it more efficient because two environmental screening events occur during the transportation planning and programming phases.

According to the department, this process provides stakeholders with an opportunity for early input, involvement

FDOT
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Administrative judge invalidates new DEP emergency notification rule

By ROY LAUGHLIN

In late December, Administrative Law Judge Bram D.E. Canter invalidated the Florida Department of Environmental Protection's recently passed Public Notice of Pollution Rule, 62-4.16.

"The proposed rule is invalid because the agency failed to follow rule-making requirements, there is no statutory authority for the rule, it enlarges the law implemented and it imposes invalid regulatory costs," wrote Judge Canter in his ruling.

Petitioners against the rule included Associated Industries of Florida, the Florida Farm Bureau Federation, the Florida Retail Federation, the Florida Trucking Association and the National Federation of Independent Businesses.

Their counsel contested the rule on four points of law and Judge Canter accepted all four. The primary reason for invalidating DEP's emergency notification rule was that no state statute allows the imposition of such a requirement.

The plaintiffs' brief made a distinct point that the rulemaking authority DEP

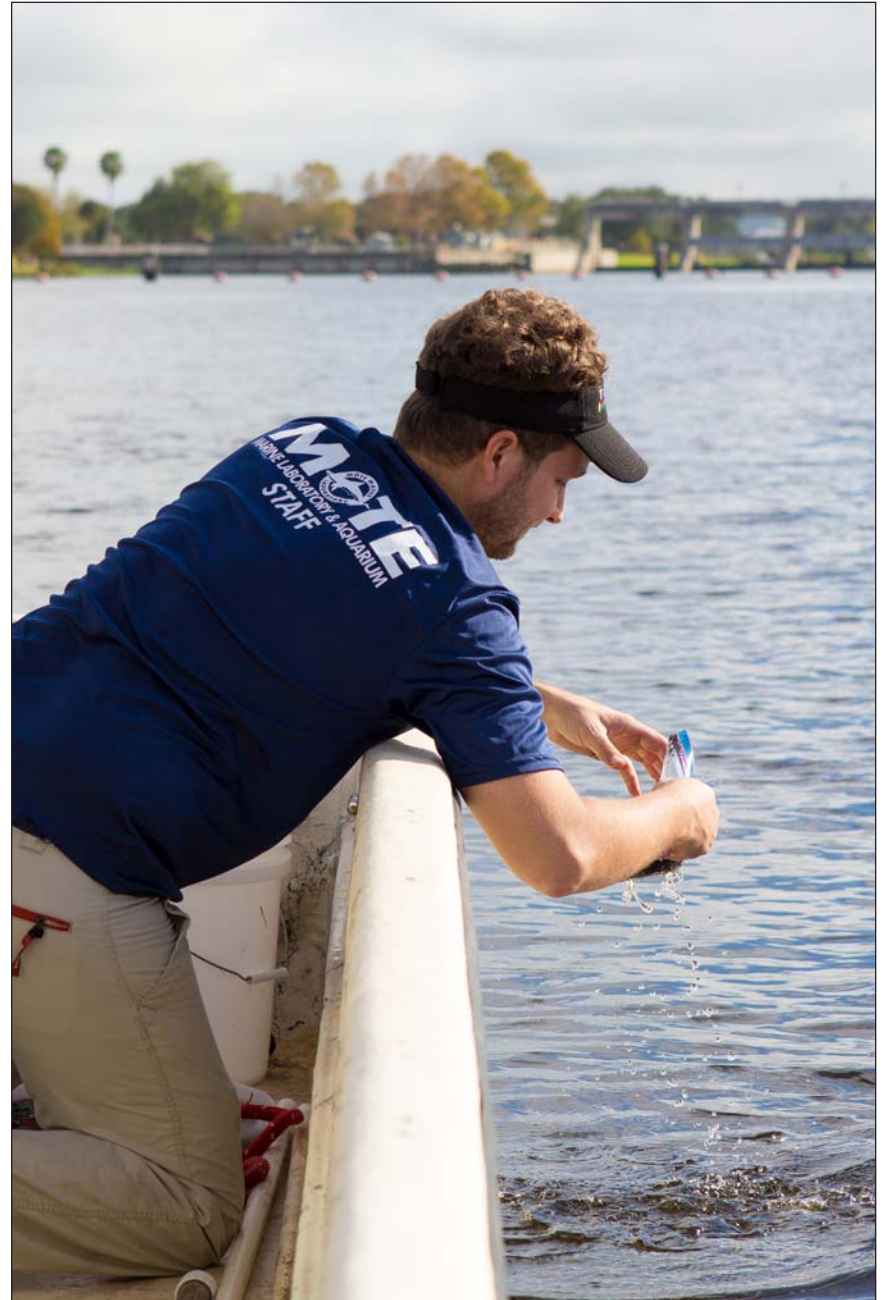


Photo by Conor Goulding, Mote Marine Laboratory

Jordan Beckler, PhD, ocean technology research program manager at Mote Marine Laboratory in Sarasota, collects sediment samples from the Caloosahatchee River for his research to characterize sediment-derived iron bioavailability to Gulf of Mexico phytoplankton. The research addresses whether iron reaching the Gulf from Florida freshwater river sediments plays a role in red tide blooms. See story on Page 14.

invoked authorizes notification only to the department.

The plaintiffs' counsel noted that in two other statutes, the legislature specifically authorized notifications, for example to adjacent property owners, indicating that the Legislature unambiguously had chosen public notification versus notification sent in this case to the Department of Environmental Protection.

Therefore, DEP exceeded its grant of rulemaking authority by requiring public notification in the rule.

The plaintiffs raised three other issues regarding the rule's validity.

Judge Canter also agreed that the proposed rule "enlarges, modifies or contravenes the specific provisions of law implemented" because DEP lacked authority under law to require public notification.

The rule, if left to stand, would have inappropriately enlarged DEP's authority.

Two other of the plaintiff's complaints revolved around the requirement to consider lower cost regulatory actions as required by law.

The plaintiffs noted that during the rulemaking process, the department was asked to consider a proposal for it to conduct the emergency notifications because that would be a more appropriate, lower cost alternative. DEP rejected that proposal.

By that inappropriate rejection during the rulemaking process, the rule "imposes regulatory costs on the regulated person, county or city (that) could be reduced by the adoption of less costly alternatives that substantially accomplish the statutory objectives."

Judge Canter sidestepped a direct assessment of the primary argument that DEP notification is a lower cost alternative to holding individuals and businesses responsible for public notification procedures.

"The proposed rule is an invalid exercise of delegating legislative authority under section 120.52 (8) (f), Florida Statutes, because it would impose unauthorized regulatory costs that could have been reduced by the alternative of

RULE
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EPA regulatory enforcement actions in 2016 dominated by three notable settlements

Staff report

The U.S. Environmental Protection Agency recently announced enforcement activity in the 2016 fiscal year, the final full year of Obama administration efforts. Three notable enforcement actions dominated the agency's 2016 record.

In April, 2016, the EPA, state and other federal agencies reached a landmark \$20.8 billion settlement with BP to settle violations of the Clean Water Act arising from the Deepwater Horizon oil spill.

The agency said the money would go toward restoring impacted communities and the environment.

Elsewhere, Volkswagen agreed to spend \$14.7 billion on air emission reduction projects, remedy environmental damage and buy back diesel vehicles that allegedly used illegal software to bypass emission controls and deceive customers.

That agreement was formally inked in October, but EPA's enforcement efforts occurred during the 2016 fiscal year.

The EPA also settled a multi-year lawsuit with Mosaic Fertilizer that guaranteed improvements in phosphate ore handling, beneficiation and waste storage to reduce toxic substance release to the environment.

The agreement also set up a trust fund for long-term management of gypsum

stacks.

The settlement affects several phosphate facilities in Florida and Louisiana and reflects a big win for maintaining Florida's air and water quality.

The EPA also secured commitments from companies to spend \$13.7 billion to improve technology or management practices that ensure proper treatment, storage and disposal of about 62 billion pounds of hazardous waste.

The cases settled require 17,000,000 cubic yards of contaminated soil remediation and 174,000,000 cubic yards of water to be cleaned up.

Most of the EPA's enforcement actions involved civil cases and penalties. For the smaller set that involved criminal activities, 2016 was a notable year.

The agency opened 170 criminal cases involving 184 defendants. Successful prosecution yielded \$207 million in fines and restitution.

Court-ordered environmental projects added another \$775,000 to the monetary

tally for criminal prosecution.

Many of these cases involved criminal environmental practices at mines and within waste handling companies.

The EPA under the Obama administration has followed a policy of pursuing "high impact cases to drive compliance and tackle the biggest pollution problems across industries."

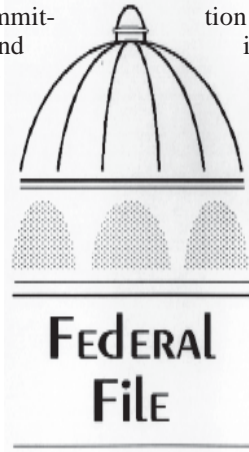
A settlement with a major industry segment member establishes a precedent for compliance by other members.

In this category, Tesoro Corp. agreed to spend \$403 million on advanced air emission control equipment at six refineries, and to spend \$12 million to improve public health in communities adjacent to those refineries.

The oil pipeline company Enbridge will spend at least \$110 million to install leak detection and monitoring technology to prevent spills.

Marathon Petroleum Co. agreed to spend \$319 million on state-of-the-art pollution control at its refineries in five states.

This case included substantial environ-



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mental justice components because the agreed-upon measures are intended to protect the health of low income members of communities near the refineries in the Southeast and Midwest.

Southern Coal Corp. will spend up to \$5 million upgrading coal mining and processing operations to prevent wastewater from contaminating rivers and streams near its mines.

Trader Joe Co., the well-known grocery store chain, will take measures to reduce greenhouse gas emissions from its refrigeration equipment in 453 stores nationwide.

This is a precedent case. The EPA said that the settlement "sets a high priority for the grocery industry for detecting and fixing coolant leaks."

Excess nutrients in U.S. lakes. Four out of 10 lakes in the U.S. have excess nutrient levels that can spur algal growth and algal blooms to levels that cause low oxygen levels, degrade habitat for aquatic life and lower water quality for recreation, according to an EPA study.

Microcystin, a toxin produced by cyanobacteria, was present in 39 percent the water in lakes across the country. However, microcystin was below the 10 parts per billion level of concern in almost all cases.

Low concentrations of the herbicide atrazine occurred in 30 percent of U.S. lakes.

The results of this study support the conclusion that eutrophication is one of the most widespread and costly environmental and public health challenges in the U.S.

The results may be used to oversee regulatory programs, conduct outreach and engage partners, provide technical and programmatic support for state programs, implement research and development studies, and for financing nutrient reduction activities.

The data is part of the EPA's National Lakes Assessment. The prior assessment conducted in 2007 focused on larger lakes in the U.S.

This one included many smaller lakes and increased the total number of lakes in all size categories assessed.

The work is part of the National Aquatic Resource Surveys program that provides information about the condition of water resources around the country. State agencies and tribes were partners in the survey effort.

