

Mississippi River Basin / Gulf of Mexico Nutrient Runoff Network Info Bulletin

Sharing information and making connections from the headwaters to the gulf

September 11, 2023

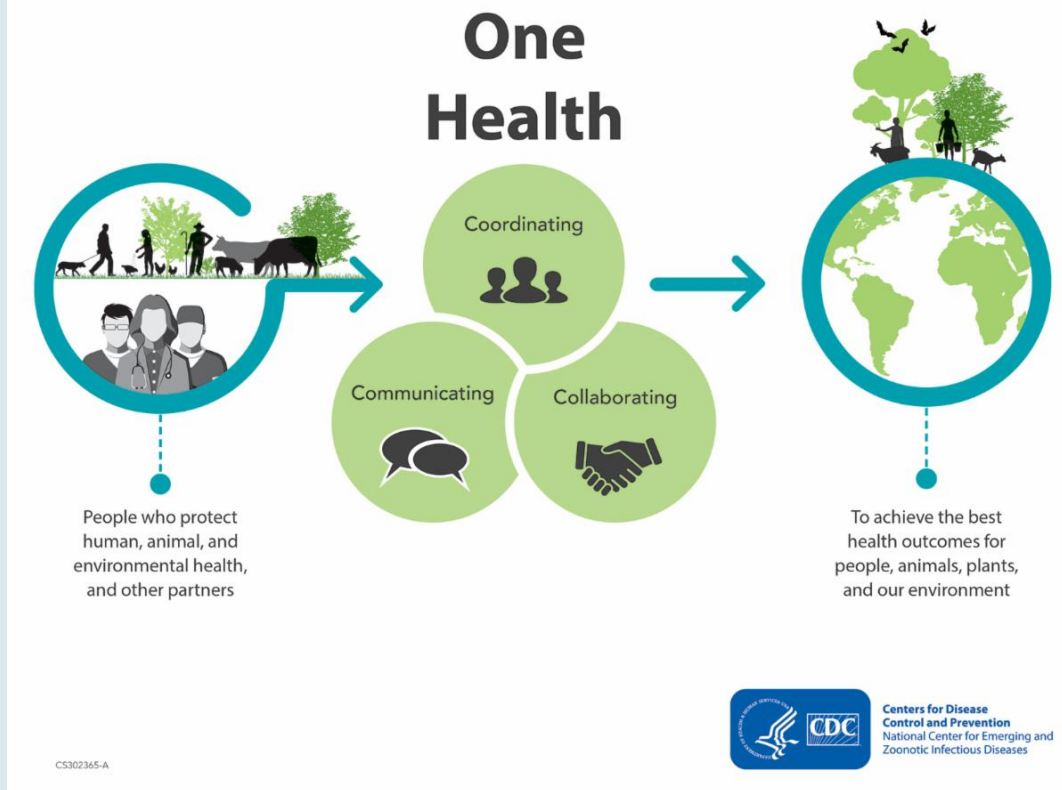
Welcome!

This bulletin is designed as a way to share information with those interested in nutrient runoff issues and impacts. ***We hope you find this a valuable resource and encourage you to be a part of the exchange!*** You can share resources or information for inclusion in future bulletins, or join the distribution list, by sending an email to noaa.centralregion@noaa.gov.

Spotlight: One Health

One Health is a concept which recognizes the ties between environmental and ecosystem health and the health of humans, animals, and plants. Although not a new concept, this has recently been the focus of global and national health organizations, including the Center for Disease Control and Prevention (CDC). The CDC's [One Health initiative](#) is described as being "a collaborative, multi-sectoral, and transdisciplinary approach — working at the local, regional, national, and global levels — with the goal of achieving optimal health outcomes recognizing the interconnection between people, animals, plants, and their shared environment." As natural and anthropogenic changes have occurred around the world, health concerns requiring multi-disciplinary cooperation have increased. Examples of One Health issues include zoonotic diseases, antimicrobial resistance, food safety, and contamination of water by many sources - including nutrient runoff. To address these issues, a One Health approach calls upon experts across all relevant disciplines to participate in monitoring, mitigating, and learning about an issue to achieve the best outcome for people, animals, and plants in a shared environment.

The National Oceanic and Atmospheric Administration ([NOAA](#)) [also applies the One Health approach](#) to NOAA's science and services by focusing on the connection between environmental conditions and health outcomes. The first NOAA One Health Summit was hosted in August, 2023, and was preceded by a webinar series highlighting health work being done in each of the eight NOAA regions supporting this One Health approach.



