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Hilfiker on value consulting 7

Managing risk involves finding the right balance between risk tolerance and budget, between environmental protection and economic development, and between owner objectives and regulatory compliance. Consulting and balance go hand in hand. Columnist Steve Hilfiker weighs in.

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DEP issued a notice of violation to FPL to address noncompliance with their NPDES industrial wastewater permit for violating minimum water quality standards for discharge into the Turkey Point nuclear plant's cooling canals.

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Got a story lead?

Got an idea for a story? Like to submit a column for consideration? Fire when ready. And don't forget to fill us in on your organization's new people and programs, projects and technologies—anything of interest to environmental professionals in Florida. Send to P.O. Box 2175, Goldenrod, FL 32733. Call us at (407) 671-7777; fax us at (407) 671-7757, or email mreast@enviro-net.com.

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Photo courtesy of Edward Rectenwald, MWHGlobal, and Virginia Walsh, Miami-Dade Utilities

Bill Musselwhite, Youngquist Brothers Drilling Inc., left, and Ed Rectenwald, MWH Americas, examine a custom drill rig that bored an exploratory well on Virginia Key to 10,000 feet to evaluate Southeast Florida's Cretaceous geological strata as an alternative for deep disposal of Miami-Dade's wastewater treatment plant effluent. See story on Page 10.

Springs council challenges groundwater flow models now used by DEP, WMDs

By **BLANCHE HARDY, PG**

The Florida Springs Council recently sent a letter to Drew Bartlett, deputy secretary at the Florida Department of Environmental Protection, questioning the method of development of the North Florida-Southeast Georgia Regional Groundwater Flow Model.

FSC claims that the NFSEG flow model may not be sufficiently peer-reviewed for implementation in all uses.

Dan Hilliard, chairman of the council, said their concerns are both procedural and technical.

FSC has expressed concerns about the groundwater models used by the state's water management districts for some time.

In 2015, the council formally requested the release of groundwater modeling related public records from each district including a list of all groundwater models used as part of regulatory decision-making and water-use planning for the issuance of water-use permits, minimum flows and levels, prevention and recovery strategies, water supply plans, basin management action plans, and other similar activities.

In addition to the modeling records, FSC requested a description of the review process for each groundwater model including the extent of peer-review of each model by internal and external parties, the names of the reviewers and dates of the reviews, copies of all documents related to peer review and responses to review comments and suggestions, including changes in model simulations resulting from review comments and suggestions.

"The districts are not consistent in

the peer review process and they are not as responsive in addressing peer review comments as the U.S. Geological Survey," Hilliard said.

FSC reported that its final review of the records provided by the water districts showed no uniformity between districts in the peer review process for the models.

The council believes that the state's inconsistency in the peer review process for groundwater models results in a lack of rigor required to qualify the models as "sound science."

They suggested that some of the

models used in the private sector might be more flexible and accurate than those currently used by the districts.

Hilliard said FSC is "looking for an enhanced process and model suitable for a particular domain."

For springs advocates, the lack of a Karst component within the state's models is one significant technical deficiency.

Todd Kincaid, PhD, founder of Nevada-based GeoHydros, a consulting

MODELING
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Jacksonville to spend another \$30 million on septic-to-sewer conversion

By **ROY LAUGHLIN**

The city of Jacksonville will extend its ambitious interagency agreement to subsidize conversions of failed septic tanks to the city's sanitary sewer system for another five years.

The city and its utility department, JEA, will jointly fund and implement the program.

The effort will help Jacksonville meet requirements for its MS4 stormwater permit and meet nutrient release limits imposed by three basin management action plans.

Program officials hope to reduce nitrogen releases to the St. Johns River and its tributaries by 117.96 metric tons and reduce fecal coliform bacteria sources.

Jacksonville started the conversion program two years ago.

JEA Spokesperson Marsha Oliver said the program has completed 154

conversions to date. Thirteen are in progress and four are in line for conversion.

The interagency program slated to begin Oct. 1, 2016, is a successor to the current program and potentially a much larger effort.

The city did not meet its nutrient loading limits in 2015, and likely will not meet them by 2023 without considerably reducing nutrients in its stormwater runoff and from failing septic tanks.

In total, the city needs to reduce its nutrient loading by 324,328 pounds per year of total nitrogen. Successful implementation of the planned conversion program would achieve a good portion of that reduction.

The city and JEA will invest \$30 million over the next five years in a phased program to identify septic tanks

CONVERSION
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District court approves \$20 billion Deepwater Horizon oil spill settlement

Staff report

U.S. District Judge Carl Barbier granted final approval to an estimated \$20 billion settlement with BP arising from the 2010 Deepwater Horizon oil spill in the Gulf of Mexico.

The settlement is essentially the same as that announced in July 2015. It includes \$5.5 billion in Clean Water Act penalties with most of the remainder being paid to five states bordering the Gulf of Mexico and local governments claiming damages arising from the massive spill.

This settlement is the largest environmental settlement in U.S. history and the largest ever civil settlement with a single entity.

In addition, BP reached a separate settlement agreement in 2012 with individuals and businesses who claimed losses from the spill. That deal, which does not have a financial cap, has a court-supervised claims administrator who is still handling claims and payouts. Those claims may exceed \$30 billion.

The entire settlement costs including cleanup, civil and private claims may exceed \$53 billion, experts predict.

BP has 16 years to pay the court-ordered civil penalties. Agreements with individuals and businesses may be similarly

protracted.

Florida's share of the civil penalties is \$3.25 billion. Local governments and individuals have received uncounted millions more.

In addition, two foundations setup to fund ecological and community remediation efforts have prioritized several Florida projects to receive funding. These includes efforts such as sea turtle nesting surveys and protection on Panhandle beaches, and projects in Apalachicola Bay for habitat improvement.

Advanced energy industry jobs. More than 160,000 new jobs in the Southeast U.S. could be created annually if southern states promoted policies favorable to advanced energy technologies.

That's the conclusion of recent research from Berkeley, CA-based American Jobs Project.

The report focused on job growth in 10 southeastern states including Florida as well as Midwestern manufacturing states such as Ohio, whose strong manufacturing foundation stands to benefit from manufacturing solar and wind energy de-

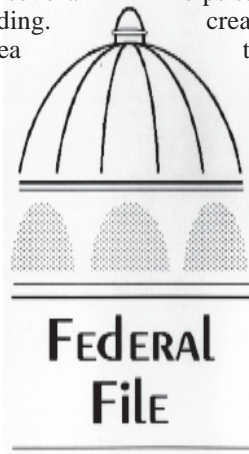
velopment.

The report is notable because it spotlighted policies implemented at the state level as the most effective way to more broadly implement renewable and alternative energy. The idea is that appropriate policies and a focus on industrial clusters helps states to align innovation and job creation in advanced energy industries with the state's existing strengths.

The report promoted states' efforts as being more capable of moving forward than the federal programs currently bogged down in Washington. The report specifically noted that state policies could foster higher-paying manufacturing, installation and construction projects.

Since the recession, most of the energy sector jobs have been low paying, low skill jobs that include maintenance.

The U.S. currently has about 3.64 million employees in the traditional energy industries that include generation, transmission and distribution. About 600,000 of those work in low carbon energy sectors including renewables, nuclear energy and



natural gas.

The energy efficiency sector, in contrast, employs about 1.9 million people. And it is the sector with the highest prospects for increasing employment with an estimated 14 percent increase annually in the coming years.

Solar energy firms, which currently employ about 300,000 Americans, project a 15 percent job increase annually.

Not surprisingly, the report's researchers concluded that advanced energy manufacturing has its best prospects in states that already have strong foundations in equipment manufacturing, skilled labor forces, and well-established research institutions.

Florida received close scrutiny with significant opportunities for solar power development. The report noted Florida's "strong foundation" in advanced energy. That sector, worth \$6.2 billion, is comprised of 14,000 businesses employing more than 130,000 Floridians.

But Florida is one of the states with the greatest legal and policy impediments for advanced alternative energy development.

It is one of only four states that grant monopoly privileges to its traditional franchise power companies to distribute electricity.

The so-called "Consumers for Smart Solar" Amendment on the 2016 ballot would allow—if approved by 60 percent of voters—franchise monopoly power companies to levy transmission fees on any customer who generates solar power.

Apparently, the state's Public Services Commission will have no oversight of the fees that power companies might impose. This is a strong disincentive for solar power development in the state.

Nevada voters passed a similar amendment in 2015, and solar power installation has declined dramatically because the transmission fees make solar power much more expensive than it had been before the state law passed.

Florida also lacks the technological infrastructure to support a solar power implementation effort, including a manufacturing capability.

In the absence of any demand in the state for solar power—which the current power company monopoly privileges reinforce—Florida seems to have little prospects at the state level to increase employment or provide other economic advantages related to renewable power.

Those prospects may be permanently extinguished if Florida voters approve the upcoming utility-backed constitutional amendment.

GHG emissions rise slightly. In 2014, U.S. greenhouse gas emissions rose one percent compared to 2013 levels. Nevertheless, since 2005, greenhouse gas emissions dropped nine percent.

By sector, power plants accounted for 30 percent of the total U.S. greenhouse gas emissions. Transportation was close behind it at 26 percent. Industry and manufacturing was the third-largest source, at 21 percent.

The U.S. Environmental Protection Agency attributed the overall one percent increase in 2014's annual greenhouse gas emissions to increased use of transportation and heating fuels.

The electricity-generating sector continues its decade long migration to natural gas fuel, which helps reduce overall greenhouse gas emissions.

In addition, in the years since Pres. Obama took office, the U.S. has generated three times more wind power and 30 times more solar power than was the case a decade ago.

The small increase in greenhouse gas emissions due to increased motor vehicle and space heating fuel use suggests that mileage efficiency and climate control in buildings could be improved before additional greenhouse gas emissions are reflected in national tallies.

Going forward, the EPA has initiated efforts to reduce methane emissions in the

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

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- Vapor intrusion
- Regulatory policy and initiatives
- Brownfields

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

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

Please submit abstracts of 250 words by July 1, 2016.

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Orlando introduces compressed natural gas fuel stations

Staff report

The city of Orlando recently opened a new multi-acre compressed natural gas fueling station for buses, trucks and others. The facility features two stations—a private station for LYNX buses and another station for use by the public.

The station was built over eight months at a cost of about \$10 million.

Coral Gables-based Nopetro built the fueling station and upgraded LYNX's existing maintenance facility.

