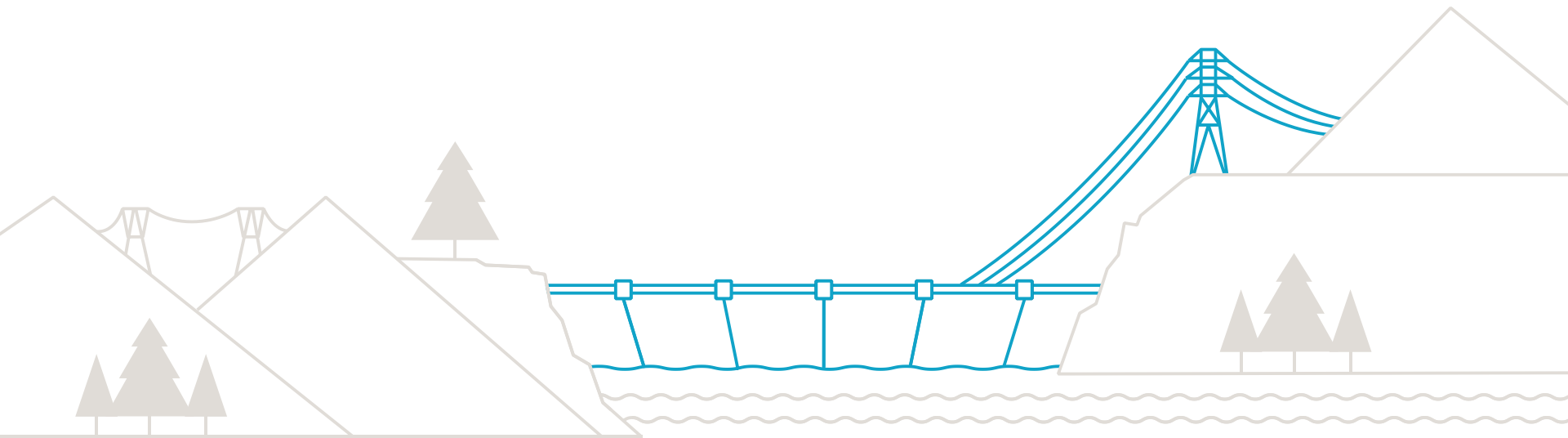


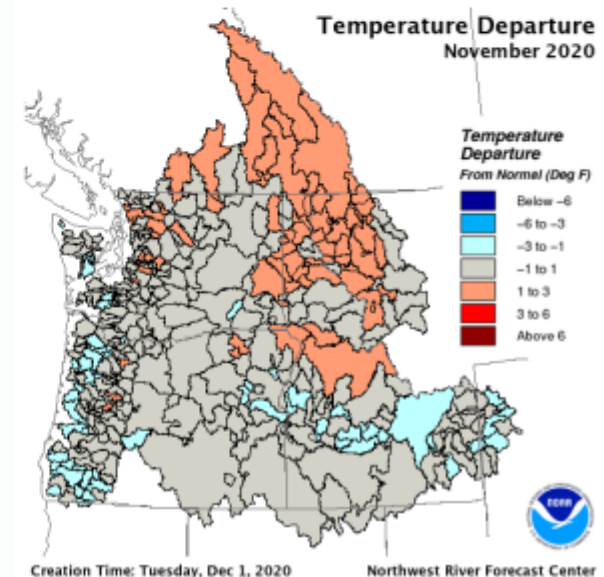
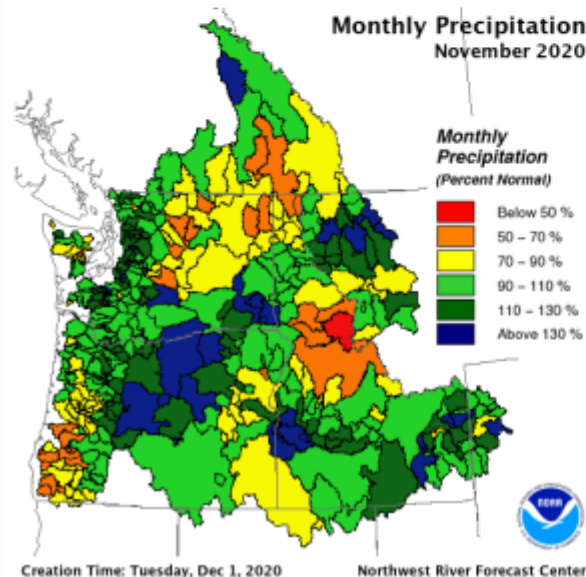
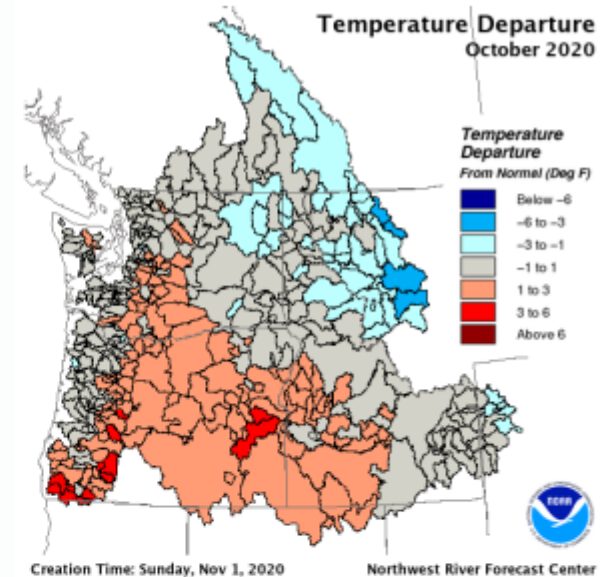
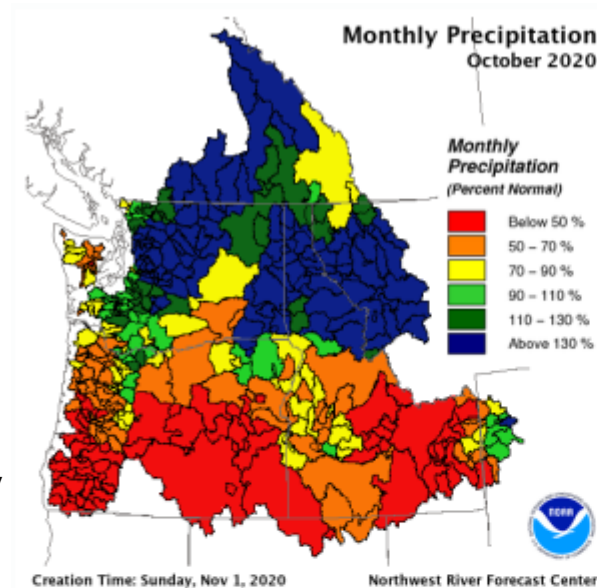
2021 Columbia Operations Update



CBRAC Conference Call
Tue, 25 May 2021
Gillian Kong

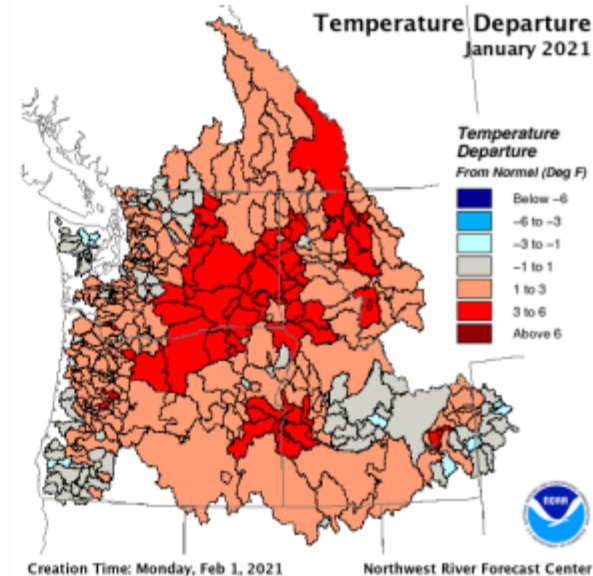
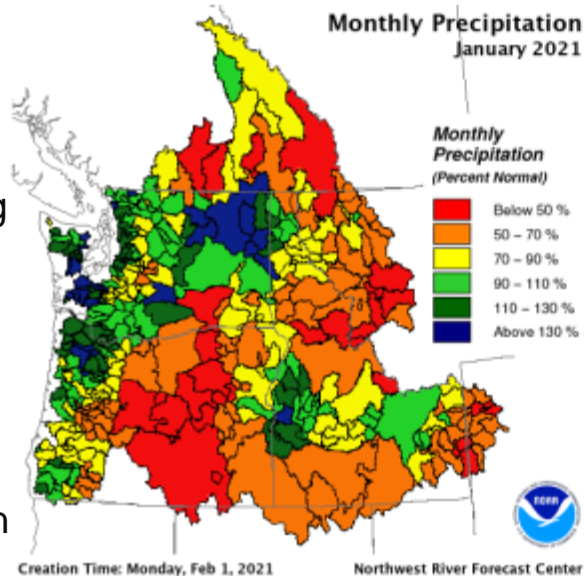
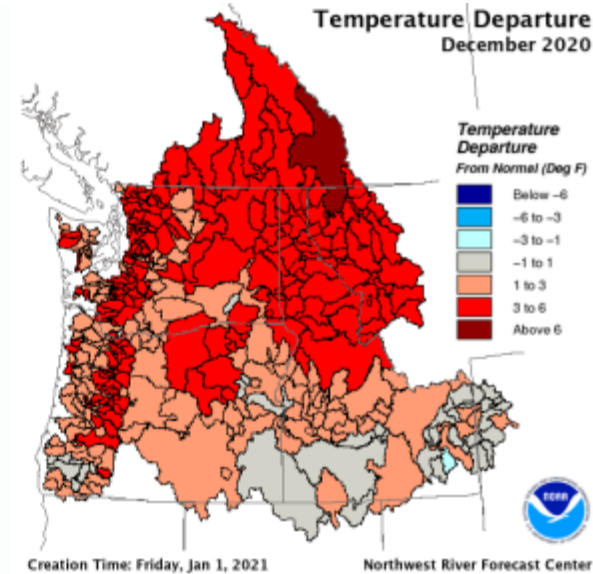
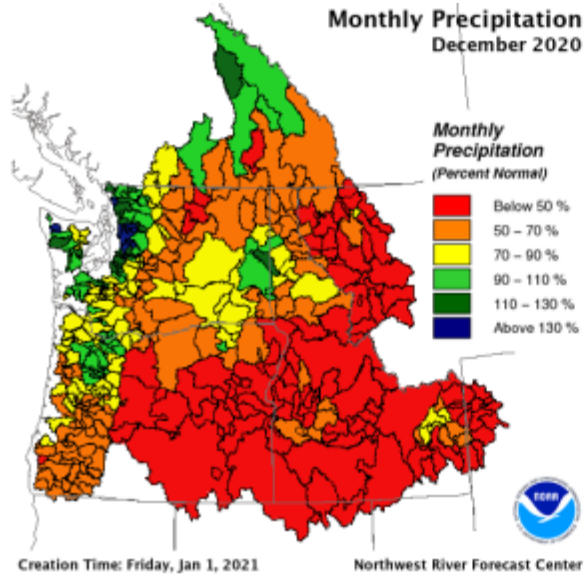
2020/21 Weather Summary

- Oct was significantly wetter than normal in the northern half of the Columbia basin.
 - Precipitation above The Dalles was 116% of normal.
 - Temperatures were generally cooler in Upper Columbia but near to slightly above normal elsewhere.
- November brought wide ranging weather conditions to the region.
 - Precipitation above The Dalles was near normal at 98%.
 - Temperatures were generally near normal for much of the basin otherwise warmer temperatures in Canada.



