

**March 27, 2024**

# **Red River Basin River Watch 2023 Final Report**

Red River Basin River Watch employs a watershed-based, cross-curricular approach to learning. We strive to introduce students to their local watershed, allowing them to connect to the world around them both upstream and downstream. We do this by educating students in their home watershed as well as connecting them with schools throughout the basin.

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## Program Overview

The Red River Basin River Watch Program (RW) delivers innovative watershed education programming to schools and communities across the Red River of the North Basin. Believing education is the most effective tool to change attitudes and behaviors, RW delivers watershed education for elementary, middle, and high school students through hands-on science and watershed exploration activities designed to challenge students and facilitate understanding of water resources. RW classroom and outdoor activities are designed to help address MN water quality improvement initiatives and fit with the MN Clean Water Council's Mission to Protect and Restore Minnesota's Waters for Generations to Come, including:

- ✓ Build capacity of local communities to protect and sustain water resources
- ✓ Provide education and outreach to inform Minnesotans' water choices
- ✓ Encourage citizen and community engagement on water

Support from the Red River Watershed Management Board and local watershed districts has built an effective and popular watershed education program across the Red River of the North Basin that focuses on water quality. For 29 years, RW students throughout the Red River Basin have collected water quality data used by the MN Pollution Control Agency to complement the state's assessment of surface waters.

Clean Water funds enable the International Water Institute to build on this established and popular RW foundation by providing additional opportunities for participants to understand how to protect and improve MN's valuable water resources, including:

### [Water Quality Monitoring:](#)

Collect and record conditions at local rivers and streams using state-of-the-art scientific methods and equipment.

### [Annual River Watch Forum:](#)

Annual event challenging students to learn and share about emerging local watershed issues.

### [Macroinvertebrate Monitoring:](#)

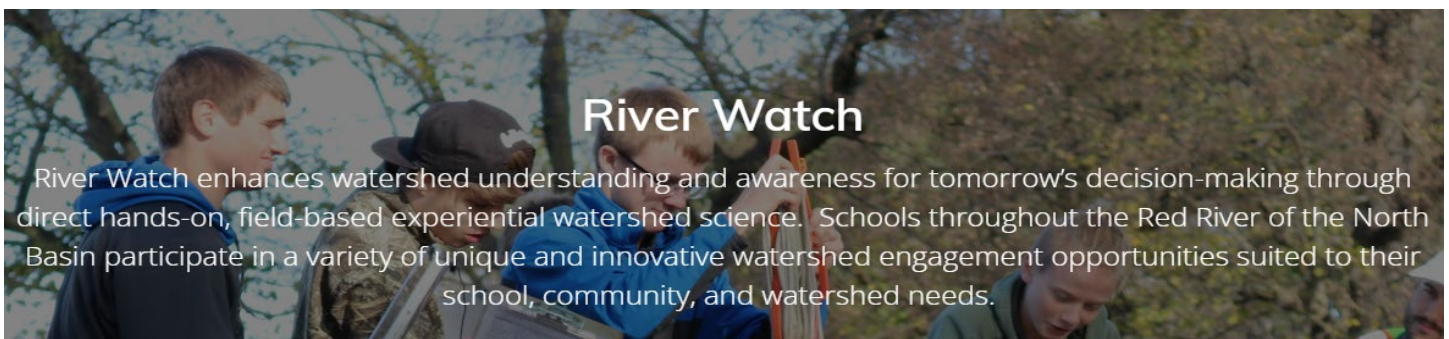
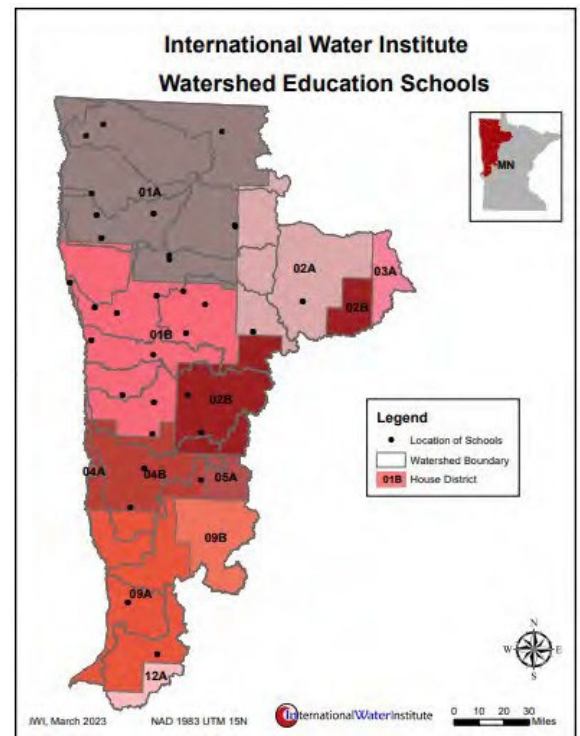
Macroinvertebrate monitoring provides additional insights on watershed and ecosystem health.

### [River Explorers:](#)

Guided kayak excursions on local rivers to observe and document watershed conditions.

### [River of Dreams:](#)

A cross-curriculum watershed education program tailored to elementary students.



