

# Florida Specifier

**FLORIDA  
REMEDiation  
CONFERENCE**

**Call for Papers**  
Information inside on Page 2

**Practical Information For Environmental Professionals**

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**April 2016**

Volume 38, Number 4

## **Invasive species report 6**

DOI released a report on invasive species that laid out a plan to refocus efforts on early detection and rapid response to locate and eradicate potential invasive species before they have a chance to spread.

## **South Florida report 8**

The latest South Florida Environmental Report from the South Florida Water Management District and the Florida Department of Environmental Protection details a year of science, engineering and restoration progress to improve the Everglades, Lake Okeechobee, the Kissimmee River Basin and South Florida coastal areas.

## **Advanced septic systems 9**

The Florida Department of Health teamed with engineers at Hazen and Sawyer to test advanced multi-stage septic system designs that provide sanitation reliably capable of reducing sewage effluent nitrogen concentrations from the typical 40–100 parts per million to below 5 ppm.

## **Ashey, Hilfiker on PRP 10**

Mike Ashey and Steve Hilfiker provide details on legislative changes made to the state's Petroleum Restoration Plan during this year's session—changes dependent on Gov. Scott's autograph.

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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](mailto:mreast@enviro-net.com).

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Photo courtesy of Hazen and Sawyer

Averett Septic Tank Co. Inc. contractors install an aerobic media filter, part of a three-chamber advanced on-site wastewater treatment and disposal system. The installation began a two-year trial by scientists and engineers at Hazen and Sawyer who designed the system. Such systems could replace conventional septic systems to provide significantly improved nitrogen removal from treated wastewater. See story on Page 9.

## **Kinder Morgan, activists battle over pros and cons of proposed Palmetto Pipeline**

By PRAKASH GANDHI

A major Florida environmental group has joined Georgia activists in the battle against a proposed \$1 billion petroleum product pipeline, fearing it could have serious environmental impacts in Northeast Florida.

The St. Johns Riverkeeper is working with Georgia environmental activists who oppose the Palmetto Pipeline that would travel 47 miles across Florida in Nassau and Duval counties to its terminus in Jacksonville.

There has been fierce opposition to the pipeline in Georgia and the fight against the project has led to proposed legislation in the two states.

The pipeline's owner, Houston-

based Kinder Morgan Energy Partners, filed preliminary documents with the Florida Department of Environmental Protection and the U.S. Army Corps of Engineers.

Kinder Morgan said it hopes to have the pipeline up and running by December of 2017.

The company operates 84,000 miles of pipelines that carry natural gas, crude oil, refined petroleum products and carbon dioxide for oil companies, energy producers and shippers, and local distributors.

More than 4,000 miles of Kinder Morgan pipelines already run through the state of Florida. The company has eight terminals in the Sunshine State.

St. Johns Riverkeeper Lisa Rinaman said most of the impact of the project

would fall on Georgia. But Florida would also suffer if the project was approved, she said.

"We are concerned about the cumulative impacts of the pipeline," said Rinaman. "We believe we need to move to renewable energy where we would not have cumulative impacts on our wetlands and waterways.

"Construction of the pipeline would have negative impacts and there could be leaks, which happen far too often."

Two years ago, Kinder Morgan unveiled its plans for the 360-mile pipeline that would provide up to 167,000 barrels a day of gasoline, diesel fuel and ethanol to Augusta and Savannah, GA, as well as to Jacksonville.

The pipeline would start in Belton, SC, and connect with the Plantation Pipeline that runs from Louisiana to the Washington, DC, area. It would terminate at the port of Jacksonville.

The company said the proposed pipeline would be safe because it would feature round-the-clock computer monitoring. The firm would also use high-strength steel, drill under waterways and bury the pipeline four feet underground.

Kinder Morgan said the pipeline will provide the first direct pipeline connection into the Savannah and Jacksonville markets.

Allen Fore, public affairs vice president for Kinder Morgan, strongly defended the project. He said that pipelines safely and efficiently transport a large percentage of all the crude oil and refined products in the U.S.

Currently, Jacksonville depends on trucks and ships to get refined products

## **FPL proactive in addressing concerns at Turkey Point plant**

By BLANCHE HARDY, PG

In March, Commissioners in Miami-Dade County received a report from University of Miami Professor David Chin, PhD, indicating that contaminated water from Florida Power & Light Co.'s cooling canals at the Turkey Point nuclear plant is seeping into Biscayne Bay.

The findings, including the detection of tritium at 130 to 215 times its typical occurrence in ocean water, were eye-opening.

"Frankly we shouldn't be talking about this anymore. We need to solve it," said Miami-Dade County Mayor Carlos Gimenez.

Tritium is a commonly occurring

isotope and a by-product of nuclear power generation.

The cooling canals are now augmented by millions of gallons of water from the L-31 canal and from local groundwater sources that assist in cooling the increasingly hot water discharges that have occurred since improvements were made to the reactors in 2013.

Subsequent to those improvements, elevated levels of ammonia and salinity have been detected south of the site.

Phosphorus and ammonia levels shot up dramatically in samples of water collected from the aquifer under

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**PALMETTO**  
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# EPA endorses increased water supply scrutiny nationwide following Flint

## Staff report

Following the lead contamination debacle in Flint, MI, the U.S. Environmental Protection Agency encouraged states to pay closer attention to treatment procedures and sampling of drinking water supplies.

It also encouraged state agencies to broadly disseminate analytical results for lead and copper testing in drinking water and suggested that states provide online access to information identifying the location of lead and copper pipes in their distribution systems.

EPA Administrator Gina McCarthy sent letters to the governors of all states that administer their own compliance and state implementation programs offering to send EPA staff to meet with state drinking water administrators to ensure that federal rules for lead and copper are being properly followed.

Florida is included among the group of states with an SIP.

The EPA also expects to propose a rule update for corrosion control in drinking water systems and is shooting to have that rulemaking complete sometime next year.

Some city officials have claimed that the federal corrosion control rules—and responses to the high lead levels found—are ambiguous with respect to requirements for

an immediate response.

Michigan has its own SIP, so its state officials are responsible for regulations and enforcement. Nevertheless, Ari Adler, a spokesman for Michigan's governor, said that what happened in Michigan could happen anywhere in the U.S. because the EPA's lead and copper rule is inadequate.

The EPA's immediate interest in renewed outreach to state drinking water regulators is said by some to be a response to these charges. In any case, it gives local officials the voluntary opportunity for direct access to EPA staff.

**Mapping tool for drinking water sources.** A new online mapping tool called the Drinking Water Mapping Application to Protect Source Waters is now available from the EPA.

The new tool provides access for public water system operators, state programs, federal agencies and others to "critical information to help them safeguard the sources of America's drinking water."

DWMAPS is essentially a GIS map and database overlay system with a drop-

down menu that allows users to select databases such as "sources of drinking water" or "potential sources of contamination."

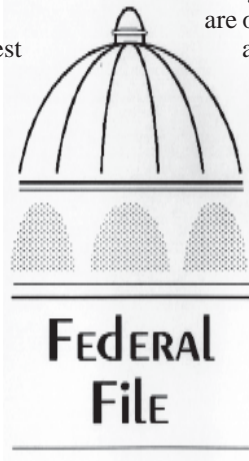
The EPA said that the tool allows users to learn more about their watershed and water supplier, and see if sources of their drinking water are polluted, or if there are other pollution sources that could affect their water supply.

The agency said that DWMAPS "can even guide users to ways they can get involved in protecting drinking water sources in their community."

Professional users in Florida will likely find DWMAPS to be a useful tool for accessing state and local data, helping them to identify local facilities with RCRA, TRI and other federal and state programs that register potential contamination risks.

This information could be particularly useful for emergency responses to accidental releases.

On another level, DWMAPS' GIS format integrates drinking water protection efforts with other environmental programs at the federal, state and local levels.



Databases in the program can help update source water assessments, prioritize source water protection up to the watershed scale and promote the integration of drinking water protection activities with other environmental programs.

Notably, for security reasons, the mapping system does not display the locations of public water treatment facility intakes.

**Revisions to CAA risk management.** The EPA is proposing revisions to the Clean Air Act's Accidental Release Prevention regulations, also known as their Risk Management Program, or RMP.

The revisions are intended to improve chemical process safety, assist local emergency authorities in planning for and responding to accidents, and improve public awareness of chemical hazards at regulated facilities.

The rule update was undertaken in order to modernize the existing RMP. It is based on agency review, as well as information and feedback from stakeholders in public comments.

To explain the need for the revised rule, the agency noted that while chemical plants are generally operated safely, over the past decade more than 1,500 accidents were reported.

Those accidents caused 60 deaths, 1,700 instances of injury or need for medical treatment, evacuation or sheltering in place for a half million people, and resulted in more than \$12 billion in property damage.

The proposed revisions are described as "a key action item under President Obama's Executive Order 13650, improving chemical facility safety and security."

The EPA will open a 60-day public comment period when the proposed rule is published in the Federal Register. Comments may be submitted online at [www.regulations.gov](http://www.regulations.gov).

**Clean Diesel Program grants.** The EPA announced the availability of \$26 million in grant funding for clean diesel projects.

This year, the agency solicits proposals that will significantly reduce diesel emissions and human exposure, particularly from diesel engine use in areas already designated as having poor air quality.

The agency also said that projects that "engage and benefit local communities and applicants who demonstrate their ability to promote and continue efforts to reduce emissions after the project is ended" will receive priority evaluations.

The nationwide grant program's funding for the year is double what was available in the preceding two years combined, and is similar to what had been available prior to 2013.

The agency expects to offer between 10 and 40 grants with proposed funding from \$300,000 to \$1,900,000.

Applicants eligible to apply include regional, state, local and tribal agencies. Port authorities with jurisdiction over transportation or air quality are also eligible.

Nonprofit organizations may apply if they provide pollution reduction or education services to diesel fleet owners, or have as their principal purpose the promotion of transportation or air quality.

The closing date for applications is Apr. 26, 2016.

**AEE Institute electricity rates report.** A recent think tank research report said that Florida can meet the EPA's Clean Power Plan by 2030 without increased electricity rates.

The assertion came from the application of an "analytical tool" and econometric model to predict electricity costs based on projected fuel prices, sources of electricity including renewable and power plant sources, population growth and increases in energy efficiency.

Under the two scenarios modeled, electricity costs would remain stable within one

**FEDFILE**  
Continued on Page 13

## 22nd Annual

# FLORIDA REMEDIATION CONFERENCE

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**October 6-7, 2016**  
*Rosen Centre Hotel — Orlando*

We are now identifying sessions and talks for presentation at FRC 2016 this fall and are seeking abstracts on a variety of topics:

**Risk assessment/risk-based closure**

**Bioremediation**

**Emerging/innovative technologies**

**Mixed-waste challenges**

**Site assessment technologies/characterization**

**Field sampling**

**Contaminant transport and modeling**

**Site stabilization**

**Vapor intrusion**

**Regulatory policy and initiatives**

**Brownfields**

**Cleanup case studies of sites and surface water contaminated with petroleum, PCBs, DNAPLs and LNAPLs, chlorinated solvents, arsenic and heavy metals, pesticides, nitrates/nitrites and other contaminants.**

In addition, we are considering presenting several sessions featuring open forum discussion on technologies, site assessment techniques and regulatory subjects. If you have a suggestion for an open forum subject, please chime in.

