February 12, 2015

Red River Basin River Watch Annual Report 2014

Red River Basin River Watch partners with K-12 and community education staff, resource management professionals, higher education institutions and other non-profits to create opportunities for citizen engagement in surface water quality issues in the Red River Watershed through data collection and field experiences.

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Director - Education
International Water Institute

Contents

Introduction

This report fulfills the interim reporting requirements for the Clean Water Legacy River Watch Project from January 2014 through December 2014. The Red River Watershed Management Board is the project sponsor with lead coordination and project management provided by the International Water Institute. The purpose of this report is to provide a summary of progress towards meeting the identified outcomes within the FY 2014 – 2015 Clean Water Fund Work Plan.

Program Overview

River Watch enhances watershed understanding and awareness for tomorrow's decision-makers through direct hands-on, field-based experiential watershed science. Over 40 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.

Water Quality Monitoring: Collect and record conditions at local rivers and stream using state-of-the-art scientific methods and equipment.

Biological Monitoring: Macro invertebrate and mussel monitoring provides additional insights on watershed health.

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

Ongoing ***Teacher Training*** provides access to resources and experts on current watershed issues.

Adopt-A-River: Civic engagement through river and stream clean-up activities.

River Watch Forum: annual opportunity for students to share and learn about emerging watershed issues.

Progress and Evaluation

The remainder of this report discusses the project progress in meeting the tasks and measureable outcomes of the expanded River Watch activities from January 2014 through December 2014 (12 months).

OBJECTIVE 1: Develop a standardized framework for program implementation to build rigor and consistency with communities currently involved in River Watch (RW), while expanding monitoring and engagement opportunities.

Work tasks/*Measureable outcomes***:**

1A Expand/Update the current River Watch Database to allow for the input and use of Water Quality and Snow Study data by mobile devices.

1A1 Transfer the current River Watch Database to a new mobile device friendly web platform by December 31, 2013.

1A2 Develop and add a data portal to the website for entry of Snow Study data by December 31, 2013.

1A3 Training for education staff on use and features of new website, completed by January 15, 2014.

1B **Develop native mussel monitoring options for RW teams as means of developing native mussel reference collections and assessing watershed health in the Red River Basin**.

1B1 Native mussel inventory protocols developed, materials assembled and permits acquired. Collection and identification protocols established by April 2014.

1B2 Training and implementation of native mussel field collection methods, documentation, and identification. Ongoing over contract period, completed by October 2015.

1B3 Resources (modules, videos, print) developed and/or adapted to connect mussel findings with water quality conditions. Mussel data entered in MN DNR Natural Heritage Information System database. Ongoing over contract period, completed by January 2016.

1B4 Teacher evaluation of ease of use, problems, and highlights of native mussel collection activity, as well as pre/post surveys of students. Ongoing over contract period, completed by October 2015. Results will be reported as part of Final Report due June 30, 2016.

Objective 1 Progress:

- The River Watch Database transfer to the mobile friendly platform was completed in April 2014 along with the addition of a data portal for Snow Study data. You can review the updated website at this link and the snow study data portal here. Education staff were also trained in the use and features of the new website. *Objective 1A* work tasks have all been completed.
- As part of our kayak outings we have begun to collect mussel shells on our river paddling excursions to make a reference collection for our watersheds. A permit was obtained from MN DNR to allow us to collect shells. One condition of the permit is that we do need to enter our findings in the MN DNR Natural Heritage Information System, http://www.dnr.state.mn.us/nhnrp/nhis.html (the mussels and fish data base component). As part of that process, we need to find partners who can assist us in positively identifying the shells we have collected—and in essence train us in identification. We have taken a first stab at identification, but need to find "experts in the field" to confirm and/or correct our identification. To date we have not entered our mussel findings into the Natural Heritage Information System as we are seeking help with positive identifications prior to data entry.
- IWI staff have been working with Bernard Sietman (MNDNR) and Andre Delorme (Valley City State University) two mussel experts within the Red River Basin to develop collection protocols and other reference materials. A mussel guide for the Red River of the North has been developed and is included for review in the attachments. We have also experimented with different collection protocols in the field and hope to have an official method chosen by the 2015 mussel collection season.
- Resources for connecting mussels to water quality are in development as is the teacher evaluation piece. We hope to have all of the mussel resources, protocols, and evaluation tools in place prior to our 2015 mussel collections.

