

Florida Specifier

The Next Full Moons

April's Full Moon reaches peak illumination at 2:55 p.m. EST on Saturday, April 16, 2022. It's known as the Pink Moon.

May's Full Moon reaches peak illumination at 12:14 a.m. EST on Monday, May 16, 2022. It's known as the Flower Moon.

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A note to readers

On April 22, 2022, we celebrate Earth Day No. 52. On this day, we ask for basic protections to safeguard our planet, the animals that live alongside us, the air we breathe and, yes, the water we drink. We each have a role to play in ensuring that we do not pass a world beyond repair to our children. This Earth Day, let us accept our individual responsibilities to care for the world we live in, and let us marshal our best efforts toward building a safer, more stable and sustainable world.

—John Waterman

Business profile

10

Jim Clark's company, Clark Environmental, has been a success story in Mulberry for the past 31 years. The company specializes in the recycling, disposal and transportation of liquids, solids and sludges.

Fishing report

11

Pompano are prevalent at Sebastian Inlet as Capt. Sandy Bottoms enjoys a day of fishing with an old friend.

Departments

| | |
|---------------|---|
| Federal File | 2 |
| Florida Notes | 3 |
| Water Watch | 4 |

Have a story idea or lead?

Have an idea for a story? Would you like to submit a column for consideration? Please let us know. And don't forget to fill us in on your organization's new people, programs, new offices, projects or technologies — anything of interest to environmental professionals working in Florida. Send to *Florida Specifier*, 2901 1st Ave. N., Suite 202, St. Petersburg, FL 33713.

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Weeki Wachee River dredging project begins

State, partners aim to restore natural habitat

By BLANCHE HARDY, PG

The Southwest Florida Water Management District is partnering with Hernando County, the Florida Fish and Wildlife Conservation Commission and the Florida Department of Environmental Protection to dredge roughly 1.6 miles of the lower Weeki Wachee River to remove sediments, reestablish historic river depths and restore the natural habitat.

Sedimentation is identified as the priority issue impacting the waterway's ecosystem in the Weeki Wachee River Sur-

face Water Improvement and Management (SWIM) Plan. It alters the river channel and smothers beneficial aquatic vegetation and other habitats.

Although most sources of erosion were removed in the past, sediment continues to work its way downstream widening sandbars and increasing shallow areas in the lower river.

This multiyear project evaluated accumulated sediments in the river and identified where sediment removal will best benefit the river's ecosystem.

Work began on the project in early spring and is anticipated to be completed in fall 2022.

The river will remain navigable during the project. •



Photo courtesy of Florida State Parks

Weeki Wachee was named by the Seminole Indians. It means "little spring" or "winding river." The mermaids perform three times a day.

Howard Frankland Bridge kicks off area facelift

By VICTOR RIVERA-DIAZ

With construction beginning in April 2020, the replacement of the northbound Howard Frankland Bridge on Old Tampa Bay has been an ongoing endeavor.

It is an \$814 million project to renovate a critical thoroughfare that connects Pinellas and Hillsborough counties by way of St. Petersburg and Tampa, respectively.

For regular commuters who cross this bridge, traffic congestion spanning several hours is a known and often cumbersome occurrence on the Interstate 275 Causeway. Moreover, it is a considerable choke point in the region's evacuation route network.

The project underway will add an additional bridge, which will carry four southbound lanes along with four express lanes (two lanes in each direction), as well as a protected pedestrian/cyclist lane. A transit rail is proposed for the future.

The southbound traffic currently carried by the 1990 Bridge will be converted into northbound traffic; the original 1960 Bridge is slated for demolition. Crucially, the potential and expected environmental impacts of this project have been assessed by the Florida Department of Transportation and partner organizations and agencies in order to avoid or minimize the effects on neighboring

seagrass communities and Tampa Bay water quality.

History of Howard Frankland Bridge

Construction for the original span of the Howard Frankland Bridge began in 1956, and it opened for operation Jan. 15, 1960. Named after Howard Frankland, the businessman who proposed it, the bridge was comprised of four lanes with two lanes running in each direction. The total cost of its initial construction

of the 1960 Bridge was briefly closed and then rehabilitated in 1992, exclusively carrying northbound traffic.

Through the 60-plus years since it first opened, the Florida Department of Transportation has underscored the rising costs of maintenance for the 1960 Bridge. Among the associated costs, continual repairs to the cathodic protection system and the restoration of the spalled concrete areas have prompted concerns about its capacity to withstand present-day traffic pressures.

In addition, the findings of an inspection conducted in 2010 revealed that a sufficiency rating of 61.8 for the 1960 Bridge rendered it "structurally deficient." Necessary repairs were made in 2013 to bring the sufficiency rating up to 80.0.

However, the department recognizes that the original design was meant for a 50-year life span. In terms of an 80-year analysis period, the results of a life-cycle cost analysis conducted by the department in 2011 found that replacing the 1960 Bridge would be considerably less expensive than continuing to repair it by more than 25 percent.

The Frankland Bridge carries an average of 139,000 vehicles daily along Interstate 275. This makes it the foremost bridge of three bridges between Pinellas

By the numbers

- Total project length = 6.4 miles
- 3,006 piles = 40 miles
- 1,727 beams = 46 miles
- 172,000+ cubic yards concrete
- 36,674,636+ lbs. of rebar
- Beam placement is slated for late spring; deck construction begins in early summer.
- 250-plus workers onsite during the peak construction period

was \$16 million. Through the years, the original design, referred to as the 1960 Bridge, was considered to be below construction standards. It also proved to be dangerous due to the lack of emergency shoulders.

Twenty years later, in the 1980s, the escalation of traffic conditions in the region had caused the original 1960 Bridge to quickly deteriorate. This led to calls to build a four-lane bridge running parallel to the original. The construction of the additional span, or the 1990 Bridge, began in 1988 and received its first flow of traffic in 1991. Around the same time,

To BRIDGE Page 9

Study: Florida has most acres of polluted lakes

STAFF & WIRE REPORTS

Florida's waters have long been fouled by dirty stormwater and algae blooms fed by fertilizer runoff from farms. Now a new study examining water quality across the U.S. shows Florida ranking first for the highest total acres of lakes too polluted for swimming or healthy aquatic life.

That means water can have high levels of fecal matter and other bacteria that can sicken people or have low levels of oxygen or other pollution that can harm fish and other aquatic life.

The state ranked second for polluted estuaries.

The Environmental Integrity Project launched the project to track the progress of the Clean Water Act as it approaches its 50th anniversary.

"Fifty years ago, we had the imagination and political will to face big problems and try to do something about them," said Eric Schaeffer, the project's executive director and former head of the U.S. Environmental

Protection Agency regulatory office. "We're hoping at this half-century mark that we can find the courage to recommit."

The Environmental Integrity Project is a 501 (c)(3) nonpartisan, nonprofit watchdog organization that advocates for effective enforcement of environmental laws.

Comprised of former EPA enforcement attorneys, public interest lawyers, analysts, investigators, and community organizers, the EIP has three goals:

To illustrate through objective facts and figures how the failure to enforce or implement environmental laws increases pollution and harms public health;

To hold federal and state agencies, as well as individual corporations, accountable for failing to enforce or comply with environmental laws; and

To help local communities obtain the protections of environmental laws.

The EIP acts as a watchdog since state and federal agencies charged with protecting the environment often are squeezed by limited resources and political interference

from well-funded lobbyists hired by the industries they are required to regulate.

\$1.1 billion slated for Everglades

The President's Infrastructure investment and the Jobs Act includes \$1.1 billion for Everglades revitalization. The funds will be distributed among projects in the Comprehensive Everglades Restoration Plan passed in 2000. The plan includes 68 projects anticipated to cost \$23 billion.

The funds to be distributed in this fiscal year for Everglades restoration will increase the ecosystem's resilience against climate change by storing surface water runoff and minimizing seepage losses during dry periods.

NWRA schedules conference

The National Waste & Recycling Association's (NWRA) fall leadership conference, the Executive Leadership Roundtable (ELRT), will be Oct. 11-13 at the Hotel Hershey in Pennsylvania. The conference will include several education sessions, committee meetings and a golf event.

There will be an awards dinner to recognize NWRA's 2022 Recycling Award

winners and honor NWRA's Member Award winners.

"This event is an important opportunity for industry leaders to hear from experts and share best practices," said NWRA President and CEO Darrell Smith. "Everyone looks forward to the awards dinner each year."

For information about ELRT, check out www.wasterecycling.org.

Rubio's bill passes

The U.S. Senate has unanimously passed U.S. Senator Marco Rubio's bipartisan South Florida Clean Coastal Waters Act legislation. The bill was reintroduced with the support of Senator Rick Scott (R-FL) and U.S. Representatives Brian Mast (R-FL) and Darren Soto (D-FL). The bill was unanimously approved by the Senate Committee on Commerce, Science and Transportation in June 2021 and will now proceed to the U.S House of Representatives for consideration.

The Task Force will develop an Action Plan in coordination with the state and local stakeholders to reduce, mitigate, and control harmful algal blooms and hypoxia. •



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Safety Day scheduled for May 4 in Orlando

By JEFF NAVIN

John Lucarelli remembers more than 20 years ago when the first safety conference was a small, hard-hat affair held in the parking lot of Universal Studios.

Since then, the ACFS Safety Day (Alliance for Central Florida Safety) has grown into a prestigious event featuring guest speakers and signature, platinum, gold and silver guest vendors. It also has a nominal fee of \$30 for people who just want to walk in, listen to the speakers and help themselves to the Italian buffet.

It is from 8 a.m. to 3 p.m. Wednesday, May 4, at the Rosen Plaza at 9700 International Drive in Orlando.

"It's amazing how it's morphed into this," said John Lucarelli, the co-chair of the ACFS Safety Day. "That first event was really small."

Emily Cunis of the Walt Disney Company is the co-chair of the event with Lucarelli. Trevor Browning of the Miller Electric Company is the treasurer and Travis Chaput of Brasfield-Gorrie is the secretary.

"It's a great team; they're fantastic," said Lucarelli, the business development program manager for Alpha Omega Training and Compliance which is based in Cocoa. "We'll have 50 vendor tables altogether. People will have a chance to earn CEUs (Continuing Education Units) and get certified in CPR."

Several speakers will share their knowledge on a wide array of topics. Some of the sessions will have a question and answer period.

"Our speakers enjoy that," said Lucarelli, a native of New Haven, Connecticut. "We don't want people just sitting there and falling asleep. These question and answer sessions can be very interesting."

William Watson, the senior director of safety for the Miller Electric Company, will conduct a seminar called Safety Leadership.

To SAFETY DAY Page 3

JOHN WATERMAN

Publisher

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Proof Brewing Company earns efficiency award

STAFF & WIRE REPORTS

Leon County has recognized Proof Brewing Company with Gold level status through the SustainaBiz program. SustainaBiz recognizes local businesses for implementing sustainable practices throughout everyday operations in the areas of energy, water, waste management, community and staff involvement and the local economy.

Proof Brewing has received the greatest number of collective points at the Gold level status and joins Architects Lewis + Whitlock, Square Mug Café, and Black Dog Café as a Gold recognized business.

Florida Senate confirms three

The Florida Senate has confirmed the appointments of three Southwest Florida Water Management District (District) Governing Board members.

Jack Bispham represents Manatee County. Bispham was appointed to the Governing Board in November 2019. He was reappointed in May 2021 and his term ends March 1, 2025.

John Hall represents Polk County. Hall was appointed to the Governing Board in May 2021 and his term ends March 1, 2025.

William Hogarth represents Pinellas County. Hogarth was appointed to the Governing Board in May 2021 and his term ends March 1, 2022.

Permit not renewed

The state has refused to renew BS Ranch & Farm's state permit needed to continue operating as an organic waste recycling facility, according to the *Lakeland Ledger*.

