

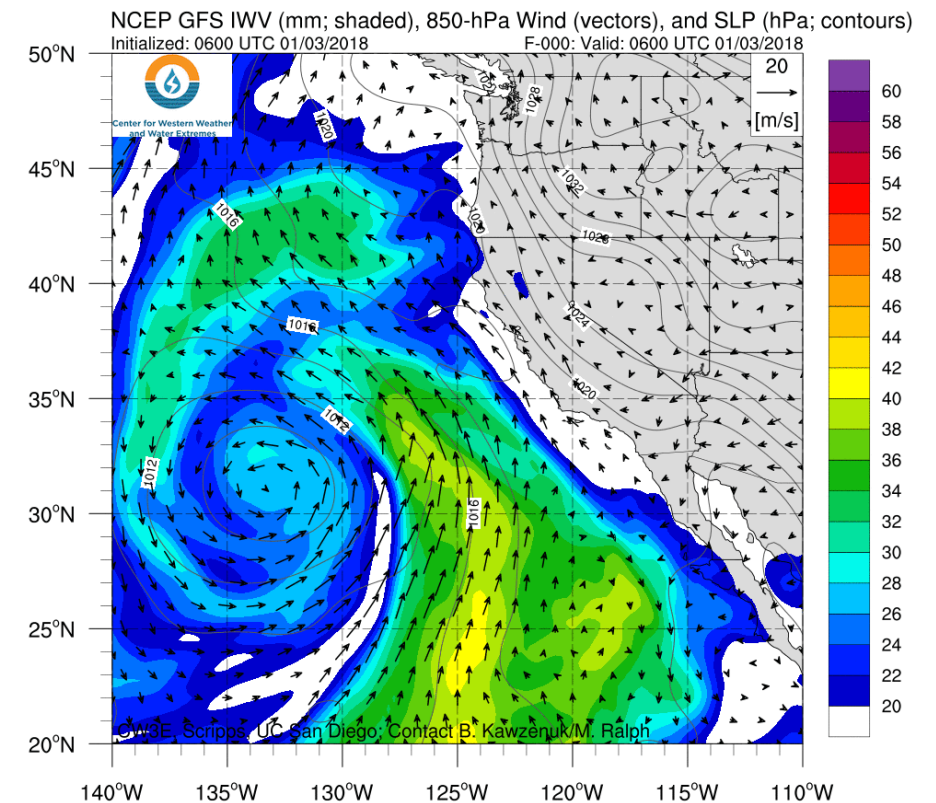
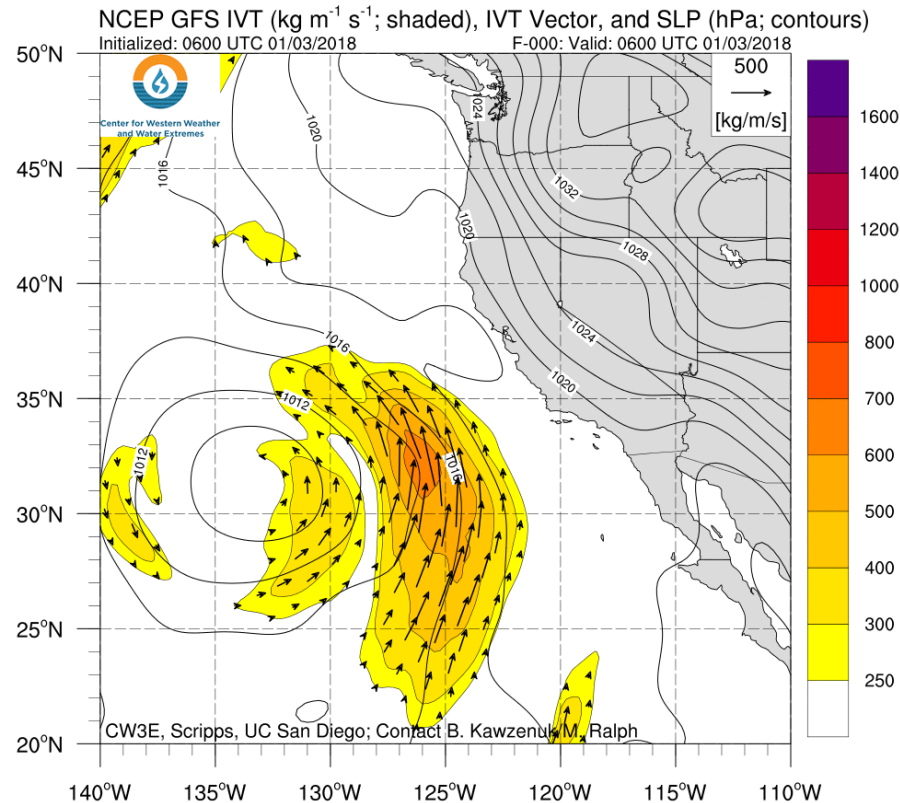
CW3E Atmospheric River Update – Outlook



