

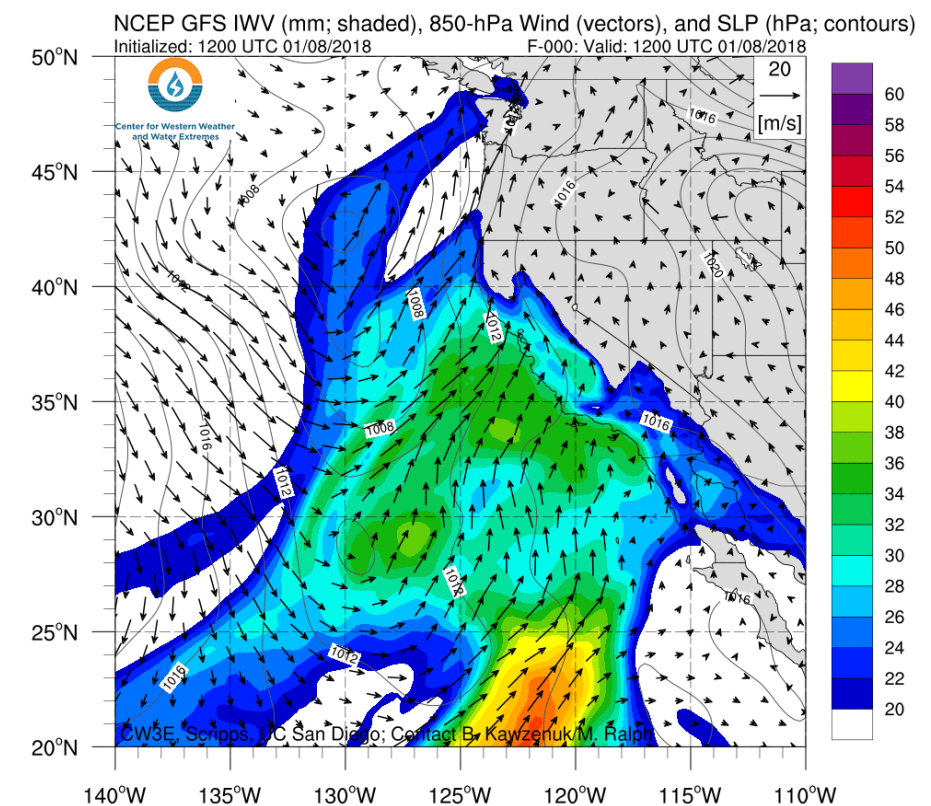
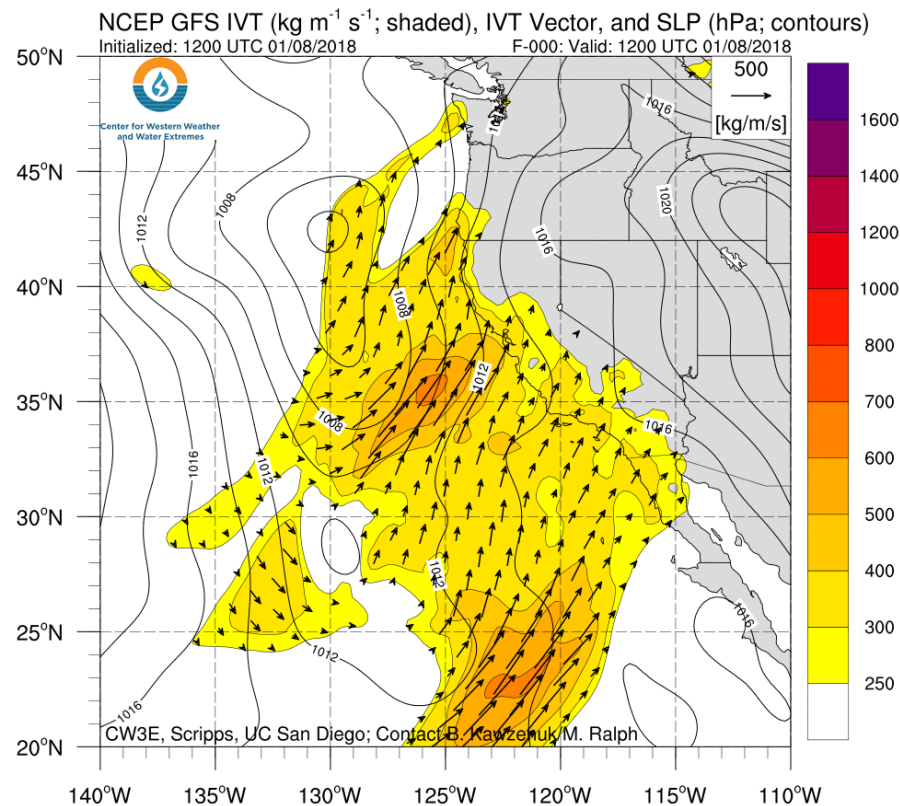
CW3E Atmospheric River Update – Outlook



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AR conditions currently bringing precipitation to U.S. West Coast

- The majority of the U.S. West Coast is currently experiencing AR conditions ($IVT > 250 \text{ kg m}^{-1} \text{ s}^{-1}$ and $IWV > 20 \text{ mm}$) and precipitation associated with these conditions
- These conditions could lead to precipitation over the majority of CA and southwest OR for the next 36 hours with accumulations up to 7 inches over CA
- An AR is expected to make landfall over the Pacific Northwest on 10 January 2018 and could produce up to 6 inches of precipitation over the Cascade Mountains



Outlook provided by B. Kawzenuk, J. Kalansky, and F.M. Ralph; 11 AM PT Monday 8 January 2018

