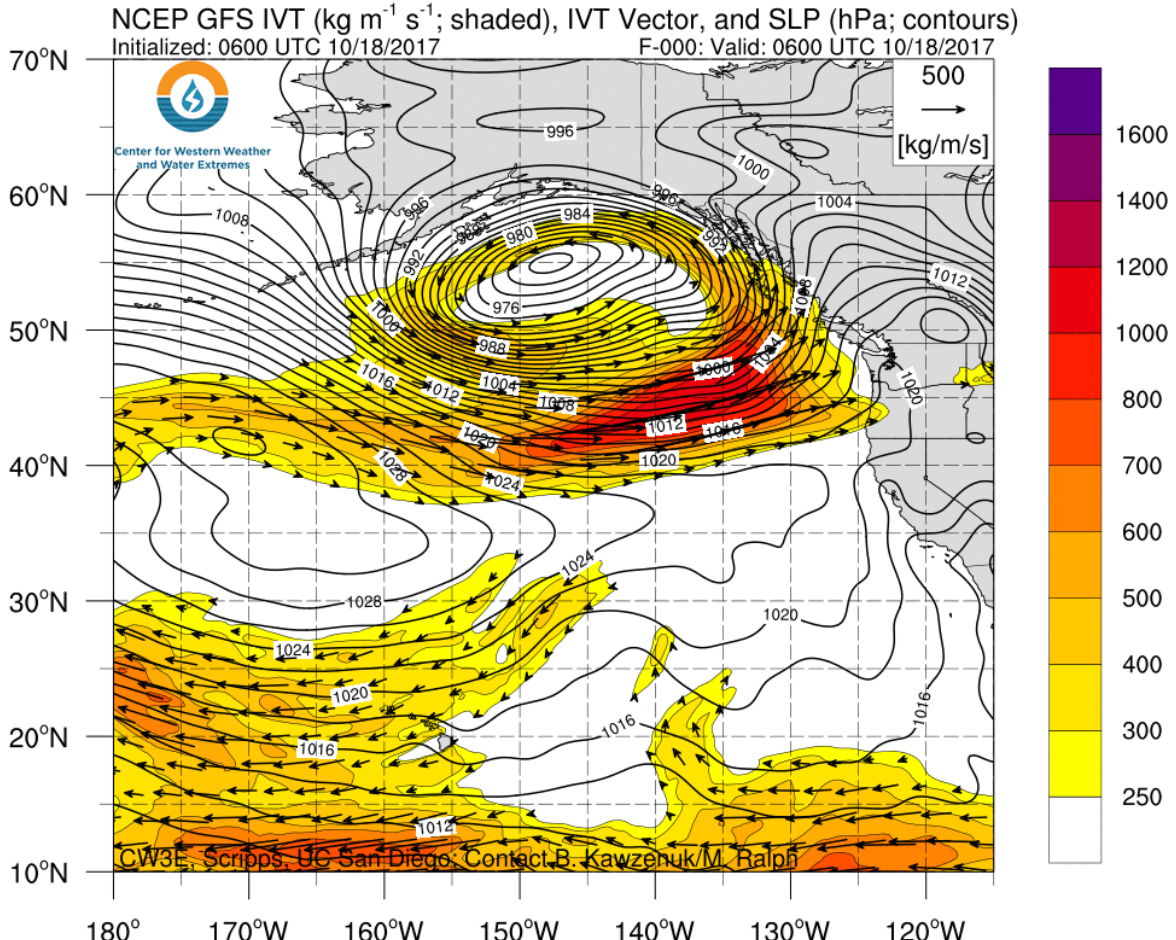
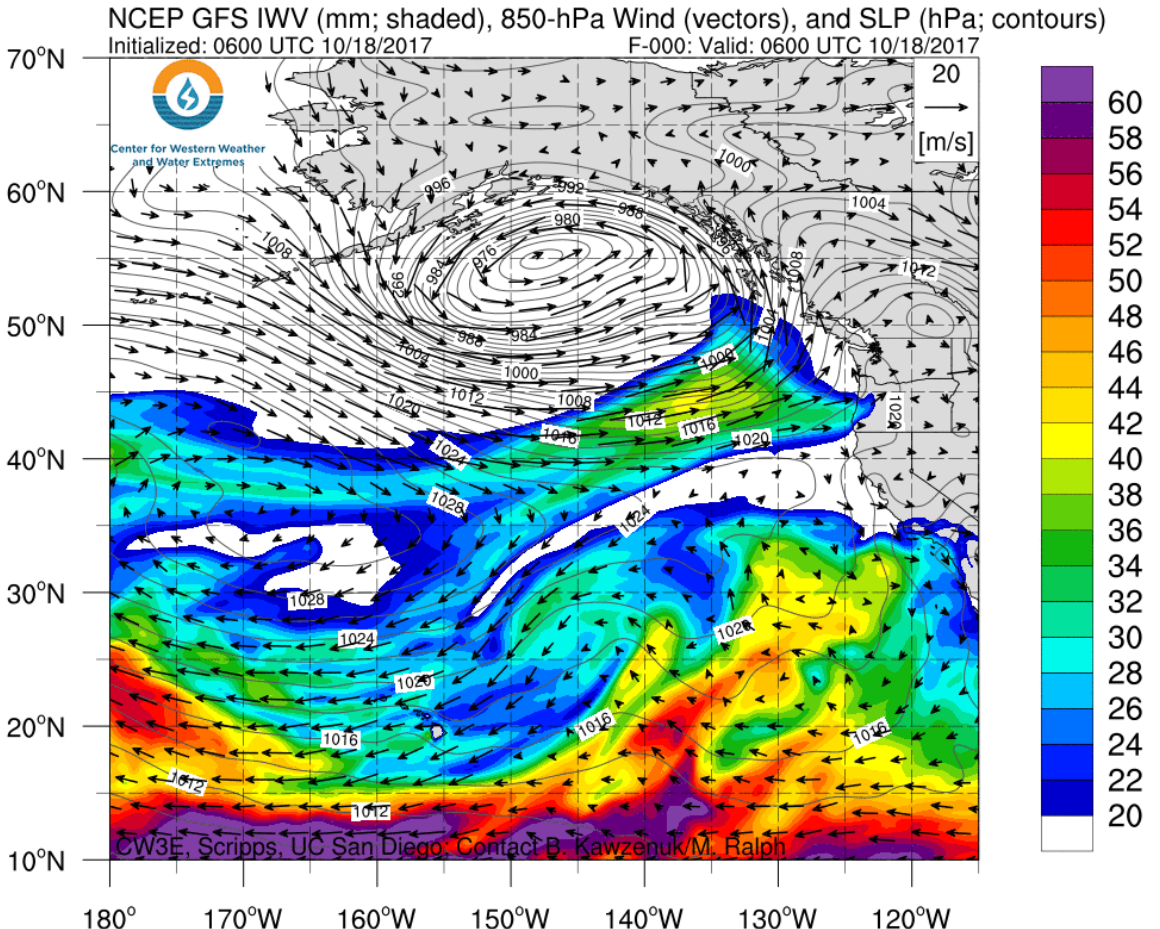
CW3E Atmospheric River Update – Outlook

