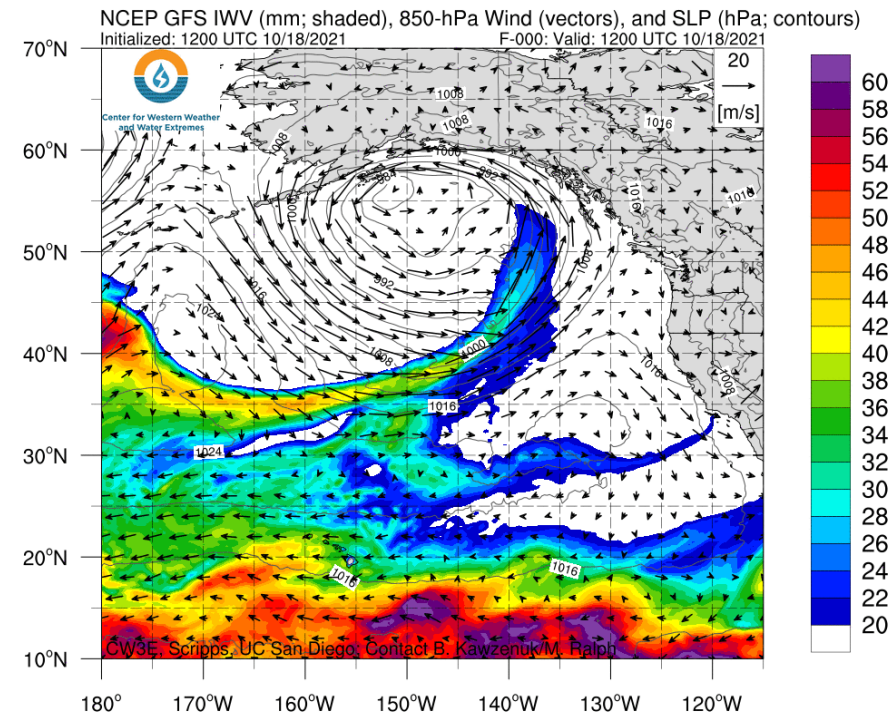
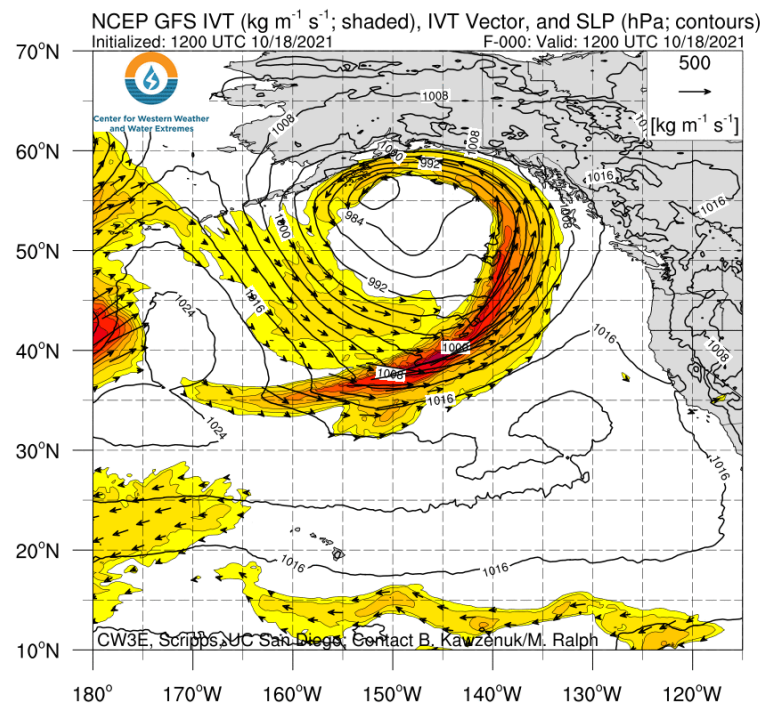


CW3E Atmospheric River Outlook

Active weather is forecast to continue, bringing multiple landfalling ARs to the U.S. West Coast

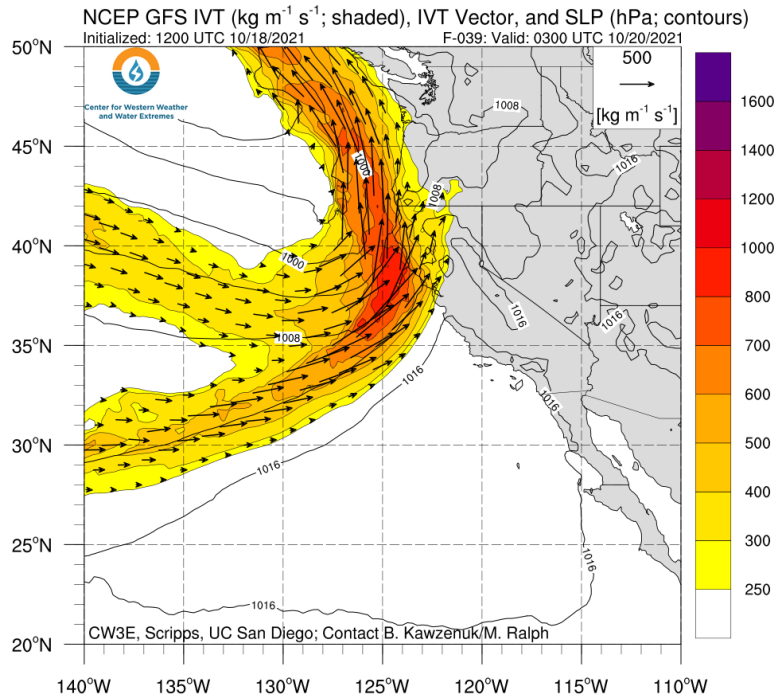
- The first AR is forecast to make landfall over Northern California on Tuesday evening, bringing moderate to strong AR conditions to the region
- The second AR is forecast to make landfall on Thursday and is forecast to be stronger and last longer than the first AR
- Current forecasts suggest the active pattern to continue with a third AR potentially making landfall between 23 and 25 October, but forecast uncertainty is high due to the long lead times.
- The Weather Prediction Center is forecasting >10 inches of precipitation over the higher elevations of the Pacific Northwest and Northern California due to these successive and potentially strong storms



