MERCOLA
Take Control of Your Health

Gulf of Mexico Now Largest Dead Zone in the World, and Factory Farming Is to Blame

Analysis by Dr. Joseph Mercola | December 28, 2023

STORY AT-A-GLANCE

- By 2017 nitrogen fertilizers and sewage sludge runoff from factory farms were responsible for creating a dead zone in the Gulf of Mexico spanning more than 8,700 square miles — at that time the largest recorded dead zone in the world
- Seven million Americans have levels of nitrates in their drinking water that are high enough to be associated with cancer, according to some studies
- Nitrogen builds up far below the soil surface where it can continue to leach into groundwater for 35 years. This means environmental concerns remain for decades even if nitrogen fertilizer use stops
- The environmental group, Mighty, has launched a national #CleanItUpTyson campaign, calling for the meat company to clean up pollution from its supply chain
- No-till alone cannot reduce water pollution. Other regenerative methods must also be used. Adding native prairie strips to 10% of crop areas reduces phosphorus and nitrogen runoff by 77% and 70% respectively, and lowers nitrate concentrations in groundwater by 72%

Editor's Note: This article is a reprint. It was originally published October 17, 2017.

As reported by CBS Miami (above), by 2017 nitrogen fertilizers and sewage sludge runoff from factory farms were responsible for creating an enormous dead zone in the Gulf of Mexico. As fertilizer runs off farms in agricultural states like Minnesota, Iowa,

Illinois, Wisconsin, Missouri and others, it enters the Mississippi River, leading to an overabundance of nutrients, including nitrogen and phosphorus, in the water.

This, in turn, leads to the development of algal blooms, which alter the food chain and deplete oxygen, resulting in dead zones. In 2017 the dead zone in the Gulf of Mexico was the largest recorded dead zone in the world,[1] beginning at the Mississippi River delta and spanning more than 8,700 square miles — about the size of New Jersey.

Needless to say, the fishing industry is taking a big hit, each year getting worse than the last. The featured news report includes underwater footage that shows you just how bad the water quality has gotten.

Gulf of Mexico — Largest Dead Zone in the World

Nancy Rabalais, professor and Shell Endowed Chair of oceanography at Louisiana State University, is an expert on dead zones. She has measured oxygen levels in the Gulf since 1985, and blames agricultural runoff entering the Mississippi River for this growing environmental disaster. Recent measurements reveal the area has only half the oxygen levels required to sustain basic life forms.

> *"The solution lies upstream in the watershed,"* she says, *"with agricultural management practices; a switch to crops that have deeper roots and don't need so much fertilizer and are still just as profitable as corn."*

According to CBS, the U.S. Environmental Protection Agency has created a task force to assess dead zones, and hope to reduce nutrient-rich agricultural runoff by 20% by 2025. Common sense will tell you that's nowhere near enough. A study[2] published last year revealed nitrogen builds up far below the soil surface, where it can continue to leach into groundwater for 35 years.

This means environmental concerns would persist for decades even if farmers were to stop using nitrogen fertilizers altogether. The researchers analyzed more than 2,000 soil samples from the Mississippi River Basin, finding nitrogen buildup at depths of 10 inches to 3.2 feet. According to the authors:

> *"[W]e show that the observed accumulation of soil organic [nitrogen] … in the [Mississippi River Basin] over a 30-year period … would lead to a biogeochemical lag time of 35 years for 99% of legacy [soil organic nitrogen], even with complete cessation of fertilizer application.*
>
> *By demonstrating that agricultural soils can act as a net [nitrogen] sink, the present work makes a critical contribution towards the closing of watershed [nitrogen] budgets."*

Lake Erie Suffers From Chemical Pollution

The problem is hardly restricted to the Gulf of Mexico. Many other waterways are being choked by agricultural chemicals as well. Lake Erie, for example, in 2017 reported a 700-square-mile algal bloom,[3] the toxins from which may also contaminate drinking water.

Algal blooms also fill the largest tributary to the Great Lakes, the Maumee River. At present, officials claim microcystin levels (toxins produced by the algae) in intake pipes from Lake Erie are low, but that can change at any time.

In 2014, Toledo, Ohio, was forced to shut off the supply of drinking water to half a million residents for three days due to elevated microcystin levels in the water. The algae also hurt the regional economy each year, as recreational fishing and beach visits must be restricted. Lake Erie began experiencing significant problems in the early 2000s.

