**REPORT FROM 2024 HYPOXIA CRUISE**
**EAST OF THE MISSISSIPPI RIVER**

**LOUISIANA STATE UNIVERSITY**

**AUGUST 2, 2024**

The bottom area of low oxygen waters west of the Mississippi River (often called the 'Dead Zone') was mapped July 21-26, 2024, in Louisiana/Texas offshore waters. The mapped area was calculated to be 17,360 square kilometers (6703 square miles) large and stretched from the Mississippi River across Louisiana coastal waters into Texas to the west.

The science crew and the RV *Pelican* also worked the waters east of the Mississippi River off Louisiana, Mississippi, and Alabama.

It is well known to fishers, resource managers and scientists that hypoxia (low dissolved oxygen) also occurs in waters offshore of Mississippi and Alabama. The measured area of bottom-water low dissolved oxygen was large to the east of the Mississippi River and its delta and extended from the Chandeleur Islands, Louisiana to as far as Mobile Bay, Alabama, and perhaps further to the east (Figure 1). Logistical constraints called the RV *Pelican* and the science crew back to the dock, and the eastern extent was not closed off. The area of bottom-water hypoxia east of the Mississippi River is illustrated in Figure 1 (compared to the area west of the Mississippi River in Figure 2; note differences in scale). The size of the bottom-water area east of the Mississippi River is approximately 6536 square kilometers, or 1634 square miles, making it half again as large as Lake Pontchartrain.

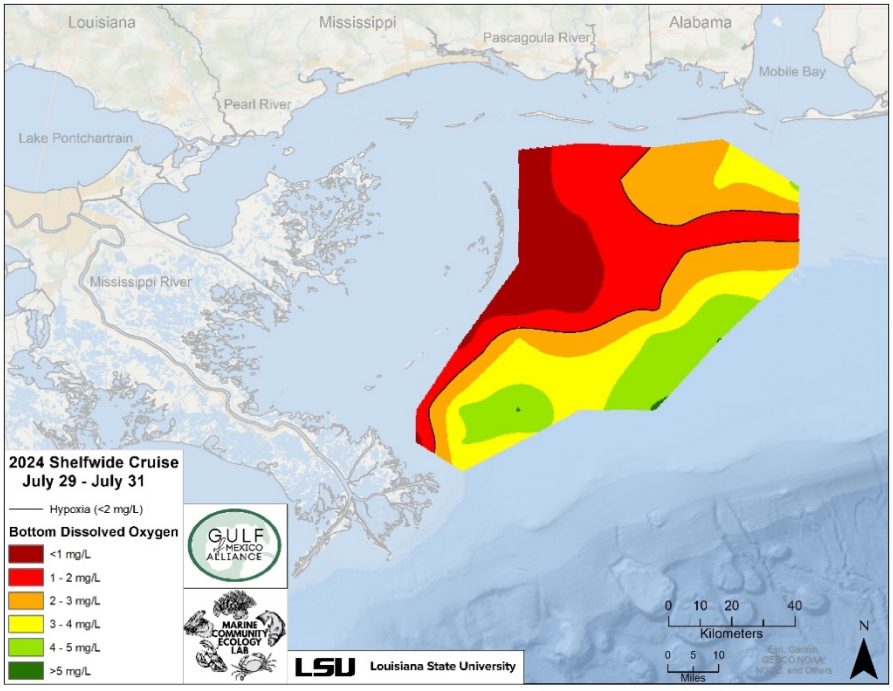


*Figure 1. Distribution of bottom-water dissolved oxygen concentration for July 27-30, 2024, east of the Mississippi River delta and areas of Louisiana, Mississippi, and Alabama. The combined area less than 2 mg $l^{-1}$ and 1 mg $l^{-1}$ are the darkest colors and outlined by the black line. Data source: CN Glaspie, NN Rabalais, and RE Turner, Louisiana State University. Funding: Gulf of Mexico Alliance and National Oceanic and Atmospheric Administration, National Centers for Coastal Ocean Science.*

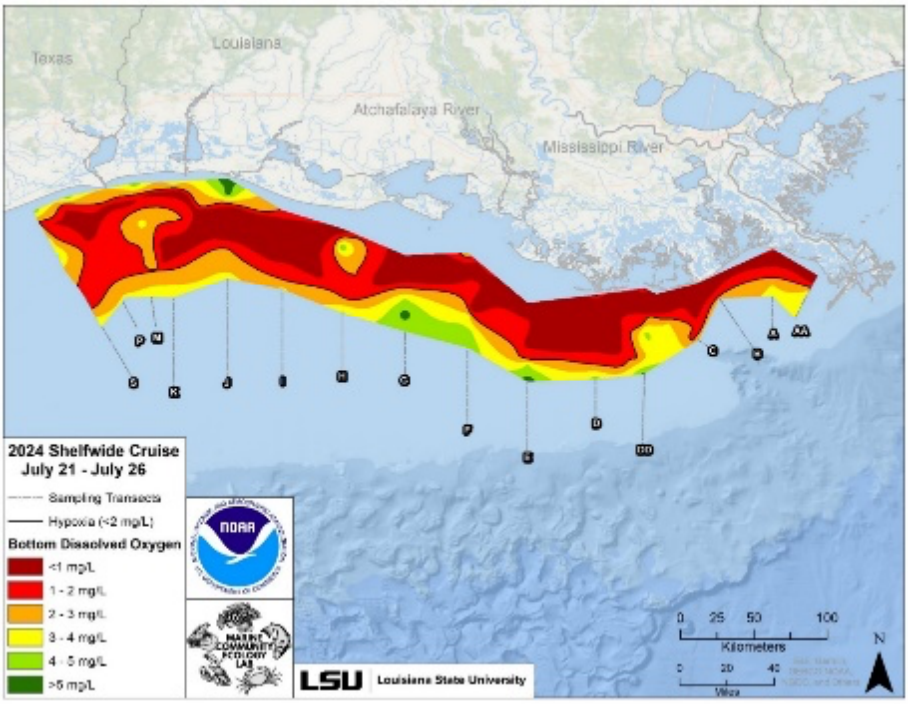


*Figure 2. Distribution of bottom-water dissolved oxygen concentration for July 21-26, 2024 on the Louisiana/Texas shelf. The combined area less than 2 mg $l^{-1}$ and 1 mg $l^{-1}$ are the darkest colors and outlined by the black line. Note different scale compared to Figure 1. Data source: CN Glaspie, NN Rabalais, and RE Turner, Louisiana State University. Funding: National Oceanic and Atmospheric Administration, National Centers for Coastal Ocean Science.*

