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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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Work ramps up on Lake O dike

By BLANCHE HARDY, PG

The U.S. Army Corps of Engineers is expanding its repair program on the 143-mile earthen Herbert Hoover Dike surrounding Lake Okeechobee.

Over the past thirty years, leaks have developed in the dike with increases in water levels.

Investigations of the system conducted in the 1980s and 90s identified potential seepage and bank instability problems around the dike's water control structures and problematic foundation conditions.

Dike breach was determined to be likely if the elevation of water in the lake rises above 20 feet.

"The corps continues work on the dike, having invested more than \$500 million in rehabilitation efforts since 2007," said John Campbell, a spokesperson in the corps' Jacksonville District office. "Work completed to date includes installation of a 21.4-mile par-



Photo courtesy of Michael J. Canella, www.aerial-photo.com

An agreement was reached between the St. Johns Riverkeeper and business and civic leaders in Jacksonville that will enable the start of dredging work on the St. Johns River near the port, shown above. See story below.

DIKE
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Florida's Amendment 1:

Debate continues on how to spend proceeds from conservation initiative

By PRAKASH GANDHI

Florida lawmakers are still deciding how best to divvy up the funds from Amendment 1, the conservation initiative passed by voters last November.

The amendment, backed by 75 percent of voters, requires 33 percent of the proceeds from documentary stamps on real estate transactions to be spent on conservation projects over the next two decades.

Amendment 1 is expected to provide over \$750 million for such projects in the fiscal year that starts July 1.

Environmental activist groups believe that Amendment 1 funds are intended solely for land acquisition and conservation.

But other interests think the money should also be directed to drinking water supply projects, wastewater treatment facilities and other environmental projects.

Exactly how the funds should be divided was one of the main environmental priorities of the 2015 Florida Legislature session that convened in early March.

Clay Henderson, senior counsel at Holland & Knight LLP, has been closely involved with Amendment 1. He said in March that it is still too early to determine how the funds will be spent but that there has been plenty of buzz on the subject.

"We are setting the table, but the food has not been delivered," he said. "The governor has laid down his cards. There is agreement on a lot of the fundamental issues that he supports, such as springs restoration, land acquisition and Everglades restoration."

Most groups are now waiting to see

specifically what direction lawmakers will take on the issue. Both houses of the Legislature have drawn up bills dealing with environmental issues.

House Bill 7003, among other things, emphasizes reliance on basin management action plans to cleanup Lake Okeechobee and has backing from agriculture, business and industry groups.

The bill also requires the state Department of Environmental Protection to complete a water quality assessment of Florida's springs by Dec. 1, 2018.

Over in the Senate, SB 918 requires the state to identify septic tanks within springs' protection zones and develop remediation plans for those contributing nutrient pollution.

The group known as Florida Land

and Water Legacy, which led the amendment drive, has outlined its plan that would send \$150 million to the Everglades and South Florida estuaries and another \$150 million to the Florida Forever program for land acquisition, springs and trails.

In addition, \$90 million would be spent on land management, \$50 million on springs restoration, \$25 million on rural lands and \$20 million on beach management.

Meanwhile, Gov. Rick Scott wants \$150 million for the Everglades of which \$122 million would cover work already underway. He also wants lawmakers to allocate \$50 million for

AMENDMENT
Continued on Page 6

Unique environmental agreement enables St. Johns dredging to begin

By SUSAN TELFORD

A deal struck between the St. Johns Riverkeeper, and Jacksonville city and business leaders will enable the start of dredging on the St. Johns River. The project will allow larger ships to access the port in Jacksonville.

For their part, the Jacksonville Chamber of Commerce, the Jacksonville Port Authority and city officials agreed to find funding and obtain permission to breach the Rodman Dam and restore the Ocklawaha River.

In exchange, the St. Johns Riverkeeper agreed to drop plans to legally challenge the environmental impact statement from the U.S. Army Corps of Engineers regarding the dredging of the

river.

According to the Riverkeeper, breaching the Rodman Dam and restoring the Ocklawaha would add more freshwater to the St. Johns while also providing important mitigation.

St. Johns Riverkeeper Lisa Rinaman said the restoration would offset some of the impacts of dredging.

She also said that her organization will not issue a legal challenge if the Ocklawaha River restoration is successful, or will drop the challenge if it was already issued.

However, the group plans to continue with the challenge process until the dam-breaching issue is resolved.

ST. JOHNS
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Cross-State Air Pollution Rule winds its way through court system, again

Staff report

After more than seven years of effort, the Clean Air Act's Cross-State Air Pollution Rule is still far from settled.

Last April, the Supreme Court overruled a lower court, upholding the U.S. Environmental Protection Agency's decision to use costs for emission reduction to establish state targets for reductions in nitrogen oxide and sulfur dioxide emissions.

The Supreme Court, in the most general terms, upheld the EPA's use of costs. But the case is back before judges of the U.S. Court of Appeals for the District of Columbia who must weigh the challenges of how the agency will implement the rule.

The court of appeals is now hearing arguments on the contentious points of the rule. The first involves some instances of how the EPA apportioned air pollution contributions of upwind states and therefore how much they have to now reduce their emissions.

Lawyers for the upwind states contend that the agency unreasonably required them to reduce air emissions, even when the downwind states could meet compliance goals without any change in upwind states' emissions.

The cost criterion bears directly on each state's required effort to reduce emission levels.

The EPA believes that the court decision that upheld the use of costs methodology endorses the cost formulas for all states subject to the rule. Lawyers for the states challenging the rule contend that some states meeting the requirements will end up reducing air emissions well in excess of the law's requirements.

In a legal opinion last year for the Supreme Court, Justice Ruth Bader Ginsburg opened the door for "as applied" challenges on this aspect of the EPA's rule.

The cross-state rule applies to 25 states east of the Mississippi River. Fourteen of those states are plaintiffs against the EPA. The list includes Florida as well as Alabama, Georgia, Indiana, Kansas, Louisiana, Michigan, Mississippi, Nebraska, Ohio, Oklahoma, South Carolina, Texas and Wisconsin.

The circuit court heard arguments at the end of February and a decision is expected later this year.

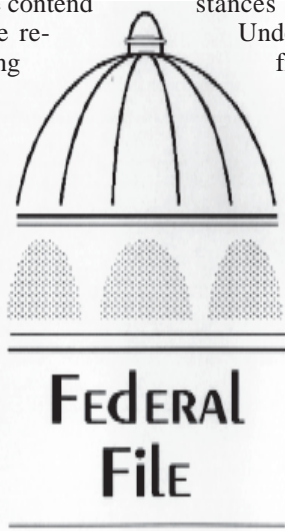
Oil dispersant rule. Early this year, the EPA proposed amendments to Subpart J of the National Oil and Hazardous Substances Pollution Contingency Plan.

Under the proposal, it will for the first time regulate the use of dispersants, other chemical and biological agents, and other spill-mitigating substances used in response to oil discharges into waters of the U.S.

Some portions of the new rule proposed a substantial change in how dispersants should be used.

The new rule includes monitoring requirements for dispersants used in response to "major discharges and/or certain dispersant use situations."

It also includes new dispersant testing and listing requirements, including the use of a baffled flask test for dispersal capability.



The proposed rule mandates the use of new developmental and some chronic toxicity testing requirements, revisions to the acute toxicity testing methodologies, and some limitations for dispersal use in saltwater environments.

The use of dispersants as surface washing agents will also be subject to new acute toxicity tests, efficacy requirements and use limitation based on the new tests for saltwater and/or freshwater environments.

Bioremediation agents that encourage microbial attenuation of oil concentrations under the proposed rule will be subject to new listing requirements and subject to tests for efficacy and acute toxicity testing.

This part of the rule includes exceptions for nonproprietary products. It also establishes limitations on use in saltwater and freshwater environments. Solidifier and herding agents will also be subject to similar types of testing.

The new testing procedures for dispersants, bioremediation agents and other chemical agents will result in extensive revisions of Appendix C to Part 300 of the EPA's oil dispersant rule. The EPA also proposes to remove Appendix E to Part 300.

The new rule establishes a list of "known, nonproprietary sorbents to be made publicly available in lieu of listing sorbents on the schedule." For sorbents not specifically listed in the rule, new requirements for data and information about the products and their components are also proposed.

Confidential business information policies will be revised to give the public more information about chemicals used in sorbents. This is one aspect of a larger effort to revise the "addition of a product of the schedule" submission requirements.

The new rules are a direct result of the Deepwater Horizon oil spill, during which two different formulations of the approved oil dispersant Corexit were used. More than 1.8 million gallons of the dispersant was used during an 85-day period.

Since the spill, much evidence has accrued that Corexit use reduced the immediate harm of floating oil.

But in the post-mortem, Corexit did not escape blame. Many of the dispersant's components have not been tested for sub-chronic developmental effects that could indicate whether its massive use will influence long term changes to the Gulf of Mexico ecosystem.

Portions of this rule, if implemented, will close the gap between testing done in the 1970s and testing that will be performed over the next few years.

EPA, state department partnership.

The EPA and the U.S. Department of State recently initiated a partnership focused on U.S. diplomatic missions overseas.

The partnership's goal is to "enhance the availability of outdoor air quality data and expertise at a number of U.S. diplomatic missions."

Expanding the EPA's AirNow monitoring system to include data from U.S. embassies overseas is an effort the EPA cited as a "key feature" of the partnership.

The partnership also includes a fellowship program to enable technical experts to visit participating diplomatic missions to help transfer skills and improve capabilities for air quality monitoring data analysis and instrument maintenance.

The program will also have opportunities for training and exchanges with host governments and other participants.

Record coal ash fines. Duke Power has negotiated a plea agreement to settle multiple violations of the Clean Water Act arising from years of seepage and overflows from coal ash impoundments.

According to court filings and statements from Duke, the company will admit guilt and pay \$102 million in fines, restitution and community service. The company's shareholders—not electricity

FEDFILE
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FPL, Daytona International Speedway make solar plans

Staff report

Florida Power & Light Co. and Daytona International Speedway announced plans to install more than 5,000 solar panels at the race track.

FPL officials said the panels will produce enough zero-emission solar energy annually to offset the carbon dioxide created by an average car lapping Daytona International two million times.

The project includes constructing solar panels on canopy-like structures that will provide shade for race fans.

The solar panels will provide power for the speedway's operations as well as FPL's 4.7 million customers.

FPL officials said that the 1.7 megawatts generated will make the project one of the largest distributed solar installations in Florida. That's enough power to prevent an estimated 2,200 metric tons of carbon dioxide emissions annually.

The project will rank the speedway as the fifth largest for solar energy capacity among professional sports facilities in the country.

FPL plans to install the solar panels this fall and have them providing energy to the grid by the end of this year.

Solar-powered brewery. Gainesville-based Swamp Head Brewery is using Florida sunshine to power its brand new brew house.

The brewery is installing over 50 solar panels on the roof of its new building. The 57 panels will generate enough energy to power about three average-sized homes.

The brewery has enough room to install about 100 more panels.

The project will cost Swamp Head about \$45,000.

Wind power purchase agreement.

