

International Osoyoos Lake Board of Control

2009 Annual Report to the International Joint Commission



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International Osoyoos Lake Board of Control

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The International Osoyoos Lake Board of Control was established on September 12, 1946, by the International Joint Commission (IJC) to carry out the provisions of the Commission's Order. The present Board operates under the authority of the Commission's Order dated December 9, 1982, and the Supplementary Order of Approval dated October 17, 1985.

ACTIVITIES OF THE BOARD

Meetings

On June 13, 2009, U.S. Board member Kris Kaufmann was present in Niagara Falls for IJC's Centennial Celebration of the Boundary Waters Treaty of 1909 and the creation of the International Joint Commission of Canada and the United States.

Several studies outlined in the publication "Plan of Study for Renewal of the International Joint Commission's Osoyoos Lake Orders" began in 2009. On June 25, 2009, several Board members attended a kick-off meeting in Oroville, WA with Brian Guy and associates from Summit Environmental Consultants Ltd., the consultant hired to conduct studies 7 and 8 (the studies are listed by number in the appendix). On September 23, 2009, the Board participated in a similar meeting in Olympia, WA with Michael Barber of Washington State University, who was hired to conduct studies 1, 4, and 5.

On October 20, 2009, the Board held its annual Board and Public meetings in Osoyoos, BC. Michael Laitta with IJC gave the Board a presentation on harmonization of GIS data sets for the Okanagan Basin that is planned as part of the International Watershed Initiative. Updates on studies currently underway in advance of the 2013 renewal of the IJC's Osoyoos Lake Order were presented to the Board and public by Brian Guy from Summit Environmental Consultants Ltd., and, Michael Barber from Washington State University. On October 21, the Washington State Department of Ecology hosted a tour of Zosel Dam for Board meeting participants. Minutes for both meetings are available on the Web at http://www.ijc.org/conseil_board/osoyoos/en/osoyoos_home_accueil.htm.

On October 29, 2009, the Board participated by videoconference in the Commission's Fall Semi-Annual meeting in Ottawa. U.S. Board Chair Cynthia Barton presented a brief summary of 2009 hydrologic conditions associated with Osoyoos Lake and of the studies underway as part of the order's renewal process.

HYDROLOGIC CONDITIONS IN 2009

Drought Criteria

Condition 8 of the Commission's Order of Approval dated December 9, 1982, provides three criteria for declaring a year of drought. In a year of drought, the level of Osoyoos Lake during summer may be managed within a wider range as compared to non-drought years. The actual water-level ranges are discussed in the next section. During 2009, all three drought criteria were met (table 1). On April 15, 2009, the Board notified the Washington State Department of Ecology in writing that drought conditions for operating Osoyoos Lake would be invoked in 2009.

Table 1. Summary of drought criteria and actual values in 2009. [ac-ft, acre-feet; ft, feet]

Criteria for declaring a drought	Actual value in 2009	Drought criteria met?
Condition 8(a) - Volume of flow in the Similkameen River at Nighthawk, WA, for the period April through July is less than 1 million acre-feet	808,400 ac-ft	Yes
Condition 8(b) - Net inflow to Okanagan Lake for the period April through July is less than 195,000 acre-feet	148,570 ac-ft	Yes
Condition 8(c) - Level of Okanagan Lake in June or July is less than 1,122.80 feet (Canadian Geodetic Survey Datum)	1,122.40 feet	Yes

Osoyoos Lake Levels

Throughout any given year, the level of Osoyoos Lake may fluctuate in accordance with criteria specified in the IJC's Order of Approval dated December 9, 1982. Lake levels are influenced naturally by discharge in the Okanagan and Similkameen Rivers and by the operation of Zosel Dam, situated at the outlet of the lake. The Oroville-Tonasket Irrigation District operates Zosel Dam under authority from the State of Washington, Department of Ecology.

The blue area in figure 1 shows the authorized range of normal operating elevations, 909.0 to 911.5 feet (277.06 to 277.83 meters) in the winter months and 911.0 to 911.5 feet (277.67 to 277.83 meters) in summer. The area contained within the dotted line in figure 1 shows the authorized range of elevations, 910.5 to 913.0 feet (277.52 to 278.28 meters) that may be used to manage storage from April 1 to October 31 if at least one of the drought criterion listed in table 1 is declared in effect by the Board. Condition 9 of the 1982 Order recognizes that backwater from high flow in the Similkameen River and (or) excessive flow in the Okanagan River may cause Osoyoos Lake levels to rise above the authorized range.

