

WATER

NORTH DAKOTA

March 2025

CALLING ALL PHOTOGRAPHERS!



Dani Quissell
Executive Director
North Dakota Water
Education Foundation

The *North Dakota Water* magazine is known for its eye-catching covers, which feature pictures of water features from across North Dakota. These covers are curated from the annual North Dakota Waterways Photography Contest—which is open now!

Contest entries are accepted until May 16 and could be featured on the cover of a future magazine! To be eligible, pictures must be taken in North Dakota and water must appear in some form. Past pictures have featured rivers, lakes, ice, snow and rain. The contest gives us the opportunity to showcase all the water resources we have in North Dakota.

Pictures can be sent digitally to editor@ndwater.net or via mail to:
2024 Waterways Photo Contest,
c/o *North Dakota Water* magazine
P.O. Box 2254
Bismarck, ND 58502

Digital photos preferred and must be at least 300 DPI at 9 x 12 inches, vertical orientation.

Results will be announced in the July *North Dakota Water* magazine. Winners not only will have their picture featured in a future magazine, but are also eligible to win cash prizes.

I hope you'll take some time this spring to spend some time enjoying our water resources! If you do, snap a picture and send it to us. You never know, you might just see your picture on a future issue of the *North Dakota Water* magazine!

A scenic photograph of a waterfall cascading over rocks in a wooded area. The water is white and frothy, and the surrounding trees are bare, suggesting a cooler season. The image is used as a background for the contest announcement.

2025 North Dakota Waterways PHOTOGRAPHY CONTEST

Winter, Summer, Spring or Fall . . . WE WANT TO SEE THEM ALL!

We're looking for those hidden away people and places to help us showcase North Dakota's water treasures. Take a picture suitable for the magazine's front cover. It could be taken in your backyard, at the neighborhood playground, by the creek, behind the farm house, or near your favorite fishing hole - in any season.

Be creative! If you "Discover our Cover," you win!

ENTRIES ACCEPTED UNTIL MAY 16, 2025
Entry forms can be found at <https://ndwater.org/photo-contest>

NORTH DAKOTA WATER

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The purpose of the North Dakota Water Education Foundation is to develop and implement water information and education programs to increase awareness, understanding and knowledge about water resource issues in North Dakota. The Foundation publishes the North Dakota Water magazine, sponsors summer water tours, and supports the Water Education Today (WET) for teachers and students. North Dakota Water is supported by several private, federal, state and local organizations and agencies.


The opinions and viewpoints expressed by the various authors and sponsoring entities in this magazine do not necessarily reflect the opinions and views of the North Dakota Water Education Foundation board and staff or other sponsoring entities.

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On the Cover

"Beaver Bay Golden Hour" by Casey Helling, Golden Valley. This photo was the 3rd Runner Up in the 2024 North Dakota Waterways Photo Contest, sponsored by the North Dakota Water Education Foundation.



North Dakota Rural Water Systems Association 2024-2025 Partnerships

North Dakota Rural Water Systems Association (NDRWSA) would like to extend a heartfelt thank you to our dedicated association partners and devote this article to recognizing them! Their generous support allows us to fulfill our mission to educate, promote, support and lead North Dakota's water industry in providing quality service to their customers.

With five sponsorship levels – Legendary, Water Champion, Industry Leader, Visionary and H2O Hero – you can partner with NDRWSA to ensure clean, reliable water reaches every corner of our state. As an association partner, your company receives unique advertising, sponsorship, and virtual opportunities.

Contact us at 701-258-9249 or visit <https://www.ndrw.org/partnership> to learn more.

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AE2S (Advanced Engineering and Environmental Services) began in 1991 as a water engineering and consulting firm specializing in surface water systems in North Dakota. Since then, it has grown in services and markets beyond water and wastewater with more than 20 office locations across the USA. It has motivated, collaborative, entrepreneurial professionals empowered to change our world and the world around us.

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Apex Engineering Group

Apex Engineering Group partners with clients to create practical and efficient solutions for complex water, transportation, municipal and facility projects. It proposes focused solutions that solve problems. Apex approaches each project with a clean slate, taking all experiences and applying a “lessons learned” philosophy. Apex understands each project completed for a community becomes a comprehensive engineered facility. And, while each one is important, all projects tie together to function efficiently and prolong the life of infrastructure systems. Apex has offices in Bismarck, Fargo and Dickinson, North Dakota, and Detroit Lakes, St. Cloud and Minnetonka, Minnesota.

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Moore Engineering Inc., an employee-owned firm, has been enhancing lives and strengthening communities across Minnesota and North Dakota for more than 60 years. As a full-service civil engineering and consulting company, Moore offers expertise in municipal engineering, water resources, land surveying, GIS, transportation and environmental services.

From designing water and wastewater treatment systems to managing stormwater and transportation projects, Moore Engineering delivers tailored solutions for cities and communities. Its municipal engineering services include water distribution, stormwater management, pumping facilities, and transportation systems like pavement design, highway capacity analysis and pedestrian-friendly corridors.

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As an employee-owned company, Moore Engineering takes pride in building partnerships that prioritize innovation, reliability and community-focused solutions.

Learn more about its impact and services by visiting www.mooreengineeringinc.com.



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Bismarck State College (BSC), North Dakota's Polytechnic Institution, is a leader in innovative education, offering programs that meet the state's evolving workforce needs. Known for its focus on technical excellence and hands-on learning, BSC prepares students for real-world success while supporting industries critical to our communities.

The college's fully online Water and Wastewater Technology program exemplifies this commitment, delivering flexible, high-quality training to help students and professionals maintain and operate vital water systems with confidence and expertise. With both credit and non-credit options, learners can tailor their education to their career goals while staying aligned with the latest industry standards.

Through a partnership with the National Rural Water Association (NRWA), BSC expands its reach with an online apprenticeship program that combines hands-on training with career advancement opportunities for water professionals across the region.

By equipping individuals with the skills needed to protect and sustain our most essential resource, BSC strengthens communities across North Dakota and our region.

Visit www.bismarckstate.edu to learn more about how BSC shapes the future of education and industry.



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"INNOVATIVE SOLUTIONS"

Team Lab

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Learn more by visiting www.teamlab.net

H2O HEROES

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COMPOSTING ALL WINTER LONG: How to Keep Your Pile Going in Cold Weather

When winter blankets North Dakota with snow and frost, many gardeners assume their composting efforts must pause until spring. However, winter composting is not only possible, but also a rewarding way to keep turning kitchen scraps into nutrient-rich compost. By using the right strategies, you can continue composting through the colder months and prepare for a thriving garden come spring. Here's how to maintain your compost pile all winter long.

WINTER COMPOSTING is the practice of maintaining a compost pile or bin through the coldest months of the year. Although the cold weather slows down decomposition significantly,

microorganisms continue to work, breaking down organic matter and creating the rich, dark compost which means your pile will take longer to break down compared to the warmer months.

