

2024 ANNUAL REPORT



NITRATE WATCHSM
IZAAK WALTON LEAGUE OF AMERICA

INTRODUCTION

In 2024, the Nitrate Watch program continued to support volunteers located throughout the country, united by a common concern – nitrate pollution. Nitrate Watch is a crowd-sourced community science project of the Izaak Walton League of America. This program, launched in February 2023, mobilizes volunteers to monitor and report nitrate levels in the waterways they care about and the drinking water they rely on.

THE GOALS OF NITRATE WATCH ARE...

- **Raise awareness** about the impacts of nitrate on the environment and human health.
- **Identify hotspots** of nitrate pollution.
- **Advocate for solutions** that reduce nutrient pollution.



For more information about nitrate pollution and the Nitrate Watch program, visit www.nitratewatch.org.

This report will summarize the results and participation that Nitrate Watch has seen in 2024 and take a look ahead toward goals for the years to come.

Questions about this report? Email nitratewatch@iwla.org.

THE TROUBLE WITH NITRATE

SOURCES

Nitrate is formed when nitrogen combines with oxygen in water. Nitrogen is an essential nutrient for plant growth, but human activities produce more nitrogen than natural systems can use.

Human-made sources include **fertilizers**, runoff from **animal feedlots**, and **sewage**. Nitrate dissolves in water and can easily be carried by rainwater and melting snow until it reaches surface water or groundwater. When there are elevated levels of nitrate in a water source, that's almost certainly because of human-made contaminants.

IMPACTS

Nitrate pollution has negative impacts on **human health**, the **environment**, and the **economy**. For a detailed look at each of these impacts, click on a fact sheet to learn more:

Nitrate & Drinking Water

Nitrate in Drinking Water

Chemical fertilizers, animal waste, and leaky septic tanks are just a few sources of the elevated nitrate levels in many public water systems and private wells. The impact of nitrate on human health is an area of ongoing research, but there are several health risks that are known to be linked with nitrate in drinking water.

DRINKING WATER STANDARD

The drinking water standard for nitrate as nitrogen is 10 mg/L, as established by the U.S. Environmental Protection Agency in 1992 (over 30 years ago). Current research suggests that prolonged exposure to nitrate levels below 10 mg/L can still lead to increased health risks.

WELL WATER ISN'T TESTED

Approximately 43 million Americans get their water from private wells, which are not regulated by the EPA, and users are responsible for testing their own water. Most states recommend testing at least once every other year.

HEALTH CONCERNS

- THYROID DISEASE
- BIRTH DEFECTS
- COLON CANCER
- BLUE BABY SYNDROME (METHEMOGLOBINEMIA)

WHAT TO DO

If your drinking water contains nitrate levels above 10 mg/L, take the following steps:

- Contact a licensed well contractor or your public system operator to identify, test, and seal leaks.
- Obtain drinking water from a safe source, such as bottled water. Boiling water will not remove nitrate.
- Consider installing a reverse osmosis, ion exchange, or distillation water filtration system. Well users may also consider drilling a new well.

JOIN NITRATE WATCH

Want to find out how much nitrate is in your water? Visit nitratetopwatch.org to request your free nitrate test kit!

NITRATE WATCH

Nutrient Pollution 101

Nutrient Pollution 101

Eutrophication (n): the process by which a body of water becomes enriched by excessive nutrients, especially nitrogen and phosphorus.

Causes:

Eutrophication is caused by **nutrient pollution** which may come from agricultural runoff, wastewater discharge, industrial operations, or stormwater.

Effects:

Nutrient pollution sets off a cascade of ecological effects, illustrated below:

- A nutrient influx encourages the rapid growth of algae.
- The resulting **algal bloom** blocks sunlight, lowers the pH, and uses up available nutrients.
- When the algae die, its decomposition depletes oxygen in the water.
- The lack of oxygen creates a **dead zone**, where aquatic wildlife and plants struggle to survive.

NUTRIENT RUNOFF

ALGAL BLOOM

DEAD ZONE

Want to learn more about nutrient pollution near you? Visit nitratetopwatch.org to request your free nitrate test kit!

NITRATE WATCH

Nitrate and Algae

Nitrate and Algae

Nitrate pollution can lead to toxic algal blooms, which can harm human health, the environment, and our economy. Luckily, Nitrate Watch gives you the ability to assess nitrate pollution in the waterways you care about.

NECESSARY NUTRIENT TO POLLUTION PROBLEM

Nitrate is a naturally occurring compound and an important nutrient for plant growth. Unfortunately, chemical fertilizers, animal waste, and leaky septic tanks introduce excessive amounts of nitrate to the landscape, which washes away and collects in surface waters or seeps into the water table.

ALGAL BLOOMS

When exposed to excess nitrate, algae utilize the nutrient and explode in population, forming an **algal bloom**. The rapid growth and decay of algal sets off a cascade of effects, including:

- Lack of oxygen and available food causes fish kills and dead zones.
- Presence of toxins like microcystin threatens wildlife, pets and humans.
- Proliferation of algae impacts businesses and property values.
- Raises treatment costs for drinking water.

JOIN NITRATE WATCH

Want to learn more about nitrate pollution in your community? Visit nitratetopwatch.org to request your free nitrate test kit!

NITRATE WATCH

Cost of Nitrate Pollution

The Cost of Nitrate Pollution

The combination of surface water and drinking water with nitrate is dangerous to human health and harmful to the environment. But what is the economic impact of nitrate pollution?

WATER TREATMENT COSTS

When nitrate is present in drinking water sources, water utilities must remove the excess to meet the EPA standard. Specialized nitrate removal infrastructure is required, which is expensive to install and operate.

MEDICAL COSTS

Health conditions associated with nitrate pollution like thyroid disease, birth defects, and some cancers - are costly to treat.

IMPACT ON THE FISHING INDUSTRY

Algal blooms that harbor toxic cyanobacteria can contaminate fish and shellfish, meaning the commercial fishing industry suffers.

DECLINING PROPERTY VALUES

Uniquely and dangerous algal blooms affect the value of waterfront property.

LOSS IN RECREATION

Nitrate pollution can lead to uniquely and dangerous algal blooms. It makes sense that this could negatively impact recreation activities, like fishing and paddling.

Visit www.nitratetopwatch.org to learn about nitrate pollution and how you can help protect clean water in your community.

NITRATE WATCH

ESTIMATED U.S. ECONOMIC IMPACT: \$210 BILLION/YEAR

© 2024 Nitrate Watch. All rights reserved. Nitrate Watch is a registered trademark of Nitrate Watch. All other trademarks are the property of their respective owners.

2024 BY THE NUMBERS

This year, we sent **1,060 kits** to volunteers and partners received an impressive **5,427 nitrate readings** from volunteers. We prioritized forging relationships with new partner organizations, educating volunteers about the connection between soil health and water quality, and providing opportunities to advocate for Farm Bill policies that would reduce nutrient runoff. In 2024, hundreds of advocates pressed their lawmakers for legislation to improve water quality by promoting soil health and wetlands conservation.

See below for a snapshot of key stats for Nitrate Watch in 2024.

5,427

nitrate readings reported



10

new partner organizations engaged



35

states reporting data



1,339

sample locations



4

webinars from the experts

6

short-form videos exploring the relationship between soil health and water quality



OUR PARTNERS

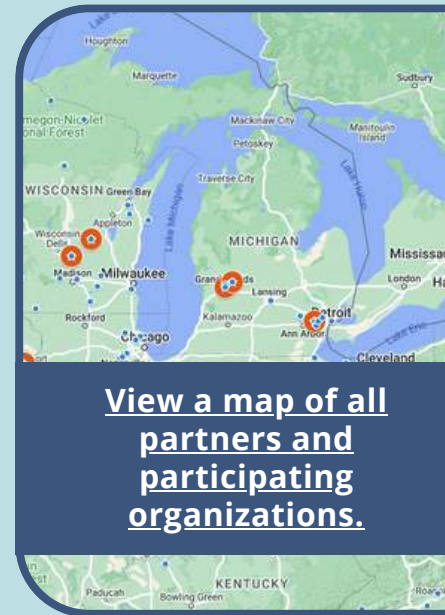
We are grateful for our cohort of partner organizations, and are excited to have welcomed **10 new partners** in 2024. These organizations are spreading the word about the Nitrate Watch program, reporting data, and advocating for reduced nitrate pollution in their local communities. In many cases, our partners serve as an important hub of information and action, providing vital support to volunteers at the local level.

