

# Florida Specifier

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**March 2016**

Volume 38, Number 3

## Oil seeps v. well blowout 7

Natural oil seeps are more common in the Gulf of Mexico than anywhere else in the world's oceans. But in terms of the amount of oil released into the ocean, there's no comparison between oil seeps and the Deepwater Horizon well blowout, researchers say.

## Latest TRI report 8

In its latest Toxic Release Inventory, the U.S. Environmental Protection Agency said that 84 percent of the nation's reported 25 billion pounds of toxic chemical waste was diverted from release to the environment. Instead, the wastes were recycled, used for energy recovery, or treated to reduce toxicity or chemical reactivity.

## Indirect potable reuse 9

The city of Clearwater is in the design phase of a water treatment system at their Northeast Wastewater Treatment Plant that will treat wastewater to drinking water standards before injection into the Floridan Aquifer. City officials say the "indirect potable reuse" project could be the first in the state.

## St. Pete waste to energy 10

The St. Petersburg Water Resources Department broke ground on a waste-to-energy biosolids treatment facility. The plant, located at the city's Southwest Water Reclamation Facility, could eventually treat up to a million gallons a day of effluent containing biosolids from the city's three major wastewater treatment plants.

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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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## Construction of Brevard landfill hits snag

By **BLANCHE HARDY, PG**

In February, the Brevard County Commission voted unanimously to postpone a proposal to construct a landfill on a 3,000-acre site acquired from Deseret Ranches of Florida in the early 1990s.

The site is surrounded by Deseret Ranches property west of the St. Johns River just north of U.S. 192 and immediately east of the Brevard-Osceola county line.

"The footprint of the Class III landfill will be 202 acres with an initial cell of 28.1 acres," said Euripides Rodriguez, director of Brevard County's Solid Waste Management Department. "This initial landfill will have a life expectancy of at least 25 years. There will also be a multiuse area for yard waste, tires and metal goods."

Class III landfills may accept only yard waste, construction and demolition debris, processed tires, asbestos, carpet, cardboard, paper, glass, plastic, furniture other than appliances, or other materials approved by the department, that are not expected to produce leachate that poses a threat to public health or the environment.

Brevard County Commissioners will re-engage the topic of the landfill during a March 31 workshop.

Alternatives to the landfill suggested

**LANDFILL**  
Continued on Page 16



Photo courtesy of NOAA

Scientists on board the National Oceanic and Atmospheric Administration Ship Henry Bigelow prepare to lower an array of Niskin bottles to collect seawater samples in U.S. coastal waters to support an ocean acidification study. See story on Page 5.

## New legislation shuffles the deck in Florida's water resources game

By **ROY LAUGHLIN**

After the delay of a year ago, both houses of the Florida Legislature hastily passed a "reform" water bill that amends several Florida statutes, adds a few more, affects two agencies and all five water districts, and maintains the Legislature's direct control over Florida's water projects through required reporting and annual budget appropriations.

The legislation marks a generational

shift in Florida's efforts to prioritize the allocation of water to users, and water quality preservation for the environment, agriculture and potable water use.

SB 552 includes significant new provisions that amend statutes affecting water management district programs, endorse best management practices for agriculture, and favor urban fertilizer, stormwater management BMPs and basin management action plans.

Annual reporting to the Legislature

will become more complex, and the five-year water resources planning exercises will have new stipulations.

The bill's first measure requires the Florida Department of Environmental Protection to "publish, update and maintain" a list of conservation lands where public access is compatible with conservation purposes.

Another section requires Florida's permitting agencies—the water management districts and DEP—to approve consumptive use permit applications.

Florida's growing number of regional water initiatives is given preference for water projects. The bill also endorses inter-basin water transfers.

### Watershed programs

SB 552 identifies four watersheds that are already the focus of water projects for additional restrictions and specific efforts: the Everglades, the Okeechobee and Kissimmee river watershed; the Caloosahatchee River; the St. Lucie River; and Florida's first magnitude springs, including an additional six springs named in the bill.

Springs designated in SB 552 and existing first magnitude springs are designated as Outstanding Florida Springs.

Within these watersheds, SB 552 ends biosolids disposal by land spread-

## PSC approves new FPL power plant in Okeechobee

By **ROY LAUGHLIN**

In January, Florida's Public Service Commission approved the need for Florida Power & Light Co.'s proposed Okeechobee Clean Energy Center.

This was the first of several comprehensive government reviews, including an air quality permit, site certification applications and underground injection control permits that are still under review.

All are expected to be green-lighted within the next 12 months.

FPL's proposed plant will be a

1,633-megawatt combined cycle electrical generation facility located on a 220-acre site in Northeast Okeechobee County, adjacent to the Indian River County line and near the border with Osceola County.

FPL said it selected the site because it is close to existing resources including power transmission lines and a planned pipeline—an extension of the Sable Trail natural gas pipeline.

Like many recent new power plants, this one will use natural gas as a fuel,

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**WATER**  
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# EPA: U.S. needs \$271 billion for wastewater treatment infrastructure

## Staff report

From piping and collection systems, treatments and treatment systems to stormwater management, the U.S. Environmental Protection Agency estimates that the country needs to spend \$271 billion to maintain the nation's wastewater treatment infrastructure.

That's the conclusion of the agency's quadrennial Clean Watersheds Needs Survey.

The report is a summary of responses to a survey sent to states, territorial governments and the District of Columbia.

Respondents provided a description of water quality-related public health problems, site-specific solutions and detailed information about project costs.

The EPA broke down the funding into subcategories for spending needed within the next five years: \$52.4 billion to meet secondary treatment standards, \$49.6 billion to provide treatment plant upgrades, \$51.2 billion for conveyance system repair, \$44.5 billion for new conveyance systems, \$48 billion for combined sewer overflow correction, \$19.2 billion for the stormwater management program and \$6.1 billion for recycled water distribution.

The agency focused on several aspects of wastewater treatment that are important

to local communities. The first is maintaining and upgrading treatment plants and collection systems.

The U.S. has made huge strides providing modern wastewater treatment since the Clean Water Act passed in 1972. The number of people served by secondary wastewater treatment has increased from 75 million to 90 million.

More dramatically, the number of people benefiting from advanced treatment increased from 7.8 million to 127 million. That part of the U.S. population receiving less than secondary wastewater treatment decreased from almost 60 million to 4.1 million.

The significant improvement in wastewater treatment dramatically improved the water quality and ecological status of waterways receiving effluent.

Although stormwater management has not advanced as far as wastewater treatment, according to the report, the progress provides significant ecological benefits fostered by the Clean Water Act, and serves as an incentive to continue to focus on infrastructure improvements.

Wastewater treatment infrastructure is primarily the responsibility of local and state governments. The Clean Water State Revolving Fund, first capitalized by federal appropriations in 1987, provides low or no interest loans for potable water and wastewater infrastructure projects.

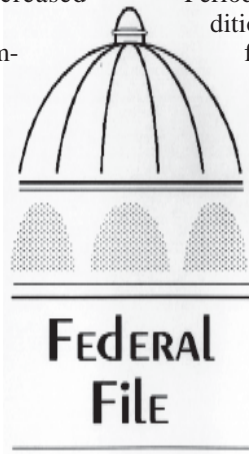
Periodically, Congress authorizes additional appropriations for the state funding mechanism. It has provided more than \$111 billion in funding nationwide.

In 2015, EPA began providing information to local utilities through its Water Infrastructure and Resiliency Finance Center. The effort expanded to regional finance centers, providing financial expertise and technical assistance to help communities make informed decisions about wastewater infrastructure projects to meet local needs, some of which may be

eligible for Clean Water State Revolving Fund loans.

The report includes a state-by-state characterization of wastewater infrastructure needs.

For Florida, advanced wastewater treatment needs would cost \$11.4 billion,



65.1 percent of the \$18.4 billion total projected for wastewater infrastructure.

The other needs are ranked as follows: new wastewater conveyance systems with an estimated cost of \$2.8 billion; recycled water distribution with a cost of \$2.1 billion; conveyance system repair, \$1.7 billion; and stormwater management at \$500 million. These numbers are based on documented needs and costs in 2012.

**Clean Power Plan on hold.** On Feb. 9, the Supreme Court issued a stay on the EPA's Clean Power Plan, at least temporarily suspending implementation until the District of Columbia Court of Appeals hears a case challenging the rule. The decision was a 5-4 split vote.

The plan's compliance phase does not begin until 2022, but states are required to submit proposed implementation plans in September of 2016.

As soon as the Obama administration established the Clean Power Plan last summer to reduce greenhouse gas emissions to the atmosphere, opponents led by West Virginia Attorney General Patrick Morrisey challenged the law in court. Their goal is a court decision invalidating the plan but plaintiffs asked initially for the court to stay the plan's implementation.

A three-judge panel of the Court of Appeals for the District of Columbia Circuit refused to issue a stay, noting that plaintiffs failed to meet the stringent requirements for a stay. The judges ordered an expedited hearing, currently scheduled for June 2-3, 2016.

In addition to West Virginia, 24 other states—characterized in one news story as energy producing states or states with Republican governors—joined West Virginia as plaintiffs against the plan. Florida is one of those plaintiff states.

**Proposed Phase II MS4 Rule.** Under the National Pollutant Discharge Elimination System, the EPA issues Municipal Separate Storm Sewer Systems permits. For municipalities that serve 100,000 residents or fewer, the original rule allowed permit applicants to publish a notice of intent without considering public comment.

It also allowed permit applicants to identify the best management practices it intends to undertake to meet the Clean Water Act's requirements.

But permitting authorities had no review authority that ensured that the intended actions would produce measurable improvements to meet the Clean Water Act. The CWA requires such review.

Based on these findings during a recent lawsuit, the U.S. Court of Appeals for the Ninth Circuit issued a remand of the EPA's Phase II rules.

The EPA issued a proposed "remanded rule" that, according to the EPA, addresses the procedural issues of rulemaking. It does not address or change Phase II MS4 requirements.

The new rules modify 40 CFR 122.33 and 40 CFR 122.34. The EPA provided details and discussion of the proposed remanded rule in the Federal Register, Volume 81, Wednesday, Jan. 6, 2016, page 415 and following.

The rule will be open for a 75-day public comment period to end Mar. 21. The EPA must issue the final rule by Nov. 17, 2016. As part of the settlement, the EPA also agreed to determine by May 26, 2016, if it will regulate stormwater runoff from forest roads.

The circuit court's decision also required the agency to consider stormwater treatment for runoff on logging roads.

**Coastal waters ecological health.** Fifty-six percent of coastal and Great Lakes near-shore waters have a good rating for biological quality with healthy communities of bottom-dwelling macroinvertebrates.

Water quality ratings are little bit lower,

**FEDFILE**  
Continued on Page 12

## 22nd Annual

# FLORIDA REMEDICATION CONFERENCE

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**October 6-7, 2016**  
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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 approximately 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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## Tampa Electric unveils solar project at Tampa International

### Staff report

In February, Tampa International Airport and Tampa Electric unveiled a canopy of solar panels on the top floor of the airport's south economy parking garage that will provide solar energy to Tampa Electric's customers and shade for parking patrons.

