9.0 ADDITIONAL ACTIVITIES IN THE RED RIVER BASIN

As outlined in Appendix A -International Red River Board Directive, the duties of the Board include maintaining an awareness of other agencies in the basin, of developments and conditions that may effect water levels and flows, water quality and ecosystem health of the Red River and its transboundary tributaries, and activities that contribute to a better understanding of the aquatic ecosystems. Chapter 9 provides an overview of a number of relevant activities and developments in the basin.

9.01 Garrison Diversion Project

Dakota Water Resources Act

The Dakota Water Resources Act (DWRA) of December 2000 amended authorizing legislation for the Garrison Diversion Project. The legislation outlines a program to meet Indian and non-Indian water supply needs in North Dakota and authorizes water uses including municipal, rural and industrial (MR&I), fish and wildlife, recreation, irrigation, flood control, stream flow augmentation, and ground water recharge.

Red River Valley Water Supply Project

Authorized in the DWRA, the purpose of the Red River Valley Water Supply Project is to identify the comprehensive water quantity and quality needs of the Red River Valley in North Dakota and options for meeting those needs.

As required in DWRA, the Bureau of Reclamation(Reclamation) is preparing a feasibility-level engineering report, the *Report on Red River Valley Water Needs and Options* (Needs and Options Report), to address the following categories of need: MR&I water supply; water quality; recreation; aquatic environment; and water conservation measures. The draft Needs and Options report was released for a 120 day public review as required by DWRA in May 2005. The comment period on the draft report closes on October 3, 2005. The final *Report on Red River Valley Water Needs and Options* (Needs and Options Report), will be completed by Reclamation in November 2005.

The DWRA also requires completion of an Environmental Impact Statement (EIS) that evaluates environmental impacts of the alternative ways to meet the water needs of the Red River Valley. As directed by the DWRA, Reclamation and the State of North Dakota are jointly preparing the EIS. The Governor of North Dakota has designated the Garrison Diversion Conservancy District as the state entity responsible for serving as co-lead with Reclamation in the preparation of the EIS.

Three groups of alternatives are being studied for inclusion in the EIS: a No Action Alternative, required by the National Environmental Policy Act; in-basin alternatives that propose use of water sources within the Red River Basin including Lake of the Woods; and import alternatives that propose moving water from the Missouri River to the Red River Valley. The State of North Dakota plans to identify a state-preferred alternative in the draft EIS; however, final selection of the preferred alternative will be made by the Secretary of the Interior in consultation with the State of North Dakota in coordination with local affected communities, as required by the DWRA. A draft EIS is scheduled for release for public review in December 2005.

Progress reports on Reclamation's Needs and Options Report are available via the Needs and Options Newsletter, and progress on the jointly prepared EIS appears on the EIS website (www.rrvwsp.com) and in the EIS newsletter.

Northwest Area Water Supply Project

The MR&I component of the Garrison Diversion Project also includes the Northwest Area Water Supply Project (NAWS). The NAWS Project, now under construction, will carry pre-treated water from Lake Sakakawea to the city of Minot where it will be fully treated to drinking water standards and distributed to surrounding communities and rural areas in the Souris River basin. Potential international issues related to NAWS are the responsibility of the International Souris River Board. However, the IRRB will continue to be interested in activities associated with the NAWS project because the project is an interbasin water transfer from the Missouri River basin to the Hudson Bay basin.

9.02 Devils Lake Sub-Basin

The level of Devils Lake reached a recorded high of about 1449.2 ft msl on August 3, 2005. The elevation on October 1, 2005, was about 1448.1 ft msl. At its peak, the area of the lake was 140,199 acres, with a volume of 2.72 million acre-feet. Stump Lake was at an elevation of about 1431.7 ft msl on August 3, 2005. Stump Lake rose a total of about 8.7 ft since January 23, 2005, and as of October 1, 2005, had reached about 1433.7 ft msl. At this level Stump Lake covers approximately 11,019 acres, with a volume of 325,164 acre-feet.