OBJECTIVE 2: 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***:**

2A Expand capacity and structure of Red River Explorers Paddling Program to allow RW teams and community members to safely explore and document river conditions, including development of website to share information about river conditions.

2A1 *Adult team members scout rivers at different water levels to assess safety and water levels needed for safe passage by RW student exploratory teams. Ongoing through 2015.*

2A2 *Additional features and information that might be collected will be reviewed with watershed district managers and research scientists to maximize utility of data collection from river trips. Equipment purchased for documenting field conditions. Completed by July 2014.*

2A3 *Scouting reports posted to IWI website for RW teams and public access in planning river trips. Ongoing through 2015.*

2B Lead six guided river ecology excursions in both 2014 and 2015 on various reaches of rivers in the Red River Basin.

2B1 *Twelve guided river ecology excursions in the Red River Basin, all utilizing GPS and mapping/photo documentation of baseline geomorphology and recreation conditions.*

2B2 *Share information from river trips on public website. Reporting will include 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.*

2B3 *Final Report to include link to all of trip reports and responses from local resource managers and research scientists as to utility of reconnaissance information provided about watershed conditions, due June 30, 2016.*

2C Watershed Connections via stream tables and groundwater models.

2C1 *Stream tables and ground water models purchased and staff trained in use and presentation. To be completed by July 2014.*

2C2 *Resources (modules, videos, print) developed and/or adapted to connect streams with ground water. Eight classroom visits with materials and equipment provided for use by teachers with staff assistance. Ongoing over contract period, completed by January 2016.*

2C3 *Evaluation (self-reported) of changes in knowledge, attitude and perceptions of local rivers after stream table and/or groundwater model exposure. To be completed by November 2015 and included in Final Report due June 30, 2016.*

Objective 2 Progress:

- A River Explorers web page is now active and can be viewed by clicking here. .
- Each river reach that was paddled in 2014 was pre-scouted by IWI staff. Information including notes and geo-tagged pictures from these scouting trips are in the process of being reviewed with resource managers. An initial meeting with watershed, county, and SWCD staff was held on December 12, 2014 to discuss desired content of these scouting reports prior to posting the reports to the River Explorer web page. Additional meetings with individual Watershed District Boards are being planned for early 2015. When the desired content of the reports is decided they will be posted to the River Explorers web page as they are completed.
- Twenty (20) river trips were completed in 2014, eleven (11) with River Watch teams and nine (9) with other community organizations. Adequate river levels and good weather allowed for more river trips than planned for in 2014. River Story Maps for several of the Explorer trips have been completed and are posted on the River Explorers web page referenced above. And a 2013/2014 trip summary is included in the attachments for your review.

- Input from local resource professionals and managers will guide the content and process for posting all river trip reconnaissance information and watershed condition reports will be posted as they are completed.
- Three stream tables and two ground water models were purchased in early 2014 and have recently been made available to the River Watch schools for classroom use. IWI staff have been trained in the set up and use of the models and will be assisting the schools in their use when requested. Resources and information relating to the stream tables and groundwater models are available on the IWI website. You can review this information by clicking here.

OBJECTIVE 3: Assist in provision of Science, Technology, Engineering and Math (STEM) education and engagement opportunities through watershed science.

