

With funding from Gulf Coast Community Foundation, team at work on 'Community Playbook' to improve water quality in Sarasota County

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By Rachel Brown Hackney, Editor & Publisher

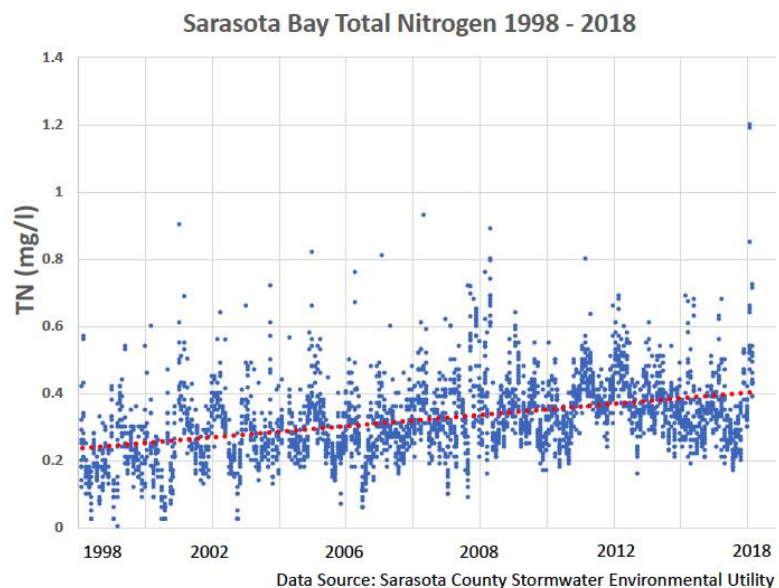
March 19, 2020



Proposals for nitrogen reduction highlighted in presentation to County Commission

Nitrogen is increasing in Sarasota's Bays

Our southern bays may be designated "impaired" for *chl-a* by FDEP this year



Gulf Coast Community Foundation Clean Water Playbook (Preview March 2020)

The red dotted line on this graph shows the increase in the nitrogen load in Sarasota Bay over the past decades.
Image courtesy Sarasota County

Research undertaken by a Sarasota County group focused on water quality initiatives has shown that golf course managers in the area potentially have been putting twice as much nitrogen on the grounds than they needed.

Eliminating fertilizer applications on courses where reclaimed water is used for irrigation would reduce the amount of nitrogen going into the ground and, ultimately, into the watershed, Stephen Suau of Progressive Water Resources of Sarasota told the Sarasota County commissioners on

March 10.

Suau is one of the members of the Steering Committee of the Community Playbook for Clean Water, an undertaking sponsored by the Gulf Coast Community Foundation in Venice. He formerly was executive director of what was called at the time the Sarasota County Planning and Development Services Business Center. Additionally, he has served as chair of the Sarasota County Stormwater Environmental Utility Advisory Committee and the county's Environmentally Sensitive Lands Advisory Committee.

The reclaimed water/fertilizer application study was just one element of research the Community Playbook Steering Committee has undertaken in an effort to achieve water quality improvements and reduce algal blooms, Suau and other committee representatives explained on March 10.