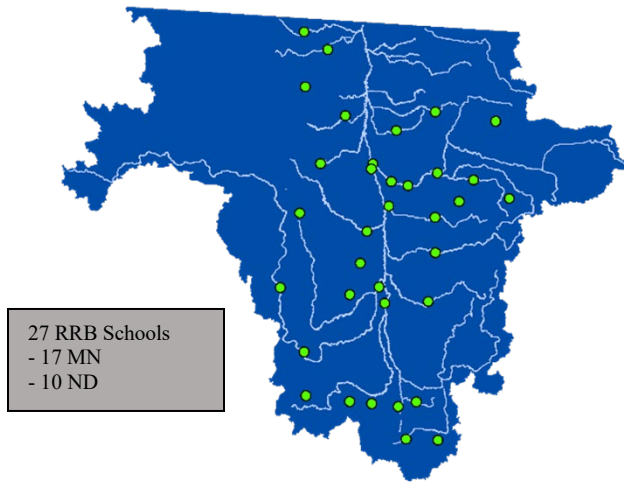
## River Watch

River Watch enhances watershed understanding and awareness for tomorrow's decision-making through direct hands-on, field-based experiential watershed science. Schools throughout the Red River of the North Basin participate in a variety of unique and innovative watershed engagement opportunities suited to their school, community, and watershed needs.

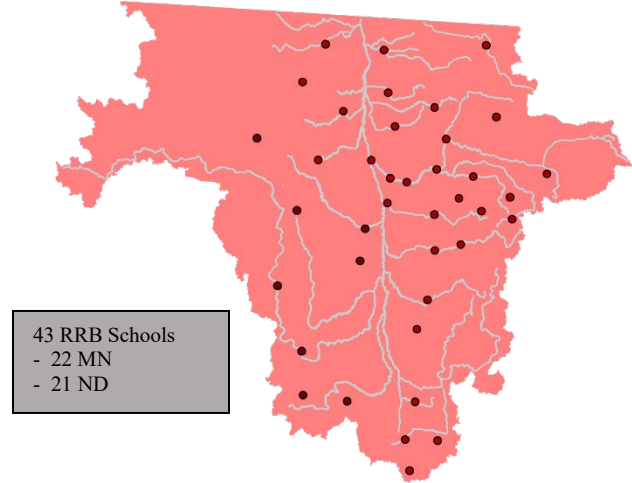


## Participating Schools

*River Watch*



*River of Dreams*



## Project Goals, Work Tasks, and Outcomes

The project goal is to engage Red River Basin high school, middle school, and elementary students in hands-on education programs focused on river resources within their local watershed. Program activities include integrated classroom and outdoor experiences that build awareness of river ecosystems and watershed connections, increase student capacity to make informed decisions about their environment, and instill a sense of place about the uniqueness of their local watershed. The work tasks and activities completed from January 2023 through March 2024 are discussed below. For reference, the 2022 – 2023 Clean Water Fund Work Plan is included as *Attachment A*.

**Task 1. River of Dreams:** Engage elementary students in River of Dreams (ROD) a hands-on education program focused on the valuable river resources of the Red River Basin. Provide integrated classroom and outdoor experiences that; build awareness of river ecosystems and watershed connections, increase student capacity to make informed decisions about their environment and instill a sense of place about the uniqueness of their local watershed—historic, economic, and ecological.

### Measurable Outcomes - ROD

- Classroom resources prepared and delivered including books, art supplies, and canoes.
- Completed 92 classroom sessions to present materials and go over program expectations.
- Completed 46 field sessions with ROD participants. Release of individual ROD canoes and review of watershed lessons learned by students.
- Created canoe pages and entered canoe tracking information into the ROD database. Program and canoe information can be found [here](#).
- Assessment pre/post surveys of students.
- Completed March 2024.



**Task 2. Red River Explorers Paddling Program:** Increase awareness and knowledge of local land use and watershed connections through a Red River Explorers Paddling Program to allow RW teams and community members to “water-truth” streams in the Red River Basin, documenting local watershed conditions.

## Measurable Outcomes – Paddle Trips

- Provided seventeen (17) guided river ecology excursions with 398 participants.
- No river trip reports were completed in 2023. Past reports can be viewed [here](#).
- Completed November 2023.

## Measurable Outcomes – Watershed Connections

- Two macroinvertebrate monitoring events completed. Provided resource materials and equipment for RW schools with assistance from IWI staff.
- Produced and distributed three electronic newsletters promoting watershed education and awareness in the Red River Basin.
- Participated in three Red River Basin Water Festivals. Three staff lead activities related to relevant watershed issues (water quality, flooding, groundwater, AIS). Over 700 grade school students participated.
- In partnership with MN 4-H IWI provided paddling equipment and staff resources for 4-H camp held August 2<sup>nd</sup> and 3<sup>rd</sup> at Lake Bronson State Park.
- Completed January 2024.

**Task 3. Stem Assistance:** Assist in provision of Science, Technology, Engineering and Math (STEM) education and engagement opportunities through watershed science. Provide professional teacher development through watershed inquiry and education opportunities. Provide opportunities for youth to engage in scientific research and outreach. Supplement stream monitoring activities with real-time continuous data collection.

## Measurable Outcomes – Teacher Development/Student Training

- Three regional fall kick-offs were held in 2023. 102 students and ten teachers received training in water quality site documentation requirements, watershed/river themed podcast production, River Watch calendar creation, and poster display development.
- Partnered with Wilderness Inquiry to provide canoe trips for participants at each location (Moorhead, East Grand Forks, and Thief River Falls).
- Completed October 2023.

