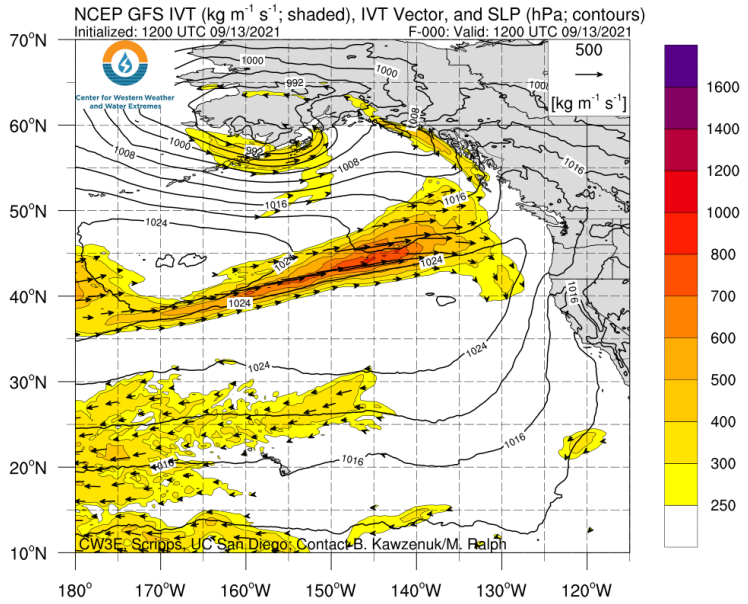
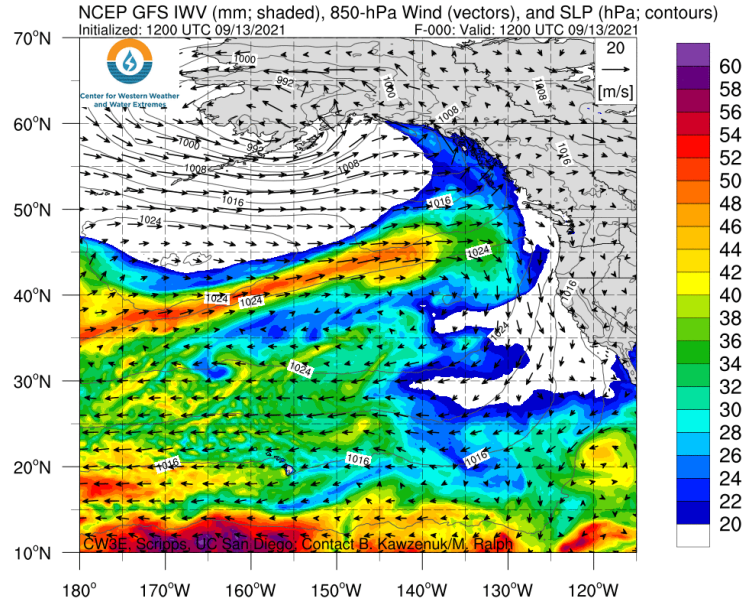
CW3E Atmospheric River Outlook

For California DWR's AR Program

An increase in activity over the Eastern Pacific is forecast to bring multiple ARs to the Pacific Northwest

- The first AR is forecast to be weak and brief, bringing as much as 1 inch of precipitation to far Northwestern Washington
- The second AR is forecast to bring much stronger and a longer duration of AR conditions to the Pacific Northwest, though there is currently much higher ensemble spread in timing, magnitude, and overall duration of AR conditions
- ~12 GEFS ensemble members are predicting the second AR to bring AR 4 or higher conditions to Coastal Oregon
- The NWS Weather Prediction Center is currently forecasting as much as 7 inches of precipitation to fall across several high elevation locations in the Pacific Northwest during the next seven days
- While early season ARs tend to produce less precipitation than their mid-winter counterparts, any precipitation that these two ARs produce will bring much needed relief to the numerous active wildfires and drought conditions in the Pacific Northwest