LYNX is switching from diesel to compressed natural gas and will have a new line of buses that run on the cleaner fuel.

Each new bus will cost about \$500,000. More than 150 CNG buses will be added to the system within five years.

Officials said that switching to CNG will reduce particulate matter emissions by 89 percent, carbon monoxide by 70 percent, carbon dioxide by 25 percent and nitrous oxide by 80 percent.

Floating solar. Five engineering students at the University of Central Florida successfully designed and installed a floating solar farm.

The project is backed by David Norvell, assistant vice president of UCF's Sustainability Initiatives program, and is part of the university's environmental effort to become climate neutral by 2050.

University officials put together their climate plan in 2007. One goal was to reach 15 percent of energy consumption by renewable resources by 2020.

The solar panels are located behind UCF's Bright House Networks Stadium and serve as a prototype for a model 200 times its size. This could eventually offset the stadium's entire energy consumption.

UCF officials hope to eventually move forward with a full-scale project and are considering a range of energy efficiency and energy production projects.

If implemented, the payback period for the full-scale solar farm would be between 10 and 15 years.

The floating solar farm would produce one of the eight megawatts that they have committed to producing from renewable sources by 2020.

FPL busy with solar. Hendry County officials have approved a new solar plant. Florida Power and Light said the plant is needed to accommodate the state's rising population.

Construction of the facility could take two years.

Elsewhere, the utility has commissioned its newest clean energy plant at Port Everglades. That plant went into operation on Apr. 1, two months ahead of schedule.

The project's final cost will be less than \$2 billion.

FPL officials said the plant demonstrates their commitment to reducing foreign oil use while producing clean and affordable energy.

According to officials, the plant will require 30 percent less fuel than its predecessor and will save its customers about \$400 million over its 30-year life span.

Air emissions from the plant have been reduced by more than 90 percent and carbon dioxide emissions by about half, officials said.

The Port Everglades facility is FPL's third natural gas plant built in recent years.

In January, the Florida Public Service Commission approved construction of another natural gas-fueled plant in Okeechobee County by June 2019.

Utility acquisition. TECO Energy has been acquired by Emera Inc.

TECO recently built a reclaimed water facility at its Polk Power Station, closed a coal-fired plant in favor of a natural gas-fired plant and built a two-megawatt solar array at Tampa International Airport.

Rob Bennett, president and chief executive of Emera U.S., said the company's strategy will continue to be on the transformation of energy towards cleaner alternatives.

People news. Marion County Utilities has appointed Angel Roussel, PE, as utilities director. Roussel replaces Flip Mellinger who resigned in December.

Roussel first joined the department in November 2007 as engineering manager and served for nearly six years.

As the county utilities director, he will oversee 95 staff members.

He brings more than 16 years of engineering and management experience to his new role.

Jarvis Middleton, an engineer with more than 30 years of experience, is the city of Palm Bay's new public works director.

Middleton has managed public works departments in New Mexico, Georgia and Florida.

Stephen Arms joined Laboratory Data Consultants FL Inc. in Royal Palm Beach as a senior scientist. He brings 32 years of experience in environmental laboratory testing, quality assurance and certification.

His career with the Florida Department of Health combined 13 years in analysis, supervision and management in the DOH environmental laboratory with 19 years as the administrator of the DOH Environmen-

tal Laboratory Certification Program.

Arms was instrumental in the establishment and ongoing implementation of the National Environmental Laboratory Accreditation Program and served for three years as the chair of The NELAC Institute's Board of Directors and on various committees and workgroups in NELAC, INELA and TNI.

Environmental attorney Craig Varn with the law firm Manson Bolves Donaldson Varn in Tallahassee was

appointed to the state's Environmental Regulation Commission in May.

Varn served as general counsel at the Florida Department of Environmental Protection.

He received his undergraduate degree from the University of Florida and his master's and law degrees from Florida State University.

His appointment must be confirmed by the Florida Senate.

Awards. Professor K. Ramesh Reddy, chairman of the University of Florida In-

Florida Notes

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St. Pete moves forward on capital improvements to wastewater system

Staff report

A recent consultant's report for the city of St. Petersburg laid out a five-year capital improvement plan for the city's wastewater treatment system.

Between now and 2021, the city could spend about \$20 million on the low end or more than \$90 million on the high end of estimates to improve capacity and treatment effectiveness at their three wastewater treatment plants.

The St. Petersburg City Council's Budget, Finance and Taxation Subcommittee recently approved \$3.4 million to conduct phase one of a wet weather overflow mitigation program. Flow monitoring and pipeline infiltration/exfiltration characterization are the two largest parts of the effort.

Also included are improvements to wastewater hydraulic models to help manage flows. The goal is to mitigate the wastewater system's extreme wet weather overloads.

Last summer was a wet one along the

Gulf Coast, capped by several days of flood rains in late August. Collection pipeline infiltration increased the treatment volume from about 20 million gallons per day to 65 mgd, overwhelming St. Pete's wastewater system.

The result was the release of raw and partially treated wastewater to Boca Ciega Bay and Tampa Bay.

City officials have approved the project but have not yet determined where the funding will come from.

St. Pete Mayor Rick Kriseman endorsed the treatment system upgrades as necessary for resiliency in the face of potential impacts from climate change. Climate scientists predict more frequent extreme rainfall events and sea level rise.

The mayor's action is one of the few widely-publicized cases where an elected Florida official has pointed to the reality of climate change as a justification for needed public works improvements.

ASR feasibility study. Lee County's Board of County Commissioners approved

a nearly \$1 million feasibility study for the first phase of a project to construct an aquifer storage and recovery well.

The well is part of a project that will store and reuse as much as 250 million gallons annually from the Fort Myers Beach and Fiesta Village wastewater treatment plants.

Excess reuse water available during the wet season will be pumped into the aquifer and then withdrawn during dry periods to irrigate lawns and landscaping.

ASR implementation may also prevent the release of almost 3,000 pounds of nitrogen in wastewater annually to the Caloosahatchee River and adjacent estuaries.

The feasibility study is the first phase of an ASR construction project that could cost about \$7 million and be completed by the end of 2020.

Drinking Water State Revolving Fund program.

The program's low interest loans help communities finance new drinking water infrastructure and system upgrades that provide potable water supply.

The loans announced in April were primarily to North and Central Florida communities.

The city of Marianna received an additional \$2.9 million on an existing

loan to fund their dual water main distribution project—a project that will remove contaminants from the Sunland Water System.

The city of Havana received \$1 million for a new water well project. The project also includes upgrades to water storage, treatment, pumping and a water main.

The city of Bunnell received \$1.2 million in loan funding for a recently opened ion exchange water treatment facility. The process produces one million gallons per day of drinking water treated to simultaneously remove contaminants and soften the water.

The city of Fanning Springs will get a \$400,000 increase to an existing loan so that the Nature Coast Regional Water Authority can extend its service to the Old Town area. The installation of approximately 20 miles of distribution pipelines plus an elevated storage tank will provide water to 600 residents and businesses that now rely on local wells.

The city of Orange City received an additional \$500,000 on an existing loan to fund distribution pipe rehabilitation and water treatment plant upgrades. When completed, the improvements will reduce the level of disinfection byproducts.

The town of Ponce Inlet will use a \$212,000 increase in an existing loan to fund replacement of undersized and aging drinking water pipes and older galvanized pipes that will increase the reliability of its potable water distribution system.

Recovered seagrass beds. In 2014, Charlotte Harbor's seagrass beds increased by 985 acres compared to coverage found in a similar survey done in 2012. The increase of 5.2 percent brought the harbor's total seagrass bed acreage to 19,896 acres, the widest coverage since 1996.

Port Orange stormwater. On Earth Day, city of Port Orange officials inaugurated a stormwater treatment facility that includes two lakes covering 100 acres, a treatment wetland, a pumping infiltration plant and a three-million-gallon above-ground storage reservoir.

The facility, located on the city's western edge, will store the city's reclaimed wastewater during the rainy season, and provide up to two million gallons a day for landscape irrigation.

Storing water in the new reservoirs diverts it from release to the Halifax River. Future releases to the Halifax will occur only during intervals of extremely high rain, or in the event that the treated wastewater does not meet pathogen standards for release to treatment wetlands around the reservoirs.

The reservoir project has been in the works for more than a decade. Construction began about two years ago with some delays during excavation, necessitating system design modification.

The outfall and filtration system cost just over \$2 million.

Until now, during dry periods, utility customers used all of the available reuse water. The additional two million gallons a day represents a substantial additional resource that will help to assure year-round reuse water availability for residents.

DEP drinking water funding. In April, the Florida Department of Environmental Protection awarded more than \$13 million in low-interest loans through its

WATCH
Continued on Page 5



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WATCH
From Page 4

Aerial seagrass coverage surveys have been conducted since the Southwest Florida Water Management District first began its formal seagrass mapping program in 1988.

Between 2000 and 2008, seagrass coverage was consistently around 18,000 acres. In the last six years, the coverage has increased by an additional 2,000 acres.

This year's increase is the largest of any of the three recent biennial surveys.

Surface Water Improvement and Management programs in Florida use seagrass mapping to assess an estuary's broader ecological health.

Seagrass is a keystone species that provides habitat for fish and invertebrates. Seagrass growth and coverage is very sensitive to poor water clarity that attenuates light.

In Charlotte Harbor, seagrass beds typically occur to depths of about six feet, but around Boca Grande Pass, good water clarity allows seagrass to grow up to 10 feet deep.

The seagrass recovery in Charlotte Harbor is similarly successful to that recently observed in Tampa Bay, which also experienced significant increases in seagrass coverage in recent years thanks to water quality improvement efforts.

Polk cooperative. The Southwest Florida Water Management District Governing Board formally approved the Polk County Water Cooperative.

It also increased its financial commitment help the cooperative fund the development of alternative water supplies in Polk County.

The board's vote to approve marked the end of a year-long effort, initiated and funded by the district, to convince at least five Polk County local governments that accounted for at least 70 percent of the public supply demand to establish and join the cooperative.

The district offered an attractive incentive to enlist willing participants. It promised \$10 million towards developing alternative water supplies if Polk County officials could bring an approved agreement to the governing board by April.

Local government recruitment into the cooperative was impressive.

Fifteen local governments representing 99.7 percent of the public supply demand agreed to join the cooperative.

