

# CW3E Atmospheric River Update – Outlook

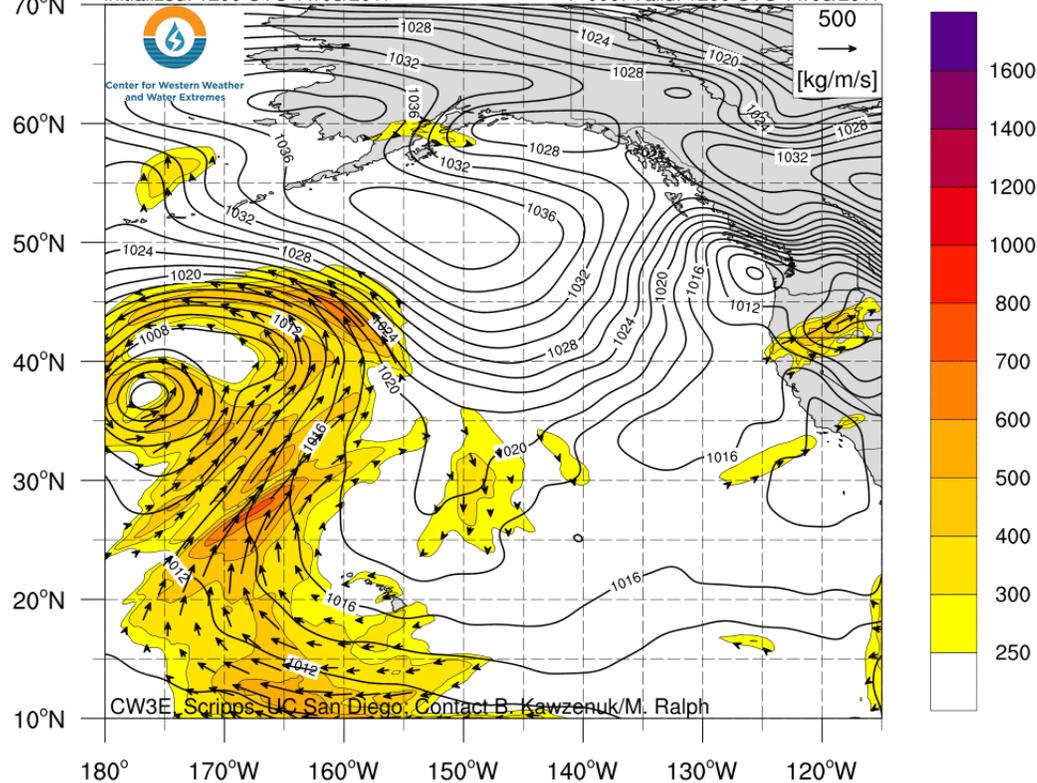


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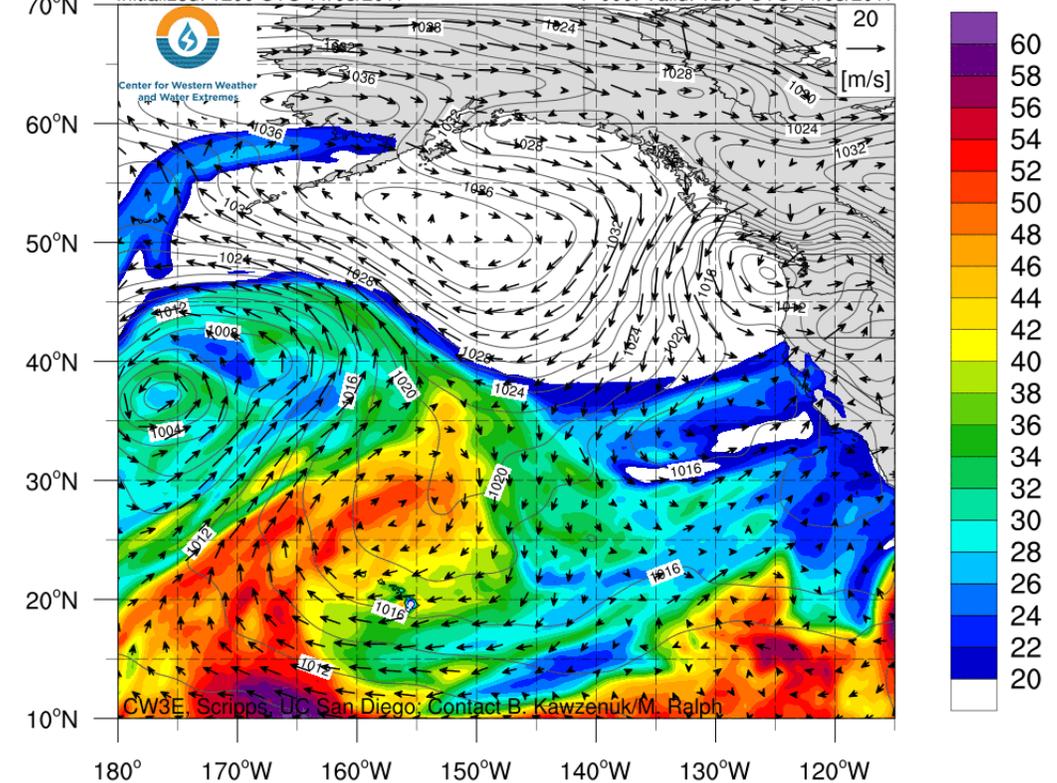
## Two systems expected to produce precipitation over the U.S. West Coast in the next week