The Centers for Disease Control and Prevention illustrates the concept of One Health by showing that it takes experts from all disciplines working together to achieve the best health outcomes in a shared environment. (Centers for Disease Control and Prevention)

[One Health Harmful Algal Bloom System - Keeping Track of Toxic Impacts](#)

The CDC's [One Health Harmful Algal Bloom System \(OHHABS\)](#) is a One Health surveillance system serving as a place for public health departments and their environmental health and animal health partners to report occurrences of illnesses caused by harmful algal bloom (HAB) toxicity. This voluntary reporting system collects data on human and animal illnesses caused by HABs, and information on the surrounding environmental conditions, so scientists and land managers can better define patterns of occurrence, protect water and food supplies, and communicate with the public to prevent future illnesses. In addition to serving as a repository for data, OHHABS provides a [partner toolkit](#) with outreach materials and other resources related to HABs and their effects.

The [2021 OHHABS Summary Report](#) includes data shared by 16 states on 368 HABs resulting in 117 human illnesses and at least 2,715 animal illnesses. Most (90%) of these reported cases resulted from freshwater HABs, and for those salt-water cases reported, *Pseudo-nitzschia* was found to be the causative organism. None of the Gulf of Mexico states contributed to this most recent OHHABS report, which may explain why there were no reports of illnesses caused by *Karenia brevis*, a common cause of HABs in the Gulf.

[The Harmful Algal Blooms Observing System - Tracking HABs in the Gulf of Mexico](#)

A good example of the work NOAA is doing in the One Health space is the [Harmful Algal BloomS Observing System \(HABSOS\)](#). HABSOS is a data collection and distribution system designed to provide environmental managers, scientists, and the public with a tool for tracking and observing current and historical HAB events in the Gulf of Mexico. The HABSOS interactive map combines *Karenia brevis* cell counts and associated environmental information into a single product, using the latest sample data available to create an accurate picture of HAB location and quantity.

Nutrient Runoff News

[Smaller than Average Dead Zone Measured in Gulf of Mexico](#)

This year's annual survey cruise in the Gulf of Mexico found the dead zone, an area of low to no oxygen harmful to marine life, to be [approximately 3,058 square miles](#). This area, also known as the hypoxic zone, was the 7th smallest recorded in 37 years of surveying, and it brings the 5-year average size down to 4,347 square miles. However, this is still more than twice as large as the management goal of 1,930 square miles set by the [Hypoxia Task Force](#), and this year's lower-than-average size may not be attributable to better land management within the Mississippi River Basin. The Mississippi River supplies most of the excess nutrients which act as a key driver for the size of each year's dead zone, and this year's flow was much lower than average. As part of 2021's Bipartisan Infrastructure Law, \$60 million was allocated to fund nutrient reduction efforts through the [Gulf Hypoxia Program](#). This funding will support the work of protecting water quality, supporting fisheries, creating a more stable economy and advance progress towards collective water quality goals across the Mississippi River Basin and Gulf of Mexico.

[The Dead Zone: What Is It, and How Can We Fix It?](#)

Interested in learning more about what makes an area a "dead zone," and what can be done to address it in the Gulf of Mexico? This [educational video](#) put out by the National Oceanic and Atmospheric Administration (NOAA) shows how activities occurring in the 31 states comprising the Mississippi River drainage basin contribute to the Gulf's dead zone, and describes steps we can take to help improve the situation for this critical ecosystem.

[A Wealth of Information: The Economics of Farming Conservation Practices](#)

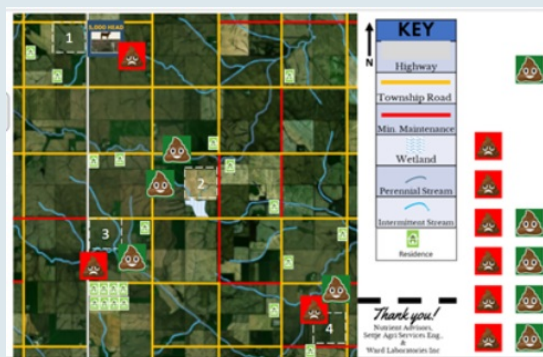


Information on the profitability of agricultural conservation practices can go a long way in convincing farmers to try out new techniques meant to protect soil and water. However, even when the relevant cost/benefit information exists, it can be hard to know where to find it. Since 2015, the North Central Region's Soil Health Nexus has been collecting information, studies, and reports on the economics of farming conservation practices. The [Conservation Economics and Finance Resource Hub](#) collects research and reports on the economics of cover crops, conservation tillage, nutrient management, and managed grazing. All of the

information is organized under those four categories, and each item includes a title, the source, and a short description for ease of use. Funded by the North Central Region Water Network, the Soil Health Nexus is made up of representatives from Land Grant Universities across a 12-state region of the Upper Mississippi River Basin working to address the challenges of increasing access to soil health research, knowledge, extension, and resources. *(Photo: The North Central Region Water Network is a 12-state collaboration designed to enhance connectivity and coordination. Northcentralwater.org)*