To get started with winter composting, choosing the right container is essential. A sturdy compost bin or tumbler, preferably one with insulation, helps retain heat and keeps animals from scavenging. Consider that close, larger compost piles tend to retain heat better than smaller ones, so aim to build your pile to a sufficient size. Begin by layering your materials – alternate “browns” like dry leaves and straw with “greens” such as vegetable peels and coffee grounds.



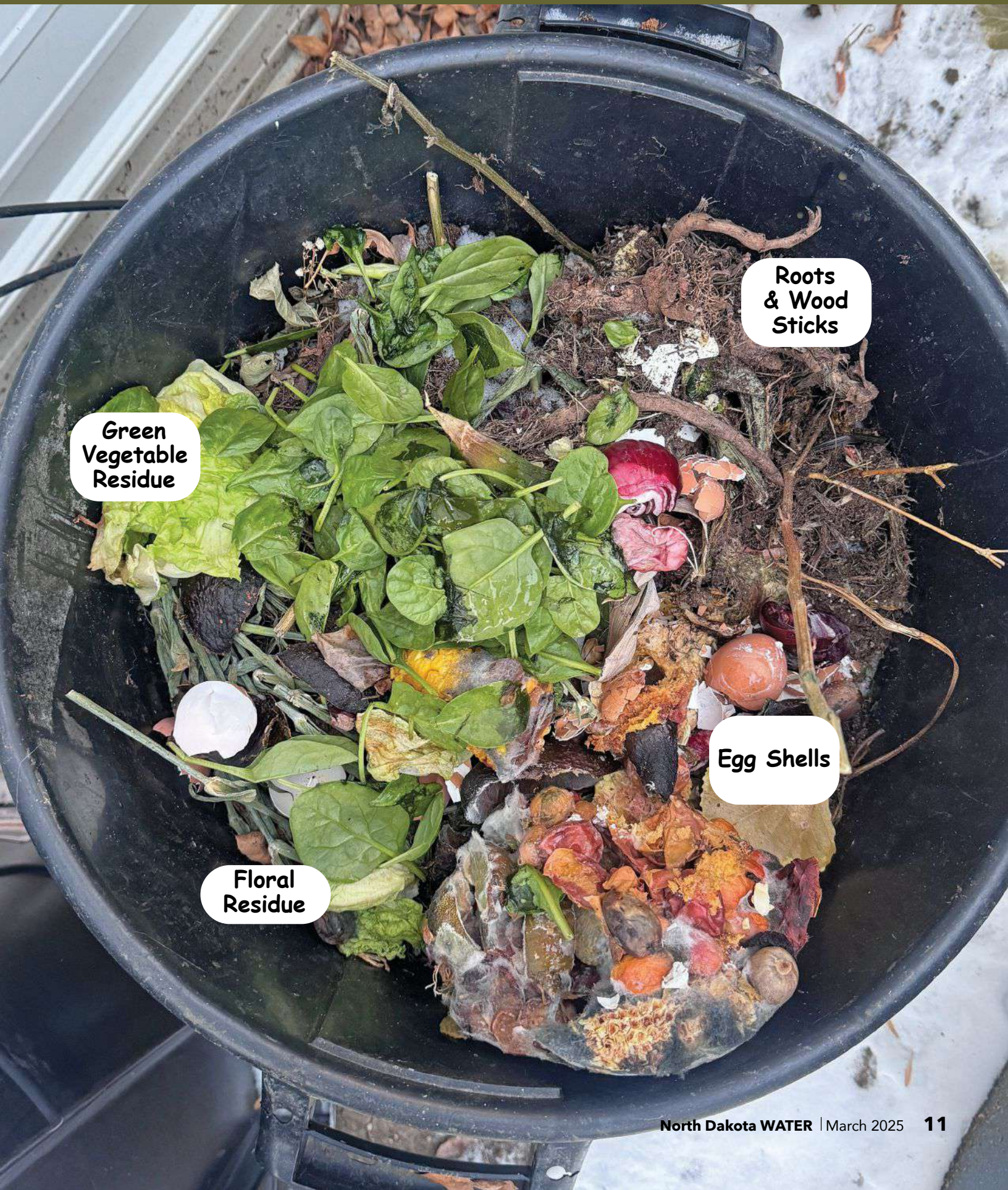
A three-section wooden compost bin standing in a garden during winter, designed for composting food scraps and garden waste.

This balance is crucial for maintaining microbial activity, even when the temperature drops. Adding an extra layer of insulation, like straw or a tarp, on top of your pile can help retain heat and keep snow and rain out.

While maintaining your compost pile, it's important to monitor its moisture level. Excessive snow or rain can make the pile too wet, while freezing temperatures can cause it to dry out. The pile should be damp, like a wrung-out sponge, but not soggy, so it's best to keep it close or protected and add moisture sparingly. Turning the pile occasionally can help aerate it, though it's important not to disturb it too often, as frequent turning can release heat.

By the time spring arrives, your compost pile will be rich with nutrients, ready to nourish your soil and support your plants. Where the growing season is short and every bit of preparation counts, winter composting is a valuable tool for gardeners and conservationists alike. It's a reminder that even in the coldest months, the cycle of life continues – and with it, the opportunity to cultivate sustainability and growth. So, bundle up, gather your scraps, and keep the composting spirit alive all winter long. Your garden will thank you in the spring.





**Green
Vegetable
Residue**

**Roots
& Wood
Sticks**

Egg Shells

**Floral
Residue**

Fighting Aquatic Nuisance Species:

Idaho's Ongoing Battle Against Quagga Mussels and Other Invaders

By Scooter Pursley

The fight against aquatic nuisance species (ANS) is likely to be never-ending, and the best way to slow the invaders is aggressively testing and attacking the invaders wherever they are found.

That approach is working in Idaho where early detection of quagga mussels in the Snake River met a quick response that slowed, but did not stop, the spread.

“Aquatic and noxious weeds have been something we’ve done for nearly 20 years in Idaho,” said Idaho Department of Agriculture Deputy Director Lloyd Knight. “Eurasian watermilfoil, flowering rush and curly leaf pondweed have been programs and projects we’ve been involved in.

“We spent a lot of time learning and planning ... and a lot of time talking to the public about what we were doing, a lot of time monitoring and a lot of times inspecting boats,” Knight added. “It has been a learning process.”

In North Dakota, zebra mussels are making headway in North Dakota waterways, prompting calls for more funding and manpower to prevent further spread. According to the North Dakota Game and Fish Department, they are present in the length of the Red and Sheyenne rivers, Ryan Pond, Twin Lake, Lake LaMoure and the James River, North and South Golden lakes, Lake Elsie and Lake Ashtabula.

The executive budget presented by former Gov. Doug Burgum recommended \$2.9 million in the North Dakota Game and Fish Department budget to fight ANS in the next biennium.

