



Snow Survey & Water Supply Forecasting Program

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Canada, Mexico and the USA

In the western United States, water supply forecasts are used by water managers to operate dams and stream flow diversions in ways that follow prescribed water law and that prevent injury to parties that depend on prescribed water rights for their economic livelihood. In addition, the United States has entered into international treaties with Canada and Mexico to administer waters that cross the boundary from one country to another. The intent of these treaties is also to mitigate or prevent injury (economic or otherwise) to downstream water users. Water law and water treaties that affect the western United States are many and complicated. The two major ones that will be described within this article are the International Boundary Waters Treaty Act of 1909, between the United States and the King of Great Britain, and the 1884 treaty between the United States and Mexico. The former affects water use and regulation between the United States and Canada and the latter is administered by the International Boundary and Water Commission that was established in 1889. The major Western basins affected by these treaties are the Columbia, Colorado, Rio Grande, and Milk/St. Mary.

Columbia

The Columbia River Treaty is an international agreement between Canada and the United States of America (U.S.) on the development and operation of the upper Columbia River basin. The Treaty was initially signed in January 1961, however further negotiations completed in 1964 clarified certain rights and obligations. With these clarifications, the Treaty was ratified and implemented in September 1964. Under the terms of the agreement, Canada was required to provide 19.12 km³ (15.5 million acre-feet (Maf)) of usable reservoir storage behind Mica, Hugh Keenleyside (Arrow), and Duncan dams. The operation of the three Canadian Treaty projects provides flood protection and enables increased power generation at downstream hydroelectric projects in Canada and the U.S. As payment for this storage operation, the Treaty requires the U.S. to deliver to Canada one-half of the increase in U.S. downstream power benefits as estimated five years in advance (the Canadian Entitlement).

The Treaty also allowed the U.S. to build the Libby Dam on the Kootenai River in Montana which provides further active storage in the Koocanusa reservoir. The name is a concatenation of the first three letters from Kootenai, Canada and USA, and was the winning entry in a contest to name the reservoir. Water behind the Libby dam floods back 42 miles into Canada, while the water released from the dam returns to Canada just upstream of Kootenay Lake. Libby is operated for power, flood control, and other benefits at-site and downstream in both Canada and the United States. With the exception of the Mica Dam, which was designed and constructed with a powerhouse, the Canadian Treaty projects were initially built for the sole purpose of

regulating water flow. In 2002, however, Arrow Lakes Hydro project was constructed in parallel with the Keenleyside Dam near Castlegar, British Columbia, 35 years after the storage dam was originally completed. The Duncan Dam remains a pure storage project, and has no at-site power generation facilities.

Additional controversy surrounded the flooding caused by the filling of the four Treaty reservoirs. In particular the filling of the Arrow Lakes reservoir and the Koocanusa reservoir flooded fertile farm land, inundated many ancient Native archaeological sites and artifacts, and displaced a large number of long term residents. The Columbia Basin Trust was established, in part, to address the long term socio-economic impacts in British Columbia that resulted from this flooding.



Mica Dam



Duncan Dam



Hugh Keenleyside (Arrow) Dam



Libby Dam

The Treaty has no specified termination date, but either Canada or the United States can terminate the Treaty any time after 16 September 2024, provided a minimum ten years written notice is provided. Certain terms of the Treaty continue for the life of the projects, however, including called upon flood control provisions, Libby coordination obligations and Kootenay River diversion rights.

Colorado

Mexico and the United States governments, through the International Boundary Waters Commission (IBWC), jointly administer the terms of the 1944 Water Treaty relating to the Colorado River, which guarantees an annual quantity of 1,500,000 acre-feet (1,850,234,000 cubic meters) to Mexico. The application of these terms began in 1950. The operations are performed in collaboration with the United States Bureau of Reclamation, Department of the Interior. The procedure is as follows: Mexico, before the first of each calendar year, presents through the IBWC and

annual schedule of requested deliveries by months, within the Treaty annual allotment and specified rates. Mexico also submits a weekly schedule of deliveries by day, within the monthly amounts scheduled. Mexico's requests are transmitted by the United States Section to the Bureau of Reclamation, which makes the releases as necessary from the United States storage works on the Colorado River to fulfill the delivery schedule. The deliveries to Mexico are jointly monitored by the IBWC to ensure compliance with the Treaty allotment and schedules.

For this purpose, the 1944 Treaty also provides that the IBWC shall construct, operate and maintain the boundary section of the Colorado River, and in each country its Section of the IBWC construct, operate and maintain all necessary gaging stations and other measuring devices for the purpose of keeping a complete record of the waters delivered to Mexico and of the flows of the Colorado River downstream of Imperial Dam in the United States. Pursuant thereto, the IBWC jointly operates and maintains six gaging stations on the Colorado River. The United States Section operates and maintains five other gaging stations for Treaty purposes. The field data collected are jointly compiled and reviewed by the IBWC. Records of the flows of the Colorado River reaching Mexican points of diversion are published annually in IBWC bulletins entitled, "Colorado River and other Western Boundary Streams," in English and Spanish.