Over the years, it's only gotten more extensive, the bloom covering an increasingly larger area. The University of Michigan is now using a robotic lake-bottom laboratory to track microcystin levels in the lake (see video above), thereby allowing them to detect and report water safety issues to water management officials more quickly.

Toledo Mayor Appeals to President Trump — 'Declare Lake Erie Impaired'

According to a study by the Carnegie Institute for Science and Stanford University, the expansion of algal bloom in Lake Erie is primarily attributable to a rise in the amount of dissolved phosphorus from farm land entering the lake. Part of the problem is that agricultural runoff is typically exempt from clean water laws.

On September 26, 2017, Toledo mayor Paula Hicks-Hudson urged the federal government to declare Lake Erie impaired due to excessive algae.[4] Doing so would allow the lake's nutrient load to be regulated under the Clean Water Act. Many activists believe Hicks-Hudson has been too slow to act, and still isn't taking it far enough. The Blade reports:[5]

> *"Activist Mike Ferner dumped a pitcher of algae-infested water and two dead fish into One Government Center's public fountain … to highlight the condition of the river and lake. Mr. Ferner, joined by more than a dozen other members of the Advocates for a Clean Lake Erie group he founded in response to the 2014 Toledo water crisis, said the protest was in response to foot-dragging by local, state and federal officials.*
>
> *He said the administrations of Mayor Hicks-Hudson and Ohio Gov. John Kasich are complicit in allowing manure and other farm fertilizers to pollute the water because they won't call for the open water of Lake Erie to be designated as impaired."*

Drinking Water Threatened by Agricultural Pollution

Agricultural runoff threatens drinking water across the U.S. as well. As reported by Fern's AG Insider:[6]

> *"Seven million Americans who live in small cities and towns have worrisome levels of nitrates in their drinking water — below the federal limit of 10 milligrams per liter, but high enough to be associated with cancer in some studies, said an Environmental Working Group official.*

Craig Cox, head of EWG's Midwest office, said 1,683 communities had nitrate levels above 5 milligrams per liter and, when plotted on a map, they 'crazily lined up with intensive agriculture.' Farm use of nitrogen fertilizer is regarded as a frequent source of nitrates in groundwater. Soils also shed nitrates naturally. Urban runoff and septic systems also are sources."

Meat Industry Implicated in Creation of Gulf Dead Zone

According to Mighty Earth,[7] an environmental group chaired by former Congressman Henry Waxman, a "highly industrialized and centralized factory farm system" — consisting of a fairly small number of individual corporations — are responsible for a majority of the water contamination and environmental destruction we're currently facing. Tyson Foods, which produces chicken, beef and pork, was identified as one of the worst offenders. As reported by The Guardian:[8]

"Tyson, which supplies the likes of McDonald's and Walmart, slaughters 35 [million] chickens and 125,000 head of cattle every week, requiring five million acres of corn a year for feed, according to the report. This consumption resulted in Tyson generating 55 [million] tons of manure last year … with 104 [million] tons of pollutants dumped into waterways over the past decade.

The Mighty research found that the highest levels of nitrate contamination correlate with clusters of facilities operated by Tyson and Smithfield, another meat supplier …

The report urges Tyson and other firms to use their clout in the supply chain to ensure that grain producers such as Cargill and Archer Daniels Midland employ practices that reduce pollution flowing into waterways. These practices include not leaving soil uncovered by crops and being more efficient with fertilizers so plants are not doused in too many chemicals."

October 2, the group launched its national #CleanItUpTyson campaign,[9] calling for Tyson, the largest meat company in the U.S., to "clean up pollution from its supply chain

that's contaminating local drinking water and causing a massive dead zone in the Gulf of Mexico." According to Mighty Earth:

> *"The local campaigns are part of Mighty Earth's national effort to hold the meat industry accountable for reducing its vast environmental impact, which is driving widespread water pollution, clearance of natural landscapes, high rates of soil erosion, and greenhouse gas emissions. Local communities from the Heartland to the Gulf are among those most affected by the meat industry's impacts, and pay billions each year in clean-up costs."*

Factory Farming — The Ultimate Threat to Life on Earth

According to Philip Lymbery, global CEO of Compassion in World Farming and author of "Farmageddon" and "Dead Zone" — two books detailing the destructive impact of industrial agriculture — factory farming is a threat to all life on Earth.

