

Flooding



Red River Joint Water Resource District

Upper Sheyenne River Joint Water Resource Board

A HISTORY of Flooding in the Red River Basin

Major Red River of the North (Red River) Floods

1882 - 1883: Major flood in the Red River Basin, causing significant damage to infrastructure and property.

1897: Major flood in the Red River Basin, causing significant damage to infrastructure and property.

1917: Major flood in the Red River Basin, causing significant damage to infrastructure and property.

1929: Major flood in the Red River Basin, causing significant damage to infrastructure and property.

1939: Major flood in the Red River Basin, causing significant damage to infrastructure and property.

1943: Major flood in the Red River Basin, causing significant damage to infrastructure and property.

1949: Major flood in the Red River Basin, causing significant damage to infrastructure and property.

1950: Major flood in the Red River Basin, causing significant damage to infrastructure and property.

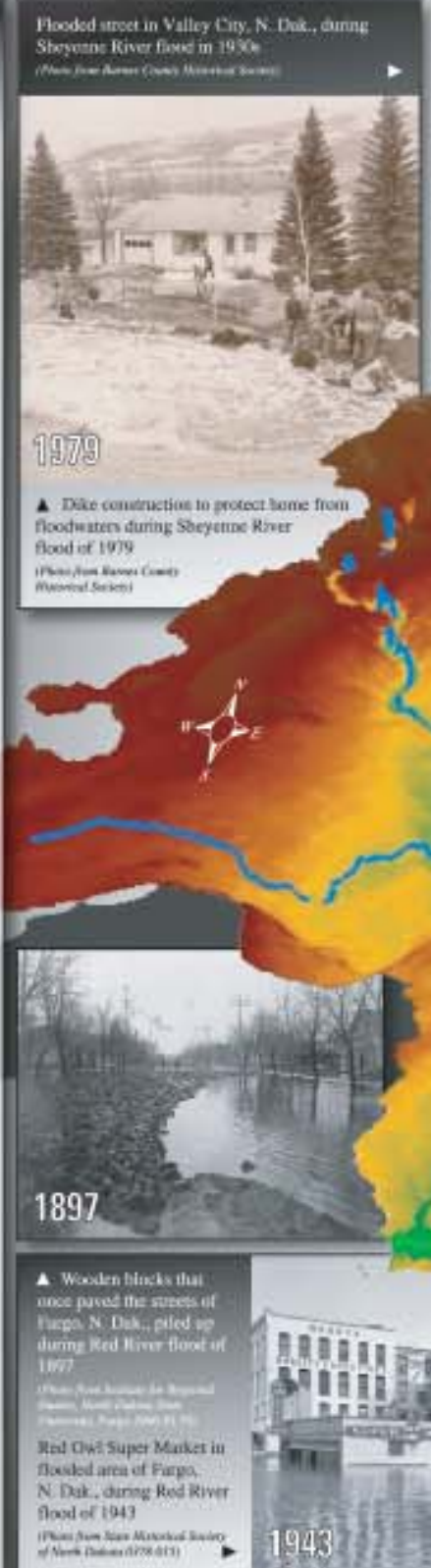
1959: Major flood in the Red River Basin, causing significant damage to infrastructure and property.

1969: Major flood in the Red River Basin, causing significant damage to infrastructure and property.

1979: Major flood in the Red River Basin, causing significant damage to infrastructure and property.

1997: Major flood in the Red River Basin, causing significant damage to infrastructure and property.

2006: Major flood in the Red River Basin, causing significant damage to infrastructure and property.



1930s

▲ Viking Bridge in Valley City, N. Dak., during Sheyenne River flood of 1969, at gage height of 17.65 feet.

1979

▲ Dike construction to protect home from floodwaters during Sheyenne River flood of 1979.



1897

View of East Grand Forks, Minn., during Red River flood of 1897. Center span of Northern Pacific Railroad bridge propped horizontally to allow ice to flow past. Engines are parked on stationary spurs to weigh down bridge.



