Albeni Falls Dam Downstream Water Temperature Study

Interim Results

Amy Reese, Chief Water Management Section

Seattle District

June 24, 2014

US Army Corps of Engineers

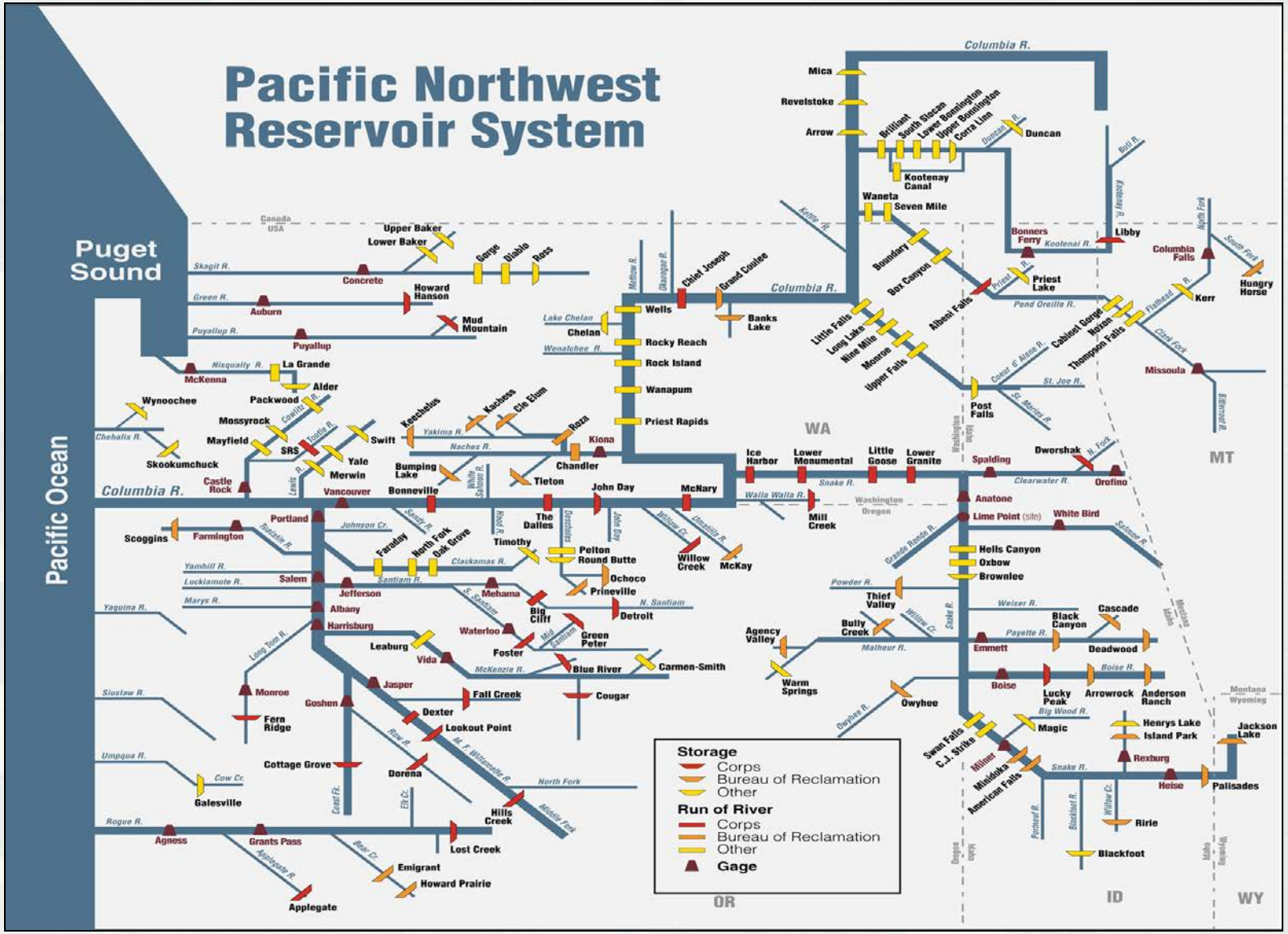
BUILDING STRONG®

What we hope to cover today

- Albeni Falls Dam – General Operation
  - Authority and Operational Requirements
  - Corps plan for 2014 operations
- Kalispel MOA –
  - background
  - water temperature modeling work
  - results and next steps