**Please submit abstract of 250 words by July 1, 2016.**

FRC presentations are limited to 25 minutes in length.  
E-mail abstracts to [mreast@enviro-net.com](mailto:mreast@enviro-net.com).

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For more information, call (407) 671-7777 or visit [www.enviro-net.com](http://www.enviro-net.com).



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## Proposed seismic testing for oil, gas now on hold

### Staff report

Proposed seismic testing for oil and gas in Gulf and Calhoun counties has been put on hold.

A petition was filed by Robert Voss to block the permits. Voss is a retired law enforcement officer and board president of the Panhandle Pioneer Settlement.

The Florida Department of Environmental Protection had announced its intent to issue two permits for the seismic testing in January.

Voss said that the proposal is a threat to the watershed, area rivers, the underground substrate and wildlife.

He wrote further that the area chosen for the testing is one of the worst possible places in terms of disruption to wildlife and the environment.

In his petition, Voss wrote that the testing would eventually lead to fracking and its use of volatile chemicals to release gas and oil from underground structures.

He believes that seismic testing could increase pollution and would certainly lead to excessive truck traffic on rural roads in the area.

The proposed testing would be done by Cholla Petroleum, a Dallas-based oil company. Nearly all of it will be conducted on land.

If the testing work is approved, crews will drill holes 100 feet deep in roughly 1,000 locations along crisscrossing lines spanning 63 miles. A small explosive charge would be dropped in the holes and detonated, providing underground data for modeling.

Once the testing and modeling is complete, it would be up to Cholla to decide the next step in the exploration effort.

**Gun club lawsuit dropped.** The Southwest Florida Water Management District dropped its suit against the Skyway Trap & Skeet Club in Pinellas Park.

The club has been around for 71 years. It sits adjacent to Sawgrass Lake Park, which is owned by the water management district and operated by Pinellas County.

The park has had to deal with pollution caused by lead bullets and shots fired from the club.

DEP sued Skyway in 2000 over the lead contamination. To avoid future lead pollution problems, the club has since switched to requiring all its members to use steel shot.

In 2004, the National Rifle Association asked the Florida Legislature to pass a bill banning state agencies from suing gun ranges, calling such lawsuits "back door gun control."

To no one's surprise, the bill passed and then-Gov. Jeb Bush signed it into law.

Lawmakers said legislation was necessary because of the high cost of fighting off lawsuits filed by state regulators that threatened to destroy the sport shooting and training range industry.

Swiftmud and DEP reached an agreement with the gun club and the settlement left taxpayers footing the \$25 million bill to cleanup a million pounds of lead in the park and lake.

Late last year, Swiftmud sued the club again. This time, the district claimed the club had failed to follow through on a promise to build a barrier to block any more shots from going into the lake.

Skyway appealed the ruling and convinced a judge to stay all further proceedings in exchange for agreeing not to allow any more shooting until the matter is fully settled.

**Spaceport opposed.** Environmental advocates are fighting a proposed spaceport in Central Florida.

The proposed 200-acre Shiloh Launch Complex would be built on the grounds of the John F. Kennedy Space Center in Cape Canaveral.

Wildlife advocates are concerned because the space center is surrounded by the Merritt Island National Wildlife Refuge, home to bald eagles and endangered panthers.

The National Parks Conservation Association said the Shiloh spaceport and another proposed spaceport just north of the Florida-Georgia border would lead to water pollution, noise pollution and other environmental problems.

**Hillsborough transportation tax.** Building more roads will make global warming's consequences worse for the entire Tampa Bay region, according to the head of Tampa's Sierra Club chapter.

In a February letter, chapter chairman Kent Bailey said the club would not support a proposed half-cent transportation sales tax referendum known as "Go Hillsborough."

Bailey said that adding more roads and cars to an already congested system will only serve to increase carbon pollution.

He said the Tampa Bay area will be among the first to suffer from flooding caused by climate change.

Economists examined 136 port cities in 2008 and found that Tampa and St. Petersburg were among 10 cities with the most property at risk to wind damage and coastal flooding from storm surge.

Many of the same economists revisited

the rankings in a 2013 study. The Tampa-St. Petersburg area was ranked as the seventh most at risk of flooding.

**Conservation land purchases.** The Conservation Trust for Florida will protect 2,198 acres of important habitat and rangeland in the Everglades Headwaters National Wildlife Refuge and Conservation Area.

The U.S. Fish and Wildlife Service bought a 662-acre conservation easement from Adams Ranch Inc.

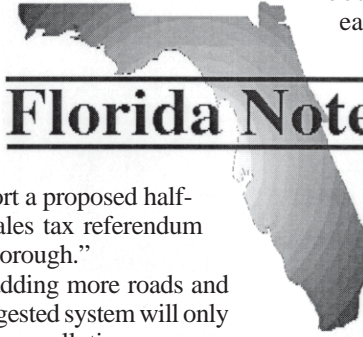
The purchase protects one of the last remaining grassland and long leaf pine savanna landscapes in eastern North America.

In addition, the Florida Forest Service purchased a 1,536-acre conservation easement from the ranch.

The 24,000-acre Adams Ranch is situated within the heart of the national wildlife refuge and the Kissimmee River Basin, where major hydrologic restoration is ongoing to improve water resources critical for Everglades ecological functioning.

As the state's population continues to climb, privately owned ranches in Florida are becoming increasingly more valuable for conservation.

## Florida Notes



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# Volusia County drafts proposal to prioritize wetland protection measures

## Staff report

Volusia County officials are considering a significant change to wetland protection rules within county boundaries.

A proposed ordinance would establish three regulation areas, primarily based on location: "Basic," wetlands in urban areas; "Intermediate," wetlands in unincorporated areas; and "Priority," wetlands including Outstanding Florida Waters or wetlands that could be designated as priority wetlands by the county.

According to county officials, the proposed change would allow the county to establish three tiers of protection with the greatest level of protection focused on those wetlands deemed to be most significant.

As of early March, the rule was still taking shape. The rule would apply only to new development.

Another proposed change is that in Priority areas, the buffer between wetlands and development would be increased to 50 feet from the current 25 feet.

The Volusia County Board of County Commissioners could vote as early as mid-March on the ordinance, but many observers expected a delay. Part of the delay may occur as the need for additional clarification arises.

The county posted a GIS map online showing wetlands classifications across the

county, but acknowledged that sub-parcels within broad areas may not as yet be correctly classified.

If the county approves its new wetland classification plan, its cities must adopt it by early 2017, the deadline still dependent upon if and when the county commission passes the proposed ordinance.

Volusia County cities could pass more stringent regulations or simply defer to the county regulations.

In addition, cities may have the opportunity to permit construction within Priority areas with specified mitigation requirements.

Nevertheless, local press reports indicate that elected officials in some municipalities do not support the county's wetland reclassification plan and differential protection, citing its complexity.

They see an additional set of compliance regulations and its permit requirements as potentially onerous.

Some county officials endorsed the proposed wetland classification rules, explaining that it will allow them to prioritize wetlands protection, update regulations that have not been revised since 1989, and update the county's regulations with

recent land use practices and science.

A spokesperson for the county said that she expected the proposed wetland's classification ordinance to be on the council's agenda for discussion at one of their upcoming meetings.

### NWFWMD agricultural cost-share funding.

The Northwest Florida Water Management District is providing \$1 million to fund eligible agricultural best management practices through its Jackson Blue Spring Agricultural Best Management Practice Cost-Share Program.

The grant program provides cost-share funding to agricultural producers for irrigation system improvements as well as equipment and tools such as software that improves water use efficiency or reduces fertilizer and pesticide use.

System improvements may include subsurface drip irrigation, variable rate fertilizer applicators, irrigation system retrofits, and remote control and zone management tools for irrigation systems.

Applications were accepted through late March for the current grant cycle. Applications received after that will be held

for the next award cycle.

To be eligible, agricultural producers must be operating within the Jackson Blue Spring and Merritts Mill Pond Groundwater Contribution Area, be enrolled in the appropriate Florida Department of Agriculture and Consumer Services' Best Management Practice program and be in regulatory compliance with district rules.

The district noted that agricultural producers that have not previously received cost-share funding will be given priority status for funding in this cycle.

Potential applicants for future grant funding can expedite the process by enrolling in or upgrading their enrollment in the FDACS BMP program.

Information is available online at [www.freshfromflorida.com](http://www.freshfromflorida.com).

Applicants applying for funding to upgrade irrigation equipment should contact Mark Miles of the Northwest Florida Mobile Irrigation Lab at (850) 482-0388 to schedule an irrigation system evaluation.

The district will fund 75 percent of a qualifying BMP up to a maximum of \$56,250 for each producer. Producers will fund the remaining portion.

The program is funded as part of Florida's \$100 million effort for springs restoration and protection initiated two years ago.

Agricultural producers interested in further information should contact Angela Chellette with the district at (850) 539-2650.



## Florida Specifier 2016 Drillers Directory *Don't be left out again!*

If your firm provides environmental/geotechnical drilling or direct push services, you're invited to complete the form below. Our annual directory appears 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 2015 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](mailto: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, no need to complete—we will be in touch.** The deadline for submitting listings is **Wednesday, Apr. 6, 2016.**

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**Reducing Lake O dumping.** In late February, the Sanibel City Council approved a four-point initiative to reduce or eliminate the dumping of excess Lake Okeechobee water through the Caloosahatchee River to tidewaters, including those around Sanibel Island.

The first point is to discharge Lake Okeechobee water to the agricultural land south of the lake and to other public or private lands in the Caloosahatchee River watershed.

The Everglades Agricultural Area covers 700,000 acres.

The second point is to utilize emergency storage within the Kissimmee, Lake Okeechobee, St. Lucie and Caloosahatchee basins.

Third, the initiative encourages maximizing storage within the Kissimmee Chain of Lakes. Increasing storage in the Kissimmee River's headwaters will provide adaptive flexibility for water level management through discharges.

The final point is to obtain emergency temporary deviations from federal and state water quality criteria and restrictions that limit discharges into the Everglades' water storage areas and Everglades National Park.

Several state agencies as well as the U.S. Army Corps of Engineers have programs and efforts, some of them unfinished, addressing the first three points.

Abundant rains this winter have raised Lake Okeechobee's water levels to well over 16 feet in early February. That's about four feet higher than what the corps considers safe.

To reduce the lake's level, more than 3.7 billion gallons of lake water is being released daily into the Caloosahatchee River.

About two billion gallons are also being released to the east coast through the St. Lucie River.

Although water released to lower Lake Okeechobee's levels occurs every year, this year the releases are occurring months earlier than usual, intersecting with the tourist season on Florida's Gulf Coast.

The water is stained brown, and characterized as polluted.

On Feb. 11, Gov. Rick Scott sent a letter to corps officials requesting water releases to the Everglades to relieve flooding in the water conservation areas.