The slow decline (after August 03, 2005) in the elevation of Devils Lake continued due to evaporation and flows to Stump Lake. At its peak in August, the lake was about 1ft higher than in the spring with the October level approximately 0.2 ft higher than the spring levels.

Stump Lake has risen about 10.6 ft since September 2004, and about 8.0 feet since the spring of 2005. Flows from Devils Lake remain elevated with fall flows around 250 ft^3/s versus the maximum of about 380 ft^3/s during the summer. Approximately 100,000 ac-ft of water have registered flowing past the USGS gage from Devils Lake to Stump Lake since the beginning of the year.

State Outlet Project

The Devils Lake Emergency Outlet has begun operations. The pumps were tested on August 5 and 6, 2005 with a small amount of water being discharged into the Sheyenne River. Operation of the outlet within the guidelines of the water quality discharge permit began on August 15, 2005. Due to discharge permit conditions and performance, the pumps operated over a span of about 10 days discharging a total of about 38.5 acre-ft into the Sheyenne River.

Operation was halted when permitted sulphate levels in the Sheyenne River were reached. The permit allows sulphate concentrations of up to 300 mg/L. Given the dilution capacity of the Red River and the small volume of diverted flow, the increase in sulphate levels is not considered to have caused harm to the Canadian waterways or to violate IJC water quality objectives at the international boundary. The permit allows the outlet structure to operate May through November contingent upon flow and quality constraints.

Last minute negotiations involving diplomatic levels, federal, state and provincial authorities and The White House Council on Environmental Quality (CEQ) resulted in the installation of a rock filter to act as a barrier against transfer of fish and some plants to the Red River system. The barrier does not protect against viruses and other foreign organisms smaller than about two millimeters in diameter that may exist in Devils Lake. The negotiations also resulted in a 4-day sampling project involving scientists from Minnesota, North Dakota, Manitoba, and Canadian and U.S. federal agencies. The purpose was to provide additional information regarding the presence of targeted aquatic biota and fish pathogens and

parasites of concern in Devils Lake. Reports documenting the survey results are expected to be released in November 2005.

Through the CEQ negotiating process, a multilateral agreement-in-principle/statement was drafted in August 2005 which addresses additional mitigative filtration measures and post-diversion monitoring. This agreement/statement has not been ratified, however, it could potentially assign oversight responsibility for post-diversion monitoring to the IJC and its International Red River Board (IRRB).

Tolna Coulee

The issue of clean-out, or lowering of the present Stump Lake outlet channel (Tolna Coulee) was raised at the July 2005 IRRB annual meeting. The clean-out, presently being investigated by the Devils Lake Basin Joint Water Resource Board, would lower the natural Stump Lake outlet below its present elevation of about 1459 ft msl, allowing outflow to occur and hence, eliminate or reduce further rises in Stump Lake and flooding of the surrounding area. This investigation is not yet complete.

Roads Acting As Dams

The U.S. Army Corps of Engineers(USACE) has committed to working with the State of North Dakota to determine a solution for the roads acting as dams. Data necessary for evaluating the existing roads and to identify the risk of road failure were gathered during the winter and spring of 2005 (phase 1). The analysis of the existing roads began in September 2005 (phase 2).

As part of the FY06 Transportation Bill, the language makes the Federal Highways (FHWA) responsible for addressing this problem. The 2006 Transportation Bill authorizes FHWA to pursue implementation of a solution that accommodates both surface transportation and acts as a water barrier. The USACE will participate on a technical coordination task group to develop a design that will implement the recommendations of the Devils Lake Surface Transportation Task Force.