- AR conditions ( $IVT > 250 \text{ kg m}^{-1} \text{ s}^{-1}$  and  $IWV > 20 \text{ mm}$ ) are expected over most of CA over the next four days
- While AR conditions are forecast for some locations of the USWC, this event is not necessarily an AR due to geometric and spatial structure, but could produce up to 5 inches of precipitation and some snow over the Sierra Nevada
- A potentially strong AR is expected to make landfall over CA, OR, and WA on 8 November 2017
- The highest amounts of precipitation are expected over the coastal ranges of CA and OR
- The AR is currently expected to have a southerly orientation which will result in less extreme precipitation

NCEP GFS IVT ( $\text{kg m}^{-1} \text{ s}^{-1}$ ; shaded), IVT Vector, and SLP (hPa; contours)  
Initialized: 1200 UTC 11/03/2017 F-000: Valid: 1200 UTC 11/03/2017

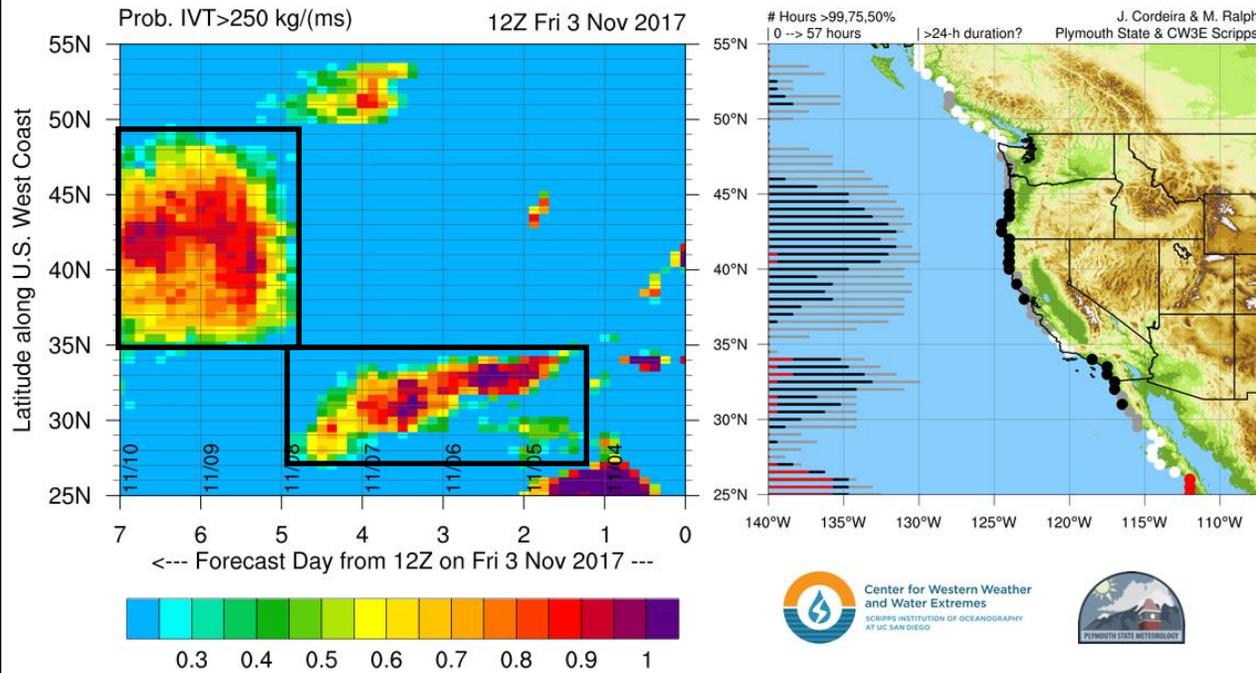


NCEP GFS IWV (mm; shaded), 850-hPa Wind (vectors), and SLP (hPa; contours)  
Initialized: 1200 UTC 11/03/2017 F-000: Valid: 1200 UTC 11/03/2017