Gulf Power has asked Florida regulators to approve its first-ever wind power purchase agreement to buy 180 MW of output from its 300-megawatt Kingfisher project in Oklahoma.

The wind power purchase agreement would be the first for any utility in the state of Florida.

The state has no wind capacity at present and less than 200 megawatts of photovoltaic power generation, despite its immense solar resources.

The only renewables capacity Gulf Power currently has on its books is a land-fill gas-to-energy facility.

Gulf Power recently announced plans to build three utility-scale PV projects totaling 120 MW in Florida which, if approved by regulators, may enter service by late 2016.

SWA news. Sun Recycling has entered into a fuel contract with Palm Beach County.

The governing board of the Solid Waste Authority of Palm Beach County has voted to bring supplemental waste fuel to the authority's Renewable Energy Facility when there is excess capacity.

SWA also reported that it will enter into a contract with Sun Recycling LLC to bring in processed construction and demolition material as well as processed municipal solid waste from Sun's Palm Beach and Broward county recycling facilities.

Monroe waste hauling agreement.

Monroe County commissioners have voted to sign a 30-month interim agreement with Energy 3, a Maryland firm, to haul yard waste out of the county.

Energy 3 is pursuing efforts to build an innovative gasification plant in southern Miami-Dade County to convert yard waste from the Florida Keys into a synthetic fuel used by power plants.

The plant is not expected to be operational for more than two years.

Commissioners agreed to let Energy 3 handle the yard waste at a cost of \$79.50 per ton for the duration of the interim contract.

The county produces about 30,000 to 40,000 tons of yard waste annually.

People news. Herschel Vinyard joined Foley & Lardner LCP's Government & Public Policy and Environmental Regulation practice as Of Counsel in its Jacksonville and Tallahassee offices.

Vinyard recently completed a four-year stint as secretary of the Florida Department of Environmental Protection.

Matthew Leopold joined the law firm of Carlton Fields Jordan Burt. Leopold is former general counsel of the Florida Department of Environmental Protection and a former attorney at the U.S. Department of Justice. He joins the firm as Of Counsel in Tallahassee and will be a member of Carlton Fields' Government Law and Consulting practice group.

Charlie Owens has retired as president of Environmental Remediation Services Inc. in Jacksonville. John Anderson has assumed the duties of president at the firm.

Company news. International law firm Fowler Rodriguez, based in New Orleans and South Florida, said it will open an office in Tampa. Christopher Koehler will be its resident attorney. Koehler has

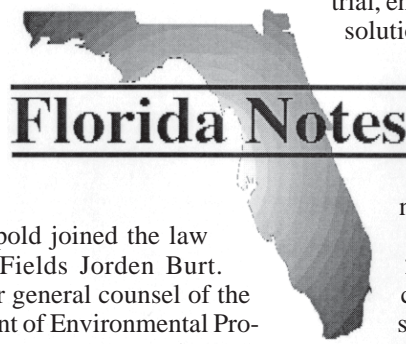
experience in federal district and Florida circuit courts, and focuses on maritime law.


United States Environmental Services and K2 Industrial Services have joined forces to provide a wide range of industrial, environmental and specialty craft solutions, including hazardous material emergency response, oil spill cleanup, environmental remediation, industrial coatings, insulation and industrial cleaning and maintenance.

K2/USES has over 2,000 employees and 40 service centers nationally including several in Florida.


Recycling workshop. On April 23, the Southern Waste Information eXchange Inc., in partnership with the Florida Department of Environmental Protection and others, will conduct a one-day recycling workshop for small businesses.

Workshop participants will learn how to start or improve a workplace recycling program and what resources are available in Florida to help them succeed. The event will take place at the Second Harvest Food Bank Meeting Facility in Orlando. Register online at <http://swixusa.org/recycle/> or call (850) 386-6280.

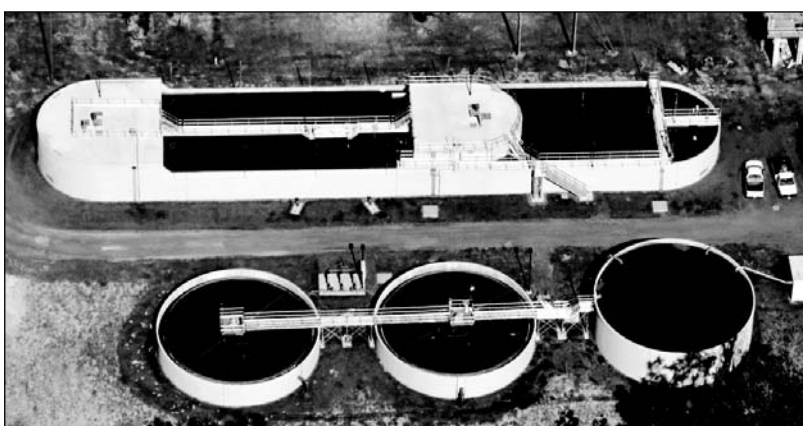




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Vero Beach installs hybrid system to eliminate septic discharges

Staff report

The city of Vero Beach is installing a hybrid septic tank effluent pumping system, or STEP, in an effort to reduce nutrient loading to the Indian River Lagoon.

The new system is a fix to an existing septic system that links it to a wastewater sewer line, conveying the effluent to a central wastewater treatment facility.

The STEP system is affordable, according to city officials, because it does not require the removal of an existing septic tank and its drainfield. The septic tank remains functional, and can be used during

periods of power outages when STEP pumps are not working.

Installation of the STEP sewage line is much cheaper than installing an eight-inch gravity-based sewer line.

Initially, a directional boring contractor places a two-inch pressurized sewage line along the road right-of-way. Then residents hire a plumbing contractor to connect their septic tank piping to the STEP system.

Vero Beach City Manager Jim O'Connor said that connection to the system is voluntary at the time the lines are placed.

Those who connect will have their sep-

tic tanks pumped, and will pay the same monthly wastewater treatment fee as any other customer in Vero Beach.

Residents who continue to use septic tanks may use them until they fail. But the city will no longer approve septic tank repair or approve permits for replacement where connection to the STEP system is available.

Residents will then be required to connect to STEP, perhaps at higher prices than are assessed during the initial year.

The typical lifetime of a septic tank is about a decade, so all currently used septic tanks in Vero Beach could be on the STEP system within 10 years.

O'Connor said that the city plans a phased approach to install the STEP system mains so that up to 1500 residences now on septic could connect to wastewater treatment plants.

The phase currently underway involves over 50 beach-side residences north of the commercial district. Two-inch mains will be installed and ready for customer connection by June.

Subsequent phases will move south along the beaches, then along the western shore of the Indian River.

Converting to STEP is expected to divert up to 40,500 pounds of nutrients from septic system drainfields to Vero Beach's wastewater treatment plant.

Otherwise, those nutrients would continue to percolate through the soil and into the Indian River, causing eutrophic algal blooms.

In some parts of the Indian River Lagoon, up to 60 percent of the nutrients contributing to eutrophication come through groundwater infiltration.

The STEP conversion is a joint project between the St. Johns River Water Management District and Vero Beach.

The total cost will be \$885,000 with the district supplying \$292,050.

Destin stormwater. In February, the Destin City Council unanimously gave staff the go-ahead to apply for \$1,061,742 from the Florida House's Agricultural & Natural Resources Appropriations Subcommittee.

The money would be used to install an automatic pump and dry well system to help control flooding at the city's Heritage Run subdivision.

Destin has been working to reduce flooding during rain events at Heritage

Run since 1994 following Hurricane Alberto.

In 2006, the city received a hazard mitigation grant from the state. It was used to improve drainage in the neighborhood by installing an automatic floodgate and larger drainage pipes, and constructing a 30-foot conveyance swale. Drainage was gravity-based. But the system has proven insufficient.

The city hired Jenkins Engineering to perform a storm-

water analysis. Its report submitted in January noted that the primary problem at Heritage Run was that it was located in a land-

locked basin with no adequate discharge area for stormwater.

Sarasota, Manatee line up project funding. Officials in Manatee and Sarasota counties have submitted requests to the Southwest Florida Water Management District to fund 23 water-related projects.

The total cost for the projects is \$23 million. Local officials are hoping to get at least \$20 million from the district.

Eighteen of the 23 projects are rated above median priority and the same number of projects include habitat restoration, at least to some extent.

One example of the projects is a flood mitigation study for the city of North Port in Manatee County. The city is experiencing persistent flooding in some areas from water flowing from Big Slough. The flooding is backing up sewage lines.

The Federal Emergency Management Agency is redrawing flood zone lines that will dramatically expand zones within the city. As many as 22,614 property owners will be required to buy federal flood insurance if they have a mortgage on their property.

North Port's city government has already approved \$125,000 for a flood study that will, among other things, evaluate stormwater diversion away from major roads to avoid flooding.

City officials expect that diverting water away from roadways will be much cheaper than construction projects to raise them.

The city of Venice in Sarasota County is asking for funds to address Dona Bay water quality improvements. This effort has already received \$3.1 million in prior years. \$3.15 million is requested for next year.

WATCH
Continued on Page 5



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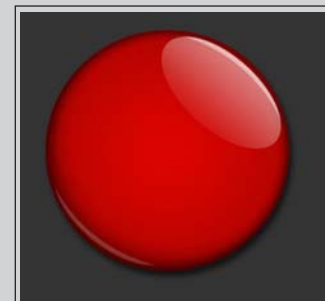
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St. Johns River WMD working to address impacts to Silver Springs

By **BLANCHE HARDY, PG**

The St. Johns River Water Management District is developing a prevention and recovery strategy to address the potential impacts to Silver Springs that result from the consumptive use of water in the region.

The various components of the district's strategy—water conservation, flow and water quality enhancement projects, and regulatory options to achieve proposed minimum flows and levels—were presented to the district's governing board in February.

The board is tasked with ensuring that sufficient drinking water is available for existing users, developing new water supply projects and preserving the environment.

The flow of water in the Silver Springs system is being adversely impacted by excessive groundwater withdrawal. The draft strategy's focus is on recovery of flow at the springs and resulting compliance with MFL standards from the increased infusion of freshwater downstream.

Implementation of the strategy anticipates a phased approach including incorporating revisions based on the results of monitoring as mitigation is undertaken.

Among the suggested methods are enhancing water conservation by all user groups including potential cost-sharing for new conservation lands and increasing Upper Floridan Aquifer recharge near Silver Springs.

WATCH From Page 4

Sarasota County will also ask for funds for a \$12.5 million project to restore 363 acres of wetlands along Cow Pen Slough. The restored wetlands will remove excess nitrogen in water flowing to Dona Bay.

The cities of Bradenton Beach, Anna Maria and Holmes Beach are requesting \$452,500 to reduce the impact of storm-water discharges on Sarasota and Tampa bays.

Elsewhere, the Sarasota Bay Estuary Program is requesting \$300,000 to pay half the cost of restoring 16 acres of wetlands and dunes on Lido Key. In addition, Lake-wood Ranch would get funding to extend reclaimed water lines near Bradenton.

The district's governing board will approve a final ranking for each project during its April meeting. Those projects with ranks higher than median are expected to receive funding.

