RFA RENEWABLE FUELS ASSOCIATION

The Facts on Ethanol, Corn Production, and Hypoxia in the Gulf of Mexico

In an attempt to divert attention away from the ongoing oil spill disaster in the Gulf of Mexico, opponents of biofuels and agriculture are again dredging up false allegations about the environmental impacts of increasing grain and ethanol production. Specifically, detractors are suggesting that expanded grain and ethanol production in the Midwest is leading to a larger hypoxic area (often erroneously referred to as the "dead zone") in the Gulf of Mexico. However, data and information from government agencies, university researchers, and other sources reveals that there is no correlation whatsoever between recent trends in corn and ethanol production and the size of the Gulf of Mexico hypoxic zone.

What is Hypoxia?

According to the U.S. Geological Survey, hypoxia occurs when oxygen concentrations in water fall below the level necessary to sustain most animal life. Hypoxia results when oxygen consumption exceeds oxygen production through photosynthesis and replenishment from the atmosphere. The presence of excess nutrients in water is thought to lead to reduced oxygen concentrations.

What are the Causes of Hypoxia in the Gulf of Mexico?

Since the Gulf hypoxic zone was first discovered in the 1970s, scientists have struggled to identify its specific causes. It is generally believed that the presence of excess nutrients—such as nitrogen and phosphorous—in the Mississippi and Atchafalaya Rivers lead to the formation of the hypoxic zone every summer. However, determining the precise sources of those excess nutrients has proved challenging.

While some scientists suggest agricultural fertilizers are a primary source of excess nutrients, others believe residential lawn fertilizers, urban storm water run-off, sewer overflows, industrial discharge, and dumping by marine vessels are significant contributors. In fact, Southeast Missouri State University professor and soil scientist Michael Aide says, *"…credible evidence shows that [excess] nutrients [in the Gulf] may also be derived from atmospheric deposition, sewage and industrial discharge and fertilizer runoff from residential areas. Nutrient runoff from suburban areas roughly equals that of agricultural lands."*[1] Further, the scientific community believes naturally occurring events—such as weather patterns, flooding, and atmospheric deposition—significantly contribute to the occurrence and magnitude of hypoxia in the Gulf.

The uncertainty surrounding the sources of excess nutrients in the Gulf and the tremendous year-to-year variability in the size of the hypoxic zone was recently acknowledged by an interagency task force convened to examine the issue. The group recognized that "…uncertainties remain in the ability to characterize the spatial and temporal dynamics of hypoxia and the biological, chemical, and physical properties that contribute to it."[2]

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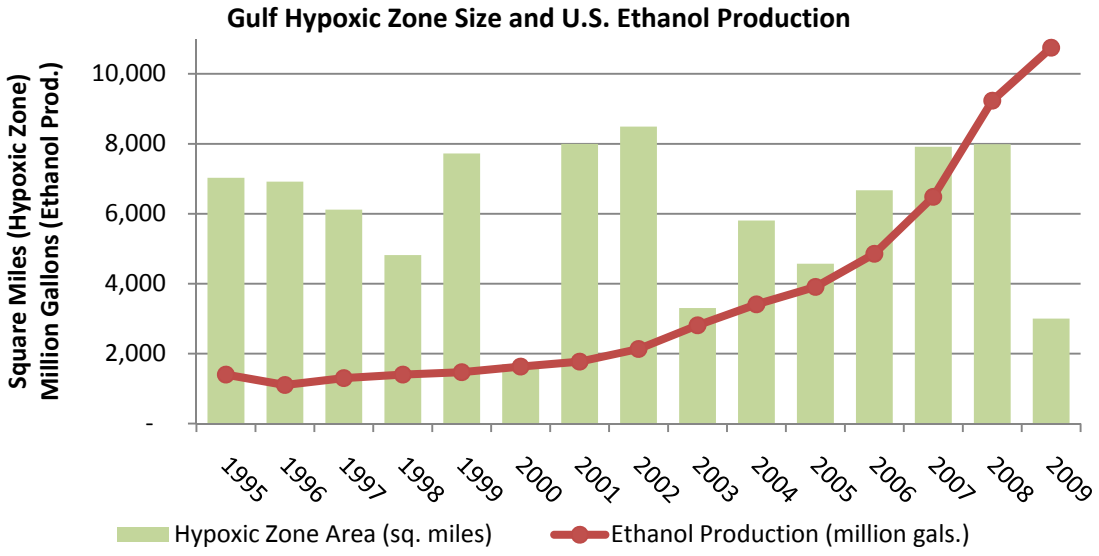
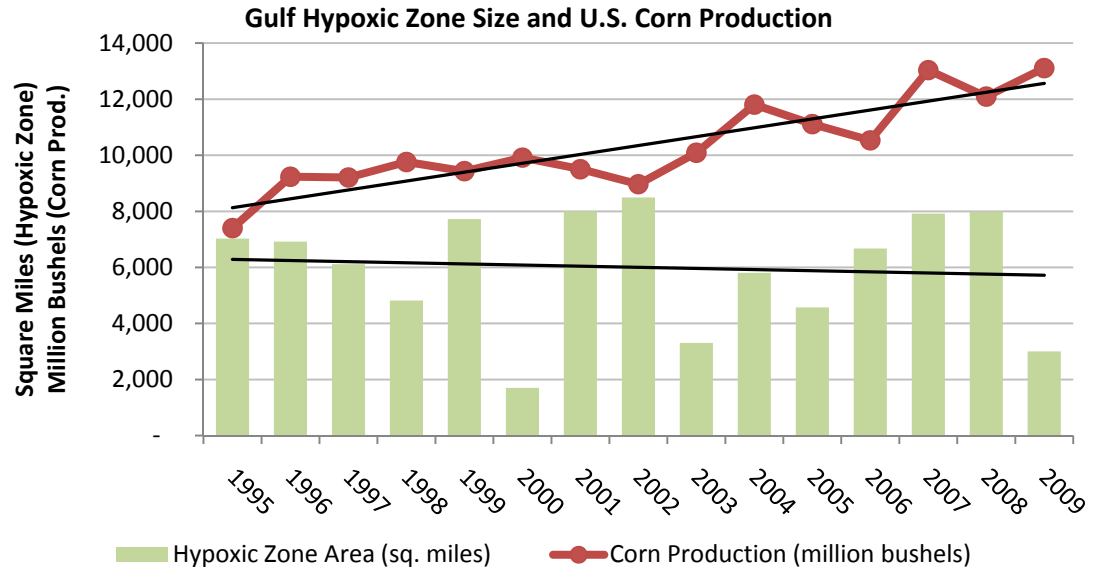
[1] Aide, Michael. Letter to the Editor. Southeast Missourian. February 10, 2008. http://medialab.semissourian.com/story/1310172.html

