

# CW3E Atmospheric River Outlook

For California DWR's AR Program

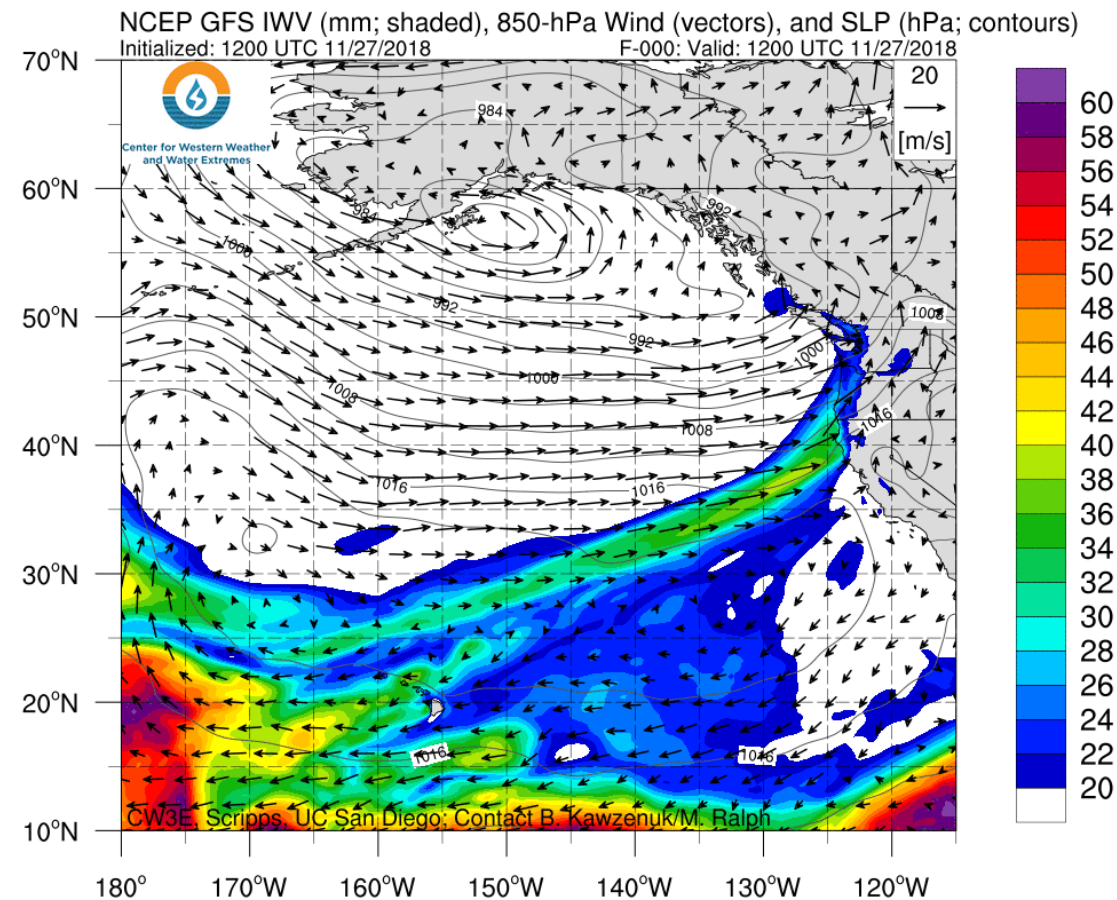
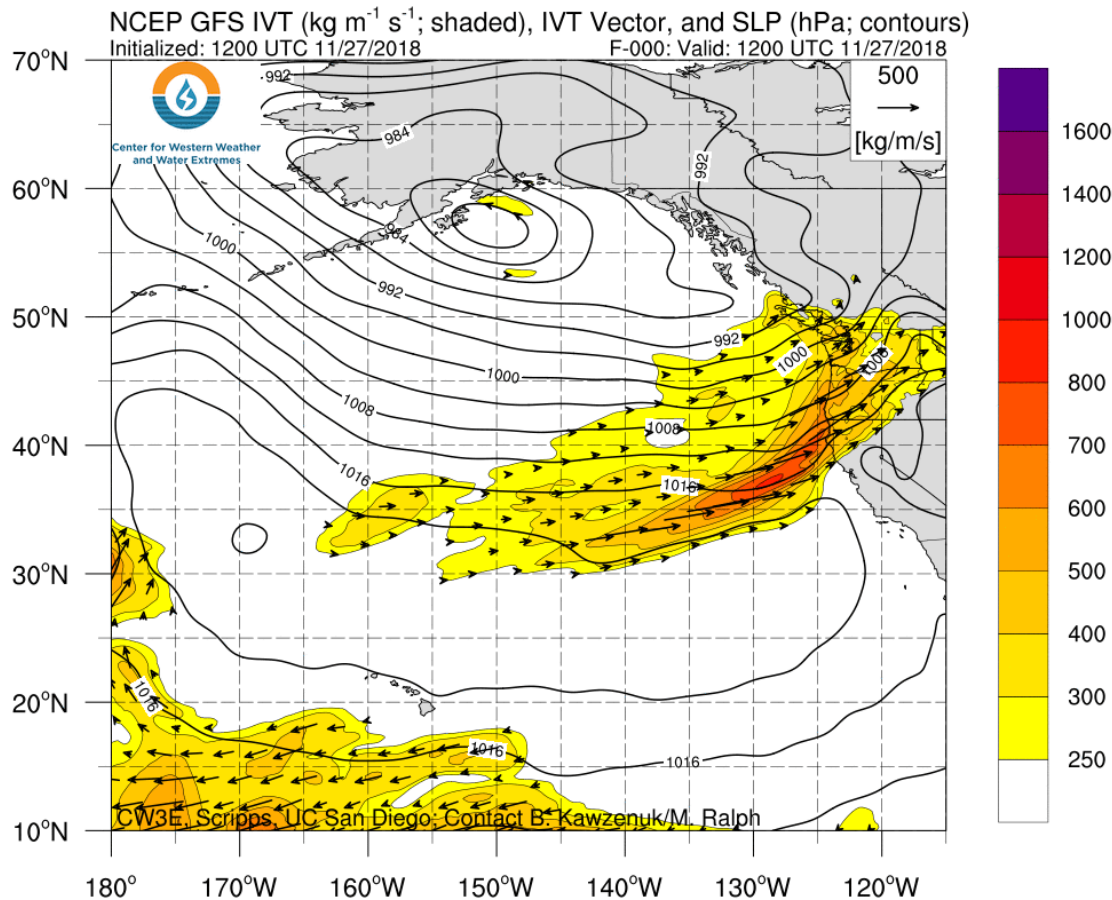


