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Texas Impacted by Longest Red Tide on Record

Texas is suffering from a prolonged red tide that might go down in the record books as the longest lasting and costliest red tide in state history.

The red tide was first detected in early September, when staff of the Texas Parks and Wildlife Department's (TPWD) Coastal Fisheries division saw stressed fish surfacing inside Brazos-Santiago Pass. Discolored water and dead fish were reported the same weekend from the Brownsville Ship Channel and San Martin Lake. Reports soon followed of additional dead fish in the Lower Laguna Madre and South Bay as well as Boca Chica Beach. Water samples confirmed that south Texas was experiencing a red tide.

Just over a week later, the red tide was also confirmed along the upper coast, from San Luis Pass to the Brazos River. By early October, the bloom enveloped most of the Texas coastline, stretching from the lower reaches of Galveston Bay to the Rio Grande and further south into Mexico.

What is red tide?

Red tides are caused by an overabundance of *Karenia brevis*, a species of microscopic toxic algae. These algae occur naturally as part of the makeup of the Gulf of Mexico, and when conditions are right they reproduce very rapidly. Transported to shore by currents, the algae cause the water to turn red, brown or green and litter the beaches and bays with dead fish. At times the water might also contain another species called *Karenia mikimotoi* in addition to *K. brevis*. These species often occur simultaneously.

K. brevis contains brevetoxin, a neurotoxin that kills fish by attacking their central nervous system and causing paralysis, suffocating the fish. The brevetoxin also accumulates in the tissues of molluscan shellfish (oysters, whelks, clams, mussels); the shellfish are not harmed but their meat is rendered inedible by the toxin. Brevetoxin is heat-stable, meaning that it will remain in the shellfish meat even after cooking. A specific type of food poisoning called Neurotoxic Shellfish Poisoning can result after eating red tide-affected shellfish; symptoms can persist for days and include nausea, vomiting, and numbness or tingling of the lips and tongue.

Anglers and beachgoers are often affected by brevetoxin's telltale allergy-like effects. Burning eyes, runny nose, coughing, and wheezing are some of the symptoms caused by breathing in the toxin. Fortunately, for most people, these symptoms are a temporary annoyance and subside quickly once you leave the area. However, for people with asthma, emphysema or other lung problems, brevetoxin can present a potential health concern; these people need to avoid areas affected by red tide.

Impact on Oyster Season

Red tides can bring the Texas oyster industry to an abrupt halt. Under Federal law, shellfish harvesting must be restricted once concentrations of *K. brevis* reach a threshold of 5 cells per milliliter of water, or when any amount of toxin is detected in the shellfish meat, regardless of cell concentration. Even after the red tide has subsided, residual toxin levels in shellfish meat can

remain elevated for weeks. For example, Copano Bay remained closed to shellfish harvesting for an additional 100 days following the end of the 1996 red tide due to elevated brevetoxin in the oyster meat.

On October 26, 2011 the Texas Department of State Health Services issued a news release announcing that oyster season would not be opening on November 1 due to the red tide. At press time, it seems that Texas has seen the worst of the bloom, but *K. brevis* continues to linger along the coast, causing intermittent fish kills. All Texas waters remain closed to shellfish harvesting and it is unclear when they may reopen, if at all this season. TPWD estimates that the closure has cost the Texas oyster industry more than $7.5 million through the end of January.

Impact on the Texas Fishery

As of November, the red tide had killed over 4.4 million fish. Striped mullet made up the largest percentage of this figure, numbering over 2 million. Additional fish kills have occurred since November and these have also been almost exclusively comprised of mullet. The rest of the top ten species killed by the red tide in descending order are scaled sardine, Gulf kingfish (whiting), Atlantic bumper, pinfish, ladyfish (skipjack), spot, hardhead catfish, Gulf menhaden, and pigfish. Other recreational fish, in addition to Gulf whiting, were also affected by the bloom. These included red and black drum, flounder and spotted seatrout, but in much smaller proportions comprising less than 1% of the total fish killed. Fortunately, ongoing resource assessment and long-term monitoring programs, such as the Coastal Fisheries Resource Monitoring and Commercial Landings programs, continue to give TPWD the ability to adapt management strategies as needed to address any impacts to our resources.