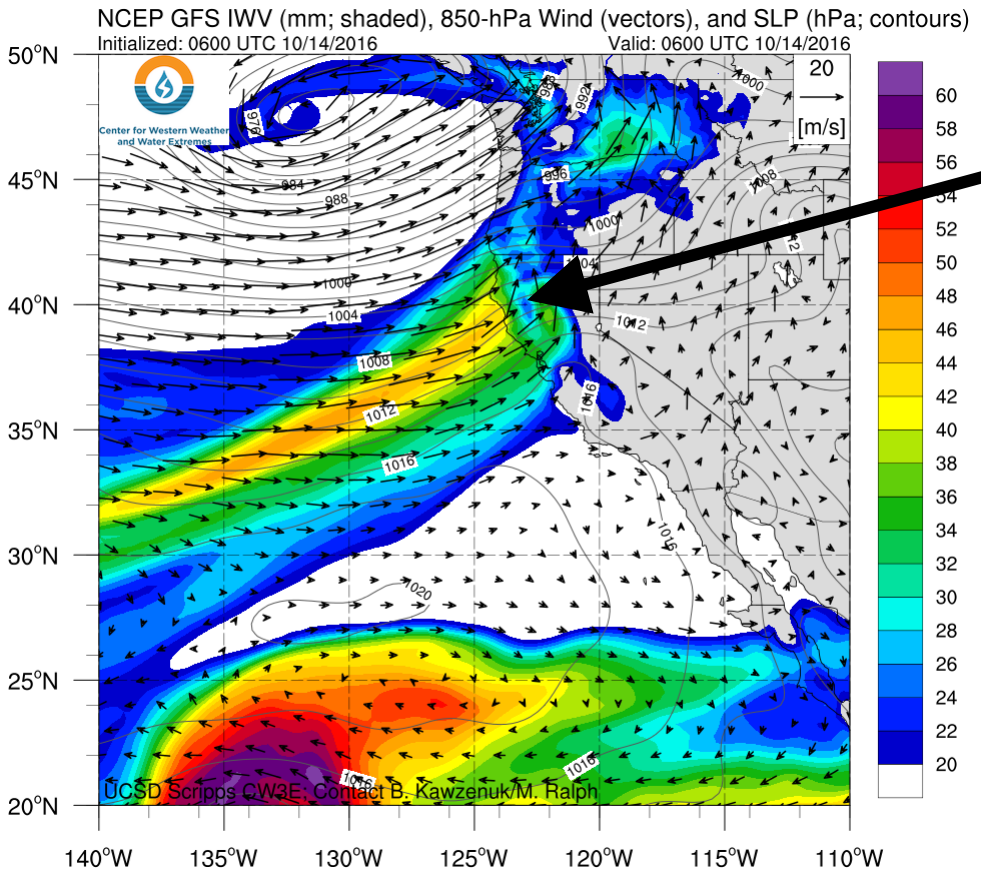
CW3E Atmospheric River Update – Summary & Outlook

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

For California DWR's AR Program

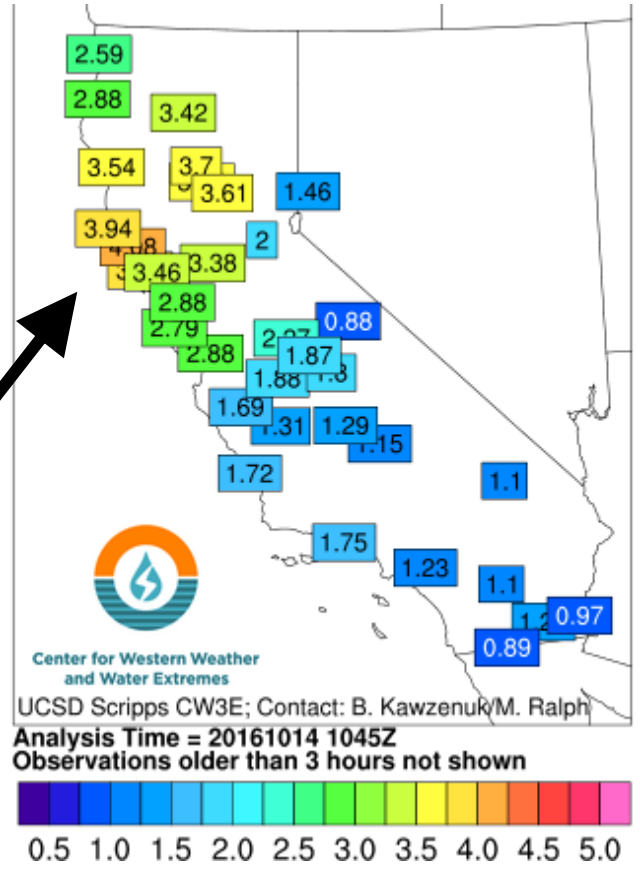
First strong landfalling Atmospheric River this water year hits NW US, including N. CA