Work tasks/*Measureable outcomes***:**

3A **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 to provide extended learning opportunities on watershed topics such as river ecology, watershed connections, and biological monitoring.**

3A1 *2-3 regional fall kick-off events in both 2014 and 2015; and minimum of two, one-day, summer teacher training sessions. 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 teacher training documenting participation, materials presented, and evaluation summary from participants.*

3B **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.**

3B1 *River Watch Forum presented in March 2014 and 2015 with keynote speaker and concurrent sessions focused on emerging watershed education and research. Poster displays of assigned research topic and special investigations by RW teams in collaboration with research partners.*

3B2 *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, 2014and June 30, 2015 and included in Final Report due June 30, 2016.*

Objective 3 Progress:

- Three (3) regional fall kick-off events were held across the basin in November 2014. River Watch teams were introduced to the River Watch Forum 2015 Team Challenge and the activities at each kick-off event prepared the attending teams for their poster presentations. This year we also incorporated our teacher workshop sessions into the kick-off events. Fifty-three (53) students and nine (9) teachers attended these events. Students received training on how to create a River Story map, mussel identification, and how to tell their Watershed Story. Teachers attended sessions on the setup and use of stream tables, setup and use of groundwater models, mussel collection procedures, and resources were reviewed that will help them make "Watershed Connections" in their classroom. All of the information related to the 2015 Forum and the 2014 kick-off events can be viewed on the web here.
- The 2014 River Watch Forum was held March 18, 2014 with 303 people in attendance, 230 students and teachers along with 73 public at large including resource managers. Students prepared posters for the event and presented them throughout the day's proceedings. The posters that were at the 2014 forum can be viewed here and the proceedings for the day were highlighted in our March/April 2014 newsletter and can be viewed on the web and also in the attached 2014 River Watch Forum Planner.
- Planning for the 20th Anniversary River Watch Forum to be held March 17, 2015 at the University of Minnesota, Crookston is underway. IWI staff are preparing the program and schools are developing their poster displays. Classroom visits will begin in January 2015 to provide River Watch teams with assistance in preparing their poster displays.

OBJECTIVE 4: Project Management and Reporting

Work tasks/*Measureable outcomes***:**

4A **Track project grant-related expenditures. Compile and organize invoices, pay bills and submit for expense reimbursements in a timely manner.**

4A1 *Grant-related expenditures tracked, bills paid and expense reimbursements submitted at least quarterly.*

4B **Track objectives and tasks to ensure outcomes are being met. Prepare and complete reports and results from the Red River Basin River Watch program as follows:**

1. **December 31, 2014, Interim report to MPCA**
2. **February 15, 2015, Interim report and initial evaluation results to the:**
   - **Commissioners of Education and the Pollution Control Agency,**
   - **Legislative Natural Resources Finance and Policy Committees, and**
   - **K-12 Finance and Policy Committees**
3. **June 30, 2016, Final report including final evaluation results to entities identified for February 15, 2015 report above.**

4B1

1. *Interim report of project status and budget to MPCA by December 31, 2014.*
2. *Interim report and initial evaluation to Commissioners of Education, MPCA and Legislative and Education Committees by February 15, 2015.*
3. *Final report of project outcomes, budget, and final evaluation results by June 30, 2016 to all entities receiving February 15, 2015 report noted above.*

Objective 4 Progress:

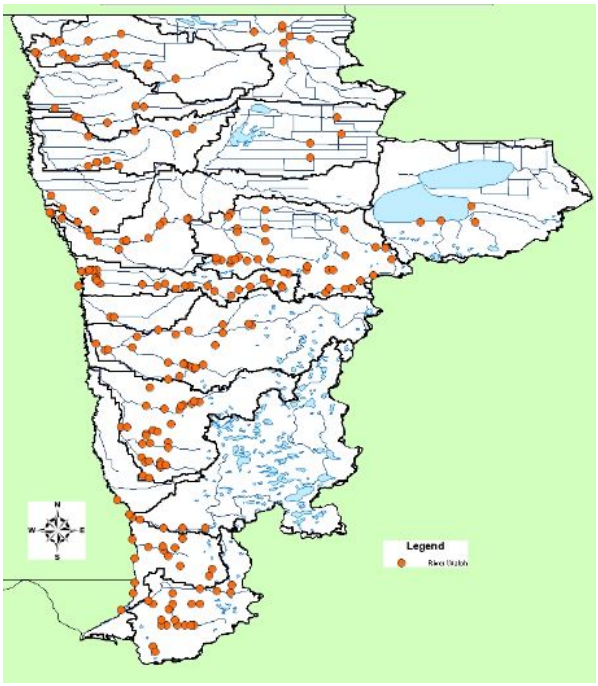
- This first interim report was submitted to the MPCA project manager December 31, 2014.
- This interim report satisfies reporting requirement 2 listed above.
- Invoices have been submitted quarterly and reimbursement request #4 was submitted the first week of January 2015 to bring the budget up to date through December 31, 2014. Below is a summary of the project budget through this period.