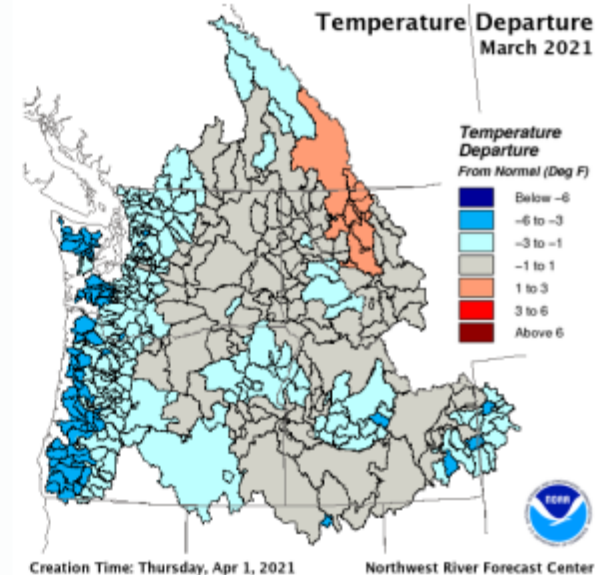
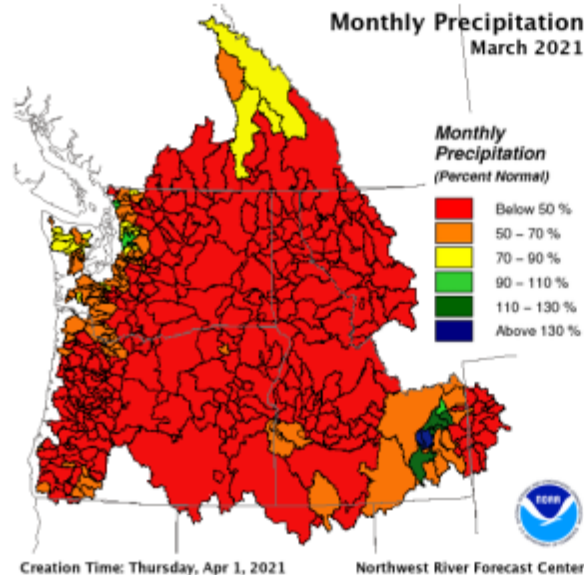
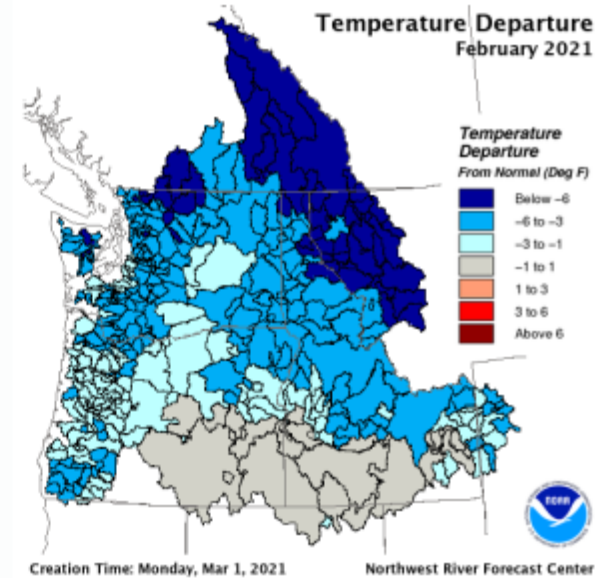
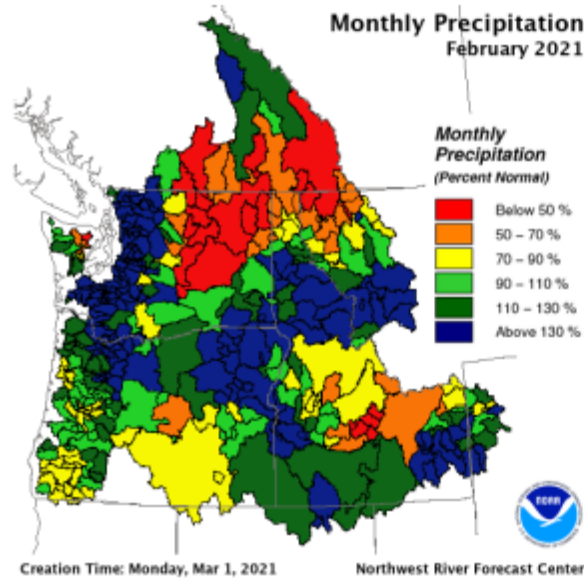
2020/21 Weather Summary

- December was generally warm and dry for much of the basin.
 - Precipitation above The Dalles was well below normal at 57% of normal.
 - In contrast, precipitation in the Columbia River basin above Arrow was near normal.
 - December was the basin warmest month in this water year.
- Dry and warm conditions in January.
 - Precipitation above The Dalles was below normal at 73% along with also below normal precipitation in Canada.
 - Temperatures were warmer than normal except during a cold snap mid month resulting in unseasonably cold weather in the northern region.



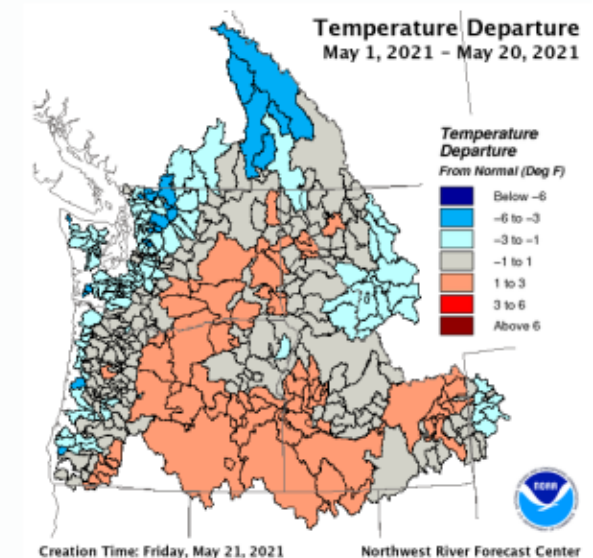
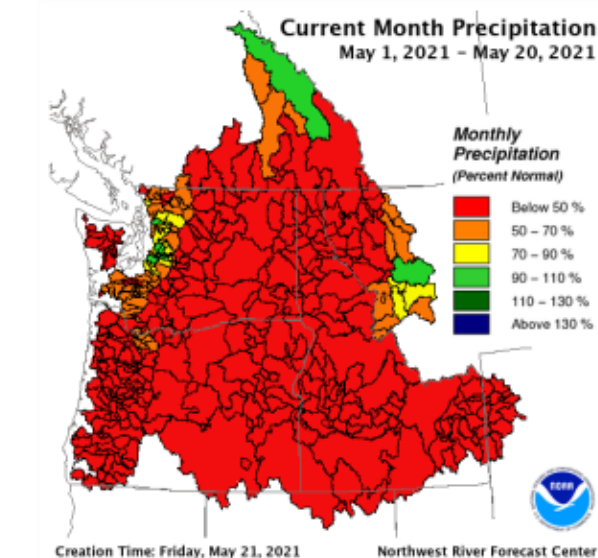
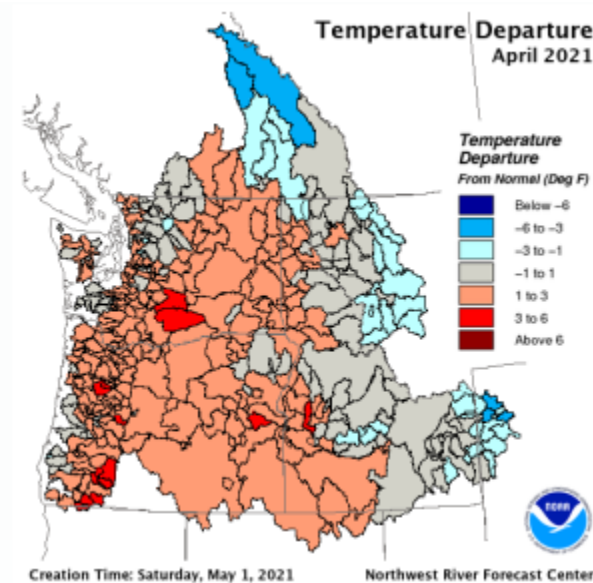
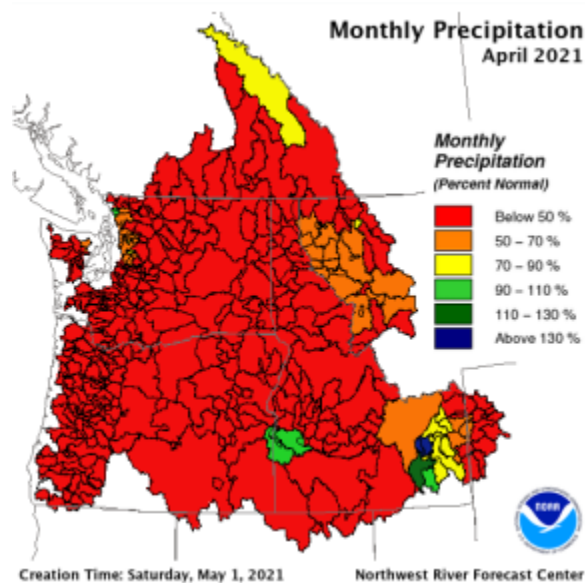
2020/21 Weather Summary

- In contrast, February was generally wet and cold.
 - Precipitation above The Dalles was above normal at 109% of normal and much above normal for locations above Arrow.
 - Arctic outbreak in Feb brought extremely cold temperatures particularly in the Canadian portion of the basin.
- In March, the Columbia basin was extremely dry.
 - Precipitation above The Dalles was well below normal at 32% along with also below normal precipitation in Canada.
 - Temperatures were generally cooler than normal in Canada but otherwise near normal in most locations.



