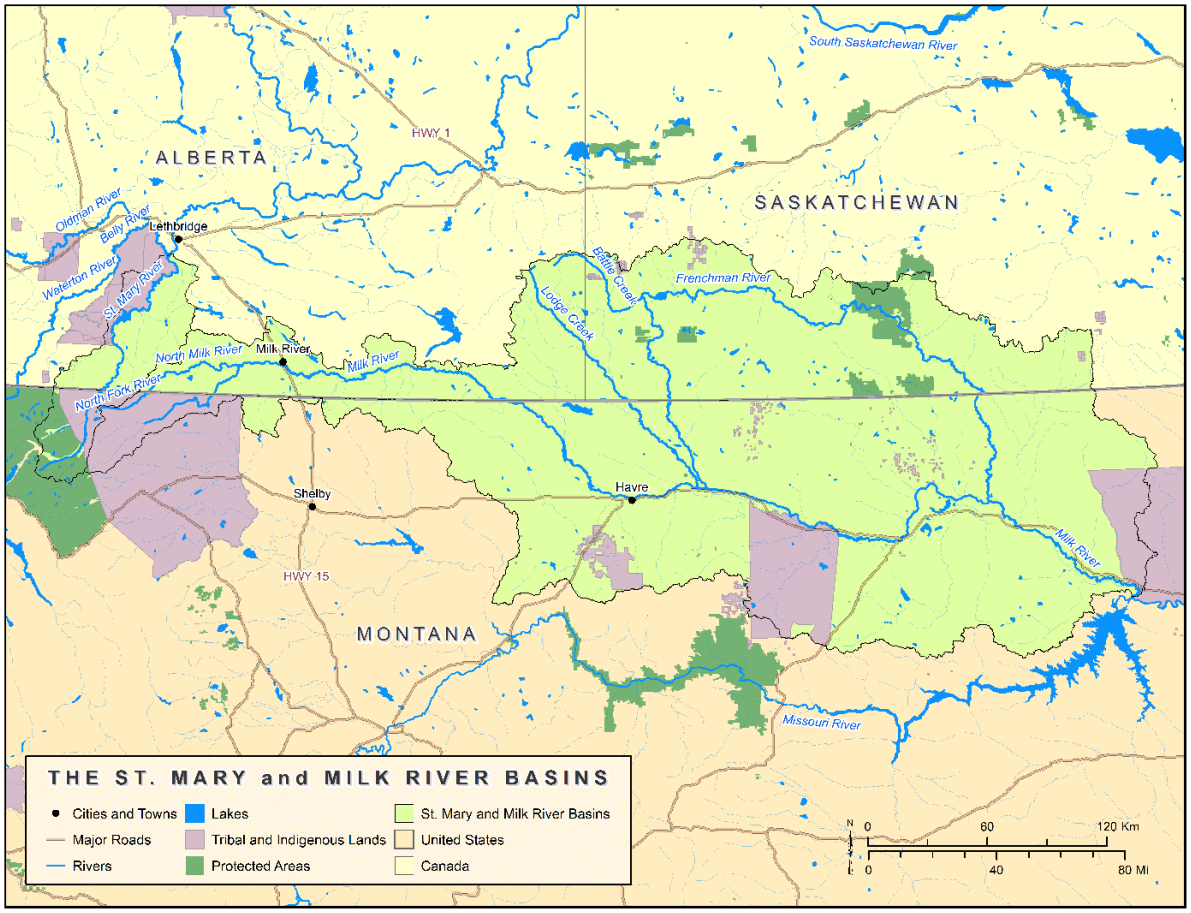
The St. Mary and Milk Rivers: Geography and Infrastructure

Fact Sheet
October 14, 2022



The St. Mary River and Milk River are interconnected systems that arise in the mountains of northwestern Montana and initially flow north into Canada. They pass through semi-arid lowlands where their water is critical for sustaining agriculture and other activities. The Boundary Waters Treaty of 1909 allows the United States to divert water from the St. Mary River into the Milk River for use further downstream.

