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# Annual Report

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**Winnebago County**

*Land & Water Conservation Department*

## OUR MISSION

The Winnebago County Land and Water Conservation Department is dedicated to providing competent, professional services in the planning, design, and implementation of programs and projects that protect, restore and sustain the natural resources of Winnebago County.

# New Winnebago County LWCD Staff



Hello! My name is Emily Dufek and I am the new Watershed Specialist with Winnebago County. I have been working with the department since February 2022. I began full-time in May after I graduated from Fox Valley Technical College with an Associate's Degree in Natural Resources.

I am originally from northeast Wisconsin where I grew up on a dairy farm. I still travel back to help out on some weekends. In my current role, I work with farmers as they implement conservation practices such as no-till, cover crops, and low-disturbance manure injection. I enjoy that I get to bring conservation together with agriculture overseeing the two watershed grants and assisting with the County Soil Health Challenge (SHC).

In my free time I love to fish, camp, and explore new places! I am very grateful for the opportunity to serve Winnebago County and I look forward to working with farmers and landowners as they begin their soil health journey.

I'm Alix Bjorklund-Patil, one of Winnebago County's new Conservation Technicians. My journey with the Land and Water Conservation Department began in June of 2022 and my main role consists of planning, designing, and supervising construction for soil and water conservation practices.

My education consists of a bachelor's degree in Biology and a master's in Environmental Science and Policy from the University of Wisconsin-Green Bay. My graduate focus was in environmental policy and administration. I am very passionate about conservation practices being implemented, not only on the ground, but also through collaborative action at higher levels that can aid in wider-reaching goals being achieved.

In my previous position, I served as Coordinator for Timberland Invasive Partnership, a cooperative invasive species management area. I gained experience collaborating with landowners, governmental bodies like county conservation departments, as well as local organizations to achieve common goals in terrestrial invasive species management. I found the cooperative aspect of my position highly rewarding and strive to bring my enthusiasm for such into my current role. I look forward to getting to know the Fox Valley area and the people of Winnebago County and I am grateful for the opportunity to work in a place that has a variety of ways to implement conservation practices.



Hello, my name is Brandon Flenz and I am a new Conservation Technician with Winnebago County. I started in September of 2022 and I am excited to be working with our team to help with soil and water conservation. Since starting here, I have been designing and overseeing construction of waterways, wetlands, and shoreline restoration projects. I have a bachelor's degree in Environmental Studies from UW-Oshkosh with an emphasis in environmental policy. In my previous position I worked for the Department of Natural Resources in the agricultural wastewater program. I worked with the large agricultural facilities throughout northeast Wisconsin. I helped with permitting and inspecting the facilities along with auditing nutrient management plans and responding to spills. In my free time I enjoy hiking, camping, and going to classic car shows with my dad to show off his cars. I also enjoy watching movies and playing games with friends. I am excited to work with landowners to protect and enhance Winnebago County.

# Winnebago County LWCD, NRCS & FSA

## Administer \$1,181,540 in Conservation Program Funding

In 2022, the Winnebago County Land and Water Conservation Department (LWCD) was awarded \$288,971 in state grant funding. This funding was used to cost-share projects and practices for landowners and offset departmental expenses. In addition, the LWCD budgeted \$87,500 of cost-share funds provided to county constituents through the Winnebago County Water Quality Improvement Program. The LWCD carried over \$212,029 of state and local contracted cost-share funds from 2021 to be utilized in 2022. The LWCD also administered \$120,991 in other grant funding for conservation work in the County.

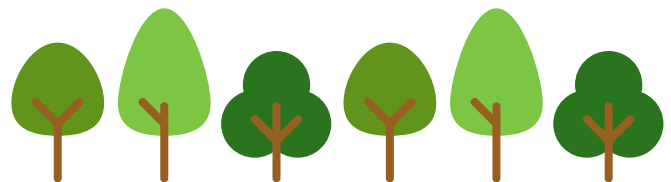
The USDA Natural Resource Conservation Service (NRCS) provided \$129,576 for the installation of Best Management Practices (BMPs) contracted through the Environmental Quality Incentives Program (EQIP) and \$102,030 in incentives to producers/landowners for current and new conservation farming practices through the Conservation Stewardship Program (CSP).

The USDA Farm Service Agency (FSA) provided \$201,392 in annual payments for 132 Conservation Reserve Program (CRP) contracts that total 2,051 acres of enrolled land and \$39,051 in annual payments for 52 Conservation Reserve Enhancement Program (CREP) contracts that total 311 acres of enrolled land.

These conservation program funds, totaling \$1,181,540, are utilized to cost-share and support the installation of BMPs and reward conservation land practices throughout Winnebago County. Grant and program funds such as these provide a significant and positive economic impact for our local producers/landowners, contractors and related businesses.



## Annual Tree Sale



Annually, the Winnebago County Land & Water Conservation Dept. (LWCD) distributes trees through the Wisconsin Department of Natural Resources (WDNR) Tree Program. In 2022, 10,640 trees and shrubs were planted by landowners in Winnebago County and 5,600 trees were planted by landowners outside of Winnebago County. The trees mainly come from the WDNR's Wilson Nursery in Boscobel and arrive in mid to late April.

As part of the tree distribution day, the LWCD offers many materials and tools for landowners to ensure the growth of a healthy tree. In 2022, the department sold 40 bags of root gel, 1,275 fertilizer tablets, and 99 four-foot tree shelters. Another service the LWCD offers is the rental of tree planters. The planters are used mostly by landowners with large tree amounts. In 2022, five landowners took advantage of our tree planter rental service and planted 14,100 trees. All materials and equipment listed above are available year round for purchase and/or rental.

Landowners may purchase the trees and shrubs for installing riparian buffers, creating a wildlife enhancement area, or for tree production. Often, landowners purchase the trees as part of an incentive program which may include the Conservation Reserve Program, Conservation Reserve Enhancement Program, or Wisconsin's Managed Forest Law.



