What You Need To Know about Florida Red Tide

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The ecological disaster that the Refuge experienced in 2018 was caused primarily by red tide. Unfortunately, red tide is back, and while this year's bloom is nowhere near as bad as last year's, the current bloom is having a negative impact on both humans and wildlife. For all of us to effectively advocate for the protection of the Refuge, we need to know all we can about Florida red tide.

In mid-November, the Captiva Island Yacht Club's environmental committee hosted a forum on red tide that featured two distinguished scientists: Dr. Michael Parsons and Dr. Cynthia Heil. The forum's goal was to provide answers to some fundamental questions related to red tide. While their presentations contained a lot of scientific references, it's possible to get a good understanding of what Drs. Parsons and Heil were saying about red tide without having to have a deep understanding of science.

What is Florida Red Tide?

Parsons started the forum with a brief discussion of phytoplankton, which is a simple, single-celled aquatic plant that forms the base of the food chain in our oceans, rivers, and lakes. These plants are also responsible for most of the oxygen that we breathe.

There are tens of thousands of phytoplankton species, according to Parsons, about 300 of which form blooms, and about 100 of which contain toxins. While red tide occurs around the world, only in Florida is it caused by the species of phytoplankton called Karenia brevis. This is why our unique version is often referred to as Florida red tide. Parsons also pointed out that red tide isn't a new phenomenon. It has been reported in Florida as far back as the 1500s.

As anyone who has visited the Refuge when it was experiencing red tide can attest, the toxins associated with a red tide can kill fish. The cells also can break apart in surf and release toxins. The most common human health problems associated with red tide are various types of gastrointestinal, respiratory, and neurological disorders. See more.

Are Florida Red Tides Increasing in Frequency?

Dr. Heil stated that Florida red tide blooms start 10 to 40 miles offshore. She also noted that in 2002 the state of Florida created the Harrmful Algal Bloom (HAB) database, which brought together 50 years of data gathered by both state-sponsored and independent researchers. However, in spite of having decades of data, scientists disagree as to whether or not outbreaks of Florida red tide are becoming increasingly common. Over the years, the monitoring data were gathered by different organizations for a variety of different purposes, and the organizations used multiple sampling methods and sampling frequencies. This resulted in inconsistent data.

Because of the impact it had on the Refuge and the surrounding area, many people who experienced the 2017–2019 red tide outbreak believe that it was the longest in history. It was the fifth longest, according to Dr. Heil. The longest red tide outbreak occurred between 1994 and 1997 and lasted 30 months.

What Are the Differences between Blue-Green Algae and Red Tide?

While last year's ecological attack on the Refuge was primarily caused by red tide, we were also impacted by a large blue-green algae bloom. Blue-green algal blooms release a toxin called microcystin, which takes effect when eaten or inhaled or comes in contact with the skin. Contact with affected water can cause skin irritation and mild respiratory effects. Ingesting toxins can also cause gastroenteritis

symptoms, such as vomiting, diarrhea, fever, and headaches. These toxins can also impact the liver and the nervous system. See more.

Both red tide and blue green algae are naturally occurring. However, unlike red tide, which thrives in salt water, blue-green algae thrive in fresh water. Blue-green algal blooms are driven by several factors, including excessive nutrients, warm temperatures, and an abundance of sunlight. A primary cause, excess nutrients (e.g. phosphorus), is largely due to nonpoint source runoff from agricultural lands (e.g., row crops), urban areas (e.g. streets, parking lots, lawns, etc.), and point sources, such as wastewater treatment facilities. See more.

As mentioned below, many believe that there is a link between blue-green algae and red tide.

What Feeds Red Tide?

Scientists have identified 13 different nutrient sources for red tide in Southwest Florida, according to Dr. Heil, and the impact of each source depends on factors such as the age of the bloom and whether it is offshore or close to the coast. Some of the sources that feed a Florida red tide include sediment at the bottom of the gulf and atmospheric conditions such as dust coming to the Gulf from the Sahara, she said. A small, naturally occurring red tide outbreak can be become a medium-sized, self-sustaining outbreak based just on the nutrients from the fish that the outbreak kills.

Dr. Heil downplayed the role of blue-green algae in last year's red tide outbreak, saying that most likely no more than 30% of that red tide bloom was caused by blue-green algae. She did urge a reduction of nearshore nutrients for both human and environmental health reasons, but she pointed out that while the science indicates that nutrient reduction does decrease outbreaks of blue-green algae, it does not predict a similar reduction in the occurrence of red tide.

What Is Being Done about Red Tide?

Dr. Heil reported that the state of Florida has a long red tide mitigation history going back to at least 1957, when Florida experienced a red tide outbreak that stretched 32 miles from St. Pete Beach to Anclote Key. To mitigate that outbreak, the U.S. Fish & Wildlife Service and the state of Florida used crop-dusting planes to drop copper sulfate on the bloom. That action did kill some of the red tide, but it also led to the release of toxins that killed marine life. This attempt at mitigation highlights an important principle: Any attempt to mitigate red tide must not have a worse negative impact.

Mitigating red tide drove the creation of the Red Tide Institute at the Mote Marine Laboratory. Dr. Heil, who is the director of that laboratory, said that the goal of red tide mitigation is to either control the bloom itself or control the impact of the bloom. Most likely there will not be a single technique that can mitigate all types of red tide outbreaks, she added. She hopes that through rigorous scientific testing, the scientific community can develop a tool box of technologies and compounds, along with the knowledge of how and where to best to apply these techniques

Conclusion

Red tide outbreaks are with us for the foreseeable future. The key to reducing or hopefully eliminating the their impact is scientific research that identifies techniques that are effective and scalable, and which don't have significant unintended consequences.

Scientific research takes both time and money. How much of each is required is unknown. The good news is that there are multiple sources of funding for red tide research. Earlier this summer, the U.S. Congress voted to earmark $6.25 million for research on the long-term effects of red tide. Closer to home, the

previously referenced Red Tide Institute at the Mote Marine Laboratory has received a combination of state and private funding. In August of this year, Governor DeSantis announced the formation of the Red Tide Task Force. The task force received $4.8 million in funding from the state budget and will be supported by the Florida Fish & Wildlife Conservation Commission's existing red tide research program. The task force is intended to play an important role in determining strategies to research, monitor, control, and mitigate red tide and other harmful algal blooms in Florida waters.

In Case You Missed It:

The National Fish and Wildlife Foundation announced that it would award $5.3 million to the J.N. "Ding" Darling National Wildlife Refuge to restore the newly acquired 68-acre Wulfert Bayous. See more.