Despite Idaho’s best efforts, quagga mussel veligers showed up in the Snake River in 2023, prompting a response that has been developed since passage of the state’s Invasive Species Act in 2008.

“We have taken 15,000 samples from anywhere we can get safely with our crews throughout the state,” Knight said. “We have multiple samplings from each water body where water touches a boat. Our goal from the outset was to sample enough, frequently enough that if we found an infestation early enough that we could do something about it.”

A state-created rapid response plan included communication and decision-making. “We had to have



Quagga mussels at different stages on a pipe.

something walk us through to find out if something was really infested or if we're just seeing ghosts in the background," Knight explained. "We wanted to make sure if we were going to ring the bell, we're ringing it for real and the right people found out in the beginning."

In September of 2023, Idaho rang the bell and began mitigation efforts after a detection was confirmed on Sept. 18. The river was quarantined around Twin Falls, Idaho, where the infestation was found. Two 96-hour treatments were conducted on that stretch of river. Post treatment showed no active veligers.

Between 2023 and 2024, the Idaho legislature awarded an extra \$6.5 million and more full-time people to "dramatically" expand outreach and education efforts and doubled monitoring efforts statewide.

When a second infestation was discovered in the Snake River in September of 2024, testing was increased and treatment was changed to address what was believed to be a source of the infestation. Logistics were adapted to the terrain and one 200-hour treatment was made. Follow-up testing is ongoing. A second treatment is planned, if needed.

Quagga mussels are native to eastern Europe and originated in Ukraine. The "D" shaped species are similar to their cousins – zebra mussels – in the damage they cause to water intake structures, water treatment facilities and power plants, boating



Quagga mussels infest a boat propeller.

structures and native fauna.

In addition to the large-scale treatment of the river infestation, Knight said his department conducts roughly three dozen treatments a year of intakes, primarily with chemicals but some by diver and hand-removal.

Treatment is not the only activity Idaho conducts. The state also has between 20 and 25 inspection stations on routes coming into the state and roving crews that conduct watercraft inspections. It has conducted 1.2 million inspections, including 156,000 last year, and the number will go up with the discovery of mussels for the second straight year in the Snake River.

As a closing, Knight had this advice: The keys are people and partners. The more you can do to identify these keys in advance of something happening, and developing a plan, the better off you'll be.

North Dakota Use of the Missouri River

Followers of these Missouri River articles are aware that the mighty Missouri River, the longest in the nation at more than 2,300 river miles, is a natural resource shared by a large part of our country.

Starting as a mere trickle in west-central Montana, it flows through and drains more than 529,000 square miles of land in parts of 10 states and two Canadian provinces. All told, the Missouri River system provides drainage on more than one-fourth of all agricultural lands in the United States.

By the time it empties into the Mississippi River near St Louis, Missouri, the “Mighty Missouri” is of formidable size, providing a contribution to that river of an average of more than 60,000 cubic feet of water per second (cfs). It is such a valuable and visible resource that four state capitals are found along its banks: Helena, Mont., Bismarck, N.D., Pierre, S.D. and Jefferson City, Mo.

North Dakota, with most of the drainage into the river from dry lands of the central and west, contributes roughly 10 percent into the system.

In the drought of the 1930s, the Missouri River was the only river system in the Great Plains states that did not go dry. At the height of the drought, the river still flowed past Bismarck at near 17,000 cfs, a flow that guaranteed water for users during this period.

The river enters the state near Williston at an average annual flow rate of approximately 13,000 cfs and enters South Dakota south of Bismarck at an average annual flow rate of nearly 20,000 cfs. That equates to approximately 7,000 cfs of North Dakota water flowing in the river. As a measure of volume, that is approximately 5 million acre-feet of water per year.

A river of that abundance and reliability begs to be recognized and put to a beneficial use. Since statehood, North Dakota has understood that value and created programs, projects and policies for use of the river by our state.

North Dakota State Engineer John Paczkowski gave a presentation on the state's usage of the Missouri River at the 2021 North Dakota Water Users Convention. His presentation revealed facts that bear repeating and are shown in Figure 1.

Who holds North Dakota usage permits, and who



KEN ROYSE
Program Manager, Missouri River Joint Water Board

uses that water? Figures 2 and 3 are again from the state engineer’s presentation and provide some insight.

Figure 2 shows that most of the permit allocation is for the category entitled “multiple use.” Those include permit allocations for the Garrison Diversion Conservancy District, the North Dakota Department of Water Resources (DWR), the Northwest Area Water Supply Project and the Red River Valley Water Supply Project. Those four permits collectively account for more than 84% of all the permitted Missouri River water in the state. Municipal, industrial and irrigation use all follow as other major users of the system.

Figure 3 shows that the number of permits is spread in



- There Are **248** Appropriators Using Missouri River Flows In North Dakota
- **3,724,165** Acre-Feet Approved For Annual Consumptive Use
- In 2020, Reported Use Was **124,716** Acre-Feet
- This Means Reported Annual Use Constitutes **3.4%** Of The Total Consumptive Volume Allocated Annually

Figure 1. Missouri River use in North Dakota.

Source: ND Department of Water Resources (DWR)