- By Friday morning several areas received over 5 inches of rain in 24 hours
- Diagnosis confirms this included a strong landfalling atmospheric river
- Another AR is likely to hit, keeping things on track for 3-day totals in wettest mountain areas to exceed >12 inches (R-Cat 2)
- Dry soil and low streamflow in early season has absorbed a significant portion of the rain thus far



First AR had very large water vapor content at landfall on 14 Oct.

New network of sensors shows very large water vapor contents in northern California, up 4 cm.



Summary by F.M. Ralph 10 AM PT Fri 12 Oct 2016

Observations show the precipitation from Thursday morning to Friday morning was associated with the first landfalling atmospheric river of this wet period

National Weather Service
National Oceanic and Atmospheric Administration

WEATHER AND HAZARDS DATA VIEWER

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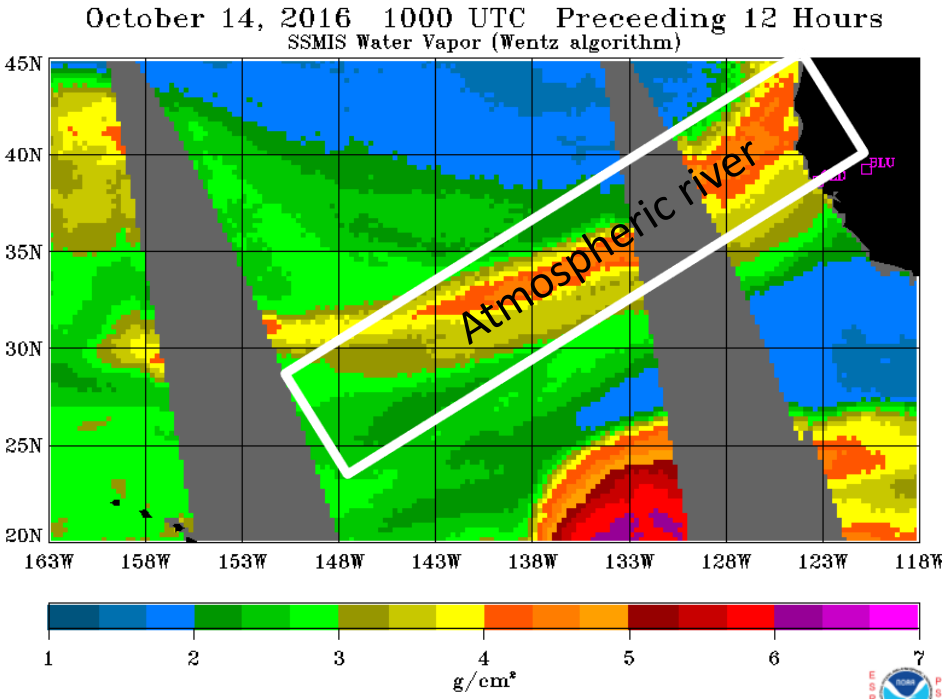
24 hour precipitation (inches)
Ending 6 AM PT Friday 14 October 2016

(only sites with over 1.5 inches are shown)

Maximum of over 7 inches near CA/OR border

Regions receiving over 5 inches are circled

7.3 inches of rain in 24 hours

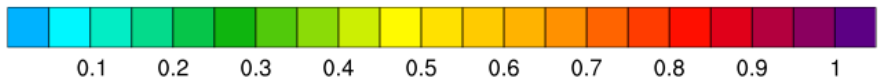


Satellite observations from NOAA/Wick showing Atmospheric river conditions Thursday night

