

Understanding red tide and its effects on coastal wildlife

Information courtesy of Mote Marine Laboratory

While not an everyday occurrence, the Florida red tide does make an appearance on an occasional basis- usually every year or so- its last visit taking place in November, 2007.

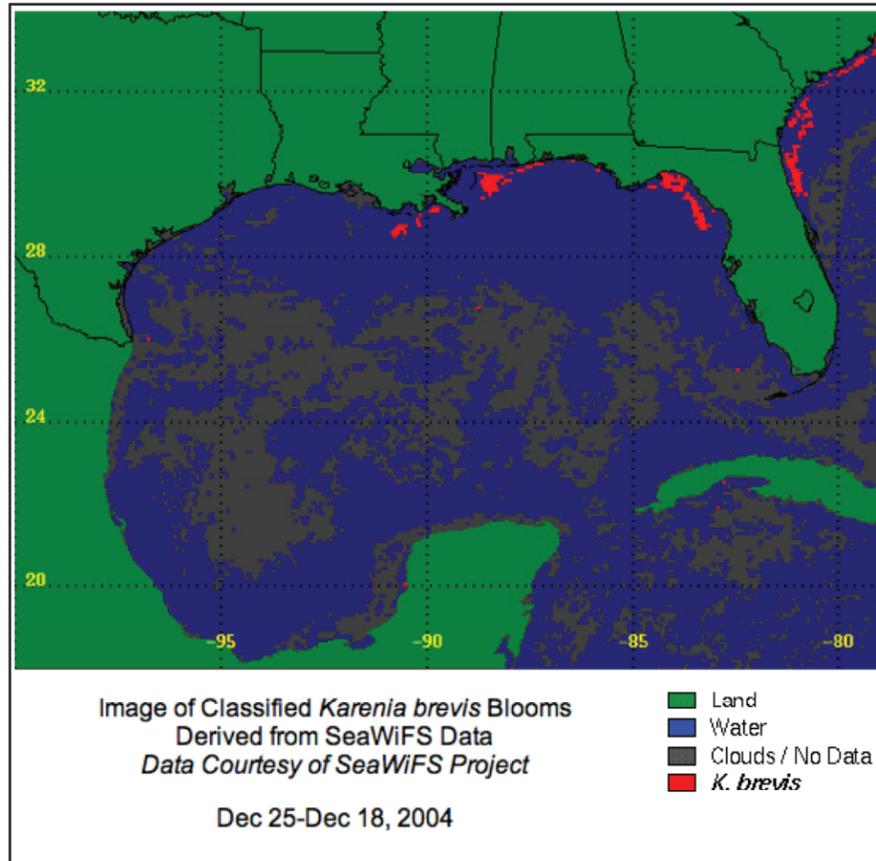
The red tide, also known as *Karenia brevis*, is a single-celled algae which contains a powerful toxin that kills fish and other marine life. Red tide can affect respiratory systems in mammals and can cause eye, nose, and throat irritation similar to cold symptoms.

Some may believe that the red tide is a fairly recent phenomenon. Actually, written records from the 1500s by Native Americans indicate that red tide has long been a part of Florida's Gulf Coast history. Red tide occurs when high concentrations of microscopic, single-celled phytoplankton accumulate. These phytoplankton are always present in the water; but when a bloom develops, the water can turn a reddish-brown, greenish, or even a yellowish color. These blooms can be harmful to public health and natural resources when its toxins are released.

At least 40 species of toxic or potentially toxic marine microalgae have been identified in Gulf of Mexico waters; as many as 100 species of harmful algae have been identified around the world. All have a potential impact on natural resources and public health.

Annually, blooms of Florida red tide appear to start several miles off the Florida Gulf Coast. The winds and currents then play a role in determining when and where these blooms occur. *K. brevis* red tides have been observed at least once along the length of Florida's coastline. They have also occurred in coastal waters of the other Gulf States and in Mexico. On the Atlantic Coast, it has been transported as far north as the Carolinas.

