

# Florida Specifier

Practical Information For Environmental Professionals

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## Changing of the guard 1,13

DEP appointed a water management district executive director as its new secretary, the assistant ED at the district was bumped up to ED and a new administrator was named to head the state's Petroleum Restoration Program.

## USGS water study 6

Nationally, water consumption has declined even as the population continues to increase, according to a new report from the U.S. Geological Survey.

## Tri-state water plan 9

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## PSC ends solar rebates 12

Environmental groups are unhappy with a decision by Florida regulators allowing electric utilities to cut energy efficiency goals and end solar rebates after 2015.

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The city of Madeira Beach is developing an aggressive stormwater and roads program to identify and implement needed infrastructure improvements.

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### Got a story lead?

Got an idea for a story? Like to submit a column for consideration? Fire away. 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 the state. 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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## Agencies partner to conserve water, minimize fertilizer use

By ROY LAUGHLIN

The Suwannee River Water Management District is partnering with two state agencies and the University of Florida's Institute of Food and Agricultural Sciences to develop and promote agricultural practices that conserve water, control nutrient runoff and yield economic benefits to farmers.

The water management district is spearheading a three-year collaborative program to characterize how different irrigation schedules and fertilizer applications influence water savings and nutrient movement through soils and into the water table.

The use of electronic monitoring and computer-aided data collection and analysis will be among the tools developed during the study.

The project includes field demonstrations using soil types specific to this region for corn-peanut crop rotation schedules. These two are the most commonly grown crops in the Suwannee River Watershed.

While corn needs nitrogen fertilizer, peanuts, a legume, do not. Farmers will benefit because the study will show how to use water and fertilizers more efficiently.

**CROPS**  
Continued on Page 14



Photo by Wendy Blondin, AMEC Foster Wheeler

Jeremy Paris with AMEC Foster Wheeler collects a water sample from a canal on Big Pine Key. The sample will be submitted for testing for polymer addition for a dewatering design—part of an organic removal restoration project in the Keys. See story on Page 10.

## Expanding use of reclaim, stormwater and excess surface water under study by DEP

By BLANCHE HARDY, PG

The Florida Department of Environmental Protection is reviewing ways to expand the utilization of reclaimed water, stormwater and excess surface water in Florida.

The study was mandated by Senate Bill 536, approved unanimously by the Florida Legislature during its 2014 session. Efforts by senior staff at DEP and the five water management districts are underway to fulfill the legislative directive.

Actions required include public meetings to gather input on the study and to provide an opportunity for public comments. Public workshops were conducted in each of the five water management districts in October and November 2014.

In addition to the workshops, thousands of people were invited to complete on-line surveys on reclaimed water and stormwater. Over three times the number of expected responses were received—close to 1,000. Many participants completed both the reclaimed water and stormwater surveys.

Public comments were also collected until early December.

"536 teams" under the direction of working team leaders from the water management districts and Florida Department of Transportation have been formed to lead concurrent sub-studies in five areas: reclaimed water, stormwater, excess surface water, storage reservoirs, and aquifer storage and recov-

ery.

Team meetings were scheduled throughout December 2014 and into January 2015.

"The 536 teams that make up the committee are holding routine meetings to work on topic areas and are collecting background information for much of the report," said DEP Deputy Press Secretary Dee Ann Miller. "The major

goal is to identify existing and potential future water sources while soliciting and processing comments received from experts and the public.

"Beginning in early 2015, the working teams will identify impediments to water reuse and begin preparing options

**STUDY**  
Continued on Page 16

## New chief at the helm of DEP

By PRAKASH GANDHI

Florida's top environmental agency has a new name at the top of the organizational chart.

Jonathan P. Steverson has been appointed as secretary of the Florida Department of Environmental Protection.

He replaces Herschel Vinyard Jr. who resigned after four sometimes controversial years as head of the state's environmental agency.

And while Steverson may be a relative unknown to many folks in Central and South Florida, he's a familiar face in the state's Panhandle area having served as executive director of the Northwest Florida Water Management District since 2012 when he replaced Douglas Barr.



Steverson

During Steverson's tenure there, the district made progress in priority areas such as protection of the Apalachicola River and Bay watershed, springs restoration and preservation, and water supply development.

Prior to his time with the district, Steverson served at DEP as special counsel on policy and legislative affairs and acting deputy secretary for water policy and ecosystem restoration.

He also served in the Executive Office of the Governor from 2005 to 2009 in a variety of roles including environmental policy coordinator.

"Florida's natural resources are an important

part of what makes our state the best

**STEVERSON**  
Continued on Page 13

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# EPA seeks applicants for 2015 environmental justice small grants

Staff report

The U.S. Environmental Protection Agency is soliciting applications for its fiscal year 2015 Environmental Justice Small Grants program.

The agency expects to spend a total of \$1.2 million to fund grants of up to \$30,000 per award per two-year project.

In its announcement, EPA said the agency is particularly seeking projects that have a special emphasis on supporting community-based preparedness and resilience efforts (community climate resiliency).

The agency noted that it will prioritize funding so that applicants who have not recently received an EJSG program grant may have a better chance of landing one this year.

The application deadline, originally Dec. 15, 2014, was rescheduled to the later date of Jan. 9, 2015.

Nonprofit groups and tribal communities are eligible to apply for these grants.

Applicants with questions should call Deborah Carter with EPA's Region 4 at (404) 562-9668 or e-mail [carter.deborah@epa.gov](mailto:carter.deborah@epa.gov).

**Seminole Tribe funding.** The Seminole Tribe of Florida's Public Works Department will receive continuing training and technical assistance from the federal government to bolster its climate change resilience and readiness.

EPA funding will provide technical assistance in using the agency's climate resilience evaluation and awareness tool, software that helps users identify assets, threats and adaptation options to help reduce risk from climate change.

In this case, the users are drinking water, wastewater and stormwater utilities.

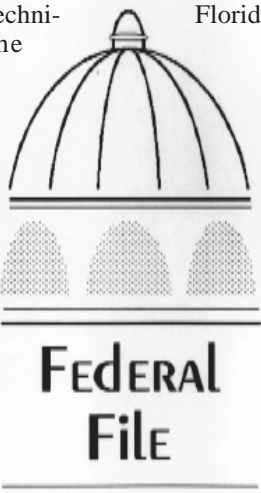
The risks, according to the EPA, specifically include droughts, more intense and frequent storms, flooding, sea level rise and changes in water quality.

In its project description for the Seminole Tribe of Florida, EPA specifically mentioned protecting critical pumping stations from flooding due to heavy rains as an adaptation option that its assistance

might help better characterize.

Total funding for the initiative is \$600,000 and is provided by the EPA Office of Water's Climate Ready Water Utilities initiative.

The Seminole Tribe was the only Florida participant in this program.



**EPA LMOP plan.** The EPA's Landfill Methane Outreach Program released its final report, RE-Powering America's Land initiative.

The report, several years in the making, supports practical and relevant information for both public and private efforts to site alternative energy production facilities on lands that have been historically contaminated, disturbed or may otherwise have limited use potential.

Landfills, in particular, have recently become prime sites for siting photovoltaic installations.

The final draft of Action Plan 2.0 followed the release of first draft in 2014 and solicitation of public input last May.

Revisions in response to public comment reflect perceived needs and opportunities for siting renewable energy facilities on contaminated land, landfills and former mining sites.

More information about the program, a download link for Action Plan 2.0 and other information about the EPA's efforts to repurpose contaminated land for energy facilities is available online at <http://www.epa.gov/oswercpa/>.

**Fertilizer settlement.** The EPA reached a settlement with three subsidiaries of the Potash Corp. of Saskatchewan over alleged violations of the Clean Air Act.

The settlement affects multiple plants in several states including North Carolina, Louisiana and Florida.

In Florida, White Springs Agricultural Chemicals Inc., a PCS subsidiary, will be required to install, upgrade and operate state-of-the-art pollution reduction equipment at four plants. In addition, emission monitors will be installed at eight plants in the three states.

Between this subsidiary and the two others, the settlement may cost PCS up to \$50 million. In addition, the company must pay \$1.3 million in civil penalties.

Louisiana will receive \$350,000 of the \$1.3 million penalty to resolve allegations of violations of Louisiana air-quality laws at a facility in Geismar, LA.

The settlement must receive final approval from the U.S. District Court for the Middle District of Louisiana after a 30-day public comment period.

EPA alleged that PCS made plant modifications that produced more air emissions. The agency did not issue Clean Air Act citations to the company when officials there agreed to negotiate a settlement.

A spokesperson said that PCS spent \$83 million last year for "environmental stewardship" at its Aurora, NC, plant.

The primary goal of the settlement is to reduce sulfur dioxide emissions to air from plants that use sulfuric acid.

The EPA estimated that air pollution reduction measures required by the settlement could reduce harmful air emissions by over 13,000 tons per year. Approximately 12,600 tons of that total will be sulfur dioxide.

In addition, 430 tons of ammonia and 60 tons of nitrogen oxide will also be removed.

The settlement also includes a supplemental environmental project that could cost up to \$4 million to reduce air emissions at the PCS Nitrogen nitric acid plant in Geismar.

The goal of that project is to install equipment to reduce nitrogen oxide and ammonia air emissions.

According to the agency, this is the tenth settlement under EPA's National Acid Manufacturing Plant Initiative and the seventh one involving sulfuric acid plants.

**Proposed ozone standard.** In late November, EPA released a long-anticipated proposal to set both primary and secondary national ambient air quality standards for ozone to within the range of 0.065 to 0.070 parts per billion.

The Federal Register will publish the proposed rule in the coming days, and interested parties will be able to comment for ninety days from the date of publication.

EPA stated that the standard should provide increased protection against vegetation-related effects on public welfare.

The standard derives from the agency's conclusion that "air quality in terms of a three-year average seasonal W126 index value, based on the three consecutive month period within the (ozone) season with the maximum index value, with daily exposures cumulated for the 12-hour period from 8:00 am to 8:00 pm within the range from 13 ppm-hrs to 17 ppm-hrs, would provide the requisite protection against known or anticipated adverse effects to the public welfare."

EPA plans to conduct three public meetings regarding the proposed rule this month.

The proposed standards are tighter than the current standard of 75 ppb, but above the 60 ppb that health advocates have consistently advocated.

The agency's proposal does not rule out adoption of a standard below 65 ppb.

The standard that EPA finally selects will also become the secondary ozone standard to protect environmental resources such as trees and crop plants.

Under the Bush administration, EPA established the current 75 ppb ozone standard.

Then in August, 2011, the agency proposed a lower ozone standard.



However, the White House pulled back that proposal in the face of the 2012 elections and the likelihood of a significant congressional battle.