The two-megawatt solar panel array produces enough electricity to power up to 250 homes. It is Tampa Electric's first foray into large-scale solar power and its largest solar photovoltaic installation.

Tampa Electric plans to build several more large-scale solar arrays in the next few years, including a 23-megawatt solar project at the Big Bend Power Station in Apollo Beach. That system will be the largest in Hillsborough County, able to produce enough power for 3,500 homes.

In addition to the solar project, Tampa International recently installed a dozen new electric vehicle charging stations and provided preferred parking for people driving alternative fuel vehicles.

The airport also operates a fleet of 54 alternative fuel vehicles and since 2009 has saved over 315 million gallons of potable water through the use of reclaimed water.

Tampa Electric is part of the TECO Energy family of companies and serves nearly 725,000 customers in West Central Florida.

**Landfill expansion.** Santa Rosa County charges lower tipping fees at its Central Landfill in Milton than other nearby solid waste management facilities. And in spite of a likely increase in fees to support the landfill's expansion, those fees will remain among the lowest.

The county commissioners are considering an increase of four dollars a ton—to \$38 a ton—to pay for the expenses associated with permitting, design, excavation, lining and other construction costs related to landfill expansion.

Construction of the new six-acre cell is now underway.

**St. Lucie compost.** Planners in St. Lucie County banned new composting plants for a year while they work out details regarding where the facilities can be built and how they should function.

The decision was made after Compost-USA requested a permit to build a compost facility that uses wastewater biosolids in its process.

Local residents and environmental activists expressed concern about the facility's potential impacts to air and water quality in the area.

**Closing.** The Arthur R. Marshall Foundation for the Everglades is closing its West Palm Beach office. However, the staff will continue key environmental education programs while working with other environmental organizations.

Since its inception, the organization has awarded over \$450,000 in scholarships and internships, planted almost 100,000 native Florida trees in wetlands, educated more than 250,000 students and involved more than 5,000 volunteers in local restoration projects.

**Dark skies.** The International Dark-Sky Association designated the Kissimmee Prairie Preserve State Park as an International Dark-Sky Park.

Dark skies have rapidly vanished in the eastern U.S., leaving few locations relatively untouched by the effects of artificial light at night.

The need to identify and preserve these places is important for everyone dependent on the natural nighttime environment, from wildlife to stargazers.

A ceremony was held at the park on Saturday, Feb. 6, to celebrate achievement.

IDA officials said that the Kissimmee Prairie is exemplary in the conservation of its dark night skies, and is a model for other parks in the Southeast.

**Product news.** Regensis received approval from the Florida Department of En-

vironmental Protection for its Plumestop® treatment substrate as an innovative technology for the treatment of contaminated soil and groundwater.

DEP's Innovative Technology Acceptance program provides exposure and credibility to alternative, cost-effective remediation methods.

**Company news.** Advanced Disposal Services Inc., an environmental services firm based in Ponte Vedra, postponed its previously announced initial public offering. The company will continue to evaluate the proposed offering as market conditions evolve.

**People news.** Marijke Noens joined Stantec as an ecologist in their Naples office. Noens has more than five years of experience providing environmental consulting and project services for private sector clients and governmental agencies.

Erdman Anthony hired Omar Morgan as a design engineer in their West Palm Beach office. Morgan holds a bachelor of science degree in civil engineering from Central Connecticut State University.

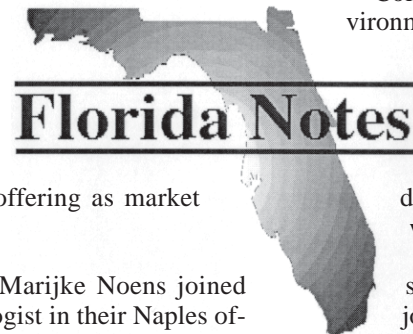
SCS Engineers added two specialists to its environmental management group. David Beben, PE, and Andrew Collins, PG, both senior project professionals, are now working for SCS out of offices in Orlando, and Atlanta, respectively.

Beben comes to SCS from a waste management team in Jacksonville, FL. He is a professional environmental engineer and a LEED-accredited project manager with over ten years of experience.

Collins joined SCS from an environmental consulting firm, where he was the environmental/geosciences lead. Collins, a professional geologist, has managed groundwater and environmental remediation projects throughout the world.

Former Miami Commission Chairman Marc Sarnoff joined Shutts & Bowen LLP as a partner in the government law and land use practice groups in the firm's Miami office.

Jim McLellan was named as the new director of the Bradenton Public Works & Utilities Department. McLellan takes over for Director Claude Tankersley who was hired by the city of St. Petersburg to direct its public works department.



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# DEP awards \$160 million in revolving fund loans for eight wastewater projects

## Staff report

The Florida Department of Environmental Protection provided \$160 million in loans from the Clean Water State Revolving Fund to cover the costs for eight wastewater projects.

Three new projects and five projects currently underway received funding.

The loans ranged from \$28.8 to \$40 million for the three new projects.

Brevard County received the largest loan, \$40 million, for upgrades and expansion of their South Central Regional Wastewater Treatment Plant.

The plant is within the county's rapidly growing Viera Development of Regional Impact. It will add three million gallons a day to current treatment capacity, plus new aerators and a one-million-gallon storage tank and treatment plant.

Palm Coast will use its \$30.1 million loan for new force mains, a master lift station and a two-million-gallons-a-day wastewater treatment facility.

Lee County will use its \$28.8 million loan to modify existing and new oxidation ditches and head works to handle an additional 1.5 mgd, construct a new administrative building and a new electrical ser-

vice building. The upgrades and construction will enable the county to meet permitting requirements.

The city of Largo and Charlotte, Monroe, Orange and Putnam counties received incremental increases to existing loans, ranging from \$24.4 to \$1.4 million.

Largo, which received the largest loan supplement, plans to improve its wastewater collection system and build a wet weather monitoring and pumping system to prevent flooding.

In the Keys, Monroe County received \$19 million for continued construction of its Cudjoe Regional Wastewater Collection System & Treatment Plant.

Orange County will use its \$10.5 million loan increase to complete expansion of its Eastern Regional Water Reclamation Facility.

Charlotte County is completing its East and West Lake collection systems that will switch 2,116 properties from septic systems to a central treatment plant. The change will improve water quality in Charlotte Harbor by reducing nutrient loading.

Putnam County will use its \$1.5 million loan increase to complete its East Regional Wastewater System project. The project includes a septic tank to central treatment plant conversion affecting about 140 septic tanks and two package plants near the St. Johns River.

The eight projects combined total more than \$375 million, a small part of the more than \$4 billion Florida's CWSRF has provided for wastewater and stormwater treatment since 1989.

About \$1.1 billion of that total has been spent in the past five years.

**Dispersed water projects.** The St. Johns River Water Management District Governing Board approved two pilot projects to build and test "water farms."

The term refers to temporarily storing water on converted agricultural land to control peak runoff flows and allow nutrients to settle out with nutrients to be sequestered by plants and microorganisms.

The two projects to be built in and near Fellsmere in northern Indian River County will handle water from the surrounding terrain and drainage canals, diverting contaminants that would otherwise end up in the Indian River Lagoon.

The St. Johns district now has agreements with two landowners, Fellsmere Joint Venture LLC and Graves Bros. Co., to build the two water farms.

Danielle Spears, SJRWMD spokesperson, noted that the larger project, Fellsmere Joint Venture, is expected to remove about 64,000 pounds of phosphorus over the 10-year term of the agreement.

Its total cost of just less than \$16 million breaks out to \$8.8 million in capital costs and \$7.2 million for operation and maintenance. That translates to an estimated \$250 per pound of phosphorus removed.

The smaller project with Graves Bros. has a total cost of about \$5.9 million, with capital costs of \$3.6 million and O&M

budgeted at \$2.3 million, yielding an estimated cost \$380 per pound of phosphorus removed.

In a press release, SJRWMD noted that the estimated cost per pound for nutrient removal is much less than the \$500-\$3,000 per pound of phosphorous cost for other methods such as treatment wetlands.

The St. Johns River district's payment model is different from that used in other water management districts where dispersed water projects have paid land owners a guaranteed fixed annual fee for up to 20 years, cancelable by the districts on short notice.

SJRWMD will contribute to project design and construction. Once in operation, the district will pay for performance for "proven" nutrient removal.

"We are only paying for one nutrient per invoice," Spears said. "In other words, if total phosphorus reductions are highest one month, that is the nutrient that will be reimbursed. Total phosphorus will be reimbursed at a higher per pound rate than total nitrogen, but since TN removal rates are almost always higher than TP, the monthly reimbursement is about the same whether we count TP or TN."

Planning and design is scheduled for 2016, with permitting and construction of levees and control structures set for 2017-2018.

Both projects are expected to be in operation by 2019, but the smaller one could begin operation sooner.

Spears said that this project will be the district's first dispersed water project that uses the public-private partnership model.

**Corps restricts water use from Chattahoochee reservoirs.** The Mobile District of the U.S. Army Corps of Engineers announced in January that property owners adjacent to reservoirs along the Chattahoochee River in Florida and Georgia will no longer be allowed to use water from the lakes behind dams for irrigation.

Restrictions specifically address the practice of placing pumps on or near docks that pump water from the lake for boat washing and landscape irrigation.

The restrictions are an attempt to bring shoreline management practices into conformance with federal laws, some dating back to the 1940s.

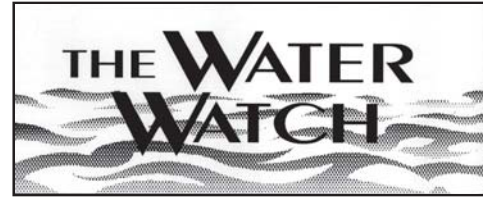
The dams and lakes were built for flood risk reduction, water supply, water quality, wildlife management, recreation, hydropower and navigation—but not for irrigation.

The corps has issued about 80 permits withdrawing lake water, and some of those may have been permitted to use the water for irrigation in the past.

Public response to the new rules that became effective Jan. 1, has been negative. The total ban may be reconsidered in the future.

**Vero Beach biosolids.** In about six months, the city of Vero Beach will complete wastewater treatment equipment installation and begin using the CleanB System from NuTerra to disinfect and remove odors from biosolids in its treatment plant.

The CleanB System is a proprietary chlorine dioxide-based biosolids treat-



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**WATCH**  
Continued on Page 5

# SE regional network monitoring CO<sub>2</sub>, ocean acidity in marine waters

By ROY LAUGHLIN

The Southeastern Coastal Ocean Observing Regional Association in the past year established a Southeast Ocean and Coastal Acidification Network “to support and encourage discussions on ocean and coastal acidification in the Southeast region,” according to the group.