Tree Planter for Rent

# Lake Winneconne Offshore Breakwall

The Stabenow Wetland is located in Winnebago County on the southeast shore of Lake Winneconne. Over 1,700 feet of wetland frontage was currently unprotected and experiencing a high rate of erosion threatening the remaining wetlands. Since 1941, the damage done by high water, waves, and ice has resulted in an average lateral recession of around 2.5 ft. of wetland per year. This shoreline recession releases large amounts of sediment and nutrients to Lake Winneconne and results in increased turbidity and a loss of fish and wildlife habitat.

In order to address the wetland loss and erosion concerns, the Winnebago County Land & Water Conservation Department (LWCD) worked with Allen & Valerie Stabenow on an offshore breakwall project. Three offshore breakwalls were designed by the LWCD to protect the wetland frontage from future losses and reestablish wetlands that have been lost over time. In the winter of 2021, the ice conditions allowed for a portion of the offshore breakwall project to be installed. Approximately 50% of the project was completed before the ice conditions deteriorated and construction had to stop.

In the winter of 2022, construction of the remaining breakwall began again. Due to the Wolf River currents adjacent to the project, ice conditions were not safe to work. In order to address this issue, a slight design modification was done to build the breakwall on safe ice. The contractor was then able to successfully complete the project by constructing 452 ft. of breakwall. All three breakwalls are now reducing sediment re-suspension within the habitat restoration area by reducing wave size and protecting the shoreline of the emergent marsh from further erosion.

The resulting effect is a calm backwater which will result in expansion of residual native emergent and submergent aquatic macrophytes forming the basis for newly created fish and wildlife habitat and improved water quality. Over 1,700 feet of wetland frontage is now protected from further erosion and an estimated 14.1 acres of open water will now be converted into this newly created habitat. This will provide the added benefit of restoring critical aquatic habitat in the zone between the offshore breakwall and the present shoreline. Openings in the structure were installed to allow for fish and wildlife migration, boat ingress and egress, and adequate water exchange. The Winnebago County LWCD plans to document any change in species composition and area of plant coverage at the Stabenow breakwall project post construction. Secchi disk readings will be done to document and monitor the water clarity. The Winnebago County LWCD will also fly a drone to document the plant response by capturing video and pictures behind the Stabenow breakwall project. The WDNR will also do fisheries post-breakwall monitoring surveys to evaluate fish abundance and population metrics.

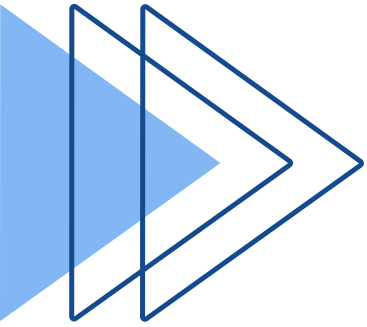
This project was funded by the Winnebago County Water Quality Improvement Program, Natural Resource Damage Assessment (NRDA), North American Wetlands Conservation Act (NAWCA), Lake Poygan Sportsman's Club and Allen & Valerie Stabenow.



Winnebago County

Land & Water Conservation Department





# Terrell's Island & Samer's Bay Project



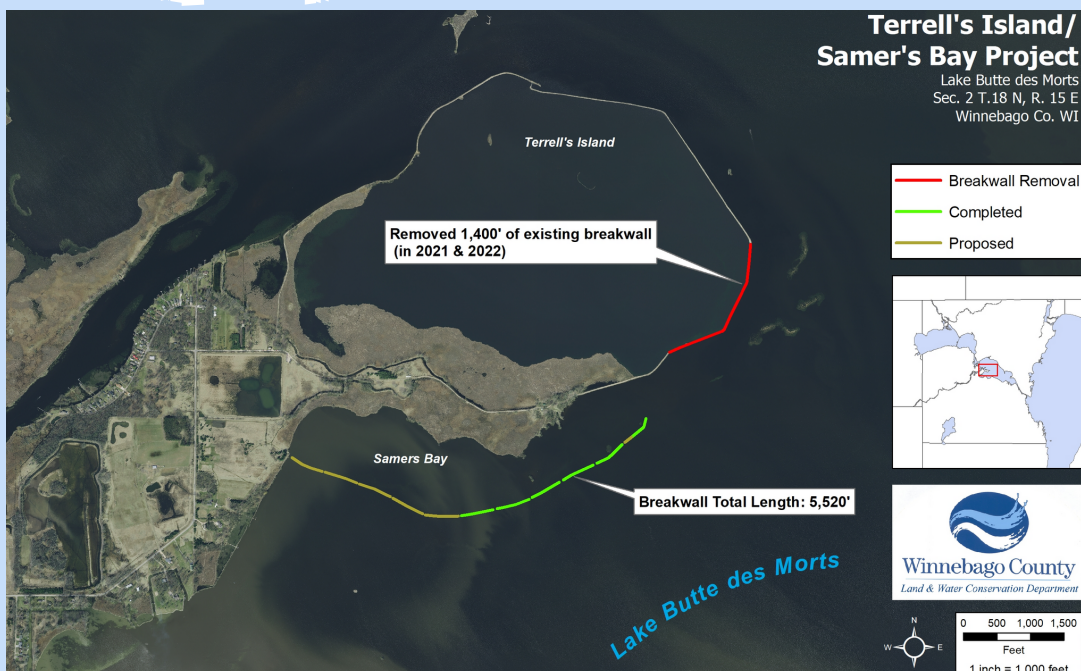
In order to address issues with the accumulation of pollutants and lack of waterflow present at Terrell's Island, the WI DNR, Winnebago County LWCD, Fox-Wolf Watershed Alliance and the Butte des Morts Conservation Club partnered on a large-scale restoration project to improve water quality and habitat in Lake Butte des Morts. The project team secured approximately \$1 million to fund the project from the NRDA Grant Program, the Great Lakes Fish and Wildlife Restoration Act, Wisconsin Habitat Partnership Fund, Butte des Morts Conservation Club, WDNR Lake Protection Grant Program, and the Winnebago County LWCD.

The Winnebago County LWCD designed the project with input from the public and all the project partners. The project was highly publicized through press releases, local postings, social media, newsletters, websites, and more. Overall, project partners received positive feedback with the acknowledgement that water quality improvements and increased recreational opportunities for fishing, hunting, kayaking, and wildlife viewing far outweighed the changes being made to the existing breakwall.