Center for Western Weather
and Water Extremes
SCRIPPS INSTITUTION OF OCEANOGRAPHY
AT UC SAN DIEGO

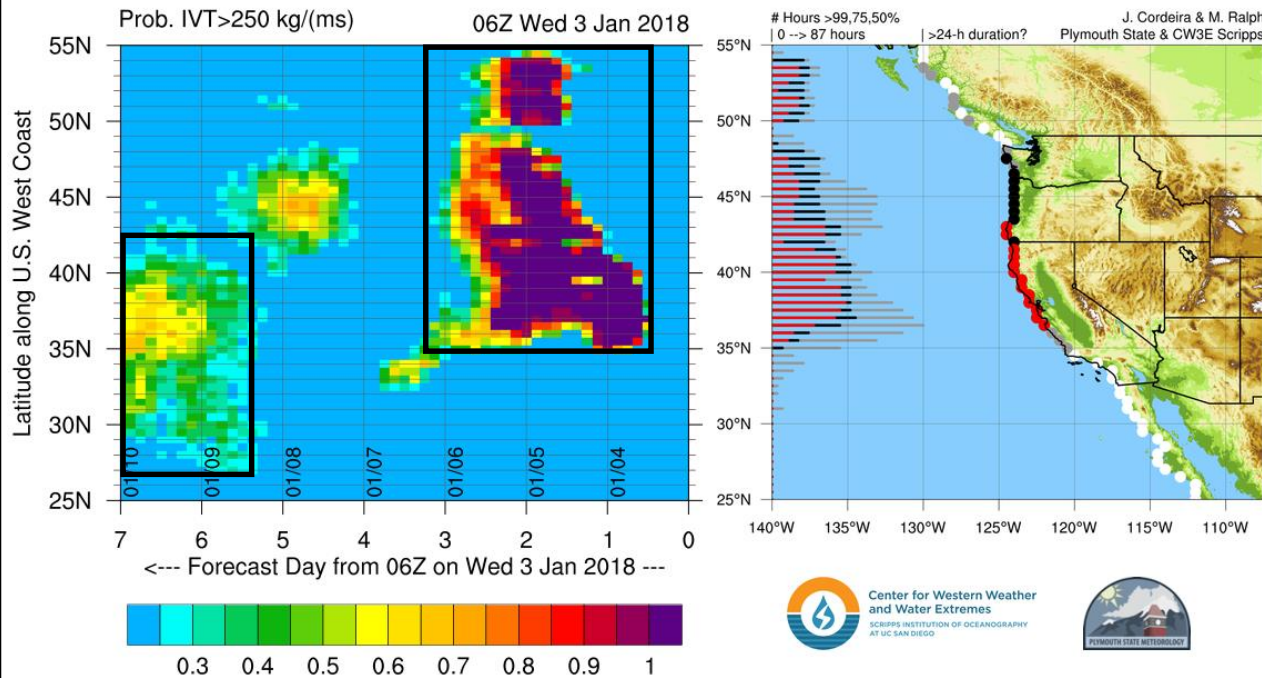
Two systems expected to produce precipitation over the U.S. West Coast in the next week

- AR conditions (IVT $>250 \text{ kg m}^{-1} \text{ s}^{-1}$ and IWV $>20 \text{ mm}$) are expected over most of the U.S. West Coast over the next two 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 over the Sierra Nevada
- A second period of AR conditions is expected to make landfall over CA, OR, and WA on 9 January 2018
- Both periods of AR conditions are currently expected to have southerly oriented IVT which will result in less extreme precipitation