The National Oceanic and Atmospheric Administration is the public partner with SECOORA, providing financial support for SOCAN’s activities.

Ocean acidification is a chemical process, but SOCAN members are spread across many scientific disciplines. They are biologists, fisheries scientists, oceanographers and state regulatory agency officials.

Debra Hernandez, executive director of SECOORA, headquartered in Charleston, SC, said that her organization “provided some ‘glue’ in partnership with NOAA’s Ocean Acidification Program to get the regional program going,” referring to SOCAN.

During its first year, SOCAN recruited a 24-member steering committee that currently guides its activities. SOCAN also has about 45 regular members.

The “glue” that holds the members together includes regular webinars featuring speakers addressing specific topics related to ocean acidification.

The webinars, sometimes with an accompanying series of Powerpoint slides, are archived and available on SECOORA’s website.

In January, SOCAN held its first face-to-face meeting in Charleston, SC, to make many of the issues of interest to its members more broadly familiar.

Some of those included what appears to be acidification damage to corals in

Florida and off the South Carolina coast.

Declines in commercial shell fisheries and hatchery operations are occurring in many of the Southeast’s coastal waters. Ocean acidification is one potential cause for the dropoffs, according to some scientists, and needs to be given critical consideration.

Southeast fisheries are particularly at risk because they depend on just a few species, and if those are sensitive to ocean acidification, the fishery is at risk of collapse.

The discussion of ocean pH levels seems a paradox of big numbers and small numbers that is hard to parse outside of expert discussion.

In 2014, human activity emitted about 36 billion tons of CO<sub>2</sub> into the atmosphere. About a quarter of that dissolved within a short time frame—but not immediately—into the ocean. That’s the big number part.

The discussion of the change in marine water chemistry is the small number side. Reaction of the gas with water produces carbonic acid, which subtly shifts the ocean’s carbonate-bicarbonate buffering system to a slightly more acidic status.

Ocean water is still closer to alkaline pH 8 than below pH 7, which chemically

defines an acid.

Even considering that the pH scale is logarithmic, the number seems minuscule, both intuitively and chemically.

When oceanographers report that the average ocean pH over broad areas has declined from the 8.2-8.3 range to the 8.0-8.1 range, it doesn’t seem like much of a change.

But in terms of biological effects, that small pH shift can lead to major changes in calcification, an essential function in many taxa.

A slightly higher level of acid dissolves calcium carbonate in the skeletons of marine organisms to a damaging extent.

Marine taxa apparently affected by ocean water below pH 8 spans the gamut from single cell plankton, hard coral, mollusks, annelid worms, and perhaps crustaceans and echinoderms.

The influence of subtle pH shifts on other physiological processes such as enzyme function has hardly been examined.

SOCAN fills a potentially significant niche with its regional observations because ocean pH is variable and typically spans more than 0.2 pH unit range.

Factors that control this buffering system are CO<sub>2</sub> partial pressure, dissolved in-

organic carbon, temperature, salinity and biological activity.

Intense photosynthesis that fixes CO<sub>2</sub> into organic compounds can reverse ocean acidification, and can have a measurable influence on pH in near-shore waters.

Change in ocean acidification is currently being measured by instrumentation on ocean buoys.

Hernandez said that NOAA has two such buoys in the Southeast region, including one at Grey’s reef funded to the tune of about \$110,000 per year.

Remote sensing does not measure actual ocean pH, but can measure some of the factors that influence it.

The most useful information about local conditions comes from measurements of the marine waters. Because of the chemical complexity of the ocean’s subtle carbonate-bicarbonate buffering system, biological responses are considered by many to be the most useful sentinels of ocean acidification effects.

SOCAN and its 10 sister organizations in other regional networks may not yet be broadly familiar to the public, but its members’ activities could become much more visible in the future.

There is no realistic end anticipated to the increasing atmospheric CO<sub>2</sub> emissions and so, for decades, ocean pH will continue to inch up for the first time in human history.

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### WATCH

From Page 4

ment, according to Rob Bolton, Vero Beach’s director of water and sewer administration.

CleanB treatment eliminates the need for aerobic digestion of biosolids and reduces odors.

NuTerra’s web page notes that the CleanB System renders dewatered biosolids suitable for composting or other reuse—instead of disposal at a landfill. NuTerra offers disposal of biosolids by composting.

Currently, Vero Beach’s biosolids are hauled under contract to a landfill in Okeechobee. Bolton said that will continue during the CleanB System installation and until the end of the current landfill contract.

The CleanB System installation will open more options to the city for biosolids disposal or beneficial reuse in the future.

**Biosolids trace contaminant study.** A new research study is underway to better understand fate and effects of polybrominated diphenyl ethers, azithromycin and ciprofloxacin in wastewater treatment biosolids.

PBDE is used as a flame retardant in clothing, upholstery and other consumer products, and is released to sewage during laundering. The other two compounds are widely used antibiotics that enter the wastewater stream.

The study’s goal is to obtain data for a risk assessment of biosolids-amended soils. The data will promote a better understanding of fate and exposure of terrestrial ecosystems receiving biosolids, focusing on ecological health and groundwater quality where trace-contaminated biosolids are spread.

The study, Developing Exposure and Toxicity Data for Priority Trace Organics in Biosolids, will be conducted by McAvoy Consulting, Cincinnati, OH, with collaborators at the University of Cincinnati and the University of Florida.

The Water Environment Research Foundation and more than a dozen other partners funded the study. The anticipated cost of the research is \$250,000.

# NGWA releases best practices document for ASR, managed aquifer recharge

By **BLANCHE HARDY, PG**

The National Ground Water Association published an information brief and best suggested practices document, Best Suggested Practices for Aquifer Storage and Recovery, to assist water providers in managed aquifer recharge, or MAR.

The association believes that the management of groundwater aquifers will become increasingly important as drought continues in several regions of the country.

MAR captures water during wet periods, during periods of low demand or ex-

cess otherwise discharged or lost, and then transfers it through wells into subsurface aquifers.

"The number of wells needed, if wells are used, will depend on the volume of water intended to be captured over what period of time from how large an area, and then subsequently, the design of the well and its development," said Kevin McCray, CAE, chief executive officer of NGWA.

MAR projects are occurring throughout the country. NGWA reports properly sited, designed, constructed, operated and maintained MAR projects will be a critical component in addressing the nation's water supply needs.

The association is promoting additional research on the long-term physical and chemical impacts on aquifers, optimal management in different environments, uses of stormwater and reclaimed water, and other considerations.

The association identified the Peace River Water Treatment Facility as an example of a MAR project in Florida. The treatment facility provides alternatives to groundwater withdrawal while allowing water to be transferred among Charlotte, DeSoto, Manatee and Sarasota counties and the city of North Port.

Water is pumped from the river and stored in a reservoir when flows are high. During dry periods, the stored water may be treated and distributed for use as potable supply.

In addition to the reservoir, 21 aquifer storage and recovery wells have been installed at the Peace River facility.

Water treated to drinking water standards is injected through ASR wells hundreds of feet below ground surface. When it is needed, the water is recovered and returned to the raw water reservoirs and processed to meet supply demands during dry periods.

The ASR system was designed to store up to 6.3 billion gallons of water. MAR is monitored by 24 observation wells at various depths to help gauge system performance across the subsurface flow regime.

According to Peace River facility MAR data, the aquifer zone used for storage is the Suwannee Limestone at a depth of 600 to 900 feet below land surface.

Some water is also stored in the Tampa Limestone zone between about 350 and 500 feet below land surface.

ASR injection rates commonly range from about five million to 15 million gallons per day depending on the demand and operating conditions at the Peace River facility.

The NGWA identified MAR is an important tool that will become increasingly valuable because approximately 78 percent of community water systems and many individual households use groundwater as source.

In addition, groundwater is used for 42 percent of the nation's agricultural irrigation water. It also feeds natural systems such as streams, rivers and wetlands, especially during dry periods, and assures the sustainability of ecosystems.

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## EPA awards Embry-Riddle Aeronautical, UCF sustainable project grants

### Staff report

The U.S. Environmental Protection Agency awarded Embry-Riddle Aeronautical University in Daytona Beach and the University of Central Florida in Orlando with People, Prosperity and the Planet grants.

Nationally, the grants were awarded to 38 university student teams for proposed projects to develop new, sustainable products and strategies. Each team will receive up to \$15,000 for their proposals.

"This year's P3 teams have created innovative research projects that tackle some of our most pressing environmental and public health challenges," said Dr. Thomas Burke, EPA's science advisor and deputy assistant administrator of EPA's Office of Research and Development.

Funding for the P3 competition is split into two phases. Teams selected for Phase I awards receive grants of up to \$15,000 to fund the development of their projects, which are then showcased at the National Sustainable Design Expo in the spring.

Following the expo, P3 teams compete for Phase II awards of up to \$75,000 to further develop their designs and potentially bring them to market.

This year's teams are testing innova-

tive ideas such as repurposing chemical byproducts from the mining industry into new concrete that helps inhibit the corrosion of steel, and developing a food waste collection kiosk that will spur food waste-to-energy production in the local community.

Previous P3 teams have used their ideas and gone on to start businesses. For example, Lucid Design traces its beginnings back to EPA's first P3 award to the founders' Oberlin College team in 2004.

Lucid Design specializes in tracking and analyzing energy consumption and resource use data for clients that include Google and Sony.

In 2011, a P3 team from Embry-Riddle developed a portable, solar-powered, water purification system in the form of a backpack. The team went on to launch AquaSolve Ventures to produce backpacks that are capable of purifying an impressive 4,300 gallons of water a day.

Another P3 success story is the startup OneEarth Designs, which specializes in solar-powered technology formed from a 2010 Harvard University team. One Earth Designs' signature product, the SolSource 3-in-1, is a 100 percent solar-powered grill that can provide home heating and electricity.

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# Natural oil seep releases common but not comparable to Deepwater spill

By ROY LAUGHLIN

Natural oil seeps are more common in the Gulf of Mexico than anywhere else in the world's oceans. And those in the Gulf are most abundant near and to the west of the 2010 Deepwater Horizon oil spill disaster.

But in terms of the amount of oil spilled, there's no comparison in the volume of oil released between oil seeps and the well blowout.

A group of scientists, led by Ian MacDonald, PhD, a professor at Florida State University, concluded this in a recent research paper.

The research team used satellite-derived synthetic aperture radar, or SAR, images to identify the location of oil slicks in the Gulf of Mexico.

An oil slick dampens very small waves, a change that SAR can accurately capture in images when wind speeds are below 10 meters per second.

The research team obtained 1,153 SAR images of the Gulf of Mexico from May 1997 to November 2007, and "stitched them together" to obtain 166 images of the entire Gulf. They then analyzed the images using a texture classifying neural network algorithm to identify natural oil slicks.

Using those images, they estimated the duration, areal coverage and volume of the oil observed. They also presented maps showing the distribution of natural seeps that could be the result of individual seeps or seeping formations on the seabed.