Environmental activists then files suit seeking a new standard that would comply with the Clean Air Act and won, to the extent that the agency is required to at least evaluate the justification for a new standard and propose one, if appropriate.

The proposed rule is a positive response to the court ordered evaluation and meets the by Dec. 1 deadline.

EPA Administrator Gina McCarthy approved the notice of proposed rule making on Nov. 25.


These new standards still have a long way to go before they go into effect.

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Florida Specifier

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## Soil cleanup complete at Gainesville Superfund site

### Staff report

Beazer East has finished soil cleanup at over 100 residential properties at the Cabot Koppers site in Gainesville. Cleanup also took place at seven commercial sites, four vacant lots and the Genesis Preparatory School.

The effort started in February last year. Soil replacement was completed in October. The entire remediation project was done by November.

The 140-acre contaminated site includes the Koppers area covering 90 acres on the western side of the property and the Cabot Carbon area covering 50 acres on the eastern side.

A wood treating facility operated on the Koppers portion of the site from 1916 until 2009. Cabot Carbon operated a charcoal production facility on the Cabot Carbon portion.

In 1984, the U.S. Environmental Protection Agency listed the site on the Superfund National Priority List.

Future activities at the site include installation of a multi-layer cap over the containment area and treatment of the identified threat contaminants in the four source areas and below the engineered cap.

**Deepwater Horizon research funding.** Two South Florida universities will receive a total of \$37.5 million to continue research on the impacts of the 2010 Deepwater Horizon oil spill.

The disaster—the worst oil spill in U.S. history—killed 11 workers and spewed 200 million gallons of crude oil into the Gulf of Mexico.

The University of Miami Rosenstiel School of Medicine and Atmospheric Science won \$29 million. Nova Southeastern University's Oceanographic Center received \$8.5 million.

The money is part of a \$500 million, 10-year independent research program established by BP after the spill.

The Gulf of Mexico Research Initiative's 20-member board recently awarded \$140 million to 12 research teams including one from the University of South Florida.

Since the spill, BP claims it has spent about \$24 billion for cleanup costs and compensation to businesses damaged by the spill. The company also agreed to pay the U.S. Department of Justice \$4 billion after pleading guilty to manslaughter in the workers' deaths.

In September, a federal judge found the company acted recklessly, exposing it to another \$18 billion in fines under the Clean Water Act.

The goal of the research is not just to understand the impacts of the Deepwater Horizon disaster, but to be able to better respond to the next spill by understanding how oil is likely to spread throughout a body of water.

**Pinellas waste-to-energy.** Pinellas County commissioners approved a nearly 600-page service agreement with Covanta Energy to operate their waste-to-energy facility.

GCS Energy Recovery of Pinellas took over operations at the facility from Veolia Environmental Services in December 2012 after Veolia sold the county's contract.

Veolia was awarded a \$615 million, 17-year contract to renovate and manage the county's facility in January 2007.

The Clerk of the Court's inspector general reviewed bids from Covanta and another qualified bidder, Wheelabrator Technologies Inc.

Covanta submitted a bid of just over \$477 million for the 10-year contract. Wheelabrator's bid was nearly \$537 million.

The contract calls for Covanta to receive a 10 percent share of revenue from the sale of electricity and 50 percent from sales of metals recovered from the waste.

Covanta will also be paid to manage capital projects at the facility.

**Palm Beach recycling revenues.** Palm Beach County residents recycled more

than 87,000 tons of materials that otherwise would have wound up in the landfill, according to the Solid Waste Authority of Palm Beach County.

During that period of time, SWA paid more than \$842,000 to local cities through the municipal revenue sharing program.

Since the authority started the revenue sharing program in 2010, local municipalities have received more than \$7.3 million.

From July through September this year, more than \$217,000 in revenue was distributed to the municipalities.

**St. Pete curbside recycling.** The city of St. Petersburg has launched a curbside recycling program for about 80,000 single-family homes.

The city council approved two contracts for \$6.1 million to buy trucks and 95-gallon barrels to start the residential recycling program next summer.

St. Pete was one of only a few major cities in the state that was not providing a curbside recycling pickup for its residents.

A voluntary program was available for those who sought it out and paid for it.

The new program, which will operate using city sanitation workers, is expected to cost residents \$2.95 a month for pickups every other week.

Officials are hoping that through increased recycling, people will begin to think more about how to reduce the waste stream.

**Gator waste reduction.** The University of Florida is working to reduce waste at its football games.

By the end of the last football season, 78 percent of the waste generated in the stadium was either recycled or composted.

Everything sold inside the stadium can either be recycled or composted, and signs around the stadium direct people to the correct bins to dispose of the waste.

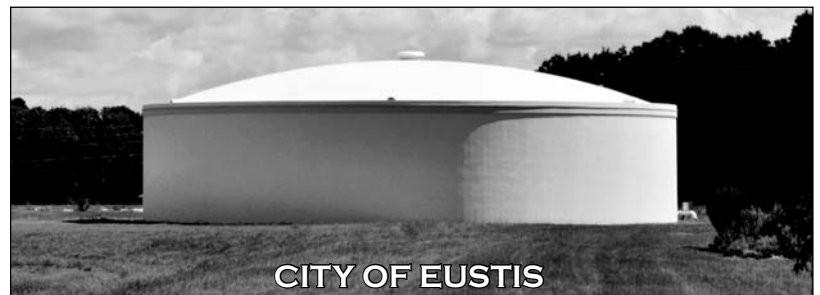
The university's Office of Sustainability partners with the Waste Corp. of America and Watson C&D, who transport the stadium waste to their sites for composting.

The resulting soil amendments are then sold to residents of the local community.

## Florida Notes



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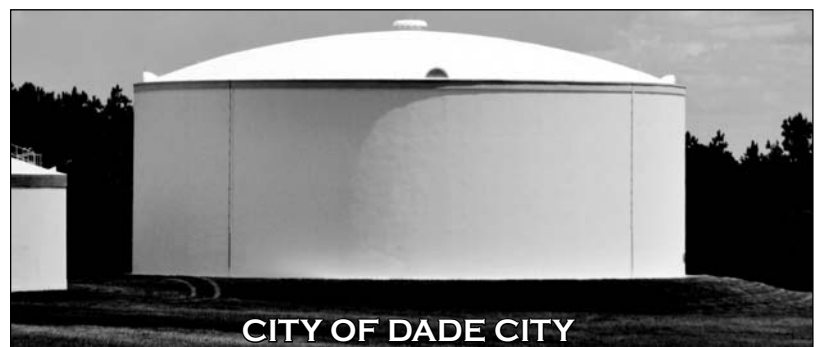


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# SFWMD's innovative Dispersed Water Storage Program doubles capacity

## Staff report

In November, the Florida Department of Environmental Protection awarded the South Florida Water Management District \$3 million to support the district's Dispersed Water Storage Program.

This program establishes additional storage capacity for water on public and private land in South Florida. DEP's grant funds will cover service payments as well as operation and maintenance costs.

Following closely on the heels of DEP's funding grant, the SFWMD Gov-

erning Board approved seven new contracts. The largest area added is more than 35,000 acres of Alico Inc. ranch land in the Caloosahatchee River Watershed of Hendry County. This area could retain up to 92,000 acre-feet of water per year.

The other contracts included Rafter T in Highlands County to store 1,298 acre-feet per year; Babcock Holdings in Charlotte and Lee counties, 1,214 acre feet per year; MacArthur Agro Research Component 1 in Glades County, 620 acre feet per year; MacArthur Agro Research Component 2 in Glades County, 508 acre feet per

year; Bull Hammock Ranch at the border of Martin and St. Lucie counties, 288 acre feet per year; and a nutrient removal contract for 1567 pounds of phosphorus removal annually at Adams and Russakis Ranch along the border of St. Lucie and Okeechobee counties.

Adding the new storage sites more than doubled the water district's storage capacity in its Dispersed Water Storage Program.

Currently, they operate 29 sites, all but one of which are now full of water following the abundant summer and fall rains. They have the potential storage of 93,342 acre feet.

The Alico Inc. property is notable because plans are to outfit it with a pump allowing it to withdraw water from the Caloosahatchee River during high rainfall events and to pump it back into the river during the dry season, if needed.

"The district received \$10 million for the DWS program from the Legislature for FY 2015," said Gabe Margasak, a spokesperson for the district. "The contracts are for 11 years, one year for construction and 10 years of payments, all subject to legislative funding."

The Dispersed Water Storage Program includes a coalition of public agencies, environmental organizations, ranchers and researchers working together to expand the area's wet weather water storage capacity.

Their strategy is to encourage private property owners to retain water on their land rather than drain it, to accept and detain regional runoff—or a combination of the two.

It has been far easier for the district to lease the land than it has been to convince the land owners to sell.

With the addition of the new sites recently placed under contract, the water storage capacity now totals about 189,000 acre-feet.

**Largo wastewater improvements.** Largo City Commissioners approved construction of 14 miles of sanitary sewer mains and the expansion of seven pump stations.

The project involves the repair and upgrade of sewer mains throughout Largo.

Construction will occur along Wilcox Road, Pine Street, Hillsdale Avenue, 16th Avenue SW, 20th Street, 8th Avenue SW, Donegan Road, 142nd Avenue, Fulton Street, Wyatt Street, Highland Avenue and

150th Avenue to the city's wastewater reclamation facility.

Construction should begin early this year and continue for over a year.

The project consists of components throughout the city, but no street or neighborhood is expected to see construction continue for more than several weeks.

In total, about 3000 properties will be affected by the work.

The cost of the project became a contentious issue in the final stages of

commission approval.

The city initially budgeted about \$33 million for the project as a result of estimates made during the recession.

Two qualified contractors submitted bids that were \$6 million apart but still about \$7 million over the original estimate.

City commissioners approved a \$40.3 million contract with provisions for "value engineering and negotiating processes" that may identify opportunities for savings if alternate construction materials and methods can be identified and substituted.

Officials said that changes in materials and engineering could lower construction, but perhaps not to the original \$33 million originally anticipated.

**Eckerd College protests tank construction.** Officials with the city of St. Petersburg announced plans to build a 220-foot-wide concrete tank at the city's Southwest Water Reclamation Facility adjacent to Eckerd College.

The tank is intended to store reject water—treated reclaimed water that does not meet water quality tests and needs to be treated again. Treated water that passes water quality tests may either be used for landscape irrigation or injected into a deep disposal well.

Eckerd college officials are concerned because the open circular tank will be just 20 feet from the college campus. They said that such a large tank adjacent to its campus would make a poor first impression on visitors.