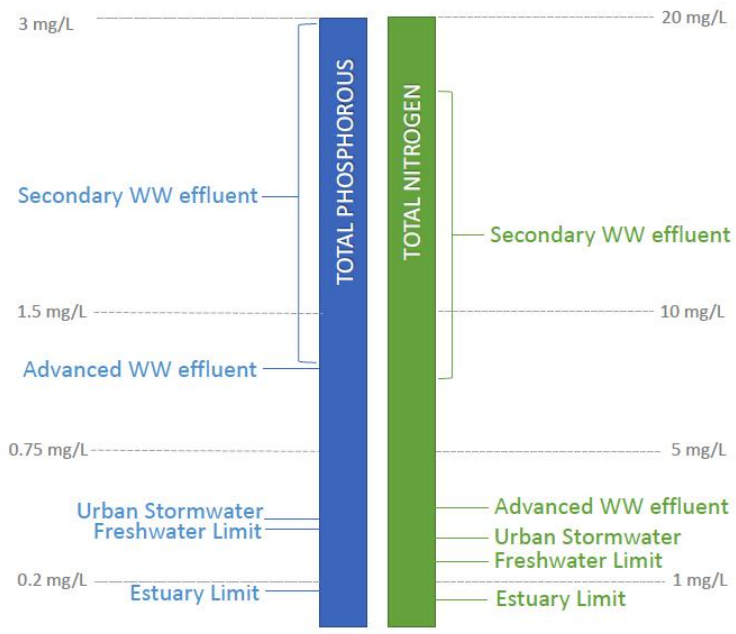
Jon Thaxton, a former county commissioner who is senior vice president of the Gulf Coast Community Foundation, pointed out that Sarasota County leaders have had a "long-lived" commitment to improving water quality in the community. However, he added, "There is an acknowledgment that there's still more work that needs to be done."

Referring to the commission he sat on and others prior to the current board, Thaxton noted, "Some of our decisions in the past were not based upon the best data because we didn't have the data at the time."

Why worry about excess nutrients?

- State law limits nutrient pollution

"In no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora or fauna."
- F.A.C. 62.302.530



Gulf Coast Community Foundation Clean Water Playbook (Preview March 2020)

A graphic shows details about the amount of nitrogen and phosphorus in wastewater effluent allowed by state law for estuaries, fresh water and stormwater, as well as the results from types of treatment. Image courtesy Sarasota County

The Community Playbook vision, he continued, is to take the best data and information available “and craft action items” everyone in the county can pursue. “The overall goal ... is for Sarasota County to become a, if not *the*, model community in the state of Florida for nutrient management.”

A staff memo provided to the commissioners in advance of the March 10 meeting explained that, as they have “demonstrated a commitment in addressing nutrient pollution that may impact our precious waters and fuel harmful algae blooms,” the Gulf Coast Community Foundation Community Playbook for Clean Water leadership team had requested an opportunity to present a preview of the Playbook. The team wanted to “[emphasize] how it might help inform future public policy.”

The memo added, “Staff will review information provided by [the Foundation] when considering opportunities for water quality outreach and improvements.”

During his part of the March 10 presentation, Suau explained that the committee members were able to get data for two years for a golf course in the Sarasota County region.

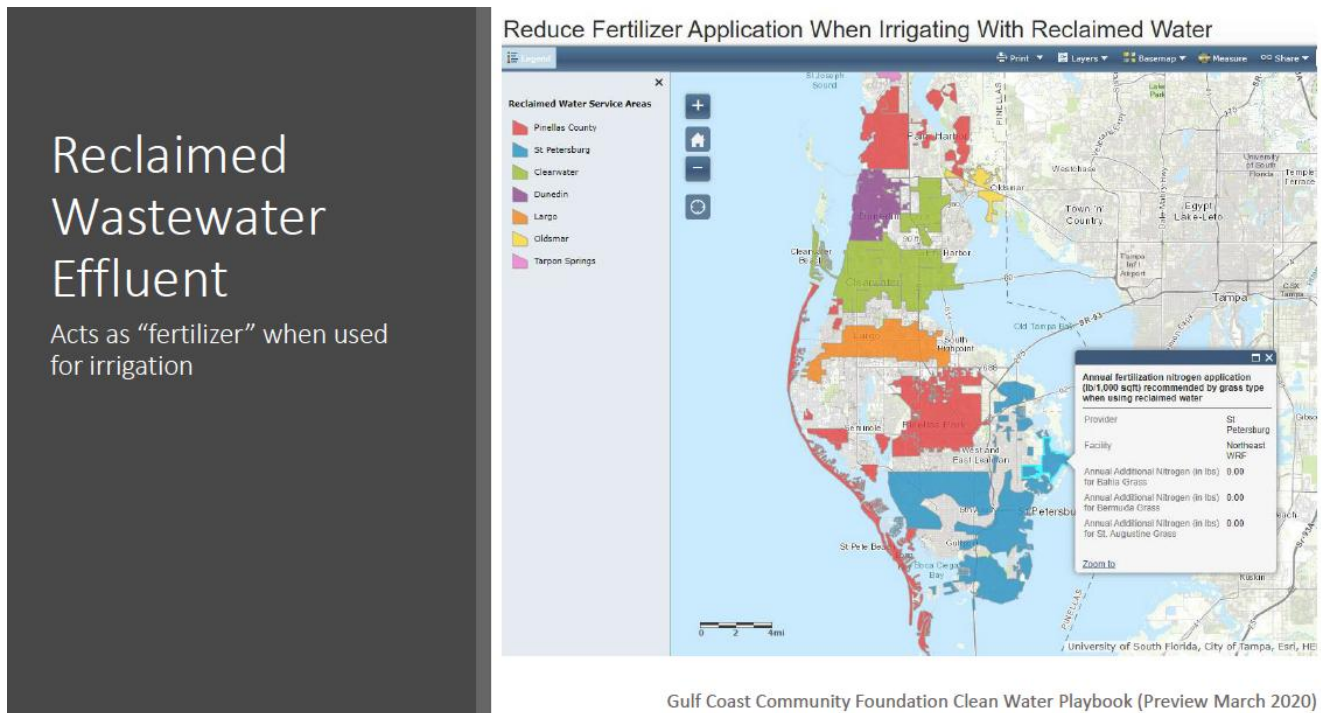
They wanted to learn, he said, of whether reclaimed water used for irrigation purposes would be able to offset the application of fertilizer.