Subsurface intrusion now part of Superfund ranking. In early December, the EPA finalized a proposal that adds subsurface intrusion to the agency's Hazard Ranking System used to quantify adverse impacts to air, groundwater, surface water and soil.

The scoring system helps evaluate the need to place a contaminated site on the Superfund's National Priorities List.

Subsurface intrusion is the term for the migration of hazardous substances, pollutants or contaminants from groundwater or soil into an overlying building. It is therefore specifically focused on human exposure and the human health risks of cancer and chronic disease.

This regulatory change, the EPA noted, affects only sites being evaluated for future addition to Superfund's NPL. It does not immediately affect the status of sites currently on or proposed to be added to the NPL.

Sites on the NPL are eligible to receive federal funding for long-term cleanup that provides a permanent remedy to soil and groundwater contamination.

RMP amended. In late December, the EPA issued a final rule that amends its Risk Management Program.

The RMP's goal is to reduce the likelihood of accidental releases at chemical facilities and improve emergency response activities if releases occur.

The EPA's amended RMP regulations

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Environmental groups threaten to sue over phosphate mining approval

Staff report

Four environmental groups are threatening to take legal action against the U.S. Army Corps of Engineers and the U.S. Fish and Wildlife Service for approving more than 50,000 acres for phosphate mining in Central Florida.

The Center for Biological Diversity, Manasota 88, Suncoast Waterkeeper and People for Protecting Peace River filed a notice of intent to sue.

The groups want the federal agencies to amend outlined violations of the Endangered Species Act within 60 days.

The groups are concerned about the Mosaic Co.'s South Pasture Extension mine, the Desoto mine, the Ona mine and the Wingate East mine.

The four mines are just south of the Peace River watershed within a 1.32 million-acre area spanning Manatee, Hillsborough, Polk and Desoto counties.

Federally listed endangered and threatened species live within the areas.

The potential lawsuit was due to come before the Manatee County Commission's January meeting that addressed Mosaic's request to rezone nearly 3,600 acres of its Wingate East mine property for additional mining activities.

Mosaic postponed its original commission hearing scheduled for September, 2016, after it was publicly discovered that a sinkhole had opened up at its New Wales facility.

In a statement, Mosaic officials claimed that shutting down one of Florida's most important industries would put 4,000 Floridians out of work.

They said the phosphate industry accounts for more than \$12.2 billion in annual regional economic activity.

Carbon neutrality. The University of South Florida St. Petersburg created a climate action plan to help the university reach its goal of carbon neutrality.

The university's action plan will serve as a guide to help it reach its sustainability goal of 50 percent carbon neutrality by 2035 and 100 percent carbon neutrality by 2050.

The plan reflects an extensive analysis of the campus's 2014 greenhouse gas inventory and daily use forecast.

The St. Petersburg City Council recently approved the city's own Integrated Sustainability Action Plan that will help the city transition to 100 percent clean, renewable energy.

St. Pete is the first city in Florida and 20th in the nation to commit to this goal.

Delray sea grape trimming. City commissioners in Delray Beach approved a plan to trim sea grapes that have become a problem for the city's coastal dune ecosystem.

The commission adopted the \$75,000 plan to retain three sea grape canopies near Atlantic Avenue while allowing landscapers to trim the rest.

Officials said the sea grapes block the light and crowd out smaller grasses and flowers that are essential to the dune's biodiversity and that hold the sand in place.

State and environmental officials said that sea grapes have become more dominant in many areas, and that trimming will protect biodiversity and maintain a healthy ecosystem.

NAS Pensacola cleanup. The cleanup of contamination at Naval Air Station Pensacola is winding down.

Engineers met with former base employees to discuss the last few areas of potential contamination to be addressed.

Potentially contaminated areas identified included an old landfill site used to dispose of construction materials that contained asbestos, the site of a now demolished building where radium was used to make dials for airplane gauges, and another area where an industrial solvent used to wash airplanes.

In 1996, the Navy identified 46 sites with potential contamination on the base.

Only four sites remain and those sites are now being addressed.

Artificial reef. An artificial reef is being planned for a pier in the Tampa Bay area.

During a recent reef cleanup effort, volunteer divers discovered that most of an existing artificial reef had sunk deep into the sea floor.

Now, workers are trying to build a new habitat off Pier 60, improving one of the only artificial reefs in Tampa Bay accessible without a boat.

The reefs help restore fish habitats and boost fish populations, which play a vital role in the local tourism industry.

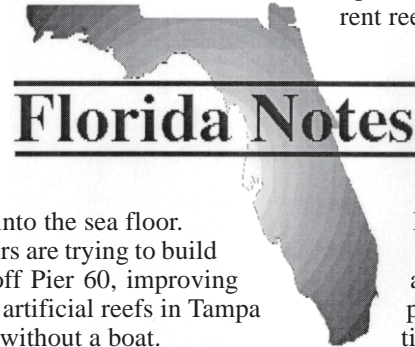
More than 1,800 people in Pinellas County use the artificial reefs every day and spend more than \$79 million in the area annually, according to a study by the Florida Sea Grant and the University of Florida.

The rows of concrete culvert, mostly old stormwater infrastructure, will be do-

nated from local construction sites. Officials will use the city's barge and current employees to position it underwater.

Work could begin on the reef by next summer if the project is granted the required state permit.

The reef will be placed in the waters directly in front of and around the end of the pier, which will be closer than the current reef that is 160 feet out.



People news. Jim McCarthy, executive director of North Florida Trust, has been appointed to serve on the state's Environmental Regulations Commission.

His term started Dec. 16, 2016, and will end July 1, 2019. His appointment is subject to confirmation by the Florida Senate.

Stephen James was named as the new director of the DEP's Office of Water Policy. He will be responsible for overseeing implementation of Florida's statewide water policy with water management districts and other agencies.

James most recently served as the senior associate director of public policy and

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Efforts to reduce total phosphorus in EAA runoff would benefit from property-specific standards

Staff report

When the South Florida Water Management District leases idle land in the Everglades Agricultural Area, it does not require its crop-growing tenants to meet current nutrient limits in runoff.

A recent feature in the *Palm Beach Sun Sentinel* illustrated this point based on records of two sugar cane producers that, in combination, lease more than 1,200 acres in Palm Beach County from the district.

The *Sun Sentinel* reported that one property, 634 acres in Southwest Palm

Beach, is leased by a Florida Crystals affiliate, Sugar Farms Co-Op. Between 2011 and 2015, phosphorus in its runoff averaged 141 percent higher than the current standard.

Another property, 594 acres northwest of Wellington, released water that averaged 210 percent higher than the current phosphorus standard.

Phosphorus releases from the two properties have not been consistently high over the entire period between 2011 and 2015. They experience spikes of high re-

leases due to weather effects and other uncharacterized factors that push the annual average well over the limit.

The standards for phosphorus in crop land runoff that apply to the Everglades Agricultural Area have two components.

The first component is a numerical standard—a 25 percent reduction from the phosphorus level established more than two decades ago.

The second is that the standard applies to the average total phosphorus concentrations in water pumped from the entire EAA.

Although farmers must monitor phosphorus levels in water draining from their fields, no individual farmer is required to meet nutrient standards.

Neither of the two properties is violating any rule because the total EAA drainage meets the requirements for the 25 percent reduction target for phosphorus levels across the area's nearly half million acres.

The SFWMD's recent South Florida Environmental Report discussed the EAA's efforts to meet phosphorus release standards. The report noted that EAA farmers use best management practices rather than numeric standards to reduce phosphorus releases below the benchmark year, twenty-one years ago.

In water year 2016, EAA farmers released 151 metric tons of total phosphorus in runoff water with an average TP concentration of 142 ug/L.

The report also explained that Lake Okeechobee, with TP concentrations in excess of 100 ug/L, contributed 115 metric tons to the EAA in irrigation water drawn from the lake.

Forty-six tons of that total phosphorus from Lake Okeechobee passed through the EAA to stormwater treatment areas.

The year 2016, with its record high rainfall, was a challenging year to meet the 25 percent total phosphorus loading target. EAA-wide, it was just 27 percent.

Environmental activists are particularly critical of the current EAA total phosphorus standard because they claim farmers negotiated a lenient, easily attained standard. They want a more stringent one.

They would like to see both a lower phosphorus standard, as well as specific targeting to reduce phosphorus release from those farms responsible for elevated phosphorus in their drainage.

For STAs outside the EAA, the target TP concentration is 14 ug/L TP, and the STAs are averaging 17 ug/L TP. That is well below the 100 plus ug/L coming in from Lake Okeechobee, or the 142 ug/L average TP in EAA runoff water as a whole.

SRWMD water conservation grants. The Suwannee River Water Management District announced a cost-sharing program intended to help dairy farmers conserve water by increasing operating efficiency.

The program will pay 75 percent, up to \$500,000, for conservation efforts.

The Florida Department of Environmental Protection's Springs Program is the source of the money supporting the district's cost-share program.

The program is voluntary and requires a completed application with information about the farm, and the crops and animals grown on it.

Recipients are required to implement best management practices stipulated by the Florida Department of Agriculture based on the supplied information.

The program directly addresses a predicted regional water deficit characterized in the recent North Florida Regional Water Supply Plan, a joint planning document prepared by the SRWMD and the St. Johns River Water Management District.

That report characterized a significant

shortage of aquifer-based water resources along the common boundary between the two water management districts in North Florida.

Newberry to extend water lines. City commissioners in Newberry voted to extend an eight-inch potable water supply line an additional 1.5 miles east towards Jonesville.

The decision was made following a complicated but successful negotiation process that required a payment agreement from owners of four large parcels

bordering the north side of the State Road 26 right-of-way.

The properties range from 37 acres to 272 acres. One parcel is individually owned while the other three are owned by business or investment entities.

The potable water line extension's total cost is estimated to be \$684,273. The four property owners would together pay \$454,109, leaving the city with the balance of \$230,164.

Newberry would recoup its share of the expenses from development fees as the system expands, and future users would pay for connections.

The water line extension, which would take about a year to complete, addresses two recent issues in the city.

The first was a requirement for a church to install fire suppression equipment east of the four large properties and at the terminus of the planned potable water line expansion. The extension now provides a source of water for the fire suppression system.

The second is a response to a privately-commissioned economic development study, paid for by property owners along the SR 26 corridor. That analysis identified the need for potable water and sewer as a prerequisite to improve development potential of the five-mile corridor through downtown Newberry and Jonesville.

The current plan addresses only potable water and includes only about 1.5 miles within the corridor.

City of Newberry staff prepared a conceptual plan that estimated a \$10 million cost for both water and wastewater infrastructure through the entire five-mile SR 26 corridor.

Newberry submitted a community-based inclusion request to the Florida Legislature in late 2015, but lawmakers did not act on it last spring.

If wastewater collection lines were installed along with potable water distribution lines, the estimated cost would be an additional \$1.5 million.

According to local reports, the city manager is pursuing funding opportunities for wastewater treatment line extension.