The authors said that their work—based on the technique of gridding oil volumes on maps and interpolating among images with partial coverage that has not been previously used to assess oil spill impacts or natural seeps—provides a common reference framework for future research and recovery efforts in the Gulf of Mexico.

The researchers identified about 100 active natural oil seeps in the Gulf of Mexico that are randomly distributed. The gulf's northwest quadrant, including the Texas-Louisiana slope, had the most seeps, contributing 68 percent of the total of oil

from seeps.

The southwest quadrant was second with 25 percent. The northeast quadrant, in which the Deepwater Horizon blowout occurred, was third in number of seeps, contributing just seven percent of the naturally seeping oil.

The Florida platform covers most of the northeast and all the southeast gulf quadrants. There are few oil seeps in it because of its carbonaceous structure and lack of sedimentary layers that trap significant oil and gas deposits.

Oil slicks from natural seeps have identifying characteristics. They are thin and form linear slicks downwind of where they emerge on the surface. They have an 8-hour to 24-hour lifespan before evaporation and dissolution by wave action dissipates them.

In the second part of their paper, the group described research using SAR images to characterize the volume and distribution of oil from the Deepwater Horizon spill, and compared the well blowout to natural seep oil contributions.

For this effort, they used both the texture classifying neural network algorithm to identify thin slicks and the oil emulsion detection algorithm to estimate oil present as emulsified, thick surface slicks.

They noted that over the 87-day Deepwater Horizon event, the surface-oil footprint was fundamentally different from background seepage.

They also found that the floating oil volume decreased by 21 percent—due to efforts to reduce flow from the well, disperse oil at depth and burn oil off the surface—while the area covered increased by 499 percent.

This research is important because it puts into perspective a quantitative comparison of the contribution of the Gulf's natural oil seeps with the oil spill's volumes.

Comparing the surface oil concentration attributable to natural seeps to the surface concentrations during the Deepwater Horizon spill, the researchers noted that the two distributions did not overlap—an indication of how completely the oil spill

overwhelmed background seepage during the spring and summer of 2010.

Another difference between slicks from natural seepage and the spill event was that a persistent natural oil slick, fed by a fixed geologic process, was observed in a relatively restricted area.

Freshly surfacing oil consistently renews the slick's origin, and then it rapidly disappears, consumed and dispersed by weather processes.


They noted that the oil spill, on the other hand, was one of the greatest environmental crises in U.S. history and remains so in the aftermath.

The research includes a lengthy discus-

sion of the precision and error potential of the SAR estimation techniques. But even with some wide error measurements, the magnitude of the oil slick volumes was record-setting.

The research is valuable for its pioneering survey methods and data analysis that may be used for future monitoring in the Gulf now that the lawsuit is settled and funding for such efforts is available.

It also clearly lays to rest statements that natural oil seeps in the Gulf of Mexico are in any way analogous to the well blowout. From the perspective of this research, there is no valid comparison in scale, location or biological effects.




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## SJRWMD well conversion project will benefit North Florida water resources

Staff report

The St. Johns River Water Management District Governing Board approved moving forward with a public-private partnership project in Putnam County that will help meet future water demands and offset impacts from domestic self-supply wells in North Florida.

The project calls for moving the Grandin Sand Plant's groundwater withdrawals from the Upper Floridan Aquifer to the Lower Floridan Aquifer.

"This project is a cost-effective opportunity to protect MFL waterbodies," said Ann Shortelle, executive director of the water management district. "What's more, the district will benefit from the data that will be collected from a new monitoring well—the first Lower Floridan Aquifer monitoring well in Putnam County."

The district will partner with Vulcan Materials Co. at its 1,131-acre Grandin sand mining facility in Putnam County.

The mine has held a consumptive use permit for more than 30 years and currently uses water from the Upper Floridan Aquifer to process sand and maintain water levels in its dredge lake, as well as for typical domestic water use for employees and minor landscape irrigation.

The \$760,000 project includes construction of a Lower Floridan Aquifer production well, construction of a Lower Floridan Aquifer monitoring well and conversion of the Grandin Sand Plant to use the Lower Floridan as its water source.

The district will fund up to \$425,000 of the project to cover impacts from self-supply wells.

Moving groundwater withdrawals from the Upper to Lower Floridan Aquifer has the potential to benefit the lakes, rivers, streams and wetlands that have a hydrologic connection to the Upper Floridan Aquifer.

The project supports the district's minimum flows and levels prevention/recovery strategy goals.




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# PEER blasts recent DEP enforcement record on haz waste violations, fines

By **BLANCHE HARDY, PG**

In January, Public Employees for Environmental Responsibility released an analysis of recent Florida Department of Environmental Protection enforcement files for the discharge of hazardous waste.

The analysis indicated that fines—including fines for repeat and serious violations—have fallen well below assessment guidelines.

Florida received final authorization on Nov. 17, 2000, to implement the federal Hazardous and Solid Waste Amendments

of 1984.

State authorization is granted through a rulemaking process executed by the U.S. Environmental Protection Agency, allowing the federal government to delegate primary responsibility for implementing the RCRA hazardous waste program to individual states.

While all states and territories have been granted authority to implement the base program, not all states have received HSWA authorization.

Under the EPA's authorization program, Florida agreed to "issue permits that conform to the regulatory requirements of

the law, to inspect and monitor activities subject to regulation, to take appropriate enforcement action against violators and to do so in a manner no less stringent than the federal program."

The delegation of authority takes place under a Performance Partnership Agreement. The agreement in place during PEER's records review was executed on Sept. 30, 2014.

DEP regulates approximately 75,000 hazardous waste operators, according to PEER's assessment. Their evaluation of the numbers indicates that the initiation of enforcement cases has dropped by 80 percent and the level of fines assessed has dropped by 90 percent since 2011.

"The case files depict a bureaucratic obstacle course that precludes meaningful enforcement action, no matter how serious or chronic the violation," said Jerry Phillips, a former DEP enforcement attorney and PEER's Florida director.

The PEER assessment indicated that the state ignores violation records when levying fines, allowing violators to pay very low or no fines. Similarly, repeat and serious violators are allowed to skirt enforcement by completing "compliance education" instead.

The use of this compliance education has resulted in claims from the agency that non-compliance rates have dropped significantly.

The assessment also indicated that the reports of program success attributed to reduced non-compliance rates have likewise been facilitated by a change in the inter-

pretation of the phrases "significant non-compliance" and "significant compliance."

"Significant compliance" means facilities are in compliance, as it did historically. But now the phrase may also include facilities with violations, such as paperwork violations, that are considered to present no serious environmental harm.

The phrase "significant non-compliance" is generally considered to mean chronically out of compliance.

As described by PEER, a facility with numerous paperwork violations that would have been chronically out of compliance and therefore significantly non-compliant in the past is now significantly compliant, according to the new interpretation.

Paperwork insufficiencies are considered a permit violation in many cases.

As Phillips sees it, "logically, if the department doesn't have the required paperwork that demonstrates the nature of discharges, it cannot be said that the department knows whether or not the offending facility is otherwise in compliance."

The assessment contains a number of detailed case studies. PEER considers each of these cases to be significantly non-compliant although they may not have been designated as such by the state.

The advocates make note of the millions of dollars Florida receives from the federal government to administer the EPA authorized programs.

To PEER, the lack of compliance observed during their review is equivalent to paying the state to "abuse its discretion in these cases."

## TRI report shows less toxic waste produced, released to environment

By **ROY LAUGHLIN**

In its latest Toxic Release Inventory (for 2014), the U.S. Environmental Protection Agency said that 84 percent of the nation's reported 25 billion pounds of toxic chemical waste was not released to the environment.

Instead, the wastes were recycled (37 percent), used for energy recovery (14 percent), or treated to reduce toxicity or chemical reactivity (34 percent).

The agency reported that the remaining 16 percent of toxic waste was released to air, water or landfills. For most of those wastes, regulatory handling requirements limited human and environmental risk, the agency noted.

The 3.89 billion pounds of released chemicals, or 16 percent of 25 billion pounds, although a large amount, was six percent less than the amount of wastes re-

leased to the environment in 2013, based on TRI data.

Decreases in on-site land disposal in the metal-mining sector, attributable to changes in composition and production of waste rock, made a significant contribution to the lower waste levels reported.

The EPA also highlighted a four percent decline in air emissions—34 million pounds—that occurred in 2014. Chemical manufacturing facilities and electric utilities were the two industry categories responsible for the emissions decline.

Conversion from coal to other fuels for electricity generation lowered waste production for that category. Notable progress in reducing air emissions continues a trend evident since 2013, with a 55 percent cumulative air emission reduction during the last decade plus.

The 2014 report includes data from 21,783 U.S. facilities.

The TRI report is available at [www.epa.gov/trinationalanalysis](http://www.epa.gov/trinationalanalysis). Users can examine the data by state, metropolitan area, watersheds or tribal areas.

Florida's total amount of waste ticked up in 2014, for the first time since 2010, perhaps reflecting an improving economy.

One chemical company, Ascent Performance Materials near Pensacola, dominated the releases with more than 26 million pounds taken to land disposal. According to the EPA, the company manufactures plastic materials and resins.

Three power-generating plants, led by Duke Power's Crystal River nuclear power plant landed in second through fourth place among the top five waste releasers. Mosaic Fertilizer landed in fifth place with about two million pounds of waste.

The EPA's web interface allows queries by zip code or city, and produces a map showing locations of reporting facilities, and tabular and graphic presentations of reported data.

Transparency was one of the Obama administration's mantras beginning in 2009. This year's data indicate that the administration has worked with waste producers to maintain low waste emissions and releases by promoting recycling and treatment. Now, as the economy improves, industrial facilities are making more and wasting less, and that shows up in less toxic waste reported in the annual TRI.



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# Clearwater may be first in Florida to implement indirect potable reuse

By ROY LAUGHLIN

The city of Clearwater is in the design stage of a potable water treatment system at their Northeast Wastewater Treatment Plant that will treat wastewater to drinking water standards before injection into the deepest parts of the Floridan Aquifer's Zone A.

The upper part of Zone A is the source of about half of the city's drinking water. Clearwater officials call this water reuse plan indirect potable reuse.

Clearwater has been scoping out prospects for this project since 2011 when the city council approved a feasibility study and received \$1.7 million in funding from the Southwest Florida Water Management District.

The Clearwater Public Utilities Department built a small scale treatment system with all the components needed to perform the proposed processes of their full implementation plant.

The pilot test included drilling an injection well to the Lower Floridan Zone A, and four monitoring wells at its northeast treatment plant.

City officials and their communications consultants emphasized the distinction between the term treated wastewater and the term for water obtained by their multi-step process destined for aquifer injection.

They prefer to use the term "purified water" to distinguish it in general from treated wastewater.

According to city officials, the pilot test was successful. The water purification process draws from Clearwater's reuse water supply, wastewater treated for irrigation reuse.

The project's final report noted that a serial "multi-barrier advanced treatment processes" yielded purified water destined for aquifer injection.

