BUREAU OF RECLAMATION

Klamath Project
Temporary Operating Procedures

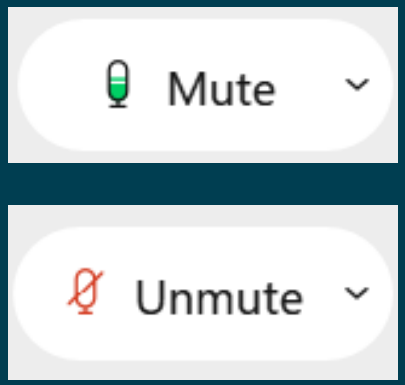
February 24, 2023

Webex Guidelines

Mute function

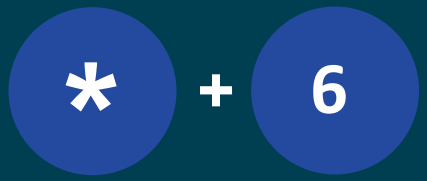
Desktop App

Click button



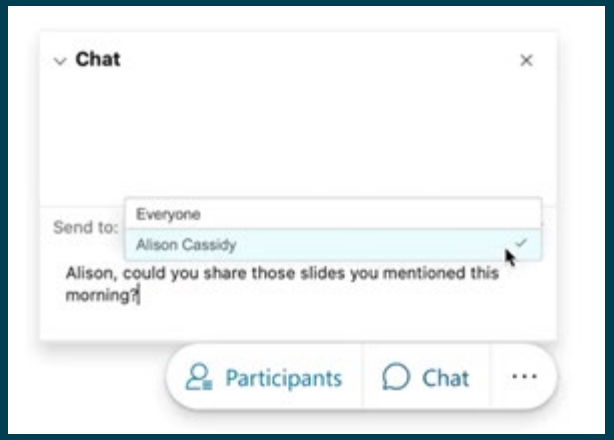
Phone

Dial * 6



Browser

Chat us with issues

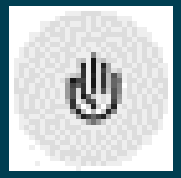


Webex Guidelines

Raise Hand Function

Desktop App

Click button



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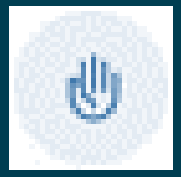

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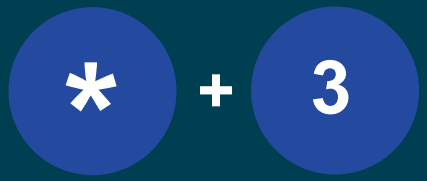
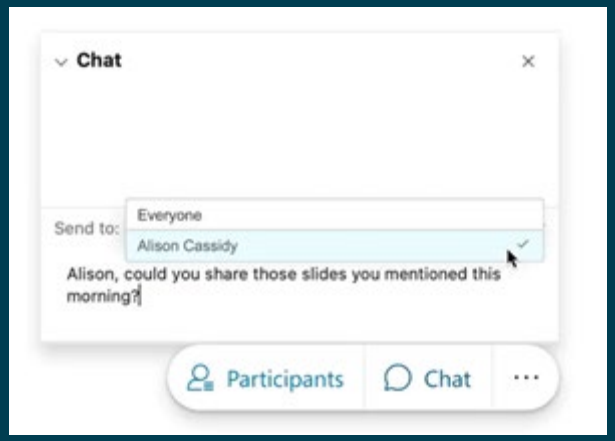


Browser

Chat us!



Meeting Guidelines

- Listen first
- Share the airtime
- Allow speakers to finish
- Respect agenda topics and times

- *This meeting is not being recorded.*

Outline

- TOP Operations Changes, Feb 14
- Concepts for improving ESA compliance

- Monitoring Information
- Current Forecasts and Reclamation Interpretation
- Temporary Operating Procedures
- Schedule for Input and Action

- Supplemental Information

TOP Operations Changes, Feb 14

- February 13 – NMFS, FWS and Reclamation finalized a coordination plan for Winter/Spring 2023 Klamath Project Operations. (See https://www.usbr.gov/mp/kbao/)
- Balance of risks based on real time hydrologic conditions, minimizing some of the short-term impacts based on conditions of redds and as hydrology requires it.
- Initial reduction in NMFS BiOp-required minimum flows by 11% started on February 14, additional adjustments possible based on monitoring and hydrology
- Conserved water in UKL will only be used for ESA purposes.
- Continued adaptive management with weekly technical input, continued monitoring of changes from the initial trim, future increase or decrease depending on impacts to redds and forecasts.
- Longer term – work with agency experts and stakeholders to better understand forecasting tools

Concepts for Improving ESA Compliance

Diversion reduction strategies

1. Halt out-of-basin diversions to the Rogue River basin
   IN PROGRESS - Data posted to KBAO website, Workshop being scheduled for technical questions
2. Halt diversions from the Keno Impoundment
   COMPLETED – Action taken per TOP to halt diversions at Ady Canal for refuges, gate closed on (02/16/2023@1300)

Supply augmentation strategies

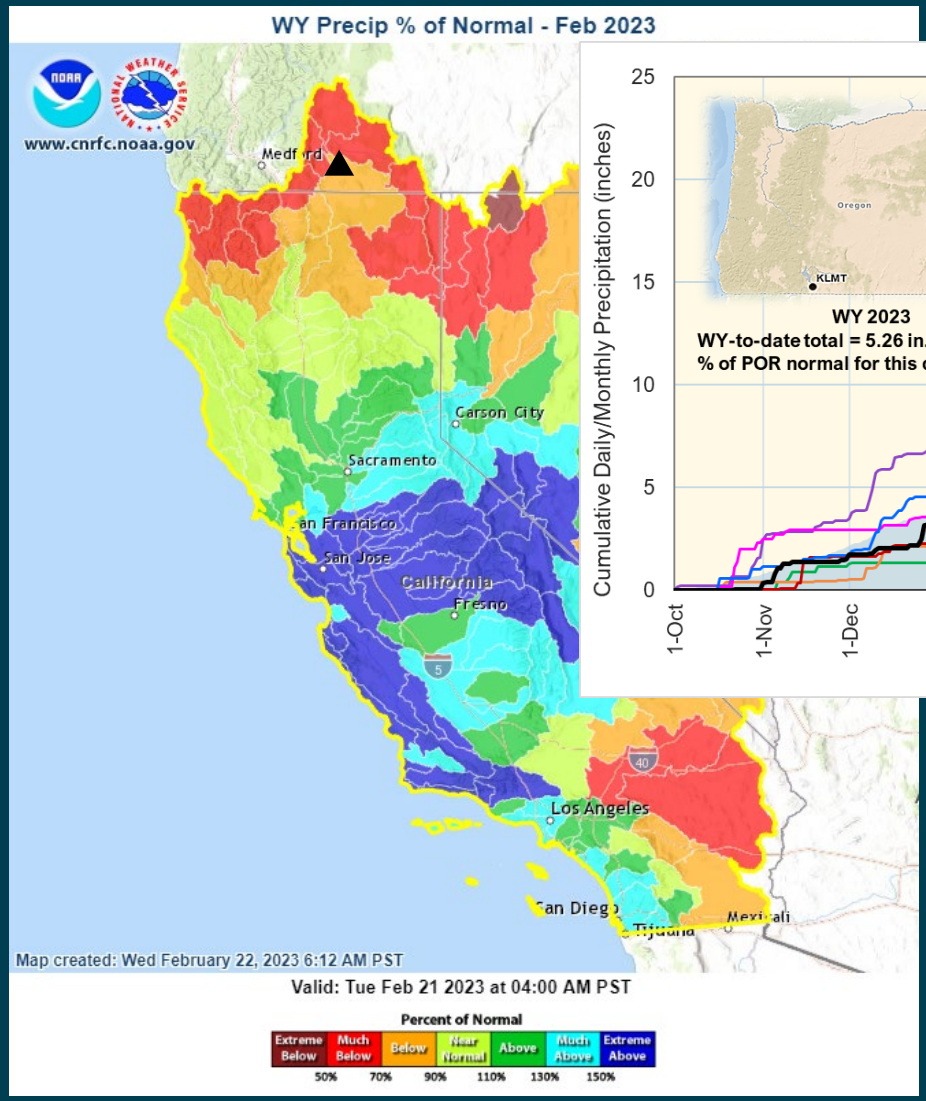
3. Initiate out-of-basin diversions into Klamath River from Lost River
   COMPLETED – Not available as a discretionary action to Reclamation
4. Consider planning for a lower volume pulse/flushing flow from Upper Klamath Lake
   COMPLETED – Plans for pulse flow will be limited to supply available
5. Consider use of Klamath Drainage District drainage supplies
   COMPLETED – Reclamation and USFWS are working with KDD to understand plans for said supplies

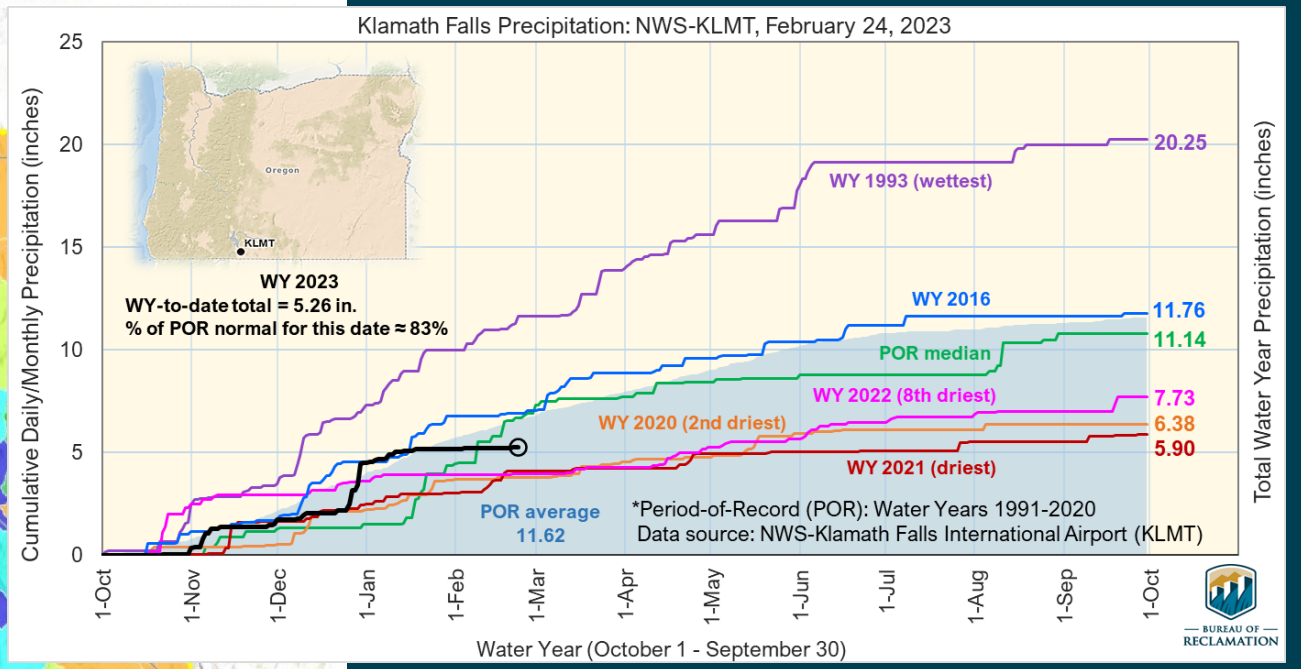
Operation modification strategies

6. Borrow or exchange water with KRRC (former PacifiCorp reservoirs)
   COMPLETED – KRRC and States have told Reclamation that supply flexibility is not available this year
7. Reduce Link River Dam outflows to make better use of storm events
   COMPLETED – Reclamation has made all preparations to maximize inflow from any future storms
8. Establish higher end-of-season elevation requirements for Upper Klamath Lake
   IN PROGRESS – Reclamation is evaluating the effect of ESA requirements on 2023 Project supplies

Monitoring Information

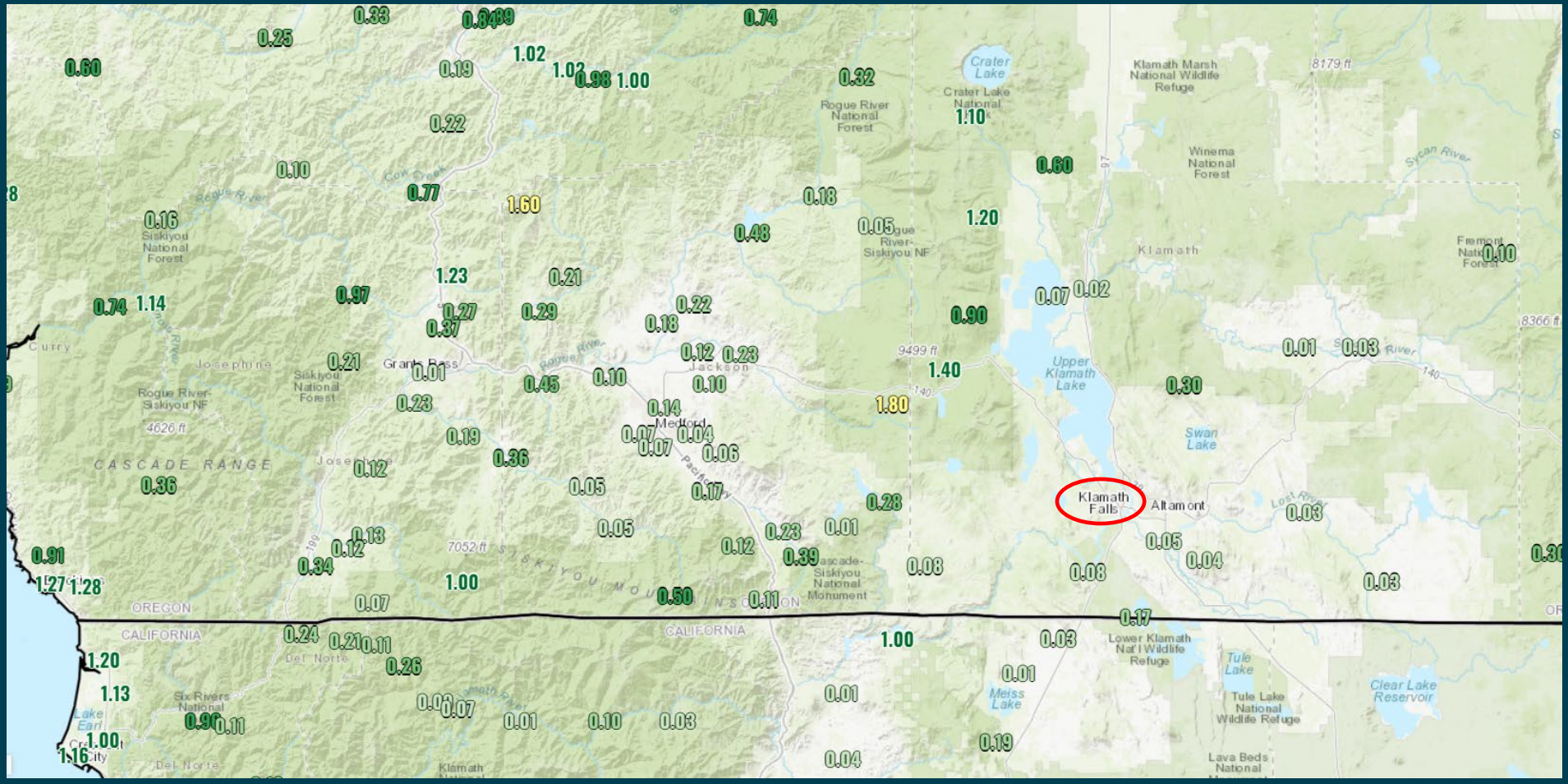
Precipitation To-Date Compared with Normal
February 24, 2023





