

LIBBY DAM OPERATIONS SPRING/SUMMER 2023

Date: 15 May 2023

Leon Basdekas
Greg Hoffman



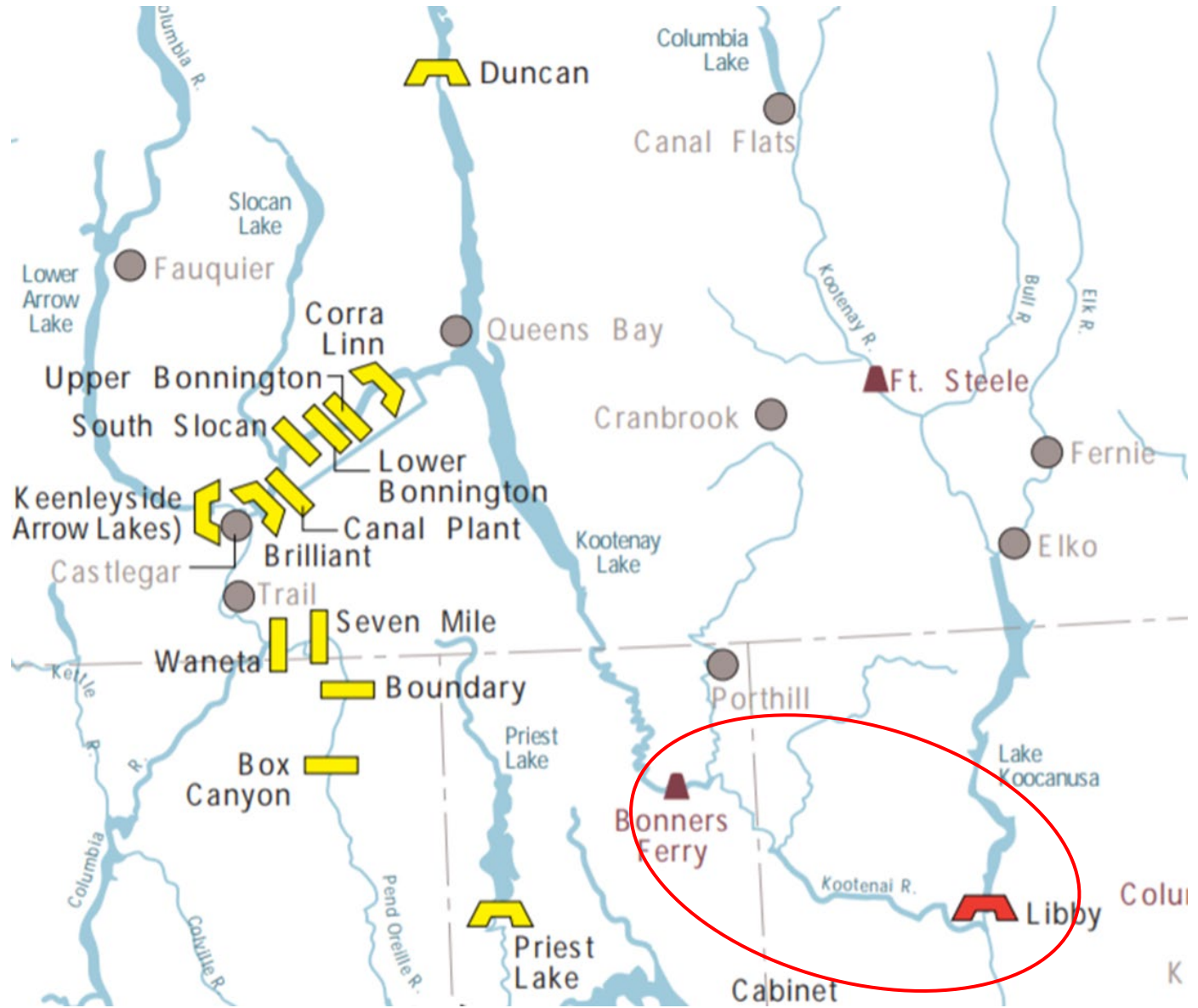
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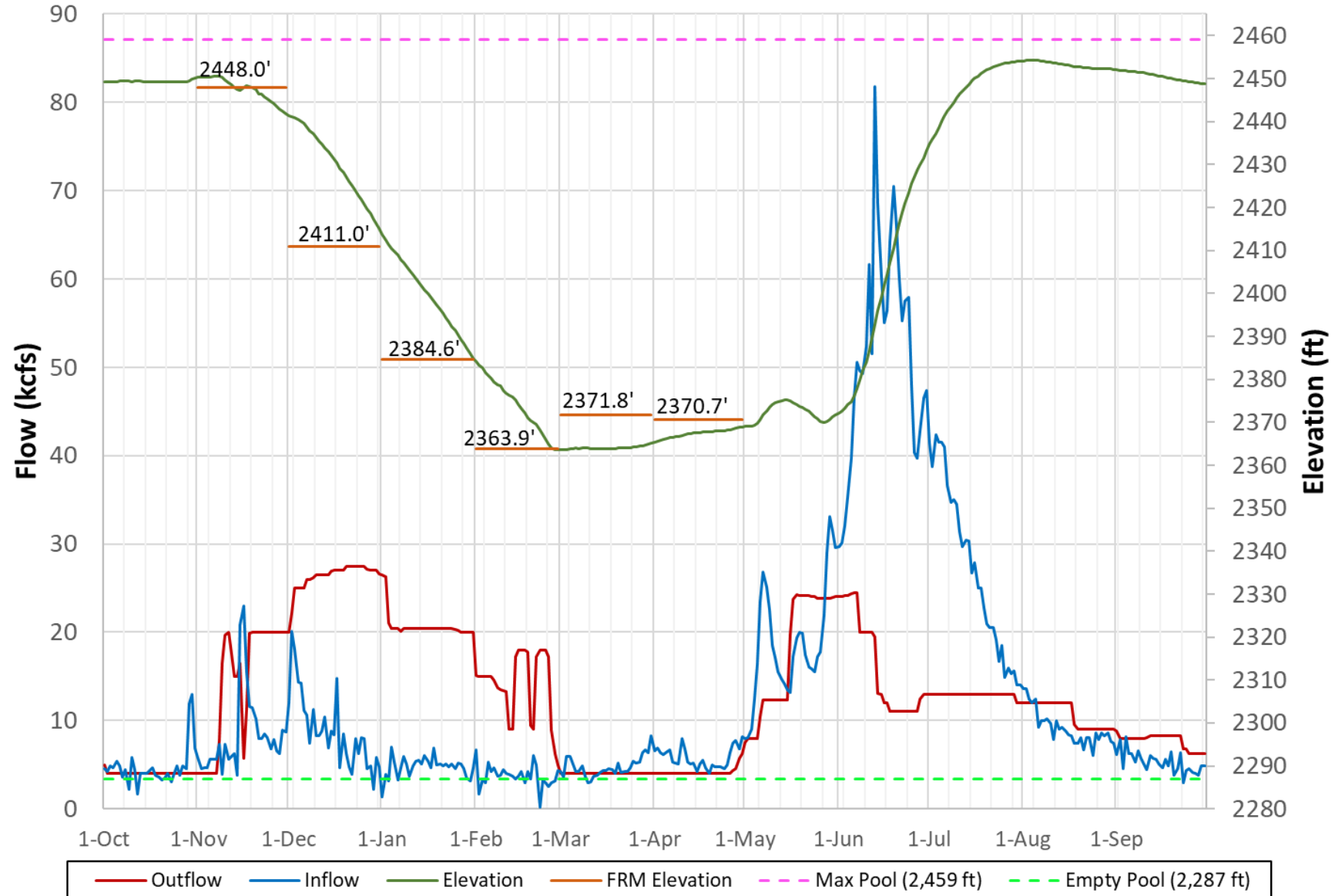