Pursuant to the 1944 Water Treaty, Mexico constructed the Morelos Dam at its expense and under the supervision of the IBWC in order to divert the major part of its allotted waters from the river. The waters diverted are used to irrigate the extensive and highly-developed lands in the Mexicali Valley. The dam is designed to pass a flood of 350,000 cfs (9,911 cms) and is operated and maintained by Mexico under the supervision of the IBWC.



Morelos Diversion Dam



Imperial Dam

Under the terms of the 1944 Water Treaty, the river levees along the Colorado River in the United States upstream from Morelos Diversion Dam and along the Gila River near Yuma, Arizona were raised to protect lands in the United States against flood damages resulting from the construction and operation of the diversion dam.

In 1965, the two Governments approved recommendations of the IBWC to alleviate the problem of increased salinity of the Colorado River treaty deliveries to Mexico, caused by saline drainage waters originating in the United States. The agreement provided for the construction and operation by the United States of a bypass channel, which could pass to the river downstream of Morelos Dam a part of the saline drainage waters and enable substitution of low salinity waters.

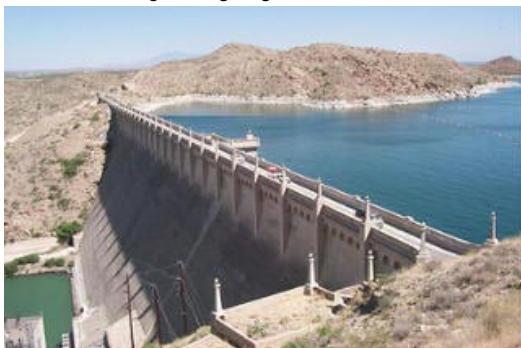
On August 30, 1973, agreement was reached by the two Governments under the terms of the 1944 Water Treaty for a permanent solution to the international problem of the salinity of the Colorado River. This agreement provided for immediate

further reduction in the salinity of the waters delivered to Mexico, stipulating that the United States shall adopt measures to assure that the approximately 1,360,000 acre-feet (1,677,545,000 cubic meter) delivered upstream of Morelos Dam, have an annual average salinity of no more than 115+30 parts per million (ppm) over the annual average salinity of the Colorado River at Imperial Dam. Compliance with the agreement is jointly monitored by the United States and Mexican Sections of the IBWC.

The Congress of the United States recognized that to continue the interim measures to implement the agreement with Mexico would result in a serious loss of water needed to meet uses within the Colorado River Basin in the United States. To prevent such loss, the Congress in the Salinity Control Act authorized the Secretary of the Interior to construct, operate and maintain a desalting plant in the United States to reduce the salinity of drain waters from the Wellton-Mohawk Irrigation and Drainage District, to enable their delivery to Mexico within the terms of the agreement. The desalting plant is located just west of Yuma, Arizona.

Rio Grande

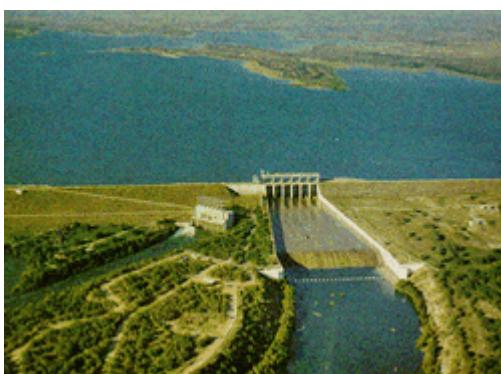
The Rio Grande is an important source of internationally regulated irrigation. Several major dams on the river not only regulate the stream flow for irrigation, but also for flood control. Elephant Butte Dam (completed 1916) and Caballo Dam (completed 1938) in New Mexico, create reservoirs that serve large agricultural areas. Further downstream, in Texas, is the Amistad Dam (completed 1969) and Falcon Dam (completed 1954). Amistad Dam is the largest of the storage dams and reservoirs built on the international reach of the Rio Grande River. The dam is operated and maintained jointly by the United States and Mexico Sections of the IBWC.



