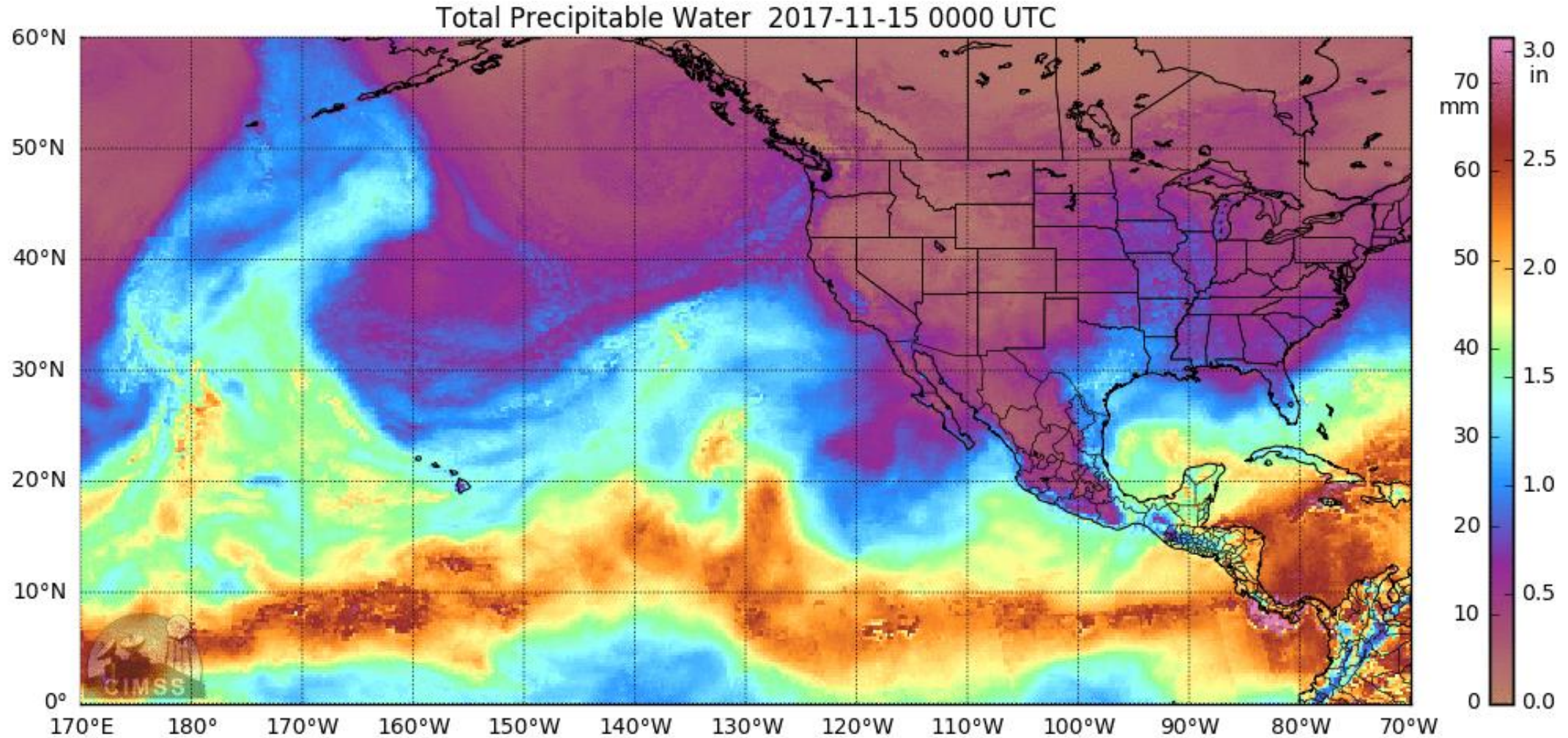


# CW3E Atmospheric River Post Event Summary



Center for Western Weather  
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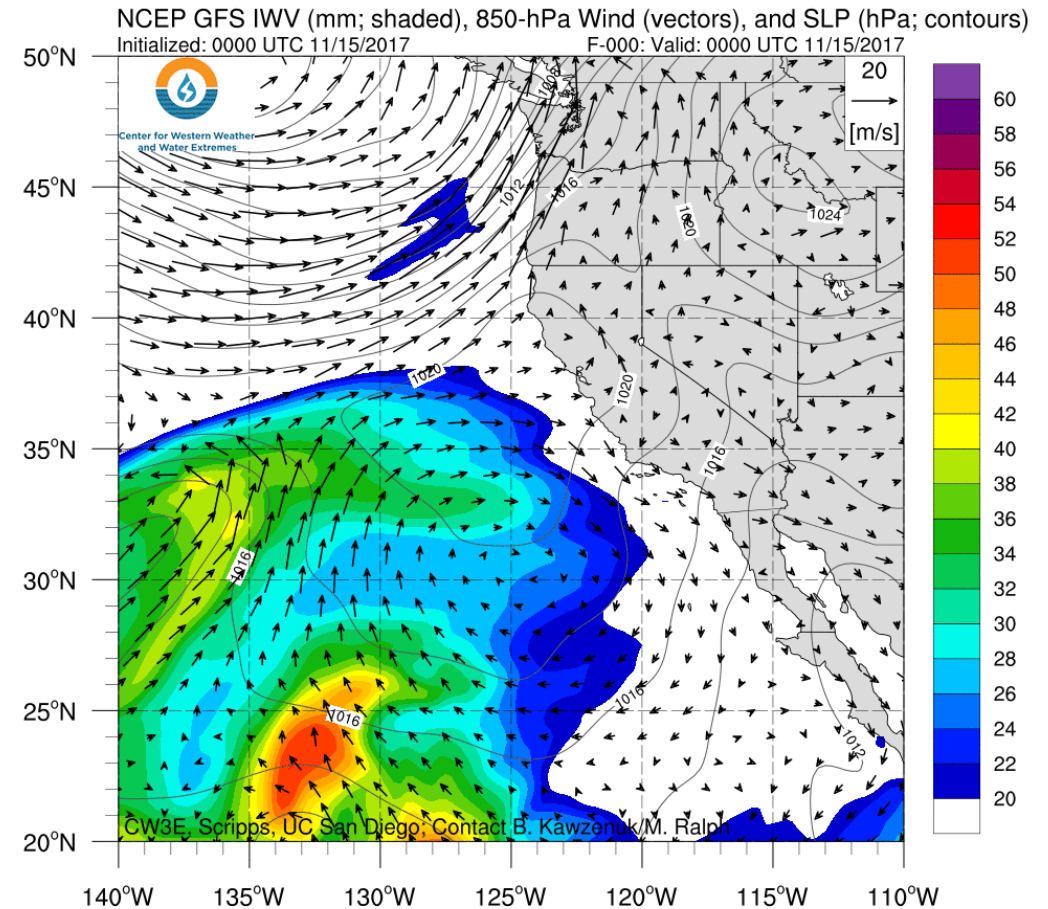
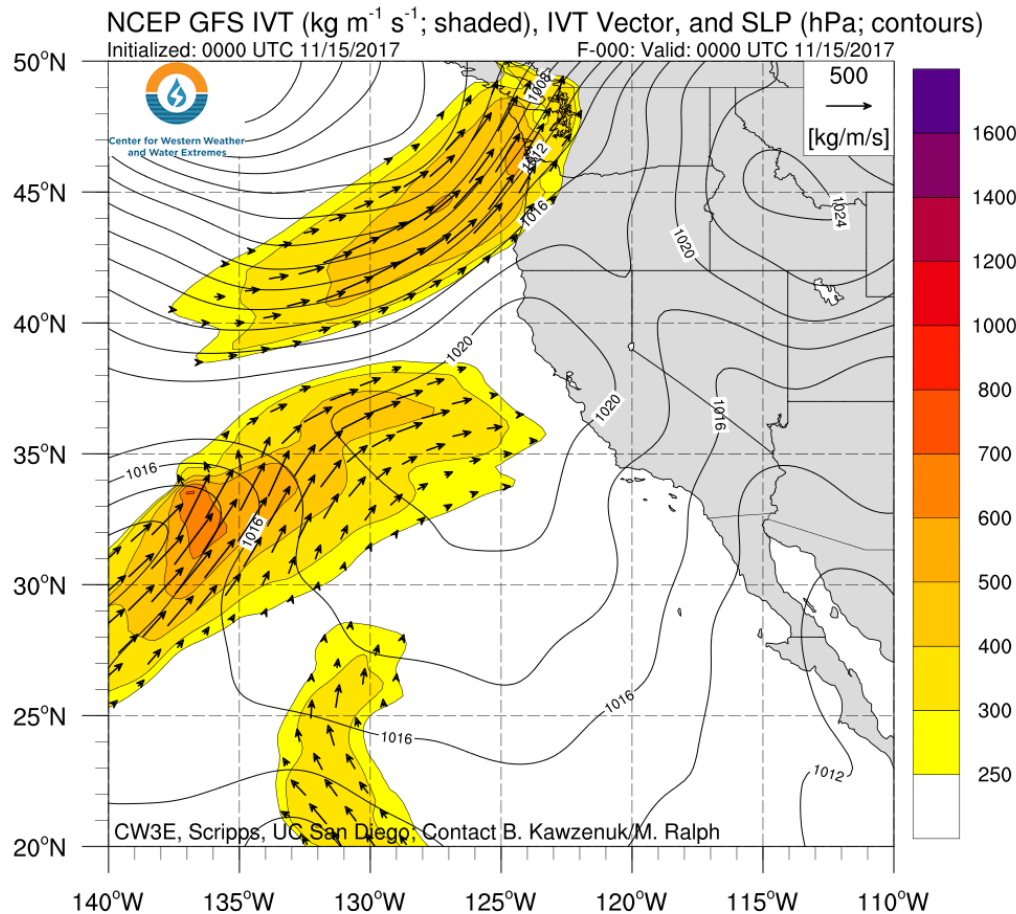
# CW3E Atmospheric River Post Event Summary