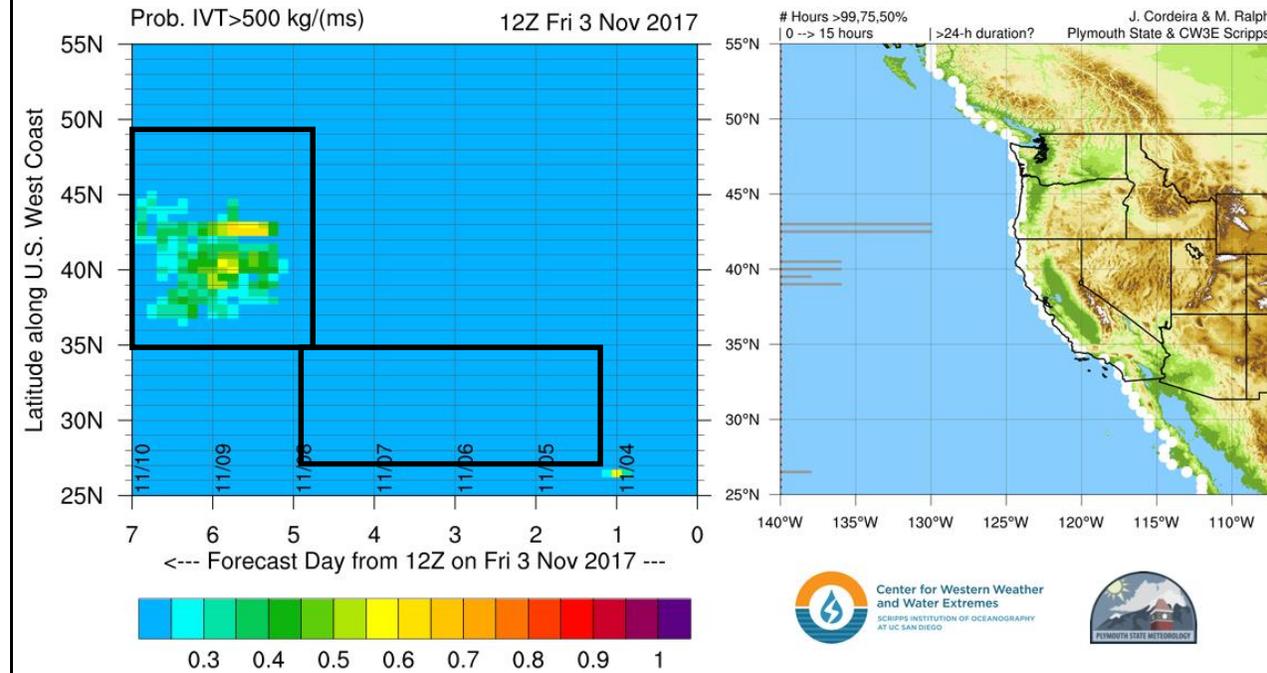




## Odds of at least a **WEAK** AR making landfall



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



- There is high certainty (>95%) of weak AR conditions (IVT > 250 kg m<sup>-1</sup> s<sup>-1</sup>) over southern CA during 5–8 November 2017
- There is relatively high certainty (>80%) of weak AR conditions over northern CA, OR, and WA during 8–10 November 2017

- Less than 25% of GEFS members are predicting moderate AR conditions (IVT > 500 kg m<sup>-1</sup> s<sup>-1</sup>) during the first period of AR conditions
- ~50% of GEFS members are currently predicting moderate AR conditions over northern CA and OR during the second AR

# AR Outlook: 3 November 2017

For California DWR's AR Program



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There is uncertainty in the GEFS of the onset, magnitude, and end time of the AR conditions over southern CA during 5–8 Nov