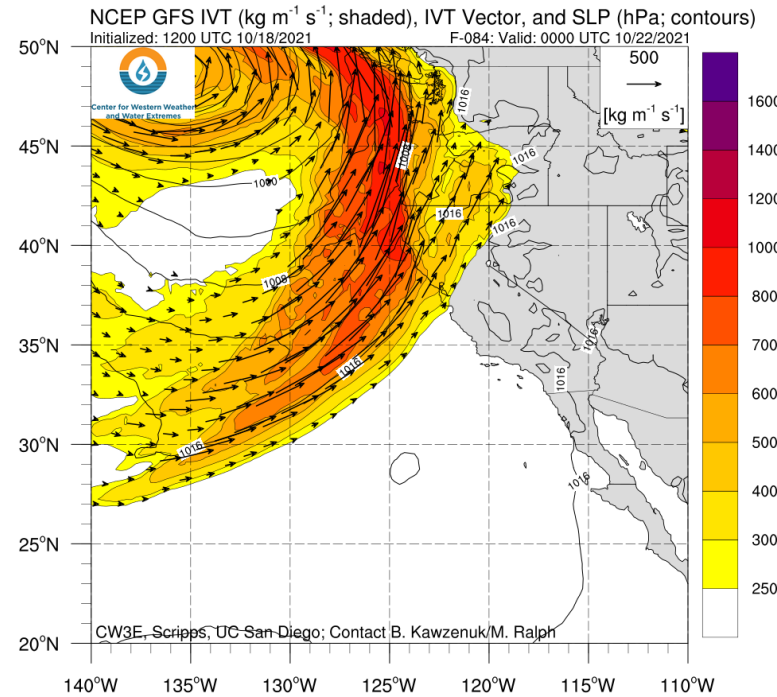
Atmospheric River Outlook: 18 October 2020

For California DWR's AR Program

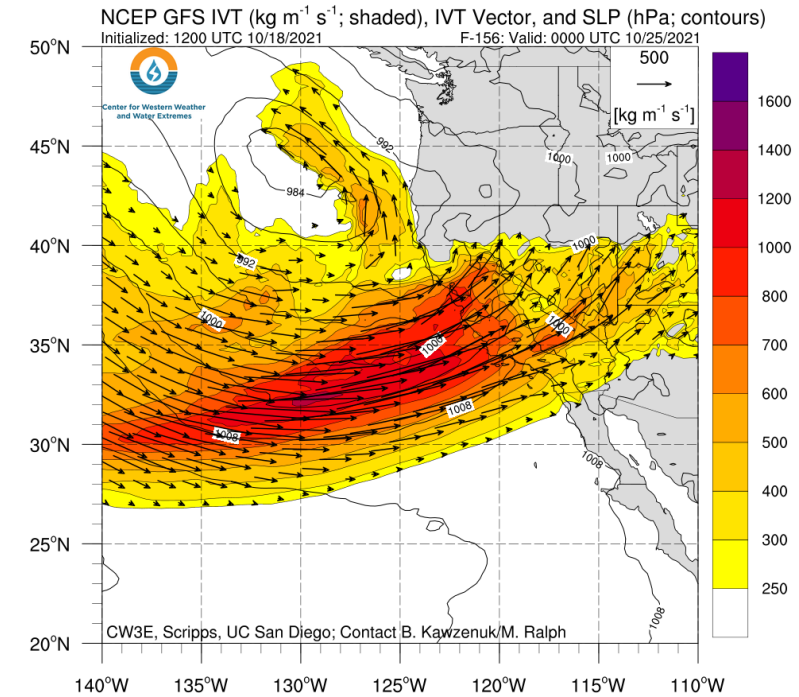
A) Valid: 0300 UTC 20 Oct (F-39)



B) Valid: 0000 UTC 22 Oct (F-84)



C) Valid: 0000 UTC 25 Oct (F-156)



