

CW3E Atmospheric River Outlook – Ridge Update

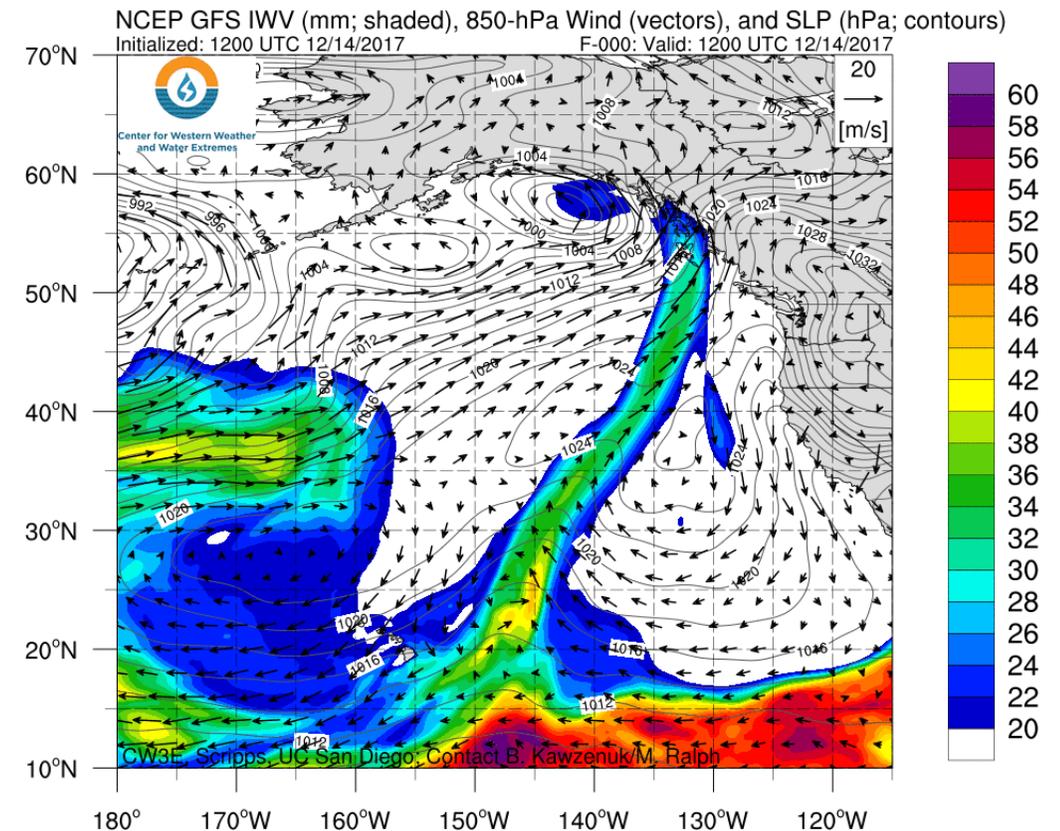
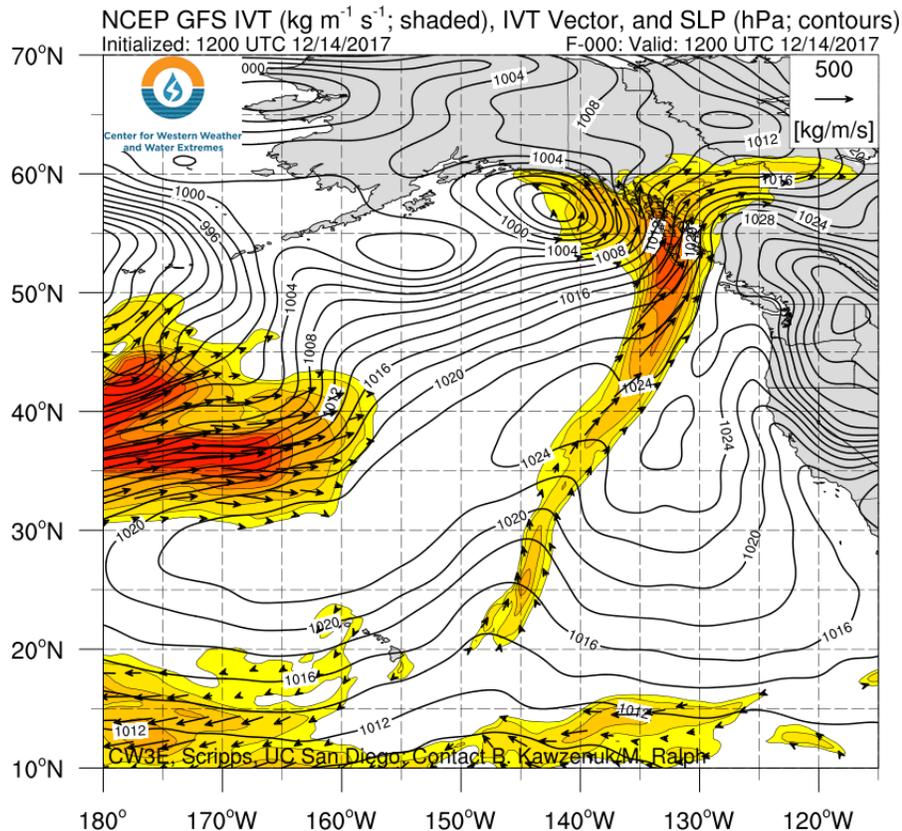