[New Interactive Nutrient Management Exercise](#)

For land managers dealing with manure such as agriculture state agencies, manure applicators, concentrated animal feeding operation (CAFO) producers and employees, and others, attending required training just got more exciting. A new [interactive exercise](#) developed by extension professionals in Nebraska and Minnesota allows land managers to make hypothetical manure application decisions and discuss the real-time tradeoffs and risk balancing that takes place when making decisions on a field-by-field basis.



In [describing the effect of this training](#) on her work in Nebraska, Leslie Johnson said, "Since we started using the exercise, participant discussion has increased dramatically. Because the exercise requires active participation, very few participants feel comfortable just passively observing the activities and discussion," Johnson is the Animal Manure Applicator Extension Educator at the University of Nebraska and a member of the team responsible for this new training. Continuing to highlight the positive feedback of trainees, she added, "Most notably, participants are surprised when the exercise is completed and how quickly the training has gone. Their engagement in discussion distracts them from watching the clock, which we feel is a

complement to the program. Evaluations administered at the end trainings indicate that the favorite part of the program is engagement within groups and the ability to ‘visualize and understand nutrient application’.”
(Photo: The curricula contains a map where participants keep track of their progress visually as they work through the different activities. Livestock and Poultry Environmental Learning Community; LPELC.org)

[The Uncertainty of Phosphorus Monitoring](#)

For land managers tracking the phosphorus-loss from a farm, it is critical to [understand how uncertainty changes](#) with different edge-of-field monitoring strategies. Sub-surface drainage and overland flow are both pathways for phosphorus loss from a farm field. Monitoring how much phosphorus is lost is key to understanding the effectiveness of conservation practices aimed at keeping this critical nutrient on the fields and out of waterways. Monitoring for this phosphorus loss involves collecting water samples, typically done following one of three strategies: 1) flow-proportional sampling; 2) time-proportional sampling, or 3) grab-sampling. However, the strategy chosen has an impact on the uncertainty of the phosphorus-loss estimate - it is important to select an appropriate strategy based on your project objective!

[One Good Idea: Learning From Each Other to Improve How We Farm](#)

For farmers considering making a change in how they do business, hearing other farmers describe their own experience can help with the decision. To give farmers a place where they can learn from one another, [One Good Idea](#) is a clearinghouse of videos and podcasts featuring farmers' ideas and experiences with practices that are helping them improve their soil, land, water, and bottom lines. These helpful videos and podcasts address topics such as cover crops, tillage, nutrient management, livestock management, water management, land stewardship, and economics, with the goal of farmers teaching farmers how to be profitable and successful using what they have learned.

A good example of the stories found at One Good Idea comes from Bob Uphoff, who shares [his experience farming without tillage](#). Bob farms with his two sons just south of Madison, WI, raising hogs and grain crops. The Uphoffs began to integrate no-till farming practices into their operation over four decades ago and have since transitioned all of their acres to no-till. In this 25-minute video, Bob describes how he made changes over time to make no-till farming work for him on his farm, and gives advice on how others can get started.