Only one small town of a couple of hundred residents choose not to join.

County Commissioner George Lindsey, chair of the Polk County Board of County Commissioners, presided over the water cooperative's formation committee. He is quick to credit local officials for the success of the cooperative's timely and orderly formation.

He, too, deserves credit for effectively convincing his fellow political leaders that the way forward for developing Polk County's alternative water supplies is through this unified effort.

The Polk County Water Cooperative, established in a single year, showed that local governments can function to get something accomplished when motivated people, strong leadership and reasonable goals come together.

Conservation and water reuse will be among the first types of programs likely to be implemented by Polk County water utilities. SWFWMD's funding will provide valuable financial assistance to the projects.

The cooperative's first board meeting occurred in May. The agenda included a program to select and prioritize projects for discussions at future meetings.

An important aspect of project development is that voting membership privileges for project approval will be determined by which local government members are willing to make capital investments toward the projects to cover costs beyond what SWFWMD provides.

Cape Coral water quality lawsuit. The Florida Clean Water Network filed a letter of intent to sue the city of Cape Coral for alleged water quality violations.

At issue is the city's removal of a dam from a stormwater drainage canal dating back to the 1970s. The plug removal allowed high nutrient runoff to flow into the Matlacha Pass Aquatic Preserve treatment area.

The lawsuit alleged that the dam's removal increased nitrogen concentrations in the treatment area that is reducing the preserve's effectiveness as a treatment system. The city releases the water under a National Pollution Discharge Elimination System permit. The suit alleged violations of that permit's conditions.

Cape Coral has 60 days to respond to the lawsuit.

Monitoring water quality. In 2014, the Fort Pierce-based Ocean Research & Conservation Association received a \$2 million grant from the Florida Legislature to deploy 25 remotely operated water quality monitoring devices called Kilroys.

The devices were installed at locations in the St. Lucie River as well as the Indian River up to near the Max Brewer Causeway in Titusville. The full complement of monitors has been in operation since the summer of 2015.

But for the 2016 fiscal year, continu-

ing funding was not appropriated by the Legislature.

According to ORCA, it costs about \$30,000 per year per unit to regularly maintain each Kilroy monitor, or about \$750,000 for the entire 25-unit array.

The maintenance consists of cleaning the solar-powered units every other week, running verification checks to ensure instrumentation accuracy, and replacing reagents that measure nutrient levels.

A Kilroy unit can measure water temperature, water level, flow speed, direction, conductivity, salinity, turbidity, pH, nitrogen, phosphorus, blue-green algae, chlorophyll, dissolved fluorescent organic matter, dissolved oxygen and oxygen reduction potential.

All of these are useful indicators of water quality and dynamic processes that may influence water quality.

An ORCA spokesperson pointed out that, in 2014, Harbor Branch Oceanographic Institute also received \$2 million to put out four of its land/ocean biogeochemical observatory sensors. It still receives \$350,000 annually to maintain those sensors.

Without at least \$500,000 in additional funding this year, ORCA may have to re-

move as many as 15 of the 25 Kilroys in its monitoring network.

ORCA is reportedly soliciting county governments for continuing support to cover the shortfall. It is also looking for grants from other sources. There may be a source of currently unallocated state funding to continue the work, which is being explored.

Caloosahatchee project. The South Florida Water Management District Governing Board approved an agreement that protects Florida's investment in a restoration project under construction to store and deliver water to benefit the ecology of the Caloosahatchee River and Estuary.

The partnership agreement with the U.S. Department of the Army ensures that Florida will receive credit for its investment in the Caloosahatchee River West Basin Storage Reservoir Project.

The effort is a 50/50 partnership between Florida and the federal government.

To date, SFWMD and the state have invested \$83.5 million buying land, designing and constructing portions of the project. The Florida Legislature approved \$49 million during the past two years to advance the work.



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Report compares brackish groundwater use policy in four Sunbelt states

By ROY LAUGHLIN

A recent technical publication from Rice University's Baker Institute focused on brackish water exploitation and water resource management policy in the four Sunbelt states of Texas, Florida, New Mexico and Arizona.

Those states face drinking water supply limits due to population growth, natural supply limitations or both.

The report noted that all four states have substantial brackish groundwater aquifers. Some of the aquifers have acquired dissolved solids from soil and the aquifer matrix. Others are dilute, connate seawater.

In a few instances, saltwater intrusion following excessive pumping of a freshwater aquifer near the sea has produced or expanded brackish aquifers.

The report's writers posit that brackish water substitution by industrial and agriculture users can extend the longevity of drinking water aquifers.

The U.S. Environmental Protection Agency's secondary drinking water standard for total dissolved solids is 500 parts per million. At least one state raises that standard to 1,000 ppm as its secondary drinking water standard.

Water with a total dissolved solid con-

centration of 1,000-10,000 ppm is considered brackish water.

In terms of current classification, there is no overlap of the two types of water. But in reality, aquifers separately classified as brackish or fresh may be functionally connected by such conditions as density stratification or by incomplete confining strata.

The report noted that "switching to brackish groundwater can reduce freshwater demand without incurring a high cost, making incentives to use brackish groundwater a potentially strong water policy tool to augment water supply and ease freshwater demand in some regions."

That policy has to be implemented within existing frameworks consistent with existing user privileges and expectations.

Texas and Florida are the two states with the greatest divergence in current policy for groundwater management, including brackish water.

In Texas, landowners have absolute property rights to groundwater beneath the surface of their land and the rule of capture applies. Landowners can take all the water available with wells on their land, even if it depletes an adjacent property owner's supplies.

In contrast, all Florida groundwater is

considered a public resource. Florida requires consumptive use permits for all groundwater users. It extensively—but not universally—regulates wells and withdrawals.

In no state is brackish water, according to the report, separately regulated or considered a different resource from drinking water.

In Florida, water withdrawn from the Lower Floridan Aquifer, because of its high salt content, is managed differently than that from the Upper Floridan Aquifer, whose water typically has sufficiently low TDS that it meets secondary drinking water standards.

For states that want to establish a discrete policy, the report urges consideration of five specific policy components that encourage brackish aquifer exploitation in ways that will extend available freshwater supplies.

Four of those components are applicable to Florida: facilitating access and incentivizing development of brackish groundwater supplies; creating regulatory certainty for all aquifer users so that they can count on water quality and water supply; ensuring that freshwater aquifers are protected from the consequences of over-pumping brackish groundwater from the same or nearby aquifer; and ensuring that

brackish water aquifers are protected from contamination from deep injection disposal wells.

With respect to Texas, they add the fifth caveat that property rights must be respected.

Florida, in contrast to assertions in this report, has made substantial progress in utilizing water from the brackish Lower Floridan as a source of drinking water and increasingly as a location for aquifer storage and recovery water supply.

Florida already promotes many of the policies that the Baker Institute's report encouraged.

But the state diverges markedly from scenarios described in the report because Florida's water management districts have assertively promoted and provided significant cost-sharing contributions to increasing use of brackish water from the Floridan Aquifer to supply drinking water and electrical utility cooling water, for example.

Florida leads the nation in alternative water supply development, much of it directly or indirectly relying on the brackish Lower Floridan Aquifer.

The energy sector uses about a third of all water across the country. In Florida, electricity production is also the largest user, but about 88 percent of cooling water is seawater or brackish estuarine water. Both spare groundwater and surface water resources.

Florida currently is not facing a demand for fracking water, a serious concern for Texas and other energy states. So Florida's industrial sector is not a significant competitor for groundwater resources.

If fracking should become commonplace in Florida, brackish water from the Lower Floridan could be used. In that case, Florida could face the situation that Texas now faces—industrial brackish water exploitation under the right of capture rule is occurring at an unsustainable rate.

Even though the report writers may have mischaracterized Florida's current water resource policies, the report is still be of interest to water planners in the state.

Senate Bill 503 passed in this year's legislative session requires providing consumptive use permits to all applicants. That is a policy similar in effect to the rule of capture followed in Texas.

Even if the Lower Floridan and coastal brackish water supplies are currently much larger than ground and surface water sources that meet current secondary drinking water standards, brackish water aquifers have finite sustainability limits.

Like Texas, Florida may face limits on its current brackish water sources at some future date. The policy guidelines in the report may be helpful as a larger framework for renewed policy development.

NutriBind now part of DEP Innovative Technologies Acceptance program

Staff report

Tersus received approval from the Florida Department of Environmental Protection, formally accepting the use of its NutriBind™ product as an innovative technology in the treatment of contaminated soil and groundwater.

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Florida Specifier

2016 Environmental Lab Directory

Each August, we turn our attention to the environmental laboratory business in Florida. As part of this special annual issue of the *Florida Specifier*, we include a directory of environmental labs providing analytical services in the state.

You're invited to complete the form below, providing details about your lab and its analytical capabilities. **There is a fee of \$200 to list your lab this year.** (*Fee waived for Specifier advertisers, and FRC exhibitors.*) In addition to your listing in the directory, **your lab will also be included in a special lab listing on our Enviro-Net website.**

Please type or LEGIBLY print the information requested and return as soon as possible to Mike Eastman via fax at (407) 671-7757, e-mail mreast@enviro-net.com or mail to P.O. Box 2175, Goldenrod, FL 32733. You can reach us at (407) 671-7777. The deadline for submissions to the August Lab Directory is **Friday, July 18, 2016.**

Note: If you were listed last year, we will be in touch. Do not complete this form.

Please include only lab operations, capabilities and personnel in Florida.

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E-Mail: _____ Web: _____

Contact: _____ Title: _____

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Remediation industry clients best served by high value consulting that properly assesses, manages risk

By STEVE HILFIKER

The distinctions between environmental contractor and consultant can be blurry, and the roles are often combined in the environmental assessment and remediation industry.

Consulting has high value and should not be lost in the process of site characterization or remedial planning.

Florida Department of Environmental Protection agency term contractors should understand their role as consultants with site owners and responsible parties, even though their contract is with the DEP.

This is most significantly highlighted on sites with funding caps. Many owners are not aware of the amount remaining in their cap, and some do not even know there is a limit to the funding. Some project managers do not know or consider the cap.

Planning the best strategy for a property should always start with site eligibility, deductible level and funding cap communications between all stakeholders.

As described in the January issue of the *Specifier*, there are numerous methods to obtain a "no further action" status on a site. Most site owners are not aware of the options or the requirements to achieve the NFA goal. Consulting is needed to educate them.