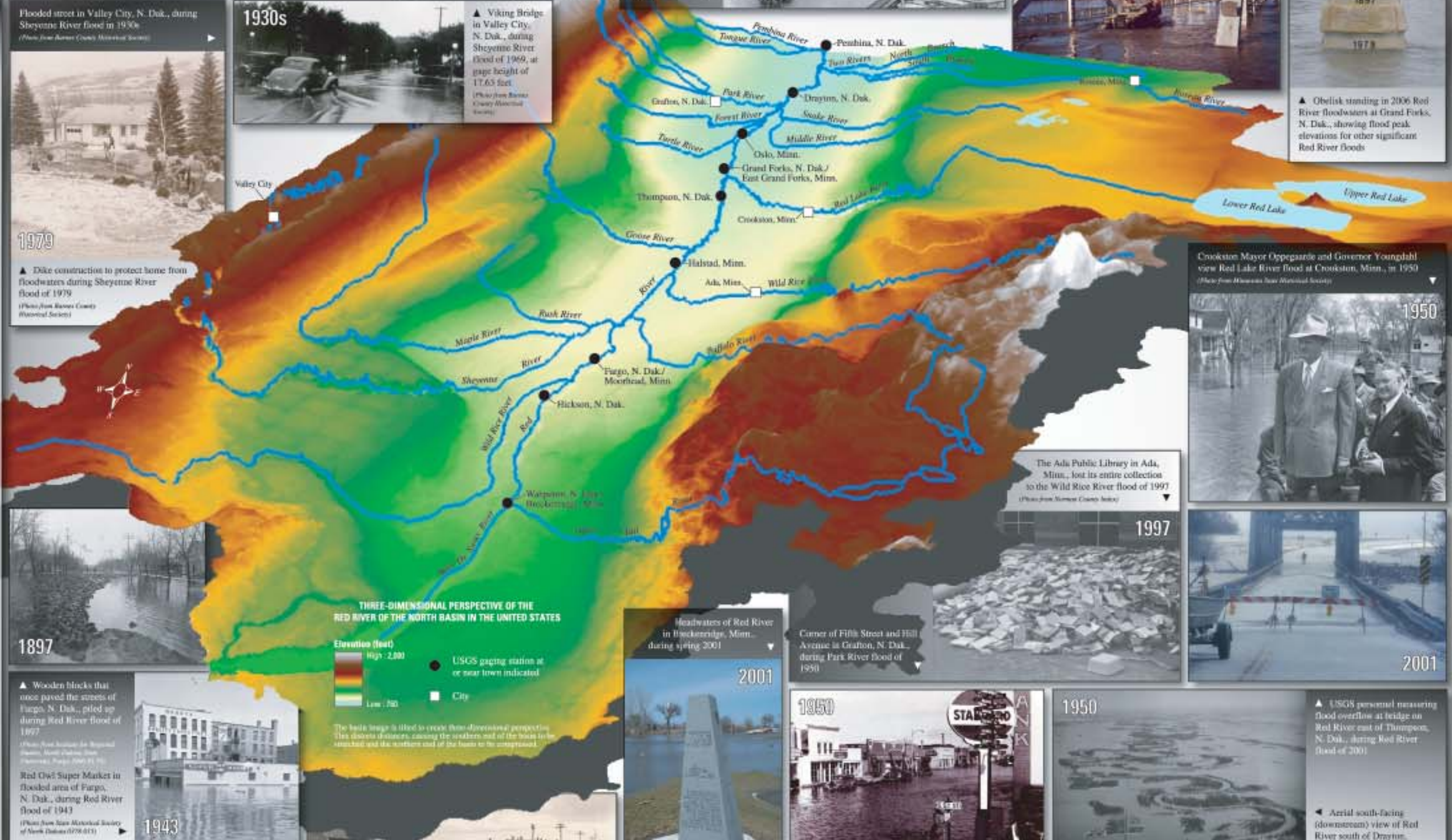
1997

U.S. Geological Survey employees transported by National Guard personnel to site on Sottis Bridge between Grand Forks, N. Dak., and East Grand Forks, Minn., during Red River flood of 1997.