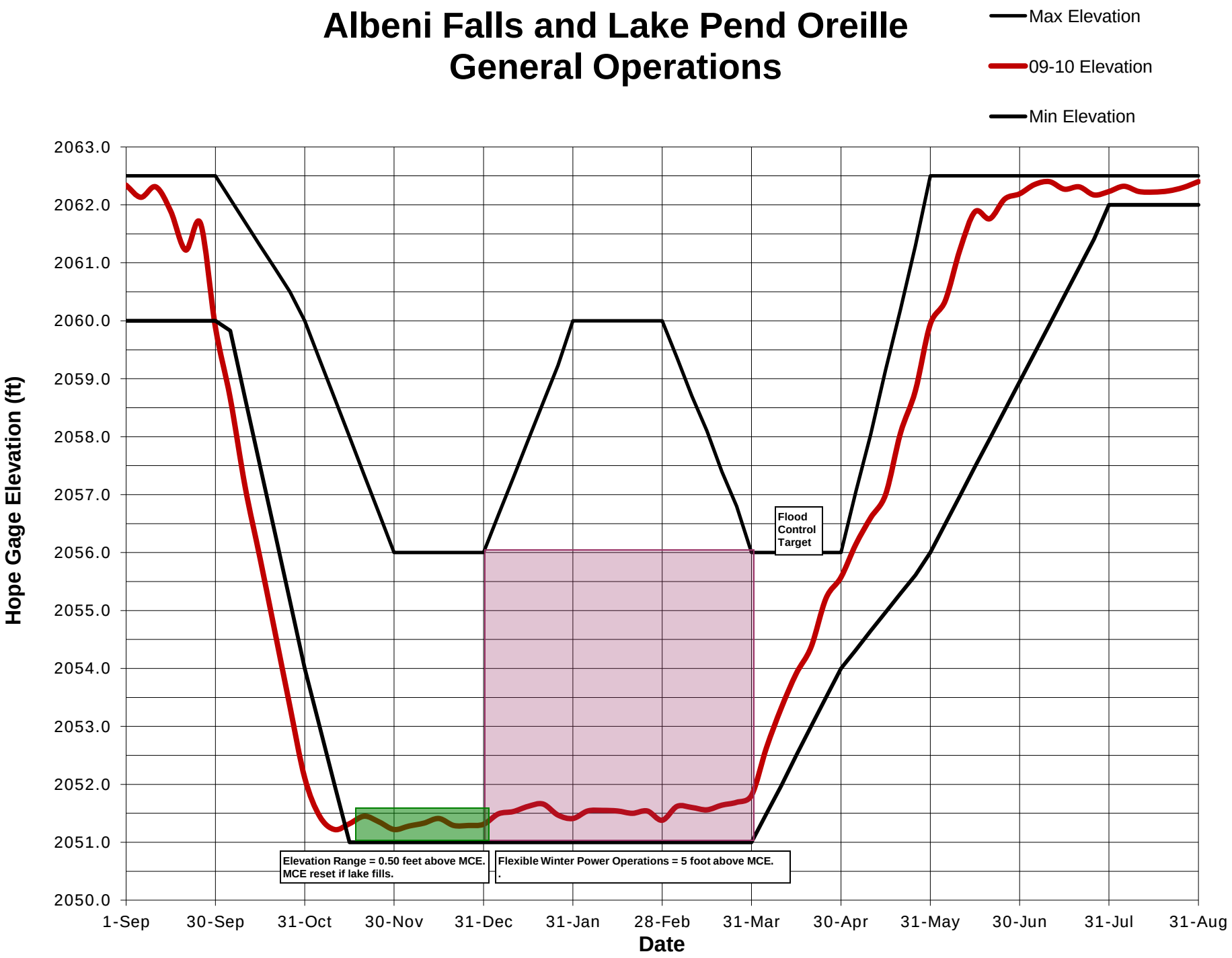
Project Authority and Operation Requirements

- Authorized under Flood Control Act of 1950; substantially in accordance with Senate Doc No. 9
- Authorized as part of a system-wide development to respond to the great flood of 1948 and meet PNW electric generation needs
- Clean Water Act, Endangered Species Act, National Environmental Policy Act, Northwest Power Act
- Applicable Treaties (1964 CRT)
- Executive Orders, Court Orders or agreements such as the Kokanee Agreement with the state of Idaho 1957