Okaloosa expanding wastewater plant. Several months ago, Okaloosa County's Water and Sewer Department began a \$13.5 million expansion of its Arbenie Pritchett Water Reclamation Facility.

The project could be complete by late 2017. CDM Smith of Maitland is the construction contractor.


The plant currently treats about seven million gallons of wastewater a day, which is three million gallons below its rated capacity. The current expansion will increase the total capacity to 15 million gallons per day.

The Pritchett plant is the largest of the county's three wastewater treatment plants. It serves 23,000 homes and businesses in the county's unincorporated neighborhoods, Eglin Air Force Base and the city of Fort Walton Beach.

The plan includes a seven-mile pipeline from the Niceville-Valparaiso regional sewer plants to the Pritchett facility.

WATCH
Continued on Page 5






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Latest Sleepy Creek Ranch consumptive use permit in limbo after activists petition for hearing

By **BLANCHE HARDY, PG**

After initially recommending denial of the Sleepy Creek Ranch consumptive use permit application, St. Johns River Water Management District staff reversed course and recommended approval of the cattle operation's request for more water.

Sleepy Creek, previously known as Adena Springs Ranch, requested an increase in the facility's water use of up to 1.22 million gallons per day for part of its sprawling 30,000-acre cattle operation in northeast Marion County.

District staff based the decision to recommend approval on an updated version of the Northern District Groundwater Flow Model, which is also used to establish minimum flows and levels for state waterways.

The district completed its review of Sleepy Creek Ranch's revised Sequence 4 Permit in December last year. Staff recommended increasing the requested total CUP allocation by 1.22 mgd for a limited duration.

As a result, if approved, the permit would authorize a total allocation of 2.54 mgd of groundwater from the Upper Floridan Aquifer for pasture irrigation, crop irrigation and livestock use, and 0.14 mgd for commercial and industrial use for years 2017 through 2023.

From year 2024 through 2034, the per-

mitted allocation would revert to the current permitted allocation of 1.46 mgd.

The cattle operation did not request a change in the duration of the permit.

Sleepy Creek Ranch LLC is close to the already stressed Silver Springs. Advocates for denial of additional water for the ranch opposed the permit due to its potential for increased withdrawal that may result in groundwater quality degradation beyond that currently impacting Silver Springs, the Silver River and Ocklawaha River.

"Silver Springs is an important source of freshwater to the St. Johns River," said Lisa Rinaman, St. Johns Riverkeeper in Jacksonville. "Water flows from the aquifer out of spring vents into the Silver River and then to the Ocklawaha, which is the largest tributary of the St. Johns."

"Further reduction of flow and increased nutrient pollution in Silver Springs will further degrade downstream waterbodies."

District staff said that the results of the revised computer model, and the collection and analysis of better data predict the groundwater withdrawals in the permit will have minimal impact on Silver Springs and the Silver River.

The Northern District Groundwater Flow Model, Version 5, was created through a partnership between the St.

Johns River and Southwest Florida water management districts.

New and different data were used to complete the model according to district staff, including expanded data for neighboring springsheds.

"The requested groundwater withdrawals of 978 million gallons per year will further reduce the flow of Marion County's springs, according to the SJRWMD Technical Staff Report," said Rinaman. "Average flows at Silver Springs over the past decade are already reduced more than 35 percent compared to historic levels."

According to Rinaman, the St. Johns district previously determined that the agency has already over-allocated pumping from the aquifer that feeds Silver Springs by about 50 million gallons per day.

"The Technical Staff Report for the permit originally recommended a substantive denial due to a projected reduction in the flow of Silver Springs by approximately 80 cubic feet per second, adverse impacts to riparian floodplains and the in-stream channel, potential for land collapse and a reduction in aquatic fauna and habitat," she said. "No mitigation has been offered to offset these impacts."

The water district's governing board was originally scheduled to take up per-

mit approval on Jan. 10, 2017.

However, St. Johns Riverkeeper, Florida Defenders of the Environment, Silver Springs Alliance, and Ocala resident Alice Gardiner filed a petition for a formal administrative hearing to contest the issuance of the CUP in advance of the board meeting.

In accordance with district procedures for cases under protest, SJRWMD Communications Manager Tiffany Cowie said the permit's status was removed from their January meeting agenda.

"The district referred the petition to the (state) Division of Administrative Hearings where an administrative law judge will conduct a hearing regarding the permit and submit a recommended order," noted the district. "After receiving the order, the governing board will then consider the judge's recommendation and vote to approve or deny the permit application."

The petitioners are seeking the hearing to challenge the appropriateness of the model, along with the assertion that Sleepy Creek Lands provide reasonable assurances that the proposed withdrawals would not cause harmful impacts to Silver Springs and the Silver River, and that the project is in the public interest.

Activists said they will continue to protest at future water management district board meetings in hopes of obtaining a permit denial from the governing board.

WATCH

From Page 4

The line extension will transfer wastewater from about 3,000 homes in the Bluewater Bayou subdivision to the Pritchett plant.

That will divert the water from Niceville's regional facility, freeing up a million extra gallons per day of treatment capacity at the Niceville-Valparaiso regional sewer plant. That capacity is expected to be tapped by ongoing development in the Niceville-Valparaiso area.

The Pritchett plant expansion will not require additional customer charges. Revenue for the expansion came from the county's capacity expansion charges paid by builders and developers.

Funding also came from capacity expansion charges paid by Eglin Air Force Base when it mothballed several aging sewer plants at its airbase and consolidated wastewater treatment into the county system.

Everglades City to repair plant. Everglades City has experienced long-standing problems with its wastewater collection system and treatment plant.

Last March through early April, the treatment plant allegedly released hundreds of thousands of gallons of untreated sewage into a nearby mangrove swamp.

That resulted in a lawsuit, one of several over recent years between the Florida Department of Environmental Protection and the city.

In December, as a result of mediation, Everglades City officials agreed to a two-year timeline to correct the problems.

By June, 2017, Everglades City will complete repairs on its wastewater collection system. The goal is to have all repairs completed before summer rains begin.

Everglades City has also developed a plan to repair and upgrade its plant. Under the terms of the negotiated settlement, the city must file applications and begin treatment plant construction by June, 2017.

Cost estimates made by Collier County put the cost of upgrading the city's sewage collection system and treatment plant at \$30-\$55 million.

DEP and Everglades City have been at odds for several years.

In November, 2015, DEP sued Everglades City for failing to make 12 of 24 necessary repairs it had previously agreed to as a result of a lawsuit.

For missing those deadlines, Everglades City could be fined \$1,000 per day for noncompliance.

From July 5, 2015, to March 7, 2016,

Everglades City operated its wastewater treatment plant without a permit, leaving it subject to a \$10,000 per day fine.

State inspectors allege that between March 21 and March 25, 2016, Everglades City allowed 100 to 200 gallons per minute of sewage to seep from a percolation pond into adjacent mangroves.

Those discharges ended in April, 2016, and have not occurred since because the city hired a contractor to haul excess sewage to a wastewater treatment facility in Hendry County.

In March, DEP asked Collier County to take over Everglades City's wastewater treatment plant or to help operate it. Collier County officials declined the request.

With its history of infractions dating back years, there's every reason to wonder if Everglades City will meet DEP's demands to adequately improve its wastewater treatment process.

This may be the city's last opportunity to obtain state revolving funds to pay for the upgrades at low interest rates.

City officials' actions over the next few months will indicate whether they are serious about addressing their operational problems at the wastewater plant.

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Researchers model carbon storage value of 'Glades mangrove ecosystems

By ROY LAUGHLIN

Researchers from Florida International University, Louisiana State University and the National Aeronautics and Space Administration recently published a study that estimated the value of carbon stored in the Everglades' mangrove ecosystems.

In the larger context, the authors' methods and data sources for their calculations are a model for future carbon cost-benefit calculations.

With respect to the Everglades specifically, the authors calculated that the value of carbon stored in the Everglades National Park ranges between \$13,859 and \$23,728 per hectare.

For the more than 144,000 acres of mangroves in Everglades National Park, the total value of carbon storage ranges between \$2 billion and \$3.4 billion.

Is this a good economically, considering the high cost of the Everglades restoration effort?

Based on the current cost of \$18.3 billion for Everglades restoration and the proportional mangrove area in the Everglades, the authors estimated the cost of preserving the Everglades mangroves to be \$2.72 billion.

In terms of carbon storage, research-

ers estimate the average abatement cost of the mangrove carbon in the Everglades to be \$56 per metric ton of carbon.

The cost-to-value estimates suggest costs and benefits are similar, and thus represent a good financial deal.

The authors are primarily ecologists who have spent many years studying Everglades mangrove forests, the largest area of mangrove forests in the country.

They estimated ENP mangroves' median carbon storage to be 335.6 - 888.1 megagrams carbon per hectare. This is a high value in comparison to terrestrial biomes and is typical of other studied western hemisphere mangrove swamps.

It is, however, lower than some of the most productive western Pacific and Indian Ocean mangrove ecosystems, some of which have mean values as high as 1,023 megagrams carbon per hectare.

For those wishing to promote useful ecological carbon storage, mangroves are likely to serve the purpose, according to the researchers.

Worldwide, less than seven percent of

mangrove ecosystems are protected from physical destruction, so efforts to provide that protection seems to be economically warranted.

The research provided a good summary of published information about carbon sequestration and storage by mangrove ecosystems globally and a critical discussion

of the ecological characteristics of Florida's mangroves for ecological carbon storage.

Its calculation of costs and values is one of the first and most comprehensive available.

The authors discussed the estimation process, critical data sources for estimating costs and values, and how to address variability in both ecological function and economic factors in the calculation.

"Our methodology focuses on the first logical step of estimating and valuing the stored onsite carbon," wrote the authors. "Such valuation will provide a baseline of stored carbon (in physical and monetary terms), serving as a benchmark for evaluating the impacts of restoration programs that might occur over a long period of time."

For coastal countries, this study represents a valuable contribution to a rational evaluation of the cost and benefit of carbon storage in coastal and riverine mangrove ecosystems.

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If your organization provides environmental or geotechnical drilling or direct push services, you're invited to complete and return the form below. Our annual directory will appear in the May issue. **There is a fee of \$100 to list your firm.** (The fee is waived for current *Florida Specifier* advertisers and FRC 2016 exhibitors.) Please type or LEGIBLY print the information requested and return as soon as possible to Mike Eastman via fax at (407) 671-7757, e-mail mreast@enviro-net.com or mail to P.O. Box 2175, Goldenrod, FL 32733. You can reach us by phone at (407) 671-7777. **If you were included in last year's directory, there is no need to complete this form—we will be in touch.** The deadline for submitting listings is **Wednesday, Apr. 5, 2017.**

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The second half of the paper discussed critical distinctions between carbon sequestration (the taking up of carbon dioxide in the air by plants) and carbon storage, which in mangroves may occur in different parts of living and dead plants and mangrove soils, and may be influenced by transport of sequestered carbon from the mangrove swamp.

The economic discussion included an illustrative comparison of determining carbon storage cost.

In the Everglades, the dominant cost driver has been the Everglades restoration plan. In other areas, the local economic costs are lower because the Everglades has a well characterized price following 20 years of restoration spending.