The project design includes creating a 1,400-foot opening on the east side of the existing breakwall to allow for substantial water exchange between the area inside of Terrell's Island and Lake Butte des Morts. This will help create better water quality and reestablish aquatic plants resulting in more use by desirable fish and wildlife species within the 569-acre Terrell's Island Habitat Restoration Area. Since 1941, the damage done by high water, waves, and ice has resulted in an average lateral recession of around 8 ft. of wetland per year in Samer's Bay. To protect the wetlands, the rock riprap material removed from the existing Terrell's Island breakwall to create the 1,400 opening is being reused to build a large portion of a new Samer's Bay breakwall. The Samer's Bay breakwall will total 5,870 ft. in length (5,520 ft. of breakwall with 35 ft. openings every 500 ft.) and will restore 111 acres of wetland habitat and prevent further wetland losses.

Construction of the project began on Phase 1 of the Terrell's Island and Samer's Bay Restoration Project in February of 2021. The property owner, Butte des Morts Conservation Club, hired two local contractors to complete the work. Despite the less than ideal conditions, 458 feet of the 1,400 feet was removed from the Terrell's Island breakwall and 1,000 ft. of the Samer's Bay Breakwall was completed.

Project construction oversight by the Winnebago County LWCD continued in February of 2022. The contractors were able to complete the removal of stone from the Terrell's Island breakwall to create the 1,400-foot opening on the existing breakwall. This stone was then reused to build an additional 1,858 ft. of the Samer's Bay breakwall. There is now a total of 2,858 ft. of the Samer's Bay breakwall installed and new stone is now planned to be hauled in to build the remaining 2,662 ft. of breakwall to complete the project. The project is scheduled to continue construction in the winter of 2023 pending adequate ice conditions.

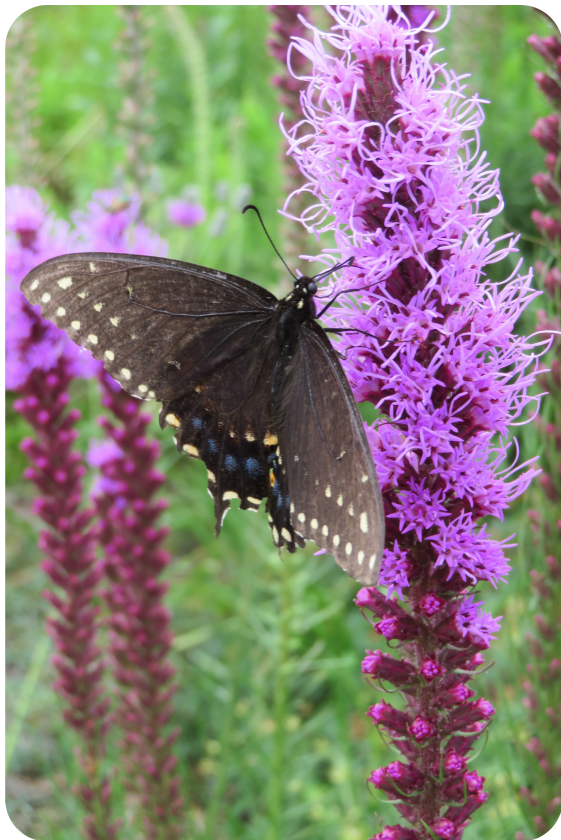


# Shoreline Habitat Restoration

In 2022, three shoreline habitat restorations for developed areas (SHRUB) were installed that were funded through Winnebago County's Water Quality Improvement Program. These restorations reduce pollutants entering lakes and streams by stabilizing the bank and filtering runoff from the yards of local landowners through a shoreline-adjacent native planting. These plantings have a minimum width of 20 to 35 feet landward and can be combined with other practices, such as rock riprap, in order to provide multiple conservation benefits. Native plantings provide beautiful color throughout the warm months as well as an attractive draw for pollinating insects, birds, and animals. Depending on the size of the property and the needs of the landowners, these native planting areas can vary greatly in size. For example, the SHRUB projects completed in 2022 varied from 616 sq. ft. to just over 10,000 sq. ft.

Two of the SHRUB projects had rock riprap installed in tandem with the native planting, while the third project had rock riprap already in place. Rock riprap prevents shoreline loss from wave and ice action, while the root structure of the SHRUB installation provides a mechanism for soil to be held more securely in the upland area to prevent erosion while the vegetation helps to filter runoff into the adjacent water bodies.

The installation process of a SHRUB begins with the killing of the existing vegetation to prepare the site and the planting of native plant plugs or a seed mix. Mulch or other materials can be used between plant plugs to deter weeds. Part of the appeal of shoreline restorations such as these is that landowners can install them on their own or with the help of a contractor. Landowners also get to select a mix of native plants that suits their needs and desired appearances that will bloom throughout the year. For the first few years following installation, maintenance must be done regularly to aid in establishment of the plants. For seed mixes, maintenance will be mowing to keep back weeds, while manual weeding is more effective for plant plug maintenance during establishment. Following installation and with proper maintenance, landowners can expect blooms and benefits within a year or so of planting. These buffers will provide years of decreased pollutants to local water bodies and a beautiful array of native plants with lots of birds and butterflies.



# Installed Best Management Practices

The Winnebago County Land and Water Conservation Department (LWCD) has several funding sources available to provide cost-sharing for the installation of eligible conservation projects. These funds help financially aid operators and landowners with the installation of various eligible Best Management Practices (BMPs). Along with the funding assistance, our department provides surveying, engineering design, and construction supervision to ensure the projects are installed according to proper design specifications. Installing these BMPs will reduce the sediment and phosphorus loading to our local waterways. The BMPs will provide protection of water quality and groundwater resources throughout Winnebago County. The following table illustrates a summary of the structural BMPs designed and installed in 2022 with and without cost-sharing.