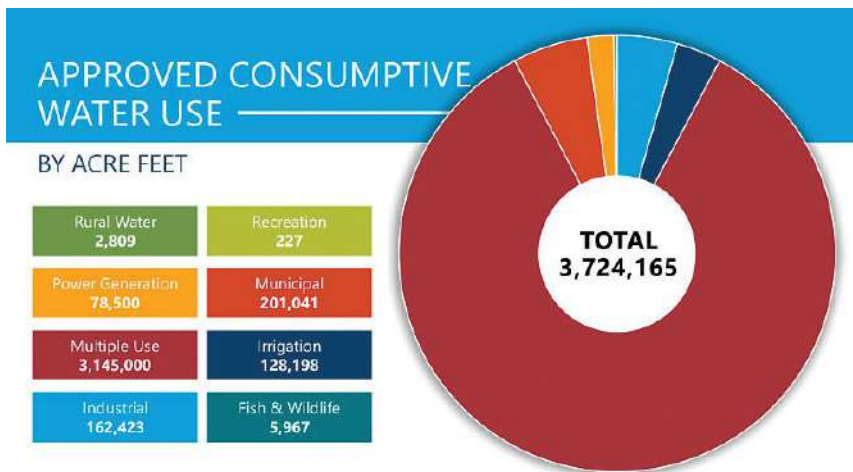


Figure 2. Approved consumptive use of Missouri River water in ND. Source: DWR

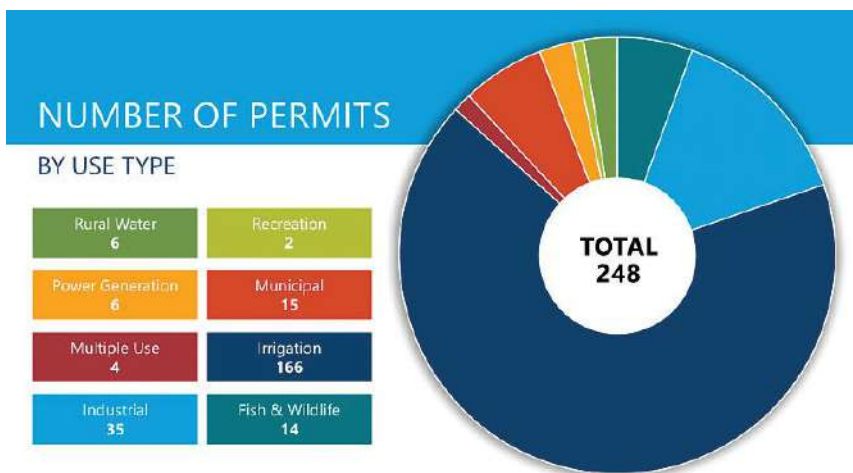


Figure 3. ND Missouri River water use permits by type. Source: DWR

a different fashion than water allocation. Most Missouri River water permits go to irrigation interests, with industrial and municipal users falling far behind. This follows a pattern across the West; large projects demand significant amounts of water, but irrigation holds most

permits.

Relative to this discussion of water use from the river, the DWR undertook an analysis this year of who is using the water from the Missouri River (North Dakota and other states) and more importantly, how water is being used in North Dakota. The results are found in Figure 4.

Comparisons and analysis are difficult between the states because each state allocates and accounts for their permitting in slightly different fashions. For example, note the large permitted amount from the state of Montana (132 million acre-feet). No other state approaches that number. That is due mostly to the way Montana tracks allocations for hydropower generation and what it calls “in-stream flow” allocation for the benefit of fish, wildlife and recreation.

To date, North Dakota has used only a small portion of its permitted water allocation, a pattern seen in other states in the system.

North Dakota, using approximately 1.68% of its permitted volume, appears to be the most successful of the upstream states in fully utilizing the water permitted.

Future articles on this issue will further discuss the use of the Missouri River, and as important, the potential uses of the river by North Dakota and other states. The potential

impacts of such current, future and potential uses will be a topic for discussion that all users of the river system should be aware of, and which North Dakota will need to recognize to protect its abilities to permit and use the system.

STATE	AVERAGE ANNUAL CONTRIBUTION	TOTAL PERMITTED	TOTAL CONSUMPTIVE USE	% USED vs. INPUT
	Acre-feet per year	Acre-feet per year	Acre-feet per year	
MONTANA	17,600,000	132,000,000		
NORTH DAKOTA	7,000,000		117,570	1.68%
SOUTH DAKOTA	11,300,000	2,200,000	72,007	0.64%
NEBRASKA	21,800,000	4,400,000	74,800	0.34%
IOWA	Included with Nebraska input			
KANSAS	13,400,000	460,587	160,587	1.20%
MISSOURI	Included with Kansas input		466,065	3.48%

Figure 4. Consumptive use of the Missouri River by state. Total permitted and consumptive use data was provided by the DWR.

WHEN DO I NEED A SOVEREIGN LAND PERMIT?

The Department of Water Resources (DWR) manages all navigable waters of the state. Any project that lies partially or wholly within the ordinary high-water mark (OHWM) of a navigable waterbody will need a sovereign land permit from the DWR prior to construction.

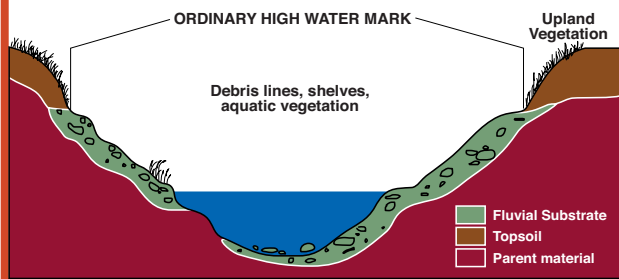
Projects that would require prior authorization to begin construction include water intakes, boat docks, electrical power line crossings, bored utility lines, bridges, the placement of rock riprap for bank stabilization, and dredging within the OHWM of a navigable waterbody. If you are planning to build or install anything in or around a navigable river or lake, you will likely need a permit.

DEFINITIONS

Though the above explanation seems simple enough, it may provoke a couple of the other fair questions, such as – what is an ordinary high-water mark, and what is a navigable waterbody?

ORDINARY HIGH WATER MARK

Defined in North Dakota Administrative Code (NDAC), it's the line below which the action of water is frequent enough either to prevent the growth of vegetation or to restrict its growth to predominantly wetland species. In addition, any islands in navigable waterbodies are generally considered to be below the ordinary high-water mark in their entirety.



NAVIGABLE RIVER OR LAKE

Navigable means any waterbody that was used or susceptible for use for commerce at the time of statehood (1889). There are currently 17 navigable waterbodies in North Dakota, including the Missouri River, Red River, Cannonball River, Heart River, Knife River, Painted Woods Lake, Yellowstone River, Upper De Lacs Lake, Mouse River, Long Lake (Bottineau County), Lake Metigoshe, Pembina River, Sheyenne River, Devils Lake, Sweetwater Lake, James River, and Bois De Sioux River.



NAVIGABLE WATERS OF NORTH DAKOTA



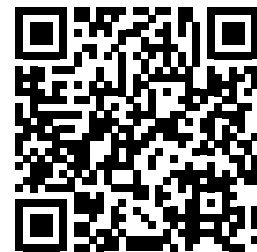
THE PERMIT PROCESS

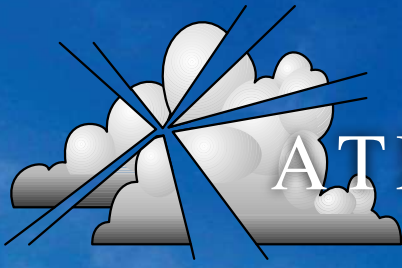
To acquire a sovereign land permit from DWR, an *Authorization To Construct a Project Within Sovereign Lands of North Dakota* application form must be filled out and submitted to DWR, along with a map showing the project location. After the application is received, it is reviewed by DWR staff and comments are requested from several local, state and federal agencies. After the 30-day comment period ends, all comments are reviewed. It is possible that a public meeting may then be held as deemed appropriate by the DWR. The DWR will then make a determination on the permit applications.

Exemptions are available for sovereign land permits, primarily related to certain boat docks, water intakes and riparian landowner use. To learn about those exceptions, or to find additional information, see DWR's website (<https://www.dwr.nd.gov/>) or you may contact DWR's Sovereign Land Manager Jerry Heiser at 701-328-4935 or gheiser@nd.gov and Sovereign Land Specialist Amy Winkelman at 701-328-4988 or awinkelman@nd.gov.