2006

▲ Obelisk standing in 2006 Red River floodwaters at Grand Forks, N. Dak., showing flood peak elevations for other significant Red River floods.



Factors contributing to flooding in the Red River Basin:

Landform factors

- A relatively shallow and meandering river channel - a shallow channel holds less water and the meandering can cause flow to slow down as the channel makes its turns, causing overbank flooding.
- A gentle slope (averaging 0.5 to 1.5 feet per mile) that inhibits channel flow and encourages overbank flooding or water "ponding" (especially on even, saturated ground) in the basin.
- The northerly direction of flow - flow in the Red River travels from south (upstream) to north (downstream). The direction of flow becomes a critical factor in the spring when the southern (upstream) part of the Red River has thawed and the northern (downstream) part of the channel is still frozen. As water moves north toward the still frozen river channel, ice jams and substantial backwater flow and flooding can occur.

Weather factors

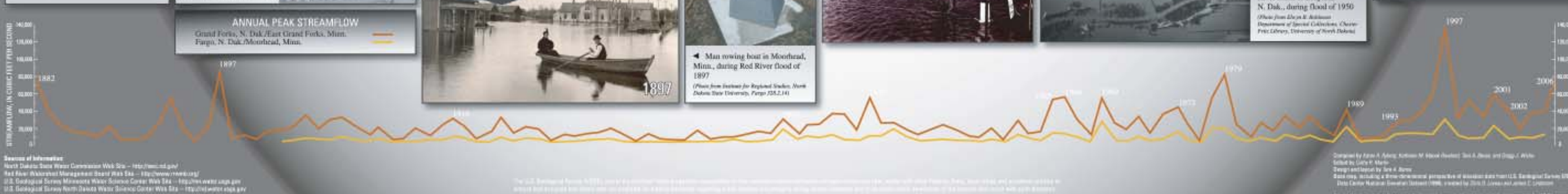
Spring (snowmelt) floods

- Above-normal amounts of precipitation in the fall of the year that produce high levels of soil moisture, particularly in the surface areas, in the basin.
- Freezing of saturated ground in late fall or early winter, before significant snowfall occurs, that produces a hard, deep frost that limits infiltration of runoff during snowmelt.
- Above-normal winter snowfall in the basin.
- Above-normal precipitation during snowmelt.
- Above-normal temperatures during snowmelt.

Summer floods

- Above-normal or intense precipitation in the same area over a short duration from May through October.
- Saturated ground causing more runoff.
- Limited vegetative cover leading to less absorption of water and more runoff.

Landform factors, combined with any or all of the weather factors, determine the severity of flooding. For example, below-normal fall precipitation combined with above-normal winter snowfall, above-normal temperatures during snowmelt, and above-normal precipitation during snowmelt can lead to significant flooding. In contrast, below-normal fall precipitation combined with above-normal winter snowfall, below-normal temperatures during snowmelt, and little precipitation during snowmelt may cause only minimal flooding. Most of the catastrophic floods that occurred in the Red River Basin were caused by a combination of landform factors, and most or all of the weather factors affected the magnitude of those floods.



Source of Information: North Dakota State Water Commission Web Site - http://www.nd.gov/red-river/water/management-board/ Red River Watershed Management Board Web Site - http://www.river.org/ U.S. Geological Survey Minnesota Water Science Center Web Site - http://www.water.usgs.gov/ U.S. Geological Survey North Dakota Water Science Center Web Site - http://water.usgs.gov/

U.S. Department of the Interior
U.S. Geological Survey

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A view of the backyard of the Jensen's house (now the Living Lab's caretakers house) during the 1997 flood. For a reference location look at the large spruce tree.

This sign is located on the spot where the flood waters reached in 2006. The flood waters were even higher in 1997 and 1897. During the flood of 2006 there was water seepage into the basement of what is now the Living Lab Conference Center. That spring flood covered many of the wood duck nesting boxes which had just been installed. There were also beaver, carp and wood ducks swimming just inches from where this sign is now located.