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Dry Conditions Expected to Persist over CA for the Foreseeable Future

- Persistent high pressure and ridging over the northeast Pacific and USWC is directing moisture transport towards AK and resulting in long periods of dry conditions over the USWC
- The lack of precipitation over the southern USWC is increasing Drought conditions and has resulted in the Northern Sierra 8-station index dropping below normal accumulations to date
- While ridging is forecast to persist, AR conditions are currently forecast to impact the West Coast but the unfavorable north/northwesterly orientation of IVT will result in little or no precipitation over CA



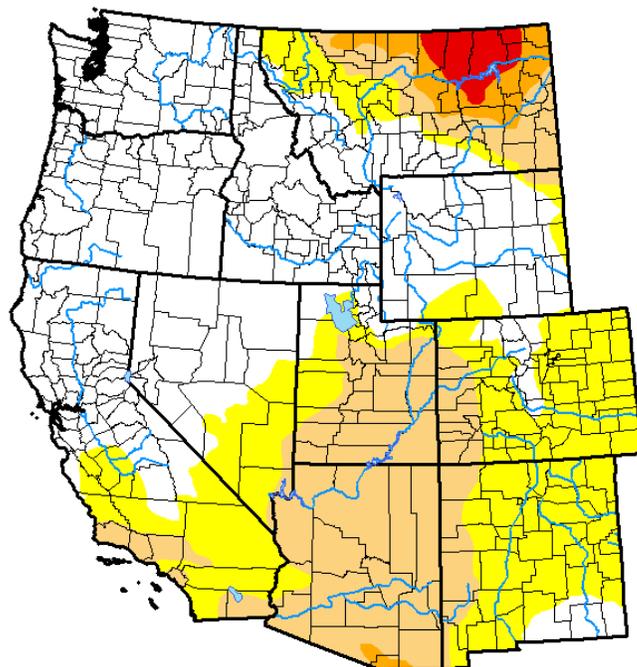
Ridge Update: 14 December 17

For California DWR's AR Program



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U.S. Drought Monitor West



December 12, 2017

(Released Thursday, Dec. 14, 2017)

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	48.48	51.52	25.17	3.94	1.52	0.00
Last Week 12-05-2017	59.75	40.25	24.59	3.94	1.52	0.00
3 Months Ago 09-12-2017	53.28	46.72	24.11	9.34	6.18	3.22
Start of Calendar Year 01-01-2017	54.19	45.81	21.51	8.53	5.11	2.44
Start of Water Year 09-26-2017	55.72	44.28	21.01	8.72	5.30	2.17
One Year Ago 12-13-2016	43.15	56.85	25.99	10.03	5.73	2.81