[2] The Mississippi River/Gulf of Mexico Watershed Nutrient Task Force is a federal interagency working group that includes representation from the National Oceanic and Atmospheric Administration, U.S. Army Corps of Engineers, U.S. Dept. of Agriculture, U.S. Environmental Protection Agency, U.S. Dept. of the Interior, White House Office of Science and Technology Policy, Council on Environmental Quality and various state agencies from Arkansas, Illinois, Iowa, Louisiana, Minnesota, Mississippi, Missouri, Ohio, Tennessee, and Wisconsin. The draft Action Plan is available at http://www.epa.gov/msbasin/taskforce/pdf/2008draft_actionplan.pdf

Is the Gulf of Mexico Hypoxic Zone Growing as U.S. Corn and Ethanol Production Increases?

Detractors of the biofuels and agriculture industries have attempted to suggest increased corn and ethanol production in the Midwest is causing the Gulf hypoxic zone to expand. Yet, data from university researchers and government agencies tells a much different story. At 3,000 square miles, *the Gulf hypoxic zone in 2009 was the smallest in 10 years and the second-smallest in the last 20 years*. Meanwhile, farmers harvested the largest crop on record and the ethanol industry produced a record amount of biofuel. The hypoxic zone may be relatively small again in 2010. According to a USGS official, the 2010 spring nutrient load transported to the northern Gulf of Mexico is about 11 percent less than the average over the last 30 years.[3] Data from university and government sources clearly show that there is absolutely no correlation between the size of the annual Gulf hypoxic zone and yearly corn and ethanol production.





Sources: U.S. EPA, Louisiana Universities Maritime Consortium (LUMCON), USDA, RFA

[3] Matt Larsen, USGS associate director for water. http://www.ur.umich.edu/update/archives/100628/deadzone

What are Farmers Doing to Mitigate Their Environmental Impacts?

Midwestern farmers are actively engaging in practices to conserve soil, restore and enhance wetlands, and reduce nutrient application. A number of new technologies and practices—such as the use of nitrogen inhibitors and variable application technologies—are making fertilizer application more efficient than ever. The amount of fertilizer applied per bushel of corn produced continues to decline. It is estimated that in 2005 (the most recent year for which fertilizer application data is available), U.S. farmers applied nearly **40 percent less nitrogen and 51 percent less phosphate** per bushel of corn than was applied in 1980.

		1980	2005	Change (%)
Corn Production				
Corn Acres Planted	*million*	**84.0**	**81.8**	**-2.6**
Corn Acres Harvested	*million*	**73.0**	**75.1**	**+2.9**
Corn Yield	*bu./acre*	**91.0**	**148.0**	**+62.6**
Total Production	*mil. bu.*	**6,639**	**11,112**	**+67.4**
Nutrient Use per Bushel Produced				
Nitrogen per bushel	*lbs./bu.*	**1.567**	**0.972**	**-38.0**
Phosphate per bushel	*lbs./bu.*	**0.874**	**0.432**	**-50.6**
Potash per bushel	*lbs./bu.*	**0.874**	**0.396**	**-54.7**
Aggregate Nutrient Use				
Total Fertilizer Used	*mil. tons*	**10.6**	**9.6**	**-10.0**

Sources: USDA; The Fertilizer Institute

Additionally, most corn produced today is grown under conservation practices, which reduces the potential for nutrient loss and erosion. According to a recent Conservation Technology Information Council survey, nearly 55 percent of farmers surveyed are practicing conservation tillage and 77 percent are engaged in crop residue management. Only 23.5 percent of farmers used conventional tillage in 2006, down from nearly 40 percent in 1990. Conservation tillage practices reduce rainfall runoff by more than 60 percent and soil loss by more than 90 percent.

Further, in the next several years, seed companies are expected to introduce corn hybrids containing biotechnology traits designed to further increase corn nitrogen, phosphorous and potassium utilization efficiency.