The treatment steps include membrane filtration, reverse osmosis and an advanced oxidation process employing ultraviolet light and hydrogen peroxide.

The final conditioning process before aquifer injection includes oxygen removal by a membrane contactor system, calcium hydroxide stabilization to increase water hardness and a final sodium bisulfide addition to dechlorinate and neutralize the residual peroxide from the oxidation step.

The goal of multi-barrier advanced wastewater treatment is to produce injection water that will meet the standards of Chapter 62-610.562, Florida Administrative Code.

The project's final report noted trihalomethanes exceeding drinking water standards early in the pilot testing.

The water analysis also examined contaminants of emerging concern that the report characterized as "constituents." CEC include cleansers, disinfectants, pharmaceuticals and synthetic compounds with suspected hormone mimicry, bisphenol A being the most familiar one.

CEC are of current interest because they are not always removed by secondary or advanced wastewater treatment.

After the multi-step wastewater treatment in the pilot test, chemical analyses detected two "constituents" in a few samples. One was Atenolol, a beta-blocker pharmaceutical, present at low nanogram per liter levels.

The other was chlorate, a disinfection byproduct, detected a few times at moderate microgram per liter levels in the finished water.

"Detection of these two constituents was concluded to be insignificant," the final report said.

David Porter, PE, public utilities director for the city of Clearwater, said that the use of a multi-step serial treatment is "to ensure—to the best of technological ability—that we don't have ... glitches" in the future that prevent the process from meeting water quality standards for injected water.

The purified water will be injected through the same well used in the pilot project to the lower aquifer Zone A, a depth

of 200-230 feet.

The injection well at Clearwater's Northeast Wastewater Treatment Plant is closest to Clearwater's drinking water Wellfield 3. The two are just a bit more than a mile apart.

Geological investigations of the injection well and injection water during pilot scale testing indicated that injected water would move first laterally in the Floridan Aquifer's lower Zone A and then could also move upward.

Under full scale operation, Clearwater could be injecting up to 3.8 million gallons a day of purified water through its injection well.

Project consultants concluded that it could take as long as 20 years for the injected water to migrate through the aquifer from the injection well to the drinking water wellfield.

Because there is the prospect that at least some of the injected water would at some time in the future be withdrawn for drinking water, this project is considered indirect potable reuse.

Upon scheduled completion in 2018, Clearwater's will be the first operational indirect potable reuse project in Florida, and one of less than a dozen such projects in the country.

In addition to augmenting Clearwater's drinking water source through indirect potable reuse, Clearwater officials see other potential benefits.

The Floridan Aquifer under Clearwater experiences poor recharge, and well-field pumping at current rates causes saltwater intrusion from lower aquifer levels and from the influence of adjacent saltwater bodies.

"The effect of the recharge is to increase aquifer levels upgradient of the city's supply wells and reduce the amount of drawdown induced by the wellfield," according to a pilot project report by Jeffrey Trommer, PG, a senior associate with Leggette Brashears & Graham Inc. in Tampa.

While the water injected during the first few years of use is not expected to reenter Clearwater's drinking water supply during that time interval, it would positively influence drinking water quality and supply in Clearwater's wellfield immediately.

Diverting water from Clearwater's reuse wastewater stream to aquifer injection after purification will also reduce by up to 3.8 mgd the amount of treated wastewater that Clearwater releases into nearby waterways.

According to Porter, Clearwater's wastewater treatment plants produce up to 15 mgd of "reclaimed quality water" but

on average, only part of it—5-7 mgd—is beneficially reused.

The remainder, up to 7 mgd, is released into Stevenson Bay or Old Tampa Bay.

Water diverted to Clearwater's indirect potable reuse will reduce the level of treated wastewater released to the local surface waters.

With the completion of its pilot study, Clearwater officials and utilities department staff enter into the second half of the marathon to complete Florida's first indirect potable reuse project.

The Southwest Florida Water Management District has entered into a coopera-

tive cost-share agreement to provide half the cost.

The city council has approved the \$28.7 million construction project as well as contracts with Tetra Tech and Leggette, Brashears & Graham, according to Lan-Anh Nguyen, PE, a senior professional engineer with the city of Clearwater's Engineering Department.

The city council will still have to approve bidding and construction contracts in the future.

The project, if all goes according to schedule, could be up and running by the end of 2018.



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# St. Pete building biosolids waste-to-energy plant at southwest facility

By ROY LAUGHLIN

The city of St. Petersburg's Water Resources Department just broke ground on a waste-to-energy biosolids treatment facility.

The new plant, located at the city's Southwest Water Reclamation Facility, could eventually treat up to a million gallons a day of effluent containing biosolids from St. Petersburg's three major wastewater treatment plants.

Steven Marshall, CEM, LEED AP BD+C, CEA and CBCP, energy efficiency and sustainability manager in the city's

Water Resources Department, said that the new plant will provide multiple benefits.

Anaerobic biosolids digestion will produce methane to fuel a 1.6-megawatt electricity co-generator, providing electricity to power machinery at the new plant and heat to warm the anaerobic digester producing methane from biosolids.

With the cogeneration, Marshall noted, the combined energy efficiency from methane combustion will increase from about 40 percent for electricity alone to 83 percent total.

The anaerobic digester will produce more methane than needed to power the

plant. The surplus methane will be sent to a city fueling station.

St. Pete is converting its garbage trucks and other vehicles from diesel fuel to methane gas and the excess methane will augment pipeline supplies.

After biosolids removal, the water that carried it to the plant will be added to the city's reuse system. After passing through the anaerobic digester, biosolids will be pathogen-free, Class A biosolids suitable for use as a soil amendment for landscaping.

The utility expects to see about \$3.7 million in annual operational expense savings and will net about \$1.5 million after construction loan repayments.

Part of those paybacks will come from the city selling credits under the U.S. Environmental Protection Agency's Renewable Fuel Standards.

The city cannot take advantage of tax credits because it does not pay federal taxes, but it can sell the credits to raise revenue.

That revenue is 0.60–0.95 dollars per unit of fuel use more than the savings from sending the methane to an electrical generator and selling the electricity.

That explains why the city is powering its trucks with the methane, according to Marshall.

The Haskell Co. of Jacksonville is the prime contractor for the new biosolids facility that will cost about \$65 million.

As a prelude to new construction, the 1960s era treatment plant now on the site will be demolished, beginning in early February.

Other contractors include AECOM, Black and Veatch and Carollo Engineers.

The entire project consists of three phased projects. The biosolids treatment plant construction is in its early stages.

Black and Veatch will construct the

pipeline to carry biosolids from St. Petersburg's Northeast and Northwest treatment plants to the new biosolids treatment facility at its Southwest plant. That project has a budget of \$5.8 million.

The project to create biogas from the digester and build the two-mile-long transmission lines to deliver it to St. Pete's offsite fueling station is expected to cost \$6.3 million.

Both projects will go to the city council within the next two years for funding approval within a timely manner related to construction progress at the biosolids plant.

Construction of all components should be completed by mid-2019.

The project initially met with opposition from the public and sharp questioning from at least one city council member because the Southwest Water Reclamation Facility is adjacent to Eckerd College.

There is a history of complaints about odors from the plant, as well as the unsightliness of the large reuse water storage tank now nearly complete.

Marshall said that the anaerobic digester will sharply reduce or eliminate the odor issue. The digester will be enclosed.

In addition, the dewatering equipment will operate under negative pressure with odor handling treatments.

If odor problems crop up during transfer of the treated biosolids to removal trucks, that process may be moved to an enclosed building.

The project began over two years ago, seeded by a Department of Energy grant. "We're one of maybe three or four cities in the U.S. doing something along these lines," Marshall noted.

In particular, he emphasized that the project will make something useful from the biosolids and wastewater, which until recently were just disposal problems.



## Turkey Point cooling canal water may be impacting groundwater supplies

By BLANCHE HARDY, PG

Miami-Dade County has initiated an investigation to determine if water from Florida Power & Light's industrial cooling canals at its Turkey Point Nuclear Power Plant is seeping into the Biscayne Aquifer and Biscayne Bay, or otherwise affecting groundwater quality.

The Turkey Point facility includes more than 150 miles of networked canals that cool water generated during operation of the plant's two nuclear reactors.

The Miami-Dade County Division of

Environmental Resources Management observed that cooling water discharges were hotter after the reactors were overhauled a few years ago. In response, the facility began introducing additional water into the canals to cool its water.

Shortly after the canal water began to be augmented by millions of gallons of auxiliary water from the L-31 canal and groundwater, elevated levels of salinity were detected south of the site.

In addition to higher salinity, phosphorus and ammonia levels shot up dramatically in samples of water collected from the aquifer under Biscayne Bay.

The canals are being considered the source of groundwater contamination because low levels of tritium, a byproduct of the generation of nuclear energy, have been detected.

In response to the detection of the elevated levels of contaminants, DERM and FPL expanded water sampling to better understand what is occurring in the canals and if water in the canals may be impacting potable groundwater supplies.

The results of analyses are being evaluated as they become available.

While temperature and contamination were being addressed, environmental advocates, local industries and municipalities were gearing up to protest Turkey Point's increased water use and the resulting potential impact on already stressed potable and natural system water supplies.

Three million South Floridians between Boca Raton and southern Miami-Dade County get their drinking water from the Biscayne Aquifer.

Among the advocate's primary concerns are impacts to wildlife including crocodiles. The Turkey Point canals have long been a recognized as a crocodile breeding center.

Data collected by the University of Florida indicate that the number of nesting crocks in the canals dropped to less

**BISCAYNE**

Continued on Page 11

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# Calendar

## March

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

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

MAR. 5-13 – Course: Backflow Prevention Assembly Tester Training and Certification, Jacksonville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

MAR. 7-11 – 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](http://www.treeo.ufl.edu).

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

MAR. 7-11 – Course: Asbestos: Contractor/Supervisor, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

MAR. 8-10 – Course: Water Distribution Systems Operator Level 1 Training, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

MAR. 9-11 – Summit: Environmental Industry Summit XIV, San Diego, CA. Presented by Environmental Business International Inc. Call (619) 295-7685 or visit [www.ebionline.org](http://www.ebionline.org).

MAR. 10 – Course: 8-Hour OSHA HazWoper Annual Refresher, Tallahassee, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

### BISCAYNE

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than half the previous year. The number of baby crocks dropped by three quarters.

The Tropical Audubon Society said that the use of the cooling canal system as an industrial wastewater facility for the nuclear facility is highly damaging to Biscayne Bay, Biscayne National Park and the Biscayne Aquifer.

The group claims that the cooling canals are in direct conflict with the goals of the Comprehensive Everglades Restoration Plan and are in potential violation of federal and local laws based on the localized seepage into the aquifer and surrounding surface waters of Biscayne Bay.

In a related Atomic Safety and Licensing Board hearing in January, it was agreed that temperature levels in the canals could only be raised a small amount for a short period time per day.

But there are concerns even this will have adverse long term impacts.