9.03 U. S. Geological Survey (USGS) Water Resource Investigations and Activities

Supporting Project for the Bureau of Reclamation's Red River Valley Water Supply Project

DWRA authorized Reclamation, to conduct a comprehensive study of the future water-quantity and quality needs of the Red River of the North Basin in North Dakota and Minnesota. In support of the Reclamation's Red River Valley Water Supply Project, the USGS is conducting several projects to provide information that Reclamation needs to evaluate water delivery options. Reservoir evaporation estimates were modified based on methods used to estimate evaporation at Williams Lake, Minnesota and Cottonwood Lake, North Dakota. Also, water-use data have been collected from various agencies and reviewed and used to provide better estimates of withdrawals and return flows. Reservoir evaporation estimates and withdrawals and return flows have been used to improve and update an unregulated flow data base for selected locations in the Red River of the North Basin. Ground-water data are being compiled on selected surficial aquifers in or near the Red River of the North Basin in Minnesota. The potential effects of ground-water development on lakes, streams, and wetlands that are hydraulically connected to the aquifers will also be evaluated. The quality of water during various flow regimes and seasons, particularly during low flows are being determined. The existing water quality limits or effect on specific uses of surface water will be described.

Reports that have been published are:

- *Regression equations for estimating concentrations of selected water-quality constituents for selected gaging stations in the Red River of the North Basin, North Dakota, Minnesota, and South Dakota* (U.S. Geological Survey Scientific Investigations Report 03-4291).
- *Estimation of monthly evaporation form Lake Ashtabula in North Dakota, Orwell Lake in Minnesota, and Lake Traverse in Minnesota and South Dakota, 1931-2001* (U.S. Geological Survey Water-Resources Investigations Report 03-4282).
- *River gain and loss studies for the Red River of the North Basin, North Dakota and Minnesota* (U.S. Geological Survey Open-File Report 2004-1076).
- *Water-use data for the Red River of the North Basin, North Dakota, Minnesota, and South Dakota, 1979-2001* (U.S. Geological Survey Open-File Report 2004-130).
- *Historic and naturalized monthly streamflow for selected sites in the Red River of the North Basin, North Dakota, Minnesota, and South Dakota, 1931-2001* (U.S. Geological Survey Scientific Investigations Report 2005-5092).
- *Water quality of streams in the Red River of the North Basin, Minnesota, North Dakota, and South Dakota, 1970-2001* (U.S. Geological Survey Scientific Investigations Report 2005-5095).

Hydrologic Changes from Wetland and Prairie Restoration at Glacial Ridge, Polk and Red Lake Counties, Minnesota

This USGS study is investigating the surficial hydrology of an area of drained wetlands and linear prairies on the eastern edge of Glacial Lake Agassiz. The study will produce a set of background data of surface- and ground-water flow and quality in an area about to undergo major wetland and prairie restorations. This data set can be used in the future to attribute hydrologic changes to this land-use change. The study is also beginning to quantify the short-term hydrologic variability of the area to help separate land use hydrologic changes from other sources of hydrologic change

Real-time water quality monitoring station

A continuous real-time water-quality monitoring station and monitor with probes to measure specific conductance, water temperature, pH, dissolved oxygen, and turbidity was installed in March 2003 at the USGS gaging station Red River at Fargo. An Acoustic Doppler Velocity Meter was added in 2004. Water-quality samples will be used along with continuously-recorded data to develop statistical regression relations between properties of water that can be measured continuously in real time and chemical constituents of concern, such as total nitrogen, and sediment.

9.04 U.S. Army Corps of Engineers Flood Control Activities

The existing levee system protecting the city of Devils Lake is about 7.2 miles in length with a top elevation of 1457 ft above mean sea level to provide protection from a lake elevation of 1451ft. Devils Lake reached its highest recorded level of about 1449.18 ft in August 2005. The project includes five pumping stations for interior drainage. The USACE awarded a construction contract to raise the top of levee to elevation 1460 ft in August 2004. Construction is expected to be completed the fall of 2005 and will raise the existing level of protection 3 feet to elevation 1454. The design includes new levee sections in low-lying areas and the extension of the existing levees to high ground. The initial levees were constructed in the 1980's to an elevation of 1445 ft msl. Costs of the 3-foot levee raise are estimated at $8 million, bringing the total project costs to approximately $50.5 million.