BUILDING STRONG®

Albeni Falls and Lake Pend Oreille General Operations



Kalispel MOA

- 10-year agreement between BPA, Corps and Kalispel Tribe of Indians
- BPA conducted a 30-day review period June 30 – August 1, 2011 and entered a record of decision July 6, 2012
- Includes schedule for fish passage studies

Kalispel MOA

- Includes the Corps and Tribe to collaborate on temperature studies
  - Can releases from Albeni Falls Dam benefit bull trout?
  - Distinguishes between post-labor day temperature operation and pre-labor day
  - Post-labor day requires “SOR” and may be implemented
  - Pre-labor day has potential to be evaluated

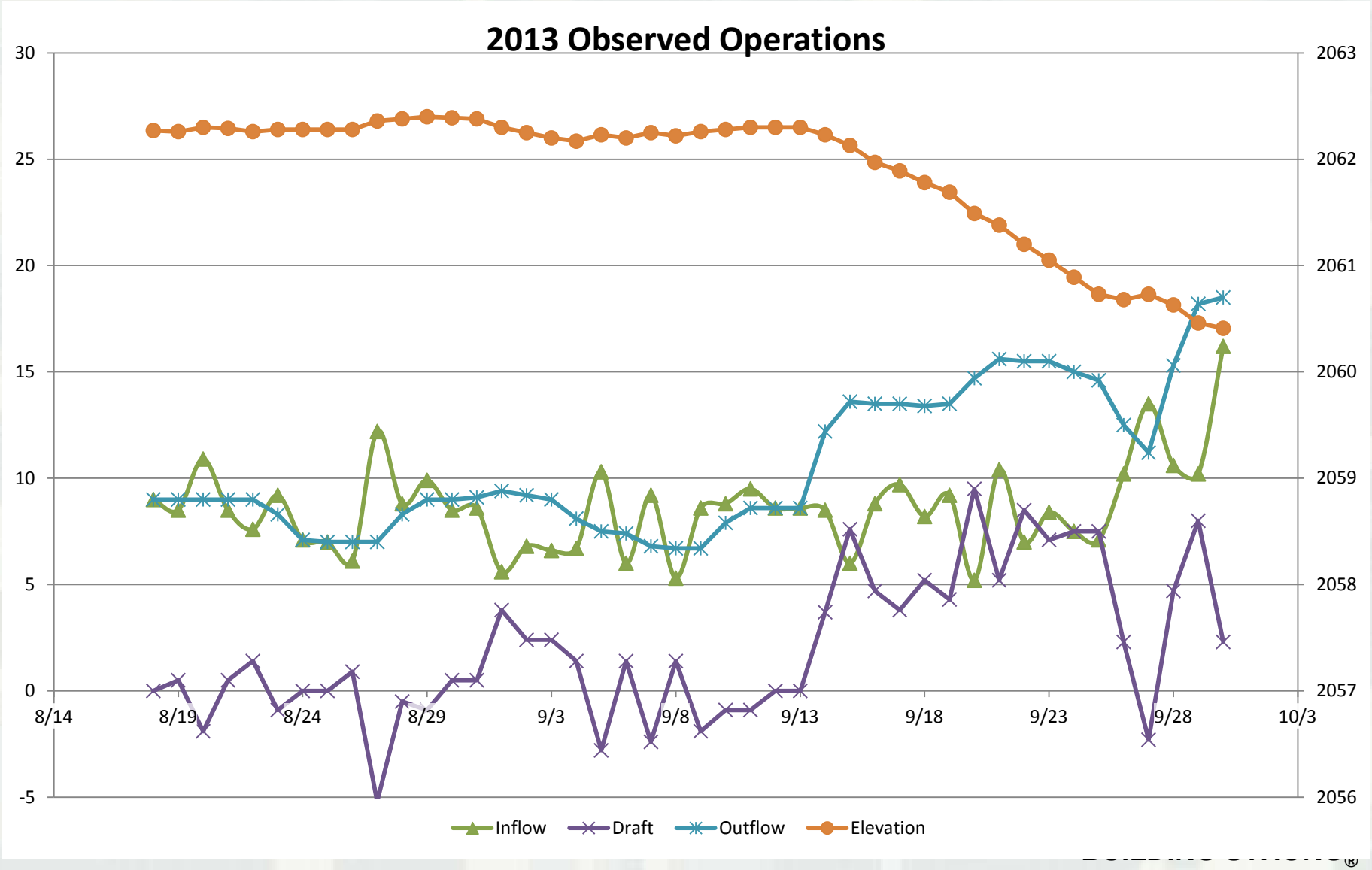
Does this mean that we will draft the lake in summer?