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

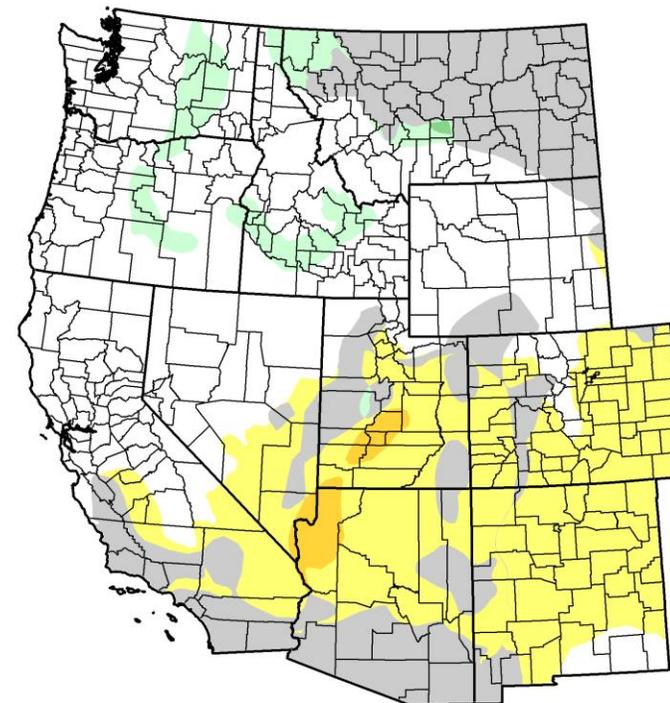
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<http://droughtmonitor.unl.edu/>

U.S. Drought Monitor Class Change - West 1 Month



December 12, 2017
compared to
November 14, 2017

<http://droughtmonitor.unl.edu>



The latest US Drought Monitor Index indicates that southern California, Arizona, southern Nevada, and Utah are under Abnormally dry to Moderate Drought conditions.

The absence of precipitation over the southern US West Coast since November has resulted in 1–2 drought class degradations over portions of southern CA, AZ, NV, and UT.

