

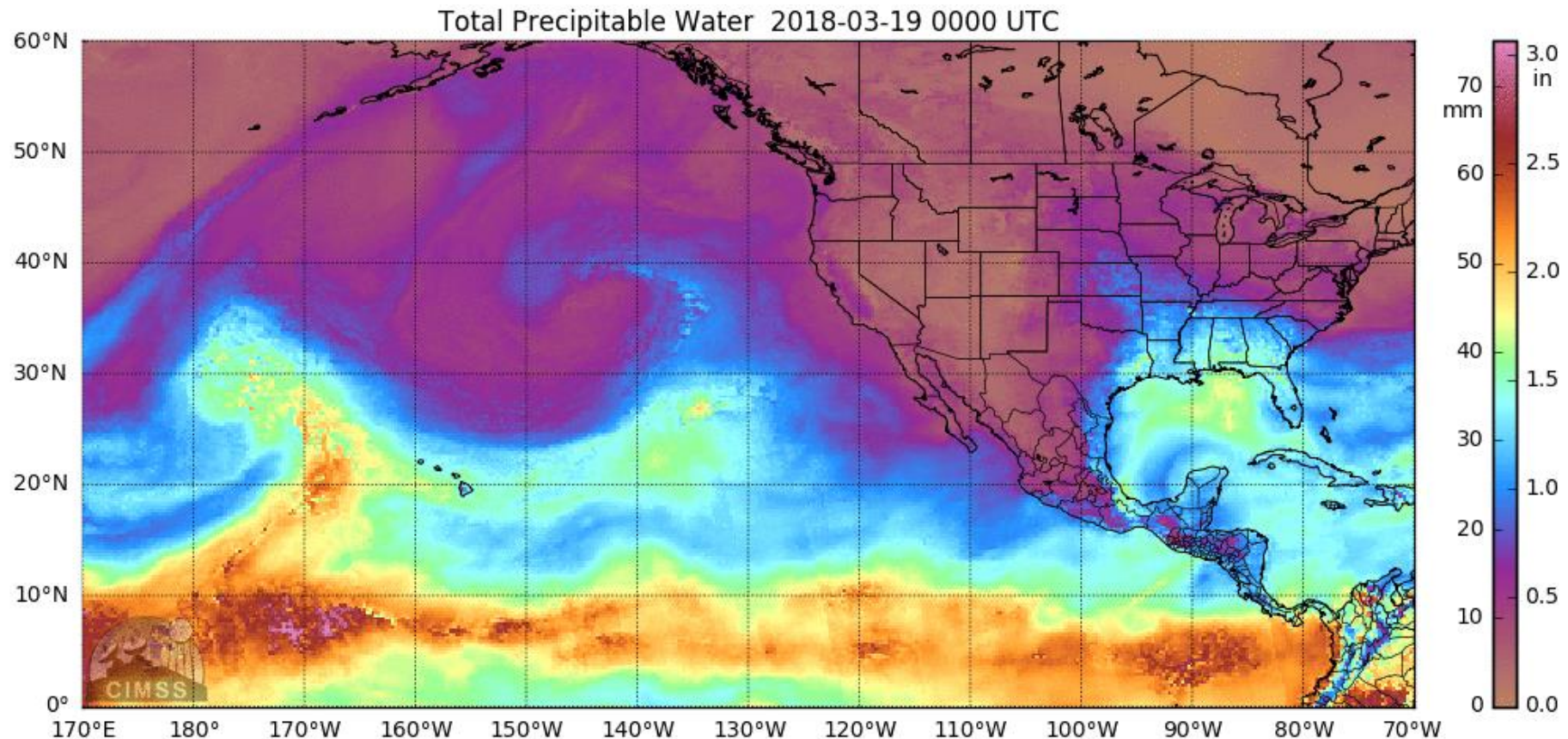
CW3E Atmospheric River Outlook



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

Update on Atmospheric River Forecast to Impact California This Week

- Precipitation continues to fall across portions of California
- The AR will begin to propagate southward bringing moderate AR conditions to Orange and San Diego Counties
- As much as 9.5 inches of precipitation has fallen over the Coastal Mountains of California during the last 48 hours
- ~3.75 inches of precipitation has fallen over the high elevations of Santa Barbara and Ventura Counties and 3.5 more inches could fall during the remainder of the storm
- AR conditions are expected to end at ~11 pm PDT (+/- 3 hours) tonight over Southern California