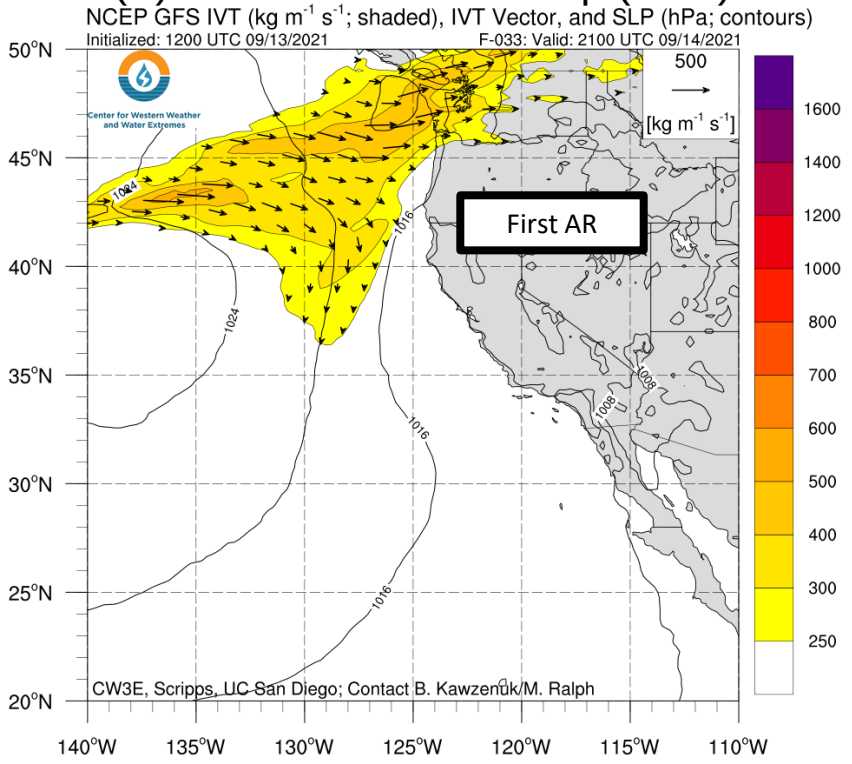


AR Outlook: 13 September 2021

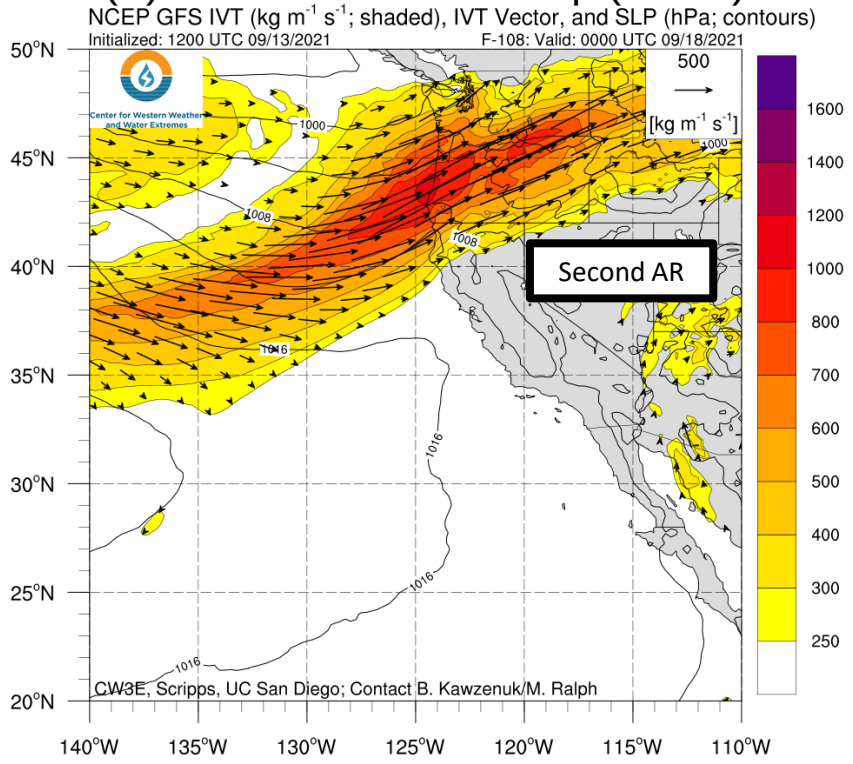
For California DWR's AR Program

GFS IVT/IWV Analyses and Forecasts

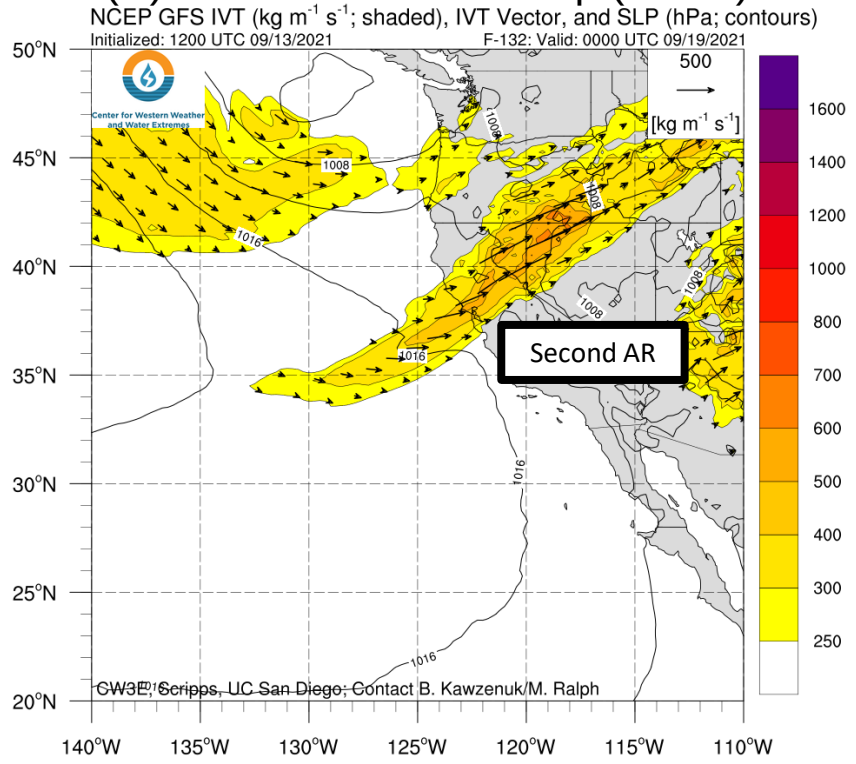
(A) Valid: 1400 PT 14 Sep (F-33)



(B) Valid: 1700 PT 17 Sep (F-108)



(C) Valid: 1700 PT 18 Sep (F-132)