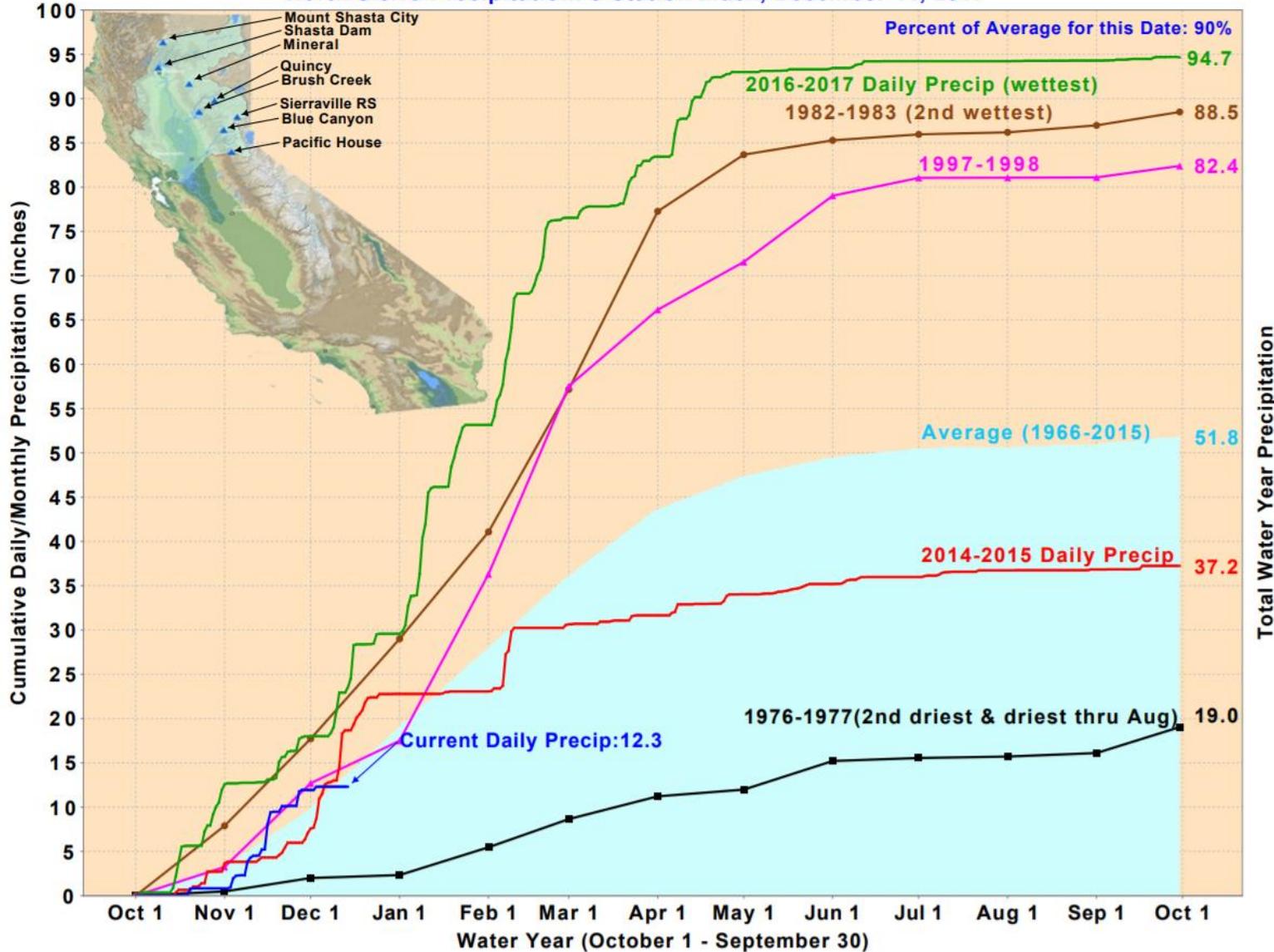
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