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

Sharing information and making connections from the headwaters to the gulf.

September 28, 2021

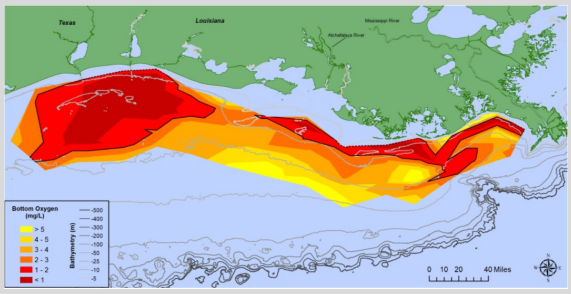
Welcome!

This bulletin is designed as a way to share information with those interested in nutrient runoff issues and impacts. ***We hope that 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.

Gulf of Mexico Highlights

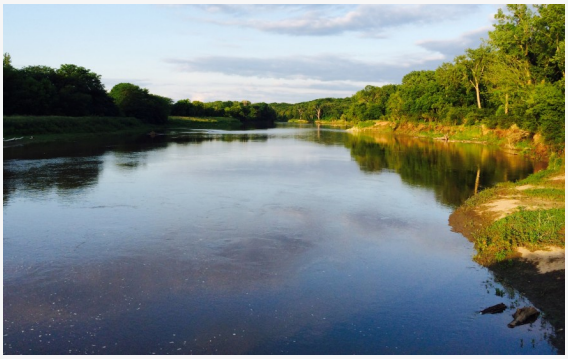
Survey Finds Larger than Predicted Gulf of Mexico 'Dead Zone'

National Centers for Coastal Ocean Science-supported researchers **announced** that this year's Gulf of Mexico "dead zone"— an area of low to no oxygen that can kill fish and marine life — is approximately 6,334 square miles, or equivalent to more than four million acres of habitat potentially unavailable to fish and bottom species. The annual dead zone survey was led by scientists at Louisiana State University and the Louisiana Universities Marine Consortium (LUMCON) during a research cruise from July 25 – August 1 aboard the LUMCON *R/V Pelican.*



Map of measured Gulf hypoxia zone, July 25-31, 2021. (LUMCON/NOAA)

The average hypoxic zone over the past five years is 5,380 square miles, which is 2.8 times larger than the 2035 target set by the **Hypoxia Task Force**. Since records began in 1985, the largest hypoxic zone measured was 8,776 square miles in 2017.



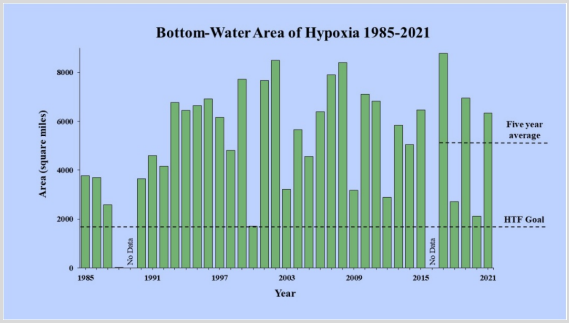
The Raccoon River is a main source of drinking water for the Des Moines metro but is routinely impaired by high levels of farm nutrients. (Christine Warner / Iowa Public Radio)

Spotlight: Nitrate in the Hawkeye State

'Water Atlas' Highlights Correlation with Fertilizer Use on Cropland and Water Pollution

Using public records on phosphorous and nitrate pollution in surface water and groundwater from state and federal water monitors, as well as nitrate in the drinking water provided by community water systems, the **Environmental Working Group** (EWG) has developed a **clickable map** of four Upper Mississippi River basin states (Iowa, Illinois, Minnesota, and Wisconsin) illustrating some of the area's most pressing pollution problems in fine detail.

According to EWG, 86% of communities with drinking water contaminated with nitrate at half or more of the federal legal limit are in counties where at least 70% of the cropland is fertilized, revealing a close correlation between intensive fertilization and high levels of nitrates in water resources that put recreation, aquatic life and drinking water at risk.



Long-term measured size of the hypoxic zone (green bars) measured during the ship surveys since 1985, including the target goal established by the Mississippi River/Gulf of Mexico Watershed Nutrient Task Force and the 5-year average measured size (black dashed lines). (LUMCON/NOAA)

Exposure to hypoxic waters has been found to alter fish diets, growth rates, reproduction, habitat use, and catchability. NOAA continues to fund monitoring and research efforts to understand the impacts of hypoxia on fish and fisheries in the Gulf of Mexico through its Northern Gulf of Mexico Ecosystems and Hypoxia Assessment (**NGOMEX**) program. Data from this cruise are also used by NOAA and its partners to refine models to more accurately simulate the relationships between river discharge, nutrient loads, and oceanographic conditions that can cause and sustain hypoxic conditions.