The flood control project for the Cities of Grand Forks, North Dakota and East Grand Forks, Minnesota, is located at the confluence of the Red River of the North and the Red Lake River. The project consists of levees and floodwall set back from the river, forming rings around the two communities. The project also includes: stabilization of an existing dam, removal of a former railroad bridge, construction of interior flood control features, pump stations, numerous road and railroad closures, extension and expansion of an existing diversion channel, and construction of a new diversion channel with associated structural features. The design level of protection is equivalent to the peak discharge experienced during the 1997 flood. Construction is completed on a majority of the project. The last two phases (Grand Forks Phase 4 and East Grand Forks Phase 4) have just been awarded. Construction began during summer of 2000 and completion is expected prior to spring of 2007, the 10-year anniversary of the 1997 flood. The final project cost is estimated to be $407 million.

Flood protection project for Crookston, Minnesota, located on the Red Lake River, 52 miles upstream from its confluence with the Red River of the North, consists of two downstream high-flow cutoff channels and levees built to the 100-year level of protection for the Thorndale, Woods and downtown/Riverside neighborhoods. The project is substantially complete.

Flood protection projects for Wahpeton, North Dakota and Breckenridge, Minnesota, located at the confluence of the Bois de Sioux and Ottertail Rivers and the beginning of the Red River of the North, are treated as two separate, but dependent projects. The Breckenridge Project consists of a high-flow diversion channel located to the north of the Ottertail River and entering into the Red River and two separable permanent levee reaches that would protect all of Breckenridge. Congress authorized the Breckenridge project consistent with the plans identified in the Feasibility Report and appropriated construction funding in 2001. Construction of the diversion was completed in the fall of 2004. Construction of the levees is subject to availability of funds. The Wahpeton Project, authorized under Section 205 of the Continuing Authorities Program, consists of a permanent levee system and flood easements. Construction of the Wahpeton project began in 2003. The levees portion of the Wahpeton and Breckenridge projects must be initiated together to avoid adverse impact to the community on the other side of the river.

Studies:

Upstream of Fargo-Moorhead

A feasibility study has been completed for a flood protection project for Ridgewood Addition, Fargo, North Dakota. The study report was prepared under the Section 205 Continuing Authority and is under review by USACE authorities. The project will provide protection to the portion of Fargo between 15th Avenue North and 22nd Avenue North and the Department of Veterans Affairs hospital.

A feasibility study of the Red River of the North watershed above Fargo-Moorhead (Fargo-Moorhead and Upstream) was initiated with the signing of a Feasibility Cost Sharing Agreement in August 2004. The study is looking for opportunities to reduce flood damages and restore aquatic ecosystems in the watershed. Phase 1 of the study, completed in June 2005, concluded that a system of impoundments could reduce the 1 percent chance flood stage in Fargo-Moorhead by up to 1.6 feet. Phase 2 will include more detailed investigations to look at environmental benefits and site-specific economic benefits.

Wild Rice River Basin

A feasibility study of the Wild Rice River watershed is underway that is based largely on the Wild Rice River Watershed District's watershed management plan update. Types of measures that will be investigated under this study are gated diversion, setback levees along the Wild Rice River, restoration of the Wild Rice River, and off-channel storage. Phase 1 of the $2.8 million study was completed in July 2005. Phase 1 is a preliminary assessment of measures to determine their potential for Federal partnership. Phase 2 will be a more rigorous analysis of measures that survive Phase 1. A public meeting was scheduled for September 8, 2005, after which the Wild Rice River Watershed District gave their consent to proceed to Phase 2. Phase 2 of the study will begin in October 2005, pending Federal funding.

