

International Columbia River Board of Control

2020 Annual Report to the International Joint Commission



Cover photo (U.S. Bureau of Reclamation): Grand Coulee Dam in Washington State. Grand Coulee Dam was completed in 1941 and created Franklin D. Roosevelt Lake. The lake is about 150 miles (240 km) long and extends to within about 15 miles (24 km) south of the international boundary, with a transitional reach that extends upstream of the boundary due to backwater effects. The lake covers an area of about 80,000 acres (320 km²) and is the largest lake in Washington State.

TABLE OF CONTENTS

ACTIVITIES OF THE BOARD IN 2020 2

HYDROLOGIC CONDITIONS IN 2020 2

COLUMBIA RIVER TREATY REVIEW 3

REINTRODUCTION OF SALMON TO THE UPPER COLUMBIA RIVER..... 4

INTERNATIONAL COLUMBIA RIVER BOARD OF CONTROL MEMBERSHIP 7

This page left intentionally blank.

International Columbia River Board of Control

2020 Annual Report to the International Joint Commission

The Order of the International Joint Commission (IJC) dated December 15, 1941, in the matter of the application of the United States for approval of the construction and operation of the Grand Coulee Dam and reservoir (Franklin D. Roosevelt Lake) provided for the creation of an engineering board to be known as the International Columbia River Board of Control. The Order provides that the Board shall conduct studies under the supervision of the Commission as to the effect of the operation of Grand Coulee Dam and Franklin D. Roosevelt Lake on water levels at and upstream of the international boundary and shall submit a report to the Commission annually. The Board's studies are currently limited to the monitoring and reporting of the lake elevation at Grand Coulee Dam and discharge and backwater of the Columbia River at the international boundary.

The monitoring function of the Board is intended to ensure compliance with the terms of the IJC Order, which specifies that the operation of Grand Coulee Dam must comply with the following conditions with respect to the backwater effect across the international boundary:

- When the lake elevation at Grand Coulee Dam is 1,290 ft (393 m) above mean sea level, the increase in water level at the boundary due to backwater must not exceed about 2.5 ft (0.76 m) when Columbia River discharge at the boundary is 20,000 cubic feet per second (cfs) (570 cubic meters per second [cms]), or about 1.0 ft (0.31 m) when the discharge is 50,000 cfs (1,400 cms), and there must be no effect on the water level at the boundary when Columbia River discharge at the boundary is 400,000 cfs (11,000 cms).
- There must be no appreciable or measurable increase in the water level at Columbia Gardens, British Columbia (located 4.5 miles [7.2 km] from the boundary), when Columbia River discharge at the boundary is less than 50,000 cfs (1,400 cms), and no appreciable or measurable increase in water level at Trail, British Columbia (located 10.5 miles [16.9 km] from the boundary), regardless of Columbia River discharge or lake elevation at Grand Coulee Dam up to 1,290 ft (393 m) above mean sea level.

ACTIVITIES OF THE BOARD IN 2020

The Board determined that the Applicant was in compliance with the IJC Order in 2020.

The Board presented a progress report during fall semi-annual IJC meeting on October 22, 2020, which was held over teleconference. The 2020 Washington DC, spring semi-annual meeting was cancelled due to the coronavirus pandemic. The October meeting was attended by the Canadian and U.S. section Co-chairs Dave Hutchinson and Cindi Barton, respectively, and was supported by the secretary of the Canadian and U.S. sections. Both Co-chairs and secretaries attended remotely via teleconference.

The Board website (<https://ijc.org/en/crbc>) was updated to include the Board's 2019 annual report to the IJC.