Flooding in the water conservation areas endangers wildlife because the water

**WATCH** \_\_\_\_\_  
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**WATCH**  
From Page 4

may be too deep for nesting birds to feed in.

In the past, deer herds have been driven to higher lands where insufficient forage exists, leading to significant deaths due to starvation.

On Feb. 16, releases from Lake Okeechobee to the Everglades began. About the same time, releases from Water Conservation Area 3 to Everglades National Park began.

On March 4, the corps announced that releases to the Caloosahatchee and St. Lucie rivers would decrease by about half.

A spokesperson said that dry weather was responsible for decreasing the water releases from Lake Okeechobee but that releases could occur again if heavy rains made it necessary to lower Lake Okeechobee water levels again.

**Polk County cooperative.** In late February, Polk County's Board of County Commissioners and representatives of nearly all of its cities approved an agreement establishing the Polk County Water Cooperative. The approval was unanimous.

This step formally acknowledged the completion of a process that defined responsibilities, activities and membership in the Polk County Water Cooperative.

The next step is for formal acceptance of the agreement by Polk County member cities and the Polk County Board of County Commissioners. That approval is likely.

In April, the Southwest Florida Water Management District Governing Board is expected to vote on, and approve, the establishment of the water cooperative.

Once the Polk County Water Cooperative is established through the necessary votes, it will form a board of directors with one member appointed representing each municipal government participating and the Polk County board.

The board will be responsible for selecting specific projects and seeking funding from the water management districts, the state and other sources.

The cooperative will also focus on countywide conservation efforts and the development of alternative water supplies for public supply, agriculture, power generation and other end uses.

The cooperative is part of the Central Florida Water Initiative, a broader regional effort to develop alternative water supplies that serve to lessen direct demand on diminishing groundwater supplies.

**Turkey Creek muck removal.** In mid-February, dredging to remove 230,000 cubic yards of muck sediment from Turkey Creek in southern Brevard County began.

The muck will be pumped to an existing spoil site owned by the Florida Inland Navigation District just north of Turkey Creek.

The project is expected to take at least two months to complete and may include a two-month hiatus beginning May 1 to comply with manatee protection rules.

Muck removal is intended to remove a fine, light absorbing organic sediment. When suspended in water, it blocks sunlight sufficiently to reduce the coverage and density of seagrass beds in the Indian River Lagoon.

In addition, it supports bacterial growth and is enriched in nitrogen and phosphorus nutrients that may cause significant algal blooms.

Muck removal physically removes a nutrient source from the lagoon.

Advocates of muck dredging hope that it will help reduce the increasing frequency and intensity of algal blooms in the IRL.

The project is budgeted for \$7.2 million, much of it going to Gator Dredging of Clearwater.

In addition, faculty from the Florida Institute of Technology will be conducting research on the environmental impact of the dredging, supported by part of the project's funding.

The Turkey Creek Project is the sec-

ond of five dredging projects slated to remove 1,400,000 cubic yards of muck from the lagoon.

A project to remove muck from canals in Cocoa Beach and Sykes Creek began in January. In addition, the Grand Canal in Satellite Beach and waters near the Jones Road boat ramp in Mims will also be dredged.

Brevard County officials estimated that all the dredging projects will remove 1,344 tons of nitrogen and 288 tons of phosphorus.

Those quantities are approximately equal to the mass of nutrients that annually entered the Indian River Lagoon in 2009, before Brevard County adopted its Basin Management Action Plan.

The Florida Legislature approved \$20 million to fund these dredging projects in 2014-2015.

**Palm Coast wastewater plant.** In mid-February, the Palm Coast City Council approved a \$30 million project to construct a new wastewater treatment plant and supporting facilities.

The new plant, when completed in 2018, will immediately add two million gallons a day of additional wastewater treatment capacity at the city's Plant 3, about three miles north of Palm Coast Parkway on U.S. 1.

The plant will be expandable to treat six mgd as demand for wastewater treatment grows.

The construction project includes funding to build a pipeline to convey most of the treated wastewater to Palm Coast's reuse water treatment center at the city's Plant 1.

The city will also construct a master pump station to redirect some of the sewage from the city's northwestern collection system to the new wastewater treatment plant.

In February last year, Palm Coast obtained a \$30 million loan from the state revolving fund.

The wastewater treatment plant construction is expected to cost \$26,365,400. The remaining loan funds will cover the cost for the wastewater main and master pump station.

**Miami-Dade water transmission line.** In February, the Miami-Dade County Water & Sewer Department broke ground on a 36-inch potable water transmission line to be installed along Southwest 152nd Street.

The new transmission line, part of WASD's 20-year, \$13.5 billion capital improvement program, will provide multiple benefits.

It will provide additional water capacity to South Dade County's potable water supply.

It will also reduce water pressure fluctuations, in particular water pressure for fire suppression. It also supplies redundancy that may be useful during emergencies.

The project, which will cost \$10 million, is expected to be completed within 18 months.

**SJRWMD ag cost-share projects.** The St. Johns River Water Management District Governing Board approved \$1.9 million to fund 15 agricultural cost-share projects that are part of the district-wide agricultural cost-share program.

The governing board also approved \$1 million to fund six projects that are part of the Tri-County Agricultural Area Water

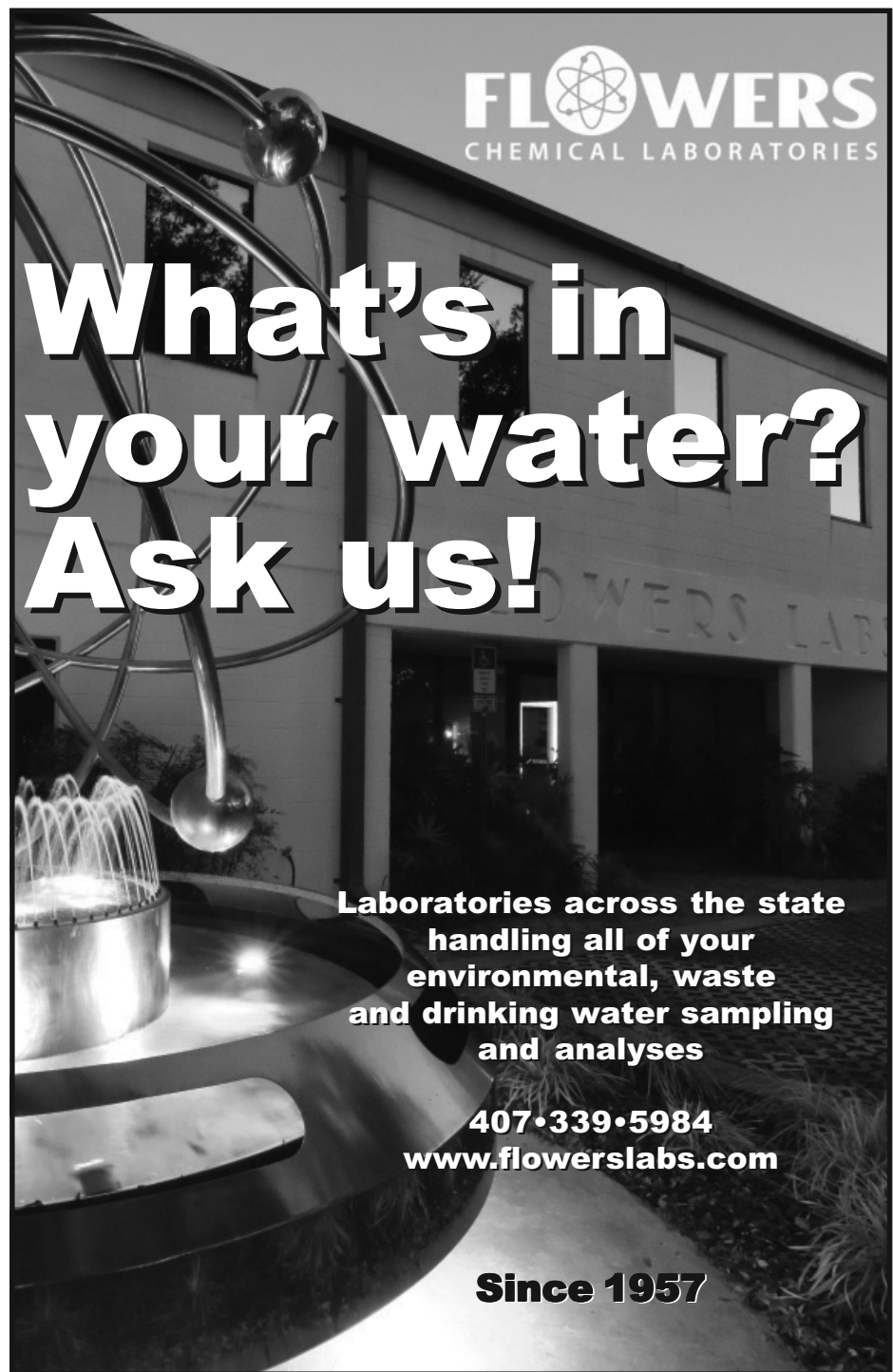
Management Partnership.

The two cost-share programs received a total of 40 applications, and funded 21 of them.

The approved projects include irrigation retrofits, rainwater harvesting, soil mapping and variable-rate fertilizer spreaders.

Funding provided by these programs helps farmers, growers and ranchers within the district's 18-county service area to enhance water conservation and reduce nutrient discharge.

The funding provided by the water management district may be leveraged with other agricultural cost-share sources directed toward achieving water resource improvements.



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# DOI publishes framework to safeguard against spread of invasive species

By ROY LAUGHLIN

The U.S. Department of Interior recently released an interdepartmental report of interest to environmental professionals who deal with invasive species.

The document, entitled *Safeguarding America's Lands and Waters for Invasive Species: a National Framework for Early Detection and Rapid Response*, laid out a plan to refocus efforts on early detection and rapid response, or EDRR, to locate and eradicate potential invasive species before they can spread.

The report noted that invasive species are among the most significant causes of environmental degradation and species extinction worldwide. In fresh waters and on islands, exotic species invasion is a primary cause of biodiversity loss.

"Invasive species are responsible for the endangerment and extinction of a wide range of taxa; degradation of fresh water, marine, and terrestrial ecosystem; and the alteration of biogeochemical cycles," said the report. Those damages are familiar to Floridians with an interest in the environment.

The report advocated preventing intro-

duction as the most effective way of controlling invasive species. Eradicating the founding populations is the second priority and, if invasive species become established, containment and long-term control that require substantial investment is the only remaining option.

This approach was apparent in last year's federal budget for the three categories when the U.S. spent a total of about \$2.2 billion for invasive species control: about \$875 million for prevention; \$675 million for control and management; and \$300 million for early detection and rapid response.

The U.S. Department of Agriculture contributed the lion share, about 91 percent of the \$2.2 billion, followed by five percent from the DOI and three percent from the U.S. Army Corps of Engineers.

The total cost including state and local efforts exceeds \$9 billion per year. If the cost of losses and damages due to aquatic and terrestrial invasive species were added, a 2005 report tallied the total financial impact of invasive species at \$120 billion annually.

A breakdown of USDA activities includes \$989.1 million to pay for efforts against bird flu, close to half of what that agency spent for all invasive species control efforts and about a third of all federal spending.