The Florida Department of Environmental Protection issued a six-page Notice of Permit Renewal Denial stating it would not renew the East Lakeland company's permit since there were five deficiencies in its application.

The state agency found BS Ranch "did not provide reasonable assurances" it can operate in compliance with state laws governing treatment and disposal of solid waste. It cited concerns with odors and groundwater contamination.

Fertilizer ordinance

The Orange County Board of County Commissioners unanimously voted to update its Fertilizer Management Ordinance to prevent nitrogen and phosphorus nutrient pollution from entering the county's water bodies.

Temporary waste collection

Polk County has implemented an emergency plan for waste collection. The county reached an agreement with the FCC, its contracted waste hauler, to implement an emergency plan for collection services. This temporary change is for customers who live in unincorporated areas west of US 17.

Building Efficiency 305 winners

Mayor Daniella Levine Cava is celebrating the success of the inaugural year of the Building Efficiency 305 Chal-

From SAFETY DAY Page 2

Meredith M. Stephens, a partner with Rissman, Barrett, Hurt, Donahue, will conduct a seminar entitled How to defend an incident from a legal perspective.

Matt Law, the manager of safety strategy at Grainger, will give a talk entitled Selling Safety.

Heather Earl, Madeline Lee, Gabriella Pace and Stefania Evanko, representing safety services at the Walt Disney Company, will conduct a seminar called Tech on the Go. •

lenge (BE305) launched in April 2021 with support from the Miami-Dade County Office of Resilience and in partnership with leading businesses and community organizations. The BE305 Challenge empowers owners and managers to improve building performance and reduce operational costs



by implementing low- or no-cost strategies to cut energy and water use.

Significant study

The Volusia County Council approved a grant agreement with the Florida Department of Environmental Protection (DEP) to conduct a wastewater treatment feasibility analysis and septic system remediation plan within the Blue Spring spring shed.

Pipeline completed

Broward County recently held a ribbon cutting ceremony to celebrate the completion of a 10-mile underground water reuse pipeline system that runs from the Broward County North Regional Wastewater Treatment Plant through Quiet Waters Park along the Hillsboro Canal to the county's northwest region.

Emerald Award winners

Broward County NatureScope has announced the 2022 Emerald Award

winners. The NatureScope Emerald Award recognizes businesses, municipalities, schools, government facilities (excluding Broward County agencies) and homeowners that have created and maintained model Florida-friendly landscapes or completed exceptional projects that demonstrate visible ecological practices.

Videos of the winning gardens are available at the Water Matters Month's website.

Smooth initiative

Downtown Jacksonville is serving as a national model for smart city planning helping the region to grow and modernize its economy, as well as welcoming more innovation to Northeast Florida.

The U2C project will convert the existing 2.5-mile elevated monorail known as the Skyway to a 10-mile AV network that will operate across downtown and in its surrounding residential neighborhoods.

Jacksonville chosen for EV facility

Electric vehicle (EV) technology company Cenntro Automotive, a leader in advanced, market-validated commercial vehicles, selected Jacksonville for its first U.S. manufacturing facility.

The company will create 34 jobs, including research and development specialists, highly skilled technician positions and administrative support, at the \$25 million state-of-the-art facility.

Construction begins at PortMiami

Construction has begun on PortMiami's fourth new cruise terminal, according to the *Maritime Executive*. •



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UF study questions stormwater ponds

STAFF & WIRE REPORTS

A study by the University of Florida found that stormwater ponds emit more carbon into the atmosphere than they retain.

Many master-planned communities, especially in Florida, rely on stormwater ponds to help prevent flooding and remove pollutants from water before it drains into the ground or nearby bodies of water.

Recent University of Florida research shows the ponds also could be environmentally problematic, said Mary Lusk, a UF assistant professor of soil and water sciences, in a news release. There are about 76,000 stormwater ponds statewide.

“Stormwater ponds are everywhere in Florida,” Lusk said. “Because they are man-made parts of the landscape, they sort of get overlooked, and people might assume they’re not very important ecologically. Once people start to understand that better, we hope they will take stormwater ponds into account for policies related to carbon control.”

Graduate student Audrey Goeckner, who studied under Lusk, completed a review in Manatee County that found the ponds emit more carbon into the atmosphere than they store. She also discovered that the amount of carbon emitted is greater among newer ponds.

Goeckner is now a Ph.D. student in soil and water sciences.

“Turns out that despite their small size, they can rapidly store and process carbon, which adds up when you consider how many of them exist in developed landscapes and how many continue to be built,” Goeckner said in the news release.

To conduct her experiment, which was done as a part of her master’s thesis at the Gulf Coast Research and Education Center, Goeckner designed a way to measure the amount of carbon leaving the ponds.

First, she took two tethered canoes into the ponds and collected muck from the bottom. She measured the depth of the muck, which showed when the pond was built and the amount of carbon stored.

Then she modified a chamber that is typically used to measure greenhouse gases such as carbon dioxide and methane from soil to measure the gases from the surface of the ponds.

She compared the two findings and found

that the ponds release more carbon into the atmosphere than they store.

“This means the older ponds are doing less of an ecosystem disservice to us than the younger ponds,” Lusk said. “But if you think about the rate of new housing development in Florida, and how fast new stormwater ponds are being built in all that new development, it means we will always have a fresh new batch of young ponds that are just pumping carbon out to the atmosphere.”



Injecting water considered

Providing new water to residents in fast-growing southern Hillsborough County could be aided by injecting old water into the ground, according to the *Tampa Bay Times*.

The new water will be fresh from the aquifer drawn to the surface by additional wells run by Tampa Bay Water, the regional water supplier. The old water will be treated wastewater injected at sites several miles away and pushed down 1,000 feet below the surface.

Hillsborough County and Tampa Bay Water dispute how much the county should be paid for giving up its reclaimed water.

“We’re not real close on the value,” said George Cassidy, Hillsborough’s assistant county administrator for public utilities.

The proposal calls for Hillsborough County to inject a total of 10 million gallons of reclaimed water into the ground each day at a series of four wells west of Interstate 75 near the county’s coastal areas.

Tampa Bay Water says studies show the injections do two things: create a barrier preventing saltwater from intruding into fresh groundwater and increase aquifer levels at inland locations several miles away.

Septic to sewer

Flagler County is slated to receive \$8 million for an ongoing septic-to-sewer conversion initiative in the Malacompra area.

Clams used in project

Local nonprofit Sarasota Bay Watch recently hosted its annual Scallopooza fundraiser event, where Helios Technology donated \$10,000. The money will help fund an ongoing water improvement project involving clams.

More than 400 donors attended and raised enough money to provide 1 million clams for the project. Clams have a natural ability to clean water, which was displayed at each table at the fundraiser.

Millville struggling

Panama City officials could be relocating the Millville wastewater treatment plant, according to *mypanhandle.com*.

The city is conducting a \$1.5 million study with the Department of Environmental Protection to determine if it should repair the existing plant or build a new one.

Bilirakis secures funding

U.S. Rep. Gus Bilirakis, who represents Tampa’s 12th Congressional District, has secured \$13.79 million for local appropriation projects from the federal budget.

A few of the projects, according to *Florida Politics*, include:

- \$1.6 million for the Oldsmar State Street Drainage Ditch, which will enclose the ditch with a box cover to mitigate the unsafe conditions from the undermining of driveways, streets and sidewalks on a public street.

- \$1.75 for the Dade City Wastewater Treatment Plant. This project involves the design and permitting of the city’s wastewater treatment plant relocation and upgrade.

- \$1.5 million for the Zephyrhills Lift Station and Force Main Project. These funds will assist with wastewater system improvement in Zephyrhills that will allow the city to balance wastewater flow, provide water quality protection and support water supply needs in the Hillsborough River Basin.

Projects for Hillsborough

Sen. Janet Cruz has secured \$7 million from the Legislature-approved budget for projects in her Tampa-based district, according to *Florida Politics*.

Cruz prioritized funding Hillsborough County’s water quality and waterways, including nearly \$1 million for improving Tampa’s water quality, \$950,000 for combating red tide on the county’s shores and \$96,000 for Purity Springs restoration. •

NOAA predicts La Niña pattern thru summer

By TAMERA McBRIDE, PG

The National Oceanic Atmospheric Administration (NOAA) is predicting a La Niña weather pattern continuing into summer. Hydrologic Data Manager Tamera McBride explains in a question and answer what that could mean for rainfall and weather conditions throughout the Southwest Florida Water Management District in the coming months.

QUESTION: Is there a rainy season and dry season in Florida?

ANSWER: Yes, rainfall is seasonal. Our rainy season is a four-month period from June through September, with average rainfall of about 7.8 inches each month. About 60 percent of our average annual rainfall is received during that time.

The higher rainfall results in rising water levels in wells, lakes, rivers and springs.

Our dry season is an eight-month period from October through May.

During the dry season, our average rainfall is around 2.7 inches per month. Water levels typically decline in wells, lakes, rivers and springs during these eight months.

Q: Have we had normal rainfall conditions during the last 12 months?

A: As of February 2022, the Districtwide 12-month rainfall total is 4.6 inches below the historical annual average of 52.7 inches. Rainfall was 2.3 inches above normal in the northern counties and 7.3 and 7.1 inches below normal in our central and southern counties, respectively.

The northern District 12-month total is above average due to plentiful rainfall during the wet season. Last year, Citrus County had the second highest wet season rainfall totals on record since 1915.

Q: What is the role of La Niña in our weather?

A: We are currently in a La Niña period. La Niña is a weather pattern related to the cooling of waters in the central and eastern tropical Pacific Ocean, and it has global impacts on weather. In Florida, La Niña normally results in warmer air temperatures and lower rainfall. Water resources typically decline during La Niña periods.

Q: What is the forecast for the next several months?

A: The National Oceanic and Atmospheric Administration’s (NOAA) Climate Prediction Center predicts La Niña is favored to continue into the summer due to below average east-central and eastern Pacific Ocean temperatures. Current forecasts indicate below-normal rainfall is likely during the next several months with a chance of normal rainfall conditions returning in the May to July time period.

Q: How can the public access the District’s hydrologic data, including rainfall and water levels?

A: These data can be accessed and downloaded from the Environmental Data Portal (EDP) at WaterMatters.org/EDP. •

Tamera McBride is the Hydrologic Data Manager for the Southwest Florida Water Management District. She oversees hydrologic conditions monitoring and reporting at the district and coordinates and manages the district’s hydrologic data collection program. As a professional geologist with 26 years of experience, McBride holds a master’s degree in hydrogeology from the University of South Florida and a bachelor’s degree in environmental studies from Rollins College.



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PFAS roadmap: What's next for water, forever chemicals?

By APRIL DAY

The Biden Administration aims to address a class of chemical compounds called the forever chemicals, per and polyfluoroalkyl substances. These forever chemicals are used for different applications and products such as firefighting foam, nonstick cookware and waterproof clothing.

Last October, the administration released the PFAS Strategic Roadmap, which spans from 2021 to 2024. The United States Environmental Protection Agency is taking an integrated approach that focuses on three goals: research, restrict, and remediate. The EPA will invest in research, development, and innovation to learn more about PFAS. Additionally, the EPA will look at ways to restrict PFAS entering the environment at levels that can adversely affect human health and the environment. These pathways include air, land, and water. The roadmap also includes a goal to remediate PFAS contamination by broadening and accelerating cleanup efforts. So, what's on the table for the PFAS Strategic Roadmap for the EPA's Office of Water this year?

A major change in PFAS regulation is on the horizon: setting enforceable limits for PFAS in drinking water. Through the National Primary Drinking Water Regulation, the agency will set enforceable limits on two better known and studied PFAS: perfluorooctanoic acid, also called PFOA; and perfluorooctanesulfonic acid, also called PFOS. There are ongoing consultations with the Science Advisory Board for setting these enforceable limits and requiring ongoing monitoring. A proposed rule is expected to be published in the Fall, and a final rule is expected by next Fall in 2023. This timeline is shorter than required. The statutory deadline

for the proposed rule is March 2023.