Reestablishment of oyster reefs, seagrass beds. The Florida Oceanographic Society and the Sanibel-Captiva Conservation Foundation will each receive half a million dollars in grant funding from DEP to restore seagrass beds and oyster populations in the St. Lucie and the Caloosahatchee estuaries.

In both estuaries, excessive and poorly timed freshwater discharges have caused loss of seagrass habitat and oyster reefs. The funding is intended to restore the critical habitat for seagrass and shellfish.

The Florida Oceanographic Society operates a shellfish hatchery in Stuart that will provide spat for oyster restoration.

The society also grows five common seagrass species. The funding will allow the society to continue this effort.

Smart meters for GRU. Gainesville Regional Utilities, one of Alachua County's largest public drinking water suppliers, plans to spend \$212,000 to install digital smart meters on its water distribution lines.

The St. Johns River Water Management District will contribute \$66,000 to cover some of the costs.

The new digital meters will help improve water conservation by providing accurate information about water consumption while detecting system leaks, theft and backflows.

Once the meters are installed, GRU hopes to reduce water loss by 120,000 gallons a day, a substantial contribution to

Central to the strategy is an aquifer recharge project that would significantly improve spring flows for Silver Springs. U.S. Geological Survey data indicates flow rates in the spring declined at a rate of 0.05 cubic feet per second between 2000 and 2012.

The Howard T. Odum Florida Springs Institute in Gainesville considers Silver Springs one of the most endangered large springs in the state.

Diminishing flows have dropped the Silver Springs group from first in flow to second, now trailing the Rainbow Springs group in order of Florida's first magnitude artesian spring groups.

Proposed projects include a wetland treatment system to store and enhance water quality before recharge.

Recharge supply is anticipated from a variety of sources including reclaimed water projects, and storm and surface water when available from the Ocklawaha River.

The board approved a land exchange facilitating the district's acquisition of 1,041 acres of the Half Mile Creek property and Ocklawaha River Tract in Marion County in exchange for \$1 million and 625 acres of the district-owned Bear Track Bay property.

The district will retain a conservation easement on the Bear Track Bay property.

The Half Mile Creek property is located within the Silver Springs springshed and is being considered a potential site for the recharge project due to its proximity to the

water conservation.

Customers will benefit because early leak detection helps avoid higher costs. In addition, leaking lines can be repaired before complete failure.

Information from smart meters may also help customers modify their water use behavior.

Pasco County firm fined. Concord Station LLC received a \$30,000 administrative penalty from the U.S. Army Corps of Engineers for permit noncompliance.

Concord Station failed to complete wetland compensatory mitigation involving the creation of two acres of herbaceous wetlands, as well as the restoration of about four acres of herbaceous wetlands and about five acres of forested wetlands.

A 10-acre upland buffer was also part of the plan that was not completed and a quarter of an acre of temporary wetland impact was not restored to its previous condition.

The company also discharged fill material to over an acre of wetlands after the permitted construction window closed. The habitat involved was in the Anclote River Watershed in Pasco County.

Withlacochee contamination. The city of Valdosta, GA, is months ahead of its construction schedule to install a force main for its sewage system.

When the project is complete, the city's sewage overflows into Knights Creek, One Mile Branch, Two Mile Branch and Sugar Creek should end.

The overflows, which have occurred several times this winter, forced the Florida Department of Health to issue "avoid contact with water" warnings downstream in the Withlacochee River in Florida's Hamilton and Madison counties.

The most recent warnings were issued in early March following heavy rains. Usually within a week, water analyses indicate that bacteria levels have dropped enough to lift the warnings.

By next fall, the frequent warnings may be a thing of the past.

WMD board appointee. Marc Dunbar was appointed to a vacant seat on the governing board of the Northwest Florida Water management District. His appointment is through March 1, 2018.

Dunbar is lawyer and partner in Jones Walker LLC and an adjunct professor at the Florida State University College of Law.

main vent at Silver Springs.

"We are preparing to close on the exchange this spring," said St. Johns River Water Management District Spokesperson Hank Largin.

"We continue to evaluate the recharge project feasibility and the (property) exchange offers some recharge protection merely by adding acreage within the springshed into conservation," he said.

"The new property may be an important location as part of a recharge enhancement project, most likely by providing a site for treating water prior to recharging

into the aquifer for the benefit of springflow in the Silver Springs complex."

Additional strategies proposed by the district to enhance water quantity and quality include supporting additional reclaimed water supply projects for irrigation by Marion County and the cities of Ocala and Belleview.

The district is evaluating cost-sharing for the new projects, optimization/relocation of wellfields and conversion of some of the withdrawals for public supply to the Lower Floridan Aquifer, and alternative water supply projects for potable use.

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New report: Florida fisheries at heightened risk from ocean acidification

By ROY LAUGHLIN

Florida Gulf Coast mollusk fisheries face extremely high risks from ocean acidification due to increasing atmospheric carbon dioxide concentrations.

The risks to the fisheries are not due solely to CO₂, however. The overall risk is a result of eutrophication in estuaries, reliance on a single fishery species—the oyster—and a low level of institutional support for the fishery and those involved with it.

These are the conclusions of an extensive research project led by the Natural Resources Defense Council.

The peer-reviewed report, published in *Nature Climate Change*, is a multidisciplinary characterization of the likely effects of increasing atmospheric CO₂ on U.S. shell fisheries on both coasts.

The report is a first because it bases its conclusions on a matrix of factors influencing the effects of ocean acidification on shell fisheries.

Fundamentally, the risks are driven by increasing hydrogen ion concentrations in the oceans and estuaries. When CO₂ dissolves in water, it reacts with the water to form carbonic acid, H₂CO₃.

That compound itself does not harm organisms. It is an acid that dissociates partially to release hydrogen ions—the problem child of the dissociation process.

The hydrogen ions cause a decline in the aragonite saturation state, the source of calcium for shells. This means that calcium is less likely to precipitate to form shells.

The declining aragonite saturation state makes it more difficult and energetically costly for larval bivalves to build shells before the declining aragonite saturation state becomes corrosive. The declining aragonite saturation seems to be the important variable for the most sensitive early stages of a bivalve's larvae.

As they focus their discussion on the role of aragonite saturation in ocean acidification, the authors include the important point that the oceans have not crossed the threshold of pH 7 that marks the boundary between acids and bases.

The ocean's pH is still close to 8 and, in most estuaries, it is still usually well above 7.5. The ocean remains a mildly alkaline solution, whose aragonite buffer stabilizes its pH.

It is the change in the chemistry of the buffer that is causing problems for any marine organism that depends on calcium

for a skeleton, including about half the invertebrate phyla in the ocean.

It is an almost impossible challenge to explain to the layperson this process in specific chemical terms, so the term "acidification" is used to explain what otherwise is a minor shift on a global scale of a chemical reaction's delicate equilibrium.

The report expands insights into the effects of ocean acidification by evaluating how contributing and interacting factors such as eutrophication increase the damage done by increasing hydrogen ion concentrations, and the resulting decrease in calcium ion concentrations.

In New England, freshwater inflow from the granite shield has virtually no buffering capacity, and the acidity of that freshwater affects bivalve mollusks in a straightforward context of acidic chemical reaction.

However, along the U.S. Gulf Coast, eutrophication and low oxygen tensions interact to magnify damage of habitat acidification. Along the Mid-Atlantic and Pacific coasts, ocean upwelling brings acidic water onto the continental shelf from deep water to reduce yields in the largest bivalve fishery in the country, the ocean scallop fishery.

The U.S. Pacific coast is the region

identified in the report as the one most vulnerable to "marine ecosystem exposure." It has already suffered approximately \$130 million in economic losses attributable to ecosystem exposure.

The Florida Panhandle's estuary and fishery communities have one of the worst prognoses of any when considered in the larger context of both chemical processes and the local community's adaptive capacity.

Extensive eutrophication is already a factor in reducing oyster fishery yields, and increasing ocean acidity is making the problem worse.

According to the report, "Pockets of marine ecosystems along the East and Gulf coasts will experience acidification earlier than global projections indicate, owing to the presence of local amplifiers such as coastal eutrophication and discharge of low aragonite saturation river water ... The inclusion of local amplifiers reveals more coast line segments around the United States that are exposed to acidification risk than when basing exposure solely on global models."

In summary, the authors said that 16 out of 23 bioregions across the U.S. would be exposed to rapid ocean acidification with one amplifier. Ten of those regions are now exposed to two or more threats of acidification.

Florida's problem is not only the biological response of the oyster to acidification. It is also that local institutions are not likely 1) to be capable of mitigation based on replacement species or resistant strains of existing species obtained by selective breeding or other methods; 2) to support aquaculture efforts to grow spat in protected environments before they are placed in estuaries; 3) to retrain local residents for these new fisheries practices; or 4) to retrain fishermen for new livelihoods should shell fisheries collapse entirely.

Like many of the other effects of increasing atmospheric CO₂, ocean acidification has not caught up with the levels of gas that are already in the atmosphere.

Even if all CO₂ emissions were to end immediately, ocean acidification will continue to increase for years.

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AMENDMENT

From Page 1
 springs and \$178 million for debt service on bonds tied to the Florida Forever and Save Our Everglades programs. Another \$20 million would go for land purchases and restoration of the Kissimmee River.

Scott has drawn criticism because his plan includes a proposal to provide wastewater treatment in the Florida Keys, which activists question as an allowed use under Amendment 1. In addition, criticism has focused on the governor's proposal to use \$156 million to cover operating expenses at state agencies.

Unlike the Senate version, the House bill does not include springs protection zones that would regulate the impact of septic tanks and the flow of stormwater and agricultural runoff into springs.

The key issues involve water policy, how the increased funding will be used and the possible creation of a single trust fund to handle the money.

"The Senate is clearly very interested in fixing up springs," Henderson said. "But we won't know the final answer on how Amendment 1 funds will be spent until the last week of the session."

"Clearly what motivated me to work for three years to get this amendment passed was the inability to fund land acquisition and Everglades restoration. But we also talked about cleaning up springs and estuaries."

Eric Draper, executive director of Audubon Florida, agreed that it's still too soon to determine where the funds will end up.

"The House has set a lot of money aside for water projects," he said. "But voters approved using the money for land acquisition. It's still very early in the session, so we are not too worried. There is some money for the Everglades and some money for springs. We are happy about that."

Challenges to Lower Santa Fe, Ichetucknee MFLs end in DEP's favor

By ROY LAUGHLIN

In mid-February, Administrative Law Judge Bram Cantor upheld a Florida Department of Environmental Protection rule establishing minimum flows and levels for the Lower Santa Fe and Ichetucknee rivers. The decision ended two legal challenges heard by the judge.

DEP issued a statement of its proposed rule in March, 2014, and was almost immediately challenged by Bradford Still, an administrator of the Bradford Soil & Water Conservation District, and the Ichetucknee Alliance, a local environmental advocacy group.

A major issue for the plaintiffs was a "grandfather clause" in DEP's rule that for the next 20 years gives automatic renewal to permit holders for their current water allocation.

The petitioners were concerned that if the existing users are withdrawing so much water that the rivers are below acceptable MFLs already, it gave DEP no way to reduce withdrawals to meet the new rule's MFLs.