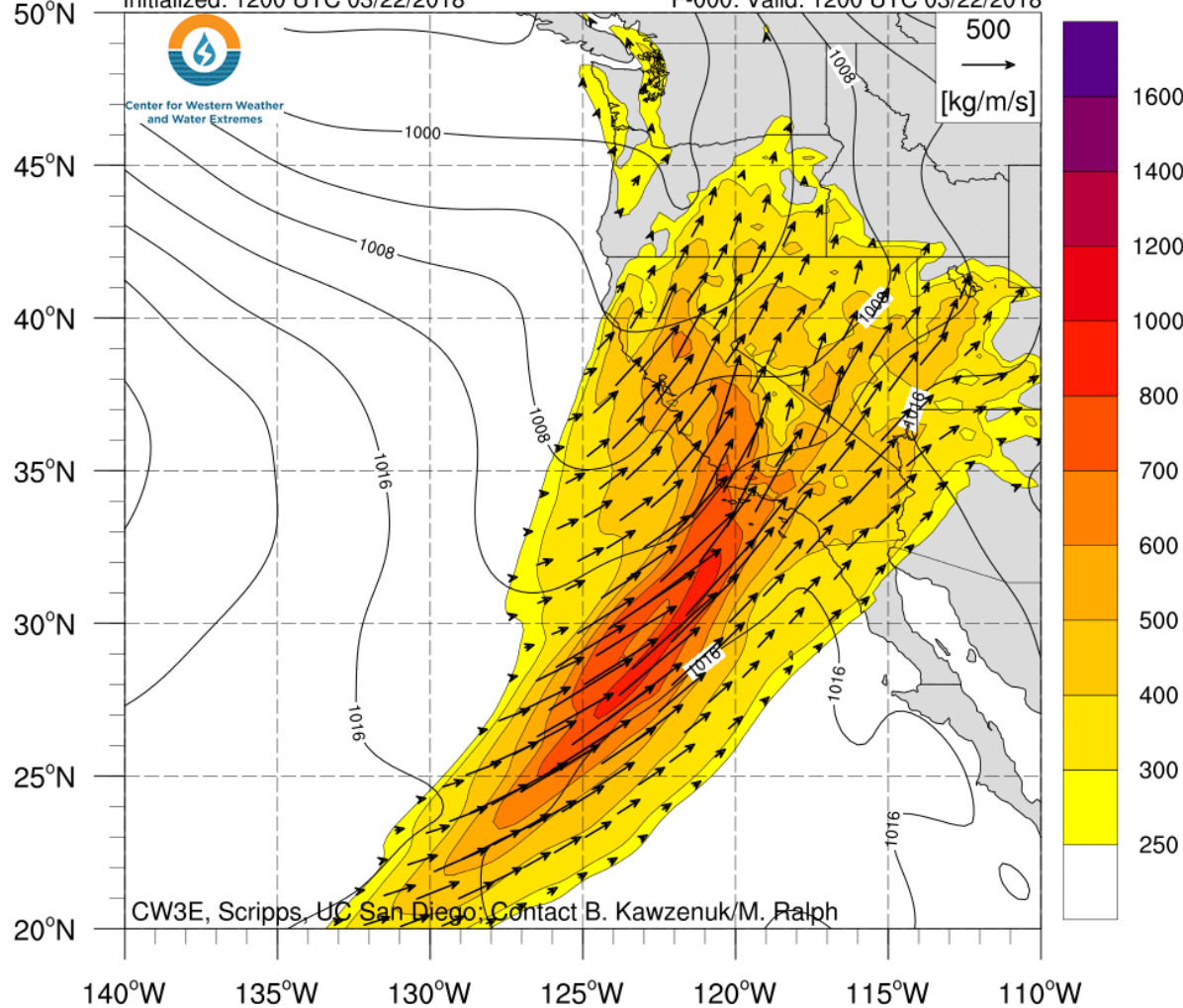
AR Outlook: 22 March 2018



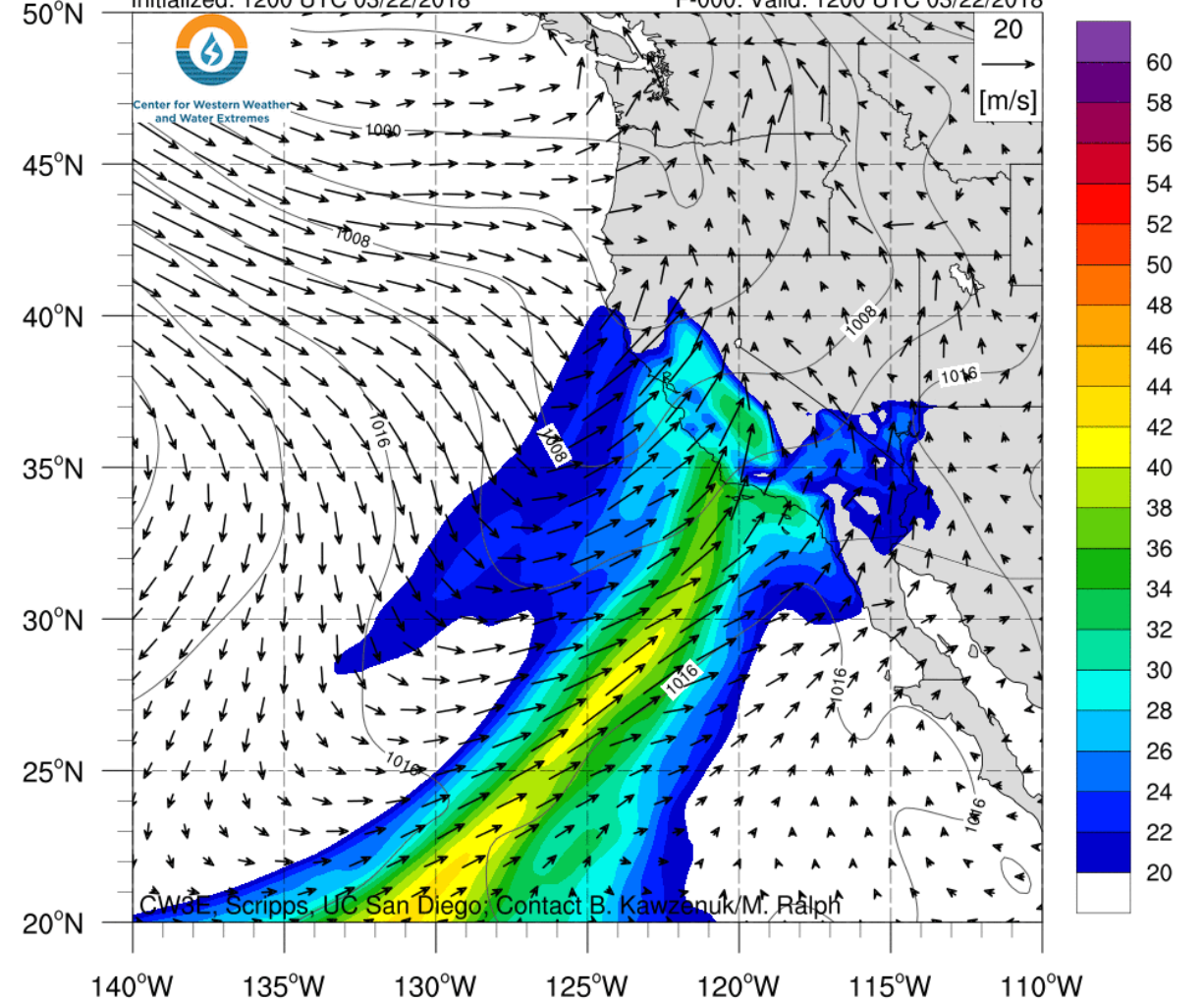
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NCEP GFS IVT ($\text{kg m}^{-1} \text{s}^{-1}$; shaded), IVT Vector, and SLP (hPa; contours)