In addition, they believe that the odors wafting across campus would magnify the negative impression given by the tank.

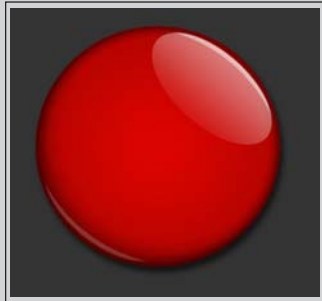
College administration officials suggested that the city build a smaller, covered tank.

St. Petersburg officials are perplexed

**WATCH**  
Continued on Page 5



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# DEP, St. Pete Beach sign consent order for wastewater system overhaul

By PRAKASH GANDHI

State environmental officials want the city of St. Pete Beach to repair and refurbish its aging wastewater system. The work will cost several million dollars to complete.

The Florida Department of Environmental Protection entered into a consent order with the city due to unauthorized wastewater spills that occurred in October and November of 2013.

During a lengthy DEP investigation, officials found that sewage spills continued to occur, mainly during rain storms with heavy winds. The department also determined that the city failed to provide timely notification of the spills.

## WATCH From Page 4

by the opposition. The wastewater treatment facility next to Eckerd College already includes two large water storage tanks similar to the one proposed for construction.

The city plans to include vegetation buffers between the new construction and the adjacent campus.

In the past, campus officials have not made an issue of the wastewater treatment plant or its tanks.

Reducing the tank's size is not an option because the facility's permit from the Florida Department of Environmental Protection requires sufficient storage capacity to handle one day's average water flow, approximately 20 million gallons.

They are concerned that bids submitted by contractors will not be honored if the project is delayed.

Nevertheless, the St. Pete City Council voted for a 30-day delay while the two parties attempt to negotiate a mutually acceptable solution.

**Agricultural cost share funding.** The Northwest Florida Water Management District Governing Board approved nearly \$490,000 to fund eligible agricultural best management practices as part of the Jackson Blue Springs Agricultural Best Management Practice Program.

This year's appropriation follows an expenditure of \$566,000 during last fiscal year.

Last year, 20 agricultural producers in Jackson County received payments. Funding for both years came from the state of Florida's \$100 million expenditure for springs.

The grant program funds cost sharing with agricultural producers for irrigation system improvements, equipment and tools to reduce fertilizer and pesticide use, and for water use efficiency that protects both water quality and quantity.

NFWFMD funds 75 percent of qualifying BMPs to a maximum of \$56,250 per producer. Agricultural producers pay the remaining balance.

Specific projects from the first year of funding included subsurface drip irrigation, variable rate fertilizer applicators, fertilization equipment, irrigation system retrofits and remote zone control for irrigation systems.

Farmers within the Jackson Blue Springs and Merritt's Mill Pond Groundwater Contribution Area are eligible to apply for funding. They must be enrolled in the Florida Department of Agriculture and Consumer Services' Best Management Practice Program and must have a clean compliance record with the district.

Agricultural producers who wish to apply can expedite their application by becoming enrolled or updating their enrollment in the FDACS BMP Program.

**TBW reservoir back in business.** In November, the Florida Department of Environmental Protection issued an operation permit for Tampa Bay Water's refurbished regional reservoir.

The 15.5-billion-gallon CW Bill Young Regional Reservoir is now operational and may be filled to capacity and water withdrawn for use. The man-made reservoir

The consent order includes a long-term plan to implement capital improvements to the city's sewer system within specific timeframes.

The agreement requires the city to submit an operations and maintenance policy within 180 days of the signed consent order. This includes procedures to address unauthorized releases and notification.

By Dec. 31, 2017, the city must implement a fats/oils/grease ordinance to help reduce related spills.

"These are just some of the requirements. But the goal is to reduce the number of unauthorized wastewater spills and improve overall compliance with notification requirements," said DEP spokesperson Ana Gibbs. "Wastewater spills can

had been closed for renovation requirements resulting from flawed construction.

In July, TBW received authorization to fill the facility half way for pilot testing. Now that the permit is in place for full operation, sufficient rainfall is required to fill it completely.

The reservoir is designed to store water during the rainy season and release it for use in typically dry winters and springs.

The authorization to fill could not be timelier. Two unseasonably heavy rainfall events in November caused by stalled cold fronts added three billion gallons to the reservoir, according to Brandon Moore, a spokesperson for Tampa Bay Water. That is 20 percent of the reservoir's capacity, and raised its water level 10 feet.

The reservoir is about two thirds full now, well ahead of the refilling schedule expected from typical rainfall levels.

**Water Star community.** Friendship Village Apartments in Tampa is the first Hillsborough County housing project to receive certification as a Florida Water Star community.

The apartments are owned by Florida Home Partnership, a nonprofit organization that offers affordable housing to low and moderate income home buyers and renters.

The apartment complex received Water Star certification because it installed water-efficient showerheads, low flow commodes and Energy Star dishwashers.

In addition, apartment managers planted drought resistant plants that require less watering and less pesticide use. Less than 20 inches of irrigation water per square foot per year is now budgeted for the landscaping.

Florida Water Star is a voluntary certification program for builders, developers and homeowners. It encourages water efficiency in appliances, plumbing fixtures and landscape irrigation.

pose a threat to the environment and public health."

Spills that are of 1,000 gallons or greater are required to be immediately reported to a toll-free, 24-hour hotline. A spill of less than 1,000 gallons is required to be reported to DEP.

In most cases, wastewater spills can be contained and much of the released volume can be recovered for proper treatment.

"It is important to note that the department's primary compliance efforts are to prevent spills by ensuring facilities are properly constructed, operated and maintained," Gibbs said.

The city's sewer system has 41.5 miles of pipes, 751 manholes and 14 pump stations that collect and send the city's wastewater to St. Petersburg for treatment. Much of the system dates back to before the city was incorporated in 1957.

If the city fails to report future spills within 24 hours of their occurrence, or if spills are caused through the negligence of the city or its contractors, the city could face fines of as much as \$30,000 a day.

The city will spend about \$500,000 in 2014, another \$2.2 million this year and a total of \$6.4 million by 2019 to repair its aging sewer system.

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# USGS study: Water use continues to decline in spite of population growth

By ROY LAUGHLIN

Total U.S. water use in 2010 declined even as the population increased, according to a new report issued by the U.S. Geological Survey.

The decline was the largest five-year change in overall water consumption since 1970.

Over the past 40 years, water use never increased in a five-year interval as much as it decreased in the past five. Withdrawals of both surface water and groundwater declined in similar proportions.

The report begins with a broad brush characterization of overall water use in the country, which averaged 355 billion gallons per day.

Four use categories accounted for most of that: cooling for thermal electric power, 161,000 million gallons per day; irrigation, 115,000 million gallons per day; public supply, 42,000 million gallons per day; and self-supplied industrial, 15,900 million gallons per day.

Public supply, which reflects drinking

water use, declined five percent in 2010, compared to 2005, in spite of population increases. The small decline occurred in spite of more people using public drinking water supplies.

The per capita water consumption of public drinking water, now about 88 gallons per person per day, dropped enough to compensate for the additional users.

The per capita consumption by state, however, varies widely—from a low of about 70 to a high of 168 gallons per person per day.

Thermoelectric power typically uses the most water across the country. Its use fell by 20 percent in 2010 compared to prior years. The poor economy played a role, but more significantly, recirculating cooling water systems, increased cooling efficiency and other water conservation measures taken at thermoelectric plants substantially reduced withdrawals.

The situation in agriculture is similar. The use of spray irrigation and drip irrigation coupled with monitoring continued to substantially improve irrigation efficiency and lowered water withdrawals for irrigation use.

The report tallies water use by state. The top four users were California, Texas, Idaho and Florida.

In California, irrigation dominated the state's water consumption, comprising well more than half of that state's 38,000 million gallon per day water withdrawals.

Texas was a distant second to California, with about 25,000 million gallons per day of water withdrawals.

Florida has an unusual water withdrawal pattern compared to most other states.

Only Illinois and Texas exceeded Florida in the proportion of water with-

drawals used for thermoelectric power. Those states used primarily freshwater for cooling. Florida used seawater.

Florida users withdrew 8,740 million gallons per day of saline water, almost all of it seawater, for thermoelectric power. The remaining 6,300 million gallons per day of Florida's total water withdrawals for power were almost entirely freshwater.

In Florida, irrigation accounted for 2,920 million gallons per day withdrawal. Public supply withdrawals were slightly less at 2,270 million gallons per day.

With respect to public supply, Florida's overall consumption is in third place, behind California and Texas. Florida is tied with New York for the third-place ranking.

Florida obtains almost two thirds of its freshwater for all uses from the ground. Surface fresh water sources are usually the largest supplier nationwide and only a few states rely so heavily on groundwater.

The forty-year trend in water withdrawals is one of stable or declining use. Whether that can continue into the future remains to be seen. The energy sector is the wild card.

In 2010, hydraulic fracturing accounted for a mere one percent of water use within the energy sector.

However, that has changed dramatically over the past five years of increased fracking activity and these numbers are not included in the report's statistics.

In some states, fracking has become a major water consumer. Many activists fear that increased fracking will produce dire environmental consequences, reducing aquifer yields and contaminating groundwater.

The decreased water withdrawals will be greeted by many as progress with environmental resource use. If it can be extended into the future through conservation and technological improvements in the energy and agriculture sector, it will be good news for all.



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## TBW awards water supply grants

Staff report

Tampa Bay Water awarded grants of \$10,000 each to Tampa's Lowry Park Zoo and Keep Tampa Bay Beautiful for its efforts to protect the sources of the region's drinking water supplies.

The grants were presented by the Tampa Bay Water Board of Directors at regular board meeting.

"Through the source water protection grant program, Tampa Bay Water partners with the Tampa Bay community to guard our most precious resource and to ensure that our ecosystems remain healthy and functioning now and into the future," said Matt Jordan, general manager for Tampa Bay Water.

Since 2008, TBW has offered \$20,000 in grants annually to fund projects and events sponsored by local community groups, nonprofit groups, schools and universities that help promote protection of the region's drinking water sources.

"This grant helps Tampa's Lowry Park Zoo share a water conservation success story with almost a million visitors a year," said Craig Pugh, CEO of the zoo. "Source water is a precious resource. This project helps the zoo manage it wisely, which is important because whatever we do in Tampa affects the water we drink."

"Keep Tampa Bay Beautiful believes that protecting water at the source is an important way to ensure the health of humans, ecosystems and economies," said Patricia DePlasco, development & community relations director for KTBB.

To qualify for a grant, applicants provide a plan for a project or event related to source water protection in the area.