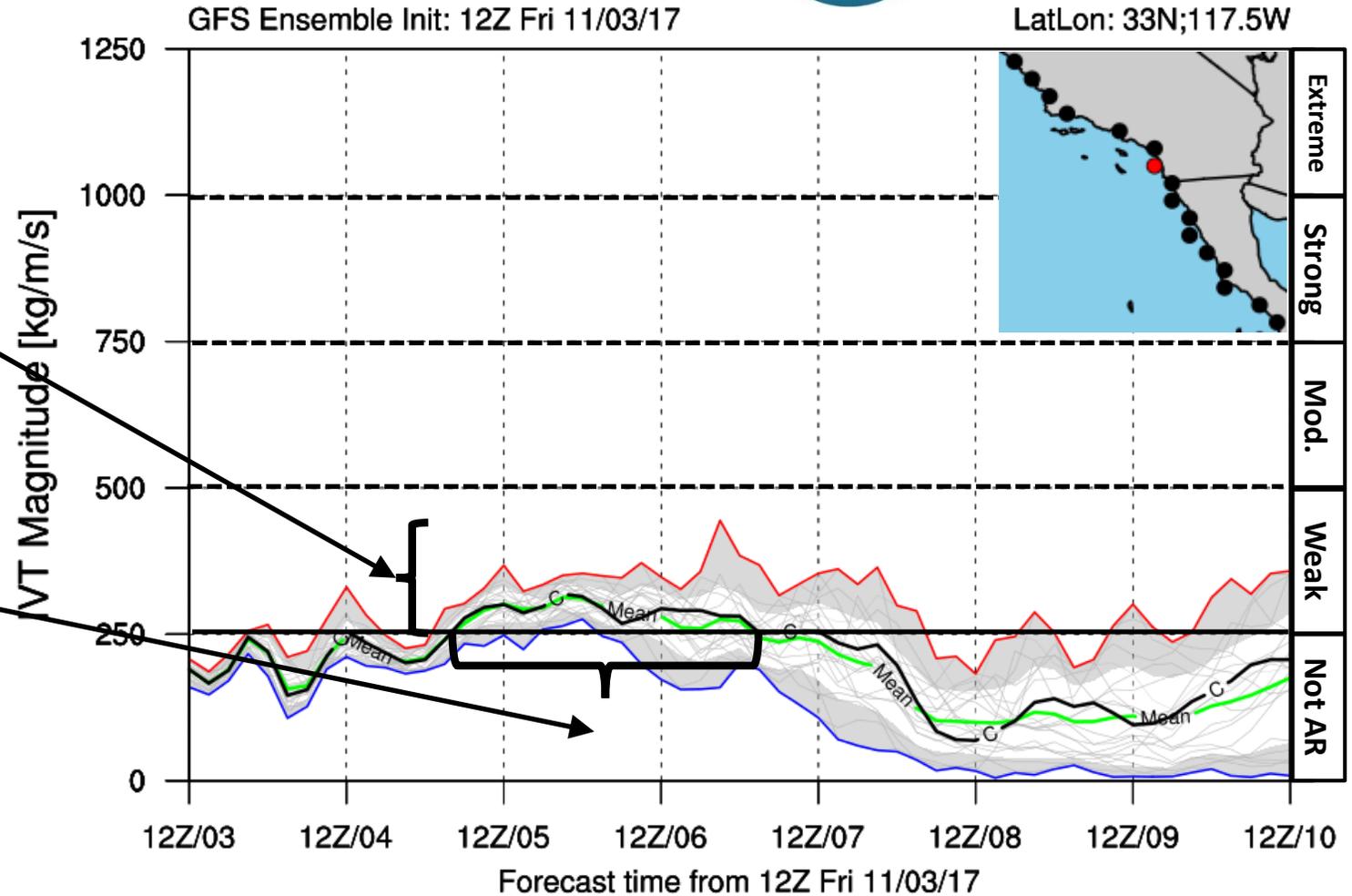
## Magnitude of Potential AR

- Maximum possible IVT  $\sim 430 \text{ kg m}^{-1} \text{ s}^{-1}$
- Mean IVT  $\sim 300 \text{ kg m}^{-1} \text{ s}^{-1}$
- Minimum possible IVT  $\sim 260 \text{ kg m}^{-1} \text{ s}^{-1}$

## Duration of AR conditions

- Weak:  $\sim 36 \text{ hours } \pm 6 \text{ h}$
- Moderate: Unlikely

Based on geometric characteristics of IVT and IWV this event is not considered an AR, but AR conditions are predicted over southern CA



# AR Outlook: 3 November 2017

For California DWR's AR Program



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There is large uncertainty in the GEFS of the onset, magnitude, and end time of the AR over CA during 8–10 Nov

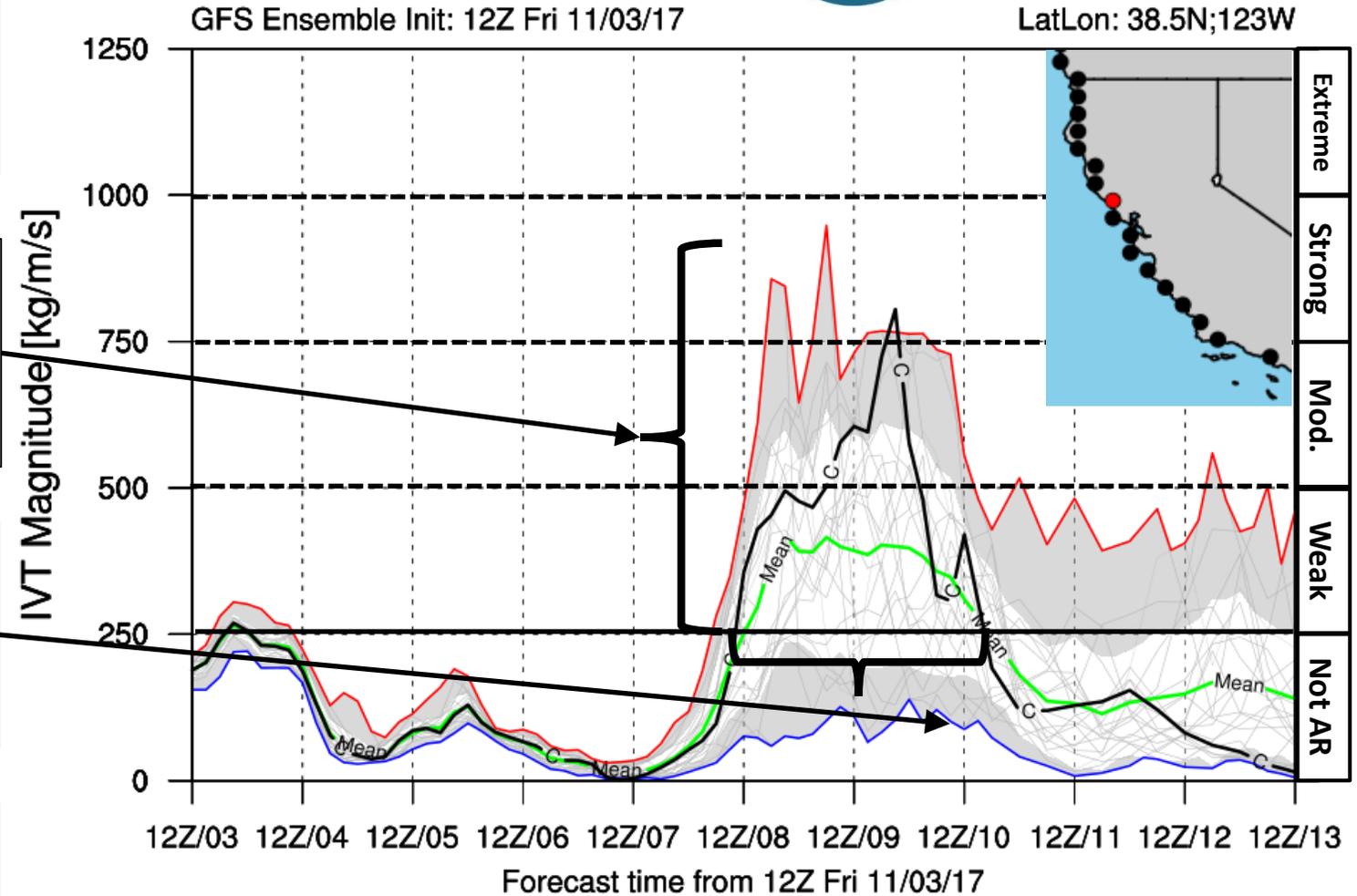
## Magnitude of Potential AR

- Maximum possible IVT  $\sim 900 \text{ kg m}^{-1} \text{ s}^{-1}$
- Mean IVT  $\sim 400 \text{ kg m}^{-1} \text{ s}^{-1}$
- Minimum possible IVT  $\sim 150 \text{ kg m}^{-1} \text{ s}^{-1}$