Best Management Practice (BMP)	Units Installed
Critical Area Stabilization	0.4 Acres
Waste Transfer	1 Each
Riparian Buffer	3.9 Acres
Roof Runoff System	1 Each
Shoreline Habitat Restoration of Developed Areas	446 Lin. Ft.
Streambank/Shoreline Protection	2,724 Lin. Ft.
Waterway Systems	1.8 Acres
Wetland Restoration	10.3 Acres
Well Decommissioning	13 Each



**Offshore Breakwall**



**Wetland Restoration**



**Grassed Waterway**



**Waste Transfer Channel**



Larry Engel



# Soil Health Winnebago

## WINNEBAGO COUNTY SOIL HEALTH CHALLENGE



Rick Gehrke

The Winnebago County Land and Water Conservation Department (LWCD) currently has three farms participating in the Soil Health Challenge (SHC). The three "SHC Farmer Champions" are Shane Kallas, Todd Messerschmidt, and Dave Zwicky. The SHC is a six-year program sponsored by the Winnebago County Water Quality Improvement Program (WQIP) designed to reward participants that are willing to work with the Winnebago County LWCD by committing a portion of their cropland to soil health principles. These principles include no-till planting and the use of diverse cover crops to increase soil organic matter and microbial activity that will help to reduce soil erosion, improve water infiltration, increase carbon sequestering, and create more wildlife and pollinator habitat. This fall the cover crops were planted in three different ways. The first field was planted with a Hagie sprayer which has been modified to drop the cover crop seed between the rows of corn before harvest. The second field was no-till drilled after the corn came off. And the third field was broadcast spread after the corn was harvested. All three fields had verifiable growth by late November. Three different methods to achieve the same result.

## UPPER FOX - WOLF RIVER DEMONSTRATION FARM NETWORK



Shane Kallas

The Winnebago County Land & Water Conservation Department enjoyed being part of the fourth year of the Upper Fox-Wolf Demonstration Farm Network (UFW DFN). UFW DFN is a collaboration of 8 County Land & Water Conservation Departments, the Green Lake Association, and the Natural Resource Conservation Service in the Upper Fox River and Wolf River Watersheds. The purpose of the UFW DFN is to have the 10 demonstration farms share information with the community about the conservation practices they are testing to help reduce phosphorus, nitrates, and sediment from entering the Great Lakes Basin while improving their soil health.



Brian Krenke

Rick Gehrke and Jamie Albright are Winnebago County's Demo farmers and have been very helpful in educating local farmers about soil health practices. Rick held a great field day in September that focused on the changes he has made and the new ideas he is trying. Rick has been no-tilling since 2000. In 2008, he started incorporating single-species cover crops into his crop rotation. In the fourteen years since, he has completely changed his farming practices. His goal every year is to have a cover crop on all of his acres to overwinter. He has worked to diversify his cover crop mix on all his crop acres. This past year his cover crop after wheat contained at least six species. Not only does he have a large number of species, but each species has a different purpose in the mix. In 2020, Rick started interseeding cover crops into his corn crop in the spring when the corn is still small. At the field day, he showcased the herbicide applied and, the cover crop field trials he planted this year. These trials help determine which herbicides can be used on the corn crop to suppress weeds and still maintain yield, yet allow the six species cover crop to thrive once the corn is harvested.



Todd Messerschmidt

This year the main Project Team put great effort into outreach with the creation of 6 new videos. The videos were posted on Facebook and YouTube. The top-performing video, "Winter Peas and Balansa Clover as an Overwintering Cover Crop", had three thousand views on the Facebook page. This group also created Photo stories on Facebook to showcase the demonstration farmer's experiences and new practices for the year.

If you haven't visited the Facebook page at [facebook.com/FoxWolfDemo](https://facebook.com/FoxWolfDemo), or the UFW DFN website at [UFWDemoFarms.org](https://UFWDemoFarms.org), please do and consider joining a field day.





# Champions of County



Lydell  
Pethke

## GREAT LAKES SEDIMENT & NUTRIENT REDUCTION PROGRAM

The Great Lakes Sediment and Nutrient Reduction Program (GLSNRP) is a grant funded by the Great Lakes Commission. The GLSNRP grant was awarded to the Fox-Wolf Watershed Alliance (FWWA) in 2021 who partnered with Winnebago County LWCD to increase soil health adoption in the Rat River Watershed. The Winnebago County LWCD signed up three farmers to implement soil health practices in their operations.

Dan Rieckmann, Larry Engel, and Lydell Pethke are the Rat River's three "Farmer Champions" with the GLSNRP grant. They have begun their soil health journey by planting cover crops this fall and will continue with no-till in the spring. Lydell Pethke also incorporated low-disturbance manure injection into his system this September.

As a part of the outreach for this grant, Winnebago County LWCD staff have been promoting the use of soil health practices and benefits in the Rat River watershed. While doing so, they met Jim Luedtke. Jim is very passionate about agriculture and has an innovative mind, and is currently implementing cover crops and no-till. After meeting Jim, the LWCD hosted a field day on his farm to bring together farmers in the area. At this field day, Jim shared his experiences with soil health practices and showed the equipment that he uses. The field day brought a great turnout of farmers, including the three "Farmer Champions", and allowed them to talk about the challenges they face and suggestions on how to overcome them, along with the benefits they have seen.

Farmer Champion Dan Rieckmann hosted a field day on his farm last fall. The field day brought together farmers and agency staff to learn about the technologies of an agricultural drone. Jeremy Williams from American Drone LLC. spread a rye and rape seed cover over Dan's soybean field with his DJI T-30 drone. This was a fascinating sight to see as well as a very educational event where farmers were able to engage and ask questions about the new technology. Along with planting Dan's fields, Jeremy also aerial spread cover crop mixes on two other farmers' fields while in the area.

LWCD staff are looking forward to seeing the changes in soil health as these implementations continue!



Jamie  
Albright



Ted & Clint  
Eckstein

## FOX-WOLF WATERSHED SOIL HEALTH GRANT

Winnebago County's newest soil health grant, funded by the National Fish and Wildlife Foundation (NFWF) and Fund for Lake Michigan, was awarded through FWWA. The Fox-Wolf Watershed Soil Health (FWWSH) grant provides farmers with cost-share dollars for committing to no-till and cover crops for a two-year period. Winnebago County is one of nine counties participating in the FWWSH grant to help farmers explore how these practices can improve soil health while protecting water quality.