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

Multiple ARs forecast to Impact US West Coast

- A potentially extreme AR is forecast to make landfall over the Pacific Northwest today.
- NWS precipitation forecasts show accumulations of ~10 inches for the Olympic Mountains in NW Washington
- A second AR is forecast to make landfall on Saturday, though forecast uncertainty is currently high
- Total 5-day precipitation accumulations could be as high as 15.5 inches
- Current soil conditions are dry which could lead to less runoff and lower flooding potential





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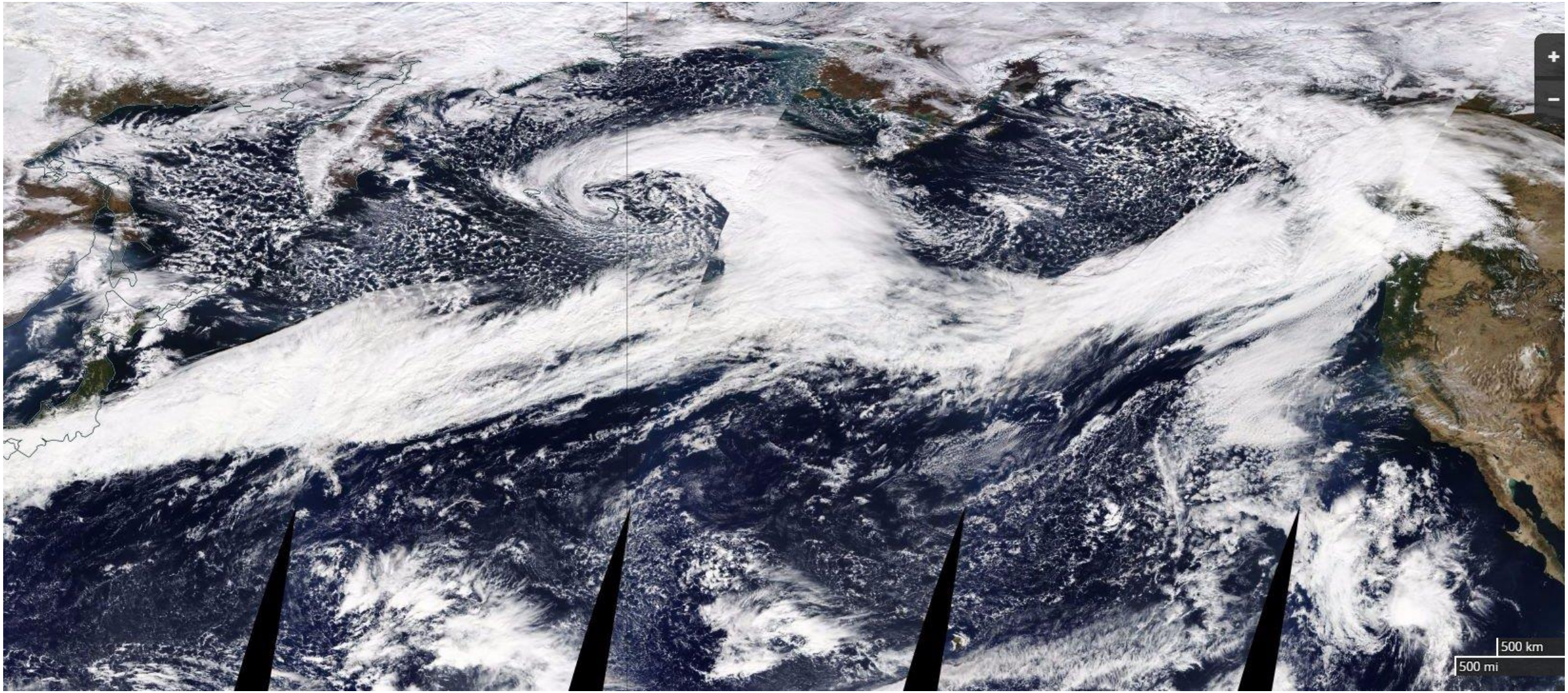

