



Everything New Orleans

Gulf's low-oxygen 'dead zone' covers 5,052 square miles along Louisiana's coast

dead zone map 2014

This color-coded map shows oxygen levels in bottom waters of the Gulf of Mexico off the Louisiana coast. The darkest red areas, surrounded by a black line, show where the oxygen level is below 2 parts per million, which is considered hypoxia or the "dead zone."

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This year's low-oxygen "**dead zone**" along Louisiana coast covers 5,052 square miles, an area the size of the state of Connecticut but about 800 square miles less than the **2013 dead zone**, according to a week-long survey released Monday.

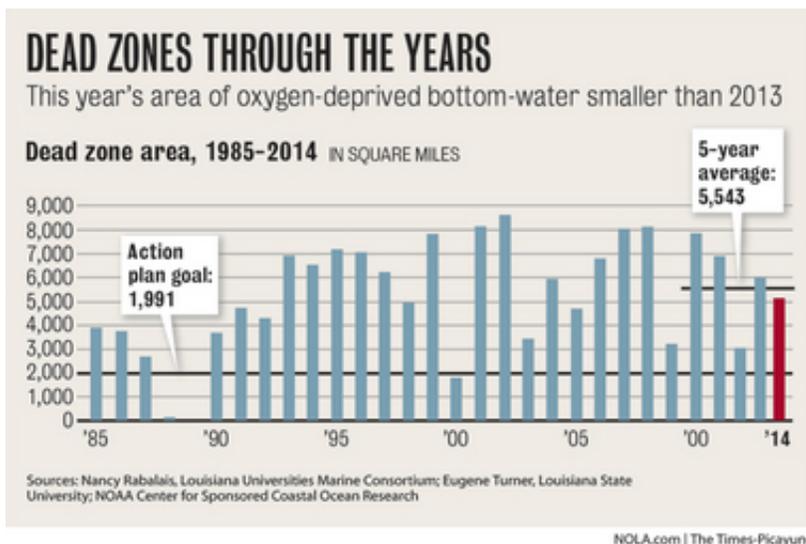
The finding, by a team of scientists led by **Louisiana Universities Marine Consortium** Director **Nancy Rabalais**, is within the range estimated in **late June** by scientists who based their prediction on measurements of the amount of nutrients carried in May by the Mississippi and Atchafalaya rivers. The dead zone is mostly caused by excessive nitrogen, mainly from Midwest agricultural runoff.

Based on the 2014 results, the five-year average size of the low-oxygen area is 5,543 square miles, which is almost three times larger than the target set by a federal/state **Mississippi River Gulf of Mexico Watershed Nutrient Task Force** in 2001 as part of a national effort to reduce the size of the dead zone. The task force goal of reducing the low oxygen zone to 1,991 square miles, or 5,000 square kilometers, was reconfirmed in 2008, but has never been met.

"The Mississippi River discharge levels and associated nutrient data, supplied in May by the **USGS**, pointed to an average size hypoxia area based on the inputs which fuel mid-summer's dead zone algal growth," Rabalais said in a separate news release issued Monday by NOAA.

"If the heavy rains in the Upper Midwest in June and the record high nitrate concentration in the Mississippi River at Baton Rouge on July 18 had coincided with a later survey, chances are that the area would have been larger," she said. "The high phytoplankton biomass and large area of fresher water would have eventually led to more bottom-water hypoxia."

This is the 30th year that Rabalais' LUMCON team has measured the size of the Louisiana dead zone. Louisiana State University and Florida State University scientists participated in this year's cruise.



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This chart shows the size of the "dead zone," with less than 2 parts per million of oxygen, since 1985. A multi-state and federal task force has set a goal of reducing the five-year average size of the dead zone to 5,000 square kilometers, or 1,991 square miles.

The research was paid for by the National Oceanic and Atmospheric Administration, the Environmental Protection Agency's Gulf of Mexico Program and the National Science Foundation.

The size of the low-oxygen area drew an immediate response from several environmental groups that have sued the Environmental Protection Agency in an attempt to get the agency to adopt regulations that would reduce nutrients flowing into the Mississippi by adopting numeric standards for the amount of nitrogen flowing in the river.

"We keep being told by both regulators and industry that a hands-off approach to

dealing with the algae pollution fueling the Dead Zone is working just fine, but the Dead Zone is clearly not going away," said Ann Alexander, a senior attorney with the Natural Resources Defense Council. "As we've seen this week with the drinking water problems in Toledo, we need to take the algae pollution problem more seriously and get tough about regulating it."