2020/21 Weather Summary

- Prolonged dry conditions in April.
 - Precipitation above The Dalles was well below normal at 32% of normal and below 50% for much of the Canadian region.
 - Temperatures in April were generally cooler than normal in Canada otherwise mostly above normal in the U.S.
- May marked the basin third consecutive dry month.
 - Precipitation above The Dalles was well below normal at 27% while the northern region above Arrow saw closer to normal levels.
 - Temperatures were generally cooler than normal in Canada but otherwise mostly above normal in most locations in the U.S.



2021 Water Year Precipitation

October 1, 2020 through May 20, 2021

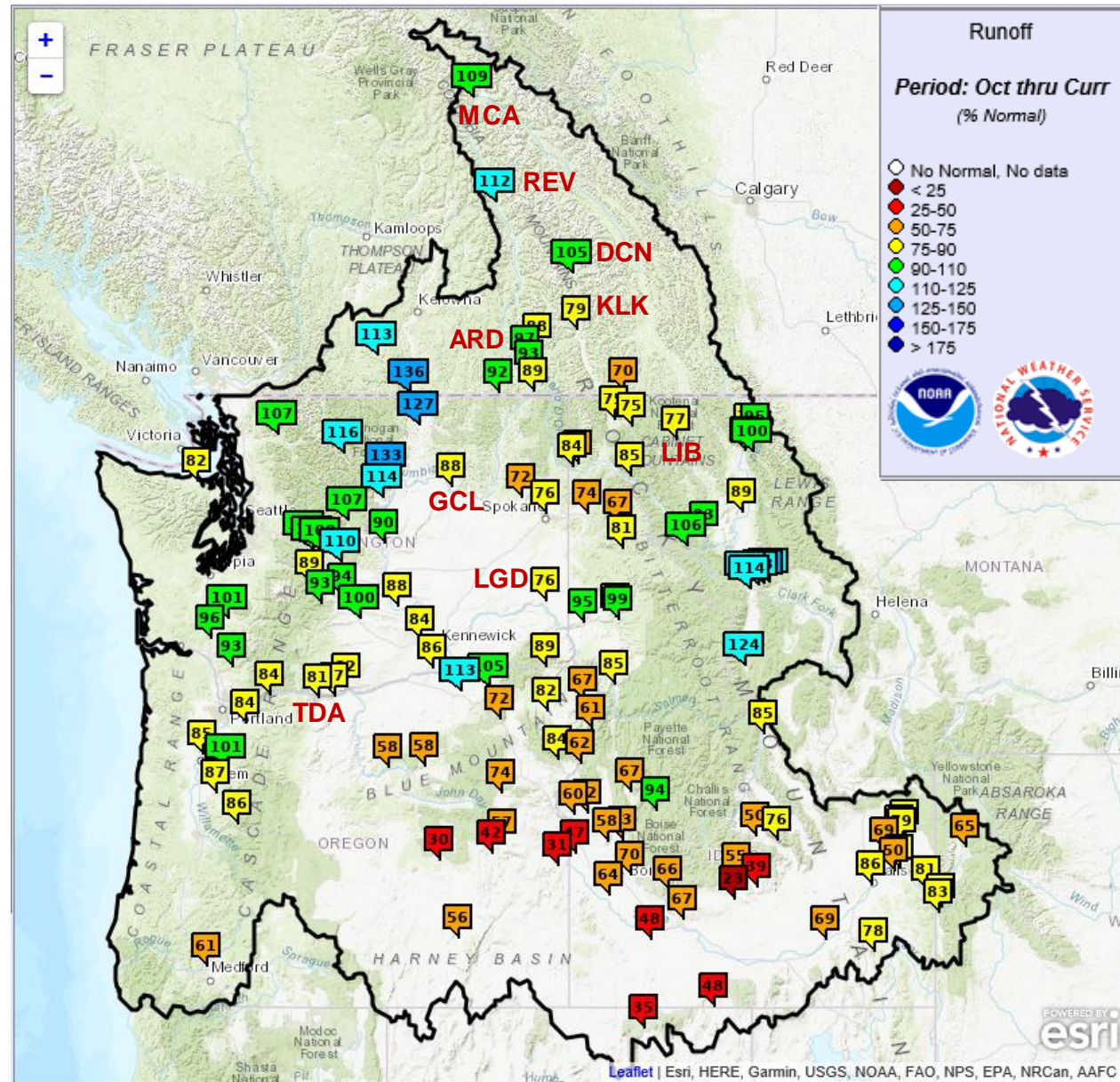
Water Year Precipitation Table

Percent normal comparisons based on 1981-2010 average

LOCATION	Percent of Normal (%)
Snake River	
Snake River Basin above Hells Canyon Dam	61
Clearwater River Basin	69
Salmon River Basin	47
Snake River Basin above Ice Harbor Dam	61
Upper Columbia Basin	
Pend Oreille River Basin above Waneta Dam	78
Kootenai River Basin	59
Spokane River Basin	84
Columbia River Basin above Arrow Dam	104
Columbia River Main Stem	
Columbia River Basin above Grand Coulee	77
Columbia River Basin above The Dalles	70
Willamette River	
Willamette River Basin above Portland	74

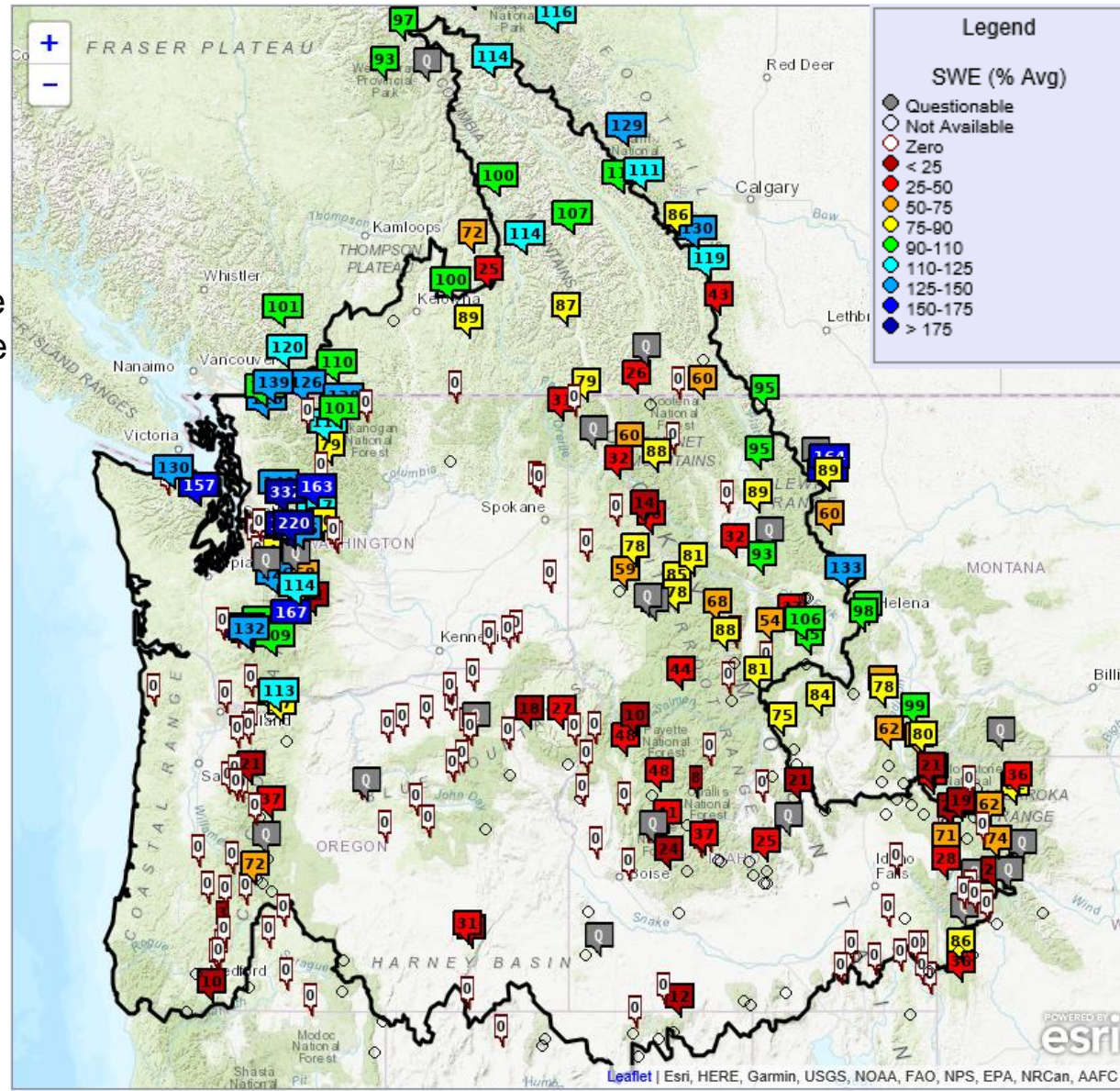
WY2021 Observed Runoff (% of Normal)

- The 2021 water year observed runoff to-date is highly variable across the basin with the lowest runoff volumes in the Snake River basin and the highest runoff in the Upper Columbia.