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## Strong AR recently made landfall over northern California

- The AR reached its strongest magnitude of  $\sim 750 \text{ kg m}^{-1} \text{ s}^{-1}$  at  $\sim 6 \text{ PM PST}$  over Northern California making this a strong AR
- IWV values within the AR ranged from 34–40 mm during the event
- The AR is currently over Southern California bringing precipitation to the Los Angeles area
- Another AR is forecast to impact the USWC in the next several days

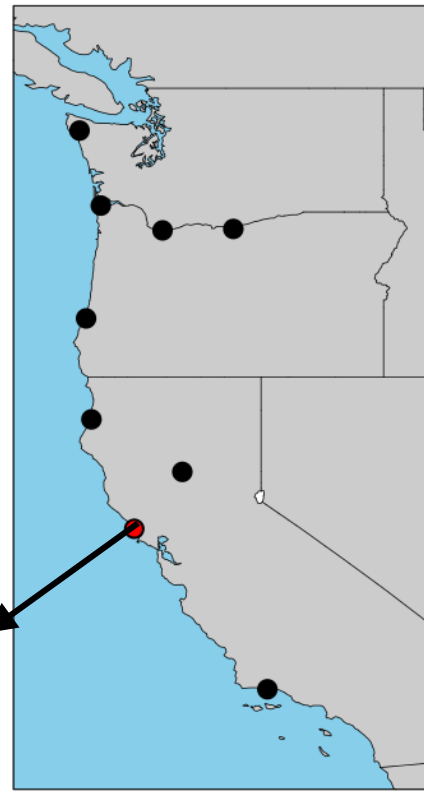
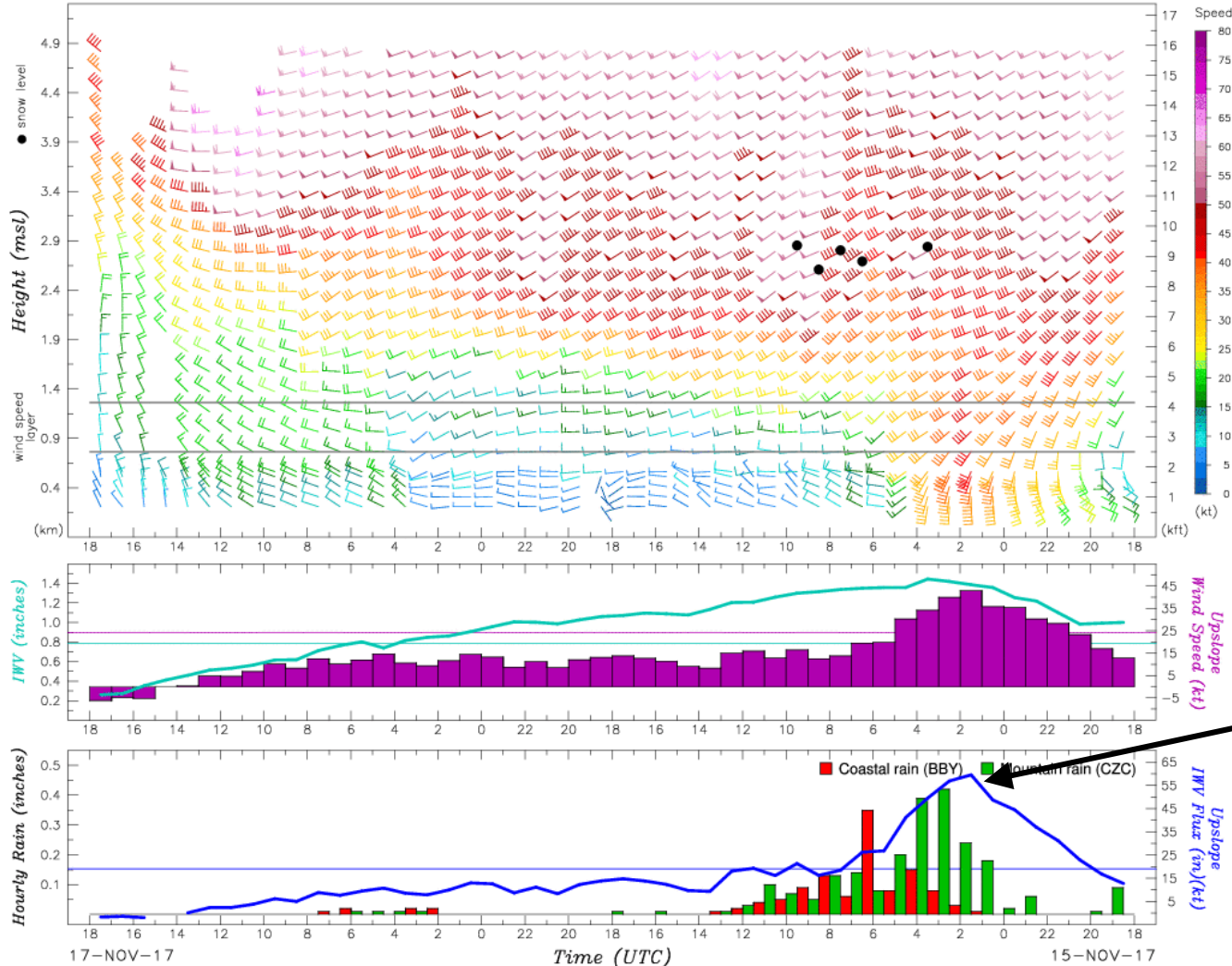