Flood protection project for Ada, Minnesota, located in the Marsh River watershed, which is tributary of the Red River of the North. Ada is subject to flooding from the Wild Rice River, which can break out of its banks and flow into the Marsh River. Although initially found not justified under study through the Section 205 Continuing Authority, two record-breaking flood events occurred in June 2002, and the existing levees protecting the city were found to be deficient, which drove the benefit-cost ratio over 2.0. A new feasibility cost share agreement will be signed between the USACE and the city of Ada. The project will be continued under the Section 205 authority subject to availability of funds.

A flood protection study began in 2005 at Borup, Minnesota on the South Branch of the Wild Rice River in Norman County, Minnesota. The initial study phase will determine if there is a Federal interest with benefits in excess of the cost of the project. A Federal-interest report is scheduled for completion in 2006.

A flood protection study began in 2005 for Marsh Creek in Mahnomen County, Minnesota. The initial study phase will determine if there is a Federal interest with benefits in excess of the cost of the project. A Federal interest report is scheduled for completion in 2006.

Roseau River Basin

A feasibility study is underway for Roseau, Minnesota, located on the Roseau River, a tributary to the Red River of the North. The study has been completed, and the draft report was submitted to USACE authorities for review in September 2005. The recommended plan is the 150-foot East Diversion Plan with associated recreational features. This plan has an estimated cost of over $26 million and a benefit cost ratio of over 3:1.

Hay Creek Project, located in the Roseau River watershed, 5 miles northeast of Roseau, Minnesota is a multipurpose project that will improve the wildlife habitat and reduce flood damages by restoring more natural hydrologic and hydraulic behavior. Features include replacement of a six-mile ditch with a 500-foot stream corridor border by setback levees and 1000 acres of permanent wetland and adjacent buffer zone. Total project cost is approximately $8 million. Construction is dependent on availability of funds.

Other Studies

Flood protection project, Baldhill Dam, North Dakota, located on the Sheyenne River, a tributary of the Red River of the North, consisted of replacing the existing spillway gates, allowing the dam to temporarily store up to 5 feet more (30,000 acre-feet of additional storage) during major floods, acquiring 1,500 acres of flowage easement around Lake Ashtabula and 300 acres for a mitigation area, raising land and buildings at a church camp, and constructing several small levees and placing fill near structures

around the reservoir. All construction is complete on this project and real estate acquisition and monumentation should be completed in 2006.

The city of Crookston, Minnesota requested the USACE initiate a Section 205 study for the Sampson's and Chase/Loring neighborhoods, which are not currently part of the authorized project being constructed. The initial work on the Section 205 study indicated that a project is likely to be economically feasible, but the Federal cost would exceed the amount allowed under that authority. A supplemental 905(b) analysis is under way to support conducting a feasibility study to seek specific authorization for the project.

The Red River Reconnaissance Study (RRRS), approved in October 2002, will continue to be a vehicle for initiating feasibility studies in the basin. The USACE plans to prepare a supplemental 905(b) analysis for the Pembina River Basin in Fiscal Year 2006 if funding allows. A Basin-wide/main stem watershed study was proposed in the original reconnaissance study report, but that study is on hold pending non-Federal sponsorship.

Flood protection project for Minnewaukan, North Dakota, located on the western shore of Devils Lake. The city is not able to cost share a study at this time; they may require emergency flood control assistance if the lake continues to rise.

More detailed information may be obtained from the USACE website: http://www.mvp.usace.army.mil/

9.05 Energy and Environmental Research Center

The Energy and Environmental Research Center (EERC) is a research, development, demonstration, and commercialization facility at the University of North Dakota, recognized internationally for its expertise. The EERC is dedicated to moving promising technologies out of the laboratory and into the marketplace.

The EERC's business partners range in size from large multinational corporations to regional and small local businesses. The EERC's government partners include federal, state and local government entities.