HYDROLOGIC CONDITIONS IN 2020

During 2020, the U.S. Geological Survey continued the collection of information concerning the water level of Franklin D. Roosevelt Lake at Grand Coulee Dam (USGS gaging station 12436000), the Columbia River at Grand Coulee Dam (USGS gaging station 12436500) and, in cooperation with the Water Survey of Canada (Environment and Climate Change Canada), the water level and discharge of the Columbia River at the international boundary (USGS gaging station 12399500). Discharge is computed for the Columbia River at the international boundary using a stage-discharge rating during non-backwater conditions. During backwater conditions, discharge is computed using a slope rating from the water-surface slope measured between the base and auxiliary gages. Backwater at the international boundary was estimated by the U.S. Geological Survey by computing the difference between the gage height measured at the Columbia River at the international boundary and the equivalent gage height using the stage-discharge rating for the reported discharge.

The annual flow of the Columbia River at Grand Coulee Dam for calendar year 2020 totaled 77.8 million acre-feet (96.0 cubic kilometers), or 100.1 percent of the mean annual volume for the 92-year period of record of 77.7 million acre-feet (95.8 cubic kilometers). The instantaneous maximum (peak) discharge of the Columbia River at the international boundary was 230,000 cfs (6,512 cms) on May 31 and June 1, which is 88 percent of the mean annual peak discharge for the 84-year period of record of 260,300 cfs (7,371 cms). Daily mean discharge for the Columbia River at the international boundary for 2020 is shown in Figure 1, while discharge for the period 2016-2020 is shown in Figure 2A.

Extremes of instantaneous stage recorded on the Lake Roosevelt in 2020 varied between elevations 1,246.03 ft (379.79 m) at 03:00 PDT on April 23 and 1,289.69 ft (393.10 m) at 05:00 PDT on July 11. Elevations reported are above mean sea level, with respect to a U.S. Bureau of Reclamation datum adjusted in 1937. This datum is 1.425 ft (0.434 m) above the U.S. National Geodetic Vertical Datum of 1929 (NGVD 29). The stage at midnight on January 1, 2021, was 1,286.15 ft (392.02 m). Water-level elevation in Franklin D. Roosevelt Lake for 2020 is shown in Figure 3, while Figure 2B shows elevation for the period 2016-2020.