The program provides grants of \$2,000 to \$10,000 for community-based activities including river cleanups, stormwater nature walks and educational field trips.

# Naples approves water quality project to assess conditions in stormwater lakes, future trends in bay

By **BLANCHE HARDY, PG**

In November, the Naples City Commission unanimously approved an agreement with Cardno Entrix for \$168,680 to perform water quality sampling at fifteen stormwater lakes and three pump stations throughout the city and to provide a statistical analysis of Naples Bay water quality and biological data.

The project is funded through the city's stormwater budget and includes an option to renew Cardno Entrix's sampling analysis services annually for four years at \$100,000 per year.

The city's Natural Resources Division established a formal water quality sampling program in 2006. The division currently monitors surface estuarine waters in Naples Bay, the Gordon River and Moorings Bay.

Prior to implementing the program, limited water quality assessment was conducted in Naples Bay by the Florida Department of Environmental Protection and Collier County.

The city's monitoring program has been widely successful. Having compiled data for the nine years that DEP recommends before quantifying the quality of a body of water, Naples is at a critical point in moving forward.

"First and foremost, we want to determine if there have been any statistically significant changes in the water quality of Naples Bay over the nine-year period we have been collecting data," said Mike Bauer, PhD, the city's natural resources manager. "If there are positive results, we want to relate them to specific management

activities.

"Over this time period, we have passed a fertilizer ordinance, built a filter marsh, and treated runoff in our stormwater retention ponds with floating islands, aerators and littoral shelf plantings. We have raised (awareness) of the problems associated with stormwater runoff by talking to various groups and residents."

Cardno Entrix's contract with the city contains four primary tasks, according to Bauer. They will be responsible for performing upland water quality sampling at stormwater lakes and pump stations; reviewing all water quality sampling programs and proposing refinements as needed to ensure statistical representation and appropriate use of city resources; analyzing water quality, trawling and seagrass data with statistical models and correlating trends with the implementation of past city projects; and determining pollutant loading of upland stormwater runoff to receiving water bodies.

These activities will allow the firm to fulfill the city's second goal of correlating the results of years of water quality monitoring, comparing water quality to species diversity and numbers in different locations in the bay, said Bauer.

"We believe that less developed areas, areas with mangrove fringes, seagrass beds and oysters will be different than areas with developed shorelines or navigation channels," he said.

The ability to complete robust statistical analyses of the Natural Resources Department's years of accumulated water quality and ecological data was a critical point made to the commission by staff in

their request for approval of the Cardno Entrix contract.

The department hopes to determine if city efforts to improve water quality and restore ecosystems are resulting in trends and relationships that favorably impact the health of the habitats and organisms in the city's natural waters.

The data has already been used to assist DEP in implementing more precise numeric nutrient criteria for Naples Bay, as the city's historical data was more reflective of water quality in the Naples Bay

estuary than the water quality results predicted by DEP's computer models.

Bauer hopes the statistical analyses will help the city improve planning in such areas as where to do future sampling, where to concentrate stormwater cleanup efforts, where best to create oyster reefs and restore seagrasses, and where best to build future stormwater treatment BMPs.

The city expects the first results of the statistical analysis to be available in March this year and the final report to be completed by October.

## List of new Endangered Species Act candidates released

Staff report

The U.S. Fish and Wildlife Service released the Candidate Notice of Review, a yearly status appraisal of plants and animals that are candidates for Endangered Species Act protection.

Twenty-two species from Hawaii and one from Independent Samoa and American Samoa were added to the candidate list, one species was removed, and one has changed in priority from the last review conducted in November 2013.

There are now 146 species recognized by the FWS as candidates for ESA protection.

FWS is now soliciting additional information on these species and others that may warrant ESA protection to assist in preparing listing documents and future revisions or supplements to the Candidate Notice of Review.

Candidate species are plants and animals for which the FWS has enough information on status and threats they face to propose as threatened or endangered, but for which a proposed listing rule is precluded by other, higher priority listing actions.

The annual review and identification of candidate species helps landowners and natural resource managers understand which species need most to be conserved, allowing them to address threats and work to preclude ESA listing.

The 23 species being added to the candidate list include the Ma'oma'o, a large, dusky olive-green honeyeater native to Upolu and Savaii, Independent Samoa, and Tutuila Island, American Samoa, but now only found in small populations on the islands of Savaii and Upolu.

Also being added were 18 Hawaiian flowering plants and four ferns found on one or more of the Hawaiian Islands; all are being negatively affected by nonnative animals and plants.

Although candidate species do not receive ESA protection, FWS works to conserve them and their habitats using several tools: a grants program funds con-

servation projects by private landowners, states and territories, and two voluntary programs engage participants to implement specific actions that remove or reduce the threats to candidate species, which helps stabilize or restore the species and can preclude ESA listing.

All candidate species are assigned a listing priority number based on the magnitude and imminence of the threats they face.

When adding species to the list, FWS addresses species with the highest listing priority first.

The complete notice and list of proposed and candidate species is published in the Federal Register.



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# Real-time measurement platform provides broad area waterbody surveys

By ROY LAUGHLIN

In the past few months, two U.S. Geological Survey research teams have published results of research based on high frequency sampling platforms they developed to measure nutrients and other water quality parameters.

The Mississippi River was, at least in part, the first focus of the research because nutrients from the country's heartland were carried to the Gulf of Mexico by the river causing a large "dead zone" due to eutrophication every summer.

The first study from a research team headed by Brian Pellerin, a research soil scientist with the USGS in Sacramento, CA, used moored instruments to measure nitrogen and other water quality parameters in the Mississippi River at multiple locations.

The moored instruments were capable of making several determinations per hour for a number of days. Pellerin said that water quality at one location has never been measured at that temporal frequency.

The results showed a much higher temporal variability in the Mississippi's water than had been demonstrated by earlier re-

search. It gave more accurate insight into how nitrogen carried by the Mississippi promotes the summer dead zone.

In a second research effort, researchers with the USGS and the Center for Limnology, University of Wisconsin-Madison, led by Dr. John Crawford, a post-doctoral researcher with the USGS' National Research Program, described a different high-frequency sensing platform used to make measurements of water chemistry and nutrient levels.

They used instruments similar to those used by Pellerin's team, but mounted them on a high speed water collecting manifold attached to a boat able to cruise at speeds of up to 35 kilometers per hour.

The results of three measurement exercises in freshwater lakes and a segment of the Upper Mississippi River provide remarkable quantitative characterization of short-term—less than 12 hours—nutrient and water chemistry dynamics in aquatic ecosystems as large as ponds, lakes and river segments.

The researchers used commercially available electrical and optical water chemistry sensors. In the results reported in their recent paper, researchers used sensors that

measured carbon dioxide, conductivity, water temperature, pH, dissolved oxygen, turbidity, fluorescent dissolved organic matter, chlorophyll a fluorescence, phyco-cyanin fluorescence and NO<sub>3</sub>.

Using time stamps generated by data loggers for the separate sensors and GPS data, they created an integrated spatial and temporal data set.

The boat's forward motion drove water through the manifold and through its sensor array. In half a day, high resolution data collection of miles of a river segment or entire lakes or ponds can be completed.

The platform allows for easy integration of multiple sensors and allows for both low-speed and unprecedented high-speed sampling. The collection manifold in its present configuration samples water less than one meter from the surface.

Pellerin said the focus on smart sensors and data loggers came from a White House initiative encouraging the development and use of these electronic devices. The U.S. Environmental Protection Agency has also stepped up to develop and approve methods and reporting for such devices.

The performance of the instrument platform was evaluated through measurements in the three different freshwater ecosystems: a lake, a lake/pond system and a several-mile segment of the Upper Mississippi.

The results provided a detailed, fine-grained picture of water chemistry differences over short distances. The researchers described the results as having an "unexpected high variability in surface water chemistry."

Measurements taken in the Mississippi provided these results.

"Somewhat surprisingly, NO<sub>3</sub> variability in Pool 8 during a single summer day was nearly equivalent to the two-year range observed in the Lower Mississippi River with a similar sensor located at a fixed-station," said Pellerin.

Such measurement capability adds an entirely new dimension to aquatic ecosystem monitoring.

However, the researchers noted that this new technique should not be considered a replacement for fixed sensor installations or long-term sampling programs.

Its specific applications, according to the authors, include sampling temperature and dissolved oxygen during mixing and turnover using depth-profiling buoys, tracking nutrient exchanges between river channels and backwaters in relation to changes in the hydrography, and tracing distinct water plumes in transit.

Sampling results are presented in the

research as color-coded overlays of aerial photos and maps of the sampling locations, making them very easy to understand on an ecosystem level.

For researchers, statistical analysis provides additional insight. The authors discussed the prospects of new statistical analysis protocols that might be applied to a data set with both spatial and time series characteristics.

Crawford's team suggested that the sampling data has broad application, from public outreach, environmental monitoring and management, to fundamental studies of aquatic ecosystem processes in biogeochemistry.

It is another example of how miniaturization of electronics for sensors and communication are changing environmental monitoring more rapidly than at any time in the past.

The USGS did not develop any of the sensors used; they are all commercially available. But the agency did develop the "infrastructure" for mounting the sensors and combining their data transmission, storage and analysis.

The team led by Crawford developed the water collection manifold mounted to the stern of a small boat and developed the GPS and coordinating data protocols.

The Florida Department of Environmental Protection purchased and installed several dozen of these water quality monitoring systems to provide real-time water monitoring. Five of them are installed in the Indian River and seven Florida springs have one or more of them.

An additional 15 springs are slated to receive one or more of the monitoring platforms. The state has committed approximately \$1.7 million dollars to equipment purchase and construction, according to Dee Ann Miller, DEP deputy press secretary.

As new high-frequency sampling is more widely used, how its data yield will change perceptions of nutrient dynamics is a tantalizing question.

Means and dispersion around the mean are the usual descriptive statistics reported. Its impression is like a map printed on a page. With high-frequency sampling, the representation may become more like a topographical map, bringing a new level of detail to ecological, biogeochemical and environmental management studies.

## Miami-Dade names program manager for ocean outfall program

Staff report

The Miami-Dade County Water and Sewer Department's awarded a \$3.3 billion ocean outfall program management contract to CH2M Hill.

The 11-year Ocean Outfall Legislation Program is the culmination of a regulatory mandate by the Florida Legislature to cease all wastewater discharge to the ocean by 2025.


As program manager, CH2M Hill will manage the long-term program that encompasses the design, procurement, construction and commissioning of an estimated 28 capital improvement projects.

The company will oversee all activities necessary to reverse the county's wastewater system flows away from the ocean outfalls and reroute them to a new membrane bioreactor treatment plant.