# AR Summary: 17 November 2017



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ESRL Physical Sciences Division  
Coastal Atmospheric River Monitoring and Early Warning System



Upslope IWV flux was strongest over Bodega Bay, CA at ~5 PM PST (1 AM UTC) on 15 Nov 2017 reaching magnitudes of ~60 (in)(kt)

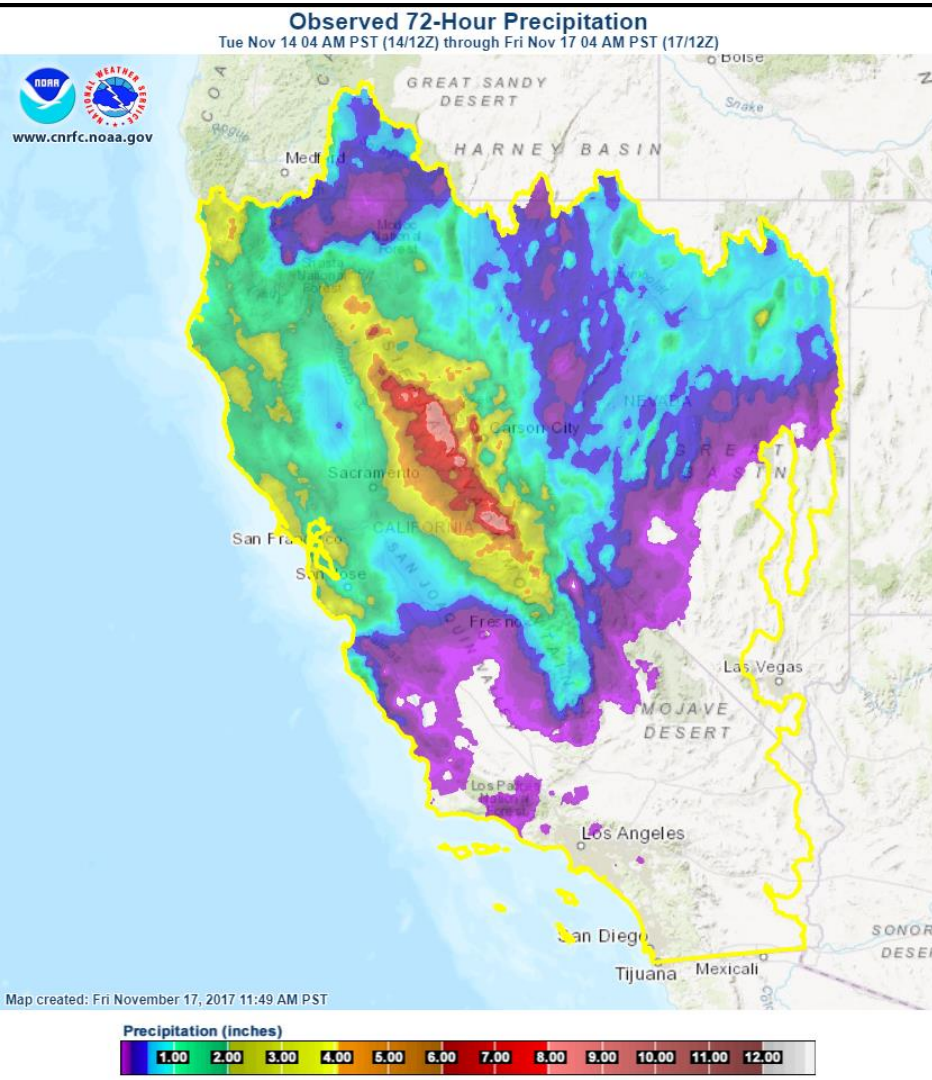
Winds in the controlling layer (2,500–4,000 ft) were ~40 knots (46 mph) during the period of peak upslope IWV

Cazadero, CA received ~2.28 in. and Bodega Bay, CA received 1.17 in. of rain in association with this event

Bodega Bay, CA (BBY)  
38.3191 N, 123.0728 W, 15 m  
Cazadero, CA (CZC)  
38.6107 N, 123.2152 W, 478 m

Upslope Direction = 230 deg  
BBY 48-hr precip: 1.17 in  
CZC 48-hr precip: 2.28 in

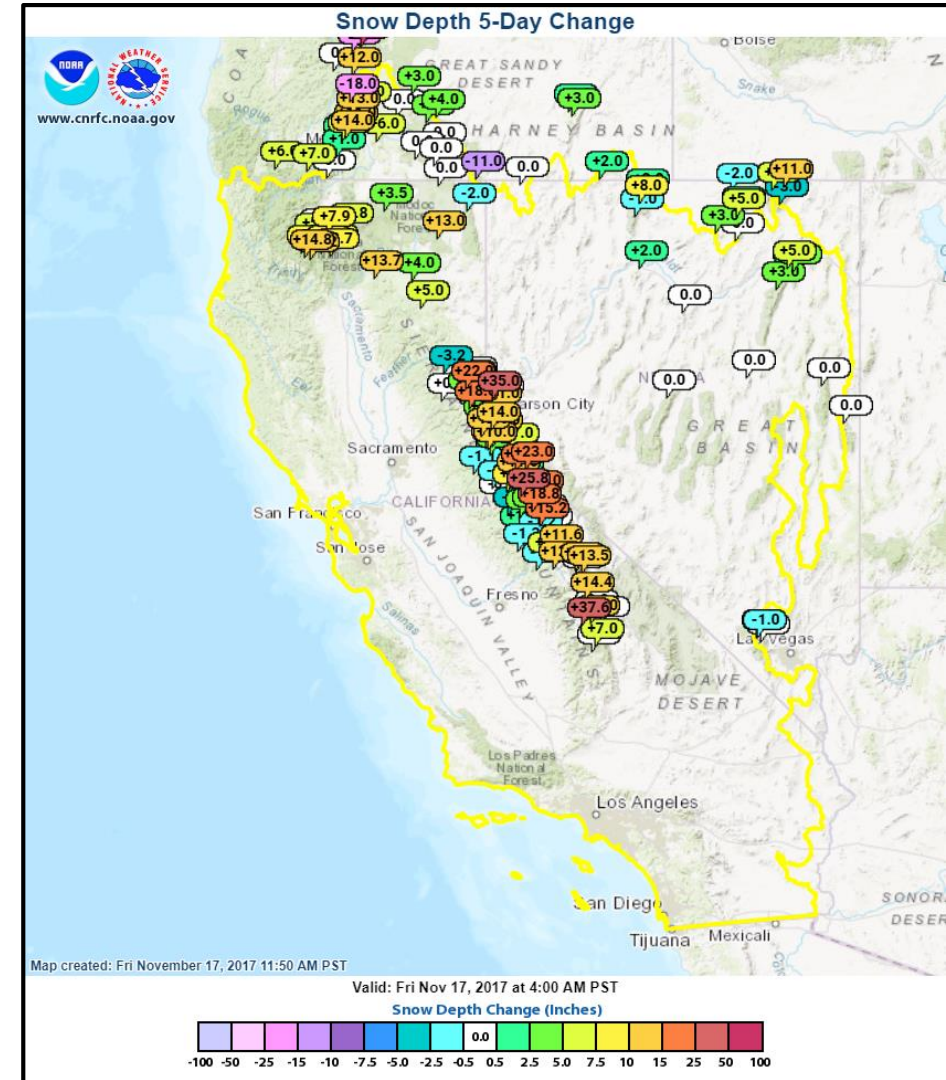
# AR Summary: 17 November 2017



Between 5 and 9.75 inches of precipitation has fallen over the higher elevations of the Sierra Nevada Mountains since 12 UTC on 14 Nov. 2017