In addition to our official partners, Nitrate Watch volunteers represent **480 organizations** across the country.

NITRATE WATCH PARTNERS:

**new in 2024*

- Antietam-Conococheague Watershed Alliance*
- Columbia County Division of Health*
- Faithful Shepherd Catholic School
- Farmington River Watershed Association
- Friends of the Lower Olentangy Watershed*
- Friends of the Minnesota Valley*
- Friends of the Rouge
- Green Lake Association*
- Iowa Citizens for Community Improvement
- Iowa Environmental Council
- Iowa Learning Farms
- Jefferson County Farmers & Neighbors*
- Little Falls Watershed Alliance
- Loudoun Wildlife Conservancy
- Lower Grand River Organization of Watersheds*
- Partners of Scott County Watersheds*
- Prairie Rivers of Iowa
- Rogue River Watershed Partners*
- The Field Trip Academy*



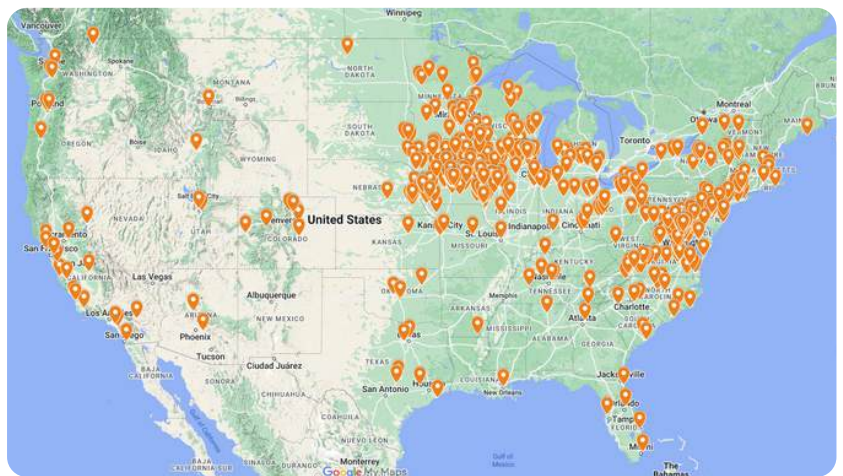
View a map of all partners and participating organizations.

Interested in becoming a Nitrate Watch partner organization?
Email us at nitratewatch@iwla.org.

OUR VOLUNTEERS

Nitrate Watch would be nothing without the dedicated volunteers who monitor nitrate and report their results. Whether they participate independently or as part of an organized monitoring effort, these volunteers are the backbone of our program.

In 2024, we distributed **1,060 kits** to volunteers across the country. The map to the right shows where those kits were sent.



When requesting a Nitrate Watch kit, volunteers are asked how they plan to make a difference about nitrate pollution in their community. Here are just a few of their responses:

Beyond monitoring, I plan to make a difference about nitrate pollution in my community by...

Collecting data and raising awareness in the event the results deviate from background levels.

Sharing results with neighbors and the city council.

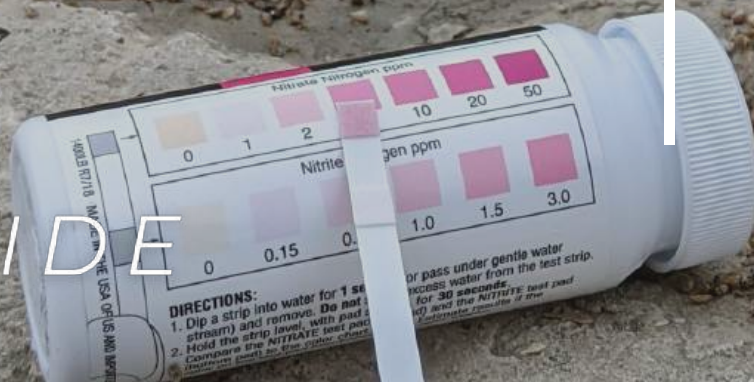
Educating my family, friends, and community!

Supporting politicians who work to improve water quality, conservation and sustainability.

Increasing education and awareness to activate change.

Writing a letter to the editor of the local newspaper and passing out flyers.

RESULTS NATIONWIDE



In this section we will summarize nitrate data reported by volunteers in 2024. This includes nitrate readings reported by **Nitrate Watch** volunteers as well as volunteers who participate in **Save Our Streams Chemical monitoring**. In addition to summarizing nationwide findings, we'll zoom in and isolate the results for states that reported at least 100 nitrate readings in 2024.

Nitrate Watch data is reported by volunteers on the Clean Water Hub water quality database. To view and/or download Nitrate Watch data, visit www.cleanwaterhub.org.

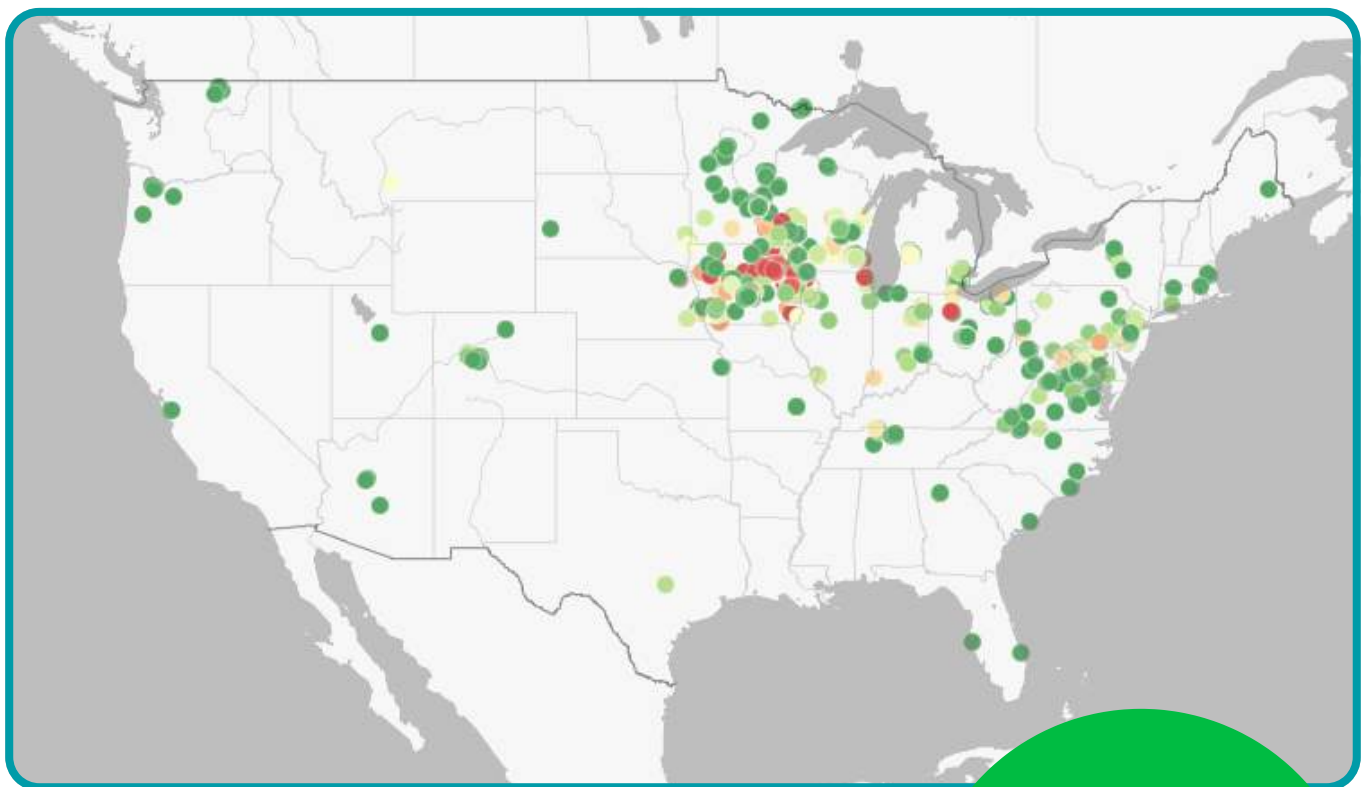


SURFACE WATER & DRINKING WATER

The water sources monitored by Nitrate Watch volunteers fall into two categories:

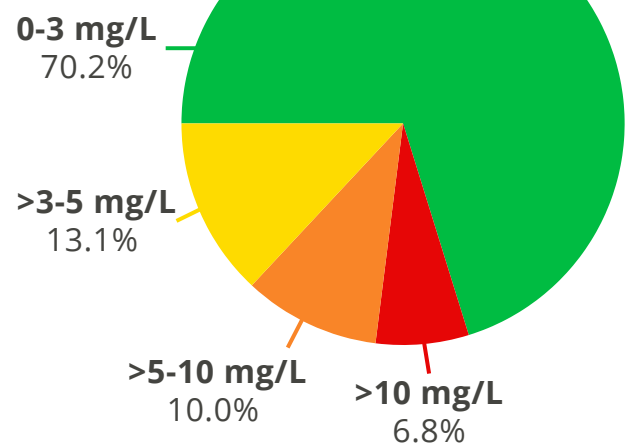
- **Surface Water** includes water from small streams/creeks, rivers, lakes, ponds/wetlands, and drainage/outlet pipes.
- **Drinking Water** includes water from private groundwater wells and public drinking water systems.

RESULTS NATIONWIDE



Total nitrate readings: **5427**

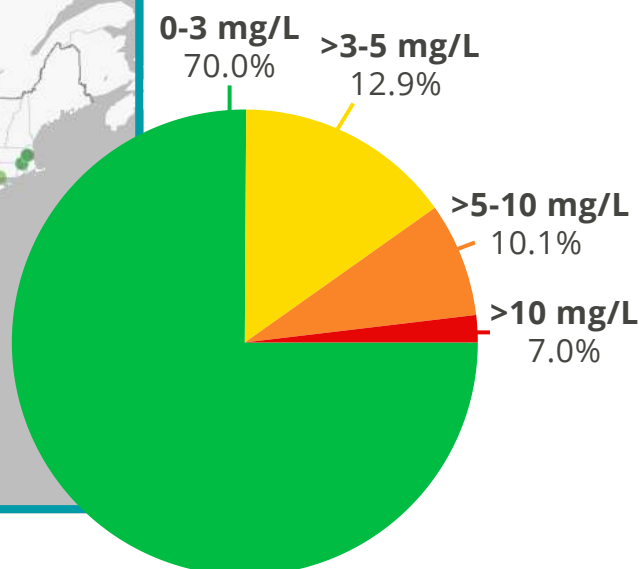
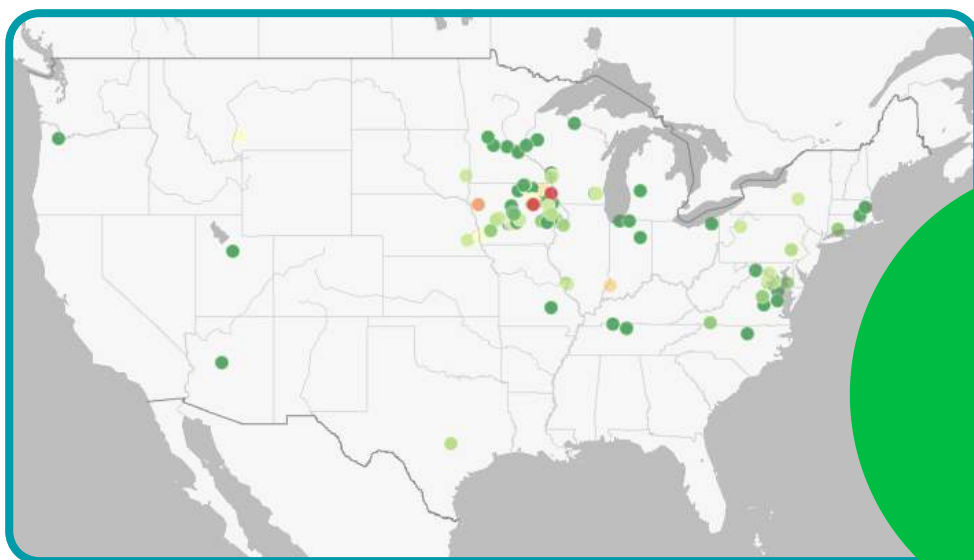
● 0-3 mg/L:	3810
● >3-5 mg/L:	708
● >5-10 mg/L:	541
● >10 mg/L:	368



RESULTS NATIONWIDE



DRINKING WATER



The U.S. Environmental Protection Agency mandates that the maximum allowable nitrate concentration for drinking water is **10 mg/L**. Well water is not subject to this regulatory standard.

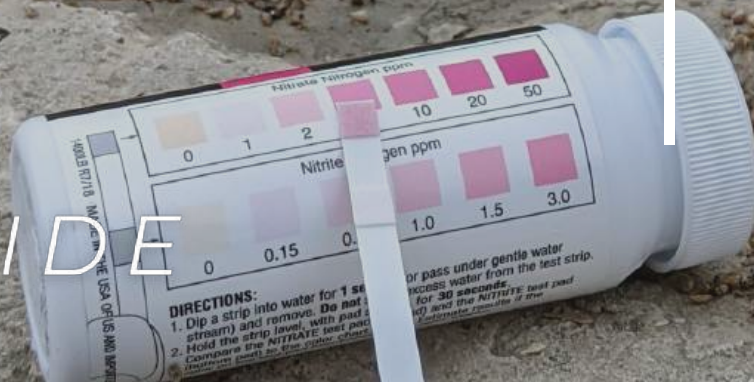
Total nitrate readings: **265**

- 0-3 mg/L: **199**
- >3-5 mg/L: **40**
- >5-10 mg/L: **21**
- >10 mg/L: **5**

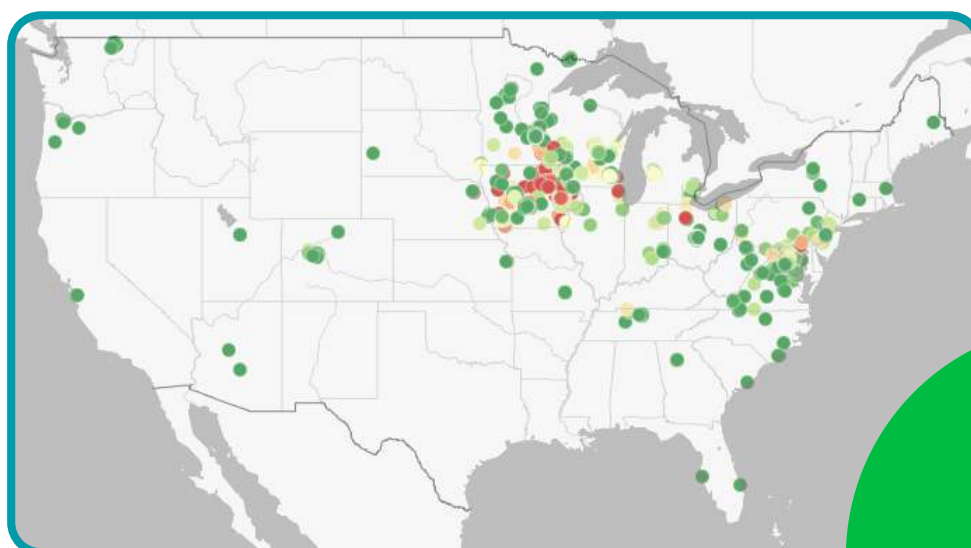
Research indicates that a drinking water standard of 10 mg/L may not be sufficiently protective of human health. Adverse health effects have been observed with prolonged exposure to drinking water containing nitrate concentrations of 5 mg/L, or even less.