Brian Krenke, the owner of Krenke Farms, operates 175 acres near Fremont. Brian is a fourth-generation farmer. He has currently been no-till planting for 10 years. Brian has been interested in implementing cover crops into his rotation and learning more about the benefits of soil health practices. Last fall a drone was used to plant a cereal rye and rape seed mix on 50 acres. The Eckstein Brothers, Ted and Clint, have taken over their father's and grandfather's farms located in the town of Winchester. The Eckstein's operate 400 acres and last fall planted winter wheat for a cover crop on 48 acres using a no-till drill. They are looking forward to saving time and fuel costs by implementing these practices and seeing an increase in soil health.

The efforts the farmers are making not only benefit their own soils and yields, but also makes a difference for the community. By implementing a soil health system, these practices are improving the water quality in the area. The LWCD is working hard to educate farmers about soil health by creating events where farmers can share their successes and failures. This will help them to overcome hurdles in their soil health journey while they protect water quality and grow a successful crop.



Dan  
Rieckmann



Dave  
Zwicky

# 2022 Farmer Roundtable

## "Redefining the Soil Health Conversation"

### An opportunity for farmers to hear from other farmers about what's working locally.

The roundtable event began with Keynote Speaker Keith Berns, farmer and co-owner of Green Cover Seeds, discussing the "Seven Lessons I Have Learned about Cover Crops." This was followed up with a panel of farmers Eric Lind, Chris Pollack, Dave Schultz, and Dustin Schultz, discussing "The 'Why' and The 'How', Learning Relevant Soil Health Information from Local Experienced Growers". All four of the panelists are farmers in the Upper Fox-Wolf Watershed Demonstration Farm Network and farm in our area. They bring years of experience with no-till and cover crops which made the question and answer session very enlightening. There were three Breakout Sessions after lunch. The first session, "No-till and Cover Crop Equipment Considerations", was presented by Ryan Jones from Country Visions Co-op along with Dave and Dustin Schultz from Schultz Legacy Farms? They discussed planter setup, equipment attachments and adjustments and planting green. The second session, "Farm Economics: Do You Know your numbers?", was given by Sara Maass - Pate from Fox Valley Technical College and Matt Hinz from Hinz Farms. They discussed farm financial analysis and how important it is to know the farm's bottom line. The third session, "Incorporating Manure Management into Continuous Cover Systems", given by Chad Tasch, farmer and owner of Tasch's Custom, LLC, discussed low-disturbance manure management on fields with continuous cover. The event was the first Soil Health Farmer Roundtable in Winnebago County and had an excellent turnout. Because of this success, the hosting group is planning on making this an annual event. Hope to see you next year.



EVENT HOSTED BY THE  
WINNEBAGO WATERWAYS AGRICULTURE OUTREACH WORKGROUP



Gehrke Family Farm  
Lind Family Farm  
Bouressa Family Farm



# Nutrient Management Planning

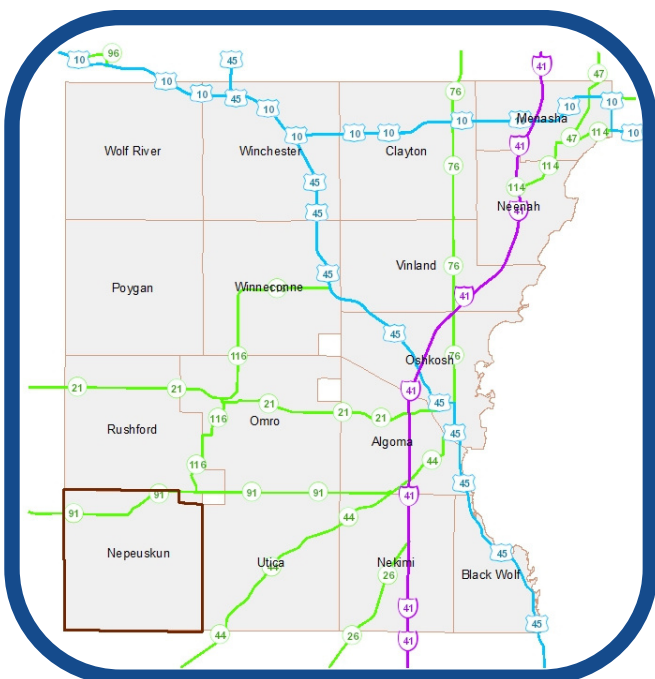


A nutrient management plan (NMP) is an annual plan which helps farmers make the best use of their manure and fertilizer while also protecting the soil from erosion and improving our water quality. A NMP first begins with soil samples. These soil samples are sent to a lab and analyzed to determine the amount of available nutrients in the soil. The results help the farmer determine their fertilizer needs on a field-by-field basis. The Snap Plus software is used to calculate potential soil and phosphorus losses. The farmer can change his tillage system or crop rotation to have less soil loss. Starting a NMP is a proactive stance toward improving, protecting, and conserving their cropland. The farmer is slowing erosion and conserving the soil while also fertilizing where needed to keep the soil in place with the necessary nutrients for crop growth. A NMP is not only for the present but also for the future.

Many one-on-one educational sessions were held to assist farmers in the learning process. NMP classes will also continue in the winter of 2023. These classes give farmers a better understanding of the required steps to write a Nutrient Management Plan, work with the soil test results, understand the soil erosion factor of their soil, and learn how to improve the phosphorus index within their fields.

In Winnebago County, the total acreage of land with a NMP in 2022, was 64,549 acres. There are 723 new acres that have been contracted to receive state-funded cost-sharing to write a NMP for 2023. Currently, 55% of Winnebago County farmland has a NMP, whereas the state average is 37%. This illustrates the priority the Land & Water Conservation Department has placed on this practice and the impact of the State Agricultural Performance Standards on ag producers within Winnebago County.

## Farmland Preservation Program



The Wisconsin Farmland Preservation Program (FPP) provides a state income tax credit to farmers in exchange for keeping land in agricultural use and maintaining compliance with the State Agricultural Performance Standards (NR151).

The Town of Nepeuskun is the only township in Winnebago County with FPP. The Farmland preservation plan was certified by the Department of Agriculture, Trade and Consumer Protection (DATCP) in December 2021. This allows new participants in Nepeuskun to claim the FPP tax credit if they are deemed In Compliance by the Winnebago County Land and Water Conservation Department (LWCD).

