

Red River Basin Commission FLOOD DAMAGE REDUCTION UPDATE January 2008

- ◆ MN-Marais River Project 60: The Brandt Impoundment 3,507 ac/ft of gated storage and the Euclid East Impoundment 2,140 ac/ft of gated storage. (RLWD, RRWMB, MN-DNR)
- ◆ MB-Ring Dykes: 12 community and 1,830 homes/businesses ring dykes were constructed after the 1997 flood to 1997 plus two ft level of flood protection. (MB-WS, locals)
- ◆ MB-Roseau River: Watershed plan. (RM's Franklin, Piney, Stuartburn, Montcalm, Roseau First Nation, RRBC).
- ◆ MN-Roseau River: 10 year updated watershed plan. (RWD, RRWMB, BWSR)
- ◆ MN-Breckenridge Diversion Channel: which routes water from the Ottertail River to the Red River downstream of Breckenridge prevented \$20M in damages to the two communities during 2006 flood. Interior drainage improvements for Wahpeton. (Breckenridge, Wahpeton, BSWD, Richland WRD, ND-SWC, MN-DNR, US-COE)
- ◆ Forecasting: U.S. National Weather Service re-modeled the Red River after 1997. (US-NWS, ND-SWC, USGS, MB-WS, MN-DNR, Env Can, US-COE)
- ◆ Winnipeg: Has an interactive GIS based Flood Manual that outlines all flood fighting activities that the City must undertake to fight major floods and has installed permanent flood gate structures on most of their land drainage outfalls. (Floodway Authority, MB, Winnipeg, Fed Gov)



What Next?

There are some areas needing additional work in the near future. These are:

Forecasting:

- ◆ Basin jurisdictional and agency Precipitation Task Force:
 - Enhanced real time rain gage data and snow water equivalent data.
 - Sharing data and uniformity of data.

Mitigation Activities:

- ◆ Fargo Moorhead upstream flood reduction strategies.
- ◆ Pembina River modeling that includes the new LiDAR and culvert inventory data. Local match for federal funds for a Feasibility Study.
- ◆ Flow reduction goals for each tributary that relate to mainstem points.

Recovery:

- ◆ There is a need to have mitigation plans in place before disasters strikes.
- ◆ Local entities need to work better with emergency management.
- ◆ Promotion in the basin of the National Flood Insurance Program.

Through the NRFP, RRBC is working on basin-wide approaches to address these issues. And, things are getting accomplished.

This is the 2nd annual update on flood damage reduction activities around the basin related to forecasting, mitigation, and response and recovery. We do not claim to have covered everything and expect this document to become more complete and comprehensive as we add to it year after year. We apologize for any activities we may have missed and for any other errors. If you identify an area that needs correction, please contact one of the offices.

What Are We Trying to Accomplish?

- ◆ Natural Resource Framework Plan (NRFP) Goal 4: To maintain state of the art flood forecasting tools for the Red River Basin.
- ◆ Goal 5: To reduce the risk of flood damages for people, property and the environment in the mainstem floodplain and in tributary watersheds of the Red River.
- ◆ Goal 6: To ensure that flood response and recovery programs meet the needs of all Red River basin residents.

Why Are We Concerned?

- ◆ Average annual damage estimate: about U.S. \$28 million.
- ◆ Significant social and environmental consequences.
- ◆ 1997: The largest flood of recent years.
- ◆ 2000: A severe rainstorm caused significant spring damage in Fargo, ND; Winnipeg, MB, was threatened with a freeze-up flood later the same year.
- ◆ 2002: Intense summer rains caused damaging floods on the MN Wild Rice River and the Roseau and Pembina trans-boundary Rivers.
- ◆ 2004: In late spring, the southern portion of the ND side of the Red River experienced extremely dry conditions at the same time as severe flooding occurred from Mayville-Portland, ND to the Canadian border.
- ◆ 2005: Record high summer levels were experienced on the Red River.
- ◆ 2006: One of the worst spring floods of recent years occurred, yet a mere two months later, water flows were low and use restrictions were being imposed.
- ◆ 2007: Wet spring and summer conditions and crop losses in parts of basin.