RESULTS NATIONWIDE



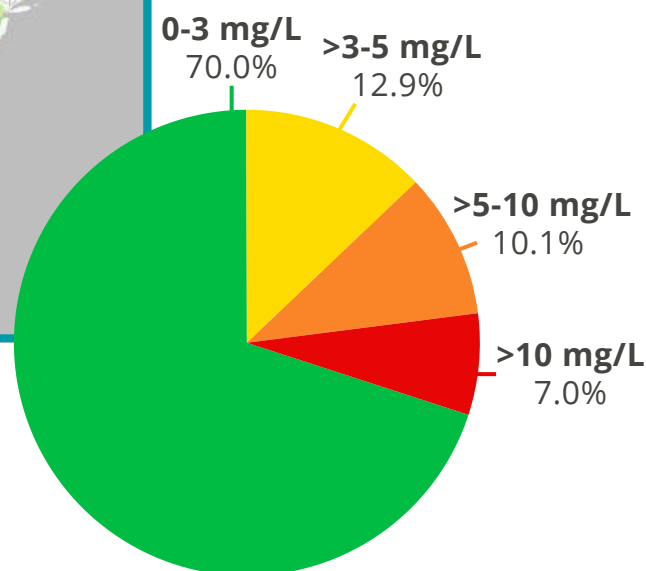
SURFACE WATER



There is no national standard for nitrate in surface water. In general, a natural range for nitrate in a stream is 0-3 mg/L. Surface water nitrate readings in excess of 3 mg/L can serve as an unofficial indicator that external inputs of nitrate, such as agricultural runoff, are present.

Excess nitrate in surface water contributes to:

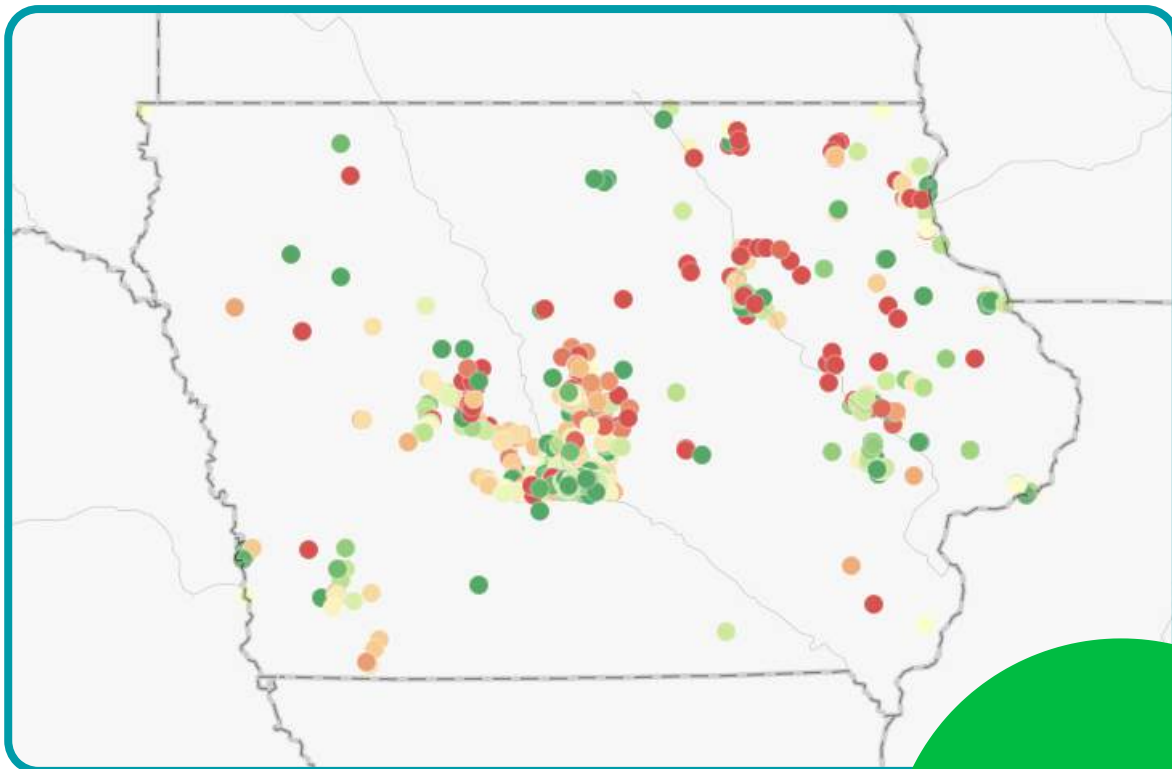
- algae blooms
- fish kills
- hypoxia/dead zones
- contaminated drinking water sources



Total nitrate readings: **5162**

● 0-3 mg/L:	3611
● >3-5 mg/L:	668
● >5-10 mg/L:	520
● >10 mg/L:	363

RESULTS IOWA



Total nitrate readings: **3445**

● 0-3 mg/L: **2116**

● >3-5 mg/L: **537**

● >5-10 mg/L: **479**

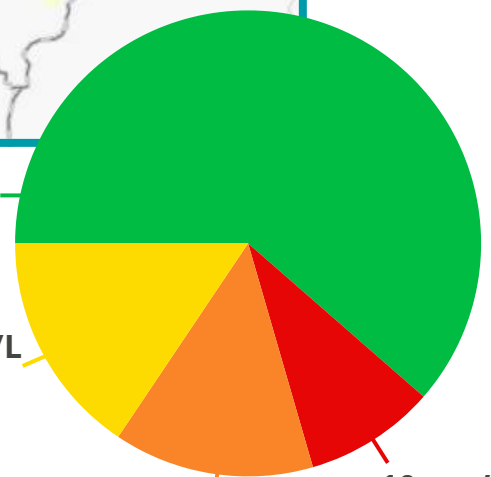
● >10 mg/L: **313**

0-3 mg/L
61.4%

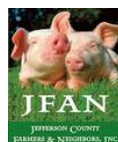
>3-5 mg/L
15.6%

>5-10 mg/L
13.9%

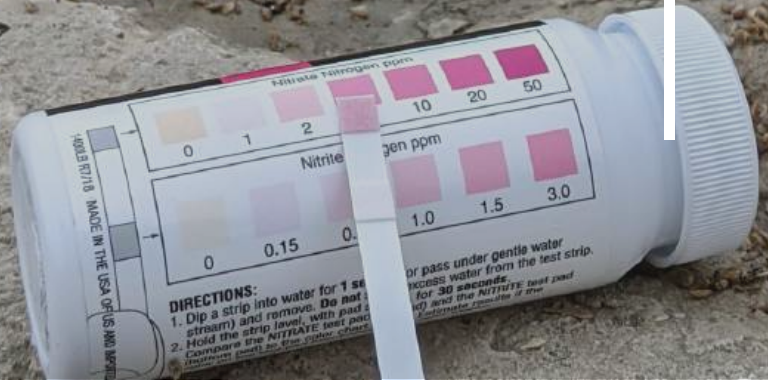
>10 mg/L
9.1%



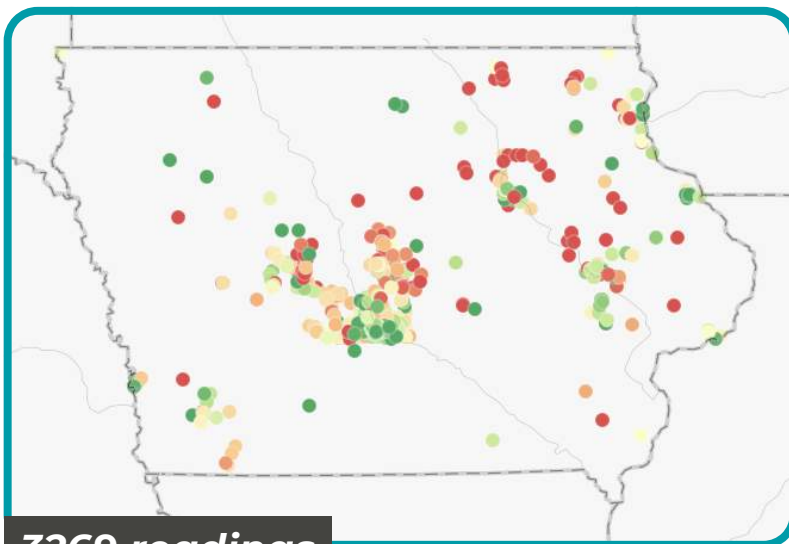
Regional Partners:



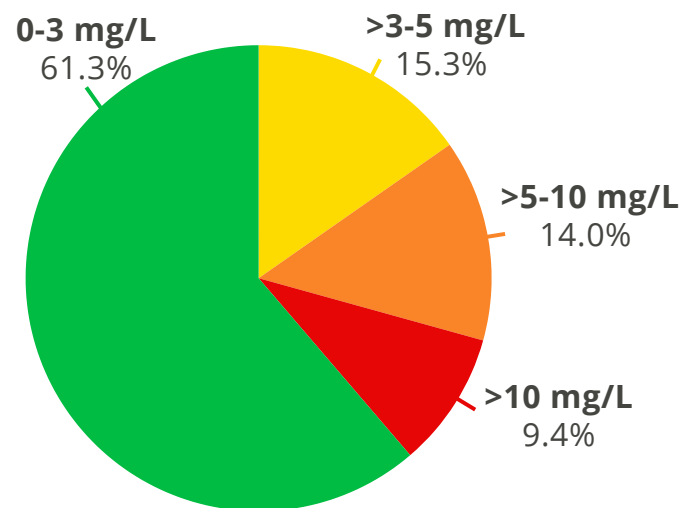
RESULTS IOWA



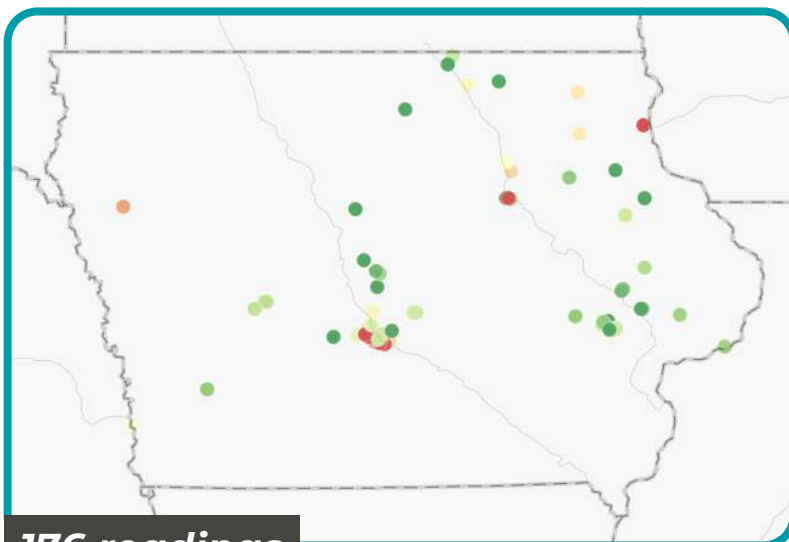
SURFACE WATER



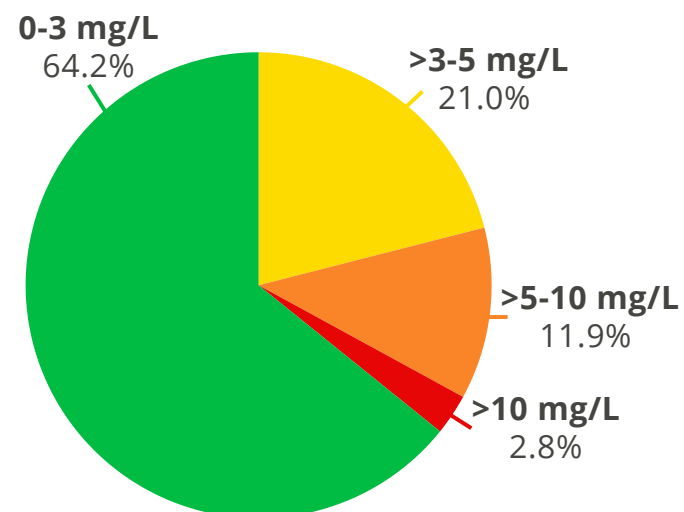
3269 readings



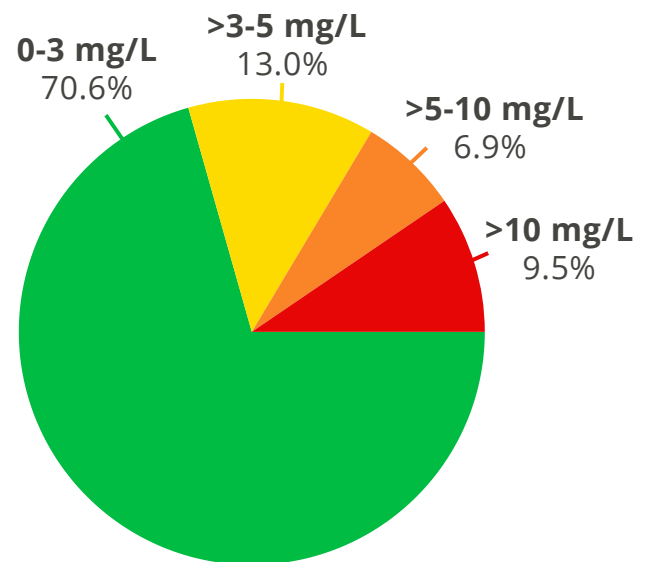
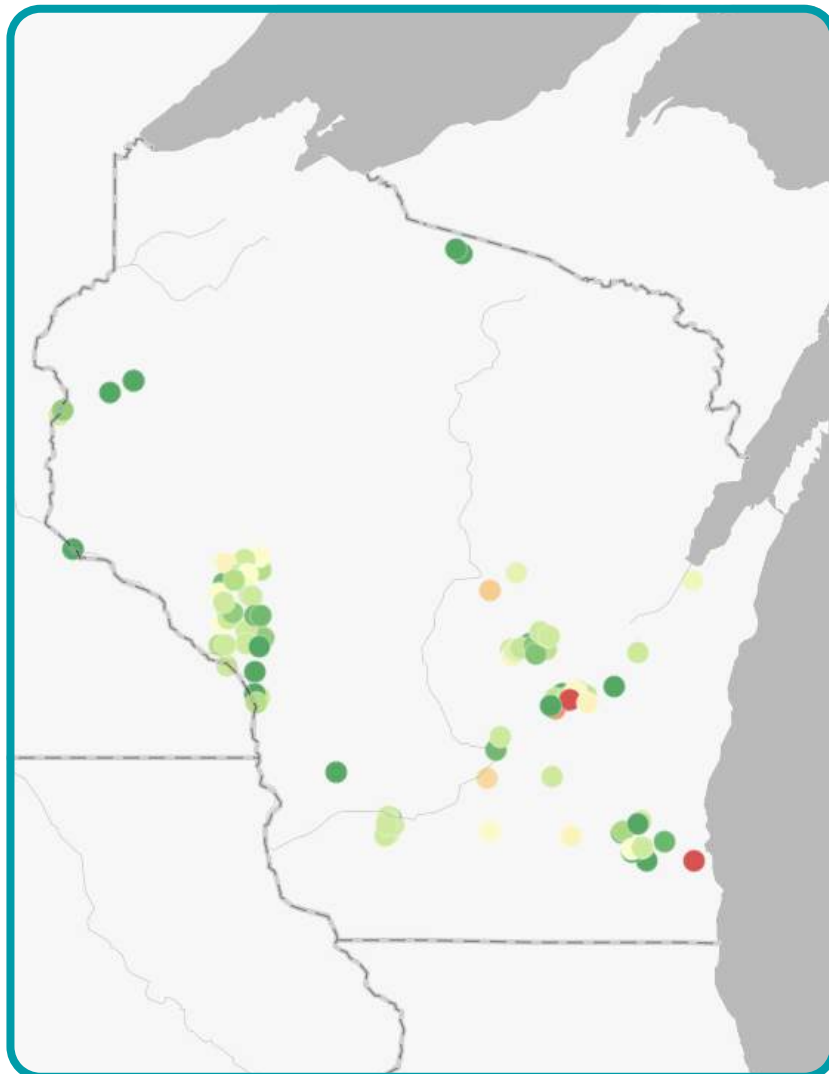
DRINKING WATER