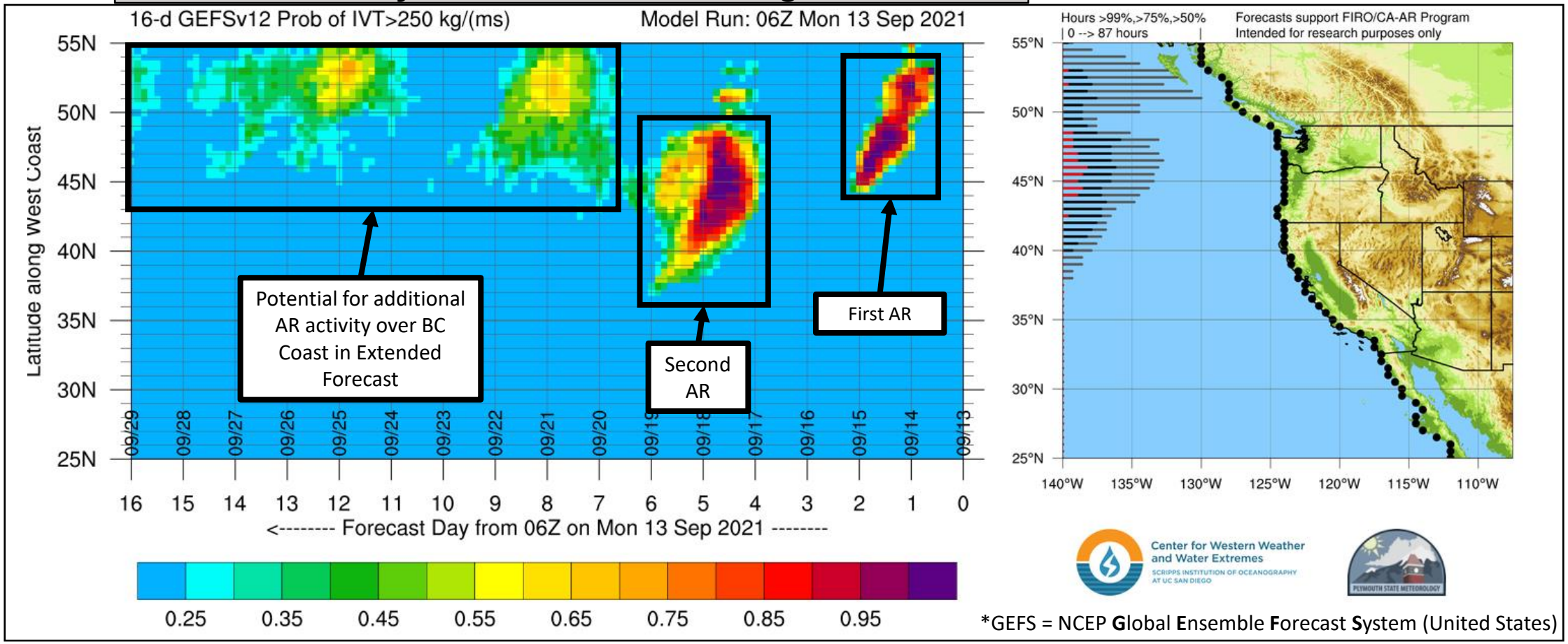


- The 12Z GFS Deterministic forecast shows that a weak and dissipating AR will bring IVT magnitudes between 400 & 500 kg/(ms) to coastal Washington at 2 PM PT 14 September (Figure A)
- The second AR is currently forecast to be much stronger than the first, bringing IVT magnitudes between 1000 & 1200 to coastal Oregon at 5 PM PT 17 September (Figure B)
- As the second AR begins to weaken, it is forecast to bring weak to moderate AR conditions to the drought stricken and fire prone North-Coastal and Sierra Nevada mountains of Northern California (Figure C)

AR Outlook: 13 September 2021

For California DWR's AR Program

Probability of AR Conditions Along Coast



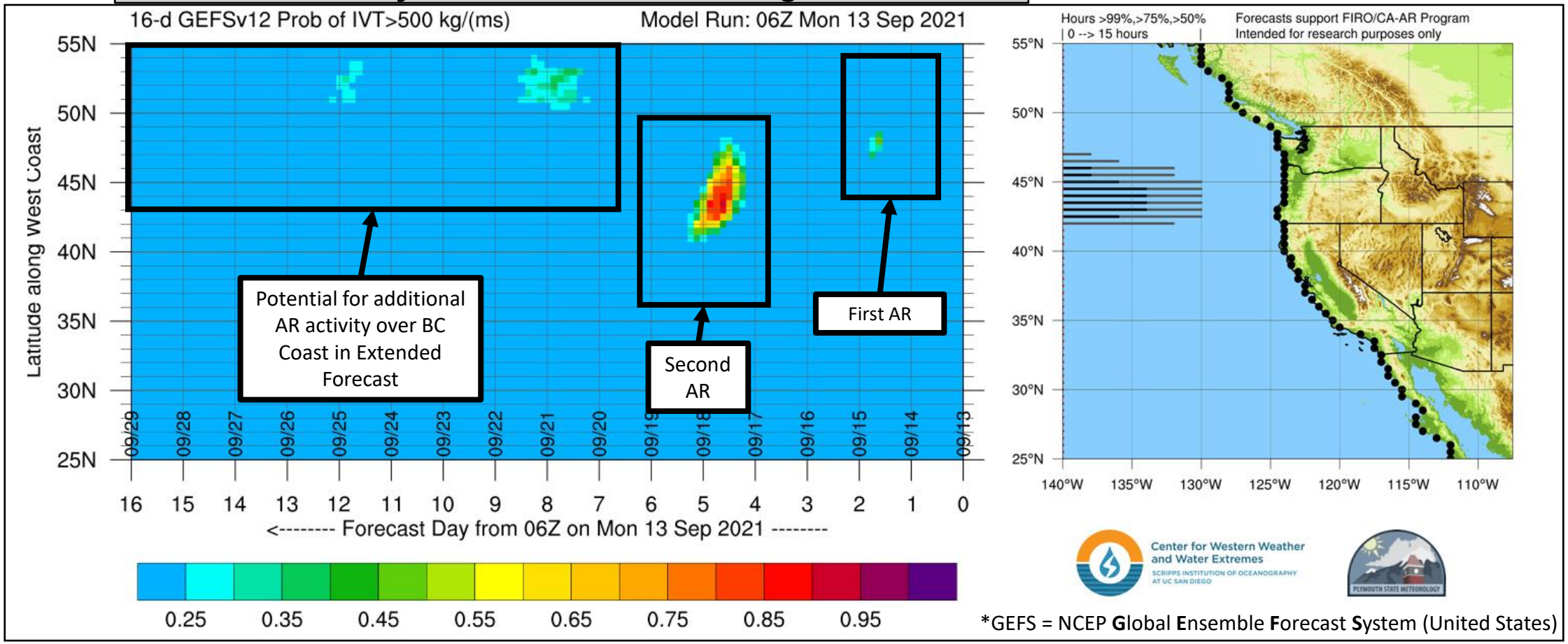
*GEFS = NCEP **G**lobal **E**nsemble **F**orecast **S**ystem (United States)