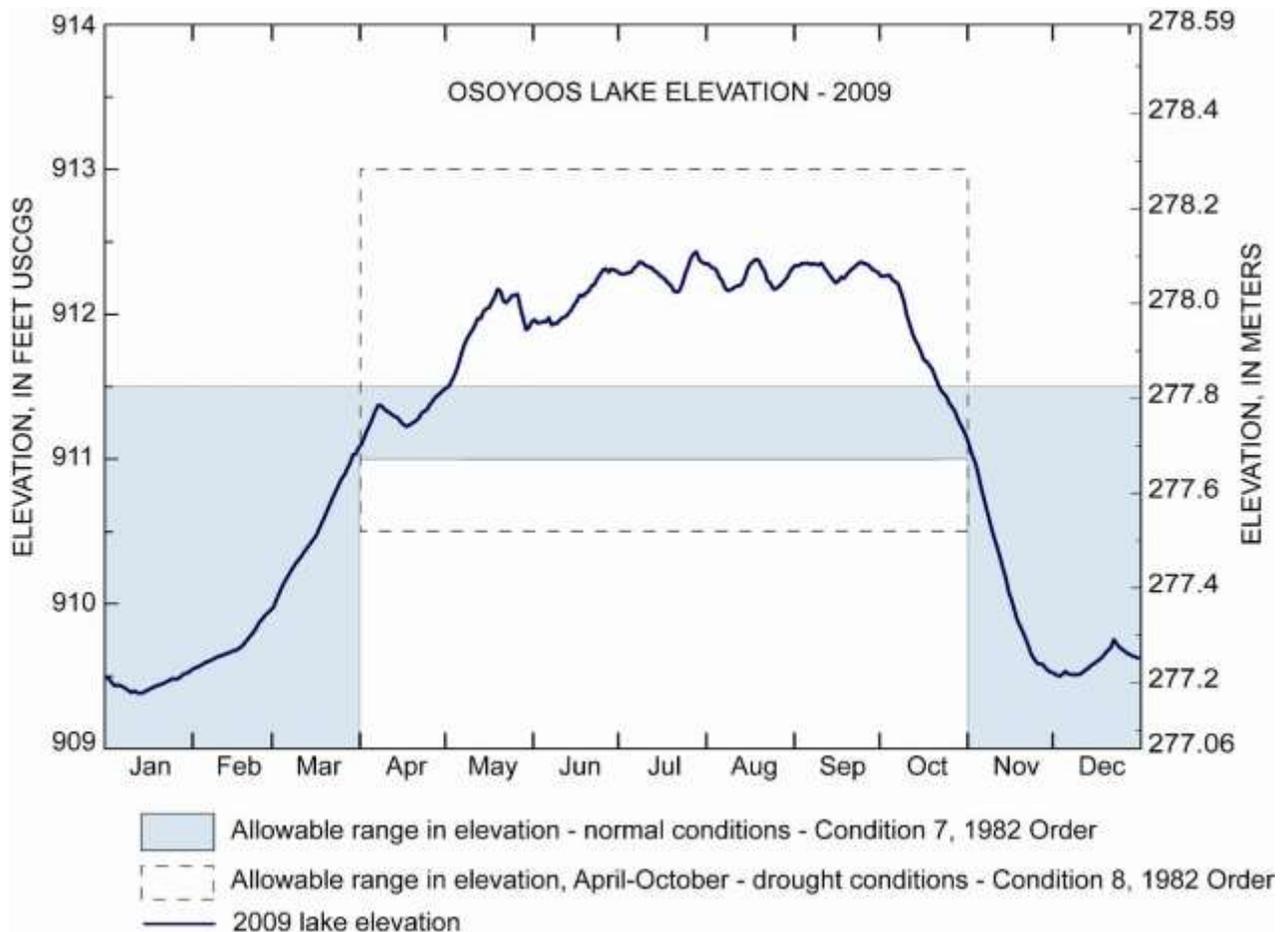


Figure 1. Osoyoos Lake elevation in 2009, and the range of lake levels permitted under the IJC Order of Approval dated December 9, 1982.