Notably, bird flu, a virus, is not an organism and depends on a host that is not necessarily an invasive species for propagation and spread. It could be prevented by vaccination, which is not widely practiced in the U.S. for this disease.

State program budgets for invasive species that are not viruses typically have budgets of up to the \$20 million range and have successful track records.

The report said that EDRR efforts may be too focused on combating selected invasive species, focusing on select geographic areas; that the efforts can be disconnected from neighboring activities; and that there is a lack of decision-support tools.

The report noted that a well-supported EDRR framework could address these gaps and help prevent the continued establishment and spread of invasive species.

The report made a strong case for developing a nationwide, multi-level EDRR effort in the U.S. But the lack of funds to fully implement such a proposed EDRR framework is a large impediment. Even a "focused engagement in priority landscape and aquatic areas may be difficult to achieve within existing resources," said the report.

The report identified four specific efforts that should be initiated: 1) EDRR

funding should be readily accessible so that evaluation of a threat can be made quickly; 2) implementing decisions to conduct EDRR activities should follow expeditiously; 3) consistency in essential monitoring requires consistent funding; and 4) control activities must be well funded to avoid end-of-fiscal-year shortfalls that lead to gaps until a new budget is in place.

Cost sharing including direct payments, and matching or in-kind contributions are essential because EDRR actions typically cross jurisdiction lines, necessitating federal and non-federal partnership approaches.

This is particularly germane to Florida because of the large number of invasive species already introduced and spreading through the state's major biomes.

"The state of Florida has made significant investments in invasive species management and is sharing many lessons learned," said Hillary Smith, invasive species coordinator for the DOI. "For example, entities within Florida share approaches for managing aquatic invasive plants, coordinating local cooperative invasive species management areas and leading landscape-level conservation initiatives through public-private partnerships, such as the South Florida Ecosystem Restoration Task Force."

Beyond a pervasive commentary about inadequate funding, the report discussed several ways to make funding go further, whether or not it increases.

"EDRR activities can be directed in a variety of ways to be cost-effective, such as focusing on priority pathways of introduction, geographic areas of importance or specific species of concern," she said.

The report presented a detailed discussion of the role of regional networks. All U.S. states are part of at least one regional network. Florida is part of the Gulf and South Atlantic Invasive Species Network of the Regional Panels of the Aquatic Nuisance Species Task Force. It is also part of the Southeast Exotic Pest Plant Council.

The states that are in these two networks are different, so there is little redundancy. The first group includes states primarily along the Gulf Coast and Southeast Atlantic Coast. The exotic pest plant council includes states east of the Mississippi River and south of the Ohio River, more than twice as many.

For novel approaches to increase invasive species control effectiveness, the DOI's report proposed risk assessment as a valuable tool for guiding and focusing EDRR. However, risk assessments for this use are either nascent or in their infancy.

"There is no single protocol or standard format for risk assessments to identify potentially invasive species," said Smith. "Criteria that are often included in risk assessment tools are species biology, history of invasiveness and invasion potential, impacts, ease of eradication, pathways of spread, and climate suitability, among others."

At this point, risk assessment is a long term option.

The White House Council on Climate Preparedness and Resilience urged the National Invasive Species Council to provide leadership in early detection and rapid response for invasive species.

This report raised a host of issues currently restraining the prevention and management of invasive species. Given the complexity of the problem, this report is not the place to look for panaceas.

Even with substantially more funding on the level that Congress and the states have been unwilling to provide any other programs, using the funds effectively would still be a challenging effort.

Nevertheless, the report cites existing regional and cost-share programs that are models to be imitated or expanded. Risk assessment is one new tool potentially capable of making significant contributions.

Considering its current undeveloped state for assessments of invasive species, risk assessors wishing to develop new tools and convince people to use them have their work cut out for them.



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# Algal bloom on Highlands County's Lake Istokpoga subject of study

By ROY LAUGHLIN

Last summer, Lake Istokpoga in Highlands County experienced an algal bloom that stained the water brown and persisted for many weeks.

In its biweekly algal bloom report in July of 2015, the Florida Department of Environmental Protection noted the bloom, characterizing its intensity as only "moderate."

Nevertheless, the color changes caught the attention of a number of local residents. Friends of Lake Istokpoga, a local grassroots environmental advocacy group, asked DEP and the Florida Fish and Wildlife Conservation Commission to conduct field studies to better characterize the algal species involved.

During the past year, several other water bodies experienced algal blooms and chemical analysis showed algal toxins present.

In September, the agencies' staff collected samples around the lake at Windy Point, Mid Lake and Upper Lake. The water samples were analyzed for chemical constituents and the phytoplankton samples were characterized and enumerated taxonomically.

The cyanobacteria *Planktolyngbya contorta* dominated two of the three collection sites. A green flagellate, *Chlamydomonas*, was the dominant phytoplankton by number of cells per milliliter.

At Windy Point, three cyanobacteria taxa accounted for more than half of all algal cells sampled.

In addition to *Planktolyngbya contorta*, *Cylindrospermopsis raciborskii* and *Aphanocapsa* were present in high numbers.

Although the algal bloom persisted for several weeks through middle and late summer when the area experienced heavy rains, the only fish kills reported were of bait fish that may have been kept in high numbers in bait pens.

A local newspaper report included comments from local fisherman who said

## Scientists closer to finding key to converting algae to biofuel

By BRAD BUCK

University of Florida Institute of Food and Agricultural Sciences researchers may have found a key to converting algae to fuel.

The scientists found what researchers call a "transcription factor," called ROC40.

Bala Rathinasabapathi, a UF/IFAS professor of horticultural sciences, likened a transcription factor's role in controlling the expression of many genes inside the algae cells to a policeman controlling a large crowd.

To draw lipids out of algae, scientists must starve the algae of nitrogen. Among the hundreds of proteins modulated by nitrogen starvation, the synthesis of ROC40 was the most induced when the cells made the most oil.

The high induction of that protein suggested to scientists that it could be playing an important biological role, said Elton Gonçalves, a former UF/IFAS doctoral student in the plant molecular and cellular biology program.

In fact, the team's research showed that ROC40 helps control lipid production when the algal cells were starved of nitrogen.

"Our discovery about the ROC40 protein suggests that it may be increasing the expression of genes involved in the synthesis of oil in microalgae," Rathinasabapathi said.

"Such information is of great importance for the development of superior strains of algae for biofuel production," Gonçalves said. "We conducted this research due to the great socioeconomic importance of developing renewable sources

no open water fish kills occurred even when the water was noticeably brown.

DEP's reports attributed the brown color to the presence of high numbers of *Planktolyngbya contorta* and *Cylindrospermopsis raciborskii*. Both species have a filamentous cell surface that is responsible for the distinctive color.

Lake Istokpoga is a large shallow lake that is intensively maintained for freshwater sports fishing. Annually, macrophytes are cleared to optimize habitat for bass, as well as other sport fish.

In addition, Lake Istokpoga's drainage, sometimes considerable, flows to Lake Okechobee. These two situations give the lake a recent history of careful water quality monitoring.

The water quality results for the September, 2015, sampling were 73, 82 and 137 parts per billion of phosphorus at Windy Point, Mid Lake and Upper Lake, respectively.

In the years 1990-1994, average phosphorus concentration was 30 parts per billion at S-64, the lake's water outflow control structure. During the years 1995-1999, phosphorus in the outflow waters doubled to 60 ppb.

For the two time intervals, 27.3 tons of phosphorus was released from the lake in its drainage water. Phosphorus measure-

ments in 2015 suggest that during the 15 years since the previously reported values, Lake Istokpoga has continued to eutrophy, although at a slower rate than in the 1990-2000 decade.

Algal blooms with blue-green algal dominance are a reflection of the lake's increasingly eutrophic condition.

During the last summer's algal bloom,

nutrient levels were apparently sufficient to spark a multi-week persistent algal bloom in the lake, but other conditions including algal density apparently did not induce the dominant cyanobacteria to produce algal toxins.

The bloom, though easily apparent to casual observers, was not one that harmed the lake's substantial sports fishing industry.

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# SFWMD moves forward on CREW flood control, restoration efforts

By **BLANCHE HARDY, PG**

The South Florida Water Management District authorized execution of a 580-day construction contract with EnviroTech Systems Inc. earlier this year to restore the hydrology and ecology on more than 1,000 acres within the Southern Corkscrew Regional Ecosystem Watershed, or CREW.

The district's construction cost is \$3,223,726. Approximately \$2.9 million of the total estimated cost is currently budgeted.

In addition to restoring natural systems,

the project will provide water storage that will assist in protecting nearby residential developments from flooding.

The 60,000-acre watershed spans the Lee and Collier counties near the Imperial River, east of Estero Bay on the Gulf of Mexico, and includes a 5,000-acre marsh at its headwaters.

CREW also includes habitat for a number of listed species including the Florida bonneted bat, the rarest bat species in Florida and among the rarest bats in the world.

The bat was listed as a federally endangered species by the U.S. Fish and

Wildlife Service in October of 2013. Potential impacts to the bat were assessed prior to approval of the restoration contract.

The CREW project will alter berm and ditch features installed to facilitate the creation of a now-abandoned residential area near Bonita Beach Road where water sheet flow has been blocked by dirt roads, agricultural ditches and home sites.

The restoration project will address 1,080 acres within an environmentally sensitive natural area encompassing 4,150 acres of the former residential development within the Lee County Imperial River watershed.

"Roads will be degraded to natural grade, road swales will be filled to natural grade and low water crossings will be installed on Sand Road," said Gabe Margasak, a spokesperson with the water management district. "The berm around the restored grant parcel will be degraded to interconnect the two project sites, public access parking area will be constructed at Vincent Road and all ditches within the project footprint will be filled to natural grade."

No significant change in peak discharge to the Imperial River is anticipated. Construction is expected to take 18 to 24 months depending on the magnitude of site

inundation, Margasak said.

The district expects the restoration to provide significant benefits to the South-west Florida ecosystem including: restoring wetlands and the historic sheet flow of water, improving regional flood protection and drainage, and increasing water storage and aquifer recharge capability.

The alteration of natural lands and water flow regimes—such as those to be corrected by the construction—has contributed to flooding in residential areas.

Between September and November of 1995, flooding in Bonita Springs and the surrounding vicinity resulted in the evacuation of 1,700 residents and significant property damage.

In response to the flooding, the district began acquiring private lands for the restoration effort and, in conjunction with public and private partners, managing the watershed to improve water storage and increase the level of wildlife preservation.

Work leading to the execution of the current restoration project has been underway for more than a decade.

The district has acquired approximately 4,000 acres of land, cleared exotic vegetation from more than 2,500 acres of land, and removed roads and plugged agricultural ditches on more than 600 acres to date.

## Latest South Florida Environmental Report provides good news on water quality

By **PRAKASH GANDHI**

Water quality is improving significantly in the Florida Everglades thanks to major efforts to stem pollution there, according to a recently released report.

The progress to cleanup Florida's famous ecosystem is detailed in the 2016 South Florida Environmental Report from the South Florida Water Management District and the Florida Department of Environmental Protection.