## Measurable Outcomes – Research and Outreach

- Hosted the 28<sup>th</sup> and 29<sup>th</sup> Annual River Watch Forums at the Alerus Center in Grand Forks, ND. Over 200 students and teachers were in attendance for each forum. Forum schedules included a keynote speaker and break-out sessions with hands-on activities relating to watershed management or river monitoring careers. Break-out sessions featured speakers who all interact with the land, water, and rivers in different ways.
- In 2023, River Watch Teams compared water quality data from rivers in their community to downstream sites on those same rivers. They also determined the drainage area for their monitoring sites and their entire watershed. Finally, they compared their water quality data to state standards. Each school made a poster board and a brochure and presented this information to a live panel of judges at the Forum.
- The 2024 theme “Leaping into Watershed Communications” had students dropping their scientific equipment and reaching for a camera and entering the recording studio instead. Each participating team created content by designing a calendar and by producing a podcast all about their local river or watershed. They also added a binder to catalog information about their water quality monitoring sites and a poster display for live judging.

- Past forum events can be viewed [here](#).
- Completed March 2024.

## Measurable Outcomes – Real-Time Data Collection

- Classroom sessions were not held but rather information materials on deployment, maintenance and data downloading was covered during deployment.
- Installed eight monitoring stations with assistance from partner schools. Live data was accessible over the duration of deployment at [Monitor My Watershed](#).
- Removed eight stations for winter maintenance and storage.
- Completed November 2023.

## Task 4. Oversight: Project Management and Reporting.

### Measurable Outcomes – Oversight

- Grant-related expenditures tracked, bills paid and expense reimbursements submitted quarterly.
- Final report completed and submitted to Commissioners and Legislative Committees.
- Site visit with MPCA project manager January 20, 2023.
- Completed March 2024.

## Budget Performance

Below is the final project budget summary through March 31, 2024.

Line Item	MPCA Funds Awarded	MPCA Funds Expended	Balance	Budget Expended (%)
Personnel	\$255,585.00	\$255,585.00	\$0.00	100%
Travel Reimbursement	\$19,065.00	\$19,065.00	\$0.00	100%
Equipment & Supplies	\$25,350.00	\$25,350.00	\$0.00	100%
<b>Total:</b>	<b>\$300,000.00</b>	<b>\$300,000.00</b>	<b>\$0.00</b>	<b>100%</b>

## Project Evaluation

Twenty-five Minnesota and North Dakota educators that were involved with the RW program were provided an opportunity to complete an online survey. Eighteen educators completed the online survey (eleven from Minnesota). Overall teachers were pleased with the quality of watershed science activities offered and found them useful in helping meet education requirements. Select individual question responses are shown below (Figures 1 – 5).



Figure 1.

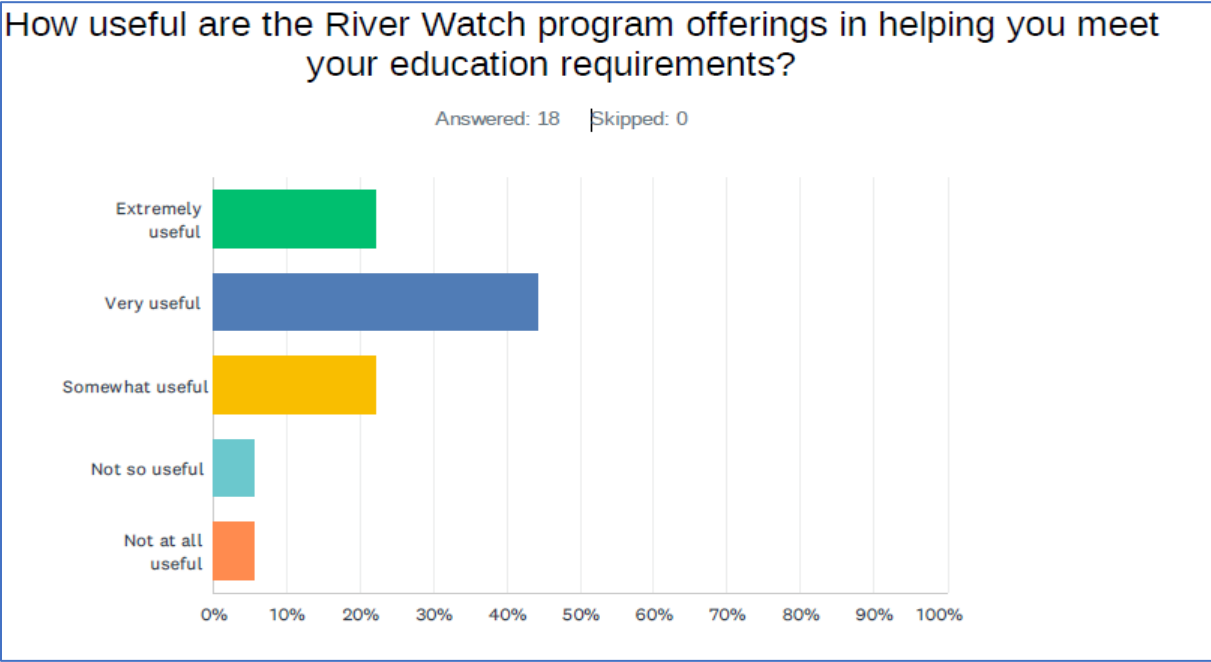


Figure 2.