Project Budget	**MPCA Grant Funds Available**	**Total MPCA Funds Expended**	**Total Remaining Balance**	**% Budget Expended**
Objective 1: Rigor	$50,475.04	$33,532.25	$16,942.79	66**%**
Objective 2: River Recon	$89,730.31	$47,212.01	$42,518.30	53%
Objective 3: Educate and Engage	$47,774.65	$28,229.88	$19,544.77	59%
Objective4: Project Mgmt. & Reporting	$12,020.00	$6,526.00	$5,494.00	54%
TOTAL PROJECT BUDGET	$200,000.00	$115,500.14	$84,499.86	58%

Summary

Past support for Red River Basin River Watch (RW) from the Red River Watershed Management Board, local watershed districts, and other regional partners has built a solid watershed education foundation across the Red River Basin. The International Water Institute (IWI) RW program provides training to students who monitor physical and chemical conditions of local rivers using standard operating procedures. The scientific data are used by the MN Pollution Control Agency to assess the state's surface waters. RW teams have collected data at over 150 sites on rivers, streams, and agricultural ditches in the Red River Basin.

River Watch Site Map



Clean Water Funds enable IWI to build on this solid watershed education foundation by providing additional learning opportunities that complement the core physical and chemical monitoring done by RW teams with our resource agency partners. These new learning opportunities provide a more comprehensive understanding of watersheds, promoting land and water stewardship to protect and improve Minnesota's valuable natural resources.

The Red River Watershed Management Board is committed to continue building this program and will be requesting matching Clean Water Funds in 2015 to continue this project into 2016/2017 and beyond.

Progress toward meeting each of the objectives reported herein provides evidence that the River Watch Project is making substantial headway towards meeting its goals of developing program rigor and consistency, increasing awareness of watershed connections, and providing STEM watershed education activities. 2015 project activities will continue to develop the critical thinking and human resource capacity of our youth which is critical to protecting and improving the natural resource capital of Minnesota.

APPENDICES

Appendix A: Project Relevant Document Web Citations

Citation #	Page	Title	Web Reference
1	3	River Watch Database	http://riverwatch.wq.io/
2	3	Snow Study Data Portal	http://riverwatch.wq.io/reports/new
3	3	MN DNR Natural Heritage Information System	http://www.dnr.state.mn.us/nhnrp/nhis.html
4	4	River Explorers Web Page	http://www.iwinst.org/education/river-watch-river-explorers-program
5	5	Stream Tables and Ground Water Models	http://www.iwinst.org/education/resources/stream-tables-and-ground-water-models
6	5	Fall Kick-Offs and River Watch Forum	http://www.iwinst.org/education/river-watch-forum/team-resources
7	5	2014 River Watch Forum Posters	http://www.iwinst.org/education/river-watch-forum/school-water-quality-posters
8	5	March/April 2014 Newsletter	http://www.iwinst.org/wp-content/uploads/2014/04/RWRendez_Issue_16_Mar_Apr2014.pdf