Current Snowpack (% of Normal)

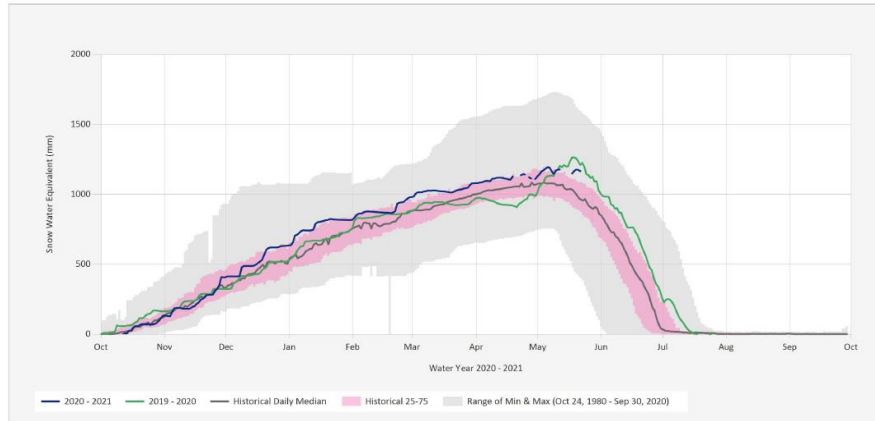
- Snow accumulation varies across the basin.
- By the beginning of the runoff period in April/May, snowpack in the northern portion of the basin (above Arrow) was generally above average while below average in the south.
- Warmer temperatures in the U.S in April/May accelerated snowmelt contributing to increasing spring runoff, resulting in zero snow in many locations.
- Freshet is a bit delayed in Canada due to cooler temperatures.
- Snowmelt in the Canadian basin have just started in mid May contributing to noticeably higher streamflows.



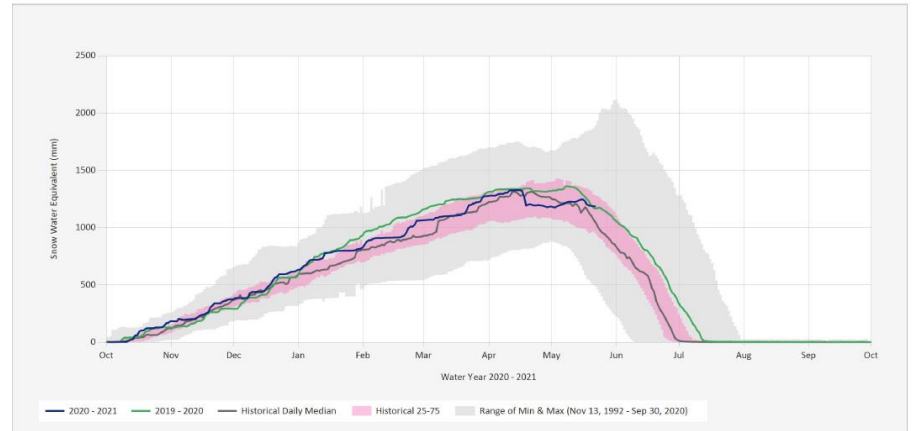
2020/21 Canadian Columbia Snowpack

- Current (22 May) snowpack:
 - Molson creek (MCA) – 114% of average
 - Mount Rev (REV) – 100% of average

Source Data: SW.Daily@2A21P
Location: Molson Creek, Latitude: 52.220556, Longitude: -118.225833, Elevation: : 1935 m

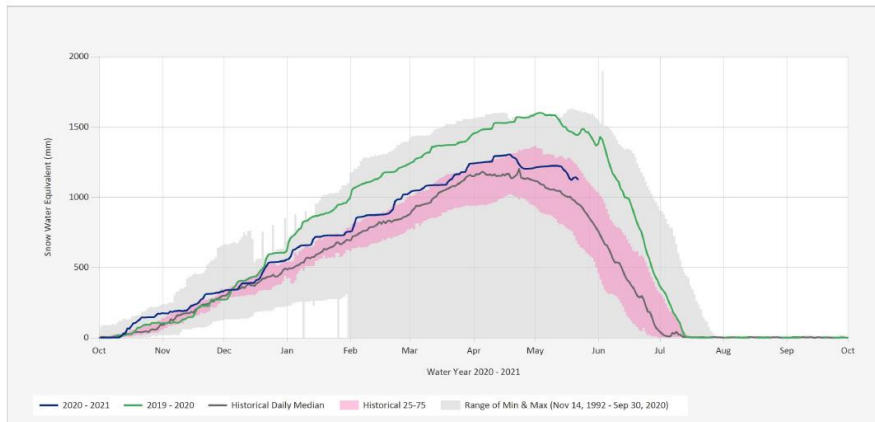


Source Data: SW.Daily@2A06P
Location: Mount Revelstoke, Latitude: 51.036342, Longitude: -118.151603, Elevation: : 1850 m



- St. Leon Creek (ARD) – 114% of average

Source Data: SW.Daily@2B08P
Location: St. Leon Creek, Latitude: 50.434172, Longitude: -117.701214, Elevation: : 1800 m

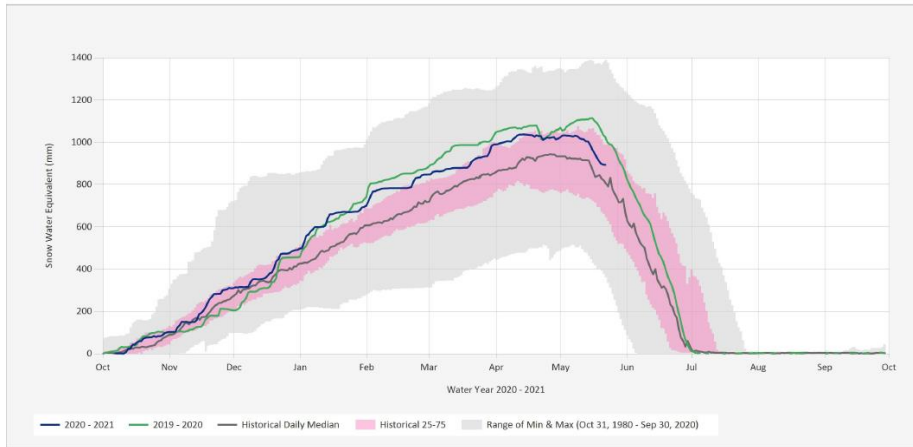


2020/21 Canadian Columbia Snowpack

- Current (22 May) snowpack:

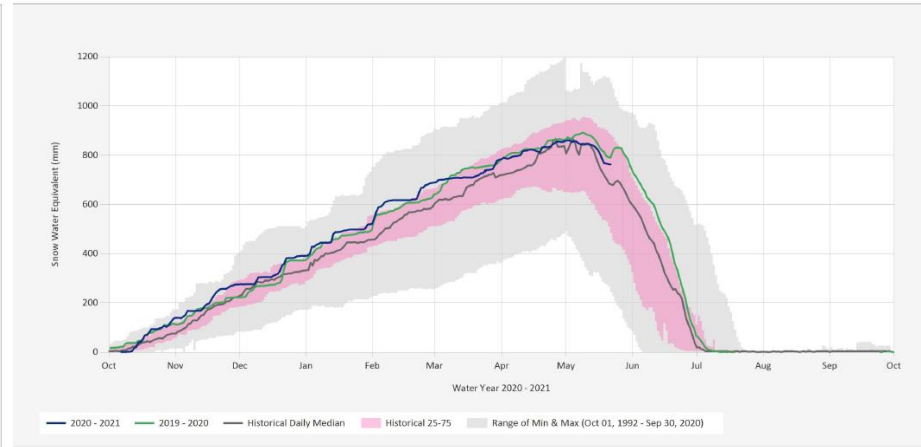
- East Creek (DCN) – 107% of average

Source Data: SW.Daily@2008P
Location: East Creek, Latitude: 50.6396, Longitude: -116.9297333, Elevation: 2030 m



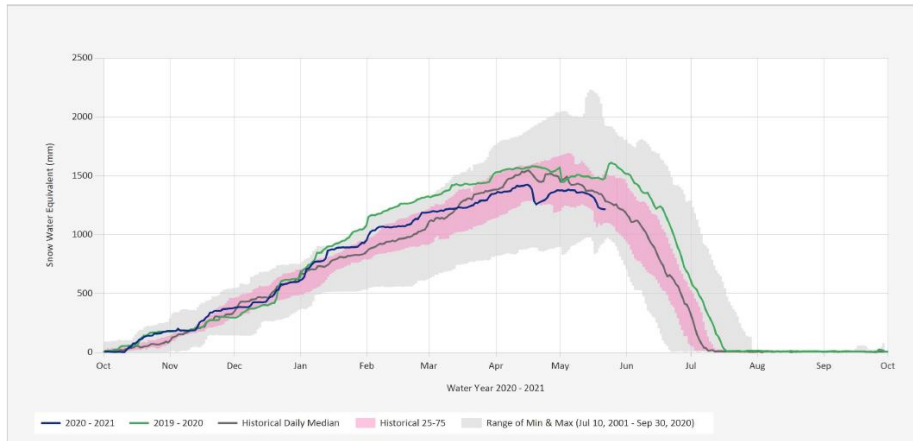
- Floe Lake (LIB) – 110% of average

Source Data: SW.Daily@2C14P
Location: Floe Lake, Latitude: 51.059917, Longitude: -116.137117, Elevation: 2090 m



- Redfish Creek (KLK) – 87% of average

Source Data: SW.Daily@2D14P
Location: Redfish Creek, Latitude: 49.694721, Longitude: -117.084724, Elevation: 2104 m