The Waffle Project

A strategy being investigated by the EERC is the feasibility of temporary water storage to augment existing flood control structures and help mitigate springtime flooding throughout the Red River basin. This project, commonly referred to as the Waffle project, is evaluating the technical and economic feasibility of utilizing existing "depressions," such as low-relief fields bounded by raised roads, for temporary water storage during the spring. These preexisting storage areas, supplemented by roads and drainage structures, could act as a network of channels and control structures to slowly release stored water into the Red River and its tributaries after the flood crest passes. The Waffle concept applies a spatial approach that may provide benefits with respect to major floods as well as the less severe but more frequent events.

Progress on the Waffle project to date includes the development of hydrologic models using the Soil and Water Assessment Tool (SWAT) for 27 of the 28 watersheds in the U.S. portion of the Red River Basin. These models are being used to evaluate the effectiveness of Waffle storage on reducing flows in the tributaries of the Red River during major spring flood events. Current results indicate that flow reductions ranging from negligible to as high as 60% may be achieved at the confluences of the tributaries with the

Red River. The next step in the project will be to evaluate the impacts of Waffle storage on water levels at key points along the Red River.

Additional information and updates on the progress of the Waffle Project are available at http://www.eerc.und.nodak.edu/waffle/aboutus.asp

Red River Water Management Consortium (RRWMC)

The RRWMC continues to address stakeholder-specific water-related issues and develop comprehensive water management strategies for its vested stakeholders from a basin-wide perspective. Key elements of recent research for municipal issues has included investigations of source reduction of fat, oil, and grease discharges to publicly owned treatment works (POTW) and developing strategies for reducing the levels of mercury in POTW effluent. Field sites in Grand Forks County have been monitored for nutrients and suspended solids and flow to assess water quality and quantity changes resulting from field tile drainage. Industrial stakeholder issues have ranged from developing water conservation strategies to wastewater pretreatment and odor control. Storm water management, groundwater monitoring, and information dissemination and stakeholder education are examples of other ongoing RRWMC activities.

Other Water-Related Activities Updates:

-A recently completed pilot-scale project demonstrated the successful application of anaerobic treatment of coal gasification wastewater to remove problematic organic constituents, enhance the operation of downstream unit operations and processes, and produce methane, a valuable by-product fuel gas.

-Ongoing activities are investigating enhancements to anaerobic digestion of wastewater treatment sludge to produce methane that, when combined with landfill gas, could, in turn, power a microturbine to produce electricity and offset energy requirements at the POTW.

9.06 International Water Institute

The International Water Institute (formerly Red River Basin Institute) was formed in 2000 following a series of recommendations from the International Flood Mitigation Initiative (IFMI). The Institute is charged with conducting applied research through partnerships with existing research assets in the Red River basin, assisting and monitoring implementation of state-of-the-art flood mitigation projects, and building on the data gathering, mapping, and decision support tools that were developed through the International Joint Commission's Red River Basin Task Force. Guided by a public, private and non-profit Advisory Board, the Institute serves as a collaborative mechanism for Canadian and U.S. governments, the private sector, NGOs and academic and research institutions in the Red River basin to deliver watershed education programs and identify and conduct applied natural resources and flood damage reduction research.

Basin Digital Elevation Model

The International Water Institute (IWI) and the Energy and Environmental Research Center (EERC) are working together to develop a seamless basin-wide digital elevation model. Accessible high resolution topography can provide immeasurable benefits to residents and decision-makers in the Red River basin. Recent adjustments in the project deliverables along with substantial cost reductions for collecting these elevation data using light detecting and ranging (LIDAR) are making undertaking economically feasible.

