

1.01 PROJECT PROPOSAL SUMMARY SHEET

PROJECT TITLE: Red River Basin River Watch and River of Dreams

NAME, ADDRESS, PHONE AND E-MAIL OF LEAD PROJECT SPONSOR/SUBGRANTEE:

International Water Institute
1120 28th Ave. N. Suite B
Fargo, ND 58102

STATE CONTACT PERSON: Charles Fritz

TITLE: Director

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STATE: North Dakota

WATERSHED: Red River Basin

HYDROLOGIC UNIT CODE: 0902 **HIGH PRIORITY WATERSHED (yes/no):** No

PROJECT TYPES

STAFFING & SUPPORT
 WATERSHED
 GROUNDWATER
 I&E

WATERBODY TYPES

GROUNDWATER
 LAKES/RESERVOIRS
 RIVERS
 STREAMS
 WETLANDS
 OTHER

NPS CATEGORY

AGRICULTURE
 URBAN RUNOFF
 SILVICULTURE
 CONSTRUCTION
 RESOURCE EXTRACTION
 STOWAGE/LAND DISPOSAL
 HYDRO MODIFICATION
 OTHER

SUMMARIZATION OF MAJOR GOALS:

Continue to provide watershed education opportunities to the five high schools and sixteen elementary schools currently involved with the Red River Basin River Watch (RW) and River of Dreams (ROD) programs. Expand RW to include eight more high schools with the goal to have at least one high school and one elementary school participating in each water resource district within the Red River Basin.

PROJECT DESCRIPTION: The RW program provides watershed education opportunities for local high school students through hands-on science, water quality monitoring, and river recreation activities designed to challenge students and facilitate understanding and appreciation of water resources. ROD is a complimentary program that engages elementary students to explore the connectivity of our planet's water supply and how watershed's function.

FY 2020 319 funds requested \$178,800 Match \$119,200

Other Federal Funds \$0 Project FTE: 1.00

Length of proposal: 2 years from July 1, 2020 to June 30, 2022.

Total project cost \$298,000

2.0 STATEMENT OF NEED

2.1 The North Dakota Department of Environmental Quality (NDDEQ) has identified the need to deliver a balance of information and education throughout North Dakota as a critical component of the Non-Point Source (NPS) Pollution Management Program. NPS pollution can affect the state's water resources and it is important for citizens to understand NPS causes and effects; including how the NPS pollution is affected by a variety of water issues ranging from flooding, farming practices, drought, and wetland drainage.

Students today are increasingly disconnected from the natural environment. The IWI's RW and ROD projects will engage students in hands-on education programs to better understand how humans interact and affect valuable river resources of the Red River Basin through integrated classroom and outdoor experiences that:

- build awareness of river ecosystems and watershed connections
- increase student capacity to make informed decisions about their environment
- instill a sense of place highlighting the historic, economic, and ecological uniqueness of their local watershed

2.2 RW and ROD increase knowledge, understanding and appreciation of water resources through education of non-point source pollution, water quality issues, connectivity of our planet's water supply, and how watersheds function. RW and ROD target elementary through high school aged students and teachers (specifically 4th – 12th grade). The majority of teachers have little or no training in NPS pollution causes and effects. Teachers are more likely to teach subjects they are familiar with and understand themselves. RW and ROD will increase teacher awareness and understanding leading to more classroom activities on water issues.

3.0 PROJECT DESCRIPTION

3.1 The IWI will engage high school and elementary students within North Dakota Red River Basin school districts in hands-on education programs focused on river resources within their local watershed. IWI will 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.

3.2 Objectives/Measureable outcomes:

Obj. 1. **River Watch:** Increase awareness and knowledge of local land use and watershed connections through water quality monitoring, biological monitoring, watershed exploration and STEM activities. Engage thirteen RW teams (260 students) to explore streams and other aquatic environments in the Red River Basin, documenting local watershed conditions.

Water Quality and Biological Monitoring: Stream Sampling and Macroinvertebrates.

- Water Quality – RW Students and Team Leaders will be trained to use field sampling equipment (e.g. sonde, Van Dorn sampler and Secchi tube). RW teams monitor local rivers and streams. Parameters measured typically include stage, appearance, recreational suitability, stream condition/habitat assessment, transparency, water temperature, dissolved oxygen, pH, and conductivity. Frequency: Two times annually. Ongoing completed May 2022. Estimated cost \$53,471.