But water regulators are not so locked

in as the 20-year renewal might indicate. DEP's rule also included provisions to modify permitting withdrawals when the Suwannee River Water Management District validates a groundwater flow model for North Florida and South Georgia.

Staff at the SRWMD will begin running the model in 2015 and expect it could be ready for use related to permit allocations in five years.

Judge Cantor found that the provisions of the proposed MFL and recovery plans, including rules for 16 springs that feed the rivers, were legal.

He did note that DEP failed to follow procedural requirements to comply with rulemaking.

"Two rules setting the river MFLs are vague because either the period of record or the technical source document for the flow duration curve used to set the MFLs was not referenced in the rule," he noted.

During the first week of November, 2014, DEP formally supplied the missing information.

Almost immediately, Paul Still filed a second request for a hearing with Florida's Division of Administrative Hearings.

This time, he challenged the location where flow measurements will be taken—Fort White on the Santa Fe. He said it would not adequately show the effects of groundwater pumping at the Gainesville Regional Utilities' wellfield in Alachua County.

In February, Cantor issued his decision—brief and to the point: "Petitioners are estopped to challenge the unchanged portions of the rule and failed to prove that the changed portions of the rule are vague."

This ruling should mark the end of challenges against DEP MFLs for these two rivers within the Suwannee River district.

Judge Cantor's ruling upholding Chapter 62-42, Florida Administrative Code, is important because this is the first time that DEP established cross-boundary minimum flow and level rules.

Chapter 62-42 will be a blueprint for other regional water management efforts in the state.

Regional water management plans are currently under development for the I-4 corridor between Orlando and Tampa.

Rule development for Chapter 62-42 is an important step forward—not just for any specific case, but as a general model for future use in what DEP characterizes as a "streamlined rulemaking process."

Bradenton drainage model expected to minimize future flooding problems

By BLANCHE HARDY, PG

The city of Bradenton recently began a \$699,000 effort to develop a city-wide drainage model to quantify the interrelated workings of its drainage system.

The modeling effort is supported by a \$349,500 matching grant from the Southwest Florida Water Management District. The city's stormwater utility fee will cover the balance.

"The overall project is a two-year effort that calls for the model to be developed and peer reviewed by April, 2016," said Jim McLellan, Bradenton's engineering section manager. "It will then be used first by the project team to evaluate best management practices and alternatives to address flooding issues and prepare a recommendation plan. By November 2016, the model will be submitted to SWFWMD for their use as well."

The city hopes the model will address a variety of issues throughout their service area by allowing for enhanced definition of problem areas and resulting in better informed solutions. Once established, the model will also be provided to developers for incorporation into their drainage planning to help assure future development will not create additional flooding problems.

The best possible stormwater management decision making is critical to the city. The 2012 flood maps produced through a partnership between Manatee County and the Federal Emergency Management Agency indicated Northwest Bradenton, as an individual entity, could experience more than \$1 billion in property damage as a result of storm-related flooding.

The area, along with nearby Sarasota, appears on property analysis provider Core Logic's top-ten list for number of homes at risk in the U.S. for hurricane-related storm surges.

The city has engaged residents to assist in identifying potential flooding problem areas. For example, they have received a number of dated photographs from citizens showing localized flooding that may be useful in estimating flood stages.

Bradenton's engineering section also hopes the model will allow the city and developers to utilize smaller alternatives to traditional retention ponds for stormwater management.

McLellan suggested that options may include things like bioswales, pervious pavement and stormwater gardens. Bioswales are landscape elements designed to remove silt and nutrient pollution from surface water using vegetation as a filter.

Senate Bill 536 from last year's legislative session directed the state's five wa-

ter management districts to consider stormwater as a potential alternative water supply source. More attention is now being directed toward the use of green space stormwater management options such as rainwater gardens.

"These types of alternatives will certainly be given consideration where appropriate and viable," he said. "These items are currently included in our form-based codes as items that qualify for credits. Evaluation of alternatives, however, will not begin officially until the summer of 2016."

Although the model will be specific to Bradenton, the project may be useful in assisting other municipal governments in developing similar tools.

"The concept of such a model is not new," he said. "However, the model will be highly useful for us as a heavily developed urban community to allow us to better manage stormwater flows from future development/redevelopment."

"Perhaps more importantly, it will provide us the ability to design and implement solutions to flooding in one area without creating new flooding issues elsewhere within a drainage basin, something that is required by SWFWMD but which is difficult to accurately predict without such a model."



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Arsenic turns up again at high levels in Miami-Dade County soils

By ROY LAUGHLIN

When city of Miami Beach officials stockpiled soil from two recent construction projects, they intended to use it as inexpensive fill for future public works projects. They stockpiled the soil at the Bayshore Municipal Golf Course.

Prior to its use as fill, the soil was tested to ensure that it met appropriate standards for urban environments. The results of

those preliminary tests were troublesome.

The soil contained, among other things, substantial construction debris including pieces of tile, brick and rebar. City officials asked Miami-Dade County's Division of Environmental Resources Management to investigate further.

The county found that the soil also contained four times the allowable amount of arsenic, up to 19 mg/kg.

Miami Beach's acceptable background soil arsenic level is 4.2 mg/kg.

The soil came from two large building projects. One was the Alton Road drainage and road rebuilding project in Miami Beach, a Florida Department of Transportation project. The other was a mid-beach condominium project being built by local developer Alan Fuena.

Contractors for both projects said that the soil was clean when they delivered it. Initial news reports said that city officials planned to have all the soil removed.

More recent reports from the city indicate that they may be changing their original plan.

A February memo from Wilbur Morga, PE, chief of the county's Environmental Monitoring & Restoration Division, noted that significant portions of the various types of soil were also spread across the western side of the golf course along with a western berm of sand material.

The memo noted that additional piles of soil had been added to the golf course storage area, west of piles with a strong petroleum odor, and a characterization of the soil piles would be provided in the near

future.

Since then, the city has separated the building debris from the fill dirt.

Miami Beach is still committed to re-using the soil, according to a statement from Julia Yarbough in the office of communications at the city.

"The soil could potentially be used at another site," she said. "The city is in the process of conducting additional testing to determine potential reuse options."

Its use for fill in parks, though, seems less likely than city officials had intended when they made the deal to take it from the construction sites.

Finding high arsenic concentrations in soils in the Miami area is a sensitive issue because over the past couple of years, Miami-Dade County and local municipalities have spent significant time and money testing soils in over 100 parks.

Seven parks had high levels of arsenic and heavy metals in the soil, and remediation efforts were necessary.

In the case of those parks, the contamination came from trucked-in soils used to fill quarries that were converted to parks.

Orange County gets approval to drill deeper wells into Floridan Aquifer

By PRAKASH GANDHI

Water managers have approved a request by Orange County officials for permission to drill wells deeper into the Floridan Aquifer.

County officials said the drilling will be more expensive than tapping into the Upper Floridan. But they said the effort will have environmental benefits.

"It will cost us more, but it will be better for the environment," said Christine Doan, Orange County Utilities' chief engineer. "We will show less drawdown in the nearby waterbodies."

Within the 18-county St. Johns River Water Management District, Orange County is the third largest supplier of water to homes and businesses, ranking behind utilities in Jacksonville and the city of Orlando.

Orange County has permits to pump as much as 100 million gallons a day. One of those permits, authorizing 56 million gallons a day, was issued by the St. Johns River district in 2006 and was up for revision earlier this year.

Orange County is proceeding with the development of six wells and a treatment plant on Malcolm Road near Ocoee to supply thousands of new homes approved for construction.

"We have an area of West Orange County that is growing considerably," said

Andres Salcedo, assistant director at Orange County Government.

"We had a regional water plant planned in the 1990s, but the growth that was supposed to happen didn't happen because of the slowdown in the housing market," he said. "Now, we are seeing an upturn in growth."

Lakes and wetlands in the area west of Orlando already show distress related to excessive pumping from the Floridan, which supplies the region with virtually all of its drinking water.

Under the original permit, the half-dozen wells would have been drilled a few hundred feet deep.

Instead, the county wants to extend the wells to about 960 feet.

Each is expected to cost about \$500,000—as much as \$200,000 more than a shallow well.

Officials said that going deep would mean much less decline in aquifer and lake levels in western Orange County.

"We are good stewards of the environment," Salcedo said. "We don't want to damage our environment or water supply."

With a drilling schedule of two years, Orange's new wells are expected to provide as much as four million gallons a day of drinking water.

"We have been meeting the minimum flows and levels, and we will be meeting them even better in the future," said Doan.

Northwest Florida counties receive grant for storm damage repairs

By PRAKASH GANDHI

Officials in Northwest Florida received a big cash boost in their efforts to repair the damage from the devastating storm last year.

The storm tore through the Florida Panhandle dumping 20 inches of rain in 24 hours, causing flash floods, collapsing roads and leaving 30,000 people without power.

Since then, city and county officials have waited to see if funds would become available from the Emergency Watershed Protection Program through the Natural Resources Conservation Service to help with repairs not covered by other federal and state emergency response programs.

Now, thanks to a \$5.9 million grant from the U.S. Department of Agriculture's Natural Resources Conservation Service, 18 projects in Escambia, Okaloosa, Calhoun and Jackson counties will be completed.

The project sponsors are providing 25 percent of the cost in matching funds or in-kind services.

"I'm very thankful and grateful Escam-

bia County was able to secure this funding," said Keith Wilkins, Escambia County's director of community and environment. "This is a very strict grant program. It only applies to a narrow group of solutions."

"This money will allow Escambia County to complete a lot of important repairs in a much quicker time frame."

Escambia County suffered an estimated \$90 million in infrastructure damage from the April 2014 floods.

The projects will alleviate hazards to life and property caused by floods, fires, windstorm and other natural occurrences.

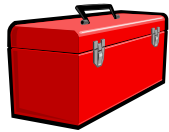
Aid includes financial and technical assistance to remove debris from streams, protect destabilized stream banks and establish cover on critically eroding lands, update conservation practices and purchase flood plain easements.

Congress appropriated the funds in December, 2014. Now, sponsors will enter into cooperative agreements, and work can begin.

More than 3,200 homes were damaged in the flooding, with 1,687 of those receiving major damage.



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Offshore wind power a reasonable option for new electricity generation

By ROY LAUGHLIN

Offshore wind exploitation could provide twice as many jobs and twice as much energy over 20 years as all the commercially exploitable oil and gas reserves on the Atlantic continental shelf.

Those are among the conclusions outlined in a recent report, "Offshore Energy by the Numbers," produced by Oceana, an international conservation group working to protect the world's oceans.

The report said that over the next 20 years, the U.S. could generate up to 143 gigawatts of electricity—enough to power over 115 million households—by exploiting offshore wind.

That development effort would create an estimated 218,640 jobs, about 1.7 times as many jobs as offshore drilling for oil and gas, which could create 127,682 jobs. These numbers are in stark contrast to estimates from oil and gas interests.

Oceana's report said that the oil and gas industries' estimates of the energy and jobs potential of U.S. offshore energy yield is based on total hydrocarbon resources. Oceana said its report, in contrast, based its estimates of energy and jobs on economically recoverable deposits.

