

# Spring rains bring life to Midwest granaries but foster Gulf of Mexico 'Dead Zone'

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The most serious ongoing water pollution problem in the Gulf of Mexico originates not from oil rigs, as many people believe, but rainstorms and fields of corn and soybeans a thousand miles away in the Midwest. An expert on that problem—the infamous Gulf of Mexico "Dead Zone"—today called for greater awareness of the connections between rainfall and agriculture in the Midwest and the increasingly severe water quality problems in the gulf.

Keynoting a symposium at the 245th National Meeting & Exposition of the American Chemical Society, the world's largest scientific society, Nancy N. Rabalais, Ph.D., emphasized that oil spills like the 2010 *Deepwater Horizon* disaster, claim a terrible toll. Sometimes, however, they overshadow the underlying [water](#) pollution problem that has been growing more and more severe for almost 40 years.

"The Dead Zone is a vast expanse of water, sometimes as large as the state of Massachusetts, that has so little oxygen that fish, shellfish and other marine life cannot survive," Rabalais explained. "The oxygen disappears as a result of fertilizer that washes off farm fields in the Midwest into the Mississippi River. Just as fertilizer makes [corn](#) and soybeans grow, it stimulates the growth of plants in the water—algae in the Gulf. The algae bloom and eventually die and decay, removing oxygen from the water. The result is water too oxygen-depleted to support life."

An oceanographer and executive director of the Louisiana Universities

Marine Consortium, Rabalais spoke at a special symposium organized by 2012 ACS President Bassam Z. Shakhashiri, Ph.D. Abstracts of other presentations in the event, titled "Water: A Grand Challenge for Science and Society," appear below.

"Shortages in availability of water suitable for drinking, [agriculture](#) and industry are the common denominator in some of the great global challenges facing society in the 21st century," Shakhashiri said. "More than 1 billion people already lack access to reliable supplies of clean water. Climate change, surging population growth and other factors stand to make matters worse. I hope this symposium helps engage scientists in seeking solutions that help sustain Earth and its people."

Rabalais described how the Dead Zone is getting larger and more desolate, with lower concentrations of oxygen dissolved in the water. The Gulf also seems to be more sensitive to the nitrogen and phosphorous fertilizers that wash down the Mississippi River and the Atchafalaya River today than it was in the past. Concentrations of fertilizer that caused a relatively small amount of oxygen depletion now are having a more profound effect.

Fish and shellfish either leave the oxygen-depleted water or die, causing losses to commercial and sports fisheries in the Gulf, she noted. Dead fish sometimes wash up onto beaches, with a negative impact on recreational activities and tourism.

Oil spills and other local pollution compound those negative effects on marine life, Rabalais noted. By day 77 of the *Deepwater Horizon* disaster, for instance, the oil slick had covered about one-third of the Dead Zone, making it even more inhospitable.

The amounts of phosphorus fertilizer compounds in the Lower Mississippi have doubled and nitrogen compounds have tripled nitrogen

over the last 50 years, Rabalais said. Oxygen levels in the Dead Zone have declined in parallel.

Rabalais pointed out that advances in chemistry and other fields do promise solutions. Fertilizers that stay in the soil and resist runoff, for instance, could have a big impact. Genetically modifying crops so that they produce some of their own fertilizer could also help with the problem.

### **More information: Abstract**

Water is life and is to be celebrated

Every day I do, but I annually bring water from the Gulf of Mexico dead zone to a water ceremony at the Unitarian church in Baton Rouge where it is combined with waters from others from all over the world and locally. Some of the water is retained in the urn for the next year's ceremony. Each year I bring my intent to continue to work for water quality in the Mississippi River watershed and its coastal ocean. The distances and seeming disconnects are large, but surprisingly short for a drop of water from the Gulf of Mexico to be transported inland and then flow with other droplets down the river to the ocean.

Provided by American Chemical Society

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