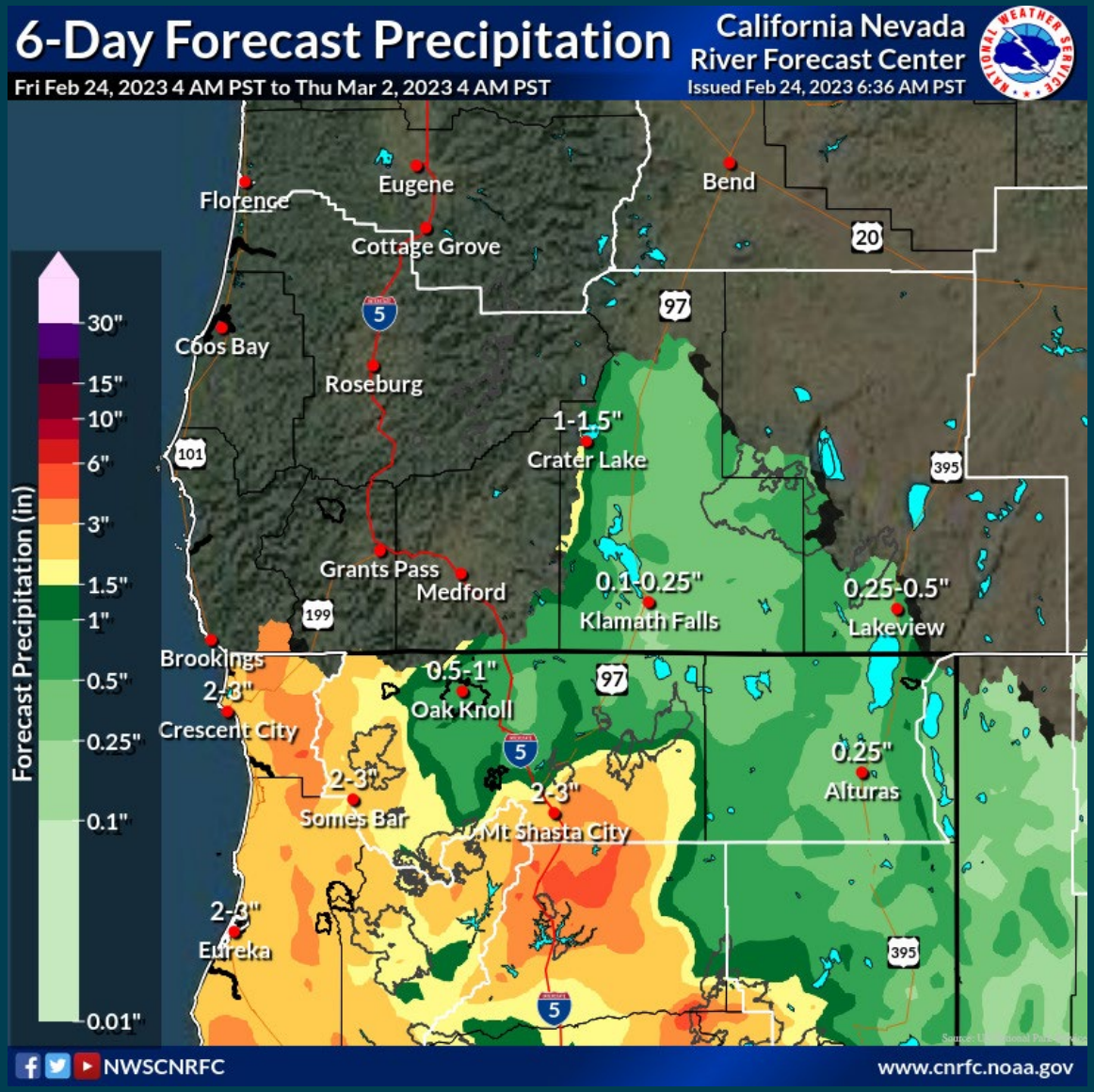
https://www.cnrfc.noaa.gov/precipForecast.php?cwa=MFR&imgNum=1&mobile=0

Precipitation – 2/18/2023 12:00am to 2/23/2023 10:00am



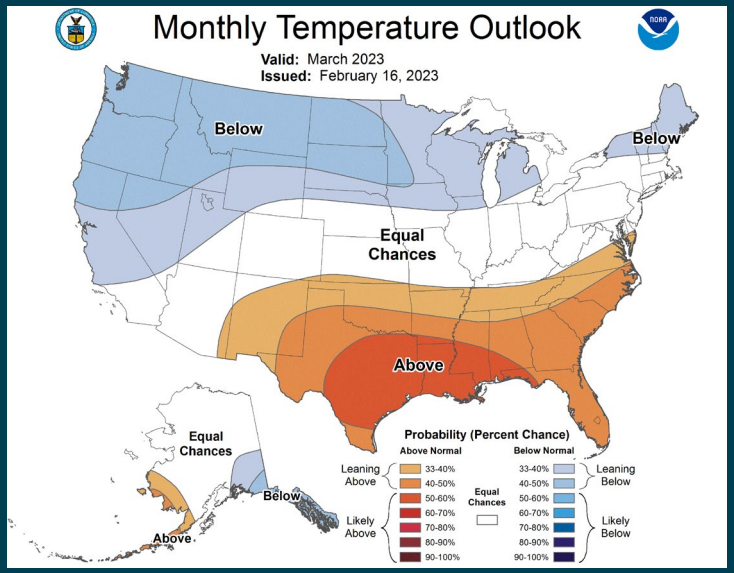
https://www.wrh.noaa.gov/map/?obs=true&wfo=mfr&basemap=OpenStreetMap&boundaries=true,false&obs_popup=true

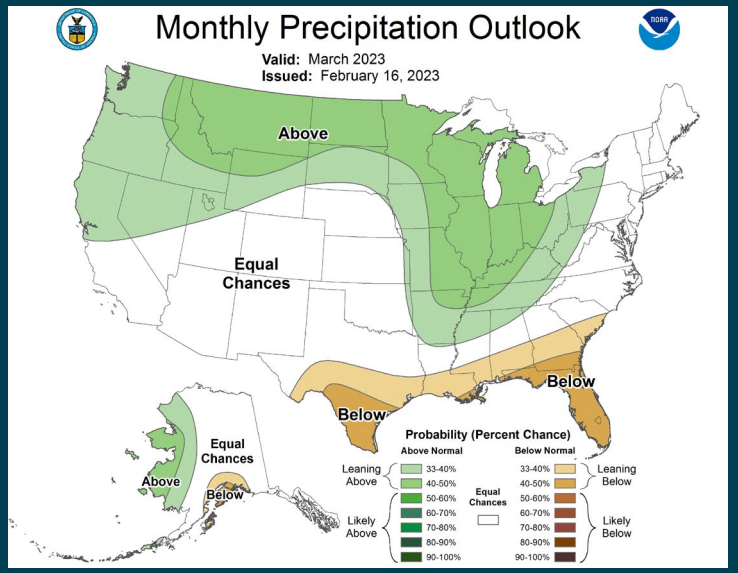
6-Day Precipitation Forecast – California Nevada River Forecast Center

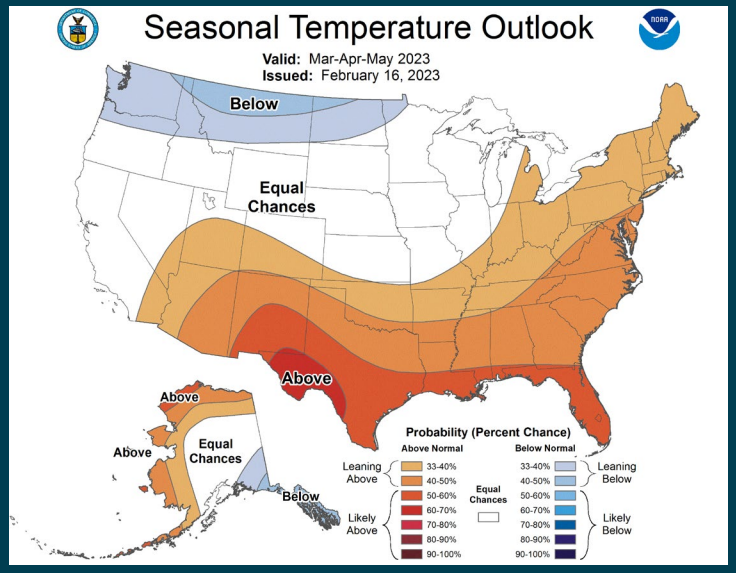


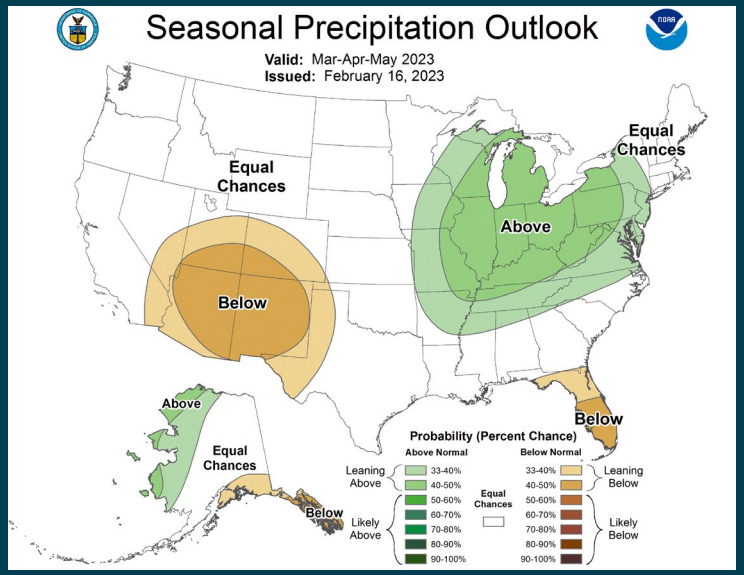
https://www.cnrfc.noaa.gov/precipForecast.php?cwa=MFR&imgNum=1&mobile=0

March/Seasonal Monthly Weather Outlook



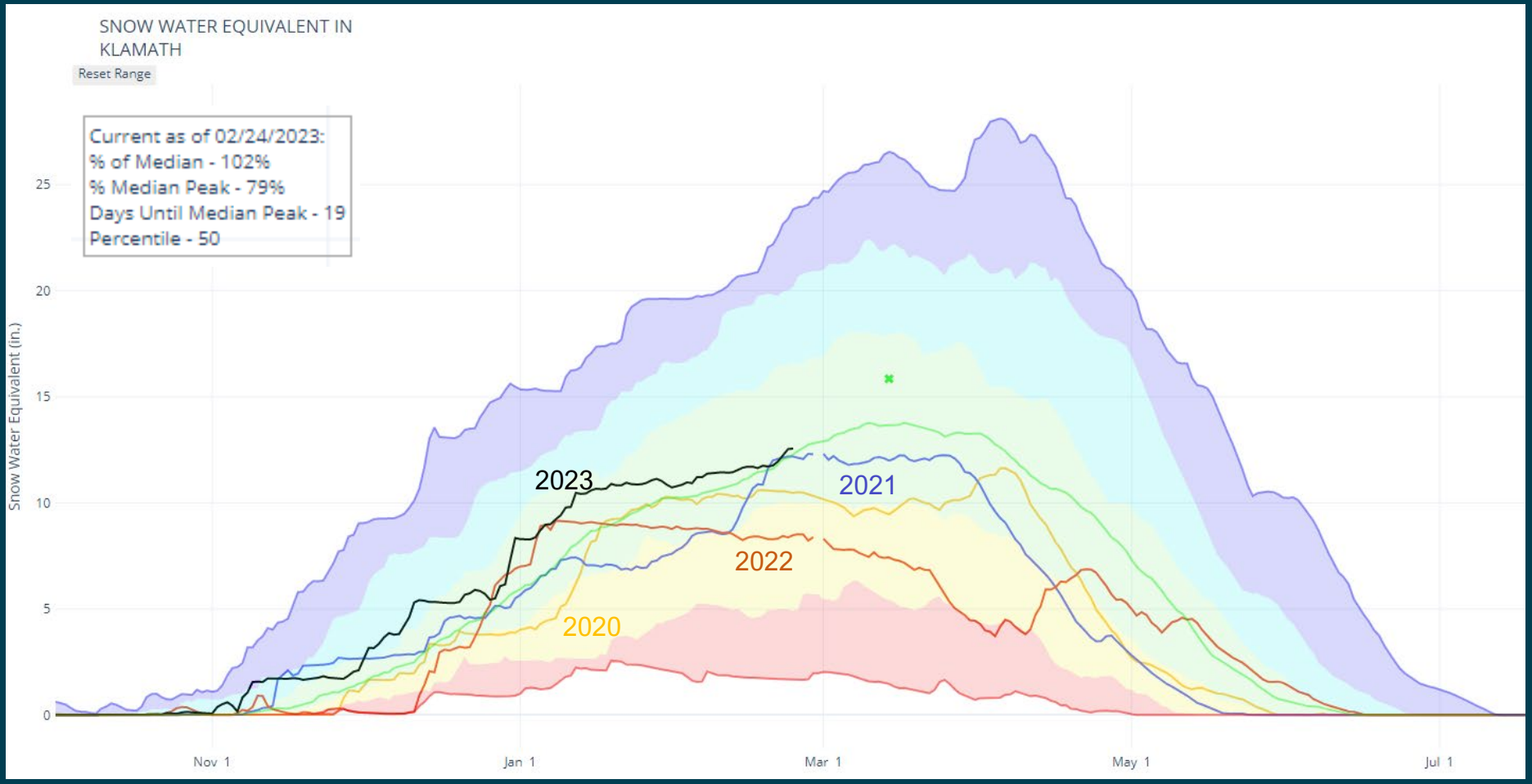






https://www.cpc.ncep.noaa.gov/products/predictions/long_range/seasonal.php?lead=1