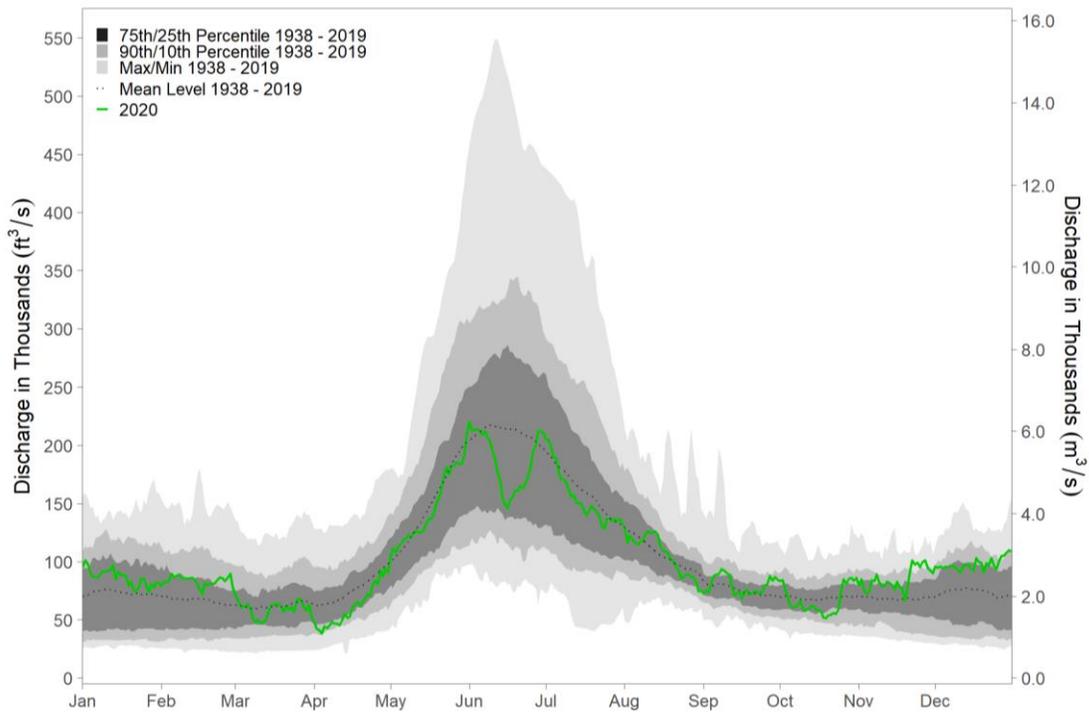


Figure 1. Columbia River at the International Boundary (USGS Station 12399500). Historical range (1938 - 2019): maximum, 90th/10th, 75th/25th percentiles, minimum, and 2020 daily mean discharge (USGS, 2021).

An analysis of the data computed that backwater at the international boundary varied during the year between 0.00 ft (0.00 m) and 0.20 ft (0.061 m). The discharge at the international boundary was 116,000 cfs (3,285 cms) when backwater was 0.20 ft (0.061 m) on August 2, 2020. Backwater on December 31, 2020 was 0.05 ft (0.02 m). Backwater that occurred at the international boundary during 2016-2020 is plotted in Figure 2C. Backwater since the time of filling of Franklin D. Roosevelt Lake in June 1942 to December 31, 2019, is plotted on the charts submitted with previous annual reports.

COLUMBIA RIVER TREATY REVIEW

Grand Coulee Dam (subject of the 1941 IJC Order of Approval) was completed in 1942 and pre-dates the Columbia River Treaty. It is not a Treaty Dam in this context, but it operates as part of the Columbia River System, in coordination with other hydro-electric dams, some of which were constructed as part of the Columbia River Treaty. The 1964 Columbia River Treaty is an agreement between Canada and the United States for the cooperative development and operation of water resource regulation for the upper Columbia River. The Treaty has no specified termination date; however, either Canada or the United States can terminate the Treaty any time on or after September 16, 2024, with a minimum 10 years written notice. Because either country may give notice to terminate the Treaty, government agencies in Canada and the United States have been in the process of evaluating future

options regarding the Treaty, with respective Canadian and U.S. Entities having provided recommendations to their respective governments prior to September 2014 (earliest date for 10-year termination notice). The respective recommendations did not promote Treaty termination. Through 2020 there was no announcement by either country of intent to terminate or seek changes to the Treaty; however, Treaty modernization discussions between the two countries have been taking place.

REINTRODUCTION OF SALMON TO THE UPPER COLUMBIA RIVER

The Upper Columbia United Tribes, which includes the Coeur d'Alene Tribe of Indians, Confederated Tribes of the Colville Reservation, Kalispel Tribe of Indians, Kootenai Tribe of Idaho, and the Spokane Tribe of Indians, have developed a phased approach for the reintroduction of salmon to the Upper Columbia River upstream of Chief Joseph and Grand Coulee Dam. In 2019, the tribes released a study that found suitable salmon habitat in the Columbia River basin upstream of Chief Joseph and Grand Coulee Dams. During the second phase of study, which is currently taking place, the tribes are studying fish passage through the dams and survival of migrating salmon through the reservoirs, which will be estimated through releases of radio-tagged Chinook salmon upstream of the dams. The final phase of reintroduction will include construction of fish passage facilities at the dams.

