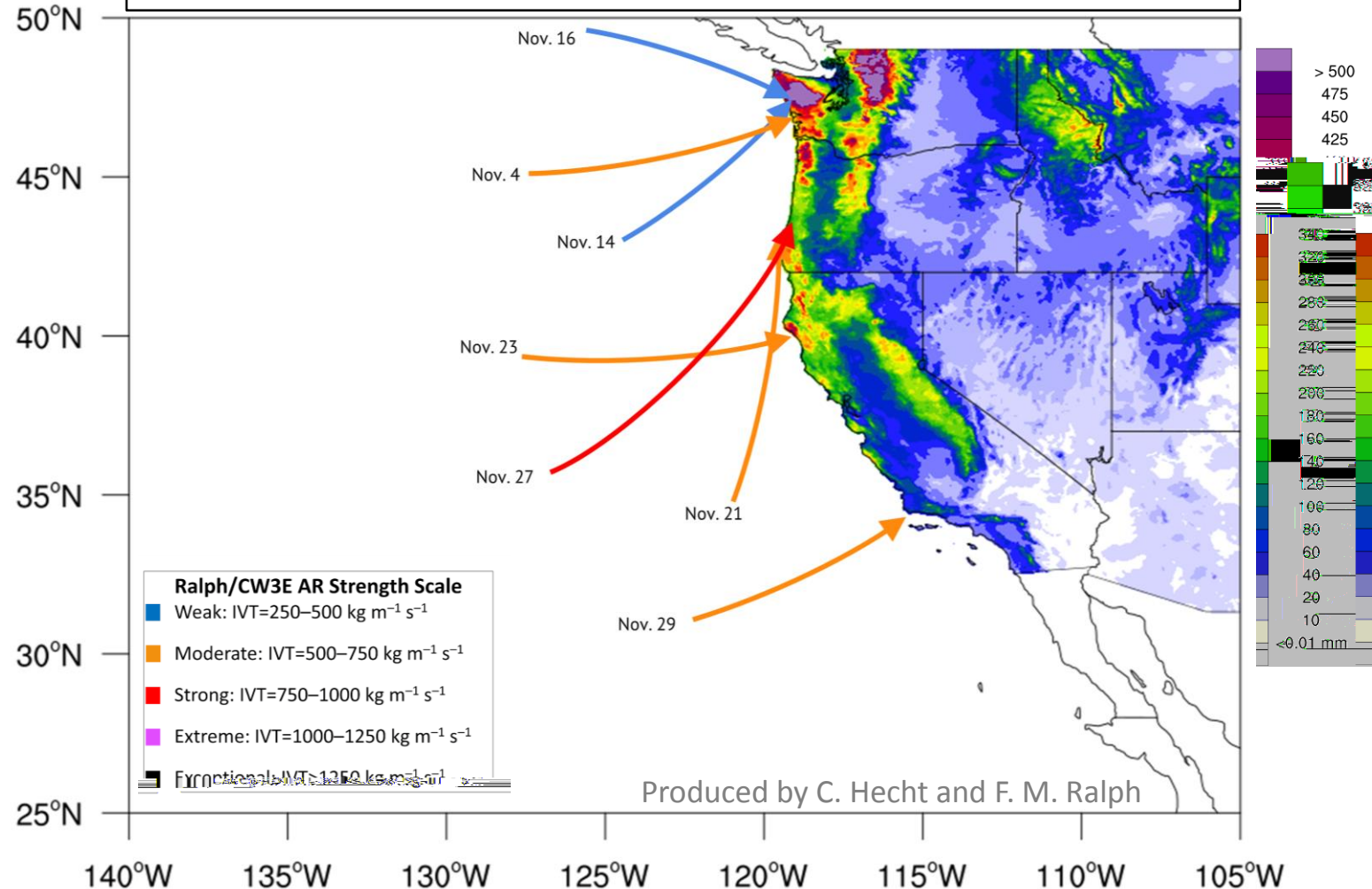


Water Year 2019: November Atmospheric Rivers

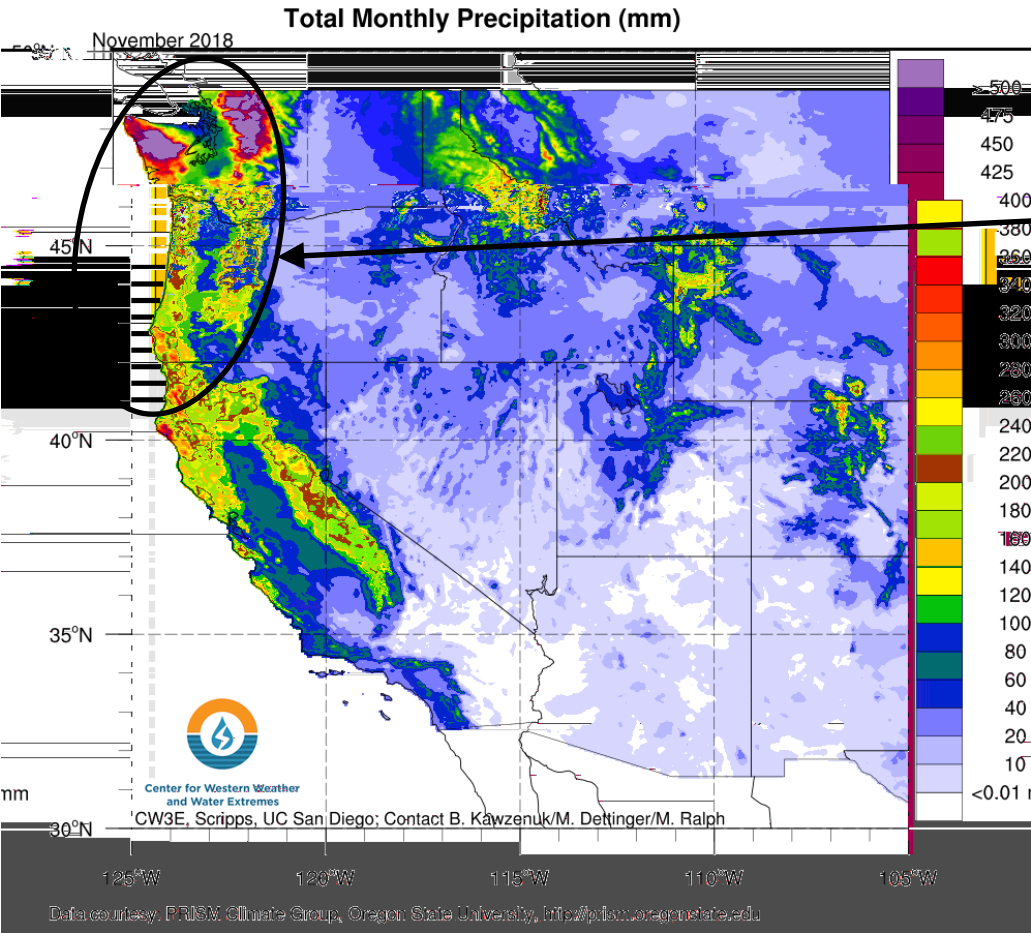
AR Strength	AR Count
Weak	2
Moderate	4
Strong	1
Extreme	0
Exceptional	0

Regions Impacted by Each AR	
State/Region	AR Conditions
Washington	6
Oregon	5
Northern CA	5
Central CA	5
Southern CA	3

- **Seven** atmospheric rivers made landfall over the U.S. West Coast during November 2018 (Second Month of WY 2019)