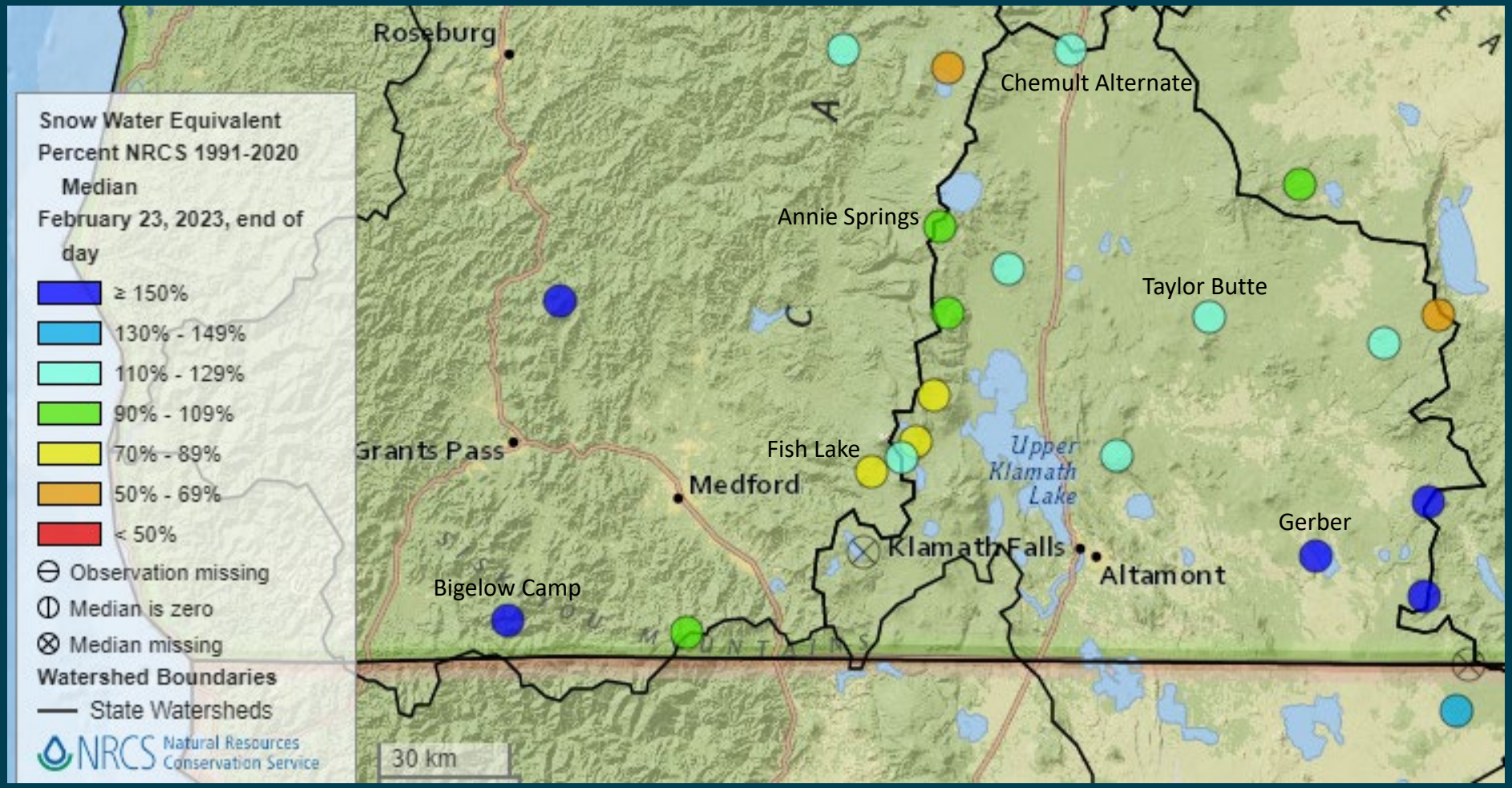
NRCS Upper Klamath Basin Snow Water Equivalent (SWE) Water Year 2023 & Last 3 Water Years



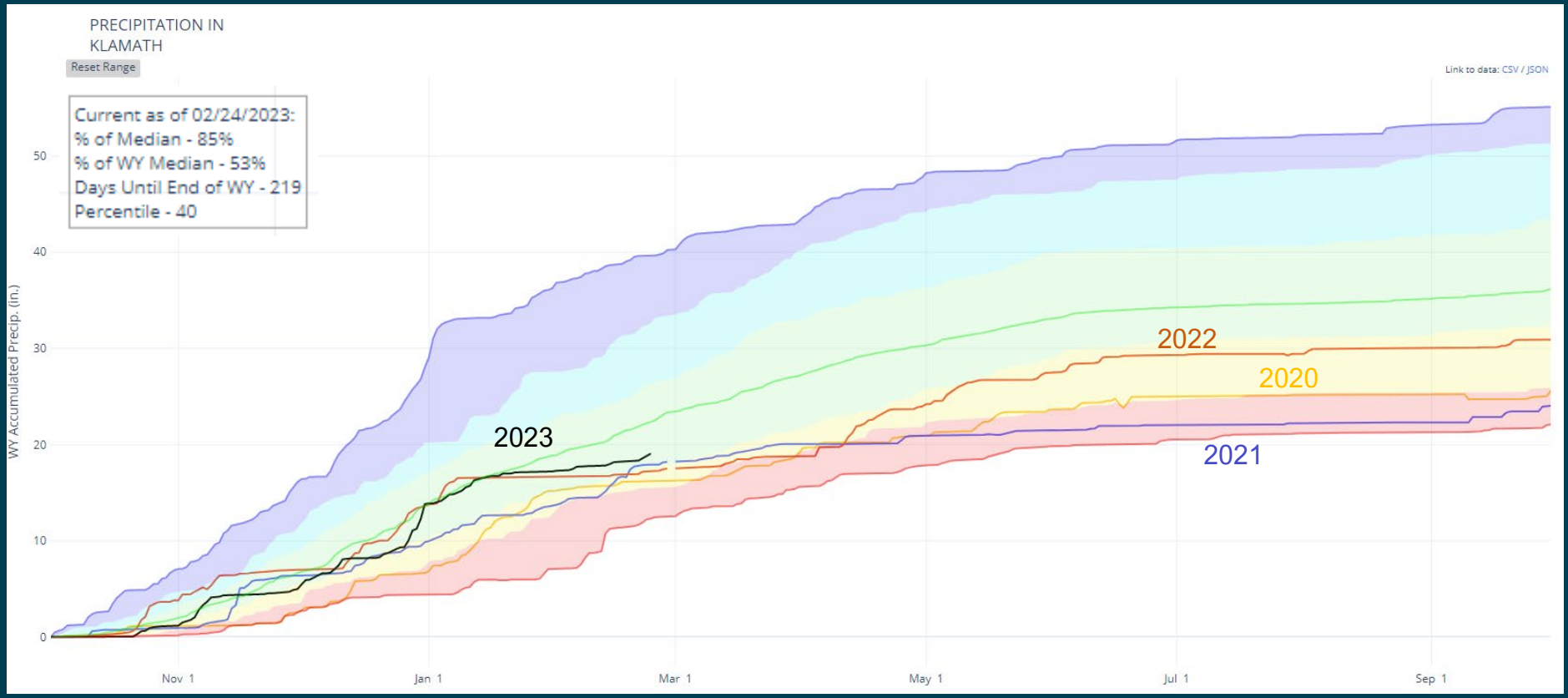
Statistical shading breaks at the 10th, 30th, 50th, 70th, and 90th percentiles

https://www.nrcs.usda.gov/Internet/WCIS/AWS_PLOTS/basinCharts/POR/WTEQ/assocHUC6/180102_Klamath.html

NRCS Upper Klamath Basin Snow Water Equivalent (SWE) By Site



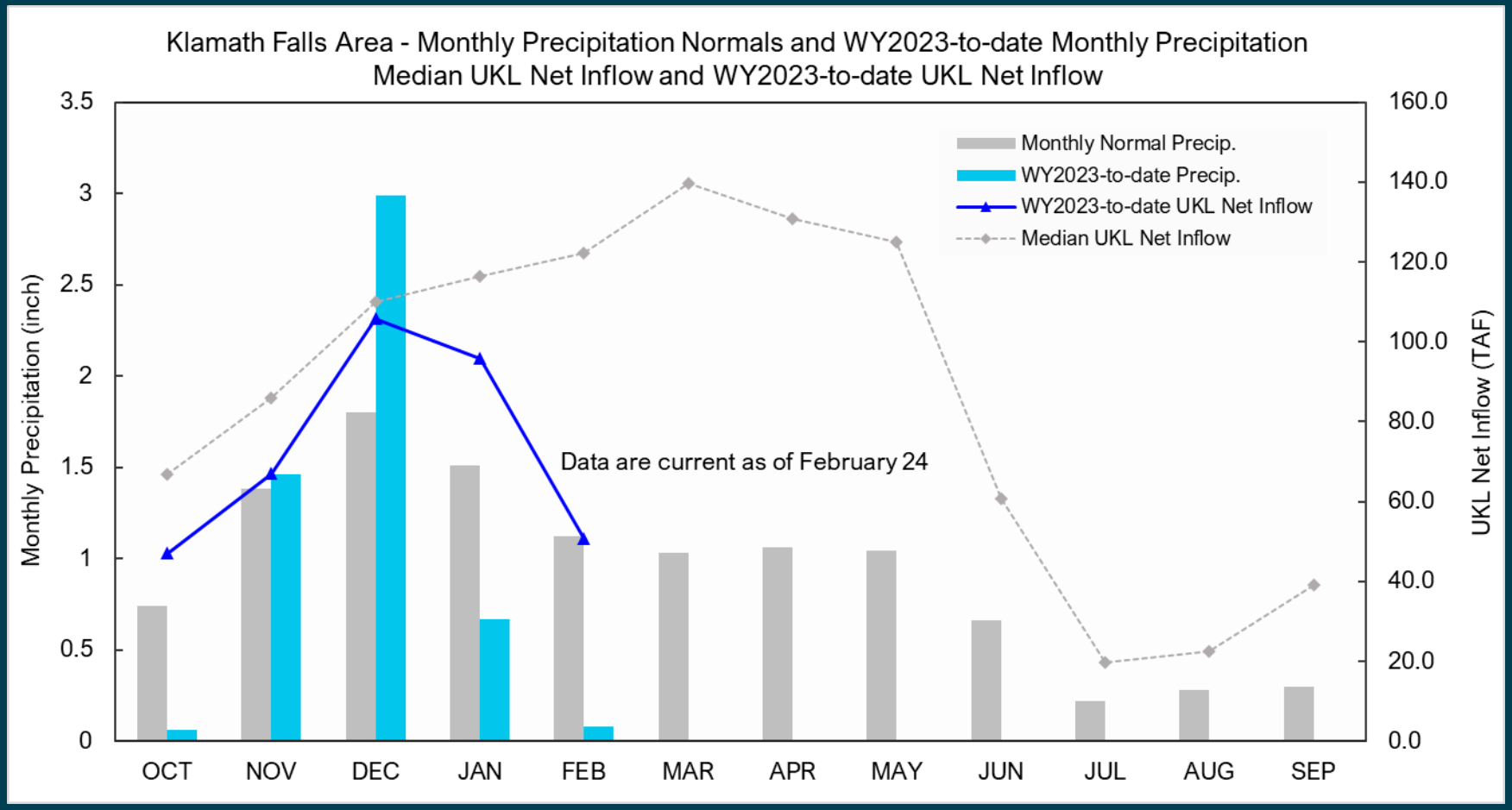
NRCS Upper Klamath Basin Snow Water Equivalent (SWE) Water Year 2023 & Last 3 Water Years



Statistical shading breaks at the 10th, 30th, 50th, 70th, and 90th percentiles

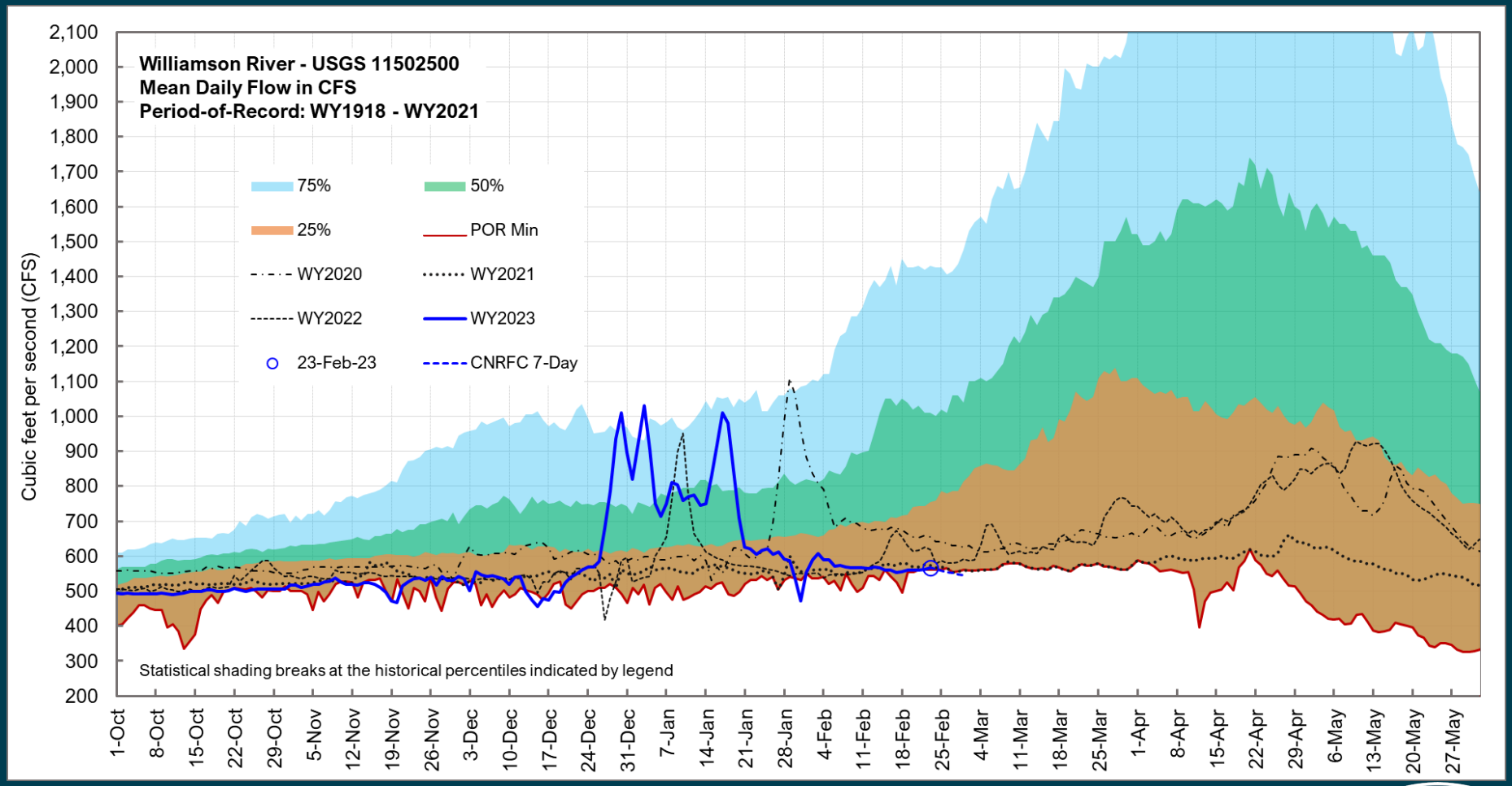
https://www.nrcs.usda.gov/Internet/WCIS/AWS_PLOTS/basinCharts/POR/PREC/assocHUC6/180102_Klamath.html