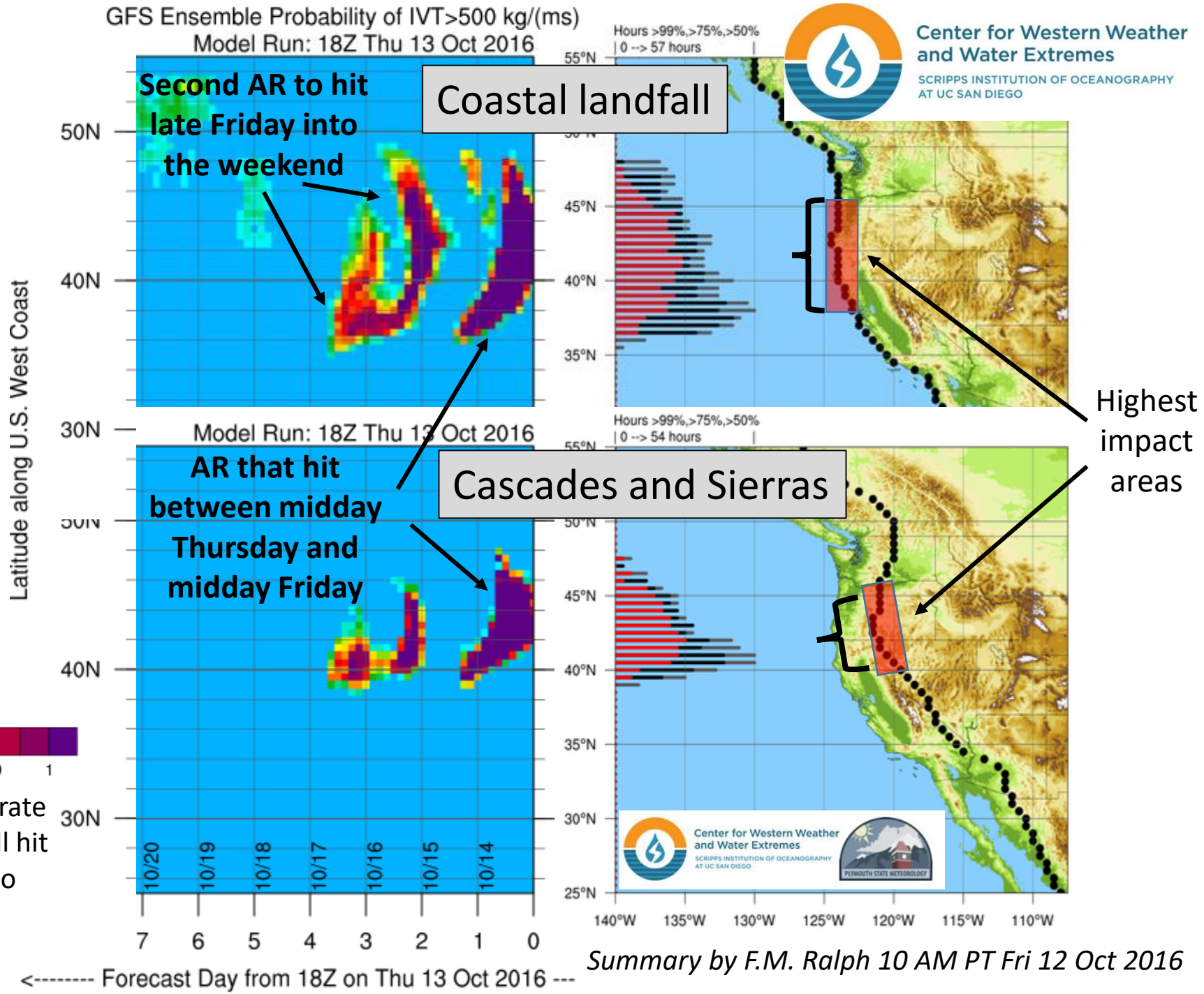
AR Landfall and Inland Penetration Probabilities

(as of midday Thursday 13 Oct)

Odds of a moderate strength atmospheric river making landfall (top panel), or penetrating inland to the Cascade and Sierra Nevada Mountains (bottom panel)



Color fill represents the % chance that moderate strength (>500 kg/m/s) atmospheric river will hit at that time and the latitude corresponding to the black dots in the right panels



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AR Outlook for Russian River CA area: 2 ARs back to back