Outlooks and Forecasts

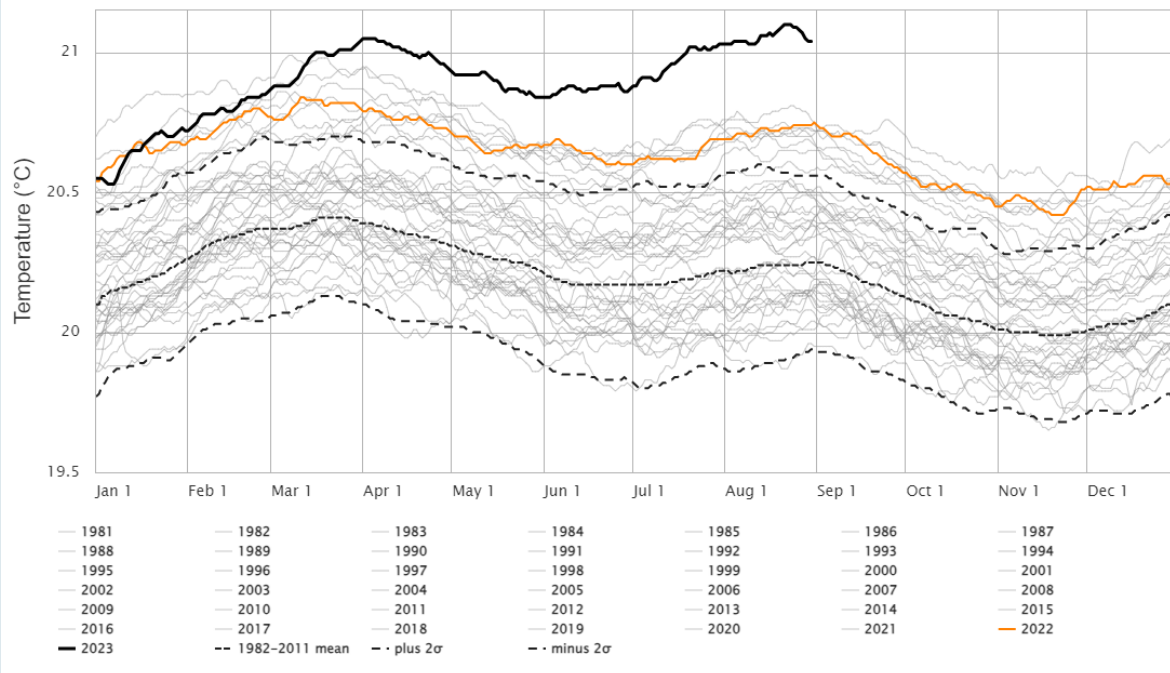
[Strong El Niño, Record Ocean Warmth](#)

El Niño, a climate pattern driven by above-average sea-surface temperatures in the central and eastern tropical Pacific Ocean, can have significant impact on wintertime weather in the Mississippi River Basin and Gulf of Mexico. While we officially crossed the El Niño threshold (+0.5 degrees Celsius) in spring, current forecasts call for a strengthening of this pattern into the winter and lasting at least into spring 2024. For the U.S., El Niño generally brings warmer winters to the north-central and northwestern states, drier weather for the Ohio River Valley, and colder and wetter conditions for the south.

[This thorough article](#) by Andrej Flis provides a great deep dive on what leads to an El Niño, what characterizes this type of climate pattern, and what we can expect for this winter in the U.S. Part of what makes the current El Niño notable is that its occurring against a backdrop of record-high global ocean temperatures. With these abnormally warm global oceans in mind, Andrej says, "we are entering uncharted waters with such a global configuration, so this El Niño might be something we have not seen before."

SST World (60S–60N)

NOAA OISST V2.1 | ClimateReanalyzer.org, Climate Change Institute, University of Maine



Maps depicting how El Niño commonly affects Northern Hemisphere winter and summer climate patterns around the globe. Notice that there are no consistent impacts on North America during the summer months, while areas around the tropics and Southern Hemisphere subtropics (Australia, for example) experience impacts in both seasons. (Climate Change Institute, University of Maine)