The data showed that the amount of nitrogen in the reclaimed water was equal to the amount in the fertilizer application, he noted. Following the guidelines of the county’s fertilizer ordinance, Suau pointed out, the fertilizer application put 4 pounds of nitrogen on the course per every 1,000 square feet.

He and other members of the group talked with several golf course managers, he continued. None of them seemed to realize that the reclaimed water they were using had nitrogen in it.

If the Steering Committee can get that information out to the community, Suau stressed, then the nitrogen load on golf courses could be reduced accordingly.

Nitrogen, researchers have explained, is the primary food source for the *Karenia brevis* algae that causes red tide.



This is the Pinellas County map showing areas where reclaimed water is used. Image courtesy Sarasota County

Suau showed the board members a map created by Pinellas County Government staff that utilized color coding to denote reclaimed water service areas. Golf course managers could use that map, he added, to determine whether they need to apply fertilizer.

“Do we have the ability in this county [to create such a graphic]?” Commissioner Alan Maio asked.

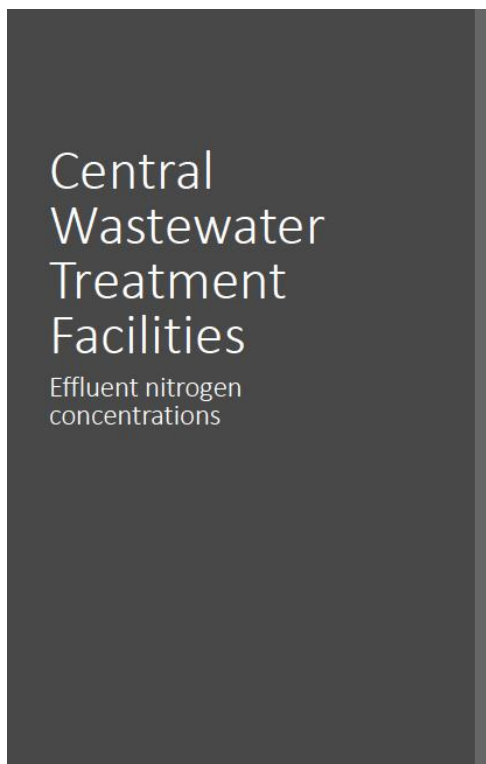
“Yes,” Suau replied, noting that he had discussed the potential with Mike Mylett, director of the county’s Public Utilities Department. “It would take a little bit [of effort],” Suau added, “but something like this could be done in Sarasota County as well.”