Even with their much higher carbon storage masses, western Indo-Pacific mangroves ecosystems have a lower calculated carbon storage value than those in the Everglades because of lower expenditures on them. In both cases, the monetary value is positive, however.

Societal economic valuation of stored carbon remains one of the greatest sources of variability in the model's calculations, and one likely to have the greatest future impact on any estimation of monetary value.

The authors discussed the suitability of using marginal damage costs, the theoretical voluntary societal cost of avoiding damage from CO₂-mediated climate change, the marginal abatement costs, the voluntary cost of maintaining or reducing carbon emissions, loss from storage, and the market cost of reducing carbon emission.

Cap-and-trade programs are prevalent examples of the third pricing method. Many economists prefer them because they are considered to be the most robust and accurate pricing mechanism.

In their calculations, the researchers derived CO₂ prices from the average 2014 auction clearinghouse price obtained by the Regional Greenhouse Gas Initiative.

The researchers adjusted their prices for carbon based on the differences between mass of carbon and CO₂; a ton of CO₂ corresponds to 0.27 ton of carbon.

But, the authors noted, these markets price carbon sequestration, not necessarily carbon storage.

The major limitation of using market value in the model, in addition to the distinction between sequestration and storage, is the lack of a "robust carbon market that considers carbon stored in protected areas ... and the resultant carbon market prices (that) represent a balance between what the society would be willing to pay and what it costs to supply carbon storage."

The authors concluded as a result that "the current market prices may not be appropriate for valuation of stored carbon" in some mangrove ecosystems such as those in the Everglades.

The Clean Power Plan would have established a nationwide cap-and-trade exchange on carbon emissions for the electricity generating sector. Such a cap-and-trade program might have provided a more accurate idea of the true market price for carbon storage.

Those fine-tuned figures would be useful to compare a variety of "green" carbon storage options including mangrove ecosystems.

The whole idea of addressing CO₂ and climate change in the U.S. may experience a tectonic shift at the national level beginning in January 2017, obviating any need for the concepts discussed in this paper. Time will tell.

But for other coastal countries, this study is a valuable and useful contribution to a rational evaluation of cost and benefit of carbon storage in coastal and riverine mangrove ecosystems.

Editor's note: The benefits of Everglades restoration extend well beyond carbon storage capability. Neither the report's authors nor our writer intend to imply it is that program's sole, greatest or most essential benefit.

Advocates' lawsuit may delay new water quality rule implementation

By **BLANCHE HARDY, PG**

Florida Clean Water Network Inc. filed suit in U.S. District Court in Pensacola asking the court to intervene with the U.S. Environmental Protection Agency to address Florida's comprehensive new water quality standards.

The nonprofit advocacy group has threatened to file suit on this issue in the past, and is now seeking action on a petition filed by the group in 2009 seeking new water quality criteria in Florida.

A growing list of organizations and individuals oppose the proposed water quality rule and the method of its progress, and are seeking more restrictive guidelines governing allowable levels of toxins that can be released into Florida waters.

The current round of disagreements began on July 26, 2016, when the state's Environmental Regulations Commission approved a proposal to adjust the allowable limits for 43 chemicals the state currently regulates, while adding new standards for 39 chemicals the state hasn't been regulating.

The ERC meeting was initially proposed for the fall of 2016, but was noticed on June 30th, 26 days before it occurred. At the time of the meeting, the seven-member ERC was short two members, one advocacy representative and one local government representative, who had yet to be appointed.

The accelerated timing of the plan, the lack of a full seven-member board and the

recent appointment of one of the seated members left activists feeling that the proposed rule was inappropriately fast-tracked.

As a result of the ERC vote, the Seminole Tribe, the city of Miami, Martin County and the Florida Pulp and Paper Association challenged the proposed rule seeking a hearing to address their concerns before an administrative law judge.

All four challenges were dismissed in September for procedural issues as the result of motions filed by the Florida Department of Environmental Protection.

As early as August, 2016, elected officials including U.S. Senator Bill Nelson and U.S. Representative Ted Deutch, D-Boca Raton, began making strong public statements questioning the proposed rule.

The legislators questioned the rule's timing, lack of public engagement opportunities and unclear safeguards for vulnerable populations.

In general, the rule's opposition questions whether the rule weakens—rather than preserves or enhances—Florida's water quality standards.

According to DEP, the department and EPA are strengthening Florida's water quality standards, not weakening them.

"Moving forward with the proposed criteria is critical to better protect Floridians' health because the criteria nearly double the number of chemicals that the department will be able to regulate," said Dee Ann Miller, DEP's deputy press secretary.

"The proposed rule sets stringent and

protective criteria for 39 chemicals that currently have no limits. In addition, the rule includes updates for 43 chemicals whose standards are more than 20 years old," she said.

"Both the new and updated criteria have been calculated using the most advanced science, including recently issued guidance from the EPA. Each and every criterion protects Floridians, according to both EPA and the World Health Organization," she continued.

Florida Clean Water Network's lawsuit was filed against the federal government, not the state. EPA's approval of Florida's proposed water quality standards rule may

now be delayed.

Controversy surrounding the content and method of promoting the rule continues to build.

The Senate Committee on Environmental Preservation and Conservation questioned DEP staff members on the department's handling of the new water rule in January, 2017.

Florida lawmakers questioned the acceleration of the ERC hearing date, considering ERC seats were vacant at the time, and the use of a procedural technicality to have the Seminole Tribe and related challenges dismissed considering the importance of water quality.

Duke Energy announces latest plans to recycle coal ash from closed plant

By **PRAKASH GANDHI**

One of the Southeast's leading power providers is finding a new and productive use for coal ash.

Duke Energy Corp., which provides electricity to large parts of Florida and five other states, is planning to recycle coal ash from a closed plant.

Duke has chosen a plant in Goldsboro, NC, as the second of three plants from which the company will recycle ash.

Dawn Santoianni, lead communications consultant with Duke, said in December that the company will be installing a coal ash reprocessing unit at its H.F. Lee plant in Goldsboro to recycle ash from the basins to be suitable for use in concrete products.

She said there were several factors that led to the decision to install the reprocessing unit at H.F. Lee, including close proximity to the market demand, the volume of ash at the site, the quality of the ash and the site's current closure deadline.

As much as six million tons of coal ash once slated to be buried at Lee County's Colon Mine reclamation site will be recycled for use in manufacturing concrete instead.

Duke is required to recycle ash from the ponds of at least three of the 14 current and former coal plants it owns in North Carolina.

In October, Duke announced that the ash from the Buck Steam Station in Rowan County would be recycled.

Any of the ash that cannot be recycled will be excavated and buried at an off-site, lined landfill.

Santoianni said the majority of the six million tons of ash on the H.F. Lee property will be safely reprocessed for use in concrete products by the current 2028 closure deadline.

"This is an important step in Duke Energy's efforts to safely close all of its ash basins in ways that protect people, the environment and families' wallets," Santoianni said.

Last year, Duke announced it would excavate the ash and ship it by rail to the Colon Mine reclamation site. But the North Carolina Legislature amended the state's

coal ash law to require that the ash from three sites of Duke's choosing would have to be recycled.

Duke has already announced plans to excavate and rebury the ash from basins at six of its current and former NC coal plants in addition to excavation and recycling at Buck and Lee.



Santoianni said a recent evaluation by the Electric Power Research Institute confirmed that recycling ash for concrete is one of the most practical and proven uses of the material.

The study examined well-established uses for ash, commercial technologies and innovative technologies.

Santoianni said more than half of the concrete produced in the U.S. contains coal ash because it makes roads, bridges and buildings more durable.



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Progress slow on Alachua County's Orange Lake water quality improvements

By **BLANCHE HARDY, PG**

The Florida Department of Environmental Protection is facing increasing impatience from environmental advocates and residents on the progress of phosphorus reduction efforts for Orange Lake.

Many feel that water quality improvements are moving way too slowly.

Orange Lake is near Gainesville in Alachua County and within the Orange Creek Basin that includes Newnans Lake, Orange Lake, Lake Wauberg, Hogtown Creek, Sweetwater Branch, Tumblin Creek and Alachua Sink.

It is a popular destination for boaters, fisherman and bird watchers.

The lake is a designated impaired waterbody with a total maximum daily load goal of 0.031mg/L of phosphorus that was adopted in 2003 to address nutrient pollution.

The TMDL targeted phosphorus in order to reduce the abundance of algae.

Between 1995 and 2000, the level of phosphorus in the lake was roughly twice the goal and from 2008 to 2013 it was three times the goal, according to Phase 2 of the Orange Creek Basin Management Action Plan.

Excess nutrient loads typically result

in an overabundance of vegetation that can clog boat ramps, impair boat passageways and make fishing difficult.

In Orange Lake's case, the nutrients may also increase the size and presence of the lake's numerous tussocks, or floating islands, comprised of mud, soil and vegetation.

"One of challenges facing Orange Lake has been management of floating islands and aquatic plants to allow access to the lake by fisherman while maintaining water quality and habitat beneficial to fish and wildlife," said Florida Department of Environmental Protection Deputy Press Secretary Dee Ann Miller.

The Florida Fish and Wildlife Conservation Commission prepared a management plan for the lake to address the floating islands and aquatic plants.

According to DEP studies, the phosphorus impacting Orange Lake predominately comes from residential and agricultural fertilizers.

"The Orange Lake watershed contains most of the agriculture acreage identified in the Orange Creek Basin," said Miller. "DEP and the Florida Department of Agriculture and Consumer Services are working together to identify agriculture producers and ensure that those producers are signed up with DACS for appropriate best

management practices.

"Within the BMAP area, the use of commodity-appropriate BMPs by agricultural producers is required by statute."

Although progress is slow, actions are underway to improve the lake's water quality. A total of 205 projects have been adopted in conjunction with the two phases of the Orange Creek BMAP. Of these projects, 115 have been completed.

Compounding the phosphorus loading and its lengthy reduction times is the lake's connection to other nutrient-laden waterbodies within the basin.

"As the TMDL found that 49 percent of the loading that affects Orange Lake comes from outside its watershed, specific projects to be implemented to reduce total phosphorus in Newnans Lake and Lochloosa Lake will also benefit Orange Lake," said Miller.

These projects include addressing phosphorus sources in Newnans Lake's

Little Hatchett Creek and Gum Root Swamp watersheds.

The Orange Lake and Lochloosa Lake watersheds are also included in the Silver Springs BMAP area. Projects have been completed to improve water quality under that BMAP.

"Related to that effort, the Silver and Rainbow Springs Onsite Sewage Treatment and Disposal Systems Advisory Committee has been meeting since July," said Miller. "Their purpose is to assist the department with preparation of an OSTDS remediation plan by June 2018."

"Natural systems take time to respond to reductions in pollutant loading," she said. "For some lakes, the impacts from interconnected waters or in-lake processes will continue to be seen even after successful completion of restoration projects."

"Setting water quality restoration goals and accompanying restoration plans is an inherently adaptive process."

Princess Cruise Line hit with \$40M penalty

By **PRAKASH GANDHI**

The U.S. government slapped a major cruise line with a \$40 million penalty for illegally dumping oily wastewater into the ocean.