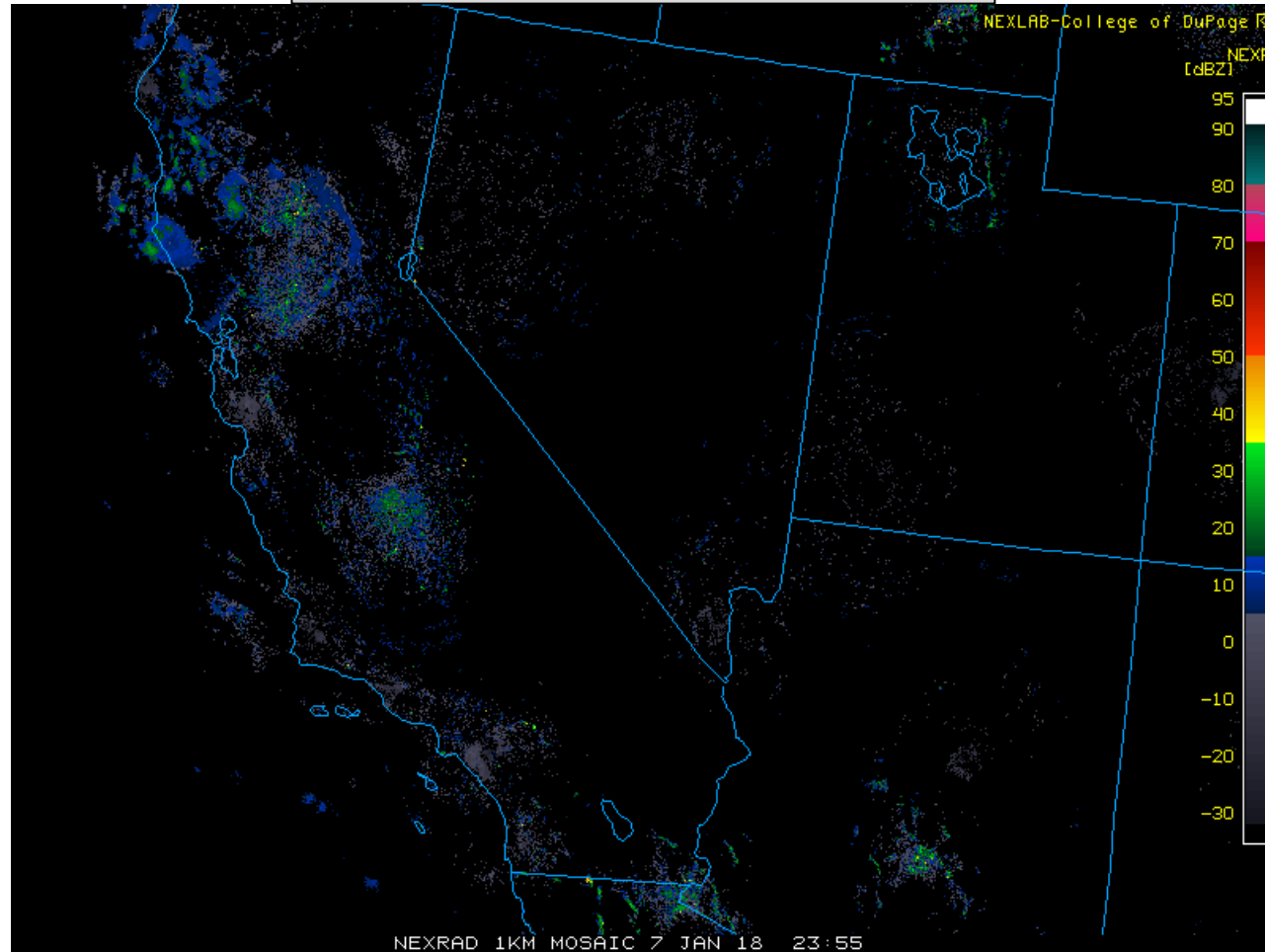
AR Outlook: 8 January 2018

For California DWR's AR Program



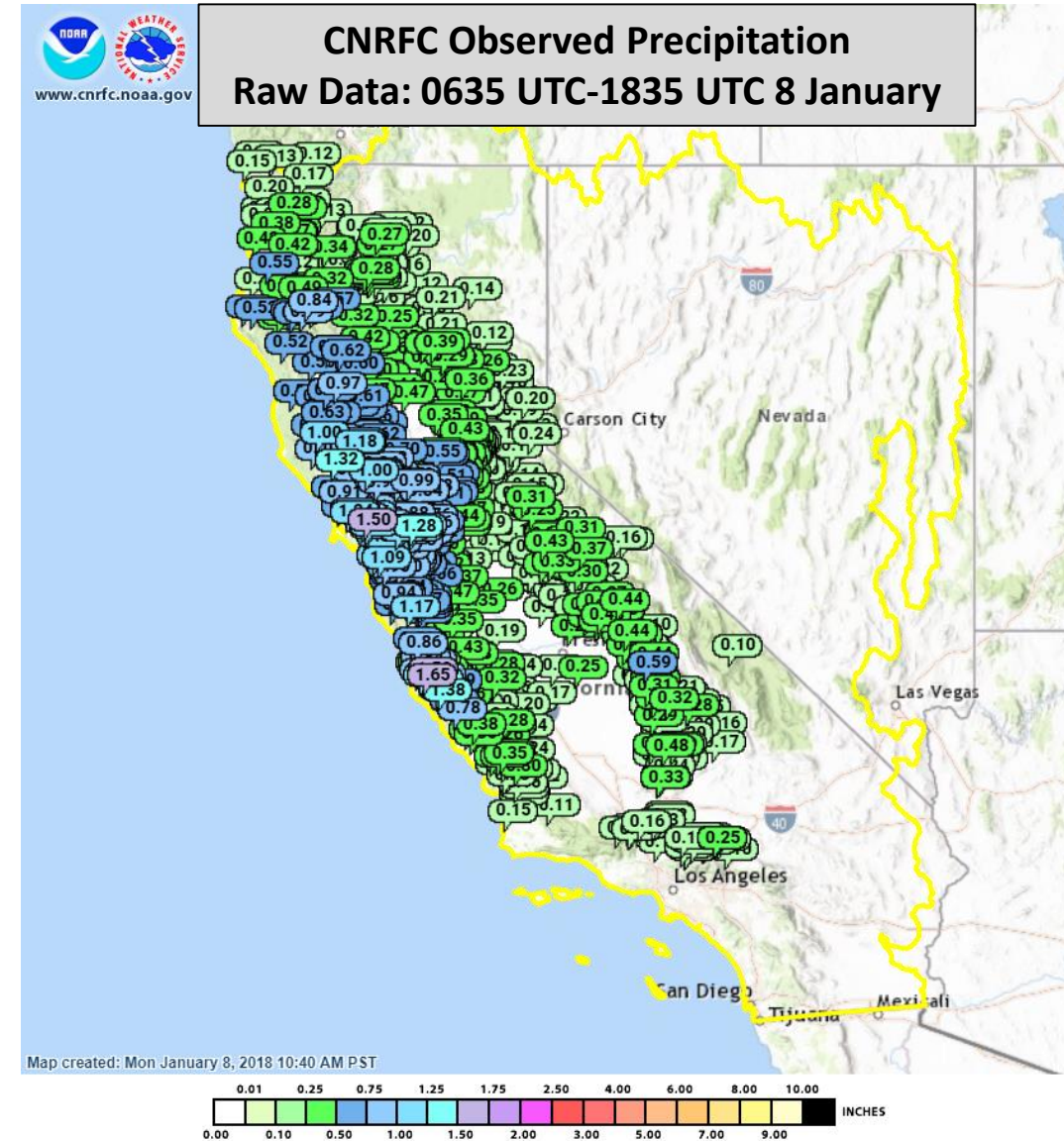
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NEXRAD Radar Imagery
0000 UTC – 1800 UTC 8 January 2018