Red Tide Forecasts for the Gulf of Mexico

In the Gulf of Mexico, some harmful algal blooms (HABs) are caused by the microscopic algae species *Karenia brevis*, commonly called red tide. *K. brevis* blooms can cause respiratory illness and eye irritation in humans. It can also kill marine life, and lead to shellfish closures. HABs in the Gulf pose a risk to human and animal health, foul coastlines, and negatively impact communities and businesses. Blooms are often patchy, so impacts vary by beach and throughout the day. NCCOS monitors conditions daily and issues regular **forecasts** for red tide blooms in the Gulf of Mexico and East Coast of Florida.

Fish killed by red tide along Florida Gulf coast. (Chris O'Meara / Associated Press)

Des Moines Water Works nitrate removal facility. (Kelsey Kremer / The Des Moines Register)

Des Moines Turns to Groundwater Sources

Iowa's capital city, Des Moines, and its surrounding area has long relied on abundant clean drinking water from two rivers: the Des Moines and the Raccoon, both tributaries of the Mississippi. Now, however, two crises, severe drought and nutrient runoff, are combining to force the city to drill $30M dollars worth of groundwater wells.

For 110 days in 2020, Des Moines was unable to use the Des Moines River as a water source. Des Moines has become an **extreme example of the conflict over clean water** between agriculture and cities in farm states with minimal regulation. Water Works, the city's water utility, for years has tried to force or cajole farmers upstream to reduce the runoff of fertilizer that leaves the rivers with sky-high nitrate levels but lawsuits and legislative lobbying have failed. Now, it's considering a drastic measure that, as a rule, large cities just don't do — **drilling wells to find clean water**.

Small communities and individuals use wells, but large U.S. metro areas have always relied primarily on rivers and lakes for the large volumes of water needed. Surface sources provide about 70% of fresh water in the U.S., as a reliance on wells for big populations would otherwise quickly deplete aquifers.

Des Moines Water Works employee Bill Blubaugh makes his way to collect a water sample from the Raccoon River, Thursday, June 3, 2021, in Des Moines, Iowa. Each day the utility analyzes samples from the Raccoon River and others from the nearby Des Moines River as it works to deliver drinking water to more than 500,000 people in

Unique Collaboration Provides Data to Help with Red Tide Response

Commercial fishermen near Tampa Bay are **providing oceanographic data** to the team at NOAA's Southeast Fisheries Science Center in order to identify locations to focus research efforts, and start to understand the impacts on managed species. The observations provided by **Florida Commercial Watermen's Conservation** will provide key information that could be used by the fishing community to mitigate the impact of these HABs.

One of the challenges in identifying red tides is that they are not a single featureless blob. Since fishermen are already out on the water and a healthy ocean is important to them, this is a natural partnership. The data provided by this collaboration gives necessary information to forecast bloom behavior, helps plan efficient research trips, and is crucial in filling in information gaps between NOAA sampling trips.

Red Tide Respiratory Forecast Now Operational

The Red Tide Respiratory Forecast — part of a suite of NOAA tools focused on predicting the movements and impacts of harmful algal blooms in the Gulf of Mexico — has moved from "experimental" to "operational" or "sustained." That means the Forecast, developed by the National Oceanic and Atmospheric Administration's National Centers for Coastal Ocean Science in partnership with the Gulf of Mexico Coastal Ocean Observing System, the state of Florida, and others, is now fully supported and available to the public. This new forecast provides a near real-time prediction of whether beachgoers can expect red tide conditions on individual beaches at three-hour increments throughout the day.

The sea of red in the waves is caused by an algae called Karenia brevis. (NOAA)

In 2004, NOAA-National Centers for Coastal Ocean Science and partners started issuing twice-weekly condition reports and bulletins that identified the risk

Iowa's capital city and its suburbs. (AP Photo / Charlie Neibergall)

Nitrate Contamination More Likely to Affect Lower Income Communities in Iowa

Iowa communities whose drinking water is contaminated with nitrate are more likely to be lower income, according to a **new analysis** conducted by the Environmental Working Group. In Iowa, 68 percent of communities with elevated nitrate had incomes below the state's median. But that jumped to 85 percent for communities with levels at or above the federal Safe Drinking Water Act's legal limit of 10 mg/L. Federal data show that about two-thirds of those – 1,155 systems serving more than 3 million people – have no treatment systems to lower nitrate concentrations to safer levels. Smaller communities have the highest costs per person, because costs are shared by fewer residents. Small, lower-income communities are likely to struggle the most to afford nitrate treatment.

The issue is nuanced and yet critical to address - it's much cheaper to keep nitrate out of drinking water in the first place than to remove it. But so-called volunteer approaches, like making tax-funded payments to farmers who change where and how they farm, have not worked. Without aggressive, targeted and enforceable protection efforts, America's nitrate problem will get worse, and more Americans will be at risk of drinking contaminated water.