- No. Any change of operation from our current water control plan (which is in accordance with authorized purpose, subsequent agreements and law) would undergo NEPA documentation and coordination.
- There are no plans to make a change from our water control plan at this time.

Project Status

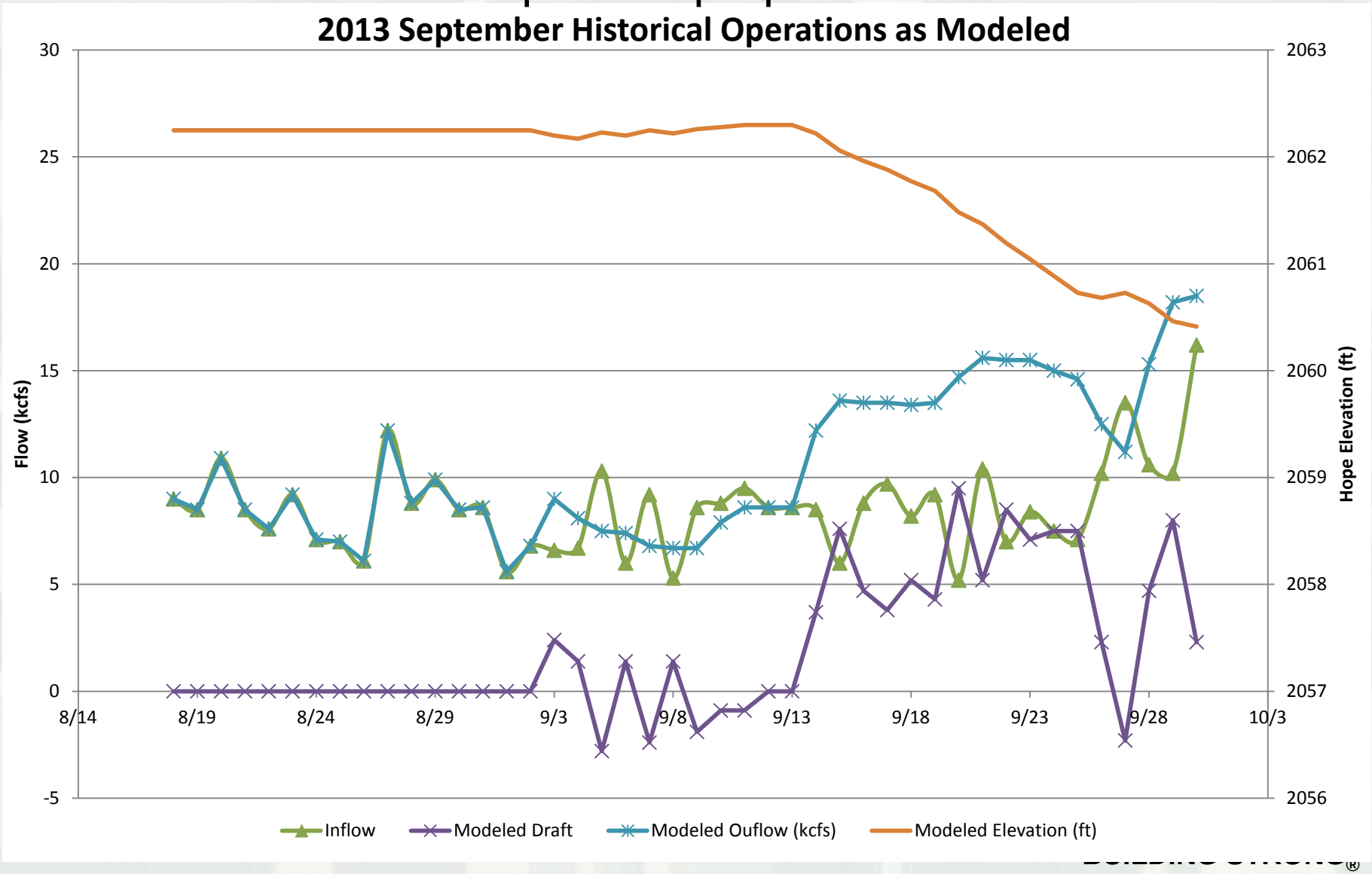
- Review of and agreement to use CE-QUAL W2 model
- 4 sets of modeling completed, 5th set nearing completion.
- *Draft* triggers identified for executing a Temperature Management Operation:
  - During prominent cold weather conditions, decrease river flows to increase exposure time in the POR
  - During hot weather conditions, increase river flows to reduce exposure time in the POR
  - When surface water temps in LPO are cooler than POR at AFD, increase flows to introduce cooler water downstream