The Winnebago County LWCD will continue to assist current and previous participants to maintain compliance with the State Agricultural Performance Standards. Once a farm has become compliant with the State Agricultural Performance Standards (NR151), it must remain in compliance.

# Technology Update



The Land & Water Conservation Department (LWCD) is one of the heaviest users of technology among the County Departments. GIS (Geographic Information Systems), CADD (Computer Aided Design & Drafting), and GPS (Global Positioning System) are core software and hardware tools that are used. In fact, the LWCD is the only department that routinely uses these very sophisticated software and hardware platforms on a daily basis! GIS is used for basic things like creating generic base maps of sites to sophisticated predictive models that help plan best management practices (BMP). CADD and GPS are used by our Conservation Technicians to design those projects for installation on the landscape.

A few accomplishments this year range from improving satellite coverage for survey data collection, completing training on new GIS software and models, to finding new ways to integrate GIS data into CADD designs. This article will describe in more detail the improvements made for collecting data in the field.

While most people have a basic understanding of GPS and how it works, when it comes to getting highly accurate locations using GPS, things get a bit more complicated. A common misconception when referring to GPS is the name itself, the more accurate term is GNSS (Global Navigation Satellite System). GPS only refers to the satellite constellation that is operated and maintained by the United States. There are 4 other satellite constellations that comprise the entire satellite constellation. These constellations are: QZSS (Japan), BEIDOU (China), GALILEO (Europe), and GLONASS (Russia). Perhaps your hand-held unit includes both GPS and GLONASS to improve its ability to collect data.

Up until this year, the local GNSS was connecting to both GPS and GLONASS constellations. One issue that the crew regularly faces when surveying is collecting data under a tree canopy and/or losing connection to the satellites. No matter if you have a basic hand-held GPS or a sophisticated unit, not having a clear view of the sky will limit the ability to collect data or get a good signal.

After discussion, it was decided that adding the GALILEO constellation was something that could improve efficiency in the field. After getting the appropriate software installed on our GNSS receiver and reconfiguring the system, staff were rewarded by regularly connecting up to 24 satellites per job. In the past, that number was rarely more than 16. By having more satellite connections, it allows our technicians to get a "fixed" location more readily and improves under-canopy performance. In order to get the "survey grade" or sub-centimeter accuracy required for engineering work, it is necessary to utilize "corrected" data that fine-tunes the signal from the satellites. Bear in mind that the data collected will have not only X and Y coordinates (latitude & longitude), but also Z (elevation) values. Knowing precise elevation is extremely important when considering the flat landscape of Winnebago County. LWCD technicians need elevation values accurate to within one-tenth of a foot when designing BMPs such as waterways.

Consumer grade GPS, such as a hand-held GPS or even a GPS on a phone, use "uncorrected" GPS location data that is fine for basic navigation but isn't suitable for engineering purposes. This requires using equipment with RTK (Real Time Kinematic) positioning and is what separates consumer grade GPS from professional grade. Having the ability to collect corrected data in the field eliminates the need for post-processing and adds to our ability to start designing projects quickly.

The space race is continually evolving and using satellites to communicate is the next advancement on the horizon. By using satellites to supplement traditional cell-tower networks, it is possible to completely eliminate "dead zones" in cell coverage. Apple recently introduced this capability by offering a SOS feature that allows a user to connect to a satellite to make an emergency call when in out of network coverage. Before long, your next call may truly be long-distance!

# Information & Education

Improving the water resources of Winnebago County is one of the main goals of the Winnebago County Land and Water Conservation Department (LWCD). Winnebago County citizens depend on these water resources to provide drinking water, recreational opportunities, and habitat for wildlife. One of the ways that we can achieve this mission is through educational opportunities with Winnebago County citizens. Continually educating citizens with the information that they need to make changes or assisting them with the installation of best management practices (BMPs) can make great strides to help protect and improve water quality.

One of the main Information & Education (I & E) objectives is to educate the youth. Our Department works with the Winneconne Community School District to put together an educational event for fourth grade students every year at the Norbert Rich School Forest. Our department teamed together with the Department of Natural Resources to present an educational event for students focusing on Forestry, Soil Health, Wildlife, and Water Quality. This hands-on experience provides education to the youth concerning these vital areas of the environment, the problems that are occurring, and what is being done to correct these problems along with information about what the students can do to help protect the environment.

LWCD Staff participated in Career Days for Winneconne and Omro 8th grade students. These events give students an understanding of the different career paths that may be available to them so that they can focus their studies to their career goals. Staff also participated in a spring and a summer tour for Fox Valley Technical College students. These tours expose college students to the BMPs that our department works with to protect water quality, what our jobs entail, and the challenges and successes that are experienced. The Director of the LWCD gave a presentation for Youth Government Day for Oshkosh area High School students at the Winnebago County Courthouse. This event gives students exposure to the different county government departments and their individual rolls.

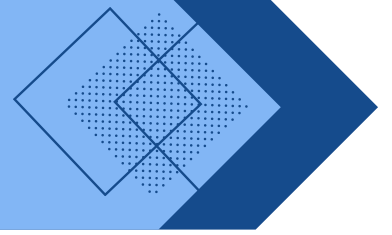
LWCD Staff presented at the Wisconsin Woodland Owners Association Field Day on the importance of wetlands and wetland restoration. The LWCD also set up staffed and unstaffed displays at various events. These displays assist us in providing information to the community that the Department might not normally interact with. Displays were presented at the Winnebago County Fair and the WPS Farm Show.

A large portion of our I & E efforts in 2022 was educating farmers and landowners on different methods of farming that can help reduce phosphorous and sediment runoff to surface water as well as improve soil health. Various field days for cover crops and no-till were held as well as a roundtable event and a luncheon to introduce a new grant. Many one-on-one visits were conducted with farmers and landowners. These interactions are extremely important, whether it's to discuss an erosion problem, plan a wetland restoration project, or help with a nutrient management plan. The LWCD also worked to create a larger social media presence through contributions through Facebook, published articles, newsletters, and the department website.