Lower elevations have received .5 to 2.5 inches across Northern CA with lower accumulations across Southern CA

A majority of the precipitation fell as snow over the higher elevations of the Sierra Nevada with some locations receiving >1.5 feet of accumulation



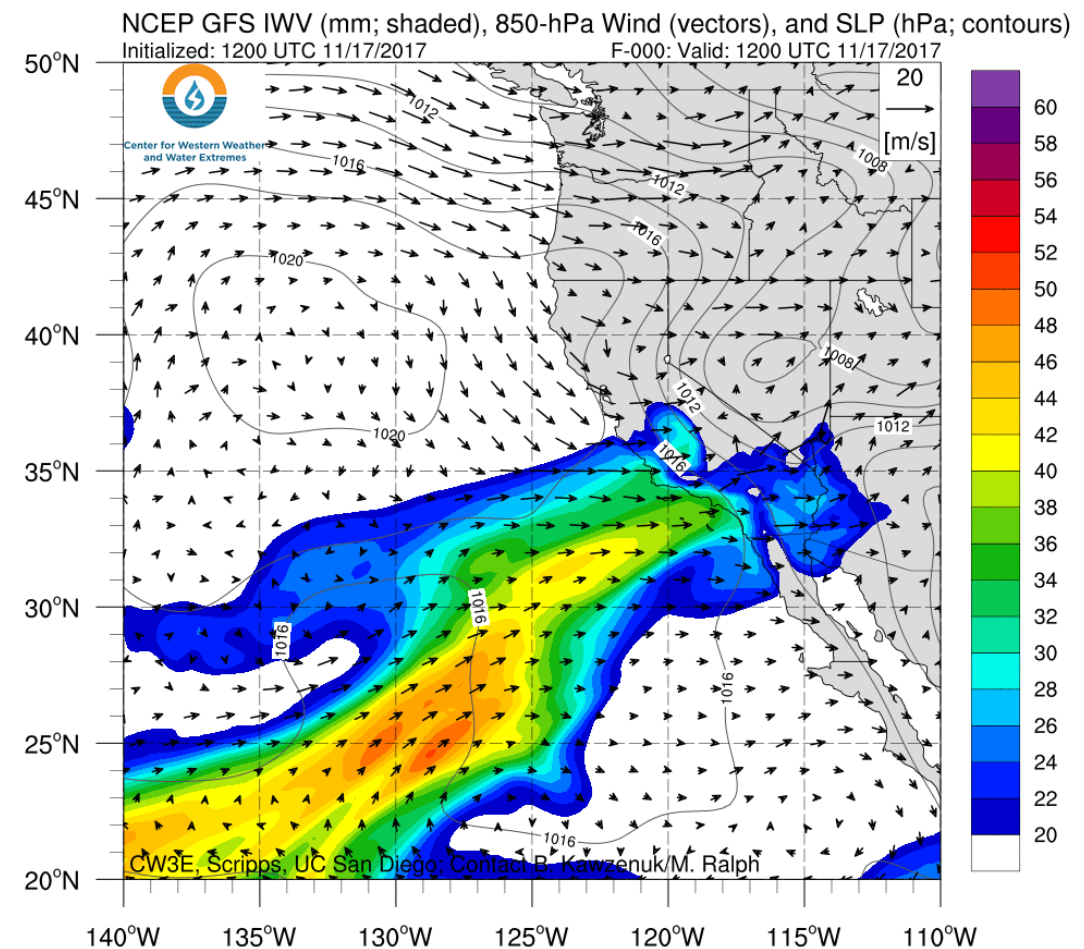
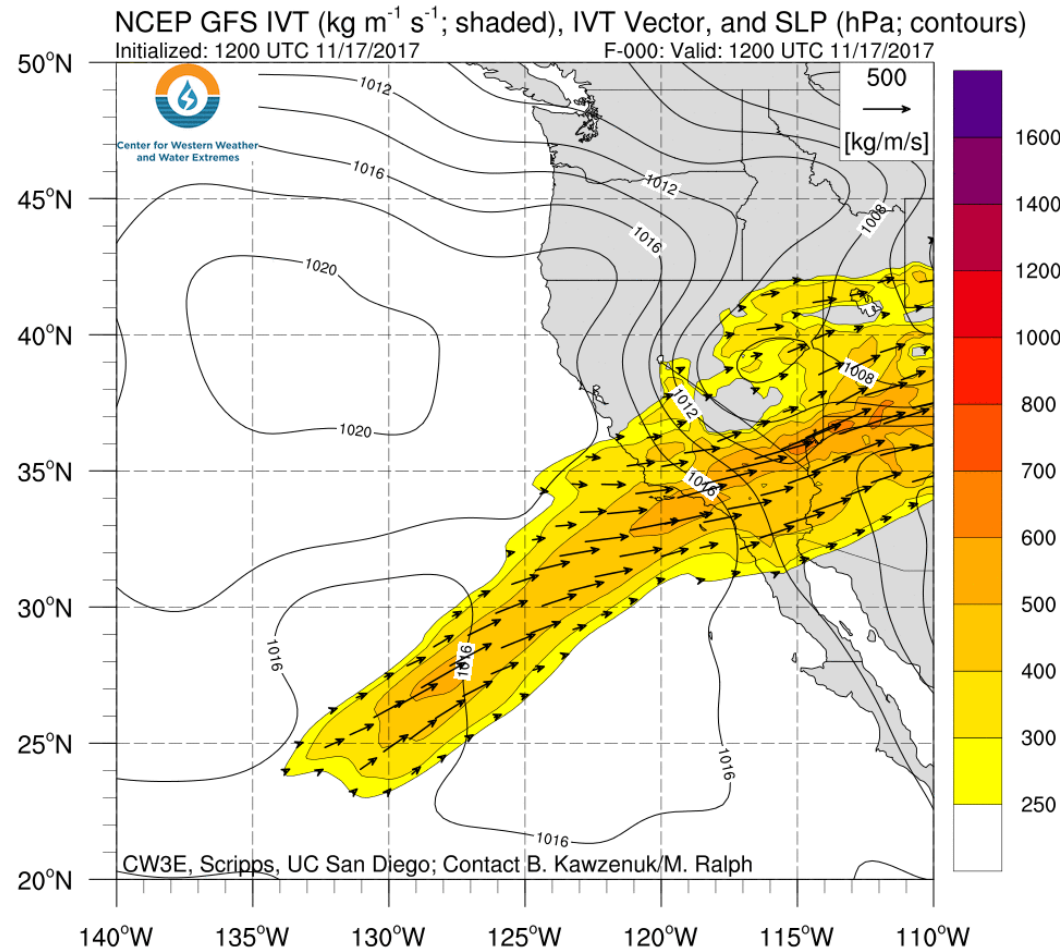
# CW3E Atmospheric River Update – Outlook