GENERAL BACKGROUND





RESERVOIR OPERATIONS 2022

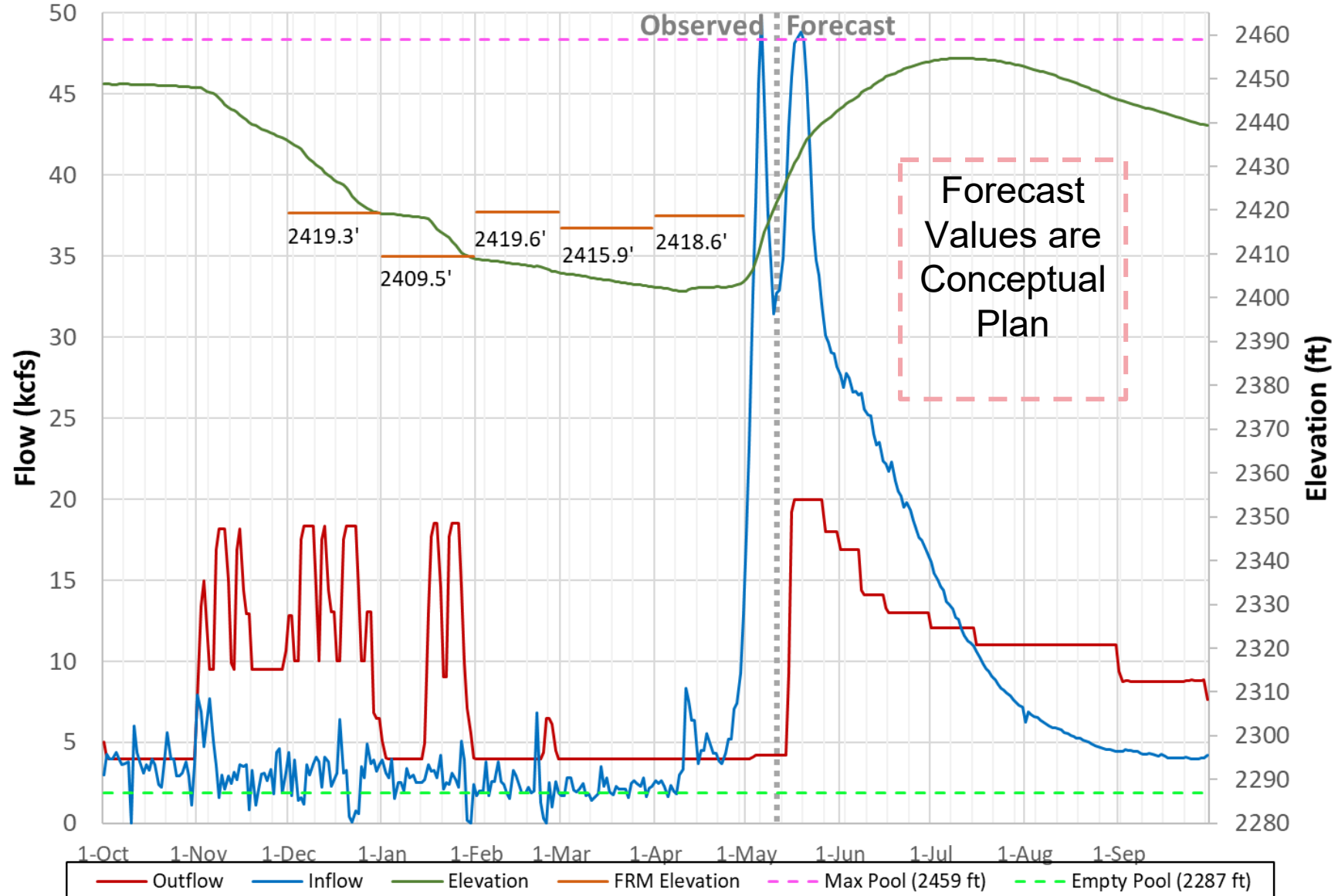




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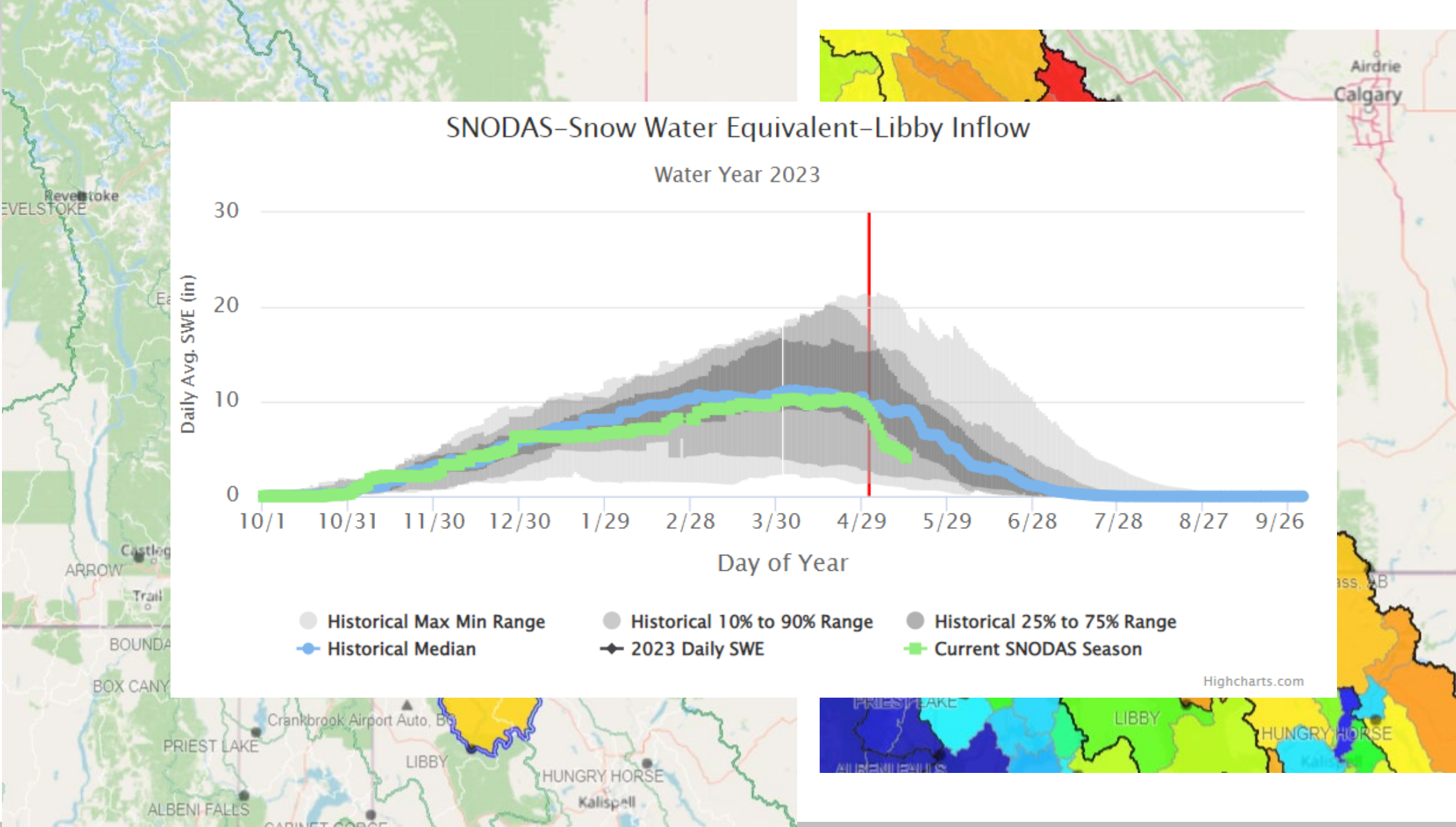