Basin Geography

The St. Mary River begins in the eastern slopes of the Rocky Mountains in Montana and flows northeast through the Blackfeet Nation territory. It crosses into Alberta just east of the Piegan-Carway border station. The river then flows northward, forming the eastern boundary of the Kainai Nation (Blood Tribe) reserve. It empties into the Oldman River, which eventually flows into Hudson Bay. The St. Mary River

has a fairly regular and dependable flow during the summer because of its source in the high elevations of Glacier National Park. Winter flows are sustained by a ground-water base flow.

The North Fork and the main stem of the Milk River originate in the foothills of the eastern slopes of the Rocky Mountains in Montana. The two streams flow northeast across the Blackfeet Nation territory before crossing the international boundary to enter Alberta. The Milk River then flows eastward and roughly parallels the international boundary for about 120 river kilometers or 70 miles. From there it flows southeastward, re-entering Montana and forms the northern border of the Fort Belknap Reservation. The Milk River eventually empties into the Missouri River. Flows in the Milk River are dependent on spring snowmelt and rainfall in the foothills. The flow is less regular and dependable than the St. Mary River as a source of water.

	St Mary River	Milk River	
		Milk River Mainstem	Eastern Tributaries
Drainage Area	1,210 km^2 (at the International Boundary) 3,500 km^2 (at Oldman River)	11,700 km^2 (at Eastern Crossing) 61,000 km^2 (at Missouri River)	10,200 km^2 (combined area at international boundary)
Mean Annual Flow	790,000 dam^3 (at the International Boundary) 865,000 dam^3 (at Oldman River)	160,000 dam^3 (at Eastern Crossing) 570,000 dam^3 (at Missouri River)	100,000 dam^3 (combined natural flow at international boundary)
Receiving System	Saskatchewan River (North)	Missouri River (South)	Milk River/Missouri River (South)
Water Source (dominant)	Glacier/Snow fed (continuous flow)	Snow/Rain fed (ephemeral flow)	Snow/Rain fed (ephemeral flow)
Headwater Elev.	2,304 m	1,342 m	1,470 m

One dam^3, or cubic decameter, is equivalent to 0.813 acre feet.

The St. Mary River basin is relatively small but well supplied with water. It has a total drainage area of approximately 3,500 square kilometers or 1,350 square miles. South of the international boundary, the St. Mary River drainage basin has a mean annual precipitation of about 1,200 millimeters or 47 inches, most of which falls as snow. North of the boundary, the St. Mary River basin is drier.

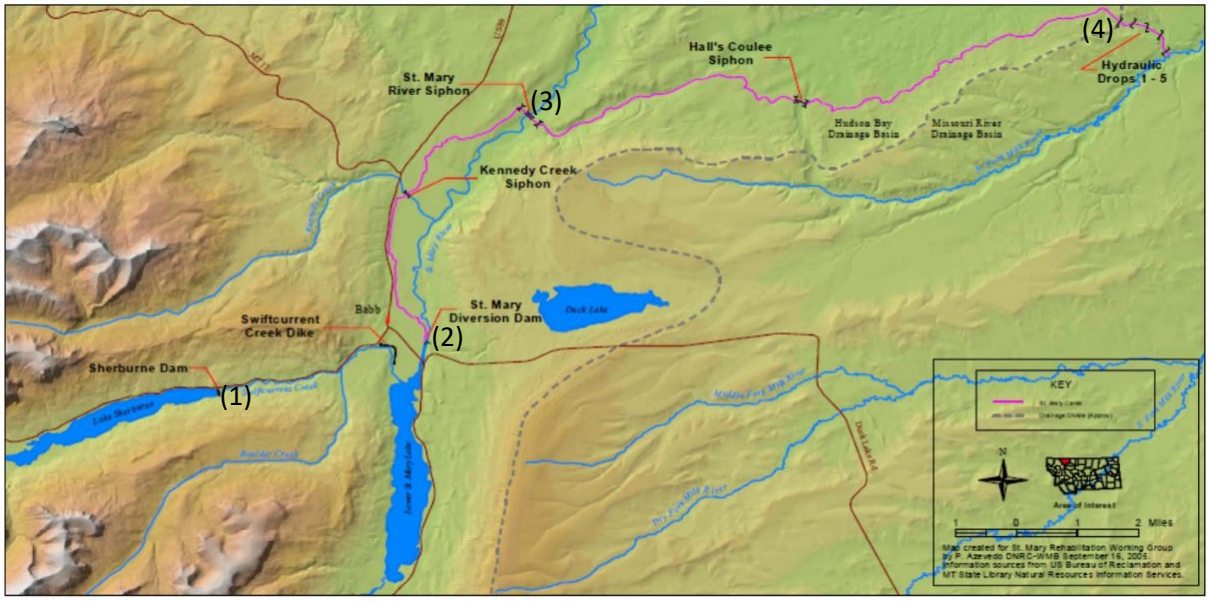
The Milk River basin is much larger, as shown above, but produces less mean annual flow. It has a total drainage area of approximately 61,000 square kilometers or 23,600 square miles. Upstream of the eastern crossing of the international boundary, the Milk River drainage basin has a mean annual precipitation of about 350 millimeters, or 13.8 inches, and a mean annual lake evaporation of 770 millimeters or 30.3 inches. The moisture deficit places the basin in a semi-arid zone.