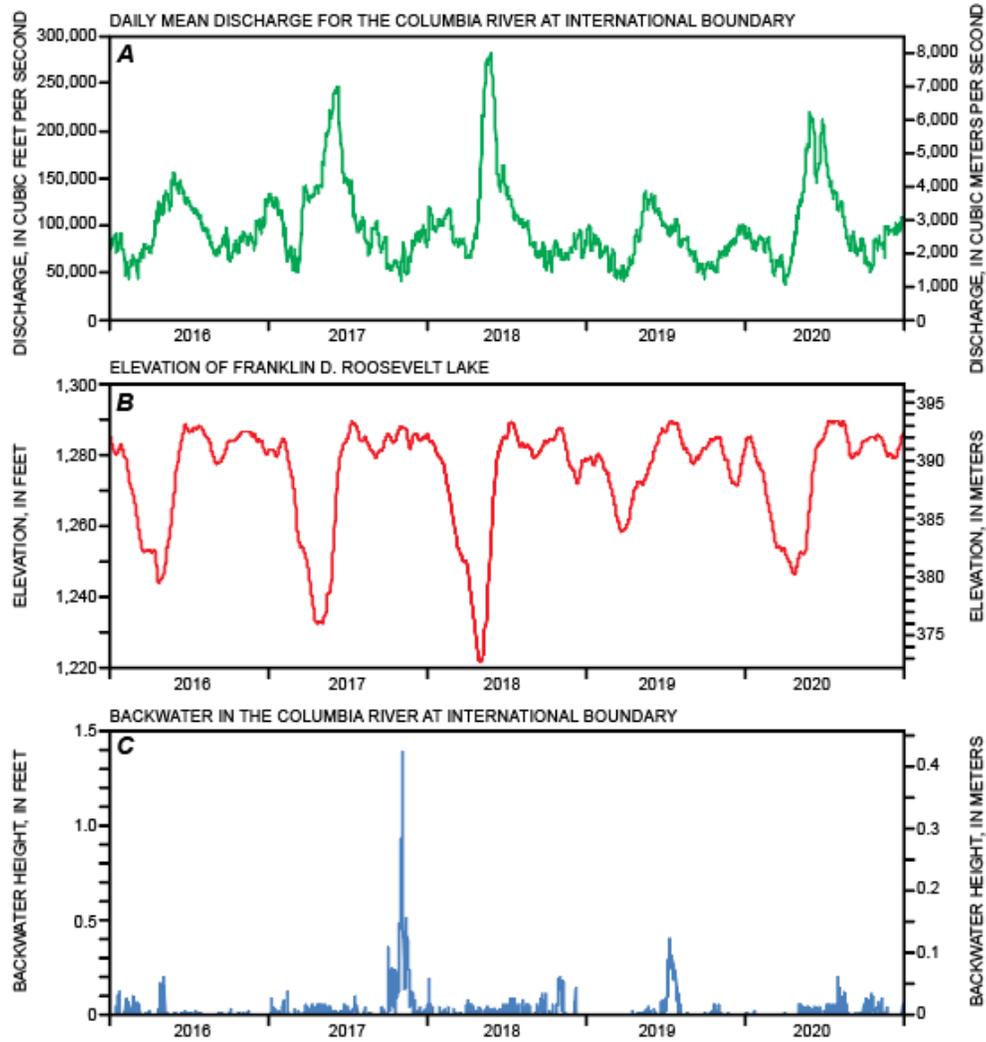


Figure 2. Hydrographs of A) daily mean discharge for the Columbia River at the international boundary, B) elevation of Franklin D. Roosevelt Lake, and C) backwater in the Columbia River at the international boundary.