The penalty was levied against Carnival Corp.-owned Princess Cruise Line for dumping the wastewater in 2013 and then trying to cover up the crime.

Investigators said it was one of several cases where the ship pumped wastewater into the Atlantic, including off the shores of U.S. ports from Texas to South Florida and along the eastern seaboard in 2012 and 2013.

Officials with a leading environmental group are now calling for new get-tough measures against cruise lines that violate environmental rules.

"We are incredibly frustrated by this blatant pollution violation," said Marcie Keever, oceans and vessels program director for Friends of the Earth.

"It seems like Princess was still on probation when they started this type of behavior again," she said. "No matter what pollution technologies you put on your ship, if you have bad actors (in charge), you can bypass the technology and dump the water into the ocean."

The fine is the largest-ever settlement for a case where a vessel was deliberately polluting the environment.

Prosecutors charged Princess Cruise Line with seven felony counts after an extended investigation.

Carnival Corp. will pay a \$40 million penalty—\$10 million of which will be directed to community online programs that will benefit the maritime environment—and will undergo five years of court-supervised environmental compliance monitoring aboard 78 ships from its 101-ship fleet.

In the late 1990s and early 2000s, there were a series of environmental violation cases against Carnival and several other cruise lines.

Two Carnival Corp. cruise lines, Carnival Cruise Line and Holland America Line, were fined a combined \$20 million.

In addition, Royal Caribbean International was fined \$27 million and Norwegian Cruise Line another \$1.5 million in cases involving illegal oil dumping.

This latest case shows that much more needs to be done to regulate the environmental practices of the cruise industry, Keever said.

"We are glad about the fine. But it is a drop in the bucket when you look at the enormous profits Carnival makes each year," she said. "At a minimum, the Princess ships should be inspected when they come into U.S. ports."

"Much more scrutiny needs to be placed on the cruise industry. There needs to be more monitoring and more enforcement."

Cruise ships must comply with international standards for discharging oily water from their ship's engine lubrication and fueling systems.

Onboard filtration systems separate oil from water, removing enough contamination to make the water legal to pump over-

FINE
Continued on Page 13



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Tarpon Springs officials making preparations to dredge Anclote River

By **BLANCHE HARDY, PG**

The city of Tarpon Springs is preparing to dredge the Anclote River. Silt has accumulated causing the channel to become so shallow that larger boats are no longer able to access the port at water levels that can be as shallow as three feet at low tide.

Boats are avoiding getting stuck by skipping the port all together. Tourism and commercial operations are beginning to suffer.

Tarpon Springs is home to the largest Greek population in the country. The city's downtown is on the National Register of Historic Places and it is known as "the sponge capitol of the world."

A great deal of the city's charm can be attributed to the sponge docks and related traditional sponge boats. Access to the Gulf is critical to the city's cultural character.

The dredging effort is expected to take approximately 40 months to complete and will generate more than 105,000 cubic

yards of silt. The channel is proposed to be 11 feet deep upon completion of the dredging.

"The U.S. Army Corps of Engineers is in the early stages of the design and permitting process," said Bob Robertson, PE, the city's public services program manager. "The city is working to secure a spoils site. Dredging activities are most likely to begin by the fall of 2018."

The corps recommended that the city use the G.P. Satmas property—the same three-acre site the city used when the river was last dredged in 1998—to stage silt dredged from the river.

Staff is now preparing to suggest one of three viable silt-staging sites to the city commission.

"A preferred site will be recommended to the city's board of commissioners," Robertson said. "Staff is working to prepare documents for the board to approve leasing the same site used for the previous river dredge located on L&R Industrial Blvd."

The city approached Pinellas County asking for financial support for the project. Commissioners there reacted favorably to the request for \$300,000 to initiate the first phase of the project that includes design and permitting.

The entire navigable portion of the river will be dredged so the project benefits other communities and the county as well.

"Costs will be shared among city, county, state and federal sources, with the largest portion of the funding coming from the federal and state sources," Robertson said. "The total estimated cost for the

project will most likely fall within a range of \$3 million to \$5 million based on the quantity of materials dredged and the duration of the project."

The benefits of dredging are numerous, including safer boat transit around Anclote Key and through the channel, improved marine commerce efficiency, increased marine support services, safer recreational and emergency boat access, tourism and more, said Robertson.

The project is also anticipated to alleviate area flooding that has become increasingly persistent with the shallowing of the river.

Corps to study potential use of foreign sand for Florida beach renourishment

By **BLANCHE HARDY, PG**

Coastal regions of Florida are facing a sand shortage. Repeated and extensive beach replenishment projects have left some coastal communities in short supply.

President Obama may have provided a solution when he signed into law the 2016 Water Resources Development Act in December.

The WRDA, part of the Water Infrastructure Improvements for the Nation Act, authorized the U.S. Army Corps of Engineers to study the potential of using foreign sand to enhance shorelines and protect coastal areas from hurricanes.

"There are limited sand resources in state waters for both Dade and Broward counties," said Erica Skolt, public affairs specialist with the U.S. Army Corps of Engineers, Jacksonville District. "However, there are significant sand resources in federal waters off Martin and St. Lucie counties.

"These sources are considered native sand sources. Currently known sediment resources offshore of Southeast Florida exceed 50-year sediment needs by 100 million cubic yards."

The Miami shoreline is one of the hardest hit by beach erosion. Beaches in Miami-Dade County are integral to the area's tourism industry.

Current beach renourishment construction valued at \$11.9 million is underway under corps' direction to address "hot spots" in the county.

"Projects such as the Miami-Dade County Beach Erosion Control and Hurricane Protection Project are not currently using imported sand," Skolt said. "The use of imported sand is not currently authorized by federal law."

For the corps' Miami-Dade project, Eastman Aggregate Enterprises will spread 220,000 cubic yards of beach-appropriate sand on approximately 3,000 feet of eroded shoreline in two locations near 46th and 54th streets.

"Section 935 of the Water Resources Development Act of 1986 and a congressional directive from 1999 indicate that the corps can only use domestic sources of sand for this project, unless domestic sources are not available for environmental or economic reasons," Skolt said.

To utilize new sources of sand, the corps completed a limited reevaluation report and environmental assessment with a finding of no significant impact with updated economics to justify potential alternative sand sources for future renourishment projects, Skolt said.

In 1998, the Florida Legislature dedicated a portion of the Ecosystem Management and Restoration Trust Fund for beach management.

Local governments have entered cost-sharing agreements with state and federal agencies to execute projects totaling approximately \$626.6 million from the program's inception.

Each partner contributes roughly one-third of the project cost. Florida Department of Environmental Protection records indicate the agreements have resulted in the restoration and subsequent maintenance of over 227.8 miles, or nearly 56 percent, of the state's 407.3 miles of critically eroded beaches.

Currently, federal funds may not be used for projects using imported sand, Skolt said.

"Importing sand may change the sand color and grain size, as well as how sand arrives on the beach," she said. "It may come by barge, be re-liquefied offshore and pumped to the beach, or it may come to a port by barge, where it is offloaded to dump trucks and driven to the beaches."

Given the state and federal beach restoration project financial contributions, local governments typically can't afford to secure foreign sand, even if it is physically more appropriate and less expensive than inland mined sands.

Approximately 60 percent of Florida's beaches are suffering from erosion.

In 2016, DEP identified more than 400 miles of beach and almost nine miles of inlet as critical erosion areas.



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Glades restoration efforts producing ecosystem improvements

By ROY LAUGHLIN

The recent biennial progress review of the Comprehensive Everglades Restoration Plan by an expert panel of the National Academy of Sciences had two primary themes.

The first was to report that ecosystem benefits are already apparent in work completed to date. The second was a discussion of issues and circumstances that detract from CERP's progress and overall success.

"Sixteen years into the CERP, there are some demonstrable ecosystem improvements from initial program investments. Additional major restoration enhancements are within reach as two CERP projects are nearing completion, four are ongoing and three major non-CERP projects ... should be completed and operational in the next five years," the report summary noted.

The winter of 2016 was notable because flooding rains in South Florida allowed the Mod Waters Program to begin releasing significant volumes of water into Everglades National Park. For the first time, a CERP project supplied water to rehydrate ENP.

In spite of finishing projects that provide hydrologic conditions that are simi-

lar to pre-drainage flows, such as the Pica-yune Strand and Biscayne Bay Coastal Wetlands projects, these areas at the periphery of the remnant Everglades account for only a small proportion of the overall CERP footprint, according to the report.

Much more restoration progress over a larger area remains to be done.

Increasing water storage

In the 16 years since CERP goals were set, new insights and information have changed some fundamental assumptions about the Everglades.

The report panel for this review cycle extensively discussed the fact that "the natural system was historically much wetter than previously assumed, bringing into question some of the hydrologic goals embedded in the restoration plan."

In addition, climate change will likely influence the quantity and intensity of runoff and increased temperatures will increase evaporative water loss.

For the first time, the report explicitly addressed sea level rise, endorsing the fact of a changing and shrinking footprint of the Everglades system.

Insufficient water storage is a product of the changing plan itself. More than a million acre-feet of originally envisioned water storage has been jettisoned because of CERP design changes.

Regional aquifer storage and recovery that was originally anticipated to become a significant water storage strategy is now seen to have substantially reduced capacity, especially ASR wells close to the Atlantic and Gulf coasts.

The feasibility of the Lake Belt Reservoir was also questioned. In 2008, reductions in Lake Okeechobee water storage reduced capacity by 564,000 acre feet.

Changes to Lake Okeechobee's operating schedule are specific adjustments that may be necessary. But the reliability of the Hoover Dike to substantially increase Lake Okeechobee water levels remains an unresolved issue.

Nutrient reduction

Progress on nutrient reduction in waters affected by the plan was mixed.

South of Lake Okeechobee, stormwater treatment areas are removing 80 percent of in-flowing phosphorus. The flow-weighted phosphorus concentrations in STA outflow water is 17 parts per billion, and some STAs are approaching the desired 13 ppb target.

But similar progress in reducing nutrients in Lake Okeechobee has not been made. There is no decrease in its phosphorus inflows in spite of phosphorus reduction projects north of the lake.

Since 1980, Lake Okeechobee phos-

phorus concentrations have more than doubled to near 100 ppb. Nitrogen levels are also high.

The recent extensive cyanobacteria blooms in Lake Okeechobee and their spread by excessive drainage to Indian River Lagoon waters are a direct consequence of nutrient enrichment in the lake.

If phosphorus levels in Lake Okeechobee inflows cannot be reduced by projects north of the lake, larger or additional STAs will be needed south of the lake that move the water towards Everglades National Park, the report stated unequivocally.

Reducing nutrients to below 20 ppb in runoff from the Everglades Agricultural Area remains a distant future prospect.

The latest South Florida Environmental Report presented data showing that during water year 2016, average total phosphorus runoff from 451,000 acres in the EAA was 142 ppb. This corresponds to a total phosphorus load of 151 metric tons.