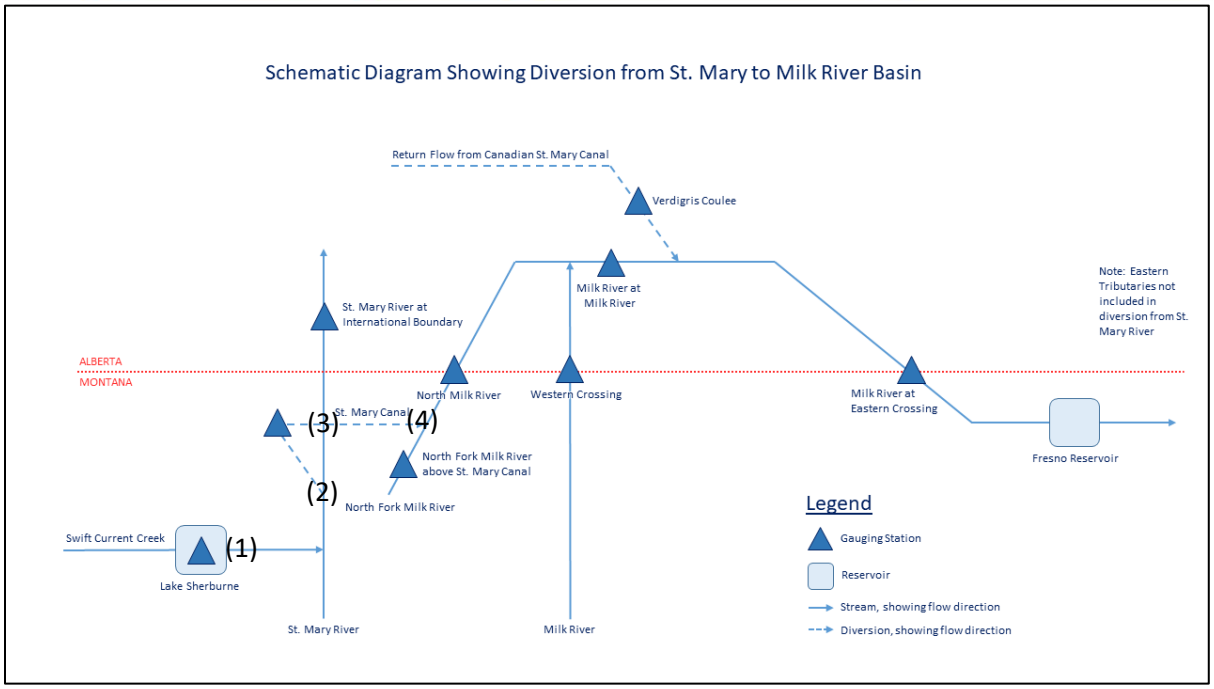
The Milk River basin includes portions of the Cypress Hills in Canada, the Sweetgrass Hills, Bears Paw Mountains and Little Rocky Mountains in Montana, and extensive prairie areas in both the United States and Canada. The tributaries of the Milk River which flow south from the Cypress Hills in Alberta and Saskatchewan are collectively known as the Eastern Tributaries. These include the Frenchman River,

Battle Creek and Lodge Creek. The natural flows of these tributaries are highly variable and are often low after the spring runoff.