Klamath Falls Area – Monthly Precipitation Normals and WY2023 Monthly Precipitation
Median UKL Net Inflow and WY2023-to-date UKL Net Inflow



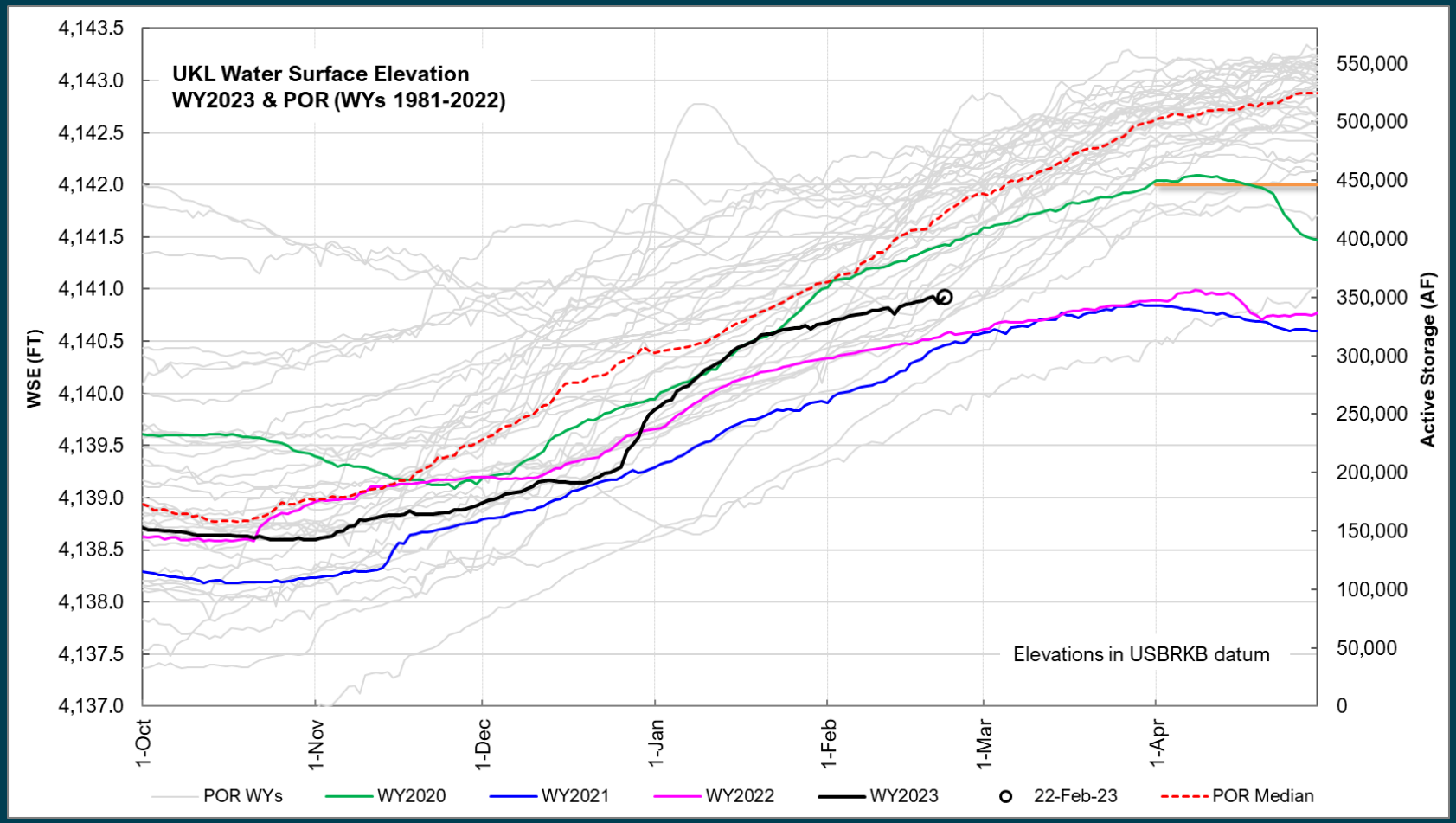
Precipitation Feb 1 - Feb 23: 0.08"/0.92" normal = 9%

Williamson River is a Strong Indicator of Net Inflow at UKL



WY2022/2023 data are provisional and subject to revision

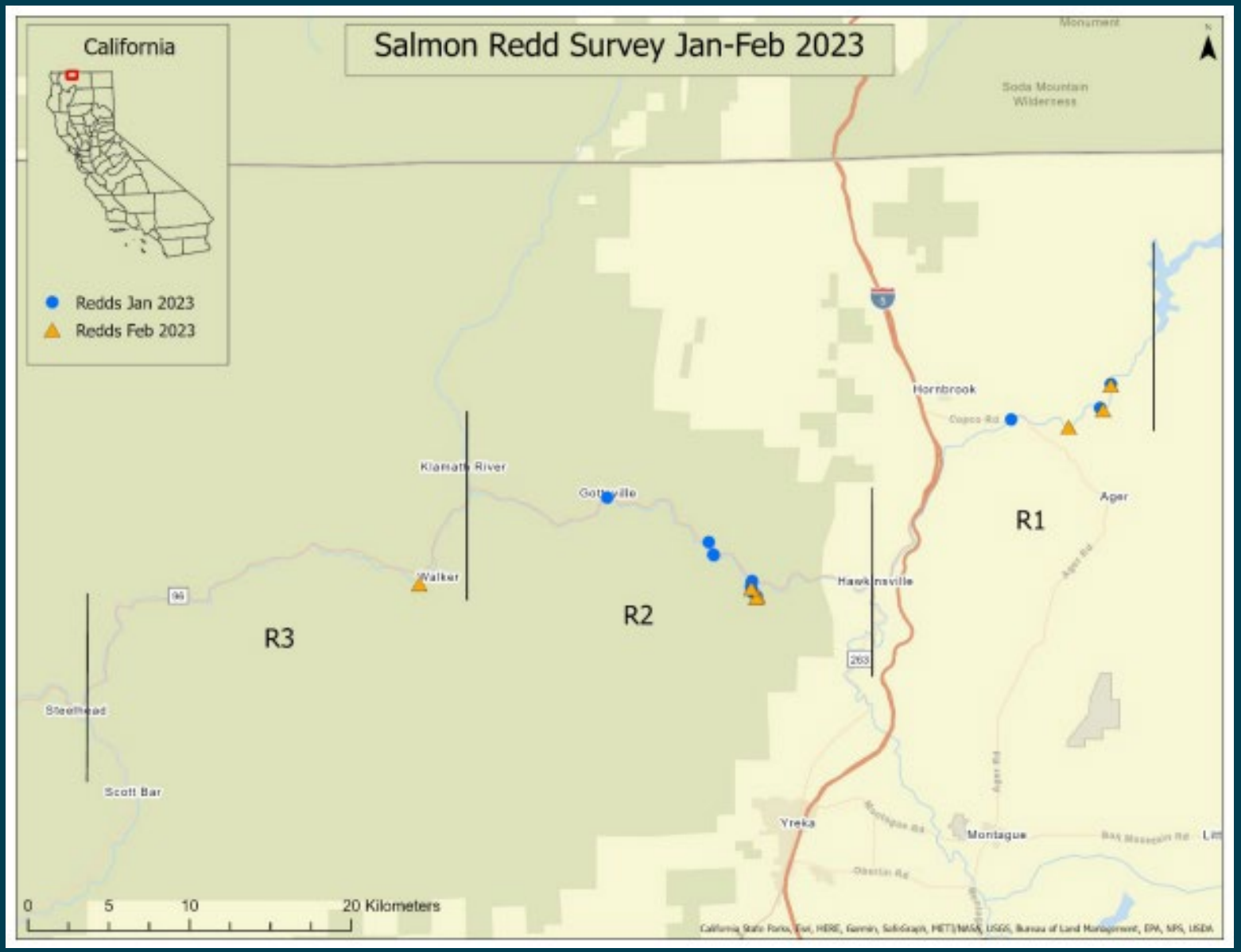
UKL Water Surface Elevation
Water Year 2023 & Period-of-Record-to-Date



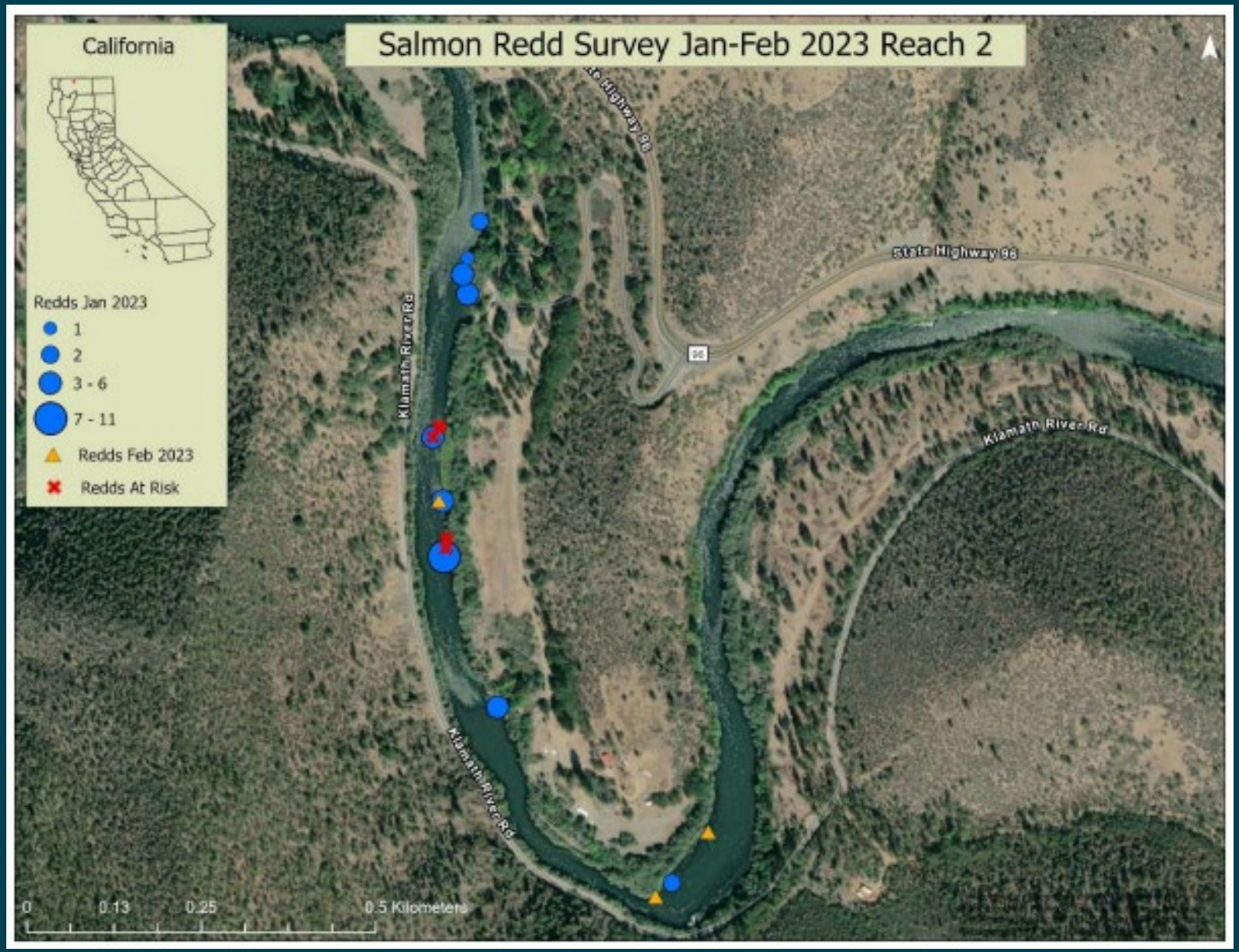
WY2022/2023 UKL water surface elevation observational data are provisional