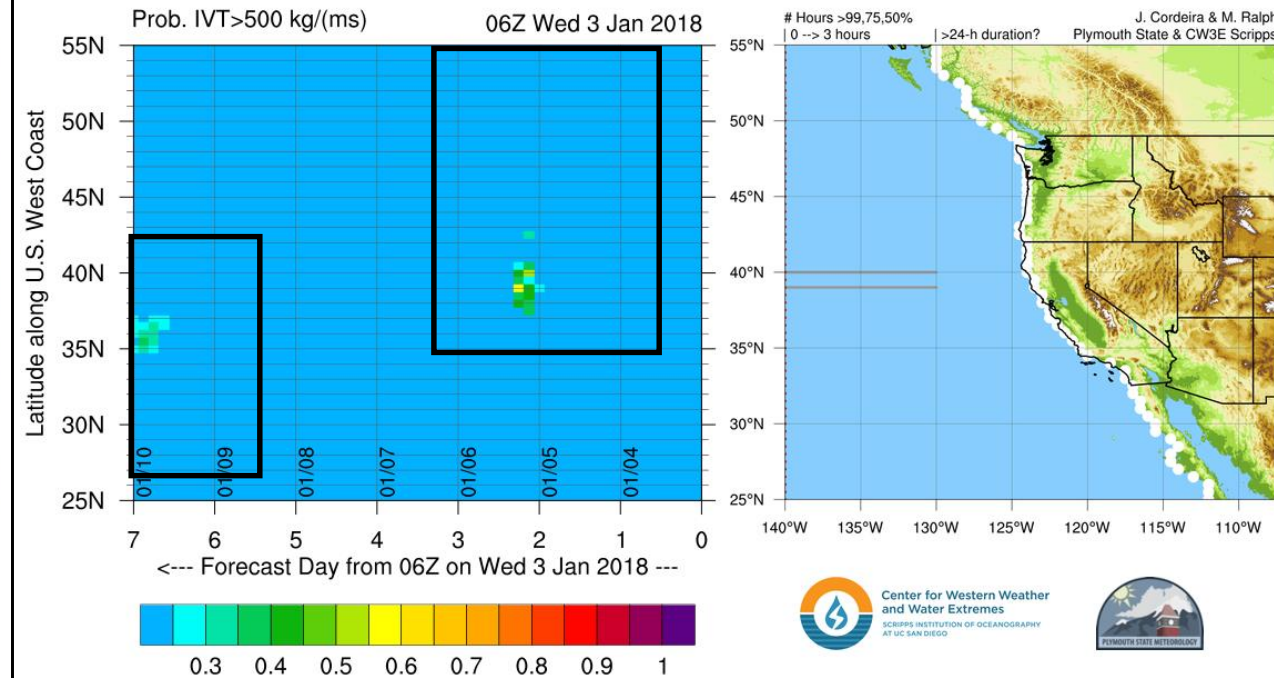




Odds of at least a **WEAK** AR making landfall



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 to BC during 3–5 January 2018
- There is moderate certainty (>60%) of weak AR conditions over CA during 8–10 January 2018

- Less than 40% of GFS members are predicting moderate AR conditions (IVT >500 kg m⁻¹ s⁻¹) during either period of AR conditions