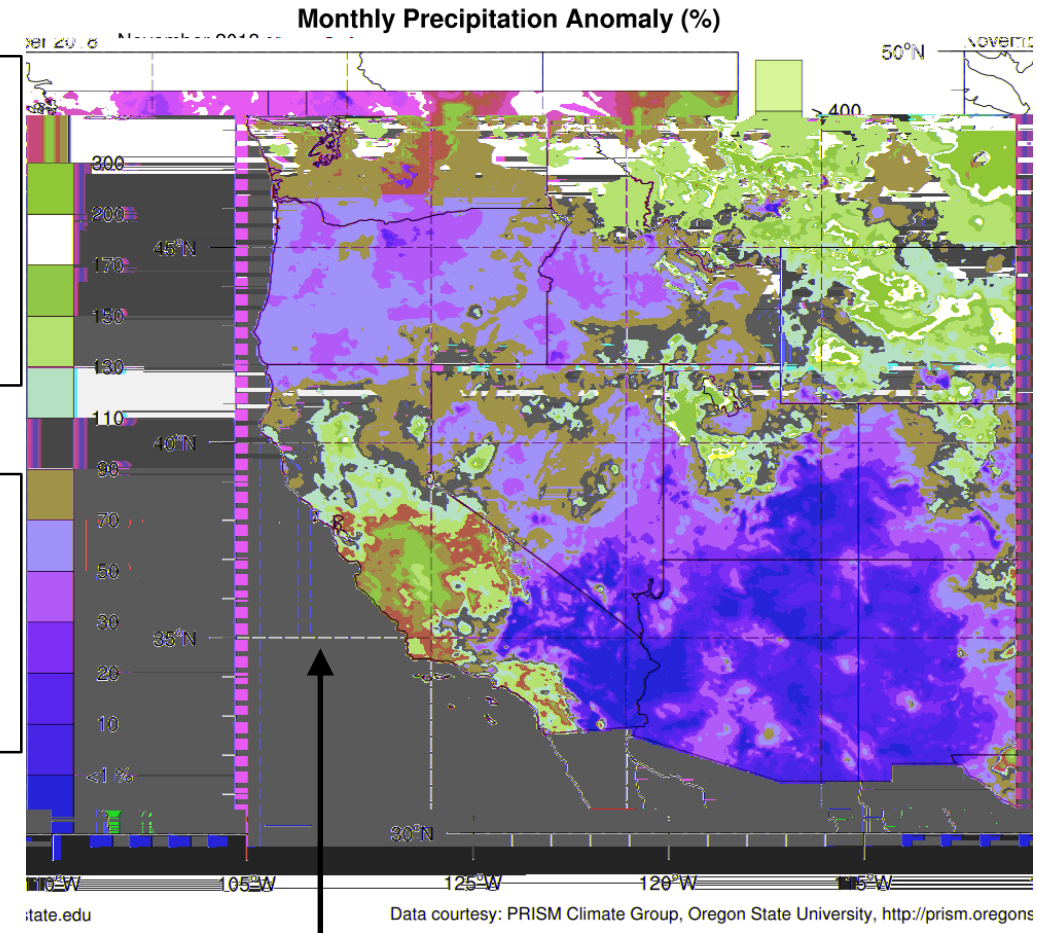


November 2018 Precipitation



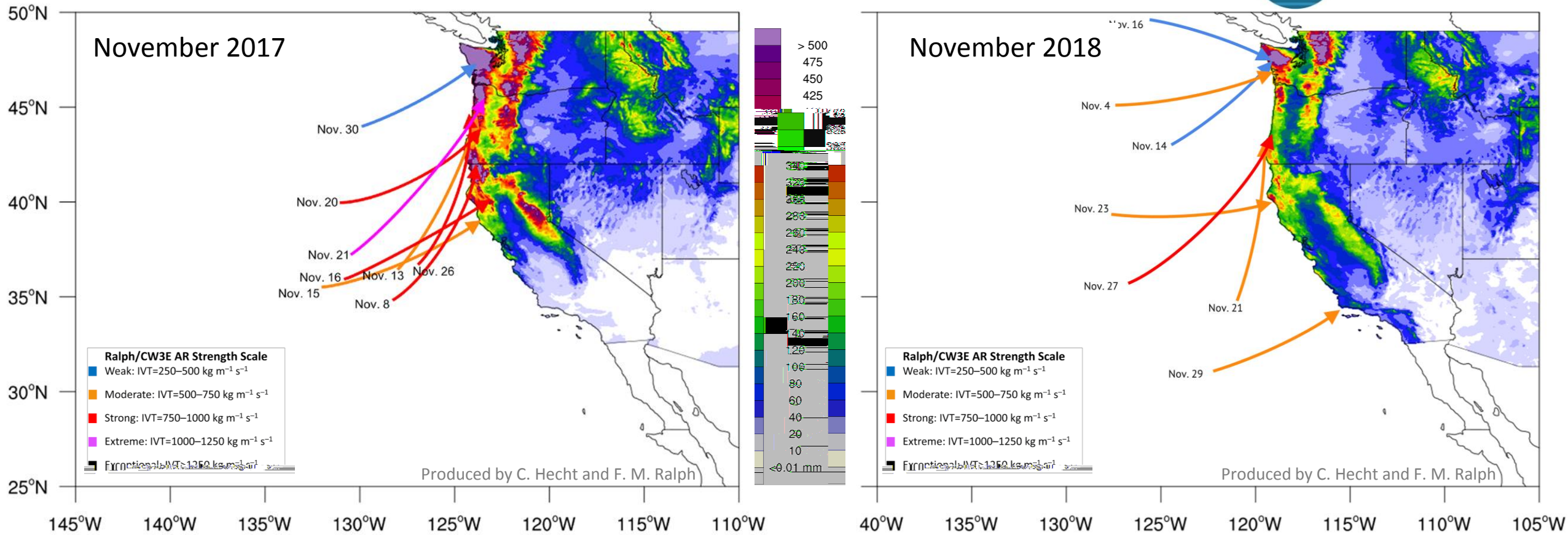
- The 7 total landfalling ARs contributed to >400 mm over portions of the Coastal, Olympic, and Cascade Mts. of the Pacific Northwest