Feb 8-15 increased by 0.010 ft/day
Feb 16-23 increased by 0.018 ft/day

Redd Survey Locations

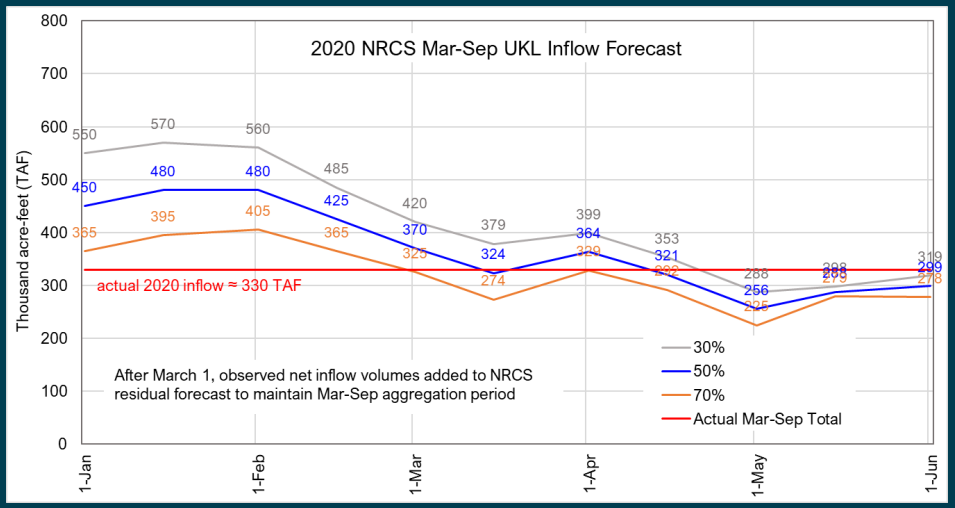


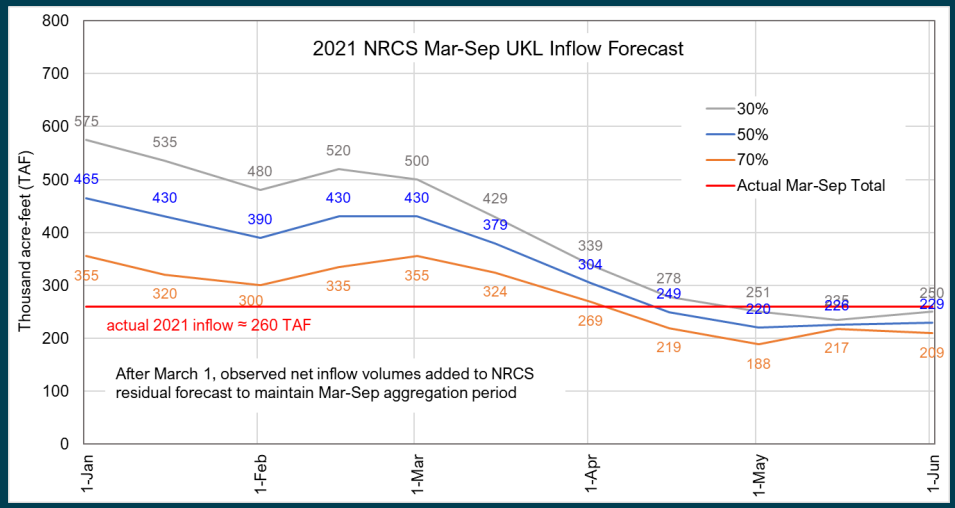
Redd Survey Locations

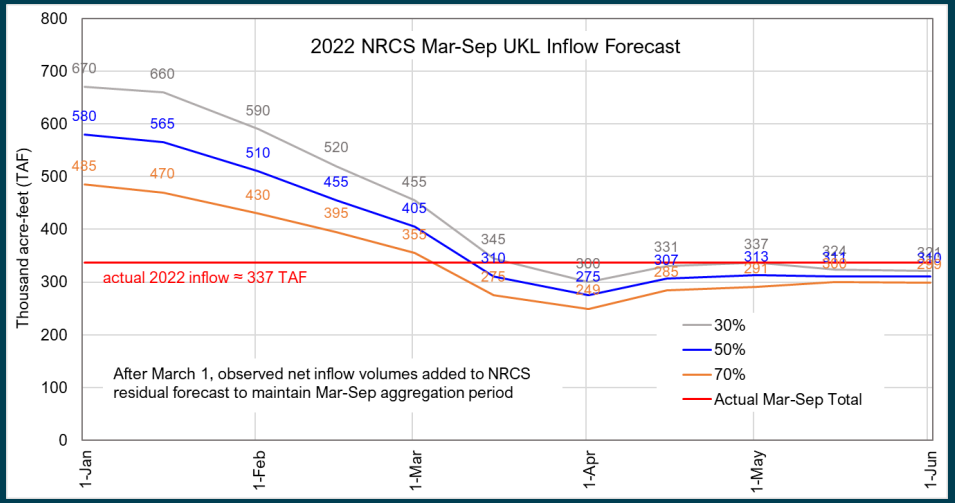


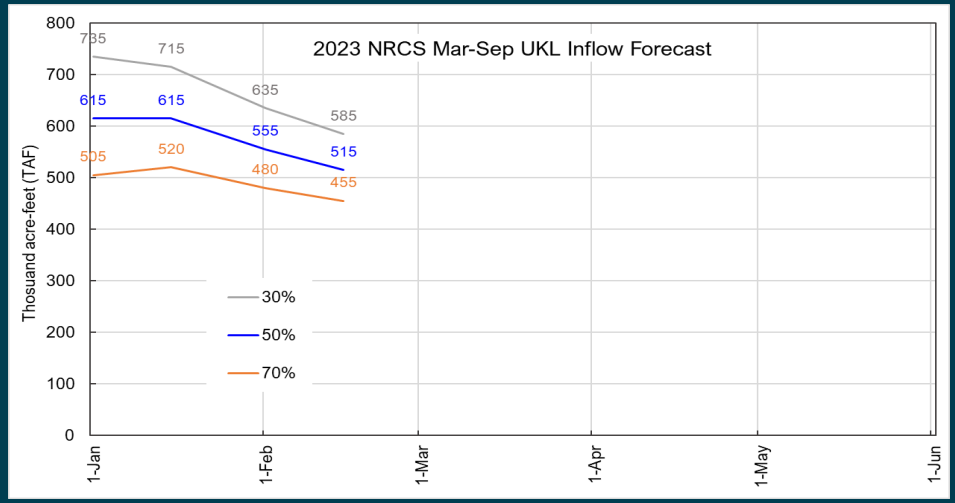
Long-Term Upper Klamath Lake Inflow and Operations Forecasts

NRCS Klamath River Basin Water Supply Forecast
Last Three Water Years – March-September

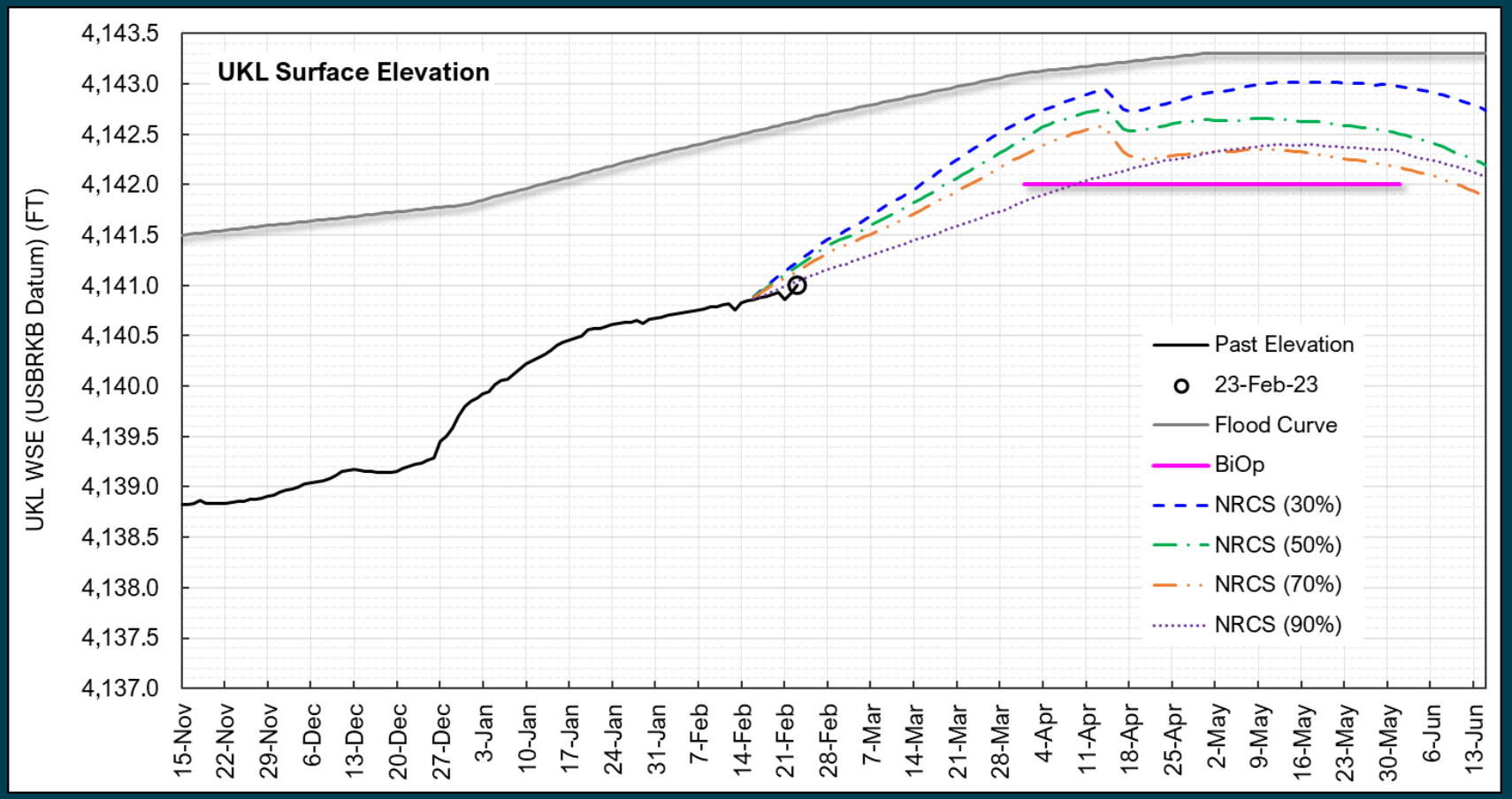








UKL Water Surface Elevation – NRCS mid-February Klamath River Basin (KRB) Water Supply Forecast (WSF)

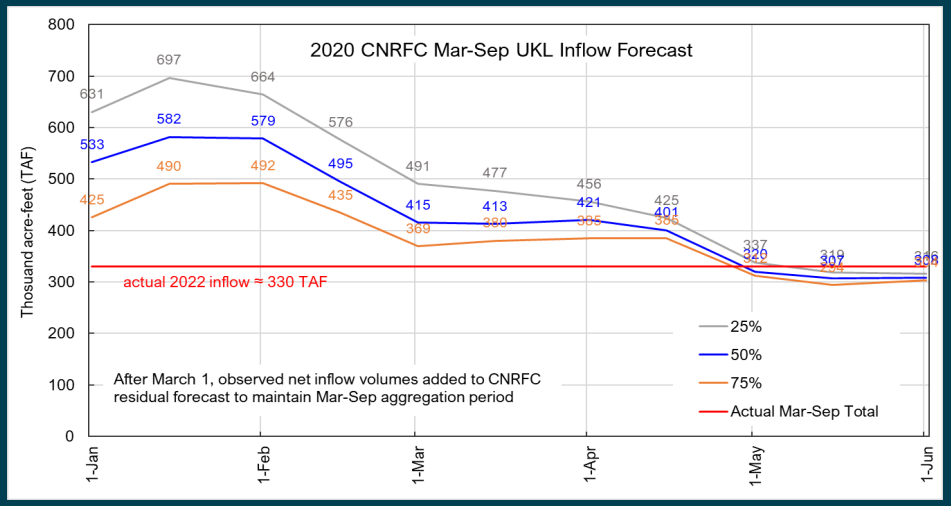


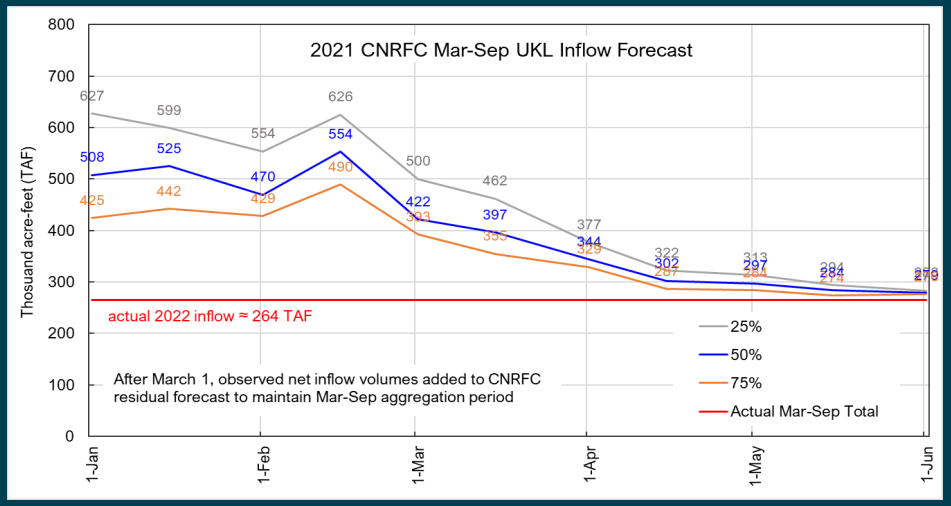
Projections, including WY2023 target elevations and surface elevation trajectories, are provisional and subject to revision based on future water supply forecasts, hydrologic conditions, and operational decisions

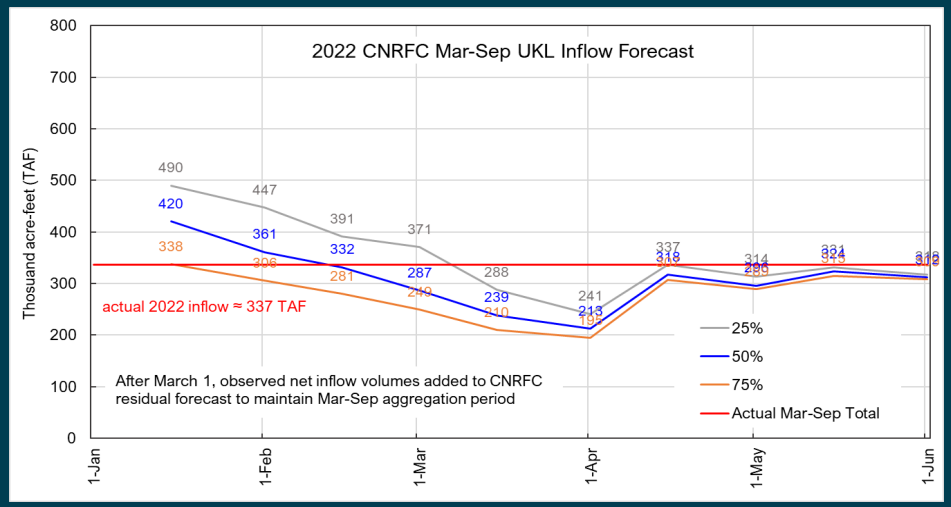
NRCS mid-February KRB WSF UKLNI forecast volumes at 30%, 50%, 70% and 90% probability of exceedance (POE) levels used in ensemble

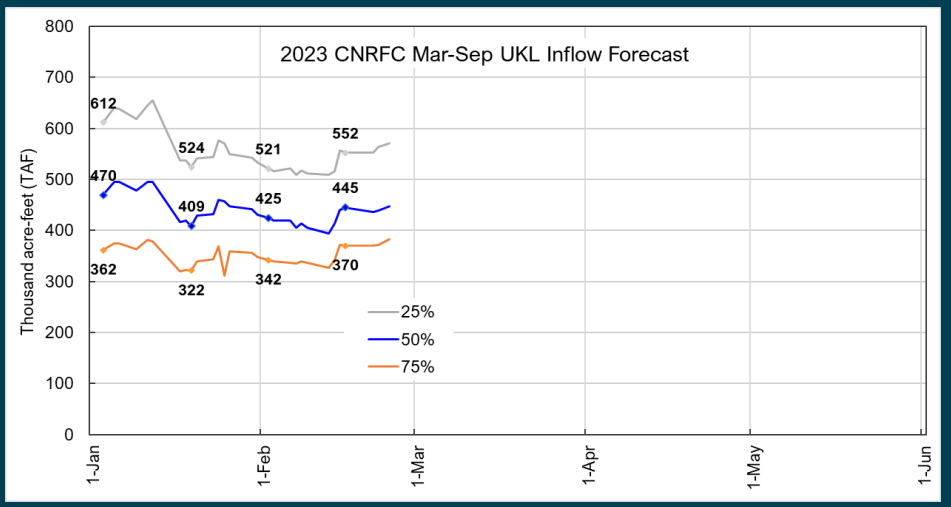
WY2023 observed UKL water surface elevation data are provisional