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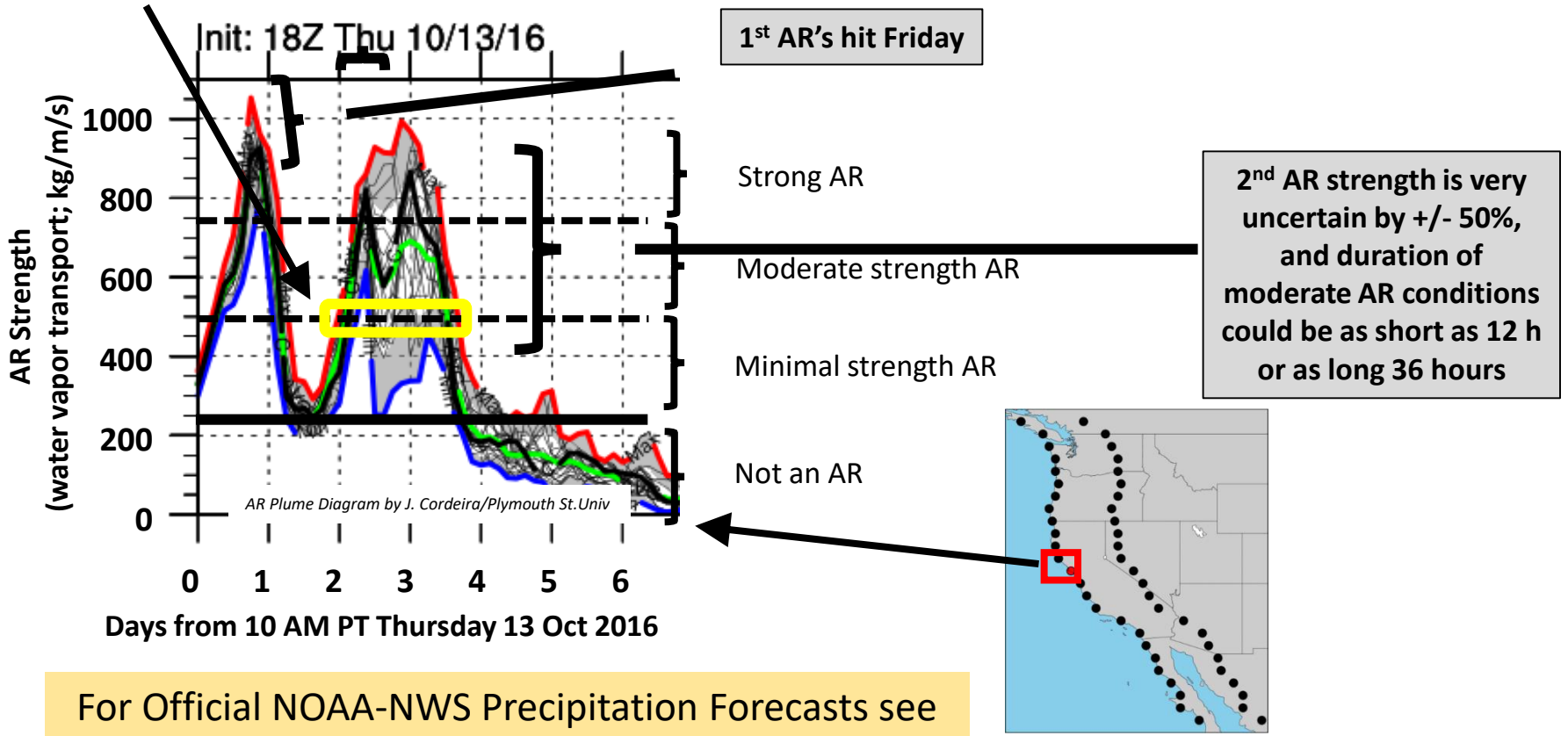
Onset of moderate-strength AR conditions Midday Saturday 15 Oct.



For Official NOAA-NWS Precipitation Forecasts see
http://www.wpc.ncep.noaa.gov/qpf/qpf2.shtml

For Official NOAA-NWS CNRFC Streamflow forecasts see
http://www.cnrfc.noaa.gov/rfc_guidance.php

