International Columbia River Board of Control

2015 Annual Report to the

International Joint Commission

Cover: Franklin D. Roosevelt Lake in Washington State. The lake is formed by impoundment of the Columbia River by Grand Coulee Dam, for which the original construction was completed in 1941. 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 km^2) and is the largest lake in Washington State.

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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 Columbia River discharge 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.

COLUMBIA RIVER TREATY REVIEW

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 begun the process of evaluating future options regarding the Treaty. To date, there has been no announcement by either country of intent to terminate or seek changes to the Treaty.

ACTIVITIES OF THE BOARD IN 2015

The Board determined that the Applicant was in compliance with the IJC Order in 2015.

The Board presented progress reports during the semi-annual IJC meetings on April 29 in Washington, DC, and October 28 in Ottawa, ON. The April meeting was attended in person by the chairs and secretaries of the Canadian and U.S. sections of the Board. The October meeting was attended in person by the chair of the Canadian section of the Board and the secretary of the U.S. section.

The Board website (http://ijc.org/en_/icrbc) was updated to include the Board's 2014 annual report to the IJC.

HYDROLOGIC CONDITIONS IN 2015

During 2015, the U.S. Geological Survey continued the collection of information concerning the water levels of Franklin D. Roosevelt Lake at Grand Coulee Dam and, in cooperation with the Water Survey of Canada, the water levels and discharges of the Columbia River at the international boundary. Backwater at the international boundary was computed from available data.

The annual flow of the Columbia River at Grand Coulee Dam for calendar year 2015 totaled 69.2 million acre-feet (85.4 cubic kilometers), or 88 percent of the mean annual volume for the 102-year period of record of 78.4 million acre-feet (96.7 cubic kilometers). The instantaneous maximum (peak) discharge of the Columbia River at the international boundary was 162,000 cfs (4,590 cms) on June 4, which is 63 percent of the mean annual peak discharge for the 78-year period of record of 258,000 cfs (7,310 cms). Daily mean discharge for the Columbia River at the international boundary for 2011-15 is shown in figure 1A.

Extremes of instantaneous stage recorded on the lake in 2015 varied between elevations 1,248.05 ft (380.41 m) on May 24 and 1,289.70 ft (393.10 m) on July 13. Elevations 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 December 31, 2015, was 1,285.19 ft (391.73 m). Water-level elevation in Franklin D. Roosevelt Lake for 2011-15 is shown in figure 1B.

An analysis of the data indicates that backwater at the international boundary varied during the year between 0.00 ft (0.00 m) and 0.46 ft (0.14 m). Backwater on December 31, 2015, was 0.03 ft (0.01 m). Backwater that occurred at the international boundary during 2011-15 is plotted in figure 1C. Backwater since the time of filling of Franklin D. Roosevelt Lake in June 1942 to December 31, 2010, is plotted on the charts submitted with previous annual reports.

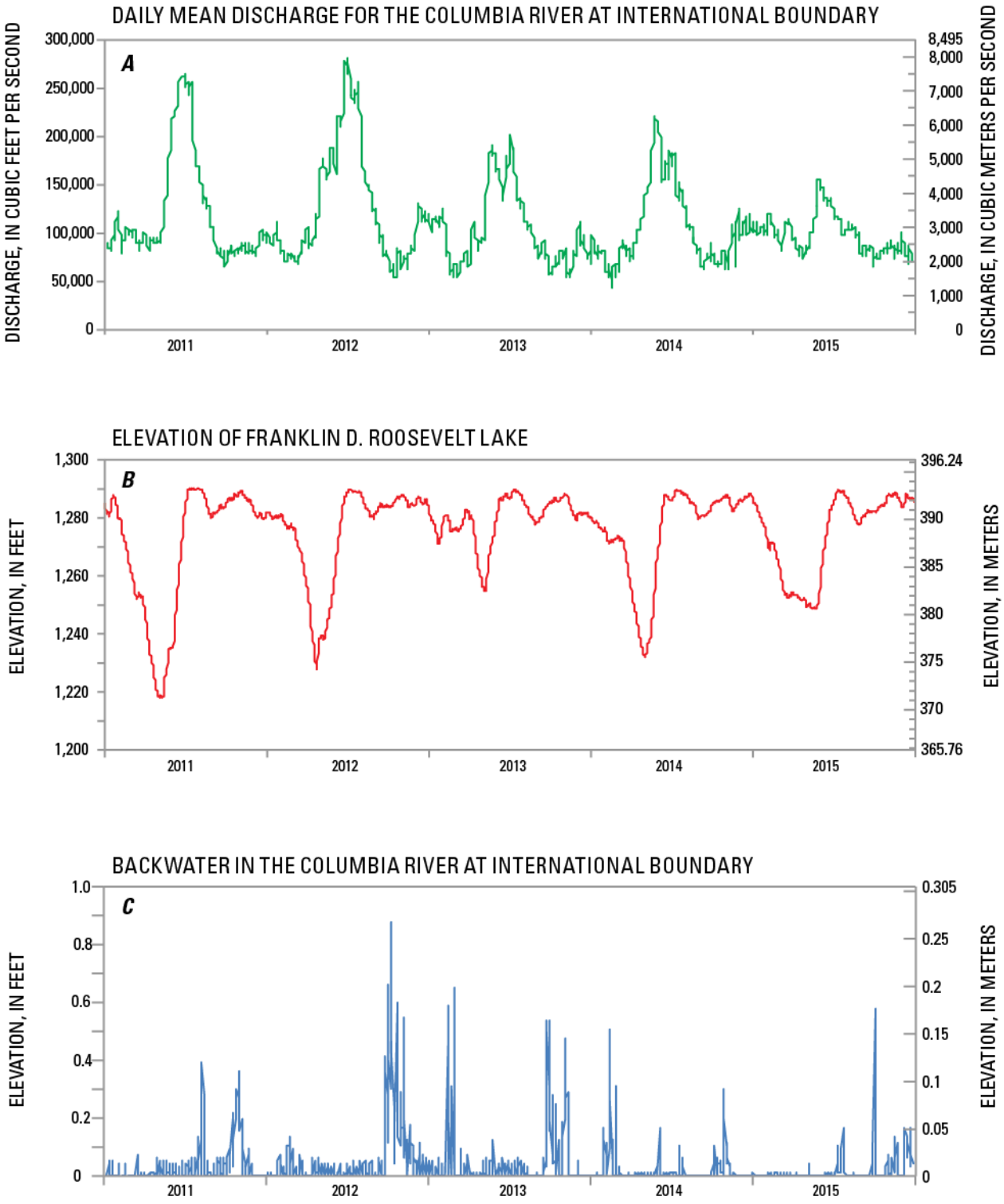

Figure 1. Hydrographs of A) daily mean discharge for the Columbia River at the international boundary, B) elevation of Franklin D. Roosevelt Lake, and C) backwater in the Columbia River at the international boundary, 2011-15.

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