The high phosphorus concentration is within the CERP's targets for the EAA but may need to be lowered to meet an Everglades-wide low nutrient regime that is targeted outside the EAA.

Funding issues

CERP is still far from complete and there are clouds on the horizon of a project originally envisioned to require 30-40 years for completion.

Since 2012, CERP's year of lowest appropriations, funding has increased.

"As of September, 2016, the corps and the state of Florida have each invested over a billion dollars into the Comprehensive Everglades Restoration Plan," said Jennifer Miller, a public affairs specialist for the U.S. Army Corps of Engineers, Jacksonville District.

By some tallies, local funding may raise the total spending to date for Everglades recovery to about \$3.2 billion, not even a fifth of the currently projected funding needed.

The report presented the prospect that CERP will require well beyond 60 years and cost even more than the currently estimated \$16 billion dollars.

In the recently passed Water Resources Development Act, the Central Everglades Planning Project that would move treated water south from the EAA was approved for a \$2.2 billion appropriation.

With less than 18 percent of the total estimated cost being funded and almost half the original project duration approaching, only substantial additional funding will improve chances for project completion and provide the benefits of that effort.

Measuring progress

Even with its extensive discussion of costs and spending to date, the report took issue with using only cost as a metric for measuring project progress.

The report urged that future CERP progress reports "describe the ecosystem effects predicted to result from the project relative to baseline and/or reference conditions and the time frame over which they are likely to unfold."

Avoiding unrealistic expectations is a primary benefit of this recommendation.

In a press conference last fall, Lt. Col. Jennifer Reynolds, deputy district commander and the corps' CERP leader, said that the greatest number and most extensive benefits of restoration benefits will become apparent near the completion of the projects.

Delays translate to greater costs and, at least in a specific time frame, lower benefits.

CERP needs mid-course adjustment

Adaptive management was explicitly envisioned in the CERP plan to help address unforeseen issues and to incorporate new knowledge. However, the original vision of adaptive management at the program level remains unfulfilled, according to the report.

Conflicts have arisen, for example, due

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Watch the pages of the *Florida Specifier* for the Call for Papers.

Calendar

February

FEB. 4-7 – Conference: National Association of Clean Water Agencies' 2017 Winter Conference, Tampa, FL. Call (202) 833-2672 or visit www.nacwa.org.

FEB. 6-10 – Course: Backflow Prevention Assembly Tester Training and Certification, Destin, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeco.ufl.edu.

FEB. 6-7 – Exam: Backflow Prevention Recertification Exam, Lake Buena Vista, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeco.ufl.edu.

FEB. 6-9 – Course: Landfill Design and Construction, Tampa, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeco.ufl.edu.

FEB. 7-9 – Course: Process Control of Waste Treatment Plants, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeco.ufl.edu.

FEB. 7-10 – Course: Water Distribution Systems Operator Level 2 & 3 Training, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeco.ufl.edu.

FEB. 7-10 – Conference: The Utility Management Conference, Tampa, FL. Presented by the American Water Works Association and the Water Environment Federation. Call 1-800-926-7337 or visit www.awwa.org.

FEB. 8-10 – Conference: Florida Shore & Beach Preservation Association's National Conference on Beach Preservation Technology, Stuart, FL. Call (850) 906-9227 or visit www.fsbpa.com.

FEB. 8-10 – Course: Backflow Prevention Assembly Repair and Maintenance Training and Certification, Lake Buena Vista, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeco.ufl.edu.

FEB. 9 – Seminar: Air Quality Seminar, Fort Myers, FL. Presented by the Florida Water Environment Association. Call (407) 574-3318 or visit www.fwea.org.

FEB. 14 – Course: Refresher Training for Experienced Solid Waste Operators - 8 hour, Daytona Beach, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeco.ufl.edu.

FEB. 14-15 – Course: Initial Training for Transfer Station Operators and Materials Recovery Facilities - 16 hour, Daytona Beach, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeco.ufl.edu.

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FEB. 14-15 – Course: Initial Training for Landfill Operators and C&D Sites - 24 hour, Daytona Beach, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeco.ufl.edu.

FEB. 14 – Course: Initial Training for Spotters at Landfills, C&D Sites and Transfer Stations - 8 hour, Daytona Beach, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeco.ufl.edu.

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FEB. 16 – Course: Asbestos Refresher: Worker/Trainer, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeco.ufl.edu.

FEB. 15-16 – Course: Cross Connection Control Conference: Protecting Public Health, Daytona Beach, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeco.ufl.edu.

FEB. 17-18 – Exam: Backflow Prevention Recertification Exam, Venice, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeco.ufl.edu.

FEB. 19-21 – Seminar/Conference: SWANA Senior Executive Seminar and Florida Chapter Winter Conference, Tampa, FL. Presented by the Solid Waste Association of North America and SWANA/Florida. Contact Crystal Bruce at (727) 940.8855 or visit www.swanafl.org.

FEB. 21-23 – Course: Train the Trainer: How to Design and Deliver Effective Training, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeco.ufl.edu.

FEB. 23-24 – Exam: Backflow Prevention Recertification Exam, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeco.ufl.edu.

FEB. 24-25 – Course: Backflow Prevention Assembly Repair and Maintenance Training and Certification, Venice, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeco.ufl.edu.

FEB. 27 – Seminar: 2017 Integrated Water Seminar, One Water - Right Use, Right Balance, Bartow, FL. Presented by the Water Resources, Reuse and Resiliency Committee of the Florida Water Environment Association. Call (407) 574-3318 or visit www.fwea.org.

FEB. 27 - MAR. 1 – Course: Water Distribution Systems Operator Level 1 Training Course, Gainesville, FL. Presented by the University of Florida TREEO

Center. Call (352) 392-9570 or visit www.treeco.ufl.edu.

FEB. 27 – MAR. 1 – Conference: NWRA Industry Conference, Ponte Vedra Beach, FL. Presented by the National Waste & Recycling Association. Call 888-839-9145 or visit www.wasrecycling.org.

FEB. 28 – MAR. 3 – Course: Water Class B Certification Review, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeco.ufl.edu.

March

MAR. 2 – Course: Basic Water and Wastewater Pump Maintenance, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeco.ufl.edu.

MAR. 4-5 – Exam: Backflow Prevention Recertification Exam, Bradenton, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeco.ufl.edu.

MAR. 6-10 – Course: Asbestos: Contractor/Supervisor, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeco.ufl.edu.

MAR. 6-10 – Course: Backflow Prevention Assembly Tester Training and Certification, Lake Buena Vista, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeco.ufl.edu.

MAR. 6-7 – Exam: Backflow Prevention Recertification Exam, Altamonte Springs, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeco.ufl.edu.

MAR. 6-7 – Conference: Greenprints 2017, Atlanta, GA. Hosted by Southface and Georgia State Univer-

sity. Visit <http://www.greenprints.org>.

MAR. 7-8 – Course: Initial Training for Transfer Station Operators and Materials Recovery Facilities - 16 hour, Crestview, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeco.ufl.edu.

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Developers of once-denied Manatee County project resubmit plans

By ROY LAUGHLIN

Two Manatee County developers resubmitted plans for a real estate development that includes what would be Florida's smallest mitigation bank on adjacent mangroves and bottom-land in Sarasota Bay.

The U.S. Army Corps of Engineers denied a permit for an earlier mitigation plan on submerged parts of the property. The new development, now called Aqua by the Bay, was formerly known as Long Bar Pointe.

The newly proposed development would consist of 522 acres with 3,200 homes and a 78,000-square-foot commercial space on about half of those acres.

In contrast, the Long Pointe Bar development included plans for 3,500 homes and multi-family units, and 200,000 square feet of commercial space, a conference

center, hotel and marina.

A portion of the plan includes 260 acres of submerged seagrass beds and mangroves that are proposed as a mitigation bank.

The site plan includes construction of a ditch between the mangrove-lined shore and the bank behind it, and the sea wall.

According to local newspaper accounts, homeowners could build boardwalks and docks through the mangroves beyond the sea wall.

Small non-powered boats will be allowed to launch from those docks and, in the future, power boats might be allowed.

The developers also have left a 100-foot gap between the development site and mangroves and wetlands in Aqua by the Sea's site plan.

A National Oceanic and Atmospheric Administration review of the earlier plan

questioned this and other stipulations in the permit application because they seem to be precursors to future development activities that should not be authorized.

Manatee County activists opposed to the project are concerned that the 100-foot gap that includes seagrass-covered bottom land is not included in the conservation easement.

They, too, fear it is a ploy to leave a location for future development of a channel to a marina that could be built in the development's residential portion.

The plan calls for invasive plants to be removed from 17.35 acres of degraded coastal freshwater marsh and replaced with native vegetation.

An additional 6.44 acres of less impacted coastal uplands will be improved by removing vines and exotic vegetation.

Nuisance and invasive vegetation on all areas of preserve mangroves and salt marsh will be removed.

The plan also calls for signage including buoys to protect submerged bottom lands, primarily seagrass beds.

sources coordination program administrator with DEP, included the following stipulation regarding mangrove trimming: "The applicant has reserved approximately 30 percent of the onsite mangrove acreage for potential future trimming to a minimum height of 12 feet, as measured from the substrate. This project does not authorize mangrove trimming."

In January, a consortium of environmental activists including Suncoast Water-

keeper, the Florida Institute for Saltwater Heritage and Joe McClash, former Manatee County Commissioner and an outspoken critic of the development in its different phases, petitioned the Florida Department of Administrative Hearings for a repeal of DEP's intent to permit.

The department accepted the petition but had not announced a hearing date as of press time.

"The mitigation bank project as currently proposed does not meet the statutory purpose and intent for establishment of a mitigation bank," the petitioners wrote.

They argue that seagrasses are al-

ready protected and healthy. They need no further protection because Manatee County already has ordinances preventing seagrass bed destruction.

In addition, Manatee County would require exotic vegetation removal as part of its permitting process, which is already approved.

And they also protested the approval to trim mangroves. In general, their petition said that "the overall plan does not include sufficient restoration and enhancement of the degraded ecosystems."

"(The developers are) trying to game the system and trying to get credits for mitigation where none is due," said Justin Bloom, executive director of Suncoast Waterkeeper. "It weakens the mitigation bank system. The benefits are extraordinarily exaggerated."

In addition, the possible insertion of a marina channel adjacent through mitigation areas and the extensive area in which mangroves may be trimmed further reduce the mitigation bank status, raising activists' skepticism about the persistent environmental benefits that established mitigation bank practices ensure.

This will be a precedent-setting development case, regardless which way the Department of Administrative Hearings rules.

It will determine whether mitigation bank credits will become just another lotto game for developers, or continue to be, as intended, an effort yielding significant benefits for the public and the environment that sustains the state's economy.

A complicated history

The plan for this development near Long Pointe Bar has a complicated history since the real estate partnership behind it first applied for permits back in 2013.

The property includes many acres of bottom lands and mangrove swamps that the partnership owns.


In the 1970s, a change to Florida's constitution asserted public ownership of most of Florida's mangrove swamps and seagrass beds. But in some cases, such as the property now slated to become Aqua by the Bay, private ownership is legal.