Beyond the above listed I & E activities, the Department participated in various other activities mentioned in different articles in this annual report as well as participation on several steering teams and work groups. The LWCD continues to be receptive to new opportunities to present to the community and looks forward to being involved in many different I & E activities in 2023.



# Annual Poster Contest

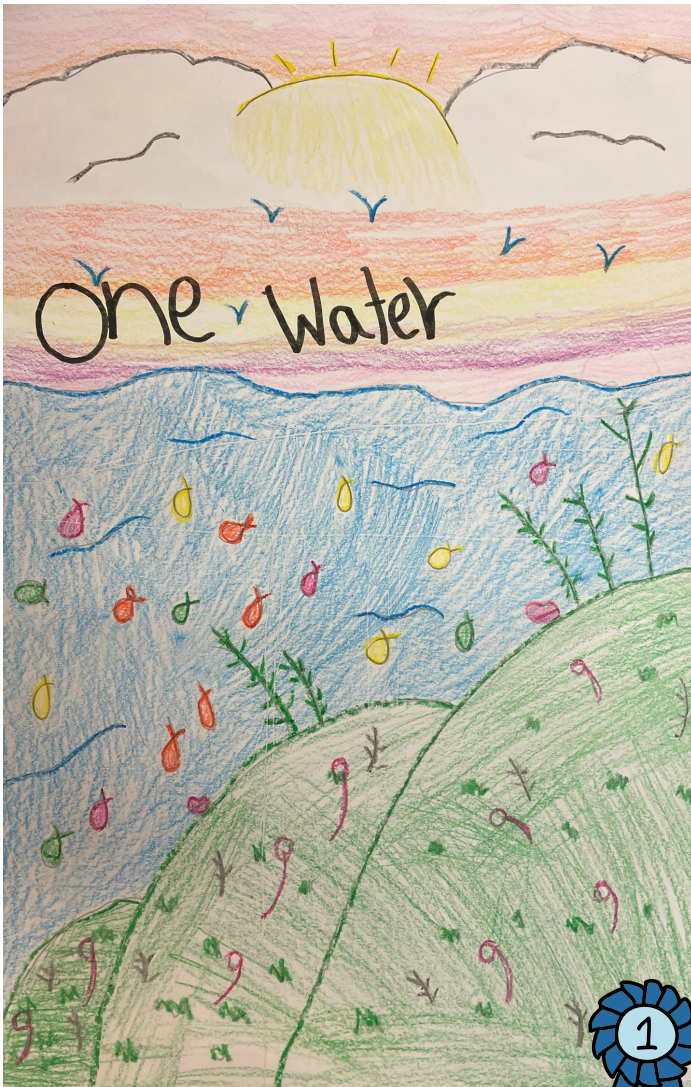


The Winnebago County Land and Water Conservation Department would like to extend our THANKS to all the students that participated in this year's contest with a big CONGRATULATIONS to all the winners! This poster contest would not be possible without the many extremely talented students and several dedicated teachers. This year's theme was "One Water."



There were 30 posters submitted for this year's Conservation Poster Contest. All posters that won first place at the local level went on to the Area Level Competition.