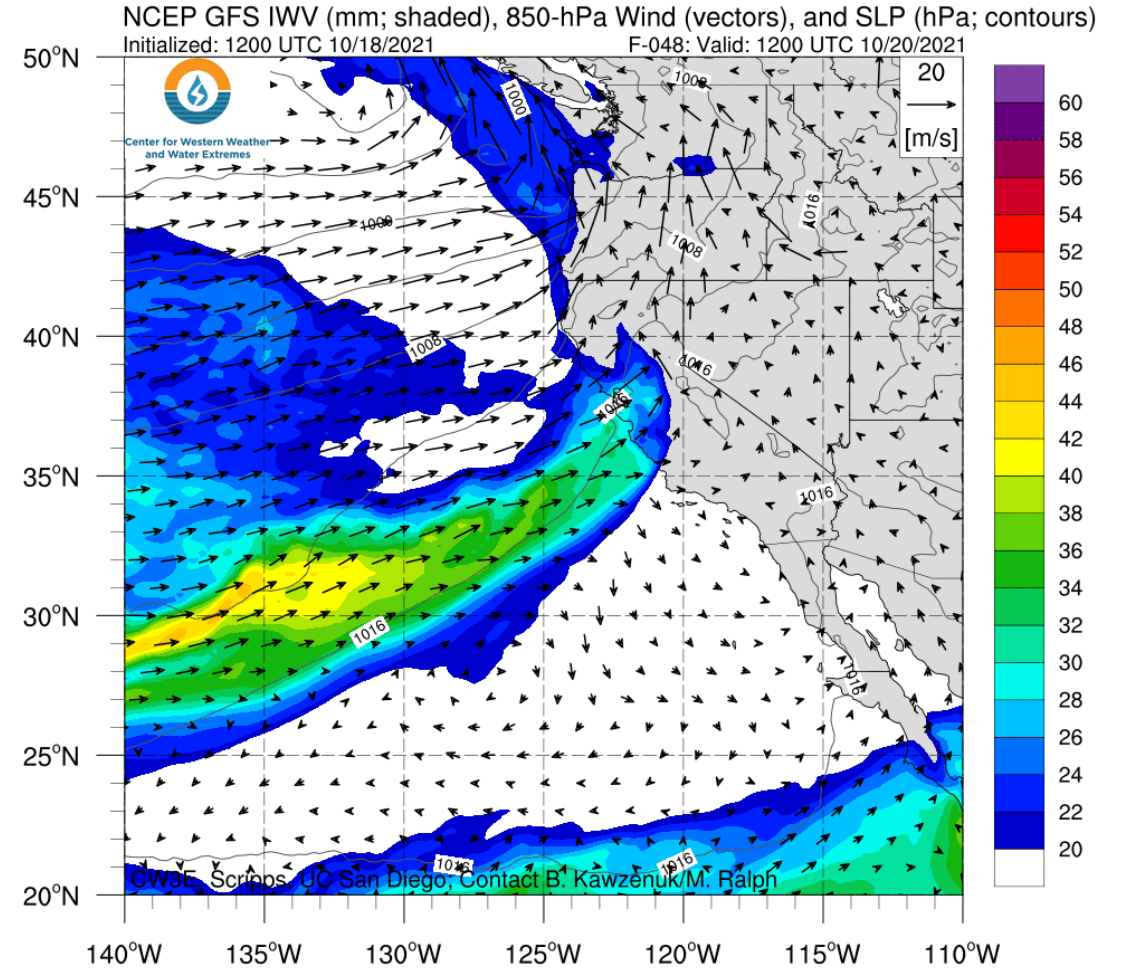
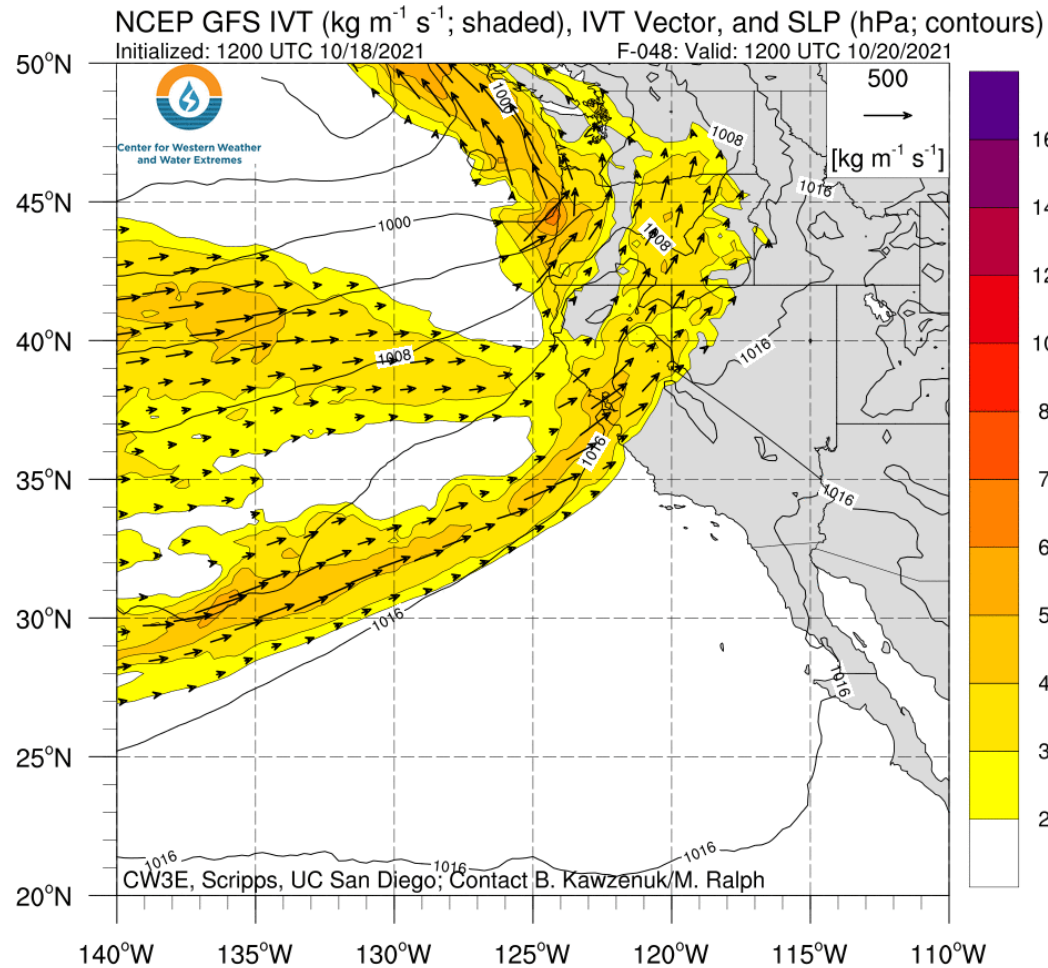
- The first AR is forecast to make landfall over Northern California late on Tuesday, bringing IVT magnitudes between 600 and 800 kg/(ms) to much of the Coast

- A second and stronger AR is forecast to make landfall over the Pacific Northwest on Thursday bringing IVT magnitudes >800 kg/(ms) to coastal locations in Washington to Northern California

- A third AR is then forecast to impact a majority of California, making landfall on Sunday, though forecast uncertainty is currently high due to longer lead-times

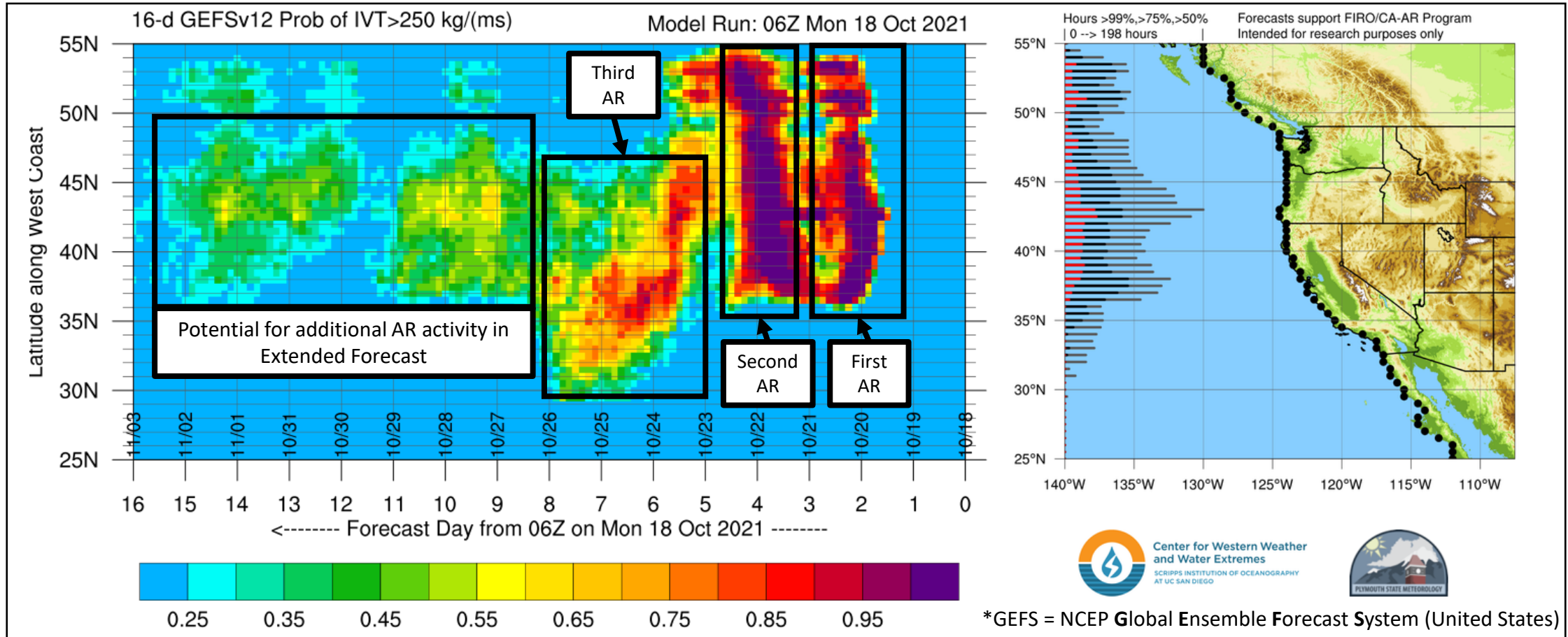
Atmospheric River Outlook: 18 October 2020