Turkey Point has a unique location between the Everglades National Park and Biscayne National Park, which creates a great potential for ecological harm.

A ruling by the board's panel is due in April.

*Editor's note: At press time, Administrative Law Judge Bram D.E. Canter ruled that the cooling canal system at the plant is the primary cause of a saltwater plume in the drinking water aquifer. The judge recommended that the state Department of Environmental Protection rescind or amend its December, 2014, order approving a plan to fix the cooling canals.*

## Florida Specifier

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

MAR. 11 – 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](http://www.treeo.ufl.edu).

MAR. 14-18 – 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](http://www.treeo.ufl.edu).

MAR. 15-16 – Course: Effective Utility Leadership Practices, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

MAR. 11 – 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](http://www.treeo.ufl.edu).

MAR. 18 – Meeting: Technical Meeting of the Florida Section of the America Water Resources Association, Steinhatchee, FL. Visit [www.awraflorida.org](http://www.awraflorida.org).

MAR. 21-25 – Course: Backflow Prevention Assembly Tester Training and Certification, Altamonte Springs, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

MAR. 21-23 – 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](http://www.treeo.ufl.edu).

MAR. 22-23 – Course: Initial Training for Transfer Station Operators of and Materials Recovery Facilities-16 Hours, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

MAR. 22 – Course: Refresher Training Course for Experienced Solid Waste Operators-4 Hours, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

MAR. 22-24 – Course: Initial Training Course for Landfill Operators and C&D Sites-24 Hour, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

MAR. 22-23 – Course: Refresher Training Course for Experienced Solid Waste Operators-16 Hours, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

MAR. 22-24 – Course: Initial Training for Landfill Operators and Waste Processing Facilities, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

MAR. 22 – Course: Refresher Training Course for Experienced Solid Waste Operators-8 Hours, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

MAR. 22 – Course: Initial Training Course for Spotters at Landfills, C&D Sites and Transfer Stations-8 Hours, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

MAR. 26-APR. 3 (Two Consecutive Sat. & Sun.) – 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](http://www.treeo.ufl.edu).

MAR. 29-30 – Conference: 34<sup>th</sup> Annual Water Law Conference, Austin, TX. Presented by the American Bar Association Section of Environmental, Energy and Resources. Call 1-800-285-2221 or visit [www.americanbar.org](http://www.americanbar.org).

## April

APR. 1-9 – Course: Backflow Prevention Assembly Tester Training and Certification, Venice, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

APR. 2-3 – Course: Backflow Prevention Recertification Exam, Jacksonville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

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](http://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](http://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](http://www.treeo.ufl.edu).

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](http://www.treeo.ufl.edu).

APR. 6 – Course: Hazardous Waste Regulations for Generators, Palm Coast, FL. Presented by the Uni-

versity of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://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](http://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](http://www.treeo.ufl.edu).

APR. 7-8 – Conference: 2016 GMEC Conference, Orlando, FL. Presented by the Geotechnical & Materials Engineers Council. Call (850) 224-7121.

APR. 8 – Course: Brownfield Redevelopment & Golf Course Redevelopment, Fort Myers, FL. Presented by the Florida Chapter of the American Planning Association. Visit [www.floridaplanning.org](http://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](http://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](http://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](http://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](http://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 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

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Apr. 23-24, 2016 - Tampa  
Apr. 29-30, 2016 - Venice

#### Backflow Prevention Assembly Tester Training & Certification

Apr. 1-9, 2016 - Venice  
Apr. 4-8, 2016 - Lake Buena Vista  
Apr. 18-22, 2016 - Destin

#### Advanced Backflow Assembly Tester

Apr. 11-12, 2016 - Gainesville

#### Introduction to Electrical Maintenance

Apr. 18-20, 2016 - Kissimmee

#### Activated Sludge Process Control & Troubleshooting

Apr. 12-14, 2016 - Gainesville

#### DEP SOPs for Water Sampling & Meter Testing

Apr. 26, 2016 - Gainesville

#### Asbestos: Project Design

Apr. 5-7, 2016 - Gainesville

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

Apr. 18-20, 2016 - Gainesville

#### 40-Hour OSHA HAZWOPER Training Course

Apr. 4-8, 2016 - Tallahassee

#### 24-Hour OSHA HAZWOPER Training Course

Apr. 6-8, 2016 - Tallahassee

#### U.S. DOT Hazardous Materials/Waste Transportation

Apr. 6-8, 2016 - Tallahassee

#### Hazardous Waste Regulations for Generators

Apr. 6, 2016 - Palm Coast

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**FEDFILE**

From Page 2

and wildlife that consume those fish. This information comes from the recently released EPA 2010 National Coastal Condition Assessment, a part of the National Aquatic Resource Survey that the agency conducts every five years.

The goal is to advance the science of coastal monitoring and answer critical questions about the condition of waters in the United States.

Since the 2005–2006 exercise, water quality in the country remained unchanged, biological water quality improved 17 percent and sediment quality declined by 22 percent.

Excess phosphorus is the greatest con-

tributor to the poor water quality identified in the latest study. Its sources include sewage and fertilizers in stormwater runoff.

According to the data, selenium is the greatest contributor to the poor ecological fish tissue rating. The increased selenium concentrations are likely due to human activities.

Paradoxically, selenium is an essential trace element necessary for living cells. Chronic exposure to selenium above background levels may adversely affect reproduction and early life stage success in wildlife. Selenium has been characterized as the element with the narrowest concentration difference between sufficient and excess levels.

The EPA conducts NARS in partnership with state water quality agencies and other federal agencies, including the National Oceanic and Atmospheric Administration.

The ratings are based on samples of 1,104 sites in the coastal waters of the U.S. and near-shore waters of the Great Lakes.

The EPA conducts NARS in partnership with state water quality agencies and other federal agencies, including the National Oceanic and Atmospheric Administration.

The ratings are based on samples of 1,104 sites in the coastal waters of the U.S. and near-shore waters of the Great Lakes.

The reviews are the mechanism that FWS uses to provide needed protection to the most imperiled wildlife and plant species.

Under the proposed plan, the agency will place each pending petition for review into one of five priority categories.

Placement will be based on evaluation of available biological data, threats to the species, conservation measures that can address those threats and the existence of any new or developing science that can help inform the listing decision.

The five categories are: "critically imperiled," in need of immediate action; "strong data available," those with existing scientific data supporting a clear decision of status; "new science underway to inform key uncertainties," where research is underway to answer key questions that address uncertainty for a resolution in a reasonable time frame; "conservation opportunities in development or underway," conservation efforts by states, landowners and stakeholders are underway and could reduce the threat of further population decline; and "limited data currently available," where insufficient information on status and threats is available to inform a petition finding.

Under the new methodology, FWS will develop a list of prioritized actions into a National Listing Workplan, share the workplan with states and stakeholders, and post it online. The workplan will be updated annually to reflect new information.

The workplan will include set dates for undertaking status reviews and petition findings. FWS said the new procedure will help it prioritize when it should make decisions on a species' status.

The agency expects the new protocols to strategically prioritize attention to ESA listing petitions and ensure that the most urgent wildlife needs are addressed first.

It also wants to ensure a common sense and defensible path to address all petitions.

The new methodology will give state agencies and partners greater certainty and transparency as they work to develop a strategic workplan to protect endangered species.

In its proposal, FWS noted that prior listings have prevented the extinction of 99 percent of the plant and animal species originally listed as threatened or endangered. Many species have subsequently recovered from endangered status.

The public comment period was open through mid-February. FWS expects to release the final rule by the end of the year.

**Healthy watershed grants.** The EPA will contribute \$3.75 million over six years to the U.S. Endowment for Forestry and Communities Inc. The endowment will match 25 percent to bring the total funding to \$5 million.

The money will fund grants to support

local and demonstration projects to protect healthy watersheds.

Funding per grant is expected to be between \$50,000 and \$150,000.

In addition, the funding may be used to enhance collaborations between stakeholders that benefit from healthy watersheds, including drinking water utilities, hunters and fishermen, and foresters and farmers.

The endowment is a not-for-profit corporation established in 2006 in accordance with the terms of the Softwood Lumber Agreement between the governments of the U.S. and Canada.

The two governments set up the endowment with \$200 million. It is headquartered in Greenville, SC.

Its charge is to work with environmental and land conservation communities to promote healthy watersheds.

Broadly defined, healthy watersheds conserve, enhance or improve aquatic ecosystems; support natural landscapes; and foster watershed processes such as healthy hydrology.

The EPA's funding is intended for projects described as "healthy watershed program development projects and local demonstration/training projects."

There is no minimum or maximum number of projects designated by the EPA in its funding agreement. Proposed projects may be multi-year but they have to be completed within the six-year time frame of the joint agreement between the EPA and the endowment.

Grantees may also obtain cooperative funding for a proposed project from other sources besides the endowment or the EPA. Funds from this cooperative program cannot be used to purchase land or conservation easements.

The endowment is accepting proposals for the 2016 funding year through March 14.

**North Detention Area construction.** On Jan. 7, the Polote Corp. began construction of the North Detention Area in Palm Beach and Broward counties.

The project involves construction of levees and return canals along the east side of the Everglades. The north-south oriented, shallow detention area will store up to two feet of water that will act as a hydraulic barrier between the water in the Everglades and developed land to the east.

It will also serve as a conduit to provide water to two additional water control structures to be built adjacent to Everglades National Park.

In combination, water flowing through Water Conservation Area 3 and two new water detention areas on the east side of WCA 3 and ENP are integral to restoring adequate water levels and flows through the park to Florida Bay, while continuing to provide flood protection to populated areas east of the Everglades.

The North Detention Area is one of three remaining projects to be completed as part of a 20-year, multi-billion-dollar effort to restore water flows and water quality to ENP.

The two remaining components will be funded within the next two years, and the entire project could be in full operation by 2020.

**Nuclear power capacity.** In 2015, the U.S.' 99 nuclear reactors achieved a record 91.9 percent capacity factor. That beat the 2007 prior record of 91.8 percent capacity, according to the Nuclear Energy Institute. Nuclear power provided 797.9 billion kilowatt hours of electricity last year, fifth highest on record.

A year earlier, nuclear energy provided 797.1 billion kilowatt hours generated by 100 reactors operating at 91.7 percent capacity. 2007 was the record year for electricity from nuclear power in the country, when 104 nuclear reactors generated 806.4 billion kilowatt hours.

Nuclear-powered generators provided 19.5 percent of U.S. electricity last year. Nuclear power is an integral tool for lowering total U.S. greenhouse gas emissions by electrical power generating facilities, which are the largest category of CO2 emitters in the U.S.

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# New research helps characterize phosphorus mobility through soils

By ROY LAUGHLIN

Associate Professor Gurpal Toor, with the Environmental Soil Chemistry and Water Quality Group in the Gulf Coast Research and Education Center, Soil and Water Science Department at the University of Florida/IFAS and his colleague, Professor J. T. Sims with the Department of Plant and Soil Sciences at the University of Delaware, recently published research describing the mobilization of phosphorus applied to phosphorus-saturated soils in Delaware and Maryland.

