

February 11, 2021

Red River Basin River Watch Annual Report 2020

Red River Basin River Watch takes 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.

Danni Halvorson
Director - Education
International Water Institute

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Program Overview

Starting its 26th year, the Red River Basin River Watch Program (RW) has delivered innovative watershed education programming to schools and communities across the Red River of the North Basin. Education is the most effective tool to change attitudes and behaviors. RW offers a suite of classroom and outdoor activities designed to address MN water quality improvement initiatives that 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

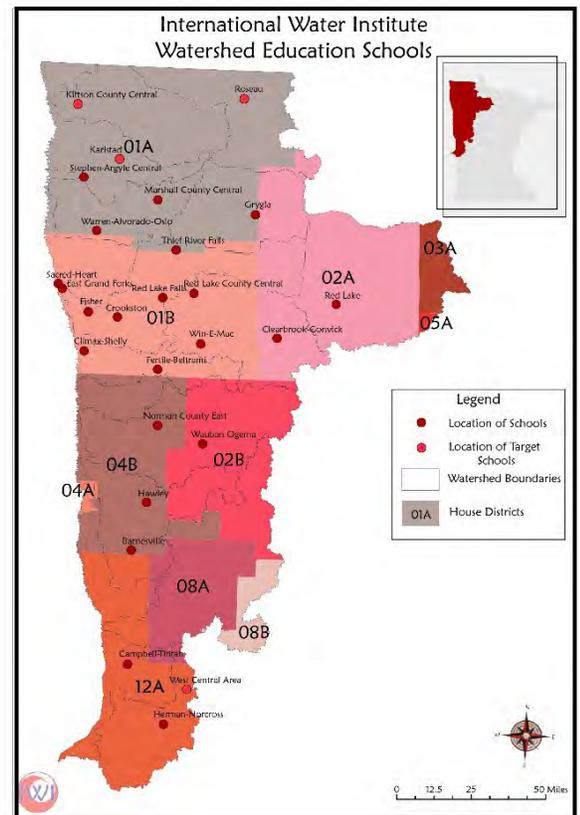
Support from the Red River Watershed Management Board and local watershed districts has built an effective and popular watershed education program across the Red River of the North Basin that focuses on water quality. Since program inception, RW teams from schools throughout the Red River Basin have 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 (IWI) 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:

- Biological Monitoring
- Real-Time Monitoring
- River of Dreams
- River Explorers
- River Watch Forum
- Teacher Training

The staggering scope and scale of Minnesota's water quality problems requires society to prioritize problems and adopt practical, cost-effective, policies and solutions. Many people lack the tools/knowledge necessary to make informed and efficient water resource decisions. The science reasoning and critical thinking skills required are seldom taught through a traditional classroom curriculum. RW allows us to put the tools in the toolbox giving our future decision makers a strong water resource foundation to draw on.

Project Progress

This report is for the Clean Water Legacy Red River Basin River Watch Project covering January 2020 through December 2020. The Red River Watershed Management Board is the project sponsor with lead coordination and project management provided by the International Water Institute. The remainder of this report is organized by activities undertaken in 2020. The 2020 – 2021 Clean Water Fund Work Plan is included as *Attachment A*.



25th Annual Forum

The 25th River Watch Forum wrapped up in early May in quite an unusual way. Although the Forum projects took place in person, in classrooms and community meetings throughout the Red River Basin, we were unable to gather all our students together in one place to celebrate 25 years of River Watch. Though nothing truly compares to gathering students from across our watershed, we did create a series of videos to highlight the work being done by our River Watch Teams and to celebrate another year of River Watch. For this year's Forum project, River Watch Students and teachers delivered many innovative and exciting programs to engage people of all ages in watershed education. Portions of our virtual Forum videos came from elementary classrooms, early morning team meetings before school, and community gatherings throughout the Red River Basin. We had a total of 19 projects turned in from 13 sub-watersheds. Combined, the efforts of our River Watch Teams reached over 305 people!





Plan to complete goals:

- Pre-Tests
- Vocab Words
- Book
- Water Clarity Worksheet
- Clarity Lab



Though we were expecting to gather in March with over 300 students in attendance and are looking forward to working with students again, we were encouraged that our videos, and student projects, were viewed over 2,400 times!

With so much of this year's Forum being focused on the future of River Watch, one thing we want to continue to grow in is sharing information or videos online to reach a greater amount of people. Our programming is meant to provide a diverse skill set and challenge students to think critically about the watershed they live in. As seniors in River Watch move on to their next chapter, we would like to thank them for being in River Watch and encourage them to keep in touch about special projects and internships in the future.

Check out the 2020 Forum details [here](#).

The Clean, Drain, Dry Game

*This game was played with 3rd graders but can be played with other grade levels!