Iowa Supreme Court Tosses Lawsuit Aimed at Mandating Water Quality Regulations

In June, the Iowa Supreme Court ruled that a lawsuit aimed at creating mandatory water quality regulations to reduce farm pollution in the Raccoon River **will not proceed** because the case asked the courts to infringe on the powers of the legislature. For years, scientists and environmental advocates have been calling on state lawmakers to enforce mandatory agricultural conservation practices to protect the state's water.

Iowa Citizens for Community Improvement and Food & Water Watch **filed the lawsuit in March 2019**. They argued the Iowa Nutrient Reduction Strategy, the state's policy encouraging farmers to adopt conservation practices voluntarily, has failed to protect the Raccoon River as a public resource for drinking water and recreation. In a 4-3 decision, the Iowa Supreme Court sided with the Iowa Department of Natural Resources and livestock groups that argued the state cannot be forced to create mandatory programs to regulate farmers in

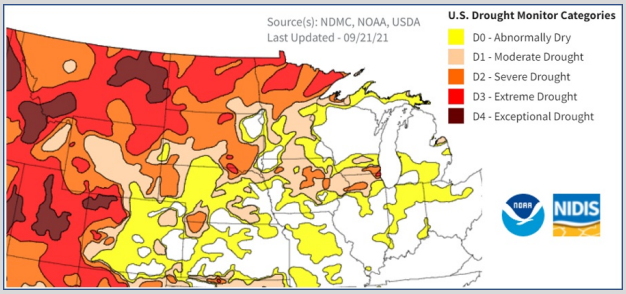
of respiratory irritation for three-to-four-day periods on a county-by-county level. The information was then released through the National Weather Service's regular Beach Hazard Statement alerts. Today, the Red Tide Respiratory Forecast builds on these condition reports and bulletins by providing information at a finer scale — at the beach level, not just the county level.

More details are available from the Gulf of Mexico Coastal Ocean Observing System.

Outlooks and Forecasts

Drought in the North Central U.S.

NOAA and USDA scientists say drought conditions in the western Upper Mississippi River basin **could continue into 2022**. Despite recent significant rainfall over in some parts of the region, drought severity and extent remained virtually unchanged according to the U.S. Drought Monitor. 100% of Montana and North Dakota are in drought, as well as 97% of Minnesota, 95% of Wyoming, 94% of South Dakota, and 57% of Iowa.



U.S. Drought Monitor *map showing the western Upper Mississippi River basin with data valid for September 21, 2021. Maps are updated each Thursday at 8:30 a.m. Eastern Time. Drought categories show experts' assessments of conditions related to dryness and drought compared to usual for the same time of year. (National Drought Mitigation Center, USDA, NOAA)*

Wildfires, limited surface water (e.g., streams, rivers, livestock ponds), poor water quality, disruptions to recreation, low soil moisture, poor pasture conditions, crop yield loss, rural mental health issues, and damage to ecosystems are the major drought impacts being reported across the western Upper Mississippi River basin. Furthermore, long periods of drought **can lead to an accumulation of available soil N** that is readily mobilized while subsequent flooding events occur.

Given the severity of the current drought, consecutive seasons with above-normal rain and snow events will be needed in order to see improvement in drought impacts. As a result, drought conditions will likely persist into next year, although some improvement might be possible.

the Raccoon River watershed. An **analysis** by the Iowa Environmental Council calculated that the state's current voluntary approach could take centuries to achieve the goals set out in the **Iowa Nutrient Reduction Strategy**.

Education and Outreach

Back-to-School Fun

NOAA's National Ocean Service has incredible educational ideas for **educators** and fun for **students**! Resources, crafts, and activities cover a wide range of topics, from oceanography and marine biology to environmental science, geology, geography, and even meteorology. Start your adventure **here!**

"Every Full Moon" *- With a new video released every full moon, these thematic collections of videos for kids of all ages are a great example of the exciting resources available from the National Ocean Service.*

Educational Webinar Series Back by Popular Demand

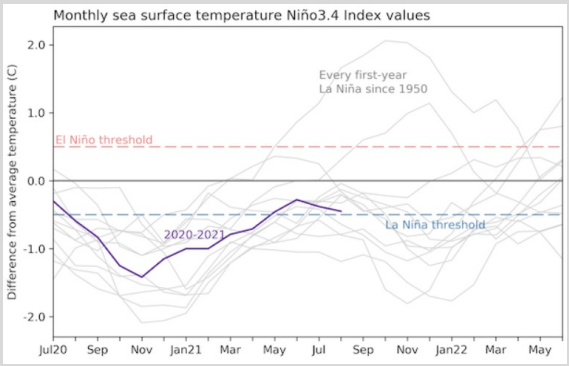
The NOAA Live! webinar series is designed to capture the imagination of young learners, but is of interest to viewers of all ages. Each weekly webinar features a different NOAA expert/topic and a moderated question and answer session. The audience comes away with a feel for what NOAA staff do within their area of expertise. To register and learn more about the series go to **NOAA Live!** The previous seasons with over 100 webinar recordings are available on the **NOAA Live! YouTube Library**.