The project, targeting the entire 39,400 miles^2 of the Red River basin in the US, is expected to be less than $5 million. Project deliverables include:

- Bare earth DEM (1m horizontal RSME and 15cm vertical RSME)
- Data archival and public web-based dissemination of DEM products through the Red River Basin Decision Information Network (www.rrbdin.org)

The IWI and the EERC are currently working out details for an equitable local-federal funding strategy and conducting outreach and information activities to local partners in North Dakota and Minnesota. The basin-wide DEM project has received support letters from the Red River Watershed Management Board and the Cities of Moorhead, MN and Fargo, ND.

Building New Bridges Between Cass County Soil Conservation Districts and High Schools in the Red River Watershed

The future of the River Watch Citizen Monitoring Program (RWCMP) is being realized in Cass County. The RWCMP is a volunteer water quality monitoring program that provides students with .real world. experience while augmenting existing government-sponsored water quality monitoring efforts. The Cass County Soil Conservation District (CCSCD) has agreed to purchase a set of monitoring equipment which includes a YSI Sonde meter, a Hach turbidimeter, and a Van Dorn sampler. The equipment will be housed at the CCSCD office and shared with high school science teachers and students in Cass County that are involved in the RWCMP. Direct interaction of Soil Conservation Districts (SCD) with high school RWCMP will become an integral part of the data collection of watershed projects within ND counties. Not only will SCD.s be able to place schools at specific monitoring sites, they will play a vital role in assisting students in becoming active participants in important projects directly affecting their communities.

River Watch Citizen Monitoring Program Strategic Planning Team

A team of science teachers, watershed managers, and professionals will come together on September 30 and October 14 at the University of Minnesota Crookston campus to participate in a series of strategic planning meetings for the River Watch Citizen Monitoring Program. The RWCMP continues to evolve and adapt to the need for valuable information about the Red River Basin's water resources. The results of these strategic planning meetings will enable the IWI and partners to:

1. Identify and articulate current program needs.
2. Develop short and long-term strategies and next steps to address program needs.
3. Develop curriculum guidelines consistent with state standards.
4. Develop strategies to incorporate watershed education across grade spans.

Red River Basin Decision Information Network (RRBDIN) Flood Forecasting Tool

The IWI will receive $250,000 from the National Weather Service to develop a flood forecasting tool for the Fargo, ND and Moorhead, MN area. The RRBDIN (www.rrbdin.org) will serve as the platform for operation. The Institute is working with the National Weather Service Rivers Forecasting Center in Chanhassen, MN, NDSU Agricultural Communications, and Houston Engineering to develop the concept and establish interactive protocols for transferring forecast data to the RRBDIN.
When completed in 2005, interested parties will be able to generate site specific:

-Flood inundation maps
-Water depth maps
-Graphics describing the time until occurrence of peak flood stage
-Flow condition graphics

Manitoba has already developed the capacity to generate these products interactively through their Red River Valley Flood Protection Site http://geoapp.gov.mb.ca/website/rrvfp/index.html.

The RRBDIN resides on the North Dakota State University (NDSU) server and is hosted by the IWI through the NDSU Agricultural Communication Department (http://www.rrbdin.org/).

Center for Watershed Education and GIS

In October of 2004 the Institute.s Center for Watershed Education received an National Science Foundation (NSF) grant to work with students and teachers to promote surface water quality education in the Red River of the North basin. One objective of the NSF project is to bridge the gap between science and technology education in the classroom and beyond. The GIS (Geographic Information System) component of the project allows for students in the five participating schools (Four Winds, Larimore, and Walhalla in North Dakota, Red Lake and Stephan/Argyle in Minnesota) to learn GIS skills through hands-on activities in their respective watersheds. Students involved in this project will be more marketable in an increasingly competitive job market River Watch Highlighted at International Water Conference.

The River Watch Citizen Monitoring Program

The River Watch Citizen Monitoring Program is a volunteer water quality monitoring program that provides students with real world experience while augmenting existing government-sponsored water quality monitoring efforts. The goal for River Watch is to develop leadership skills of students across the Red River basin. The Program continues to evolve and adapt to the needs for good information about the basin's valuable water resources. Efforts are underway to integrate the program directly into school curriculums, include biological and flow monitoring, become involved in Adopt-A-River community clean-up efforts, and much more.

