North Dakota Watersheds

To study water basin management is to study human-environment interaction. The history of every community along the Red River includes flooding. The Red River Basin has a drainage area of 17, 250 square miles. The principal river of the basin is the Red River which begins at the confluence of the Ottertail and Bois de Sioux Rivers at Wahpeton, North Dakota, and Breckenridge, Minnesota. The Red River meanders northerly nearly 555 river miles to Lake Winnipeg in the province of Manitoba, Canada (North Dakota State Water Commission, 1993). The drop in elevation from Wahpeton to Lake Winnipeg is only 233 feet (Krenz & Leitch, 1993). The U. S. tributaries of the Red River include the Rabbit, Ottertail, Buffalo, Wild Rice, Marsh, Red Lake, Grand Marais Creek, Snake, Two Rivers North Branch, Two Rivers South Branch, Joe, Roseau, Sheyenne, Maple, Rush, Elm, Goose, Turtle, Forest, Park, Tongue, and Pembina Rivers. The Canadian tributaries include the La Salle, Seine, Rat, Roseau, Marais, Pembina, and Assiniboine Rivers. The Red River flows through the bed of glacial Lake Agassiz which has a mainly flat topography. During seasonal high water, the Red River leaves the river bed and spreads overland (North Dakota State Water Commission, 1993). There are four lakes in Canada that are remnants of Lake Agassiz: Lake Winnipeg, Lake Winnipegosis, Lake Manitoba, and Lake Nipigon. Lake of the Woods, shared by Canada and the United States, is also a remnant of Lake Agassiz. The Upper and Lower Red Lakes are remnants of Lake Agassiz in the United States (Krenz & Leitch, 1993).

The Minnesota source of the Red River is the Ottertail River which drains to the south through Elbow, Many Point, Round, Height of Land, Little Pine, Pine, and Rush Lakes to Ottertail Lake. The Ottertail River travels 42 miles west of Ottertail Lake to its junction with the Bois de Sioux at Breckenridge, Minnesota. Traverse and Wilkin Counties are the drainage basin area of the Bois de Sioux River as it flows north to Breckenridge.

The secondary river of the Red River Basin is the Sheyenne River. The Sheyenne River Basin covers 16 counties. The principal tributaries are Baldhill Creek, with a drainage area of 730 square miles, the Maple River with a drainage area of 1572 square miles, and the Rush River with a drainage area of 236 square miles. The meandering Sheyenne River travels 506 river miles before its confluence with the Red River of the North at Fargo, North Dakota. (U.S. Army Corps of Engineers, 1968). The Sheyenne River has one flood control dam, Lake Ashtabula, located north of Valley City, North Dakota. The Lake Ashtabula reservoir has a maximum storage of 116,300 acre-feet (North Dakota State Water Commission, 1993).

Devils Lake is the largest natural lake in North Dakota, with a drainage area of 3580 square miles (North Dakota State Water Commission, 1993). The Devils Lake Basin is a subbasin of the Red River Basin and is usually a closed basin. The water level of Devils Lake has been rising since the 1940s and has risen more than 25 feet since 1993. Devils Lake began flowing along the 6–mile journey through the Jerusalem Outlet into Stump Lake in 1999. For the first time in 180 years, Stump Lake became Stump Bay in September of 2007, when its elevation equaled that of Devils Lake at 1447.15 feet above sea level. Stump Bay drains into the Sheyenne River when it reaches 1459 feet above sea level (Bonham, 2007).

Flooding has been experienced in each of the five major hydrologic subdivisions of North Dakota. The Souris River originates in Saskatchewan, Canada; passes through the state of North Dakota; heading toward its confluence with the Assiniboine River in Manitoba, Canada. Saskatchewan constructed the Rafferty Dam and the Alameda Dam to manage the water flow of the Souris River. North Dakota has four major water management systems: the Sheyenne River Flood Control Project, the Southwest Pipeline Project, the Souris River Flood Control Project, and the Garrison Diversion. Water flow is regulated using 14 reservoirs: Ashtabula, Bowman-Haley, Camel Hump, Crown Butte, Darling, Des Lacs, Homme, Ilo, Jim, LaMoure, Oahe, Patterson, Pipestem and Sakakawea. Numerous low-head dams are supervised by county water boards (North Dakota State Water Commission, 1993).



Red River Basin Map. Red River Basin Commission.



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