Appendix B: River Explorers 2013/2014 Trip Summary

IWI River Explorers Program

2013-14 Trip Totals

	2013	2014	TOTAL
River Watch Trips[1] -RW Teams			
# of Trips	9	11	20
Total Participants	106	124	230
River Miles	35.0	43.8	78.8
Total River Miles	409	495	904
Other River Trips - Community			
# of Trips	8	9	17
Total Participants	219	259	478
River Miles	26.7	39.1	65.8
Total River Miles	622	818	1,440
River Watch and Other River Trips-Totals			
# of Trips	17	20	37
Total Participants	325	383	708
River Miles	61.7	82.9	144.6
Total River Miles	1,031	1,313	2,344

[1] 2013 RW totals includes 2012 Grygla trip and Climax trip via waders.

Appendix C: 2014 River Watch Forum Planner

*****End of Day-Friday, March 14th – Online Registration Deadline*****

Tuesday, March 18th RW Forum at UofMN-Crookston

8:30 Registration & Display Viewing
9:30 Opening Assembly~Welcome
2:30 Adjournment

Parking: It will be spring break on the UMC campus thus all parking lots are available to use. Parking Lot A is recommended for convenient access to Forum activities. Campus map at http://www1.crk.umn.edu/prod/groups/crk/@pub/@crk/documents/content/crk_content_369822.pdf

Refreshments: A continental breakfast during registration/setup and noon meal will be provided.

On-site Check-in will begin at 8:30 a.m. with opening ceremonies beginning promptly at 9:30.

Pre-registration and Concurrent Sessions:
Concurrent sessions will **require everyone to individually Pre-register your TOPIC choices online**. Teachers, please distribute the online registration link to everyone from your team who will be coming to the Forum: www.SignUpGenius.com/go/10C0B4CAEAD2DA5FD0-river/16124718. Review the description of concurrent session topics and grid showing the schedule in this planner (pages 3-4). Your RW team can split up and individually choose which topics are of interest to them. Select just ONE entry from within EACH of the four session timeslots by clicking on the topic you wish to attend. The sessions will be filled on a "first come-first served" basis and will not let you register once it is filled, so please register as soon as possible to best ensure attending the topics you most desire. When you arrive your name tag will include the schedule of concurrent sessions for you to attend for the day.

Posters: Posters will be judged for both **People's Choice** and **Judges Choice**—with three prizes given for each method. For "People's Choice"—each RW team will be given two ballots to use for selecting their choices for best posters which will be tallied with ballots by the public at large. For Judges Choice—teams of judges will review each poster and visit with RW team representatives. RW teams are asked to have 2-3 students at your poster to provide a brief (up to 2 minutes) oral introduction and highlights of your team's activities. A schedule will be provided of time slots when you can expect your poster to be judged and thus when your presenting students should be available at your poster. A 1-2 page handout or brochure that summarizes your monitoring program and results should be available as part of your poster display (minimum of 30 copies recommended—these are excellent to use for general public marketing as well).

Watershed Awareness (Communications) Award: The Red River Basin Commission will present award(s) to schools that have shown leadership in raising watershed awareness through communications and public engagement. Details and entry instructions were emailed to all and are on the IWI website with other Team Challenge Resource information. Send entries and any questions to Joe Courneya at joe@redriverbasincommission.org. **Entries due by 4:00 p.m., Tuesday, March 11th, 2014**.

All for now. Looking forward to an exciting Forum! If you have any questions, contact Wayne Goeken at wayne@iwinst.org / 218-280-0516 or Danni Halvorson at danni@iwinst.org / 218-280-0515.

See you at the Forum!