Scan To Learn About
Sovereign Lands





THE ATMOSPHERIC RESERVOIR

Examining the Atmosphere and Atmospheric Resource Management

ON THE CONTRARY, THOSE ARE CONTRAILS

By Mark D. Schneider

Spring weather means that we're typically outside more often and have more opportunity to observe the sky. The sky is sometimes brilliant blue and clear of clouds. Other times we may see *contrails* like the ones in the included photo. The word *contrail* is a contraction for "condensation trail," defined by the American Meteorological Society as "a cloudlike streamer frequently observed to form behind aircraft flying in the clear, cold, humid air." Another common name for a contrail is a vapor trail.

Commercial aircraft have turbine-type engines that serve as a source of water vapor for contrail development. This means that even when moisture conditions aren't conducive for natural cirrus clouds to develop, contrails can appear. In fact, for every pound of fuel used by an airliner, more than a pound of water vapor is produced. Larger airliners can eject five or more pounds of water vapor into the air per second. These water vapor droplets freeze almost instantaneously due to the frigid temperatures of -40 degrees or colder (Fahrenheit and Celsius are equal at this temperature) at flight levels of over 30,000 feet.

Over rural states like North Dakota, it may seem unusual to see contrails so frequently. There are, however, approximately 5,000 aircraft flying over the U.S. at any given moment and roughly 45,000 U.S.-based flights per day! Additionally, there are international flights originating in Europe that pass over North Dakota due to the curvature of their flight paths.

The busier airways of the U.S. have multiple aircraft passing through them at the same time. This is achieved with air traffic control's separation of altitudes. With several aircraft at high altitude producing contrails, there can be crossing patterns or even grid-like formations in the sky. These may linger for several hours if the atmospheric conditions are suitable.

A common misperception about contrails is that they are really condensed jet exhaust or actually other chemicals. In the hours around sunrise or sunset, a red hue might be seen highlighting contrails close to the horizon. To the amateur observer, the red contrails have been thought to be nefarious; however, the effect is simply the sun's illumination. A "rainbow" of color can also be seen within contrails (even in the skies overhead) because they contain ice crystals that the sun's light refracts off of like a prism. Another example of this can be seen within cirrus clouds when sun dogs occur.

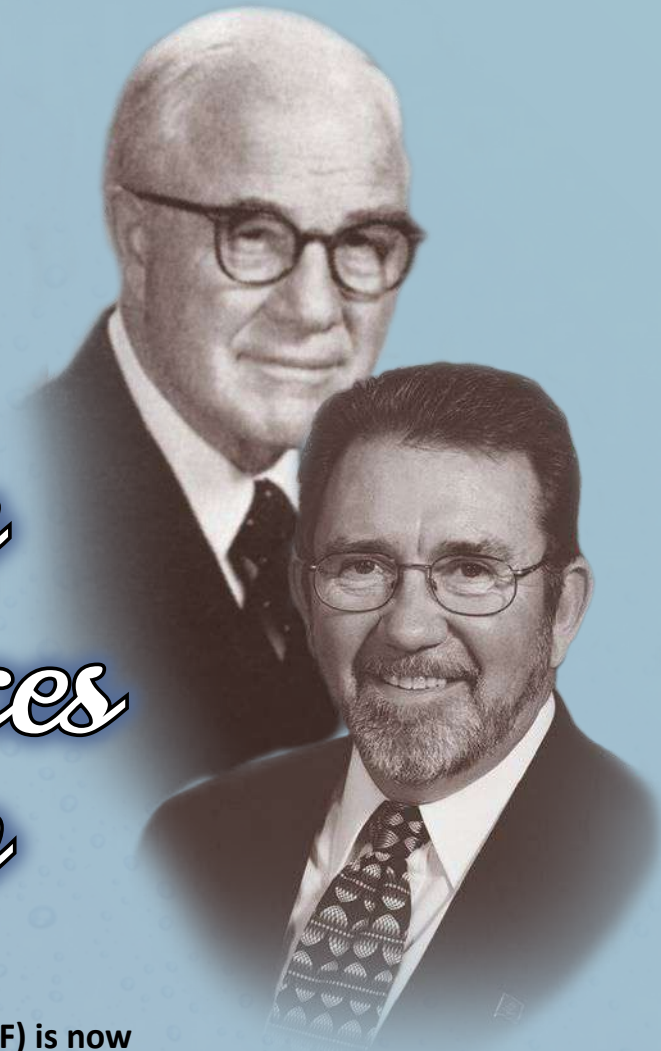
Overall, contrails are very beneficial to pilots and meteorologists alike. Pilots are served by the additional safety that contrails provide in visual identification of other aircraft in their vicinity. This "see-and-avoid" tool, along with air traffic control's altitude separation have made our skies remarkably safe. Meteorologists use contrails as indicators of upper-level wind speed, wind direction, and moisture. Sometimes contrails are good indicators of turbulence, and this is very apparent when they resemble a curvy or corkscrew shape in the sky. Observe the differences in contrail appearance both in the photo above and in the outside sky and see what you can reveal about atmospheric conditions.

Atmospheric Resource Board | North Dakota Department of Water Resources | 1200 Memorial Highway, Bismarck, ND 58504
(701) 328-2788 | dwr.nd.gov

ND Weather Modification Association | PO Box 2599 | Bismarck, ND 58502 | (701) 223-4232

2025

Dushinske & Jamison Water Resources Scholarship



The North Dakota Water Education Foundation (NDWEF) is now accepting applications for the 2025 Dushinske & Jamison Water Resources Scholarship Endowment. The deadline for applications is April 15, 2025. All applications must be postmarked by that date.

Each year, four \$1,500 scholarships are awarded to deserving students. Applicants must be enrolled in a North Dakota college or university, with preference given to, but not limited to, those pursuing water-related fields or those whose families have actively contributed to state water resource management.

The scholarship recipients will be recognized at the North Dakota Water Convention awards program on December 11, 2025. The 2025 scholarship winners will be selected by an impartial judge and announced in May, with the results published in *North Dakota Water* magazine.

APPLY NOW
Applications Due April 15

For more information and application visit www.ndwater.org/scholarships/



A Day in the Life of a Circuit Rider

By Ward Heidbreder

Having been asked several times about a typical day in the life of a North Dakota Rural Water Systems Association (NDRWSA) Circuit Rider, I thought I could answer that question. (Un)Fortunately, I can't answer what a typical day is like, as no two days are the same.

A circuit rider's day is filled with a variety of routine tasks that keep things interesting. Daily activities include phone calls, emails, texts, and essential program reporting. While I sometimes find myself grumbling about life's little inconveniences, these moments actually help me appreciate all the good that each day brings. Beyond the usual communications and reporting, no two days are ever the same. A circuit rider carefully plans their work week to maximize the number of water systems they can visit, taking into account travel time and the specific needs of each water system. This thoughtful planning ensures that each day is both productive and rewarding.