All public water systems may be impacted by the EPA's decision to set limits on PFOA and PFOS in drinking water. The EPA still is determining what economic impact this national primary drinking water rule will have on small or disadvantaged communities. The EPA will conduct a Small Business

aquatic environments.

The EPA Office of Water anticipates publishing improved analytical methods in the fall. These methods will enable monitoring 40 PFAS in eight different environmental matrices.

During the Winter of 2022, the EPA Office of Water will seek to leverage the existing

permits and assess cumulative effects of PFAS.

During 2022, the roadmap aims to restrict PFAS discharges from industrial sources. Several industries, including organic chemical manufacturers, airports, and the rug and textile industry, will likely be affected, according to the Final Effluent Guidelines Program Plan 14, which includes an update on the PFAS Multi-Industry Study. According to the PFAS Strategic Roadmap, an Effluent Limitations Guidelines program that is multifaceted will set up national technology-based regulatory limits.

There are and will be multiple ways to engage the EPA's regulatory process throughout the year. For instance, there are several due dates for submitting comments to the EPA regarding PFAS. For example, the agency has published a notice called the National Pollutant Discharge Elimination System Industrial Stormwater Fact Sheet Series with comments that were due March 29, 2022. There also is a notice called "Integrated Risk Information System Toxicological Review of Perfluorohexanoic Acid and Related Salts" with comments that were due April 5, 2022. For the upcoming proposed PFAS national drinking water regulation, U.S. EPA has published "Meetings: Environmental Justice Considerations for the Development of the Proposed Per- and Polyfluoroalkyl Substances National Primary Drinking Water Regulation" with comments due April 21, 2022.

Among other information, documents of the proposed approaches for deriving the draft Maximum Contaminant Level goal for PFOA and PFOS are available on the EPA web page for the Science Advisory Board PFAS Review Panel Meeting of Dec. 16, 2021, to Jan. 7, 2022. •

All public water systems may be impacted by the EPA's decision to set limits on PFOA and PFOS in drinking water. The EPA still is determining what economic impact this national primary drinking water rule will have on small or disadvantaged communities.

Advocacy Review Panel to engage small businesses, governments and nonprofits to provide advice and comments on how the rule will impact them. Two public meetings (March 2 and April 5) allowed and will allow comments on environmental justice considerations in developing the regulation.

Proposing new drinking water standards for PFAS is not all that's on the table this year. By Spring of 2022, the EPA Office of Water expects to publish health advisories for GenX and perfluorobutane sulfonic acid, referred to as PFBS. These advisories will be based on final toxicity assessments. Tribes, states and local governments will be able to use these advisories to take appropriate action related to these two PFAS.

This Summer, the EPA expects to enhance data that is available on PFAS fish tissue. This data will assist federal, state, and tribal efforts to set advisories for PFAS in fish. Additionally, this data will provide better information about the impact of PFAS on

National Pollutant Discharge Elimination System permitting system to reduce PFAS discharges into waterways. Leveraging NPDES permits focuses on sources of PFAS discharges. The agency will look to get more comprehensive data through monitoring the sources as well as the quantity of PFAS discharged by sources. An errata sheet for the draft method with corrected text was made available in February. According to the EPA's Clean Water Act Analytical Methods for Per- and Polyfluorinated Alkyl Substances (PFAS) web page, the agency appreciates comments on Draft Method 1633, the analytical method, that resulted in the errata sheet. The EPA further advises that if "stakeholders identify additional areas that need clarification, further revisions will be made."

During the Winter of 2022, the agency will also publish final recommended ambient water quality criteria for PFAS for both aquatic life and human health. Tribes and states may use these criteria to develop standards, write

EPA rulemaking could expand liabilities for PFAS waste

By BLANCHE HARDY, PG

The U.S. Environmental Protection Agency (EPA) has announced the addition of four per- and polyfluoroalkyl substances (PFAS) to the Toxics Release Inventory (TRI) list. The action is part of the EPA's 2021 PFAS Strategic Roadmap charting the EPA's approach for addressing PFAS.

PFAS are an increasingly critical public health and ecosystem concern. Thousands of PFAS chemicals have been manufactured and used internationally by a broad range of industries producing consumer, commercial, and industrial products during the past 80 years. PFAS can be found in manufactured goods such as cleaners, textiles, leather, paper, paints, fire-fighting foams, and wire insulation. PFAS are persistent, they break down over a lengthy period of time and are found everywhere, from rural areas to the most populated cities. They have been detected in surface water, groundwater, soil, and air.

The EPA requires PFAS TRI data to be reported annually by public and private facilities that manufacture, process or otherwise use TRI-listed chemicals above certain quantities. PFAS tracking began in January for facilities subject to the new reporting requirements. Required data includes quantities of chemicals released into the environment or otherwise managed as waste.

Information collected through the TRI allows communities to learn how facilities in their area are managing listed chemicals. The data collected also helps bolster EPA's efforts to better understand the listed substances.

"We will use every tool in our toolbox to protect our communities from PFAS pollution," said Assistant Administrator for the Office of Chemical Safety and Pollution Prevention Michal Freedhoff. "Requiring


companies to report on how these PFAS are being managed, recycled, or released is an important part of the EPA's comprehensive plan to fill critical data gaps for these chemicals and take meaningful action to safeguard communities from PFAS."

Research increasingly indicates PFAS can adversely impact human health. According to the EPA, current peer-reviewed scientific studies have shown that exposure to certain

levels of PFAS could lead to decreased fertility, increased high-blood pressure in pregnant women, developmental effects or delays in children, and increased risk of cancers, including prostate, kidney, and testicular cancers in men. The exposure also can reduce the ability of the body's immune system, interfere with the body's natural hormones and increase cholesterol levels and risk of obesity.

The roadmap presents the timelines the EPA will follow to safeguard public health, protect the environment, and hold polluters accountable. The potential risks of exposure to PFAS requires the agency to attack the problem simultaneously on multiple fronts. Hopefully, these actions will lead to more enduring and protective solutions poten-


To EPA Page 6



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EPA announces research program for review of new chemicals

By **BLANCHE HARDY, PG**

The U.S. EPA announced a new effort under the Toxic Substances Control Act (TSCA) updating the process for reviewing new chemicals prior to their introduction into the marketplace.

The Office of Chemical Safety and Pollution Prevention (OCSPP) is proposing the development and implementation of a multi-year collaborative research program in partnership with the EPA's Office of Research and Development (ORD) and other federal partners engaged in developing approaches for performing risk assessments on new chemical substances under TSCA. The collaboration is expected to bring innovative science to new chemical reviews, modernize the approaches used and increase the transparency of the human health and ecological risk assessment process.

The research program is anticipated to be a multi-year effort. The partners are tasked with refining existing approaches and developing and implementing new approach methodologies (NAMs) to ensure the best available science is being applied to TSCA new chemical evaluations.

"Science is the backbone of our chemi-

"This exciting and collaborative effort . . . will modernize the processes and bring innovative science into the evaluation of new chemicals under TSCA, leading to a more sustainable program."

— Michal Freedhoff
assistant administrator,
Office of Chemical Safety and Pollution Prevention

cal safety work, and strong science ensures we put measures in place to protect human health and the environment, when necessary," said Michal Freedhoff, the assistant administrator for the Office of Chemical Safety and Pollution Prevention. "This exciting and collaborative effort announced today will modernize the processes and bring innovative science into the evaluation of new chemicals under TSCA, leading to a more sustainable program."

Several key areas will be examined in the TSCA New Chemicals Collaborative Research Program. The OCSPP's approach will be updated to include read-across, the process of using data from structurally similar chemicals to identify potential risks from new chemicals. The team hopes to increase

the efficiency of reviews while promoting the use of best available data to protect human health and the environment.

Data that exists only in hard copy or in incongruent TSCA databases will be consolidated and digitized. This will expand the amount of information available to agency users and the public. The new database will be combined with publicly available sources to facilitate informed chemical reviews and to enable the efficient sharing of chemical information across the agency. The EPA indicates safeguards for confidential business information will be maintained as appropriate in this process.

The models used for predicting a chemical's physical-chemical properties and environmental fate/transport, hazard,

exposure and toxicokinetics will be updated and augmented to produce a suite of models incorporating the best available science for new chemicals assessments. The team also will establish a process for updating these models as science evolves.

The team will explore ways to integrate and apply NAMs in new chemicals assessments reducing the use of animal testing while informing and expanding new chemical categories. The EPA hopes to develop purpose-driven NAMs that will be made available for use by external stakeholders for data submissions under TSCA.

A decision support tool will be developed that integrates the various information streams specifically used for new chemical risk assessments. The tool is intended to efficiently integrate all the data streams (e.g., chemistry, fate, exposures, hazards) into a final risk assessment that documents the decisions and assumptions made. The decision support tool will track new chemicals program decisions over time and evaluate consistency within and across chemistries.

"This collaborative effort between OCSPP and ORD will draw on ORD's innovative science, expertise and leadership in relevant areas such as high-throughput testing, computational toxicology and exposure approaches, and development of databases and tools to make data accessible and informative for chemical assessments. Work on this collaborative effort furthers ORD's commitment to translating research into application and is complementary to efforts on EPA's New Approach Methods Work Plan," said Chris Frey, the deputy assistant administrator for Science Policy in the Office of Research and Development.

The agency plans to release a revised version of the collaborative research plan for an additional public comment period and peer review by the Board of Scientific Counselors (BOSC) later in 2022. •

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From EPA Page 5

tially including enforcement of PFAS as a regulated waste.

In June 2021, New Mexico Gov. Michelle Lujan Grisham petitioned the EPA requesting, "a timely listing of per and polyfluorinated substances (PFAS) as a class of chemicals within Subpart C of the Resource Conservation and Recovery Act (RCRA), or in the alternative, list individual PFAS chemicals under RCRA."

In response, the EPA outlined plans to initiate the rulemaking process for two new actions under the hazardous waste law and announced steps toward evaluating the existing data for four PFAS as Resource Conservation and Recovery Act (RCRA) Hazardous Constituents under Appendix VIII.

The four PFAS chemicals are: perfluorooctanoic acid (PFOA), perfluorooctane sulfonic acid (PFOS), perfluorobutane sulfonic acid (PFBS) and GenX. Identifying these chemicals as RCRA Hazardous Constituents is the first step in ensuring they are subject to corrective action requirements and will facilitate regulating PFAS as a listed hazardous waste.

The second rule-making effort will establish that the RCRA Corrective Action Program has the authority to require investigation and cleanup for wastes that meet the statutory definition of hazardous waste, as defined under RCRA section 1004(5). This will allow emerging contaminants such as PFAS to be cleaned up through the RCRA corrective action process.

Identifying these chemicals as RCRA Hazardous Constituents ensures they are subject to corrective action requirements. This establishes the foundation necessary for a future effort to regulate PFAS as a listed hazardous waste potentially opening the door to CERCLA cleanup liability. •

Study: Most drycleaning sites pose problem for Florida

By CHAD NORTINGTON, P.E.

This article is Part 1 of a two-part series investigating the potential PFAS problem at Florida drycleaners and the remedies likely to be used for reducing PFAS exposure risk.

An investigation conducted by the Florida Department of Environmental Protection (FDEP) suggests PFAS (i.e., per and poly-fluoroalkyl substances) could be present in groundwater at most drycleaner sites in the state's Drycleaning Solvent Cleanup Program (DSCP).

In 2019, the FDEP initiated a pilot study to evaluate PFAS at drycleaning facilities administered through the DSCP as part of a larger initiative to assess PFAS sources and environmental impacts in the state. The results were published in September's Florida Statewide PFAS Pilot Study at Drycleaning Sites report.