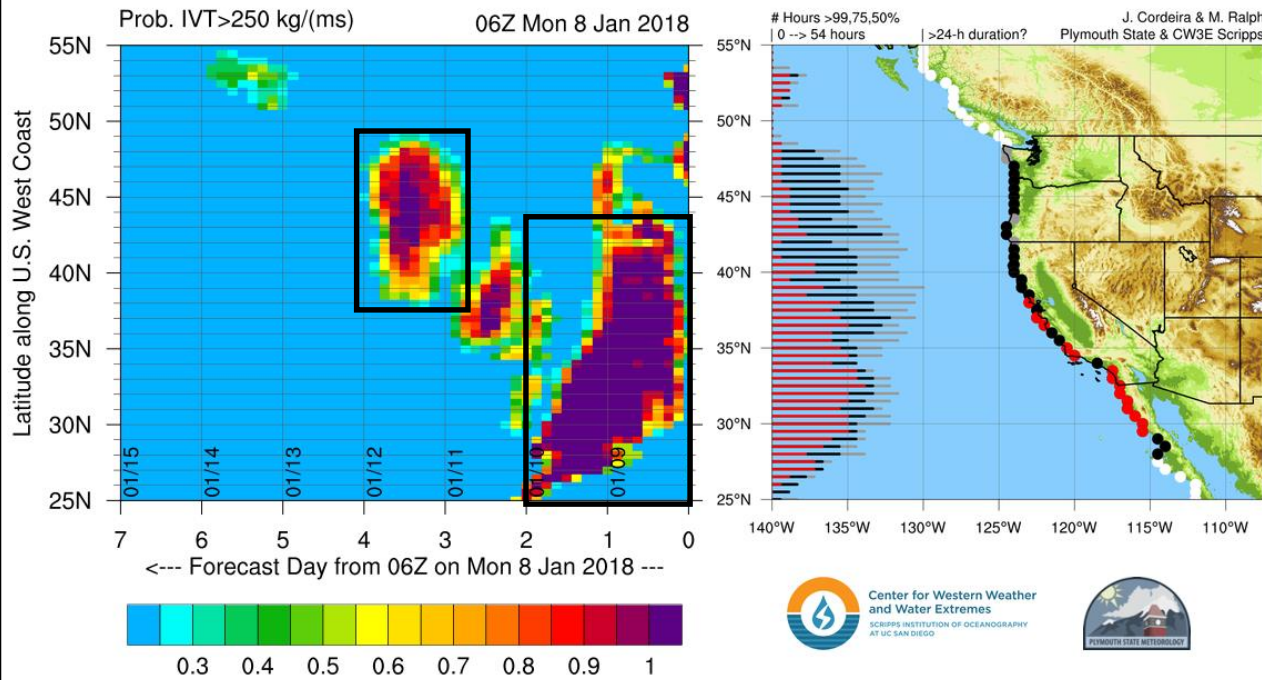
- Precipitation began over CA around 0400 UTC 8 January
- As of 1835 UTC 8 Jan, up to 1.65 inches of precipitation has been observed over coastal CA