- The GEFS is currently forecasting a high probability of AR activity (>95%) over the Pacific Northwest during two sperate events on the 14th and from the 17th to the 19th of September
- There is currently lower ensemble probabilities (<75%) during the latter portion of the second AR, suggesting uncertainty associated with the overall duration of the event over Coastal Oregon
- The GEFS is also forecasting the potential for additional ARs on days 7+ over British Columbia, but uncertainty is currently high

AR Outlook: 13 September 2021

For California DWR's AR Program

Probability of AR Conditions Along Coast



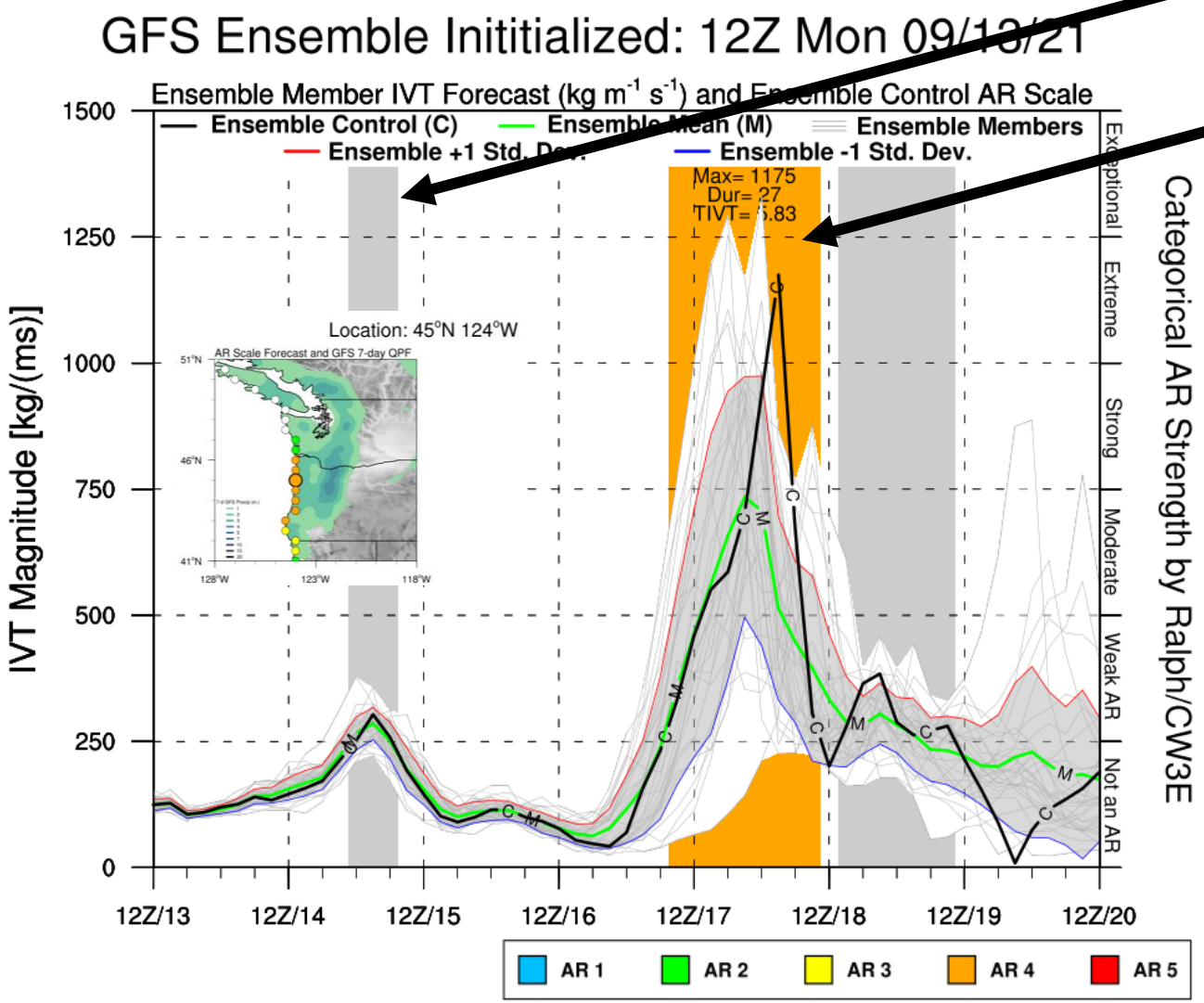
*GEFS = NCEP **G**lobal **E**nsemble **F**orecast **S**ystem (United States)

