PRESS RELEASE, JULY 29, 2003

TROPICAL STORMS PUT THE OXYGEN BACK INTO THE "DEAD ZONE"

Two tropical storms in as many weeks have mixed up the coastal waters of the northern Gulf of Mexico and disrupted the usual widespread extent of summertime waters severely depleted in oxygen, reports Dr. Nancy Rabalais who just completed this summer's mapping. The result was a half again smaller "dead zone" this summer than the average size for the last ten years. The size just mapped on a 6-day cruise was 8,560 square kilometers (=3,300 square miles).

Larger patches of low oxygen water were located near the Mississippi River delta, off Terrebonne Bay, off Atchafalaya Bay, and along the southwestern Louisiana coast near Calcasieu estuary. Smaller patches were located farther offshore. The Texas coast was spared from low oxygen waters, but also received the brunt of Hurricane Claudette on July 7-8. Tropical Storm Bill crossed the Louisiana coast near Morgan City on June 30. Both storms created 10 to 15 foot seas along the Louisiana coast. The waves mixed well-oxygenated waters from the surface down through the water column. Eventually hypoxia will reform, but will take time.

The scientific word for the commonly named Dead Zone is "hypoxia," or low oxygen. Dead Zone refers to the failure to capture fish, shrimp, and crabs in bottom-dragging trawls when the oxygen concentration falls below a critical level in bottom waters. Higher in the water column, however, there is sufficient oxygen to support sizeable numbers of fish and swimming crabs.

The seasonal formation and persistence of hypoxia are influenced by the discharges of the Mississippi and Atchafalaya Rivers. The fresh water forms a fresher layer above the saltier Gulf waters, and the resulting two-layer system inhibits the oxygen in the surface waters from penetrating to depth. Nutrients stimulate the growth of microscopic plants, the phytoplankton. These single celled plants either end up in the food web, which off Louisiana supports valuable commercial fisheries, or end up as organic debris on the sea floor. The decomposition of this organic matter by bacteria uses up the oxygen to the point that it becomes depleted and lower than what is necessary to sustain the life of most marine animals.

High river discharge in spring 2003 and another peak of fresh water to the Gulf in June, along with the nutrients carried in the flow, started the annual progression of hypoxia. Hypoxia was well established and widespread along a line of stations off Terrebonne Bay sampled in mid-June. At that time, eight of nine stations out to 100-ft water depth were severely depleted in oxygen.

Several mathematical models based on the amount of river discharge and nutrients loaded into the Gulf of Mexico in spring and early summer 2003 predicted that the size of this year's low oxygen area would be in the range of 15,000 to 17,000 square kilometers (=6,000 to 7,000 square miles). The models, however, do not take into account the mixing that resulted from the two tropical storms that passed through the hypoxic zone two to three weeks before the mapping cruise.

"It was obvious that the water column was more mixed than in most summers," said Dr. Nancy Rabalais, Chief Scientist for the cruise. Even with a very strong signature of Mississippi and Atchafalaya river water far out into the study area, there was not the usual strong difference in temperature and salinity from the surface to the bottom. The physical structure is necessary for the formation of hypoxia along with the nutrient-enhancement of the phytoplankton. "If we were to conduct this cruise two weeks from now, I would predict a much larger size," said Rabalais.

The scientific party from the Louisiana Universities Marine Consortium and Louisiana State University is funded by the National Oceanic and Atmospheric Administration, Coastal Ocean Program. For further information contact Nancy Rabalais, LUMCON, 985-851-2836.