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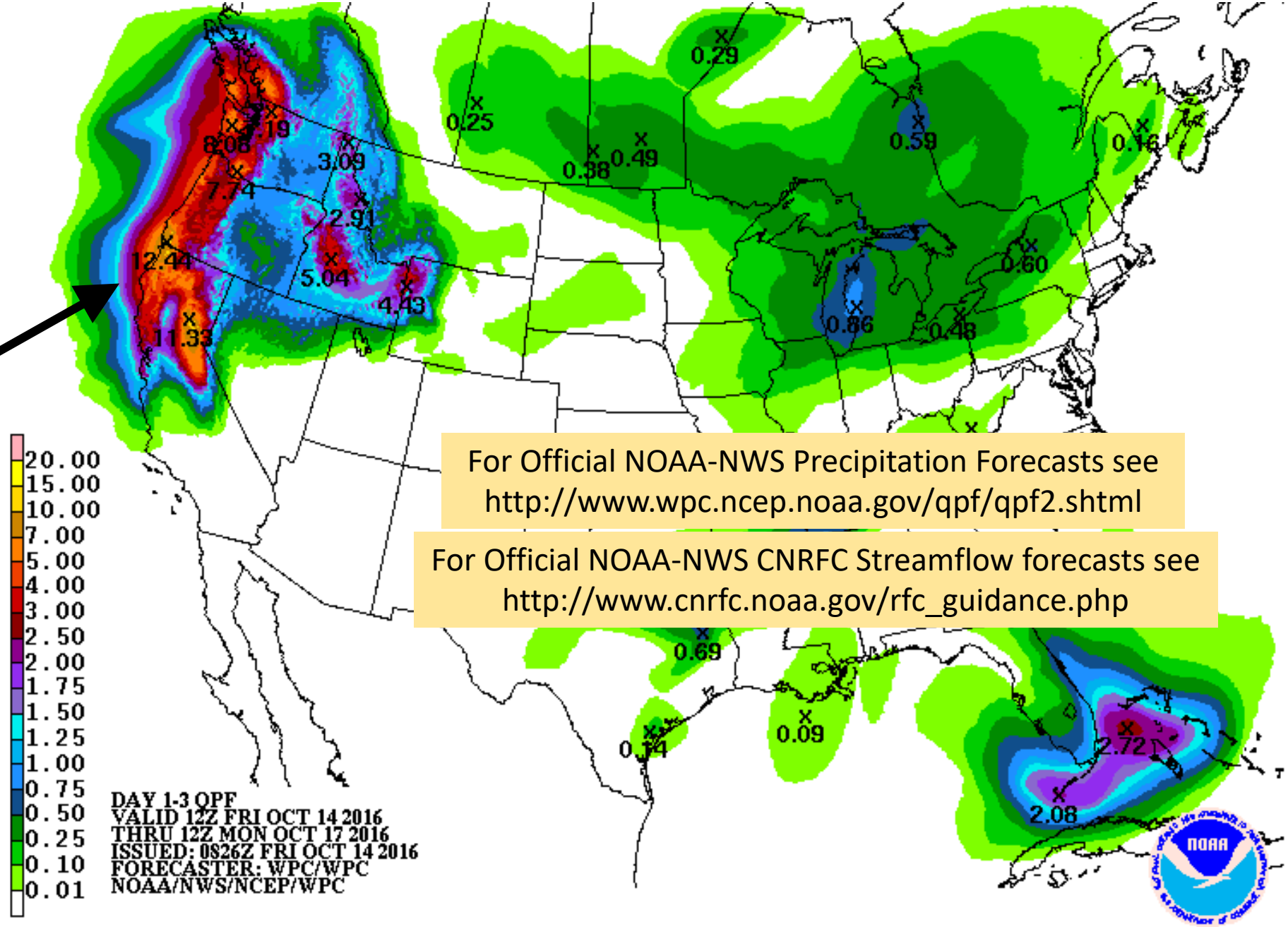
NOAA/NWS 3-day precipitation forecast Friday morning to Monday morning (14-17 Oct)