The plant will be one of the largest of its kind in the world, capable of treating more than 100 million gallons of wastewater each day and injecting the treated water into deep wells.

The OOL Program is one component of the Miami-Dade Water and Sewer Department's comprehensive capital improvement plan for numerous water and wastewater infrastructure projects.

The projects are critical for the county to meet the service needs of its customers, accommodate future growth, as well as comply with federal, state and local regulations.



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# ACF Stakeholders busy on plan seeking solutions to tri-state dispute

By **BLANCHE HARDY, PG**

The Technical Oversight and Coordination Work Group of the Apalachicola-Chattahoochee-Flint Stakeholders Inc. asked their consultants to begin crafting a multi-jurisdictional water management plan immediately preceding an ACF governing board meeting this spring.

ACFS is comprised of a group of stakeholders in the Apalachicola-Chattahoochee-Flint River Basin who became so frustrated with Florida, Georgia and Alabama's 20-year lack of progress—and inability to reach a resolution for the equitable management the basin's waters—that they created a working coalition of stakeholders in 2009 to come up with their own solutions.

They tasked themselves with the mission of developing mutually agreeable water-sharing scenarios that ensure current and long term sustainability while simultaneously balancing economic, ecological and social values.

ACFS has developed a well integrated coalition of working members who've raised in excess of \$1.5 million to collect data to adequately model and provide the information necessary to facilitate creation of a consensus-driven plan.

The diversity of the stakeholders, which includes utilities, local governments, private industries, agricultural in-

terests, the seafood industry and environmental advocacy representatives, assured that the broadest possible spectrum of needs and issues were addressed.

The stakeholders' strategic planning process has prepared them to proceed to the next phase, the creation of a water management plan for the ACF Basin. They have turned to University of Georgia Odum School of Ecology's River Basin Center for assistance.

Laurie Fowler, RBC's co-director and UGA associate dean, has helped ACFS in the past. Fowler organized the ACFS University Collaborative, a consortium of universities with members from all three states initially hired in 2011 to research water management mechanisms.

"The transboundary institute will not replace the states," Fowler said. "It will help the states manage the Apalachicola-Chattahoochee-Flint in times of existing and maybe conflicting uses."

Transboundary water management institutes have been organized to address multi-jurisdictional water issues since the 1960s, including having been created to oversee water management programs on several of the nation's largest lakes and rivers, as well as the Gulf of Mexico. The concept has been successful and has spread internationally.

The United Nations General Assembly adopted Resolution A/RES/63/124 in 2011 encouraging nations to adopt similar ar-

rangements to govern their shared transboundary aquifers.

The world's 263 transboundary lakes and rivers basins cover nearly half of the earth's land surface and, according to UN data, 3,600 transboundary agreements and treaties have already been signed.

Fowler noted that the products of the institute depend on the needs of the states and may include "studies or means of resolving conflict. It totally depends on what the states want to do about oysters, or imperiled species or comprehensive drought planning."

Black & Veatch will draft the group's water management plan for which Georgia Tech, the Georgia Water Resources Institute and Atkins Global will provide data.

ACFS anticipates the draft plan will be complete this summer. The final plan is scheduled to be completed by fall.

The University Collaborative will develop recommendations for a transboundary water management institute to perform supporting activities such as information coordination, conflict resolution and drought plan development.

## New environmental advocacy group initiates cleanup of Hogans Creek

By **ROY LAUGHLIN**

The tentative beginning of an environmental cleanup program for Jacksonville's Hogans Creek is now underway.

The first of several cleanup phases beginning at Confederate Park in downtown Jacksonville was endorsed by the mayor's office, and local environmental activists and residents.

Hogan Creek's waters are frequently so enriched with bacteria that the health department and state Department of Environmental Protection discourage skin contact with it.

Because of bacterial and chemical contamination, DEP closed the creek to fishing.

Its current condition is the legacy of a century of sewage disposal and the release of chemical wastes.

Plans to dredge contaminated sediments from the creek, build fringe wetlands to filter stormwater runoff entering in the future, and take other measures that ensure adequate water quality will take years and will likely occur in phases.

A new environmental advocacy organization, Groundwork Jacksonville, is working to establish a coalition of organizations that includes the mayor's office, the city's Department of Public Works and other departments within city government.

The group will follow a planning document to take corrective action that will bring Hogan Creek's water quality up to recreational use standards.

The key items on their to-do list are to encase or remove contaminated sediment to prevent it from migrating into the creek's waters, and to establish wetland areas adjacent to the creek to act as buffers that would remove future contamination from stormwater runoff.

The project is extremely ambitious. The creek may have to be temporarily rechanneled in order to be able to effectively remove contaminated sediments.

The envisioned project includes both the Hogans Creek watercourse and its watershed. Included is that part of Hogans Creek from Deer Creek to 20th Street on the north side of downtown Jacksonville to the St. Johns River on the south.

The watershed revitalization area, in some places, is bounded on the east side by Interstate 95. The revitalization area in-

cludes 15 brownfield sites, as well as extensive park land bounding Hogans Creek closer to the downtown area.

The first project beginning at Confederate Park is funded primarily through a grant to Groundwork Jacksonville, an independent nonprofit group and new local chapter of Groundwork USA.

Funded by the National Park Service, Groundwork USA works to revitalize neighborhoods and transform community liabilities into community assets.

Restoring abandoned and neglected parks around the country is one focus of the group.

Park renovations will be completed through an \$80,000 grant from the National Park Service and Groundwork USA for startup and technical assistance.

**CREEK**  
Continued on Page 15



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# Implementation of Florida Keys canal water quality improvement plan will benefit near-shore waters

By ROY LAUGHLIN

Monroe County and municipalities in the Florida Keys are gaining substantial traction on a number of projects aimed at improving near-shore water quality by cleaning up the water in canals.

The village of Islamorada may have the distinction of being the first to initiate projects to address the widespread problem of poor water quality in near-shore canals, but Monroe County is not far behind on three other projects.

Poor near-shore water quality is one of several identified problems; addressing poor water quality in approximate 500 canals in the Keys is the focus.

The impetus to improve canal water is associated with the goals of the Florida Keys National Marine Sanctuary and its Water Quality Steering Committee and subcommittee on canals.

Rhonda Haag, director of Monroe County's Sustainability Program, said the county has assisted the canal water improvement initiative in two ways.

First, the county developed a list of 502 canals—virtually all the canals in the county.

Staff characterized the water quality in

each canal and for those needing remediation, suggested one or two corrective methods be applied.

The methods considered are based on five methods identified by subcommittees of the National Marine Sanctuary advisory boards.

Its second contributing action was to work with permitting agencies on the three projects in Monroe County that have been funded and will begin in January and February.

In the permitting process, county staff worked with state and federal regulatory agencies to develop a set of guidelines that private, county and municipal project managers may follow to make the permitting process more efficient and

less time consuming.

As of mid-December, the Monroe County Board of County Commissioners approved \$5 million to fund vacuum removal of muck in two Big Pine Key canals and infilling without muck removal in a third canal on Key Largo.

The county will soon release six solicitations for bids on work scheduled to begin in January and February, and be completed in six months.

The county is now at work documenting current water quality levels before the demonstration project begins and will continue monitoring for two years after the

remediation work is completed. "We will evaluate the improvement in

## Islamorada Canal project leads the way

Staff report

The village of Islamorada is at the vanguard of an initiative to improve canal waters in the Florida Keys.

In the past few months, it funded and completed an \$80,000 demonstration project in two residential neighborhood canals at Treasure Harbor.

They set up a newly designed bubble curtain barrier to prevent algae from drifting in the canals and improve oxygen levels in the water.

The bubble curtain system in-

**CANALS**  
Continued on Page 16



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water quality (after the projects are completed) in terms of water quality parameters," said Haag, in order to determine what improved and by how much.

Dissolved oxygen, turbidity and nitrogen are the water quality parameters of special interest.

The U.S. Environmental Protection Agency provided funding to Florida International University to monitor water quality and other post-project monitoring work in both the Islamorada and Monroe County projects.

The three county demonstration projects are seen as the beginning of a multi-million dollar, long-term effort.

Newly elected State Representative Holly Raschein, R-Monroe County, has filed a bill to authorize \$400 million over 20 years to address water quality issues in the Keys.

In its December 2014 state legislative agenda, Monroe County said it intends to seek more money to fund wastewater construction.

The 2009 Mayfield grant authorized up to \$200 million for wastewater work and, according to the Monroe County's report, the county has less than \$100 million remaining in planned wastewater projects.

The county has identified this funding as a possible source for canal water quality improvement.

Canals have been identified as a source of poor water quality since Dr. Brian LaPointe, a research professor at Florida Atlantic University's Harbor Branch Oceanographic Institution, made canal water quality measurements in the mid-1980s.

Since then, the issue has languished but never went away. Now that wastewater treatment projects are being completed, canals are at the top of the priority list for water quality.

Haag said that progress so far with Monroe County's efforts to improve water quality in the Keys has come through cooperation with federal, state and county programs and officials.

"Without their cooperation and funding, we would not have had the success we've had," she said.

This may be the year, finally, when both the political will and project funding come together at the same time to end a decades-old water quality problem in canals of the Florida Keys.

## Porous pavement will cut pollutant loading to IRL

By PRAKASH GANDHI

The problem-plagued Indian River Lagoon will get some level of relief from a new paving project in Melbourne. Construction has begun on replacing a parking lot with a porous paver system believed to be the first of its kind in Brevard County and one of only a few in the state.

The project's goal is to divert the flow of stormwater away from the lagoon, which struggled with pollution for years.

"We have an opportunity to improve water quality that is very close to the lagoon, pave an unpaved parking lot and eliminate sediments from entering the lagoon," said Jenni Lamb, PE, Melbourne's city engineer. "We are always looking for ways to improve water quality in the lagoon."

The new stormwater filtration system is part of a broader effort to improve historic Eau Gallie and reduce pollution entering the lagoon.

Construction on the \$387,565 project started in October and should be completed in January, Lamb said.

The new parking lot surface will be concrete block pavers, linked into mats. An internal storage chamber and larger gravel layer beneath it will catch sediments.

**PAVEMENT**  
Continued on Page 11

# Calendar

## January

JAN. 7-9 – Symposium: Association of Climate Change Officers' 4th Annual Defense, National Security & Climate Change Symposium, Washington, DC. Visit [www.climatesecurity.us](http://www.climatesecurity.us).

JAN. 9 – Course: Backflow Prevention Recertification Review, Fort Myers, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

JAN. 10 – Course: Backflow Prevention Recertification Review, 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).

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JAN. 12-14 – 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).