Set E – Historical Operations

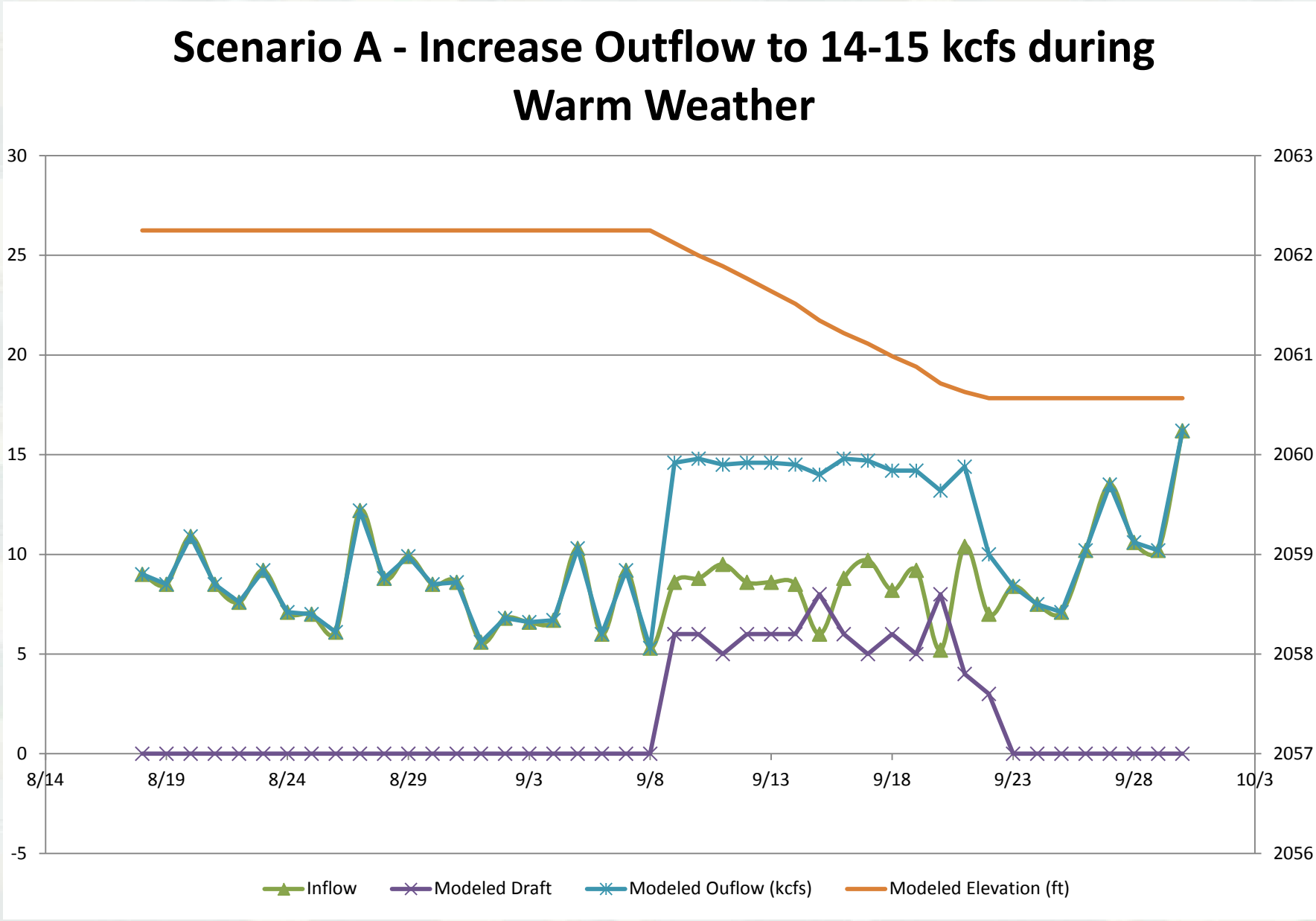


Set E – Historical Operations

as modeled for comparison purposes



Set E – scenario A



Set E Results

Case A14 Modeling Results Summary.
Difference in Daily Maximum Volume Weighted Temperatures