Center for Western Weather and Water Extremes

SCRIPPS INSTITUTION OF OCEANOGRAPHY AT UC SAN DIEGO

## Update on ARs Forecast to Impact SoCal Later This Week and Over the Weekend

- An AR that is currently impacting Northern California is forecast to propagate southward and bring AR conditions to SoCal
- A secondary low is forecast to develop along the cold front of the current AR and propagate eastward over CA
- The development of this secondary low is forecast to extend AR conditions over SoCal and bring additional precipitation
- Additional AR activity is also forecast over SoCal for the weekend, which could lead to more precipitation
- NOAA CNRFC is currently forecasting as 3+ inches of precipitation over the mountains of SoCal for the next 6 days



# AR Outlook: 27 November 2018

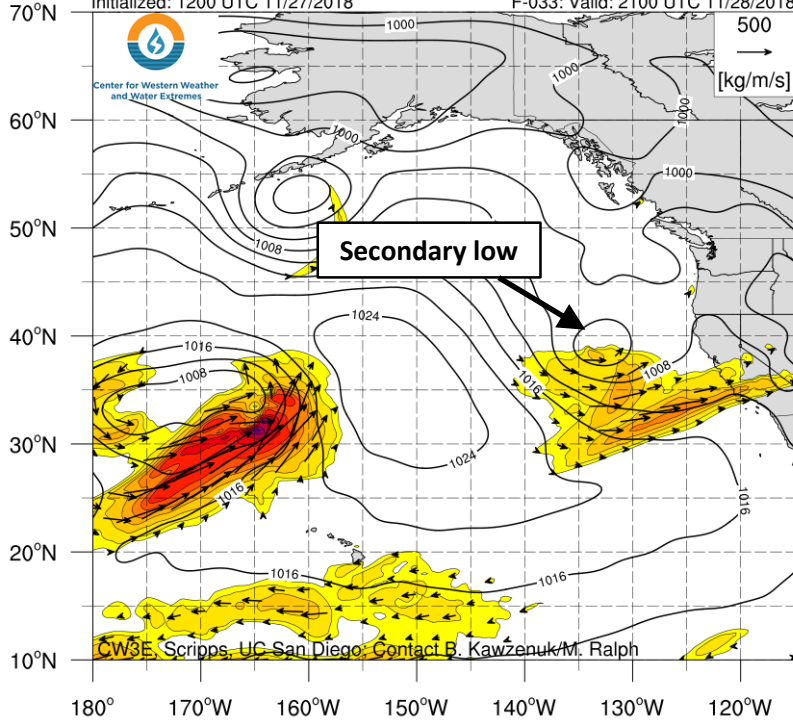
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Forecast Valid: 1 PM PST 28 Nov