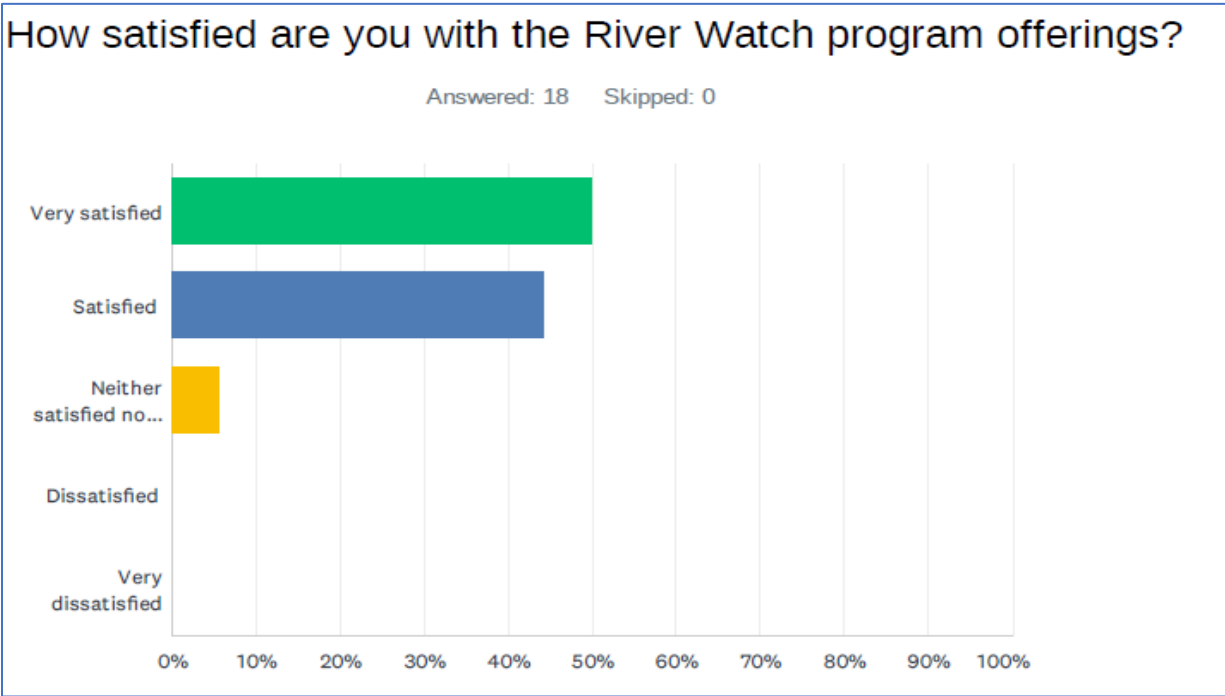


Figure 3.

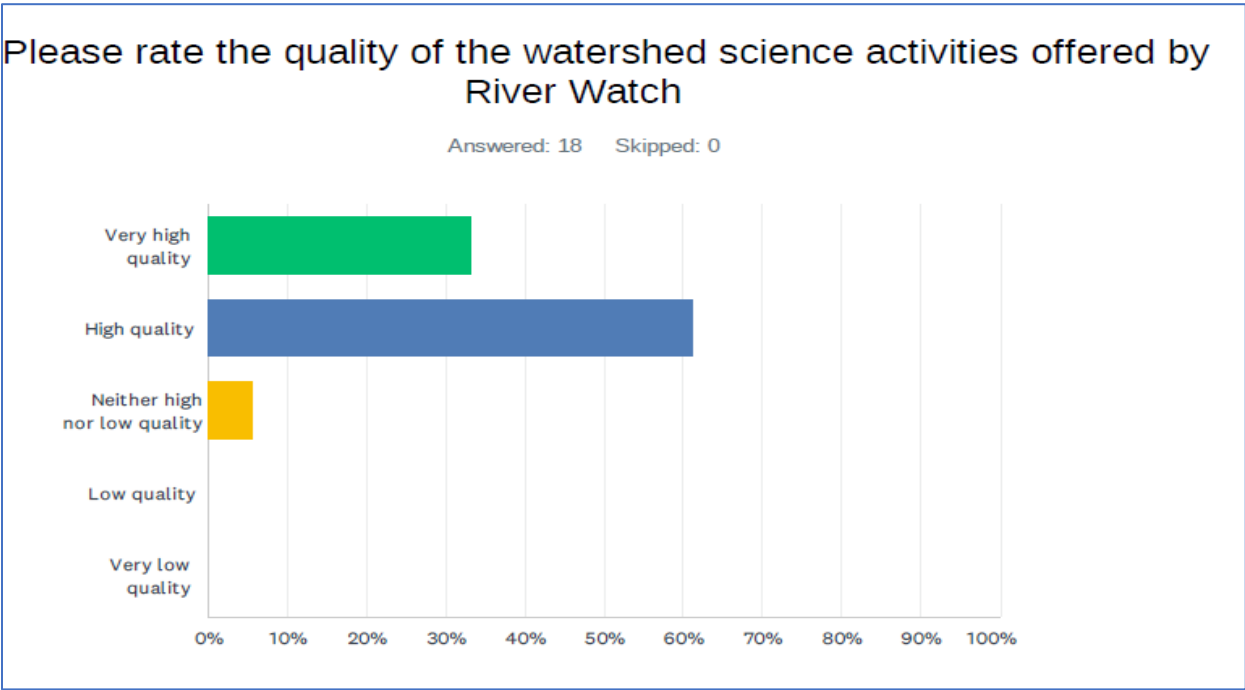


Figure 4.