AR Outlook: 3 January 2018

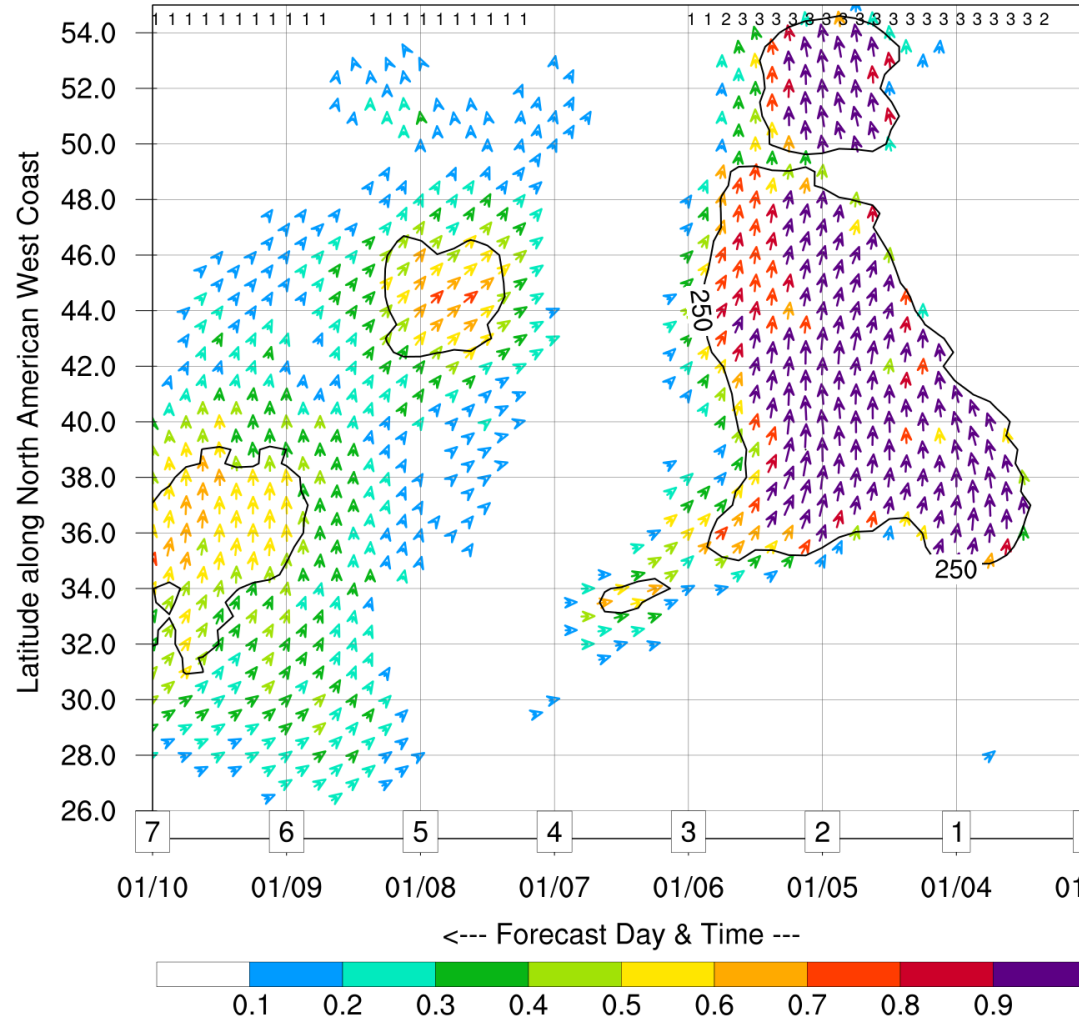
For California DWR's AR Program



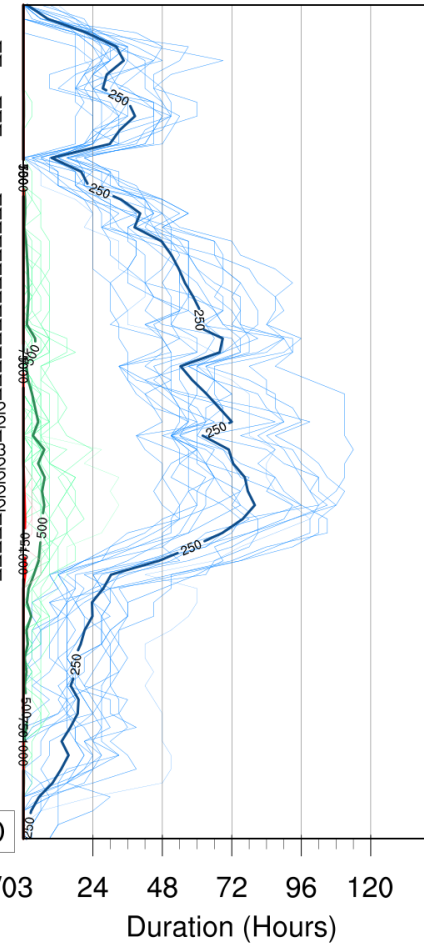
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AR Landfall Tool: 06Z Wed 3 Jan 2018

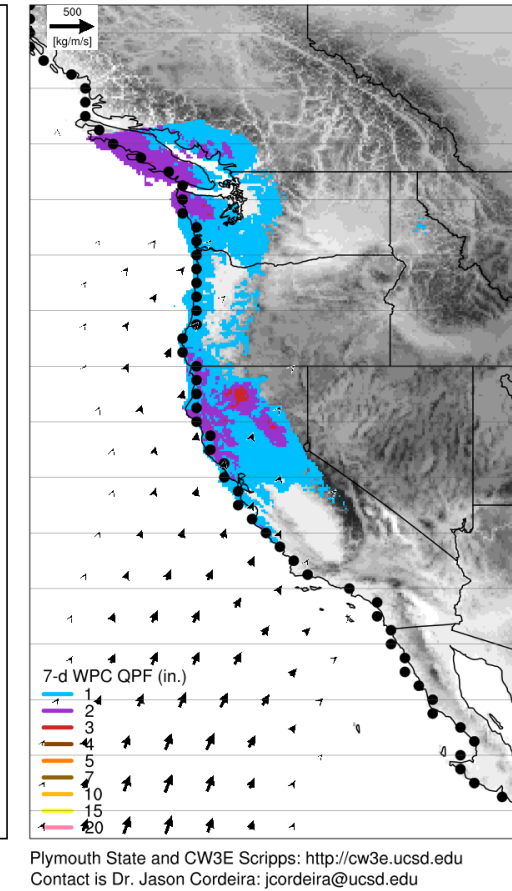
a. 7-d GFS Ens. Mean IVT Colored by Ens. Fraction >250 kg/m/s



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 both periods of AR conditions are expected to be mostly southerly (see vectors in outlines in panel a) which will result in less extreme precipitation over most of the U.S. West Coast

AR Outlook: 3 January 2018

For California DWR's AR Program



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There is uncertainty in the GEFS of the magnitude, and end time of the AR conditions over CA during 3-5 Jan