There are diverse facts and circumstances for each property. Some owners are positioning their site for sale. Buyers and sellers are assessing their risks from different perspectives.

A strategic plan to assess and manage environmental risks should be prepared for each property—and it is even more critical if there is an imminent real estate transaction.

Just as each investor needs a viable financial plan, each owner or manager of real estate should develop and employ environmental plans using various strategies to manage risk.

Managing risk involves finding the right balance between risk tolerance and budget, between environmental protection and economic development, and between owner objectives and regulatory compliance. Consulting and balance go hand in hand.

There are over 25,000 properties in Florida that have reported contamination to the DEP. There are over 50,000 registered fuel storage tanks in the state.

There are tens of thousands of generators of hazardous waste including dry cleaners, automotive facilities, manufacturing plants, industrial properties, agricultural facilities and golf course maintenance facilities; these are the usual suspects.

In addition, there are other businesses that involve environmental risks on a smaller scale such as print shops, photo labs, dental offices, medical facilities and other small quantity generators of hazardous materials.

Many people do not realize how a poorly managed environmental risk can hurt people. Health concerns have been

Martin County using new biosolids systems

Staff report

Two Martin County wastewater treatment plants, North Jensen and Tropical Farms, have begun using BCR Environmental's Neutralizer systems.

The systems are U.S. Environmental Protection Agency-approved for generating odorless on-site Class A biosolids, and are expected to save the county costs for treating, disinfecting, stabilizing and reducing their level of wastewater residuals.

The biosolids management approach supports the county's environmental goals with a significant reduction in energy consumption and greenhouse gas emissions, according to Martin County Utilities Director John Polley.

well-documented but many think it will never happen to them.

Developers have to manage every dollar or their projects can quickly spin out of control. The family who has owned and operated their business on the same site for decades and is selling to obtain retirement funds must strive to obtain the maximum purchase price.

Real estate professionals need to prevent environmental problems from killing a transaction that they've invested thousands of dollars and hundreds of hours in brokerage activities.

Environmental management should be considered by all parties to a transaction. But environmental laws are complex and unless a consultant or attorney is hired to assist with a regulatory compliance plan, each party's wallet—and health—may be impacted significantly.

The best plan can be difficult to communicate because it may not fit the client's timeline or budget.

It costs money to properly dispose of waste. It costs money to properly manage environmental risks.

In a competitive society that is prone to occasional economic recession, the pressure to cut corners and costs can be strong enough to prevent appropriate environmental risk management strategies.

Some think the process of environmental assessment is a waste of time and money on some properties, an unnecessary task completed just to satisfy the underwriters of a transaction.

But when buried drums are discovered on a remote former agricultural property planned for development of single family homes that will have numerous lakes for water retention and irrigation wells—both of which could create exposure to the contamination if undetected—the value of consulting becomes evident and makes believers of the few who don't understand why we do what we do.

Consulting is critical to the due diligence process. An innocent landowner defense based on a thorough Phase I ESA is necessary for defending liability for the borrower or investor. When issues arise, expert consulting is often required to educate the client and rescue a transaction.

The environmental issue is not new to commercial real estate, but the strategies to manage the risks have evolved over time, allowing transactions that previously faded away to now close.

Phase I environmental site assessments

Specifier guest column

and the bank is left holding an impacted property that may not cover the balance of the loan.

If the market continues to move in the direction of commoditized Phase I ESA contracting, problems for site owners are inevitable.

So whether you provide consulting services for commercial real estate transactions or government-funded cleanup projects, be sure to provide high value by educating the client.

Steve Hilfiker is president of Environmental Risk Management Inc. in Fort Myers. He can be reached at steve@ermi.net.



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Accepted by FDEP for In Situ Application

Microbial fuel cell technology may represent an opportunity to extract resources from treatment plants

By ROY LAUGHLIN

A group of researchers at the Virginia Polytechnic Institute and State University recently demonstrated that a specific bacteria species could generate recoverable amounts of electricity in a culture device referred to as a microbial fuel cell, or MFC.

The researchers suggested their findings hold promise for the use of microorganisms to generate electricity at wastewater treatment plants.

That could make treatment plants at least a little more energy independent. At a minimum, it would remove organic com-

pounds from wastewater while producing a usable amount of power.

The researchers demonstrated bacterial electricity production for the first time about a decade ago. Bacteria do not produce a stream of electricity like batteries do; they produce organic compounds capable of donating electrons to an inorganic anode that is part of an anode and cathode pair in the microorganisms' culture vessel.

This process is referred to as extracellular electron transport. When EET occurs rapidly and extensively, a useful current flows in a circuit between the positive and

negative electrodes in the culture chamber.

In their experiments, the researchers used the bacteria *Shewanella oneidensis* MR-1, a bacterial strain previously shown by another researcher to produce electricity in a prototype MFC.

The team's experiments showed that simultaneously adding both lactate—to support the microorganisms' central metabolism—and formate increased electrical current production and nearly tripled the duration of that electricity production.

Even with lactate and formate supplied together, electrical efficiency of the model MFC is low. But even at that, experiments recently reported show that bacteria in a 140 milliliter culture bottle produce between 0.5-0.35 milliamperes for periods as long as 16 hours.

The researchers also employed carbon-13 isotopic analysis in a novel exercise to show that *S. oneidensis* MR-1 used lactate under anaerobic conditions to produce energy for cell metabolism and to produce biochemicals such as amino acids used in growth.

Producing energy and biochemicals needed for growth competes with EET behavior of electron donor compounds that allow the culture to act like a microbial fuel cell.

Formate, under anaerobic conditions, was oxidized to CO₂ by a NAD⁺-dependent formate dehydrogenase. That process released substantially more electrons than lactate metabolism to the EET pathway.

The researchers attributed the improved electricity generating efficiency to "unique metabolism in *S. oneidensis* MR-1 to decouple cell growth from electricity generation during co-utilization of lactate and formate."

The researchers suggested in summarizing their research that "mutually complementary substrates may take advantage of substrate interaction in cell metabolism and generate a total effect greater than the sum of the individual contribution of single substrate for electricity generation."

That would increase the efficiency and usefulness of future MFCs.

Associate Professor Jason He, PhD, in VPI's Department of Civil and Environmental Engineering and one of the lead authors of the research, put the potential application of microbial fuel cells for wastewater treatment into a larger context.

He noted that microbial fuel cells have their primary application potential in treating primary wastewater streams to remove carbon and nitrogen, producing clean water and energy.

In that application, they would serve as a single unit in a multiple treatment sequence.

He provided two additional research reports showing experiments at a wastewater treatment plant using primary effluent "as is."

In research published in 2013, his team conducted experiments using a pair of four liter microbial fuel cells at a wastewater treatment plant in an experiment conducted over 400 days.

That experiment showed successful persistent electricity production.

It included description of flow characteristics through the cells that influenced electricity production, both positively and negatively.

The MFCs also effectively removed ammonia.

The membrane cost of that MFC system was more than half of the equipment cost. If membrane costs could be reduced substantially, the process' economic prospects would improve.

In a second paper just published, he and a colleague tested a 200 liter modularized microbial fuel cell system and performed an analysis of wastewater treatment effectiveness, energy and cost.

Modularization was by 96 smaller sub cells. The use of multiple small cells has prospects of improving electricity output by lowering a system's overall internal resistance compared to one large container of suspended culture.

It was one of the largest systems tested for more than 300 days.

This system removed 68 percent of ammonia nitrogen, more than 75 percent of the total chemical oxygen demand and 90 percent of the suspended solids. Electricity production was approximately 200 megawatts.

He noted that MFC technology at wastewater treatment plants is not a competitor of or substitute for anaerobic biosolids fermentation to produce methane, another energy source from wastewater technology that in Florida is being incorporated into treatment plants.

He characterized anaerobic biosolids fermentation and MFC as compatible specialized treatments within the larger wastewater treatment plant process.

Microbial fuel cell technology works on primary effluent, which is low in nutrients and biosolids. MFC could also treat the water pressed from fermenter-derived biosolids, which is low carbon, high nutrient water.

He has been involved in microbial fuel cell research for about a dozen years, as long as the technology has had a separate identity in research literature.

The three papers mentioned here, all published since 2013, build the case for a role for MFC in wastewater treatment plants that are intended to treat wastewater and recover resources.

"For MFC, I always want to tell people that it's at an early stage but it has promise," He said. "I don't want to over promise. We want to identify potential benefits."

So far, the extensive research record of his group over the past three years seems to bring the promise much closer to reliable application.

FWS provides CVA grants

Staff report

Multiple fish and wildlife species as well as recreational boaters in 21 states will benefit from nearly \$13.7 million in grants awarded through the U.S. Fish and Wildlife Service's Clean Vessel Act program.

The CVA program helps U.S. states and territories maintain healthy waterways.

The Florida Department of Environmental Protection plans to use the over \$2 million in grant funding to construct or replace 38 coastal and 15 inland pump-out stations for Florida boaters.

They will also continue their ongoing CVA boater education program that includes Internet postings, outreach events, public service announcements and a database monitoring program.



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SJRWMD, DEP approve cooperative bloom studies in Indian River

By ROY LAUGHLIN

The St. Johns River Water Management District's Governing Board approved funding for three investigations on groundwater sources of nutrients that cause algal blooms, biological factors that mobilize nutrients, and characterization of nutrient patchiness that may spur small algal blooms that become large ones.

In the first study, a cooperative agreement with U.S. Geological Survey scientists will investigate nutrient levels in groundwater seepage.

Charles Jacoby, PhD, supervising environmental scientist for the estuary section at the district, characterized the research as bringing in "a range of tools that operate at large scales."

They expect to establish five transects in the northern part of the Indian River, with one of those near the Eau Gallie Creek. Jacoby said that the goal is to develop an understanding of how such factors as land use, development and ground slope affect nutrient inflows to the river.

These studies are another chapter of groundwater infiltration research that began about four years ago after the 2011 algal super bloom.

Methodologies will be similar with the use of seep meters and natural radioisotope tracers to make two independent estimates of groundwater seepage into the Indian River.

Results published in 2013 for other portions of the northern section of the Indian River suggested that groundwater input contributed about five percent of interstitial water in Indian River sediments.

A second study component will employ an autonomous underwater vehicle to characterize water quality variations between existing automated water monitoring stations.

The district maintains five fixed autonomous continuous monitoring devices in the Indian River that are manually sampled on a monthly basis.