Whether on public or privately-held bottom land, Manatee County's comprehensive plan will not permit development on seagrass beds.

In 2016, the partnership filed a property rights lawsuit against Manatee County claiming that the county's land use rules deprived it of ownership rights by preventing development

AQUA
Continued on Page 13

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UF/IFAS compiles water quality, quantity-related topics on new website

Staff report

A new University of Florida Institute of Food and Agricultural Sciences website links users with programs on how to preserve and improve the quantity and quality of water in Florida.

FPL shuts Cedar Bay coal-powered plant

By ROY LAUGHLIN

On Dec. 19, Florida Power & Light Co. announced early closure of its Cedar Bay Generating Plant near Jacksonville.

In mid-2015, FPL purchased the 250-megawatt coal-burning power plant with the intention of closing it.

FPL had a 1988 power-purchase agreement with plant's owners. Buying the plant was the least expensive way to end what had become an uncompetitively expensive electricity source.

The company said the purchase and closure will save customers \$70 million. FPL will make up the lost generating capacity from its combined-cycle plants and renewable power generation facilities.

Closing the plant will also end the release of nearly one million tons of carbon emissions annually.

FPL expects to dismantle the facility, which may take several years to complete. The power company is in the process

The new website is available at <http://water.ifas.ufl.edu/>.

"I think our greatest achievement is providing a website for Florida resident to quickly access answers to their questions or solve their problems concerning water," said Kati Migliaccio, a UF/IFAS profes-

of making a similar deal to buy and shut down the Indiantown power plant, which will save FPL customers another \$129 million in pass-through rates that vary with the cost of power distributed by the utility.

Closing that plant will end the release of an estimated 657,000 tons of carbon dioxide emissions annually.

FPL announced its intention to close the Indiantown power plant by the end of 2018. Until closure, the plant will be operated at five percent of capacity.

In addition to electricity, the plant produces steam for a nearby citrus juice concentrate facility.

Last summer, FPL announced plans to build a new combined-cycle plant in northern Okeechobee County, about 40 miles from the Indiantown power plant.

The new plant will replace generating capacity of the closed plant.

FPL's moves in a small way mirror the abandonment of substantially larger coal-burning plants across the country.

ment; increase in density, intensity or use; transfer of development rights, land swaps or exchanges; and mitigation including payments in lieu of on site mitigation, monetary compensation or other mutually agreeable resolutions.

Judge John Larkin of Florida's 12th District Court conducted an all-day hearing on Dec. 2, 2016.

The developers asked for a judgment that requires Manatee County to buy the property at a fair market price through a condemnation process.

A decision had not been rendered on the case by press time.

into the ocean.

"All oil discharged to the water is harmful to wildlife," she said. "Oil is some of the most insidious pollution we can have in our oceans."

In a statement, Princess said it was "extremely disappointed about the inexcusable actions of our employees. This settlement clearly shows that we fell short on our commitment to the environment and for this, we are very sorry and take full responsibility."

Princess announced new leadership in its fleet operations organization and upgraded equipment since it became aware of the incident in August 2013.

quire development of new tools to accomplish it, including climate models, ecological modeling and especially analyses that address trade-offs.

Biogeochemistry models incorporating improved water quality modeling that the report said lag behind hydrologic and ecological models are a "key need."

The report characterized robust water quality modeling. These models will work most effectively when linked, and the report endorsed a "comprehensive sensitivity and uncertainty analysis of these link models to inform and guide assessment and planning decisions."

The report gives every reason to have confidence that Everglades restoration is achievable.

But its recommendations for CERP's conceptual framework and general activities are moving targets that need strong scientific consensus, public support and funding. Especially funding.

Editor's note: The expert panel discussed many more details than mentioned here. The full text of the recent National Academy of Sciences report, "Progress Towards Restoring the Everglades: The Sixth Biennial Review, 2016" is available online as a free PDF download.

sor of agricultural and biological engineering.

The average family in the U.S. uses about 320 gallons of water a day, according to the U.S. Environmental Protection Agency.

Landscape irrigation accounts for an estimated one-third of all residential water use—about nine billion gallons a day, according to the agency.

The UF/IFAS Extension Water Initiative Team came up with the idea for the website. A subcommittee of the initiative team manages the site.

Enhancing and protecting water quality and quantity is a priority goal for UF/IFAS.

"Florida must enhance and protect its domestic water supply while also meeting

the requirements of agriculture, horticulture, tourism and industry—as well as the state's 20 million inhabitants and its natural systems," Migliaccio said.

There are so many UF/IFAS programs on water-related topics that it can be difficult to know where to begin, Migliaccio said.

By compiling all their water-related topics in one place, IFAS hopes to provide a starting point for Florida water users.

With more than a dozen research facilities, 67 county extension offices, and award-winning students and faculty in the UF College of Agricultural and Life Sciences, UF/IFAS works to bring science-based solutions to the state's agricultural and natural resources industries, and all Florida residents.

Environmental Services



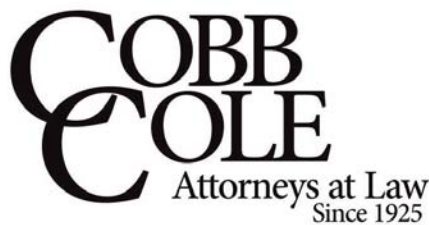
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Research indicates that sediment-derived iron may spur red tide outbreaks

By ROY LAUGHLIN

A Mote Marine Laboratory researcher is focusing on a potential causal link between iron leaching from the Gulf coast's river sediments and red tide blooms that typically begin offshore in low nutrient coastal shelf waters.

Jordon Beckler, PhD, ocean technology research program manager at the lab, hypothesizes that the release of ligand-bound iron from sediments during rainy summers carries dissolved iron to coastal waters.

Then, iron acting as a limiting trace el-

ement spurs blooms of a marine nitrogen fixing cyanobacteria, *Trichodesmium* sp.

Those cyanobacteria frequently bloom on Florida's Gulf of Mexico shelf waters about four to six weeks before red tide blooms and are most frequent in the summer and fall months that correspond to the rainy season and high runoff into the Gulf.

Trichodesmium fixes nitrogen from the atmosphere through chemical reactions powered by sunlight, forming ammonia and amino compounds from atmospheric nitrogen gas.

According to one current hypothesis, blooms of these iron-sensitive nitrogen-fixing cyanobacteria provide the necessary

nutrient boost for red tide to bloom in otherwise low nutrient continental shelf waters.

Beckler's research focuses on the first two steps described above. First, biogeochemical processes mobilize iron from sediments in the Caloosahatchee River's sediments and iron is transported to the Gulf's saline waters.

So far, Beckler has found high dissolved iron (III) concentrations near the surface of Caloosahatchee sediment pore waters. Iron is often present at concentrations exceeding 100 millimolars. Export from sediment to the overlaying water in the Caloosahatchee River occurs.

Beckler's research shows that the chemical forms of iron in sediments cycle on a delicately balanced oxidation-reduction process, alternating between iron (II) and iron (III). These two forms exist in a modestly reducing stratum below but close to the sediment-water interface.

Where reducing conditions are too strong, sulfate is reduced to sulfide, interfering with iron speciation to produce soluble iron III oxides. Near the sediment surface, iron (II) may interact with nitrites and ammonia in a coupled oxidation-reduction process that modifies iron mobilization as well.

These linked redox reactions have much in common with zero-valent iron used in environmental remediation methods for cleaning up contaminated groundwater even though the chemical products themselves differ.

In most modestly reducing freshwater and marine sediments lacking abundant iron, nitrogen reduction would be predicted over iron mobilization. But in iron-rich Florida and Georgia soils and sediments, iron oxidation and reduction predominates.

"We're dealing with a few dozen micromolar nitrogen (compounds) but a few hundred micromolar of iron," noted Beckler. "These systems (Caloosahatchee River sediments and the pore water) are incredibly enriched in iron."

Beckler's hypothesis includes another chemical process that affects iron solubilization and ensures its persistence in saltwater. Organic ligands that were produced by the decomposition of organic material and by some microorganism solubilized iron (II) in sediment pore waters.

Iron III typically occurs in pore water as reactive iron (III) hydroxides that may or may not be bound by low molecular weight organic ligands.

Beckler's dissertation research described similar iron-solubilizing ligands produced by the sediment bacteria, *Shewanella putrefaciens* strain 200.

In certain habitats, such as "black water" low pH, organic acid-rich fresh waters common in the Southeast U.S., high iron (III) concentrations occur in surface waters with sediment-derived iron bound to stable ligands.

These soluble ligand-bound iron (III) complexes, whether based on weathered organic compounds or produced by bacteria, are candidates for export by river flow to the continental shelf waters where they could spur cyanobacteria blooms.

The generally accepted characterization of iron behavior is that soluble iron in freshwater quickly flocculates and settles back to the sediment upon exposure to chloride and other seawater ions, even in the lower salinity portions of estuaries.

Extensive iron settling would break Beckler's hypothetical link between iron mobilization and freshwater sediments.

In a 2015 paper co-authored by Morris E. Jones and Martial Taillefert, Beckler characterized soluble organic-Fe (III) complexes that "are stable in pore waters and may flux from the sediments (of freshwater rivers) to the continental shelf."

A second facet of Beckler's research is to extend the 2015 study by characterizing the solubility, concentrations and persistence of ligand-bound iron in Florida's Gulf estuaries and nearshore coastal waters.

Other researchers have demonstrated that dissolved iron stimulates *Trichodesmium* blooms. Prior research has also noted a correlation between *Trichodesmium* blooms and a subsequent red tide bloom that trailed the cyanobacteria by about six weeks.

Beckler's finding is designed to demonstrate a plausible link between iron in Florida's river sediments that, with specific biogeochemical modifications, is carried to Gulf waters where it spurs cyanobacteria, a first step to red tide blooms.

The source of sufficient iron in coastal shelf waters is a scientific mini-drama for researchers who endorse its role in red tide blooms.

Researchers at the University of South Florida postulated that aerosol deposition of iron-rich Sahara sediments blown across the Atlantic during summer months may be a source of the cyanobacteria-stimulating iron in Gulf water.

But Beckler said that aerosol deposition of iron cannot account for all of the cyanobacteria blooms in the Gulf. If he demonstrates that significant iron contribution from river sediments to coastal shelf waters spurs cyanobacteria blooms, modified stormwater management techniques might then be a tool to modify red tide timing and intensity.

The hypothesis is complicated, but potentially links a disparate set of observations about chemical and biological correlates to explain paradoxical observations of blooms in Florida's Gulf waters.

Complexity doesn't faze Beckler. "The whole world of sediment diagenesis—this cascade of reaction—is what got me into geochemistry," he said.

Beckler began his current research project at Mote in May, 2016, so it is still in its early stages.

If his research shows that a set of conditions occur that solubilize sediment iron (III) to sufficiently stable complexes that survive transport from freshwater to saltwater, then his research will fill a critical knowledge gap to characterize iron chemistry in nearshore coastal waters.

And it will open a path for further research to characterize the symbiotic relationship between iron-stimulated cyanobacteria blooms and the nutrients those bacteria provide to support red tide blooms.