	1	2	3	4	5	6	7	8	9	10	11
9/1/13	0.0	0.0	0.0	0.0	-0.1	0.0	0.1	-0.1	-0.1	0.1	0.0
9/2/13	0.0	0.0	0.0	0.0	0.0	-0.1	0.1	0.0	-0.1	0.0	0.0
9/3/13	0.0	0.0	0.0	0.0	0.0	0.1	-0.1	0.0	0.0	0.0	-0.1
9/4/13	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
9/5/13	0.0	0.0	0.0	0.0	0.0	-0.1	0.1	0.0	0.0	0.1	0.0
9/6/13	0.0	-0.1	-0.1	0.0	0.1	-0.1	0.1	0.1	0.0	0.0	0.0
9/7/13	-0.1	-0.1	-0.2	-0.1	0.2	0.2	0.2	0.2	0.1	0.0	0.0
9/8/13	0.1	-0.2	-0.3	-0.2	-0.1	0.1	0.4	0.4	0.2	0.0	-0.1
9/9/13	0.1	-0.1	-0.3	-0.4	-0.4	-0.2	0.2	0.4	0.7	0.4	-0.1
9/10/13	0.0	0.2	-0.3	-0.4	-0.5	-0.4	-0.2	0.1	0.4	0.7	0.6
9/11/13	0.0	0.1	-0.1	-0.4	-0.5	-0.3	-0.4	-0.3	-0.1	0.2	0.5
9/12/13	0.0	0.0	0.1	-0.2	-0.4	-0.3	-0.4	-0.3	-0.2	-0.3	-0.1
9/13/13	0.0	0.0	0.0	0.0	-0.3	-0.3	-0.4	-0.2	-0.3	-0.3	-0.3
9/14/13	0.0	0.0	0.0	0.1	0.0	-0.2	-0.3	-0.3	-0.3	-0.2	-0.3
9/15/13	0.0	0.0	0.0	0.0	0.1	-0.1	-0.2	-0.3	-0.3	-0.2	-0.3
9/16/13	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	-0.2	-0.2	-0.3
9/17/13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	-0.2
9/18/13	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.1	0.2
9/19/13	0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.2	-0.1	-0.1	0.2
9/20/13	0.1	0.1	0.1	0.0	-0.1	-0.2	-0.3	-0.2	-0.1	-0.3	0.0
9/21/13	-0.1	0.4	0.2	0.0	-0.2	-0.3	-0.3	-0.3	-0.1	-0.2	0.0
9/22/13	0.0	0.2	0.5	0.1	-0.3	-0.3	-0.3	-0.4	-0.4	-0.3	-0.1
9/23/13	0.0	0.1	0.7	0.3	0.0	-0.4	-0.3	-0.4	-0.4	-0.3	-0.2
9/24/13	0.0	0.0	0.3	0.6	0.3	0.1	-0.1	-0.3	-0.4	-0.4	-0.2
9/25/13	-0.1	0.0	0.1	0.6	0.4	0.3	0.2	-0.1	-0.3	-0.3	-0.4
9/26/13	-0.1	0.2	0.1	0.3	0.5	0.5	0.3	0.0	-0.1	-0.2	-0.2
9/27/13	0.1	-0.2	0.5	0.2	0.3	0.4	0.4	0.3	0.2	0.0	-0.1
9/28/13	0.0	0.1	-0.1	0.5	0.1	0.3	0.3	0.3	0.4	0.3	0.3
9/29/13	0.0	0.0	-0.1	0.2	0.4	0.3	0.1	0.2	0.4	0.3	0.3
9/30/13	0.0	0.0	0.1	-0.2	0.3	0.7	0.4	0.3	0.1	0.3	0.4
10/1/13	0.0	0.0	0.0	0.0	-0.2	-0.2	0.2	0.5	0.4	0.3	0.1

Summary of Modeling Results

- Set E (Operational)
  - Modeling mostly completed. Partial results under analysis.
  - Flow increases during a warm weather event in September of 2013 may have affected river temperatures.