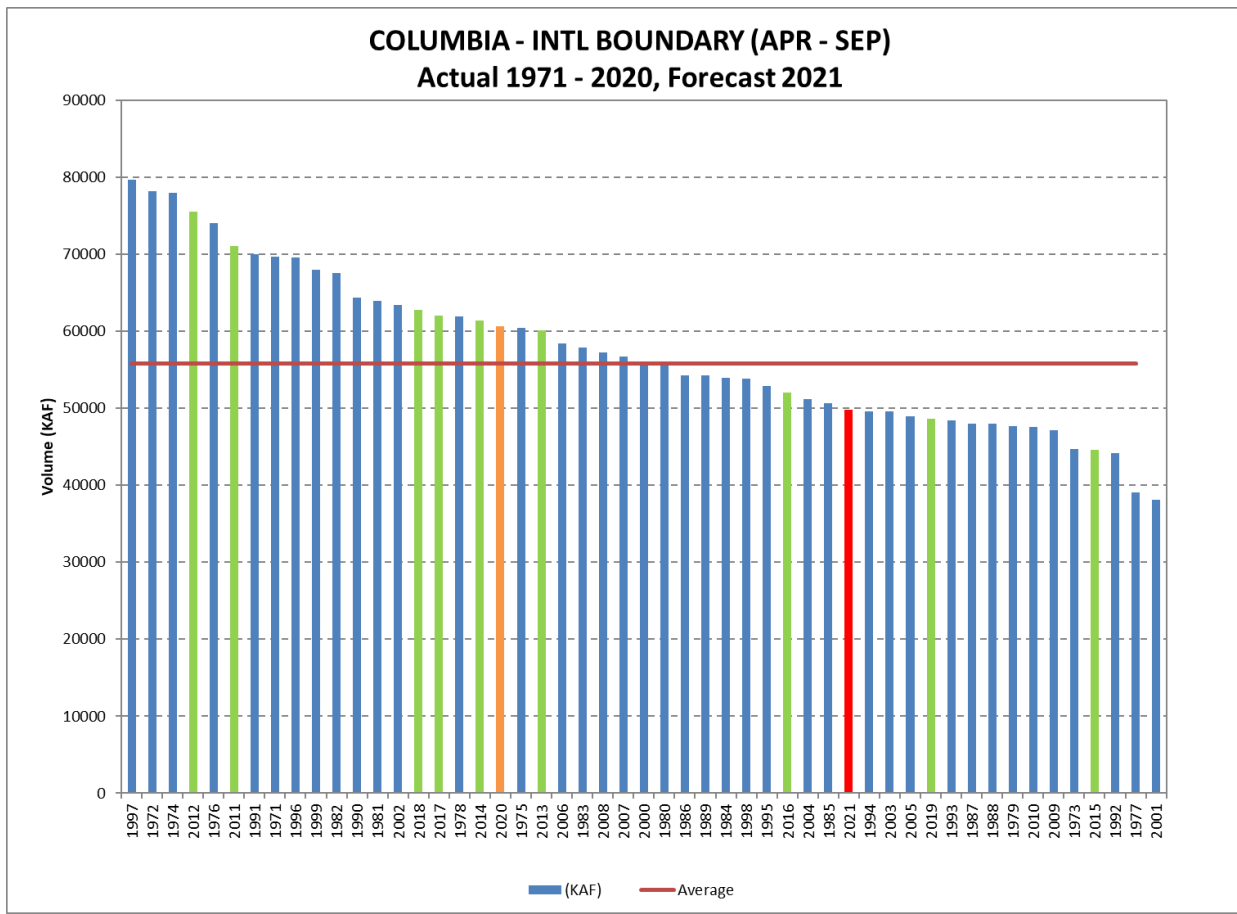


Canadian Columbia Runoff Forecast

May 1st Feb-Sep 2021 WSF (relative to Feb – Sep 2020 Actuals)

- Mica: 105% of normal (111%)
- Revelstoke: 99% (115%)
- Arrow: 92% (107%)
- Duncan: 98% (105%)
- Kootenay Lake: 84% (96%)

Normal is based on 1981 - 2010

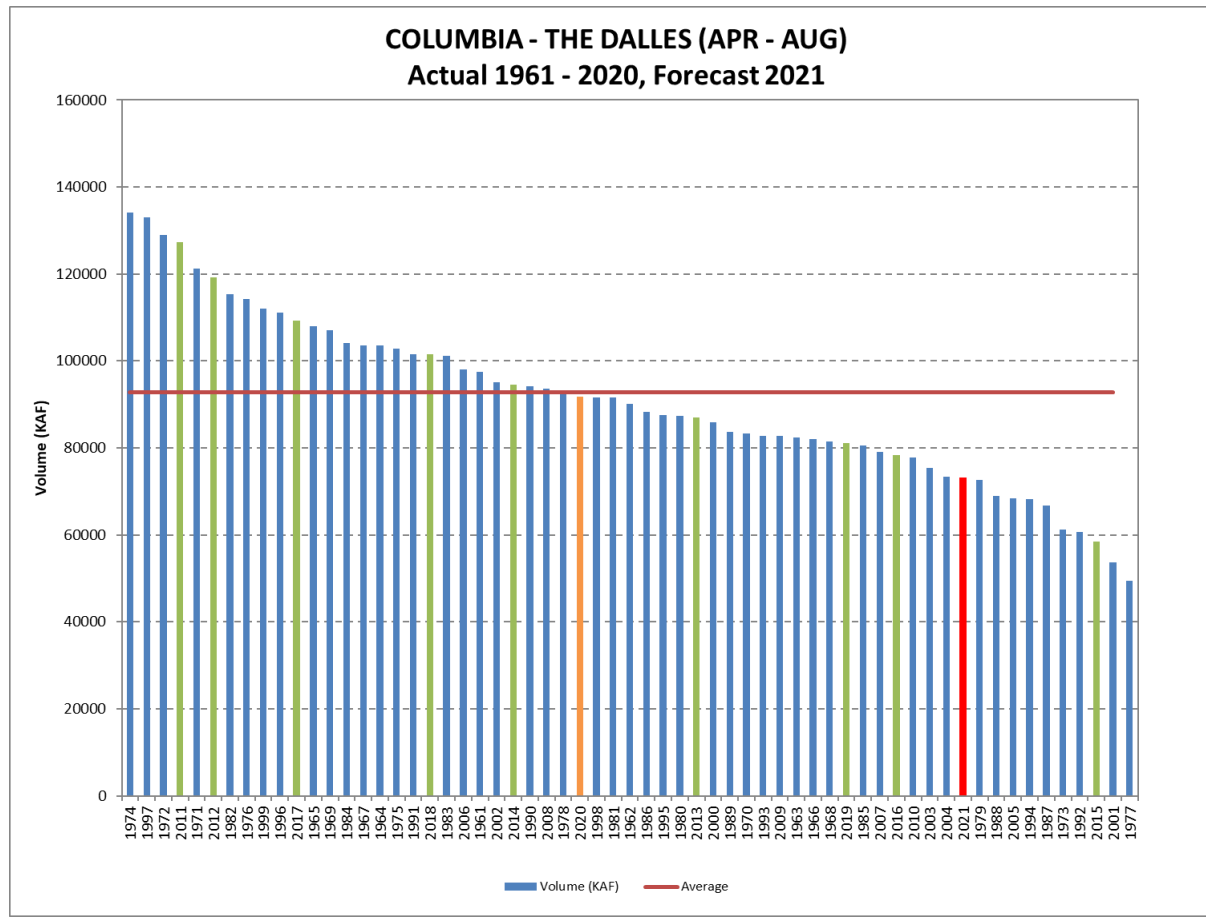


U.S. Columbia Runoff Forecast

May 21st Apr-Aug 2021 WSF (relative to Apr – Aug 2020 Actuals)

- Grand Coulee: 88% of normal (109%)
- Libby : 88% (107%)
- Lower Granite: 69% (98%)
- The Dalles: 84% (105%)

Normal is based on 1981 - 2010



Kinbasket Reservoir

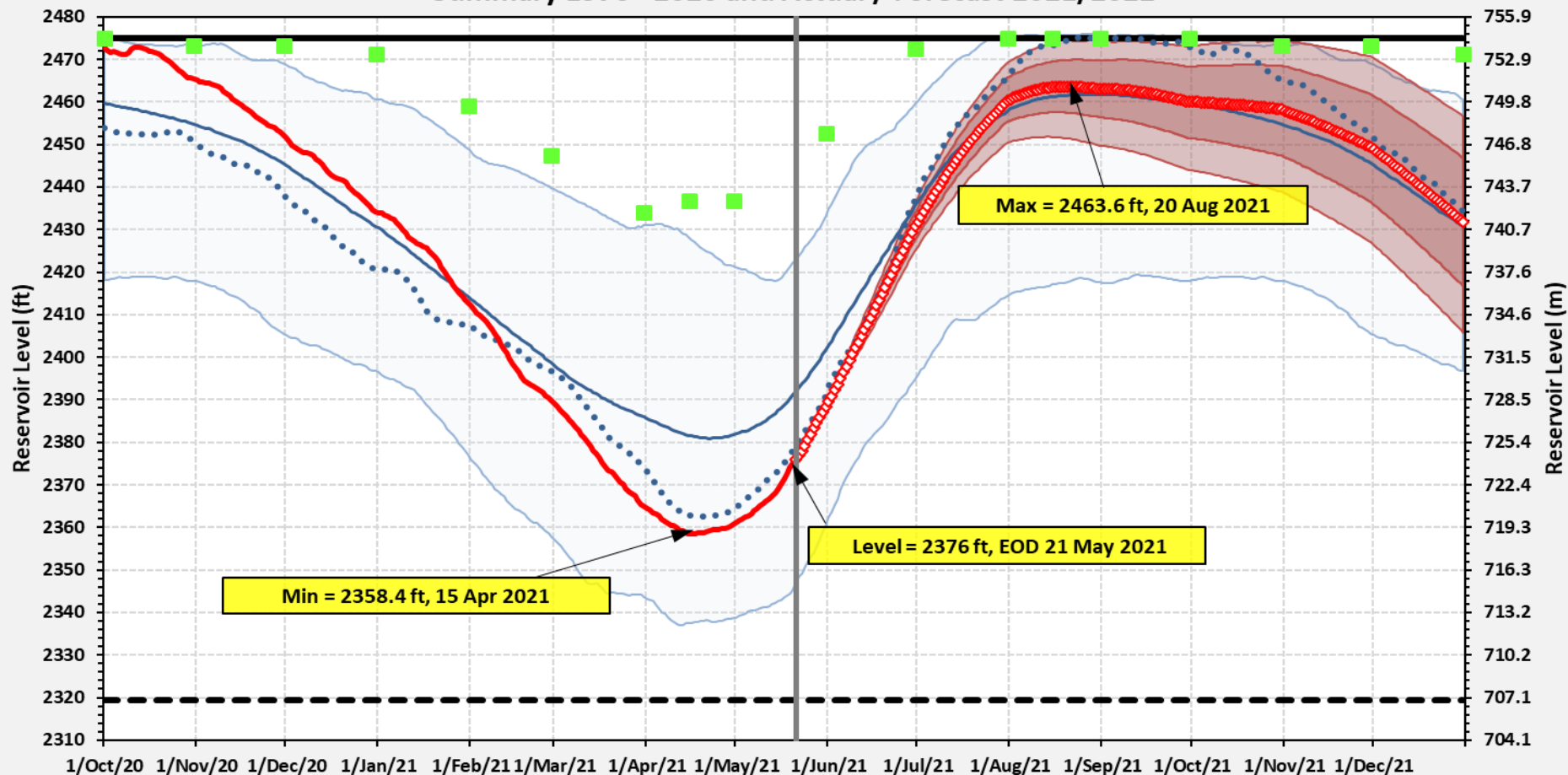
- Kinbasket refilled fully last summer due to above normal inflows.
- Reservoir drafted across the winter/fall period and began trending below average in late January 2021.
- Arctic outbreak brought unseasonably cold temperatures in January and February followed by cooler and drier conditions in March and April –this resulted in higher loads and increased reservoir draft rate.
- Kinbasket reached a minimum level of 2358.4 ft on 15 April 2021, about 5 ft below the previous year's minimum level.
- The reservoir is currently at 2376 ft, filling at about a foot a day in the past week.
- Kinbasket is forecast to refill to a summer maximum level of 2464 ft by late August, 11 ft below full pool subject to actual inflows and loads.