Speaking at an Extinction and Livestock Conference in London, Lymbery said: "Every day there is a new confirmation of how destructive, inefficient, wasteful, cruel and unhealthy the industrial agriculture machine is. We need a total rethink of our food and farming systems before it's too late."[10]

As noted by The Guardian,[11] a number of "alarming exposés" have been featured as of late, including "chicken factory staff in the U.K. changing crucial food safety information on chickens," and an admission by the European commission last month that "eggs containing a harmful pesticide may have been on sale in as many as 16 countries."

And, of course, the Gulf of Mexico being earning the recent designation of having the largest dead zone ever recorded. According to Lymbery:

> *"We need to go beyond an isolated approach. Not just looking at the technical problems around welfare, not just looking at the technical issues around the environment, not just looking at food security in isolation, but putting all of these issues together, then we can see the real problem that lies at the heart of our food system — industrial agriculture.*

Factory farming is shrouded in mythology. One of the myths is that it's an efficient way of producing food when actually it is highly inefficient and wasteful. Another is that the protagonists will say that it can be good for the welfare of the animals. After all, if hens weren't happy they wouldn't lay eggs. The third myth is that factory farming saves space.

On the surface it looks plausible, because, by taking farm animals off the land and cramming them into cages and confinement you are putting an awful lot of animals into a small space. But what is overlooked in that equation is you are then having to dedicate vast acreages of relatively scarce arable land to growing the feed …

The UN has warned that if we continue as we are, the world's soils will have effectively gone within 60 years. And then what? We shouldn't look to the sea to bail us out because commercial fisheries are expected to be finished by 2048."

No-Tillage Alone Cannot Make a Dent in Nitrate Pollution Problem

Lymbery, as many others, myself included, point out that the answer is readily available and implementable. Regenerative farming can solve this and many other environmental and human health problems, if done in a thorough and holistic manner. No-till agriculture, which has become increasingly embraced as a solution to water pollution and other environmental problems associated with modern farming, is nowhere near enough.

While it's certainly useful, and a method employed in regenerative agriculture, it alone cannot address the growing problems of chemical pollution. This was also the conclusion of a recent U.S. Department of Agriculture study. As reported by Indiana University:[12]

"Researchers in the Department of Earth Sciences in the School of Science at IUPUI conducted a meta-analysis to compare runoff and leaching of nitrate

from no-till and conventional tillage agricultural fields. Surface runoff and leaching are two major transportation pathways for nitrate to reach and pollute water.

Due to its mobility and water solubility, nitrate has long been recognized as a widespread water pollutant. 'What we found is that no-till is not sufficient to improve water quality,' said Lixin Wang, an assistant professor and corresponding author of the paper.

'In fact, we found that no-till increased nitrogen leaching.' The study suggests that no-till needs to be complemented with other techniques, such as cover cropping and intercropping or rotation with perennial crops, to improve nitrate retention and water-quality benefits."

Other recent research[13] confirms that adding native prairie strips to the rural landscape can help reduce water pollution from farm fields. Prairie strips refers to small patches of land around the edges of crop fields where native, perennial grasses and flowers are allowed to grow wild. The results show that converting as little as 10% of crop areas into prairie strips:[14,15]

- Reduces soil loss by 95%
- Reduces phosphorus runoff by 77% and lowers nitrogen loss through runoff by 70%
- Lowers nitrate concentrations in groundwater by 72%
- Improves water retention
- More than doubles the abundance of pollinators and birds

Regenerative and Biodynamic Farming to the Rescue

The only viable long-term answer is regenerative agriculture (which goes beyond mere sustainability), for which **biodynamic farming** stands as a shining ideal. In addition to no-till, regenerative farming focuses on such practices and concepts as rotational

grazing, improvement and building of topsoil (which includes cover cropping), the use of all-natural soil amendments and increasing biodiversity.

Aside from putting an end to water and soil pollution, regenerative agriculture is also needed to protect future generations from the devastating harm caused by pesticides. The amount of pesticides used both commercially and in residential areas has grown immensely since 1945.

More than 1 billion pounds are used each year in the U.S. alone. Worldwide, an estimated 7.7 billion pounds of pesticides are applied to crops each year, and that number is steadily increasing.[16] According to a 2012 analysis,[17] each 1% increase in crop yield is associated with a 1.8% increase in pesticide use.