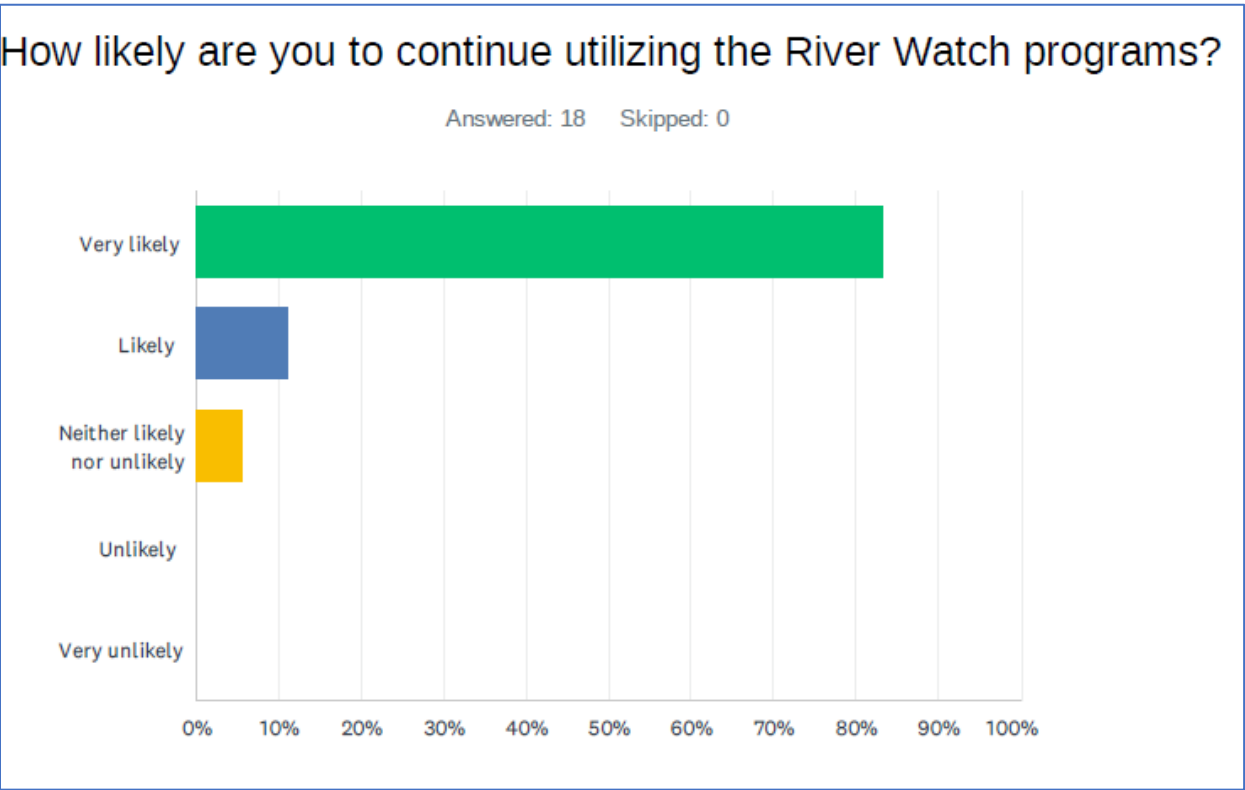
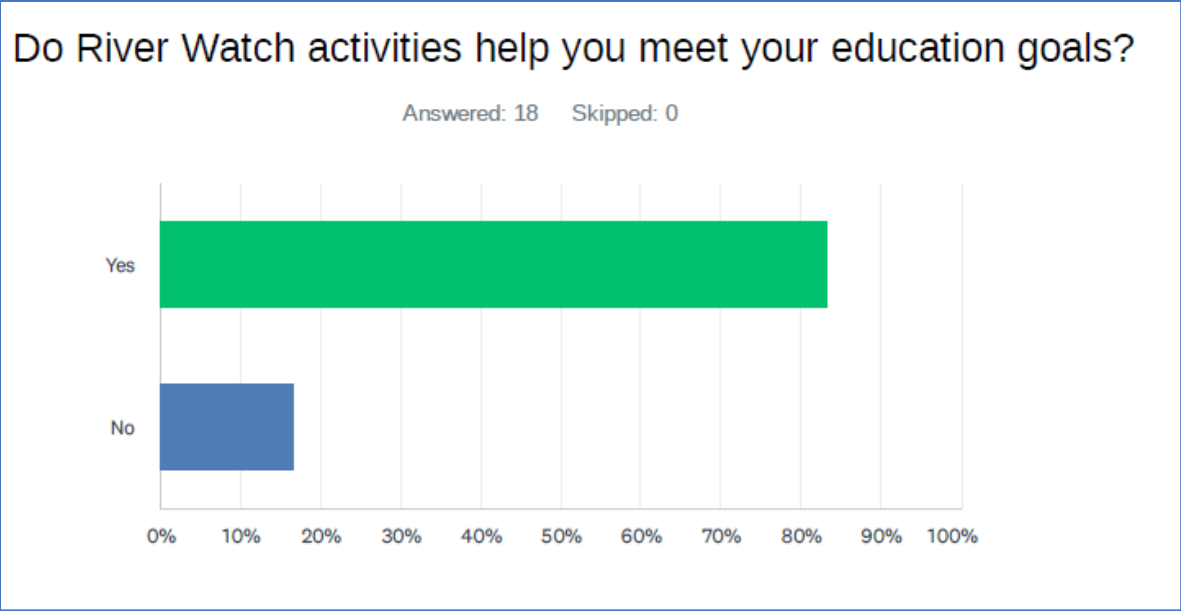