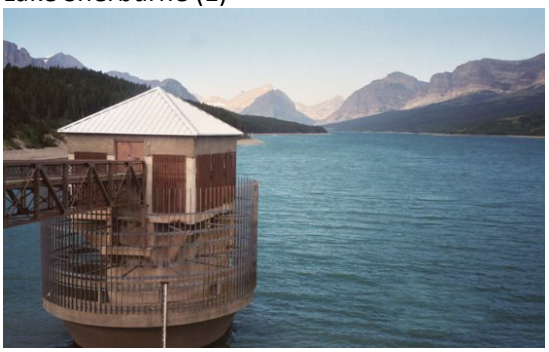
Diversion Infrastructure

The key structures used to manage the diversion of water from the St. Mary to the Milk River include Lake Sherburne Dam (1) and the diversion dam (2), siphons (3) and drop structures (4) of the U.S. St. Mary Canal.





Lake Sherburne (1)



Lake Sherburne lies on Swiftcurrent Creek, a tributary of the St. Mary River. In the winter, and during high spring flows, water is stored in Lake Sherburne and is released into the St. Mary Canal later during irrigation season, depending on weather and hydrologic conditions. Sherburne Dam, a compacted earth fill structure, controls the outlet from Lake Sherburne, which has a total storage capacity of 84,000 dam^3, or 68,080 acre-feet.

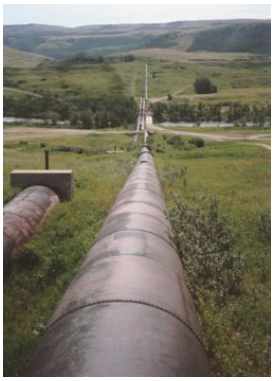
U.S. St. Mary Canal and Diversion Dam (2)

St. Mary Diversion Dam

The U.S. St. Mary Canal was constructed in 1917 and is used to divert water from the St. Mary River to the North Fork of the Milk River for use in the lower Milk River valley in Montana. The canal begins at St. Mary Diversion Dam and flows on the west side of St. Mary River for the first 15 kilometers or 9.5 miles. The total length of the U.S. St. Mary Canal is 47 kilometers or 29 miles. The United States Bureau of Reclamation is considering the design of a replacement structure.

U.S. St. Mary Canal Siphons (3)


Siphon entrance


St. Mary River Crossing


Halls Coulee Siphon

Large siphons carry water from the U.S. St. Mary Canal across parts of the landscape. The impressive design relies on the force of gravity to transport the water downhill and uphill instead of using pumps. The water from the canal crosses under the St. Mary River through the first siphon, a two-barrel, steel-plate conduit that is 230 centimeters or 90 inches in diameter, and 1,100 meters or 3,600 feet in length. A second siphon, conveying the water across Hall's Coulee, consists of a two-barrel steel-plate conduit that is 200 centimeters or 78 inches in diameter, and 430 meters or 1,400 feet long.

Concrete Hydraulic Drop Structures (4)


U.S. St. Mary Canal hydraulic drop structure #5

Before water from the U.S. St. Mary Canal can be discharged into the North Fork of the Milk River, a series of five, large concrete drop structures is used to manage the fall of 65 meters or 214 feet. In May 2020, the structure at Drop 5 failed and flows in the canal were stopped for nearly five months. The aging structure at Drop 2 was replaced as well as the structure at Drop 5. The failure at Drop 5 underscores the need to update the U.S. St. Mary Canal, which is more than 100 years old.