In October of this year, the Institute's Center for Watershed Education received an award notification of a 3-year $725,000 National Science Foundation (http://www.nsf.gov/) grant. The award enables the Institute to work with five high schools in the basin to develop a comprehensive program and support system for teachers and students working in the area of surface water quality.

2nd Biannual International Water Conference

The IWI held its 2nd International Water Conference on April 6-7, 2005 in Winnipeg, Manitoba. Plenary speakers and concurrent sessions addressed some of the most problematic issues of water management, flood damage reduction/mitigation, and natural resource protection/development confronting policy makers, scientists, educators, and citizens of the Red River basin. This international conference focusing on mutual Canada-United States concerns.

9.07 Rivers West – Red River Corridor Association Inc.

Rivers West is a non-profit organization established to further the untapped opportunities that exist along the Red River. Its mission is to develop the Red River corridor from Emerson to Lake Winnipeg as a destination. The role of Rivers West involves developing recreational, economic and tourism opportunities while staying focussed on conservation and the preservation of historic and cultural resources. Rivers West has taken a unique and integrated approach. Conservation of the natural, cultural and heritage resources, including greenway development, is melded with infrastructure construction such as docks and

pathways and is enhanced through destination promotion and tourism. This macro approach crosses many boundaries – governmental, geographic, organizational and departmental.
Its initial focus was on product development and marketing and short-term actions, including brochures and self directed tours, to introduce visitors to the area along relevant themes such as fur trade, settlers, nature, First Nations, and art and literature. Rivers West also completed an infrastructure and access study focussing on existing facilities and community needs for docks, marinas, boat launches and related infrastructure. This was followed by a plan to address the study findings.

Rivers West sponsored *Operation Clean-Up*, a restoration and conservation program designed to clean-up a 50 km stretch of land along both sides of the Red River, and is working with municipalities to extend this program throughout the Red River valley. With the assistance of Manitoba Conservation, Rivers West has undertaken a mapping project of the river corridor to identify publicly and privately owned land and its conservation and development potential. As a result of this initiative, an agreement is now in place under the provincial Ecological Reserves program to protect a parcel of rare river bottom forest.

Further, in keeping with Manitoba Premier Doer's commitment to an international greenway along the Red – from Lake Traverse to Lake Winnipeg, Rivers West has developed a greenway strategy. Created in cooperation with provincial and federal government partners, the strategy sets out a process to define and implement a greenway over time.

Rivers West is developing an education program focussing on flooding and flood management in the Red River valley. This project focuses on what can be done to mitigate the impacts of flooding – man-made and natural solutions are being explored. The program will be pilot tested in two Manitoba Grade 8 classrooms (one rural and one urban) in early 2005.

In recognition of its historical and cultural significance, Rivers West is working to have the Red River designated as a Canadian heritage river as part of the Canadian Heritage Rivers System. The nomination document will be completed by June 2005 with potential designation by June 2007.

Additional information is available at: http://www.riverswest.ca/

9.08 Greenway on the Red

Greenway on the Red is a multi-state and international effort to establish a 600 mile Greenway (150 miles completed so far) along the Red River in both the US and Canada, and works in conjunction with Rivers West in Canada. Activities include mapping to support Greenway siting, Greenway riparian restoration planning in conjunction with the Red River Basin Research Institute and other project partners, development of program elements for Gateway to the Greenway Audubon Nature Center, dissemination of successful urban Greenway protocols and initiatives among other municipalities, continued compilation of landowner handbook and web-based outputs, hydrologic modeling partnership and coordination with Canadian efforts, continued development of basin wide hydrologic monitoring data for Greenway sites and associated wetlands restoration and protection, and outreach and education.