The Mississippi River delta is a 'leaky' system and fresh water from the river escapes the lower portions of the river and moves into the areas west and east of the river and delta. The Mississippi River discharge overwhelms any local river input into the northern Gulf of Mexico. Besides the effect of the Mississippi River to the west of the river and delta, winds and currents move fresh water onto the Louisiana, Mississippi and Alabama coasts, along with additional river discharges in the areas from the Pearl River, Jourdan River, Wolf River, Biloxi River, Tchoutacabouffa River, Pascagoula River, and Mobile Bay's Mobile River. Freshwater input to Mississippi Sound, excluding that from Mobile Bay, averages 882.4 $m^3$ per second (30,806 $ft^3$ per second), but much less than the effect of the Mississippi River.

Similar influences of the Mississippi River are seen to the east of the river and its delta in lower surface water salinities (Figure 3) and in the production of phytoplankton as illustrated by chlorophyll biomass (Figure 4).

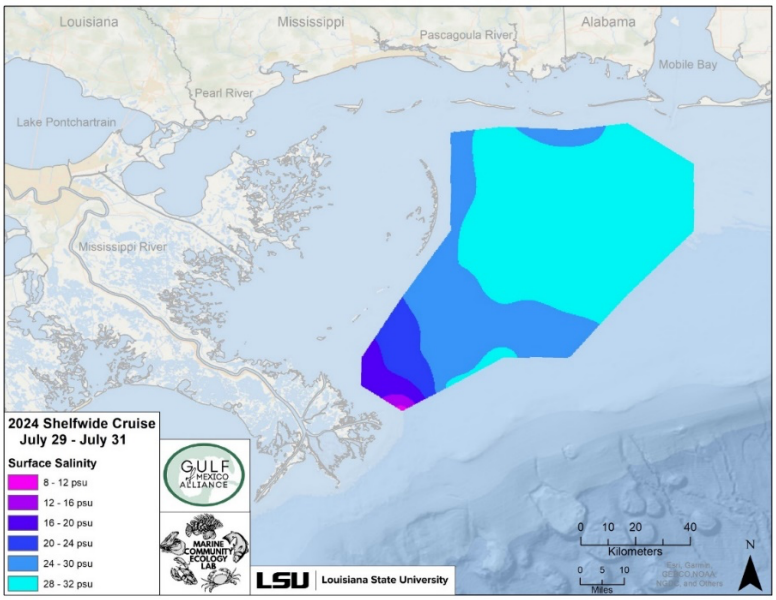


*Figure 3. Distribution of surface water salinity (psu) for 7/28-30/2024. Funding for east of the Mississippi River delta provided by the Gulf of Mexico Alliance and National Oceanic and Atmospheric Administration, National Centers for Coastal Ocean Science. Principal investigator: Nancy N. Rabalais, with co-Principal Investigators, Cassandra N. Glaspie (Chief Scientist) and R. Eugene Turner, Louisiana State University.*

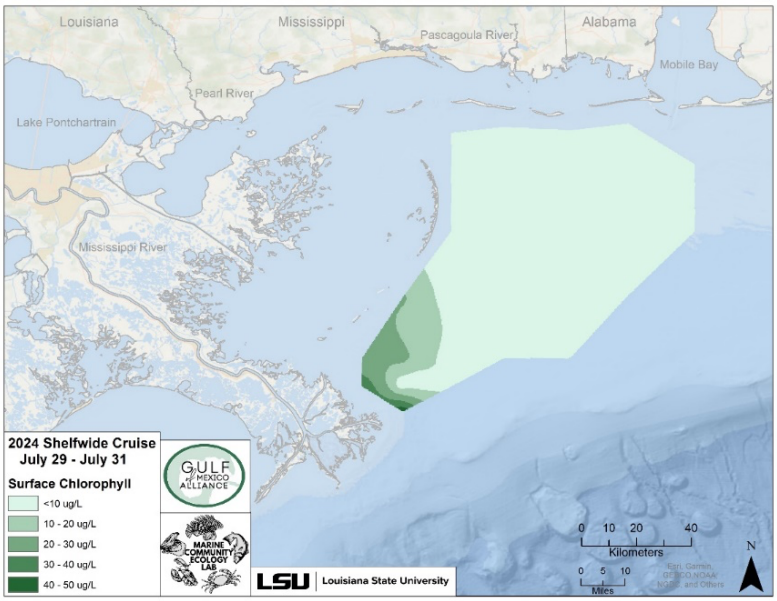


*Figure 4. Distribution of surface water chlorophyll biomass (as micrograms per liter) for 7/28-30/2024. Funding for east of the Mississippi River delta provided by the Gulf of Mexico Alliance and National Oceanic and Atmospheric Administration, National Centers for Coastal Ocean Science. Principal investigator: Nancy N. Rabalais, with co-Principal Investigators, Cassandra N. Glaspie (Chief Scientist) and R. Eugene Turner, Louisiana State University.*

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