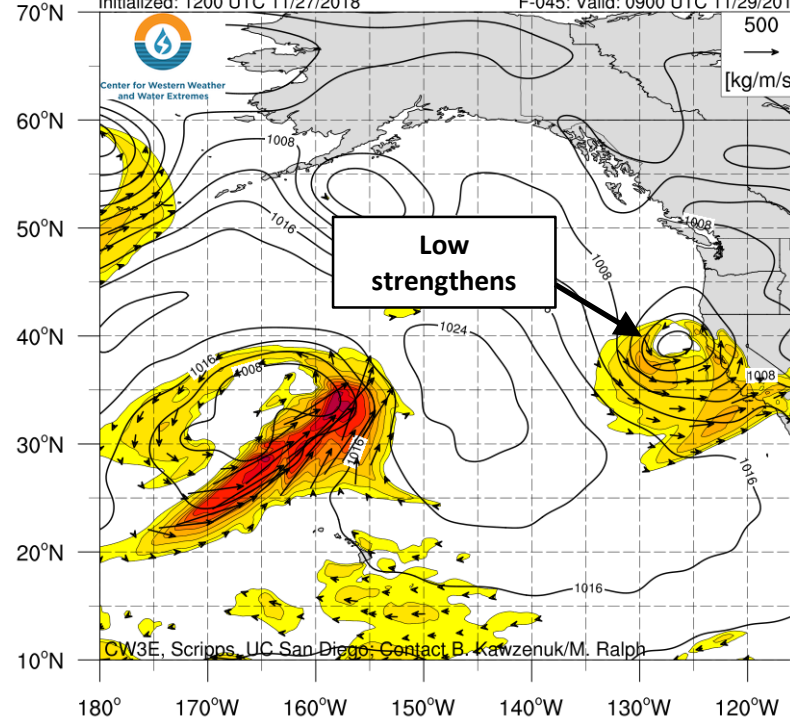
NCEP GFS IVT ( $\text{kg m}^{-1} \text{s}^{-1}$ ; shaded), IVT Vector, and SLP (hPa; contours)  
Initialized: 1200 UTC 11/27/2018 F-033: Valid: 2100 UTC 11/28/2018



A Secondary low is forecast to develop over the Northeastern Pacific to the northwest of the current AR as it is over Southern California

Forecast Valid: 1 AM PST 29 Nov

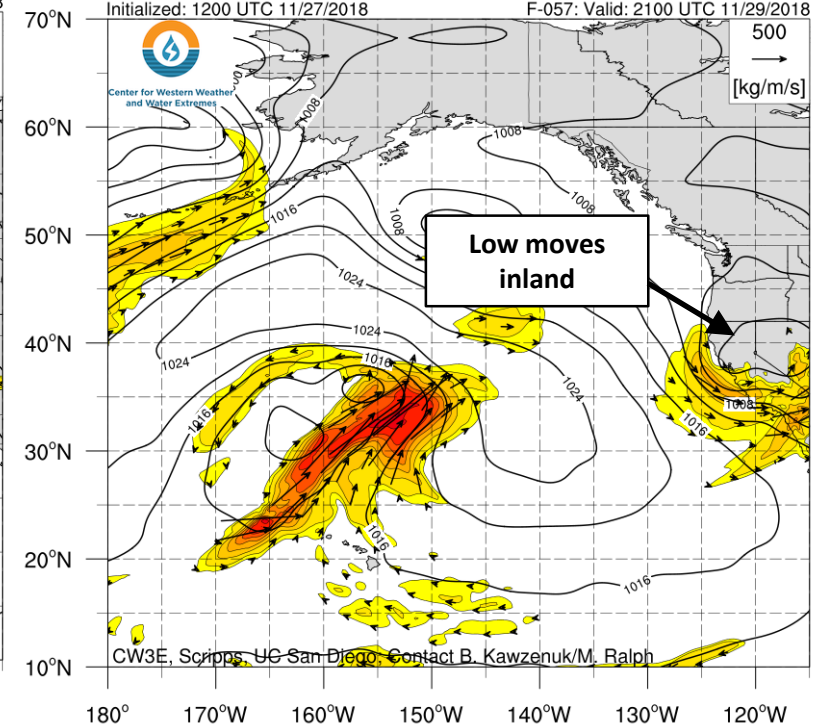
NCEP GFS IVT ( $\text{kg m}^{-1} \text{s}^{-1}$ ; shaded), IVT Vector, and SLP (hPa; contours)  
Initialized: 1200 UTC 11/27/2018 F-045: Valid: 0900 UTC 11/29/2018



The low is forecast to strengthen and propagate eastward over the Northern California coastline by 1 AM PST on 29 Nov.