Next Steps

- Kalispel Tribe currently reviewing results
- Next phase of study will be to determine significance of results
- Potential for refined model runs
- Explore potential post-labor day temperature management operation
- Plan for fall 2014 September operation…

2014 Operations

- Winter lake level for support of Clark Fork Delta restoration work is 2051 ft.
- Target 2051 ft no later than Nov. 15th
- Hold lake within summer operating range until mid-September
- At or above 2061 ft through the 3rd weekend of Sept (last day of summer)
- Plan to be at or above elevation 2060.5 ft at end of September

Summary

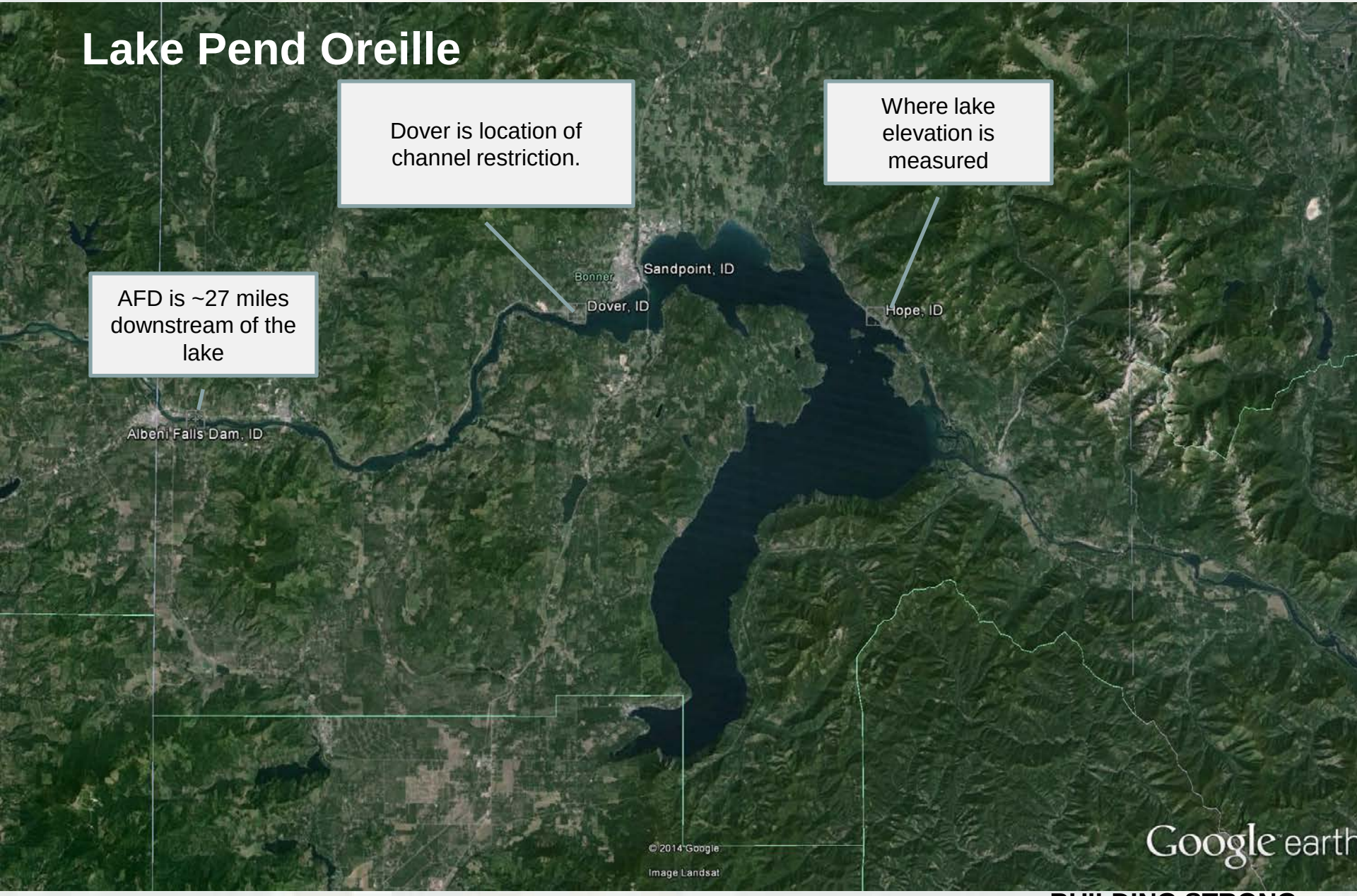
- Corps operates according to current water control plan and consistent with authorities, agreements and statutes.
- No plan to change summer operation which holds lake between 2062 and 2062.5 through Labor Day
- September 2014 operation is coordinated
- Temperature studies are ongoing, and latest results show dam releases can effect temperature.