176 readings



RESULTS WISCONSIN



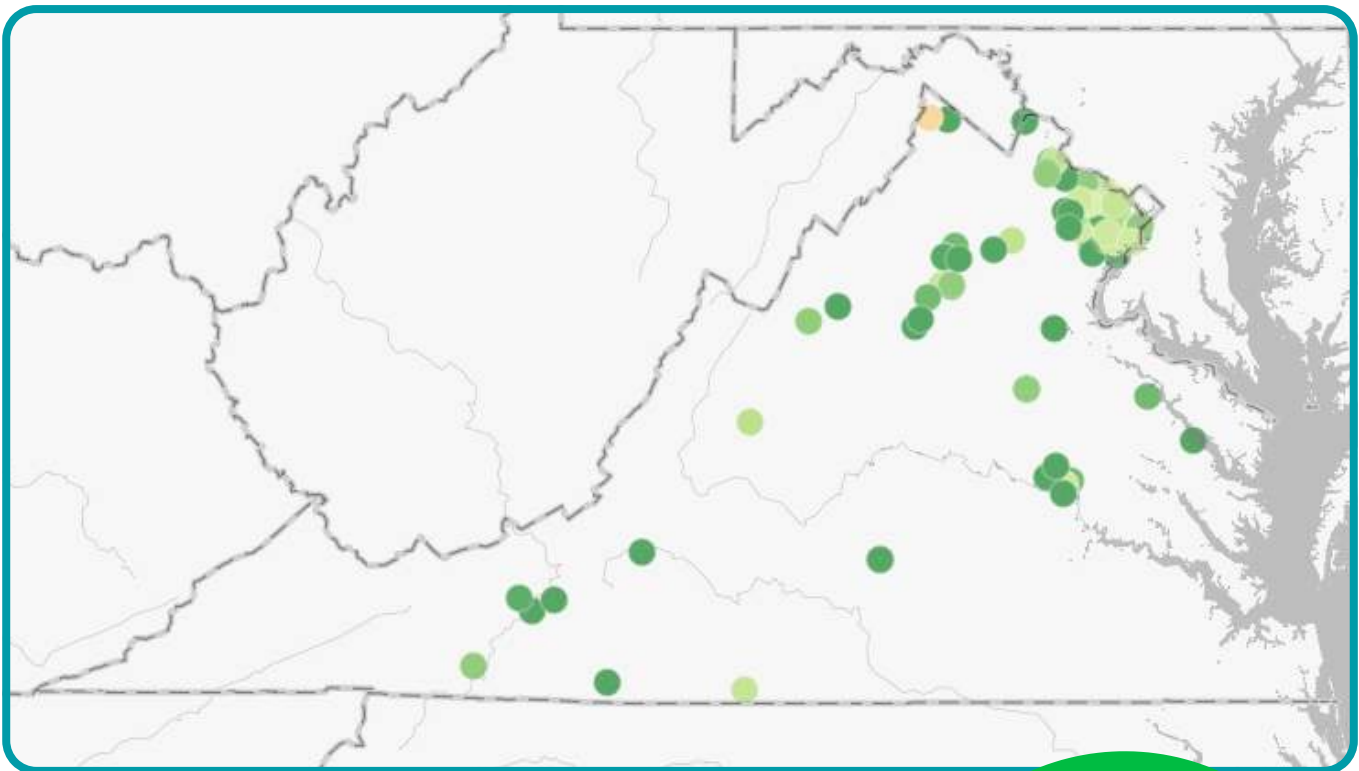
Total nitrate readings: **347**

0-3 mg/L:	245
>3-5 mg/L:	45
>5-10 mg/L:	24
>10 mg/L:	33

Regional
Partners:



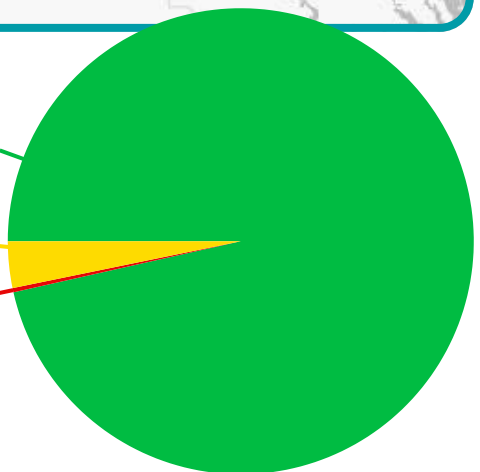
RESULTS VIRGINIA



Total nitrate readings: **341**

● 0-3 mg/L:	329
● >3-5 mg/L:	11
● >5-10 mg/L:	0
● >10 mg/L:	1

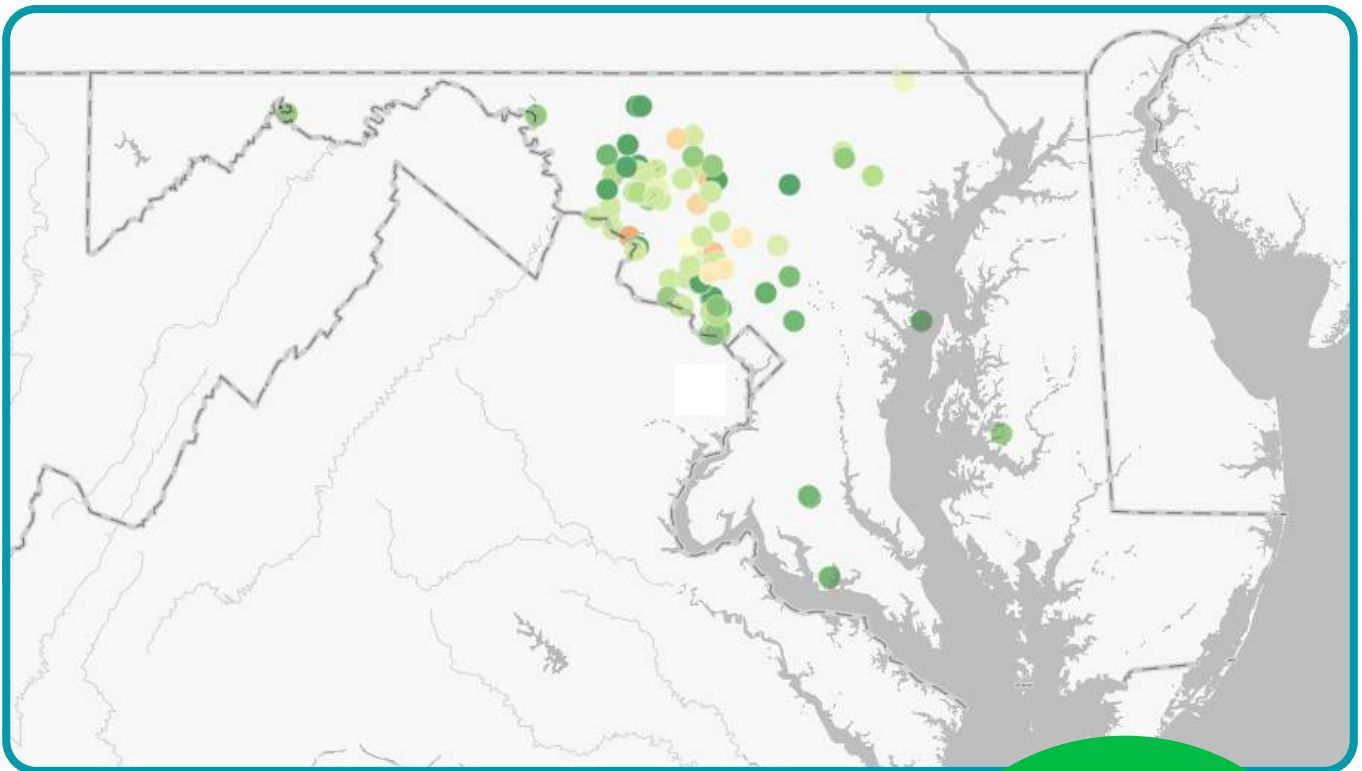
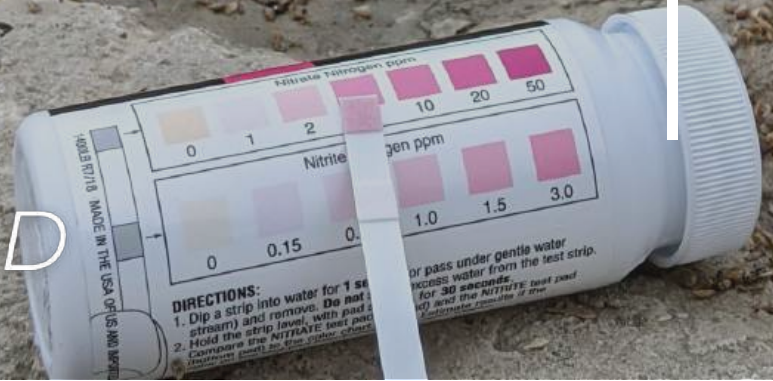
0-3 mg/L	96.5%
>3-5 mg/L	3.2%
>10 mg/L	0.3%