The next phone call, text or email may scrap a circuit rider's plan. Water system operators contact us for information, to confirm that they have the correct information to correct an issue, to schedule a future onsite visit, or to request immediate assistance with a major issue.

Circuit riders have been characterized as being resourceful and knowledgeable in all aspects of water system operations. Other characteristics that most circuit riders exemplify are responsiveness, the ability to prioritize, flexibility in scheduling, and time management skills. All these attributes help a circuit rider respond to water system emergencies or to schedule a system maintenance visit.

As for myself, I believe I embrace most of the characteristics of a circuit rider. Those closest to me – family, friends, and colleagues – are familiar with one trait I've long struggled with. While I won't elaborate here, I will say that this article is due to the editorial staff in less than 24 hours. 😊

So, after a wee bit of rambling, back to the question: what is a typical day in the life of a NDRWSA Circuit Rider? Anything but typical! Our goal is to provide onsite technical assistance and training to water systems in a professional, knowledgeable and cost-effective manner. The who, what, why, and when are the variables that change by the week, day, hour, or minute.

Contact our office if your city or system needs assistance. Learn more about the NDRWSA Circuit Rider program and the many other resources available at www.ndrw.org.





What Are the Different Types of Septic Systems for Rural Areas?

By Dean Hayes

Selecting the appropriate septic system can be overwhelming as there are numerous types available. Some factors in determining the correct type of system include soil condition and the size of the system.

Type 1 septic systems are the suitable choice for properties where the soil is ideal. They consist of a septic tank which can be made of concrete, fiberglass or plastic. Once the wastewater reaches the septic tank the suspended solids settle to the bottom, forming sludge, while the less dense layer floats to the top, forming the scum layer. The middle layer in the septic tank is the watery effluent between the scum layer and the sludge layer. This wastewater layer flows from the septic tank to the drain field where it will be filtered naturally through soil by removing bacteria and pathogens before reaching the groundwater. The scum and sludge levels left in the septic tank will have to be pumped out of tank as needed.

Type 2 septic systems include secondary treatment. A type 2 system is very similar to type 1 as both have anaerobic breakdowns of the solids in the septic tank. This means it is an oxygen-free septic tank. With type 2, there is another tank supplied with oxygen to help break down suspended solids in the wastewater. This will extend

the life of drain fields by eliminating some of the biomass that is built up in drain fields and does not let wastewater filter down through the ground. If you use this system, you have to have an effluent filter because of the aerating and to prevent solids from entering the drain field. Some benefits of this system are cleaner and safer effluent being discharged. Also, this system can be installed in a smaller area or an area with less than perfect soil conditions. The disadvantage is a type 2 septic system costs more than a type 1.

Type 3 septic systems include a secondary treatment and a disinfection filtration. This system is a custom-designed sewage treatment that does everything a type 1 and type 2 system does but adds a disinfection stage that produces clear odorless effluent that is of a much higher water quality. Type 3 is a good choice where space is limited for the drain field and has very poor soil conditions due to the high quality of effluent discharged. The disadvantage would again be higher cost.

Choosing the right septic system requires careful consideration of many factors. While this article provides a brief overview, it is wise to seek expert advice. Feel free to reach out to a professional septic installer or the local health unit for assistance.

Our Water

Keeping it Clean

North Dakota Department of Environmental Quality

Project Spotlight

Stutsman County Soil Conservation District

Meridith Miller, Environmental Scientist
North Dakota Department of Environmental Quality

In the fall of 2022, the Stutsman County Soil Conservation District (SCD) submitted a proposal for a watershed implementation project addressing nonpoint source pollution in the Jamestown Reservoir and adjacent watersheds. Nonpoint pollution occurs when runoff from rain or snowmelt carries contaminants into nearby streams and lakes. Watershed projects address nonpoint source pollution by providing financial and technical assistance to landowners implementing conservation practices known as “Best Management Practices” (BMPs). The goal of the Jamestown Reservoir project is to reduce harmful algal blooms (HABs) and improve recreational opportunities at the reservoir. Jamestown Reservoir is identified as “threatened” (based on ND Water Quality Standards) due to high levels of nutrients in the waterbody.

Harmful algal blooms are an overgrowth of cyanobacteria (blue-green algae) in surface water. When conditions are right (excess nutrients, warm water

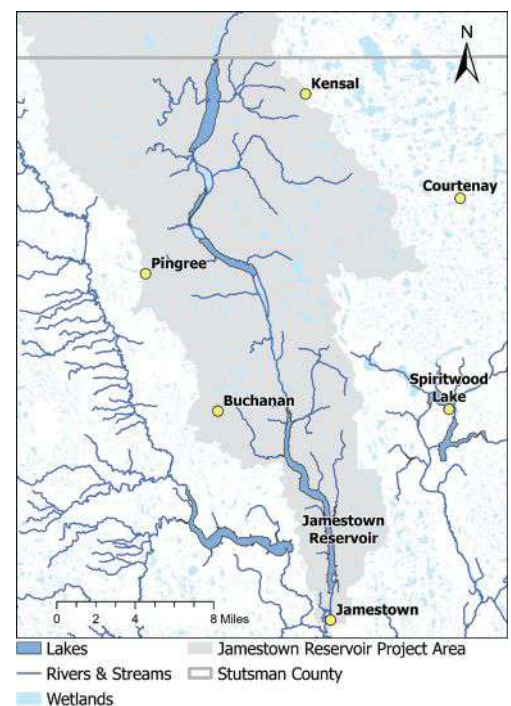


HAB on Jamestown Reservoir in September 2023.

and abundant sunlight), cyanobacteria multiply quickly and form a bloom. As the bloom dies off, the cells break down and can release toxins such as microcystin. Microcystin and other HAB toxins can cause harm to people, wildlife, livestock, pets and aquatic life. Jamestown Reservoir had warnings or advisories issued due to high levels of microcystin in 2020, 2021, 2023 and 2024.

To reduce nutrient inputs to the reservoir, Stutsman County SCD works with landowners on BMP placement throughout the watershed. Dustin Krueger, the SCD manager and watershed coordinator, says that for this project, “We have cost-shared two solar wells, pipelines, tanks and grass planting. We have planned 66.5 acres of conservation cover in non-productive land, 40 acres of hayland planting, fencing for rotational grazing, a well, pipeline and a tank.”

Stutsman County SCD has been a continual sponsor for watershed projects since 2002. The SCD is working on gully erosions, partial manure feeding operations, ag waste systems, cover crops,



Jamestown Reservoir project area in Stutsman County.



Conservation cover plantings (top) and solar wells (middle) are two of the BMPs Stutsman County SCD have completed in this watershed project.