The Watershed Game

Don't miss the September 30th demonstration of **The Watershed Game**, a series of active, hands-on simulation activities for learning how land use affects water quality and natural resources! The object of this team-building simulation is for each participant or team to use limited financial resources to reduce excess nonpoint source pollution to levels that meet a clean water goal.

A La Niña Winter Ahead?

According to the National Weather Service Climate Prediction Center, A transition from ENSO-neutral to La Niña is favored in the next couple of months, with a 70-80% chance of La Niña during the Northern Hemisphere winter 2021-22. Emily Becker digs into the science in her blog post "**September 2021 ENSO update: feeling groovy**"

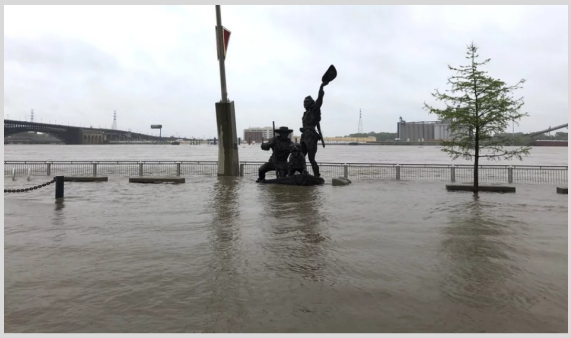


Monthly sea surface temperature anomalies (difference from average) in the Niño 3.4 region of the tropical Pacific for 2020-21 (purple line) and all other years starting from first-year La Niña winters since 1950. (NOAA Climate.gov)

Climate Highlights

What a Changing Climate Means for the Mississippi River

Friends of the Mississippi River describe how model predictions based on current carbon emissions **translate to some major impacts** on the Mississippi River, its surrounding natural lands and communities.



A statue of explorers Lewis and Clark is surrounded by floodwaters along the St. Louis riverfront. (Jim Salter / Associated Press)

Climate change is already leading to more intense rain events and flooding, trends that are expected to continue; this means that even more of what's on our land will wash into our waters. In fact, scientists expect nitrate runoff pollution in the upper Mississippi River basin to increase by about **24%**

There will also be a training workshop October 25-26 to learn how to facilitate the game.

The Watershed Game illustrates that cooperation is an essential part of managing water and land use. Participants learn to consider and involve all land uses within a watershed as they work to achieve their clean water goals. (Marie Thoms / MN Sea Grant)

Funding Opportunities

Integrated Research on Coastal and Ocean Acidification and Harmful Algal Blooms

NOAA's National Centers for Coastal Ocean Science Competitive Research Program and Ocean Acidification Program announced a new 2022 **Notice of Funding Opportunity** for projects that seek to understand interactions between ocean acidification and HABs and their cascading impacts on coastal ecosystems, communities, and economies to inform management decisions. The deadline for letters of intent is October 14, 2021, and full applications are due January 19, 2022.

Conservation Outreach: Racial Equity and Justice Conservation Cooperative Agreements

The Office of Outreach and Partnerships Division within the Natural Resources Conservation Service announced a **funding opportunity** to expand the delivery of conservation assistance to historically underserved farmers and ranchers, including socially disadvantaged, limited resource, beginning, tribal and veteran. Proposals should support activities that introduce the concepts of climate-smart agriculture and to assist producers with planning and implementation of conservation practices and principles. Applications deadline is October 25, 2021.

Upcoming Meetings

Southeast Coastal Ocean Observing Regional Association - December Meeting

during the 21st century.

There will be an in-person meeting on December 2-3, 2021 hosted in St. Petersburg, FL focused on harmful algal blooms, DEI (Diversity, Equity, and Inclusion), and new S observing projects. Registration ends November 15th.

Brought to you by...

NOAA Regional Collaboration NETWORK

This bulletin is compiled by the NOAA Central Region Collaboration Team and Gulf of Mexico Regional Collaboration Teams nutrient runoff working group.

Members represent Minnesota, Louisiana, and Mississippi-Alabama Sea Grant Programs, National Water Extension Program, Northern Gulf Institute, Mississippi State University, University of Minnesota Water Resources Center, North Central Region Water Network, NOAA National Center for Coastal Ocean Science, NOAA National Weather Service Forecast Offices and River Forecast Centers.

If you would like to join the distribution list and/or include information in the next bulletin, email noaa.centralregion@noaa.gov

NOAA Regional Collaboration: Improving NOAA's service to the Nation