CNRFC Observed Precipitation
Raw Data: 0635 UTC-1835 UTC 8 January

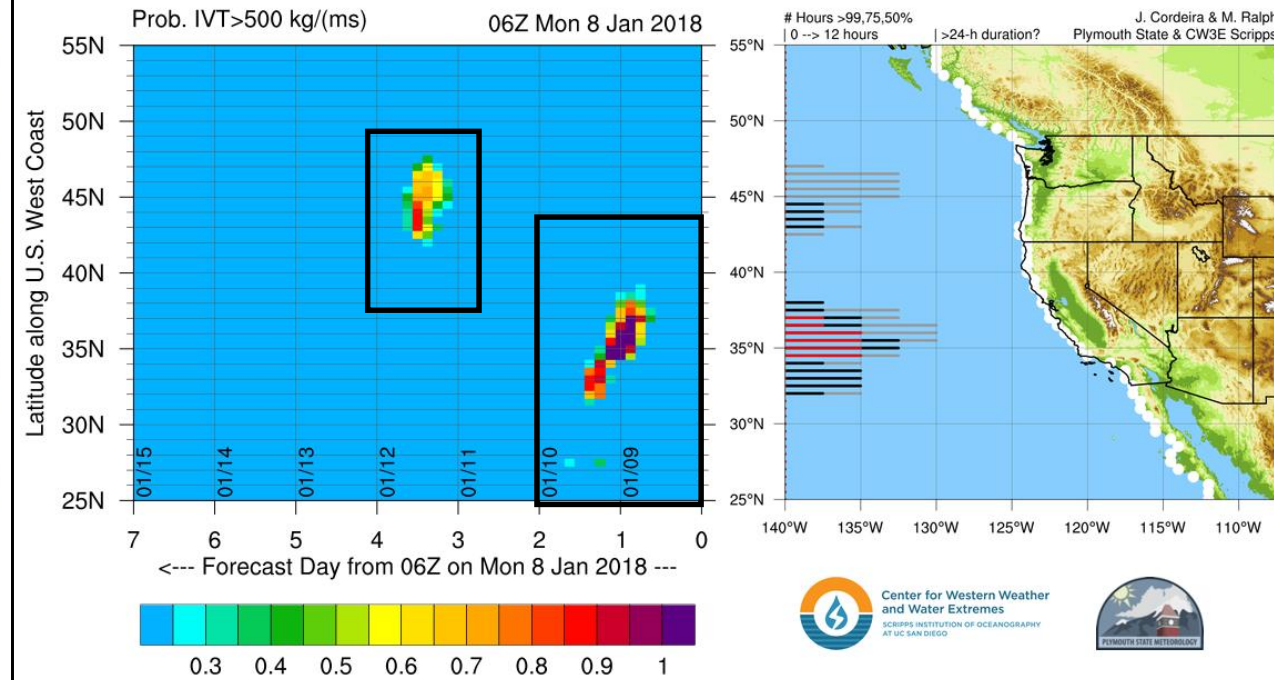




Odds of at least a **WEAK** AR making landfall



Odds of a **MODERATE-STRENGTH** AR making landfall



- There is high certainty (>95%) of weak AR conditions (IVT >250 kg m⁻¹ s⁻¹) over central CA over the next 48 hours
- There is also high certainty of weak AR conditions over the PNW during 10–12 January 2018

- There is high certainty (>95%) of moderate AR conditions (IVT >500 kg m⁻¹ s⁻¹) over central CA during 9-10 January 2018
- There is moderate certainty (~75%) of moderate AR conditions over OR during the 10-12 January 2018 AR

AR Outlook: 8 January 2018

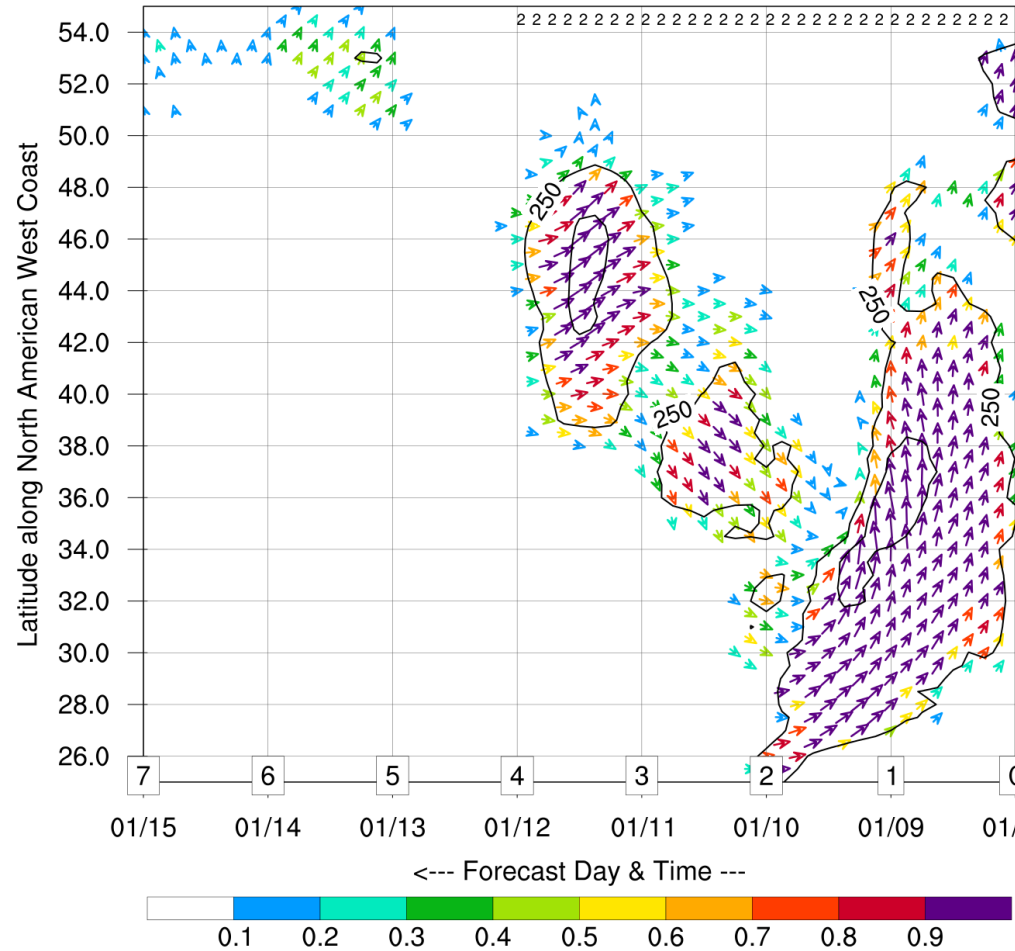
For California DWR's AR Program



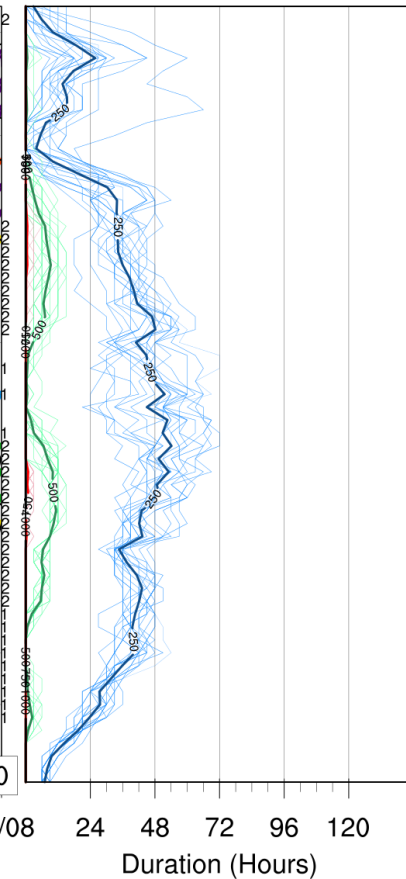
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AR Landfall Tool: 06Z Mon 8 Jan 2018