The synoptic scale configuration that is leading to these consecutive ARs over the Pacific Ocean is providing impressive satellite imagery that exhibits a cloud band that spans the entire northern Pacific Ocean (~5,000-miles). Photo credit NWS Seattle.

AR Outlook: 18 October 2017

For California DWR's AR Program

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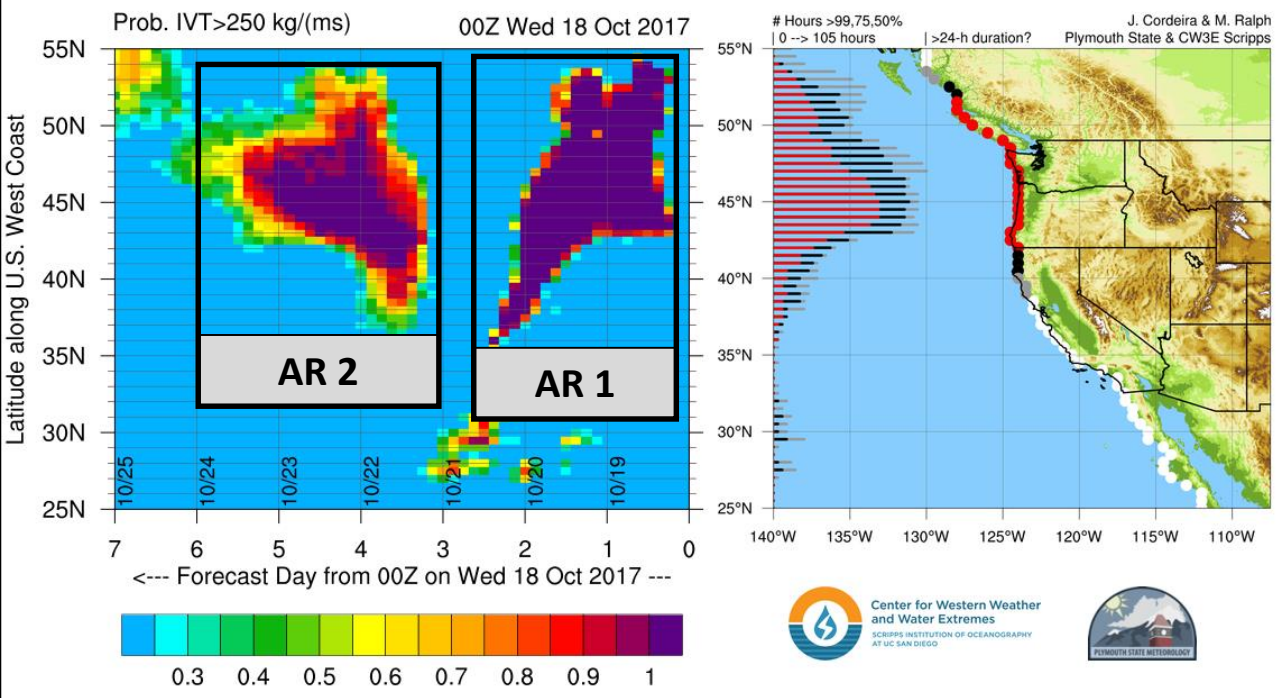
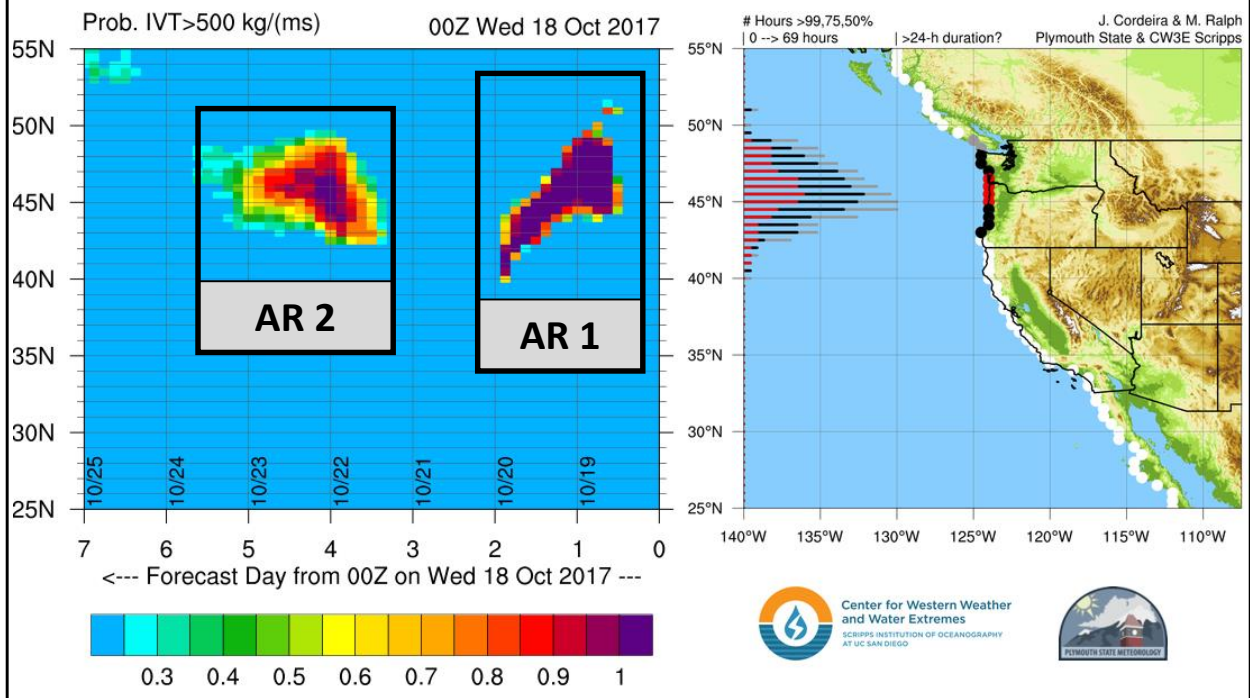
Odds of at least a **WEAK** AR making landfall