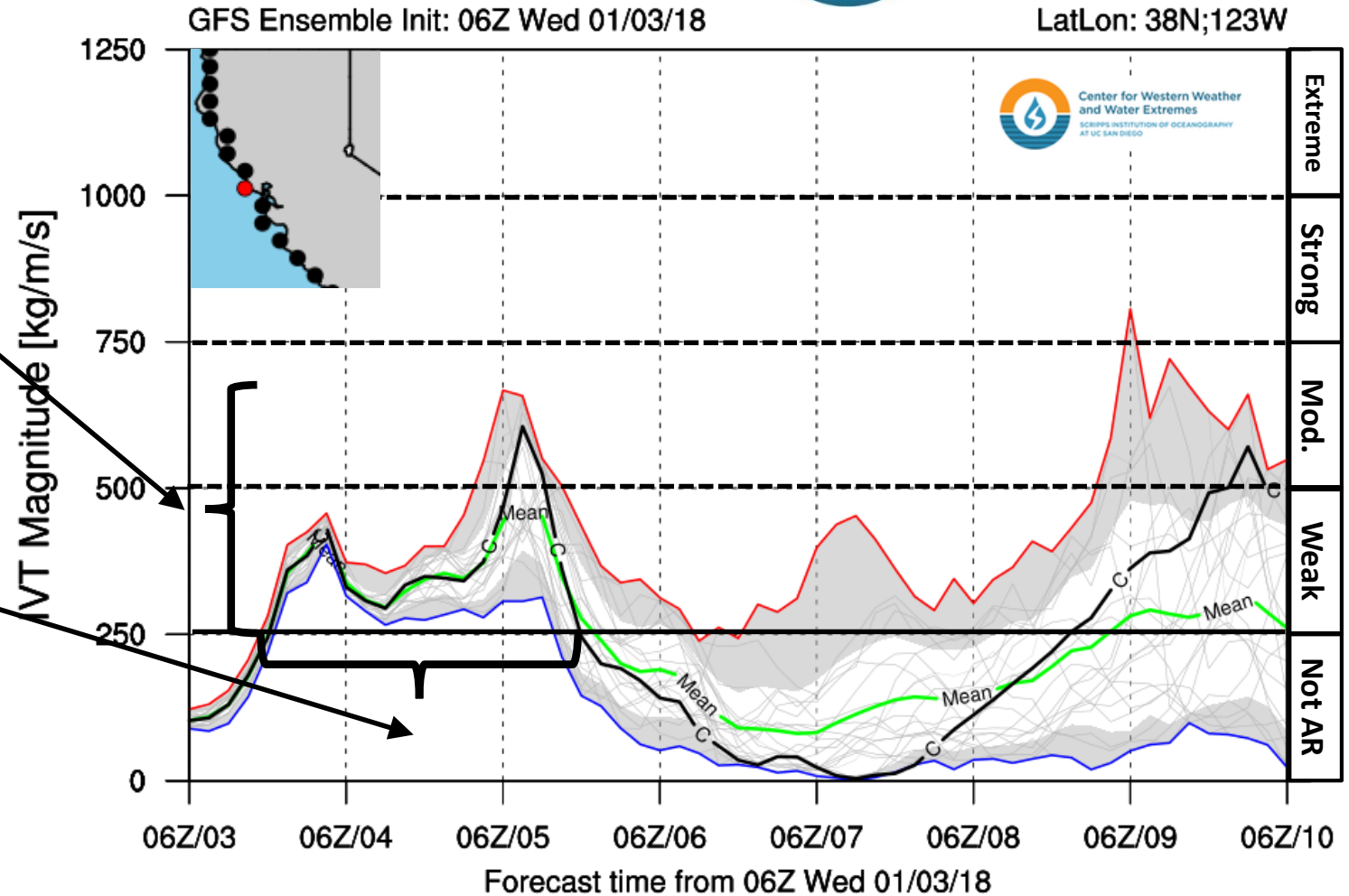
Magnitude of Potential AR

- Maximum possible IVT $\sim 675 \text{ kg m}^{-1} \text{ s}^{-1}$
- Mean IVT $\sim 600 \text{ kg m}^{-1} \text{ s}^{-1}$
- Minimum possible IVT $\sim 260 \text{ kg m}^{-1} \text{ s}^{-1}$

Duration of AR conditions

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

About 50% of GEFS members are predicting moderate AR conditions during 3-5 Jan, and all members are predicting at least weak AR conditions



AR Outlook: 3 January 2018

For California DWR's AR Program



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There are large uncertainties in the GEFS of the onset, magnitude, and end time of the AR conditions over CA during 8-10 Jan