Initialized: 1200 UTC 03/22/2018 F-000: Valid: 1200 UTC 03/22/2018



NCEP GFS IWV (mm; shaded), 850-hPa Wind (vectors), and SLP (hPa; contours)
Initialized: 1200 UTC 03/22/2018 F-000: Valid: 1200 UTC 03/22/2018



AR Outlook: 22 March 2018

For California DWR's AR Program



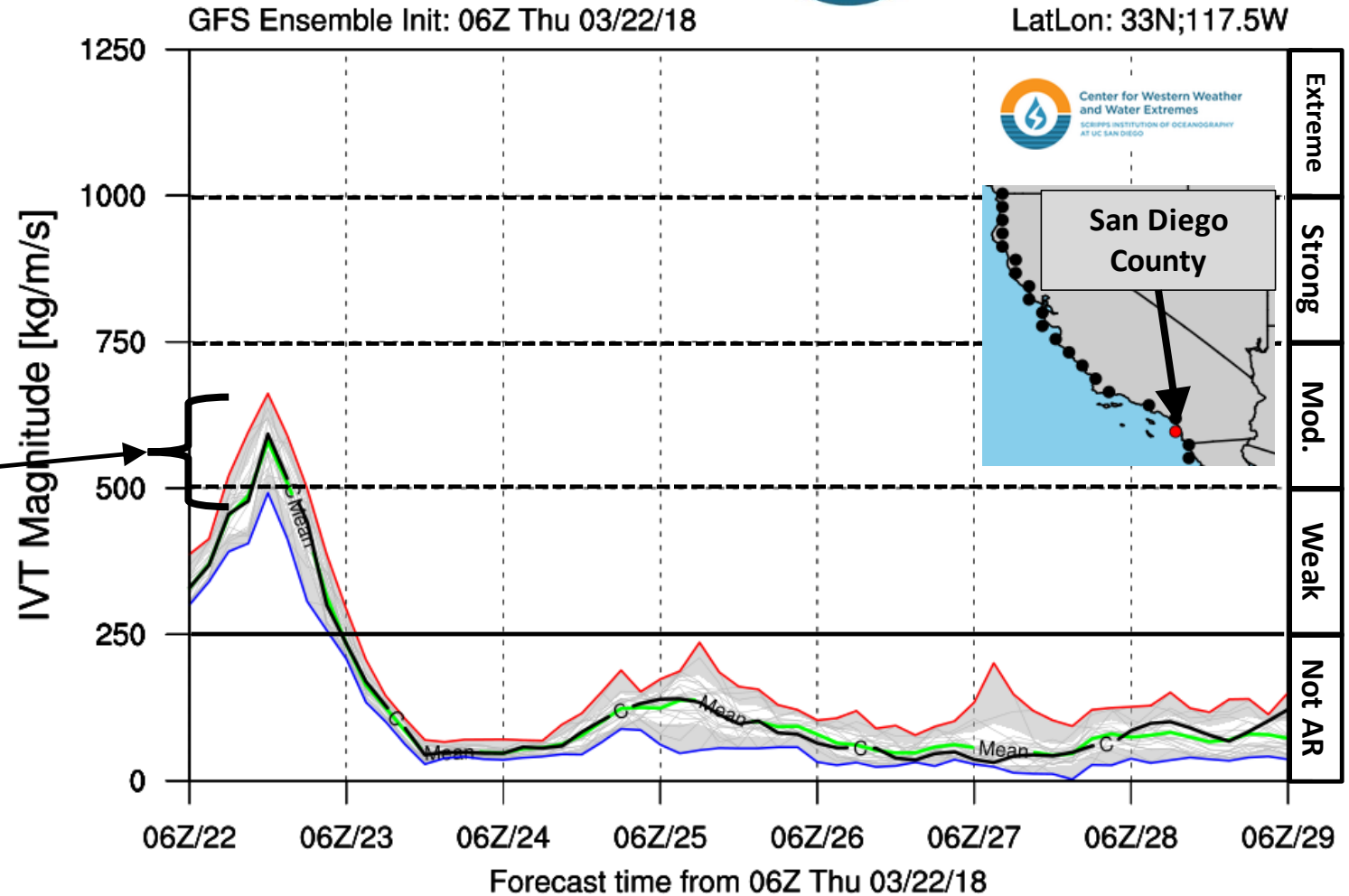
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San Diego County is forecast to experience
Moderate AR conditions for ~6 – 9 hours
between 11 AM PDT and 6 PM PDT Today