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



- **There is high certainty of at least weak AR conditions (IVT >250 kg m^{-1} s^{-1}) lasting until at least tomorrow morning over WA and OR associated w/ AR 1**
- **There is currently some uncertainty in start and end time of AR conditions associated w/ AR 2**

- **There is high certainty of moderate AR conditions (IVT >500 kg m^{-1} s^{-1}) associated w/ AR 1 over WA, OR, and Northern CA**
- **There is higher uncertainty in the forecast of moderate strength (IVT >500 kg m^{-1} s^{-1}) conditions over WA and OR associated w/ AR 2**

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Ensemble members are currently in relatively high agreement of the onset, magnitude, and end time of the first AR over Coastal Washington

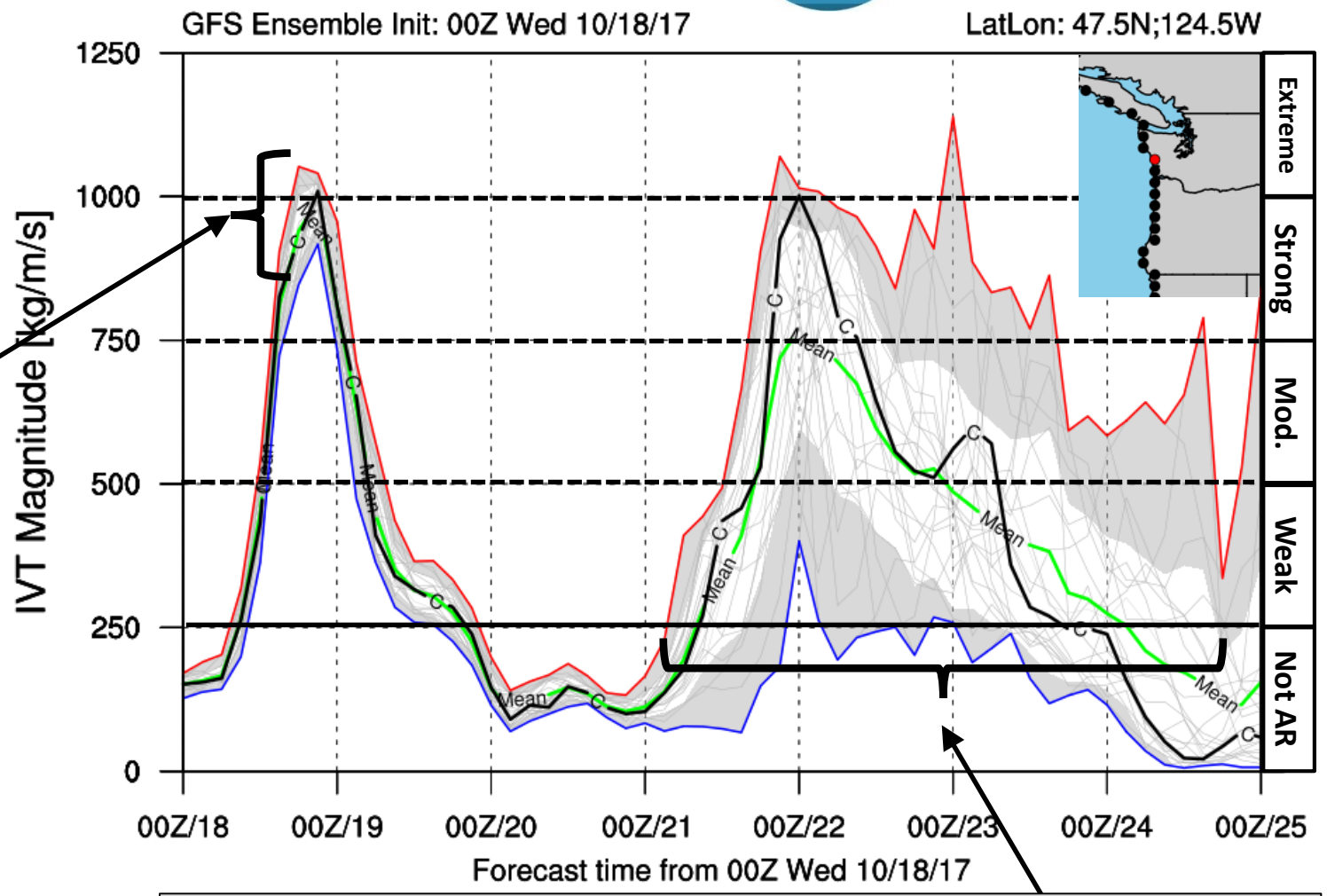
Magnitude of AR 1

- Maximum possible IVT ~ 1100 kg m^{-1} s^{-1}
- Mean IVT ~ 1000 kg m^{-1} s^{-1}
- Minimum possible IVT ~ 850 kg m^{-1} s^{-1}
- Uncertainty ~ +/– 10%

Duration of AR conditions

- Weak: ~24 hours
- Moderate: ~18 hours +/– 3 h
- Strong: ~12 hours +/– 6 h
- Extreme: ~03 hours +/– 3 h

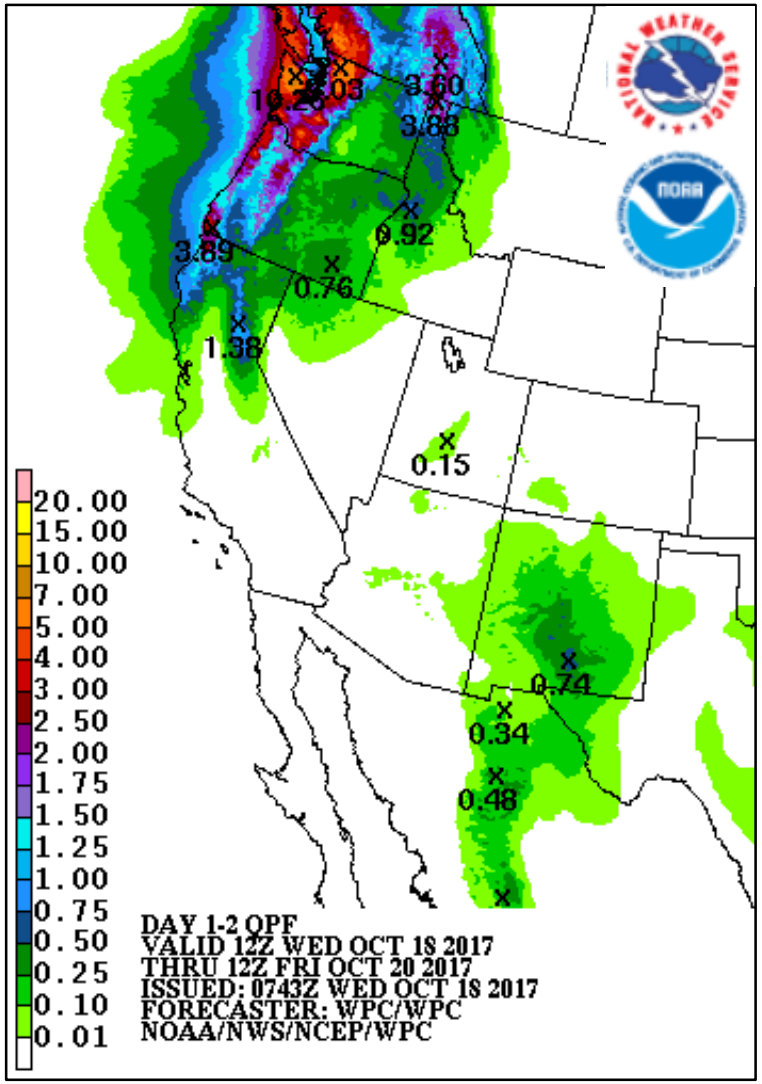
Several NCEP GFS Ensemble members are suggesting this could be an extreme AR (IVT >1000 kg m^{-1} s^{-1}) over coastal Washington