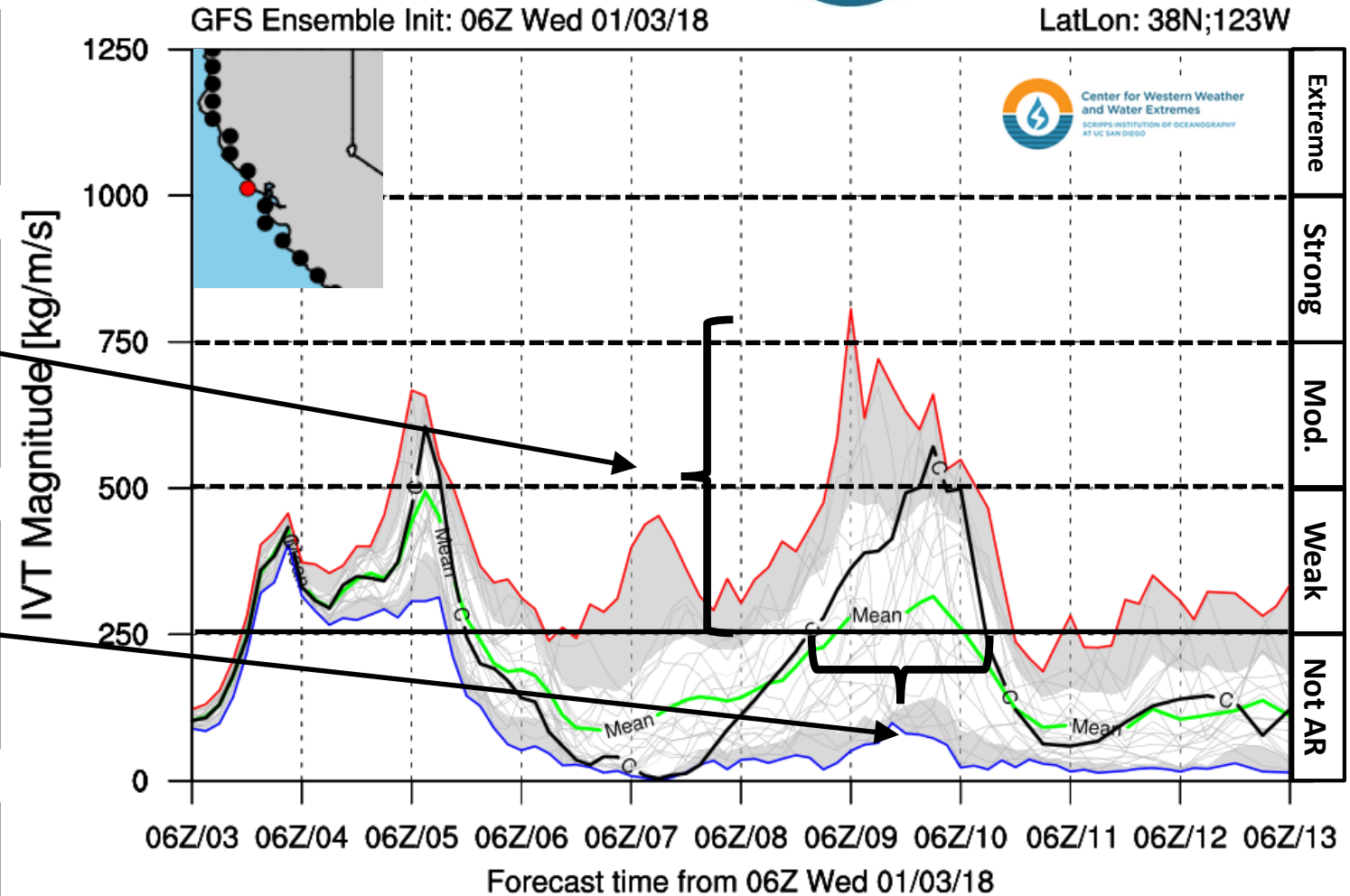
Magnitude of Potential AR

- Maximum possible IVT $\sim 800 \text{ kg m}^{-1} \text{ s}^{-1}$
- Mean IVT $\sim 600 \text{ kg m}^{-1} \text{ s}^{-1}$
- Minimum possible IVT $\sim 100 \text{ kg m}^{-1} \text{ s}^{-1}$

Duration of AR conditions

- Weak: $\sim 36 \text{ hours} \pm 18 \text{ h}$
- Moderate: $\sim 6 \text{ hours} \pm 12 \text{ h}$
- Strong: Unlikely