The document details a year of science, engineering and environmental restoration progress to improve the Everglades, Lake Okeechobee, the Kissimmee River Basin and South Florida coastal areas.

Everglades' water quality continues to show signs of improvement. In 2015, 90 percent of the Everglades was at or below 10 parts per billion of phosphorus, according to the report.

Over a 21-year operational period, Everglades stormwater treatment areas have treated more than 16 million acre-feet of water and have retained about 2,000 metric tons of total phosphorus.

"This report reflects 22 years of work we have done to improve water quality in the Everglades," said Ernie Marks, director of Everglades policy and coordination for the South Florida district.

"One of the highlights of the report is the better performance we have achieved from the stormwater treatment areas building on the work we have done over the past two decades," he said. "The stormwater treatment areas have performed above expectations."

In water year 2015, with 57,000 acres of treatment area, the STAs treated 1.4 million acre-feet of water. They reduced both the inflowing total phosphorus load and concentrations by 83 percent, and prevented 138 metric tons of total phosphorus from entering the Everglades Protection Area.

Best management practices implemented under the district's regulatory source control program reduced total phosphorus in agricultural runoff from 470,000 acres south of Lake Okeechobee by 79 percent in WY 2015, three times the amount required by state law.

Work is proceeding on two of three massive flow equalization basins that will provide 105,000 acre-feet of additional water storage designed to attenuate peak stormwater flows prior to delivery to the Everglades stormwater treatment areas.

"We have this whole other component to improve even more and that's the issue of storage," Marks said.

Construction has started on several conveyance improvement features as well as the first phase of expansion to STA-1 West.

In WY 2015, efforts were made to send regulatory lake releases south from Lake Okeechobee.

During that time, about 585,000 acre-feet of water from the lake was released to the Everglades stormwater treatment areas. This amount helped manage lake levels and reduce freshwater discharges to the Caloosahatchee and St. Lucie estuaries.

Marks said the stormwater treatment areas are vital to the health of the Everglades.

"I could not imagine living without my kidneys and that's what the stormwater treatment areas are—the kidneys of the Everglades system," he said. "The STAs are cleaning the water before it is passed out to the natural system."

"Each year, we have seen considerable improvements in the condition of the Ev-

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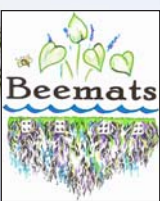
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# Use of advanced treatment septic tanks could reduce nitrogen concentrations significantly

By ROY LAUGHLIN

Over the past two decades, Florida citizens and regulators have come to understand that phosphorus and nitrogen are the two most significant nutrients contributing to poor water quality in the state.

Septic tank leachate typically contributes about 30 to 50 percent of nutrient oversupply to ground and surface waters. For purposes of this article, *nitrogen* refers to total nitrogen plant nutrients, including nitrates, nitrites and ammonia.

About a third of Florida's households use septic tanks for wastewater treatment. Most standard tank designs work well enough to meet public health standards for sanitation.

The Florida Department of Health is responsible for these standards, which are implemented at the local level through ordinances and building codes.

Since 2008, FDOH has studied advanced septic systems that can reduce nitrogen in sewage through its Florida On-site Sewage Nitrogen Reduction Strategies project.

The department teamed with engineers at Hazen and Sawyer to test advanced multi-stage septic system designs that are reliably capable of reducing sewage effluent nitrogen concentrations from the typical 40-100 parts per million to below 5 ppm.

Pilot scale systems, tested between 2011 and 2015, have been notably successful in reaching significant nitrogen nutrient reduction goals.

FDOH examined three multi-compartment designs that rely on oxidation-reduction reactions to convert nitrogen compounds to nitrogen gas.

The stepwise process first converts nitrogen to nitrate by chemical reduction reactions, and then oxidizes ammonia to nitrogen gas. The conversion of nitrogen compounds to nitrogen gas is a treatment strategy used in large wastewater treatment plants, although the specific oxidation-reduction reactions differ somewhat for septic tank systems.

The first advanced system treatment step relies on a traditional septic tank to provide for the microbial digestion of sewage. Two additional spatially separated treatment steps follow.

In the second step, all effluent nitrogen is converted to nitrates in a compartment using sand as media. The third compartment includes electron donors such as lignocellulose underlain by a layer of elemental sulfur and oyster shell through which wastewater percolates.

The carbon in cellulose and the elemental sulfur contribute electrons during chemical reactions that form nitrogen gas from nitrates.

In the pilot test systems, the septic tank effluent had total nitrogen concentrations of  $70 \pm 9.8$  parts per million. The in-ground multi-compartment design produced  $7.4 \pm 4.9$  ppm total nitrogen concentrations, reflecting a significant reduction from treatment with a septic tank alone. Investigators noted that improving the performance of the second compartment would improve nitrogen removal even more.

During the four years of testing, the researchers looked at three different treatment system designs.

The first design, a proof of principle design for the treatment process, occurred in above-ground tanks. The second design was an in-ground design with vertically stacked treatment processes: the nitrification step occurred in a buried tank with the denitrification cell buried directly below it and underlain by an impermeable barrier to collect the treated wastewater so it could be used for irrigation.

Damann Anderson, PE, vice president of Hazen and Sawyer in Tampa and one of the investigators in the septic system pilot studies, said that the advanced systems they studied will require occasional renewal of lignocellulose, elemental sulfur and oyster shell or some other form of limestone for pH buffering that are consumed over time.

For the third design studied, tanks are designed to be located near the ground's surface with entry ports at ground level so that replacement material can be easily added.

Such renewal would be on multiyear schedules, Anderson noted, based on observations during 18-24 month pilot studies. If such systems become widely used, septic tank installers, he said, would be the likeliest professionals to provide maintenance services.

The advanced system depends on a submersible pump to circulate water from the bottom of the nitrifying tank to the top of the denitrifying tank. The septic tank and the nitrifying tank would have sufficient capacity even with a short absence of pumping to the denitrification tank.

Existing septic tank systems could be modified for costs ranging from \$10,000 to \$16,000. Advanced septic tank systems for new construction could range in price from \$14,000 to \$20,000, including the drainfield.

Advanced wastewater systems will not cost exorbitantly more than existing designs.

Anderson said that as far as technical development goes, the pilot studies were completed in late 2015. By the end of this

year, FDOH should have implementation standards developed that will need to be incorporated into local building codes.

In the meantime, property owners with an avid interest in advanced on-site treatment may be able to install advanced treatment systems like those tested using special permit processes.

"The devil is in the details, so we'll see how the state regulations come out," said Anderson. "We'll need a lot of education before we can implement the systems widely."

He suggested that FDOH may initially

allow the advanced systems that his team developed, while requiring them may be a bit further in the future. That's not to say that in specific areas such as springsheds, local governments would not take the initiative through ordinances and codes to widely implement their use more quickly.

The promising performance of advanced on-site systems is welcome news for advocates of nutrient reduction to heal impaired surface waters.

In springsheds and watersheds, on-site wastewater treatment systems appear to be both affordable and technically effective to significantly reduce the excess nitrogen input to surface waters across the state.



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Everglades. Originally, we had 200 parts per billion of phosphorus being discharged untreated into the Everglades. Since these STAs were created, we have removed more than 2,000 metric tons of phosphorus that would have been delivered to the Everglades."

Marks added that because of all the water quality improvements that have occurred over the years, six stations with high soil phosphorus concentrations have been reclassified and are now considered "unimpacted" for soil phosphorus concentrations.

"I attribute that to the operation of the STAs and the work that our farmers are doing with best management practices," Marks said.

In conclusion, he said the ongoing Everglades restoration work is going well.

"We are either on time or ahead of schedule on the work," he said. "The sooner we can realize the environmental benefits, the better. We have more projects underway than we have had in the past—both at the local and state level. This is really an exciting time for Everglades restoration."

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# 2016 legislative session produces significant PRP amendments, other environmental bills

By MIKE ASHEY and STEVE HILFIKER

The 2016 Florida legislative session ended March 11, 2016, on time and with a balanced budget. It was an active session this year and environmental professionals have a few new details to understand.

A number of environmental bills passed—including House Bills 561, 589 and 7005 and Senate Bill 100—and are on Gov. Rick Scott's desk.

SB 100 is described in detail below. HB 561 provides the secretary of the Florida Department of Environmental Protection with more discretion for internal restructuring within the agency, and HBs 589 and 7005 are focused on water, permitting and conservation.

At the time of this writing, at least one bill, HB 7005, has been signed into law. The two primary hydraulic fracturing bills, SB 166/HB 19 and HB 191/SB 318, died in committee.

A total state budget of \$82.3 billion for fiscal year 2016-2017 was approved by the Legislature on the final day of the session, including \$118 million for the Petroleum Restoration Program and \$17 million for county PRP review teams.

This column focuses on amendments to Florida Statute 376 with emphasis on the impacts of the new legislation and budget levels for the state Petroleum Restoration Program.

SB 100 and HB 351 were merged in a committee substitute for SB 100 and the bill was presented to Gov. Scott on March 10. The following amendments to the DEP's PRP program will become effective July 1, 2016, if Gov. Scott signs the bill into law.

The Abandoned Tank Restoration Program formerly had a statutory application deadline of June 30, 1996. This date has been removed.

The ATRP eligibility program, which provides 100 percent state funding with no cap and has a deductible of \$500, is now open to all applicants that can demonstrate they meet the established statutory requirements and the reported discharge is not otherwise eligible for the state Petroleum Cleanup Participation Program.

When the Legislature revamped the petroleum cleanup program in 2013, the directive to DEP was to implement rules and procedures to improve the efficiency of the program. They have now added the word "productivity" in Florida Statute 376.3071.

Since the ultimate outcome of each cleanup is closure and the number of closures each year is a measure of productivity, the emphasis on productivity now adds

more pressure on the department to increase their number.

It is important to remember that any form of risk-based closure is voluntary for a property owner. It is equally as important for state agency term contractors to remember that although the contracts are with the state, consulting with and educating site owners is critical for the owners to understand their many options available.

(See the January 2016 *Specifier* column for more information on site owner options.)

The 2016 directive from the Legislature to the DEP regarding productivity is interesting.

Here is the complete text: "The department shall make efficiency and productivity a priority in the administration of the Petroleum Restoration Program and to this end, when necessary, shall use petroleum program contracted services to improve the efficiency and productivity of the program. Furthermore, when implementing rules and procedures to improve such efficiency and productivity, the department shall recognize and consider the potential value of utilizing contracted inspection and professional resources to efficiently and productively administer the program."

This language may provide the DEP

with the authority to privatize the implementation of the program to any level they deem necessary to achieve higher levels of efficiency and productivity.

HB 561 provides the DEP secretary with more latitude for internal reorganization and SB 100 requires outsourcing of professional services when necessary. The environmental industry should consider providing suggestions as we continue to improve our working relationship with the agency.

The DEP has oscillated on the question of whether program eligibility extends beyond the issuance of a site rehabilitation completion order or a no further action letter.

Even though most SRCO and NFA administrative orders have a clause included that provides for a reopener for newly discovered or existing contamination, some orders have been issued without this clause. In addition, responses from the DEP concerning the rescinding of an SRCO or an NFA have not always been consistent.