Questions

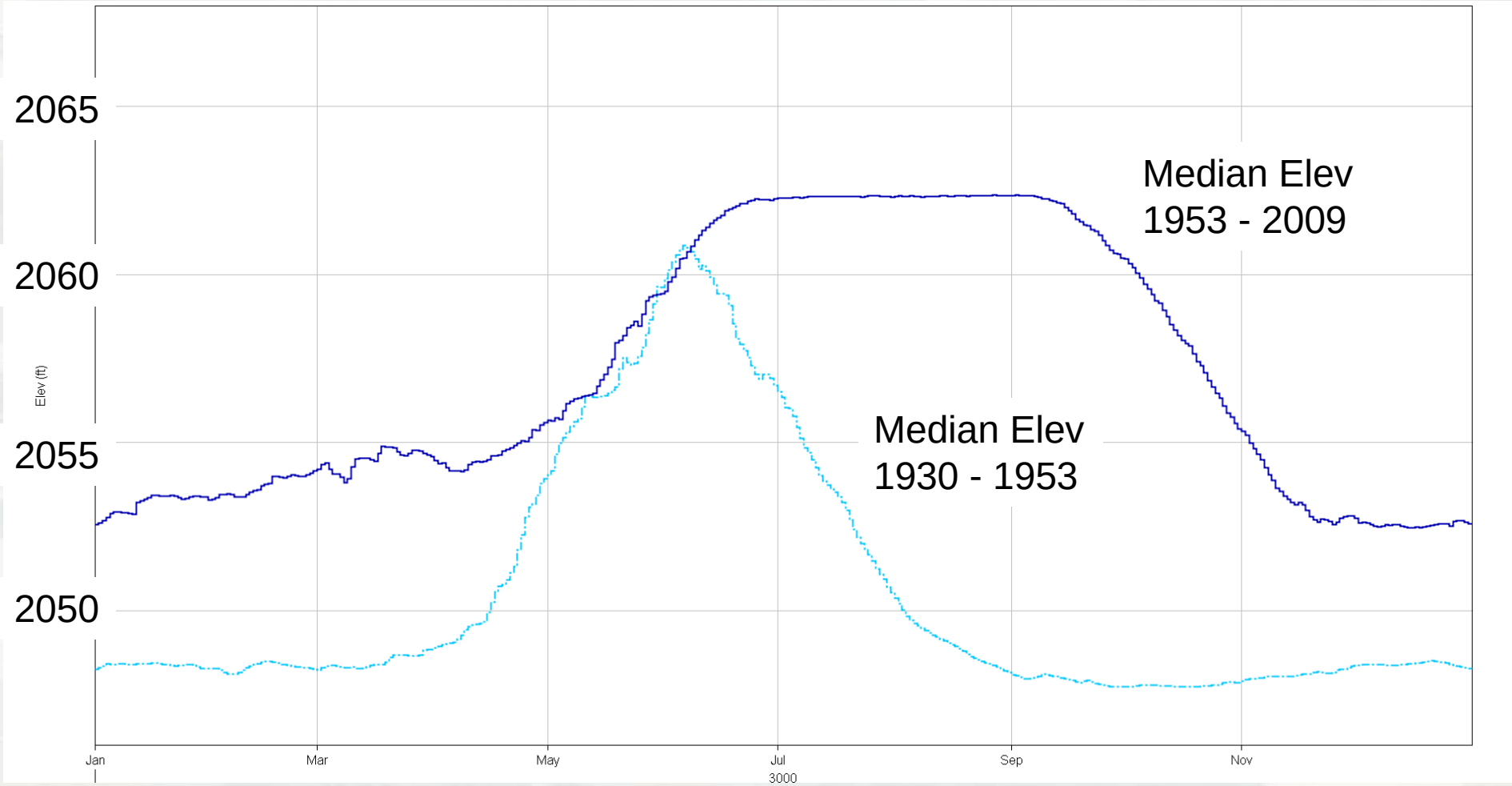
- Seattle District – 206.764.3750
- Scott Lawrence – 206.764.6896
- www.nws.usace.army.mil
  - ►Flow updates and projections

Backup Slides

Lake Pend Oreille



Lake Pend Oreille – pre and post AFD



Albeni Falls Dam Operations Aug 1 to Nov 30, 2013