Oceana estimates that all recoverable oil and gas on the Atlantic's outer continental shelf would meet U.S. national oil demand for only 132 days, and national gas demand for only 283 days at current consumption rates.

Wind energy, over 13 years of gradual development, would generate more than oil and gas combined. In 20 years, offshore Atlantic wind could produce five billion barrels of oil equivalents, or BOE, more than all the economically recoverable offshore oil and gas reserves.

In addition to these broad-stroke generalizations, the report includes a state-by-state characterization of energy and jobs. Each state's share is influenced by estimated resources and the size of the continental shelf area adjacent to the state.

North Carolina leads the list of Atlantic states because of its long coastline and the likelihood that it will have the most hydrocarbon resources and wind-generating potential.

North Carolina could obtain up to 31.7 GW of offshore wind potential, equivalent to 2.50 billion BOE. In contrast, oil and gas reserves are estimated to be 1.97 billion BOE.

Oceana estimated the state's wind potential is 22 percent of the region's offshore wind potential. Its estimated offshore BOE share is even greater at 32 percent.

Florida, according to Oceana's list, ranks third in terms of offshore wind potential for electricity generation with 16.4 GW, equivalent to 1.3 billion BOE over 20 years. In marked contrast, Florida is dead last among all states for offshore oil and gas development of recoverable reserves at 0.05 billion BOE.

In terms of job creation, exploitation of offshore wind potential for electricity generation could produce more than 28,000 Florida jobs. In comparison, projected offshore drilling would produce 3,828 jobs in Florida.

The combination of high wind energy potential and exceptionally low oil and gas reserves makes Florida the state with the highest ratio of jobs favoring development of offshore wind to generate electricity.

Oceana framed the jobs issue in Florida by comparing new jobs created by drilling with the preservation of existing jobs in sectors that oil and gas development might diminish.

In Florida, ocean-based tourism and recreation account for 276,000 jobs. Fisheries, aquaculture and seafood markets account for 4,570 Florida jobs. These contribute \$36.6 billion to Florida's gross domestic product.

The Oceana discussion qualifies the implication that the state faces an "either/or" outcome on the choice for drilling.

"We recognize that while offshore drilling can cause a loss of GDP and jobs, it would not cause a complete loss," said the report. "However, it is important to understand the magnitude of the contribution made by these two sectors."

How much of the state's \$36.6 billion GDP would be sacrificed by tourism and recreation, structures associated with oil

and gas recovery, or wind energy cannot be estimated with certainty. Most players with skin in the game believe some loss of revenues and jobs is inevitable—even if they can't put an exact number on it.

The report does not consider the risk of strong tropical storms to offshore structures that generate electricity from wind. The chance of damage to those and the ensuing loss of generation capacity are likely to be higher than the risks of an oil spill.

The report provides a valuable comparison of the long term value of offshore continental shelf wind energy and Florida's unique circumstances that make it far more

valuable than estimated oil and gas resources.

This report's contribution for Florida in particular is to counter the arguments that we must develop offshore gas and oil resources because no other economic alternatives exist.

More recently, the jobs argument has entered the debate as well with the same mantra: Oil and gas will provide more jobs than other energy production alternatives.

Oceana's report makes a strong case for offshore wind power as a reasonable alternative for new greener electricity generation.



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State's brownfield program supports economic growth

By SUSAN BEASON

Since 1997, Florida's Brownfields Redevelopment Program has been strengthening communities and the economy.

During that time, 75 contaminated sites have been cleaned up, over 65,000 confirmed and projected direct and indirect jobs have been created and \$2.5 billion in capital investment has been projected in designated brownfield areas.

Contaminated site cleanup and economic growth are the primary goals of the program administered by the Florida Department of Environmental Protection. The voluntary program encourages cleanup and redevelopment of sites underused or abandoned because of actual or perceived environmental contamination.

The first step in the redevelopment process is for a local government to designate a brownfield area by resolution.

The person responsible for the project can then execute a brownfield site rehabilitation agreement with the department. The BSRA provides a framework for cleanup and makes financial incentives available.

Florida's brownfield incentives include loan guarantees for primary lenders, ranging up to 50 percent on all sites and up to 75 percent when the end use is affordable housing or health care.

Sites with a BSRA or properties that abut a site with a BSRA are eligible for a job creation incentive of up to \$2,500 per new job as well as a sales tax refund on building materials for affordable housing.

The Voluntary Cleanup Tax Credit—applicable to state corporate income tax—

allows a 50 percent tax credit for the cost of cleanup activity essential for site rehabilitation. A one-time 50 percent tax credit for solid waste removal also is available.

BROWNFIELDS
Continued on Page 16

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Market pricing for withdrawals could resolve consequences of aquifer overpumping

By PRESTON H. HASKELL

Among the most important issues facing Floridians today is the threatened condition of state waters and waterways. Polluted rivers, diminished lakes and disappearing springs place our quality of life and economic vitality at serious risk.

Not fully understood, however, is the phenomenon that is causing low water flow from our springs to our rivers and lakes—overpumping of the Biscayne and Floridan aquifers. Overpumping has lowered aquifer levels and artesian pressures, which in turn has reduced surface water

flow from the springs. Diminished springs have correspondingly reduced river flows, which have increased pollution from fertilizer and surface nutrients. Overpumping has also made our aquifers susceptible to saltwater intrusion, increased the potential for sinkholes and damaged our wetlands.

For decades, this phenomenon has eroded our aquifers slowly, almost unnoticeably, but in recent years has produced alarming conditions. Groundwater consumption statewide has grown from 614 million gallons per day in 1950 to over 4,200 mgd in 2005. While the rate of in-

crease has moderated somewhat in recent years due to mostly voluntary conservation measures, the exhaustion of those measures and continued population growth will lead to unsustainable levels of water consumption and even greater environmental damage unless the issue is intelligently and thoughtfully addressed.

Recent attempts to remedy the situation have included both usage reduction measures and new supply alternatives. Usage reduction has been limited to small, voluntary and inadequate measures such as shorter showers, low-flow fixtures, alternate day watering and eco-friendly landscapes. As admirable and well-intentioned as these are, they have finite potential and are difficult to enforce. Further consumption decreases resulting from their use will be relatively small.

New sources of water supply implemented over the past two decades have principally included desalination and wastewater reuse. Both, however, carry high price tags. A desalination plant of moderate capacity costs several hundred million dollars to construct and consumes large amounts of electricity.

Wastewater reuse requires extensive treatment as well as installation of distribution piping with expensive price tags, except in new subdivisions. Over time, these costs will come down somewhat, but will remain far more expensive when compared to the costs of withdrawing aquifer water.

Sadly, the most effective and efficient dynamic of all for reducing groundwater use—market pricing for aquifer withdrawals—has received almost no debate, discussion or even mention.

In any situation where demand exceeds supply, the pricing mechanism is the most valuable tool available. Charging a price for aquifer withdrawals at the wellhead will discourage waste, incentivize the development of new sources, raise new revenues and bring discipline and economic efficiency to the allocation of our groundwater resources. This, in turn, will restore our springs, rivers, lakes and groundwater to their natural condition, while assuring adequate water availability for responsible users well into the future.

Under current policy, virtually any water utility, farmer or industrial concern can obtain a permit to drill a well and thereafter withdraw almost unlimited quantities of water from the Biscayne or Floridan aquifers for free. But if charged a market price for consumption at the wellhead, these users will adopt less wasteful practices and seek alternate sources.

Technologies and methodologies exist for water use reduction at relatively low cost, but there is presently no economic incentive for implementing them. If faced with either paying a price at the wellhead or undertaking water-saving measures at a lower cost, most will opt for the latter.

Indeed, numerous consumption-reducing methodologies that would be more economically attractive currently exist. Spray irrigation, both agricultural and residential, can be replaced with drip, bubble, soaker and seepage methods. Process technologies, including water reclamation and reuse, can vastly reduce industrial water use. Commercial buildings can be fitted with green roofs, cisterns, condensate reuse systems, pervious pavements, and other water reuse and reduction methodologies. Households can reduce lawn watering, car washing and inside use, as well as detect and correct wasteful leaks.

Studies indicate that agricultural spray irrigation, which constitutes almost half of all current aquifer water use, can in most cases be replaced with lower-consumption alternatives for approximately \$0.40 per thousand gallons consumed over their useful lives. Other measures cited above would cost up to \$1.00 per thousand gallons or in some cases more, depending upon specific circumstances. The lower-cost measures would be exploited first, and even where economic payback is less favorable, usage reduction by commercial and industrial users can be influenced by such factors as image, community relations and customer expectations.

To incentivize such usage reduction measures, pricing of water in a range of \$0.50 to \$2.00 per thousand gallons would be reasonable and effective. In this structure, residential usage would be progressively priced, with the lowest rates for basic necessities and highest rates for larger quantities. Nonresidential users' rates would be determined by economic payback and other financial factors.

Both economic theory and empirical evidence suggest that if aquifer water were carefully and analytically priced within this range, a reduction in use of 15 to 20 percent could be reached over a period of three to five years. Indeed, most of this could be accomplished by reducing agricultural irrigation water use by one-third, a readily achievable number. Such a reduction would return aquifer withdrawals to 1982 levels, which would largely reverse the environmentally destructive effects being experienced today.

The state revenues resulting from such a price on aquifer withdrawals could amount to between \$1.0 and \$1.3 billion annually, depending upon the exact price structure and actual reductions in water use. This revenue would be available for, among other things, restoration and protection of natural resources that have been ravaged by unrestrained withdrawals from the aquifers. Up to a certain point, even higher groundwater prices would further reduce consumption and increase revenues.

All of this constitutes a win-win-win for Floridians. First, environmental destruction will be reversed by reduced withdrawals. Second, state revenues for environmental protection will increase by sensibly pricing the remaining withdrawals. Finally, the overall economics of water production and use will ultimately be enhanced as cost savings exceed the price of withdrawals.

Water is a state resource, and our Legislature is responsible for making water policy. However, special interests have long opposed paying a price for this valuable commodity, leading us to the dilemma we face today. Thus, the solution lies in galvanizing public opinion to cause legislative action that places a reasonable price on groundwater withdrawals.

More than any other solution available, this will rapidly lead to restoration of our damaged rivers, springs, lakes and wetlands, ensuring high quality and sufficient

HASKELL
Continued on Page 11

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Calendar

April

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

APR. 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.

APR. 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.

APR. 9 – Workshop: Membrane Theory & Operation Workshop, Boca Raton, FL. Presented by the Southeast Desalting Association. Call (772) 781-7698 or visit www.southeastdesalting.com.

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

APR. 11 – 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.

APR. 13 – Course: Lead: Renovation, Repair & Painting, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

APR. 13-14 – Course: Advanced Backflow Assembly Tester, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

APR. 13-14 – Conference: UST Assessment & Remediation, Montgomery, AL. Presented by the Alabama Dept. of Environmental Management. Visit <http://adem.alabama.gov/misc/2015ustconference.cnt>.