Suau stressed that the Steering Committee members found that golf course managers “[are] just not aware” of the situation with reclaimed water containing nitrogen. After they learn the facts, he added, “They realize they could save quite a bit of money on nitrogen fertilizer application.”

‘Recipe’ for algal blooms

Another member of the committee, Jennifer Shafer of Shafer Consulting, explained earlier that state law limits nutrient pollution. Section 62.302.530 of the Florida Administrative Code says, “In no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora or fauna,” she told the commissioners.

The “recipe” for algal blooms, she continued, is sunlight, which is abundant in Florida; heat, with more warmer days being recorded; micronutrients; phosphorus, which is naturally abundant in Sarasota County because of the geology; and nitrogen. The latter, she noted, “is the one ingredient that we can most readily control.” The expense of keeping it out of waterways is much less than recovering it “after it’s already baked in,” Shafer added.



Gulf Coast Community Foundation Clean Water Playbook (Preview March 2020)

This graphic shows the average amount of nitrogen produced by six wastewater treatment facilities in Sarasota County. Image courtesy Sarasota County

She also provided the commissioners a graph showing that the nitrogen load in Sarasota Bay has been climbing since 1998. The Steering Committee used data from the Sarasota County Stormwater Environmental Utility to create that graph, the slide said.

In fact, Shafer continued, the Florida Department of Environmental Protection may designate the county's southern bays as impaired later this year, because of the amount of chlorophyll A in those waters. An article written by Lorin Martin in June 2019 for the Sciencing website explains that the primary role of chlorophyll "is to absorb light energy for use in a process called photosynthesis ... by which plants, algae and some bacteria convert light energy from the sun into chemical energy." Chlorophyll A is the primary pigment of photosynthesis, Martin added.

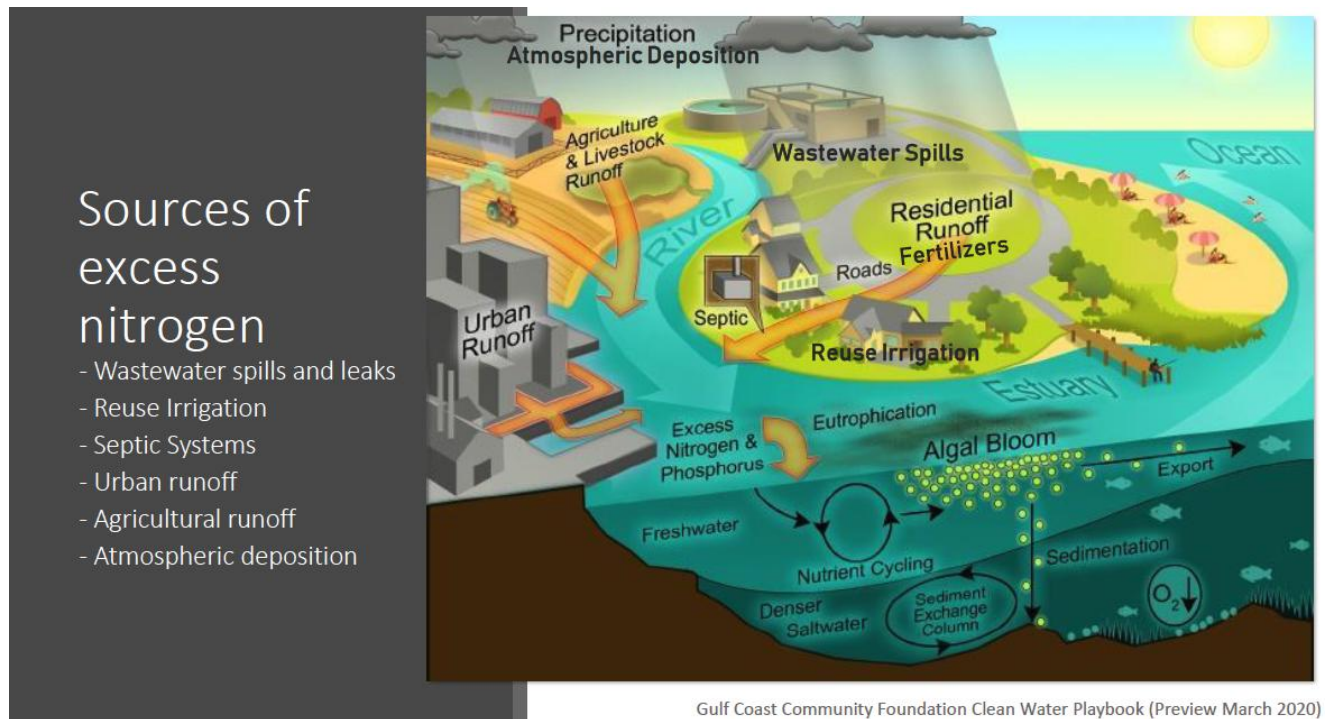
Using 2018 data from Sarasota County, as well as the Cities of Sarasota, Venice and North Port, Suau showed the board members a graphic with the average concentration of nitrogen in the wastewater from six facilities. That level, he pointed out, "can vary by as much as a factor of 10."