## Duration of AR conditions

- Weak:  $\sim 48 \text{ hours} \pm 12 \text{ h}$
- Moderate:  $\sim 18 \text{ hours} \pm 12 \text{ h}$
- Strong:  $\sim 6 \text{ hours} \pm 6 \text{ h}$

Due to large uncertainties in the forecast at this time it is difficult to determine timing and strength of the AR, but several members are suggesting this could be a strong AR over northern CA



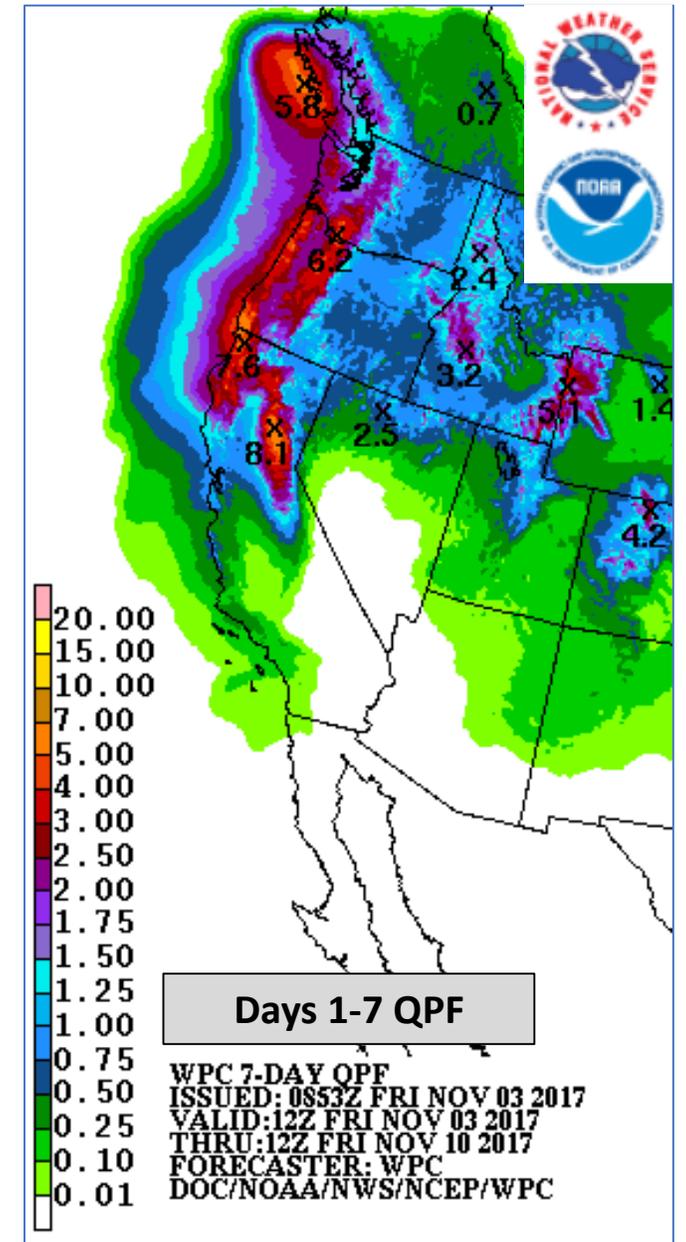
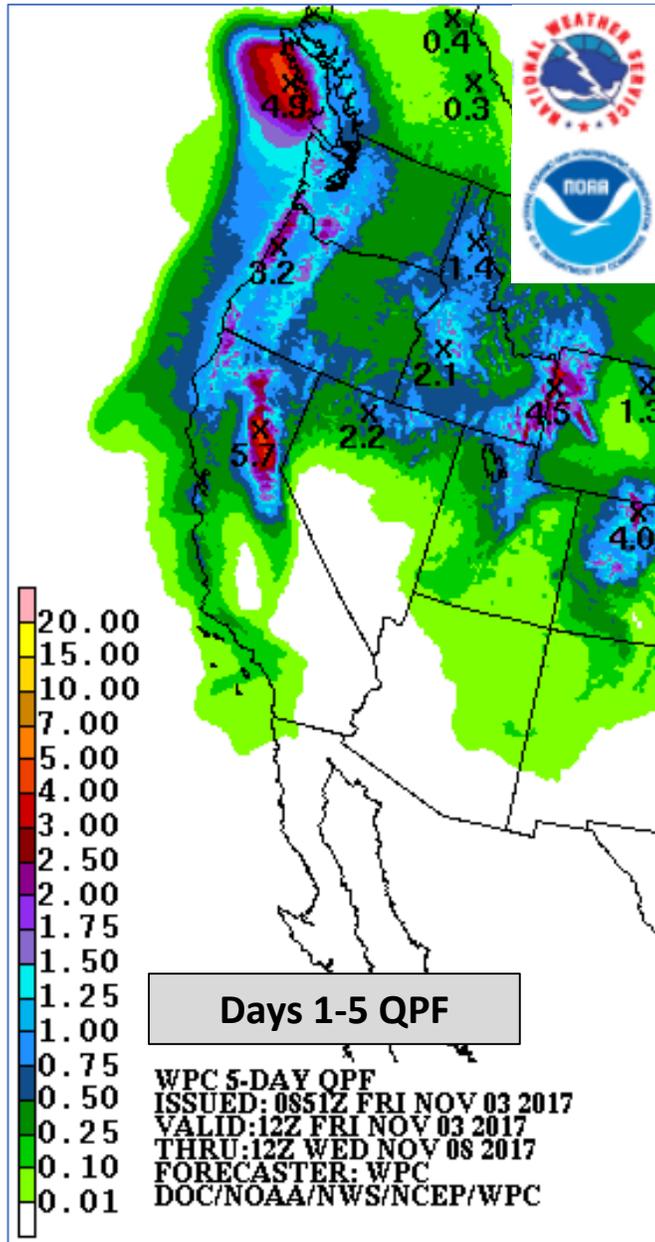
## Weather Prediction Center QPF