For California DWR's AR Program



- As the first AR is dissipating over Central California, the second AR begins to move into the Eastern Pacific, merging with the remnant moisture of the 1st AR, and resulting in a large region of enhanced IVT and IWV values >42 mm

Probability of Moderate AR Conditions Along Coast

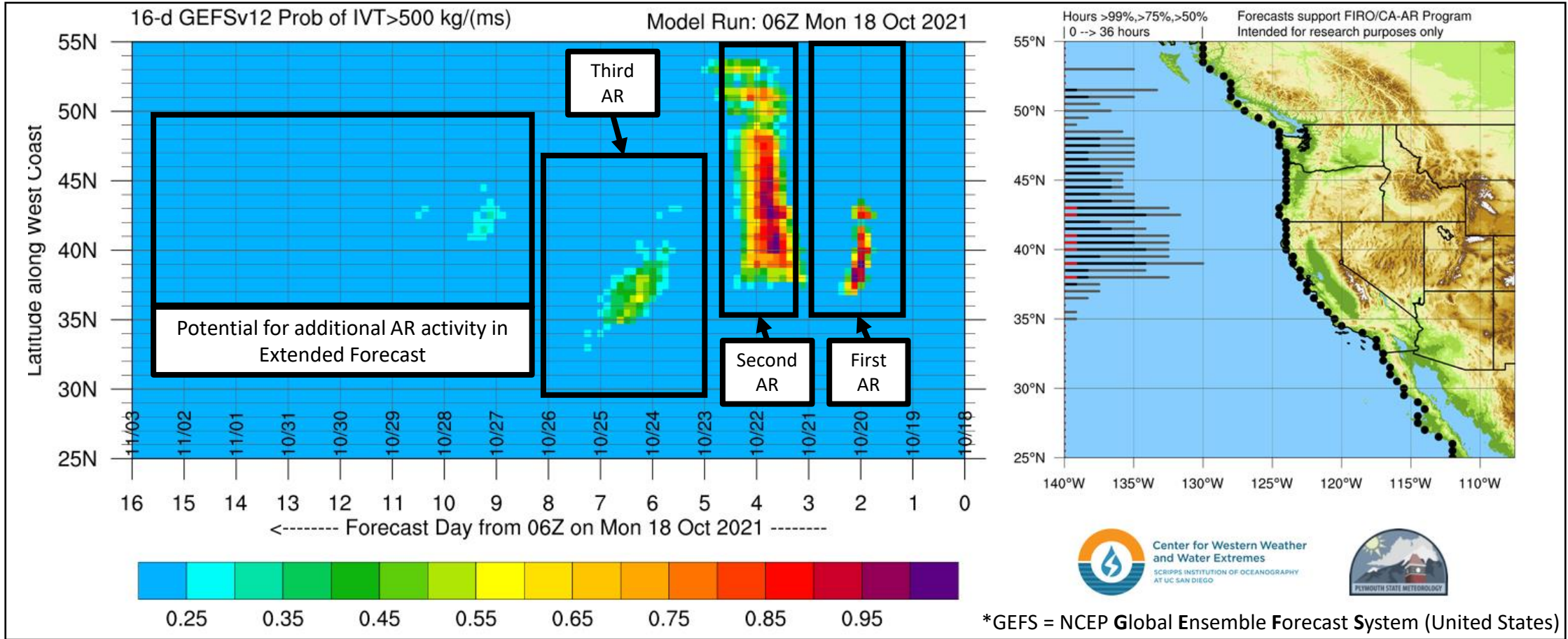


- The 06Z GEFS is showing very high confidence (>90%) in AR conditions for two separate events over coastal Washington to Central California during 19-20 Oct and 21-22 Oct.
- Ensemble agreement is increasing for additional AR conditions to impact coastal CA and OR on days 5-7, Oct 23-25.
- The GEFS is also forecasting the potential for additional AR activity beyond day 8, but uncertainty is currently high

Atmospheric River Outlook: 18 October 2020

For California DWR's AR Program

Probability of Moderate AR Conditions Along Coast



- There is currently a high probability (>75% of ensembles) of moderate AR conditions ($IVT > 500 \text{ kg m}^{-1} \text{ s}^{-1}$) over a large portion of the U.S. West Coast in association with the first and second AR
- The GEFS is predicting higher ensemble probabilities of moderate AR conditions for a longer period (~12 hrs) during the second AR
- The GEFS is also indicating the potential for moderate AR conditions during the third AR, but probabilities are currently lower (<60%)