For example, the county's Bee Ridge Water Reclamation Facility (WRF) on Lorraine Road produces treated water with an average of 18.31 milligrams of nitrogen per liter (mg/L).

The City of Sarasota has an advanced wastewater treatment system, Suau noted, which meets the state's freshwater limit of 1.65 mg/L of nitrogen. He emphasized that he was not aware of any other such facility in Florida that achieves that standard.

The County Commission last year agreed to transform the Bee Ridge WRF into an advanced wastewater treatment facility at an estimated cost of \$157 million.

The six major wastewater treatment facilities in Sarasota County generated 750,844 pounds of nitrogen in 2018, according to another slide Suau presented. Conversion of the Bee Ridge WRF to advanced wastewater treatment status, he pointed out, would reduce its annual total nitrogen load going into county watersheds from 323,461 pounds to 59,370 pounds. That return on investment of the reduction has been estimated at \$30 per pound, Suau added. "Thirty dollars a pound is a very efficient way to reduce nutrients."



This graphic shows sources of excess nitrogen in waterways. Image courtesy Sarasota County

During her remarks, Shafer showed the board another slide that noted the sources of excess nitrogen in waterways: wastewater spills and leaks; use of reclaimed water for irrigation; septic systems; urban runoff; agricultural runoff; and atmospheric deposition.

Shafer also explained a slide that compared the annual nitrogen loads in the urban Whitaker Bayou in Sarasota with those in rural Deer Prairie Creek. The slide said, "Dissolved inorganic 'reactive' nitrogen is higher in urban watersheds."

The average amount of dissolved inorganic nitrogen in Whitaker Bayou from 2006 through 2019 was 28%, Shaver pointed out, compared to 5% in the Deer Prairie Creek watershed between 1999 and 2005.