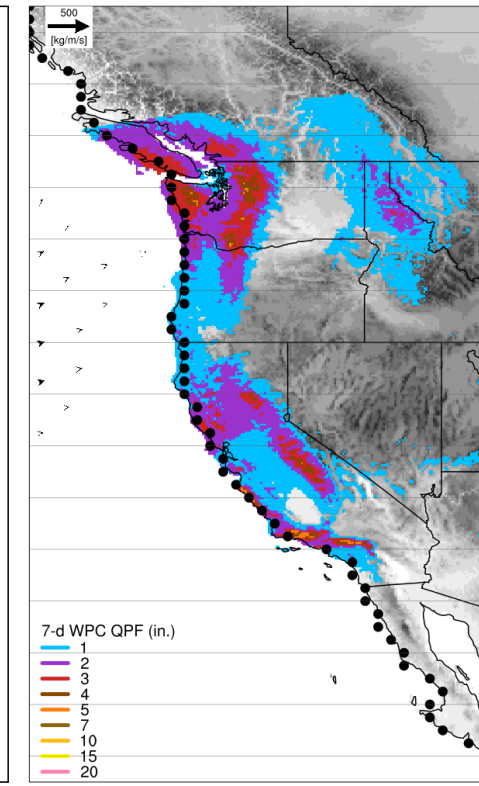
a. 7-d GFS Ens. Mean IVT Colored by Ens. Fraction >250 kg/m/s



b. Hours >250,500,750,1000



c. Time Mean IVT, Terrain, QPF



Plymouth State and CW3E Scripps: <http://cw3e.ucsd.edu>
Contact is Dr. Jason Cordeira: jcordeira@ucsd.edu



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- IVT orientation during the first period of AR conditions is expected to be southerly and southwesterly resulting in the highest precipitation amounts over the Transverse Ranges of CA
- The AR during 10-12 Jan is expected to have southwesterly oriented IVT, resulting in the highest precipitation over the Cascade and Olympic Mountains

AR Outlook: 8 January 2018

For California DWR's AR Program



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There is relatively high certainty in the GEFS of the magnitude and timing of the AR conditions over CA during 8-9 Jan

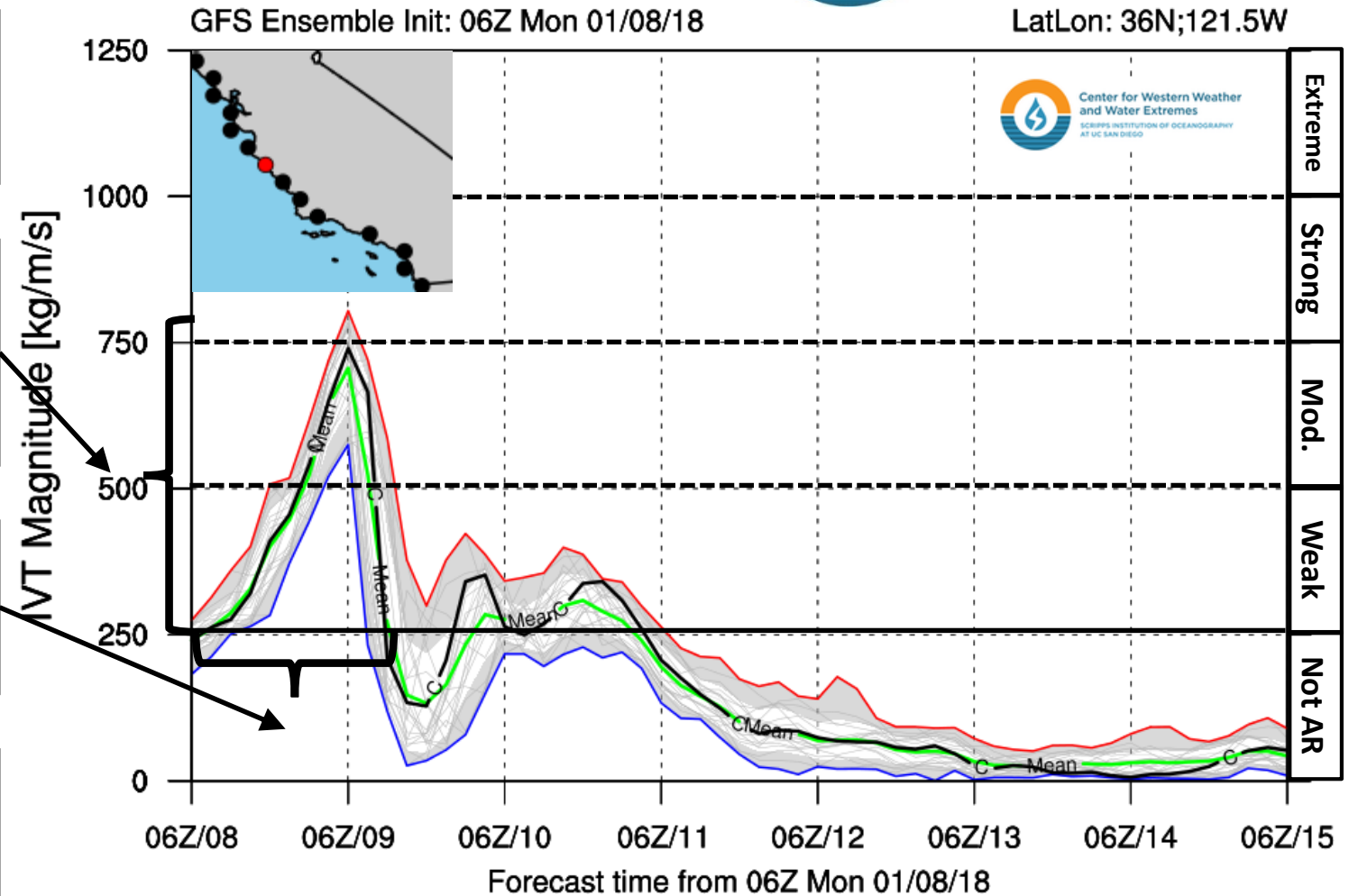
Magnitude of Potential AR

- Maximum possible IVT $\sim 775 \text{ kg m}^{-1} \text{ s}^{-1}$
- Mean IVT $\sim 750 \text{ kg m}^{-1} \text{ s}^{-1}$
- Minimum possible IVT $\sim 560 \text{ kg m}^{-1} \text{ s}^{-1}$