The elevated moisture transport over central and southern CA over the next five days could produce up to 5 inches of precipitation over the Sierra Nevada and up to 0.25 inches over coastal southern and central CA.

Precipitation over the Sierra Nevada is expected in forecast days 1-2 while central and southern CA is expected to see precipitation in days 4-5.

The AR during 8–10 Nov 2017 is expected to bring an additional 2.5 inches of precipitation to the Sierra Nevada in days 6-7.

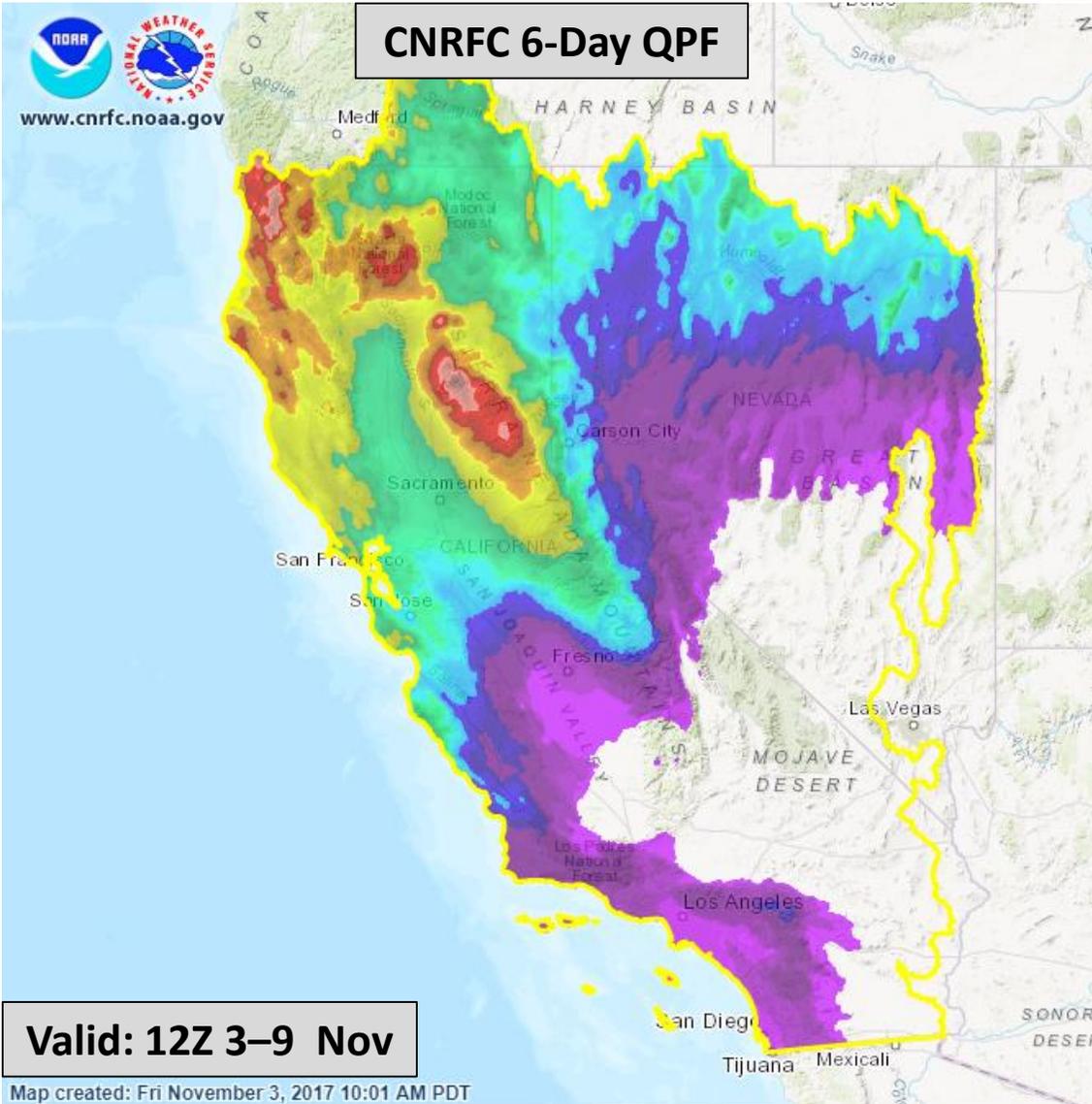
This AR could also produce up to 5 inches of precipitation along the coastal ranges of northern CA, OR, and WA and the Cascade Mountains in OR and WA