AR conditions are expected to end around 11
PM tonight

Magnitude of Potential AR

- Maximum predicted IVT $\sim 675 \text{ kg m}^{-1} \text{ s}^{-1}$
- Mean IVT $\sim 625 \text{ kg m}^{-1} \text{ s}^{-1}$
- Minimum IVT $\sim 500 \text{ kg m}^{-1} \text{ s}^{-1}$



AR Outlook: 22 March 2018



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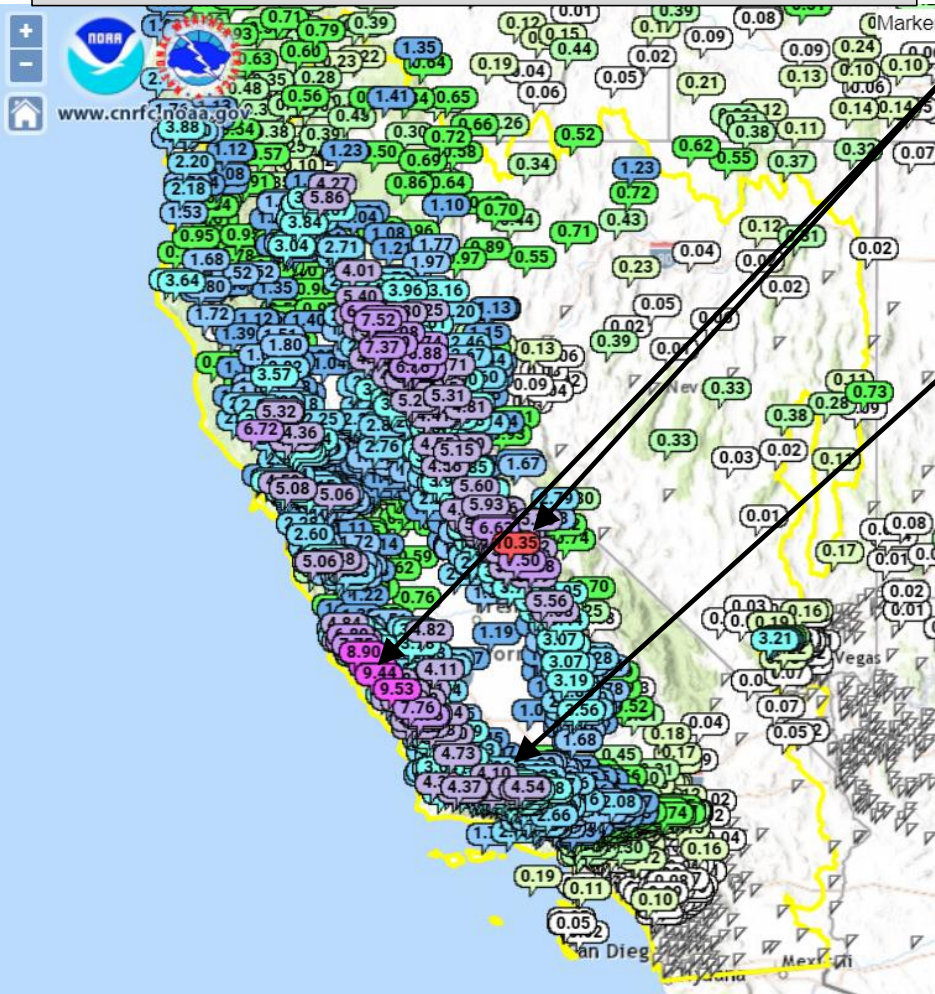
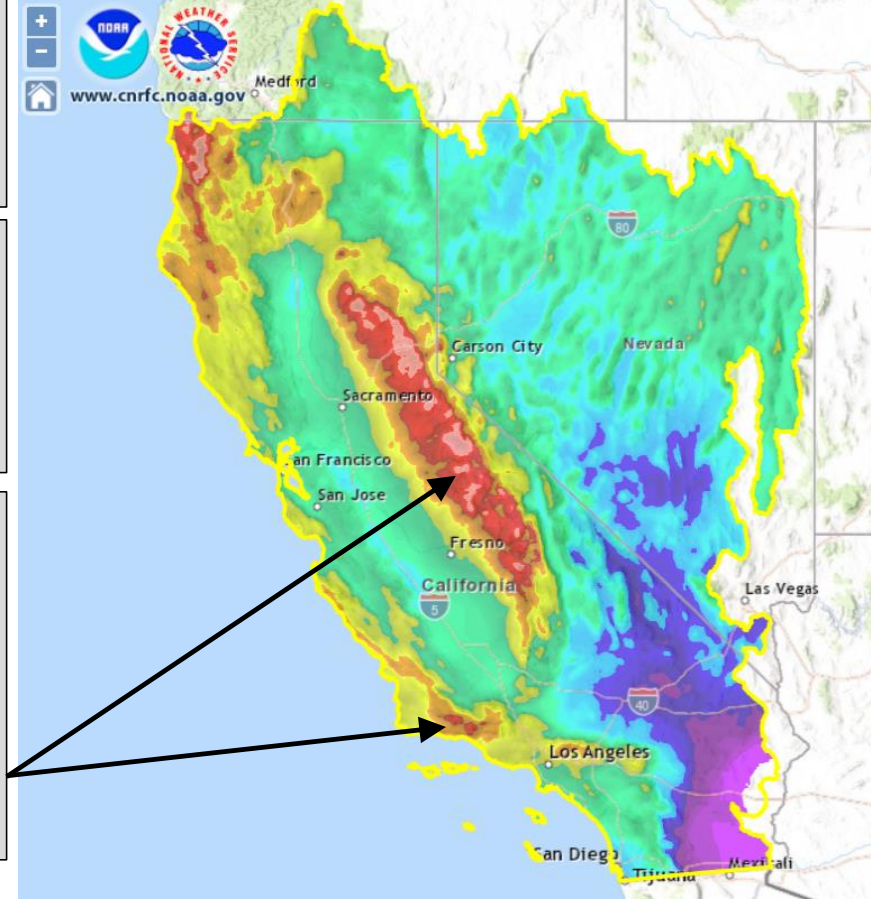
72-hr QPE ending 11:35 PM PDT 22 March
Raw Data not QC'd