CNRFC Klamath River Basin Water Supply Forecast
Last Three Water Years – March-September

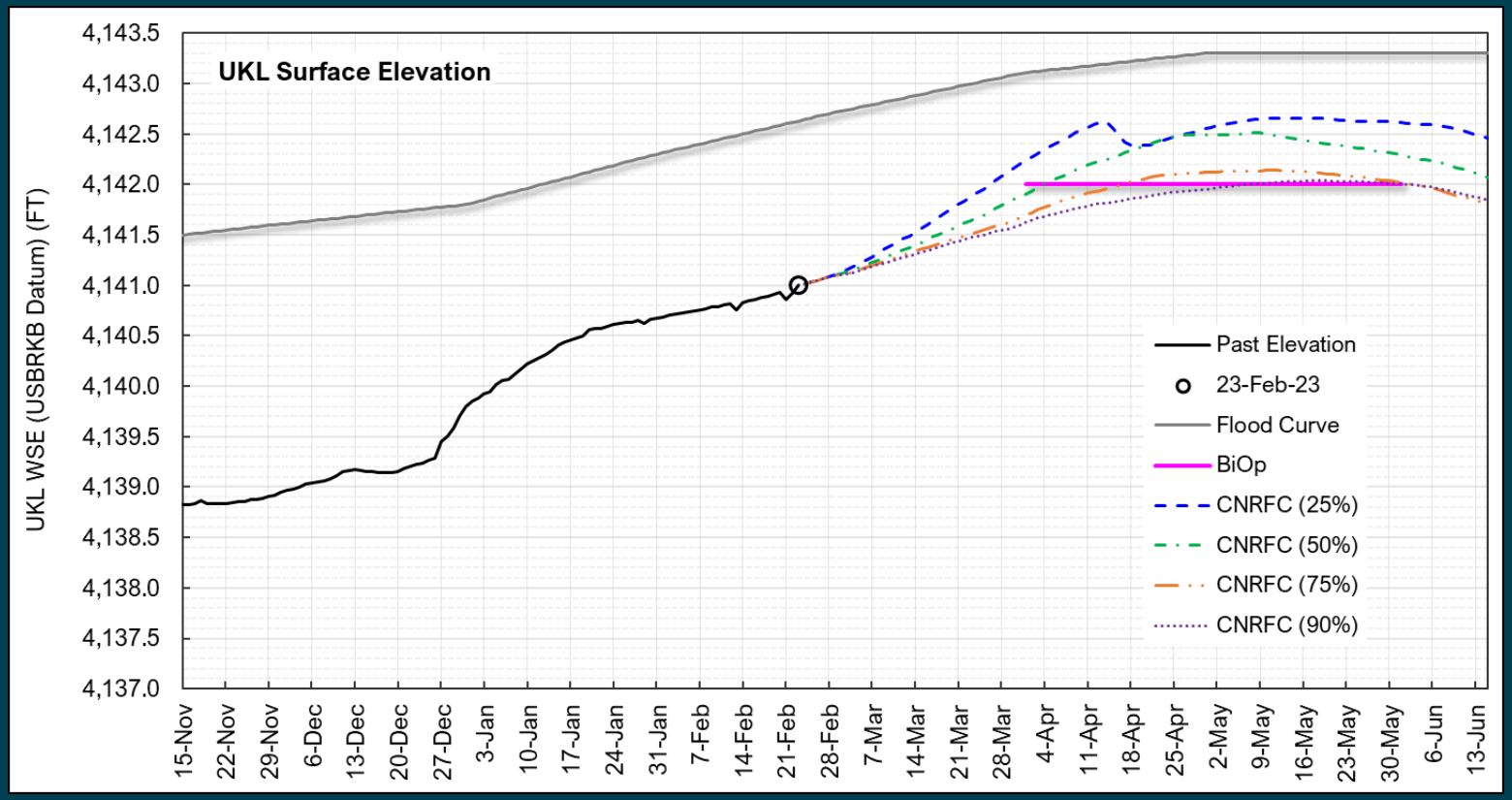








UKL Water Surface Elevation – CNRFC Upper Klamath Lake Net Inflow (UKLNI) Forecast



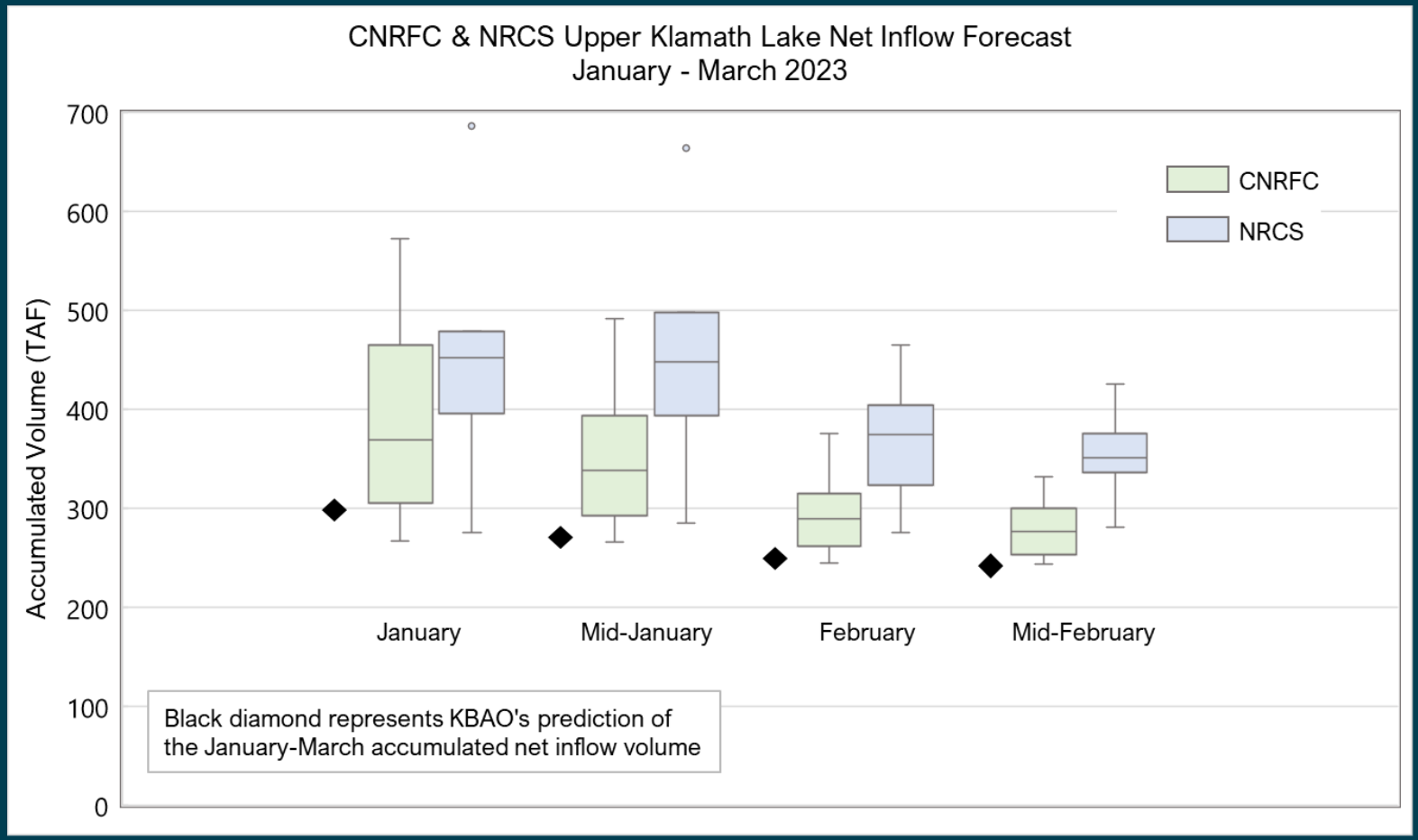
Projections, including WY2023 target elevations and surface elevation trajectories, are provisional and subject to revision based on future water supply forecasts, hydrologic conditions, and operational decisions

CNRFC UKL monthly probability net inflow forecast volumes at 25%, 50%, 75% and 90% probability of exceedance (POE) levels used in ensemble

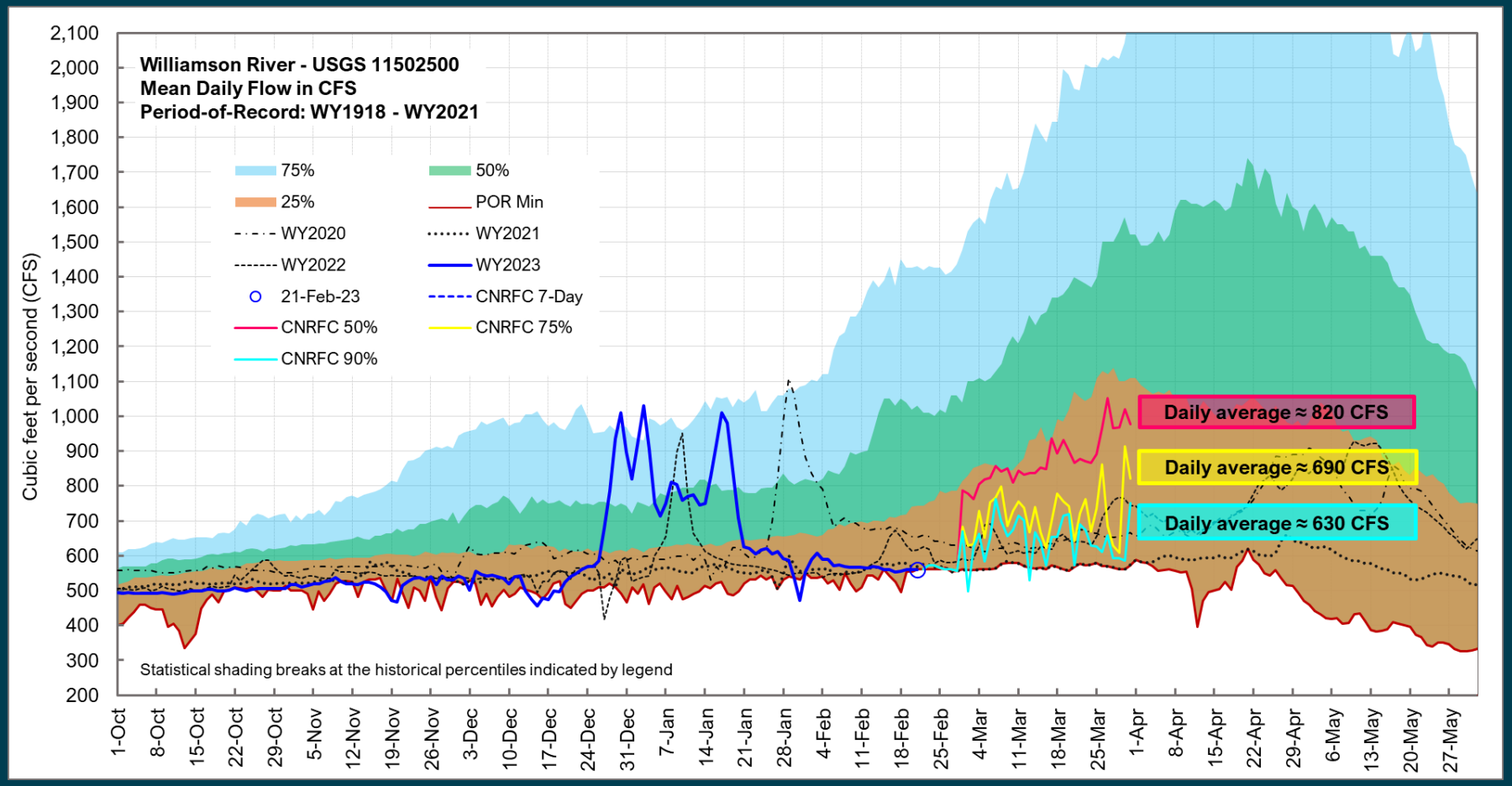
Ag diversions switched off through May for 75% and 90% POE scenarios; LKNWR deliveries switched off through Feb for 75% and 90% POE scenarios

Surface flushing flow switched off if simulated Apr 1 elevation is below 4142.00’

January 2023 Accumulated Net Inflow Forecast
CNRFC & NRCS



Williamson River - CNRFC



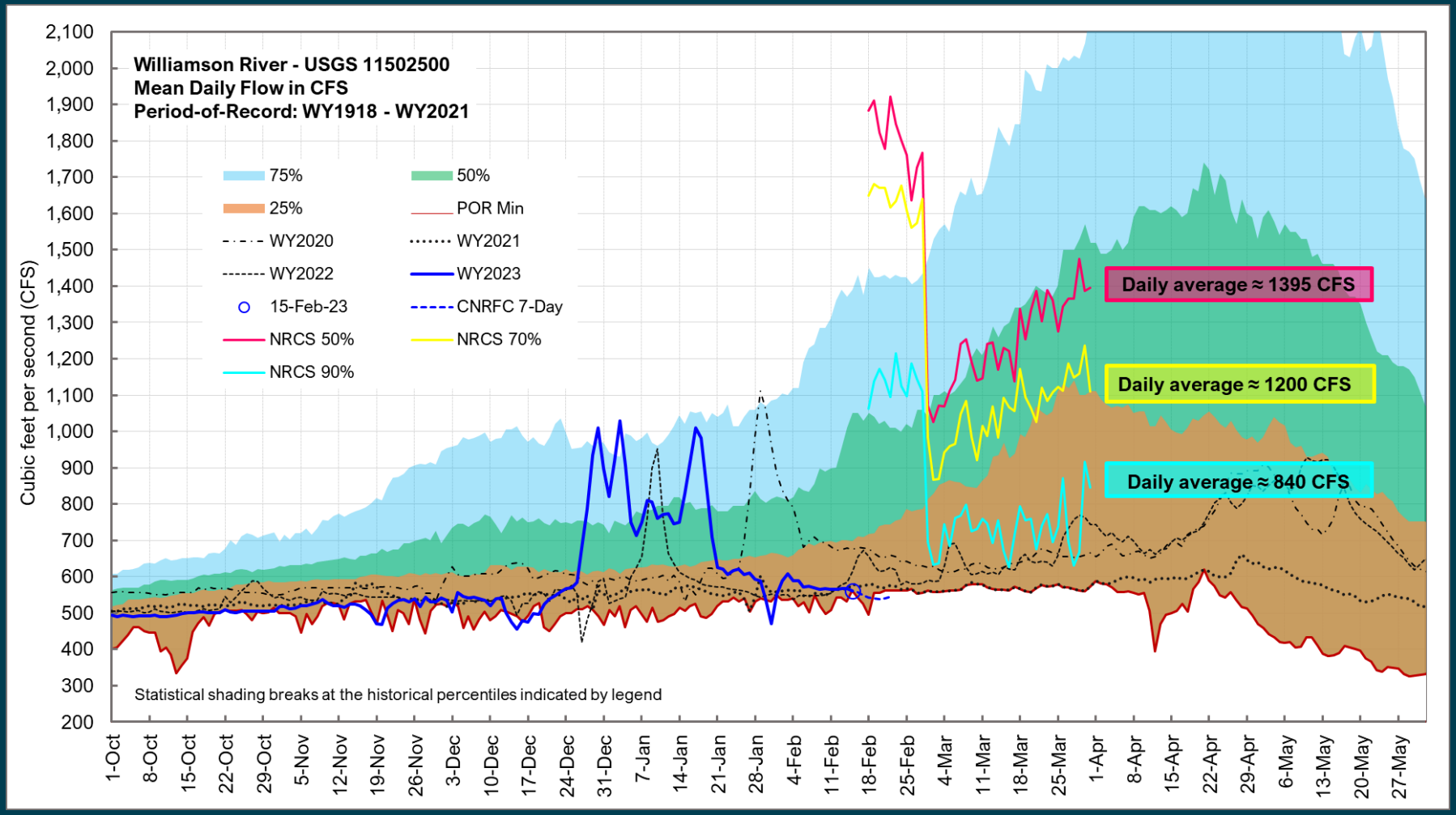
- Williamson River average percent contribution to total UKL net inflow for Jan-Mar (POR WYs: 1981-2022) ≈ 50% (ranges between 42% and 62%)
- Williamson River flow projections at the given CNRFC exceedance level UKL net inflow forecast start February 22 and end April 1