The study found PFOA (Perfluorooctanoic acid) and PFOS (Perfluorooctanesulfonic acid) at 14 out of the 15 sites sampled (93%) while at 10 sites (66%), the contaminants exceeded the FDEP's Provisional Groundwater Cleanup Target Levels (PGCTL). The two PFAS compounds are on track to become EPA-listed "hazardous substances" later this year. Drycleaners are a newer addition to

CORRECTION

Ryan Moore, the PFAS program manager at Regenesys, and Chad Northington, the Southeast district manager for Regenesys, wrote the story in the February/March issue entitled: Plumestop fights risk of PFAS compounds in groundwater.

the expanding list of business types where these contaminants have been confirmed in Florida's groundwater.

PFAS has contaminated groundwater at drycleaning facilities when the chemicals leach out of PFAS-treated fabrics during drycleaning or wet laundering. Drycleaning solvents such as perchloroethylene (PCE) are suspected to accelerate the leaching. Through time, PFAS accumulates in the solvents and filtering media.

If not handled or disposed of properly, these PFAS-containing solvents make their way through the subsurface and into groundwater. Consequently, where PCE or other solvents have been detected in soil and groundwater, PFAS are likely, resulting in commingled PFAS and chlorinated solvent plumes. This effect is best observed by sampling the groundwater and mapping/contouring the concentrations relative to the action levels.

As of Jan. 31, 2022, the FDEP lists 269 active and 877 pending cleanup sites. There are another 273 sites that have been closed either through remediation or no remedy required (107 sites). Altogether, 1,419 sites are registered through the program; presumably most have never been sampled for PFAS.

The 15 sites included in the PFAS Pilot Study are legacy projects that have undergone years of assessment and remediation work to address chlorinated solvent contamination. These sites exhibit a range of contaminant levels, geological/hydrogeological conditions, and surrounding land uses.

Extrapolating FDEP's PFAS Pilot Study results in a reasonable estimate of 900 DSCP sites where PFOA/PFOS impacts exceed the PGCTL. This number excludes contaminated drycleaner sites that have either not been discovered, reported or otherwise made eligible for the DSCP.

The number of sites in the DSCP ultimately requiring remediation will increase if the U.S. EPA settles on a lower maximum contaminant level (MCL) than the PGCTL currently established in Florida. This increase is a probable outcome based on recent EPA-commissioned toxicological studies suggesting that adverse health effects could occur at much lower levels of exposure to PFOA and PFOS than previously understood

and that PFOA is a likely carcinogen. The preliminary MCL for PFOA and PFOS are due in the fall of 2022.

Another important finding from the Pilot Study is that the sizes and extents of the PFAS and solvent plumes do not correlate, with the PFAS plumes more extensive in half of the cases. This means that if a solvent plume's extent was adequately defined per FDEP, the same might not be true for PFAS in the future as regulations continue to develop. Plume delineation is a hurdle that usually must be cleared by a site owner seeking regulatory closure.

Finally, plumes containing PFOA/PFOS above the 70 ng/L PGCTL extend offsite at seven of the Pilot Study sites (i.e., 46%). Offsite groundwater impacts are a key driver that pushes many contaminated sites into active remediation. •

In the next edition of the Florida Specifier, Part 2 discusses the likely regulatory closure pathway for PFAS-impacted drycleaners, along with an enhanced attenuation approach using Plumestop, a patented Colloidal Activated Carbon1 material proven effective at treating PFAS and chlorinated solvent mixtures in groundwater.

Canals prove to be problem for Florida Keys

BY RHONDA HAAG

Residents of the Florida Keys will have an opportunity to correct a problem caused by developers. It won't be cheap, but the state is willing to pay a percentage to clean up canals that compromise the health of the tropical paradise.

More than 500 canals were dug decades ago to provide fill for adjacent home sites. There were no regulations in place at the time.

Many canals were dug too deep, where depths below 8 feet are both light and oxygen starved. Some canals were constructed too long and winding with no viable way to flush the water columns.

Other canals open too widely, directly into Florida Bay or the Atlantic Ocean. This allows tons of floating vegetation to enter the canals and sink to the bottom. Today's canals are plagued by several feet of smelly muck.

Today, more than 216 canals in the Keys do not meet Florida standards for water quality. Many of these canals have little to no marine life in them due to being oxygen-deprived.

Monroe County recently compiled a list of 96 troubled canals in unincorporated areas that will require restoration a cost of more than \$560 million. The county receives only about \$5 million annually.

Representatives from the county recently began meeting with residents living near canals on the top 10 worst list. They discussed the proposed restoration process and potential property assessments to fund the operations and maintenance of the canals.

Most residents praised the county-funded restoration project that would restore canal water quality. Most projects exceed \$1 million, with annual operation and maintenance costs varying from \$5,000 to \$20,000.

Monroe County will offer a choice as to the level of assessment residents are willing to pay to maintain the restoration. Higher amounts will be "all inclusive." If the residents vote not to accept the county's restoration project or to pay the required assessment, the county will move on to the next troubled canal in line. •



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Brevard County offers septic-to-sewer conversions

By MATT BADOLATO

In continued efforts to reduce nutrient-rich groundwater from entering the Indian River Lagoon, Brevard County is replacing septic systems with new sewer lines.

Brevard County has allocated about \$121 million to fund these septic-to-sewer conversions which will prevent nearly 120,000 pounds of nitrogen from reaching the IRL.

“Brevard County drew inspiration from other estuaries in Florida suffering from similar issues with eutrophication,” said Anthony Gubler, an environmental scientist and project manager for the Brevard County Natural Resources Department. “We modeled our program off places like the Keys and Sarasota Bay who have been down this road before.”

Since 2001, Sarasota has been tirelessly treading the path toward septic obsolescence. Like Brevard, Sarasota County has nearly 48,000 septic systems which contribute to nutrient loading and seagrass loss in Sarasota Bay.

In areas where sewer is already available, Sarasota County offers 3.0% interest-deferred loans to pay for capacity and connection fees and septic tank abandonment when required to connect to Sarasota County’s sewer services. Repayment is not required until the property is sold, transferred, no longer owner-occupied or 20

years, whichever happens first.

“Financing is an issue — these projects are expensive,” said Gubler, who works with state and federal grant agencies to help fund the conversions as they become shovel-ready. “It can be a big expense for the county and many homeowners have never had to pay a monthly sewer bill before.”

State law requires homeowners abandon their septic and connect to a new gravity sewer line within 365 days of its installation. After that, county code enforcement might get involved.

“People are reluctant to connect if their septic system isn’t backing up into their home,” Gubler said. “They also don’t want to see their lawns and streets torn up during the sewer line construction process, or the associated road closures and utility interruptions.”

To sweeten the deal, the county aggressively seeks state and federal grant money to pay for homeowners’ connections.

The county currently has several grants through the Florida Department of Environmental Protection and the Indian River Lagoon National Estuary Program which pay homeowners’ connection fees, septic abandonment costs and the installation of a PVC line from the home’s stub-out to the main line in the street.

Hesitant homeowners should be aware that the benefits of septic abandonment go beyond cleaning up local surface wa-

ters. Without the health hazard of sewage-soaked soils in their yard, homeowners can install shallow irrigation wells, fruit trees or gardens which otherwise would be subject to contamination by pathogens — and permit restrictions. Plus, no more emergency pump-outs should their drainfields fail.

Besides funding, there are other hurdles to abandoning septic in entire neighborhoods.

Logistical issues include finding room for a sewer line in neighborhoods with little or no utility easements; having enough staff capacity to manage multiple projects; or drilling through Brevard’s natural bedrock, coquina.

“When selecting areas to convert to sewer, we found that shorelines with the highest nitrogen loading included areas with layers of coquina beneath the properties,” Gubler said. “The porosity and natural cracks in coquina make it easy for septic effluent to travel from the drainfield to the groundwater to the lagoon, but without effective treatment by bacteria in the soil.”

Septic neighborhoods — the most likely contributors to surface water pollution from groundwater — were chosen according to the priority of the site for nutrient reduction.

Groundwater modeling, calibrated with local groundwater nutrient concentration data, showed nitrogen loading to the Indian River Lagoon (IRL) was highest

from homes closest to the IRL, in sandy or rocky soils, and in low-elevation areas with a high groundwater table. These areas also had high soil hydraulic conductivity, meaning water can pass easily from septic drainfield to groundwater through porous sediment.

If situated atop a layer of earth with the proper balance of soil conductivity and fertility, a drainfield will function properly and remove significant nutrients. Soils with low hydraulic conductance — impenetrable or wet soils — can saturate easily, causing effluent backup and drainfield failure. Too much hydraulic conductance and the effluent will pass to the groundwater without adequate treatment by microorganisms, full of algae-feeding nutrients such as nitrogen and phosphorous.

Funding for Brevard County’s septic conversion program comes from the Save Our Indian River Lagoon Project, a comprehensive nutrient reduction and removal plan approved by Brevard voters in a 0.05% sales tax referendum held Nov. 8, 2016 after severe algae blooms and an unprecedented fish kill made headlines that year.

The funding covers connection of about 4% of the septic systems in Brevard County within the IRL basin, but by focusing on priority locations, will reduce more than 17% of the nutrient load contribution attributed to existing septic systems in Brevard. ●



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New technology helps remove microplastics from ocean

By LAUREN HANSEN

Finland-based environmental technology company Wärtsilä and Italy-based shipping company Grimaldi Group have launched a new technology that uses exhaust gas scrubbers on shipping vessels to gather large amounts of microplastics out of ocean water.

More than 10 million tons of plastic makes its way into the ocean each year. The U.S. contributes the most to plastic waste in the ocean, with up to 2.24 million metric tons of U.S. plastic ending up in the ocean each year. Microplastics in Florida’s coastal waters have become a growing concern, especially since a 2019 study that found four billion microplastic particles in water sampled in Tampa Bay.

Microplastics make their way into bodies of freshwater as well, posing serious threats to marine environments, whether freshwater or saltwater, including but not limited to:

- The fertility, growth and feeding rates of zooplankton
- Oyster reproduction
- Digestive system blockage in marine animals

Wärtsilä and Grimaldi have collaborated to find a new solution that uses open-loop exhaust gas scrubber washwater to collect microplastics in the ocean. Open-loop exhaust gas scrubbers are found on large marine vessels and extract harmful sulfur dioxides out of exhaust gases. They draw seawater in, spray it into the vessel’s exhaust and expel it back into the ocean.

This process creates what is called washwater that requires treatment before it gets expelled back into the ocean water because it contains gaseous emissions that the scrubber filters out. The washwater is treated by removing solids and raising its pH before it is discharged back into the ocean. The collected solids are kept onboard until they can be disposed of properly onshore.

Collaborators at Wärtsilä and Grimaldi have found that the washwater treatment process also is capable of collecting microplastics as small as 10 micra, which is about the diameter of a rain droplet.

Despite the possibility to legally require washwater treatment, at least in the U.S., the use of open-loop scrubbers on marine vessels has been banned in several countries.

These countries, and some U.S. states, have adopted stricter environmental regulations to combat ocean acidification which occurs because of washwater dis-

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To MICROPLASTICS Page 9

From BRIDGE Page 1

and Hillsborough counties; the other two are the Gandy Bridge and the Courtney Campbell Causeway.

It also serves as the main route of evacuation for Pinellas County, and it is part of the Florida Division of Emergency Management's evacuation route network.

Measures to reduce environmental impacts

In order to meet the potential environmental challenges of the bridge expansion, the Florida Department of Transportation is conducting a Project Development and Environment (PD&E) Study.

Among the many factors that this study evaluates are the potential "social, cultural, economic and environmental effects" that could arise from improvement projects to existing transportation structures. Moreover, the study is meant to position the expansion project in alignment with the requirements set forth by the National Environmental Policy Act.