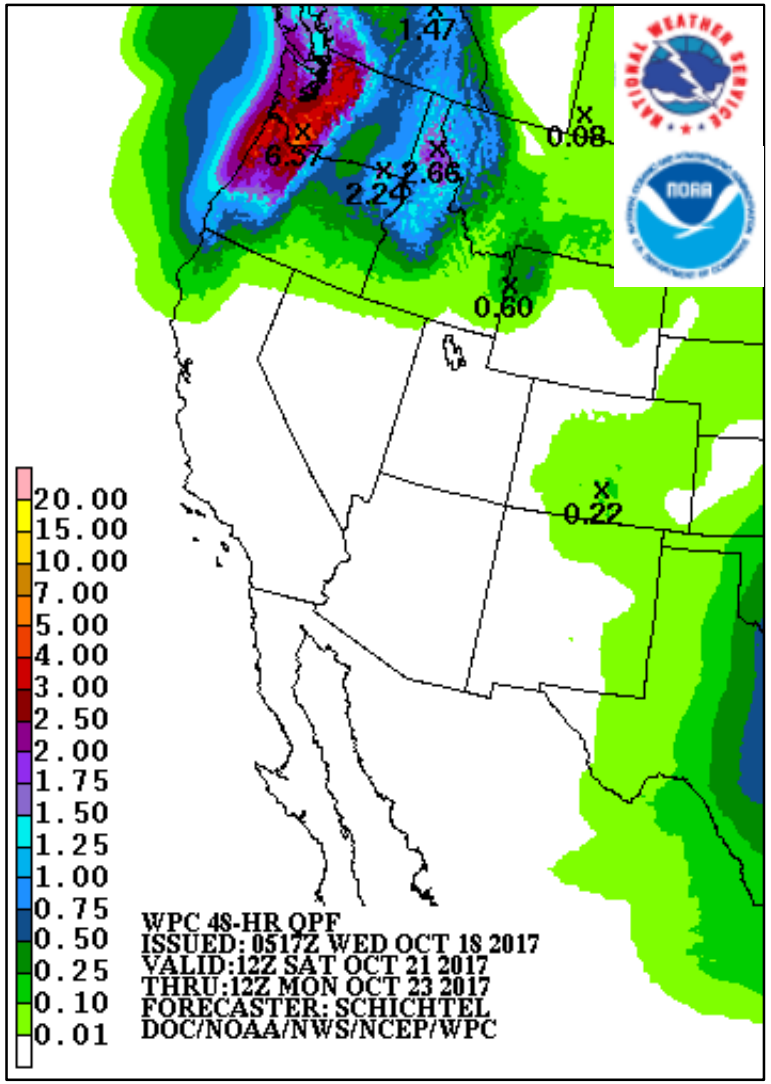
There is currently large uncertainty in the onset, magnitude, and duration of AR conditions associated with AR2