APR. 13-15 – Course: Backflow Prevention Assembly Repair and Maintenance Training and Certification, Altamonte Springs, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

APR. 13-17 – Conference: National Association of Environmental Professionals Annual Conference, Honolulu, HI. Call (856) 283-7816 or visit www.naep.org.

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

APR. 14 – Course: Refresher Training Course for Experienced Solid Waste Operators – 8 Hour, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

APR. 14 – Course: Refresher Training Course for Experienced Solid Waste Operators – 4 Hour, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

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

HASKELL From Page 10

water supplies to be intelligently utilized for decades to come. To do otherwise will result in unacceptable impacts on our unique and precious environmental resources and will make the ultimate cost of resolving the issue far greater than the cost of immediate and responsible action.

Preston H. Haskell is chairman of The Haskell Company in Jacksonville.

Florida Specifier

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

APR. 14-15 – Course: Refresher Training Course for Experienced Solid Waste Operators – 16 Hour, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570.

APR. 14-16 – Course: Initial Training Course for Landfill Operators and C&D Sites – 24 Hour, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

APR. 14-16 – Course: Initial Training for Operators of Landfills and Waste Processing Facilities, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

APR. 14-16 – Course: Activated Sludge Process Control & Troubleshooting, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

APR. 15-17 – Conference: 2015 Annual Conference of the Florida Floodplain Managers Association, Orlando, FL. Call (813) 765-3362 or visit www.fhma.conference.org.

APR. 16-18 – Conference: Spring Conference of the Geoprosessional Business Association, Miami, FL. Call (301) 565-2733 or visit www.geoprosessional.org.

APR. 17 – Seminar: Southeast Regional Stormwater Seminar, Atlanta, GA. Presented by the Southeast Stormwater Association. Call 1-866-367-7379.

APR. 17-18 – 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.

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

APR. 20 – Course: Introduction to Electrical Maintenance, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

APR. 20-22 – Course: Fundamentals of Slope Stability and Settlement for Solid Waste Disposal Facilities, Orlando, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

APR. 21 – Course: Asbestos Refresher: Inspector, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570.

APR. 21 – Course: Asbestos Refresher: Management Planner, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

APR. 22 – Course: Asbestos Refresher: Contractor/Supervisor, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

APR. 23 – Workshop: Recycling Workshop for Florida Small Businesses, Orlando, FL. Presented by the Southern Waste Information eXchange Inc., the Florida Department of Environmental Protection and others. Contact Gene Jones at (850) 386-6280 or visit www.swixusa.org/recycle/.

APR. 23 – Course: 8-Hour OSHA HazWoper Annual Refresher, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

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

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

APR. 25 – Review: Backflow Prevention Recertification Review, Tampa, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570.

APR. 26 – Exam: Backflow Prevention Recertification Exam, Tampa, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

APR. 27 - MAY 1 – Course: Backflow Prevention Assembly Tester Training and Certification, Destin, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

APR. 28 – Course: Introduction to DEP SOPs for Surface and Groundwater Sampling, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

APR. 29 - MAY 1 – Conference: North American Waste-to-Energy Conference, Tampa, FL. Presented by the Solid Waste Association of North America and the Energy Recovery Council, in cooperation with the Waste-to-Energy Research and Technology Council and the Air and Waste Management Association. Call 1-800-467-9262 or visit swana.org.

May

MAY 1-9 – Course: Backflow Prevention Assembly Tester Training and Certification, Fort Myers, FL. Presented by the University of Florida TREEO Center.

ter. Call (352) 392-9570 or visit www.treeo.ufl.edu.

MAY 2-3 – Course: Backflow Prevention Recertification, Bradenton, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

MAY 2-3 – Course: Backflow Prevention Recertification, Tampa, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

MAY 3-6 – Conference: Florida Water Resources Conference, Orlando, FL. Presented by the Florida Section of the American Water Works Association, the Florida Water Environment Association and the Florida Pollution Control Operators Association. Call 407-363-7751 or visit fwrc.org.

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

MAY 4-8 – Course: Backflow Prevention Assembly Tester Training and Certification, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

MAY 4-8 – Course: Backflow Prevention Assembly Tester Training and Certification, Lake Buena Vista, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

MAY 4-6 – Course: Process Control of Advanced Waste Treatment Plants, Gainesville, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

MAY 5-6 – Workshop: Florida ADaPT Training, Royal Palm Beach, FL. Presented by LDCFL. Contact Cathy Katsikis at (561) 753-0483 or visit www.ldcfl.com.

MAY 6 – Course: Asbestos Refresher: Contractor/Supervisor, Dania Beach, FL. Presented by the University of Florida TREEO Center. Call (352) 392-9570 or visit www.treeo.ufl.edu.

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Feds approve offshore oil drilling, but not along the Florida coast

By ROY LAUGHLIN

The Obama administration proposed for the first time to allow drilling on the Atlantic offshore continental shelf—but excluded the Florida coast.

In its 2017–2022 Outer Continental Shelf Oil and Gas Leasing Draft Proposed Program, the federal Bureau of Ocean Energy Management proposed offering leases on a single tract encompassing the continental shelf off North Carolina, South

Carolina and Georgia, with lease auctions scheduled for 2021.

Governors of those states made a strong public plea for opening their offshore continental waters to drilling operations.

BOEM's combined Mid-Atlantic and South Atlantic Planning Area proposal included a 50-mile-from-shore exclusion zone for drilling leases.

BOEM's proposed plan included a schedule for 14 lease sales by geographic area. Eight of those 14 lease sales are in the Gulf of Mexico, and six are scheduled

for the first three years of the next five-year cycle.

The draft plan closes continental shelf areas north of Alaska in a trade-off that involved opening the Atlantic continental shelf for drilling leases for the first time.

No continental shelf areas off the Florida coast are included in BOEM's proposed lease schedule. The entire west coast of Florida including the Panhandle has a congressional exclusion in effect until 2022.

No leases in federal waters of the Gulf of Mexico off Florida will be offered at least through the end of the 2017–2022 lease cycle. On the Atlantic coast, BOEM's planning area encompassed federal waters off Florida from Cape Canaveral north to the St. Mary's River. But the draft proposal included no leases off Florida's Atlantic coast.

While Florida may not be part of the area for drilling leases during the next cycle, it is open for resource exploration.

Currently, eight companies are permitted to conduct resource surveys of the Atlantic offshore continental shelf. Five of those indicated survey areas much closer than 50 miles from shore—some right up to the shore.

At least two exploration companies' permit applications show maps that characterize a survey area closer than three miles from shore.

In July, the Obama administration approved the use of seismic air guns for such exploration. Environmental advocates said that the loud sound produced by seismic air guns is detrimental to many marine organisms.

Seven Brevard County communities have adopted resolutions opposing seismic air gun testing in the Atlantic.

Although oil drilling off Florida is still at least five years away, controversial and likely damaging survey efforts are soon to be underway.

It is not clear whether exploration companies will voluntarily survey only beyond the 50-mile limit now that the draft plan stipulates a 50-mile-from-shore exclusion.

As it stands, there seems no obstacle to prevent seismic air gun use close to shore.

BOEM's release of its draft plan is the second step of a five-year cycle to define areas and schedules for offshore drilling leases. The first step, the request for information issued in June of 2014, yielded more than half a million comments.

In the next stage, BOEM will produce a programmatic environmental impact statement that may further influence which areas are made available for leases, and stipulate aspects of the drilling operations.

In the final step, the decision itself will be made and issued so that leases can be offered in 2017.

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FEDFILE From Page 2

customers—will cover the financial costs of the settlement.

Three U.S. Attorney Offices covering the state of North Carolina charged Duke with nine misdemeanor counts of violations of the Clean Water Act at five of its coal-powered plants in Eden, Moncure, Asheville, Goldsboro and Mt. Holly.

The charges stemmed from an investigation that began a year ago when a coal ash dump at Duke Power's Eden plant released tons of coal ash slurry into the Dan River.

In their court filings, prosecutors alleged that illegal dumping had occurred at least since 2010.

The separate cases have been consolidated under the jurisdiction of the U.S. District Court in Raleigh and are subject to approval by one of its judges.

Environmental activists tried three times in 2013 to sue Duke under the Clean Water Act to force it to address leakage at its coal ash dumps. They said that as many as 14 of Duke's coal-powered plants have leaking coal ash impoundments.

In each of the three lawsuits, the North Carolina Department of Environment and Natural Resources intervened and asserted its authority to take enforcement action to state court. The department proposed fines of \$99,111 to settle violations of toxic groundwater releases from two of Duke Power's plants.

Environmental activists widely decried the proposed settlement as a "sweetheart deal," noting that Pat McCrory, North Carolina's current governor, is a 29-year Duke Power employee.

Fate intervened in February, 2014, when a culvert pipe under Duke Power's Eden impoundment failed, allowing coal ash to flow into the Dan. Scores of miles along the river were tainted by the ash.

EPA regulation of coal ash disposal. In February, under court order, the EPA passed its final rule for handling coal ash residuals.

Notably, the EPA's rule treads lightly on the hazardous qualities of coal ash. The EPA wants to encourage its beneficial use rather than disposal.

Nevertheless, a subcommittee of the House Energy and Commerce Committee initiated hearings in January to discuss congressional legislation to augment the EPA's rules.

Opponents of the new rule said that both state and federal regulations would now govern coal ash use and disposal. They said it would be possible for utilities to be taken to court in states with regula-

tions inconsistent with the new rule.

Lisa Johnson, CEO and general manager of Seminole Electric Cooperative Inc. of Tampa, said that EPA's designation of coal ash as nonhazardous was appropriate. But she also asked Congress to pass legislation to ensure that the designation persists.

NRDC poll. Based on a poll of Americans in five states including Florida, the Natural Resources Defense Council said that Americans—by substantial margins—support environmental regulations and President Obama's climate and clean energy initiatives.

Several of the poll's questions revealed surprising insights that seem inconsistent with prevailing political rhetoric.

When the pollsters asked if enforcement of environmental regulations was tough enough, 50 percent of Floridians said that it was not. This was the highest percentage of all states polled including Colorado, Maine, New Hampshire and Virginia.

In Florida, 30 percent said that enforcement was "about right."

When asked if they would like to see more investment in energy efficiency and renewable sources such as wind and solar, 67 percent of Florida respondents said "yes."

Respondents in all states support alternative energy sources, with affirmative votes of 65–70 percent, except Colorado with a 56 percent "yes" majority.

When NRDC categorized responses with respect to affiliation, Republican respondents were typically less strongly in favor of energy efficiency and investing in renewables. Nevertheless, the majority of both parties favored expanding the programs.

Corps issues draft finding. The U.S. Army Corps of Engineers issued a draft finding of "no significant impact" after the first increment of the G-3273 and S-356 pump station field test.

The test evaluated raising or removing the G-3273 constraint of 6.8 feet and holding the L-29 Canal stage at 7.5 feet to enable increased water deliveries to Northeast Shark River Slough in Everglades National Park.

The evaluation is a first step in an incremental approach to develop the final operating plan for the modified water deliveries to Everglades National Park and C-111 South Dade projects.

The corps released its environmental report for public and agency review during the first week of February. Public comments will be accepted through April 5.