In 2009, Osoyoos Lake levels were maintained within the authorized ranges for the entire year (figure 1). Since a year of drought was declared in 2009, lake levels were maintained above 911.5 feet for most of the April-October period (figure 1). The maximum instantaneous elevation on Osoyoos Lake of 912.46 feet (278.118 meters) occurred on July 28, 2009. The maximum daily-mean elevation of 912.43 feet (278.109 meters) also occurred on July 28. The minimum instantaneous elevation of 909.38 ft (277.179 meters) occurred on January 10, 12-14.

River Discharges

The maximum instantaneous discharge of the Okanogan River at Oroville (downstream from Zosel Dam) occurred on May 15, 2009, and was 1,070 cubic feet per second (30.3 cubic meters per second). The peak flow did not exceed 2,500 cubic feet per second (70.8 cubic meters per second); thus, the capacity of the outlet channel was not verified in accordance with Condition 3 of the 1985 Order. The last occurrence of an instantaneous discharge in the Okanogan River at Oroville greater than 2,500 cubic feet per second was on June 16, 2006 (2,690 cubic feet per second). In November 2007, the State of Washington submitted HEC-RAS model results to the Board, thus completing the 2006 channel capacity analysis. The results verified the conveyance of the Okanogan River above Zosel Dam is at least 2,500 cubic feet per second at a lake elevation of 913 feet. The assurance of conveyance upstream of the dam is included in condition 4 of the 1985 Supplementary Order of Approval and is in

accord with the Board's requirements for step-backwater hydraulic analysis as approved in their September 16, 1998 meeting.

The maximum instantaneous discharge of the Similkameen River occurred on May 31, 2009, and was 11,300 cubic feet per second (320 cubic meters per second). The maximum daily-mean discharge of 11,100 cubic feet per second (314 cubic meters per second) occurred on June 1, 2009. High flow in the Similkameen River created variable backwater at the Okanogan River at Oroville gaging station from May 19 to June 11. The total volume of flow in the Similkameen River for 2009 (1.149 million acre-feet, 1,417 hectometers) was 69 percent of average and ranked as the sixteenth lowest runoff volume in 81 years of record.

Data on Osoyoos Lake elevation and relevant river flows for 2009 are summarized in the appendix and river hydrographs are depicted in figure 2.