Scientific research shows that the growth of *K. brevis* is influenced by a variety of factors, including sunlight, water temperature, salinity, and the amount of types of nutrients available in the water. Currently there is no evidence to suggest a connection between pollution and Florida's (off-shore) *K. brevis* blooms. *K. brevis* red tides begin offshore and have occurred for hundreds of years, long before man-made pollution became prevalent. However, pollution can cause other types of algal blooms in Florida's coastal wa-



ters and estuaries and researchers are investigating the possibility that pollution or nutrient enrichment may influence *K. brevis* blooms after the blooms are transported inshore.

K. brevis becomes a problem for many people when winds and currents drive the concentrated bloom close to shore. The organisms produce several neurotoxin or brevetoxin that become airborne in the seaspray along the shore. When these toxins are inhaled, they can cause temporary respiratory irritations such as scratchy throats, watery eyes, and sneezing. While the symptoms may only be a nuisance for some people, they can be more severe for people with respiratory illnesses such as asthma or chronic lung disease. These people are strongly urged to stay away from areas with red tide.

Red tide toxins also kill fish, especially bottom-dwelling fish such as grouper and grunts, by paralyzing their gills. When these dead fish wash ashore and decompose, the odor can be offensive to residents and to tourists.

Furthermore, red tide organisms accumulate in filter-feeding shellfish such as oysters, clams, and coquinas, which are unsafe to eat if collected from a red tide area.

Like other dinoflagellates, *K. brevis* reproduces by a cell division, with a single cell splitting into two about every 48

to 120 hours. *K. brevis* also has a sexual cycle that may include a stage where it can remain inactive during non-bloom periods.

Florida red tide blooms occur most frequently from August through February, but have been documented in each month of the year. If conditions are right, a bloom may remain in an area for several weeks or may move up and down along the coast for months at a time.

During its last significant outbreak on Perdido Key (November, 2007), State officials warned those with respiratory problems to remain inside with windows closed and to stay away from the water and beaches. Local newspapers reported that people were having throat and eye irritations within 20 paces of the surf. Numerous dead fish also washed ashore during this time.

Most effects of red tide are temporary with no long-term effects. Occasionally swimmers will contract a temporary skin rash associated with bathing in affected waters. This usually disappears within 24 hours.

While normally non-life-threatening to humans, red tide does have a significant influence on wildlife mortalities among marine and coastal species of fish, birds, marine mammals and other organisms.

To learn more about Florida red tide, here are some resources and websites that provide additional information:

- www.RedTideOnline.com
 - www.MyFWC.com
 - www.MOTE.org
 - <http://research.myfwc.com/>
 - <http://www.floridamarine.org>
 - www.START1.com
 - www.MyFloridaEH.com
 - Red Tide Health
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SOME FACTS CONCERNING RED TIDE:

- Some red tides have covered up to several hundred square miles.
- The size of a *K. brevis* red tide cell is half the thickness of a dollar bill.
- *K. brevis* has two flagella, or whip-like tails, to help it move through the water at about three feet per hour.
- About 1,000 *K. brevis* cells fit in one inch, so approximately 20 of these cells can fit across the period at the end of this sentence.
- Most people can swim in red tide but it can cause skin irritation and burning eyes. If your skin is easily irritated avoid red tide water. If you experience irritation, get out and wash off with fresh water. Swimming near dead fish is not recommended.
- Symptoms from breathing red tide toxins are normally coughing, sneezing, and teary eyes. Symptoms are usually temporary when red tide toxins are in the air. Wearing a particle mask may lessen the effects, and research shows that using over-the-counter antihistamines may decrease your symptoms.
- Checking the marine forecast can be helpful. Fewer toxins are in the air when the wind is blowing offshore.
- It's not safe to eat clams and oysters or the gastropods (shells) that feed on them during a red tide. Cooking will not destroy the toxins.
- Shrimp, crab, scallops, and lobsters in Florida red tides are safe to eat, since these marine animals do not accumulate the red tide toxin in the meat or muscle that is normally consumed. Finfish caught live can also be eaten if filleted.
- Commercial seafood found in restaurants and grocery stores is safe because it comes from red tide free water and is monitored by the government.