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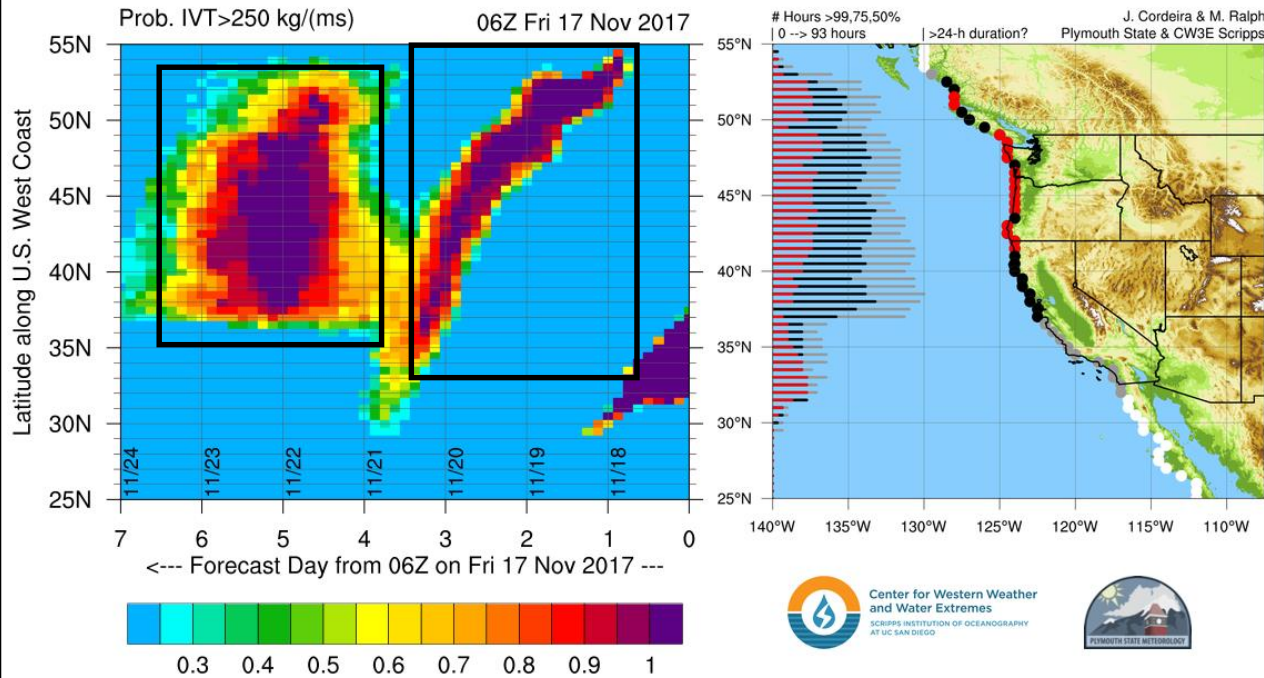
## A potentially extreme AR is forecasted to make landfall over the U.S. West Coast next

- The current AR impacting Southern California is forecast to end by later tonight
- Multiple systems are forecast to bring potentially strong to extreme and prolonged AR conditions to the USWC
- As much as 19 inches of precipitation could fall over the Olympic Mountains over the next week
- Multiple rivers in Washington are currently forecast to rise above flood stage

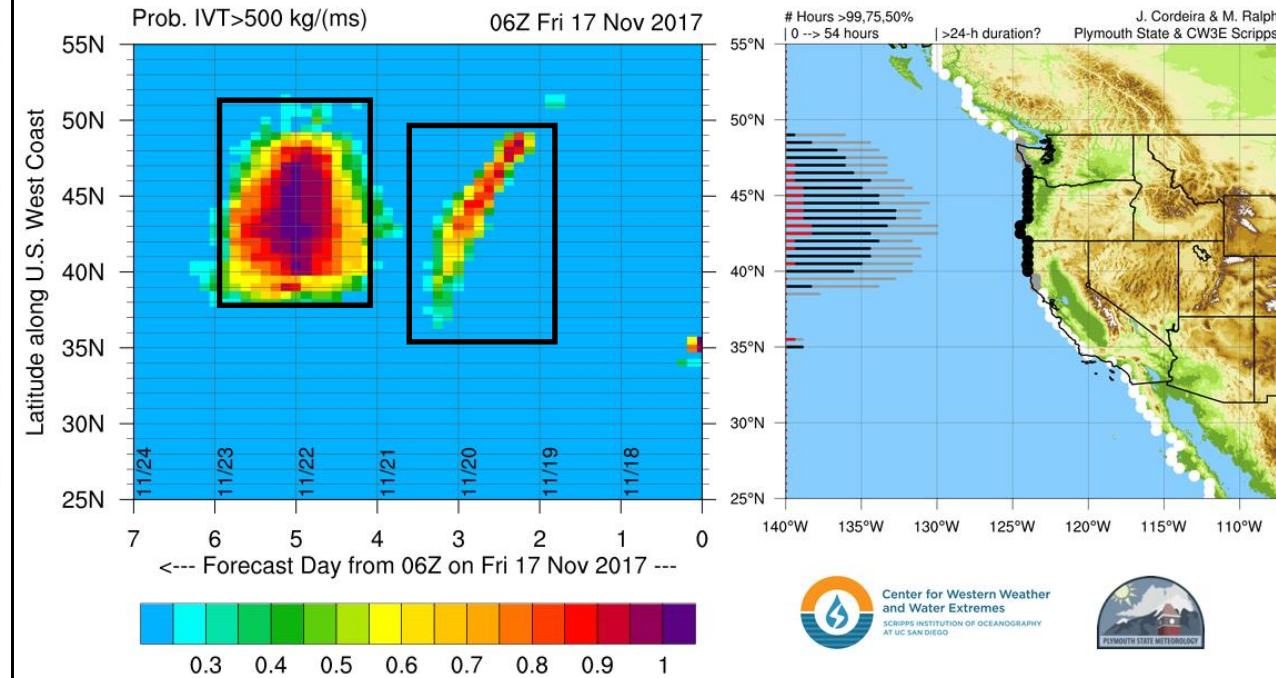




## Odds of at least a **WEAK** AR making landfall



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



- There is currently high confidence (>95%) of at least weak AR conditions ( $IVT > 250 \text{ kg m}^{-1} \text{ s}^{-1}$ ) associated with both ARs forecast to impact the USWC
- The first AR is forecast to last ~12-24 hours over several over most coastal locations while there is currently lower certainty in the start and end time of the second AR

- 70 – 90% of ensemble members are currently predicting moderate AR conditions ( $IVT > 500 \text{ kg m}^{-1} \text{ s}^{-1}$ ) lasting ~6 hours over WA, OR, and Northern CA
- There is currently higher certainty (90–100%) of moderate AR conditions associated with the second AR (21–23 Nov.)