The Legislature added a clause that now makes it clear that eligibility extends beyond the issuance of an SRCO or an NFA if the DEP determines that "site conditions are not protective of human health under actual or proposed circumstance of exposure under subsections (5) and (12)."

Subsection 5 of Chapter 376.3071 of the statute provides for the site selection and cleanup criteria for the program and Subsection 12 of Chapter 376.3071 of the statute authorizes the Low-Scored Site Initiative.

SB 100 clarifies that the program will not pay for institutional controls except for a professional land survey or a specific purpose survey. Costs associated with obtaining a title report and associated recording fees of the institutional controls can also be paid for by the program.

The LSSI was originally established for low-scored limited site assessments but has now been expanded to include limited remediation activities. The original cap expenditure for each site has been raised from \$30,000 to \$35,000.

The total amount that can be spent on the LSSI program has also been raised from \$10 million to \$15 million per year. The time limitation for completion of LSSI work has also been increased from six to 12 months for the initial assessment and limited remediation.

After approval of the initial assessment and limited remediation, the department may approve additional assessment and remediation work not to exceed \$35,000. Plus, the DEP can authorize an additional 12 months of groundwater monitoring if it will achieve the statutory closure requirements.

In addition, the following changes have been made to the assessment criteria:

- provides for specific soil contamination criteria instead of the previously stated "excessively contaminated soil,"
- increases the groundwater monitoring requirement from six to 12 months,
- removes the restriction from groundwater contamination from "less than one quarter acre" to the property boundaries of the source property unless the contamination has migrated onto a government owned transportation facility (that agrees to accept the terms),
- adds a requirement that the groundwater contamination cannot be a threat to a potable drinking water supply,
- provides for reassurance that the original state-funded eligibility does not change and is still applicable if the site conditions change or the contamination plume becomes mobile such that active remediation is necessary.

The Petroleum Cleanup Participation Program formerly had a statutory application deadline of Dec. 31, 1998. This deadline date has been removed.

The PCPP is a cost-share program with the state providing 75 percent of the

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SESSION  
Continued on Page 15



# Calendar

## April

APR. 4-7 – Conference: SWANApalooza 2016, Charleston, SC. Presented by the Solid Waste Association of North America. Call 1-800-467-9262 or swana.org.

APR. 4-8 – 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.treeo.ufl.edu.

APR. 4-8 – Course: 40-hour OSHA HAZWOPER Training Course, Tallahassee, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

APR. 5-6 – Workshop: Water Resources Unplugged: A Multi-Dimensional Workshop, Orlando, FL. Presented by the American Association of Professional Geologists. Visit www.aipg.org..

APR. 5-6 – Course: LNAPLs: Science, Management and Technology, Atlanta, GA. Presented by the Interstate Technology & Regulatory Council. Visit www.itrcweb.org/training.

APR. 5-7 – Course: Asbestos: Project Design, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

APR. 6 – Course: Hazardous Waste Regulations for Generators, Palm Coast, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

APR. 6-8 – Course: 24-hour OSHA HAZWOPER Training Course, Tallahassee, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

APR. 7 – Course: U.S. DOT Hazardous Materials/Waste Transportation, Palm Coast, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

APR. 7-8 – Conference: 2016 GMCC Conference, Orlando, FL. Presented by the Geotechnical & Materials Engineers Council. Call (850) 224-7121 or visit www.fleng.org.

APR. 8 – Course: Brownfield Redevelopment & Golf Course Redevelopment, Fort Myers, FL. Presented by the Florida Chapter of the American Planning Association. Call (850) 201-3272 or visit www.floridaplanning.org.

APR. 11-13 – Course: Backflow Prevention Assembly Repair and Maintenance Training and Certification, Altamonte Springs, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

APR. 11-12 – Course: Advanced Backflow Assembly Tester, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

APR. 11-14 – Conference: 41<sup>st</sup> Annual NAEP Conference: Charting the Next 40 Years of Environmental Stewardship, Chicago, IL. Presented by the National Association of Environmental Professionals. Call (856) 283-7816 or visit www.naep.org.

APR. 12-14 – Course: Activated Sludge Process Control & Troubleshooting, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

APR. 14-15 – Exam: Backflow Prevention Recertification Exam, Destin, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570.

APR. 18-22 – 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.treeo.ufl.edu.

APR. 18 – Course: Asbestos Refresher: Project Design, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

APR. 18-20 – Course: Introduction to Electrical Maintenance, Kissimmee, FL. Presented by the Uni-

versity of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

APR. 19 – Course: Asbestos Refresher: Inspector, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

APR. 19 – Course: Asbestos Refresher: Management Planner, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

APR. 20 – Course: Asbestos Refresher: Contractor/Supervisor, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

APR. 21-22 – Exam: Backflow Prevention Recertification Exam, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

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

APR. 24-27 – Conference: Florida Water Resources Conference, Kissimmee, FL. Presented by the Florida Water Environment Association, the Florida Section of the American Water Works Association, and the Florida Pollution Control Operators Association. Call (407) 957-8448 or visit fwrc.org.

APR. 26 – Course: DEP SOPs For Water Sampling & Meter Testing, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

APR. 29-30 – Exam: Backflow Prevention Recertification Exam, Venice, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

## May

MAY 2-6 – 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.treeo.ufl.edu.

MAY 2 – Course: Asbestos Refresher: Project Design, Dania Beach, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

MAY 2-5 – Course: Landfill Design and Construction, Orlando, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

MAY 3-5 – Course: Initial Training for Landfill Operators and C&D Sites-24 Hour, St. Petersburg, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

Mar 3-5 – 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.treeo.ufl.edu.

MAY 3 – Course: Initial Training Course for Spotters at Landfills, C&D Sites and Transfer Stations-8 Hour, St. Petersburg, FL. Presented by the Univer-

sity of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

MAY 3 – Course: Asbestos Refresher: Inspector, Dania Beach, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

MAY 3 – Course: Asbestos Refresher: Management Planner, Dania Beach, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

MAY 3-4 – Course: Initial Training for Transfer Station Operators of and Materials Recovery Facilities-16 Hours, St. Petersburg, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

MAY 3-5 – Course: Initial Training for Landfill Operators and Waste Processing Facilities, St. Petersburg, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

MAY 3-4 – Course: Refresher Training Course for Experienced Solid Waste Operators-16 Hours, St. Petersburg, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

MAY 3 – Course: Refresher Training Course for Experienced Solid Waste Operators- 8 Hours, St. Petersburg, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

MAY 3 – Course: Refresher Training for Landfill Operators-16 Hours, St. Petersburg, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

MAY 4 – Course: Asbestos Refresher: Contractor/Supervisor, Dania Beach, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

MAY 5-7 – Conference: Annual Convention & Trade Show of the Florida Ground Water Association, Or-

lando, FL. Call (850) 205-5641 or visit www.fgwa.org.

MAY 6 – Course: Basic Water and Wastewater Pump Maintenance, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

MAY 7-8 – Exam: Backflow Prevention Recertification Exam, Bradenton, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

MAY 7-15 – Course: Backflow Prevention Assembly Tester Training and Certification, Tampa, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

MAY 9 – Course: Introduction to Backflow Prevention, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

MAY 9-10 – Course: LNAPLs: Petroleum Vapor Intrusion: Fundamentals of Screening, Investigation and Management, Denver CO. Presented by the Interstate Technology & Regulatory Council. Visit www.itrcweb.org/training.

MAY 9-13 – Course: Backflow Prevention Assembly Tester Training and Certification, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

MAY 13-14 – Exam: Backflow Prevention Recertification Exam, Bradenton, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

MAY 16-18 – Course: Backflow Prevention Assembly Repair and Maintenance Training and Certification, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

MAY 20 – Meeting: May 2016 Technical Meeting of the Florida Section of the American Water Resources Association, Safety Harbor, FL. Visit www.awraflorida.org.

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May 9-13, 2016 - Gainesville

May 23-27, 2016 - West Palm Beach

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#### Backflow Prevention Assembly Repair & Maintenance Training & Certification

May 16-18, 2016 - Gainesville

#### Landfill Design and Construction

May 2-5, 2016 - Orlando

#### Initial and Refresher Solid Waste Management Courses

May 10-12, 2016 - St. Petersburg

#### Asbestos Refreshers: Project Design, Management Planner, Inspector, & Contract/Supervisor

May 2-4, 2016 - Dania Beach

#### Asbestos: Inspector

June 13-15, 2016 - Gainesville

#### Asbestos: Management Planner

June 16-17, 2016 - Gainesville

#### Water Distribution Systems Operator Level 1 Training Course

May 3-5, 2016 - Gainesville

#### Basic Water & Wastewater Pump Maintenance

May 6, 2016 - Gainesville

#### The Science of Disinfection

May 24, 2016 - Tavares

#### Process Control of Waste Treatment Plants

June 7-9, 2016 - Gainesville

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# South Florida project will restore habitat, provide water storage near Kissimmee headwaters

By **BLANCHE HARDY, PG**

The South Florida Water Management District is restoring a property formerly occupied by a sod farm located at the headwaters of the Kissimmee River.

The district is transforming the property, known as Rolling Meadows, back to its historic function as part of the Lake Hatchineha floodplain.

"The Rolling Meadows project will rehydrate the original Lake Hatchineha floodplain," said district spokesperson

Randy Smith. "The district is installing new water control structures and updating existing infrastructure so that water can once again flow onto the former sod farm.

"This will create an area where the lake can overflow its banks as it did before being altered, helping to restore wildlife habitat and also providing about 1,300 acre-feet of water storage."

The permit to implement the first phase of the Rolling Meadows Restoration Project was issued to the district by the Florida

Department of Environmental Protection in March last year.

About 2,000 acres of natural wetland habitat will be restored, reestablishing surface water flows to Lake Hatchineha, the Kissimmee River and eventually to Lake Okeechobee.

"Reestablishing the historic Kissimmee River Valley continues to be a success story for Everglades restoration," said district Governing Board Chairman Daniel O'Keefe. "Vast areas of restored marsh and floodplain are providing significant environmental benefits while increasing our water management flexibility."

Prior to modification, the Kissimmee River meandered for approximately 103 miles through Central Florida.

The river's floodplain spanned three miles in some areas and retained water for extended periods of time during seasonal heavy rains.

The river was channelized in the 1960s to provide flood protection to Central and South Florida. The 30-foot-deep C-38 canal was cut and dredged creating a straight path through the river's formerly meandering route.

The 103-mile-long Kissimmee River between Lake Kissimmee and Lake Okeechobee became a 56-mile canal.

Significant portions of floodplain-dependent ecosystems that supported threatened and endangered species were destroyed.

Rolling Meadows is located in eastern Polk County and encompasses approximately 5,787 acres south of Lake Hatchineha, east of Catfish Creek and north of Camp Mack Road.

The Kissimmee Headwaters Revitalization Project is part of the larger Kissimmee River Restoration Project being executed by the district in partnership with the U.S. Army Corps of Engineers.

Construction cost is \$3.7 million with a completion date of March 2017.

Upon completion, the Rolling Meadows project will enhance the district's flexibility to move and store water after restoration of the Kissimmee River is complete.