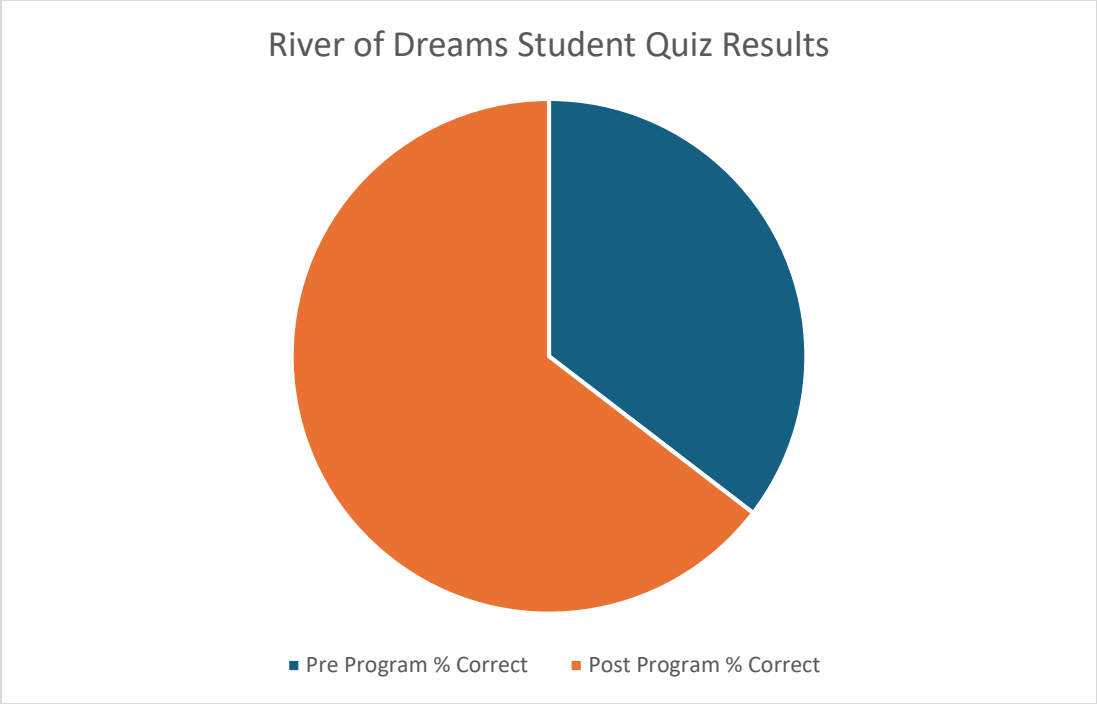


Figure 5.



Student pre and post-quizzes were given during classroom sessions to 1,225 ROD participants. Students were asked a series of questions related to watershed/river terminology and pollution sources. Post-activity correct response rates increase by 28%. Student quiz response results are shown below (Figure 6).

Figure 6.



## Future Activity Recommendations

Eligible RW grant activities should target elementary through high school-aged students, teachers, and youth groups. Examples of effective RW program opportunities suited to a local school, community, and watershed needs are listed below.

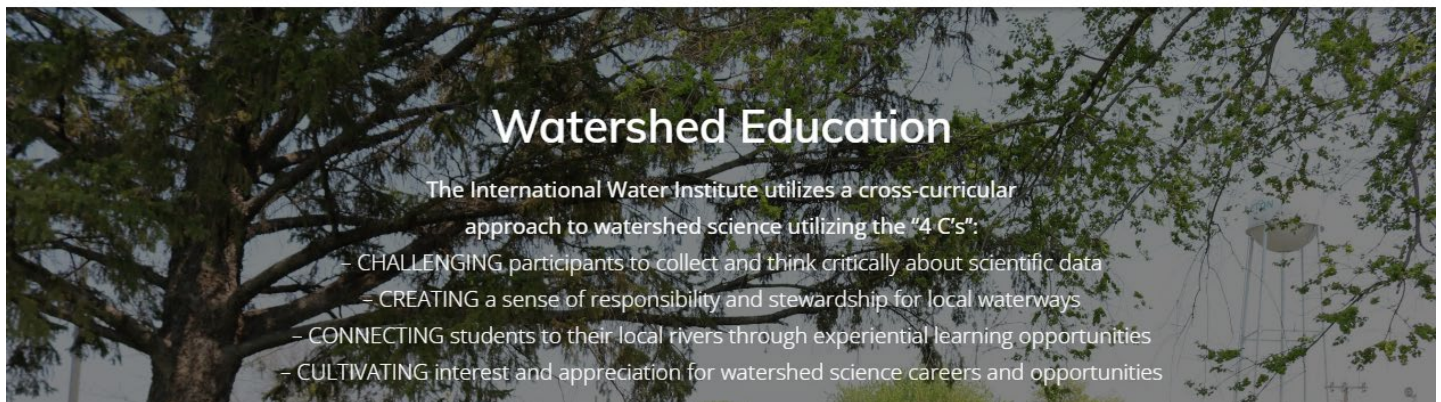
- *Water Quality Monitoring:* Collect and record conditions at local rivers and streams using state-of-the-art scientific methods and equipment.
- *Biological Monitoring:* Macroinvertebrate monitoring provides additional insights into watershed and ecosystem health.
- *River Explorers:* Guided kayak excursions on local rivers to observe and document watershed conditions.
- *Annual Teacher and Student Training:* proper sampling techniques, data analysis and provide access to resources and experts in current watershed issues.
- *River Watch Forum:* Annual event challenging students to learn and share about emerging local watershed issues.
- *Real-Time Monitoring:* Students build, deploy and maintain real-time water quality monitoring stations. Data analyzed and used to characterize stream water quality.
- *River of Dreams:* A cross-curriculum watershed education program tailored to elementary students. Participants learn watershed terminology and how their sub-watershed fits into their River Basin.