- Parts of Northern CA received 200–350 mm, while southern California received 40–150 mm



- While the PNW Received the most precipitation, only Central and Coastal Southern CA received above normal precip. for the month of Nov.
- The Northern Cascades and Olympic Mountains in Washington were the only locations in the Pacific Northwest (PNW) that were above or slightly above normal for the month of November

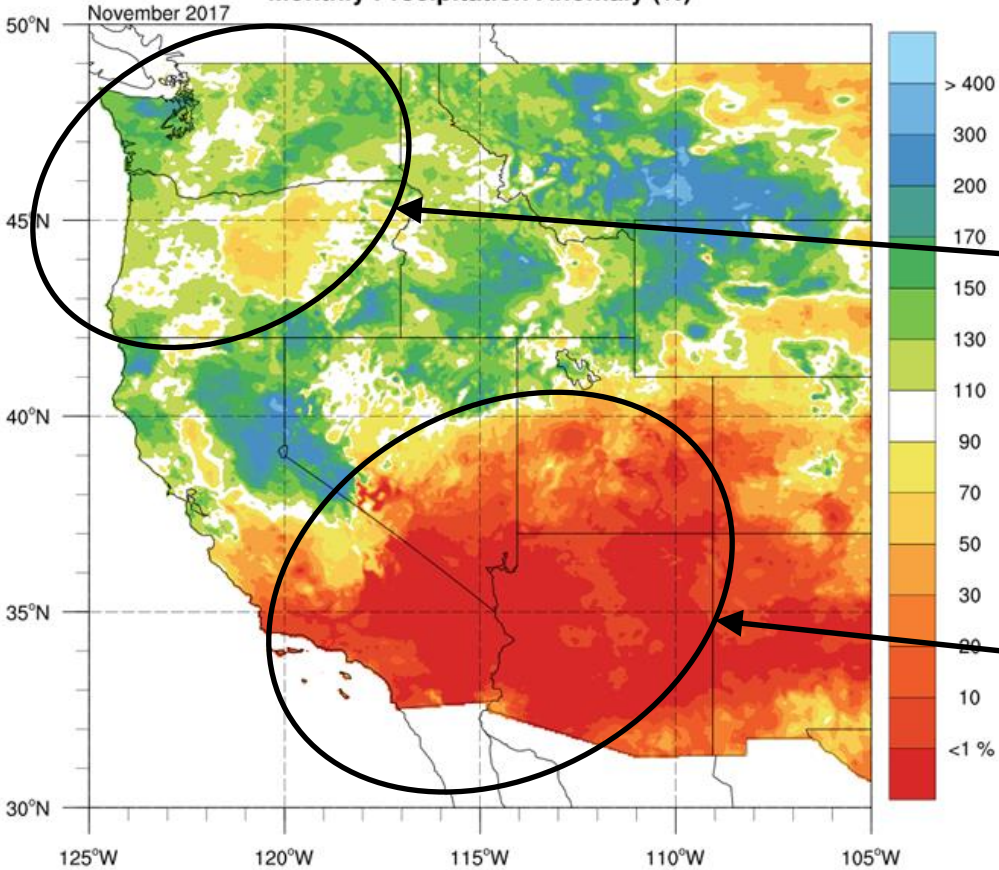
November 2018 Compared to November 2017



- November 2017 experienced one more landfalling AR compared to November 2018