# AR Outlook: 17 November 2017

For California DWR's AR Program



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There is currently some uncertainty in the onset, magnitude, and duration of AR conditions associated with the first AR (19–20 Nov) over Northern California

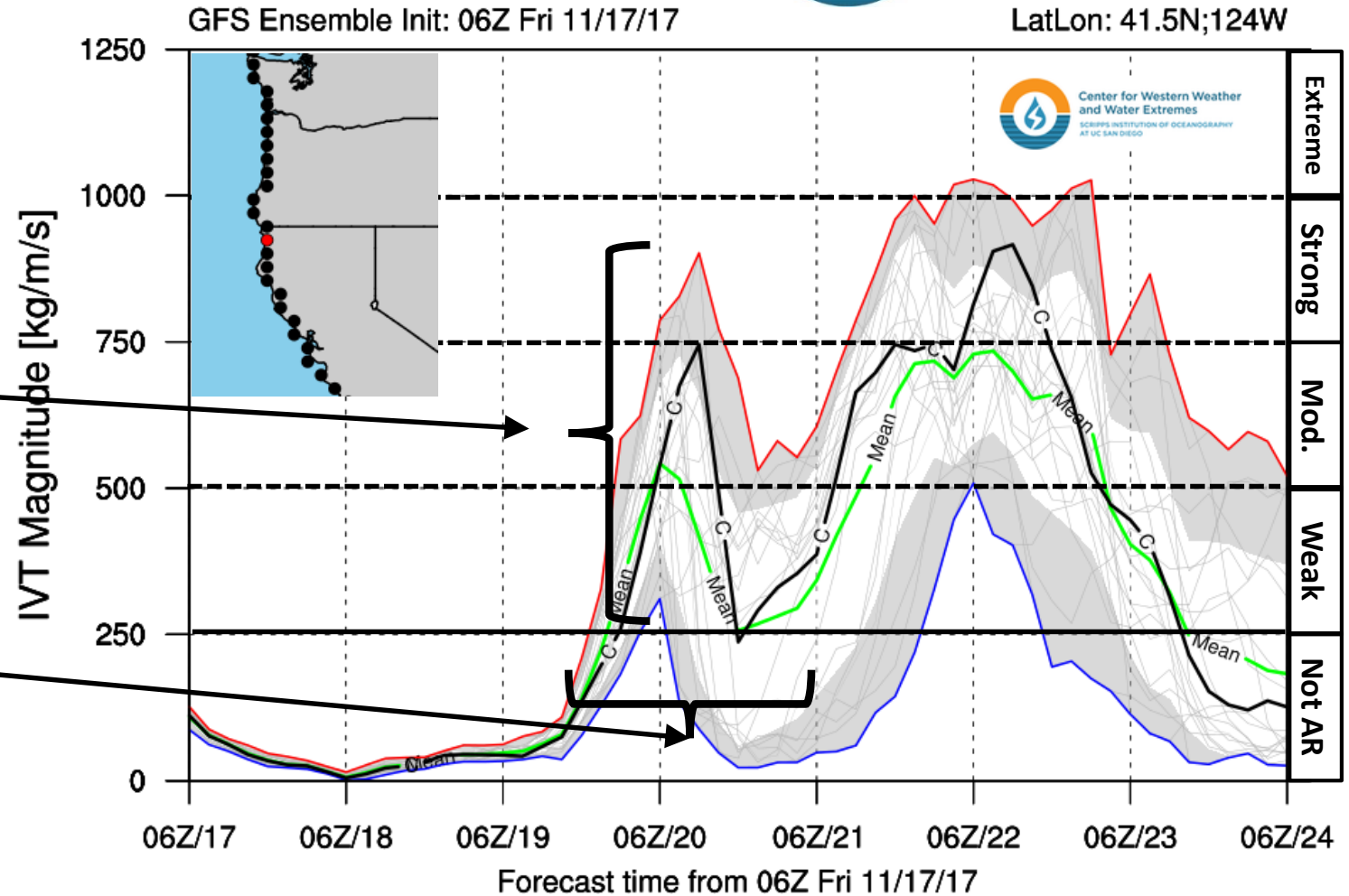
## Magnitude of Potential AR

- Maximum possible IVT  $\sim 850 \text{ kg m}^{-1} \text{ s}^{-1}$
- Mean IVT  $\sim 525 \text{ kg m}^{-1} \text{ s}^{-1}$
- Minimum IVT  $\sim 300 \text{ kg m}^{-1} \text{ s}^{-1}$
- Uncertainty  $\sim \pm 60\%$

## Duration of AR conditions

- Weak:  $\sim 24 \text{ hours} \pm 24 \text{ h}$
- Moderate:  $\sim 12 \text{ hours} \pm 12 \text{ h}$
- Strong:  $\sim 12 \text{ hours} \pm 12 \text{ h}$

With the landfall of the second AR it is possible that AR conditions do not end between the first and second AR



# AR Outlook: 17 November 2017

For California DWR's AR Program



Center for Western Weather  
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Numerous GFS Ensemble members and the GFS Control forecast are predicting that the second AR could potentially be Extreme over the central Oregon Coast