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

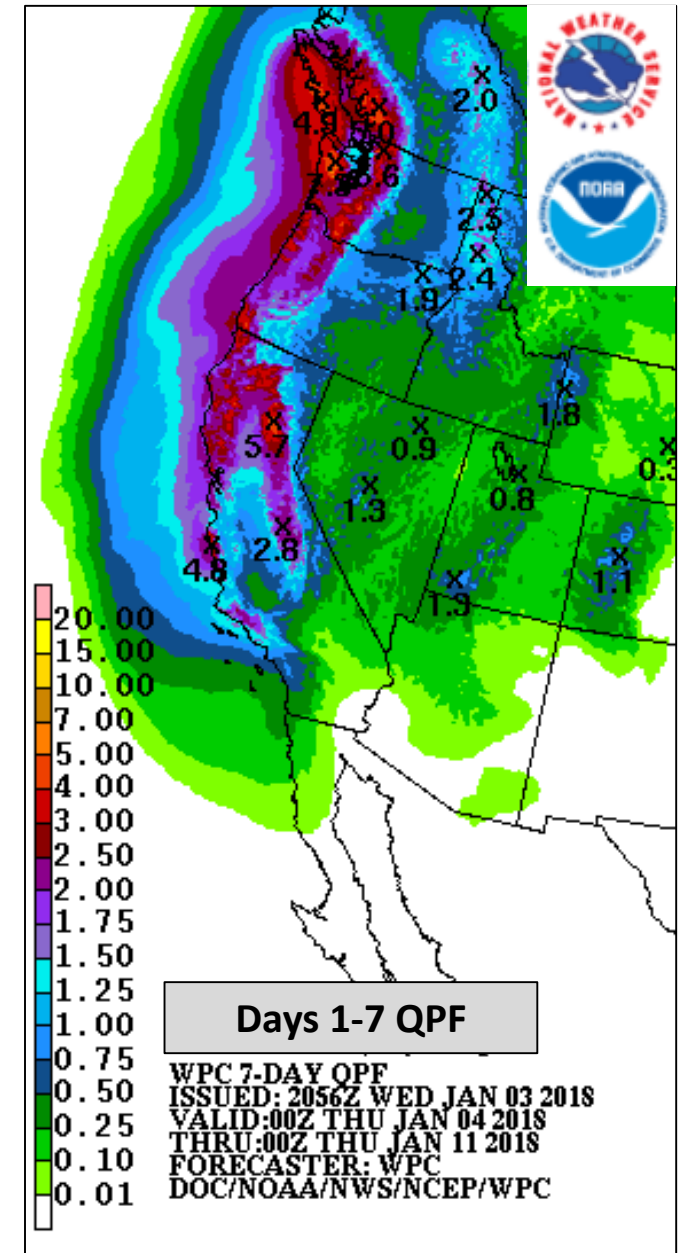
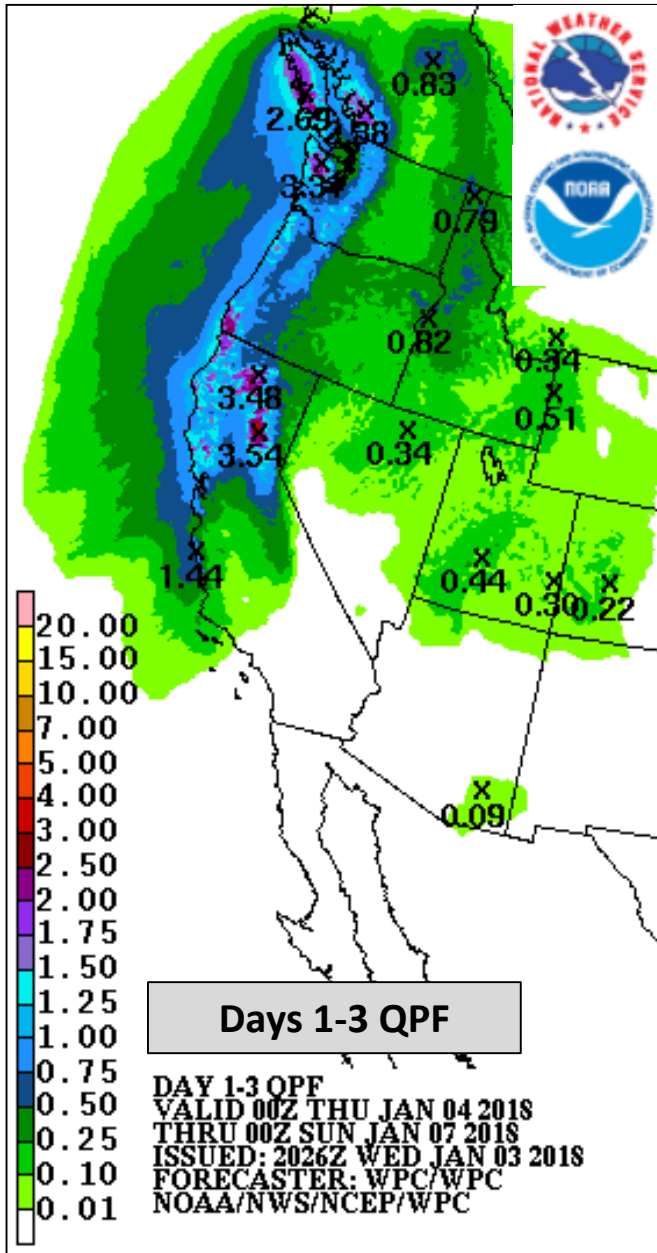