The research further explains the mechanisms of enhanced phosphate washout from agricultural soils saturated with phosphate.

The leaching of phosphate at background of environmental levels is typically limited due to strong soil binding. Agricultural soils and those with high inputs from land spreading of biosolids, for example, often have a much higher phosphate content because soil binding capability is not saturated at environmental phosphate levels.

When agricultural soils are fertilized, phosphate release is often observed to be quite high. The researchers noted that phosphate washout varies by soil type but only a part of that leaching can be explained entirely by phosphate-soil mineral interactions such as binding.

Their research showed that a soil structure that allowed quick water passage and minimal contact with soil that had binding capacity explained the excess leaching.

The researchers measured phosphate release from three different soil types taken from fields.

The soil cores, held in undisturbed lysimeters, were of three types: well-drained Matapeake silt loam, moderately well-drained Woodstown sandy loam and poorly drained Pocomoke sandy loam. The investigators characterized the soil's phosphate saturation using the Mehlich-3 soil test.

Some of the soils had high phosphate saturation because chicken manure had been spread on them, even to levels where no further improvement in crop yields occurred. These were soils, at least in some cases, likely to release added phosphate.

To conduct the experiments, the researchers added water alone to all the lysimeters for eight weeks prior to adding any phosphate fertilizer and then continued fertilizer-water addition for another eight weeks.

The data showed that all three soils leached some phosphorus during the eight weeks of phosphate addition. However, the data showed significant differences in phosphorus leaching among the three soil types.

Matapeake silt loam and Pocomoke sandy loam exhibited higher preferential phosphorus leaching compared to Woodstown sandy loam. This occurred in spite of the fact that the first two had substantial quantities of soil phosphorus-fix-

ing iron, aluminum and calcium.

In the two soils that released phosphorus, the releases were substantial with an average of over six micrograms per liter in the leachate of Matapeake soil lysimeters. All soils, including the Woodstown soil, showed substantial increases in phosphorus in leachates in the final weeks two weeks of the experiment.

The authors said the results showed evidence of the enhancing role of preferential flow pathways acting in concert with the Mehlich-3 phosphate saturation, and could be used to predict risks of phosphate leaching from soils.

To characterize the type of phosphorus leaching from soils, the researchers measured three forms of phosphorus in the leachate: dissolved reactive phosphate, or DRP, largely biochemicals such as phospholipids and nucleotides; dissolved unreacted phosphate, or DUP, biochemicals and inorganic phosphate compounds such as polyphosphates; and total particulate phosphate, or TPP, which includes insoluble phosphates and phosphates absorbed to surfaces of particulates such as mineral humic acid complexes or inositol hexaphosphate.

In most cases, the researchers found that the majority of leachate phosphorus was present as DUP or TPP. This finding indicated that phosphorus in organic and colloidal forms was responsible for the movement of phosphorus through the soils they tested. This interpretation is consistent with research conclusions from similar studies.

Experiments with soil leachates take months to accomplish. Part of the effort was to evaluate the use of Mehlich-3 categorization for phosphate saturation with the experimental results to determine if the much easier and quicker-to-measure Mehlich-3 classification is an accurate substitute.

The researchers concluded that there was a weak but still reasonable correlation between the Mehlich-3 measurement and amount of phosphate lost.

Including direct experimental characterization, preferential flow pathways in subsurface soils significantly improved predictive capability.

In physical terms, open pore space in sandy soils or other flow ways that allow water carrying phosphorus to rapidly pass through the soil before soil minerals or microorganisms have time to sequester it is the primary cause of poor phosphorus retention in saturated soils.

The researchers extended their interpretations of their experiments to discuss how their findings affect risk assessments and other characterizations of phosphate leaching from phosphate-saturated soil on surface water quality.

They suggested that estimates based on soil chemistry alone will not be as accurate as predictions that include "both physical and chemical properties of the whole soil profile."

Although the research was not conducted with Florida soils, it points the way

to managing phosphorus leaching from soil and surface waters in specific ways.

First, agricultural soils that are overly saturated with phosphate are the ones most likely to release it to the shallow water tables predominant in Florida.

Best management practices for fertilizing phosphate-saturated soils can now be tailored more effectively to promote crop yields while simultaneously reducing phosphate leaching.

For the soils tested, manure spreading was done to ensure sufficient nitrogen for crops, which meant phosphate in manure was added in excess of crop needs.

The second conclusion—to base expectations of phosphate retention and soil on both chemical and physical characteristics of the soil—may inform emerging stormwater best management practices such as dispersed water management and urban stormwater park design.

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## DEP plans to issue permits for seismic testing in Gulf, Calhoun counties

By BLANCHE HARDY, PG

In January, the Florida Department of Environmental Protection posted notice of intent to issue permits for seismic testing for oil and gas by Cholla Petroleum of Dallas, TX, on land in Gulf and Calhoun counties.

The seismic testing will be predominantly conducted within an approximately 20-mile stretch of land owned by Neal Land & Timber.

The test area ranges from south of Blountstown to north of Wewahatchka, adjacent to the Apalachicola National Forest and in direct vicinity of the Apalachicola and Chipola rivers and Dead Lakes.

The permit process was delayed briefly in February by a petition filed by Robert Voss, a private citizen from Clarksville, FL,

who challenged the permit on the grounds that it would cause environmental harm and lead to hydraulic fracturing in the future.

DEP subsequently dismissed the challenge, concluding that it failed to meet legal standards and standing. The department gave Voss until Feb. 24 to file an amended complaint.

Apalachicola Riverkeeper Don Tonsmeire is assisting Voss in securing counsel, but is not entering into the complaint at this point.

The potential for geophysical surveys for oil and gas state-wide that may eventually lead to fracking is generating increasing concern among citizens and en-

**SEISMIC**  
Continued on Page 16

## WATER

From Page 1

ing. For springs, it restricts the use of treated wastewater infiltration if its nutrient content will cause exceedances in BMAP nutrient budgets.

Beginning in 2018, the Florida Department of Transportation and the Florida Department of Agriculture and Consumer Services will prepare annual progress reports.

Instructions for the reports are specific and extensive. The annual report must discuss the goals not being met and identify

what the regulatory agencies and state water management districts could do differently to ensure compliance, or explain why the goals cannot be met by any means at their disposal.

The bill mandates new inclusions in Florida's quinquennial Water Resource Development Work Plan. SB 552 now requires a list of proposed water supply projects and who is responsible for them, budgets and financial contributions, expected benefits and prior five-year spending on the watershed or waterbody.

SB 552 also establishes a new category of water supply "pilot projects" and limits each WMD and the DEP to designate only a single project as a water supply pilot project at any one time. There will no longer be multiple concurrent pilot projects within the same district.

Research projects are also endorsed and given specific permit exemption from water quality standards that the research addresses.

### MFLs, BMAPs fast-tracked

SB 522 requires water management districts to complete water quality standards by 2017 for any waterbodies that do not yet have them, using emergency rule-making authority if necessary.

According to Dee Ann Miller, a DEP spokesperson, the department has adopted 392 total maximum daily load standards. Fifty three percent address nutrients, 46 percent set standards for bacteria and one percent limits other contaminants.

That includes a statewide TMDL for mercury, covering about 1,000 water bodies. Of Florida's 418 impaired springs, DEP has set TMDLs for 387 of them.

TMDL standards dovetail with BMAPs. DEP has adopted 24 of those, covering 19,000 square miles of Florida watersheds.

Miller noted that DEP and the WMDs have adopted 27 MFLs for springs since 2011, and had adopted nine in the years 2007 through 2010.

With respect to springs, DEP is in the process of developing BMAPs for all priority springs, previously designated first magnitude springs. In addition, Volusia Blue, Kings Bay/Crystal River, Weeki Wachee, Jackson Blue and the Lower and Middle Suwannee springs are subjects of BMAP development.

In total, the BMAPs under development will cover 1.6 million watershed/springshed acres, or 2,500 square miles, when completed.

Even with progress to date, efforts to establish additional BMAPs—and best management practices to make them work—will get a lot of attention over the new few years.

### Water resources development

On the supply side, the new law requires state agencies to grant consumptive use permits. It allows inter-basin water transfers and that may involve water transfer between water districts.

Implementation of projects, especially to move water from one basin to another, will be expensive. The bill mandates at least 50 percent cost sharing for water projects. But exceptions are liberal.

The Northwest Florida and Suwannee River water management districts are exempt from some cost-share provisions. Communities in specific redevelopment categories may be exempt from cost sharing.

In addition, some projects with broad benefit to the state and involving partners without the means to pay to formula requirements may also be exempt.

Local government officials and utility administrators who support Florida's water supply initiatives make no secret that they expect state support for the expensive projects that are necessary to develop alternative water supplies and expand potable water resources.

SB 552 makes it clear that local utilities will still have to pony up for projects.

On the plus side, however, regional water supply initiatives will get a high priority for state funding. If local utilities want water projects badly enough to cover half their costs, SB 552 indicates that the state is likely to pay its half.

The new law does not impose new water use reporting requirements on permit holders except that users drawing water through an eight-inch pipe will have to report water volume withdrawals to comply with consumptive use permits.

No new reporting requirement are stipulated, so users may be able to continue to report surrogates to water volumes, such as the duration of pumping or the amount of electricity used for pumping.

Any new reporting requirements to be implemented by the WMDs will be imposed when permits are granted or re-

newed. At least for the near future, accurate statewide water consumption data will still not be available to water supply planners and regulators.

### Water quality

SB 552 designates MFLs and BMAPs as enforceable rules for water quality management. It now requires that state regulators *simultaneously* and in a short time frame, adopt MFLs and BMAPs for any waterbodies and springsheds that do not already have them.

Spreading biosolids and septage will be curtailed in 11 designated counties in the Okeechobee watershed and other areas in South Florida as a new strategy to reduce eutrophication in Lake Okeechobee, the Everglades and the tidal waters to which they drain naturally or through flood management efforts.

SB 552 has provisions to charge customers for alternate biosolids disposal. Those charges are to be treated as separate line items on a bill, and not to be considered part of the utilities base rate. Spreading septage and biosolids on springsheds will also be curtailed.

Elsewhere, land spreading of biosolids may continue, but nutrient contributions from the practice must be included in BMAPs where land spreading occurs. Land spreading would be curtailed if it released nutrients above BMAP or TMDL standards.

### Winners

Agricultural interests and real estate development interests are the clear winners in this bill. The Department of Agriculture and Consumer Affairs is responsible for designating best management practices for agriculture, and those should provide a primary benefit to agricultural production according to wording in the bill.

Agricultural interests that follow BMPs in areas where water quality attainment is not occurring cannot be held liable for the impacts of their activities.

Agribusinesses now have the prospects of water on demand because consumptive permits cannot be denied, and Florida will still not require consumption reporting unless the water is withdrawn through an eight-inch pipe, a requirement easily circumvented if users draw from multiple smaller intake pipes.