As much as 9.5–10 inches of precipitation has fallen over the high elevations of the Coastal and Sierra Nevada Mountains over the past 72 hours

~3.75–4 inches of precipitation has fallen over the higher elevations in Santa Barbara and Ventura Counties

An additional 3.25 inches could fall over the Santa Ynez Mountains while as much as 4.5 could fall over the higher elevations of the Sierra Nevada Mountains

72-hr QPF ending 5 AM PDT 25 March
Raw Data not QC'd

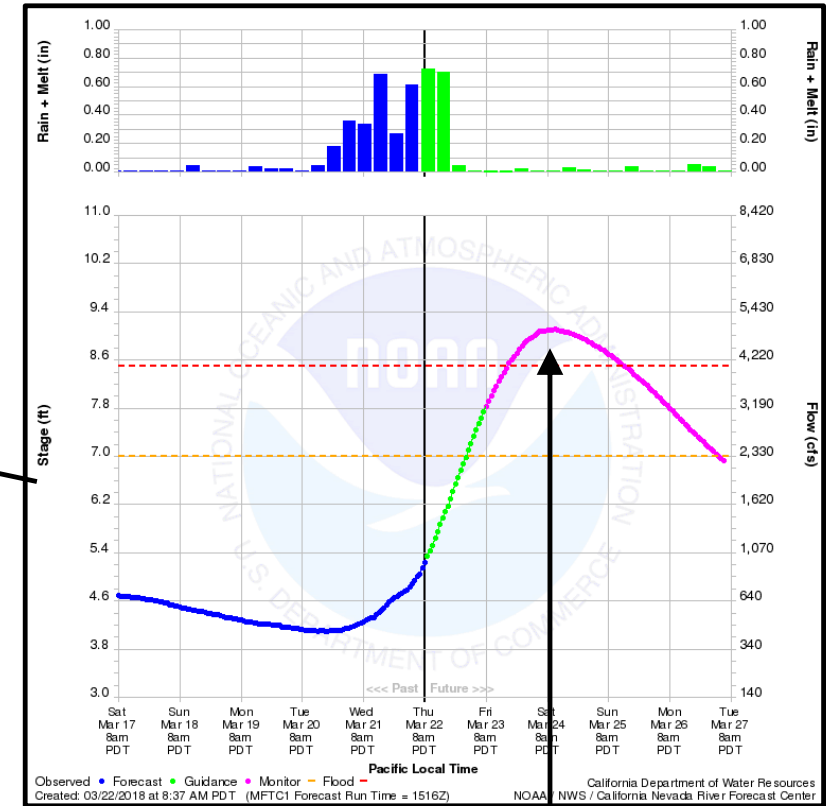
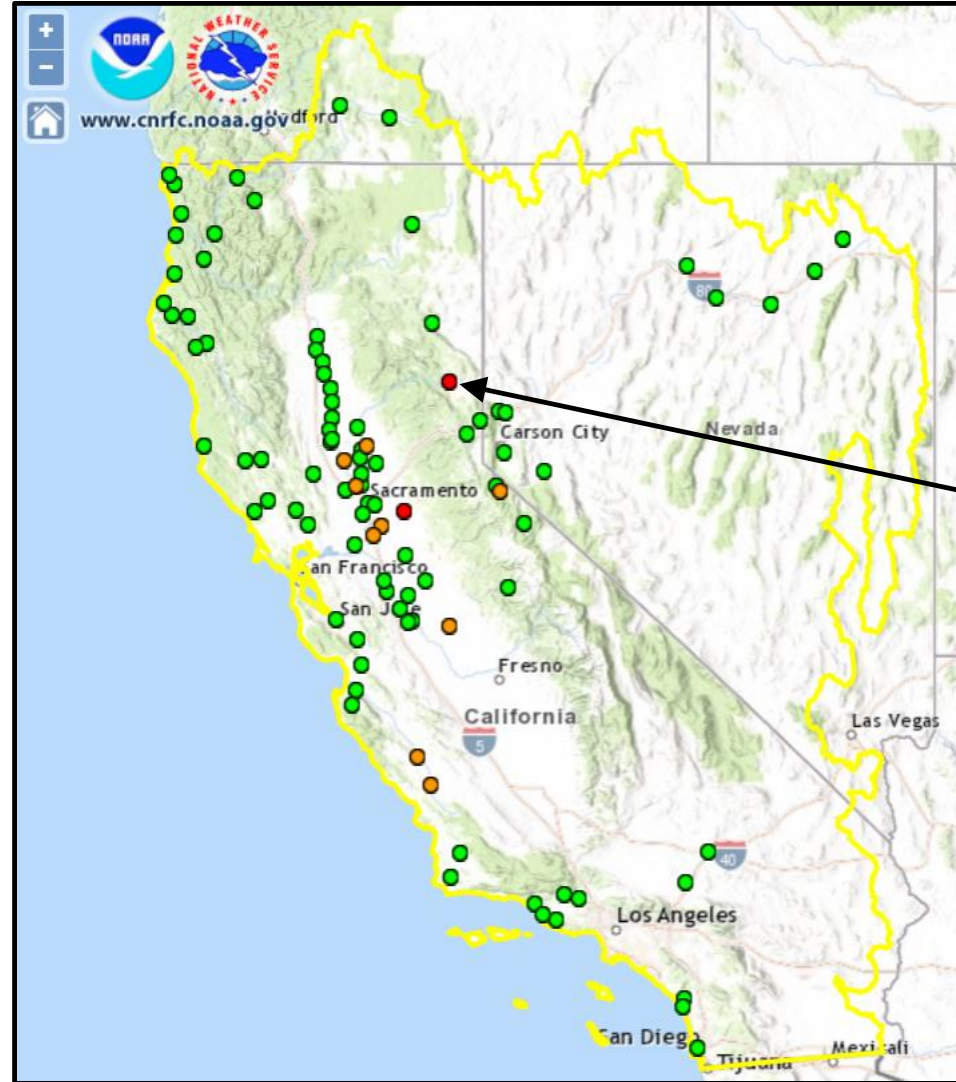


For official CNRFC Products: cnrfc.noaa.gov



CNRFC 6-day River Stage Forecast

- There are currently 2 rivers forecast by the CNRFC to rise above flood stage with an additional 9 forecast to rise above monitor stage
- There are currently no Rivers or streams in Southern California forecast to rise above monitor



The Middle Fork of the Feather River in Portola is currently forecast to rise to 9.1 feet at 6 AM 24 March, .6 feet above flood stage