- November 2017 also had 4 strong and 1 extreme AR, whereas November 2018 only had one strong and no extreme ARs
- The ARs during Nov. '17 were all strongest over the PNW/NorCal and a majority of ARs exhibited a southwesterly orientation
- These factors resulted in higher precipitation accumulations over the Cascade, Coastal, Olympic, and Northern Sierra Nevada Mountains of the PNW and Northern California during Nov. '17

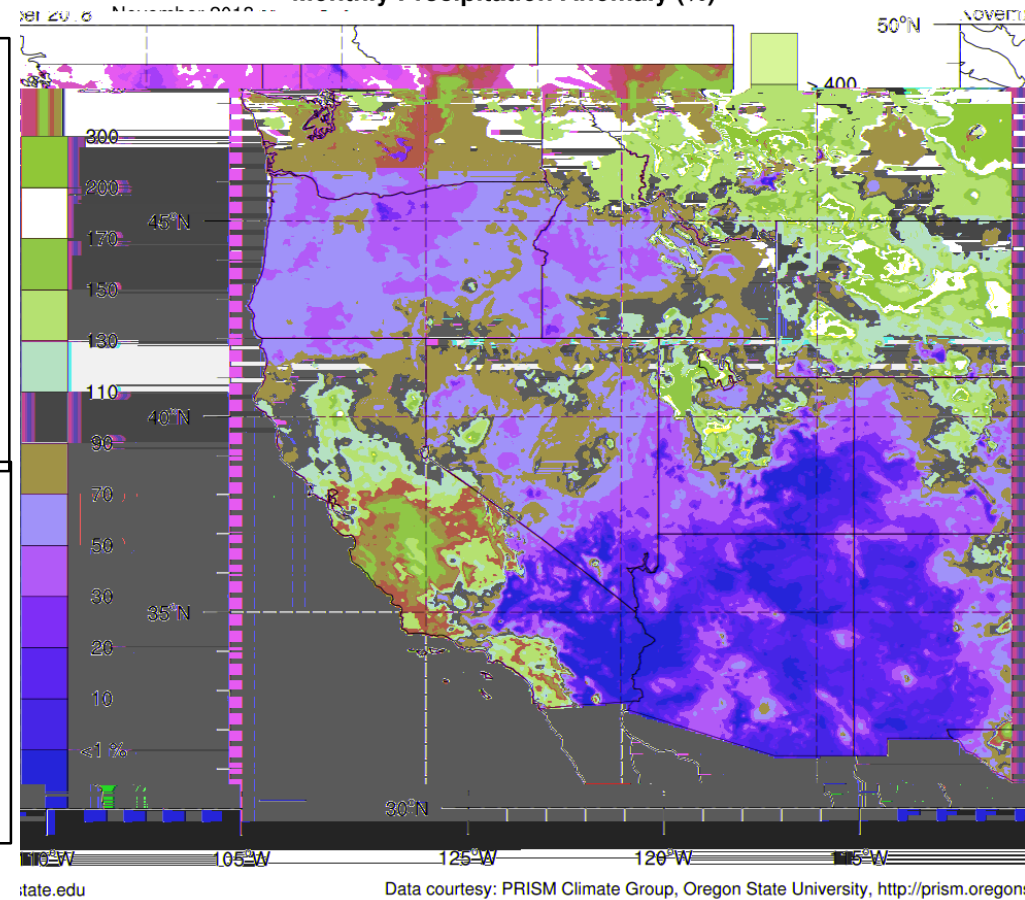
November 2018 Compared to November 2017

Monthly Precipitation Anomaly (%)