- Macroinvertebrate Collection – River Watch students will sample macroinvertebrate communities and learn about the relationship between water quality and biological communities. Teams will monitor biological communities in their own watershed when conditions allow, however; if local conditions are not adequate River Watch teams will be encouraged to visit Prairie Waters Education and Research Center. One time during the project completed November 2021. Estimated cost \$24,800.
- Review water quality data collected with RW teams and teachers. Provide insight into conditions at the monitoring sites. Once annually completed May 2022. Estimated cost \$4,000.

Red River Explorers Paddling Program: Lead guided river ecology excursions (13 trips) from July 2020 through June 2022 on various reaches of rivers in the Red River Basin.

- 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 June 2022. Estimated cost \$4,165.
- Thirteen guided river ecology excursions in the Red River Basin, all utilizing GPS and mapping/photo documentation of baseline geomorphology and recreation conditions. Completed June 2022. Estimated cost \$26,790.
- 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, land use, and recreation suitability. Completed June 2022. Estimated cost \$5,200.
- Final Report to include areas explored, number of participants and links to trip reports Completed June 2022. Estimated cost \$1,300.

Obj. 2. **STEM assistance:** Assist in provision of Science, Technology, Engineering and Math (STEM) education and engagement opportunities through watershed science.

Host regional fall kick-off events for RW teachers and youth leaders. Events will incorporate team building skills, local watershed project presentations and data interpretation.

- 2-3 regional fall kick-off events/training sessions in each year 2020 and 2021. Completed November 2021. Estimated cost \$24,885.
- Summary report will be provided each year to document participants at regional kick-off events and topics covered. Information will be included in the Final Report due June 2022. Estimated cost \$400.

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 each year 2021 and 2022 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 2022. Estimated cost \$41,700.

- Summary report written to document participating RW teams/schools and highlighting awards and watersheds represented in research, with links to materials. To be completed by June 30th of each year and included in the October annual report. Estimated cost \$600.

Obj. 3. **River of Dreams:** Engage elementary students in a hands-on education program that incorporates a number of core education topics including math, science and geography (1,200 students).

Engage an entire grade level of students by partnering with teachers to bring experiential watershed education into their classrooms and then into their watershed.

- School contacts. Solicit classrooms to be involved. Identify lead teacher and determine the number of students to be involved. Ongoing completed September 2021. Estimated cost \$2,500.
- Resources acquired to deliver ROD to local elementary students and teachers. Ongoing completed April 2022. Estimated cost \$27,200.
- Prepare materials (e.g. virtual geography tour with worksheet) and canoes for ROD activities. Ongoing completed April 2022. Estimated cost \$11,000.
- School classrooms sessions. Hold classrooms sessions to present materials and explore program expectations. Completed April 2021 (30 classrooms) and April 2022 (30 classrooms). Estimated cost \$19,650.
- Field sessions with ROD participants. Release of individual ROD canoes and review of watershed lessons learned by students. Completed June 2021 (30 sessions) and June 2022 (30 sessions). Estimated cost \$19,650.
- Evaluation of ROD activities using pre/post surveys of students. Completed December 2021. Results will be reported as part of Final Report due June 2022. Estimated cost \$3,000.

Obj. 4. **Evaluation/Reporting:** Project Evaluation, Management and Reporting. Cost \$24,130.

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

- Grant-related expenditures tracked, bills paid and expense reimbursements submitted at least quarterly.
- Provide quarterly progress reports along with reimbursement requests.

Track objectives and tasks to ensure outcomes are being met. Prepare and complete reports and results from the Red River Basin River Watch and River of Dreams program.

- Annual report to the NDDEQ and RRJWRD will be submitted by October 1, 2020 and 2021.
- Complete final report and submit by June 30, 2022.

3.3 The milestone table below shows the timeline for the different tasks previously described. All objectives and tasks are the responsibility of the IWI.

