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NEWS & VIEWS

Red River Watershed Management Board

Remembering the 1997 Flood

The following is a description of the 1996-97 floods from a U.S. Geological Survey Scientific Investigations Report published in 2005.

The harsh winter of 1996-97, combined with the 1997 spring floods, caused the worst natural disaster in recent history for North Dakota, eastern South Dakota, and western Minnesota. Above-normal snowfall in central and eastern North Dakota during the winter of 1996-97 and a blizzard on April 5-6, 1997, caused the worst flooding in the Red River of the North and Missouri River Basins in more than 100 years.

The heaviest snowfalls occurred along the main stems of the Red River of the North and the Missouri River and were about 300 percent greater than normal. About 117 inches of snow were recorded in Fargo, 96 inches in Grand Forks, and 101 inches in Bismarck (National Oceanic and Atmospheric Administration, 1996a). Elsewhere in the region, snowfalls were well above seasonal averages. Melting of the snowpack and thawing of ice began in late March on rivers and streams in the southern and western parts of the State. Flows were inhibited by a blizzard that occurred on April 5-6, 1997. The blizzard brought a severe drop in temperatures, winds up to 70 miles per hour, and up to 2 feet of snow with drifts many feet higher in several areas. In southeastern North Dakota, the blizzard was preceded by wind-driven rain and sleet. The wind and ice toppled trees and power lines, leaving thousands of people without power for days. Thousands of people were forced to flee their homes, some permanently, as floodwaters and severe weather caused over $5 billion in damage to the region (National Oceanic and Atmospheric Administration, 1997b).

Downtown Grand Forks, North Dakota, during the Red River of the North flood on April 21, 1997.

The Red River of the North is one of the few rivers in the United States to flow directly north into Canada. The basin flood plain lies in a glacial lakebed and is relatively flat (less than 0.5-foot drop in elevation per mile in the reach downstream from Grand Forks, North Dakota). Because of the flat basin, the shallow river channel, and the northerly flow, the timing of spring thaw and snowmelt can greatly aggravate flooding in the basin. Snow and ice in the headwaters of the Red River of the North begin to melt first, when areas downstream remain largely frozen. The melt pattern can cause ice jams to form, and substantial backwater can occur as flow moves northward toward a still-frozen river channel.

Two peak stages occurred in Wahpeton, which is located in the southern part of the Red River of the North Basin. On April 6, 1997, the stage of the Red River of the North at Wahpeton was 19.42 feet, which is 1.47 feet higher than the record set in 1989. Because of the additional moisture from the April 5-6, 1997, blizzard, a record flow of 12,800 cubic feet per second and corresponding stage of 19.25 feet was recorded 9 days later. On April 17, 1997, the peak stage of the Red River of the North at Fargo, about 96 river miles north of Wahpeton, was 39.57 feet, and the peak flow was 28,000 cubic feet per second. On April 18, 1997, the peak stage at Fargo was 39.72 feet, which exceeded the record set 100 years earlier, and the peak flow was 27,700 cubic feet per second.

High flows continued to move downstream in the Red River of the North.

Continued on Next Page

RRWMB Meeting Highlights

At it's regularly scheduled March meeting, the RRWMB:

- *Received a report from Naomi Erickson, Administrator.*
- *Revised committee membership as follows: Orville Knott to replace Farrell Erickson on the Human Resources Committee; and Robert Wright and Ron Osowski to replace Farrell Erickson and Vernon Johnson on the Transition Team.*
- *Received a report from Dan Thul, Red River Coordinator.*
- *Directed the Technical Advisory Committee (TAC) to review completed projects to identify total land area utilized by the projects.*
- *Discussed the Project Readiness and Compatibility Evaluation to be presented at the March Conference.*
- *Received an update on activities of the Red River Basin Commission from Lance Yohe-Executive Director.*

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Watershed District Developments

ROSEAU RIVER WD

The Roseau River WD reported that Request for Proposals (RFPs) were distributed regarding digitizing current ditch records. The District applied for a Challenge Grant through the Board of Water & Soil Resources (BWSR) to be used for digitizing paper records, maps and benefited areas of each ditch system within their jurisdiction.