The third study will look into how fish behavior influences nutrient mobilization between sediments and the water column that could play a role in initiating or expanding algal blooms.

The study will look at the kinds of fish that are in Indian River Lagoon's canals and tributaries that eat, forage or disturb sediments. This component of the study will "look at bottom up controls," said Jacoby.

Although such factors as wind-generated water movement might be more likely to move sediments and release nutrients, bioturbation by fish is still a piece of valuable information, Jacoby said.

The upcoming SJRWMD-supported two-year study has a total budget of \$926,000. It includes \$194,000 annually for the groundwater surveys, \$55,000 for surveys of water quality, and \$25,000 for surveys of fish.

USGS's 40 percent cost share is composed of \$50,000 in funding and \$328,000 in in-kind services.

In addition to SJRWMD's research, DEP will provide \$1 million to the Marine Resources Council and organizations including the University of Central Florida, the Florida Institute of Technology and the Brevard County Department of Natural Resource Management.

They will conduct a pilot study to determine what soil characteristics in proximity to both the Indian River Lagoon and stormwater drainage ditches are most conducive for nutrients in septic tank plumes to enter the Indian River.

This effort will look at septic tanks as a source of nutrients that either groundwater or stormwater may carry into the Indian River.

Virginia Barker, director of the Brevard County Natural Resources Management Department, said that she hopes the study will provide some needed information to help reduce nutrient inflows to the Indian River Lagoon.

She said that the research will evaluate

the current operational concept that septic tank plumes, their nutrients and microorganisms attenuate to insignificant levels within 65 feet of drainfields.

That standard has guided septic tank placement throughout Brevard County near the Indian River Lagoon.

Many scientists are now skeptical of that idea but it is entrenched to the point, Barker said, that until new and robust data are available to indicate otherwise, change in septic tank placement criteria is unlikely.

A second goal of the county study will be to characterize soil and site conditions such as water table elevation relative to the drainfield that might allow unacceptable leaching to adjacent surface waters.

This study brings to light a problem with septic tank management in Brevard County. No county or state department has a handle on the number of septic tanks in Brevard County or their age. There is no county-wide record of any installations prior to 1980.

The broad outlines of the proposed study will be to identify candidate properties by GIS, after which Marine Resources Council and University of Central Florida researchers will ground truth the database information.

They will then attempt to recruit the

owners of 120 properties for participation in groundwater sampling. The project involves 36 citizen scientists in the study.

Barker said that the study will provide a local, rational data set for any subsequent action to convert septic tanks to sewer connections, or to update septic tanks to advanced on-site wastewater treatment sys-

tems.

"We can't spend all our time measuring and monitoring," Barker said. She looks forward to the time when her department can begin taking actions that significantly improve wastewater treatment, reducing nutrient releases to the Indian River Lagoon.



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Miami-Dade drills deep wastewater treatment plant pilot injection well

By ROY LAUGHLIN

As part of an injection well drilling project at its Virginia Key Wastewater Treatment Plant, Miami-Dade County officials drilled an investigatory pilot well to 10,000 feet below surface.

The pilot well will not be used for wastewater injection, but may provide data about Florida's deep geology and prospects for future functional very deep wastewater injection wells in South Florida.

If the results of the pilot well are promising, very deep injection wells may be the

new destination for the dregs of Miami-Dade's treatment plants.

The deep pilot well is part of a larger drilling plan at the county's Central WWTP on Virginia Key, a small island off Rickenbacker Causeway.

Youngquist Brothers Inc. is also drilling a 24-inch-deep well within the injection zone extending from 2,780-3,150 below surface, typical of Miami-Dade's existing 21 WWTP effluent injection wells, into the Lower Floridan Aquifer.

This operational well will be permitted for a capacity of 19.9 million gallons per day, the largest component of which

will be approximately 12 million gallons a day of digester scrubber blowdown.

Leachate from an adjacent landfill will also be pumped down the new injection well.

The very deep exploratory well will be of temporary use. It will be drilled to 10,000 feet inside a 13-inch casing, continuing from the base of the injection zone of the well described above.

It will provide cores to verify geological composition. Tests will be conducted to better predict prospects for injecting effluent at this depth.

When the tests are complete, the additional approximately 7,000 feet will be plugged, and the larger boring above it will be used an operational WWTP effluent injection well.

Miami-Dade is turning to deep injection wells to comply with Florida's 2008 ocean outfall legislation, Chapter 2008-232, Laws of Florida. That chapter contains two landmark dates.

By 2018, and more stringently by 2025, ocean outfalls must reduce nutrient and other contaminant releases based on advanced wastewater treatment use targets. More than 60 percent of wastewater must be reused by 2025.

Miami-Dade currently treats a little more than 300 million gallons of sewage a day. Three large treatment plants handle most of it. But even with a target of 200 million gallons a day slated for reuse, the remaining 100 million gallons a day of effluent will need to be disposed of somehow—no small task.

In addition to complying with the state law phasing out ocean outfalls, Miami-Dade has implemented a multi-billion dollar wastewater treatment system upgrade to comply with a consent agreement with the U.S. Environmental Protection Agency.

That case arose, in part, when a defec-

tive deep injection well allowed ammonia to seep from the Lower Floridan Aquifer, a drinking water aquifer subject to stricter water quality standards.

Miami is not alone in South Florida in experiencing injection well failure. In the Florida Keys, nutrients from WWTP injection wells were found leaching into the sea miles from the injection sites.

At those sites, dense algae growth around vents was the clue linking injection wells to the nutrient-laden shallow water outfalls.

In each case, the region's carbonate rocks forming the shallower Karst strata failed to confine effluent injected in deeper strata.

The plan for deeper effluent injection is based on characteristics of Florida's deeper geology that are known, but are not familiar. Deeper injection wells will release water into ancient Cretaceous formations at the base of the Florida Platform that are below an anhydrite boundary layer.

Anhydrite is expected to be a more formidable barrier to prevent effluent or its constituents from diffusing to shallower, protected aquifers.

In addition, geologists are hoping that the Cretaceous strata include "caverns" based on decades-old seismology and more recent data.

The indirect data indicating the presence of caverns is most persuasive near Key Largo, but still sufficiently strong to justify Miami-Dade's exploratory drilling.

Geologists expect wastes injected below the anhydrite layer to eventually seep through fractures and faults along the base of the Florida Platform into the deep ocean, well below the photic zone.

Such a scenario, if true, would effectively prevent eutrophication at nutrient hot spots that occur when effluent vents to shallow water.

IFAS survey reveals high level of concern for water resources in the state

By BLANCHE HARDY, PG

According to a recent survey conducted by the University of Florida/IFAS Center for Public Issues Education, Floridians think the state's water resources are just as important as health care and the economy.

"523 Florida residents age 18 and older, representative of our state population, took the survey," said Professor Alexa Lamm, PhD, associate director of the center.

PIE reported that only two-tenths of a percent separated what the respondents tagged as the three most critical issues.

"Looking at 10 topics, water ranked second on the list of concerns with health care only slightly above and the economy slightly below," Lamm noted.

Survey respondents were asked to characterize the issues on a range from "not at all important" to "extremely important." Results indicated that 81.5 percent determined health care is highly or extremely important compared to water resources at 81.4 percent and the economy at 81.3 percent.

The survey queried participants about the rights, responsibilities, attitudes and behaviors associated with water quantity and quality. The responses were then weighted to be representative of the entire state according to 2010 Census data.

"I believe this year, being an election year and one where people are paying even closer attention to politics, that the number of Florida residents willing to vote for water conservation programs (70 percent), vote for candidates who support water conservation (56 percent), and willing to support water restrictions (64 percent) is a key finding," said Lamm.

"In addition, the number of homeowners conserving water in a variety of ways is a strong indicator of public support for water conservation and protection," she said.

Survey participants reported high levels of engagement in water conservation practices within the home, but were less likely to establish water conservation practices in their yards.

Less than 30 percent indicated they used low-water consuming plants, reclaimed water or rain barrels in their landscaping.

When projected to a statewide level, the survey results indicate more than half of state residents use water-efficient toilets and low-flow shower heads.

The largest possible water conservation

SURVEY
Continued on Page 11



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June 4-12 – Course: Backflow Prevention Assembly Tester Training and Certification, Jacksonville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

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

June 7 – Conference: 2016 Brownfields Conference, Montgomery AL. Presented by the Alabama Department of Environmental Management. Visit <http://adem.alabama.gov/misc/2016bfconference.cnt>.

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

June 7-10 – Symposium: 17th Annual Florida Lake Management Society Technical Symposium, Daytona Beach Shores, FL. Visit www.flms.net.

June 8 – Symposium: 4th Annual Southwest Florida Regional Brownfield Symposium, Sarasota, FL. Presented by the Florida Department of Environmental Protection South District and the Southwest Florida Regional Planning Council. Contact Terry Cerullo, DEP, at (239) 344-5647.

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

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June 13-15 – Course: Asbestos: Inspector, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570.

June 14-15 – Course: Cross Connection Control: Survey and Inspection, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

June 15 – Course: Hazardous Waste Regulations for Generators, Palm Coast, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

June 15 – Course: Initial Training Course for Spotters at Landfills, C&D Sites and Transfer Stations-8 Hours, St. Augustine, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

June 15 – Course: Refresher Training for Experi-

enced Solid Waste Operators & Spotters-4 Hours, St. Augustine, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

June 15-16 – Course: Refresher Training Course for Experienced Solid Waste Operators-16 Hours, St. Augustine, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

June 15-17 – Course: Initial Training for Landfill Operators and Waste Processing Facilities, St. Augustine, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

June 15-17 – Course: Initial Training for Transfer Station Operators of and Materials Recovery Facilities-16 Hours, St. Augustine, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

June 15-17 – Conference: Florida Association for Water Quality Control Annual Conference, Naples, FL. Call (813) 623-6645 or visit www.fawqc.com.

June 15-17 – Conference: Stormwater After the Storm, the 2016 Annual Conference of the Florida Stormwater Association, Sanibel Island, FL. Call 1-888-221-3124 or visit www.florida-stormwater.com.