# AR Outlook: 31 October 2017

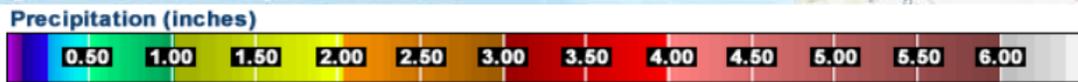


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**Valid: 12Z 3-9 Nov**

Map created: Fri November 3, 2017 10:01 AM PDT



**CNRFC quantitative precipitation forecast is predicting up to 6 inches of precipitation over the Sierra Nevada over the next six days.**

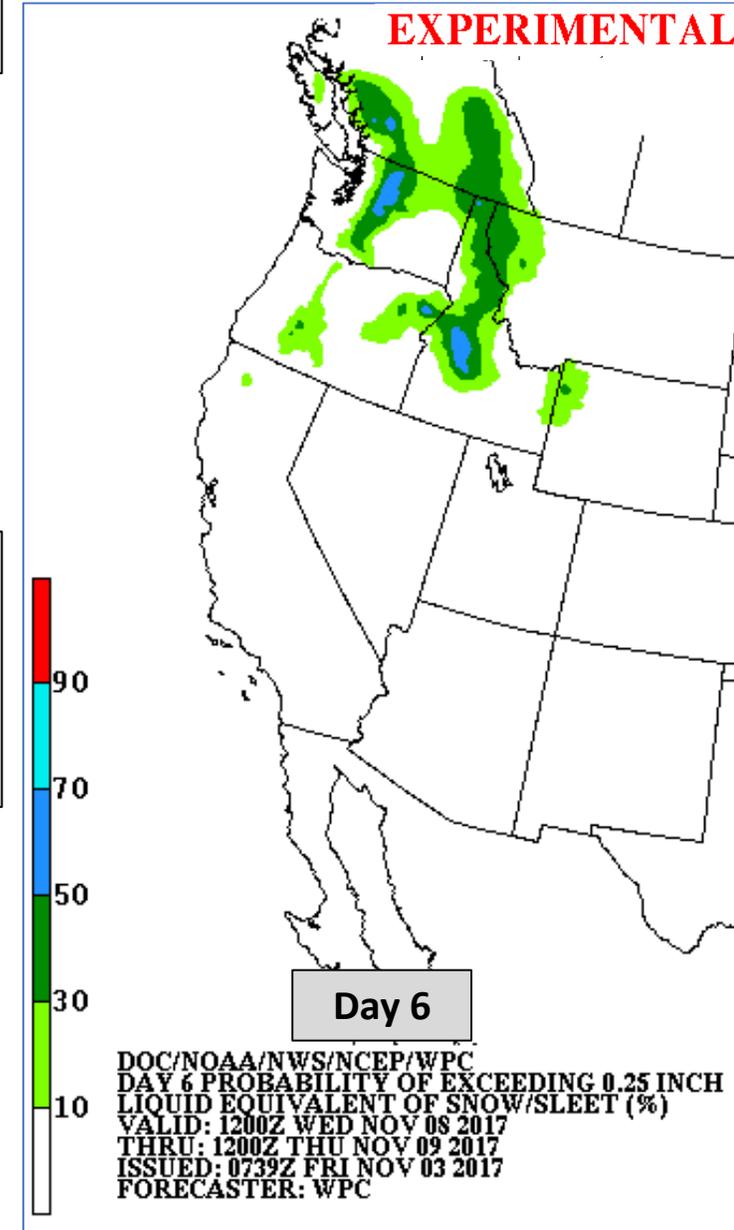
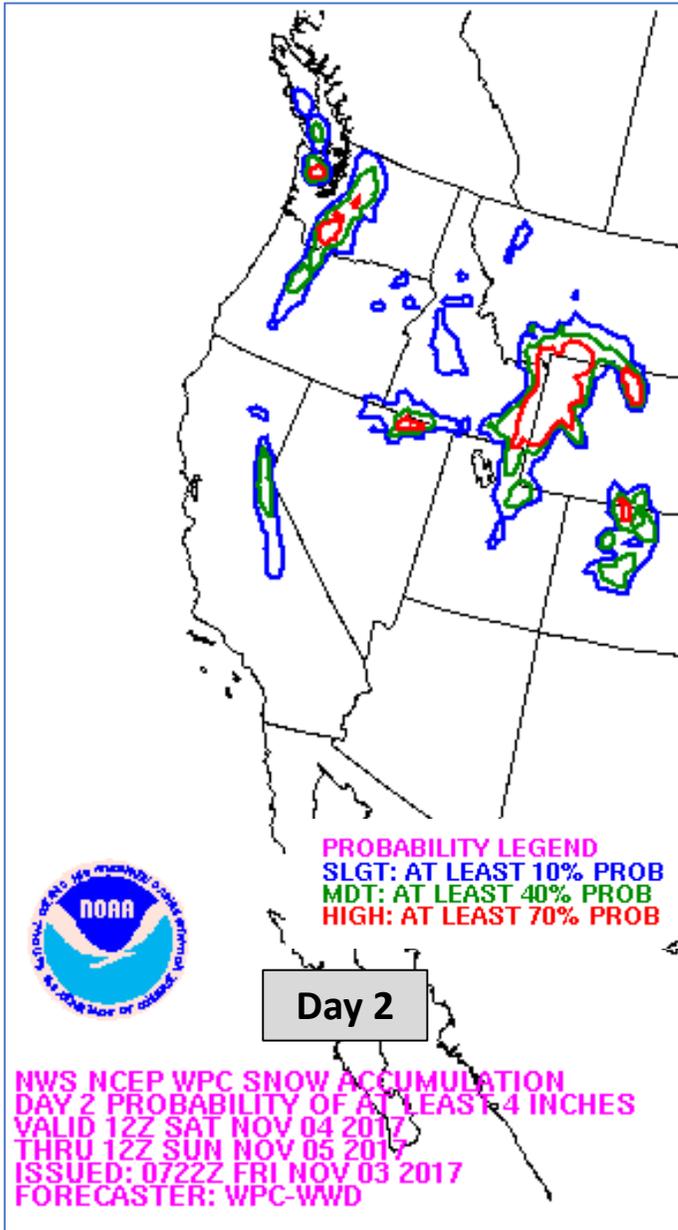
**The coastal ranges in NW CA could also receive up to 5 inches of precipitation.**