Duration of AR conditions

- Weak: $\sim 30 \text{ hours} \pm 6 \text{ h}$
- Moderate: $\sim 12 \text{ hours} \pm 6 \text{ h}$

All of GEFS members are predicting moderate AR conditions during 8-9 Jan, with several predicting strong AR conditions



AR Outlook: 8 January 2018

For California DWR's AR Program



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There is high uncertainty in the GEFS of the magnitude and timing of the AR conditions over OR during 10-12 Jan

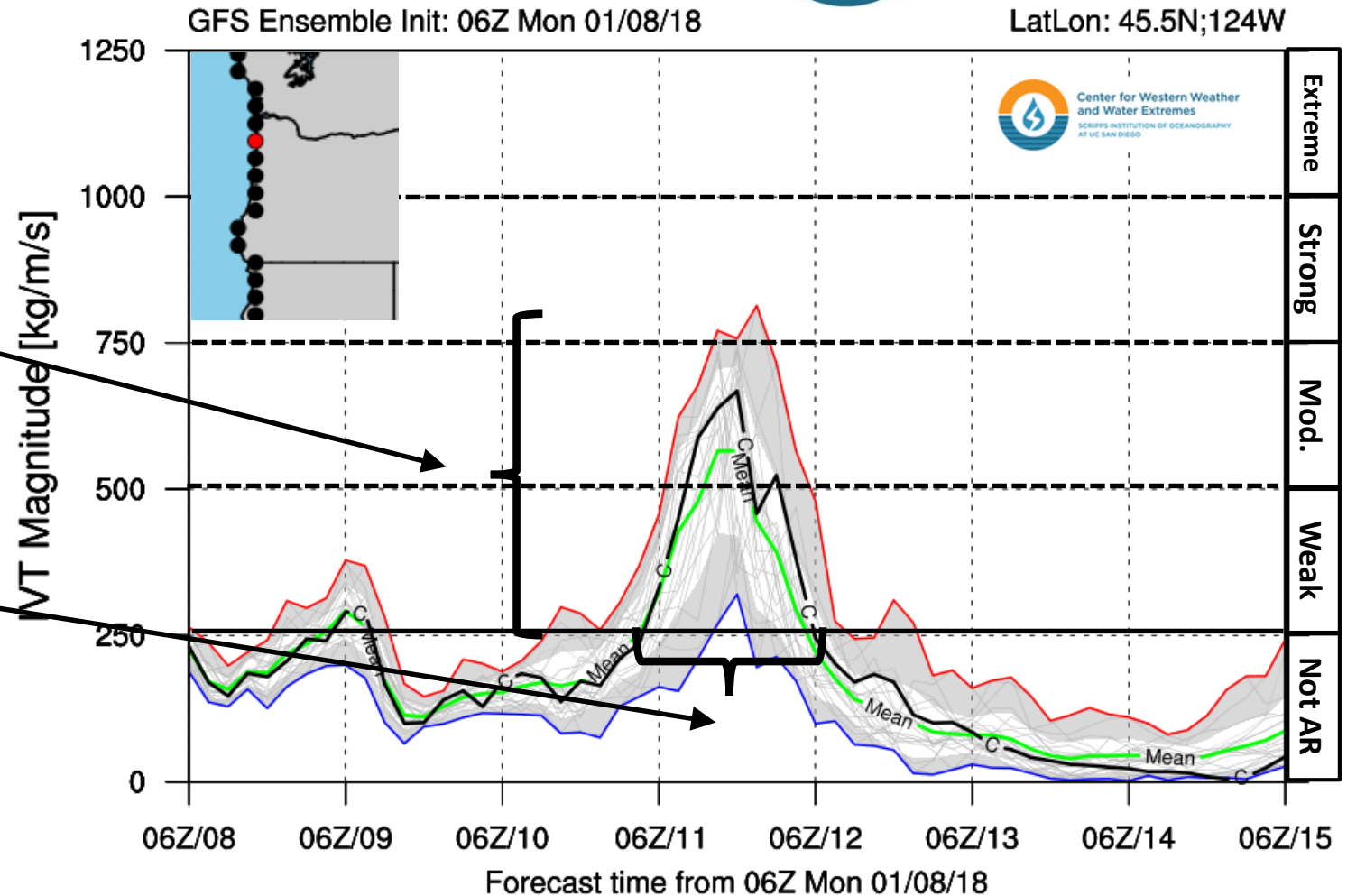
Magnitude of Potential AR

- Maximum possible IVT $\sim 775 \text{ kg m}^{-1} \text{ s}^{-1}$
- Mean IVT $\sim 700 \text{ kg m}^{-1} \text{ s}^{-1}$
- Minimum possible IVT $\sim 300 \text{ kg m}^{-1} \text{ s}^{-1}$

Duration of AR conditions

- Weak: $\sim 30 \text{ hours} \pm 12 \text{ h}$
- Moderate: $\sim 12 \text{ hours} \pm 12 \text{ h}$

All of GEFS members are predicting at least weak AR conditions during 10-12 Jan, with most predicting moderate AR conditions