Atmospheric River Outlook: 18 October 2020

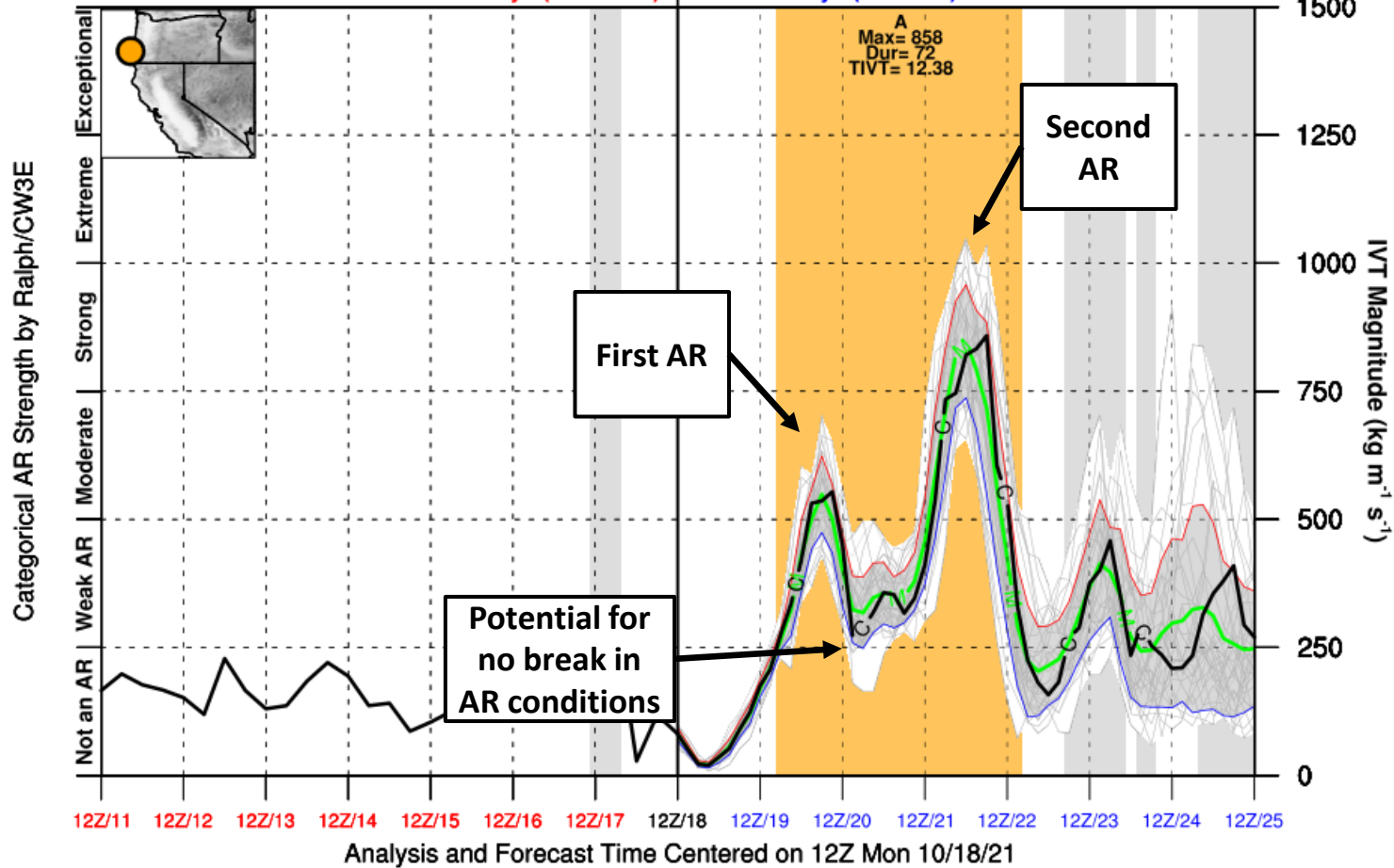
For California DWR's AR Program

GEFS AR Scale & IVT Analysis/Forecast Initialized 12Z Mon 10/18/21

<< Previous 7 days (observed)

Future 7 days (forecast) >>

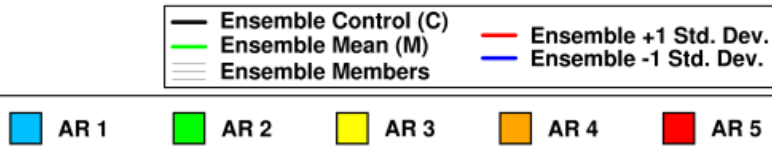
Loc: 43N, 124.5W



- The GEFS is currently forecasting AR 4 conditions over South-Coastal Oregon where there may not be a break in AR conditions between the first AR and the second, resulting in ~72-hours of AR conditions
- The first AR is forecast to bring IVT magnitudes between 400 and 700 kg/(ms) while the second AR is forecast to bring 750 to 1000 kg/(ms) of IVT



Image created: 16 UTC 10/18/2021

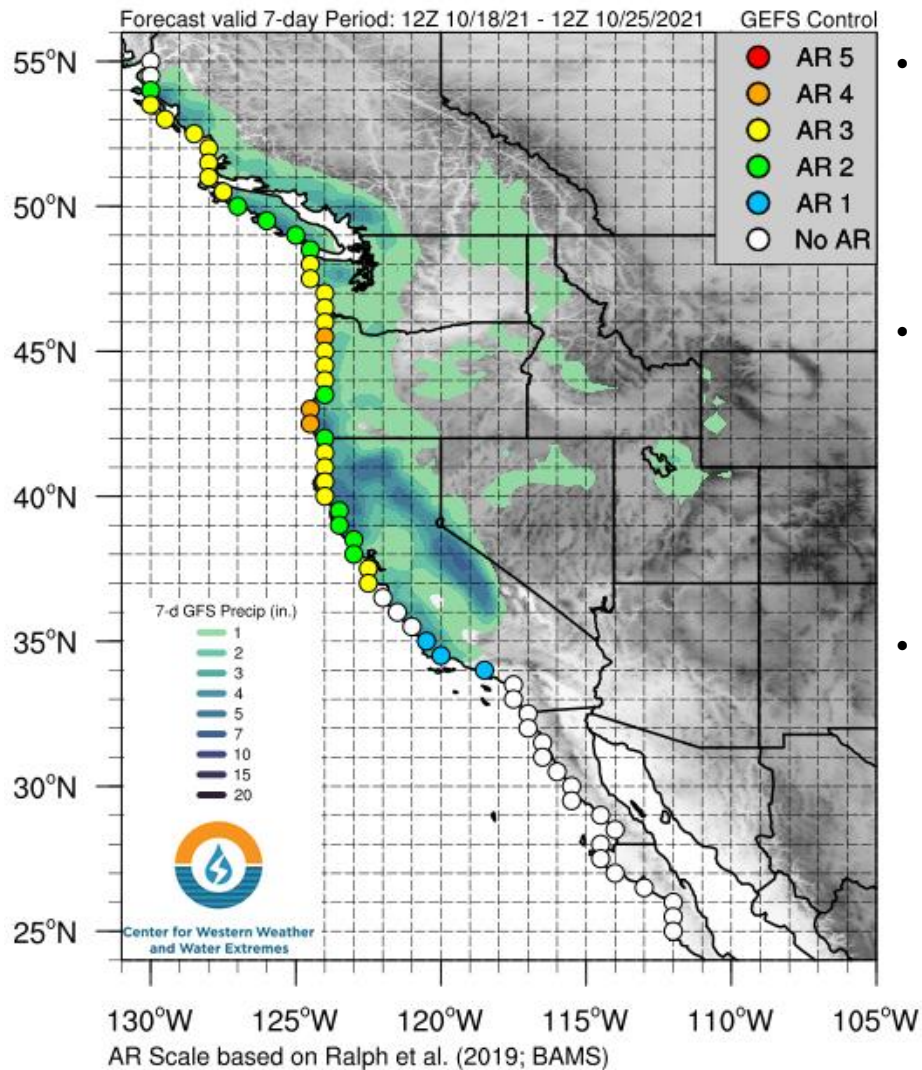


More information: <http://cw3e.ucsd.edu> AR Scale based on Ralph et al. (2019; BAMS), contact M. Ralph