**Regional
Partners:**

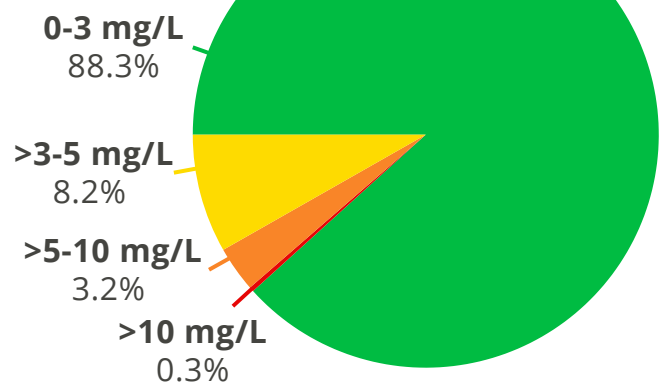


RESULTS MARYLAND



Total nitrate readings: **316**

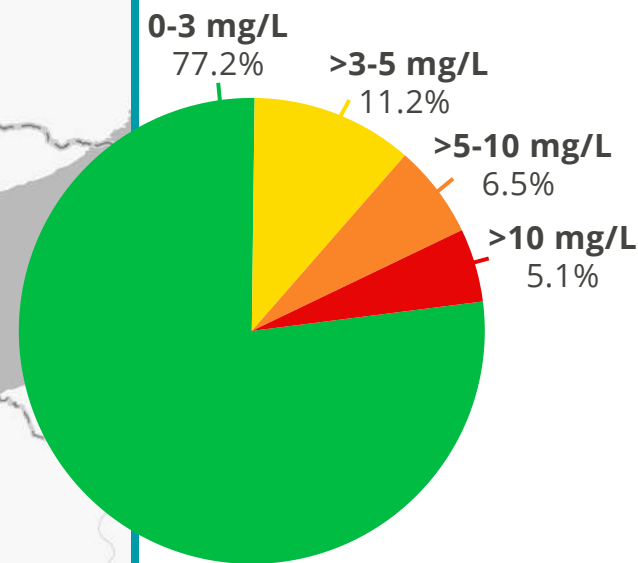
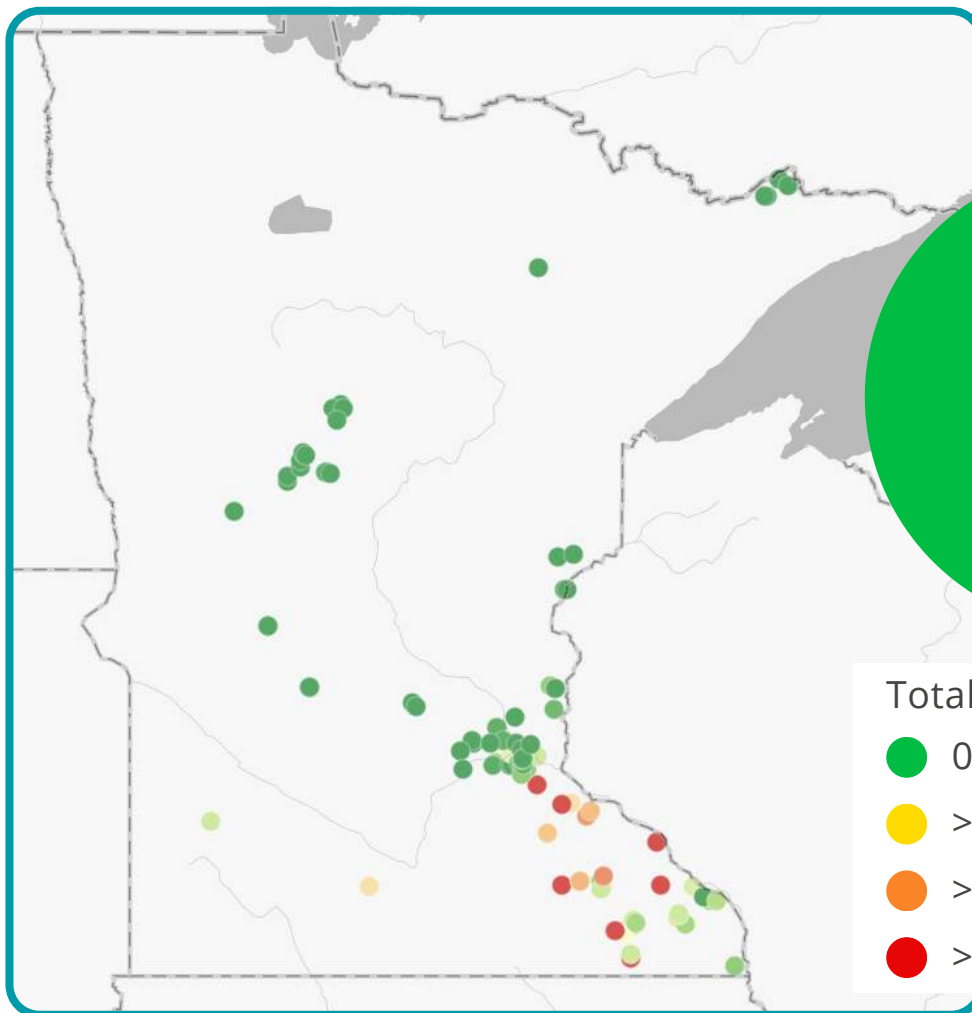
● 0-3 mg/L:	279
● >3-5 mg/L:	26
● >5-10 mg/L:	10
● >10 mg/L:	1