Forecast Valid: 1 PM PST 29 Nov

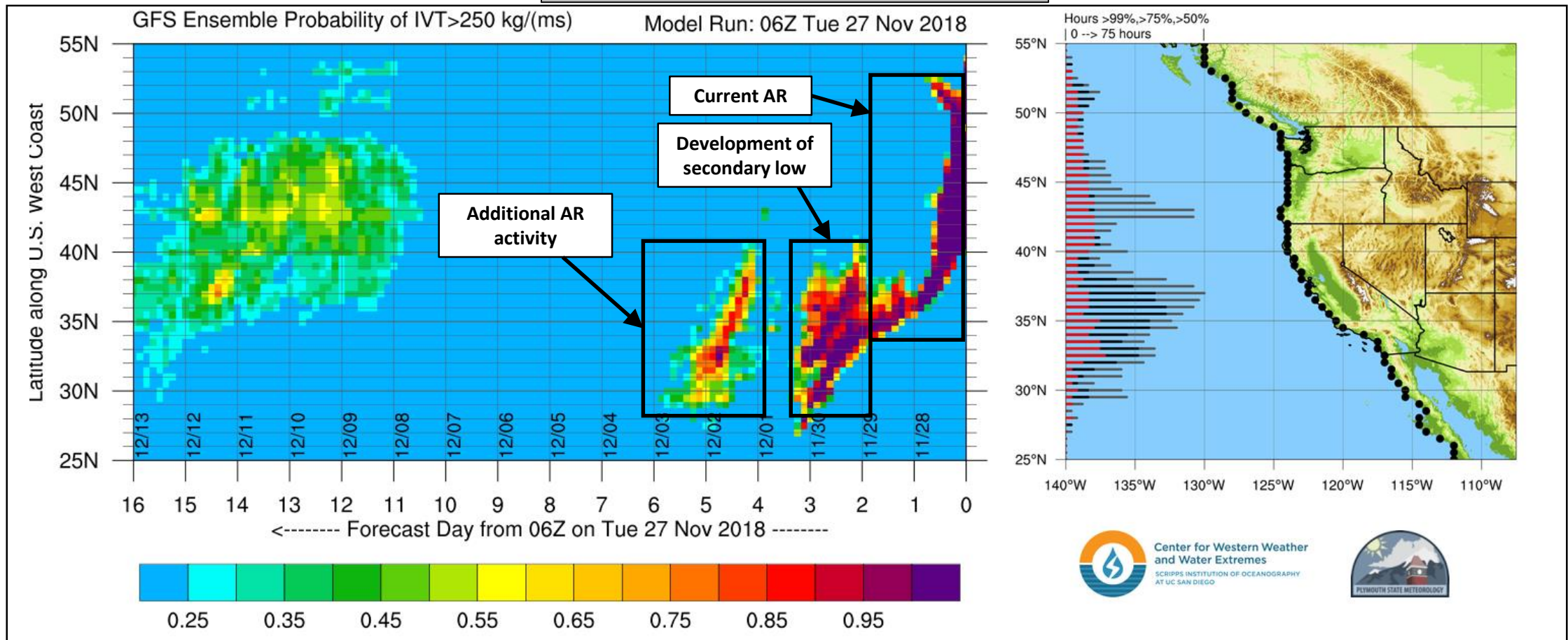
NCEP GFS IVT ( $\text{kg m}^{-1} \text{s}^{-1}$ ; shaded), IVT Vector, and SLP (hPa; contours)  
Initialized: 1200 UTC 11/27/2018 F-057: Valid: 2100 UTC 11/29/2018



The low continues to propagate inland, extending the duration of AR conditions along the coast of California