June 15-17 – Course: Initial Training for Landfill Operators and C&D Sites-24 Hours, St. Augustine, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

June 16 – Course: U.S. DOT Hazardous Materials/Waste Transportation, Palm Coast, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

June 16-17 – Course: Asbestos: Management Planner – Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

June 16-17 – Course: Cross Connection Control: Ordinance and Organization, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

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

June 18-26 – Course: Backflow Prevention Assembly Tester Training and Certification, Tampa, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

June 20-23 – Conference: 109th Annual Conference & Exhibition of the Air & Waste Management Association, New Orleans, LA. Call 1-800-270-3444 or visit ace2106.awma.org.

June 21-24 – 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.

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

July

July 8-16 – 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.

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July 9-10 – Exam: Backflow Prevention Recertification Exam, Tampa, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

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July 11-15 – Course: Backflow Prevention Assembly Tester Training and Certification, Altamonte Springs, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

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Thank you!

SURVEY

From Page 10

gains may be made by improving home landscapes, according to the survey results.

Native plants were rejected in favor of turf grass by 40 percent of those surveyed, and 45 percent weren't sure which to choose.

Only 13 percent preferred native plants and 14 percent felt turf grass requires too much water to maintain.

When projected statewide, the results of the survey indicate 72 percent of Floridians maintain a lawn, 52 percent of which have turfgrass. Fifty-four percent believe having a healthy turf grass lawn is important to retaining property value.

Forty-six percent owned irrigation systems compared to 15 percent who use rain barrels to collect water for irrigation. Only twenty-one percent said they use recycled or reclaimed water.

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

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Wastewater Class A Certification Review

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Aug. 2-5, 2016 - Gainesville

Introduction to Electrical Maintenance

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Aug. 5, 2016 - Ft. Walton Beach

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Low freshwater flow from Glades blamed for Florida Bay seagrass die-off

By ROY LAUGHLIN

A combination of little cooling shade from clouds and a lack of rain from May through mid-August last year led to high temperatures and salinity levels in Everglades National Park that has since killed 40,000 acres of seagrass.

The affected seagrass beds consisted primarily of turtle grass, shoal grass and manatee grass.

Seagrass die-off was largely confined within the Everglades National Park section of Florida Bay where a combination of conditions contributed to the damage.

Between Flamingo and Blackwater Sound, Florida Bay includes a cluster of shallow basins bounded by mud banks. Usually, freshwater from rain and inflow from the Everglades prevents the shallow waters from summertime over-

heating and high salinity following evaporation.

But in 2015, in addition to the lack of shade clouds and rain, low wind conditions contributed to the extreme heat and resultant evaporation.

The extreme weather conditions broke records for nearshore marine waters. A National Park Service report noted that water temperatures exceeded 93.2°F for more than 77 days in Garfield Bight.

By mid-July, salinity reached 72 practical salinity units—twice the normal seawater strength of 35 PSU—and the highest ambient salinity reported in Florida Bay in 68 years of measurement.

Christopher Kavanagh, PhD, a marine ecologist with Everglades and Dry Tortugas national parks, said that for many days in mid and late summer, fixed monitors in the die-off area showed nearly complete or complete anoxia by midnight. It per-

sisted until well after sunrise.

Usual summertime anoxia in bottom waters occurs for only about two hours before sunrise. Prolonged anoxia shifted many microorganisms to using sulfur as a terminal electron acceptor, yielding hydrogen sulfide.

Hydrogen sulfide is toxic to seagrass roots. Hydrogen sulfide production in sediments made irrelevant any protection a blanket of sediment might have given to seagrass roots against heat and extreme salinity.

“Once a die-off is underway, the decay of seagrass on the bay bottom and accumulated in mats along the shoreline consumes even more dissolved oxygen and further contributes to sulfide production,” noted the preliminary summary report by the National Park Service. “The result can be a continuation of anoxic conditions, fueling even more seagrass die-off.”

At the end of August, normal rains returned, dropping salinity and temperatures to normal levels.

But low dissolved oxygen levels persisted into early winter, and through April 2016, high sulfide levels persisted in some areas.

Fish kills are also observed during anoxic episodes when fish cannot escape the anoxic water.

Small areas of fish kill have occurred in the past year in regions where the seagrass die-off occurred.

Seagrass die-off due to summer heating and low rain conditions has occurred in the past, and may be closely correlated with extreme El Niño conditions.

The last large seagrass die-off occurred in 1990. It affected about 10,000 acres, just one quarter of the 40,000 acres affected last summer. Recovery took almost two decades.

In its report, the National Park Service noted that the past century of altered Everglades hydrology, especially the diversion of the flow of water from Central

Florida and Lake Okeechobee, has significantly reduced freshwater flows into Florida Bay.

The National Park Service, partnering with the Florida Fish and Wildlife Conservation Commission Fisheries Research Laboratory in St. Petersburg, continues to closely monitor the status of seagrass beds to accurately characterize the die-off event’s status.

Kavanagh said that through the 2015-2016 winter, seagrass recovery began and continues to occur.

Most of the recovery, he explained, is occurring as seagrass that survived grows from a patch into surrounding areas where seagrass was killed.

Shoal grass, which grows in shallower areas, appears to be recovering faster than turtle grass. But turtle grass is recovering.

In some areas, researchers have observed turtle grass blades growing from surviving rhizomes under bare sand as well as spreading from surviving patches.

Seagrasses also propagate by seeds. But it is too early in seasonal reproductive patterns to evaluate that possible recovery process, Kavanagh said.


For the past 20 years, state and federal governments have built infrastructure to reroute water flow to the Everglades.

Late last year, as the final construction projects to carry water down the east side of Water Conservation Area 3 to the Everglades were nearing completion, the U.S. Army Corps of Engineers and the South Florida Water Management District were beginning to raise water levels through the recently initiated MOD FLO program.

By 2020, the consent agreement reached in 1995 to restore historic water flows to the Everglades National Park may finally deliver the needed water to help prevent catastrophic salinity increases in northern Florida Bay.

Perhaps that will reduce the 20-year recovery duration observed following the 1990 seagrass die-off.

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Upgrades completed at Ocala WWTP expected to improve springs

By BLANCHE HARDY, PG

The city of Ocala recently completed improvements to their 24th Street Wastewater Reclamation Facility #2.

The wastewater treatment plant upgrades are discussed in the Florida Department of Environmental Protection’s October 2015 basin management action plan for Silver Springs and are part of ongoing efforts to preserve water quality in the underlying aquifer and in the Silver Springs system.

“This project demonstrates how the St. Johns River Water Management District, the Florida Department of Environmental Protection and the city of Ocala are working together to protect Silver Springs,” said SJRWMD Public Communications Coordinator Teresa Monson.

The \$12 million water quality improvement project will reduce the amount of nitrogen going into Silver Springs by up to 623,000 pounds.

Monson said that the project has far-reaching benefits. By upgrading the city’s wastewater facility to advanced treatment level, the quality of the effluent being discharged from the facility is greatly improved.

Silver Springs is a first-magnitude spring that forms the headwaters of the Silver River in Marion County. The springs are among Florida’s oldest tourist attractions and are a designated National Natural Landmark.

Water from the 30 springs in the Silver Springs group discharge into the Ocklawaha River by way of the Silver River. Silver Springs is among the largest artesian springs in the world.

Jeff Halcomb, the city of Ocala’s director of water resources, said that the wastewater system upgrade was necessary to allow the city’s treatment system to more effectively treat nitrogen in the effluent.

The project is intended to allow Ocala’s Facility #2 to reach reclaimed water quality effluent standards.

The treatment facility is in the vicinity of Silver Springs. Distribution piping has been installed as part of the upgrade, allowing the city to redirect effluent to local golf courses for irrigation use.

The city hopes the use of reclaimed water for irrigation will help reduce groundwater withdrawals and improve the flow of Silver Springs.

Halcomb said the project will also result in a reduction in the amount of nitrogen that potentially could reach the Floridan Aquifer that supplies water to the Silver Springs system.

DEP and the SJRWMD provided 31.3 percent of the funding for the project covering \$3.3 million of the project’s cost. The Florida Legislature provided additional funding through an award of \$750,000.

The city of Ocala provided approximately \$6.55 million to cover the balance of funds needed to complete the upgrades.

Components of the project included construction of a fourth aeration basin and reconfiguration of the baffle walls within the three existing basins to improve aeration and increase detention times to enhance nitrogen removal. A larger capacity filter was also installed.

“This is one of five projects that are underway or already completed in the Silver Springs basin in the past few years,” said Monson. “In addition, the district recently acquired nearly 4,900 acres of forestland just north of Silver Springs with financial assistance from DEP, the U.S. Forest Legacy Program, the Conservation Trust for Florida and the Felburn Foundation. That acquisition protects water resources that support the valuable recreational and biological functions of the Ocklawaha River, Silver River and Silver Springs.”

DEP action spurs additional investigation of hypersaline water plume at Turkey Point plant

By **BLANCHE HARDY, PG**

The Florida Senate held a field hearing in late April to review Florida Power & Light Co.'s long-term plan to remove hypersaline water from the cooling canal system at its Turkey Point Power Plant complex.

The hearing came on the heels of the Florida Department of Environmental Protection's issuance of a notice of violation and a warning letter to FPL.

The NOV requires a consent order to address noncompliance with FPL's National Pollutant Discharge Elimination System industrial wastewater permit for violating minimum water quality criteria for discharge into the Turkey Point nuclear plant's cooling canals.

The warning letter is the opening document in an investigation predicated by DEP's receipt of compelling evidence indicating the potential migration of canal system water into tidal surface waters connected to Biscayne Bay.

FPL anticipates an estimated \$50 million will be expended in 2016 to support ongoing cleanup efforts associated with the nuclear power generation facility and its controversial cooling canals.

During the field hearing Mike Sole,

FPL's vice president of governmental affairs and former DEP secretary, indicated the cost of the cleanup will likely be passed on to utility customers.

The cleanup plan will assess data collected from dozens of monitoring stations and include a comprehensive review and analysis of technical data by independent environmental experts.

"A data-driven, science-based approach ensures that we're taking the right actions at the right time to improve the situation," said Randy LaBauve, FPL's vice president of environmental services. "While it will take time to reverse the hypersaline plume in an environmentally responsible manner, this new data will help us achieve faster results and allow us to leverage the progress we are already making."

The utility is employing an advanced three-dimensional groundwater model that incorporates state-of-the-art groundwater mapping technology including airborne electromagnetic surveys.

Helicopter surveys will enable scientists to more accurately identify the location of hypersaline groundwater and develop additional plans for its removal.

The hypersaline plume is considered to

be a threat to drinking water supplies in South Florida.