**Regional
Partners:**



RESULTS MINNESOTA



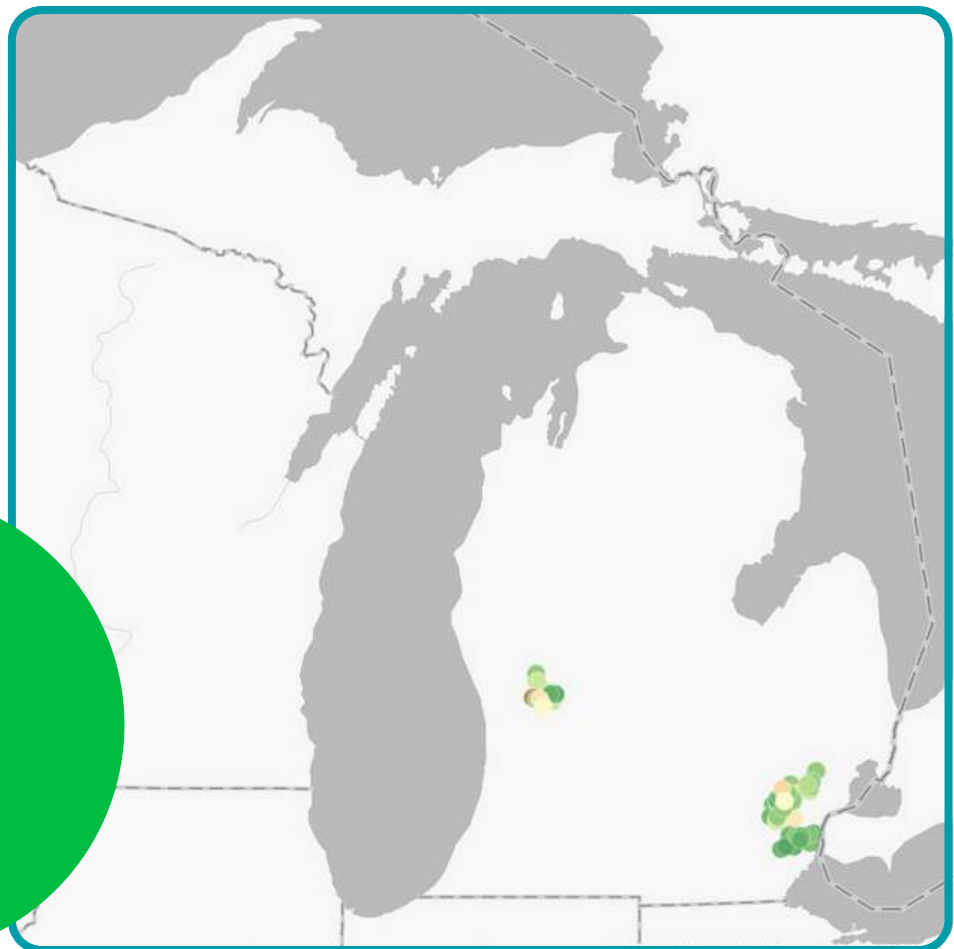
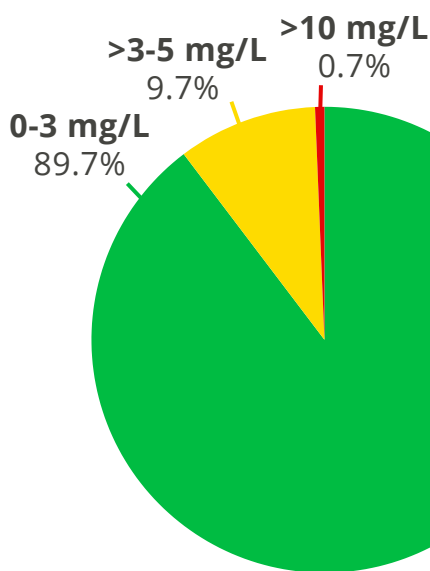
Total nitrate readings: **249**

0-3 mg/L:	227
>3-5 mg/L:	33
>5-10 mg/L:	19
>10 mg/L:	15

Regional
Partners:



RESULTS MICHIGAN



Total nitrate readings: **155**

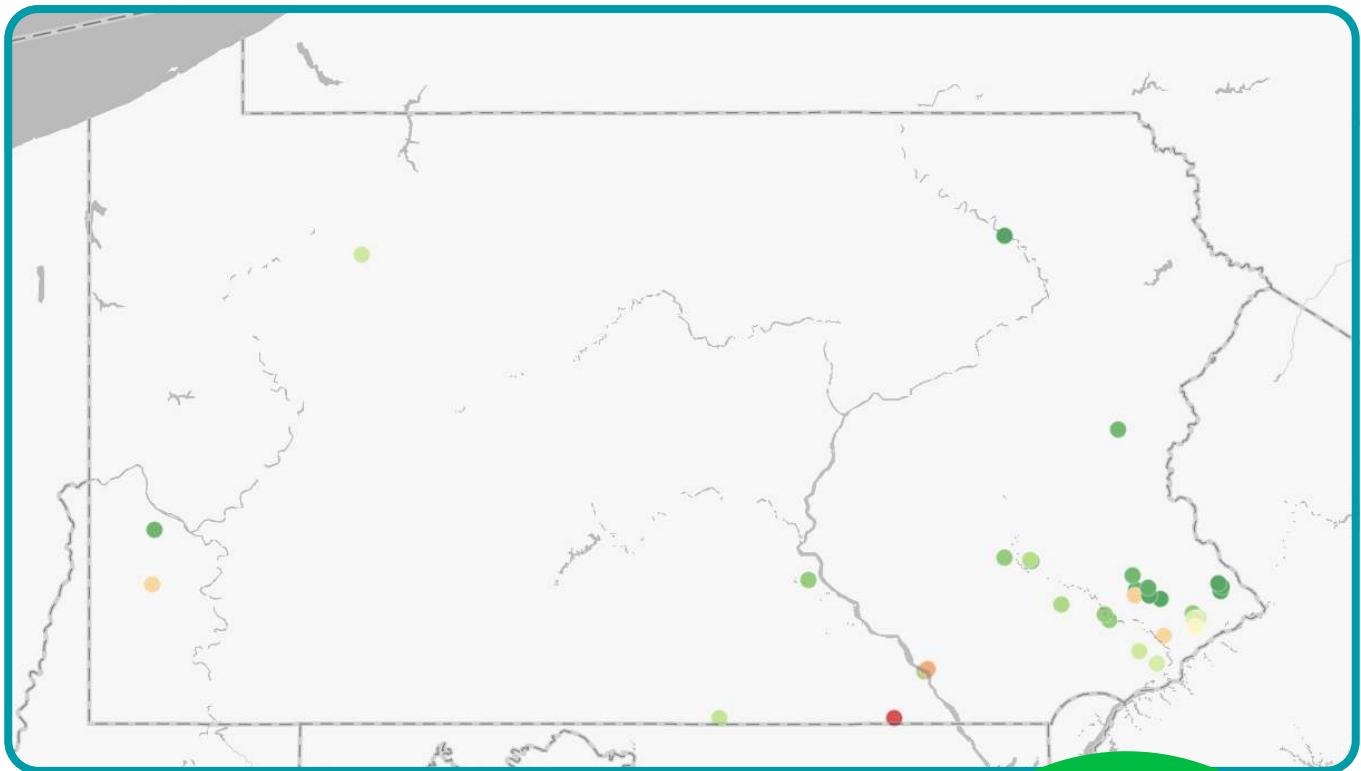
0-3 mg/L:	130
>3-5 mg/L:	8
>5-10 mg/L:	0
>10 mg/L:	0

Regional
Partners:



RESULTS

PENNSYLVANIA



Total nitrate readings: **121**

● 0-3 mg/L:	95
● >3-5 mg/L:	17
● >5-10 mg/L:	6
● >10 mg/L:	3

0-3 mg/L
78.5%

>3-5 mg/L
14.1%

>5-10 mg/L
5.0%

>10 mg/L
2.5%

LOOKING AHEAD

We are excited to see how much the Nitrate Watch program has grown and how many volunteers have joined us in just two short years. As we look downstream and make plans for the future, we intend to focus on...



Forging relationships with new partner organizations



Tracking EPA's decision-making regarding nitrate in drinking water



Creating tools and providing education to support clean water advocacy



Encouraging more monitoring of drinking water, especially from private wells



Expanding the Nitrate Watch program to reach new volunteers!

THANK YOU!

We are incredibly grateful for the volunteers and donors that support Nitrate Watch, contribute valuable data, and share the program with others.

We'd also like to extend a huge 'thank you' to the following organizations for their financial support of Nitrate Watch in 2024:

- Aegon Transamerica Foundation
- Chesapeake Bay Restoration Fund
- Iowa Division of the Izaak Walton League of America
- Iowa Department of Natural Resources REAP Conservation Education Program
- Izaak Walton League of America Endowment
- James E Dutton Foundation
- Raines Family Fund
- Roy A Hunt Foundation



IOWA DIVISION



Raines Family Fund





www.nitratewatch.org
nitratewatch@iwla.org

*Nitrate Watch is a trademark of the
Izaak Walton League of America*