TWO RIVERS WD

The Two Rivers WD reported on snow survey and flow monitoring. The District has collected snow depth and water content data at various locations. Based upon this monitoring, moderate flooding is expected in the Two Rivers, however, this could change depending on the rate of melt and future precipitation.

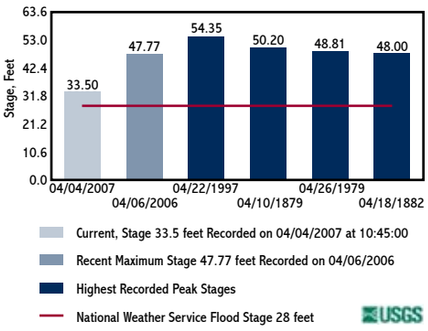
During the runoff event, staff will be monitoring stream flow at over 20 locations. Volunteer staff gage readers have been enlisted to record water levels, and staff will be monitoring and recording stream velocity and volume. This information will be provided to the National Weather Service (NWS), emergency personnel, and other interested parties on a daily basis.

MIDDLE-SNAKE-TAMARAC RIVERS WD

The Middle-Snake-Tamarac Rivers WD reported on the Agassiz Valley Water Resource Management Project (Helgeland Site). The Project Team continues to meet, with one final meeting anticipated. Permitting and finalizing the monitoring plan remain for the project. Construction is anticipated to begin this coming construction season.

On April 18, 1997, the peak stage of the Red River of the North at Grand Forks was 52.04 feet, which is 1.84 feet higher than the record set in 1897, and the peak flow was 137,000 cubic feet per second. The peak flow was unusual because it resulted from the convergence of flows from the Red Lake River in Minnesota, flows from the main channel, and breakout flows from the Red River of the North that were conveyed by old Red River of the North oxbows. Breakout flows occurred upstream from Grand Forks when plugs in the upstream end of the oxbows either were overtopped or washed away, which caused a flow of about 25,000 cubic feet per second to arrive at the confluence of the Red Lake River and the Red River of the North at Grand Forks. The flow of 25,000 cubic feet per second coincided with the peak flow of the two rivers. To compound problems in Grand Forks, a fire on April 19, 1997, demolished several buildings in the flooded city. The flooding made it extremely difficult for firefighters to reach the fires and put them out. Except for emergency personnel, Grand Forks and its sister city, East Grand Forks, Minnesota, were completely evacuated at this time.

Red River of the North at Grand Forks, ND



On April 24, 1997, the peak stage at the Red River of the North at Drayton was 45.55 feet, which is 1.89 feet higher than the record set in 1979, and the peak flow was 124,000 cubic feet per second. At the Pembina River at Neche, the peak stage was 24.51 feet, which is 0.87 foot higher than the record set in 1979, and the flow was 12,800 cubic feet per second. Six days later, the peak flow was 15,100 cubic feet per second, and the stage was 24.20 feet. On April 27, 1997, USGS personnel measured 141,000 cubic feet per second in the Red River of the North at Pembina, which is located about 2 miles upstream from the international boundary with Canada. The previous maximum discharge of this century at the Canadian streamgage, Red River at Emerson, Manitoba, located about 1 mile downstream from the border was 95,500 cubic feet per second on May 13, 1950.

Perry, C.A., 2005, Summary of Significant Floods in the United States and Puerto Rico, 1994 Through 1998 Water Years: U.S. Geological Survey Scientific Investigations Report 2005-5194, 327p.

The next scheduled meeting of the RRWMB will be held at the City Council Chambers, Warren, MN, on April 17th, starting at 9:30 a.m.

Your comments and contributions are always welcome. If you are receiving this newsletter and are not currently a member of a governing unit in the Red River Basin, please notify us and provide the name of the appropriate person to be added to our mailing list. News & Views, c/o RRWMB, P.O. Box 763, Detroit Lakes, MN 56502-0763, Phone: (218) 844-6166; Fax: (218) 844-6167.

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