JAN. 12-15 – Conference: 8th International Conference on Remediation and Management of Contaminated Sediments, New Orleans, LA. Presented by Battelle. Visit [battelle.org/media/conferences/sedimentscon](http://battelle.org/media/conferences/sedimentscon).

JAN. 13-14 – Conference: P2- Increase Profits Reduce Pollution Conference, Cincinnati, OH. Presented by the Air & Waste Management Association. Call 1-800-270-3444 or visit [www.awma.org](http://www.awma.org).

JAN. 13-16 – Course: Wastewater Class C Certification Review, 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).

### PAVEMENT From on Page 10

As gaps between the blocks get clogged, workers can vacuum or blow out the debris. The system is designed to be removed for cleaning, if necessary, then reinstalled using the original materials.

City officials estimate the new filtration system will capture three inches of rain over a 1.4-acre area that includes the parking lot, an alley and a few buildings. That will cut pollution entering the lagoon from the site by 95 percent.

The project will reduce the current 544 pounds of solids that runoff annually to 27 pounds, and the 10 pounds of nitrogen to a half-pound. It will also cut the 26 pounds of yearly phosphorus runoff to about one-tenth of a pound.

The project is funded by a grant from the Florida Department of Environmental Protection and money from the city's stormwater utility fund.

Lamb said that city officials are looking at other lots as possible sites for additional projects.

"If this works well for us, we may use the paver system at some of our other parking lots," she said.

## Florida Specifier

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JAN. 14 – Course: Understanding Hazardous Waste Regulations in Solid Waste Operations and Recycling, 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).

JAN. 16-24 – 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).

JAN. 19-21 – Conference: International Low Impact Development Conference 2015, Houston, TX. Presented by the American Society of Civil Engineers. Call 1-800-548-2772 or visit [www.asce.org](http://www.asce.org).

JAN. 20-22 – Course: Managing Collection Systems Training Course, Washington, DC. Presented by the Solid Waste Association of North America. Call 1-800-467-9262 or visit [www.swana.org](http://www.swana.org).

JAN. 23-24 – Conference: The Stewardship Network: 2015 Science, Practice & Art of Restoring Ecosystems Conference, East Lansing MI. Presented by the Association of State Wetlands Managers. Call (207) 892-3399 or visit [www.aswm.org](http://www.aswm.org).

JAN. 24 – Meeting: Quarterly Membership Meeting of the Florida Ground Water Association, Fort Walton Beach, FL. Call (850) 205-5641 or visit [www.fgwa.org](http://www.fgwa.org).

JAN. 27 – Course: Refresher Training Course for Experienced Solid Waste Operators – 8 Hour, 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).

JAN. 27 – Course: Refresher Training Course for Experienced Solid Waste Operators – 4 Hour, Jacksonville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570.

JAN. 27-28 – Course: Initial Training Course for Transfer Station Operators and Material Recovery Facilities – 16 Hour, 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).

JAN. 27-28 – Course: Refresher Training Course for Experienced Solid Waste Operators – 16 Hour – 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).

JAN. 27-29 – Course: Initial Training Course for Landfill Operators and C&D Sites – 24 Hour, 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).

JAN. 27-29 – Course: Initial Training for Operators of Landfills and Waste Processing Facilities, 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).

JAN. 27-29 – Course: Chlorine First Responder Technician Level 24 Hour Introduction, 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).

JAN. 30-FEB. 7 – Course: Backflow Prevention Assembly Tester Training and Certification, Fort Myers, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit [www.treeo.ufl.edu](http://www.treeo.ufl.edu).

## February

FEB. 2-4 – Course: Asbestos: Inspector – 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).

FEB. 2-4 – Course: Train the Trainer: How to Design & Deliver Effective 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).

FEB. 4-5 – Seminar: Winter Water Seminar, Tallahassee, FL. Presented by the Florida Engineering Society. Call (850) 224-7121 or visit [www.fleng.org](http://www.fleng.org).

FEB. 5-6 – Course: Pumping Systems Operation and 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).

FEB. 5 – Course: Asbestos Refresher: Worker – Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570.

FEB. 5-6 – Course: Asbestos: Management Planner – Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570.

FEB. 8-10 – Conference: Winter Waste Conference 2015, Sand Key, FL. Presented by the Florida Chapter of the Solid Waste Association of North America. Call (727) 940-3397 or visit [www.swanafl.org](http://www.swanafl.org).

FEB. 9-13 – Course: Backflow Prevention Assembly Tester Training and Certification – Lake Buena Vista, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570.

FEB. 10-11 – Course: Sequencing Batch Reactor Operation, Make it Work for You – 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).

FEB. 12 – Course: Backflow Prevention Recertification Review, 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).

FEB. 12 – Workshop: Air Quality Workshop: Taking Care of Odor and Corrosion on Both Sides of the Fence, Tallahassee, FL. Presented by the Air Quality Committee of the Florida Water Environment Association. Contact Larry Hickey, FWEA Air Quality Committee Chair, at (352) 237-1869.

FEB. 12 – Seminar: Expanding the Reuse Pie: Experiences with Supplementation, Storage, Integration, Potable Reuse, Innovative Treatment, Expansion, and More, Orlando, FL. Presented by the Florida Water Environment Association. Call (407) 574-3318 or visit [www.fwea.org](http://www.fwea.org).

FEB. 13 – Course: Backflow Prevention Recertification Exam, 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).

FEB. 13-14 – Course: Backflow Prevention Assembly Repair and Maintenance Training and Certification – Venice, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570.

FEB. 16-19 – Conference: 2015 Gulf of Mexico Oil Spill and Ecosystem Science Conference, Houston, TX. Sponsors include the U.S. Geological Survey, Gulf of Mexico Research Initiative, National Academy of Sciences and others. Call (228) 215-3597.

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# PSC decision to end energy efficiency programs, solar rebates irks activists

By PRAKASH GANDHI

Environmental groups are unhappy with a move by Florida regulators to permit electric utilities to cut energy efficiency goals and end solar rebates to customers after 2015.

The Florida Public Service Commission recently voted 3-2 to approve staff recommendations that backed proposals from the utilities to eliminate demand-side management programs over the next five years.

Those proposals include rebates for homeowners to install solar panels on their roofs.

The move has been widely criticized by environmental activists who believe that conservation and renewable energy can reduce the need to build new power plants.

"Florida already ranks in the bottom half of the nation for energy efficiency and now will fall further behind, costing families and businesses in the process," said Kelly Martin, senior representative in Florida for the Sierra Club.

The PSC voted to allow a pilot program for solar power to expire at the end of 2015. But they said they intend to convene a workshop this year on finding other ways to make solar power more available to Floridians.

The commission's decision was attacked by organizations including the Southern Alliance for Clean Energy, which said its goal is to provide responsible energy choices and ensure clean, safe and healthy communities throughout the Southeast U.S.

"The PSC's abdication of its responsibility as stewards for energy consumers

means fewer opportunities for Florida's families and businesses to participate in utility programs that save customers money," said Jennifer Rennicks, a spokesperson for the group.

She said the proposed rollbacks will hit lower-income Floridians the hardest as they often don't have the information or the financial resources to benefit from the utilities' energy efficiency programs.

"The goals approved by the commission are stunning rollbacks compared to the goals set by the PSC in 2009," Rennicks said.

During the proceeding before the commission, the Southern Alliance showed that higher levels of energy efficiency cost less than building new, more costly power plants.

Instead of siding with customers, the PSC supported monopoly utility shareholders, Rennicks said.

Building new power plants will the earn the power companies more profits, while leaving fewer opportunities for customers to lower energy use and save money on bills, she said.

"The commission did not set goals for promoting renewable energy, such as roof-

top solar, even though Florida law requires them to do so" she said.

Michael Regan, senior director for clean energy at the Environmental Defense Fund, said the solar industry should be booming in the Sunshine State. But instead, Florida is now taking a step further backward.

"Florida uses more electricity than most other states," Regan said. "Including more solar power in Florida's energy mix could help the state meet its rising energy needs while reducing harmful pollution and creating jobs at the same time."


But the power utilities, including Florida Power & Light, said that rebates for solar installations on homes are not cost-effective because all ratepayers contribute to a program that gives millions of dollars yearly to just hundreds of the state's homeowners.

Many solar advocates prefer programs encouraging customers to install their own solar equipment, and buy or sell energy to utilities as needed. But utilities said it is unfair they be required to provide backup energy to homes with solar, unless they receive some payment to cover the costs of that backup.

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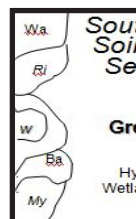
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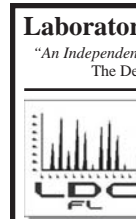
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## Research chemists discover method of catalytic conversion of biomass to fuel

By ROY LAUGHLIN

A group of university research chemists in Belgium recently described a method of catalyzed conversion of cellulose to short-chain alkanes, primarily hexane.

The researchers performed the reaction in a single batch using a two-phase reactor.

One phase in the reactor is aqueous and includes a tungstosilicic acid catalyst responsible for cellulose hydrolysis and dehydration.

Hydrocarbon products of cellulose conversion in the aqueous phase partition into an overlying dodecane phase containing a "carbon-supported ruthenium catalyst," Ru/C, which completes hydrogenation to yield alkanes.

The reaction occurs at temperatures below 220°C, under hydrogen at 5 mega-pascals. The batch conversion requires approximately five hours.

Researchers reported that fresh feedstock could be introduced through several batch processes as the hydrocarbons produced accumulated in the organic layer. After several batch runs, the catalyst has to be replaced to ensure the highest conversion efficiency.

Researchers reported two possible reaction pathways yielding alkanes in the reactor. The most effective one occurs via 5-hydroxymethylfurfural. A less desirable pathway occurs through a sorbitol intermediate.

The researchers reported that their conversion process could be fine tuned to produce more HMF and thus more alkanes.

Fine-tuning includes gradual heating of the reactor, modification of the Ru/C catalyst to favor the HMF pathway, and operation of their two-phasic reaction system to optimize partitioning of intermediates.

In laboratory experiments with cellulose alone, the highest alkane yields were 82 percent, primarily *n*-hexane and *n*-pentane.

Some char resulted but the reaction could be timed and the heating rate adjusted so that a substantial portion of the side products were alcohols that remained soluble in water.

Those alcohols could have commercial value, along with the hexanes and pentanes that were the dominant products by mass.

In separate reactor runs, the research team processed sawdust from unspecified soft wood trees. Cellulose in sawdust also yielded the expected mixture of five and six carbon alkanes, at a 60 percent yield. This percentage refers to the percent conversion of cellulose that was in wood.