## Information and Education Outputs

The Red River Basin RW Program has been an ongoing program for 29 years and has developed numerous information and education outputs throughout the years. Recent outputs including training materials, videos, virtual activities, education opportunities, and newsletters can be explored on the [International Water Institute Education Website](#).



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# ATTACHMENT A

## RED RIVER BASIN RIVER WATCH

### 2022 - 2023 Clean Water Fund Project Work Plan

**Project Description: brief description/summary of proposed project**

*MN Legislative Clean Water Fund funding (\$300,000) to the Red River Watershed Management Board for the River Watch Program. River Watch (RW) enhances watershed understanding and awareness for tomorrow's decision-makers through direct hands-on, field-based experiential watershed science. Schools throughout the Red River of the North Basin participate in a variety of unique and innovative watershed engagement opportunities suited to their school, community, and watershed needs.*

**Project start date:** April 1, 2022

**Project end date:** June 30, 2024

Non-point source pollution is the leading source of water quality impacts on rivers and lakes. In the Red River Valley, as elsewhere in Minnesota, citizen involvement is crucial to identifying and reducing problems from non-point source pollution. This project will build on the foundation of the existing Red River Basin River Watch program.

The River Watch program will be delivered through an effective working partnership between local schools and communities; local, state, and federal agencies; and academic institutions throughout the Red River Basin (<https://iwinst.org/mesmerize/watershed-education/>). The Red River Watershed Management Board (RRWMB) will be the project sponsor with lead coordination and project management provided by the International Water Institute.

**Project location:**

			09020101, 09020102, 09020103, 09020106, 09020104, 09020107, 09020301, 09020303, 09020304, 09020305, 09020306, 09020309, 09020311, 09020312, 09020314
Major watersheds:	Mustinka, Bois De Sioux, Otter Tail, Buffalo River; Upper Red River of the North, Marsh, Sandhill, Clearwater, Red Lake, Thief, Snake, Grand Marais, Tamarac, Two, and Roseau	Hydrologic unit codes:	
Counties:	Kittson, Roseau, Marshall, Red Lake, Pennington, Polk, Beltrami, Clearwater, Mahnomen, Norman, Clay Becker Ottertail, Wilkin, Grant, Stevens, Traverse and Big Stone		

River Watch teams engage in water quality monitoring, scientific research and education initiatives across the Red River Basin, extending the amount of data available for assessing our watershed health and contributing to improved awareness and involvement in watershed management.

**Work Tasks in bold** below followed by *measurable outcomes in italics* directly below task.

**RIVER OF DREAMS:** Engage elementary students in River of Dreams (ROD) a hands-on education program focused on the valuable river resources of the Red River Basin. Provide integrated classroom and outdoor experiences that; build awareness of river ecosystems and watershed connections, increase student capacity to make informed decisions about their environment and instill a sense of place about the uniqueness of their local watershed—historic, economic, and ecological

**Work tasks/Measureable outcomes:**

**Secure participation and implement ROD activities in 80 elementary classrooms in the Red River Basin.**

- *School contacts. Solicit classrooms to be involved. Identify lead teacher and determine the number of students to be involved. Completed April 2022 (40 classrooms) and March 2023 (40 classrooms).*
- *School classrooms sessions. Hold classrooms sessions to present materials and go over program expectations. Completed April 2022 (40 classrooms) and April 2023 (40 classrooms).*
- *Field sessions with ROD participants. Release of individual ROD canoes and review of watershed lessons learned by students. Completed June 2022 (40 sessions) and June 2023 (40 sessions).*
- *Teacher evaluation of implementation, problems, and highlights of ROD activities, as well as pre/post surveys of students. Completed December 2023. Results will be reported as part of Final Report due June 30, 2024.*

**Purchase ROD materials, assemble classroom packets and Data entry.**

- *Purchase classroom resources; books, art supplies, canoes and canoe labels. Ongoing completed November 2023.*
- *Package classroom resources for delivery including canoe assembly. Ongoing completed November 2023.*
- *Create canoe pages and enter canoe tracking information into the ROD database. Ongoing completed November 2023.*

**RED RIVER EXPLORERS PADDLING PROGRAM:** Increase awareness and knowledge of local land use and watershed connections through a Red River Explorers Paddling Program to allow RW teams and community members to “water-truth” streams in the Red River Basin, documenting local watershed conditions.

