

## 'Dead Zone' Present and Growing, Record Year Predicted

A team of scientists from Louisiana State University (LSU) and the Louisiana Universities Marine Consortium is forecasting that the "Dead Zone" off the coast of Louisiana and Texas in July this summer will be the largest since shelfwide measurements began in 1985.

The "Dead Zone" is an area in the Gulf of Mexico where seasonal oxygen levels drop too low to support most life in bottom and near-bottom waters. It is caused when phytoplankton growth, stimulated by nutrients such as nitrogen and phosphorus from the Mississippi and Atchafalaya rivers, settles and decays in the bottom waters. The decomposition of these algae consumes oxygen faster than it can be replenished from the surface, leading to decreased levels of dissolved oxygen. The excessive nutrient loading may also result in the growth of harmful algal blooms and a changed food web that is unfavorable to commercial fisheries. "Low oxygen conditions have been present off Terrebonne and Barataria Bays since March, and the number of stations that are hypoxic is increasing," reported Nancy Rabalais of LUMCON. "We map the whole area on July 21-29."

The modeling effort, led by R. Eugene Turner of LSU, predicts that this summer's "Dead Zone" will be about 10,084 mi<sup>2</sup> (26,118 km<sup>2</sup>), an area about the size of the state of Massachusetts. The average size of the annual hypoxia-affected area since 1990 has been approximately 6,046 mi<sup>2</sup> (15,659 km<sup>2</sup>). Tropical storms and hurricanes have the potential of disrupting the physical structure of the water column and aerating the bottom layer. But if no strong storms appear, then this year's Dead Zone will be 17-21% larger than previously measured (in 2002), and will stretch into Texas continental shelf waters.

This is a preliminary forecast based on nitrate loads from the Mississippi River in May at Baton Rouge, Louisiana. "The prediction of a large hypoxic zone this summer is because the nitrate loading this May, a critical month influencing the size, was exceptionally high," said Turner in explaining the forecast. "The size of the hypoxic zone last year was only slightly below the largest zone measured. The nitrate concentration in May 2008 is 79% of that in May 2007, but the river discharge was 75% higher. This means that nitrogen loading to the Gulf of Mexico in May this year will be 37% higher than last year and the highest since measurements began in 1970. The intensive farming of more land, including crops used for biofuels, has definitely contributed to this high nitrogen loading rate." A final forecast will be made in early July that uses a more robust estimate of nitrogen loading provided by the U.S. Geological Survey.

There are multiple models of the size of the hypoxic zone that are useful in evaluating the influence of nitrogen load and variations in ocean currents on the size of the "Dead Zone." These models do not always produce similar results, and model improvement is one focus of ongoing research. The LSU model is the most accurate model based on past performance, but the ecosystem is evolving. The size of the hypoxic zone for the same amount of nitrogen loading increases each year. Turner wonders if "the model might need to be adjusted to account for the limited space left on the shelf to accommodate the potential size of the hypoxic zone resulting from a nitrogen loading this big." Additional research for model improvement is required before predictions can become an operational forecast for other months.

Notes:

More information for the prediction and hypoxia research is on the Internet: at:

Gulf of Mexico Hypoxia website: <http://www.gulfhypoxia.net/>

and

NOAA/NCCOS/CSCOR Gulf of Mexico Hypoxia Research:

[http://www.cop.noaa.gov/stressors/extremeevents/hab/features/hypoxiafs\\_report1206.html](http://www.cop.noaa.gov/stressors/extremeevents/hab/features/hypoxiafs_report1206.html).

The public release of the 2008 Action Plan and the signing ceremony will be held on June 16 from 1 to 5 pm at The Historic New Orleans Collection, Royal Street Complex, Counting House, at 533 Royal Street, New Orleans, LA.

The public session of the Task Force Meeting will be held on June 17 from 8:30 am to 12:30 pm at the Marriott New Orleans at 555 Canal Street, New Orleans, LA. The purpose of the meeting is to publicly release the 2008 Action Plan; approve the 2008 Annual Operating Plan; and discuss composition of the Task Force.

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