Logic tells us this is an unsustainable trajectory. As just one example, studies done by the Chinese government show that 20% of arable land in China is now unusable due to pesticide contamination.[18] Earlier this year, two United Nations experts called for a comprehensive global treaty to phase out pesticides in farming altogether, noting that pesticides are in no way essential for the growing of food.[19]

The report highlighted developments in regenerative farming, where biology can completely replace chemicals, delivering high yields of nutritious food without detriment to the environment. "It is time to overturn the myth that pesticides are necessary to feed the world and create a global process to transition toward safer and healthier food and agricultural production," they said.

Each Day's Meal Can Help Bring Us Closer to the Tipping Point

You can help steer the agricultural industry toward safer, more sustainable systems by supporting local farmers dedicated to regenerative farming practices. The Demeter mark, indicative of Biodynamic certification, is the new platinum standard for high-quality foods raised and grown in accordance to the strictest environmental parameters possible.

Biodynamic is essentially organic on steroids, far surpassing it in terms of its environmental impact. Unfortunately, Biodynamic certified foods are still scarce in the U.S., unless you happen to live near a certified farm.

Most Biodynamic farms only sell locally or regionally. You can find a directory of certified farms on **biodynamicfood.org**. We hope to change that as we move forward, and building consumer demand is what will drive that change. Other U.S.-based organizations that can help you locate wholesome farm-fresh foods include the following:

American Grassfed Association — The goal of the American Grassfed Association is to promote the grass fed industry through government relations, research, concept marketing and public education.

Their website also allows you to search for AGA approved producers certified according to strict standards that include being raised on a diet of 100% forage; raised on pasture and never confined to a feedlot; never treated with antibiotics or hormones; born and raised on American family farms.

EatWild.com — EatWild.com provides lists of farmers known to produce raw dairy products as well as grass fed beef and other farm-fresh produce (although not all are certified organic). Here you can also find information about local farmers markets, as well as local stores and restaurants that sell grass fed products.

Weston A. Price Foundation — Weston A. Price has local chapters in most states, and many of them are connected with buying clubs in which you can easily purchase organic foods, including grass fed raw dairy products like milk and butter.

Grassfed Exchange — The Grassfed Exchange has a listing of producers selling organic and grass fed meats across the U.S.

Local Harvest — This website will help you find farmers markets, family farms and other sources of sustainably grown food in your area where you can buy produce, grass fed meats and many other goodies.

National Farmers Markets Directory — A national listing of farmers markets.

Eat Well Guide: Wholesome Food from Healthy Animals — The Eat Well Guide is a free online directory of sustainably raised meat, poultry, dairy and eggs from farms, stores, restaurants, inns, hotels and online outlets in the United States and Canada.

Community Involved in Sustaining Agriculture (CISA) — CISA is dedicated to sustaining agriculture and promoting the products of small farms.

The Cornucopia Institute — The Cornucopia Institute maintains web-based tools rating all certified organic brands of eggs, dairy products and other commodities, based on their ethical sourcing and authentic farming practices separating CAFO "organic" production from authentic organic practices.

RealMilk.com — If you're still unsure of where to find raw milk, check out Raw-Milk-Facts.com and **RealMilk.com**. They can tell you what the status is for legality in your state, and provide a listing of raw dairy farms in your area. The Farm to Consumer Legal Defense Fund[20] also provides a **state-by-state review of raw milk laws**.[21] In

California, Raw Farm, formerly Organic Pastures, is licensed to sell raw dairy products.

Sources and References

- [1] National Oceanic and Atmospheric Administration. August 2, 2017
- [2] Environmental Research Letters March 15, 2016
- [3] The New York Times. Miles of Algae Covering Lake Erie. October 3, 2017
- [4, 5] The Blade September 26, 2017
- [6] Fern's AG Insider October 4, 2017
- [7] MightyEarth.org
- [8] The Guardian August 1, 2017
- [9] Mighty, #CleanItUpTyson Campaign
- [10, 11] The Guardian October 4, 2017
- [12] Indiana University September 22, 2017
- [13] Proceedings of the National Academy of Sciences August 1, 2017
- [14] Iowa State University. Prairie Strips: Small Changes, Big Impacts. June 2017
- [15] Science Daily October 2, 2017
- [16, 17] Ensia June 22, 2016
- [18] The Guardian March 7, 2017
- [19] The Independent March 7, 2017
- [20] The Farm to Consumer Legal Defense Fund
- [21] The Farm to Consumer Legal Defense Fund, State by State Review of Raw Milk Laws