Are We Making Progress? YES: Progress is being seen in three areas as follows:

1. Forecasting:

- Formation of a basin Precipitation Task Force to discuss rain and snow data collection and sharing. (MB-WS, MN-DNR, ND-SWC, US-WS, Env CN, RRBC)
- Many RRB MN Watershed Districts have a stream gage system for recording runoff flows (volume and velocity). This information is used for predicting flood events and for modeling stream flows. (RLWD, TRWD, MSTRWD, BSWD, RRWD, BRRWD, WRWD)
- Many MN Watershed Districts conduct a volunteer snow survey, record the information, and forward it to the National Weather Service to be included in their database and used in their spring flood forecasts. (RLWD, TRWD, BSWD, MSTRWD)

2. Mitigation Activities:

Mainstem:

- Breckenridge/Wahpeton: Construction of levees along the Bois de Sioux and Red River will be initiated in the spring of 2008. (Breckenridge, Wahpeton, BSWD, Richland WRD, ND-SWC, MN-DNR, US-COE)



Red River Basin Commission
119 S. 5th St. • PO Box 66
Moorhead, MN 56561-0066
Ph: 218-291-0422 • Fax: 218-291-0438
staff@redriverbasincommission.org

Red River Basin Commission
206-309 Hargrave Street
Winnipeg, MB R3B 3B2
Ph: 204-982-7250 • Fax: 204-982-7255
admin.redriverbasincommission@shawcable.com

The Red River Basin Commission (RRBC) is a group of people from the Red River Basin working together to achieve common goals for water protection and management.

www.redriverbasincommission.org

- Fargo/Moorhead: Phase II Feasibility Study has federal funding, options for a south side fdr project are under review and comment, F/M are beginning discussions on large scale flood control project, a small fdr project by the Veterans Hospital is substantially complete and adjoining section of levee will be constructed in 2008, and a dike project for Oakport north side of Moorhead is underway. (Fargo, Moorhead, BRWD, SE Cass WRD, US-COE, ND-SWC, HEI, US-HS, MN-DNR, MN-BWSR, many others)
- Grand Forks/East Grand Forks: The GF/EGF diversion channels and levees will be completed in 2008, providing 250-year flood protection. (GF, EGF, US-COE, ND-SWC, MN-DNR)
- Drayton: Initial assessment of the feasibility phase for a Section 205 study for an fdr project for Drayton in 2004 did not identify a project that would be considered cost effective, based on federal guidelines. (Drayton, US-COE)
- Winnipeg: The Manitoba Floodway Authority is more than half complete in its goal of 700 year flood protection with expansion of the Red River Floodway. Over 60% of the channel has been excavated, over 50% of the West Dyke has been raised, 3 bridges are complete and 3 others are underway, and upgrading work on the Inlet Control Structure and the Outlet Structure began in 2007. (Floodway Authority, MB, Winnipeg, Fed Gov)
- Urban Areas in Manitoba: Have all been protected to the 1997 + 2 feet of freeboard level. (MB-WS)
- Mainstem LiDAR: A LiDAR for the MN side of the Red River Mainstem is underway. (MN-DNR, US-COE) and a basin LiDAR is being pursued by the International Water Institute with funding from cities, water boards, states and federal levels.
- Mike 11 Model Development: A seamless model from Lake Traverse to Lake Winnipeg is complete. More specific data is being added to the model. Tributary flow reduction goals will proceed after the new data is added. (MB-WS, ND-SWC, MN-DNR, RRWMB, NDJWRDB, RRBC, JOR, HEI, EERC, IWI, USHS, USGS, Moore Eng, US-COE)
- HEC/RAS Model Development: A model from Lake Traverse to the International Boundary is under development. (US-COE, EERC)



Tributaries:

- Wild Rice River SD/ND: The South Valley Initiative, a group of local leaders, has formed to discuss and work on flooding and related activities and are looking at upstream storage for Fargo/Moorhead. (RRBC) A study is also underway on Antelope Creek (tributary of the Wild Rice River in ND) to develop preliminary design for temporary flood water storage structures.
- Bois de Sioux River: The North Ottawa Project, providing 18,000 ac/ft (16,000 ac/ft gated) retention, is under construction controlling 75 square miles of the 320 square mile Rabbit River Watershed. (BSWD, RRWMB, MN-DNR). The Moonshine Lake Restoration Project is under development, providing 1,670 ac/ft of (1,340 ac/ft gated) retention. (BSWD, USF&W, NAWCA, RRWMB, MN-DNR). The Eldorado #7 Project is also under development, providing 1,670 ac/ft of gated flood storage. (BSWD, RRWMB, MN-DNR).
- Wild Rice River -MN: Phase II Feasibility Study has been initiated; a small fdr project for the City of Ada is under reevaluation. (WRWD, MN-DNR, US-COE, RRWMB). The Upper Felton Storage Project is under development controlling floodwaters from a 30 square mile drainage area by providing 7,140 ac/ft of flood storage (4,670 ac/ft gated). (WRWD, RRWMB, MN-DNR)
- The Two Rivers: The Ross #7 Project is presently under construction providing 4,100 ac/ft of flood storage (3,300 ac/ft gated). (TRWD, RRWMB, MN-DNR)
- Snake River: The Agassiz Valley Water Resource Management Project is scheduled for construction in 2008. This multi-purpose impoundment project will occupy 4 sections of land and provide flood flow reduction from a 33 square mile watershed by storing 11,270 ac/ft of floodwater (7,500ac/ft gated). (MSTRWD, RRWMB, MN-DNR)
- Pembina River: A choke point modeling is underway, funding for USCOE study is available but completion of the