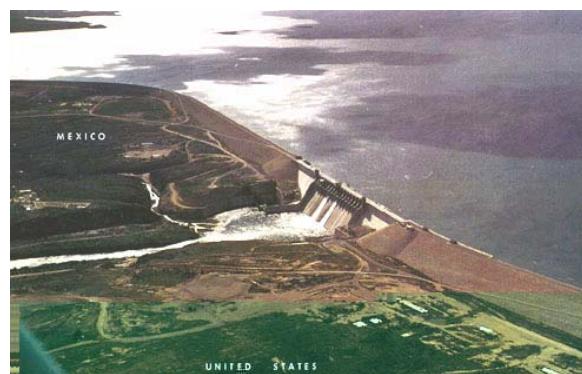
Elephant Butte Dam



Caballo Dam



Falcon Dam



Amistad Dam

Near the mouth of the Rio Grande is the irrigation-dependent citrus-fruit and truck-farm region commonly called the Rio Grande Valley that was developed in the 1920s. An agreement between the United States and Mexico in 1944 provided for future distribution of the river's water.

Shifts in the river's channel have led to border disputes between the United States and Mexico. Parts of its bed have been stabilized by canalization, and an international border commission mediates disputes. The long standing controversy over the location of the border at El Paso was finally settled in 1968 when the water of the Rio Grande was diverted into a concrete channel. A 191-mi (307-km) section of the river on the American shore below Big Bend National Park is protected as the Rio Grande Wild and Scenic River.

Milk/St. Mary Rivers

The Milk River Project is located in north-central Montana. The water supply for the project originates in the St. Mary River watershed in Glacier National Park. Runoff is stored in Lake Sherburne for release into the St. Mary River. It is then diverted into the 29-mile long St. Mary Canal and discharged into the north fork of the Milk River. The water continues along the Milk River into Canada and travels more than 200 miles through Alberta before re-entering the United States. After re-entering the United States, the water flows into Fresno Reservoir where it is stored until needed for irrigation. Down river from Fresno Reservoir, several dams divert water for irrigation of more than 120,000 acres.



Lake Sherburne



Fresno Dam

The St. Mary River begins life high on the eastern slope of the Rocky Mountains near the U.S./Canadian border. Annual precipitation in the St. Mary watershed comes as both rain and snow, and is usually very heavy. From its source in the Rocky Mountains, the St. Mary River flows north into Canada and empties into the Saskatchewan River, which flows into Hudson's Bay.

The Milk River rises from the plateau region just east of the St. Mary watershed, but is cut off from the mountain water supply by a low divide separating the two basins. The Lower Milk River Valley is well suited for agriculture, but low annual rainfall necessitates the use of irrigation to fully utilize the region's agricultural potential. Early settlers to the region soon realized that the best source of additional water for the Milk River was the St. Mary River. The problem was how to get the water from one river to the other.

The key to the success of the Milk River Project was the successful negotiation of a treaty with the Dominion of Canada that would ensure the unrestricted passage of the combined waters of the St. Mary and Milk Rivers through Canadian territory. Although not the only dispute among the two nations over waters shared by both,

the St. Mary/Milk River dispute was one of the driving forces behind the negotiation and ratification of the 1909 Boundary Waters Treaty.

When the United States Reclamation Service announced plans to divert water from the St. Mary River to the Milk River, the Canadian government protested, stating that the diversion would interfere with existing Canadian appropriations along the St. Mary River. The United States ignored the protests, contending that the diversion would have no effect on Canadian interests. Canada's response came in July 1904, when it was announced that the Canadian government had granted permission to two applicants to divert the waters of the Milk River to the St. Mary River in Canada. Realizing that it was at a severe disadvantage, the United States withdrew its plan to unilaterally divert the waters of the St. Mary River, and in December 1904, proposed a conference to seek an equitable agreement with Canada.

Although both nations recognized the benefits to each, it took several years of negotiations before the United States and Canada signed the Boundary Water Treaty on January 11, 1909, continuing a 125-year tradition of peaceably settling boundary disputes by mutual agreement.

The Milk River Project was developed to provide a reliable source of water for irrigation of over 100,000 acres of productive lands along the Milk River. While helping to provide a secure future for farmers in the region, the project was at the center of some of the most important water rights issues of the twentieth century. The 1909 Treaty with Canada set the standards for cooperation between the two nations which still stands today. The Winters Decision, though not directly linked to the Milk River Project, established the doctrine of reserved rights for Indian reservations and continues to influence water law in the West.

In the Winters decision the United States Supreme Court ruled that the 1888 treaty establishing the Fort Belknap Indian Reservation gave the Gros Ventre and Assiniboine people the right to unspecified amounts of water that they needed to modernize their land-use practices and economy. This court decision made sense to many western settlers, government officials, lawyers, justices, and others who saw reserved rights and riparianism (the right to water based on landownership along a stream) as logical, just alternatives to prior appropriation. Irrigators downstream from the Fort Belknap Reservation hailed the decision because they believed it would force upstream prior appropriators hurt by the decision to join forces with them in support of a federal government reclamation project that would store water for all regardless of priority.

The development of the Milk River not only played an important role in the development of the region, but in the development of the western United States and Canada as well.

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