How Zebra Mussels Spread

- Zebra mussels spread by boat-related equipment being transported to zebra mussel infested waters & then transferred to new and clean waters (oil and zebra mussel boat).
- Zebra mussel shells (valves) are free floating organisms that can travel through rivers and other waterways using water currents.
- Ferrous zebra mussels can produce up to 1 million eggs per year.



Zebra mussels attached to a native mussel.

Environmental Impacts

- Zebra mussels filter water resulting in removal of food sources for native aquatic species.
- Causes damage to boat engines by clogging the motor.
- In locally infested waters, zebra mussels can clog intake pipes & filters, reducing water pumping capabilities for cities.

Get Ready!

- Go through presentation and objectives in classroom with students.
- Get to gym and get into 3 groups.

Get Started!

- Each group represents a different way to Clean Drain Dry (C.D.D.).
- First group of students gets into boats (1st group doesn't C.D.D. = zebra mussel infestation. Lakes lose diversity of fish & aquatic plants).
- Second group gets into boats, only 1/2 C.D.D. (Same result as group #1).
- Third group gets into boats (all C.D.D. = no spread of zebra mussels).

Finish!

- Return to classroom to reflect on game and take post quiz. (Majority of students scored a 24% - on post quiz; some quiz questions below.)
- Bobber cookies for a job well done!

Q&A

- what do zebra mussels eat?
- how many lakes are infested in MN?
- what do zebra mussels look like?
- how do zebra mussels spread?

Objectives

- ★ Understanding how zebra mussels move through rivers & lakes.
- ★ Understand why Clean, Drain, Dry is important.



River of Dreams

Due to school closures and social distancing guidelines, all Spring 2020 group canoe launches were canceled as were the last remaining classroom visits.

In response, our teachers had to adapt accordingly and we have been working to support whatever alternative works best for them and their classrooms. A majority of our participants postponed releases until Fall 2020, with hopes of being able to launch canoes as a class. Other schools opted to have students launch their canoes with their family and share photos with one another.

Though being present at the canoes launches and hearing the dreams of each student are highlights of our staff team, we have appreciated the opportunity to support our schools in whatever we can! Even though programming has looked a little different this spring and summer, canoes launched in recent years continue to make their way to Hudson Bay!



To view the latest River of Dreams sightings, click [here](#).



A local science teacher, found a 2018 canoe while out on a recent paddling trip (left). Another 2018 canoe was found upstream from the previous find by a family out exploring, they cleaned it off and returned it to its journey (right).

2021 River of Dreams activities will begin in a virtual setting with pre-recorded local watershed information activities designed to engage the students in learning watershed vocabulary followed by an interactive Zoom session that takes students around their local watershed illustrating how they connect to the rest of the world around them.

River Explorers

River Explorers is an educational program that was created to get students in our River Watch program out on the rivers that they sample on. While out in our fleet of kayaks, students take photos and make observations on wildlife, land use, water quality, and anything else that catches their eyes. All of this is put together to create a “story map” on ArcGIS online to share the paddling adventure with the public. We hope that helping students get out on the rivers in their watershed will lead to more members in the community recreating in their free time – a hobby that is especially relevant during a season of life where people find themselves increasingly outdoors!



Using ArcGIS Online, River Watch Teams compile maps with photos and commentary from their River Explorers Paddling Trips. If you're interested in scoping out some of the tributaries to the Red River, take a look at the River Explorers Map Gallery at the button below.

View Paddling Trips [Here!](#)

 <p>Web Mapping Application</p> <p>Buffalo River: Hawley River Watch</p> <p>dyaste</p>	 <p>Web Mapping Application</p> <p>Clearwater River: Red Lake County Central River Watch</p> <p>dyaste</p>	 <p>Web Mapping Application</p> <p>Dam #5: Valley-Edinburg River Watch</p> <p>dyaste</p>
 <p>Web Mapping Application</p> <p>Mustinka: Herman Norcross River Explorers</p> <p>taylorlemieux</p>	 <p>Web Mapping Application</p> <p>Rabbit & Bois de Sioux: Campbell-Tintah River Explorers</p> <p>taylorlemieux</p>	 <p>Web Mapping Application</p> <p>Rabbit to the Bois de Sioux: Campbell-Tintah River Watch</p> <p>dyaste</p>

Water Quality and Macroinvertebrate Virtual Activities

With in-person activities limited due to COVID-19, we created virtual activities for River Watch students to work on in the classroom. A water quality activity where students look at data from water quality samples collected from the Red River and identify a location where individual samples were collected. This activity was designed to familiarize students with water quality parameters, water quality standards, ecoregions, pollutants and stressors. This activity was created in two parts. Part 1 - Water Quality Parameters can be viewed [here](#) and part 2 - Red River WQ Data [here](#).