- The GEFS is currently illustrating a high probability (>70%) of moderate AR conditions (IVT >500 kg/(ms)) over coastal Oregon during the second AR, suggesting the second AR on 17–19 September will be stronger and potentially more productive (i.e., more precipitation) than the first AR
- 25–40% of GEFS ensembles are currently predicting the potential for moderate AR conditions during the First AR for a short period over coastal Washington

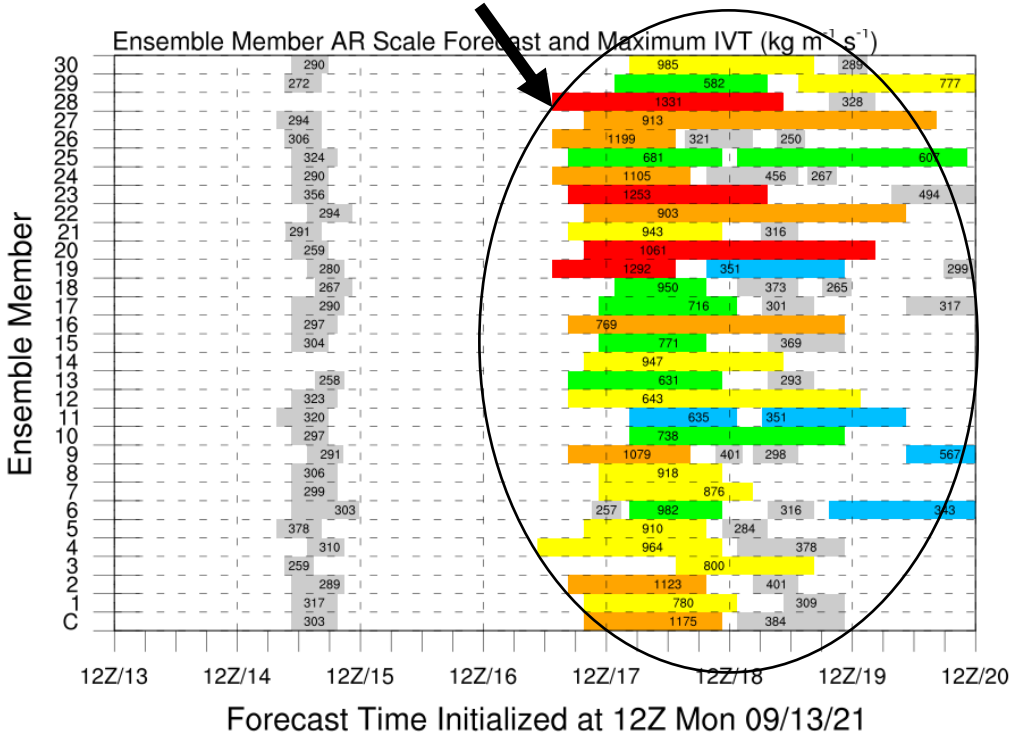
AR Outlook: 13 September 2021

For California DWR's AR Program

GEFS IVT/AR Scale Forecasts



- Due to weak magnitude (IVT <500 kg/(ms)) and short duration (<24 hours), the first AR is not forecast by the GEFS to produce conditions that fall on the AR Scale
- The Second AR is currently forecast to bring much stronger AR conditions to coastal Oregon, though there is much higher ensemble spread and uncertainty pertaining to maximum IVT magnitude and timing
- Currently, 4 GEFS ensemble members predict AR 5 conditions, 8 predict AR 4, and 19 predict AR 3 or less