In addition to ecological restoration and flow control, access to the site for nature-based recreation activities such as hiking, biking, hunting, fishing and bird watching will be provided.

According to the district, funding for the project was provided through a mitigation agreement between SFWMD and the five utilities in the upper Kissimmee basin known as the STOPR Group: the city of St. Cloud, the Toho Water Authority, Orange County, Polk County and the Reedy Creek Improvement District.

The utilities agreed to provide approximately \$4.67 million to restore 873 acres of wetlands and enhance 105 acres of wetlands for the project as part of their water use permits.

"This is an example of a successful partnership between local governments and the district," said Brian Wheeler, executive director of the TOHO Water Authority. "The agreement provides for environmental restoration and preservation to offset some of the impacts of growth and urbanization."

## Wakulla Environmental Institute opens

**Staff report**

A unique Tallahassee Community College facility just opened its doors.

The Wakulla Environmental Institute in Crawfordville is now home to TCC's Green Guide program and programs in environmental science technology, among others.

Bob Ballard, WEI's executive director, discussed the special features of the building that make it environmentally friendly and a good fit for Wakulla County. The metal roof, deep porch and thick walls were chosen with the Florida climate in mind and will contribute to the building's energy efficiency.

The property surrounding the building will be restored to its historical condition through the use of prescribed burns and other land management strategies.

The institute is located at 170 Preservation Way in Crawfordville.

sands of gallons of petroleum into a river in the state.

And the risk is not just environmental, she said.

"If you have a major leak, you have a big health risk and somebody has to foot the bill to clean it up. So these projects have a health and economic impact as well," she said.

Opponents in Georgia are concerned about the eminent domain process—the right of a government or its agents to seize, private property for public use.

But "contrary to what opponents often imply, Kinder Morgan never takes land from people by force," Fore said. "In nearly all cases, after customizing our plans and routes to each region and its particular needs, we reach mutually beneficial agreements with landowners."

Landowners in the Kinder Morgan system still own and use their land and are compensated fairly for the company's limited use of the pipeline easement, Fore added.

Last year, Georgia's transportation commissioner denied Kinder Morgan's application for a certificate of public convenience and necessity. A month later, Kinder Morgan filed a lawsuit against the state's transportation commissioner and his department.

Meanwhile, a bill has been introduced in the Georgia Legislature that would put in place a moratorium on pipeline permitting through June 30, 2017, so officials have time to better study the issue.

Rinaman said she has been supporting Georgia's efforts and speaking with elected officials in Jacksonville and the regulated community about her concerns.

"People want more information and that has been one of the big problems," she said. "Kinder Morgan is secretive and that makes this situation even more worrisome."

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# Wakulla Springs BMAP implementation plan now in the works

By ROY LAUGHLIN

The Wakulla Springs' Basin Management Action Plan is slated for serious scrutiny for future remedial actions to reduce nutrient levels.

Designated as an Outstanding Florida Water, Wakulla Springs has been on the radar since the Florida Department of Environmental Protection began its Florida Springs Initiative in 2010.

But efforts to conduct restoration ended in 2011 when the state Legislature failed to appropriate the necessary funding.

With renewed focus on springs over the past two years, DEP set the stage for more concerted efforts last October when it approved a BMAP for the Upper Wakulla River and Wakulla Springs, along with three other Florida springs, by DEP Secretarial Order.

Senate Bill 552 passage in January added more stipulations to the BMAP implementation process, even though the spring's BMAP was accepted just two months earlier.

Moira Homann, an environmental consultant at DEP and coordinator for the Wakulla BMAP, said that DEP did not initiate its Wakulla Springs BMAP efforts directly because of SB 552 legislation. Efforts had been in the works for a while.

But she said that DEP staff assumed a new water bill in some form was likely to pass this session, even after a bill introduced last year foundered.

DEP's Wakulla BMAP implementation effort will go forward with a 0.35 milligram per liter nitrogen water quality standard.

The planning process, however, will move forward under new stipulations as a result of SB 552 passage. Two of the most significant are the formation of an advisory committee and a mandated 2017 completion date for the implementation plan.

DEP is currently forming an eight-member advisory committee for Wakulla Springs according to provisions in SB 552. Homann said its membership includes representatives of public and private utilities,

homeowner associations, activists, local government, the state Department of Health and community leaders.

"We want to try to bring in some citizens so that (the advisory committee) is not just a technical committee," said Kevin Coyne, program administrator for the BMAP program at DEP.

The department asked for nominations from local governments and expects to have more nominees than available seats.

The impression is that while SB 552 requires formation of advisory committees, exactly what they must do and how binding their advice should be is not spelled out in the new bill.

Some of the details regarding how "implementation planning through committee" will be accomplished are not clear yet. The committee, however, will focus first on planning priority efforts to reduce nitrogen from wastewater released to the Wakulla springshed.

DEP's BMAP identifies septic tanks as the biggest piece of the nitrogen pie, according to Homann. An on-site treatment and disposal system initiative is the centerpiece of DEP's implementation plans to meet BMAP goals.

Fertilizer is the second most significant contributor of total nitrogen to groundwater. Cities and counties have until 2017 to implement fertilizer ordinances. Agricultural best management practices to reduce fertilizer use also need to be developed as part of the BMAP implementation.

SB 552 gives the state Department of Agriculture and Consumer Services the authority to develop agricultural BMPs to reach water quality goals. Those apparently will be developed separately on a parallel path.

Quantitatively, accomplishing Wakulla Springs BMAP goals means reducing nitrogen concentration in the spring and its run from its current mean of about 0.79 mg/L to 0.35 mg/L, a 56 percent decrease.

In the mid-1990s, Wakulla Spring's average nitrogen concentrations were 1.1 mg/L according to information in a study done by the Florida Springs Alliance. A substantial source of nitrogen in those years was

not remain stable for the next 15 years, and may increase the cost of electricity generation by 3-4 cents per kilowatt hour.

It is also likely that power companies will want to maximize shareholder value, and will increase electricity costs to consumers who use renewable energy sources as well as the grid for power.

The Advanced Energy Economy, which sponsors the AEE Institute, is 501(c)(6) business association whose purpose is to advance and promote the business interests of its members and the advanced energy industry as a whole.

**Community Resilience Grant recipients.** The National Oceanic and Atmospheric Administration announced the recipients of six Community Resilience Grants worth a total of \$4.5 million.

The grants include an additional \$2.4 million in matching funds.

NOAA said the projects selected "are designed to help coastal communities improve their resilience to adverse events by improving their ability to prepare for and respond to a variety of coastal threats, including extreme weather events, climate hazards and changing ocean conditions."

The prospects for sea level rise and storms have a significant place in these preparations.

A regional focus is a strong component of NOAA's funding plan. The agency funded applicants in Southern California, the Great Lakes Region, Cape Cod, New Jersey, South Carolina and along the Gulf of Mexico.

The programs include 100 communities as participating partners in grant activities.

These six awardees were selected from a total of 132 applications, with a total request of more than \$100 million. NOAA expects to offer a second round of funding at the same level later this year.

the city of Tallahassee's wastewater treatment plant.

In 2011, Tallahassee ended the practice of land spreading biosolids. Biosolids disposal supplied 345 tons of total nitrogen per year in 2007 with a decreasing trend to 215 tons of total nitrogen in 2009.

Then in early 2015, Tallahassee began operating an advanced wastewater treatment plant that substantially lowered nitrogen levels in its effluent. The connec-

tion between those changes and the desired reductions in nitrogen compounds in Wakulla Spring point decisively toward the human role in spring eutrophication and show that significant reductions in the nutrient levels quickly follow appropriate efforts.

Reducing eutrophication-causing nutri-

**WAKULLA**  
Continued on Page 16

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# Researchers adapt battery technology to efficiently desalinate seawater

By ROY LAUGHLIN

Researchers at the University of Illinois at Urbana-Champaign tested a modified prototype sodium battery to electrically move sodium and chloride ions to one side of the membrane in the battery, a separation technique that desalinates saltwater.

The researchers used intercalation par-

ticles in both electrode chambers rather than only one to improve desalination performance above that observed in batteries, where usually only one electrode includes sodium intercalation particles.

The process is similar to charging a battery, except with the device's internal modifications, the ion depleted chamber yields desalinated water.

In a normal battery, intercalation par-

ticles are a focus for ions to concentrate.

Intercalation particles used in the prototype device are complex salts of titanium phosphate, magnesium oxide or a copper iron cyanide complex. Their use here follows the recent demonstration of their seawater stability.

The electrodes in the modified prototype are porous composite electrodes that allow electrons and chloride ions to pass through them.

Water flows perpendicular to the electrodes to sub-chambers separated by either a polymeric membrane or an anion-selective membrane that blocks sodium ion passage.

If this system were set up at a chemical disequilibrium, it would act as a sodium ion battery and produce electricity for external circuits as ions moved in response to electrochemical gradients towards electrodes.

But the opposite process—the separation of ions—occurs when electricity supplied from outside the battery reverses electrochemical reactions.

When current is applied, sodium ions move into a solution ward in the cathode chamber.

Chloride ions move toward them from the anode chamber, creating a concentrated sodium chloride effluent.

In this design, sodium in the anode chamber diffuses into the electroactive intercalates, further increasing the efficiency of sodium ion separation from water flowing through the cell.

The researchers conducted a series of experiments intended to give leads to optimize modified prototype sodium for desalination.

For high salinity water, they found that a sodium-blocking membrane was essential to achieving a high degree of desalination.

This blocks any back diffusion of sodium at the cell's outlet, improving efficiency of desalinated water separation.

They show the range of voltages for their test cells that would separate ions without electrolytically decomposing water to hydrogen and oxygen.

Additional work remains to be done with seawater because any changes in elec-

trolyte concentration may influence the water's electrolytic splitting.

In modified sodium battery cells such as those tested, the performance and energy efficiency varies with electrode thickness, the dimensions of the flow path and the salinity of the water.

With a thinner electrode, which is more expensive to manufacture, the most energy-effective desalination occurred.

Efficiency approached 40 percent of the thermodynamic minimum energy required.

As one might expect, the amount of energy for desalination increased with salinity, but the efficiency of desalination was relatively consistent whether the salinity of influent water was high or low.

In contrast to a battery, the open flow design with two parallel paths separated by a membrane allowed the investigators to use differential flow rates in the anode and cathode sides of the separating membrane in an attempt to enhance separation efficiency.

The enhancement would occur by maintaining sodium concentrations in the cathode pathway below sodium chloride precipitation concentration.

The researchers found that up to 80 percent of water recovery is achievable with a 700 millimolar sodium chloride influent concentration, and it increases to 95 percent for influent waters of 70 millimolar sodium chloride.

The researchers noted that the current demonstration is primarily a proof of principle. They tested sodium chloride solutions, not seawater. Seawater is a complex chemical soup.

They advised that competing cation intercalation effects for Na<sup>+</sup>, K<sup>+</sup>, Mg<sup>2+</sup> and Ca<sup>2+</sup>, fouling and other counterproductive phenomena are likely to influence the use of these modified battery designs for seawater desalination in the real world.