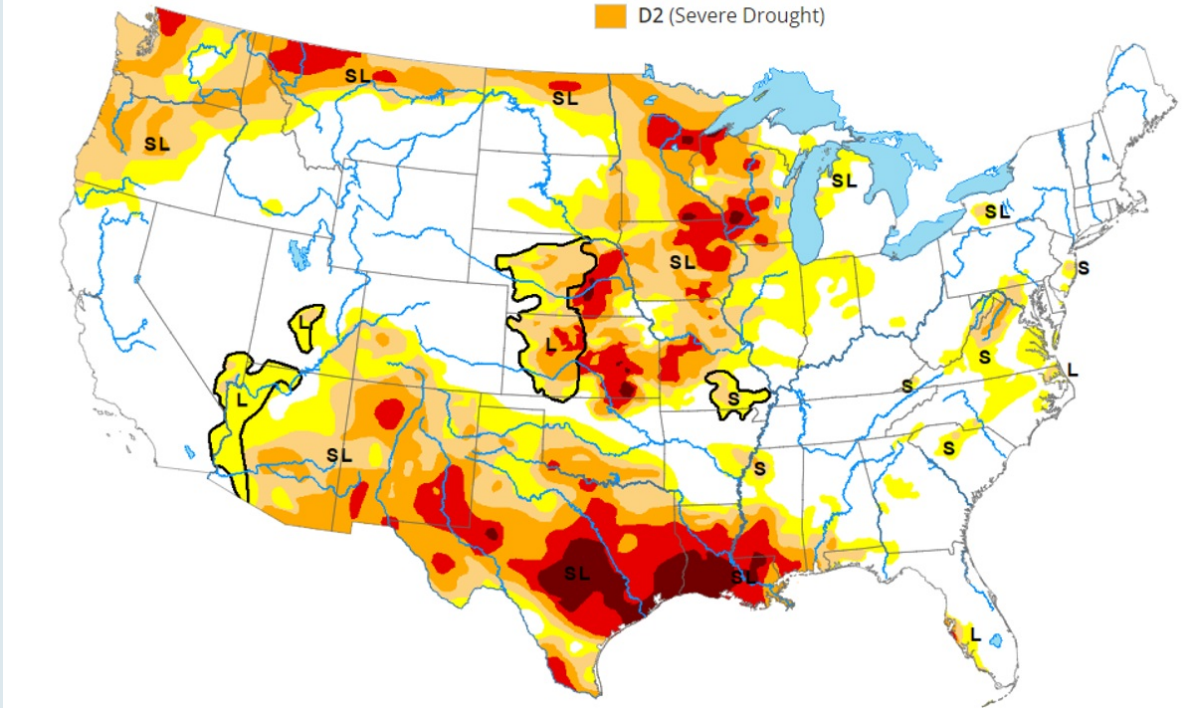
[Drought in the Mississippi River Basin](#)

The current [U.S. Drought Monitor](#) shows much of the Mississippi River Basin experiencing drought conditions. In late August, high pressure over much of the central U.S. sent temperatures soaring, breaking high temperature records in numerous places. This has allowed drought to intensify in much of the Midwest as well as in parts of the South. As a result of these hot and dry conditions, wildfires, poor hydrologic conditions, and agricultural damage have been experienced over large areas of the Mississippi River Basin.

Droughts also have implications for nutrient runoff, as scientists have found nutrients can accumulate in dry soils only to be mobilized during the next high rainfall/runoff event. And for these drought-affected areas, things may not improve anytime soon: [NOAA's drought outlook](#) through this November indicates that drought will persist in areas where it is ongoing and even develop in areas currently unaffected for a large portion of the Mississippi River Basin.

Map released: September 7, 2023

Data valid: September 5, 2023



The drought conditions as of September 7, 2023 show much of the Mississippi River Basin in drought. (U.S. Drought Monitor)

Funding Opportunities

[NCCOS Competitive Research Program: Advancing the Understanding of Social, Cultural, and Economic Impacts of Harmful Algal Blooms](#) - Letter of intent due October 13, 2023.

[NOAA Inflation Reduction Act Funding Opportunity: Climate-Ready Workforce](#)- Letter of intent due November 30, 2023

[Coastal Habitat Restoration and Resilience Grants for Tribes and Underserved Communities](#)- Proposals due December 19, 2023.

Jobs, Fellowships, and Graduate Assistantships

[EPA Fellowship on Coastal Acidification and Hypoxia: Evaluation at a National Scale](#)- Newport, OR; application deadline September 15, 2023

[USDA-ARS Fellowship in Climate Hub Regional Climate Impacts Assessment and Evaluation](#)- Ames, IA, or remote; application deadline September 29, 2023

[USDA-ARS Fellowship in Midwest Climate Hub Regional Climate Impacts Assessment and Evaluation](#) - Ames, IA, or remote; application deadline September 29, 2023

[NOAA Student Opportunities Database](#) - For students of any level (grade school through graduate school, even recent graduates), this database includes one-day events, summer internships, multi-year fellowships, and more!

Upcoming Meetings and Events

[Oceans 2023 Gulf Coast Conference](#) - September 25-28, 2023 in Biloxi, MS

[Climate, Water, Equity and Opportunity Workshop](#) - October 12-13 in Denver, CO

[2023 Living Shorelines Tech Transfer Workshop](#) - October 24-25 in Galveston, TX

[One Water Summit 2023](#) - November 14-16 in Tucson, AZ

[Gulf of Mexico Conference 2024](#) - February 19-22 in Tampa, FL

Nutrient Runoff Quiz!

Are you an expert on Mississippi River Basin nutrient runoff and Gulf of Mexico hypoxia?
Test your knowledge with our trivia quiz!

[CLICK HERE : Nutrient Runoff Quiz - September 2023](#)



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