Professor Bert Sels, Center for Surface

Chemistry and Catalysis at Catholic University of Leuven in Belgium, said that the remaining 40 percent of the cellulose was converted to alcohols, primarily hexanols and sorbitol, that remained in the aqueous phase.

Although lower than the 82 percent conversion observed after a reactor run with refined cellulose alone, the researchers described conversion of cellulose in sawdust as "respectable."

Sels, noting the widespread availability of cellulose from wood and crop plants, described the researchers' "green gasoline" as both a potential additive fuel and a source of feedstock for plastics syntheses.

He noted that in areas such as Europe with limited oil resources and few suitable fracking sites, cellulose-derived hydrocarbons could become an important alternative source.

This new method is seen as an advance because it produces comparatively high yields of hexanes, requires minimal pretreatment processing of biomass and uses only one reactor.

In addition, its commercially-available catalysts are effective over several reaction cycles and, of the other reactants, only hydrogen is an expensive reagent.

Will this new synthesis be a viable competitor of ethanol blends of motor fuel? So far, a successful process to economically produce cellulosic ethanol from crop biomass has remained "just a year from success" for nearly a decade.

If this catalyzed batch process to produce alkanes can be scaled up in a successful full production plant operation, it may very well be a game changer in the production of liquid fuels from plant biomass.

## Biomass waste to chemical products

Staff report

A new catalytic process is able to convert what was once considered biomass waste into lucrative chemical products that can be used in fragrances, flavorings or to create high-octane fuel for race cars and jets.

A team of researchers from Purdue University's Center for Direct Catalytic Conversion of Biomass to Biofuels has developed a process that uses a chemical catalyst and heat to spur reactions that convert lignin into valuable chemical commodities.

Lignin is a tough and highly complex molecule that gives the plant cell wall its rigid structure.

# NWFWMD Governing Board appoints Cyphers as new executive director

## Staff report

The Northwest Florida Water Management District's Governing Board appointed Brett Cyphers as executive director.

Cyphers has served as the assistant executive director since June 2012, and replaces Jon Steverson, who was recently

appointed to serve as secretary of the Florida Department of Environmental Protection.

As assistant executive director at the district, Cyphers lead budget and operational reform efforts, resulting in increased transparency and accountability and the development of a fiscal approach that dedi-

cates more taxpayer funds to projects with the most direct benefit to the natural resources and communities of Northwest Florida.

Cyphers has worked to implement projects and programs vital to the restoration and protection of priority waterbodies, as well as the region's springs.

During that time, the district has expanded its efforts to support local governments and utilities as they work to ensure a clean and reliable water supply to communities through a Water Supply Development Grant Program that has awarded nearly \$18 million in grant funding over the last two years.

Prior to Cyphers' appointment at the district, he oversaw water management district budget development at the Florida Department of Environmental Protection.

He has also served Floridians by working on water and environmental policy issues at the Executive Office of the Governor, Florida Senate and House of Representatives, and the Southwest Florida Water Management District.

Cyphers is a veteran of the U.S. Army and Florida National Guard and received his bachelor of science degree in history and political science from Florida State University.



Cyphers

## Pickett takes over as administrator of DEP's Petroleum Restoration Program

By ROY LAUGHLIN

Diane Pickett, PG, a longtime member of DEP's technical staff and more recently an assistant program administrator, was named as the new administrator of the Florida Department of Environmental Protection's Petroleum Restoration Program, effective Jan. 2.

Pickett can be broadly characterized as a strategic efficiency expert. During much of her career, she has "recognized inefficiencies and inconsistencies in programs and processes and then redesigned a more streamlined method to better utilize staff and other resources," according to DEP Press Secretary Tiffany Cowie.

Pickett's career has alternated between the public and private sectors. Her first professional positions included jobs with Mobil Oil and Amoco Oil.

Her public sector experience began in the DEP's Bureau of Restoration, as the petroleum program was then known.

She moved to DEP's Groundwater Section in 1989 to manage the Bluebelt Commission, which evaluated the use of tax incentives to maintain the function of privately owned high aquifer recharge lands.

From 1993-1997, Pickett returned to work in private industry where she served as chief geologist for Brown and Root's Southeast U.S. Region office in Tallahassee. She managed the firm's office and, in that role, focused on streamlining site management procedures, and contract oversight and reimbursement.

In 1997, she returned to DEP as a pro-

fessional geologist for one of the cleanup teams in DEP's petroleum cleanup program, now the Petroleum Restoration Program.

Since 1997, she has focused on technical and administrative projects. She restructured implementation methods for streamlined assessments, template site assessment reports and event-based invoicing.

In addition, she designed and implemented site characterization screening and the Low-Scored Site Initiative program, and authored technical policy documents on sampling, drilling and field methods to promote program consistency.

Administratively, she served as chief geologist and assistant program administrator responsible for devising preapproval for competitive procurement.

Pickett received her bachelor's degree in geological science from Michigan State University and her master's degree in the same field from Florida State University.

She is a registered professional geologist.

Perhaps most important to environmental professionals involved in the state's Petroleum Restoration Program is that Pickett has been in PRP's inner circle over these past two years as DEP reorganized its petroleum cleanup program.

Her experience with the details of contract management, many contractors hope, will give her the needed insight into resolving many of the glitches in the new procedures and protocols that have been a source of frustration for program contractors and their subs.



Pickett

veteran environmental attorney Bill Preston, who closely watches the regulatory and legislative developments that impact the state's environment.

"He is very experienced and he seems to have a lot of energy and a lot of good ideas," Preston said. "I think his appointment is an indication that the direction set by Herschel Vinyard and the current administration will likely continue without a whole lot of upheaval or change."

Under Vinyard's leadership, the agency has made progress, Preston said. "The department's staff is a nice combination of experience, expertise and some new blood that has brought some stability to the programs," he said.

One of the biggest criticisms of Vinyard was that he was soft on polluters, a claim strongly disputed by the agency. Those charges have been led by the advocacy organization Public Employees for Environmental Responsibility.

"Herschel Vinyard's tenure was disastrous," said Florida PEER Director Jerry Phillips, himself a former DEP attorney. "That's the only word to describe a period when you have an 80 percent drop in enforcement coupled with a streamlining of the permitting process. We have not seen any positive results in the environmental field."

Under Vinyard, the agency became simply a department that issued permits, but did not enforce them, Phillips said.

"I don't know much about Steverson. But I hope he stops this downhill slide in enforcement and allows the compliance and enforcement employees to do their jobs," Phillips added.

Steverson holds a law degree and received a bachelor's of science degree in geology from Florida State University.

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# Madeira Beach planning extensive improvements to stormwater infrastructure

By **BLANCHE HARDY, PG**

The city of Madeira Beach is developing an aggressive stormwater and roads program to identify needed improvements.

During a fall workshop, the city com-

mission considered part of the plan including \$2.3 million in improvements to the stormwater control system in the upcoming fiscal year.

The Southwest Florida Water Management District is anticipated to provide funding during this phase of improvements

with a \$1.6 million grant through 2015.

Deuel & Associates is acting as the city's engineer for the stormwater/roadway system survey and implementation of the proposed \$2.3 million upgrade.

"The Boca Ciega Drive Stormwater Best Management Practices project is currently in the data acquisition stage and preliminary design and is approaching the 30 percent milestone," said Christopher Chin, an engineer with Deuel. "The project involves roadway, drainage and TMDL water quality improvements for 131st Avenue E., through 135th Avenue E., 1st Street E. to 4th Street E., Boca Ciega Avenue and Boca Ciega Drive. The total area that will be serviced is 48.10 acres of residential single family homes and a few commercial sites."

According to Deuel, additional grants will likely be pursued to aid in funding continued stormwater upgrades in future years.

Because the evaluation is expected to identify both short and long term needs, the city may apply for financial assistance for qualifying projects in each of the

district's funding cycles until the \$22 million in potential work is complete.

Madeira Beach has taken a methodical approach to implementing improvements. As such, the Boca Ciega Drive improvements are the immediate highlight.

"The Boca Ciega Drive Stormwater BMP project was approved for \$1.2 million grant funding from SWFWMD," said Chin. "The total project cost is estimated to be \$2.4 million. Improvements include upgraded and new conveyance systems to alleviate flooding caused by stormwater runoff that include new piping, inlets, pervious concrete and baffle boxes."

In addition, pervious concrete and baffle boxes will provide water quality benefits that will reduce the amount of total suspended solids and nutrients that make their way into Boca Ciega Bay.

The Boca Ciega Drive improvements are expected to be completed in 2015.

To assist in funding, the city is also re-evaluating its stormwater fee based on the

**MAD BEACH**  
Continued on Page 16

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## Force from feces: Researchers seek to convert wastes to water, methane

By **ROY LAUGHLIN**

Human food and fecal waste may become a source of methane and water to power rockets in space, a University of Florida scientist believes.

The National Aeronautics and Space Administration is funding his research to turn the idea into a useful technology.

Professor Pratap Pullammanappallil, a professor of agricultural and biological engineering at the University of Florida, along with graduate student Abhishek Dhoble are working to develop a NASA-friendly technology to convert packaging, food waste and feces to methane and water through anaerobic fermentation.

Methane produced by fermentation is an established and widely used process on earth, and not necessarily high tech.

Methane is extensively "mined" from landfills for either direct electricity generation, or for addition to natural gas pipelines.

The system envisioned by Pullammanappallil and Dhoble will be much more sophisticated than the opportunistic dependence on microbial decomposition in a landfill.

In addition to methane, decaying mi-

crobes will release water from the food and feces. That water can be split into hydrogen and oxygen.

The oxygen can be used as a backup supply for respiration by astronauts. Respired CO2 and the hydrogen can be used to synthesize additional methane.

The biomass to be fermented to methane and water begins as cargo on the outgoing flight. If waste can be used as return fuel, it will lessen overall cargo weight.

The fermentation will increase the utilization efficiency of every pound of material carried by the first interplanetary space craft.

The researchers said that the amount of methane produced could fuel the return from the moon of a rocket carrying astronauts. But the technology provides additional operational benefits besides propulsion.

Space flight beyond Earth's orbit is still years into the future, but NASA is again in a spacecraft development and testing phase.

In early December, it tested an Orion rocket that could carry humans to the moon or Mars. NASA is currently planning to build an inhabited facility on the moon's surface within the next decade.

**CROPS**  
From Page 1

The primary research component of the study will be the establishment of 72 test plots at the UF-IFAS Suwannee Valley Agricultural Extension Center.

Each 20 by 10 foot experimental plot will be equipped with moisture and conductivity sensors at different depths in the soil to monitor water movement and nitrogen utilization.

Three different irrigation schedules and three fertilizer application rates will be used, and each will be replicated four times.