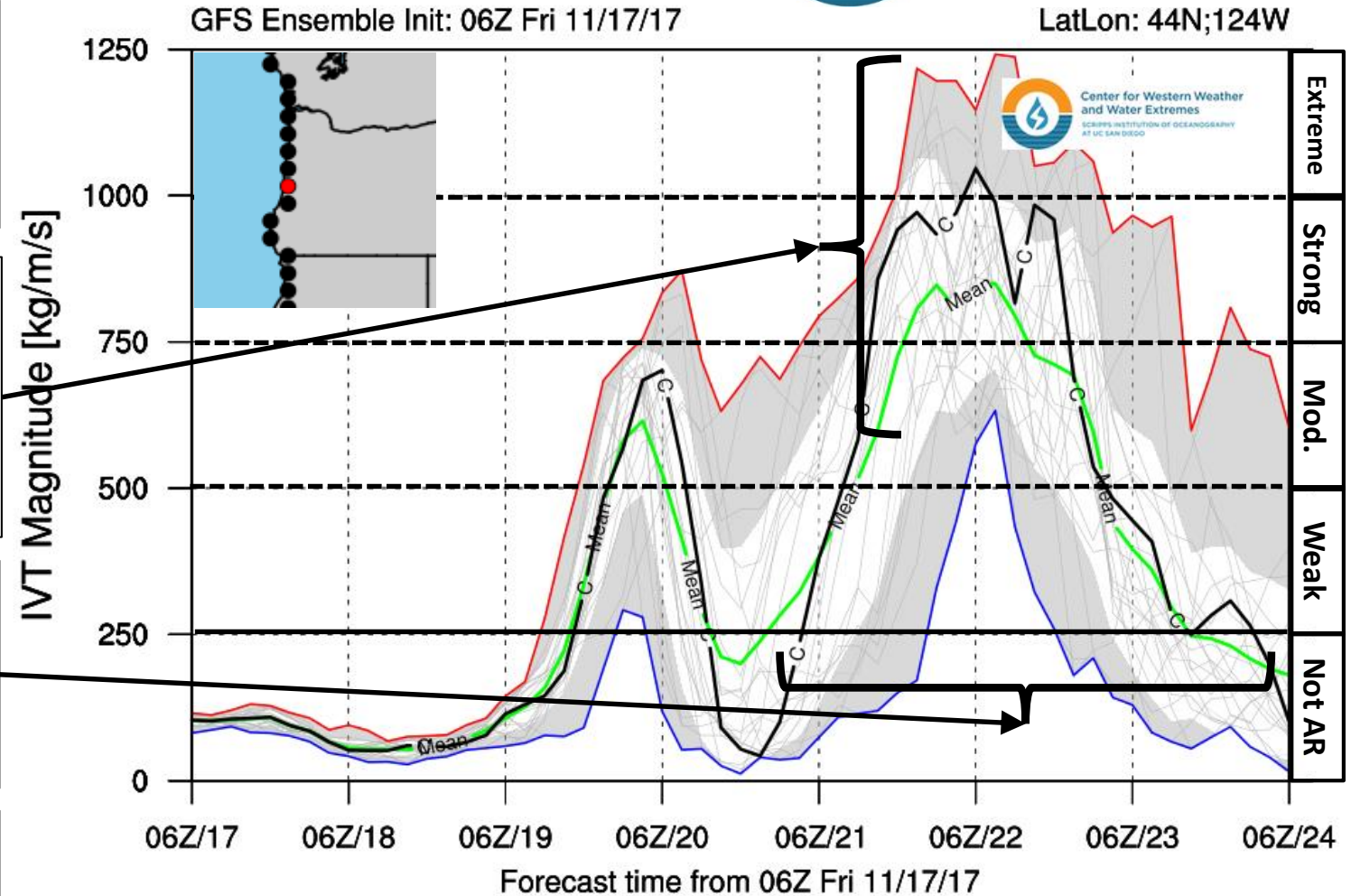
## Magnitude of Potential AR

- Maximum possible IVT  $\sim 1225 \text{ kg m}^{-1} \text{ s}^{-1}$
- Mean IVT  $\sim 850 \text{ kg m}^{-1} \text{ s}^{-1}$
- Minimum IVT  $\sim 600 \text{ kg m}^{-1} \text{ s}^{-1}$
- Uncertainty  $\sim \pm 45\%$

## Duration of AR conditions

- Weak:  $\sim 60 \text{ hours} \pm 36 \text{ h}$
- Moderate:  $\sim 36 \text{ hours} \pm 36 \text{ h}$
- Strong:  $\sim 24 \text{ hours} \pm 24 \text{ h}$

There is currently large uncertainty in the magnitude and duration of this event and the forecast may change as time progresses closer to the event





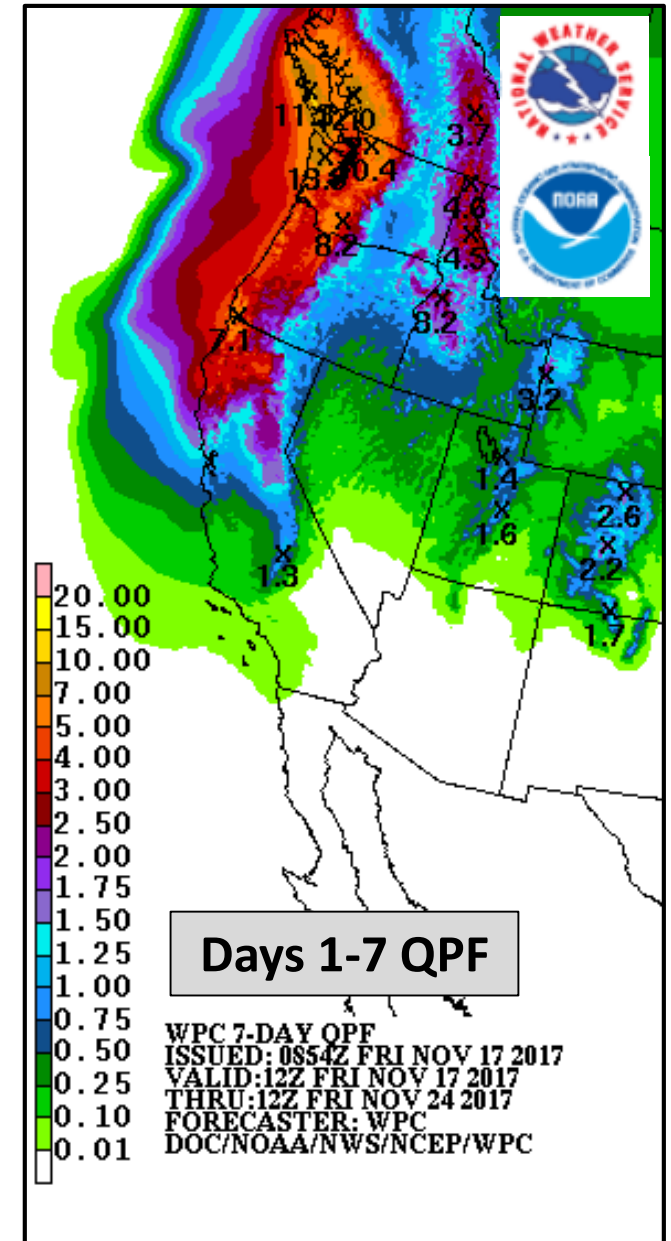
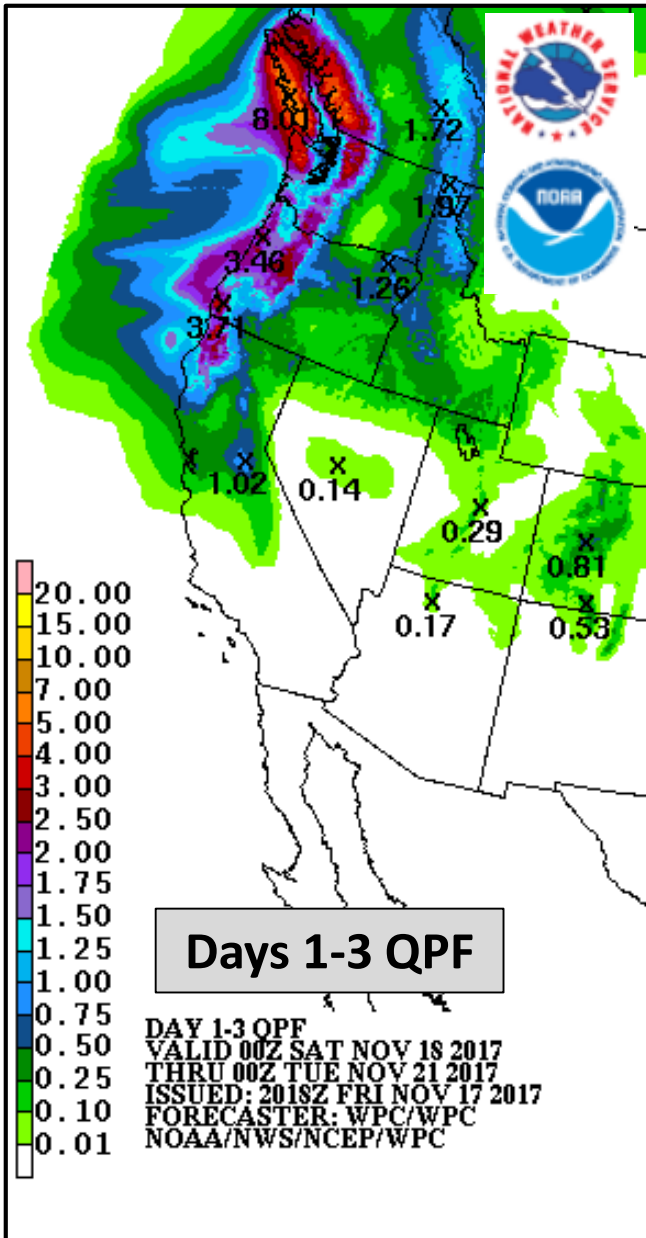
## Weather Prediction Center QPF

NOAA WPC 1–3 day precip. forecasts are predicting 3–8 inches over higher elevations of the Coastal, Olympic, and Cascade Mts. And 1–2 inches over lower elevations associated with the first AR

NOAA WPC 1–7 day precipitation forecasts are currently predicting as much as 19 inches over the Olympic mountains in Northwest Washington from both AR events