**Work tasks/Measureable outcomes:**

**Red River Explorers Paddling Program river route determinations to allow RW teams and community members to safely explore and document river conditions.**



- *IWI paddling staff scout rivers at different water levels to assess safety and water levels needed for safe passage by RW student exploratory teams. Ongoing through 2023.*
- *Equipment and materials purchased for river trips and documenting field conditions. Completed July 2023.*

**Lead 8 guided river ecology excursions in both 2022 and 2023 on various reaches of rivers in the Red River Basin.**

- *Sixteen guided river ecology excursions in the Red River Basin, all utilizing GPS and mapping/photo documentation of baseline geomorphology and recreation conditions. Completed November 2023.*
- *Create and share information from river trips on IWI website via on-line map and multimedia reports. Reports may include the following; number of trip participants, river route and reaches covered, photo-documentation of river conditions, and a summary of observations by trip participants on river conditions and recreation suitability. Completed December 2023.*
- *Final Report to include river miles explored, number of participants and links to all of trip reports Completed June 30, 2024.*

**Watershed Connections: Macroinvertebrates and outreach.**

- *Provide macroinvertebrate monitoring resource materials and equipment for RW schools with assistance from IWI staff. Ongoing over contract period, completed December 2023.*
- *Produce and distribute a quarterly electronic newsletter that promotes watershed education and awareness in the Red River Basin. 8 newsletters developed over the contract period. Completed December 2023.*
- *Participate in 2-3 Red River Basin Water Festivals. Lead activities related to relevant watershed issues (water quality, flooding, groundwater, AIS). 500-700 grade school students each year. Completed November 2023.*
- *Provide ROD and River Explorer experiences at the White Earth Math and Science Academy and Lake Bronson 4-H camp. 1-2 events each year. Completed November 2023.*

**STEM ASSISTANCE:** Assist in provision of Science, Technology, Engineering and Math (STEM) education and engagement opportunities through watershed science.

**Work tasks/Measureable outcomes:**

**Provide professional teacher development through watershed inquiry and education opportunities. Regional fall kick-off events, incorporating team building skills, local watershed project presentations and data interpretation will be held for RW teachers and youth leaders. Summer training sessions will be held for teachers and RW team captains to provide extended learning opportunities on watershed topics such as river ecology, watershed connections, and biological monitoring.**

- *2-3 regional fall kick-off events in both 2022 and 2023 two summer teacher and two summer youth training session. Summary report will be provided to document participants at regional kick-off events, topics covered, and evaluation comments from participants. A summary report will also be provided for the summer trainings*

*documenting participation, materials presented, and evaluation summary from participants. Completed December 2023.*

**Utilize the annual River Watch Forum to provide exposure to relevant research topics and an opportunity to present findings from current research involvements. Provide opportunities for youth to engage in scientific research and outreach.**

- *River Watch Forum presented in April 2022 and March or April 2023 with keynote speaker and concurrent sessions focused on emerging watershed education and research. Poster displays, written reports and/or video presentations of assigned research topics, service learning projects and special investigations by RW teams in collaboration with watershed partners. Completed April 2023.*
- *Summary report written to document participating RW teams/schools and highlighting awards and watersheds represented in research, with links to posters. To be completed by June 30, 2022 and June 30, 2023 and included in Final Report due June 30, 2024.*

**Supplement stream monitoring activities with real-time continuous data collection. Provide opportunities for youth to engage in the construction, deployment and data analysis of continuous monitoring stations.**

- *Solicit RW teams to be involved. Identify deployment locations for 10 continuous monitoring stations. Completed June 2022.*
- *School classrooms sessions. Hold 10 classroom sessions to present materials on deployment, maintenance and data downloading of monitoring stations. Completed December 2022.*
- *Field sessions to install monitoring stations. Deploy 10 stations. Completed June 2022 and June 2023.*
- *Field sessions to download data, perform station maintenance and remove for winter storage. Visit 10 monitoring stations two times per year (maintenance and removal). Completed November 2023.*
- *School Classroom sessions. Hold 10 data review sessions with RW teams using the continuous data as compared to grab sample data. Completed December 2023.*

## **OVERSIGHT: Project Management and Reporting**

**Work tasks/Measureable outcomes:**

**Track project grant-related expenditures. Compile and organize invoices, pay bills and submit for expense reimbursements in a timely manner.**

- *Grant-related expenditures tracked, bills paid and expense reimbursements submitted at least quarterly.*

**Track objectives, tasks, and FTE to ensure outcomes are being met. Prepare and complete reports and results from the Red River Basin River Watch program as follows:**

- *Interim report and initial evaluation to Commissioners of Education, MPCA and Legislative and Education Committees by February 15, 2023.*

- Final report of project outcomes, budget/FTE, and final evaluation results by June 30, 2024 to all entities receiving February 15, 2023 report noted above.
- Annual site visit with MPCA project manager. Dates TBD.

**PROJECT BUDGET:**

<b><i>Total Budget</i></b>		
<b><i>Staff total cost*</i></b>		<b><i>\$238,900.00</i></b>
<b><i>Travel reimbursement**</i></b>		<b><i>\$ 22,500.00</i></b>
<b><i>Equipment and supplies</i></b>		<b><i>\$ 38,600.00</i></b>
	<b><i>Total:</i></b>	<b><i>\$300,000.00</i></b>

***Estimated FTE: 2.25*** (Final Report shall include actual FTE)

<b><i>* Staff rates shall not exceed the following:</i></b>	
<i>Staff 1 rate: Monitoring and Education Spec. (1)</i>	<i>\$ 47</i>
<i>Staff 2 rate: Monitoring and Education Spec. (2)</i>	<i>\$ 42</i>
<i>Staff 2 rate: Project Specialist</i>	<i>\$ 72</i>
<i>Staff 4 rate: Education and Monitoring Spec.</i>	<i>\$ 40</i>
<i>Staff 5 rate: Monitoring and Ed Director</i>	<i>\$ 80</i>

***\*\*Mileage billed at current IRS Mileage Rate***