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INDIAN RIVER LAGOON

ORCA measures muck, pollution in St. Lucie River south fork; maps concerning hotspots

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The St. Lucie River's south fork has long suffered from human-caused pollution, but new research has uncovered distinct hotspots where a wide range of contaminants are lurking, including a popular but suspected cancer-causing weed killer.

The Ocean Research and Conservation Association research shows potentially harmful concentrations of glyphosate — an ingredient in Roundup herbicide — among several other pollutants in the sediment, including copper, nitrogen and phosphorus.

The research also highlights the magnitude of muck, a black mayonnaise of clay, silt and particles devoid of any life or ability to grow aquatic plants, such as seagrasses that feed manatees. The muck is nearly 11 feet deep in the worst spots, according to ORCA.

"The most important thing is that everyone should recognize the degree to which (human-caused) chemicals are accumulating in the Indian River Lagoon and St. Lucie River," said Beth Falls, an ORCA research scientist who led the mapping project. "This has the potential to impact environmental and human health."

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Glyphosate polluting St. Lucie River

The highest glyphosate level was nearly 1.3 parts per billion in a Stuart canal surrounded by waterfront homes, according to data ORCA provided TCPalm, which then cross-referenced the hotspot's coordinates with Google Earth.

In 2019, Martin County banned county employees and contractors working on county projects from using glyphosate, but the ban doesn't apply to residents or businesses.

"This is a manmade chemical that is starting to accumulate in pretty high levels into our ecosystems," Falls said. "In this particular case, you can see these are pretty high levels that we're seeing coming in and staying in the system."

ORCA's mapping project doesn't pinpoint specific pollution sources, Falls said. Instead, the research provides a roadmap for tracking down polluters in future studies.

The Environmental Protection Agency limit for glyphosate in drinking water is 700 parts per billion, according to Jason Ferrell, director of the Center for Aquatic and Invasive Plants at the University of Florida's Institute of Food and Agricultural Sciences. One part per billion is similar to a drop of ink in an Olympic swimming pool.

But it gets tricky to determine the limit in marine environments, where glyphosate tends to combine with particles in the water such as calcium, sodium and iron, he said.

High glyphosate hotspots should be studied further, said Grant Gilmore, a senior scientist at Estuarine, Coastal and Ocean Science Inc., a Vero Beach-based consulting and research firm focused on projects involving human impacts on the environment.

"This is a much bigger problem than people realize," he told TCPalm Tuesday.

Copper

The highest copper level was in a canal just south of the Palm City Bridge, in a pocket flanked by waterfront condos and boat slips on three sides, Google Maps shows.

Copper can damage the ecology starting at 112 parts per million, Falls said. The river's highest level was 170. One part per million is similar to four drops of ink in a 55-gallon container of water.

Copper is highly toxic to aquatic ecosystems, including some fish and invertebrates such as oysters and sea urchins.

A copper mixture used to paint boat bottoms could be contributing to legacy pollution in the river, but the metal also is found in herbicides, fungicides and retention ponds, Falls said. Copper sulfate, for instance, is often used to manage vegetation in ponds.

"It's something we need to pay attention to and be worried about," Falls said. "We need to figure out where that's coming from, and how we can mitigate it or stop it."

Nitrogen and phosphorus pollution

A phosphorus hotspot also was found just south of the Palm City Bridge, in the river's open water. ORCA's maps show phosphorus could be passing through the south fork where it ultimately settles into the sediment farther north in the river.

"We know there's a lot of phosphorus coming in through the C-44 Canal," Falls said, referring to the canal that connects Lake Okeechobee to the St. Lucie River. The research highlights how the phosphorus is flowing through the river system as a whole.

The maps also show high levels of nitrogen throughout the south fork. The highest level was 3,841 parts per million just north of Veterans Memorial Bridge, Google Maps show.

Nitrogen and phosphorus are fertilizer byproducts that can spark toxic algae blooms. A TCPalm investigation published in January found phosphorus levels far exceeded the state's pollution limit for every drainage basin with recorded data around Lake O over a five-year average. Lake O discharges carry that water to the St. Lucie River.

ORCA also recorded toxicity throughout the south fork. On a scale of 1 to 100, some sediment samples registered a 98. Researchers said they need to study it further to determine whether the source is natural or human-caused.

Stage is set for more research

The maps, which build on over a decade of research, are based on April water quality samples from 65 locations in the river. Using an EPA process, ORCA researchers gathered "a tremendous amount of data," including:

- Water quality
- Muck and water depth
- Sediment pollution
- Pore water pollution (glyphosate and blue-green algae toxin)

Pollution in the water column.

ORCA was founded in 2005 by Edith "Edie" Widder as the nation's first technology-based marine conservation association. The Fort Pierce nonprofit's mission is "to protect and restore aquatic ecosystems and the species they sustain through the development of innovative technologies, science-based conservation action, and community education and outreach."

The latest research project was funded by The Community Foundation Martin - St. Lucie, through the Frances Langford and Environmental Action funds.

"We use the maps to identify areas where individual pollutants are accumulating," Falls said. "They serve as blueprints to design studies to localize the sources. We have planned follow-up studies based on the south fork maps that will begin soon."

Max Chesnes is a TCPalm environment reporter focusing on issues facing the Indian River Lagoon, St. Lucie River and Lake Okeechobee. You can keep up with Max on Twitter @MaxChesnes, email him at max.chesnes@tcpalm.com and give him a call at 772-978-2224.


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