

O2 deprived: Sea life in distress

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By Kate Spinner

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If gobs of dead algae and piles of dead fish persist in area waterways this summer, parts of the estuaries and even parts of the Gulf of Mexico could become lifeless, some South Florida scientists say.

Already, conditions aren't looking good for healthy waters this summer, said Larry Brand, professor of marine biology at the University of Miami Rosenstiel School of Marine and Atmospheric Science. Red tide is killing fish in patches all along the Southwest Florida coast and the remnant of a giant seaweed bloom is decaying offshore.

The natural process of decay sucks up oxygen, and when there's too much decaying matter at the bottom of a water body, the water can become so oxygen-starved that fish can no longer live.

Brand said red tide, which historically started to get bad in late summer, is starting early this year. If the toxic algae leads to massive fish-kills in combination with other decaying algae, a dead zone could form offshore, he said.

Other scientists said oxygen-poor conditions are possible but more likely to occur in deep estuaries where wind and wave action doesn't stir oxygen into to the water as frequently.

"If it does happen, this would be the time of year for it," said Greg Tolley, professor of Marine Science at Florida Gulf Coast University.

The rainy season combination of high water temperatures and gushes of fresh water run-off contribute to a phenomenon called stratification, where the cap of buoyant fresh water prevents oxygen from reaching the underlying layer of cool salt water.

Oxygen generally enters the water from the air.

"If you don't have a way of mixing more oxygen where drift algae accumulates, you can get areas large or small that are robbed of oxygen," Tolley said.

David Fugate, professor of physical oceanography at Florida Gulf Coast University, is doing research in the Caloosahatchee estuaries to find out what degree of heating fresh water causes stratification and what level of water flow into the estuary from the rivers allows water to mix.

He said stratification and oxygen depletion doesn't happen easily in the Gulf because winds and currents help the water mix.

Dead zones do occur in the Gulf, however. For decades, a giant dead zone has lingered near the mouth of the Mississippi River where a combination of high nutrients, minimal currents, persistent algae blooms and enormous amounts of fresh water lead to stratification and severe oxygen depletion.

"We don't have nearly that much fresh water here so it doesn't tend to get stratified as much," Fugate said.

But small pockets of oxygen-starved waters formed last year off area waters, said Chris Koepfer,

natural resources supervisor for Lee County.

He said the amount of dead fish and dead algae in the Gulf now pales in comparison to the amount of rotting matter that sunk to the sea floor last year after a severe red tide bloom killed tons of fish, manatees and dolphins.

“What you had last year was a huge amount of dead fish biomass that was basically laying around the bottom and you don’t have that this year,” Koepfer said. “If we get a similar event, certainly the possibility exists (to have oxygen-starved water).”

Also last year, 696 billion gallons of fresh water poured down the Caloosahatchee and into the Gulf from Lake Okeechobee. In addition to that flow, fresh water entered the Gulf from the river’s natural watershed and other nearby rivers.

For years, area hydrologist Greg Rawl has been keeping tabs on how the fresh water loiters along the shore.

“One thing that we’ve learned is we don’t have a whole lot of currents out offshore,” Rawl said. “That’s why we see, when there’s heavy discharges, the plumes just sort of sitting out there.”

Those freshwater plumes carry high levels of nutrients that trigger algae blooms. Scientists can’t predict what type of algae will bloom when nutrients are introduced, but blooms of some sort of algae are almost inevitable.

Brand said because currents off the Southwest Florida coast are fairly weak, nutrients settle to the sea floor. They’re also recycled as algae blooms and die. Dead algae and decaying fish are like an organic fertilizer that feeds the next algae that comes along.

“We’re just building more and more nutrients and it’s not getting flushed away very quickly,” Brand said.

While an actual dead zone did not form off Lee County last year, one did form off the St. Petersburg Coast for the first time since 1971, said Cindy Heil, a harmful-algae bloom expert with the Florida Wildlife Research Institute. The coastal water temperature was about 92 degrees, with a high degree of stratification in nutrient-rich waters that were 25 to 55 feet deep.

Based on samples taken this week, Heil said, she sees no evidence now of oxygen-poor waters off the coast of Lee or Collier counties.

Fugate said scientists have a hard time guessing whether waters will become oxygen-depleted because so many factors are involved wind, nutrients, temperature, stratification and decaying organic material.

“It’s kind of like predicting the weather,” Fugate said.