These issues could be addressed by ongoing research to identify suitable and effective intercalation compounds.

The fact that a prototype demonstration was notably effective is a basis for optimism for the prospects of future improvements to this desal process.

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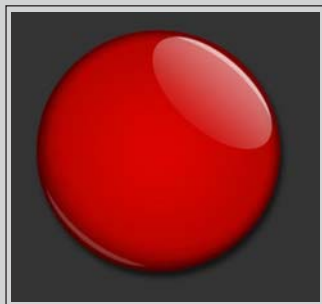
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### TURKEY POINT From Page 1

Biscayne Bay and a plume of hypersaline groundwater expanded west of the plant over four miles.

FPL officials have been engaged in expanded sampling and intensive investigations since.

“Information being reviewed now is the result of a continuing and expanded water sampling effort in and around the Turkey Point cooling canal system,” said FPL Turkey Point Nuclear Power Plant Representative Bianca Cruz. “Recent samples collected from deep canal cuts along the coastline show some elevated levels of nutrients and traces of tritium above normal background levels, but well below county drinking water standards, in samples collected near the bottom of the canals.”

“In many cases, data is being taken in unique deepwater locations that have not been sampled in the past and therefore we have no historic data for comparison,” she said. “This new data may indicate a groundwater connection between water under the cooling canals and these isolated deep water features.”

“Water samples collected in the bay do not show these elevated constituents suggesting the anomaly is limited to these deepwater canal cuts.”

Frustrations were already escalating among Miami-Dade officials, environmental advocates and mining interests by the time the March report was released.

The growing saltwater plume and fears that it may endanger potable and commercial water supplies had already prompted the county to seek regulatory action that resulted in the issuance of an administrative order to FPL late last year.

That order required FPL to complete

and receive approval for a canal cooling system salinity management plan.

“We continue to work very closely in cooperation with Miami-Dade County and the Florida Department of Environmental Protection to ensure Turkey Point operations continue to pose no adverse impacts to Biscayne Bay or the surrounding environment, including wetlands,” said Cruz. “Our multiple-part strategy to improve the health of the cooling canal system has led to a significant reduction in salt levels and restored operating conditions to a desired level, which we now are working to maintain.”

“Over the past 18 months, we’ve implemented a salinity management plan and installed a new monitoring system to gather data, both supporting a state of Florida administrative order and a Miami-Dade County consent agreement.”

In addition to surface and ground water quality impacts, environmental advocates expressed concern about the American crocodile that nests in the Turkey Point canals. Crocodile numbers have dropped dramatically in the past year.

“Our reviews for the past five years, in coordination with state and local agencies, have continued to demonstrate that there are no ecological impacts to Biscayne Bay or the surroundings,” said Cruz. “FPL has always operated in compliance with all permits and approvals associated with the Turkey Point plant.”

“We continue to monitor canal conditions as well as that of the local ecology per our monitoring program to ensure that we continue to meet all local, state and federal requirements.”

FPL is currently looking at the option of building two additional reactors, Turkey Point 6 and 7, at the existing Turkey Point nuclear facility.



# Construction underway on materials recycling facility in Escambia County

By **BLANCHE HARDY, PG**

The Emerald Coast Utilities Authority and Escambia County broke ground on a new Interim Material Recycling Facility in February.

The IMRF is located at Escambia

## SESSION

From Page 10

cleanup funds. There is also a state funding cap of \$400,000.

In addition, the program is now open to all applicants that can demonstrate they meet the established statutory requirements. The cap amount of \$400,000 remains in place, however the DEP now has the authority to expend up to \$100,000 above the cap amount for remediation and monitoring provided that such expenditures are necessary to achieve a determination of no further action.

This determination is left to the discretion of the DEP. Property ownership changes are no longer an issue for PCPP program eligibility.

SB 100 would also revise the Advanced Cleanup Program application requirements. The ACP is currently funded at \$15,000,000. SB 100 increases the annual ACP budget to \$25,000,000.

It typically provides open enrollment twice a year and allows owner selection of the agency term contractor by responsible parties and site owners that propose a cost share of at least 25 percent. Currently RPs/SOs can bundle 20 sites under PRP up to \$5 million.

The program requires a 25 percent cost savings that can be demonstrated by conditional closures, cost shares or other methods. In addition, the new bill would reduce the number of sites required in a bundle to five.

Gov. Scott signed the state budget on March 15, allocating \$118 million for the PRP for fiscal year 2016-2017.

Based on the monthly encumbrance reports published by the DEP, there may be a

County's Perdido Landfill. ECUA has been working diligently to get the new facility up and running.

"Currently, recyclables being collected in the region are being landfilled," said Randy Rudd, ECUA's deputy executive director of shared services. "Once com-

roll-over of funds from the current fiscal year.

If roughly \$150 million is obligated by June 30, 2016, the rollover would be roughly \$30 million and that amount should easily be encumbered by the Dec. 31, 2016, deadline for obligating program allocations from fiscal year 2015-2016.

If these numbers are on target, then the 2016-2017 budget of \$118 million plus the rollover of \$30 million will provide two consecutive years of funding at approximately \$150 million.

The PRP will simply need to duplicate the encumbrances of the current fiscal year for the upcoming fiscal year and obligate roughly \$150 million by June 30, 2017 to achieve this goal.

If the industry and PRP can process the workload at this pace, hopefully we can achieve the long-awaited consistent annual funding needed to maintain a healthy industry. And perhaps we will see an increase in funding for the fiscal year starting in July of 2018.

At the time of writing, over 400 sites are pending remedial work. This number does not include remedial requirements for a number of active assessments. If authorized and processed, such production is feasible.

The DEP budget request is typically made in September, so let's produce and aim for three years of consistent annual production of \$150,000,000.

*Mike Ashe is special projects director for Advanced Environmental Technologies LLC in Tallahassee and can be reached at [mashey@aetllc.com](mailto:mashey@aetllc.com). Steve Hilfiker is president of Environmental Risk Management Inc. in Fort Myers and can be reached at [steve@ermi.net](mailto:steve@ermi.net).*

pleted, this facility will divert 40,000 tons of recyclables from the landfill annually."

Escambia County and ECUA are partnering to help reach the state of Florida's 75 percent recycling initiative.

"Construction is underway and anticipated to be complete by Sept. 1, 2016, with a total project cost of approximately \$10.5 million," said Rudd. "The project includes site work, a 50,000-square-foot fabric building and 25-ton-per-hour single stream recyclables sorting system," he added.

Contracts awarded for the project by the ECUA board include approximately \$1.49 million to Brown Construction to complete site work, \$1.4 million to Big Top Inc. for the fabric building, and \$5.5 million to Bulk Handling Systems for the recyclables processing equipment.

The IMRF is projected to handle 165 tons of recyclable materials per day, with an estimated annual capacity of 40,000 tons.

ECUA serves about 75,000 customers in Escambia County and 18,000 in Santa Rosa County. Recycling pickup is provided in conjunction with regular waste services.

A series of failures by facilities that had been processing ECUA's collected recyclable materials made this new facility a necessity.

Recyclables collected by ECUA were previously processed at West Florida Re-

cycling in Pensacola. That facility recently flooded and was forced to close.

Recyclables were then delivered to the Advanced Mixed Materials Recovery Facility in Montgomery, AL. They, too, abruptly closed their doors in October last year.

A subsequent arrangement with Tarpon Paper Co. in Loxley, AL, was terminated when the company increased its tipping fees in December making the service cost-prohibitive.

ECUA agreed not to build a recycling facility as part of an arrangement with Escambia County stemming from related differences in the past. But the Tarpon Paper incident, the lack of a third party facility capable of processing the recycling stream volume and the disposal of Escambia County resident-separated recyclables at the county landfill forced all parties to seek additional alternatives.

The county and ECUA decided to proceed as partners.

Things have worked out well between the two entities who shared in the facility's groundbreaking ceremony.

The facility is considered "interim" because ECUA has plans to eventually separate recyclables from the entire waste stream in addition to processing the current "clean" customer separated materials.

ECUA is also considering options for Santa Rosa County.

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## Corps reduces flow from Lake O

### Staff report

In mid-March, the U.S. Army Corps of Engineers Jacksonville District announced its second reduction in flows from Lake Okeechobee since the beginning of the month.

### WAKULLA

#### From Page 13

ents is the first focus of the Wakulla Springs restoration efforts, but not the only one. The Florida Springs Institute in its restoration plan for the spring included two additional priorities.

The first priority is reducing the number of "dark days" or intervals when runoff water stained brown with tannins reduces light penetration in the spring run. Better managing stormwater runoff will accomplish that.

The second priority is restoring the ecology of the spring and spring run.

Reducing eutrophication and the number of dark days will set the stage for ecological recovery as evident in increasing species diversity and high primary productivity of submerged aquatic vegetation.

SB 552 lays out a 20-year time horizon for state agencies to reach BMAP goals, and funding determined through the annual state appropriations process will play a significant, if not dominant, future role.

The new target flow for the Caloosahatchee Estuary is 3,000 cubic feet per second as measured at W. P. Franklin Lock near Fort Myers. The new target flow for the St. Lucie Estuary is 1,170 cfs as measured at St. Lucie Lock near Stuart.

Additional runoff from rain in the Caloosahatchee and St. Lucie river basins could occasionally result in flows that exceed targets.

"The lake has continued to fall with the onset of drier weather," said Jim Jeffords, the Jacksonville District's operations division chief. "Based on current conditions, our water control plan calls for another reduction in flows. However, some precipitation has been forecast in the week ahead, which could slow the recession."

The agency will continue to monitor conditions and adjust flows as necessary.

### BIOFUEL

#### From Page 7

of fuels as alternatives for petroleum-based fuels for future generations.

"In order to advance the production of algal biofuels into a large-scale, competitive scenario, it is fundamental that the biological processes in these organisms are well understood."

Rathinasabapathi said this information is valuable for engineering algae so it overproduces oil without starving the algae of nitrogen.

Lipids from microalgae provide an excellent renewable source for biofuels. The algae grow quickly, tolerate extreme weather conditions and do not pose the same issues as biofuel crops that are grown both for fuel and food.

The rub was if algae are deprived of nitrogen, the cells become stressed and begin to produce lipids, but their growth rate slows.

And if alga is going to become a commercially viable fuel source, scientists must ensure that not only can it produce as much oil as possible, but also that it can grow as fast as possible.

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www.enviro-net.com	
FLOWERS CHEMICAL LABS	5
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www.flowerslabs.com	
GPServ	7
1-800-782-1997	
www.gpserv.com	
JAEE ENVIRONMENTAL SERVICES	5
(954) 476-8333	(954) 476-8347
www.jaeeenvironmental.com	
SGS ACCUTEST	7
(407) 425-6700	
www.accutest.com	
ST. JOHNS RIVERKEEPER	15
(904) 256-7591	
www.stjohnsriverkeeper.org	
UNIV OF FLORIDA TREEO CENTER	11
(352) 392-9570	(352) 392-6910
www.doce.ufl.edu/treeo	
ZEBRA TECHNICAL SERVICES	16
(813) 655-1717	(813) 626-1718
www.teamzebra.com	

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