With regard to local ecosystems, the department is implementing efforts to avoid or otherwise minimize environmental impacts to the seagrass communities and surrounding waters of Tampa Bay. Consequently, the new bridge is being built to the west of the 1990 Bridge in order to avoid



Photo courtesy of Florida Department of Transportation

The Florida Department of Transportation (FDOT) is rebuilding the existing northbound bridge, which originally was constructed in 1959, and adding capacity to alleviate traffic congestion.

disturbing critical seagrass communities found to the east of the 1960 Bridge.

In addition, several revisions to the designs for both northern (Hillsborough) and southern (Pinellas) abutments were made to minimize impact footprints that were determined to be unavoidable.

To prevent water pollution associated with the construction stage, discharge prevention measures such as silt screens and

floating turbidity barriers are being used to reduce potential impacts to Tampa Bay waters. At the same time, the department recognizes that the southern end of the bridge is located above waters designated as Outstanding Florida Waters (OFW) as well as an Aquatic Preserve.

This designation, in turn, requires that construction operations abide by water quality standards pursuant to Rule 62-4.242

F.A.C. For this reason, the department is requesting a temporary mixing zone in the event of degraded water quality during construction in accordance with the aforementioned rule.

Another water quality measure includes the proposed turbidity monitoring plan, which ensures that turbidity levels in controlled areas return to 0 Nephelometric Turbidity Units (NTUs) on the southern end (Pinellas) and 29 NTUs on the northern end (Hillsborough). The department's Construction Engineering and Inspection (CEI) firm will be the primary team monitoring turbidity levels.

Among the many challenges posed by the project, the Florida Department of Transportation's resident engineer Greg Deese points out that the first stage of the project is the most difficult.

This involves drilling through a hard rock layer beneath the bay, followed by concrete and steel piles, which are then driven into the ground.

"Once the pile-driving is done, it should be a really good job to finish up," Deese said.

With roughly 100,000 people expected to relocate to the Tampa Bay Area during the next 50 years, this expansion project will not only serve a growing population but also ease traffic congestion and improve the growing evacuation network needs. ●

From MICROPLASTICS Page 8

charge from the scrubbers that goes back into the ocean.

In fact, a 2020 study found that "the total pH decrease owing to the use of open-loop scrubbers would be equivalent to two to four years of acidification on average."

About 80 percent of scrubbers on vessels are open-loop because they are inexpensive to install and easy to operate, but closed-loop and hybrid scrubbers serve as alternatives. Closed-loop scrubbers eliminate the need for seawater intake, as they operate with alkaline-treated water stored in tanks onboard the vessel. However, vessels equipped with

closed-loop scrubbers run into logistical challenges at ports.

Close-loop scrubbers use caustic soda to treat washwater, but there are no dedicated barges that can deliver the caustic soda to such vessels. Instead, caustic soda must be delivered by truck or rail which only increases the cost of using closed-loop scrubbers. Even then, since caustic soda is a hazardous material, it is prohibited at some ports and requires special training to handle it.

Scrubber manufacturers, for the time being, are cooperating with federal governments and environmental organizations to innovate more climate-friendly scrubbers and be part of the solution.

Open-loop scrubbers have not been banned in the state of Florida, so Wärtsilä and Grimaldi's patented technology could soon be implemented on vessels in Florida's ports. Florida has 11 cargo seaports and 10 container seaports for international shipping and trade.

Moreover, given that Florida has the second-longest coastline in the U.S. with no regulation to reduce or prohibit single-use plastics, microplastics will continue to

disproportionately affect Florida's bodies of water.

A reward-benefit analysis would likely need to be conducted to compare the potential increase in ocean acidification that comes with open-loop scrubbers to the increasing microplastic accumulation if open-loop scrubbers are not more widely employed using the Wärtsilä and Grimaldi's patented filtration method. ●

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Clark deals with Florida's waste one ton at a time

By JEFF NAVIN

Years ago, Jim Clark decided to continue his education for an extra semester at Old Dominion. He was an All-America swimmer and qualified for the NCAA Championships in the 50-yard freestyle, 100-yard freestyle, and 100-yard butterfly.

Clark already had earned an education degree; adding minors in math and science proved to be invaluable for the future owner of Clark Environmental, located in Mulberry, Florida since 1991. Clark was never afraid of a challenge or to swim against the tide.

The company's slogan, "Cleaning Earth One Ton at a Time," says it all, but there's so much more. They currently specialize in the recycling, disposal and transportation of liquids, solids and sludges.

"In 31 years, there have been so many changes," said Clark, who runs the business with his wife Beth. The couple met at Old Dominion and she serves as the company president. "Rules and regulations are always changing and have changed for the better. As we adapt, the business has benefited. As we change, we take on new services, our business enjoys multiple revenue streams and the business continues to grow. If you stay still and remain put ... you'll become a dinosaur ... and they eventually disappear.

Clark's boyish exuberance becomes evident for the first time since he is both passionate, yet very serious about the work he, his wife and the team perform. "Being 'just' a recycling facility was good for a while and then we became a thermal treatment plant. We evolved. We stay relevant embracing new ideas. We stay relevant and competitive."

As well as being agile, from a business perspective ... the Clarks are pretty tough, you have to be to continuously be in business for decades. Clark was a standout football player in high school, playing tight end, defensive end and punter. Ultimately, he was recruited by an up-and-coming coach named Lou Holtz to play football at William & Mary.

His high school swimming coach urged him to commit to swimming. Clark doesn't regret the decision. He likes being able to play with his grandchildren without a noticeable limp. Football likely would have left him with nagging knee injuries, or worse.



Courtesy photo

Jim and Beth Clark created Clark Environmental 31 years ago in Mulberry. The company, located on 10 acres, specializes in the recycling, disposal and transportation of liquids, solids and sludges.

PROFILE IN INDUSTRY

For their first two years, Clark and his wife leased 10 acres in Mulberry to start the company before buying the property. Mulberry is southwest of Lakeland.

"Sludge was one of the businesses we got into," Clark said. "We took an idea and built a machine we called the Sludge 3000. It has three stainless steel and mesh wheels. It's 3 feet in diameter. That machine has taken off, and then we built one with six stainless steel and mesh wheels. It's 6 feet in diameter. We call it the Sludginator."

Clark Environmental has grown to hold five processing facilities on its 10-acre complex.

"We try to recycle what we can of the dirt and solids," said the 70-year-old Clark. "Our volume is tremendous. All the major corporations have found us. We have thousands of companies in our book."

Beth Clark has the patience to take care

of the little things that sometimes aren't so little. "Beth gets all the permits and takes care of the financials of the business," Jim Clark said. "She has a great relationship with the DEP. She keeps me away from that stuff. I'm a little confrontational. She knows when to tell me, 'Don't say a word.'"

"I do the marketing," said Clark, a regular at most industry trade shows and a generous supporter of charities. "I'm the theory guy. I'll say, 'Why not try this or let's try that.' We really work well together. I couldn't be happier."

Clark takes pride in that he has never fired anyone in 31 years of business. When people depart, they usually go out of state for more lucrative jobs.

"We started out with five of us," Clark said. "It's a family business, and we take care of everyone like they're family. We pay drivers more, and we'll train them to drive the pump truck, vacuum truck, box vans for drums and dump trucks for soil."

Two employees have been indispensable through the years, Brandy Crawford and John Warren.

"Brandy does all the internal paperwork," Clark said. "We're the village and

she watches over all of us. She's the head honcho for everything internally. John runs all the different equipment."

A few years ago, the Clarks sold the house in Brandon where they raised their children. Monday through Friday, they live on the border of Lakeland and Mulberry. On Friday afternoon, they drive to their weekend home on Manasota Key.

"It's like a release crossing that bridge," Clark said. "I just decompress. But, I'm not a Monday through Friday owner. If something comes up, I want them to call."

Fishing with his grandchildren is his favorite weekend hobby.

"I have a dock and we fish on the flats," Clark said. "If the boat sinks, we can walk to shore. We like to fish for trout, snook, redfish, tarpon and anything that bites."

Full retirement likely will never happen. "I'm looking to the future and how to help the environment," Clark said. "I want to stay ahead of the curve. I'll probably be kicking and screaming when they drag me out, but I won't be a dinosaur," he says with a boyish twinkle in his eye and a trace of smirk on his lips, after all ... he's all about the freestyle. •

Local government 'home rule' under fire from Tallahassee

By RALPH DeMEO
Guilday Law Firm and
MACIE CODINA, 3L FSU Law



Local governments throughout Florida have been on guard during the 2022 Legislative session as sweeping "preemption" bills are being expedited through the House and Senate. They bring efficiency and effectiveness into the houses and communities of their constituents.

Citizens elect and give power to local leaders because they believe the leaders will do whatever is necessary to perform governmental functions and achieve the municipalities' objectives to promote and protect the community. Sufficient protection exists to prevent violations.

The Florida Constitution grants local governments broad "home rule" authority, which allows them to enact local laws and ordinances that further citizens' health, welfare, safety and quality of life.

As for preemption, a local ordinance may

be declared invalid on the grounds that it is inconsistent with State Constitution or Florida Statutes, if the State Constitution preempts that subject area, the Legislature preempts the subject area, or a local enactment conflicts with a state statute. Preemption means that a local ordinance is precluded and displaced by state law if the state law regulates the same field and is in conflict or inconsistent with the local law.

Florida recognizes two types of preemption: express and implied. Express preemption refers to instances where the Legislature has used clear statutory language that shows the State intends to occupy a field of law, prohibiting local governments from acting.

Implied preemption refers to situations where the Legislature has demonstrated an intent to preempt an area but has not ex-

plicitly done so. Florida courts find implied preemption when "the legislative scheme is so pervasive as to evidence an intent to preempt the particular area, and where strong public policy reasons exist for finding such an area to be preempted by the Legislature."

A person may challenge a local ordinance on grounds that it violated preemption laws by filing a lawsuit against the local government.

An ordinance may be declared invalid on the grounds that it is arbitrary or unreasonable if the court finds that there is no legitimate government interest behind the ordinance. In legal challenges against local ordinances, the burden of proof falls on the challenger. A court applies the "rational basis" review standard when determining whether a challenged ordinance is reasonable.

The court will uphold the ordinance if it is at least debatable that a rational relationship exists between the regulation and a legitimate governmental purpose.

The 2022 Florida Legislature has seen an

unprecedented number of preemption bills. The most potentially impactful preemption bills are the Local Ordinances Bills, House Bill 403 and Senate Bill 280; the Local Business Protection Act Bills, House Bill 569 and Senate Bill 620; and the Sovereign Immunity Bills, SB 974 and HB 985.

Effective Oct. 1, the Local Ordinances Bills, House Bill 403 and Senate Bill 280, require the board of county commissioners and the governing body of municipalities to prepare a business impact estimate that contains the public purpose of the ordinance, an estimate of the direct economic impact of the ordinance on private for-profit businesses, a good faith estimate of the number of businesses likely to be impacted, and any other information the board views as useful. Under these bills, a plaintiff may not only challenge a local ordinance on grounds that it is preempted by Florida Constitution or state law, but also on the grounds that the ordinance is arbitrary or unreasonable. Although case law already supports a finding

To DeMeo Page 16

Fishing friends enjoy pompano, a day near Sebastian Inlet

By CAPT. SANDY BOTTOMS

We idle my Carolina Skiff away from the boat ramp at Sebastian Inlet State Park. Little waves slap under its flat bow. It's early morning and Dustin is plopped on a cooler, tying a loop knot to a pink banana jig. He's wearing a T-shirt with a bear wearing sunglasses.

"Sailboat's still there," he jokes, referencing the abandoned, sandbar-grounded craft that's been lying aside for months. We say it every time we fish here.

"Still there!" I shoot back with a fake, sarcastic-sounding southern drawl.

We've been friends almost 30 years — humor travels at different frequencies at that point. Maybe you know what I'm talking about. Inside jokes accumulate.