RESERVOIR OPERATIONS 2023





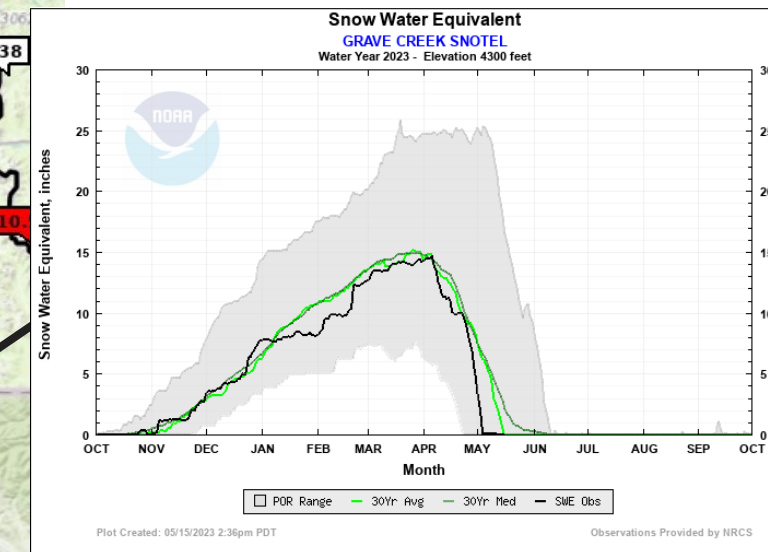
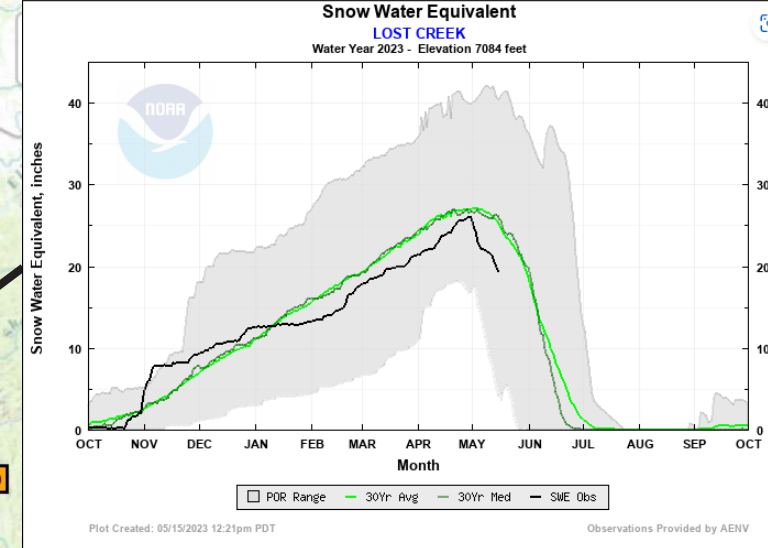
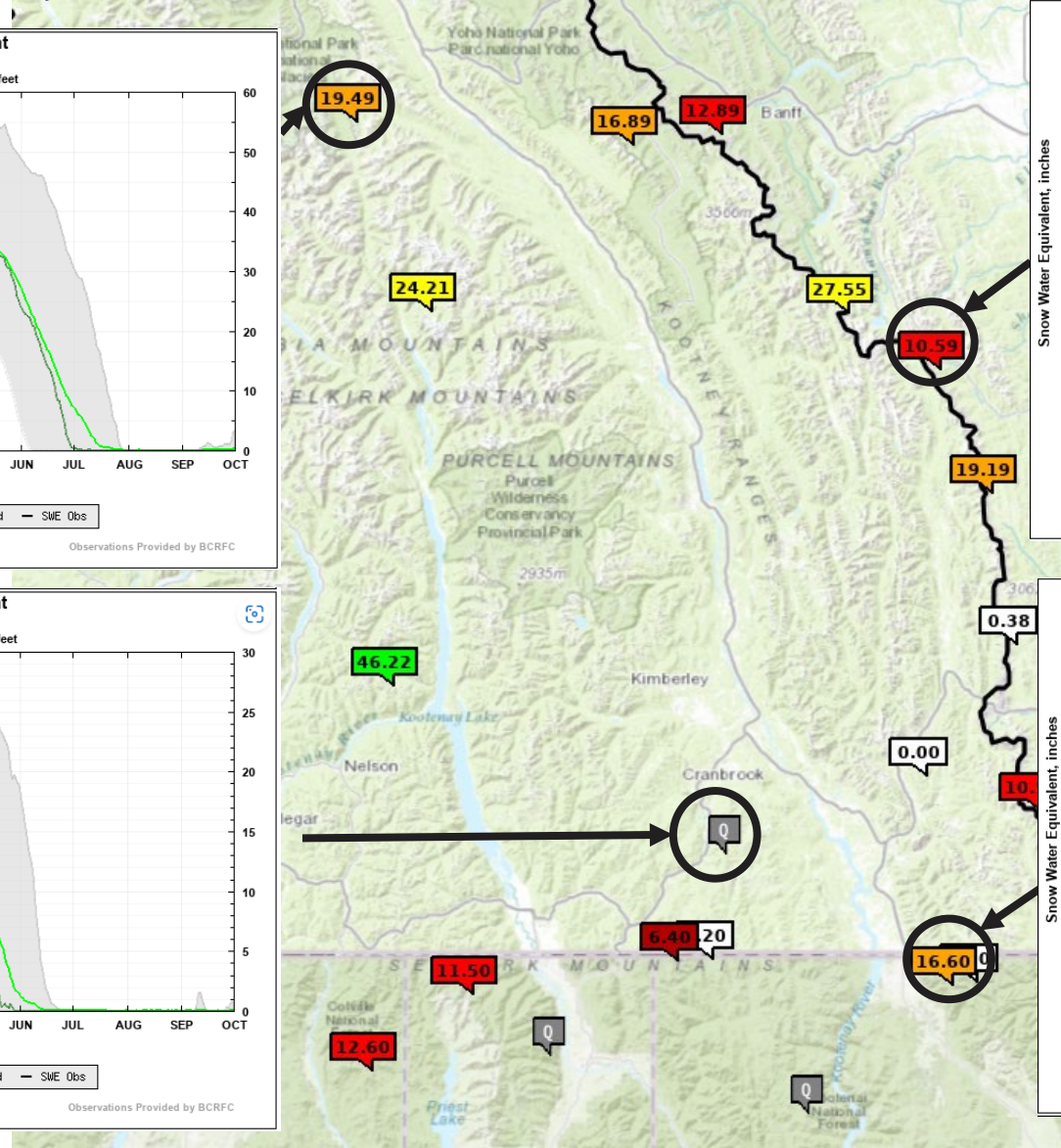
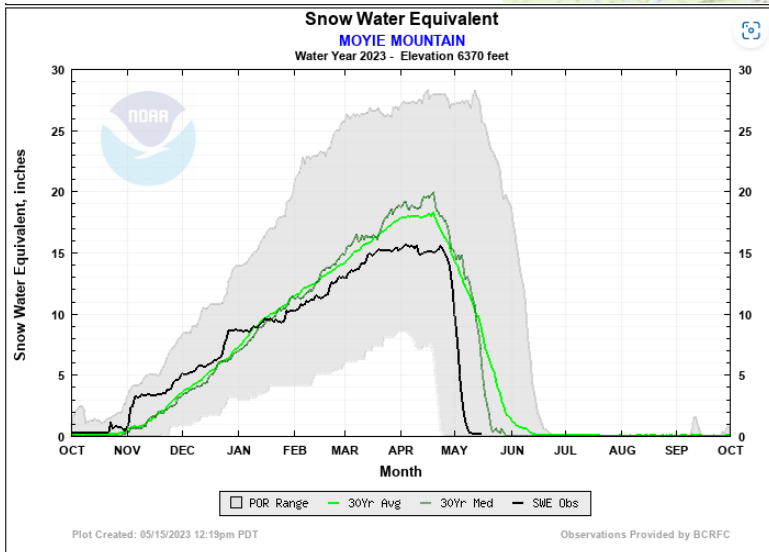
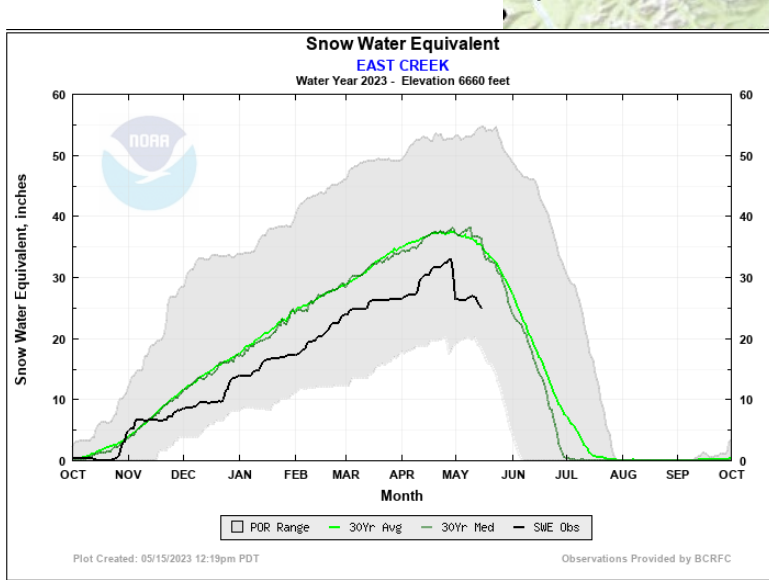
BASIN SNOW





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BASIN SNOW



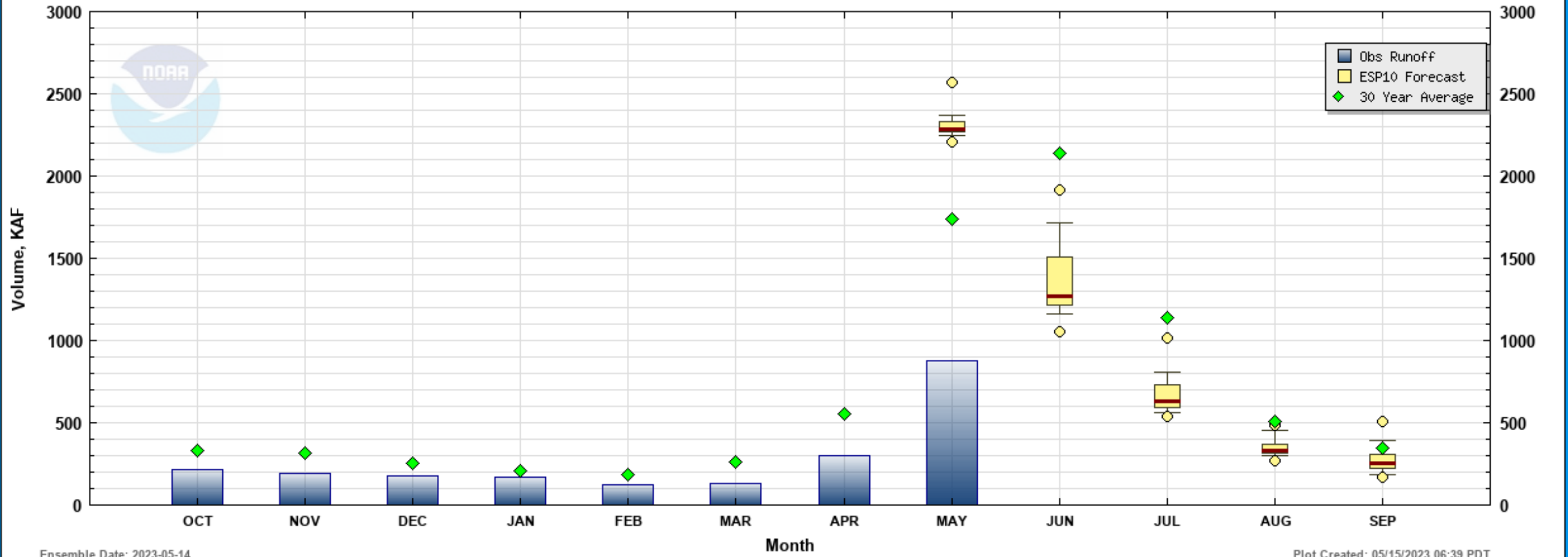


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OBSERVED AND FORECAST INFLOWS



Water Supply Volume Monthly Forecasts (ESP10) for Water Year 2023
(LYDM8) KOOTENAI - LIBBY DAM



Ensemble Date: 2023-05-14

Plot Created: 05/15/2023 06:39 PDT



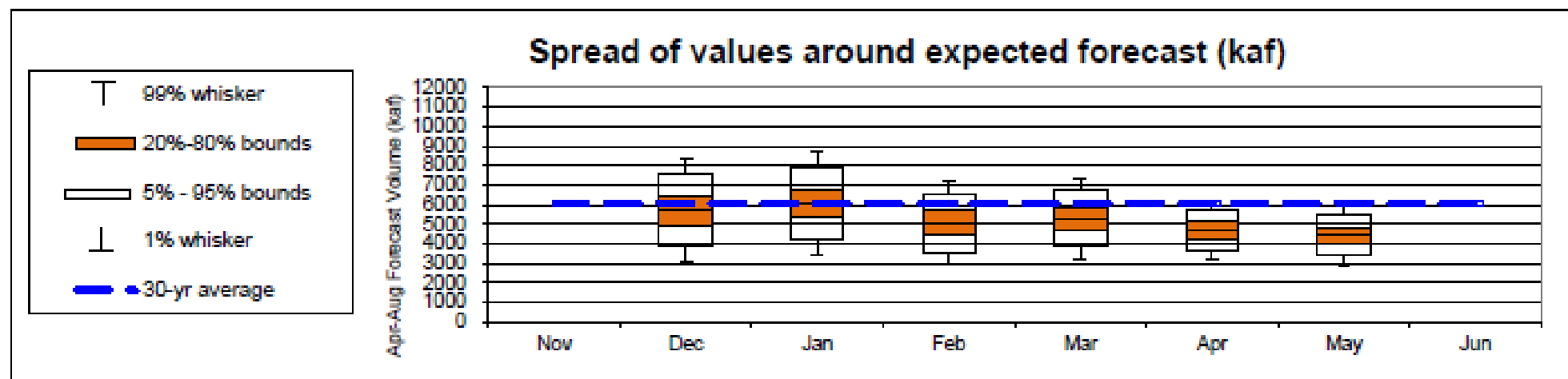
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MAY 1ST WATER SUPPLY FORECAST AND BIOP OBJECTIVES