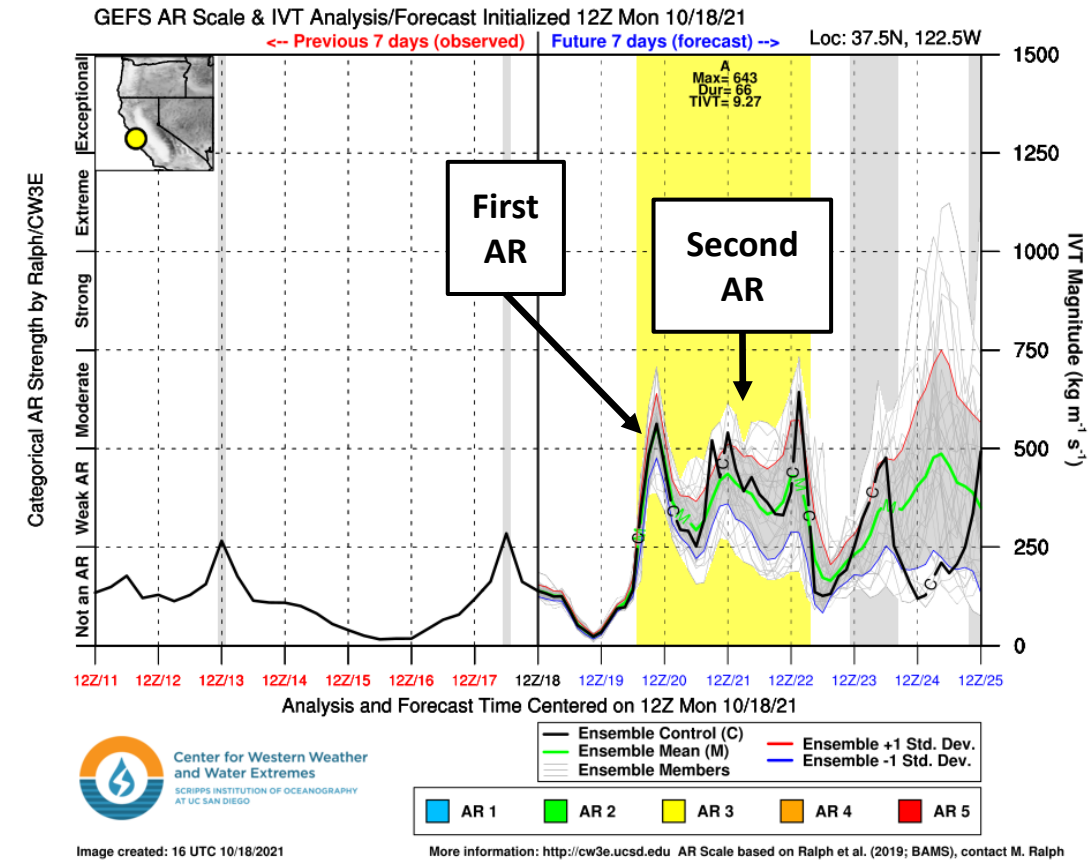
Atmospheric River Outlook: 18 October 2020

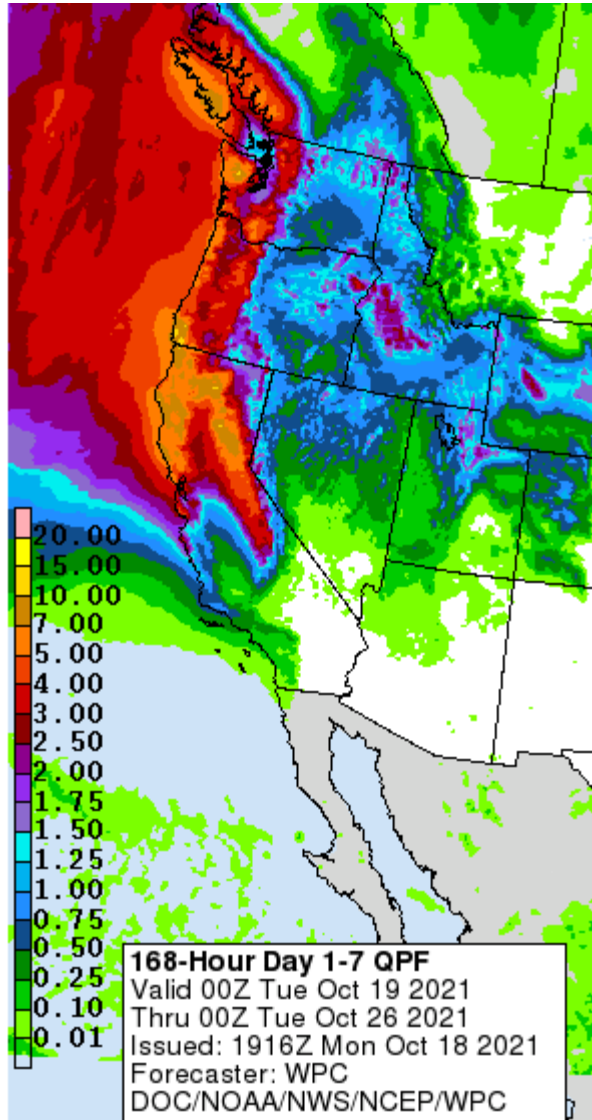
For California DWR's AR Program

Maximum Forecast AR Scale



- The GEFS control member is currently predicting AR 2 to 4 conditions along the U.S. West Coast from Monterey, CA northward
- Three separate grid points in Oregon are forecast to receive AR 4 conditions while the San Francisco Bay Area is forecast to experience AR 3 conditions
- Similar to Southern Oregon, it is possible that the Bay Area will not see IVT decrease below 250 kg/(ms) between ARs, resulting in overall AR condition durations of >60 hours

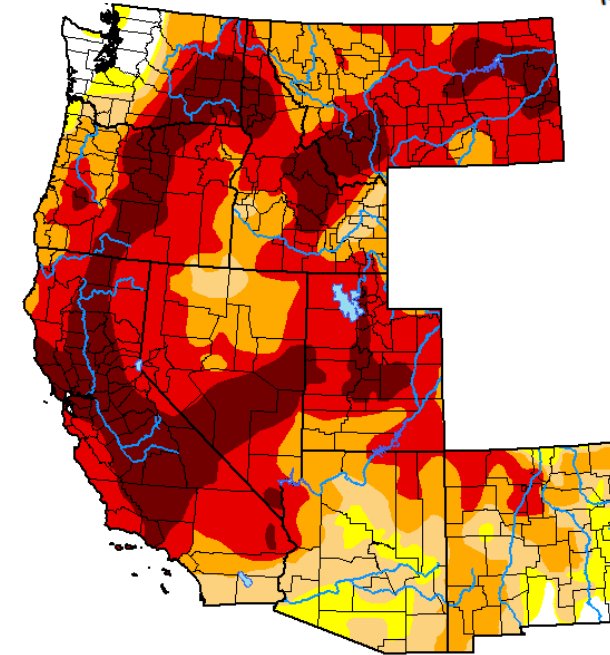




- The NOAA Weather Prediction Center is currently predicting as >10 inches of precipitation over the higher elevations of the Coastal, Northern Sierra, and Olympic mountains in N. CA, OR, and WA
- Due to an extended period of dry conditions, a majority of the U.S. West is under extreme or exceptional drought, this active period of landfalling ARs will bring much needed relief to these drought-stricken areas
- Due to the extremely dry conditions, these early season ARs will not likely result in much flooding