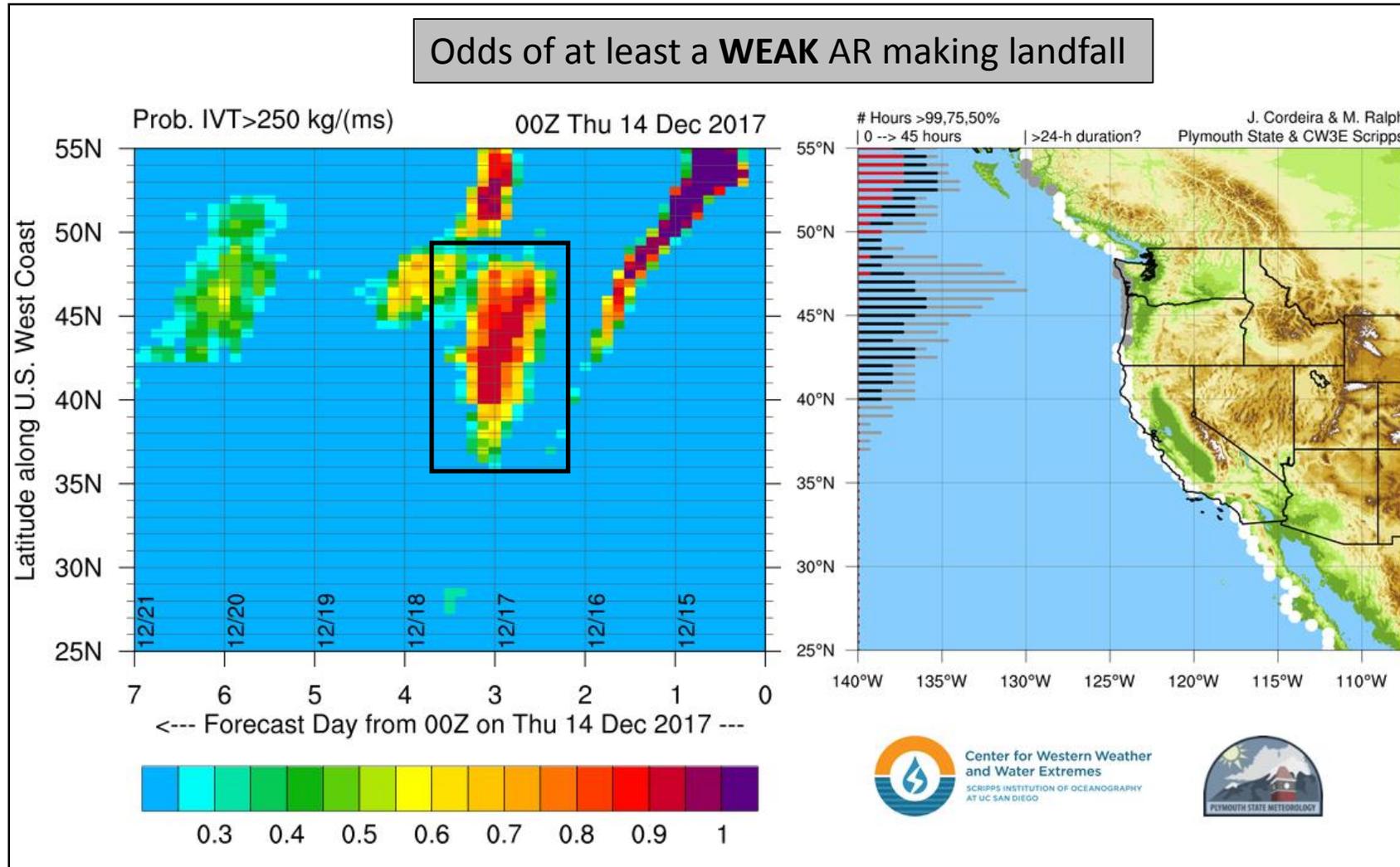
North Sierra Precipitation: 8-Station Index, December 14, 2017