Lake County officials wrestle with CEMEX sand mine permit decision

By ROY LAUGHLIN

In February, the Lake County Planning and Zoning Board withheld approval of a conditional use permit for CEMEX USA's Four Corners Sand Mine.

Four of the five county board members voted against the permit.

CEMEX is seeking a permit to mine sand on approximately 570 acres of a 1,200-acre property that the company owns in southeastern Lake County near Clermont.

CEMEX officials said it would take sand from approximately 100-acre sub-plots, leaving pits 50-55 feet deep. The sand mine would be surrounded by a 10-foot berm inside of a 200-foot vegetated setback.

In its plan, CEMEX said it would mine sand seven days a week, 24 hours a day.

CEMEX hopes to mine sand in 28 phases over approximately three decades, after which time the land would be "reclaimed."

This is the second time in four years that CEMEX has requested approval of a permit for mining on the property.

During a hearing before its vote, the board heard a litany of complaints against the proposed sand mine.

The primary concern is that the county has already proposed in its Wellness Way Sector Plan to attract healthcare and other high paying technology-based employers to the area.

It designated 16,000 acres in the southeast corner of Lake County for that plan, which is still under review by state authorities.

Area farm owners said that the sand mine is incompatible with their existing farming operations. One blueberry farm owner said that if sand blew onto his fruit, it would cause blemishes.

Proponents of the healthcare industries noted that dust from the mining would have

adverse health effects on some patients expected to patronize its providers.

In addition, dump truck traffic issues were criticized for various reasons.

A consultant for CEMEX said that the proposed mining plan would not negatively affect wetlands in the area or the local water table.

A consultant for the South Lake Regional Water Initiative said that the area where the proposed sand mine is located is a fairly high water recharge area. In addition, an attorney who spoke at the hearing pointed out that St. Johns River Water Management District maps list the area among the highest groundwater recharge areas in Lake County.

Adverse effects of the Four Corners Sand Mine also caught the attention of officials in the city of Clermont. The Clermont City Council unanimously recommended rejection of CEMEX's conditional use permit for the mine.

Clermont Planning Director Jim Hitt noted further that the future success of the Wellness Way Sector Plan is dependent on "having something to market."

Lake County competes with Polk and Orange counties—areas without sand mines and the associated traffic and environmental impacts—to lure high tech employers and businesses.

CEMEX officials and consultants said that the mine would bring jobs and \$4.2 million worth of economic development to the county.

Project proponents said that the sand mine would fill the gap until the Wellness Way Sector Plan was underway in 30 years, a time span that county officials took issue with.

Sara Engdahl, director of communications for CEMEX, said that her company's proposed Four Corners Sand Mine "will be a fundamentally important project for the region, as well as for the planned Wellness Way Development Plan."

Campbell noted that sixteen structures are currently under contract in various phases of construction. The corps plans to award contracts on the remaining 10 culverts over the next few years.

In addition to the current improvements, the corps is conducting a dam safety modification study on over 120 miles of the dike that haven't had a cutoff wall installed in an effort to determine appropriate measures for reducing the probability of failure.

Piping—the erosion of soils within or beneath the dike—is occurring from the lake to the land side of the dike. Unchecked, the piping will eventually create cavities in the dike, increasing the risk of breach.

The study is the most comprehensive investigation ever conducted on the aging dike system, and is intended to identify and address problems and provide alternatives for rehabilitation of the existing system.

The geology and geometry of the dike are being evaluated in multiple locations, and a range of structural and non-structural alternatives are being considered that can be implemented to reduce the risk of failure.

"We anticipate a draft version of that study to undergo public review late this summer or fall," said Campbell. "While the study is ongoing, the corps has identified an opportunity to execute additional embankment repairs between Lake Harbor and Belle Glade, and proposes installing an additional cutoff wall at that location."

If approved and funded, the additional cutoff wall construction could start as early as 2017.

The proposed cutoff wall installation is not anticipated to reach the depth of the freshwater/saline groundwater interface, as is the case with the wall installed between Belle Glade and Port Mayaca.

She said that CEMEX was "committed to be a responsible and diligent neighbor" and said she is confident that the Board of County Commissioners will recognize the advantages of the project.

The Lake County Planning and Zoning Board's vote is not binding on the Lake County Board of County Commissioners, who must give final approval before the county can issue its conditional use permit.

The vote had originally been scheduled for the board's Feb. 24 meeting, but was postponed until March 24.

CEMEX made its first request for a conditional use permit for the mine about four years ago. It was denied.

During the past three years, it has engaged a bevy of Florida's most active and politically connected consulting companies to prepare the application for this second round of consideration.

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DIKE

From Page 1

tial cutoff wall to reduce seepage in the southeast portion of the dike. Most of the construction effort since 2013 has focused on replacement of 26 water control structures around the dike."

Recently, the discovery of saltwater intrusion into groundwater in the vicinity of the newly installed cutoff wall between Belle Glade and Port Mayaca prompted a U.S. Geological Survey investigation.

Officials there are concerned that the saltwater may adversely impact potable water supplies over time.

"The USGS issued a report last month indicating that additional information is needed before definitive conclusions can be drawn on whether the cutoff wall installed between Belle Glade and Port Mayaca resulted in saline intrusion," said Campbell. "At this point, all available information indicates that any such impacts were limited to an area right next to the dike.

"The corps and USGS are exchanging ideas on setting up additional monitoring wells in the area to better define a) whether there is an issue and b) if there is an issue, what are the impacts? I've not heard any discussion on timetables regarding when such wells might be set up."

The original muck and sand dike was built in 1915 and was replaced in the 1930s by a hydraulic dredge- and dragline-constructed shell, rock and gravel structure.

Over time, expansion and reconstruction projects and improvements have been undertaken to secure the dike's purpose of reducing flooding to protect communities and farmland in Southeast Florida.

The current Herbert Hoover system including 143 miles of levee and 32 culverts or other water control structures was constructed in response to the 1948 Flood Control Act and was completed in the late 1960s.

The USGS study is the most comprehensive investigation ever conducted on the aging dike system of Lake Okeechobee, and is intended to identify and address problems and provide alternative options for rehabilitation of the existing system.

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Additional waste-to-energy incinerator proposed for Palm Beach County

By ROY LAUGHLIN

During the summer of 2015, the Solid Waste Authority of Palm Beach County expects to begin operation of its second waste-to-energy incinerator.

The new facility will burn up to 3,000 tons of material daily and will produce up to 99 megawatts of electricity. The plant will burn tires, wood, automobile remnants and residential garbage.

It will feature three boilers and will cost an estimated \$688 million.

In its annual directory, the Energy Recovery Council, a national trade organiza-

tion representing U.S. waste-to-energy producers, noted that "the Palm Beach County Renewable Energy Facility #2 is the first greenfield mass burn waste-to-energy project constructed in the United States in over 15 years."

An article in *National Law Review* said it would be the first commercial waste-to-energy incinerator built in Florida in two decades.

The new facility is being constructed adjacent to the existing waste-to-energy incinerator on the west side of the county off Jog Road. SWA began operating that incinerator in 1989 and performed a major renovation in 2011 to extend its ser-

vice life another 20 years.

Its capacity is less than the incinerator now under construction. Its two-boiler electrical generation system is designed to burn 2,000 tons per day and generate up to 61 MW of electricity.

Babcock and Wilcox will operate both incinerators on the site.

The decision to expand waste-to-energy incineration addressed a larger issue of extending the useful life of Palm Beach County's solid waste landfill by up to an additional 30 years.

Solid waste incineration can reduce waste volume by up to 85 percent. A new landfill for Palm Beach County would undoubtedly be located in the Everglades and a decision to locate a one there would spark heavy opposition.

Opponents of the new, larger waste-to-energy incinerator wanted the county to establish a more extensive recycling effort to reduce waste volume. Palm Beach County's recycling rate, about 30 percent, is slightly below the national average of 34 percent.

Air emissions, particularly mercury, were at the forefront of controversy over the authority's first incineration plant when it opened. At the time, some environmental advocates said incineration plants were a primary source of mercury accumulating in aquatic organisms in freshwater and marine habitats.

Over the last 25 years, the reduction in mercury use in, for example, fluorescent lighting and medical wastes, has sharply reduced its levels in trash. In addition, more effective air emission scrubbers on incinerators significantly reduce emissions of mercury to the atmosphere.

Controversy over the new facility arose last month when the PBC Board of County Commissioners approved importing solid waste from Broward County for a period of eight years.

Ray Schauer, director of engineering and public works for the authority, said that it receives a tipping fee of \$20.25 per ton

for wastes, including those it receives from Broward County.

A ton of waste will generate electricity to earn \$20.57-\$24.00 per ton.

The ash produced by burning wastes from out of county, according to Schauer, will not significantly decrease the useful life of the landfill—the final disposal location for incinerator ash. Their landfill now has sufficient capacity for at least another 36 years of use.

The facility operates around the clock and maintains no more than 15,000 tons of garbage as incinerator fuel, about five days of waste. The amount brought from out of county will not make any difference to the overall flow of refuse through the facility.

Trucks carrying trash from Broward County add an additional 11 vehicle trips per day on the roads to the incinerator. The bottom line is that temporarily accepting trash from non-county sources makes a lot of economic sense.

In August, 2014, SWA officials predicted that supplementing unused facility capacity with out-of-county waste during its first eight years of operation could generate up to \$45 million in tipping fees. These additional revenues would help offset the facility's construction costs and would save about \$10 annually for each Palm Beach County property owner.

But SWA found far less interest for its incineration services that expected. Broward County and a medical waste disposal company from Georgia were the only two respondents.

The board rejected incinerating the medical waste from Georgia. With Broward County as its only current single out-of-county customer, Palm Beach might earn \$18-19 million over five years, an amount that would save local property owners just \$3-4 per year.

The plant may find other customers in the coming years until Palm Beach County growth is predicted to catch up with its incinerator capacity.

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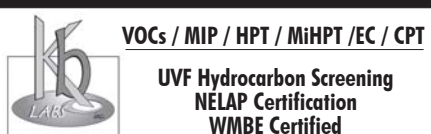
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Final phases of restoration at Volusia's North Peninsula State Park underway

By ROY LAUGHLIN

Volusia County's North Peninsula State Park will soon have another 30 acres of restored marsh as a restoration project suspended several years ago is back on track.

The restoration effort involves two parcels of former salt marsh—one approximately nine acres and a second of 23 acres. The marsh was filled with dredge spoil more than a century ago from the construction of Florida's Intracoastal Waterway.

In mid-January during Phase 3 of the project, contractors spent a couple of weeks removing invasive vegetation and spoil from approximately nine acres west of John Anderson Drive.

Then in February, Phase 4 focused on restoring a section of a 23-acre parcel north of the Smith Creek Landing use area. It too had been filled with dredge spoil a century ago.

The removal of dredge spoil to the grade of the original marsh will create conditions for regrowth of the marsh, mostly by natural recruitment. But some native species planting may be done to hasten the process.