Simple methods to remove nitrogen from waterways

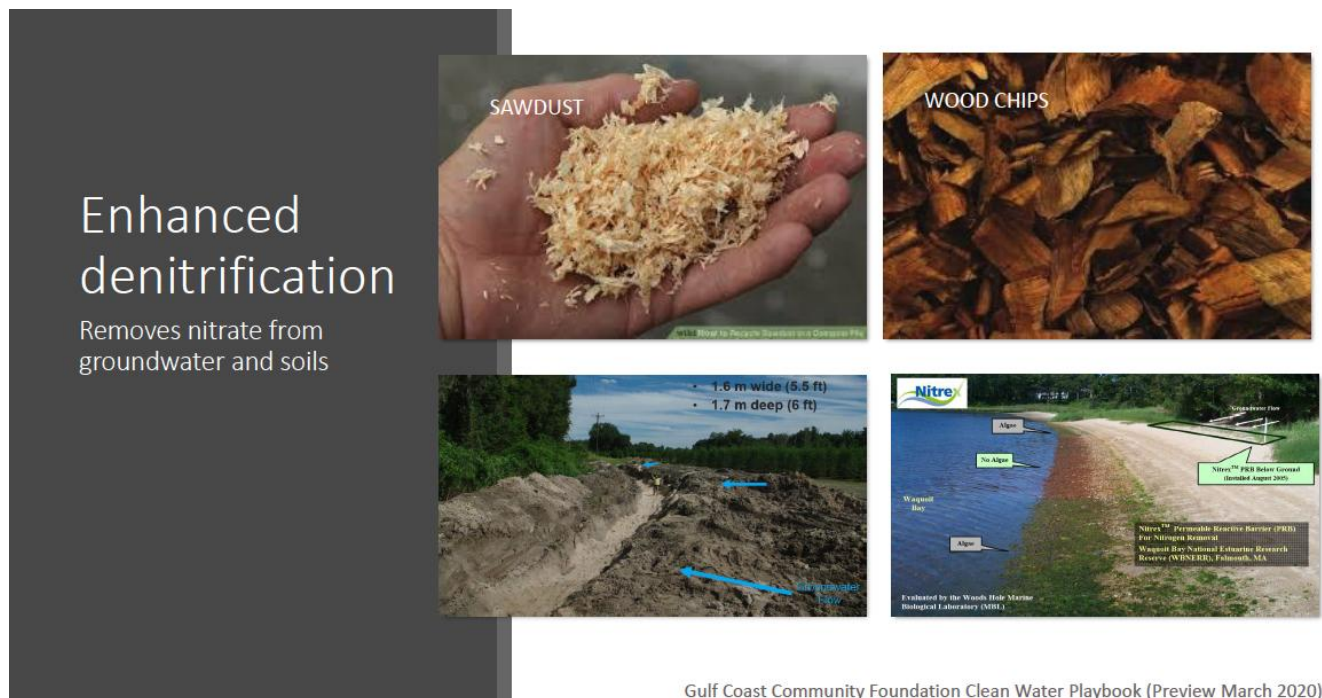
Both Shafer and Suau talked about disruptions in the natural nitrogen cycle, which lead to more nitrogen ending up in groundwater and soil.

Humans have been the primary problem, Shafer said, with their development of synthetic fertilizer, so more food can be grown in areas.

"We need to support the biology by restoring ecosystems and their ability to cycle nitrogen," Shafer pointed out.

One method, Suau explained, is to use carbon to filter out excess nitrogen before it enters waterways from septic tank drainfields. Barriers filled with organic carbon will intercept and trap the nitrogen, he noted.

Sawdust and woodchips are among the sources of carbon that can be used, he said. "Interestingly, sawdust is a waste product in Florida of unlimited supply, and there's really no use for it." It also is available at low cost, he added.



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This graphic shows a trench in northwest Florida (lower left), where a carbon barrier has reduced the amount of nitrogen entering the nearby waterway. Image courtesy Sarasota County

Suau also showed the board a slide with a photo of a trench in northwest Florida that was dug to be 5 feet wide and 6 feet deep and then filled with sand and sawdust. The trench, he said, is "at the interface of a nursery that had rich fertilizer nitrate and a waterway that was getting very high nitrate levels as a result."

A University of Florida (UF) analysis, he continued, showed that the trench reduced the amount of nitrogen going into the waterway by 60%, on average. The UF team "also conservatively estimated" the life of the system at 15 years, Suau said, but he had seen research showing that such a system could last decades. The cost of the nitrogen removal for that trench system is 36 cents per pound, he added. "Incredible."

At the conclusion of the presentation, former Commissioner Thaxton pointed out that he does not want anyone to think that red tide will go away if all the approximately 42 activities in the Community Playbook are followed. However, he continued, "One could assume" — and research has indicated

— “that by enacting some of these activities in the Playbook, the intensity, duration and extent of red tide could be reduced. ... That would be an admirable goal.”

Moreover, Thaxton said, adopting some of the recommendations would have other health, economic and quality-of-life benefits that would be “well worth the price.”