U.S. Drought Monitor West

October 12, 2021
(Released Thursday, Oct. 14, 2021)
Valid 8 a.m. EDT



Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <http://droughtmonitor.unl.edu/About.aspx>

Author:

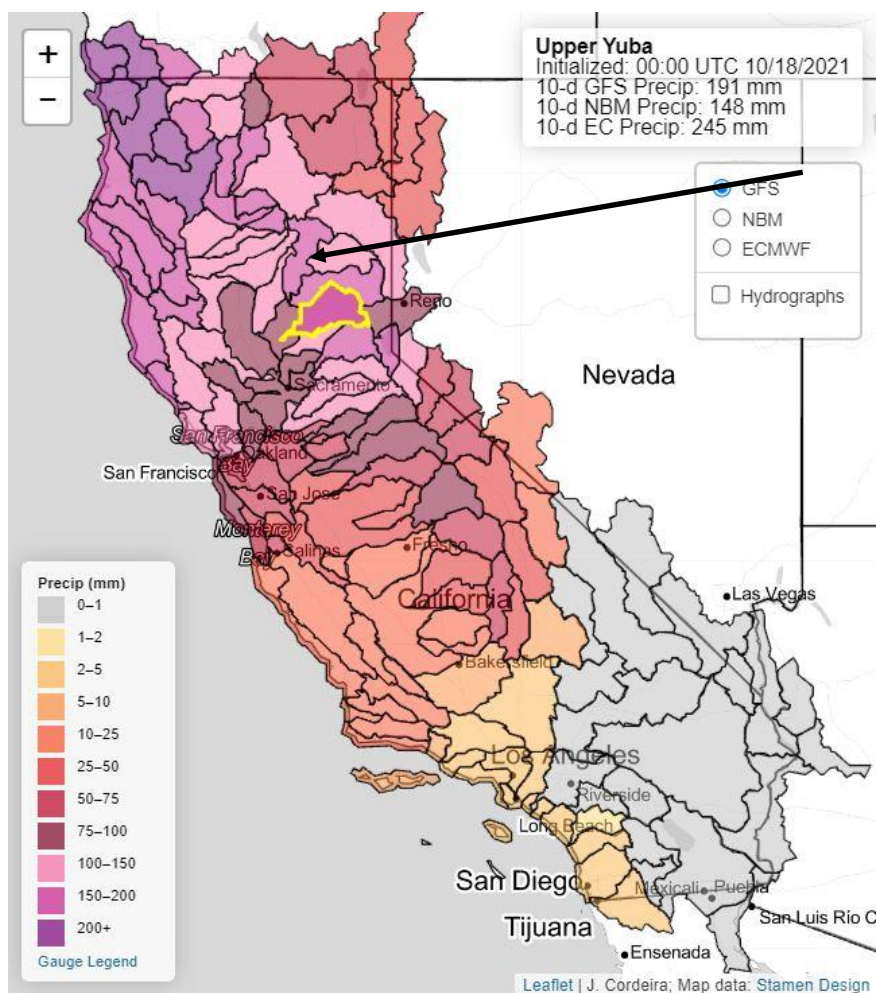
Adam Hartman
NOAA/NWS/NCEP/CPC



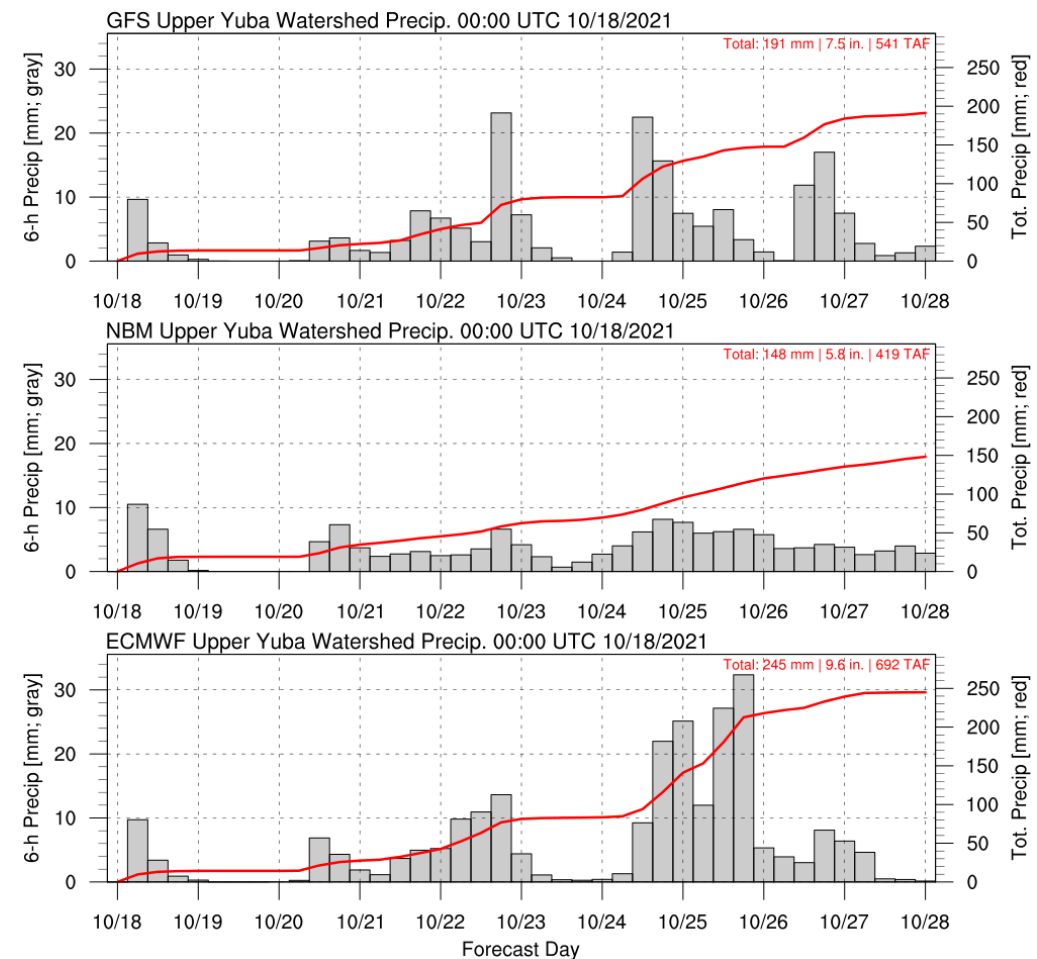
droughtmonitor.unl.edu

Atmospheric River Outlook: 18 October 2020

For California DWR's AR Program



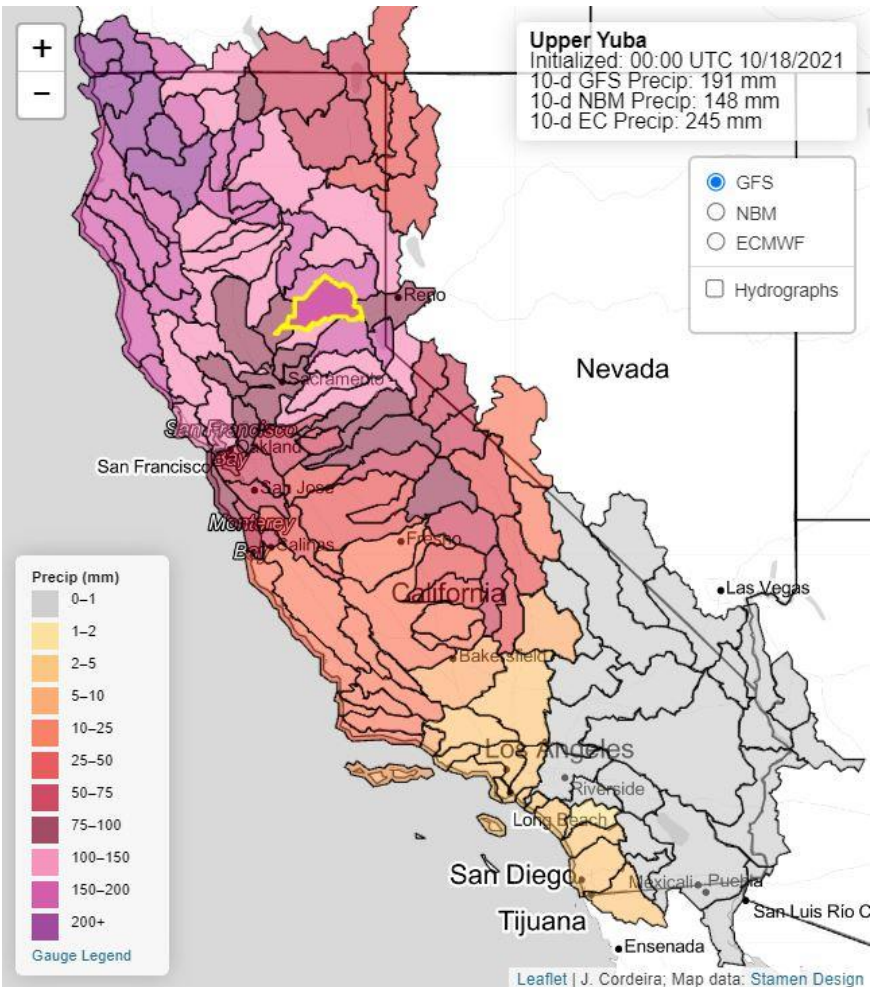
- The Upper Yuba Watershed in Northern California is forecast to receive 7.5 and 9.6 inches of watershed average precipitation over the next 10 days by the GFS and ECMWF, respectively
- Both the EC and GFS suggest AR associated precipitation will begin towards the end of the first AR and continue through the second AR, resulting in ~3 inches of watershed average precipitation