AR Outlook: 22 March 2018

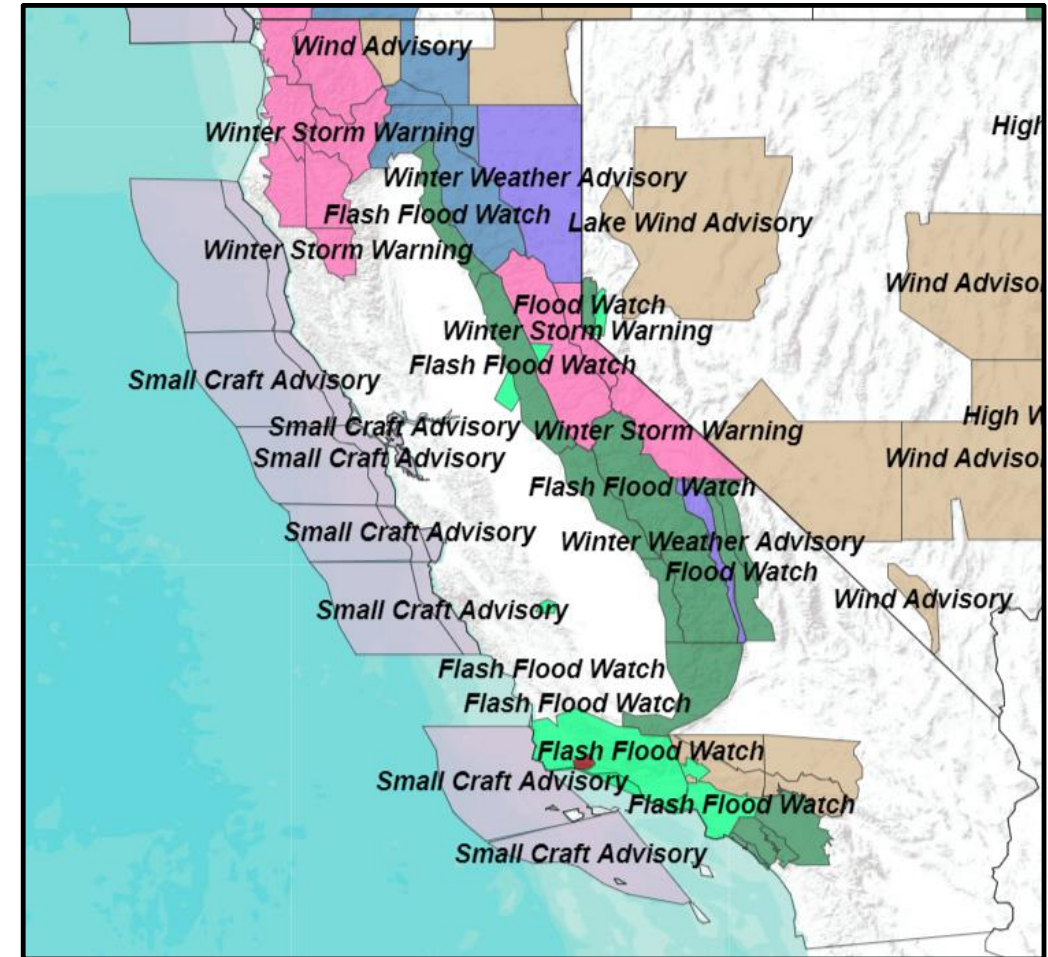


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Initial/Preliminary Impacts

- Officials ordered mandatory evacuations in Santa Barbara, Ventura, and Los Angeles counties on Wednesday due to potential debris flows, mud slides, and flash flooding on burn scar
- Falling rocks and mud sliders were reported along two highways in the foothills of Fresno County
- State route 33 is closed north of Ojai, CA due to mud and debris on roadway
- Debris flow was reported by Ventura Fire Department along Aliso Street in Ventura County
- EF-0 Tornado occurred in Yuba County on Wednesday Evening
- Urban flooding reported in Sacramento, Fresno, and Clovis, CA