Residents in the Northwest Florida and the Suwannee River districts are exempt from some requirements of the bill, including cost-sharing requirements for water development projects and other specific requirements.

Real estate development interests will be winners when local utilities apply for consumptive use permits, or are located in areas with regional water supply initiatives.

Not only will those permits be approved, but the state and WMDs will give priority to funding water supply initiatives in designated regional water initiative areas.

Even with the requirement for 50 percent local cost share, regional initiatives will have an advantage.

The legislative requirement for verification of best management practices and monitoring as a substitute for those BMPs gives special interests with access to legislators the opportunity to influence regulation in a way that rational rulemaking was designed to avoid.

Academic researchers, consultants and mission agencies that have wanted fewer restrictions to try something new on a small scale will now have fewer permitting obstacles for ecological research and pilot projects.

Experience will show if having to meet fewer standards will speed up the permit approval process.

### Losers

Conservationists and environmental activists have been disgruntled for months over this water bill. Many see it as a far weaker bill than last year's SB 1576, which passed the Senate but not the House.

In October, 2015, a rewritten water bill was filed simultaneously in both houses, becoming SB 552 and HB 7005. The bills had identical language, and went up for

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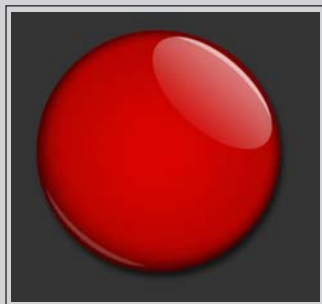
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# FWS' move to downlist manatee protection status sparks debate

By **BLANCHE HARDY, PG**

Among the first actions announced by the U.S. Fish and Wildlife Service in 2016 was a proposal to downlist the West Indian Manatee from "endangered" to "threatened" status under the Endangered Species Act.

FWS credits significant improvements in manatee populations and habitat conditions as well as reductions in direct threats as the basis for the proposed determination.

The proposal to downlist the manatee to "threatened" will not affect federal pro-

tections currently granted by the ESA.

Under ESA, species may be listed as either endangered, a species in danger of extinction throughout all or a significant portion of its range, or threatened, a species likely to become endangered within the foreseeable future.

"The manatee's recovery is incredibly encouraging and a great testament to the conservation actions of many," said Cindy Dohner, the U.S. Fish and Wildlife Service's Southeast regional director.

According to FWS' current data, the range-wide minimum known population of the West Indian Manatee is estimated to

be at least 13,000 with more than 6,300 in Florida.

The initial manatee aerial survey done in 1991 estimated that there were only 1,267 manatees in Florida. FWS reports a 500 percent increase in the species population in the state over the last 25 years.

While the service considers the manatee recovery sufficiently successful to make the classification change, environmental advocates remain unconvinced the timing and conditions are right to downgrade its status.

"The principle threats against the Florida manatee—boat strikes, cold stress, the loss of warm water refuges and red tide/algae blooms—persist, and may worsen in the foreseeable future," said Jacki Lopez, Florida director for the Center for Biological Diversity in St. Petersburg. "FWS does not have a plan to address these threats, and such plans will become even more vital as protections are weakened."

Manatee advocates have cause to be concerned. Opponents of boating restrictions, such as manatee slow-speed and boating exclusion zones, use the increasing manatee counts to support downlisting in hopes that boating and permitting restrictions will be dropped.

Among those weighing in favor of the downlisting is Brevard County Commissioner Curt Smith who proposed that the county support the manatee reclassification and petition FWC to "immediately

begin rulemaking procedures to remove unreasonable speed restrictions throughout the county."

The initial move to reclassify the species was encouraged by a Pacific Legal Foundation petition to FWS on the behalf of Save Crystal River Inc., seeking downlisting of the West Indian manatee based in part on the service's 2007 West Indian Manatee Five-Year Status Review.

Over the course of the efforts to promote manatee recovery, the service designated Crystal River as a manatee refuge, imposing speed restrictions on power boats and establishing manatee sanctuaries where boats are prohibited.

Save Crystal River boaters similarly hope the downlisting will result in the removal of boating restrictions on the river.

Public comments on the service's proposal to downlist the manatee can be made until Apr. 7, 2016.

The service is now requesting information concerning the status of the West Indian Manatee throughout its entire range.

They are seeking comments on the manatee's biology, distribution, abundance, population trends, demographics and genetics; habitat conditions; threats posed by climate change; past and ongoing conservation measures that have been implemented for the species, its habitat or both; threat status and trends within the geographical range; and a wide variety of additional information.

## WATER

From Page 14

vote that way, as House and Senate leadership opposed any and all changes to the bill, even those filed during the floor debate by members of the Senate and House.

The Florida Springs Council was among a number of advocacy groups opposed to the bill.

Bob Palmer, chair of the Legislative Committee for the group, said that while there are a few good provisions and a few bad provisions in the bill's language, "missed opportunities are the basis for FSC's opposition to the bill."

He said flatly that SB 552 does nothing for water conservation. The central strategy of the springs provisions, according to Palmer, is to continue to rely on existing tools such as MFLs and BMAs, but use them more quickly, even when they provide no relief.

"Does any Florida spring show a recovery pathway because of the use of existing MFLs?" he asked.

Palmer said that the state feels that an MFL plan will restore adequate flow to Volusia Blue Springs. Should that occur, and noting the \$135 million price tag, he questioned whether similar efforts are too expensive to be replicated at any other springs.

FSC developed 17 proposed amendments to SB 552, but the bill's sponsors endorsed none of them.

Senator Darren Soto (D-Orlando) offered four of the amendments and Representative Mark Pafford (D-West Palm Beach) offered amendments during debate in the House, but all were voted down.

Those rejected amendments included requirements to begin water-use metering immediately for all consumers permitted for at least 100,000 gallons a day; to fund a study of water-use fees as the best conservation insurance; to require each WMD to establish a sustainable water yield district-wide as an antidote to inaccurate, politically influenced computer models; and to establish a "restoration focus spring."

The final item on the FSC list involved state selection of one spring to develop a credible plan that would restore its flows and low nitrate levels within 15 years.

After SB 552 passed both houses, former Florida Governor and U.S. Senator Bob Graham sent a letter to Gov. Scott asking him to veto the bill.

Graham's criticisms reflected the views of a broad spectrum of Florida's environmental and conservation advocates.

Graham noted that a SB 552 veto would preserve the water management district's ability to deny consumptive use permits when they violate an MFL; prevent inter-basin and inter-district water transfers; preserve the South Florida WMD's Works of the District permitting program that proactively addresses nutrient pollution discharged to waterways; establish standards for cost effectiveness and water conservation for the public-private partnerships endorsed by SB 552; require immediate monitoring of all consumptive use permit water withdrawals; establish TMDLs for nitrogen in the Okeechobee watershed; expedite deadlines for meeting MFL and TMDL pollution limits, reducing them from the 20-year horizon SB 552 establishes; and exempt rulemaking for verification of BMP and monitoring from legislative ratification because it causes unnecessary delays.

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## SEISMIC

From Page 13

vironmental advocates.

"First comes seismic testing. If it's promising, then fracking/acid fracking/acidizing comes next," said Hugh MacMillan, a third generation Floridian and senior researcher on water, energy and climate issues for the advocacy group Food & Water Watch.

The seismic survey, as detailed in DEP records, will include approximately a thousand 40-100 foot deep, four-inch uncased borings installed along six two-dimensional seismic lines of between seven and 17 feet.

The proposed project total survey

length is approximately 56 miles.

The borings will be spaced at 16 points per mile at 330 foot intervals. An explosive charge will be deployed into each borehole and detonated.

The resulting seismic waves will be recorded using surface-deployed geophones spaced at 96 points per mile at 55 foot intervals.

The permit, if issued, will allow four of the seismic lines to directly intersect the Chipola River and Dead Lakes. Two of the lines run immediately parallel the Apalachicola River in part.

DEP's permit will, in conjunction with a separately noticed, proposed department action, authorize Cholla Petroleum to work

tomers' bills.

The plant will also replace older, less efficient coal- and oil-burning plants and reduce air emissions of CO<sub>2</sub>, sulfur, nitrogen and mercury.

Construction is expected to be completed by mid-2019. The work will provide up to 650 jobs and provide an economic benefit of more than \$500 million to the area.

The plant is expected to continue operations for 30 years, generating \$238 million in new tax revenues for Okeechobee County including its school districts and other local taxing authorities.

After construction, about 30 permanent jobs will be created.

in wetlands and to use seismic recording devices on a temporary basis on state-owned submerged lands.

The permit application also includes a map illustrating about fifty known locations of protected species based on Florida Natural Areas Inventory data within the area of the six seismic survey lines. A significant portion of the proposed operation will take place in wetlands.

Should the proposed seismic survey result in installation of petroleum production wells, fracking and other petroleum development practices in such close proximity to both water and ecological resources may be an issue.

"Fracking for oil and gas involves chemical injectants and it brings hydrocarbons to the surface," said MacMillan.

## LANDFILL

From Page 1

by commissioners range from using an existing out-of-county privately owned landfill to developing a waste-to-energy facility.

"There is a solid waste construction permit and we are in the process of receiving a notice of intent to issue for the environmental resources permit," said Rodriguez. "After that we will complete the U.S. Army Corps (of Engineers') permit."

On Jan. 15, the Florida Department of Environmental Protection provided notice

"These hydrocarbons have migrated into aquifers and contaminated water wells."

Current Florida legislation, HB 191, Regulation of Oil and Gas Resources, passed on its third reading on Jan. 27, 2016. The bill preempts all matters relating to the regulation of the exploration, development, production, processing, storage and transportation of oil and gas in the state. It eliminates the ability of local governments to regulate fracking. Similar legislation is proposed on the Senate side in SB 318.

A number of Florida cities and counties have already taken measures to ban fracking within their jurisdictions. The proposed legislation may void those actions.

Environmental advocates are rigorously trying to block the bills, which are supported by the petroleum industry.

of intent to issue a wetlands and storm-water permit for the proposed landfill.

Should the commissioners decide to pursue the current option, affected parties would have 21 days to petition for a hearing after the public notice of the intent to issue the permit is published by the county.

The project would also require the federal wetlands permit from the corps.

Officials with Audubon Florida and Deseret Ranches have been outspoken opponents of the proposed landfill.

Environmental advocates oppose the loss of wetlands and habitat, and have expressed concern about the site's location on the edge of the St. Johns River's flood plain.

The county anticipated the need to compensate for the loss of wetlands and has purchased mitigation credits from the Mary A. Ranch Mitigation Bank in southwestern Brevard.

"We will be setting aside over 800 acres of conservation buffer areas from U.S. 192 that will include enhancements to existing wetlands as well as creation of wetlands," said Rodriguez.

The county would avoid construction in the flood plain, choosing to stay above the 100-year flood plain boundary for development.

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