AR Outlook: 18 October 2017

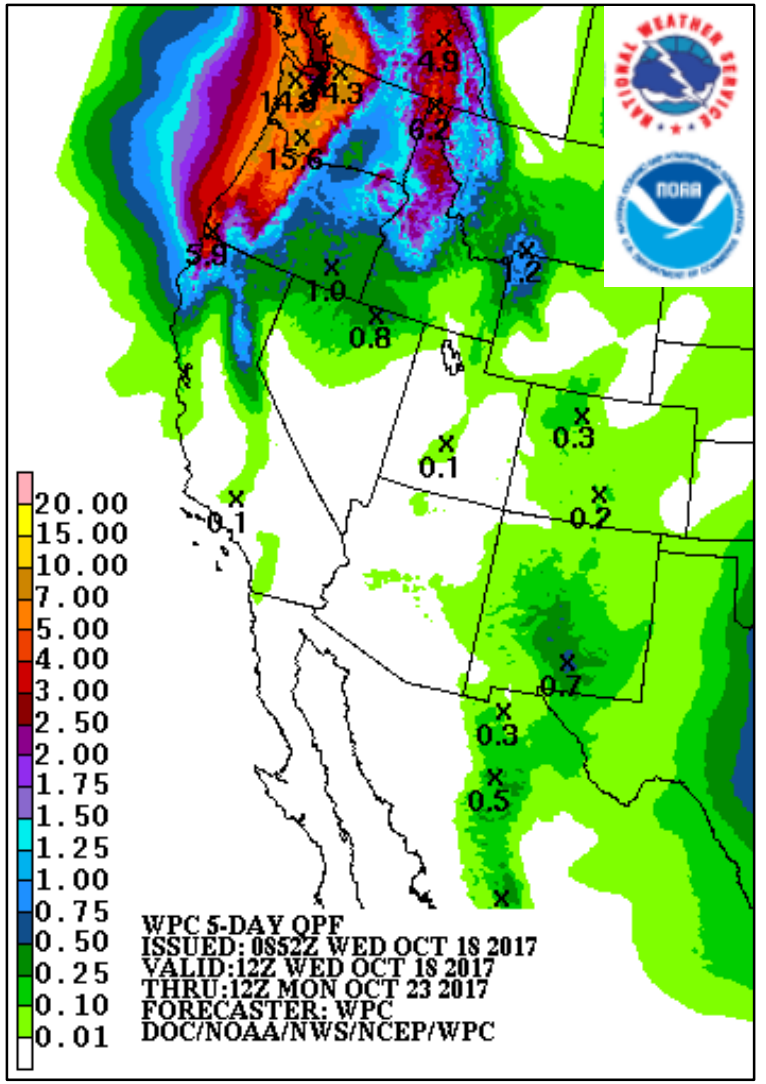
NOAA Weather Prediction Center



1-2 day QPF accumulations associated w/ AR 1 range from 1–2 in. at lower elevations and ~10 in. over the Olympic and Cascade Mts.

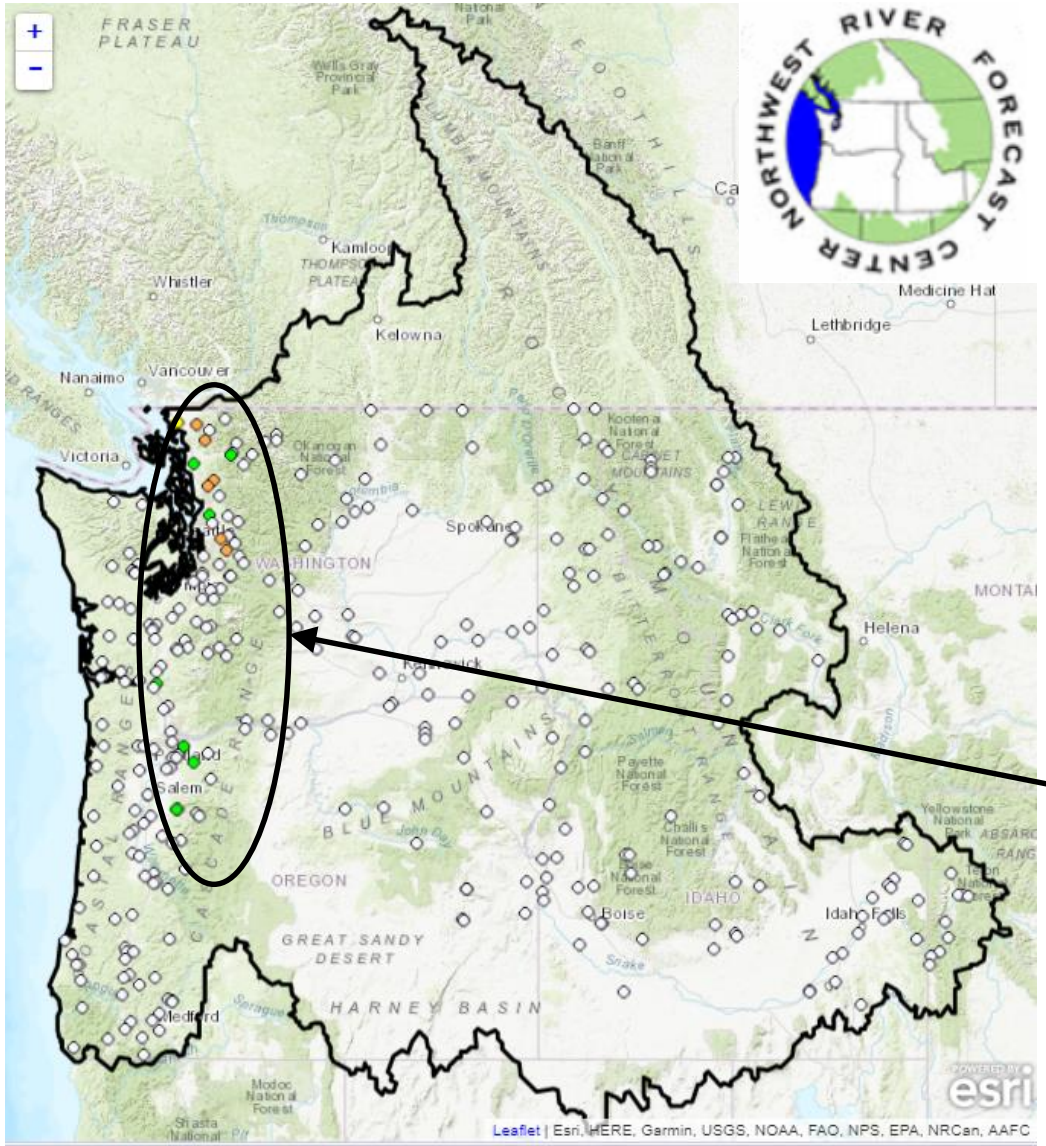


Day 4/5 QPF for AR 2 are suggesting accumulations of .5 – 2 in. at lower elevations and ~6.5 in. at higher elevations in the PNW



Total 5 day precipitation accumulations from both events could be as high as 15.5 inches over the Cascade and Olympic Mts.