KINBASKET RESERVOIR (MCA) LEVELS

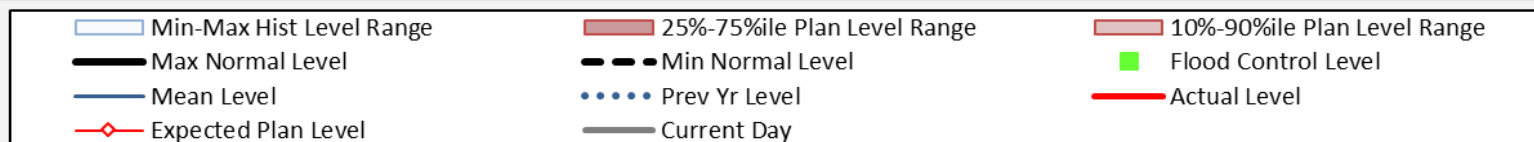
Summary 1976 - 2020 and Actual / Forecast 2021/2022

Forecast Date: May 21, 2021



This forecast is confidential and is the property of BC Hydro. The forecast is subject to change at any time without notice. Distribution of the forecast to any third party or use by any unintended recipient is prohibited without BC Hydro's written consent. Notes:

- Reservoir levels up to 2476' may be required for flood risk management in the Canadian portion of the Columbia basin or for the U.S. under the Columbia River Treaty.
- Reservoir level forecasts are subject to change due to changes in projected weather, snowpack, and runoff patterns in the Columbia basin, BC Hydro's load and generation requirements, provisions of the Columbia River Treaty, and other variables during this period.
- BC Hydro expressly disclaims any warranties or representations with respect to this forecast. BC Hydro accepts no liability arising from the use of this forecast. BC Hydro will make reasonable efforts, but is not obliged, to provide updates when the forecast changes.

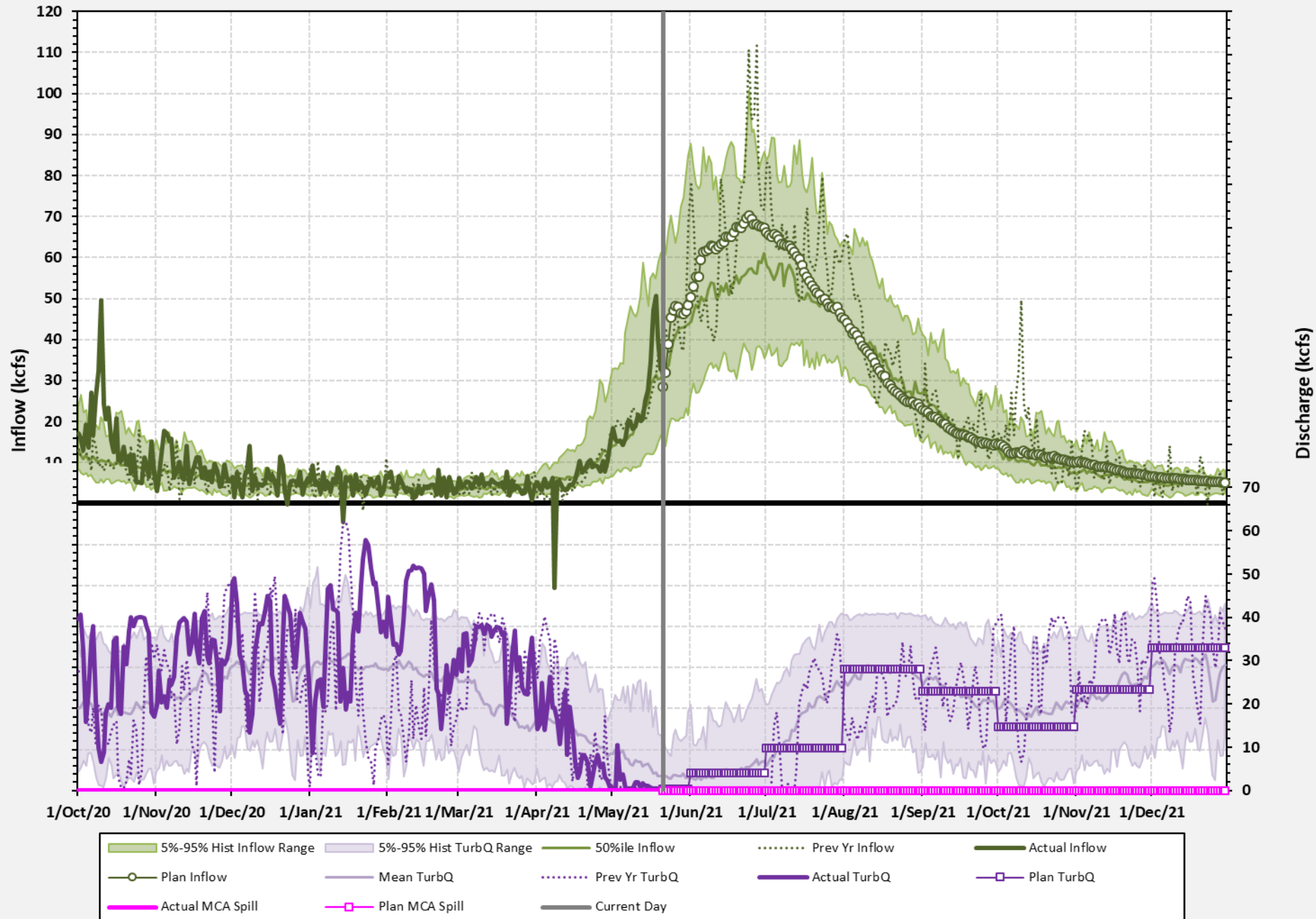


KINBASKET RESERVOIR (MCA) FLOWS

Summary 1971 - 2020 and Actual / Forecast 2021

ESP: May 17, 2021

Forecast Date: May 21, 2021



Revelstoke Reservoir

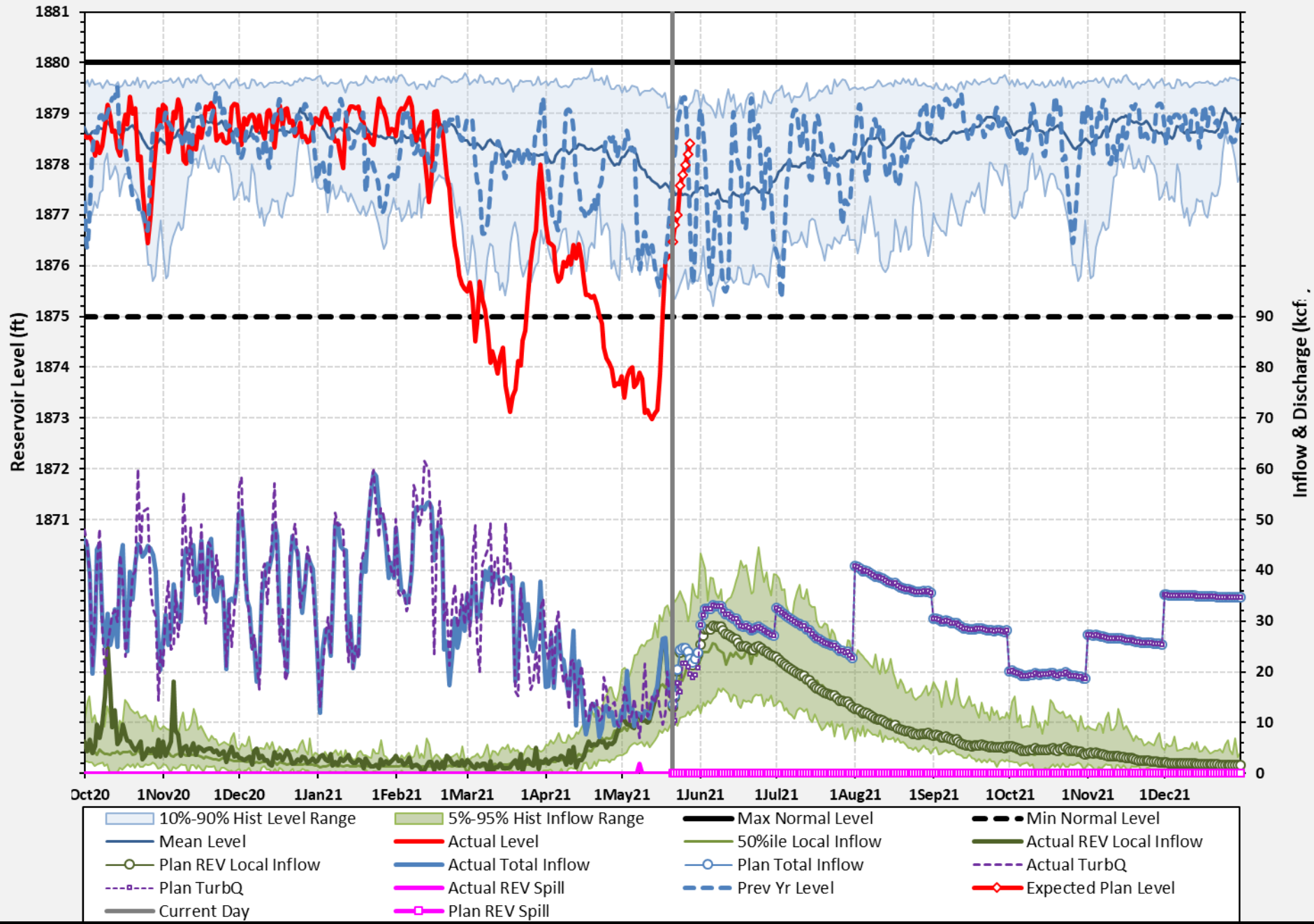
- Revelstoke reservoir's normal operating range is between 571.5 –573.0 metres (1,875 –1,880 feet).
- Occasionally, water levels are below normal operating range when needed to meet winter's high electricity demands or to manage freshet inflows.
- Revelstoke reservoir was drawn down in March to support maintenance work and again in late April through mid May due to colder and drier conditions.
- Snowmelt in the basin is a bit delayed this year. It started with last weekend's hot weather contributing to higher tributary flows and reservoir levels.
- The reservoir is expected to remain within normal operating range based on current inflows.



