

# We still have much to learn about red tide

*"If people catch a fish on hook and line and it behaves normally, then it is probably safe to eat"*

by Justin Sapp

The Fish Kill Database, a record of marine animals killed throughout Florida since 1972, reads like a coroner's report for fish:

"Thousands of dead bodies observed. Most in a state of decomposition suggesting death occurred two or more days prior.

"On Sunday, the kill was showing, and, as the week has gone on, more and more fish are floating.

"Grouper, snapper, grunts, other bottom fish in 60-80 ft. of water - nothing but dead fish . . . 85-120 ft. of water - nothing alive at all."

Since the beginning of the year, most of these grisly reports are the result of a tiny organism that takes a liking to our warm and fertile Gulf waters, and it is the cause of red tide.

Red tide is a natural phenomenon that is continuing to kill fish and other marine animals and contaminate shellfish such as clams and oysters, while challenging the people who are trying to discover its cause and keep it under control. But in order to find out why red tide happens, we need to take a look at the tiny organism that causes it.

Microscopic organisms called phytoplankton are the foundation for the bounty of life in our oceans. This phytoplankton, commonly known as algae, uses energy from the sun to produce its food. This algae is eaten by many other kinds of marine life as the food web spins on.

Some types of algae, like the one causing red tide, are capable of producing some very powerful toxins. Scientists fully understand how these toxins react in fish, but they know far less about why these types of algae produce the toxins and what—if anything—can be done to control the spread of the toxic outbreaks we refer to as red tide. According to Chuck Jacoby, an Estuarine specialist with Florida Sea Grant, red tide requires the right combination of conditions, including wind, temperature and currents.

The warm waters of the Gulf of Mexico contain an abundance of food and nutrients which creates optimal conditions for these algae to "bloom." Because they are tiny little organisms, they are not traveling anywhere on their own. Gary Kirkpatrick, Manager of the Phytoplankton Ecology Program at Mote Marine in Sarasota, explains that it is the currents in the Gulf that keep the red tide organism in the headlines.

"Instead of strong currents that sweep in and out to the open ocean, we have cycling currents going up and down the coast. It keeps organisms in place and prevents them from being washed out." As part of their natural life cycle, these algae probably bloom far out in the ocean. Since they rely on winds and currents to move about, it becomes a problem for people when these winds and currents drive the blooms close to shore, where they can become concentrated. The reddish color of the bloom is the result of pigments that the algae use as they grow.

Red tide, or what scientists call a "harmful algae bloom," can last from a few days to several weeks and may move up and down along the coast for months at a time. But figuring it all out is about as difficult as forecasting the weather.

Since the beginning of the year, southwest Florida has been hit hard with red tide. It seems that reports of dead snook, redfish, jewfish and bait fish are becoming as common as afternoon thunderstorms. Last month, the offshore fisherman who ventured out of Steinhatchee and Keaton Beach were met by thousands of dead groupers, snappers, grunts and other bottom fish in a kill that extended for hundreds of miles. Scientists are still trying to figure if it is getting worse. "We may be seeing an increase in the frequency and duration of [red tide], but we can't be certain," explains Chuck Jacoby. "We may see more and longer blooms because we are now looking harder and better."

Fisherman are concerned with red tide, not only because it can damage or

even wipe out local stocks of fish, but because they are unsure about the possible health hazards of eating fish from areas affected by red tide. Generally, there is nothing to worry about.

"If people catch a fish on hook and line and it behaves normally, then it is probably safe to eat. A sick fish typically won't feed," explains Jeff Guenther, a biologist with the Fish and Wildlife Research Institute in St. Petersburg. "Red tide produces a neurotoxin that affects the gills and the fish suffocate. Typically it (the neurotoxin) doesn't have time to enter the flesh of fish."

The greatest health threat to humans from red tide comes from eating oysters, clams and other shellfish that have been contaminated. Serious illness, including nausea, diarrhea and sensory problems can result. Whenever red tide is detected in a shellfish harvesting area, like was the case around Apalachicola after Hurricane Katrina, the state closes the harvest.

Bill Lindberg, a fisheries biologist for the University of Florida now working to create artificial reef habitat off the mouth of the Steinhatchee River consisting of nearly 1,000 artificial reef units, is concerned. Lindberg can only guess at the long-term impacts of this year's red tide, but he remembers the outbreak in 1995 very well.

While monitoring the Suwannee River Reef System, a network of artificial reefs he helped create, red tide completely wiped out five or six of the southernmost units. "Basically, all life was gone," Lindberg notes, "and it took 4 years for those reefs to recover." Lindberg adds that many of the fish will leave the area when red tide develops, and fish from neighbor-

ing areas will move in to replace the fish that died.

Due to the complicated development of red tide and the historical evidence of major fish kills before people moved into the area, scientists cannot determine if pollution is contributing to longer and more severe outbreaks of red tide. As Mote Marine's Kirkpatrick notes, "There are now more people here to see the dead fish and the red tide and we have much better equipment to observe it. We simply can't compare."

Many rivers, like the Mississippi, empty into the Gulf, depositing sewage, industrial waste, and chemicals into the ocean. These pollutants contain phosphorus and nitrogen which algae use for food.

Jacoby says, "Evidence that increased nutrient inputs encourage phytoplankton growth could be considered pretty good." Kirkpatrick doesn't know if there is any link between pollution and red tide, but he is certain that any decrease in the amount of nutrients entering our oceans is a good thing. "It is a logical hypothesis that we could cut back on the amount of coastal pollution and red tide would diminish, but that has yet to be proven."

Until more is known, we can all hope for clearer waters and tight lines. To report fish kills or view statewide conditions, visit the Fish kill Database at <http://research.myfwc.com/fishkill/>. For more information about red tide and other important topics issues about our coastal environment, visit the Taylor County Extension Web site at <http://taylor.ifas.ufl.edu>

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