Chop-Chop-Chop-SPLASH. Chop-Chop-Chop-SPLASH.

Our eyes snap back as two fat pompano skip away from our wake. Automatically yanking the skiff's little throttle into neutral, I flip the key off. We assume our positions on bow and stern, casting 3/8-ounce jigs with pop-pause-pop retrieves. The so-called goofy jigs hop off the bottom, leaving a little puff of sand in their wake as any shrimp-ish creature would.

"Sorry to cast under your line." I sarcastically razz my pal as he unintentionally casts over me. I get a sideways glance in return.

As our jigs bunny hop the inlet floor, I spot a silver flash and a big boil off the bow. Dustin sets the hook a few times and line zings off his reel. He hollers while his eyes bulge in amazement like it's the first time he's ever held a bent fishing rod.

It's genuinely dramatic.

Beneath the surface, a 4-pound pompano — a giant — blasts across the flat. Dustin's line cuts an arc through the clear water as the fish dashes to the left, then changes directions and goes right. It turns straight to the boat and we see its dark grey back and yellow fins. It strips off line again, this time fluttering powerfully on its side, applying maximum pressure against the thing pulling against it.

After a few more dizzying direction changes and spirited runs, ol' Dusty swings that fat pomp on deck.

We're environmentalists, sure, but we're not vegetarians just yet, so the pompano is quickly dispatched by a bop to the head and a slice to the gills. We bleed them out in a bucket of saltwater, then into a saltwater ice slurry. The limit is six per person, but one or two flats-size poms is truly enough. Their meat is rich, fatty and filling. Plus, the largest ones are stuffed with roe this time of year and I'd like to keep catching them until I'm old thank-you-very-much.

Flats pompano behave much like ocean-run pompano. Every good surf angler knows they like clean, turbulent, moving water where prey is churned up by ocean waves. Inside the inlets they like clear, sandy flats or islands with a strong tide streaming across.

Underwater, they behave like jacks. They don't mope around or sluggishly root in the mud like a black drum or redfish. Poms suspend off the bottom, constantly moving, constantly looking around, constantly on edge. They use their eyes more than their noses. They like flashy things. They feed below schools of minnow-crazed Spanish mackerel and ladyfish. Pompano eat clams and stuff, yeah, but they are not your average bottom feeders.

A school of cownose rays flutter by as we drift across the sandbar. Bonnethead sharks occasionally mosey on by, their shovel-like noses scanning the bottom such as metal detectors. An eagle ray leaps in the air, landing with a belly flop. All prime pompano indicators — they're here because this flat holds the shellfish foods they like.

I spot a manatee kicking up a muddy plume and launch my pink banana jig behind it. Hop-hop-hop-THUMP. Another big pompano, this one feeding in the manatee's disturbance. Another erratic fight and in the



cooler it goes.

The amount of pompano around the central Indian River

Lagoon these days is a blessing and a curse.

Light-blocking algae blooms, herbicide use, or some other evil combo has caused seagrass loss at a frightening scale, even near this twice-daily flushed inlet. I'm sure pompano like feeding above seagrass, but

perhaps the grassy habitat loss decreases competition from ambush feeders such as trout, reds, snook and flounder. The pompano is made to feed in a vast, bare sand habitat, and it seems to thrive in this new underwater desert.

We catch a few more, releasing one of the largest I've ever seen at 20 inches to the fork. The bite peaks during incoming tide, then

Want to partake?

For inshore and nearshore fishing around Sebastian Inlet, contact Capt. Glyn Austin at <https://goingcoastalcharters.com/> or 321-863-8085.

slowly fades to zilch.

We've had enough sun for one day, and head back to the dock. The sailboat is still stuck on the sandbar. We look at each other and grunt out laughs.

The complexities of any given fishery — like the nuances of a friendship or relationship — are infinite and difficult to perceive without being immersed in them. So get out there. Drift over a flat, cast a jig, watch what swims by. Consider the whole ecosystem. Bring a good friend. ●



Photo by Capt. Sandy Bottoms

Pompano are thriving at Sebastian Inlet despite the pollution in local waters.

Smart businesses find ways to bolster employee experience

By STEPHANIE LACY

As business activities reset amid the great resignation, leaders are forced to look at shifts in work trends. Leadership's focus on employee experience is more important than ever.

The workforce for many organizations has become distributed between remote, partially remote and onsite workers.

During this overwhelming time for employees, leaders must focus on building a strong culture.

To get a pulse on employee experience, leaders can focus on two key areas. The first, *trust in the organization*, is a key to retaining high performers. Employees need to believe that they are valued, and that the organization considers their well-being while making strategic decisions.

When managing a distributed workforce, a strong communication strategy is even more important. Be sure to engage your

workers by asking questions about what they need to be successful. Does the organization have the right benefits and perks to assist with work-life balance? Do employees have the tools and resources they need to do

their job? What can the organization do to better support its employees?

Not only do leaders need to ask these questions, but solutions also need to be provided. Worse

than not asking the questions, is to ask and do nothing with the information provided.

As organizations continue to focus on trust, employers can build deeper connections with their employees by creating a shared purpose. Supporting employees personally as well as professionally has a positive impact on both employee experience and productivity.

This can mean taking an interest in what is important to

your employees. Engage in the community and support the employees' desire to do the

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To BUSINESS Page 13

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Miami-Dade takes on climate change, sea level rise

By **BLANCHE HARDY, PG**

While Alaska by sheer size has the longest coastline in the U.S., Florida comes in second with 40% more coastline than runner-up California. Florida is the U.S. poster child of populated coastline potential climate change catastrophe.

Scientific American reported nearly a half-million Floridians live less than 3 feet above current high-water levels and, not so very long ago, nonpartisan Resources for the Future listed Miami as the “Most Vulnerable Coastal City Worldwide.”

Miami-Dade County has released its Year 1 Progress Update summarizing the status of implementation of the County’s Sea Level Rise Strategy released in February 2021. Miami-Dade’s report coincides with the release of the International Panel on Climate Change Working Group II, Adaptation and Vulnerability report documenting the urgency of undertaking immediate action to embrace and implement climate change adaptation.

“Climate change and sea level rise pose an immediate threat to our communities in Miami-Dade County and many residents are already feeling the effects of sunny day flooding and increased stormwater flooding when we get heavy rainstorms,” Mayor Daniella Levine Cava said. “Rising seas impact everything from our drinking water to our housing market, which is why I am so proud

of the progress we’ve made implementing our Sea Level Rise Strategy. We are building a Miami-Dade County that is future ready and a leader in climate adaptation.”

According to tide records, Miami-Dade has experienced 10 inches of sea level rise during the past 100 years. While drawn-out incremental changes go unnoticed, the county recognized the change becomes much more apparent when assessing the amplified

“Rising seas impact everything from our drinking water to our housing market.”

— Daniella Levine Cava,
Miami mayor

damage resulting from King Tides, hurricanes and heavy rains. Flooding is deeper, broader reaching and longer lasting than before and changes in sea level in a region with shallow groundwater and vast fresh surface water bodies become change that reaches far beyond the coastline and the built environment.

Miami-Dade’s Sea Level Rise Strategy outlined five key long-term approaches and 10 key immediate action items. Past year’s highlights include Miami-Dade’s successful prioritization of septic to sewer projects to protect the public health and preserve the nat-

ural systems of Biscayne Bay and submittal of applications to the Resilient Florida Grant Program that were successfully recommended for funding. Potentially, this could result in more than \$247 million in state and federal grant funds to support resilience projects.

On the delay side, Miami-Dade rejected a U.S. Army Corps of Engineer’s proposal to develop a \$4.6 billion surge barrier, flood wall and flood gate system to protect

on the plan’s timing, budget needs, return on federal taxpayer investment which determines the cost share ratio, and Congress’ willingness to consider a 2024 WRDA.

Miami-Dade strengthened its collaboration with the 34 municipalities within the county, forging partnerships for mutually beneficial projects. It continued to work with regional stakeholders and partners through the Southeast Florida Regional Climate Change Compact during Year 1 Progress.

The county budget was refocused on resilience investments and Miami-Dade is seeking opportunities to invest earlier in protective measures that will lower cost, limit impacts to property values and reduce storm damages. Miami-Dade did and has committed to continue to make incremental adjustments in capital projects and programs by identifying opportunities to include resilience measures.

The county has and will continue to encourage departments to pursue and promote external funding resources, including the federal and state government resources and private partnerships to support larger-scale adaptation projects.

Miami Dade did well in Year 1 Progress. The county recently achieved Gold certification through the LEED for Cities program and has received three awards from the Gold Coast Chapter of the American Planning Association. •

Atlantic’s waves could supplement Florida’s energy future

By **MATT BADOLATO**

As fossil fuel prices climb, scientists and engineers are searching for new renewable energy options — and they’re looking out to sea.

From redwood forests to Gulf Stream waters, the kinetics of ocean waves and currents could power the future.

Harnessing the Gulf Stream

In South Florida, OceanBased Perpetual Energy, a Miami-based company, has partnered with Florida Atlantic University to harness the perpetual power of the Gulf Stream current.

Since the Gulf Stream is more like a river — a relatively constant velocity and northward bearing — OceanBased’s project would utilize fixed propellers suspended in the water column like wind turbines.

More online

For more information on the PacWave Project, check out pacwaveenergy.org.

For more information on the FAU/OceanBased Perpetual Energy project, go to oceanbased.energy.

OceanBased will install ocean current energy converters — underwater turbines — 300 feet below the surface of the Gulf Stream. The electricity they generate will produce green hydrogen from seawater, and in later phases they plan to export power directly to South Florida’s hungry grid.

OceanBased reports that in excess of 5 gigawatts of power can be extracted from the Gulf Stream to power more than

3.5 million homes each year.

Oregon wave power

On the other side of the country, Oregon State University — after eight years of permitting, design and working with a spectrum of stakeholders — is edging closer to installing a utility-scale, grid-connected wave energy testing facility in the Pacific Ocean.

The Oregon project, dubbed PacWave, is funded by a \$40 million award from the U.S. Department of Energy. The team will install four offshore berths with a cable route to shore of about 14 miles in length. A plant on shore will receive the power, then feed it to Oregon’s grid. Academic, government or commercial entities will be able to lease the mooring sites to test energy-generating technologies in-situ.

Why Oregon?

“We have some of the best wave energy resources in the world here,” Burke Hales said. “Oregon has some of the highest wave energy per meter of shoreline, we have deep water ports for access and we have coastal communities on a large grid.”

According to a 2011 study by the Electric Power Research Institute, Oregon’s total annual available wave energy in the inner shelf alone is equal to 143 billion kilowatt-hours per year — enough energy to power about 28 million homes.

Why South Florida?

The segment of Gulf Stream that squeezes between the Bahama Bank and southeastern Florida has some of the highest velocity in the entire current, which originates in the Gulf of Mexico and follows the eastern coastline of the United States and Newfoundland before crossing the Atlantic Ocean as the North Atlantic Current.

As any Florida surfer is dimly aware, waves here are not consistently powerful compared to the raw, full-strength Pacific swells that reach Oregon. The friction of a vast, relatively shallow and slow-sloping continental shelf restricts powerful Atlantic

swells from reaching the southeast U.S., except during large nor-easters and hurricanes.

The Gulf Stream is part of the Atlantic Meridional Overturning Circulation (AMOC) a major ocean current system transporting warm surface waters toward the northern Atlantic, and — on a somber note — recent research points to potential trouble ahead. Based on observational sea-surface temperature and salinity data from across the Atlantic Ocean basin, this system — and the Gulf Stream — might be slowing down. The disruption in its flow of warm air and water from south to north would wreak havoc on climate and ecology across the world.

Working with nature

The Oregon State University team could not find an ecologically responsible way to lay the cable straight to shore as the crow flies, so they took an angled path to avoid damaging productive rocky reefs home to local angling favorites like rockfish and lingcod.