FPL intends to extract up to 14 million gallons a day of brackish water from the Floridan Aquifer to mix with water in the cooling canal system to help keep salt levels in balance with the surrounding natural systems.

The groundwater pumping is expected to begin this summer and be fully underway by the end of the year.

Augmentation of cooling canal water with Floridan Aquifer water and recent rainfall will allow FPL to eliminate their controversial surface water withdrawals from South Florida Water Management District's L-31 canal for the foreseeable

future.

"We have been taking aggressive action to address the cooling canal system's water quality challenges, and we are seeing significant progress," LaBauve said. "We have been clear that it will take several years to fully resolve the canal system's complex challenges—and that continues to be true—but the improvements we're seeing are important steps forward."

Installing extraction wells to remove the hypersaline water in the vicinity of Turkey Point and backfilling some of the canals are also planned.

In addition to cleanup measures, the monitoring of American crocodile populations is being expanded to areas around the canal system.

Corps, activists battle over impacts of South Florida port dredging projects

By **ROY LAUGHLIN**

Since PortMiami dredging began in 2014, environmental activists in South Florida have been embroiled with port officials and the U.S. Army Corps of Engineers over extensive reef damage that followed the deepening of the channel.

The expansion was completed to provide port access to larger cargo ships expected as a result of the widening of the Panama Canal.

The corps' environmental impact study predicting little damage to the reefs. But after work was completed last December, sand and sediments covered substantially more reef bottom than expected.

The corps predicted that dredging would destroy only about seven acres of reef, plus five acres more at the mouth of the Miami ship channel.

In addition, eight acres of seagrass meadows were also expected to be affected to some degree by sediments. Just 38 coral colonies near the dredging sites were expected to be moved.

Environmental activists skeptical of a projection of such limited damage sued in 2011 and obtained an agreement to transplant coral from about 17 acres around the dredging sites.

The corps hired divers to move nearly 250 coral colonies away from the channel dredging site. Then, in 2014, an additional 1,000 more colonies were moved.

As dredging began in early summer, 2014, activists and National Oceanic and Atmospheric Administration Fisheries Service divers found that sediment was covering far larger areas than originally expected.

Divers could get no closer than 150 feet to the channel dredging. But even with that limited access, they estimated that more than 160 acres on both sides of the channel—eight times the 20 acres estimated in the corps' environmental impact statement—were covered with sediments.

Activists complained that they could have rescued hundreds of more coral colonies while dredging was in progress, but dredging operations were deemed too risky by the corps to allow divers to attempt rescues while the dredging progressed.

At least some of the sediments smothered were attributed directly to dredging operations. The dredge spoil was loaded and carried five or six miles offshore then dumped it into the Gulf Stream. The barges either leaked or spilled dredge spoil.

By December of 2014, the U.S. Environmental Protection Agency listed 49

violations related to the dredging work. The Florida Department of Environmental Protection followed with additional letters regarding violations.

The corps responded to the letters with assertions that it would fix the problems, but denied that there were violations, according to news accounts. Apparently, neither federal nor state agencies formally charged permit violations associated with the dredging.

The situation worsened the following summer, as sediment coverage expanded to beyond 3,000 feet from the dredging site, along with extensive coral mortality.

"Temporary sedimentation resulting from the project was anticipated and documented in our Essential Fish Habitat consultation, National Environmental Policy Act documents, Endangered Species Act consultation, and in coordination activities that resulted in the DEP permit," said Amanda Parker, a corps spokesperson.

They have not so far characterized whether the more extensive sediment coverage was due to natural sediment redistribution or sediment released during dredging operation.

Corps contractors attributed the die-off to white plague, which occurred elsewhere in the Florida Keys last summer.

In October last year, the corps paid \$400,000 to NOAA's Fisheries Service to relocate endangered staghorn corals from reefs near the dredging site to a coral nursery at the University of Miami.

The dredging is now complete, but activists are pressing for additional mitigation efforts to be paid for by the port. So far, officials have dismissed the damages as being "insignificant" and "temporary."

The recent Fisheries Service lab report contradicts that assertion, and negotiations are likely to continue until a resolution is reached or, perhaps, an impasse that may lead to a lawsuit.

Concern for dredging problems during PortMiami expansion are now spilling over to similar plans for deepening and widening other ship channels including Port Everglades in Broward County.

That planned channel dredging will affect a different portion of the same reef formation off Miami, but 20 miles further north.

The corps produced a similar environmental impact statement predicting only minor impacts from the Port Everglades dredging. Based on that plan, dredging has been permitted.

DREDGE
Continued on Page 16

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St. Johns County opens reclamation facility to meet future water demand

By PRAKASH GANDHI

St. Johns County has taken a major step forward in expanding its reclaimed wastewater program.

The county's population is expected to grow substantially over the next few decades and with that growth will come increasing demands on the water supply.

To help meet that demand, the county has opened a new water reclamation facility in its northwestern section.

The new water reclamation plant collects and treats wastewater to be reused for lawn and landscape irrigation.

The goal is to use the water for irriga-

tion when future development occurs, said St. Johns County Utility Director Bill Young.

"It's part of our long-term plan for keeping a sufficient water supply," Young said.

In addition to supplementing supply, the facility will help keep nutrient-rich effluent out of rivers, streams and swamps. Instead, the flow will be redirected to homes and businesses for use.

"The main benefits of this new facility is that it maximizes reused water use and reduces nutrients released into the St. Johns River," Young said. "We will be treating it to a higher level and using it for irrigation. All the water that's reused is that much less

that we have to pull from the aquifer for irrigation purposes."

Young said this is the county's first major venture into residential reuse.

"In the past, we have done golf courses, but now we are getting into residential," he said. "In the short term, it will be common areas and golf courses, but eventually, we will be using the water for residential customers as growth occurs."

Officials originally launched the \$32 million project almost a decade ago. Construction started three years ago and was completed earlier this year.

Funding for the project came mostly from low interest revolving fund loans from the Florida Department of Environmental Protection. The county also received matching grants from the St. Johns River Water Management District, as well as money from other sources.

Young said the facility will be capable of meeting capacity demands from increasing growth in the area over the next 15 to 20 years.

"Currently, we have about 100,000 customers," he said. "By the year 2040, we will have an additional 85,000 people that we will service."

The new facility is currently taking in about a million gallons a day that had been going to an older plant near State Road 16 and Interstate 95.

The new plant can handle three million gallons a day. It's also designed to expand to a capacity of up to six million gallons a day in the future.

CDM Smith, a global engineering firm with offices in Jacksonville, helped design and build the facility.

Only a lead operator and four other staffers will be needed to run the plant.

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CONVERSION

From Page 1

that have failed. They are looking first at properties adjacent to existing sewage mains to which the property could connect.

The evaluation will be conducted on a lot-by-lot basis using a model developed by the Florida Department of Environmental Protection.

The model estimates the level of water quality improvement likely to be achieved if a property is converted from septic to sewer.

The estimates will help to determine each site's suitability for septic-to-sewer conversion.

The program's goal is not to replace all failing septic tanks, or to phase out all septic tanks in a given neighborhood. Only properties that are found to provide significant water quality improvement by conversion will be considered for the program.

Once a property meets the program criteria, the property owner will receive a letter with information about the program and connecting to a JEA sewer.

The property owner has to grant a temporary construction easement, apply for JEA sewer service and, if the property is on a well, install a meter on the pump.

The meter's volume reading will be used as the basis for JEA monthly sewer service charges.

The new program is currently in the planning stage. It will not begin until Oct. 1, 2016, and only after the city and JEA sign an agreement.

The plan that may be developed, the agreement notes, is "intended to broadly address both water and sewer infrastructure needs in Jacksonville ... it may include, but is not limited to, identification of areas that will provide TMDL (total maximum daily load) credit for septic tank removal."

"The current program only focuses on the removal of those tanks that have been identified to be adversely impacting surface water quality," said Oliver. "Although

MODELING

From Page 1

firm specializing in geological and hydrogeological modeling and science, provided material noting that the "dominant models of the Floridan (Aquifer) ignore Karst and assume that the aquifer is an "equivalent porous media."

The equivalent porous media is typically sand and gravel.

Kincaid's comments indicate that the use of an equivalent porous media conceptual model to predict groundwater flow in the Floridan can lead to substantial errors.

These errors can include an over-estimation of hydraulic conductivity, the inability to reasonably simulate drawdowns around pumping wells, the inability to simulate discrete spring flows and springshed boundaries, and a significant over-estimation of the volume of groundwater in the aquifer.

The districts' models, many of which have grown out of the USGS groundwater models initially created for Florida, have changed over time.

it is anticipated that the October 1 program will have a component of surface water quality benefit as criteria, it is not expected to be the only component."

The agreement acknowledges that "JEA has committed additional assistance only with respect to environmentally sensitive qualified sewer projects."

JEA will initially transfer \$15 million to the city. Those funds may be spent only on the conversion program.

The city will make annual contributions over the next five years to raise the total to \$30 million.

The new agreement changes the way Jacksonville purchases JEA's BMAP water quality credits. The city purchases credits because its nitrogen discharges are out of compliance with current state BMAP requirements.

Going forward, JEA, which has water quality credits earned by removing more nutrients than its discharge permits require, will annually transfer credits equal to 30.34 metric tons per year of total nitrogen to the city through Dec. 31, 2023.

The city is currently paying JEA a little more than \$2 million for those credits under the current water quality trade agreement. JEA will refund this year's payment under terms of the new agreement when it goes into effect in October.

Under the new agreement, JEA will contribute up to \$1 million per year in administrative costs that JEA would normally charge for sewer hookup.

The city will cover the costs of real estate purchases and transaction costs that may occur as a result of the agreement.

Jacksonville's conversion program will not result in an overnight improvement in St. Johns River's water quality. But it is a rational, defensible effort to eliminate the worst sources of nutrients from the urban landscape one by one.

Over time and with buy-in from the public, it may be a conversion model that could work for other communities across the state with limited funding and a problem too big to be tackled in a short time frame.

The models used for water supply planning cover large areas and are probably, in most cases, not the best tool for evaluating a "particular domain," as desired by FSC.

The districts do develop domain-specific models and permit applicants frequently undertake modeling specific to their concerns for presentation to the districts.

The recommendation to include the potential impacts of Karst stratigraphy, where present, is legitimate as is the need to include Florida's confining clay layers where they occur in the subsurface, particularly in a domain-specific model.