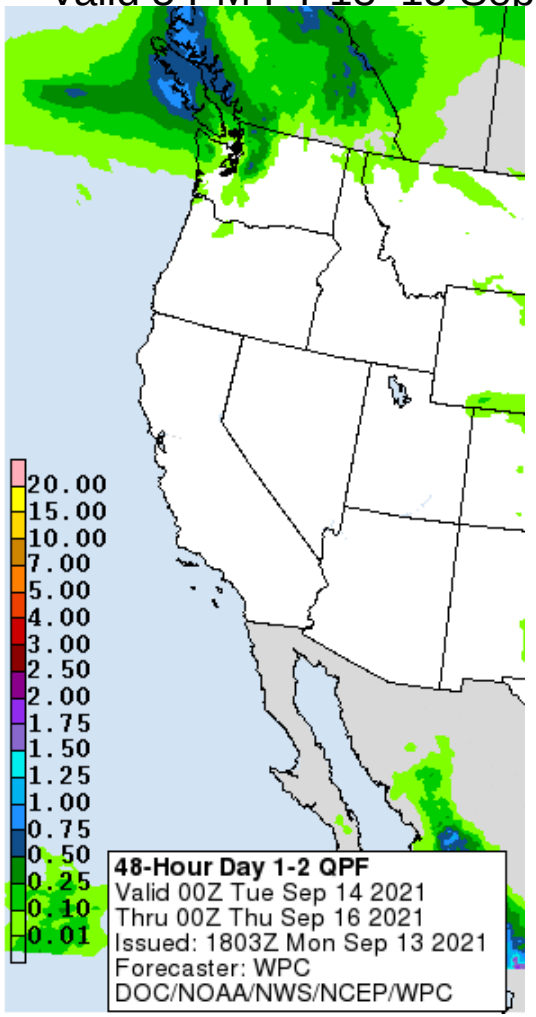
AR Outlook: 13 September 2021

AMBASSADOR™ WRN WEATHER-READY NATION

For California DWR's AR Program

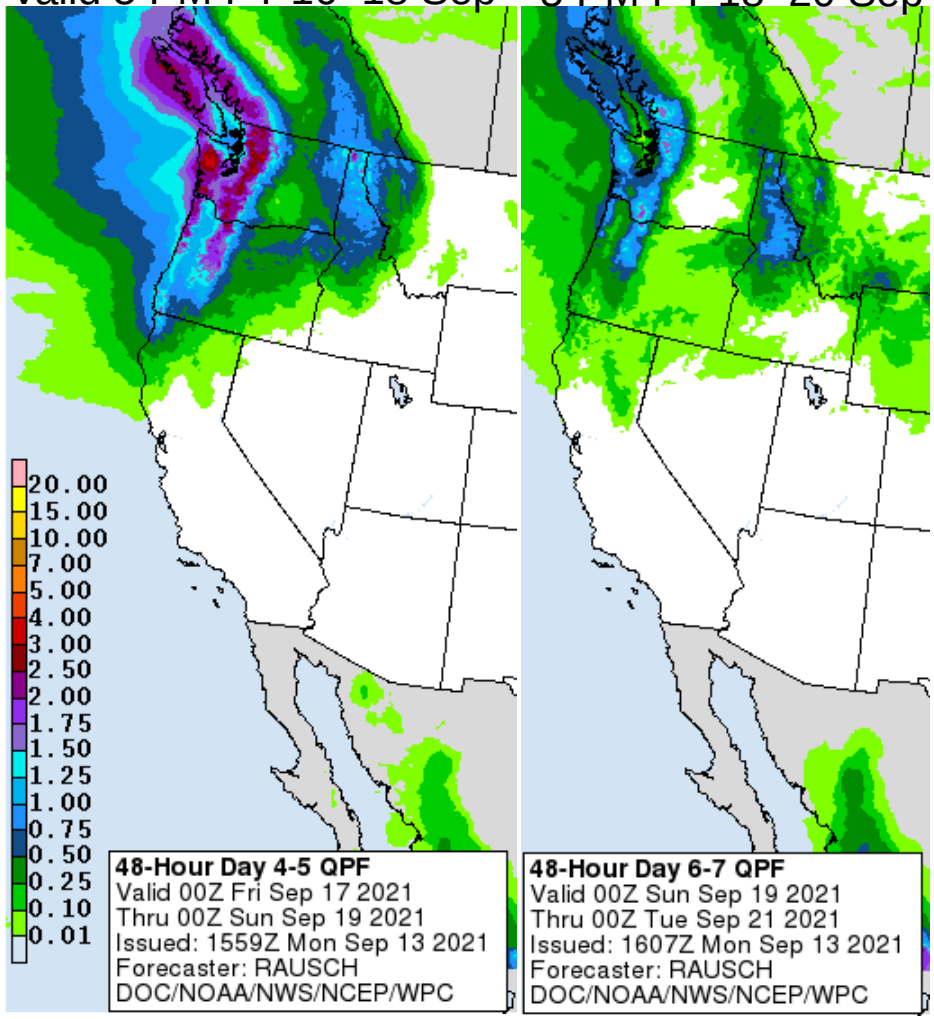
Precipitation

WPC 48-h Precipitation Forecast:
Valid 5 PM PT 13–15 Sep



- **Due to the seasonality of these ARs (Early Fall), it is likely that they will not produce as much precipitation as an AR of similar strength in the middle of the winter**
- The first AR is forecast by the Weather Prediction Center to bring ~0.1 to 1.0 inches of precipitation to the northwestern portions of Washington on 14 and 15 September (left)
- The Second AR is forecast to last longer and produce more precipitation than the first AR (right)
- The WPC is currently forecasting the second AR to produce as much as 4 inches of precipitation during the first 48-hours of the event on 16 and 18 Sep.
- As the second AR is dissipating, the WPC is predicting as much as 2 additional inches of precipitation over the higher elevations of the Cascade Mountains in Oregon and Washington, which is when there is currently the most uncertainty surrounding the AR conditions