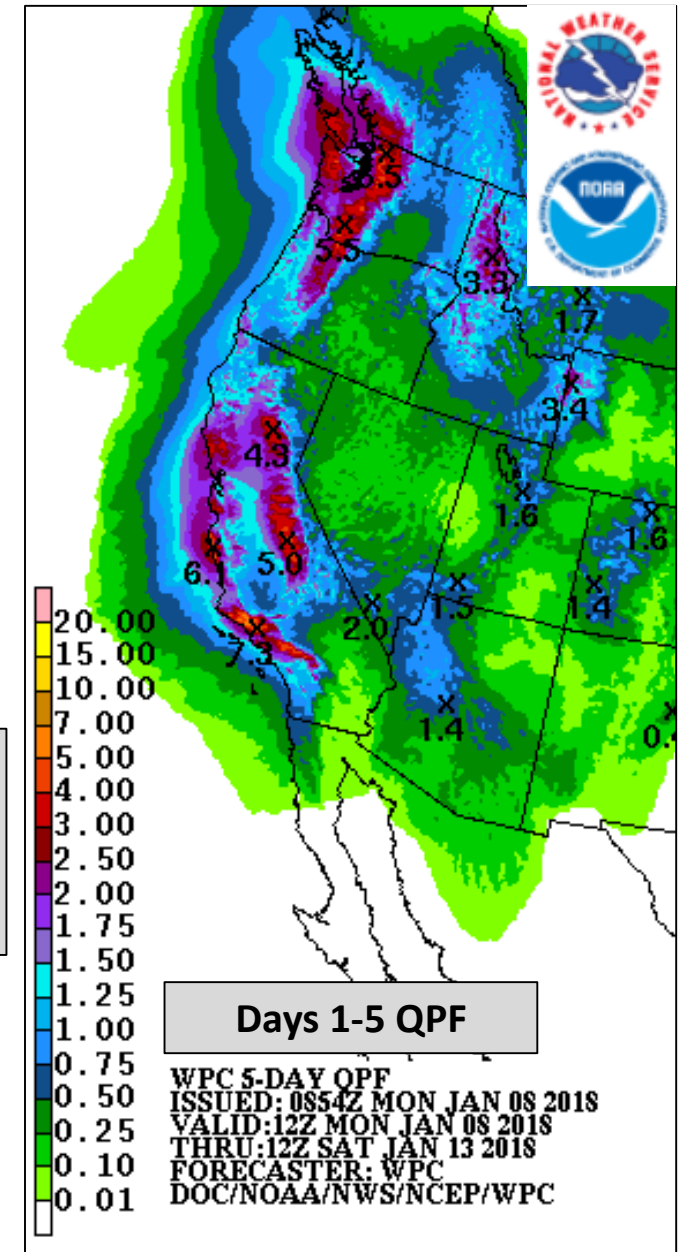
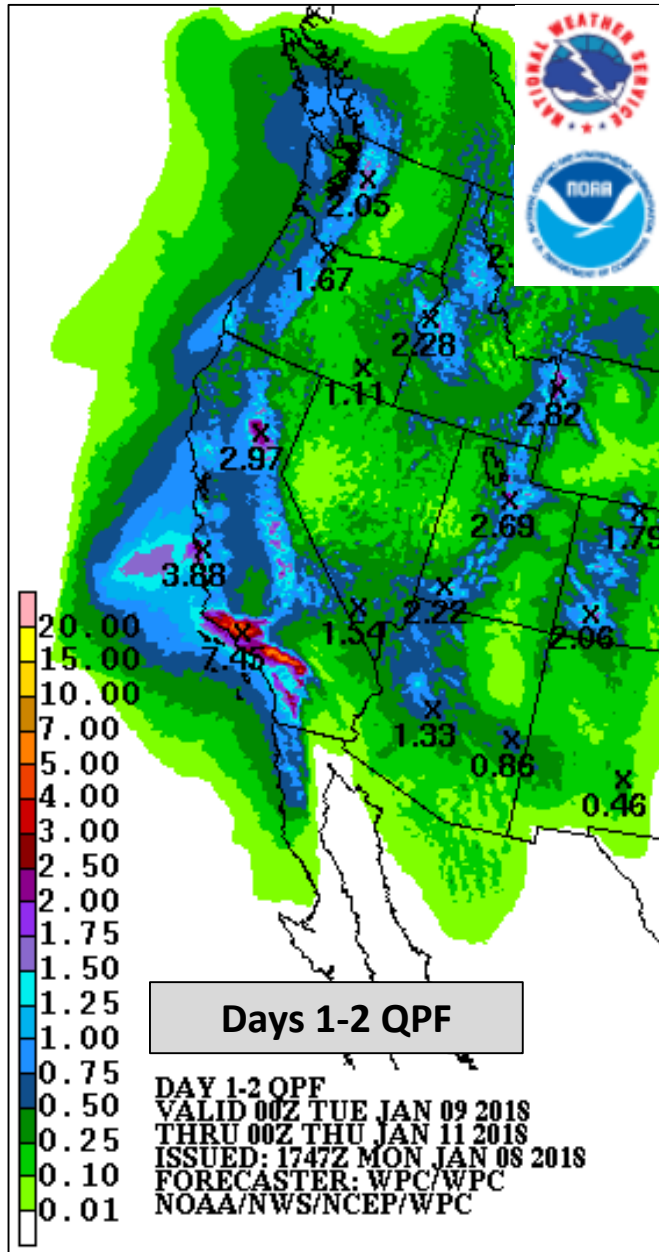


Weather Prediction Center QPF

The elevated moisture transport over central and northern CA over the next two days could produce up to 7 inches of precipitation over the Transverse Ranges