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New soil health tool available online

Staff report

The Soil Health Institute released its Soil Health Research Landscape tool, an online library and search engine for agricultural and environmental scientists, agricultural producers, conservation policy makers and others interested in soil health.

The tool is available at <http://soilhealthinstitute.org/>.

In addition to information on soil health, the tool includes data, metadata, methods descriptions, standards and related economic impacts for soil scientists, researchers and analysts.

The institute will not assess fees for using the tool.

The initial library includes more than 1,000 scientific research papers, research

progress reports and other kinds of publications and references.

Building the tool's library of soil health papers and information will be an ongoing effort of the institute and its partners.

Datu Research LLC, Durham, NC, worked closely with the institute to design the web-based search engine and assemble the initial holdings in the online library.

In addition, the U.S. Department of Agriculture's Natural Resources Conservation Service contributed their collection of more than 300 important references on soil health, and numerous individuals contributed their expertise in the design and review stages.

Ongoing partnerships with the soil health community will help the institute keep the tool current and relevant.

Monroe County hits milestone in sewage pump-outs in Florida Keys vessels

By PRAKASH GANDHI

A sewage pump-out program in the Florida Keys has reached a major milestone. The mobile vessel pump-out service collected its one millionth gallon of sewage under Monroe County's free service for boats anchored in Florida Keys waters.

The million-gallon mark was reached

FEDFILE

From Page 2

follow President Obama's Executive Order 13650, Improving Chemical Facility Safety and Security.

The rule revisions address improved chemical process safety, assistance to local emergency authorities to plan for and respond to accidents, and improved public awareness of chemical hazards at regulated sites.

The rule was formulated over the last two years in collaboration and consultation with industry, local and state governments, and other stakeholders, according to the agency's press release.

The agency said that over the past 10 years, more than 1,500 accidents were reported at RMP facilities. Those accidents caused nearly 60 deaths, resulted in 17,000 injuries or other causes requiring medical treatment.

More than half a million people were evacuated or sheltered in place as a result of chemical releases. More than \$2 billion in property damage also occurred as a result of accidental chemical releases.

Port Everglades dredging. The Senate approved the Water Infrastructure Improvements for the Nation Act just before it adjourned for the holiday break, green-lighting \$220 million to deepen the ship channel at Port Everglades in Fort Lauderdale.

The channel will be widened and dredged from 42 to 48 feet deep.

The project now includes a plan for planting 3,000 new nursery-raised corals within 18 acres of adjacent reef area. Five acres of artificial reef may be created by relocating 11,500 corals.

The Port Everglades website said that overall port expansion, which includes the ship channel dredging, will provide 4,700 construction jobs and "nearly 1,500 permanent direct jobs" attributable to additional cargo capacity.

Miami, Manatee County receive sustainability grants. The city of Miami and Manatee County are slated to receive grants from the EPA's Building Blocks for Sustainable Communities Program to help address environmental and economic development issues in 2017.

The grant provides planning assistance through the use of a set of planning protocols developed by the agency.

The EPA offers five of these planning and assessment tools under the grant funding: Green and Complete Streets, Equitable Development, Planning for Infill Development, Sustainable Strategies for Small Cities and Rural Areas, and Flood Resilience for Riverine Coastal Communities.

Miami will use the tool for creating Equitable Development. According to the EPA, this tool "helps communities evaluate their priorities to work toward equitable development and supports community goals for housing, local businesses, jobs, transportation and preserving opportunities for residents."

Manatee County will use the Green and Complete Streets tool. This tool "helps communities develop strategies for greening their streets based on national models and case studies."

The EPA received 76 requests for Sustainable Communities Program assistance. Miami and Manatee County were two of the 25 local communities selected to receive funding.

Final report on fracking. The EPA released its final report on the impacts of hydraulic fracturing on drinking water re-

sources. In an unusual move, the agency strengthened its statements regarding the risks of fracking to drinking water, compared to those in the draft report released early in 2016.

In its original report, the EPA attributed some of the case study findings involving drinking water source contamination to the failure to use casings around fracking wells, failure of the casings themselves around fracking wells, or migration of fracking fluids through abandoned or unknown wells from fracking strata to aquifers.

In a vague way, this implied that proper technological applications in fracking sharply reduced the risk to drinking water resources.

The report also included limited consideration of drinking water source degradation by spilled fracking chemicals.

The final report strengthens the characterization of risk to drinking water by providing six situations where risks are significant: water withdrawals for hydraulic fracturing during certain times of the year, or in areas of low water availability; spills that result in large volumes or high concentrations of chemicals reaching ground-

water; injection of hydraulic fracturing fluids into wells with inadequate mechanical integrity; injection of hydraulic fracturing fluids directly in the groundwater resources; discharge of inadequately treated hydraulic fracturing wastewater to surface water resources; and disposal or storage of hydraulic fracturing wastewater in pits that result in percolation to groundwater.

The report specifically noted that "data gaps and uncertainties limited EPA's ability to fully assess the potential impacts on drinking water resources both locally and nationally."

Noting that case studies were a significant component of the effort, the agency explained that more generalized data was difficult to come by, often did not fully characterize the severity of impacts or allow an estimate of the national frequency of impacts on drinking water resources, or was "prohibitively difficult to aggregate."

In spite of these data limitations, the EPA said the report provides valuable information about potential vulnerabilities to drinking water resources "and will improve over time as new information becomes available."

we hoped to achieve."

The Keys-wide mobile pump out program serves all boaters in unincorporated Monroe County. The program, funded by the state and county, has been free to boaters from Key Largo to Key West since its inception in 2013.

The county has been working to protect the water quality in the only coral reef in the nation by preventing the illegal dis-

charge of vessel sewage.

Over the past four years, Pumpout USA has steadily increased its customer base to 2,144 registered users. The program performs more than 1,500 pump-outs per month within the 120-mile-long county with numerous locations where boaters anchor and live.

Pumpout USA disposes of the sewage at marina facilities throughout the county.

The pumpout numbers translate into the disposal of more than 280,000 gallons of sewage annually that might otherwise be discharged to the water, and could create a health hazard and contribute to nutrient loading that could impact the reef system.

Pumpout USA now operates seven boats throughout the island chain. Six can hold 350 gallons of sewage each and a smaller one launched from boat ramps can hold 200 gallons.

Before the service started in 2013, the county had one pump out vessel in Key Largo. The Lower Keys had several privately operated pumpout boats that operated occasionally and in limited locations.

In 2013, the county joined with the Florida Department of Environmental Protection to start the Keys-wide program.

The county provided start-up funds of \$98,000 for the first quarter of the service. DEP provided funding through its Clean Vessel Act program. The state's contribution pays for 92 percent of the program for a one-year period.

The other funding for the pumpout service comes from a grant of \$172,350 and the county's match of that grant of \$57,000.

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Steverson steps down from top leadership spot at Florida DEP

Staff report

Jon Steverson, secretary of the Florida Department of Environmental Protection, resigned his position in a letter dated Jan. 20, 2017, to Gov. Rick Scott.

His last day at the post will be Feb. 3, 2017. In his resignation letter, Steverson did not provide reasons for his decision to leave the department.

In a statement, Scott thanked Steverson for his "hard work."

The governor's office is expected to announce Steverson's replacement soon.

Steverson's tenure at the agency was,

at times, rocky. Among other things, he upset environmental activists by suggesting to turn over some state properties, including parks, to commercial interests.

Steverson was promoted to interim DEP secretary in December, 2014, but was not confirmed by the state Senate until January, 2016.

Before moving to the department, Steverson served as executive director of the Northwest Florida Water Management District.

Prior to his time with the water management district, he served at DEP from 2011 to 2012 as special counsel on policy

and legislative affairs and acting deputy secretary for water policy and ecosystem restoration.

RULE

From Page 1

withdrawing the rule," he wrote.

The judge's opinion leaves no leeway for DEP to impose public notification that requires responsible parties to prepare and disseminate the notice. But DEP's rule requiring notice to DEP of discovery of contaminant release still stands.

DEP's web page for the former public notification rule now states that "as of December 30, 2016, DEP is continuing the public pollution notification process to

FDOT

From Page 1

and coordination; allows for the early identification of potential project effects; and informs the development of scopes of services for projects advancing to the project development and environment study phases.

In 2015, FDOT and FHWA initiated an agreement for categorical exclusions under 23 CFR 771.117 (r) and 23 CFR 771.117 (d).

In that same year, FDOT took over responsibility for specified changes in the interstate system access. That involved determination of engineering and operational acceptability.

In early 2016, FDOT took over aspects of historic preservation reviews. FDOT now consults with the State Historic Preservation Office and other historic preservation offices during highway planning and construction.

In May last year, Florida applied to take over NEPA review responsibilities from the FHWA.

FDOT's application noted that "(u)nder the NEPA Assignment Program, FDOT will continue to comply with applicable federal environmental laws and FHWA environmental regulations, national policies and guidance. The program will not change or weaken federal environmental protection standards."

Under the agreement, FDOT committed to conduct self-assessments to ensure compliance with the NEPA assignment program. During the first four years of the assignment, FHWA will audit FDOT annually to ensure the state agency meets its obligations.

Subsequently, FDOT will be solely responsible and liable for its NEPA decisions without any involvement from FHWA on assigned highway and local agency program projects in Florida.

He also served in the Executive Office of the Governor from 2005 to 2009 in multiple roles.

ensure Floridians and visitors are notified of pollution incidents."

After the Mosaic Fertilizer sinkhole event and the city of St. Petersburg's wastewater system overflow last September, Gov. Scott issued an emergency notification order, which ended when DEP finalized the rule.

Last October, both Scott and DEP officials noted that additional support from the Legislature was in order. Now, it is a necessity.

Last September, Sen. Bill Gallvano, R-Bradenton, and Rep. Kathleen Peters, R-Treasure Island, said they would propose legislation to support emergency public notification of contaminant releases, ostensibly along the lines of the recently invalidated rule.

On Jan. 3, incoming Sen. Linda Stewart, D-Orlando, filed legislation to require 48-hour emergency public notifications.

The Florida Legislature has a longstanding antipathy towards cumbersome rules for self-described over-regulated businesses.

Even with Gov. Scott's appeal for legislation, a public notification rule for contaminant releases that does not place the burden on DEP seems an unlikely outcome of this year's state legislative session.

NOTES

From Page 3

legislative staff attorney for the Florida Association of Counties, where he focused on environmental and agricultural matters.

Prior to his work with FAC, James represented a number of public and private clients on environmental, growth-management and water-resource matters as a lobbyist and consultant in Tallahassee.

He earned his juris doctor from the University of Miami and holds a bachelor's degree in chemistry from Florida International University.

Mike Fisher, PG, MEA, joined SCS Engineers as a project director in the firm's Boca Raton office. He can be reached at (954) 571-9200, ext. 2040.

Travis Wright joined Flowers Chemical Labs in Altamonte Springs as the lab's business and field services manager.

Ashley Evans, PE, joined Kessler Consulting in Tampa. She is an LEED-accredited professional with a range of experience in solid waste, stormwater, energy and remediation markets.



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