Williamson River - NRCS

NRCS 50% 6-wk avg – 38 TAF/wk

NRCS 75% 6-wk avg – 33 TAF/wk

NRCS 90% 6-wk avg – 23 TAF/wk



- Williamson River average percent contribution to total UKL net inflow for Jan-Mar (POR WYs: 1981-2022) ≈ 50% (ranges between 42% and 62%)
- Williamson River flow projections at the given NRCS exceedance level UKL net inflow forecast start February 16 and end April 1

Assumptions, Model Input, Basis of Planning

- January 1 – March 31 UKL net inflow volume ≈ 250 TAF
  - Jan 1 - Feb 21 ≈ 146.4 TAF

UKL Net Inflow			
TAF	WY2020	WY2021	WY2022
Jan-Mar	260.9	228.7	207.3

- January 1 – April 31 UKL KIG accretion volume ≈ 100 TAF
- January 1 – March 31 Lake Ewauna accretion volume ≈ 3 TAF
- LKNWR deliveries switched off from February 11 through February
- Project diversions switched off until May
- Analysis of analog year trends that includes but is not limited to the following WYs:
  - WYs 2022, 2021, 2020, 2018, 2010, 2009, 2005, 2004, 1991, 1981

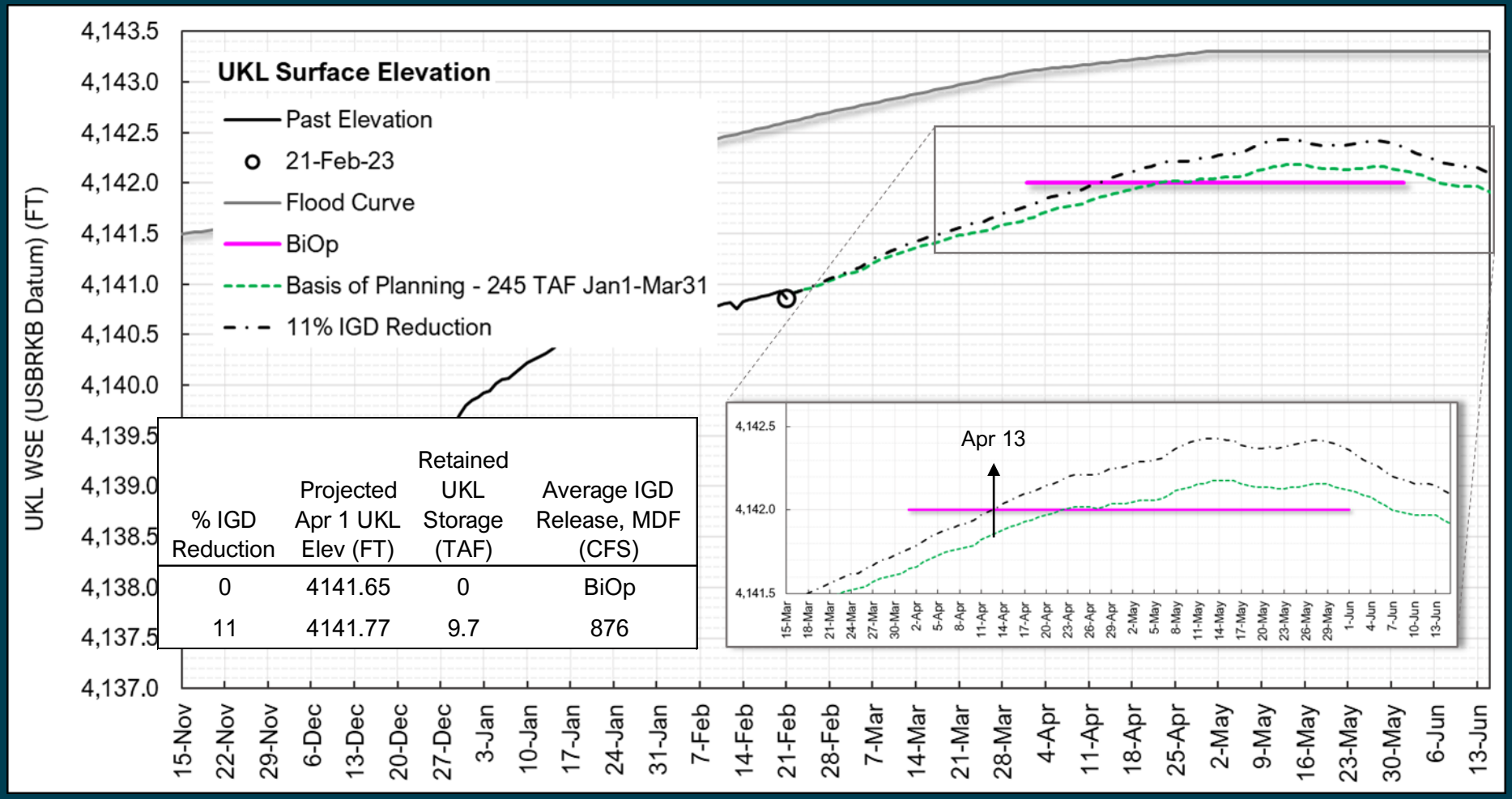
Temporary Operation Procedures

Reclamation Assessment

- Reclamation intends to balance risk between the ESA requirements by planning for a net inflow to UKL of approximately 250 TAF between Jan 1 and Apr 1.

- Consistent with the NMFS-USFWS-Reclamation agreement, Reclamation will take the following actions under the TOP
  - Beginning Tuesday 2/14, flows at Iron Gate Dam were reduced 11% below minimum flow rates in the NMFS Biological Opinion
  - Known redds that may have been dewatered by the 11% reduction were surveyed Feb 16-17 and data was received on 22 Feb.
  - Three or fewer of the known redds were dewatered, so an additional 5% reduction will be implemented (for a total reduction of 16%) on Saturday, 2/25
  - Reclamation will continue weekly adaptive management measures to adjust to information on hydrologic and biological conditions, as it becomes available

UKL Water Surface Elevation – TOP

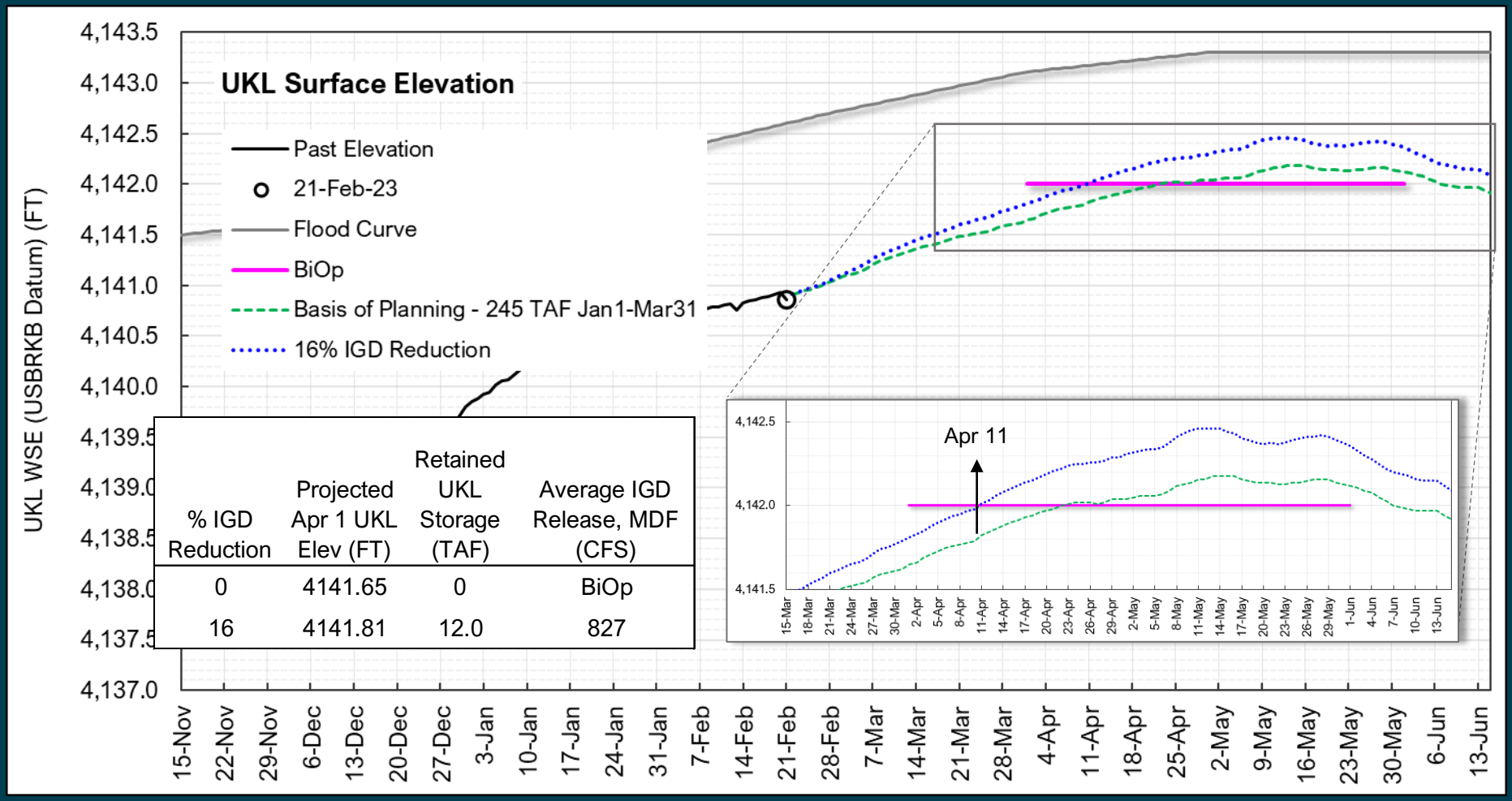


% IGD Reduction	Projected Apr 1 UKL Elev (FT)	Retained UKL Storage (TAF)	Average IGD Release, MDF (CFS)
0	4141.65	0	BiOp
11	4141.77	9.7	876

Projections, including WY2023 target elevations and surface elevation trajectories, are provisional and subject to revision based on future water supply forecasts, hydrologic conditions, and operational decisions

WY2023 observed UKL water surface elevation data are provisional

UKL Water Surface Elevation – TOP

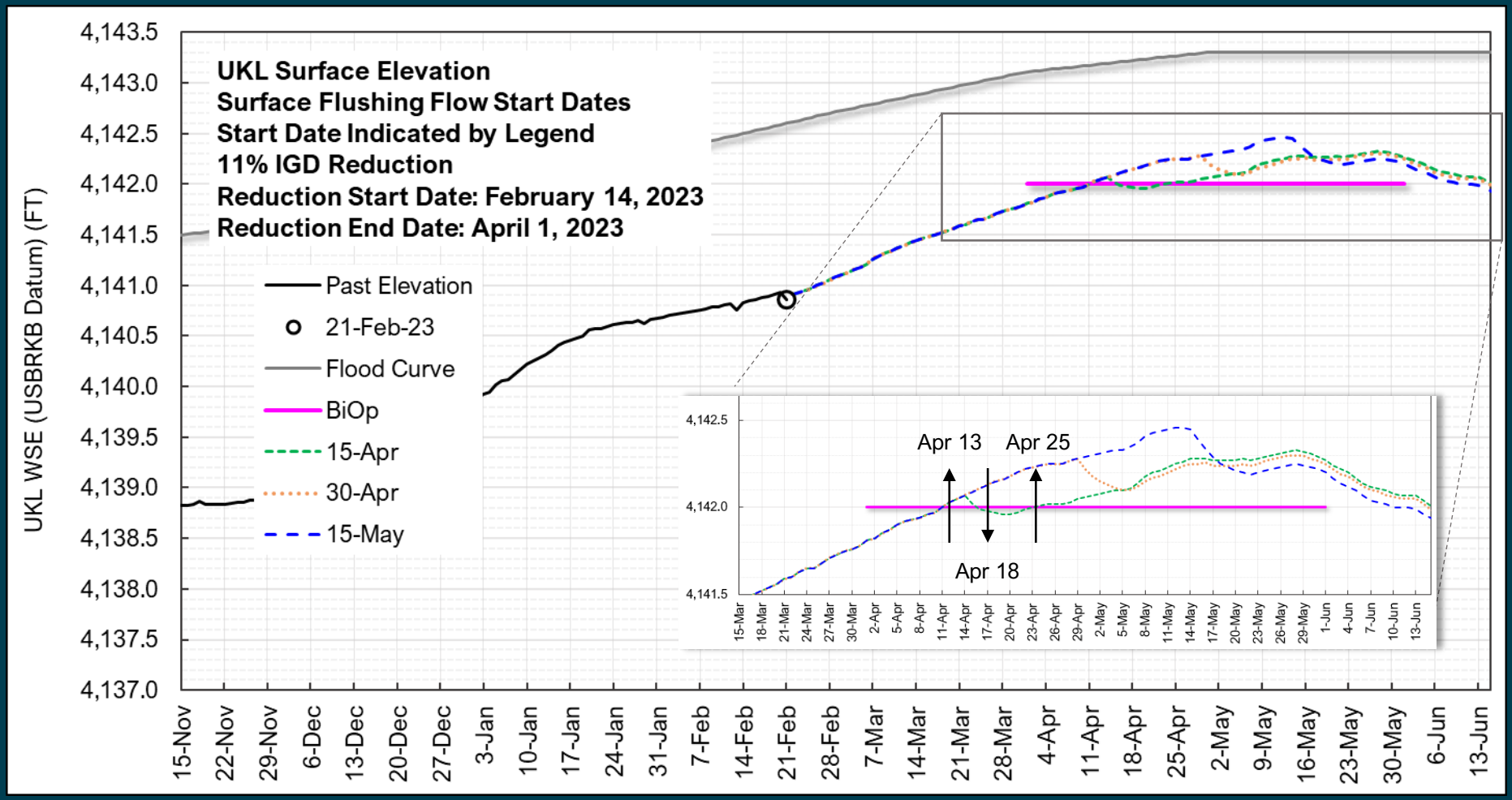


% IGD Reduction	Projected Apr 1 UKL Elev (FT)	Retained UKL Storage (TAF)	Average IGD Release, MDF (CFS)
0	4141.65	0	BiOp
16	4141.81	12.0	827