- The GFS and EC are forecasting the third AR to bring additional amounts of precipitation to the Upper Yuba watershed, though there is large disagreement on timing and amount



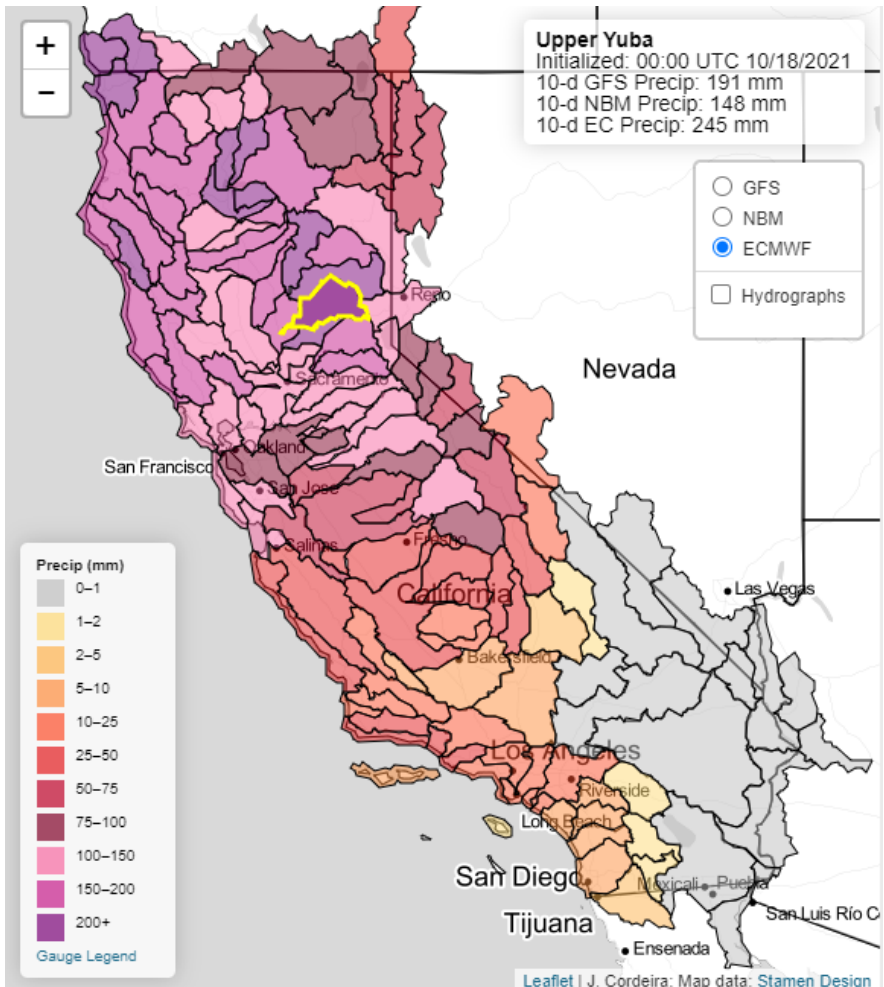
Atmospheric River Outlook: 18 October 2020

For California DWR's AR Program

GFS 10-Day Watershed Precipitation



ECMWF 10-Day Watershed Precipitation



- The ECMWF is currently predicting higher precipitation accumulations across Northern California compared to the GFS
- These higher accumulations also extend further south over the Sierra Nevada and Coastal Mountains
- Numerous watersheds across California are forecast to receive more than 100 mm (3.9 inches) by both models