- April-August inflow forecast for Libby Dam is 4.41 million acre-feet (MAF)
 - Forecast is 72% of average
 - Sturgeon Volume is 0.0 MAF, WSF < 4.8 MAF
 - Bull trout minimum flows May 15th through Sept 30 is 6 kcfs
- Libby flow augmentation draft 2439.0 ft for end of September (< 15th percentile)

- Libby Water Supply Forecast Trend:





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REFILL AND FLOW PLAN OBJECTIVES



- Meet Lake Koocanusa refill objective of 2454.0 ft; earlier than typical.
- Meet end of September draft requirement of 2439.0 ft.
- Control refill as to not fill too early or too much. Median fill date (2454.0 ft) is July 1 with a peak on July 11 at 2454.71 ft.
 - Capture early runoff.
 - Allow enough time to draft end September and avoid double peaking.
- Shape the volume of water released from 16 May to mid-June to be more hydrologically and ecologically normative.
- Releases are not a sturgeon pulse. The outflow shape simply mimics a more natural runoff hydrograph.
- As with all our plans, we will adjust to real time conditions with more or less water than is currently forecast to best meet the above objectives.

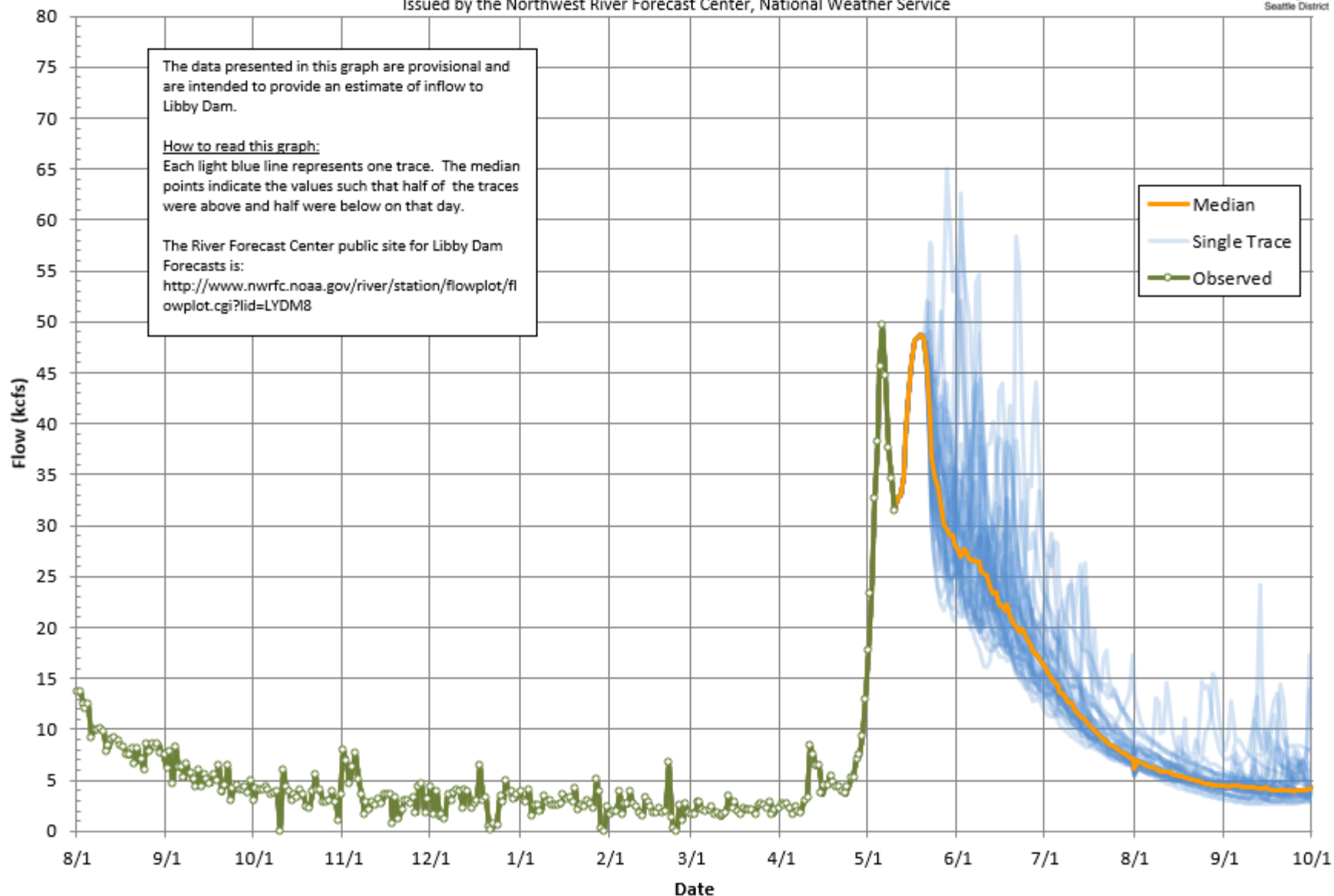


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Modeled using current ESP traces as of 05/11/23

Libby Dam Inflow - Probability Chart

Corps of Engineers Projections Based on the 40 Ensemble Streamflow Prediction Traces
Issued by the Northwest River Forecast Center, National Weather Service





Modeled using current ESP traces as of 05/11/23

Libby Dam Inflow- Probability Chart

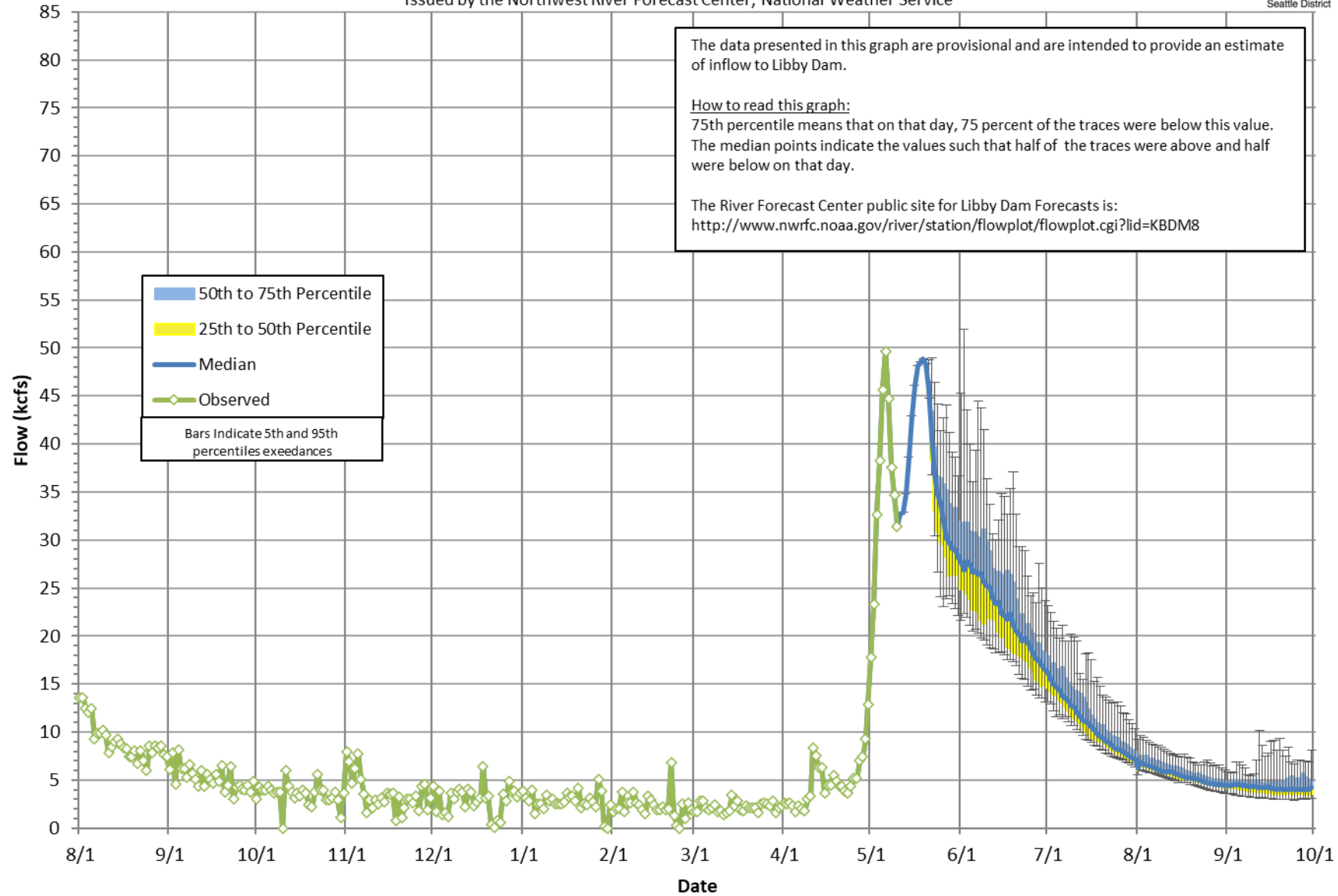
Corps of Engineers Projections Based on the 41 Ensemble Streamflow Prediction Traces
Issued by the Northwest River Forecast Center, National Weather Service



The data presented in this graph are provisional and are intended to provide an estimate of inflow to Libby Dam.