Rain Barrel construction was an educational event the SCD hosted. All photos on this page courtesy of Stutsman County SCD.

conservation cover, septic systems and many other projects. Krueger says, “The goal is to try and improve water quality going into our lakes and streams and prevent them from getting worse. This is not only a farm operation issue we need to work together in cities also.”

Krueger said getting to meet producers is his favorite part of the job. He enjoys “visiting with people about their operations and hearing their stories to see where he can help improve their operation.” One of the challenges he faces with watershed projects is getting producers to sign up for the program.

In addition to BMP assistance, the SCD also does educational events such as the rain barrel construction night pictured on the bottom left.

Krueger wants Stutsman County residents to know that the SCD is available to provide assistance, even if the operation is not in a current project area. The employees will help you find a program that fits your operation and work with you.

For more information on the Jamestown Reservoir Watershed Project, contact the Stutsman County Soil Conservation District at 701-252-2521 (ext. 3) or email Dustin.Krueger@nd.nacdnet.net.

For information on watershed projects throughout North Dakota, contact Environmental Quality Nonpoint Source Program Manager Emilee Novak at 701-328-5240 or email ejnovak@nd.gov.



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www.deq.nd.gov



THE Timmer Chronicles

By Scott Nelson

We just lost a former president, Jimmy Carter, at the age of 100. I was in high school while Carter was president.

I still remember when he was running for president in the 1976 election. I thought he would make a good president because he was a peanut farmer. I figured a common-sense farmer would be able to make the right decisions.

I remember arguing for Carter with some other kids on the school bus. Their parents were Republican and they were against Carter. My parents were strong Republicans, but I had my own mind and was for Carter, even though I was too young to vote. Carter ended up winning the election against Gerald Ford, who may have lost the election in part because he pardoned Richard Nixon for his involvement in the Watergate scandal. One consequence of Carter becoming president, this is true, was suddenly getting lots of peanuts to eat during lunch time at school.

As it turned out, Carter wasn't a very good president. Some of it was his own doing and some were events beyond his control. One thing that happened during his presidency was the energy crisis. OPEC (Organization of Petroleum Exporting Countries) banded together to limit production and spread the false pretense that the world was running out of oil. Oil prices skyrocketed, and many places experienced gas shortages. Some people actually believed we were running out of fossil fuels.

Common sense Carter encouraged Americans to conserve, turn down thermostats, drive less and live more simply. He also put solar panels on the roof of the White House to conserve energy. The American people didn't appreciate being told to live simply and use less fuel.

The Soviet Union invaded Afghanistan and much of the world protested the action. Carter decided to cut off grain sales to Russia and the Soviet Union to punish them for the invasion. Our farmers were the ones punished. Grain prices plummeted and many farmers went bankrupt.



Carter correctly allowed the Shah of Iran to come to America for cancer treatment. Iran wanted him back and Iranian students raided the American embassy in Tehran and took 53 Americans hostage. Carter OK'd a military mission to rescue the hostages, but the mission went terribly wrong with the lost of eight servicemen, one C-130 cargo plane and six Sea Stallion helicopters.

One bright spot in Carter's presidency was the peace treaty he was able to forge between Egypt and Israel in 1979 that is still in effect today.

Carter lost reelection to Ronald Regan in 1980. While most presidents, win or lose, leave the presidency very wealthy, Carter left his presidency over \$1 million in debt. His farm business suffered in the years he ran for and while he was president. It took a long time for Carter to recover financially. After losing, Jimmy and his wife, Rosalynn, went home to Georgia to live in the same modest house they had lived in before he was president. They lived in that house for the rest of their lives. Just one of the Secret Service vehicles that parked at the home was worth more than the house the Carters lived in.

Yes, Carter was not the best president, but he was a very good man. Jimmy was a Christian and fully lived as a Christian with Christian values. I don't remember him saying a bad word about anyone, even those he differed with politically. He went to and taught Sunday School at the Maranatha Baptist Church in Plains, Georgia, for many years after he was president. He cared for his fellow man and spent the rest of his life helping people through Habitat for Humanity and many other projects all over the world.

I don't know how things will turn out with the present occupant of the White House and I hope he is successful, but I wish he would be just a little more like Jimmy Carter.

See yuh next time, Scott.

New Year, New Faces

By Kimberly Cook

The Garrison Diversion Conservancy District (Garrison Diversion) board of directors has 28 members representing each of the 28 counties within the district. Each county supports Garrison Diversion's operations by issuing a one-mill levy and electing a citizen to serve a four-year term on its board of directors. The board works collectively to fulfill Garrison Diversion's mission to provide a reliable, high-quality and affordable water supply to benefit the people of North Dakota.

Each January, the board welcomes new electees to the organization and holds elections for leadership positions. This year, several new faces are visible at the regular meetings and the board is under new leadership.

NEW BOARD MEMBERS

Garrison Diversion's board of directors is pleased to welcome two new individuals elected in November's general election to replace long-time directors who retired at the end of 2024. Robin Arndt, McKenzie County, and Roger Gunlikson, Williams County, participated in their first quarterly meeting of the board of directors in January.

"It's hard to replace the wealth of knowledge and leadership lost with the retirement of Ward and Richard, but we are grateful to have gained two new individuals who are already engaged and ready for the opportunity to make a huge difference for future generations," Chairman Jay Anderson says.



ROBIN ARNDT, *McKenzie County*

Robin Arndt is stepping in to fill the McKenzie County vacancy left when former director Richard Cayko retired. Arndt is a highly respected individual in the parks and recreation circle and with over 30 years of service as the Watford City Parks District superintendent, Robin has personally seen the positive impact Garrison Diversion has made on its member counties, especially through the Matching Recreation Grant Program.



Robin brings an abundance of recreation experience to benefit the board's operations and will serve on Garrison Diversion's Recreation Committee.

"Garrison Diversion leads the way in implementation, operation and maintenance in providing quality water to the citizens of North Dakota. I'm looking forward to expanding my horizons and contributing my 30-plus years of park and rec experience in the Recreation Program," Robin says.

Robin resides in Watford City with his wife, Stacey. They have five grown children.

ROGER GUNLIKSON, *Williams County*

Roger is a retired farmer living in Grenora, North Dakota, and has been actively involved in the water community for more than 20 years, including participation on the Williams County Water Resource District Board, ND Water Resource District Association Board and ND Irrigation Association board. Roger has been a strong leader who also served as past president or chair of each of these organizations. Additionally, he has been active in multiple other community boards and organizations throughout the years.



Roger will serve on Garrison Diversion's Agriculture & Natural Resources Committee.

"I know Garrison Diversion works with the state of North Dakota and the federal government to put Missouri River water to beneficial use for North Dakota, and I'm looking forward to this opportunity to engage further with the board members and staff to continue working to fulfill this mission," Roger says.

Roger is married to Pamela. He has one daughter and three stepsons.

Each director will serve a four-year term on the board.