reconnaissance study and initiation of a feasibility study requires identification of cost sharing sponsor, and the Pembina River Basin Advisory Board continues to meet regularly and discuss jurisdictional and watershed issues. (US-COE, ND-SWC, CAN-PRFA, LSI, RRBC, PRBAB, HEI, MB-WS-IJC-IRRB)

- Local Modeling: Modeling in local tributary watersheds in all three jurisdictions using HEC, Mike II, and Surface Water Assessment Tool (SWAT) are also underway as more understanding of watershed and tributary contributions is achieved. (US-COE, EERC, RRBC)
- Roseau River: the Roseau River International Watershed board continues to meet regularly monthly and discuss opportunities (RRIW, RRBC); a Feasibility Study for a fdr project for Roseau has been completed and authorized for construction that includes a diversion channel that will remove most of the city from the 100-year flood plain and includes storage funded by the community to assure there are no downstream flooding impacts. (RWD, RRWMB, MN-DNR, MB-WS, CAN-PFRA, RRBC, RRIW, UMA Eng, JOR Eng, many others). The Palmville Fen Restoration project will restore the natural flood storage capabilities of a degraded rich fen in the upper reaches of the Roseau River thus providing peak flow reductions immediately downstream and to the City of Roseau. (RRWD, RRWMB, MN-DNR)
- Maple River: there are ongoing preliminary engineering studies on a tributary of the Maple River, Elm River, and Goose River to pursue temporary flood water storage.
- Tongue River: the NRCS is designing the renovation of Renwick Dam, located on the Tongue River just upstream of Cavalier. Construction is expected to start in 2008.



Rural:

Rural Ring Dikes/Dykes:

- Manitoba: About 95% of the infrastructure within the Red River Valley is now compliant to the 1997 + 2 foot level. (MB-WS, local)
- Minnesota: Ongoing state (\$125,000/yr) and local funds (equal match) continue to be available; more than 250 ring dikes have been completed; ring dikes average about \$30,000 each, which means about 4 or 5 are being completed each year. (MN-DNR, RRWMB, WD's, local)
- North Dakota: The program to build ring dikes continues; currently there are three farmstead ring dikes in process. There still is some interest for the construction of individual farmstead ring dikes (ND-SWC, WRD's, RRJWRDB, local)



3. Response and Recovery:

The efforts in this area are related to agency specific responsibilities. Emergency management has been working in the basin to develop plans at the county level in the US. (US-HS, OCIPEP, local)

Basin Accomplishments

These projects or activities have been completed:

- ♦ ND-Maple River Dam: A 60,000 ac/ft retention site. (SE Cass WRD, NDJWRDB, ND-SWC)
- ♦ ND-Maple/Sheyenne River: Crossover Modeling. (US-HS)
- ♦ ND-Pembina River: Structural (culvert/crossing) survey. (RRBC-HEI-IJC-IRRB)
- ♦ ND-Pembina River: U.S. federal Reconnaissance Study. (USCOE, PRBAB)
- ♦ ND-Pembina County: Flood Damage Reduction Study (ND-SWC)
- ♦ ND-Pembina County: LiDAR mapping. (CN-PFRA, ND-SWC, RRBC, LSI)
- ♦ Waffle Study: Basin Micro-storage Study. (USDA, EERC)
- ♦ MB-Ice Jam equipment and studies. (MB-WS)
- ♦ Fargo/Moorhead: Phase I Feasibility Study. (USCOE, SE CassWRD, Mrd, ND-SWC, Fargo, BSWD, BRWD, RRBC)
- ♦ MN-Wild Rice River: Phase I Feasibility Study & LiDAR. (USCOE, WRWD, RRWMB, MN-DNR)