The ability to do so in the district regional models may prove more challenging.

FSC's recommendation to establish a more consistent and forthcoming peer review process is certainly something the districts can and should do.

DEP is currently considering the suggestions provided by the council and its consultants.

Cleanup of Orlando manufactured gas plant contamination site shifts into next phase

By PRAKASH GANDHI

Efforts to clean up a Superfund site in downtown Orlando are forging ahead. In early May, some of the most visible signs of remediation began with the demolition of a warehouse.

Officials are in the process of cleaning up soil and groundwater contamination in and around the site of a former manufac-

tured gas plant that closed more than 50 years ago.

Environmental officials have spent years assessing the extent of contamination because of how far the plume has spread.

The site was once a four-acre refinery complex along West Robinson Street in the

dead in areas outside the Deepwater Horizon oil spill area.

Two of the authors of the new study also found in an earlier study that non-perinatal dolphins in the spill zone were more likely to have severe lung and adrenal gland damage.

The pathology was consistent with petroleum product exposure, according to the researchers.

The research team was led by Dr. Kathleen Colegrove of the University of Illinois, Chicago-based Zoological Pathology Program and included investigators from Mote Marine Laboratory in Sarasota.

Marine biologists and marine mammal researchers have consistently listed bottlenose dolphins among the pelagic Gulf of Mexico organisms most injured by the Deepwater Horizon spill.

With four years of stranded dolphin observations and analysis of tissues from them, the initial interpretation of the injury is now clearly attributable to petroleum compound exposure from the oil well blowout.

Callahan neighborhood. Between 1888 and 1959, the refinery heated coal to manufacture a gas used for lights, stoves and heating furnaces.

One byproduct of the process was coal tar, an oily cocktail of benzene, arsenic and other contaminants.

The pollutant is largely sealed off beneath pavement and buildings and thought to be of little immediate threat to the public through direct contact.

But the coal tar penetrated deep into the Floridan Aquifer and spread toxic chemicals across a stretch of the aquifer estimated to be a mile long and half mile wide. The site was designated as a Superfund site in 2003.

After extensive testing, the U.S. Environmental Protection Agency issued a plan to remedy contamination from the plant that could involve such measures as soil excavation and on-site treatment.

Cassandra Lafser, press secretary in the mayor's office at the city of Orlando, said that over the course of more than 125 years, a number of companies or their predecessors have operated facilities on the site or owned parts of the property.

The recent demolition of the warehouse area cleared the space needed for excavation of contaminated soil when that phase begins next year.

Tearing down the 24-foot-tall building at a cost of about \$112,000 also provided access to the ground beneath it.

"The removal of the warehouse will help to facilitate additional assessment work in the area and help further facilitate the remediation," Lafser said.

The first phase of cleanup, hauling away contaminated soil, will cost nearly \$20 million. The cost of additional cleanup methods including soil vapor extraction and chemical injection ranges from \$5 million to more than \$18 million.

The costs for investigation and cleanup are being paid by Duke Energy, Peoples Gas System Inc., Atlanta Gas Light Co., Continental Holdings Inc. and property owner Blaine Pierce.

The city of Orlando has agreed to pay 10 percent of the cost of the aquifer cleanup because of its responsibility for wells suspected to have funneled coal tar deep into the ground.

The search for coal tar in the Floridan Aquifer extends over 800 acres. The contaminant was found as deep as 300 feet.

EPA does not consider the contamination to be an immediate threat to drinking water resources as the city's wells pump from much deeper in the aquifer.

Dawn Harris-Young, a spokeswoman for the EPA in Atlanta, said the consent decree was signed in March last year.

Officials are working on the design of the remedy selected in the record of decision. The remedial design is expected to be completed by the summer of 2017.

The first phase of the project is still in the design phase. Actual cleanup work is expected to start as soon as late 2017.

FEDFILE

From Page 2

oil and gas industry through both voluntary and regulatory programs. One of those was the recent Methane Challenge Program.

The oil and gas industry accounts for a third of the country's methane emissions.

EPA recently proposed ending the use of certain hydrofluorocarbons, which also have high carbon dioxide equivalents in terms of heat trapping. A ton of methane, for example traps 25 times more heat from solar radiation than does carbon dioxide.

Only nine HFC compounds are predominant in industry and technology use. Their greenhouse gas equivalents range from 675 to 14,800 times that of CO₂. Even though HFC mass is orders of magnitude less than CO₂ emissions, their high sunlight energy absorption is the reason for the EPA's efforts to reduce fugitive emissions.

The agency would like HFC users to shift to other chemicals or to choose specific HFC compounds with the lowest greenhouse gas equivalent consistent with performance and intended use.

Draft NPDES general permit. EPA announced its intention to re-issue the general construction permit authorized under the Clean Water Act's National Pollutant Discharge Elimination System.

EPA's current GCP will expire Feb. 16, 2017. The agency intends to reissue the permit so that there's no lapse between the existing permit and its successor.

The permit stipulates requirements for managing stormwater discharges from construction sites.

The EPA collected public comments until May 26. A draft fact sheet and the draft GCP are available online.

Oil spill-related dolphin deaths. A recently published scientific study of the "unusual mortality event" of perinatal bottlenose dolphins in the Gulf of Mexico between 2010 and 2013 attributed the mortality to petroleum exposure during fetal development.

The earliest indication of young dolphin distress was apparent by increased numbers of stranded stillborn and juvenile dolphins during the four years beginning with the Deepwater Horizon oil spill.

Those dead dolphins were initially noted to be significantly smaller than dolphins of similar age stranded in years before the oil spill.

The multidisciplinary team said that their findings add to the mounting evidence that Deepwater Horizon oil was responsible for the large number of perinatal deaths of dolphins living "in the footprint" of the oil spill.

The authors said that the Gulf of Mexico populations seem to be "particularly susceptible to late-term pregnancy failures, signs of fetal distress and development of in utero infections including brucellosis."

That led to an increasing number of young bottlenose dolphin stranding as early as 2011, particularly in Louisiana and Alabama.

The researchers reported that 88 percent of the stillborn and juvenile dolphins found in the spill zone had abnormal lung morphology, including partially or completely collapsed lungs. That, and the small size, suggests the dolphins died in utero late during fetal development or just after birth.

In contrast, the same symptoms occur in only 15 percent of young dolphin found

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LaPointe, chamber partner to provide science-based water quality standards

By PRAKASH GANDHI

The Florida Chamber of Commerce announced a partnership with Brian Lapointe, PhD, a well respected research professor at Florida Atlantic University's Harbor Branch Oceanographic Institute, to promote stronger science-based water quality standards.

Lapointe's work includes extensive research on sewage-driven eutrophication and toxic algae blooms that continue to choke major waterways across the state.

Chamber Spokesperson Edie Ousley said their organization is looking forward

to working with Lapointe to ensure that Florida's surface waters, including the much-troubled Indian River Lagoon, are protected for generations to come.

"Dr. Lapointe is a highly regarded scientist who has spent a large part of his career studying Florida's waterways," Ousley said. "The Florida Chamber and Dr. Lapointe are committed to Florida's environment."

During the recently completed legislative session, lawmakers passed comprehensive water policy bills backed by the chamber.

Lapointe's work in Florida Bay and the Florida Keys National Marine Sanctuary

in the 1990s was the first to demonstrate the contribution of agricultural nitrogen from mainland sources to the development of algal blooms in the Florida Keys.

In a news release issued by the chamber, LaPointe said he has been studying issues surrounding marine pollution and land-based sources that contribute to the problems around the state.

"This is a whole new paradigm shift for me, to take what I've learned over 30

years and educate the public about these issues," he said. "And they're big issues."

Lapointe said that many of the main sources of pollution are not recognized by the public. For example, septic tanks are a major source of pollution in the state but few people recognize them as harmful.

The chamber recently developed a water education campaign that educates employers and employees on how septic tank pollution threatens the state's waterways.

EPA announces Florida cleanup grants

Staff report

The U.S. Environmental Protection Agency selected five communities in Florida for grants to cleanup and redevelop contaminated properties, promote economic redevelopment and create jobs while protecting human health.

Nationally, the agency announced the selection of 218 new Assessment, Revolving Loan Fund and Cleanup grant investments totaling \$55.2 million to 131 communities.

Recipients will receive approximately \$200,000-\$820,000 in funding toward

DREDGE

From Page 13

Based on the PortMiami experience, activists assert that the Port Everglades environmental impact study is similarly flawed. A better one, they said, would take into account the extent of damage in Miami and plan mitigation appropriately.

The corps is still working on the final assessment of the Miami dredging project's impacts. That assessment will include observations from a series of dives this summer and analysis this fall. The findings could influence dredging at Port Everglades, expected to begin in 2017.

As it stands now, the Port Everglades plan includes planting more than 100,000 nursery-raised corals over 18 acres of reef and relocating corals from five acres of reef.

Activists are critical of the plan because if there is a substantially larger area influenced by sediments during and after dredging, coral relocation and transplantation from nurseries would provide an insignificant level of mitigation.

Due to the past failure of corps' contractors and uncertainties about the present reef conditions off Port Everglades, activists want to establish an independent coral monitoring effort before dredging begins.

The monitors would keep track of the coral transplantation, and note any damage that occurs as a result of sediment smothering during or after the dredging.

EPA cooperative agreements.

Florida grant recipients include the town of Century, a \$400,000 assessment grant; the city of Ormond Beach, a \$400,000 assessment grant; the Palmetto Community Redevelopment Agency, a \$200,000 cleanup grant; the city of St. Petersburg, a \$400,000 assessment grant; and the city of West Palm Beach, a \$200,000 cleanup grant.

NOTES

From Page 3

Institute of Food and Agricultural Sciences Soil and Water Sciences Department, is among five recipients of this year's National Wetlands Awards, presented by the Environmental Law Institute.

For more than 40 years, Reddy "has led groundbreaking research on the biogeochemical cycling of nutrients in natural and managed wetland and aquatic ecosystems, particularly in the Florida Everglades," according to material from ELI.

The ELI program has recognized nearly 200 people from across the country for their exceptional and innovative contributions to wetlands conservation.

RIP... Martin "Marty" Klein, Jr. died in May at the age of 53. He was a professional geologist and owner of Martin O. Klein, PA, an environmental consulting firm in Tampa, for over 20 years. Prior to that, he was with Delta Environmental Consultants.

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