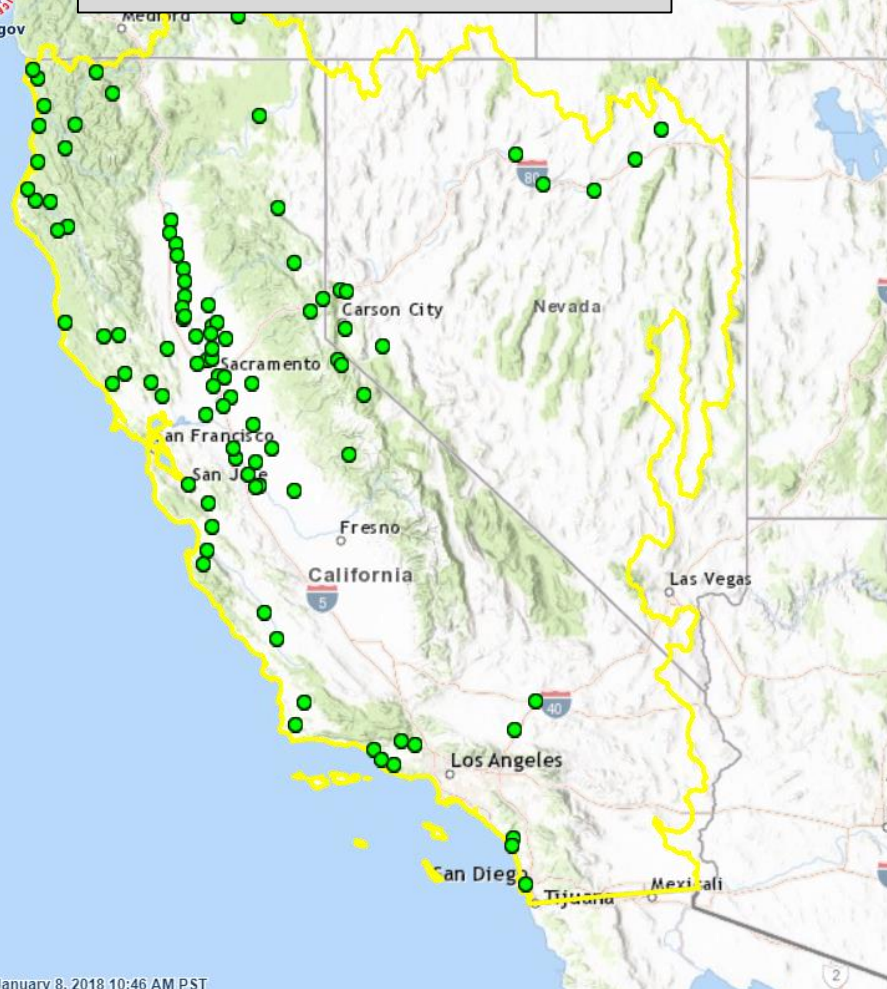
The Sierra Nevada and Coastal Range in northern and central CA could receive over 3 inches of precipitation over the next two days

The 10-12 January AR could produce an additional 4 inches of precipitation over the Olympic and Cascade Mountains in OR and WA



River Forecast Center River Forecasts

CNRFC 6-day River Forecast

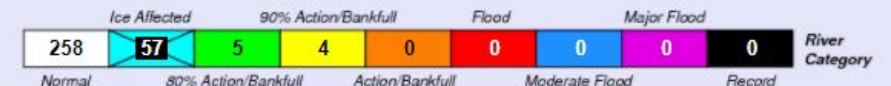
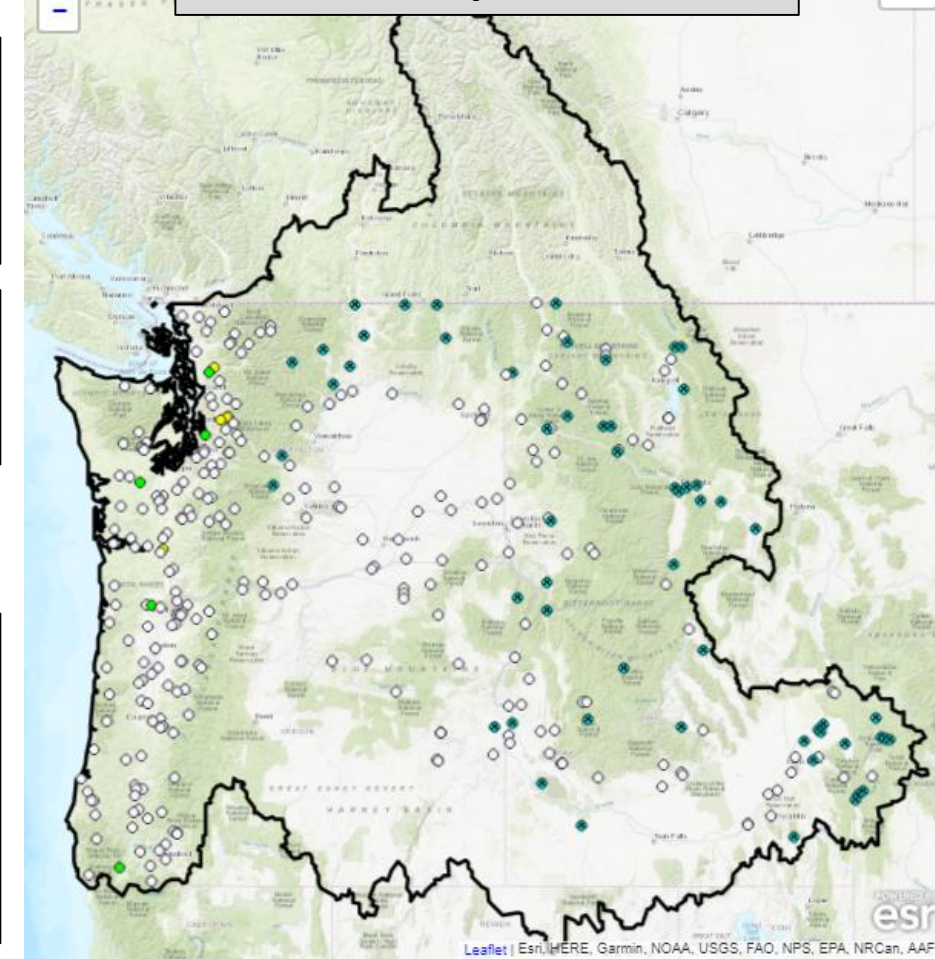


Most current river stages are still relatively low and soil moisture is relatively dry throughout CA

As a result no rivers in the CNRFC region are expected to come near flood stage.

Nine rivers in the PNW are expected to reach action level, with 4 reaching 90% bankfull, however none are expected to rise to flood stage

NWRFC 10-day River Forecast



No Monitor or Flood Stage Available
 97 Normal Conditions
 0 Above Monitor Stage
 0 Above Flood Stage
 0 Above Danger Stage

The number inside each circle above represents the number of gages with forecast conditions inside that category.