TASK/RESPONSIBLE ORGANIZATIONS	OUTPUT	Q T Y	SFY21	SFY22
OBJECTIVE 1 - River Watch				
Task 1 - Water Quality and Biological Monitoring	Sampler training, sample collection.	0.20 FTE 13 RW teams involved.		
Task 2 - Red River Explorers	River ecology excursions and trip reports.	0.20 FTE 13 river trips.		
OBJECTIVE 2 - STEM Assistance				
Task 1 - Fall Kick Off Events	Watershed education and training.	0.10 FTE 260 students		
Task 2 - River Watch Forum	Watershed education and training.	0.12 FTE 260 students		
OBJECTIVE 3 - River of Dreams				
Task 1 - School classroom and field sessions.	Deliver and present program materials.	0.25 FTE 1,200 students		
OBJECTIVE 4 - Eval and Report				
Task 1 - Track and pay bills, submit expenses.	Quarterly progress reports and reimbursements.	0.06 FTE		
Task 2 - Prepare and complete reports.	Interim and final reports.	0.06 FTE		

4.0 COORDINATION PLAN

4.1 The IWI will be the sponsoring organization with local cost share (\$119,200) provided by North Dakota Red River Joint Water Resources District (RRJWRD). The IWI Education and Monitoring Director will be responsible for project management with the IWI Project Specialist leading coordination and delivery of RW and ROD education activities. IWI will supply all education materials, presentation equipment, and the website for this project. The IWI has a strong longstanding record of working with other entities in delivering watershed education within Minnesota and North Dakota and has worked closely with the Prairie Waters Education and Research Center (PWERC) to help them develop River Watch activities and has received training from their staff to continue the development of our River Watch program (e.g. biological monitoring).

For this project, schools will be encouraged to use the PWERC for their macroinvertebrate collection activities when local conditions are not adequate. IWI and PWERC will coordinate on future education and training opportunities and staff will assist each other when and where appropriate. Since 2013, the IWI has worked with the RRJWRD, NRCS and the State Water Commission (SWC) to deliver watershed education programs within the Red River Basin, River Watch at 5 high schools and ROD at 16 schools.

As part of our ongoing coordination and internal assessment process, the IWI Board of Directors oversees the Institute, ensures it is run properly, and involves representative groups in the activities of the Institute. Below is a list board members and their agency or institution affiliation.

Officers		
George B. Sinner (Chair) Cornerstone Bank 2280 45th St S # A Fargo, ND 58104 Tel: 701.364.9630	Mike El (Vice Chair) ND Department of Health (Ret.) 918 East Divide Avenue Bismarck, ND 58501-1947 Tel: 701.328.5214	Dr. Jay Leitch (Treasurer/Secretary) Natural Resources Management Dept. Chair (Ret) ND State University Fargo, ND Tel: 701.522.2166
Board Members		
Genevieve Thompson At Large 650 NP Avenue, Suite #110 Fargo, ND 58105 Tel: 701.388.0861	Josh Irhy Red River Joint Water Resource Board P.O Box 10 Hillsboro, ND 58045 Tel: 701.786.2016	Kenneth Vein Altru Health System 1200 South Columbia Road Grand Forks, ND 58206 Tel: 701.780.5748
Dan Wilkins At Large PO Box 584 Fertile, MN 56540 Tel: 218.945.3204		Pat Fridgen ND State Water Commission 900 East Blvd. Bismarck, ND 58505-0850 Tel: 701.328.4964
Dr. Gerry VanAmburg Concordia College (Ret.) Buffalo- Red River Watershed/MN BWSR Moorhead, MN Tel: 218.790.2502	Robert Laidler Director Emeritus Oak Hammock Marsh Winnipeg, MB Tel: 204.952.4856	Dr. Ryan Yonk Undergraduate Program Director ND State University Fargo, ND Tel: 701.231.5374
Phil Murphy ND Soybean Growers 650 NP Avenue, Suite #110 Fargo, ND 58105 Tel: 701.388.0861	John Finney Red River Watershed Management Board 9 4th Ave. East Ada, MN Tel: 218.784.9502	Paul Swenson MN Department of Natural Resources (Ret.) 2115 Birchmont Brach Road NE Bemidji, MN 56601 Tel: 218.755.3623

4.2 RW and ROD have support of governmental, educational and citizen groups. The ND State Water Commission and RRJWRD provided the IWI with a grant to deliver RW in 2018 and in 2019. The NDDEQ with a match from the RRJWRD also provided NPS funds for ROD activities in 2019. Through this grant we will continue to engage students to teach them about NPS pollution, watershed functions and our water supply.

4.3 The IWI has a history of delivering watershed education using outdoor learning activities that have been supported by 319 funds. As stated earlier, we have worked with the Prairie Waters Education and Research Center to help in the development of their River Watch program and to receive training from their staff on macroinvertebrate collection and identification.