How to read this graph:
75th percentile means that on that day, 75 percent of the traces were below this value. The median points indicate the values such that half of the traces were above and half were below on that day.

The River Forecast Center public site for Libby Dam Forecasts is:
<http://www.nwrfc.noaa.gov/river/station/flowplot/flowplot.cgi?lid=KBDM8>



50th to 75th Percentile
25th to 50th Percentile
Median
Observed
Bars Indicate 5th and 95th percentiles exceedances

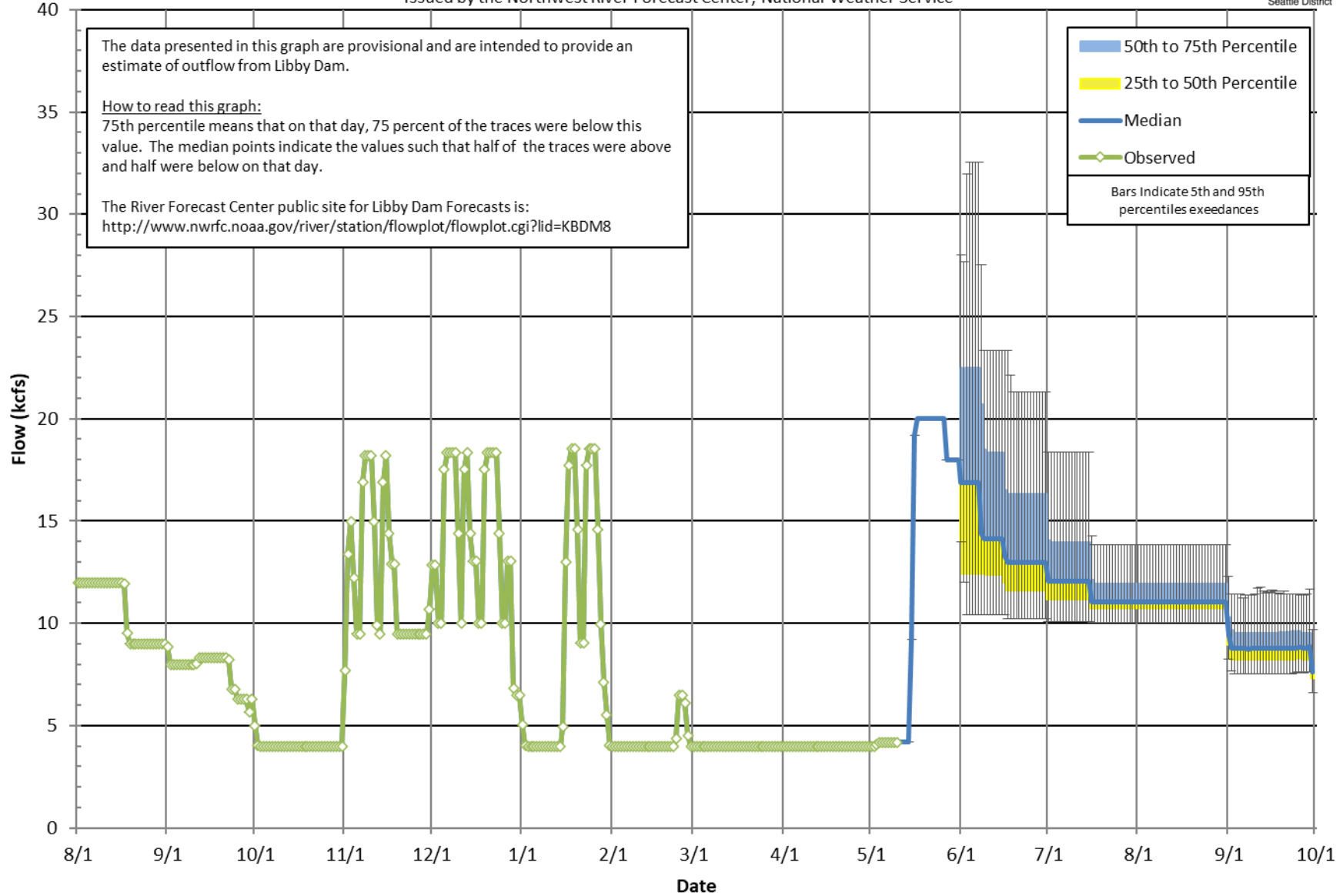


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Modeled using current ESP traces as of 05/11/23

Libby Dam Outflow - Probability Chart

Corps of Engineers Projections Based on the 41 Ensemble Streamflow Prediction Traces
Issued by the Northwest River Forecast Center, National Weather Service

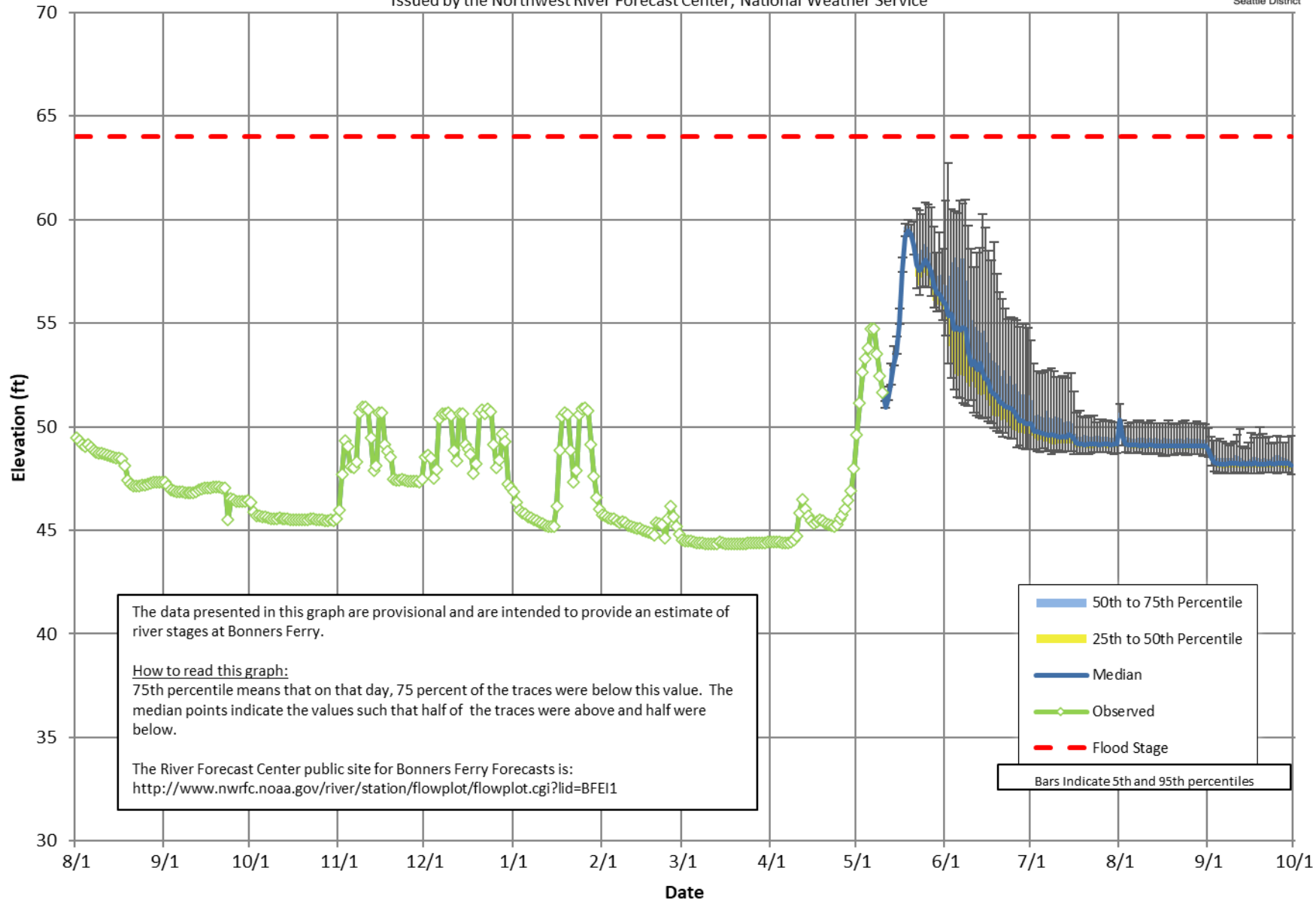




Modeled using current ESP traces as of 05/11/23

Bonnerr's Ferry Stage

Corps of Engineers Projections Based on the 41 Ensemble Streamflow Prediction Traces
Issued by the Northwest River Forecast Center, National Weather Service