Michael Dukes, PE, director of the IFAS Agricultural and Biological Engineering Department, will lead the study that will receive approximately \$300,000.

Crop plot tests will begin this March and continue for three years. Preliminary data will be reported annually, and a summary report will be completed after the third season's results are complete.

Wendy Graham, PhD, the Carl S. Swisher Chair in Water Resources and director of the University of Florida Water Institute, said that the sensors to be used are widely used in agricultural research and by farmers.

In the end, one goal of the study is to show what farmers can save in terms of water and fertilizer using best management practices.

After the data-gathering phase, results will be interpreted as a set of BMPs spe-

cifically tailored to agricultural crops and soil conditions in the Suwannee River Watershed.

The water management district and the Florida Department of Environmental Protection want farmers to use BMPs that reduce water use and fertilizer inputs. Achieving those ends will help meet minimum flows and levels in the district's springs, streams and rivers, and achieve numeric nutrient criteria standards.

For farmers, irrigation apps for computers and mobile devices will be developed to implement monitoring and irrigation schedules.

The efficient use of water and fertilizer may lower production costs. That, and meeting the requirements for MFLs and water quality standards, will ensure sustainable agriculture in the Suwannee River Valley.

The cooperative project recently approved by the district is a sophisticated three-year project that includes the Florida Department of Environmental Protection and the Florida Department of Agriculture and Consumer Services.

All of these agencies have a stake in the effective use of the findings from the three-year research project.

The project is only one of several efforts the SRWMD has initiated in the past few years to effectively meet mandates for water quality and quantity in the Suwannee River Watershed. This one is expected to have direct benefits for all parties.

# New report indicates companies face water shortage risks in the near term

By ROY LAUGHLIN

A new report claims that more than 100 of the world's largest corporations face financial and operation risks due to water scarcity.

Company executives said those risks may start affecting their corporations' bottom lines beginning as early as the next few years.

The risks from water scarcity range from closure of plants and operations, to a decrease in shareholder value.

The report, "CDP Global Water Report 2014: From Water Risk to Value Creation," tallied 853 reported risks that could influence corporate performance or already do.

Water shortages or the increasing cost of water may put some corporations at a competitive disadvantage.

Most of the world's largest corporations are multinational, and it is in developing countries, such as Brazil, China, India and Mexico, that the influence of water shortages and other water-related issues will have the greatest influence on future growth.

The report used São Paulo, Brazil, as an example. According to the report, São Paulo is a city that is "dangerously close to running out of water."

The report said that 22 percent of the companies evaluated could face limitations of growth as a result of water availability.

According to the report, at least a small number of corporate investors are agitating for water shortage preparedness to be upgraded from an operational issue to one in which the company's boardroom takes primary responsibility.

In the past year, corporate boards of almost two thirds of the 174 companies providing data have taken on water-related responsibilities.

Ninety percent of the companies polled have integrated water into their group-wide business strategies, and 82 percent are setting gains and targets for reducing water use.

## CREEK From Page 9

The city of Jacksonville is making a \$50,000 matching contribution.

Additional funding and support is coming from Wells Fargo Bank, \$10,000; the National Park Service, \$25,000; and Lowes of Mandarin with a building materials donation. The funding mechanism is a public-private partnership.

The revitalization work is consistent with the Hogans Creek Master Plan that was drafted several years ago.

Among the items in that plan that are now in the works are the revitalization of Jacksonville's extensive creekside parks, the addition of ball fields and four kayak launches, and reconstruction of architectural heritage components.

Effective remediation of Hogans Creek requires removal of both legacy contaminants, and prevention of new contaminant inputs of different types.

Legacy pollutants include heavy metals and organic chemicals from industrial activities along the creek and in the adjacent watershed.

Until the 1970s, direct disposal of untreated wastewater to the creek was a standard practice and no record-keeping was required. In addition, ashes from burning and sewage effluents were also released directly into the creek.

In the future, effluent from aging and ineffective septic tanks and wastewater treatment pipes is a primary concern. They may be a source of some chemical contamination and they are certainly a source of nutrients whose inputs, if not diminished, are likely to make Hogans Creek eutrophic.

Eutrophication from nitrogen and phosphorus that leeches first into Hogans Creek creates algae blooms in the St. Johns River as well.

The Confederate Park cleanup effort is just the start of an ambitious and extensive project destined to take many years to complete.

At the same time, some companies predict economic opportunity due to growing water risks.

For companies whose markets include water reuse, conservation or purification services and products, the new opportunities may be extremely lucrative.

For example, the German chemical company BASF projects a \$1 billion market through 2020.

The report was prepared by the English non-governmental organization CDP. CDP's report stands out because its clients are primarily from the business community.

The report was developed with water management data of 174 companies listed on the FTSE Global 500 Equity Index.

The corporations provided their water data to CDP at the request of 573 institutional investors.

Even though this report is one of the most extensive surveys of corporate water utilization data, its writers note that because all responses are voluntary, the coverage of some industry sectors remains low.

Agriculture and energy companies had the lowest responses among several sectors recognized in the report. Those sectors account for well more than half of the national water use across the globe and are among the first to be affected by water shortages and risks.

Corporate profits are just one context in which to characterize the effect of growing global water risks.

"The business world is finally understanding, accepting and proactively addressing what the Middle East has understood for a generation now. It is access to clean water—not energy—that creates both business and geopolitical vulnerability," said Nick Albergo, PE, DEE, a senior professional engineer with GHD U.S. and an expert on global clean water issues. "Efforts to identify and then conserve water are vital to industry and economic growth.

"Emerging countries have long lived with this incontrovertible fact, and now, as the effects of a lack of water quantity and/or quality impact shareholder value, the rest of the world is feeling the pressure as well."

The news on water, when expressed in economic terms is one of bedeviling paradox. The United Nations Development Programme estimated that each dollar invested in clean water provided an eight dollar return in increased productivity.

In the past decade, substantial progress has been made to provide clean water to rural areas where formerly infant death and sickness from poor water quality were prevalent.

But that clean water comes at a cost. The price in the poorest countries is often a substantial part of the household expenses. In addition, the costs of poor water quality and supply fall disproportionately on women, who now may walk further to get water and carry it back to their families.

The economic cost to poor people is measured in time and effort, not only currency. From families to multinational corporations, the cost of clean water is significantly increasing in economic terms, especially where technology replaces natural processes that provide clean water in sufficient amounts.

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# DEP adopts basin management action plan for Lake Okeechobee

Staff report

In December, the Florida Department of Environmental Protection adopted a 10-year basin management action plan for Lake Okeechobee.

The restoration plan identifies a set of strategies and projects aimed at reducing nutrient pollution to the lake, with a 33 percent reduction target for total phosphorous entering the lake over the next 10 years.

During the prior two years, DEP conducted public meetings to develop the final restoration plan.

The BMAP identifies a variety of project types to relieve the lake of large influxes of nutrient-laden water, including dispersed water storage, nutrient reduction practices for urban and agricultural areas, and a number of cost-share projects using state financial assistance to accelerate restoration.

The first five years of the plan cover a range of projects including the Kissimmee River Restoration Project, hybrid wetland treatment areas, dispersed water storage and stormwater treatment areas.

The BMAP also identifies timeframes

for the continued planning and development of longer-term projects over the next 10 years.

Located in the heart of the greater Kissimmee-Okeechobee-Everglades ecosystem, Lake O is the largest freshwater lake

in Florida and the second-largest freshwater lake within the contiguous U.S.

It is a valuable waterbody that provides drinking water for urban areas, irrigation water for agricultural lands, recharge for aquifers and freshwater for the Everglades.

## MAD BEACH

From Page 14

findings of the review of its existing stormwater system. A doubling of the existing stormwater fee, currently five dollars a month, was included in the city manager's proposed 2014-2015 budget discussion for commission consideration.

Madeira Beach has long been noted

## CANALS

From Page 10

cludes weighted frames that hold bubble-producing manifolds and 20 plate-sized aerators that produce the bubbles.

The aerators are coated with Teflon, which is intended to prevent biofouling that can close up the bubble-producing air holes.

The Treasure Harbor canals had been using aerators to raise dissolved oxygen levels, but they were wearing out.

Susan Sprunt, PhD, environmental resources program manager with the village, jumped at the opportunity to install the \$80,000 bubble curtain system and upgrade the aerators in the canal.

## STUDY

From Page 1

to address those impediments."

The bill requires a final report that identifies measures leading to the efficient use of reclaimed water; identifies engineering, public health, public perception and fiscal constraints of the expansion of reclaimed water use; identifies areas where traditional water supply sources are limited; recommends permit incentives; and determines the feasibility, benefits and estimated cost of the infrastructure needed.

The public workshops focused on a number of issues including the identification of impediments, incentives and storage methods.

Among the tasks to be completed is determining the feasibility and estimated costs of constructing regional storage features for the beneficial reuse of the assigned water sources.

Water storage features discussed during the workshops included aquifer recharge, ASR, reservoirs, dispersed water storage to retain stormwater runoff on public and private lands, and the creation and enhancement or restoration of wetlands to augment flows within the wetland system and indirect aquifer recharge.

as a flood-prone area. Some streets have flooded as a result of moderate thunderstorms during high tide.

The city's stormwater assessment program has been ongoing since 2000, at which time 27 projects were identified.

The full scope of proposed improvements is anticipated to take a number of additional years to fund and complete.

Her office used the remaining \$20,000 of the \$100,000 appropriation for the Islamorada Canal initiative to fund a survey and engineering conceptual plans for Islamorada's other 62 canals.

In an ironic twist to this narrative, Sprunt said that the Treasure Harbor canals were not among the worst of the village's canal in terms of water quality.

There are 10 other canals that have been given a priority status for future remediation efforts as a result of the assessment.

The two Treasure Harbor canals were first to see action because aeration was permitted several years ago.

Upon completion of the 536 team efforts, additional stakeholder meetings will be held to review and incorporate comments and prepare a draft report.

"The department expects to have a draft around June or July of 2015," said Miller. "After that, there will be another round of workshops on the draft."

The second round of public workshops will include meetings in each of the five water management districts to present the draft report, solicit comments, and collect and review the resulting comments.

The department is required to deliver its final report no later than Dec. 1, 2015.

Persons wishing to participate in the study can access presentation and study materials, attend the teleconferenced 536 team meetings as a guest, and provide comment at DEP's Senate Bill 536 Study website at <http://www.dep.state.fl.us/water/reuse/study.htm>.

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www.doce.ufl.edu/treeo			
ZEBRA TECHNICAL SERVICES	(813) 655-1717	(813) 654-9398	4
www.teamzebra.com			