## Odds of AR Conditions Along Coast

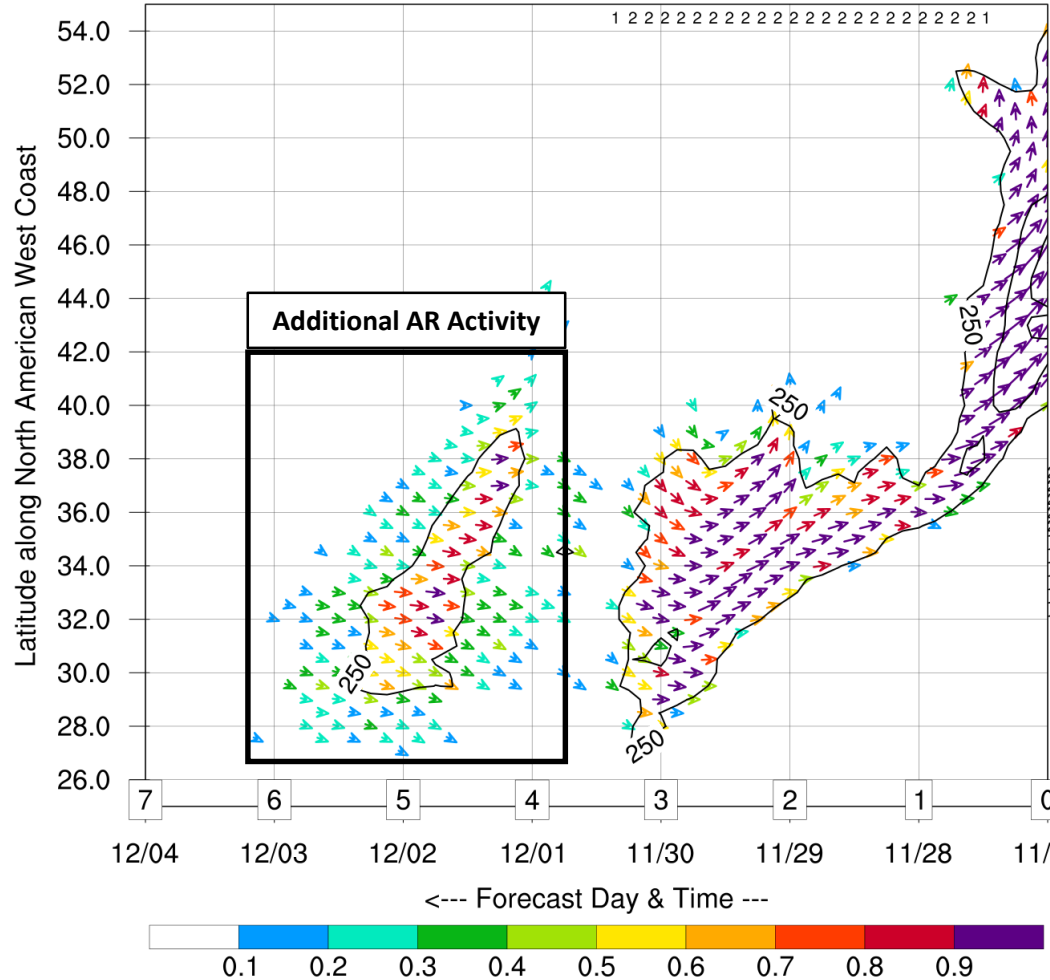


- The AR that is currently impacting the Pacific Northwest is forecast to propagate over the U.S. West Coast bringing AR conditions to the Bay Area today and Southern California on Thursday
- As the AR is impacting SoCal, a secondary low is forecast to develop along the cold front, resulting in extended duration of AR conditions over SoCal
- This secondary low is also forecast to propagate inland over CA, bringing additional precipitation and high winds to the mountains.