Other high elevation locations over the Coastal and Cascade Mountains could potentially receive 5–10 inches

Lower elevations in, WA, OR, and Northern CA are forecast to receive 1–2 inches

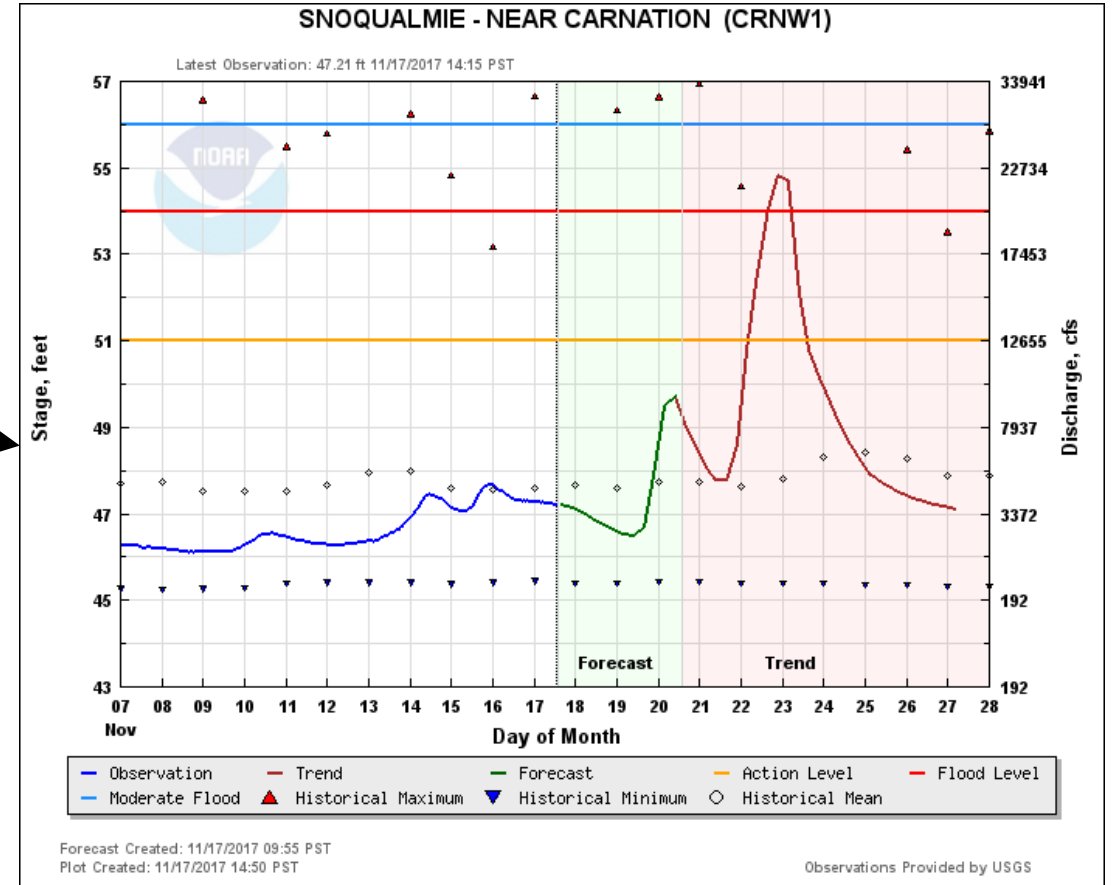
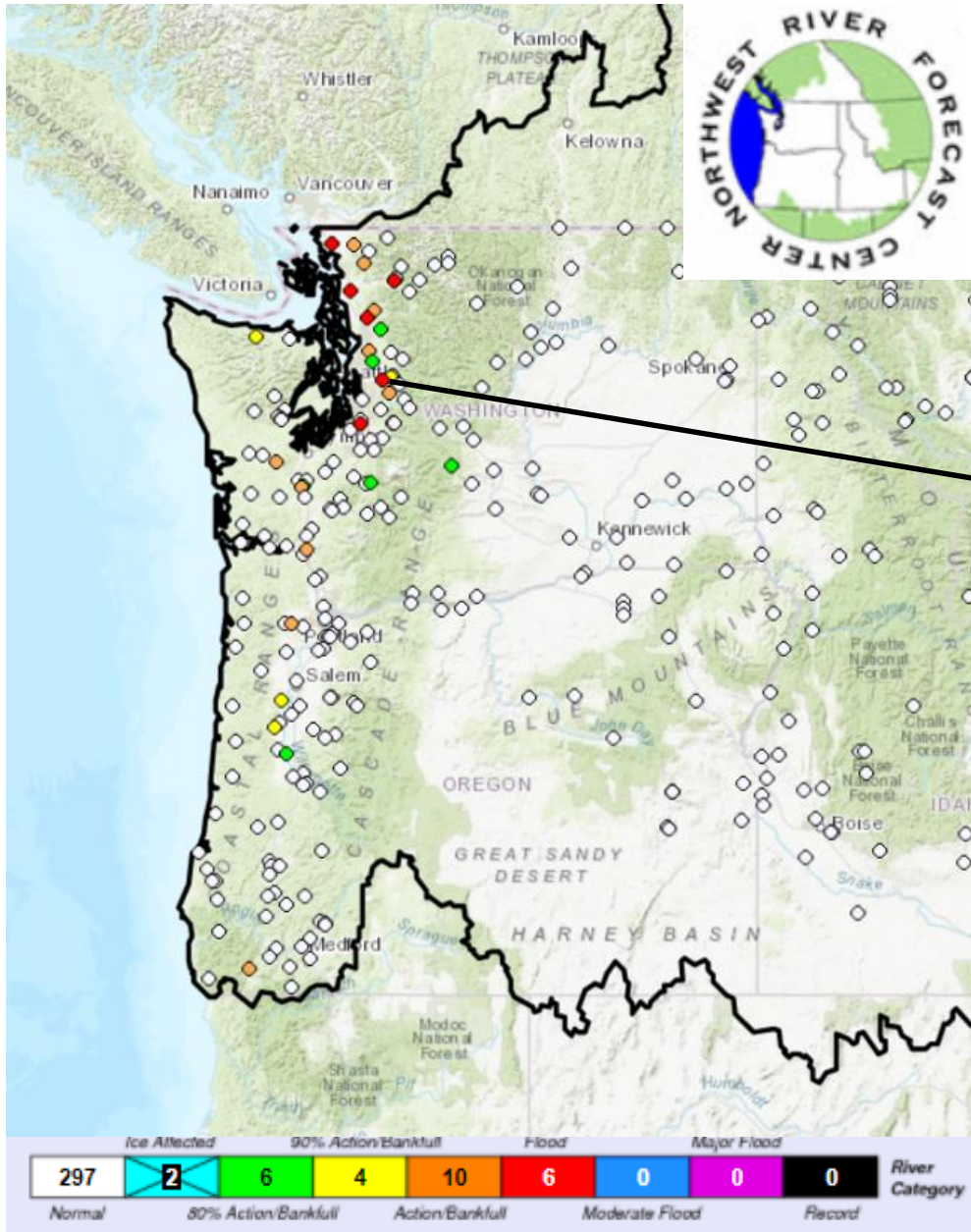


# AR Outlook: 14 November 2017



Northwest River Forecast Center

## NWRFC River Forecasts



The NWRFC is forecasting 6 rivers to flood and another 10 to reach Action/Bankfull category as a result of the precipitation over the next ten days