“Dungeness crabs are our largest commercial fishery, and their habitat is vast,” Hales said. His team has been working closely with the commercial and recreational fishing communities throughout the permitting and design process. “The crabbers have assured us the two square miles we’ve chosen isn’t a prime spot for the fishery.”

Coral reefs off South Florida might require similar maneuvering around. The OceanBased team reports multi-beam sonar will be used to evaluate sea floor habitats, pelagic and benthic animal movements and migrations will be considered, and other extensive environmental studies will be consulted in the design, installation and operation of their equipment.

Engineering

The planned installation of the 20-kilometer underwater cable off the Oregon coast is an engineering marvel. According to Hales, the copper cable is being built in Mobile, Alabama. A state-of-the-art ship

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From BUSINESS Page 11

same. Give employees time off to volunteer or reallocate resources to allow employees to co-create a giving strategy. Employees will be less likely to leave and more likely to speak positively about the organization.

The second key focus area for employee experience is **continuing education and professional evolution**. The pandemic has required many employers and employees to pivot in both operations and skills needed to be successful in the changing work environment.

Is your organization helping employees obtain the right capabilities to be successful in their new roles? Opportunities for cross-training and development of career ladders helps to re-engage high performers. Take time to ask employees where they are

interested in growing and what their future career aspirations are.

Developing a career roadmap to get employees to their goals will improve your employees' work experience. Check in with employees quarterly on their progress and revamp the roadmap for success as needed.

In addition to career development, flexibility also can fuel performance. Giving employees more control over where, when and how much they work can lead to higher-performing employees and increased retention. When possible to do so, these types of options also can help attract the best talent.

Regardless of the strategy organizations choose to implement, a focus on employee experience should be the top HR strategic priority for 2022. ●

From WAVES Page 12

from Europe must be brought in to lay the cable. The crew will use a jet plow to unzip a meter-deep trench on the seafloor, lay in the cable, and backfill to prevent anchor or net snagging.

"Nothing is getting any cheaper," Hales said. "We're now wondering about an increase in the price of copper."

Physics is one obstacle to optimizing devices for generating electricity from waves. The Gulf Stream project, or conventional dams, like those in the Columbia River basin where Hales grew up, depend on rotational forces. Unidirectional water moves a spinning turbine, which rotates magnets around a coil of copper, generating electricity. Waves, on the other hand, are oscillatory, meaning their energy travels up and down between points.

Wave engineers are faced with converting this bidirectional movement to a rotational one in order to generate electricity in the conventional way.

"There are wildly different ways to generate electricity with waves' oscillatory motion," said Hales, Oregon State University's chief scientist for the Pac Wave project. "One design uses a surging buoy on the surface which pulls up on a winch on the seafloor, causing it to spin. Another design utilizes a piston, moved by waves pushing a flap, which compresses seawater like hydraulic fluid to push a turbine which can spin whether it's moving forward or backward. Or a device can be designed where water compresses a volume of air, and the resulting unidirectional force can be harnessed."

Testing such devices is crucial to determine the most efficient design.

"I remember when all wind turbines looked different, but they eventually all converged on the most efficient three-blade style commonly seen."

In 2020, OceanBased tested several types of subsea turbines suspended in the Gulf Stream. The team submerged five experimental turbines approximately 20 miles off Broward and Palm Beach counties where the current flows along at a steady 3 to 5 knots. Not surprisingly, after 24 hours they found electricity had been generated the entire time.

The most efficient design came from a dual-propeller turbine assemblage. The linkage of two turbines together reduced the torque generated by a single-propeller system.

Ocean energy

So where does the kinetic energy obtained from wave power — or just wave as it's commonly known — stand in the spectrum of renewable energy efficiency?

"Wave is not as stable and reliable as conventional hydro power, but it's more predictable than wind," Hales said. "If you think of a portfolio of energy like your investment portfolio, wave power would be that class of investment that delivers a nice, steady 3% return. It's not going to make you rich, but there's always something coming in. In terms of the power it can generate, it's somewhere between a wind farm and a dam."

Like solar or wind, the nature of wave energy creates an asynchronous imbalance between demand for electricity and its production. In other words — the energy needs to be stored and released when needed, or simply used immediately.

"Wave could produce 10 percent of global electricity, but storage capacity of the energy is the problem. Batteries are getting better. You leave a lot unused if you can't synch up production and storage," Hales said.

To combat this imbalance, OceanBased plans to start by producing hydrogen—an excellent energy carrier used in fuel cells — by splitting water via the electricity generated in a process known as electrolysis.

The Pac Wave test site will be wired directly into western Oregon's electrical grid, feeding the state's habit of renewable production. At about \$0.035 per kilowatt hour, the state's electrical costs are some of the lowest in the nation due to their diverse use of renewables.

Like Oregon, Florida's total energy consumption per capita is surprisingly low. (Oregon is No. 42, Florida is No. 49). It's the sunshine state, but perhaps combining solar power with harnessed ocean energy will move the state toward a more diverse, stable and reliable energy portfolio. ●

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Solar recycling dawdles in the Sunshine State

By DANIEL J. TORRES

While Florida consumed less energy per capita than only three states in 2019 (*EIA.gov*) it was actually the third largest energy consuming state overall, and the second largest electricity producer, behind only Texas.

In theory, Florida is better equipped than most states to make the transition toward greater reliance on solar energy. Florida is, after all, the Sunshine State, placing 10th on a list of average annual sunlight totals (4,859 kJm²) according to a 2022 *World Population Review* study, while also surpassing Arizona in 2020 to become fourth in the nation in total solar power generating capacity.

Florida actually ranked third in cumulative solar capacity installed, with 7,765 MW, and behind only California and Texas, according to a Solar Market Insight Q4 2021 Report, and with Duke Energy and other utility companies, such as FPL, planning to effectively double Florida's solar power capacity by 2025, there is indeed hope that the Sunshine State is moving in the right direction.

In fact, many solar tax credits and incentives are available throughout Florida, making the prospect of transitioning to renewable energy even more attractive to the average homeowner.

Despite this, Florida's massive potential for solar energy was not at the forefront of its production in 2020, as natural gas accounted for roughly 75% of its total electric net generation.

While renewables are the future, as evidenced by a 42 percent growth from 2010-2020 (Center for Climate and Energy Solutions), the question then becomes — what happens to solar panels at the end of their life cycles?

In order to effectively combat climate change, potentially excessive solar module electronic waste can't be ignored. It could exceed 10 percent of global e-waste by 2050, according to Garvin Heath, a senior scientist with the Strategic Energy Analysis Center of the National Renewable Energy

Laboratory (NREL).

Many solar panels can last more than 20 years, with most manufacturers providing 25-year warranties, and are typically comprised of glass, a metal frame, copper or silver wiring, and silicon cells, which can be arrayed in a monocrystalline or polycrystalline format.

Essentially, silicon is produced by blending quartz or gravel with a carbon source, and heated in a furnace, often with coal. China accounts for nearly 70 percent of the global silica output, resulting in a high carbon footprint. This has an even greater environmental impact, such as lowering the water table in mined regions, subsequently making it more difficult to source clean drinking water.

Producing solar panels using coal and generally less than environmentally sound silica mining practices seems somewhat counterintuitive. Does a 20-year commitment from a homeowner justify these practices? The United States also significantly lags behind Europe when it comes to solar recycling programs, with the large majority of end-of-life panels ending up in landfills.

One positive is that solar panels can absolutely, at least in theory, be recycled into new polycrystalline panels. In fact, Europe has mandated that solar manufacturers provide recycling options for end-of-life solar panels, and as of February 2014, the European Union began regulating the collection, transport and treatment of end-of-life photovoltaic (PV) panels under the Waste Electrical and Electronic Equipment (WEEE) Directive.

While there are a number of solar recycling options throughout the U.S., like Solar Suns Recycling, based in Orlando, only one U.S. manufacturer of solar panels — First Solar (headquartered in Tempe, Arizona) — has actually developed in-house recycling capabilities.

With an estimated 26,000 tons of end-of-life PV panels expected to make their way into the trash this year, more needs to be done. The landfill cannot remain a viable, sustainable solution. •

There's manna from heaven, remove the Rodman Dam

By DR. ROBERT KNIGHT

Perhaps it is just a coincidence that manatee and manna have the same root. The definition of manna is an unexpected aid, advantage, or assistance . . . as in the biblical phrase "manna from heaven," referring to the miraculous food provided to the Israelites as they wandered in the wilderness. In Florida's springs, there is indeed manna for manatees.

In the mid-1980s, I censused the manatees living in the lower St. Johns River from Jacksonville to Palatka. From a light airplane, manatees were easily visible even in the tannic waters and it was possible to record their numbers and favored habitats by flying up and down the study area. I especially remember seeing manatees nibbling on boat anchor lines while the fishermen appeared to be unaware the large animals were so close.

At that time, manatee populations in the St. Johns were expanding from their historic lows due to increased awareness of manatee no-wake zones reducing motor boat impacts to the slow-moving mammals. One of the natural aquatic food plants for these giant herbivores, eelgrass, was prolific at that time in the St. Johns River, Indian River Lagoon, and throughout Kings Bay. These are three of

Did you know?

Through March 4, 2022, the Florida Fish & Wildlife Commission has recorded 400 manatee deaths, putting the state on a path to a second year of record mortality, after a total of 1,101 manatee deaths were tallied in 2021. Last year's mortality accounted for roughly 15% of the entire manatee population, then estimated at 7,520 animals.

the primary manatee population centers in Florida.

Recently the *Gainesville Sun* published an opinion piece by Kipp Frohlich and David Hankla, two of Florida's top manatee experts. In their piece, they rightly decried the state government's failure to protect water quality in the Indian River Lagoon and the state's equally poor response to the growing crisis facing the future of these iconic wild animals.

To MANATEES Page 15

Grasshopper sparrow battles back from brink of extinction

By DANIEL J. TORRES

The Florida grasshopper sparrow, one of the most endangered birds in the continental United States, is beginning to see a resurgence, despite nearly being doomed to extinction just a few short years ago.

Roughly 5 inches in length, the Florida grasshopper sparrow, a subspecies of grasshopper sparrow endemic to the dry prairie ecosystems of central and southern Florida, is short-tailed and flat-headed, with gray and black feathers used to camouflage its nests.

This description could be precisely why the Florida grasshopper sparrow has struggled to receive the attention it has desperately needed. It is not a majestic bird of prey, nor a striking water bird like the Roseate spoonbill. To many, the Florida grasshopper sparrow is simply a small brown bird.

The amount of suitable habitat available to the Florida grasshopper sparrow has dwindled significantly due to prairie and grassland conversion to land uses considered uninhabitable — such as pastures, citrus groves and sod farms. Within this small segment of remaining habitat, other factors,

The amount of suitable habitat available to the Florida grasshopper sparrow has dwindled significantly due to prairie and grassland conversion to land uses considered uninhabitable — such as pastures, citrus groves and sod farms.

such as increased fire frequency and an alteration of hydrologic events have affected the sparrow's survivability.

The outlook of this small endemic bird has looked more hopeful in recent years, however. Throughout the last few decades, the Florida grasshopper sparrow population has dwindled from the thousands, to just a few dozen in the wild only a few short years ago.

The U.S. Fish and Wildlife Commission has partnered with the Florida Fish and Wildlife Conservation Commission and the White Oak Plantation, among other partners in the last five years, to increase population numbers through intense, hands-on habitat management and captive breeding, usually reserved as a last-ditch effort.

In an effort to minimize environmental

impact, biologists incubated and hatched eggs taken from nests in the wild, rather than capturing and removing adult birds in an effort to breed them in captivity. Biologists spent three years exploring various captive breeding techniques on the eastern grasshopper sparrow, a species not considered to be endangered. Confident in their ability to replicate their success on the Florida grasshopper sparrow, biologists began locating suitable nesting sites in 2015.