International Water Institute presents 19th Annual

River Watch Citizen Monitoring Program

Red River Basin River Watch Forum ~ 2014

Tuesday, March 18, 2014
University of Minnesota-Crookston Campus

8:30 Registration. Set-up Displays. Continental Breakfast. (Bede Conference Center)

Posters from each River Watch team in Bede Conference Center for viewing throughout the day

9:30 Welcome-Bede Conference Center: Fred Wood – Chancellor, Univ. of MN-Crookston

9:40 What's Your Watershed IQ? – Danni Halvorson, Director, IWI Center for Watershed Education

10:10 Our Changing Landscape – Dr. Dan Svedarsky – Director, Sustainability Center, UofMn-Crookston

10:40 Announcements and First Door Prize Drawings

11:00 First Concurrent Session

11:30 Second Concurrent Session

12:00 Lunch (Brown Dining Hall) and Display Viewing and Voting

1:00 Third Concurrent Session

1:30 Fourth Concurrent Session

2:00 Awards ~ Recognition of Excellence for Schools and Partners
Final Door Prize Drawings ~ Parting Thoughts

2:30 Adjournment

~Public Welcome ~

CLEAN WATER LAND & LEGACY AMENDMENT

InternationalWaterInstitute
Flood research and watershed education for the Red River Basin

2014 River Watch Forum Concurrent Session Descriptions:

River Watch Posters: View and Vote~ Learn about the health of other rivers in the Red River Basin. River Watch team posters feature their latest monitoring results and research related to the Red River Basin. Vote on best displays. **Evelyn Ashiamah-**International Water Institute (Bede Ballroom, limit 50/session)

River Keepers: Citizen Engagement & Action~ River trips, water festivals, river clean-ups, tree plantings, and fishing events are just some of the river stewardship activities that River Keepers engages citizens in. Learn how you can get involved. **Bob Backman**-Executive Director, River Keepers (Student Center, limit 25/session)

Stream Table~Build a river and see first-hand "how rivers work." Explore impacts of stream flow, erosion, sediment deposition and land use. Figure out where the fast and deep waters run. **Karen Terry-**Univ. of MN Extension Water Educator (Northern Lights Lounge, limit 20/session)

Teachers Talk: River Watch 2014~Overview of options and involvement opportunities for RW schools including challenges and barriers to program implementation. Educator input on 2014 Summer Teacher Training sessions and more. **Danni Halvorson-** IWI/ (Minnesota Room, limit 20/session)

Groundwater Emerging Issues~Drought, oil spills, and irrigation demands are just some of the emerging issues facing our groundwater resources. Learn about groundwater monitoring and the scientific research underway to help understand the issues. **Steve Thompson**, MN DNR (Dowell H 200, limit 25/session)

Red River Fisheries~The Red River and its tributaries provide trophy catfish and a variety of other excellent fishing opportunities. Pick up some fishing tips and river stories from Red River fishing guide and retired NDSU Natural Resource Economics professor **Jay Leitch**. (Dowell H 206, limit 25/session)

Reading the River~What story might the layers of a river bluff tell you? Learn what to look for along a river, what might be affecting water quality, and how to document field conditions. **Girish Uprety**- NDSU Geosciences (Dowell H 207, limit 25/session)

Meteorological Mayhem—what is nOrMaL?~OK, how cold was our winter? Learn from long-term records how climate patterns are trending and how new technologies blended with good old fashion citizen reports contribute to more accurate forecasting. **Peter Rogers-**National Weather Service (Dowell 212, limit 25/session)

Watershed Science goes MOBILE~ Smartphones, mobile tablets and iPads are increasingly being used in the field to collect and share experiences. Explore apps. that can be used to enhance your watershed explorations. **Andy Ulven-** International Water Institute. (Dowell H 220, limit 20/session)

Aquatic Invasive Species~Why should we care about a few invasive species? Zebra mussels clean up water bodies by eating algae—a good thing, right? Not so fast—learn what's invading our waters, why it's important, and how citizens can help. **Moriya Rufer,** RMB Environmental Labs (Dowell H 225, limit 25/session)

Nongame Wildlife ~Our river corridors often provide some of the best remaining habitat for wildlife. Find out what citizen scientists might find that can contribute to inventories of plant and animal species that interact with our rivers. **Christine Herwig-**MN DNR-Bemidji (Dowell 308, limit 25/session)