Similar to the water quality activity, the macroinvertebrate activity was created to enable students to learn about macroinvertebrates, how to sample for them, and how to identify individual specimens. They begin by going through an Introduction to Macroinvertebrates which covers these questions:

- What is a macroinvertebrate?
- How do you identify a macroinvertebrate?
- Where do macroinvertebrates live?
- What is the purpose of macroinvertebrate sampling?
- How do you fill out a pollution tolerance index rating sheet?

Once the Introduction to Macroinvertebrates is completed, students begin working on identifying specimens collected from 5 sampling sites within the Red River Basin. For each sampling site they are asked to completing the following:

- Identify 4 specimens using a dichotomous key
- Complete a Pollution Tolerance Index (PTI) rating sheet
- Submit your PTI rating with the form included on the left side of the PTI section
- Submit a final review at the end of each site.

This activity was also created in two parts but can be viewed in its entirety [here](#).

Continuous Monitoring Stations in the Red River Basin

In the Spring of 2017, the International Water Institute hosted David Arscott and Shannon Hicks from the [Stroud Research Center](#). David and Shannon led a workshop on assembling, coding, and deploying continuous monitoring stations known as the "Stroud Stations." At the end of the workshop, our staff team deployed their first station on the Wild Rice River in Twin Valley, MN. Stroud Stations take a reading from a probe affixed to a rebar pole in the river bed. Every five minutes the stations collect conductivity, temperature, and depth readings.

Since 2017, IWI has added stations every year; launching them in the spring and retrieving them in the fall before the ice covers the basin. In addition to IWI staff, River Watch Teams help maintain stations in their sub-watershed - ensuring that the data is compared to sonde data and that the stations stay in tip-top shape. The most recent workshop resulted in 8 new stations being assembled and coded! Come this spring, 15 stations will be deployed throughout the Minnesota side of the Red River Basin!



26th Annual River Watch Forum

Theme: Just Around the River Bend in Late February to Mid-March 2021. This year's River Watch Forum will be hosted virtually over three weeks! Every week, a new challenge will be issued allowing River Watch students to work together as a team (even if distance learning). Our education team is busy building the final components and gathering resources to host this virtual forum. We are very much looking forward to being 'just around the river bend' with all our River Watch students and teachers!

Project Management and Reporting

This report was submitted to the MPCA project manager February 11, 2021. The report will also be submitted by February 15, 2021 to the Commissioners of Education and MPCA, along with the Legislative and Education Committees. Invoices have been submitted quarterly and included in *Attachment B* is a summary of the project budget covering January 2020 through December 2020.

Social Media Highlights

internationalwaterinstitute

Liked by **andyulven** and 8 others

internationalwaterinstitute Energy still high even after 35 River of Dreams classrooms!! #education #photoshop #energybus

March 2

International Water Institute
Published by Taylor Lemieux 191 · March 26 · 🌐

River Watch schools don't create their River Watch Forum projects solely for the Forum, they often present at other places around the area as well. Earlier in March, the Norman County East High School River Watch team gave a presentation to the Wild Rice River Watershed District. For their presentation, they showed the video they created for their Forum project and requested funding for their River Watch program, which was granted! Great job NCE!! 🙌

International Water Institute
Published by Taylor Lemieux 171 · March 23 · 🌐

25 Days of River Watch Day 23: Over the years, IWI and River Watch staff have acquired an abundance of River Watch t-shirts. We like to wear our shirts to River Watch and River of Dreams events, so we end up matching frequently!

internationalwaterinstitute

Liked by **andyulven** and 5 others

internationalwaterinstitute What began in the Sand Hill Watershed now spans across the majority of the Red River Basin, from the Park River to the Wild Rice River. Currently 25 schools in 9 sub-basins! Thank

Year in Review

Though this year was different than many years past, 2020 was still a great year for the River Watch program. All of our staff grew in their “virtual” skills, found creative ways to continue our programming, and made the best of an uncertain time. Some of our top highlights from 2020 are:

- ◆ The 25th Annual River Watch Forum! The Forum was meant to be a large celebration; awarding project winners amongst the 2019-2020 River Watch participants while also celebrating 25 years of watershed education. Instead, the Forum went virtual! Forum videos were viewed over 2,400 times!
- ◆ River of Dreams started with a bang! Staff visiting over 55 classrooms in 4 weeks!
- ◆ 381 River of Dreams canoes were launched with many more hoping to make a delayed start to their journey this coming spring!
- ◆ IWI was featured in the [Grand Forks Herald](#); showcasing a fun spin on our traditional ROD program with future teachers getting the opportunity to be students.

Check out a recent video, Education Program Highlights from 2020!



[Click Here!](#)

Just as ‘river recreation’ does not have a static definition, watershed education is not one-dimensional either. Watershed Education is not solely about gathering water quality data or learning geography but rather, about experiencing the river in a holistic sense. This is the idea behind expanding our programming past water quality monitoring to include annual conferences, macroinvertebrate sampling, River of Dreams, and River Explorers.