REVELSTOKE RESERVOIR (REV) LEVELS & FLOWS

Forecast Date: May 21, 2021

Summary 1984 - 2020 and Actual / Forecast 2021/2022



Arrow Lakes Reservoir

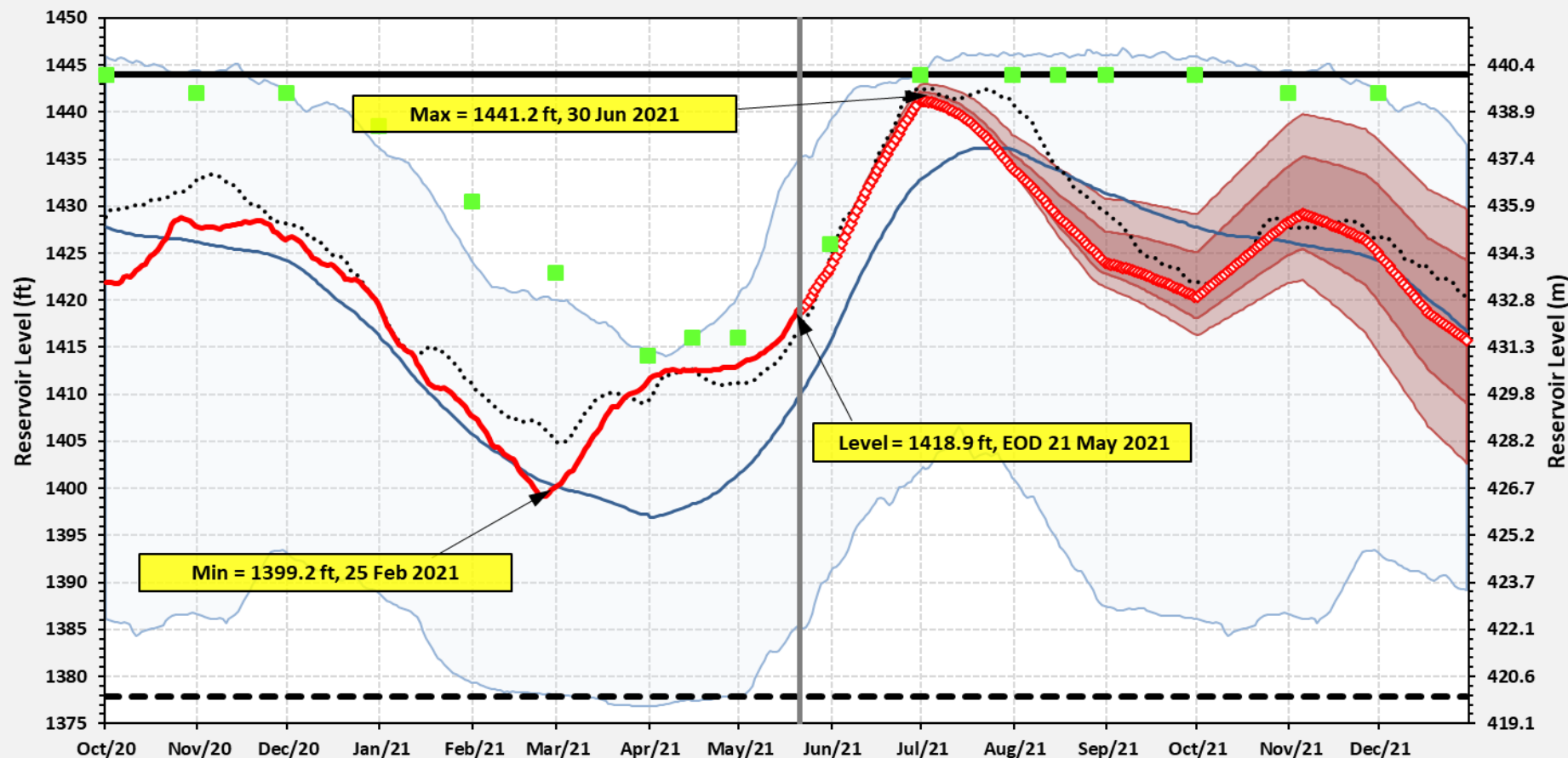
- Arrow releases are regulated under the CRT and coordination agreements.
- Nonpower Uses (NPU) agreement was developed between the CRT Entities to enable shaping of Arrow Treaty flows from January through July 2021 for U.S and Canada fish objectives.
- Arrow Lakes reservoir began the operating year near full supply at 1441 ft, 3 ft below full pool on August 1, 2020.
- The reservoir drafted as is normal in the fall and winter. It reached a minimum level of 1399.2 ft on 25 February 2021.
- Arrow refilled up to its maximum permissible level for CRT FRM (Flood Risk Management) across April and is forecast to continue to refill through the balance of May and June.
- Arrow is expected to reach a maximum level of about 1441 ft, 3 ft from full pool by late June.
- Arrow storage could return to proportional draft as early as July if dry conditions persists in the U.S.



ARROW LAKES RESERVOIR (ARD) LEVELS

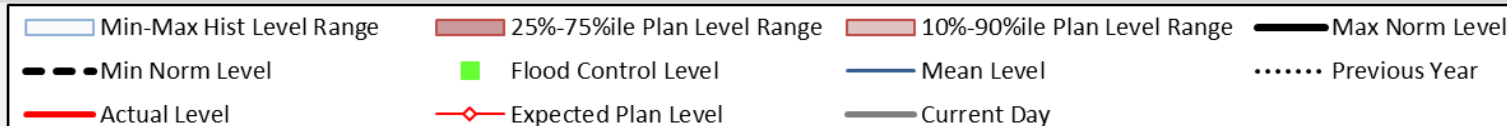
Forecast Date: May 21, 2021

Summary 1968 - 2020 and Actual / Forecast 2021/2022



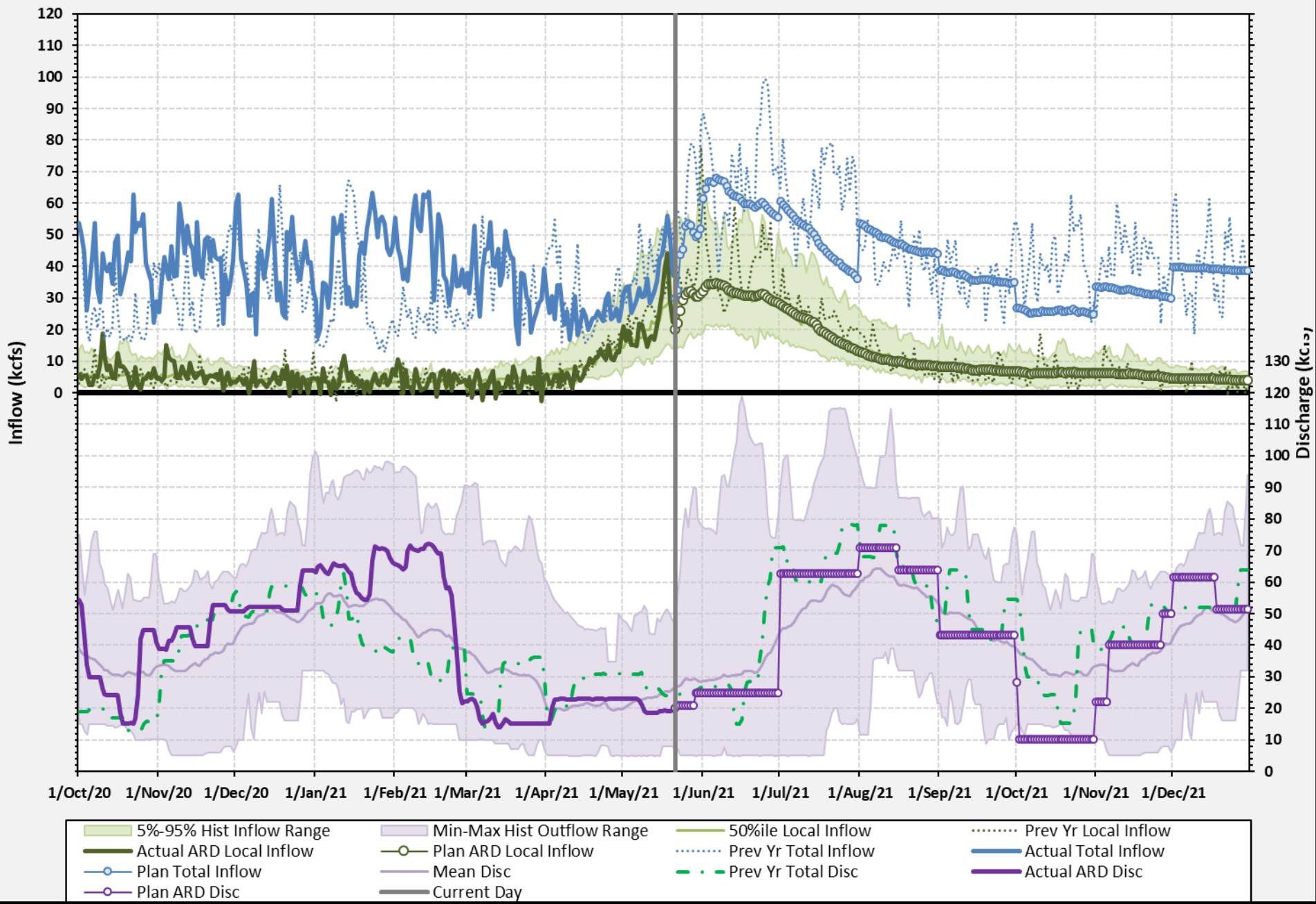
This forecast is confidential and is the property of BC Hydro. The forecast is subject to change at any time without notice. Distribution of the forecast to any third party or use by any unintended recipient is prohibited without BC Hydro's written consent. Notes:

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- Reservoir level forecasts are subject to change due to changes in projected weather, snowpack, and runoff patterns in the Columbia basin, BC Hydro's load and generation requirements, provisions of the Columbia River Treaty, and other variables during this period.
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ARROW LAKES RESERVOIR (ARD) FLOWS