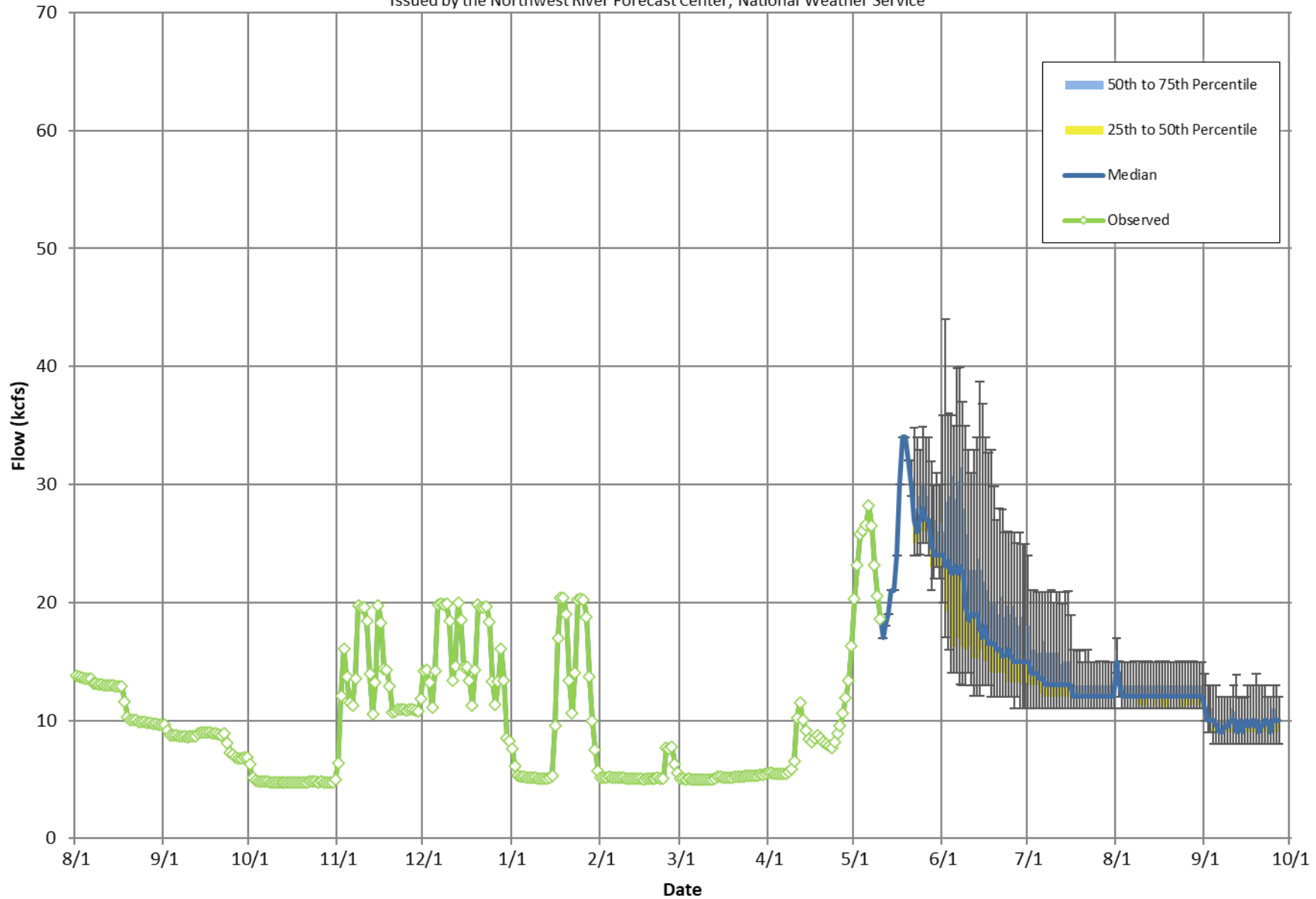
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Modeled using current ESP traces as of 05/11/23

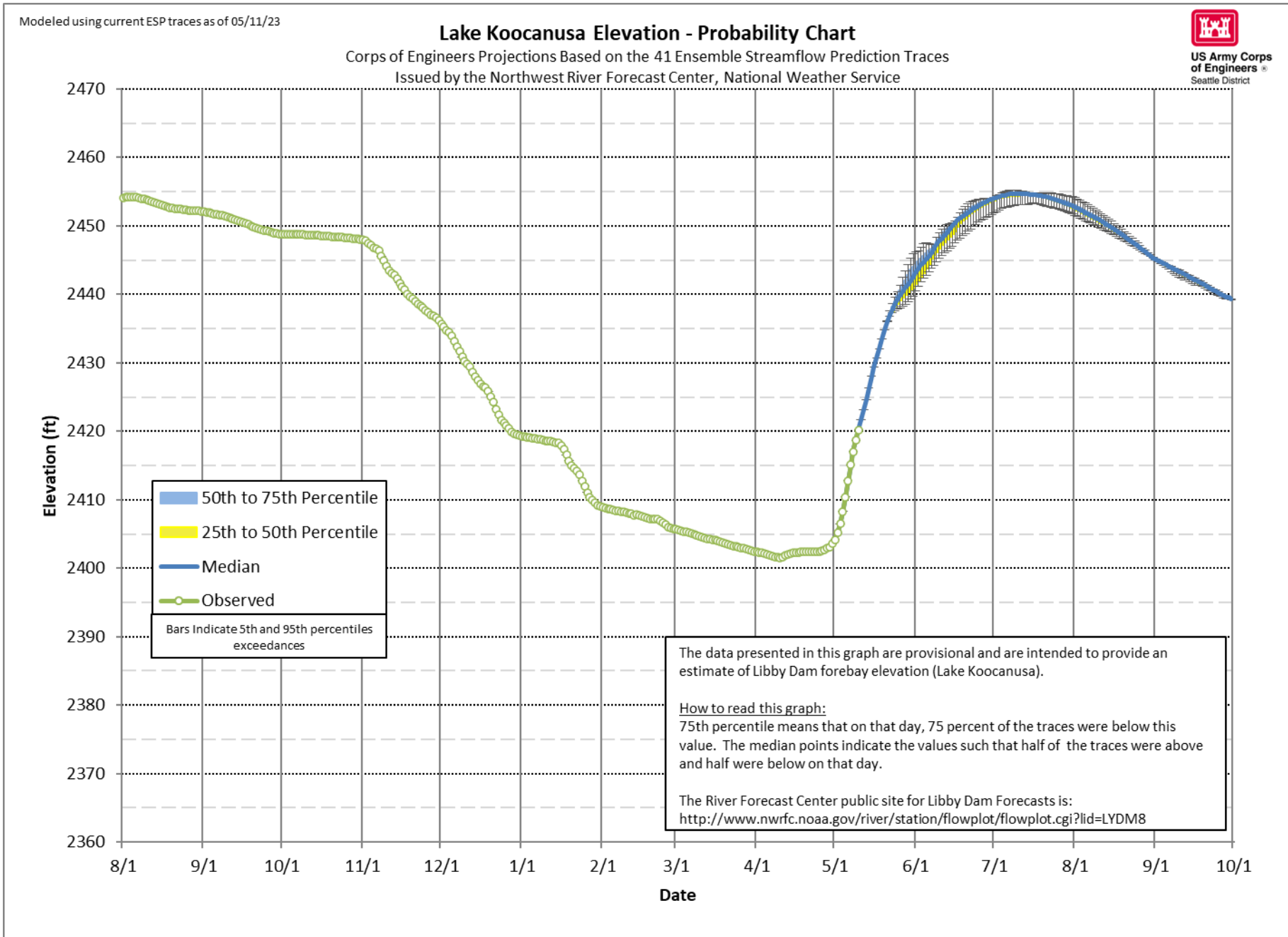
Bonnerr Ferry Flow - Probability Chart

Corps of Engineers Projections Based on the 41 Ensemble Streamflow Prediction Traces
Issued by the Northwest River Forecast Center, National Weather Service





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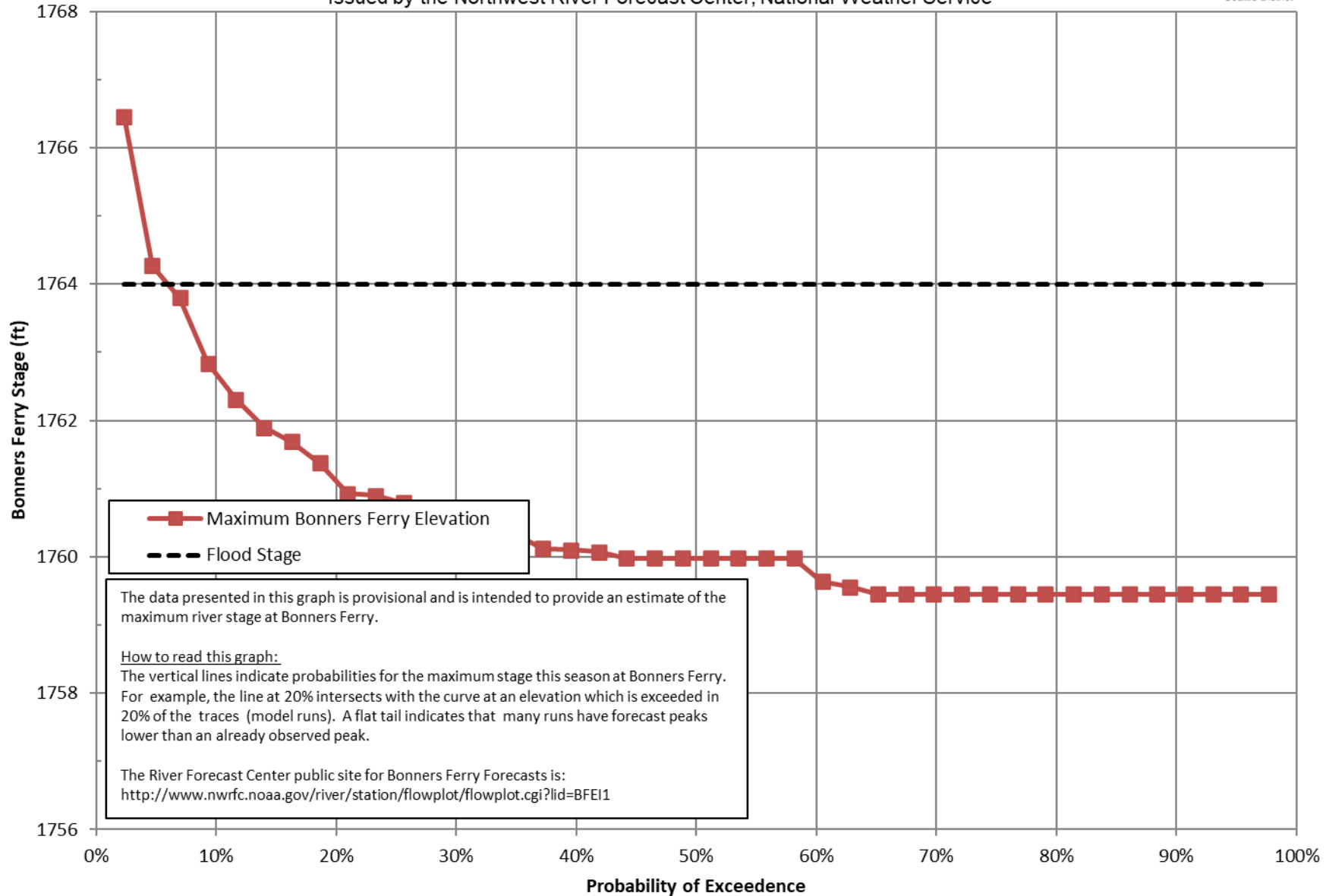