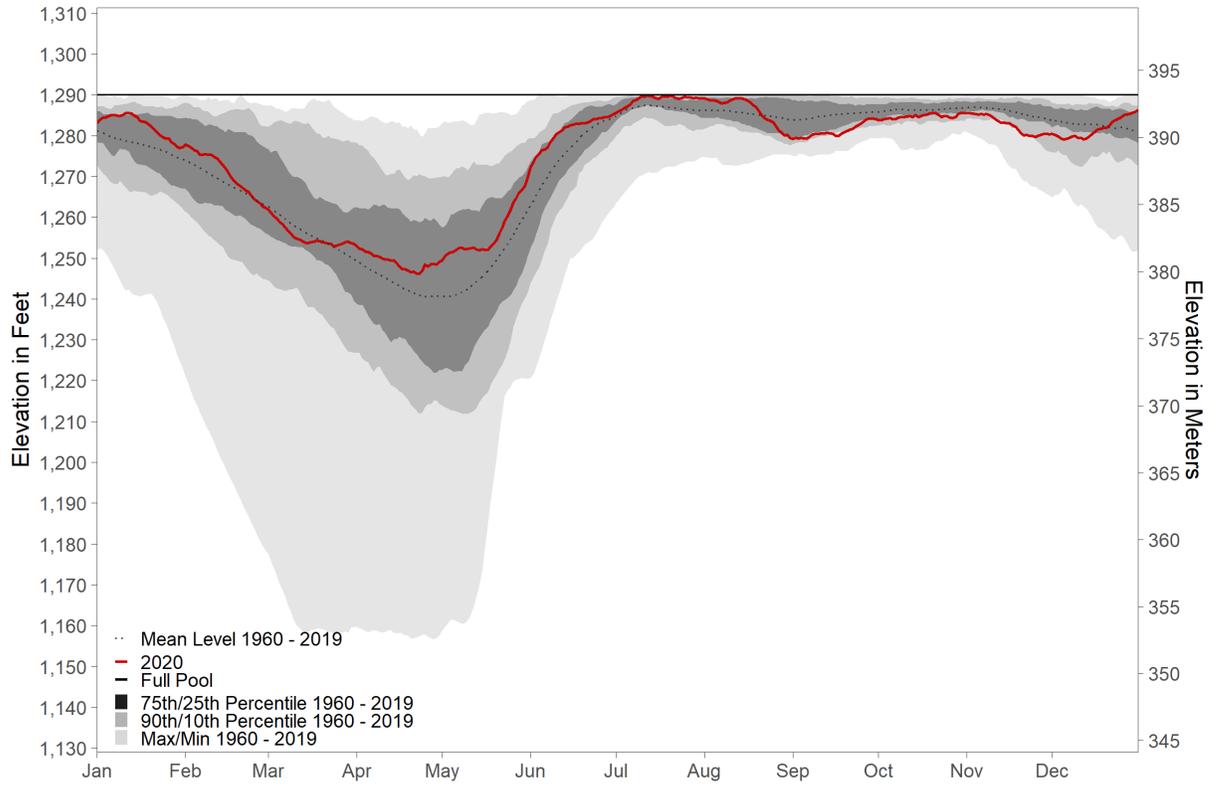


Figure 3. Franklin D. Roosevelt Lake (USGS Station 12436000). Historical range (1960-2019): maximum, 90th/10th and 75th/25th percentiles, minimum, and 2020 daily mean water-surface elevation (U.S. Bureau of Reclamation, 2021).

INTERNATIONAL COLUMBIA RIVER BOARD OF CONTROL MEMBERSHIP

 Canadian Membership	 U.S. Membership
<p>Dave Hutchinson Chair, Canadian Section Regional Chief, Pacific and North Hydrometric Operations National Hydrological Services Environment & Climate Change Canada 201 - 401 Burrard Street Vancouver, British Columbia V6C 3S5 Phone: (604) 240-7640 Email: david.hutchinson@canada.ca</p>	<p>Cynthia Barton, PhD Chair, U.S. Section Director, Washington Water Science Center U.S. Geological Survey 934 Broadway, Suite 300 Tacoma, Washington 98402 Phone: (253) 552-1602 Fax: (253) 552-1581 Email: cbarton@usgs.gov</p>
<p>Secretaries</p>	
<p>Martin Suchy Secretary, Canadian Section Hydrogeologist National Hydrological Services Environment & Climate Change Canada 201 - 401 Burrard Street Vancouver, British Columbia V6C 3S5 Phone: (604) 209-3712 Email: martin.suchy@canada.ca</p>	<p>Andrew Gendaszek Secretary, U.S. Section Research Hydrologist, Washington Water Science Ctr U.S. Geological Survey 934 Broadway, Suite 300 Tacoma, Washington 98402 Phone: (253) 552-1612 Fax: (253) 552-1581 Email: agendasz@usgs.gov</p>