Summary 1971 - 2020 and Actual / Forecast 2021

ESP: 17 May 2021
Forecast Date: May 21, 2021

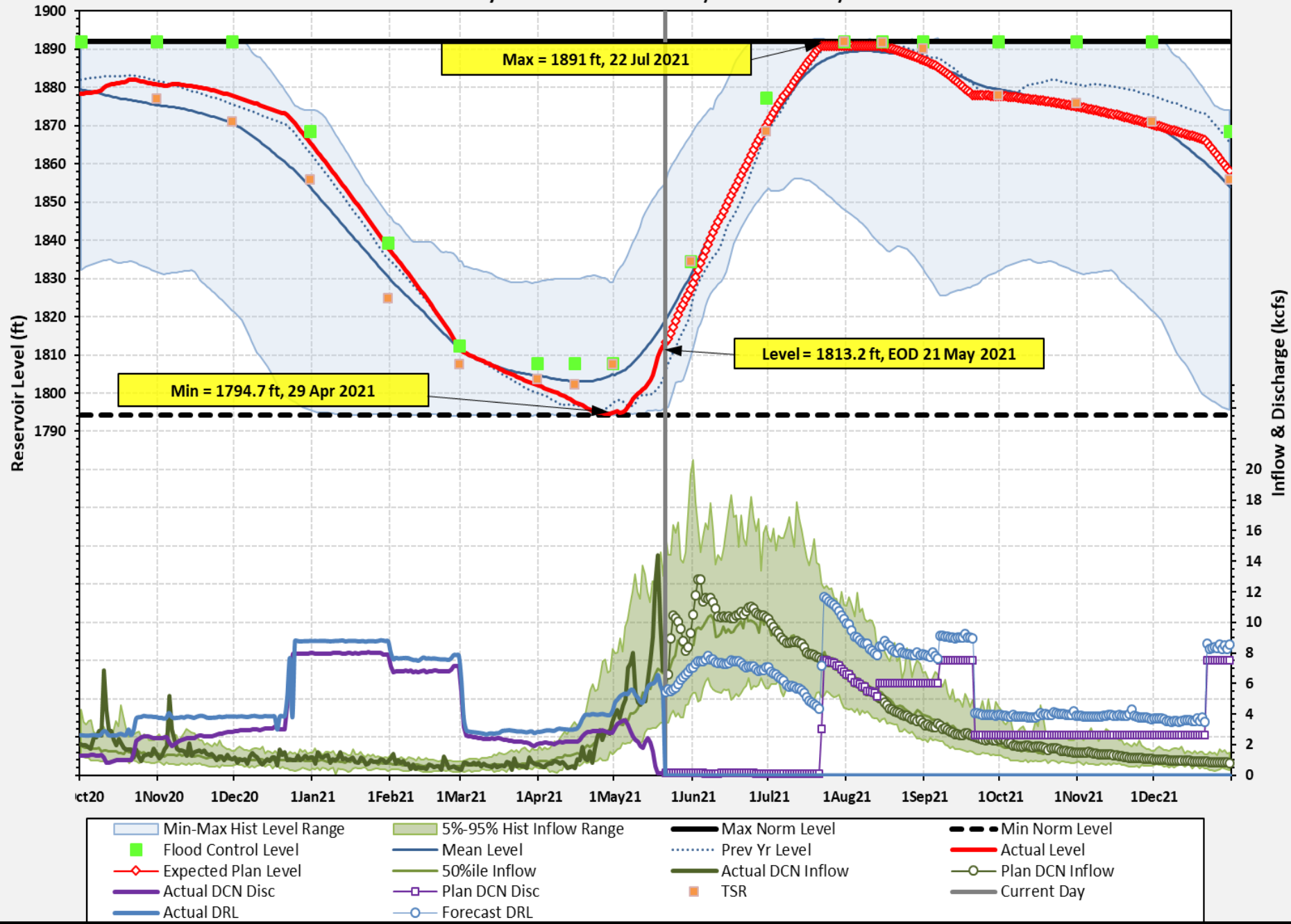
Duncan Reservoir

- Duncan is typically operated to meet Water Use Plan (WUP) provisions for flows and levels and CRT FRM requirements during drawdown and refill.
- It began the operating year near full pool in August 2020 and operated to WUP recreation targets through to Labour Day.
- Duncan discharge was reduced to WUP stipulated low flows for downstream kokanee spawning protection and ecosystem objectives from late September through to late December.
- The reservoir drafted across January through April for system and local flood risk management.
- It reached a minimum level of 1794.7 ft on 29 April 2021, 0.5 ft above licence minimum.
- Duncan discharge was reduced to minimum of 0.1 kcfs on about mid May to support refill of the reservoir.
- The reservoir is forecast to fill to a summer maximum level of 1891 ft, 1 ft below full by late July.

DUNCAN RESERVOIR (DCN) LEVELS & FLOWS

Summary 1967 - 2020 and Actual / Forecast 2021/2022

ESP: 17 May 2021
Forecast Date: May 18, 2021

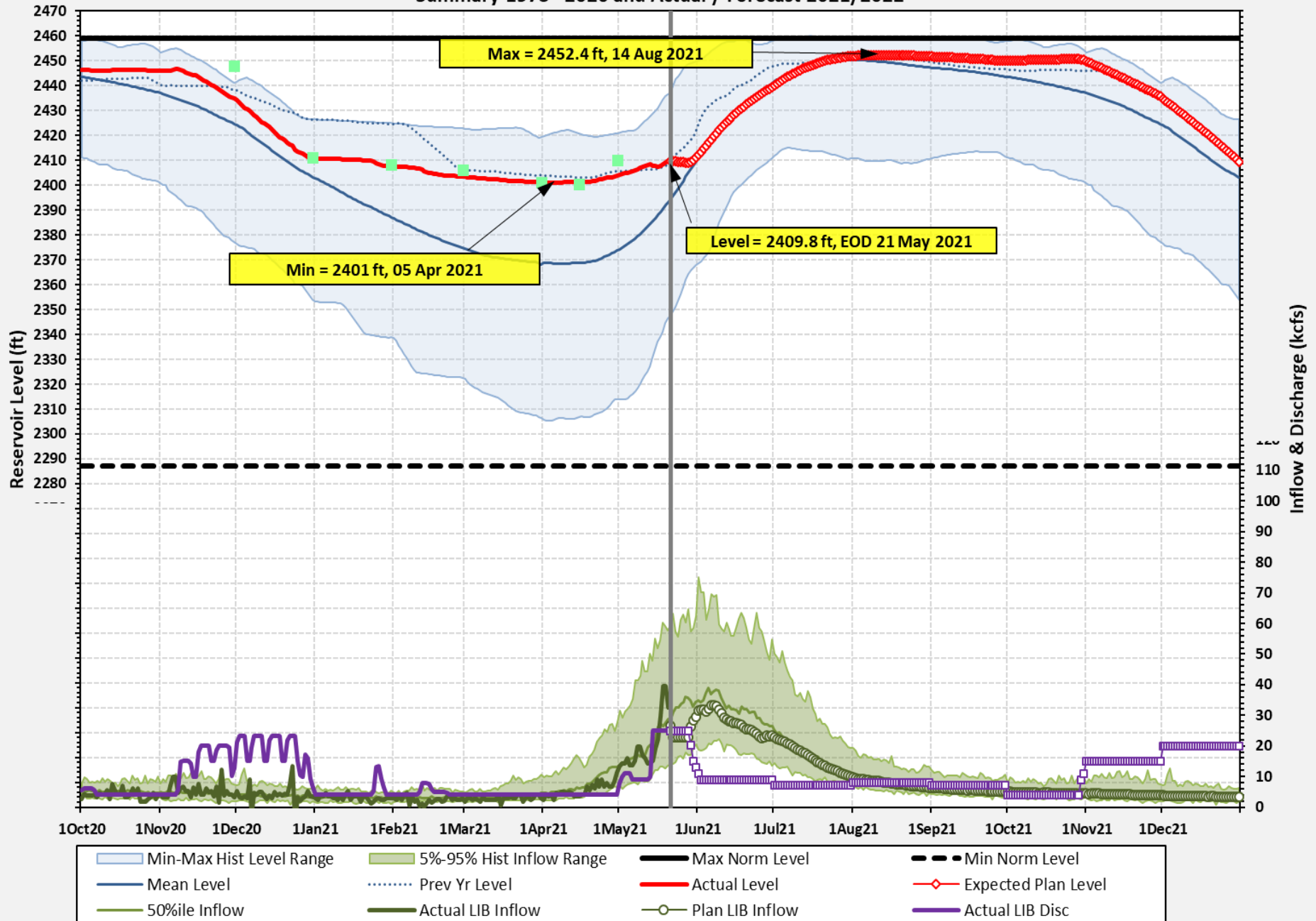


Libby Reservoir

- Libby is owned and operated by USACE, coordinated under the CRT Libby Coordination Agreement for power and flood control.
- Libby began the operating year in August 2020 at about 2451 ft, 8 ft below full pool.
- From December through April, Libby operated to meet FRM requirements with minimum outflows of 4 kcfs for most of January through April 2021.
- Libby reached a minimum level of 2401 ft on 5 April 2021.
- The May WSF for April-August was 5.2 MAF (88% of average) which set the sturgeon pulse volume at 0.8 MAF.
- The sturgeon pulse operation set a steady outflow of 25 kcfs from May 14 to May 28 followed by a ramp down to about 9 kcfs forecasted in June, above the bull trout minimum of 7 kcfs.
- Libby is forecast to fill to a summer maximum level of 2452 ft, 7 ft below full pool by mid August.

LIBBY RESERVOIR (LIB) LEVELS & FLOWS

Summary 1975 - 2020 and Actual / Forecast 2021/2022



Kootenay Lake

- Kootenay Lake operations are in accordance to the IJC which stipulates the maximum permissible levels on Kootenay Lake.
- FortisBC is the holder of the IJC.
- IJC requires the lake to be drawn down from January 7 through April 1 each year subject to Grohman Narrows restriction.
- Kootenay Lake reached a minimum level of 1738.6 ft on April 1, 0.7 ft below the IJC.
- “Spring Rise” for Kootenay Lake was declared on 21 April 2021.
- Flows were proactively maximized through Grohman Narrows beginning 21 April: “Free Fall”.
- Lake discharge will be maximized until about mid June when freshet flows are expected to taper off and no concerns with flood risk.
- Kootenay Lake is forecast to fill to a spring maximum level of 1748 ft in early June, 4 ft below onset of flood risk.

KOOTENAY LAKE RESERVOIR (KLK) LEVELS & FLOWS

Summary 1984 - 2020 and Actual / Forecast 2021/2022

ESP: 17 May 2021

Forecast Date: May 18, 2021