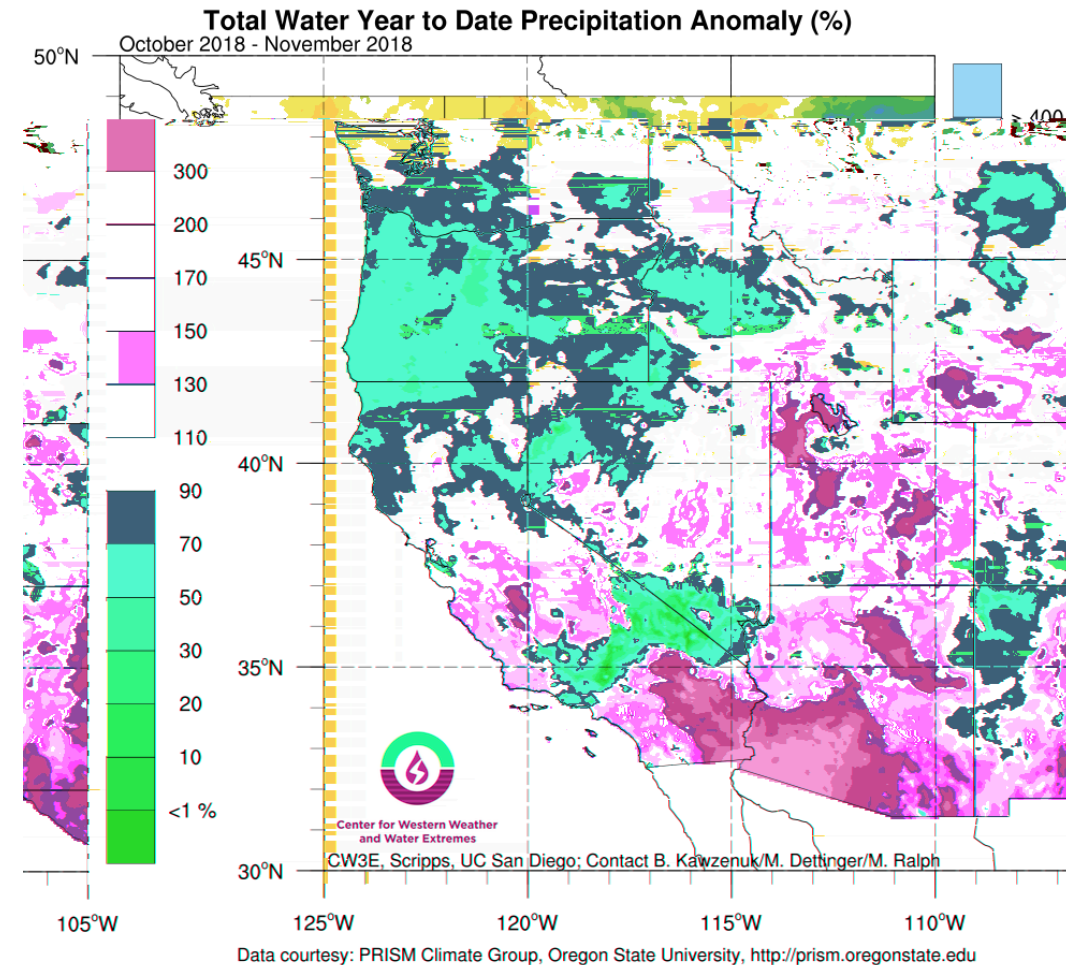
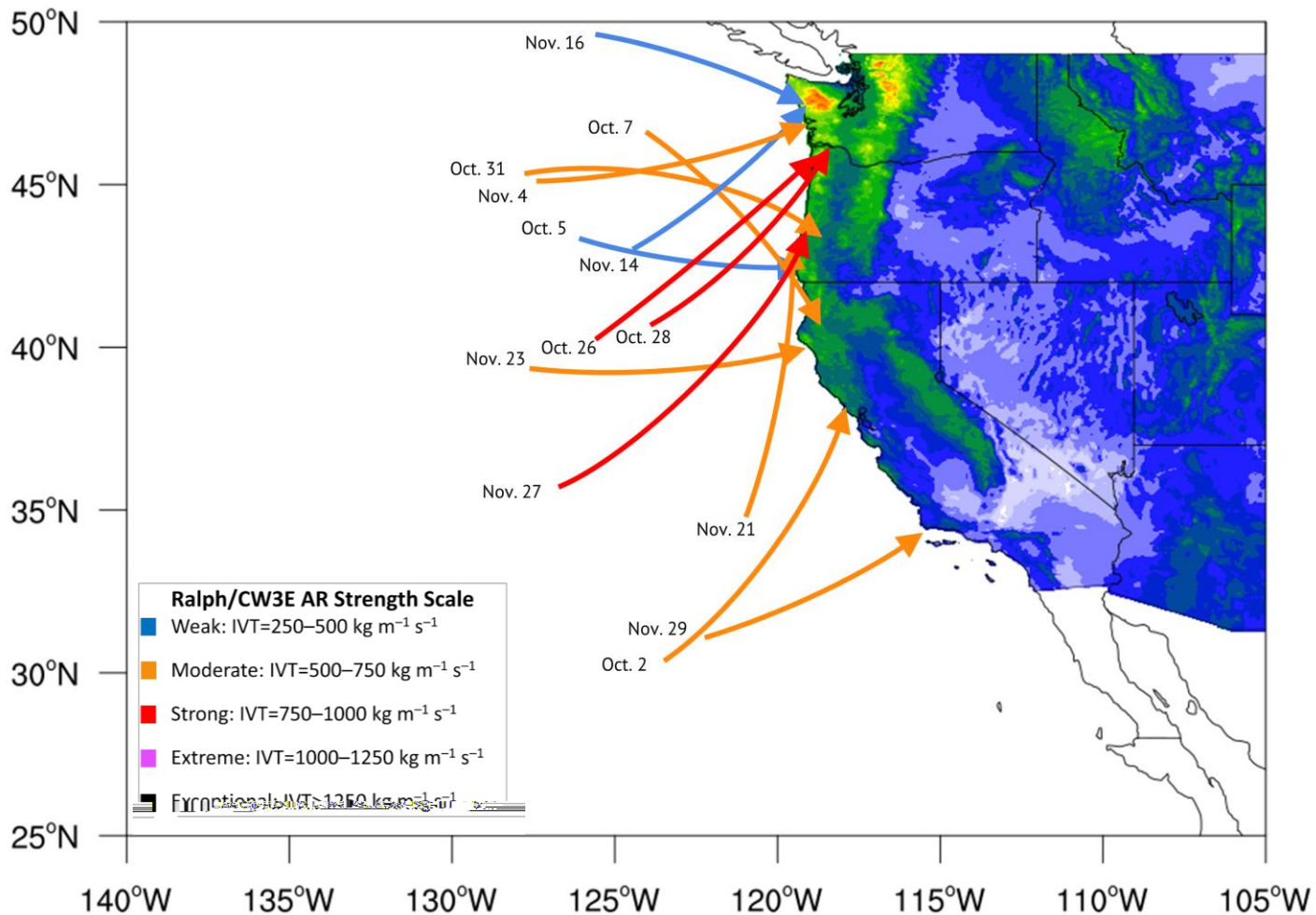
- During November 2017, a majority of WA, OR, and NorCal experienced above normal precipitation while states south experienced below normal precipitation
- Southern California, Southern Nevada, Southern Utah, and Western Arizona experienced <1% of the normal November precipitation

Monthly Precipitation Anomaly (%)



- When comparing this November to last November, there was essentially a reversal in the pattern of monthly precipitation anomalies
- Central and Coastal Southern CA received above normal precipitation, while a large portion of Northern CA was above or near normal
- Most of the Pacific Northwest, except the Olympic and Northern Cascades, was below normal for the month of November 2018

Water Year to Date Summary (Oct. through Nov.)



- The 7 ARs that made landfall during November 2018 brings the Water Year total to 13 (3 Weak, 7 Moderate, and 3 Strong)
- The total number that made landfall through November 2017 was also 13 (3 Weak, 2 Moderate, 6 Strong, and 2 Extreme)

- Through November 2018, A majority of WA and Or have received below normal WY to Date Precipitation
- Central and Southern CA, Southern NV, UT, and AZ have received above normal WY to Date Precipitation