

Modeling Results: Iteration One

COLUMBIA RIVER TREATY 2014/2024 REVIEW

CRPAG

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Overview of Today's Presentation

- ◆ Basics of Treaty Review
- ◆ Key Terms and Definitions
- ◆ Iteration 1 Alternatives
- ◆ Iteration 1 Modeling Results
- ◆ Next Steps for Treaty Review

Basics of Treaty Review

1. Understand
 - ♦ Start by understanding regional needs and priorities.
2. Determine
 - ♦ Can the current Treaty meet those needs?
 - ♦ Does the Treaty need to be changed?
 - ♦ Are the changes so significant that we have to start over with a new Treaty?
3. Arrive at that determination by:
 - ♦ Collecting information
 - ♦ Evaluating the results
 - ♦ Assessing impacts on various river interests

Basics, cont.

1. Evaluation takes place over three “iterations.”
2. Each iteration tests a number of scenarios or “alternatives.”
3. Information from each iteration used to refine approach and build alternatives for the next iteration.



Basics, cont.

- ◆ Iteration One has just been completed.
 - ◆ Current Condition (only for comparison)
 - ◆ Alternatives post 2024:
 - ◆ 450 kcfs – Treaty Continues and Treaty Terminates
 - ◆ Uses current storage reservation diagrams
 - ◆ 600 kcfs – Treaty Continues and Treaty Terminates
 - ◆ Uses relaxed storage reservation diagrams

Key Terms and Definitions

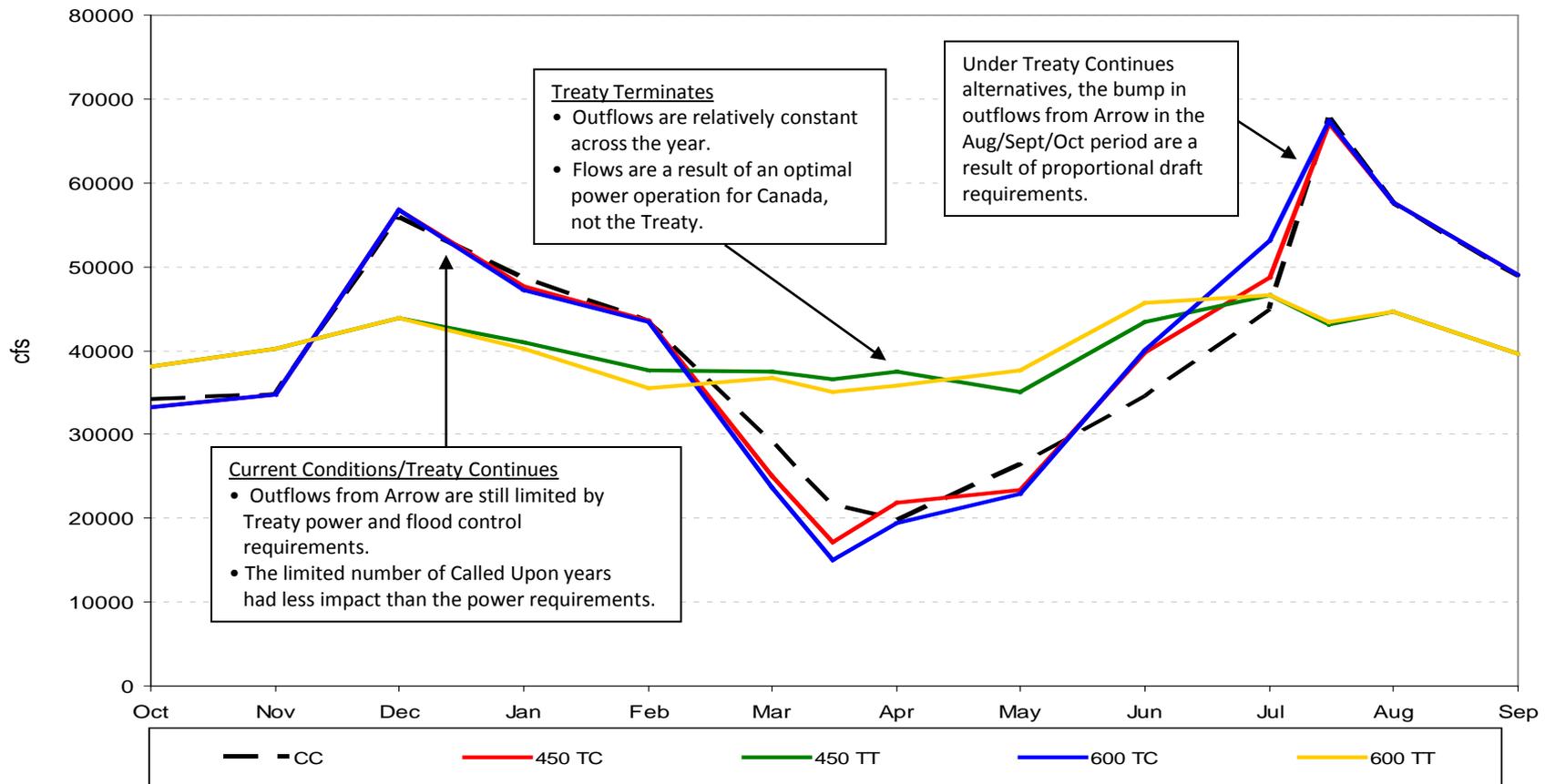
- ◆ Canadian Entitlement
- ◆ Effective Use
- ◆ Called Upon Flood Control
- ◆ Flood Flow Objective
- ◆ Storage Reservation Diagrams
- ◆ Peak Flows