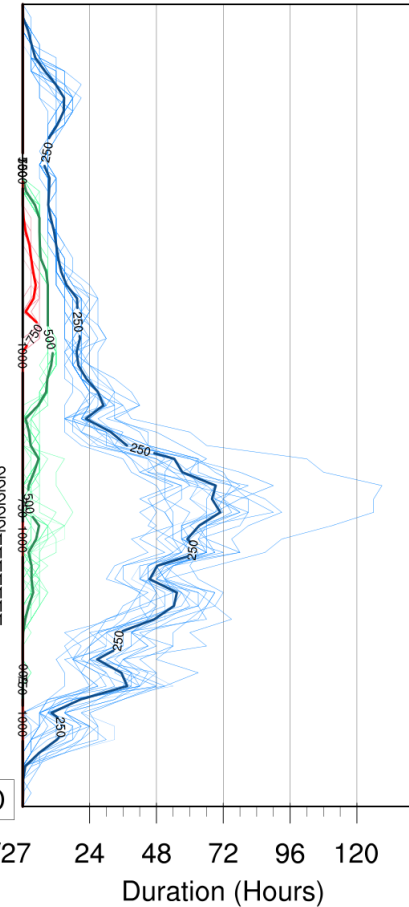


## AR Landfall Tool: 06Z Tue 27 Nov 2018

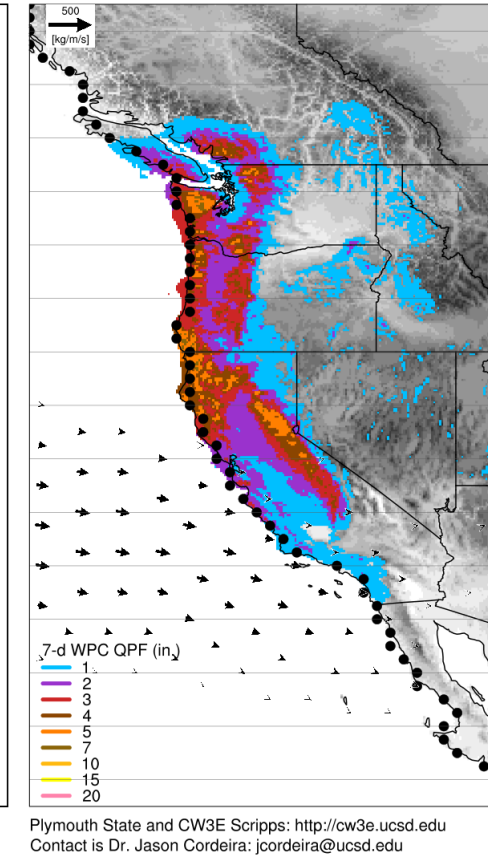
a. 7-d GFS Ens. Mean IVT Colored by Ens. Fraction >250 kg/m/s



b. Hours >250,500,750,1000



c. Time Mean IVT, Terrain, QPF



- The IVT associated with the AR activity between 01 and 03 December is currently forecast to have a west/northwesterly orientation, which will likely result in different impacts compared to the southwesterly AR that is forecast to impact SoCal tomorrow and Thurs.

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The GEFS suggests moderate AR conditions over San Diego County on Thursday and weak to moderate AR conditions on Sunday.

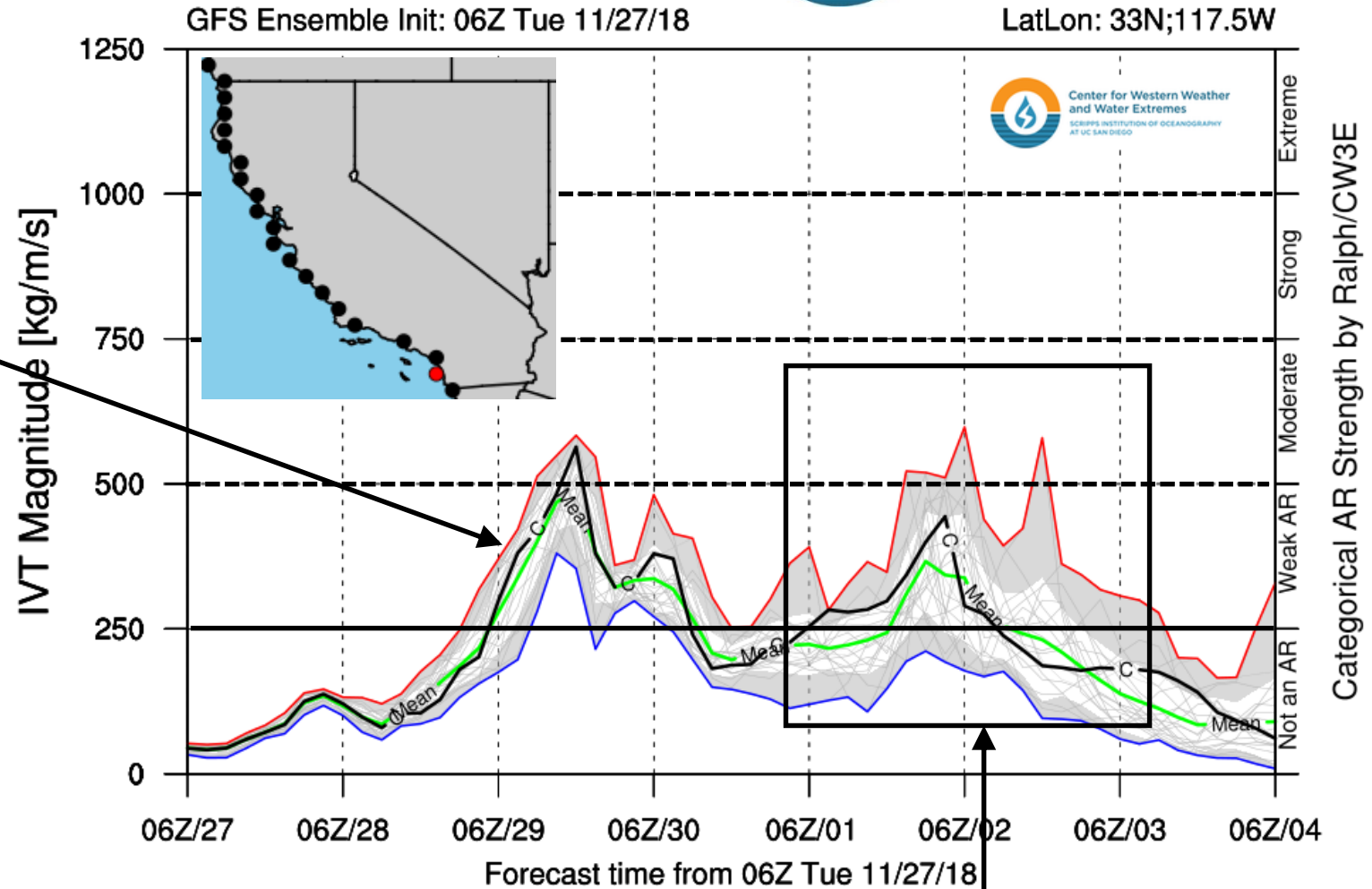
## Magnitude of potential AR 1 (21 November)