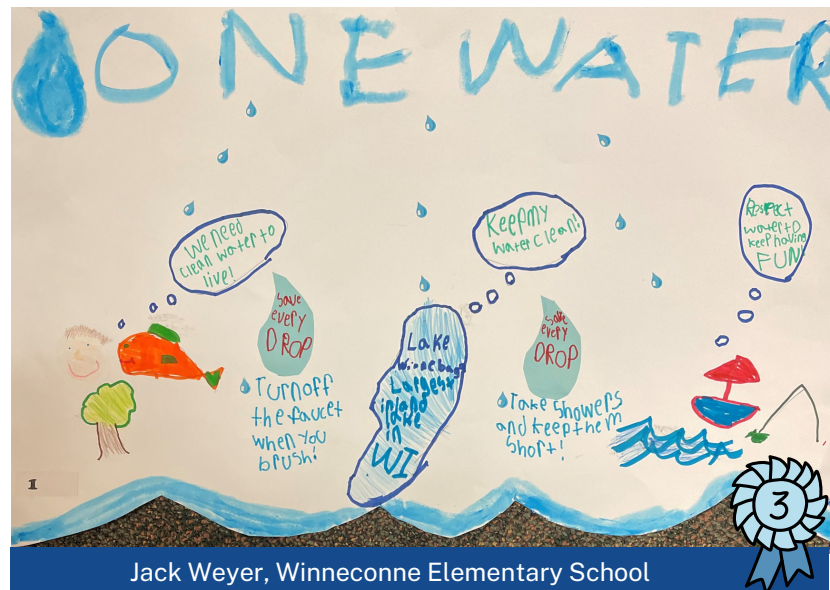
## GRADES 2-3



Amelea Haring, Winnebago County Land and Water Conservation Department

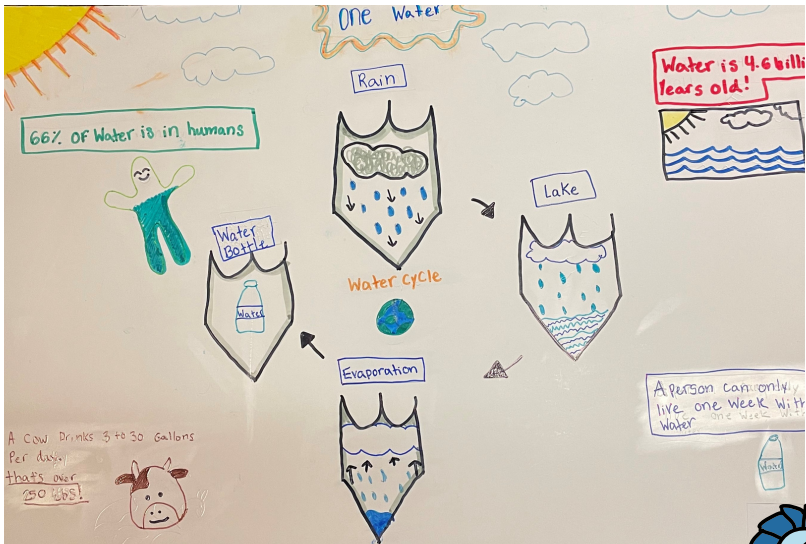


Addie Sharratt, Winnebago County Land and Water Conservation Department



Jack Weyer, Winnebago County Land and Water Conservation Department

# GRADES 4-6

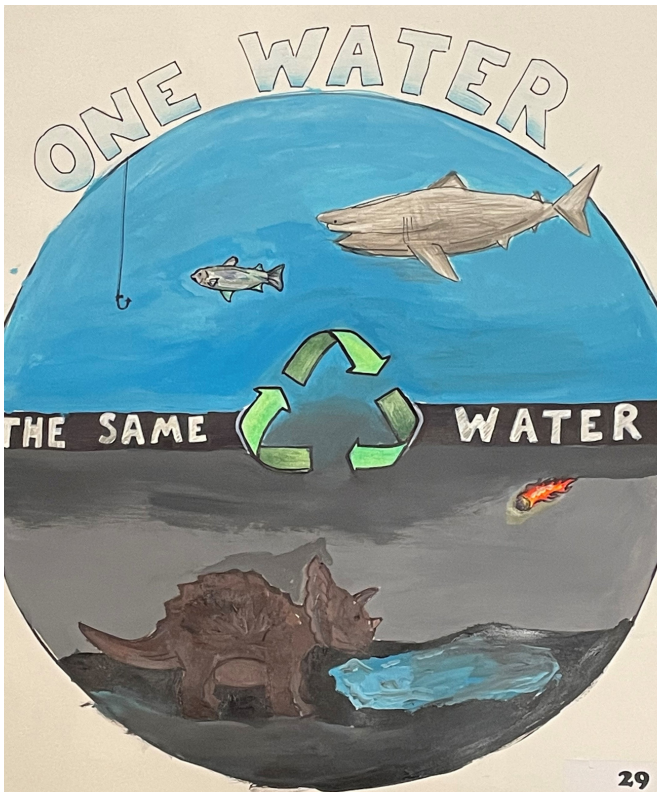


Kinsley Ahrens, Winneconne Elementary School



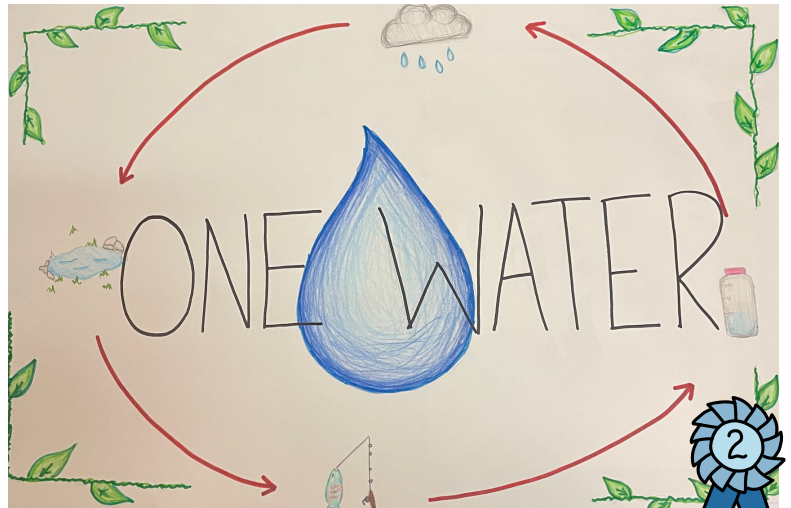
Lilly Flagg, Winneconne Elementary School

# Grades 7-9

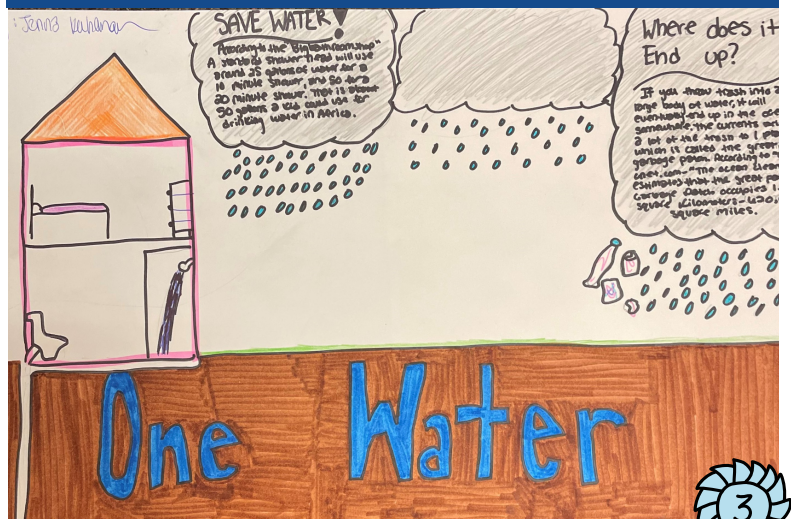


Between the ocean, atmosphere, and land, water flows constantly. The amount of water on our planet is finite, which means it neither grows nor shrinks over time. Due to this, the water that the Frank is the same water that we use today. It is recycled and renewed throughout time.

Aubrey Racine, Winneconne Middle School



Clara Allmers, Winneconne Middle School



Jenna Kuhlman, Winneconne Middle School



## Land Conservation Committee Directory

**Chuck Farrey**, Chair  
**Julie Gordon**, Vice Chair  
**Katherine Horan**, Secretary  
**Bruce Bohn**, Citizen Member  
**Doug Nelson**, County Board Member  
**Daniel Stokes**, Citizen Member  
**Doug Zellmer**, County Board Member

## Land Conservation Staff Directory

**Chad Casper**, Director  
**Alix Bjorklund-Patil**, Conservation Technician  
**Emily Dufeck**, Watershed Specialist  
**Brandon Flenz**, Conservation Technician  
**Mary Koch**, Administrative Associate  
**Melanie Leet**, Resource Conservationist  
**Andy Maracini**, GIS Specialist  
**Sheila Smith**, Agronomist



# Winnebago County

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**Follow us for updates throughout the year!**



@WinnebagoLWCD



Winnebago Land & Water Conservation



<https://www.co.winnebago.wi.us/lwcd>