WPC 48-h Precipitation Forecast:
Valid 5 PM PT 16–18 Sep 5 PM PT 18–20 Sep

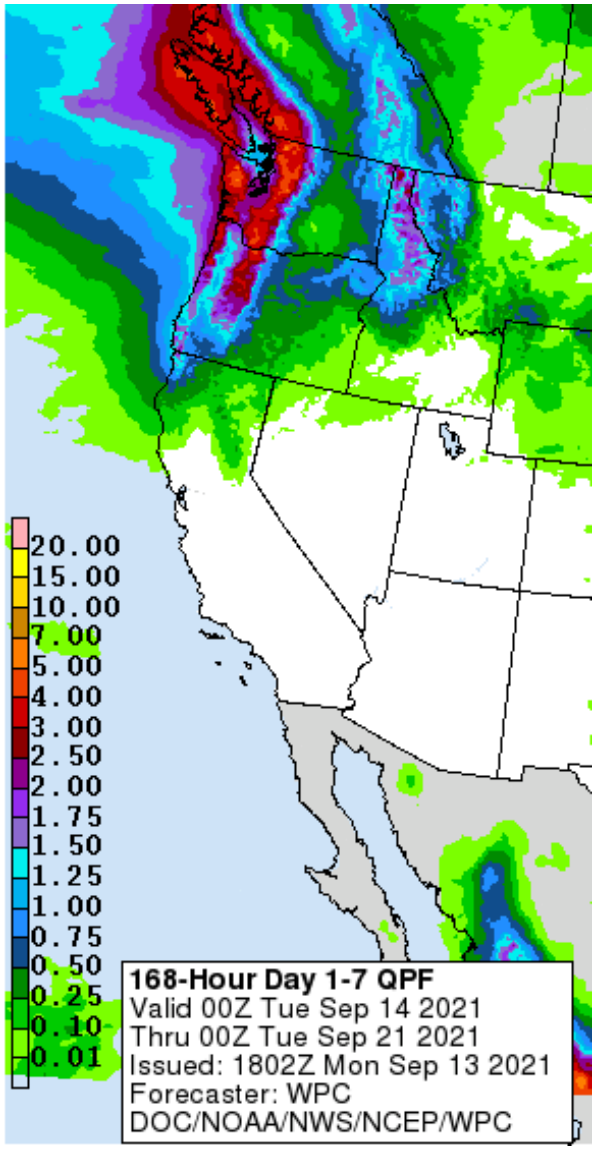


Source: NOAA/NWS WPC, wpc.ncep.noaa.gov/

AR Outlook: 13 September 2021

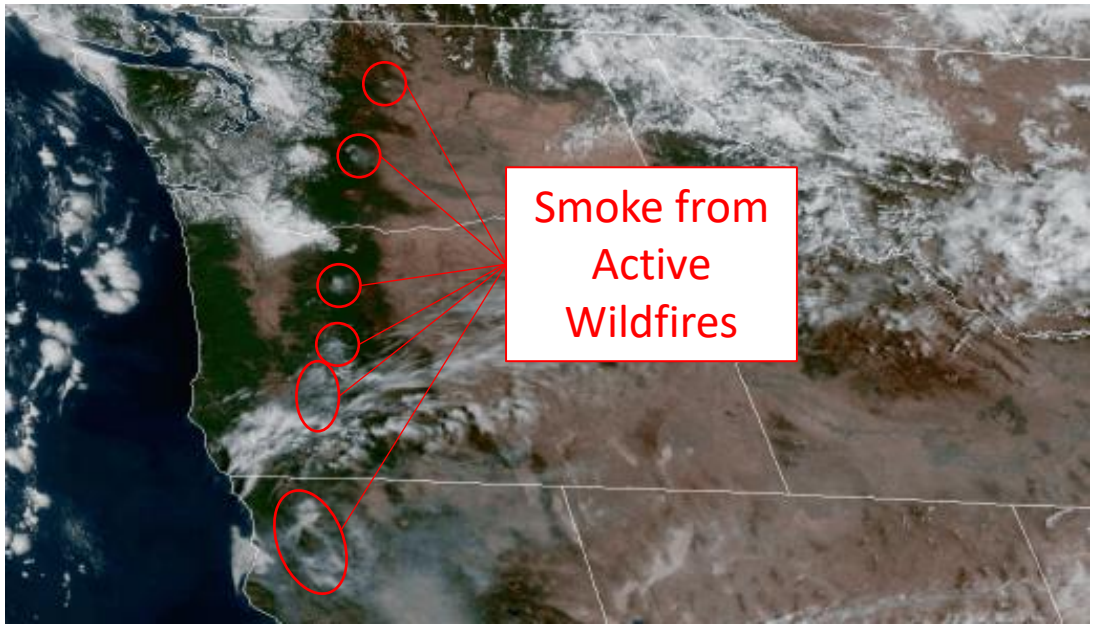
AMBASSADOR™ WRN WEATHER-READY NATION

For California DWR's AR Program

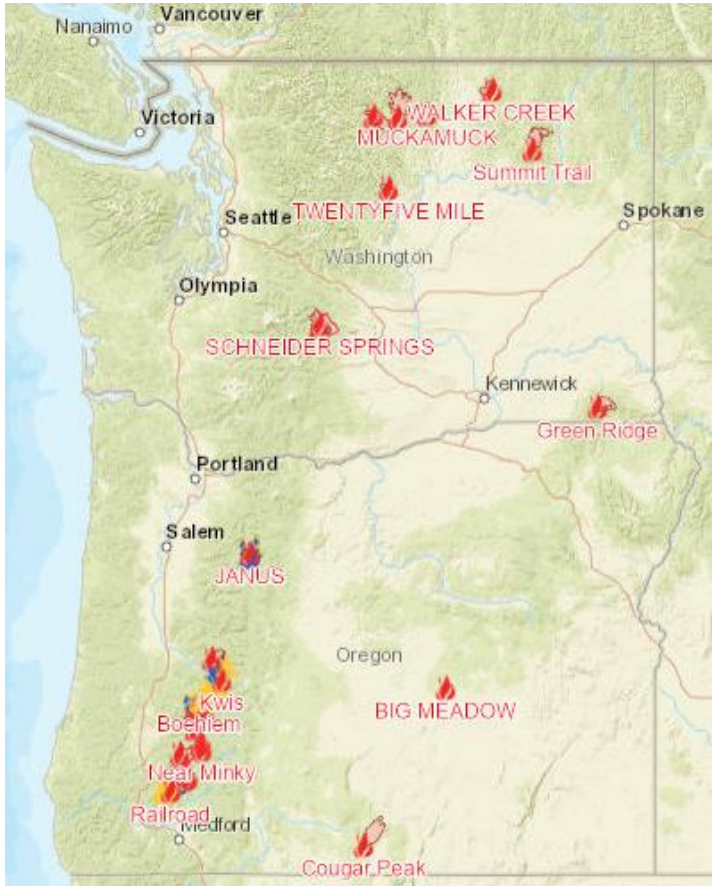


Source: NOAA NWS WPC, wpc.ncep.noaa.gov/

- The Weather Prediction Center is currently forecasting as much as 7 inches of precipitation over the higher elevations of the Cascade, Coast, and Olympic Mountains in the Pacific Northwest during the next 7 days
- The precipitation will bring relief to the numerous (~18) large and active wildfires burning across much of the PNW
- Smoke from the numerous wildfires can be seen in the most recent GOES West visible satellite



Source: Goes Image Viewer, https://www.star.nesdis.noaa.gov/GOES/index.php



Source: NWCC, https://gacc.nifc.gov/nwcc/information/firemap.aspx

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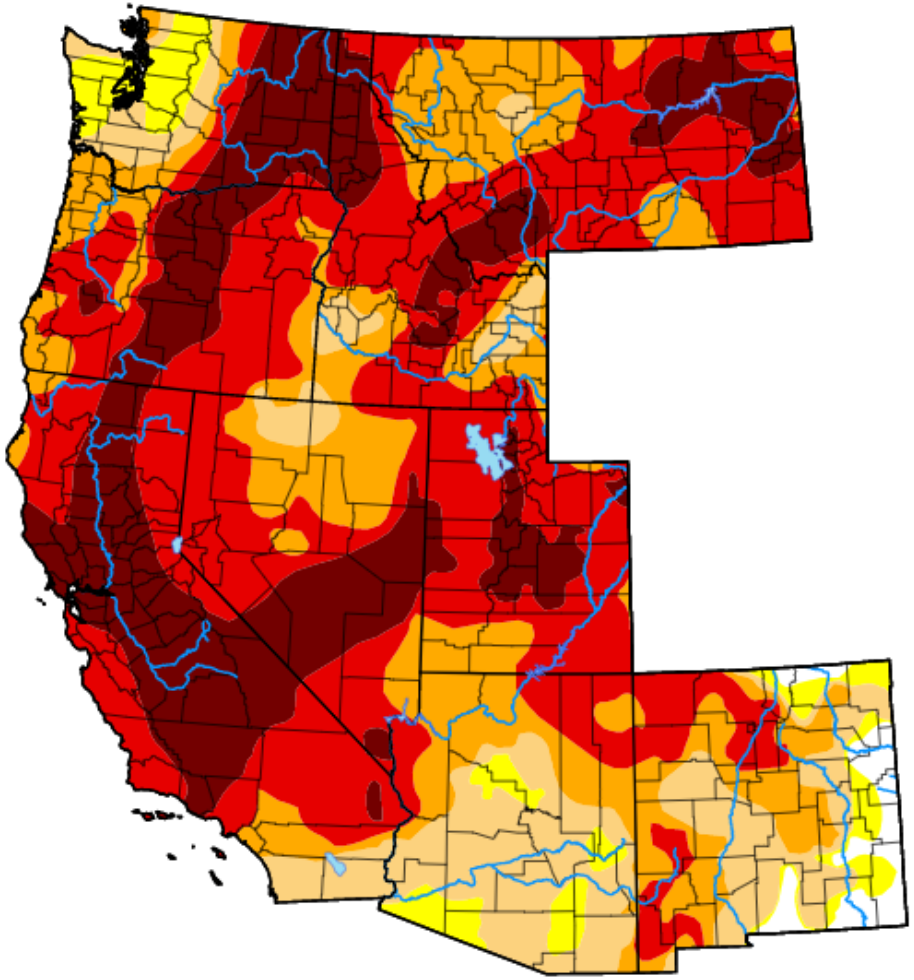
AMBASSADOR™ WRN WEATHER-READY NATION

For California DWR's AR Program

Home >

West



Map released: Thurs. September 9, 2021

Data valid: September 7, 2021 at 8 a.m. EDT

Intensity

- None
- D0 (Abnormally Dry)
- D1 (Moderate Drought)
- D2 (Severe Drought)
- D3 (Extreme Drought)
- D4 (Exceptional Drought)
- No Data

Authors

United States and Puerto Rico Author(s):
David Simeral, Western Regional Climate Center

Pacific Islands and Virgin Islands Author(s):
Richard Tinker, NOAA/NWS/NCEP/CPC

- Nearly all of the U.S. West is currently under drought conditions, with a large portion from Washington to California under Exceptional Drought (D4)
- While these storms are forecast to bring much needed precipitation to the Pacific Northwest, in addition to wildfire relief, it is unlikely that these storms will bring enough precipitation to mitigate much of the extreme to exceptional drought conditions

Source: U.S. Drought Monitor Index, droughtmonitor.unl.edu/