4.4 The RW and ROD programs provide participants with watershed education that incorporates STEM activities for high school students and geography, culture, art and music for elementary students. RW and ROD activities enable participating students to have a better understanding of how watersheds function and their importance to societal well-being.

RW is a holistic approach covering many aspects of watershed education. Students and teachers learn about watershed function and process through hands-on activities including water quality monitoring, biological monitoring and river exploration. RW participants also receive training during scheduled events throughout the year and complete a yearly assignment as a team for presentation at the annual forum.

ROD students gain an understanding of watersheds and how they function through activities tailored to their local watershed. In coordination with the classroom instruction, IWI staff assist in the implementation and launching of 14” canoes provided to the classrooms. As a canoe is located and documented on the ROD mobile application, a student may better understand the actual physical

movement of water resources within tributaries and throughout the Red River Basin through real-time interaction. Prairie Waters Education and Research Center has a different 319 NPS pollution funded program in North Dakota that brings students to their center for instruction. This project delivers RW and ROD to local schools with activities performed within and tailored to each schools watershed. Therefore, there is no duplication or replication of 319 NPS pollution funding.

5.0 EVALUATION AND MONITORING PLAN

5.1 The IWI will analyze the student participation through quantitative data including numbers of students participated, monitoring completed, explorer miles logged and canoes launched. Qualitative data will be gathered from assessment worksheets, forum assignments completed by the students and through instructor observation. Teacher evaluations of implementation problems as well as pre/post surveys of students will be utilized to gauge understanding and comprehension of key concepts and principles. These data will be collected, reviewed, and discussed by IWI Staff. A compilation of these data will be presented to major funding sources and the Board of Directors. The Director will receive feedback from these entities and implement any needed changes.

6.0 BUDGET

6.1 The funds for this project will be used for a 24 month period. Funding will start July 1, 2020 and continue through to June 30, 2022.

Budget Table for Red River Basin River Watch and River of Dreams

Part 1 – Funding sources

	SFY 21	SFY 22	Total
FY2020 Section 319 Funds	\$89,400	\$89,400	\$178,800
State and Local match:			
1) ND Joint Water Resources District	\$59,600	\$59,600	\$119,200
			\$298,000

Budget Table for Red River Basin River Watch and River of Dreams

Part 2 – Funding Budget - The funds for this project will be used for funding 24 months.

Project Objectives and Tasks	SFY21-22	Total Costs	Cash Match	319
				funds
OBJECTIVE 1 - River Watch; Monitoring and Explorers				
Salary/Fringe	\$82,844	\$82,844	\$33,138	\$49,706
Sub-Teacher	\$16,500	\$16,500	\$6,600	\$9,900
Mileage	\$13,741	\$13,741	\$740	\$13,001
Meeting Expense	\$2,000	\$2,000	\$2,000	\$0
Supplies	\$5,200	\$5,200	\$2,080	\$3,120
Subtotals	\$120,285	\$120,285	\$44,558	\$75,727
Objective 2 - STEM Assistance; Fall Kick Offs and Annual Forum				
Salary/Fringe	\$46,535	\$46,535	\$18,614	\$27,921
Sub-Teacher	\$3,900	\$3,900	\$1,560	\$2,340
Mileage	\$4,250	\$4,250	\$0	\$4,250
Meeting Expense	\$9,000	\$9,000	\$9,000	\$0
Supplies	\$3,900	\$3,900	\$1,560	\$2,340
Subtotals	\$67,585	\$67,585	\$30,734	\$36,851
Objective 3: River of Dreams; Classroom and Field Activities				
Salary/Fringe	\$52,100	\$52,100	\$20,840	\$31,260
Sub-Teacher	\$0	\$0	\$0	\$0
Mileage	\$7,300	\$7,300	\$2,776	\$4,524
Meeting Expense	\$0	\$0	\$0	\$0
Supplies	\$26,600	\$26,600	\$10,640	\$15,960
Subtotals	\$86,000	\$86,000	\$34,256	\$51,744
Objective 4 - Evaluation and Reporting; Reimbursements and Reports				
Salary/Fringe	\$24,130	\$24,130	\$9,652	\$14,478
Subtotals	\$24,130	\$24,130	\$9,652	\$14,478
TOTALS	\$298,000	\$298,000	\$119,200	\$178,800