Modeled using current ESP traces as of 05/11/23

Maximum April-August Bonners Ferry Stage - Probability Chart

Corps of Engineers Projections Based on the 41 Ensemble Streamflow Prediction Traces
 Issued by the Northwest River Forecast Center, National Weather Service





REFILL AND FLOW PLAN SUMMARY

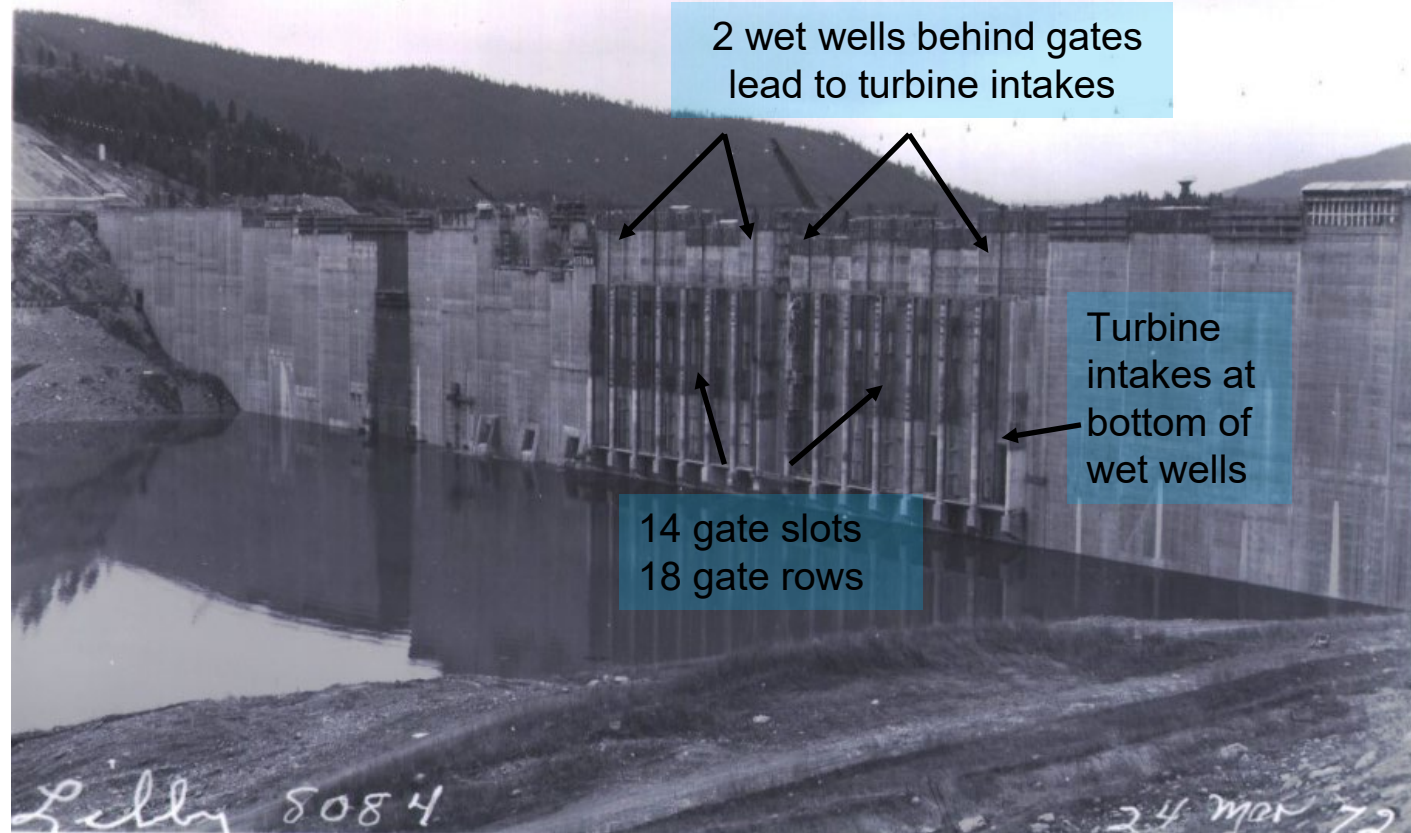
- Dry year, about 72 % of normal April – August inflow expected.
- First time for no Sturgeon pulse in over 20 years.
- Meet Lake Koocanusa refill objective of 2454.0 ft (90% of traces) and end of September draft requirement of 2439.0 ft.
- Minimize risk of double peaking Libby outflows.
- No Sturgeon pulse, but shape the volume of water released from 16 May to mid-June to be more hydrologically and ecologically normative.
- As with all our plans, we will adjust to real time conditions with more or less water than is currently forecast to best meet the above objectives.



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Libby Dam Temperature Management System



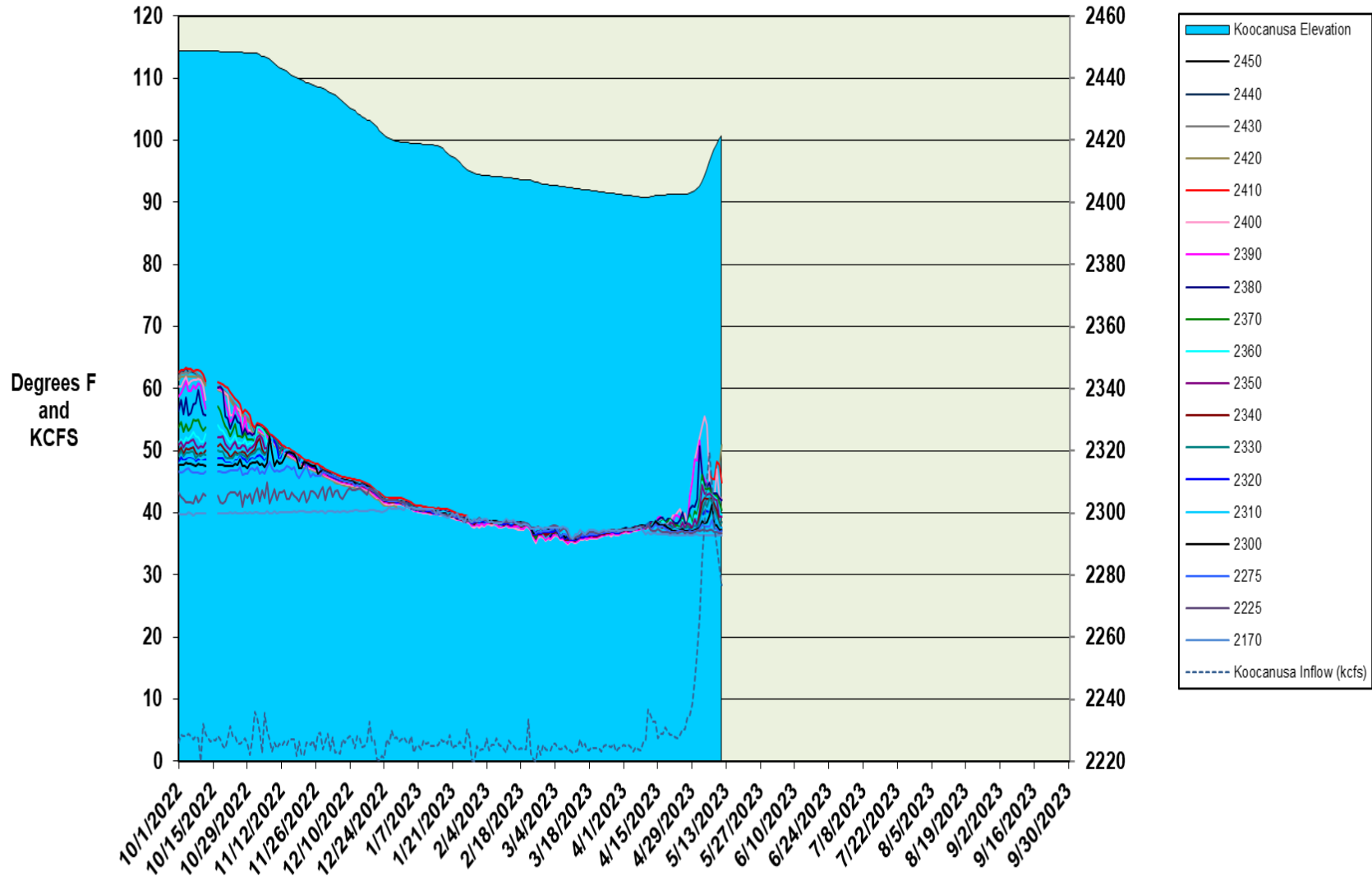
This 1972 photo of Libby Dam under construction shows various passage routes for water exiting the dam. Sluice ports (bottom left), are at bottom of reservoir where water is coldest. Vertical gate slots hold 252 panels that are stacked such that temperature-stratified water can be drawn over the top of the panels. Water then flows into one of two wet wells behind the panels and down into turbine intakes. Spillway entry (top left) is not useful for temperature management until reservoir fills to 30 feet above that level. Slots 1-7 (right to left) serve turbines 1-4. Slots 8-14 now serve only turbine 5 but would serve turbine 6 if added.