Alexander was referring to a ban on the use of tap water that the city of Toledo instituted on Sunday after toxic algae was found in the city's water supply. The algae was tracked to blooms in Lake Erie that scientists believe have been fueled by similar nutrient runoff from agriculture operations and from sewage treatment plants.

"Unfortunately, states and EPA have generally been ignoring or opposing efforts to get more stringent measures in place to deal with the nutrient problem in the Mississippi River basin and nationwide, most recently in their opposition to our lawsuit filed in Louisiana aimed at getting water quality standards in place as a first step to getting this mess cleaned up," Alexander said.

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When nutrient-rich freshwater creates a layer atop the saltier Gulf waters, nitrogen and phosphorus feed huge algae blooms. When the algae die, they sink into the saltier water below and decompose, using up oxygen to create the dead zone.

Matt Rota, senior policy director with the New Orleans-based Gulf Restoration Network, which is one of the plaintiffs in the nutrient lawsuit against the EPA, criticized Louisiana officials, including Attorney General Buddy Caldwell, for actions they've taken to block some EPA nutrient regulation proposals.

"While it is known that Louisiana is not one of the top contributors of Dead Zone-causing pollution, that is where the biggest impacts are felt," Rota said. "Despite this impact, Louisiana is simply not doing enough to make upriver polluters stop polluting the Gulf.

"Louisiana and other Mississippi River states are years behind in developing numeric criteria for nitrogen and phosphorus pollution," he said. "We see most of the Mississippi River states dragging their feet, claiming that voluntary actions alone can clean up the Dead Zone. If the past decade of 'Action Plans' and 'reduction strategies' is any indication, this simply isn't working.

"It is obvious that if the states don't want to address this issue, EPA must act, and regretfully we aren't seeing significant action from EPA either." Rota said.

State Department of Environmental Quality officials overseeing nutrient pollution regulations were unavailable for comment on Monday.

In a Monday news release, the scientists said this year's low-oxygen zone is located in two separate areas, with the largest one stretching across central and southeastern Louisiana between the Atchafalaya and Mississippi rivers. The smaller area is located off southwestern Louisiana.

The low oxygen area contains less than 2 parts per million of oxygen in water at the Gulf's bottom, a condition scientists call hypoxia. The lack of oxygen kills organisms that live on or in the bottom sediment and can cause shrimp, fish and other organisms that live in the water column to avoid the low-oxygen areas.

"The number of dead zones throughout the world has been increasing in the last several decades and currently totals over 550," Rabalais said in the LUMCON release. "The dead zone off the Louisiana coast is the second largest human-caused coastal hypoxic area in the global ocean."

A combination of physical and chemical processes cause the low-oxygen conditions.

Rainwater in the Midwest captures nitrogen fertilizer as it flows across farmland into small streams and rivers and eventually into the Mississippi and Atchafalaya.

As it exits both rivers into the Gulf of Mexico, the fresh water tends to stay on top of the saltier Gulf water until mixed by storms or hurricanes.

The nutrients act as food for huge blooms of algae along the shoreline. When the algae dies, it sinks to the bottom and decomposes, with the decomposition process turning oxygen into carbon dioxide, dropping the oxygen levels to near zero.

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LUMCON research assistant Emma Brogdan and Environmental Protection Agency scientist Kate Pinkerton wrestle a water sample rosette onto the deck of the R/V Pelican during the research cruise.

LUMCON

"The amount of nutrient loading from the river increased considerably in the 1960s as a result of more intense agricultural activity in the watershed," the scientists' release said. While the amount of nitrogen in the river has stabilized in recent years, it's still increasing, and the amount of nitrate among the nutrients in the water also is increasing.

The higher nitrate levels are consistent with higher levels of phytoplankton algae being measured in the Gulf waters where hypoxia is occurring, the news release said.

"Reducing the size of the hypoxic area requires, therefore, changes in land use," the news release said. "Pilot projects and recent development have demonstrated that this can be done for crops with benefits for farm communities, soil health, erosion reduction, and without compromising yields or profit."

Researchers warned that the continuous flow of nutrients, year after year, also results in some of the nitrogen being stored in sediments, where it can be released in later years, adding to the nutrients causing algae blooms.

Rabalais' team found that the discharge of water from the Mississippi this year was near the long-term average since 1935, and that there was a slightly lower nitrate concentration measured this year at Baton Rouge. However, the amount of water flowing out of the river just before the three-week measurement period was slightly above average and the nitrate concentration had reached a near-record high.

"The late burst of nutrient loading and freshwater discharge generated lush conditions for phytoplankton growth off the Mississippi and Atchafalaya rivers," the researchers said. They added that the effects of that growth were exacerbated by recent wind and current directions that pushed Atchafalaya River water to the east, where it joined with Mississippi River water between the two river mouths.

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