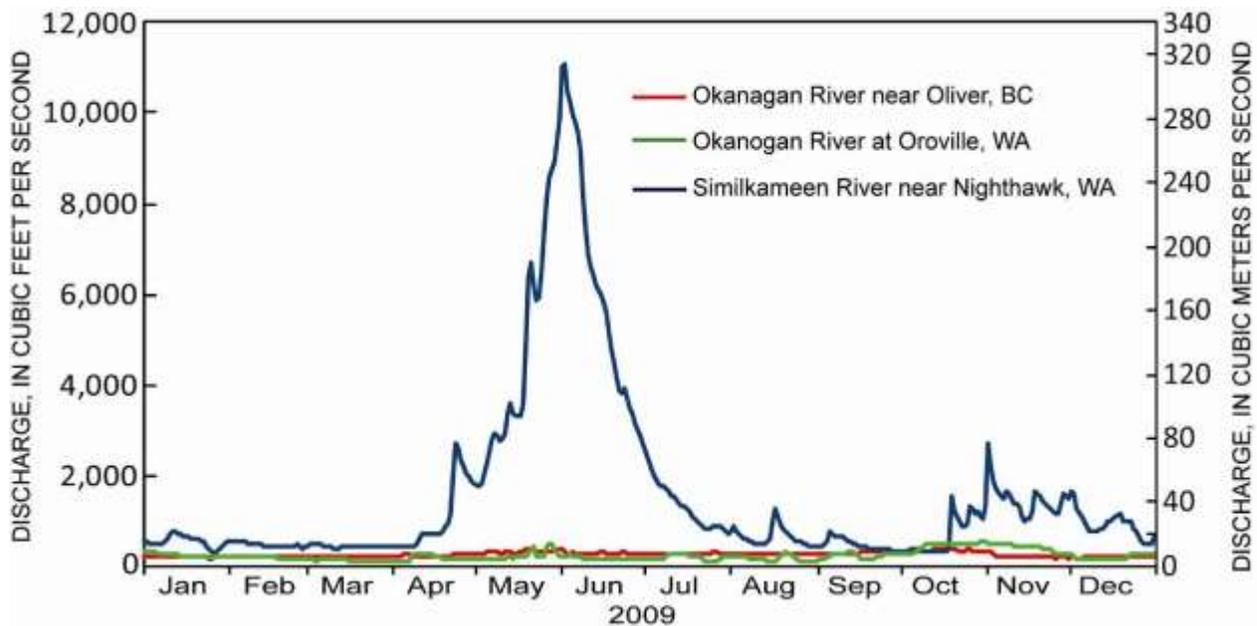


Figure 2. Hydrographs of daily-mean discharge for the Similkameen and Okanogan (Okanogan in Canada) Rivers, 2009.

APPENDIX

STUDIES LISTED IN THE PLAN OF STUDY FOR RENEWAL OF THE OSOYOOS LAKE ORDERS

1. An assessment of the most suitable water levels for Osoyoos Lake during drought years.
2. An evaluation of the criteria used to declare drought.
3. A review of the dates for switching between summer and winter operation.
4. An investigation of the effects, if any, of water regulation on water quality in Osoyoos Lake.
5. An investigation of methods for including ecosystem requirements in Orders of Approval.
6. An investigation of methods for including climate change information in Orders of Approval.
7. A Demonstration of the factors that govern lake levels during floods.
8. An assessment of the methods used to monitor flow capacity in the Okanogan River.

OSOYOOS LAKE LEVELS, INFLOWS, AND OUTFLOWS
[cubic feet per second, cfs; cubic meters per second, cms]

A. International gaging stations in operation throughout the year:

(1) For Stage Records

Osoyoos Lake near Oroville, Washington
Okanogan River at Oroville, Washington (auxiliary gage)

(2) For Discharge Records

Okanogan River near Oliver, British Columbia
Okanogan River at Oroville, Washington (base gage)
Similkameen River near Nighthawk, Washington

(3) Reports

Monthly summary reports of stage and discharge data were forwarded to the International Joint Commission and to the Board of Control members.

B. Compliance with the lake levels specified in the Orders of Approval is measured at the station "Osoyoos Lake near Oroville," where elevations are expressed in terms of USCGS datum.

C. Osoyoos Lake

Maximum daily mean elevation	912.43 feet (278.109 meters)– July 28
Maximum instantaneous elevation	912.46 feet (278.118 meters)– July 28
Minimum instantaneous elevation	909.38 feet (277.179 meters)– January 10, 12-14
Lake elevation at time of peak flow for Okanogan River at Oroville	912.02 feet (277.984 meters)– May 15

D. Okanogan River at Oroville

Maximum instantaneous discharge	1,070 cfs (30.3 cms)– May 15
Maximum daily mean discharge	533 cfs (15.1 cms)–October 29
Annual mean discharge	242 cfs (6.85 cms)

The annual mean discharge was 36 percent of the 67-year average of 669 cfs.

E. Similkameen River near Nighthawk

Maximum instantaneous discharge	11,300 cfs (320 cms)– May 31
Maximum daily mean discharge	11,100 cfs (314 cms)– June 1

High Similkameen River discharges created variable backwater at the Okanogan River at Oroville gaging station for the period May 19– June 11.

INTERNATIONAL OSOYOOS LAKE BOARD OF CONTROL MEMBERSHIP

 Canadian Membership	 U.S. Membership
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Secretaries	
<p>Daniel Millar Secretary, Canadian Section Water Issues Environment Canada 201 - 401 Burrard Street Vancouver, British Columbia V6C 3S5 Phone: (604) 664-9345 Fax: (604) 713-9527 Email: Daniel.Millar@ec.gc.ca</p>	<p>Robert Kimbrough Secretary, U.S. Section Assistant Center Director for Hydrologic Data USGS Washington Water Science Center U.S. Geological Survey 934 Broadway, Suite 300 Tacoma, Washington 98402-4300 Phone: (253) 552-1608 Fax: (253) 552-1581 Email: rakimbro@usgs.gov</p>