The Northern Sierra 8-station precipitation index was above normal through mid November after multiple ARs made landfall in late October and November

Due to the lack of AR landfall driven by the persistent high pressure and ridging since mid to late November, the 8-station index has dropped to 90% of average precipitation to date (below average)

The longer the high pressure and ridging persists over the northeast Pacific and USWC, the more water year 2018 will drop below normal, resulting in a water year much different than WY 2017 (Wettest WY on record; ~182% of average)



- The CW3E AR Landfall Tool currently projects a high probability of IVT magnitudes $>250 \text{ kg m}^{-1} \text{ s}^{-1}$ on 12/16 \rightarrow 12/17
- Is this an AR that will bring rainfall to the U.S. West Coast?

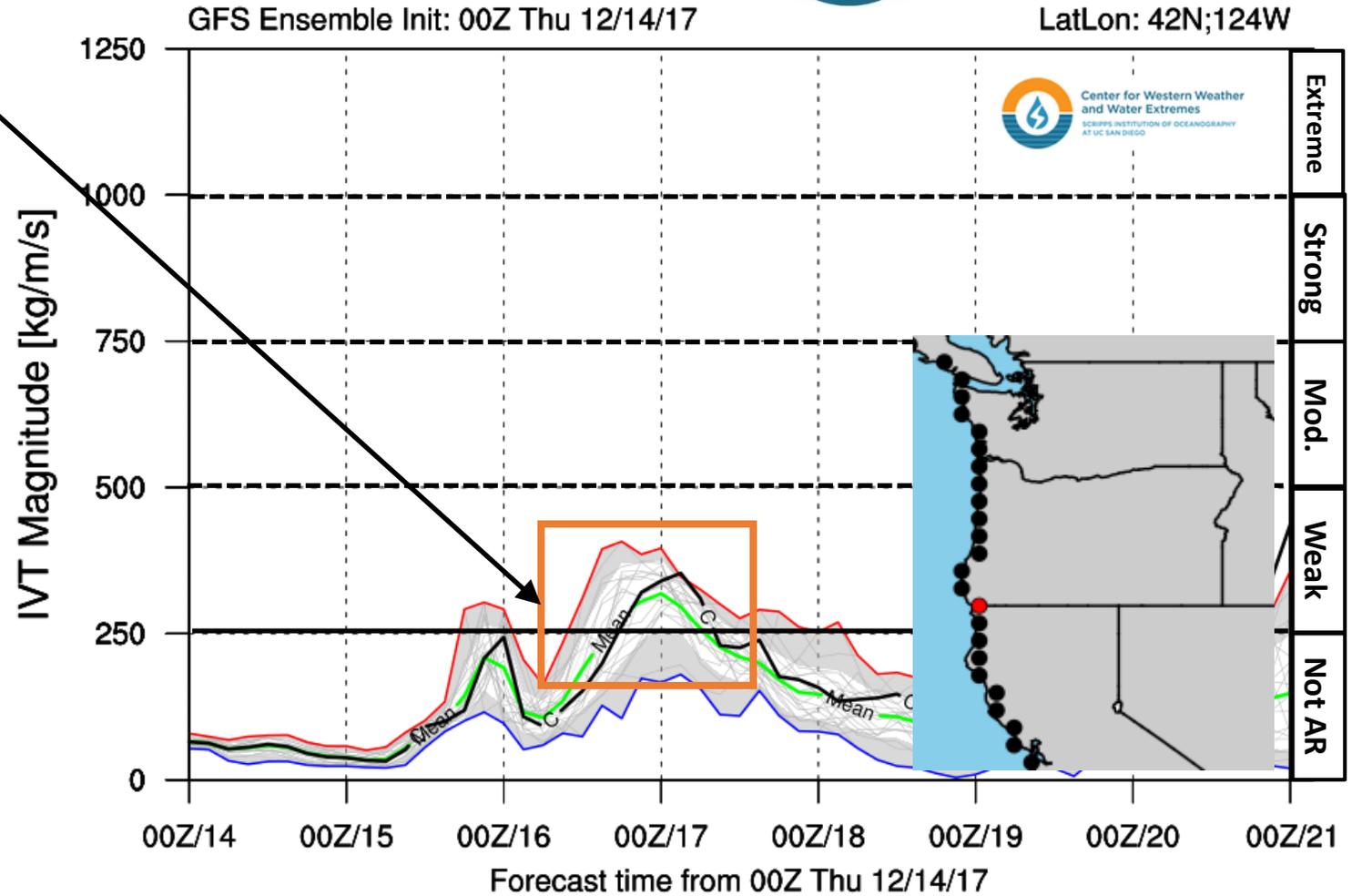
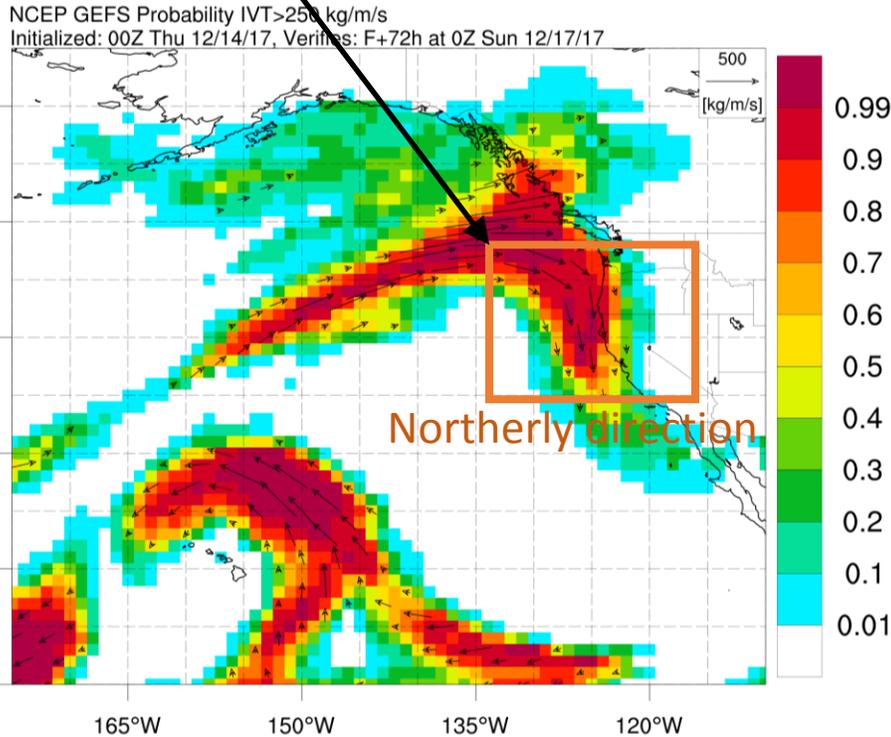
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- Plume diagrams illustrate ~12-18 hours of IVT magnitude $>250 \text{ kg m}^{-1} \text{ s}^{-1}$ at 42N
- The probability of IVT $>250 \text{ kg m}^{-1} \text{ s}^{-1}$ map illustrates that this area of enhanced coastal IVT is south of the primary landfalling AR in British Columbia and Vancouver and also associated with a northerly IVT direction
- Northerly IVT directions are unfavorable for precipitation