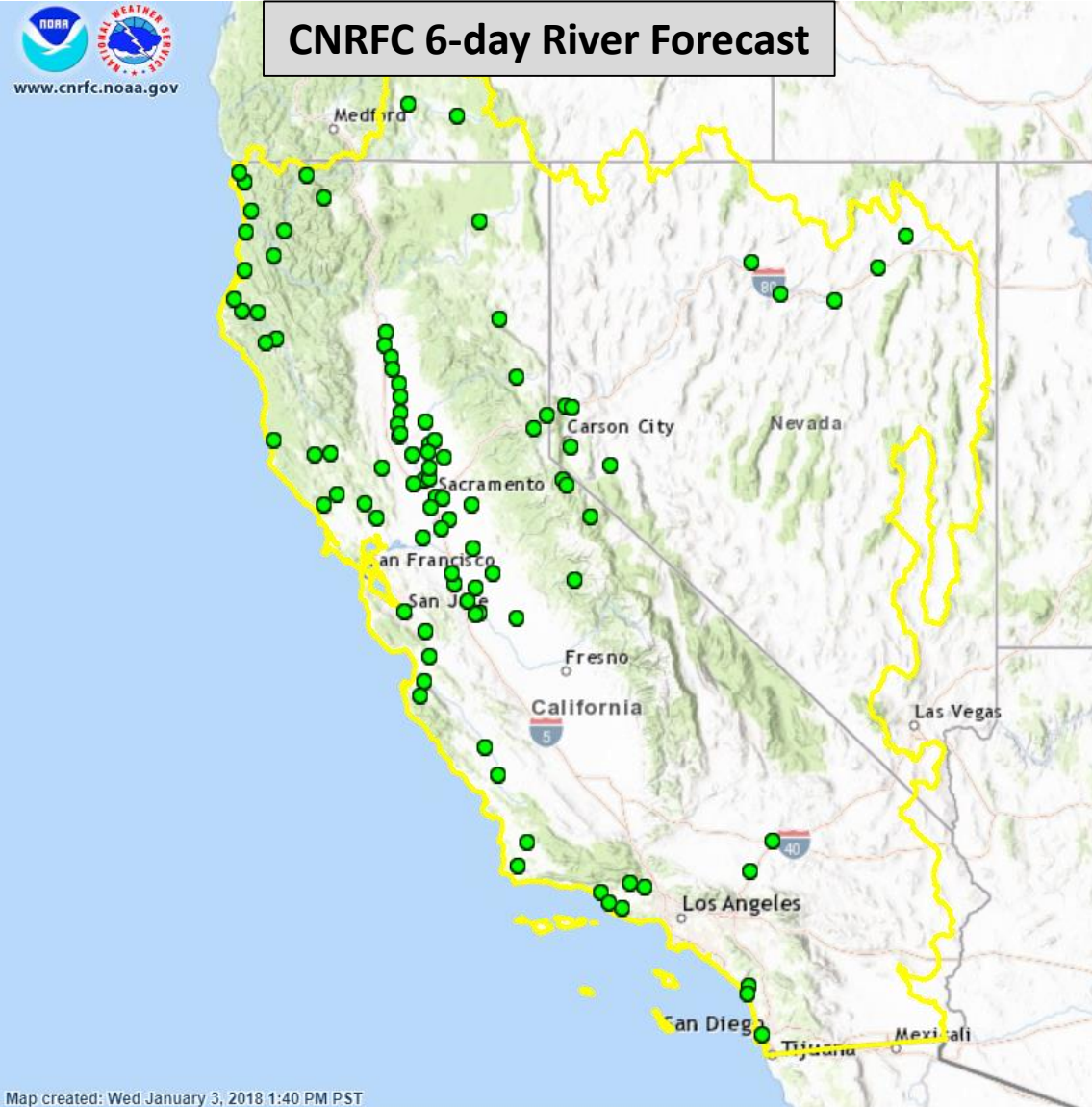
Weather Prediction Center QPF

The elevated moisture transport over central and northern CA over the next three days could produce up to 3.5 inches of precipitation over the Sierra Nevada and up to 2 inches over coastal northern CA.

Northern and central CA could see an additional 1-3 inches of precipitation during 8-11 January 2018

Seven day precipitation amounts could total over 5 inches over the northern Sierra Nevada and over 3 inches over coastal CA





○ 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.

Most current river stages are relatively low and precipitation amounts are not expected to be extremely high during these events. Soil moisture is also relatively low throughout CA as a result of a very dry December.

As a result, no rivers in the CNRFC region are expected to come near flood stage over the next six days.

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.