AR Outlook: 18 October 2017

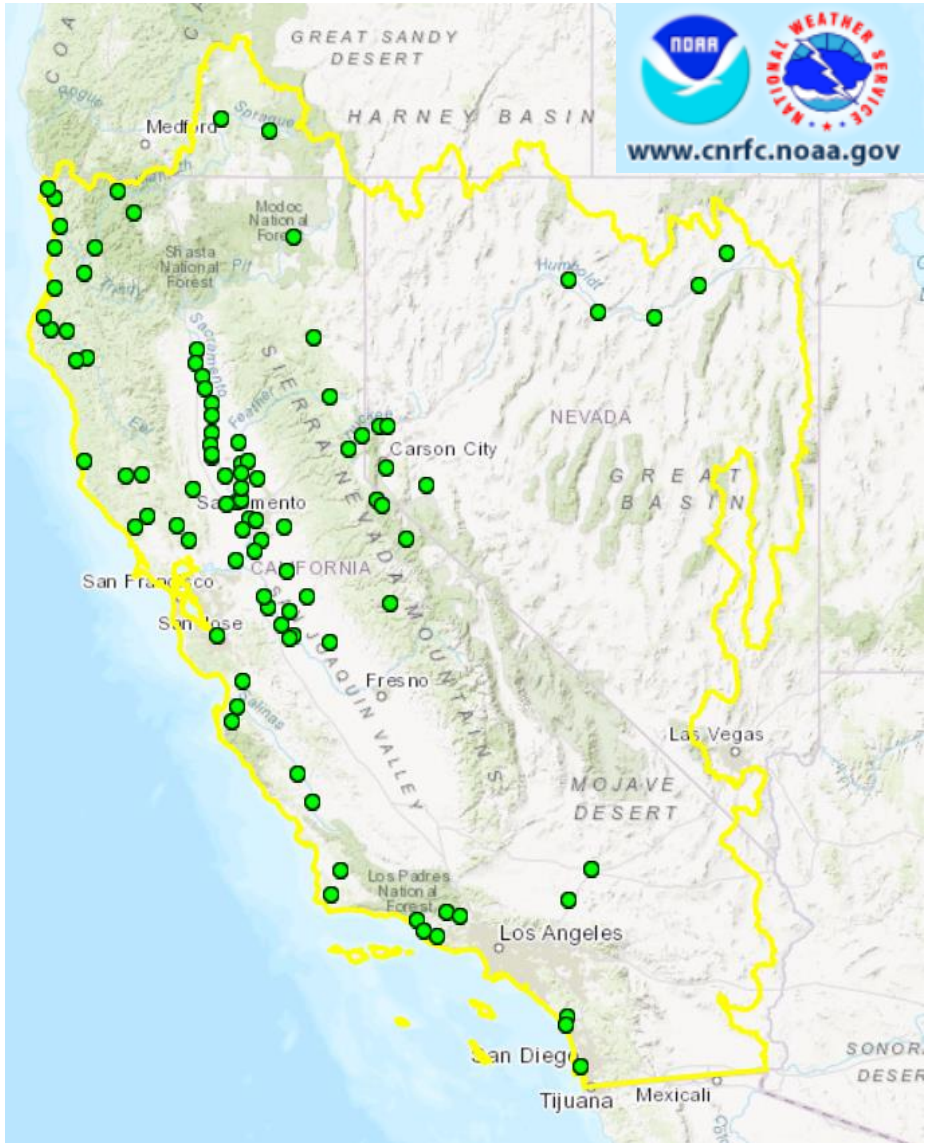


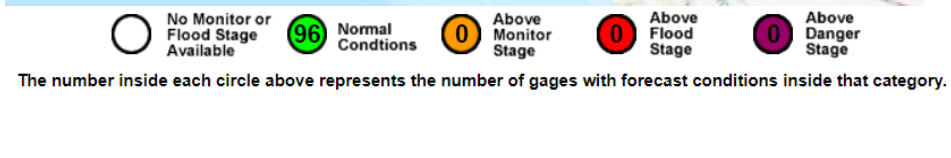
Since these ARs are early season storms (Water Year began 1 October), soil conditions are dry

Dry soil conditions will lead to less runoff as more precipitation will be absorbed by the soil

Less runoff will result in less flooding potential. Of all the forecast river stages provided by the NWRFC and CNRFC, only 14 are forecast to rise above Action/Bankfull or Monitor stage in the western foothills of the Cascades

No rivers are forecast to rise above or to flood stage





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

AR Outlook: 18 October 2017 – Will it rain over CA's wildfires?

Due to warm and dry conditions across CA, there are currently ~37 active fires.

6-day QPF from the California-Nevada River Forecast Center suggests that some CA locations could receive .1 –.25 inches in the North Bay, .3 – 1.3 in. over the Northern Sierra, and 1 – 5 in. over the Coastal Mts. Of NorCal.

This precipitation will provide some relief to active fires and dry/dangerous conditions.