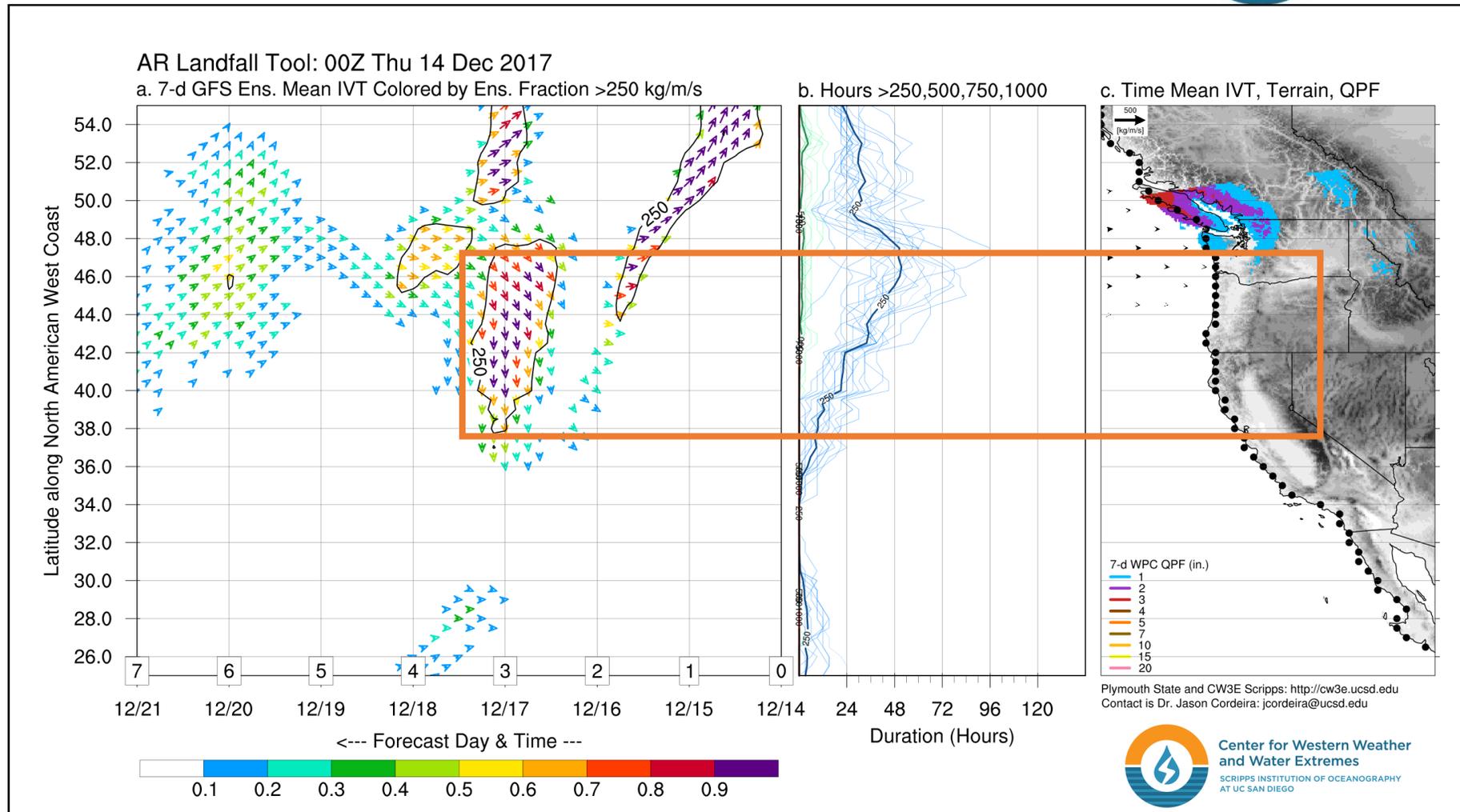


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A new tool developed by CW3E illustrates that while IVT magnitudes will exceed $250 \text{ kg m}^{-1} \text{ s}^{-1}$ for >24 hours, the IVT direction will be out of the west-southwest over Vancouver and out of the north along coastal latitudes in Oregon and California → resulting in forecasted precipitation for Vancouver and northwest Washington, and drier conditions farther south.