These projects have been dependent on funding since 2009, when the first two phases were completed with funding from the American Reinvestment and Recovery Act

"We have funding for about 10 acres now, but the whole area we want to restore is larger," said Barbara Roberts, park manager of the Gamble Rogers Memorial State Recreation Area and North Peninsula State Park. "The total will be about 23 acres. We

have confidence we will get funding for all of Phase 4."

That phase is the last of the planned spoil removal and marsh restoration efforts at North Peninsula.

The Florida Department of Environmental Protection designated this area as a park in 1984.

It stretches about half a mile on the barrier island north of Daytona Beach, and extends from ocean to salt marsh along the Intracoastal Waterway on the west side of the barrier island.

The restoration effort has two goals. The first is to restore salt marsh habitat that had been filled with dredge spoil. The second is to

provide recreational resources including scenic overlooks for hikers, increased fishing and birding opportunities, and educational opportunities to local students.

The St. Johns River Water Management District's Northern Coastal Basin Surface Water Improvement and Management Program has been a funding source for the current habitat improvement efforts.

Roberts was quick to add, though, that public volunteer organizations have also made significant contributions.

Those organizations include the Flagler Audubon, and Friends of the Gable Rogers and North Peninsula State Park. The Volusia County Environmental Management Department has also made non-cash contributions.

Progress on park restoration fell behind the curve during the recession, but it is now getting back on track.

"We're very excited to be able to do this restoration and provide the recreational opportunities," said Roberts.



North Peninsula State Park

Indian River ecosystem still accumulating persistent organic chemicals no longer in use

By ROY LAUGHLIN

Recent research portrays the stark reality of bioaccumulation and food chain amplification of persistent organic chemicals by fish in Florida's estuaries and near-shore waters.

In this case, the fish tissues analyzed were all from elasmobranchs—sharks and rays—that have been studied less than bony fish.

The chemicals found have been banned for some time—in a couple of cases for decades. Yet, they are found in tissues of sharks and stingrays that were not alive when the chemicals were banned beginning in the 1970s.

In some instances, the bull shark, in particular, had notably high tissue concentrations of some of the banned chemicals.

An international team of researchers, including Douglas Adams of the Florida Fish and Wildlife Conservation Commission's Fish and Wildlife Research Institute, measured concentrations of five persistent organic pollutants: polychlorinated biphenyls, DDT breakdown products including dichlorodiphenyltrichloroethane and metabolites and isomers, hexachlorobenzene, chlordane and polybrominated diphenyl esters.

The analysis method used was gas chromatography in combination with electron capture negative ion/mass spectrometry, a method that identifies congeners of the chemicals listed above.

The investigators examined tissues from four elasmobranch species: Atlantic stingray, bonnet head shark, lemon shark and bull shark.

The Atlantic stingray, a low trophic level species, lives most of its life in the Indian River. The bull shark, a top-level predator, spends part of its lifecycle in the Indian River, where stingrays are a substantial component of its diet.

The other two shark species spend little time in the Indian River during any part of

their lives.

Sharks and rays for this study were taken from coastal waters between Cape Canaveral and Fort Pierce.

A general summary of the research findings is that both sexes of mature sharks showed elevated levels of PCBs. Stingrays also showed elevated levels of PCBs, but stingray tissue concentrations were 1–2 orders of magnitude lower than tissue burdens of the sharks.

Both bonnet heads and bull sharks accumulated PCBs, but bull sharks showed much higher tissue levels in adults. The highest tissue burdens in adult sharks were in the tens of thousands of nanograms per gram wet weight range while in stingrays, the tissue burdens were less than 225 nanograms per gram wet weight.

The researchers noted that this was consistent with food web bioaccumulation of these two species that spend time in the Indian River Lagoon.

DDX, metabolites of DDT, were also elevated in shark tissue from all three species, although to a much lower extent than was PCB in bull sharks and bonnet heads.

DDT was one of the first persistent chlorinated organic chemicals to be banned in the U.S. The researchers noted that the

ratios of metabolites indicated unambiguously they did not arise from recent exposure to DDT.

The other chemicals were typically measured at concentrations below 50 nanograms per gram of tissue wet weight—above background levels but well below the highest levels of PCBs and DDT metabolites that clearly show food web biomagnification.

The bull shark was an exception to this generalization. Compared to other shark species, neonates of the bull shark had chlordane levels as high as 3440 ng per gram wet weight and polybrominated biphenyl esters as high as 835 ng per gww.

The highest values occurred in a female bull shark tissue sample.

Median tissue concentrations in samples of four male neonate bull sharks were only about half that of that found in the single female sampled.

Adams said that he considered the elevated bioaccumulation in the bull sharks interesting.

Bull sharks have a "placental kind of linkage" between the mother and young. She broods eggs in a pouch. Early in development, the eggs depend on yolk but in latter stages, the developing sharks re-

ceive nourishment through a uterus-like connection with the mother.

"We think they retain a maternal signal after birth," he said.

Future studies may indicate how much of the persistent chemicals are transferred by this route.

Adams is now looking at persistent organic pollutant accumulation in hammerhead sharks, a substantial amount of which may be acquired through its food web.

Researchers at Harbor Branch Oceanographic Institution in Fort Pierce have reported that dolphins from the Indian River had markedly elevated levels of brominated fire retardants in their tissues. But Adams noted that in sharks and rays, they have not observed the same kind of accumulation of the fire retardant chemicals.

"A lot more is known about [POP uptake in] freshwater fishes, but we are just beginning to understand the process in estuaries and nearshore waters," he said. "Information on elasmobranchs is untapped. The physiology and partitioning is different from other species from freshwater and land."

Adams is continuing his studies and analyses, collaborating with several other groups. There will likely be more surprises and contrasting patterns of bioaccumulation from the data he collects.

Miami waterways slated for dredging, cleanup work

By BLANCHE HARDY, PG

One of South Florida's most notoriously contaminated waterways, Miami's Wagner Creek/Seybold Canal, is scheduled to undergo dredging and cleanup of sediments polluted by dioxin, polycyclic aromatic hydrocarbons and heavy metals.

The project will be conducted along Wagner Creek that connects to the Miami River via the Seybold Canal.

In combination, the creek and canal system represents a major tributary of the Miami River, which in turn empties into Biscayne Bay, a South Florida Water Management District priority waterbody.

The three Miami waterways grew with the city from residential roots to become an important arterial system for a wide variety of commercial and industrial businesses.

As Wagner Creek became more industry-friendly, its water quality deteriorated from the effects of poorly managed stormwater runoff and increased sedimentation.

A 1997-98 study commissioned by the Florida Legislature issued a call to action, urging the community to come together to restore the river.

Shortly thereafter, the state Legislature created the Miami River Commission to improve the 5.5-mile Miami River and its surroundings, including its 69-square-mile water basin.

In an \$80 million dredging project overseen by the U.S. Army Corps of Engineers, sediment was removed along five miles of river bottom.

Once the river dredging was complete, it became clear that the roughly four feet

WATERWAYS
Continued on Page 16

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UF survey reveals citizen concerns with water

Staff report

Floridians remain concerned about water and are willing to make changes to conserve it, at least until their efforts cramp their lifestyles, according to a University of Florida study on state residents' attitudes about water.

The online survey conducted by UF's Center for Public Issues in Education showed that water ranks third on a list of 10 topics people consider important, behind the economy and healthcare and ahead of public education and taxes.

Eighty-three percent of 749 respondents indicated water is an important or extremely important issue.

Yet while three-quarters of respondents said they were likely to vote to support water conservation programs, only 42 percent were willing to take action to conserve water if it meant their laws would suffer.

Among other key findings: 72 percent of respondents said they would be willing to have their water bill increase by 10 percent if it ensured a future water supply in Florida, but only 19 percent were willing to do so if it required a 50 percent increase in the bill. The survey also revealed that respondents overall were unfamiliar with water policies.

The water survey can be found at www.piecenter.com/water.

WATERWAYS

From Page 15

deep creek and canal had a similar problem that needed to be addressed.

Before dredging the creek/canal, a study revealed that sediments along the bottom of the waterways were laced with dioxin, occurring as deep as ten feet below land surface in places.

Due to the high level of contamination, sediments dredged during the cleanup are expected to be dewatered and then transported out-of-state for appropriate treatment and disposal.

Funding for the \$23 million project will come from a number of sources. The city of Miami has asked the state provide up to \$8 million for the cleanup noting that the creek/canal system provides drainage for a sizable part of the city.

ated two brownfield areas that will enable businesses to create nearly 30 full-time jobs.

Brownfield renewal can eliminate eyesores and reinvigorate a community, bringing both job growth and higher tax revenues.

Susan Beason is an information specialist with the Florida Department of Environmental Protection in Tallahassee.

Editor's note: Visit www.dep.state.fl.us/waste/categories/brownfields for the latest information and links to state and federal partners.

liability protections and dedicated staff in each of the DEP's six district offices. The district brownfield coordinators are responsible for implementing BSRAs and providing timely review of technical documents.

In 2014, 16 areas across Florida were designated as brownfields and 21 BSRAs were executed.

The department's Northeast District recently executed a BSRA with Penman Plaza Associates LLP that will remediate a site and create jobs.

The city of Jacksonville recently cre-

The dredged waterway is expected to restore an additional level of stormwater capacity, reducing the potential for flooding in surrounding neighborhoods.

In addition to improving water quality and drainage, restoration of the creek/canal channels will provide economic benefits.

Miami's state appropriations documents point out that the waterway is heavily used for boating and that the dredging project will improve conditions for boater safety and the local commercial fishing and boat yards along the creek.

Because the waterway was initially developed for water front residences, homes still abut it. The cleanup will also improve the quality of life for residents and increase property values.

If all goes as planned, the cleanup may begin as early as next year.

ST. JOHNS

From Page 1

Prior to the deal between harbor representatives and the Riverkeeper, challenging the EIS was the only legal recourse available to mitigate the project and ensure ongoing environmental protection of the river.

"We engage in every permitting process," said Rinaman. "It's our job to hold these permitting processes accountable."

Despite the deal between the Riverkeeper and Jacksonville representatives, a rigorous fight to maintain the dam and reservoir is anticipated.

Staunch supporters of the status quo believe that the Rodman Dam and Reservoir offer excellent recreational activities and are valuable assets that bring in close to \$7 million annually to the area.

The leading candidates vying to fill outgoing State Senator John Thrasher's seat have both said that they support keeping the dam.

David DeCamp, a spokesman for Jacksonville Mayor Alvin Brown, believes that the deal is good for both business interests and the environment.

"It's a win-win where the city can help the quality of the river for the entire region, and there's a partnership that can continue to push for harbor deepening," said DeCamp in a statement.

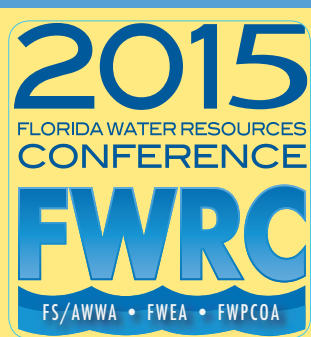
"We're working with the state now as necessary to do what we need to accomplish to win approval. At the end of the day, breaching the dam benefits not just Jacksonville, but the great number of counties who enjoy the benefits of the river."

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