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Koocanusa Reservoir Temperatures Water Year 2023

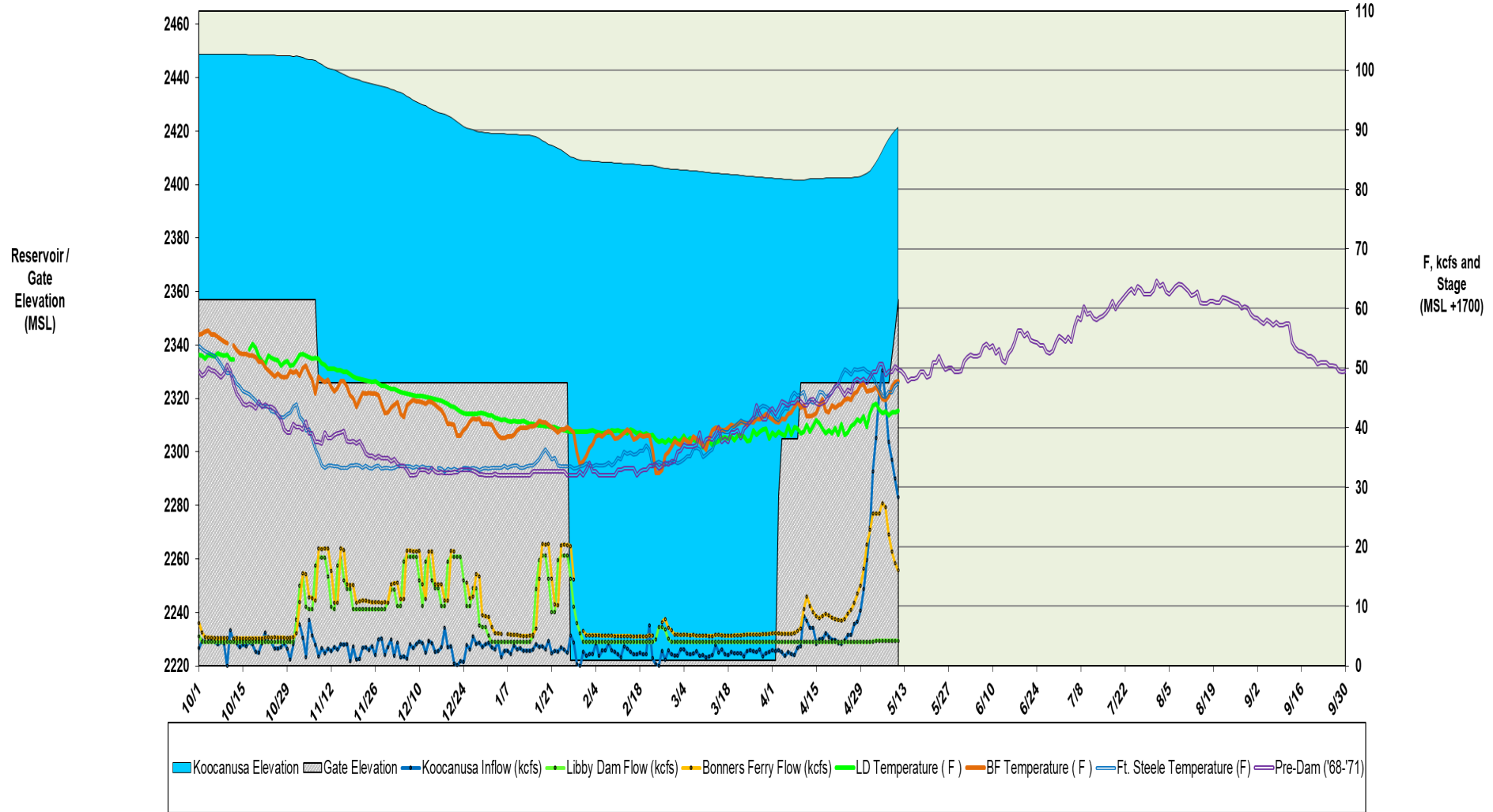




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Kootenai River and Koocanusa Reservoir Temperatures WY 2023





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QUESTIONS

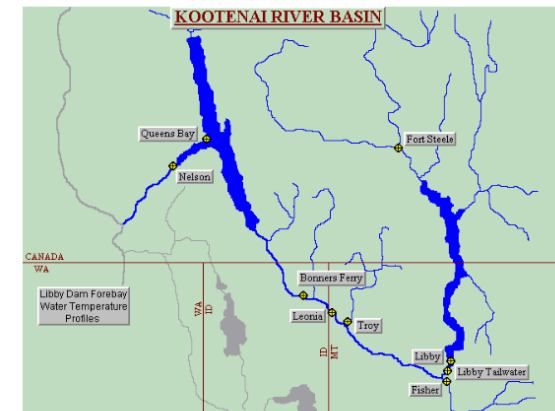
For emails regarding release changes and lake level updates email

- UpperColumbiaWM@usace.army.mil
- Leon.Basdekas@usace.army.mil

General Queries call 206-764-6702

Seattle District water management data website :

<http://www.nwd-wc.usace.army.mil/nws/hh/www/index.html#>



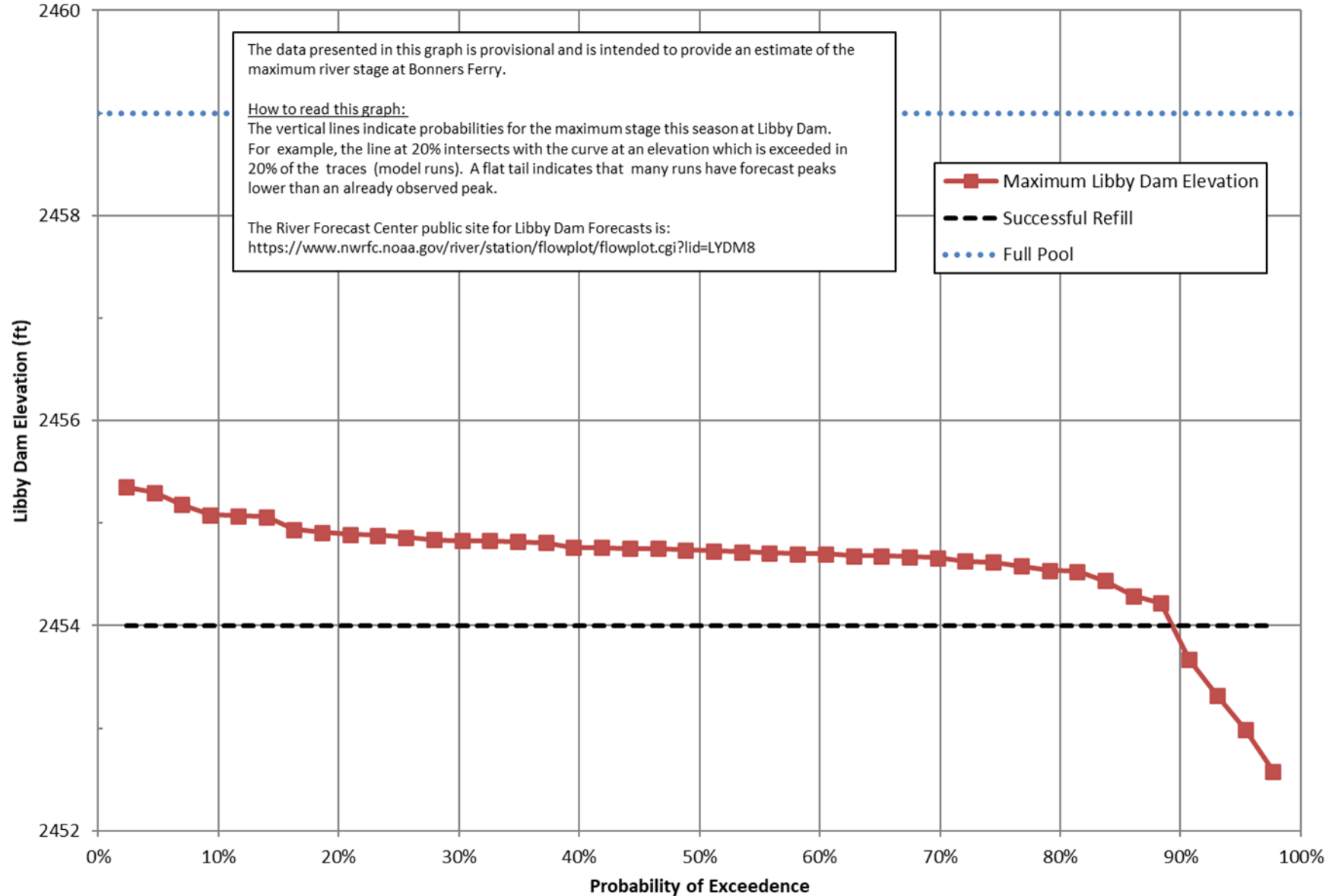
Stations

- [Bonners Ferry](#)
- [Moyie River Eastport](#)
- [Below Moyie Nr Bonners](#)
- [Fisher](#)
- [Fort Steele](#)
- [Leonia](#)
- [Libby](#)
- [Libby Tailwater](#)
- [Nelson](#)
- [Queen's Bay](#)
- [Troy](#)
- [ESP](#)
- [Libby Water Temp Profiles](#)
- [Lake Kooocanusa Summary Hydrograph](#)



Modeled using current ESP traces as of 05/11/23

Maximum April-September Libby Dam Pool Elevation- Probability Chart Corps of Engineers Projections Based on the 41 Ensemble Streamflow Prediction Traces Issued by the Northwest River Forecast Center, National Weather Service



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