On May 6, 2016, it seemed as though the grasshopper sparrow restoration program would be a success — four captive-bred grasshopper sparrow chicks were hatched in the Rare Species Conservancy laboratory, in South Florida.

New complications emerged, however —

an intestinal parasite, previously undetected — began to spread and kill the birds. While scientists searched for solutions, concerned that the disease would spread and further decimate the wild population, the wild population did indeed continue to plunge, with just 80 birds remaining in the wild by 2018. In February 2019, the U.S. Fish and Wildlife Service ended its contract with the Rare Species Conservancy, transferring the captive breeding program to White Oak Conservation — a conservation center dedicated to the care and conservation of threatened and endangered species.

Ultimately, the threat of extinction proved far more detrimental to the wild Florida grasshopper sparrow population than the risk of a parasite spreading throughout said population.

While the global COVID-19 pandemic has attempted to slow the rest of the world, scientists at White Oak Conservation remained undaunted. Since May 2019, roughly 250 captive-bred grasshopper sparrows have been released on private and public lands through-

To ENDANGERED Page 16

Opposed legislation controlling Lake Okeechobee revised

By BLANCHE HARDY, PG

Florida Senate Bill 2508, Environmental Resources, passed with a majority vote of 99-8 on March 14. The vote was accompanied by an equally overwhelming onslaught of protests.

The bill controls water in the Everglades and Lake Okeechobee and, in its original version, was seen as a reprehensible hand-out to big sugar agricultural operations and municipal utilities at the cost of already approved actions to restore water flows to the Everglades and to control discharges from Lake Okeechobee that result in Florida's red tide toxic algae surges.

The bill has been revised to allow the governor and senate more input into district rule

changes and to remove provisions related to land acquisition procedures.

Environmental advocates opposed the bill's provision requiring the South Florida Water Management District to preserve water supplies for existing users in its negotiations with the U.S. Army Corps of Engineers, who currently are developing a new operating manual for the control and management of water levels in Lake Okeechobee.

The legislators' original plan was to hold unnaturally high volumes of water in Lake Okeechobee during the dry season for irrigation and utility use south of the lake. This could harm the southern Everglades by restricting the water supply needed for the preservation of existing natural systems. Conversely, in the event of storms or heavy

rainfall, this could result in the release of large volumes of nutrient rich water causing more algae blooms, more loss of already diminished sea grass, and short and long term fish and mammal mortalities.

There also were concerns the bill would alter or reduce funding for the proposed Everglades Agricultural Area Reservoir project. The provision was removed after tens of thousands of signatures opposing the bill were delivered to Tallahassee lawmakers and a veto threat was issued by the governor.

Although the latest revision is under consideration, Gov. DeSantis issued a statement of administrative policy opposing the bill in early February saying, "I have been a champion for Everglades restoration and oppose any measure that derails progress on reduc-

ing harmful discharges and sending more water to the Everglades. Moreover, I reject any attempt to deprioritize the EAA Reservoir project south of Lake Okeechobee."

He added, "Rather than advancing legislation seeking to affect a major change in policy, SB 2508 is being rammed through the budget process, short-circuiting public engagement and leaving affected agencies in the dark."

In an uncharacteristically blunt statement, the district said they were "blindsided" by the bill.

Details of other unpopular measures in the bill, as stated by Friends of the Everglades, include, allowing utility companies to pay

To OKEECHOBEE Page 16

From MANATEES Page 14

For the past two years, Florida's manatees have been starving to death by the thousands. I have looked into the innocent eyes of these massive, but gentle giants, yet, I cannot possibly understand the pain and agony of the starvation they endure.

The recovered St. Johns River manatee population is now one of the most productive and successful in the state.

On Jan. 29, the Volusia Blue Spring winter manatee population set a record of 747 individuals in the spring run. Yet, seagrass also is disappearing through much of the St. Johns River system.

The same problems killing eelgrass in the Indian River Lagoon are occurring in the Lower St. Johns — elevated nutrient pollution, blooms of floating algae, and shading of the submerged aquatic plants that manatees favor. Manatees could soon be starving in the St. Johns River due to similar issues observed in the Indian River Lagoon.

One way to support and maintain the St. Johns River manatee population is to make sure that more large artesian springs and their ample aquatic plant communities and warm water refugia are accessible to the manatees. Silver Springs, the Silver River, and the 20 Lost Springs of the Ocklawaha River must be opened to succor these manatees.

The Rodman/Kirkpatrick Dam must be breached to allow more manatees as well as other migratory aquatic species such as striped bass to reclaim this historic warm water habitat. Like manna from heaven, the entire Silver River and much

of the Ocklawaha River are full of rapidly growing submerged aquatic vegetation favored by manatees. The outdated and on-the-brink-of-structural-failure Rodman Dam is the only obstacle to this manatee Garden of Eden.

Florida's artesian springs are likely the principal reason the state has long had a year-round, breeding population of manatees. Thermal effluents from coastal power plants have offered refuge from winter cold stress, but have not provided suitable food resources.

With increasing pollution of these waters by Florida's growing human population and lax water quality enforcement, manatees are not able to thrive.

Continued reliance on power plant thermal effluents and lettuce buffets are not a long-term assurance of a healthy manatee future.

The formerly lush eelgrass meadows in the Indian River Lagoon and in the St. Johns River must be restored through improved nutrient reduction. And accessible springs are an important part of the solution to the plight of starving manatees. Breaching the Kirkpatrick Dam to allow manatee access to extensive feeding areas in the Silver and Ocklawaha Rivers is a critical next step for manatee viability. •

Dr. Robert Knight is director of the Howard T. Odum Florida Springs Institute in High Springs. His newest book, "Saving Florida's Springs — A Prescription for Springs Health," is now available at www.floridaspringsinstitute.org.



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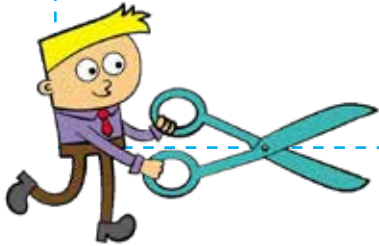
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The graphic features a central logo for the PFAS Forum, which includes a water drop icon with a factory and a leaf inside. Below the logo, there are three circular inset images: one showing a person in a field, one showing a close-up of water with foam, and one showing a hand holding a small object. The background is a textured, blue and white pattern.

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From DeMeo Page 9

that an ordinance is invalid on the grounds that it is arbitrary or unreasonable, the proposed bills will formally codify arbitrary and unreasonable grounds in statutory law.

A county or municipality must suspend enforcement of an ordinance until a final judgment is given if a proposed ordinance is challenged within 90 days, the county is served with a copy of the complaint/petition, and the complaint requests suspension. If the ordinance is found to be valid and enforceable, the county may enforce the ordinance 30 days after the entry of the final order.

The bill also requires the signature of an attorney or party on a document filed in such action to certify that the signatory has read the document and that, to the best of his or her knowledge, it is not filed for any improper purpose. Furthermore, the bill allows for up to \$50,000 in reasonable attorney's fees to be awarded to a plaintiff if a local government ordinance is found to be arbitrary or unreasonable.

However, attorney fees and costs may not be awarded against a local government if it receives written notice that an ordinance is expressly preempted and, within 30 days of receiving the notice, withdraws the proposed ordinance or notices an intent to repeal the ordinance within 30 days of receiving the notice and does so.

The HB 403 Staff Analysis lists two possible constitutional issues with the bill: applicability of municipality/county mandates provision of the Florida Consti-

tion and separation of powers. As to the first, the county and municipality mandate provisions of Article VII, section 18 of the Florida Constitution reads "no county or municipality shall be bound by any general law requiring such county or municipality to spend funds or to take an action requiring the expenditure of funds unless the legislature has determined that such law fulfills an important state interest."

There is also a separation of powers issue under Article II, s. 3 of the Florida Constitution. Under the Florida Constitution, the Legislature can repeal practice and procedural rules by general law enacted by a two-thirds vote.

The House version of the Local Ordinances Bill, HB 403, is currently waiting to be placed on the House Calendar. The Senate version of the bill, SB 280, has passed through the committee and the Senate floor. Assuming passage, the Governor is expected to sign this into law.

As for the Local Business Protection Act Bills, House Bill 569 and Senate Bill 620, the bills create a mechanism for private, for-profit business owners to recover business damages related to local government action. For-profit businesses can sue local governments to recover damages if the local government enacts or amends an ordinance or charter provision that has or will cause a 15% reduction of the business's profit.

According to the SB 620 Staff analysis, the settlement offer must include an explanation of the nature, extent and monetary amount of the damages alleged along with copies of substantiating business records.

The local government then has 120 days to accept, reject or make a counteroffer which may include a waiver of the application of the ordinance on the business. If the claim is not settled, the business may file an action to recover damages within one year of the effective date of the enacted or amended ordinance.

During debate, committee members in support of the bill repeatedly pointed to instances in which "five people in shirts" could pressure commissioners and cause "rogue municipalities" to harass local businesses. Proponents also argued that a 15% loss of revenue would likely cause a business to close.

Committee members in opposition of the bill strongly argued that the bill significantly limits a municipality's power to conduct municipal government, perform municipal functions, and render municipal services" as prescribed by the Constitution of Florida.

For a county or municipality with a population between 50,000 and 250,000 persons, including the constitutional officers of such county, the limits are increased to \$300,000 per person injured and \$400,000 per incident. For a county or municipality of less than 50,000 persons, or for a state university, public college, subdivision of the state, or any other entity covered by sovereign immunity not within the two categories above, the current limits of \$200,000 per person injured and \$300,000 per incident apply.

Those in opposition of the bill argue that the bill will have negative fiscal impacts on local governments as the change in sovereign immunity limits and the ability to settle

in excess of those limits is indeterminable. Not all of the proposed preemption bills made it to the floors. The Pet Protection Act Bills, HB 849 and SB 994, contain a preemption clause that would have prevented local governments from banning pet stores which sell puppy mill pets. There are more than 75 local governments in Florida which have prohibited sales in pet stores of puppies from mills which would be in jeopardy should this become law.

The stated purpose of these preemptive bills is to protect local businesses and sovereign immunity claimants.

These preemptive bills also take power away from local communities if they dare to deviate from the state's agenda. In this regard, these preemptive bills likely will significantly disrupt the normal activities of local governments and will have a chilling effect on even reasonable local government regulation in Florida. ●

From ENDANGERED Page 15

out South Florida. Perhaps the now extinct dusky seaside sparrow can, if nothing else, provide a cautionary tale for the Florida grasshopper sparrow, and other American bird species. In an effort to reduce mosquito populations around Kennedy Space Center, Merritt Island was seasonally flooded. The nesting grounds of the sparrow were decimated, and by the time officials approved a captive breeding program, only five dusky seaside sparrows remained in the wild — all of which were male. The last one died in 1987 while in captivity at Walt Disney World, and the species was officially declared extinct in December 1990. Ecological surveys identifying potential hazards to the Florida grasshopper sparrow and its habitat will prove absolutely essential if this species is to continue bolstering its numbers in the wild. ●

From OKEECHOBEE Page 15

to expedite wetland "dredge and fill" permit reviews and giving Florida's next Agriculture Commissioner new power to spend millions of dollars buying land. The bill is strongly backed by, and is a priority of, Senate President Wilton Simpson, who happens to be running for agriculture commissioner. The Coastal Conservation Association (CCA) of Florida issued a statement wanting "assurances that the bill does not de-emphasize the funding for the EAA reservoir, which is currently under construction, and that the "savings clause," which CCA Florida thinks is more appropriately addressed in the Lake Okeechobee System Operating Manual (LOSOM), being prepared by the U.S. Army Corps of Engineers, is not affected, modified or expanded by this legislation." Ther proposed effective date of the bill is July 1, 2022. ●

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