- Maximum predicted IVT  $\sim 575 \text{ kg m}^{-1} \text{ s}^{-1}$
- Mean IVT  $\sim 500 \text{ kg m}^{-1} \text{ s}^{-1}$
- Minimum IVT  $\sim 400 \text{ kg m}^{-1} \text{ s}^{-1}$

## Forecast duration of AR conditions

- Weak 30 hours  $\pm$  12
- Moderate 6 hours  $\pm$  6

The AR conditions that are associated with the development of a secondary low are currently forecast to bring IVT magnitudes of  $\sim 400\text{--}500 \text{ kg m}^{-1} \text{ s}^{-1}$  but uncertainty is currently higher

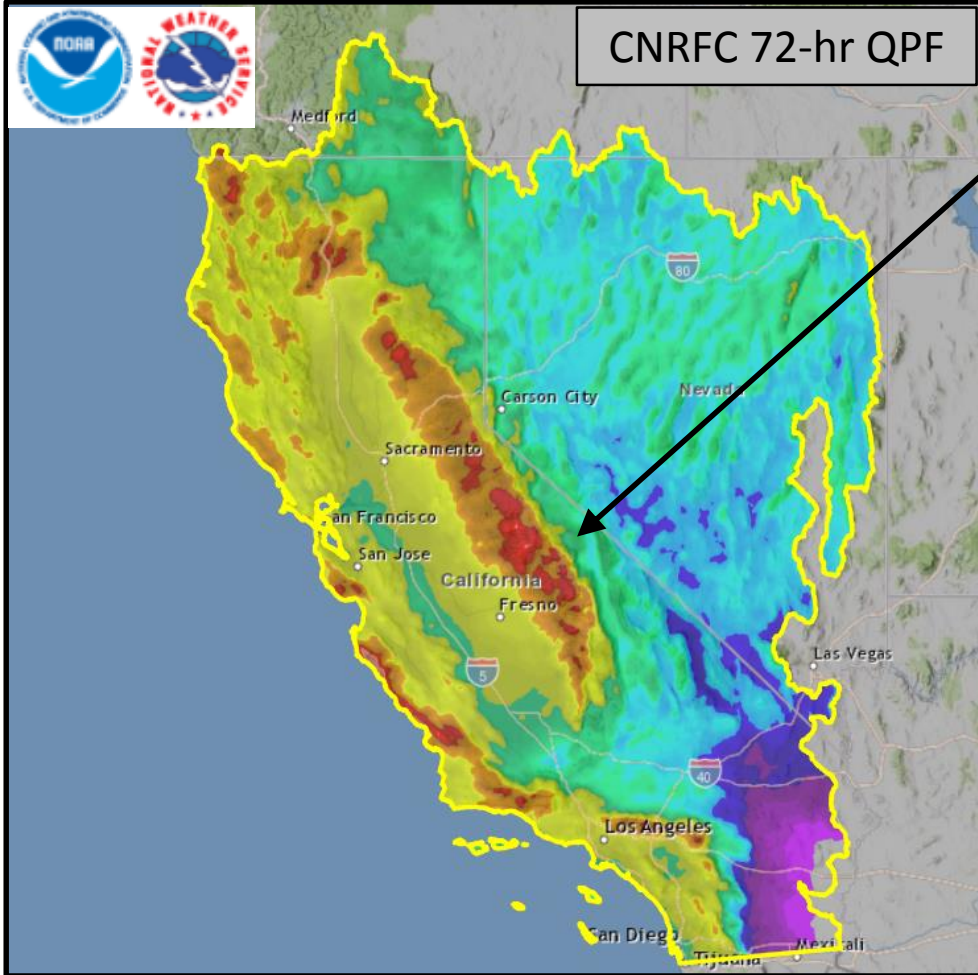


There is currently considerable uncertainty in the onset, magnitude and duration of AR conditions associated with the AR forecast to impact SoCal on Saturday 1 December