R-Cat 2 magnitude 3-day precipitation



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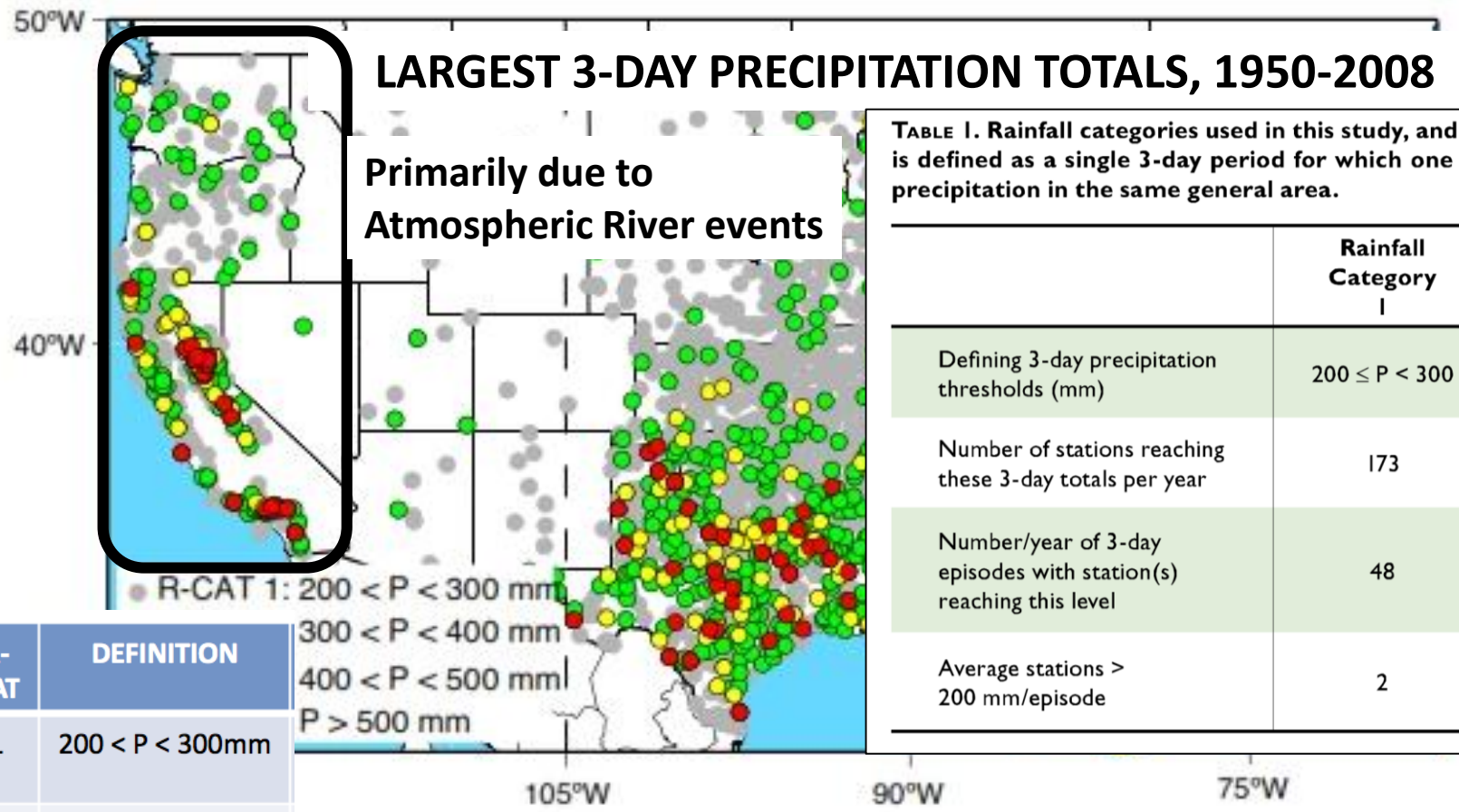
R-Cat Precipitation Scale: 3-day total rainfall



R-CAT	DEFINITION
1	200 < P < 300mm
2	300 < P < 400mm
3	400 < P < 500mm
4	P > 500mm

TABLE 1. Rainfall categories used in this study, and national frequencies of occurrence. Note that an "episode" is defined as a single 3-day period for which one or more stations observed at least 200 mm (~ 8 inches) of precipitation in the same general area.

	Rainfall Category 1	Rainfall Category 2	Rainfall Category 3	Rainfall Category 4
Defining 3-day precipitation thresholds (mm)	200 ≤ P < 300	300 ≤ P < 400	400 ≤ P < 500	500 ≥ P
Number of stations reaching these 3-day totals per year	173	23	4	2
Number/year of 3-day episodes with station(s) reaching this level	48	9	2	1
Average stations > 200 mm/episode	2	7	13	15

Ralph, F.M., and Dettinger, M.D. 2012, Historical and national perspectives on extreme west-coast precipitation associated with atmospheric rivers during December 2010: *Bulletin of the American Meteorological Society,* (2012)