Projections, including WY2023 target elevations and surface elevation trajectories, are provisional and subject to revision based on future water supply forecasts, hydrologic conditions, and operational decisions

WY2023 observed UKL water surface elevation data are provisional

UKL Water Surface Elevation – TOP (Surface Flushing Flow)

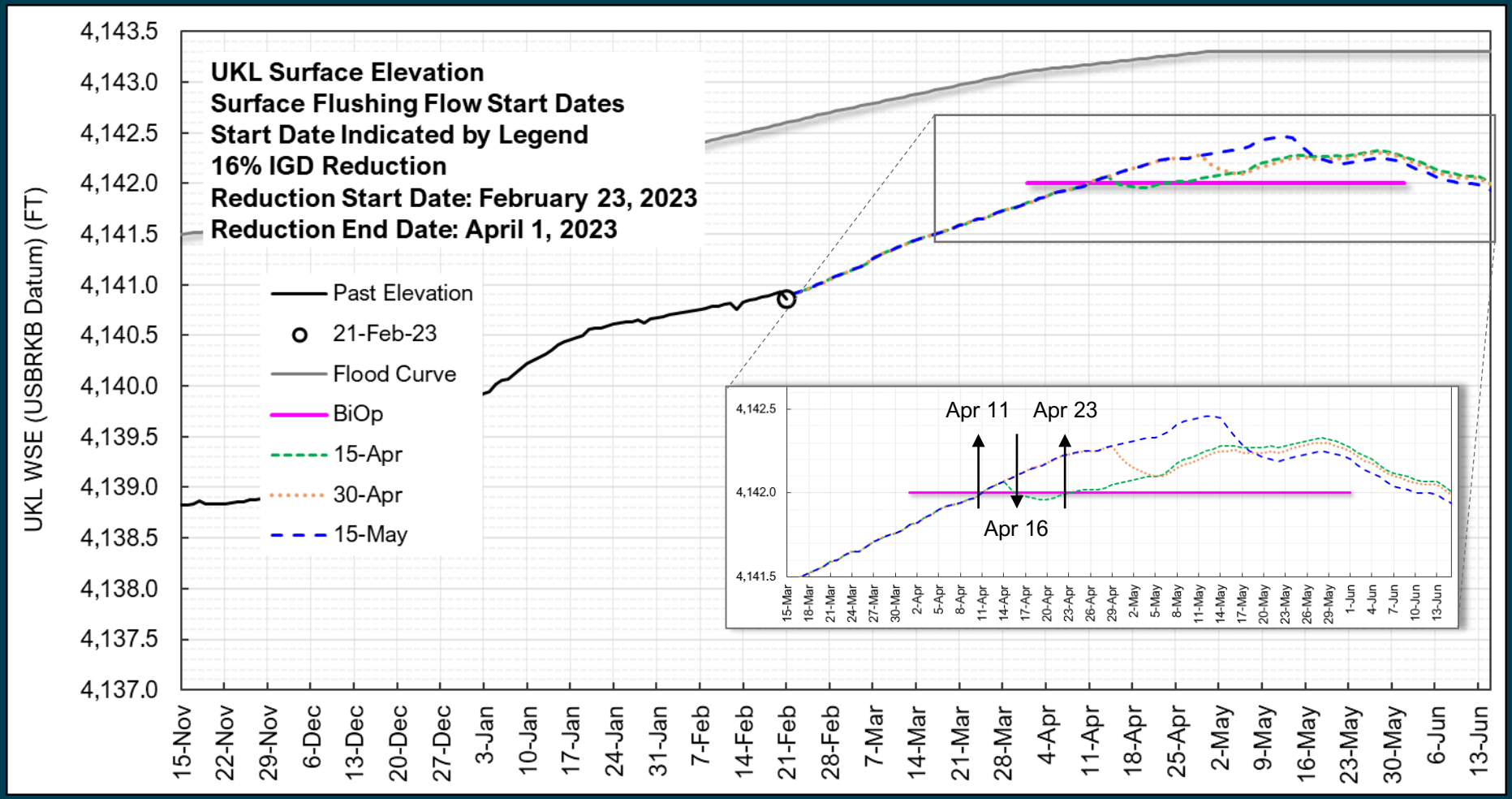


Black arrows displayed within inset plot indicate approximate dates when simulated UKL elevation rises above/falls below 4142.00' given the April 15 surface flushing flow scenario

Projections, including WY2023 target elevations and surface elevation trajectories, are provisional and subject to revision based on future water supply forecasts, hydrologic conditions, and operational decisions

WY2023 observed UKL water surface elevation data are provisional

UKL Water Surface Elevation – TOP (Surface Flushing Flow)



Black arrows displayed within inset plot indicate approximate dates when simulated UKL elevation rises above/falls below 4142.00' given the April 15 surface flushing flow scenario

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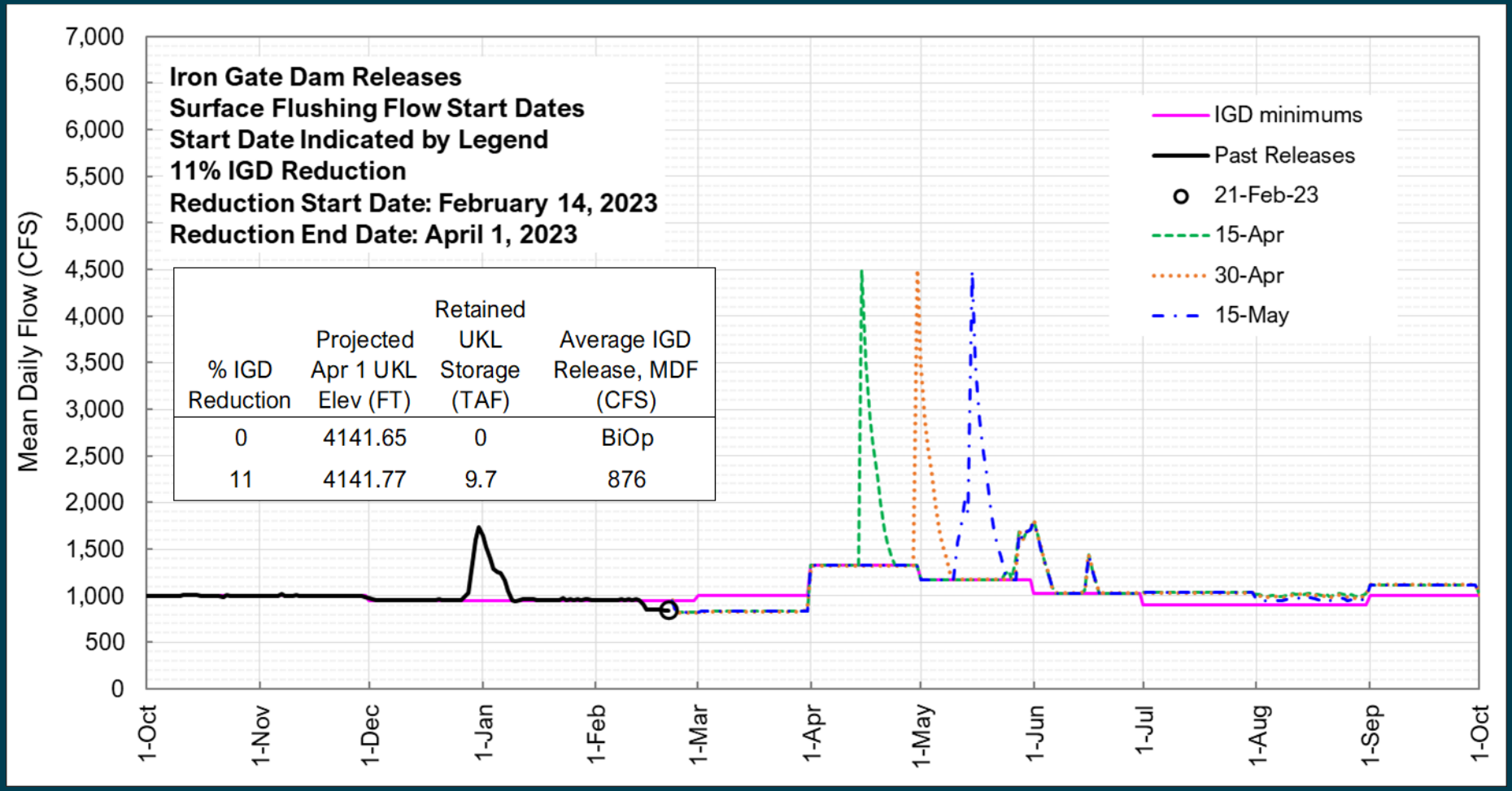
Iron Gate Dam Releases – TOP (Surface Flushing Flow)



% IGD Reduction	Projected Apr 1 UKL Elev (FT)	Retained UKL Storage (TAF)	Average IGD Release, MDF (CFS)
0	4141.65	0	BiOp
11	4141.77	9.7	876

Surface flushing flow Day 1 flow rate = 4500 CFS for each start date; BiOp-required rampdown rates after Day 1

Projections, including IGD releases, are provisional and subject to revision based on future water supply forecasts, hydrologic conditions, and operational decisions

WY2023 observed IGD release data are provisional and subject to revision

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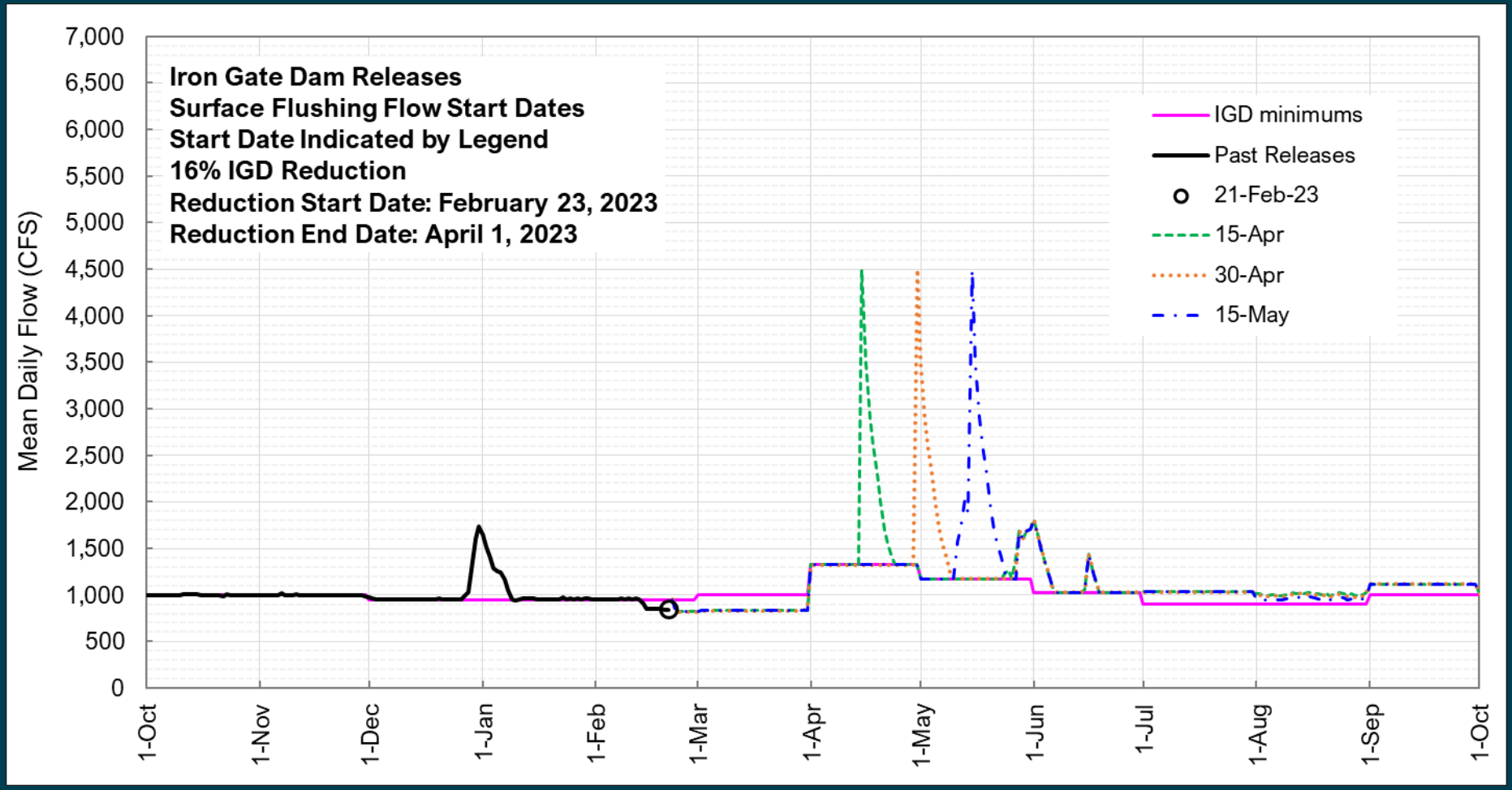

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Proposed Schedule

Jan 26 – Finalization of Temporary Operating Procedures

Feb 01 – Nation to Nation meeting convened

Feb 08 – Nation to Nation meeting with the Department of the Interior

Feb 15 – Flows reduced by 11% at IGD

Feb 25 – Flows reduced additional 5% for 16% total at IGD

Thru Apr 1 – continue monitoring redds, weekly FASTA to discuss and adjust the TOP, to achieve and remain above 4,142.00 ft. on UKL in April and May

Technical Input Requests

Reclamation is seeking input on the following technical topics:

- **The stated objective of exceeding 4,142.00 feet in Upper Klamath Lake by April 1, as a means of balancing risks to all ESA species**

- **The assessment of what the likely conditions on April 1 will be, based on available information**

- **The timing and magnitude of reductions to minimum flows that would minimize risks to salmon, as it relates to attaining 4,142.00 in Upper Klamath Lake by April 1**

Technical Input

- **Please submit comments, to Courtney Mathews, cmathews@usbr.gov**

- **Updates and materials can be found at** www.usbr.gov/mp/kbao