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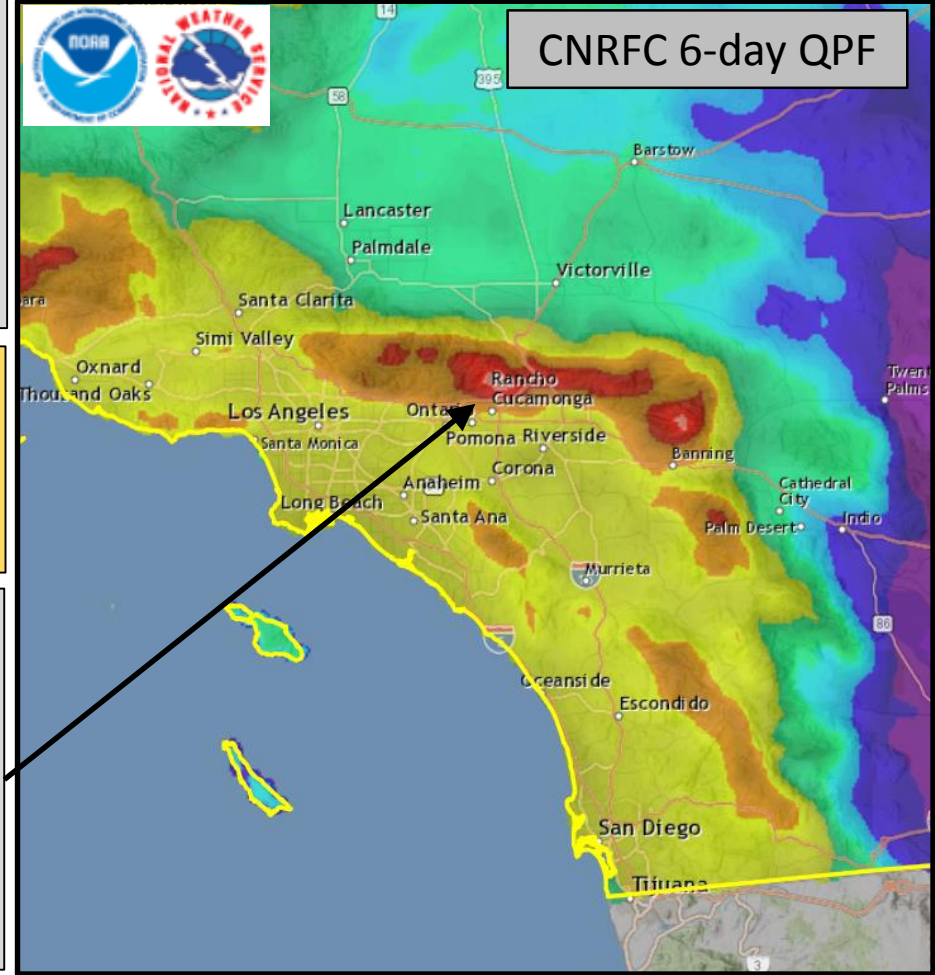
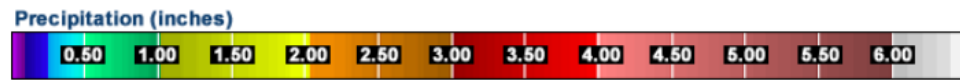


CNRFC 72-hr QPF

The CNRFC is currently forecasting 2+ inches of precipitation for the higher elevations across California over the next 72-hours ending 4 AM 30 November

NWS California Nevada River Forecast Center forecast products are located at [cnrfc.noaa.gov](http://cnrfc.noaa.gov)

The mountains of Southern California are forecast to receive 2.5 to 4.25 in. while lower elevations are forecast to receive 1–2.5 in. over the next 6-days ending 4 AM 03 December



CNRFC 6-day QPF