Attachments

Attachment A - RED RIVER BASIN RIVER WATCH 2020 - 2021
Clean Water Fund Project Work Plan and Budget

Attachment B – Budget Summary January 2020 - December

ATTACHMENT A
RED RIVER BASIN RIVER WATCH 2020 - 2021
Clean Water Fund Project Work Plan and Budget

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: January 1, 2020

Project end date: June 30, 2022

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:

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:	09020101, 09020102, 09020103, 09020106, 09020104, 09020107, 09020301, 09020303, 09020304, 09020305, 09020306, 09020309, 09020311, 09020312, 09020314
Counties:	Kittson, Roseau, Marshall, Red Lake, Pennington, Polk, Beltrami, Clearwater, Mahnommen, 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 60 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 March 2020 (30 classrooms) and March 2021 (30 classrooms).*
- *School classrooms sessions. Hold classrooms sessions to present materials and go over program expectations. Completed April 2020 (30 classrooms) and April 2021(30 classrooms).*
- *Field sessions with ROD participants. Release of individual ROD canoes and review of watershed lessons learned by students. Completed June 2020 (30 sessions) and June 2021 (30 sessions).*
- *Teacher evaluation of implementation, problems, and highlights of ROD activities, as well as pre/post surveys of students. Completed December 2020. Results will be reported as part of Final Report due June 15, 2022.*

Purchase ROD materials, assemble classroom packets and Data entry.

- *Purchase classroom resources; books, art supplies, canoes and canoe labels. Ongoing completed November 2021.*
- *Package classroom resources for delivery including canoe assembly. Ongoing completed November 2021.*
- *Create canoe pages and enter canoe tracking information into the ROD database. Ongoing completed November 2021.*

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 2021.*
- *Equipment and materials purchased for river trips and documenting field conditions. Completed July 2021.*

Lead 8 guided river ecology excursions in both 2020 and 2021 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 2021.*
- *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 2021.*
- *Final Report to include river miles explored, number of participants and links to all of trip reports Completed June 15, 2022.*

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 2021.*
- *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 2021.*

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 2020 and 2021 and one summer teacher and one 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 2021.*

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 February or March 2020 and 2021 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 2021.*
- *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, 2020 and June 30, 2021 and included in Final Report due June 15, 2022.*

Expand stream monitoring activities to include 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 and purchase equipment to build 7 continuous monitoring stations. Completed June 2020.*
- *School classrooms sessions. Hold 7 classroom sessions to present materials and build monitoring stations. Completed December 2020.*
- *Field sessions to install monitoring stations. Deploy 7 stations, instruct on maintenance and data download. Completed June 2020.*
- *Field sessions to download data, perform station maintenance and remove for winter storage. Visit 14 monitoring stations two times per year (maintenance and removal). Completed December 2021.*

- *Teacher and student evaluation of implementation, problems, and highlights of continuous monitoring activities. Completed December 2021. Results will be reported as part of Final Report due June 15, 2022.*

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, 2021.*
- *Final report of project outcomes, budget/FTE, and final evaluation results by June 15, 2022 to all entities receiving February 15, 2021 report noted above.*
- *Annual site visit with MPCA project manager in spring 2021 and 2022.*

PROJECT BUDGET:

Total Budget		
Staff total cost*		\$235,646.00
Travel reimbursement**		\$ 22,225.60
Equipment and supplies (see detailed list below)		\$ 42,128.40
	Total:	\$300,000.00

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

* Staff rates shall not exceed the following:	
Staff 1 rate: Monitoring and Education Spec.	\$ 42.26
Staff 2 rate: Project Specialist	\$ 62.87
Staff 3 rate: Education and Monitoring Spec.	\$ 36.45
Staff 4 rate: Monitoring and Ed Director	\$ 75.70

**Mileage billed according to the State of Minnesota [Commissioner's Plan Rate](#)

<i>Detailed Equipment and Supplies List</i>			
<i>Equipment - limited to items greater than \$500 with a life expectancy greater than 1 year</i>	<i>Quantity needed</i>	<i>Unit Cost</i>	<i>Total Cost</i>
<i>MayFly wireless data logging system stream station</i>	<i>7</i>	<i>\$1,600</i>	<i>\$11,200.00</i>
<i>Replacement Conductivity Temp Depth probe</i>	<i>2</i>	<i>\$600</i>	<i>\$ 1,200.00</i>
<i>10" cedar canoes</i>	<i>1,500</i>	<i>\$ 12</i>	<i>\$18,000.00</i>
<i>Supplies (Field and Safety) - items less than \$500</i>			<i>\$11,728.40</i>
<i>Total:</i>			<i>\$42,128.40</i>