Key Assumptions in Iteration 1

- ◆ Assumptions about Canadian Operations Post-2024 without the Treaty.
- ◆ Flood Risk Management: Effective Use and Called Upon
- ◆ Both assumptions affected outcomes across all scenarios.

Canadian Operations: With (TC) and without (TT) the Treaty

Arrow - Average Outflow - All Years



Iteration 1 Results

Flood Risk Management

Effective Use
Called Upon
Peak Flows



Flood Risk Management Effective Use at 450kcfs...

Treaty Continues

- ◆ Effective use in 18 out of 70 Years

Treaty Terminates

- ◆ Effective use in 23 out of 70 Years

Why is this important?

Under effective use most U.S. reservoirs are drawn down to lower water levels more frequently. This could:

- ♦ Limit a reservoir's ability to refill.
- ♦ Hinder the ability to meet needs such as irrigation, summer fish flows, recreation and protection of cultural resources.

Flood Risk Management Effective Use at 600 kcfs...

Effective use 1 time in 70 Years, Treaty Continues or Terminates

Increases fish flows during the spring and keeps some U.S. reservoirs fuller.

May increase flood risk. Increases peak river flows

Average: 17-21 kcfs higher

In 10 wettest years: 28-49 kcfs higher

(more analysis in iteration 2)

Flood Risk Management

How often do we “Call Upon” Canada for more storage?

At 450 kcfs...

- ◆ Treaty Continues – 4 times in 70 Years
- ◆ Treaty Terminates – 6 times in 70 Years

At 600 kcfs...

- ◆ 0 times in 70 Years

Why is this important?

Called Upon has financial impacts to U.S. – \$4-\$34 million per request (based on power cost to Canada).

For Iteration 2...

Analysis of the annual average payment required for Called Upon.

Iteration 1 Results

Ecosystem-Based Function

Reservoir Levels

River Flows



Ecosystem-Based Function

Reservoir Elevations

- ◆ Effective use resulted in deeper draw downs and less frequent refill for some reservoirs. Could have an impact on resident fish, cultural resources, recreation, and irrigation.
- ◆ In several tributary sub-basins, Treaty operations had little or no effect on reservoir elevations and outflows.

Ecosystem-Based Function

River Flows

- ◆ In the Lower Columbia Basin, Treaty Terminates alternatives resulted in:
 - ◆ Lower winter flows
 - ◆ Higher spring flows
 - ◆ Lower late summer flows
- ◆ 600 kcfs alternatives increased peak river flows in the spring –Treaty or no Treaty.



Why is this important?

- ◆ Lower summer flows could affect ability to meet summer fish flow objectives.
- ◆ Reduction in winter flows could affect salmon protection flow objectives.
- ◆ Higher spring flows could benefit juvenile salmon migration.

For Iteration 2...

We will continue to examine these preliminary results.

Iteration 1 Results

Hydropower

Canadian Entitlement
Hydropower Generation



Canadian Entitlement

If the Treaty continues, U. S. payment of Canadian Entitlement also continues:

- ♦ Energy -- 442aMW Capacity -- 1331 MW

Estimated value of Canadian Entitlement in 2024:

- ♦ Energy -- \$113-\$219 million
- ♦ Capacity -- \$115 million
- ♦ Combined -- \$229-\$335 million per year

Hydropower Generation

Net effect of terminating the Treaty on total power and power costs (including the entitlement) for each country:

	Average Annual Hydropower Generation (aaMW)
Canada	410 loss (-\$220 to -\$320 million)
United States	325 – 350 gain (+\$180 to \$280 million)

Next Steps for Treaty Review

- ◆ End of 2012: Iteration 2 Completed
- ◆ Winter 2013: Stakeholder Listening Sessions on Iteration 2
- ◆ Website: <http://www.crt2014-2024review.gov/>