NEW BOARD LEADERSHIP

The board is also under new leadership, as the executive committee will now be led by Chair Jay Anderson, Ransom County; 1st Vice Chair Greg Bischoff, Barnes County; and 2nd Vice Chair Jeff LeDoux, Cass County, each serving a two-year term in their new leadership positions.

Anderson, Bischoff and LeDoux will also serve on Garrison Diversion's 10-member executive committee, which monitors the financials, federal matters and overall operations of the Garrison Diversion. The committee consists of 10 members, each serving a two-year term.

JAY ANDERSON

As the calendar turned to a new year, the four-year reign of board chair Alan Walter, Ward County, also came to an end as he turned the gavel over to Jay Anderson of Ransom County.



Jay was elected by the board to serve as chairman, replacing Walter, who reached the end of his term in the leadership position. Anderson is a long-time director who has been heavily involved in the water industry since 1994, when he became involved with the Ransom Sargent Water Users. Since then, Jay has recognized that a lot of positive things have come from developing water systems across the state.

"In light of that, I think the Red River Valley Water Supply Project is one of the most vital and important water projects the state has seen and will have a bigger impact than we can even estimate. I think there is great potential here with the Missouri River," Anderson says. "What we do at Garrison Diversion is important and I'm glad to work with other very knowledgeable board members with diverse backgrounds who are willing to be involved and have purpose being involved with this board."

Congratulations to Jay on this leadership position.

GREG BISCHOFF

Greg Bischoff, first vice chair, has been a representative for Barnes County since 2016, fully immersing himself into the board operations from the start. Previously the second vice chair, Greg has been leading the board and supporting the vision and projects benefitting a large part of North Dakota. He has also been heavily involved with the Red River Valley Water Supply Project and instrumental in its forward progress.



Greg graduated from Valley City State University with a bachelor of science degree in business administration and is the owner of Allard Trophy Co. in Valley City, where he also resides.

JEFF LEDOUX

Jeff LeDoux, Cass County, steps into the second vice chair spot and his first term on the executive committee. A civil engineer with Houston Engineering for more than 35 years, including 12 years as president/CEO of the company, Jeff's professional background is an asset to the board.



LeDoux has been an active member of multiple community and professional organizations throughout his career, including the American Council of Engineering Companies of North Dakota and the North Dakota Society of Professional Engineers.

LeDoux lives in Fargo with his wife, Becky. They have three adult children.

NEW EXECUTIVE COMMITTEE MEMBERS

With several individuals reaching their term limits on the executive committee, elections were held to replace those positions. Nikki Boote, Griggs County; Bruce Klein, LaMoure County; and Jason Siegert, Traill County will now hold spots on the executive committee.

NIKKI BOOTE

Nikki represents Griggs County citizens and brings a positive attitude to the room. She's been an engaged community member, recognizing that community service is an important part of rural life. Boote is a Dickinson State University graduate and works at Dakota Central in Carrington.



Nikki will chair the Public Relations Committee in addition to serving on the executive committee. She lives in Binford with her husband, Alan, and they have three children. When not tied up with board meetings or work, Nikki enjoys playing the piano and watching her kids participate in activities, rodeo, and golf.

BRUCE KLEIN

Bruce was elected to the board in 2016 and represents LaMoure County. Since becoming involved, he has learned there is so much more to Garrison Diversion than just irrigation and the original project that was proposed many years ago.

Bruce will now chair the Recreation Committee member and enjoys awarding money to recreation projects around the state and making a difference in many communities.

Bruce has been a county commissioner for LaMoure County for over 20 years. He grew up in rural LaMoure and received a bachelor's degree from North Dakota State University. He is a full-time farmer, working the family farm with his brother. Bruce and his wife, Crystal, have been married for almost 50 years and have three grown sons. Bruce is an avid fisherman and enjoys reading, and together they enjoy camping and spending time with family.



JASON SIEGERT

Longtime water advocate Jason Siegert of Hillsboro is the Traill County representative.

While he's one of the newer members to join the Garrison Diversion board, Siegert fully understands the importance of valuable resources and the significance of a quality water supply, having served on the Traill County Water Resource District board since 2006.

Siegert is also a dedicated public servant, committing time to multiple community and church organizations. He is a farmer residing in Hillsboro, with his wife, Corrie. They have four children.

Jason will chair Garrison Diversion's Red River Valley Committee, dealing with all aspects of the Red River Valley Water Supply Project.

The remaining members of the executive committee: Mike Tweed, Eddy County; Brian Orn, Sargent County; Larry Kassian, Burleigh County; Dave Anderson, Pierce County; and Alan Walter (ex-officio), Ward County.

Garrison Diversion board members recognize the importance water plays in North Dakota's future. They are leaders in building North Dakota's water supply infrastructure and managing the water, focusing on irrigation, recreation, municipal, rural and industrial water supply and the operations and maintenance of Garrison Diversion Unit facilities.





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2025 CALENDAR

- March 12 Devils Lake Basin Joint Water Resource Board Meeting, Ramsey County Courthouse, Devils Lake
- March 13 Garrison Diversion Conservancy District's Executive Committee Meeting, Carrington
- March 20 North Dakota State Water Commission's Pre-Commission Meeting
- March 27 NAWS Authority Meeting virtually or at the Minot Public Works
- March 27 Metro Flood Diversion Authority's Board Meeting
- April 7 Southwest Water Authority's Board of Directors Meeting, Dickinson
- April 9 Devils Lake Basin Joint Water Resource Board Meeting, Ramsey County Courthouse, Devils Lake
- April 9 Red River Joint Water Resource District's Board of Directors Meeting, West Fargo
- April 10 North Dakota State Water Commission Meeting
- April 24 Atmospheric Resource Board Meeting
- April 24 Metro Flood Diversion Authority's Board Meeting
- April 24-25 Garrison Diversion Conservancy District's Board of Directors Meeting, Carrington
- April 28-30 National Water Resources Association's Policy Conference, Washington, D.C.
- May 5 Southwest Water Authority's Board of Directors Meeting, Dickinson
- May 14 Devils Lake Basin Joint Water Resource Board Meeting, Ramsey County Courthouse, Devils Lake
- May 22 North Dakota State Water Commission's Pre-Commission Meeting
- May 22 Metro Flood Diversion Authority's Board Meeting
- May 29 NAWS Authority Meeting virtually or at the Minot Public Works
- June 2 Southwest Water Authority's Board of Directors Meeting, Dickinson
- June 11 Devils Lake Basin Joint Water Resource Board Meeting, Ramsey County Courthouse, Devils Lake
- June 11 Red River Joint Water Resource District's Board of Directors Meeting, West Fargo
- June 12 North Dakota State Water Commission Meeting
- June 19 Garrison Diversion Conservancy District's Executive Committee Meeting, Carrington

For more information or if you would like a water event listed here, call 701-223-8332 or email jellingson@ndwater.net.
Submissions are due the first Monday of each month preceding the next issue.

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