**Southern CA is expected to receive less than 0.1 inches**

## Weather Prediction Center Snow Probability

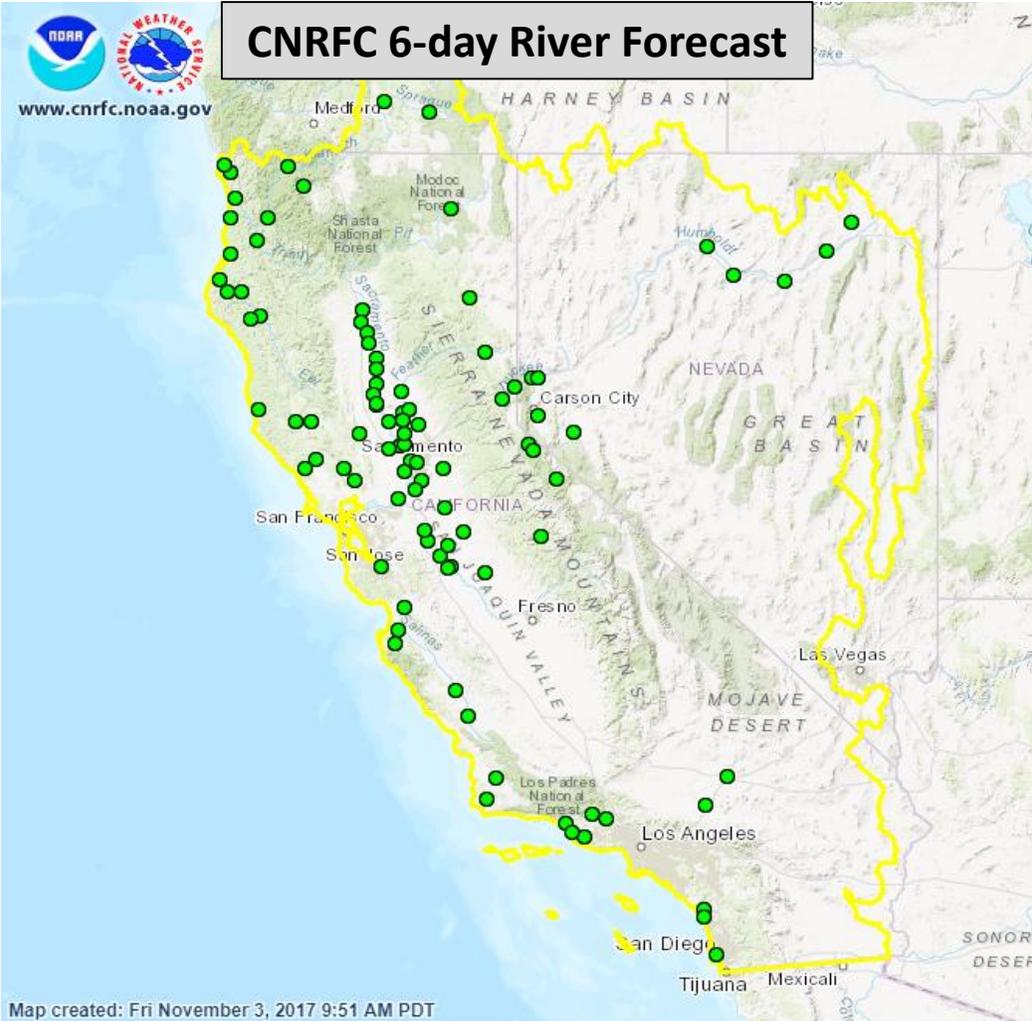
The precipitation over the next two days over the Sierra Nevada could bring the first snowfall of the season to the region

The AR during 8–10 Nov is expected to be a warmer system with higher snow levels which will result in rainfall over CA, but snow is expected over the highest peaks in the 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 precipitation amounts are not expected to be extremely high during these events.

As a result no rivers in the western U.S. are expected to come near flood stage.

CNRFC forecast is only for 6 days and precipitation is expected in days 7-9 so this forecast does not take that precipitation into account. Check back closer to the event for more forecasts.



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

### NWRFC 10-day River Forecast