Reported Impacts from the NOAA Operations Center

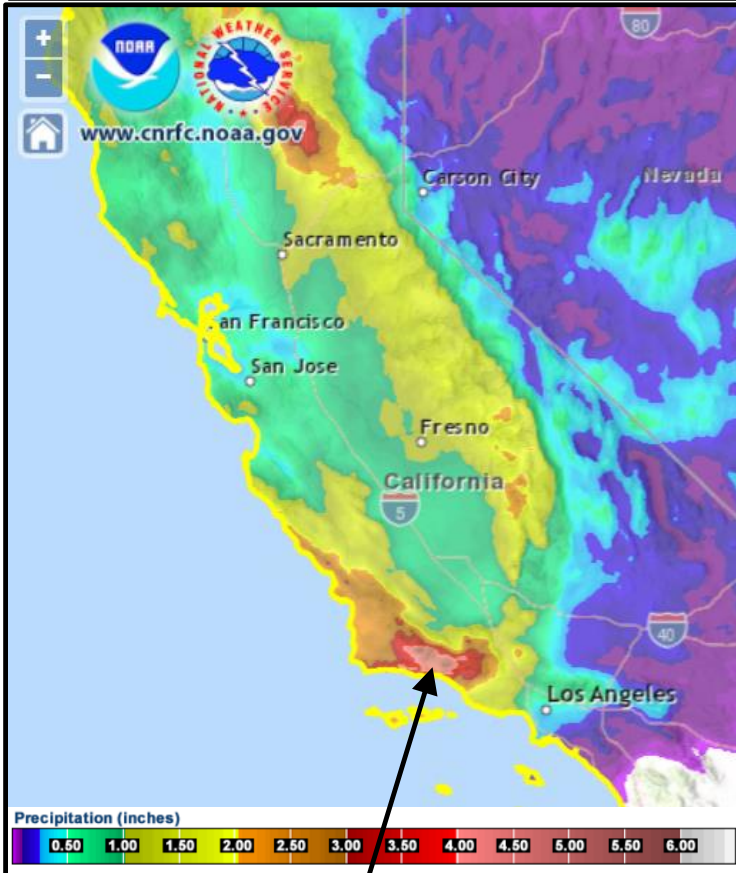


For localized forecasts and watches/warnings visit www.weather.gov

AR Outlook: 22 March 2018

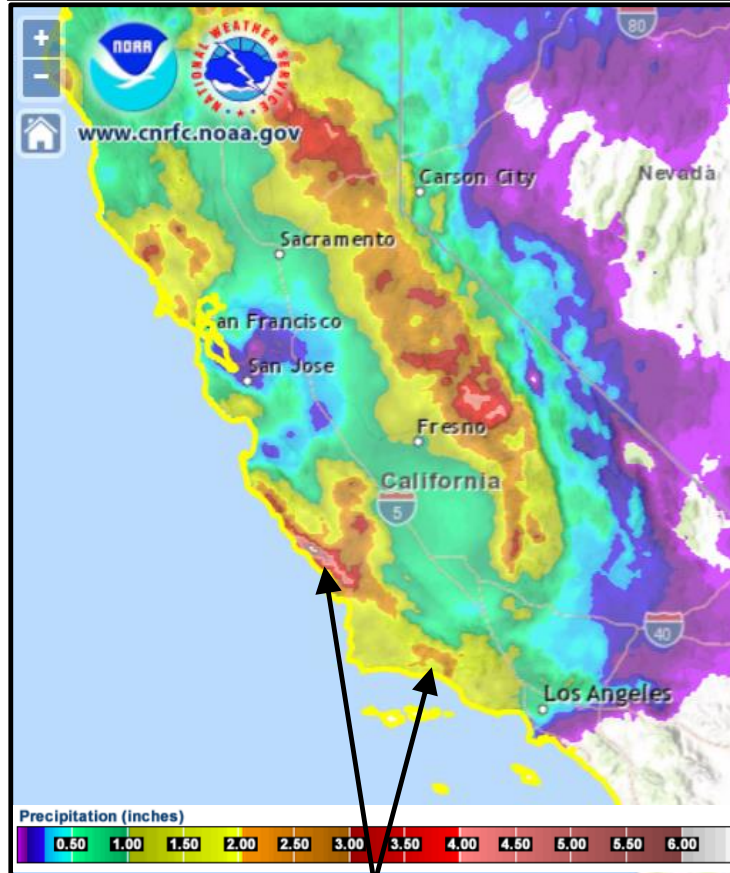


CNRFc 24-hr QPF issued 20 March valid 5 AM PDT 21 to 5 AM 22 March 2018



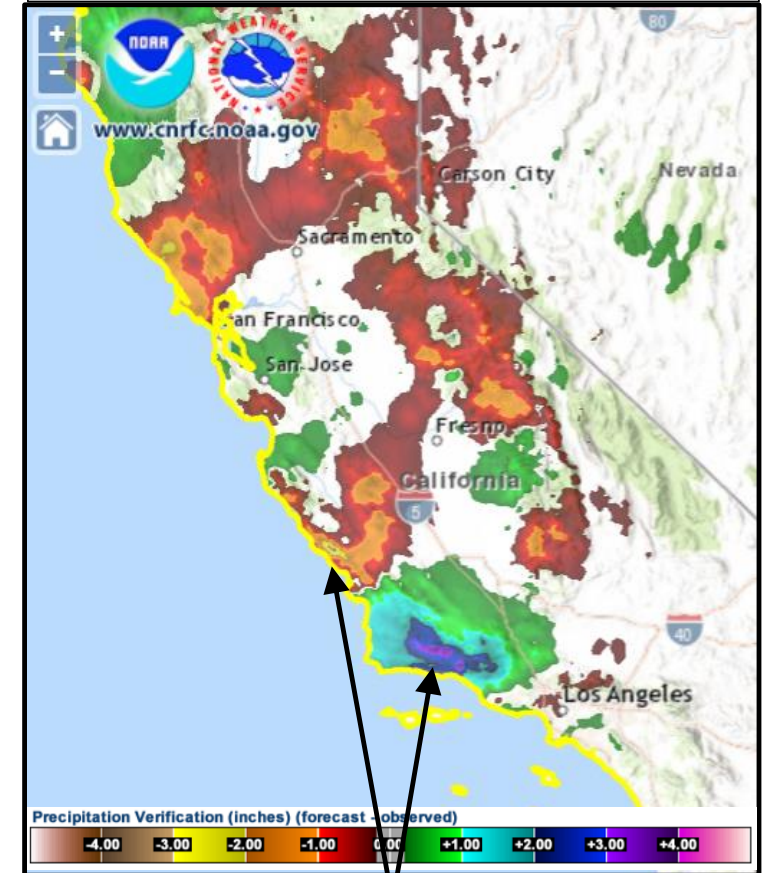
The 24-hr accumulated precipitation forecast for the period ending at 5 am PDT 22 March had a maximum accumulation of ~5.25 inches over the Santa Ynez Mts.

CNRFc 24-hr QPE valid 5 AM PDT 21 to 5 AM 22 March 2018



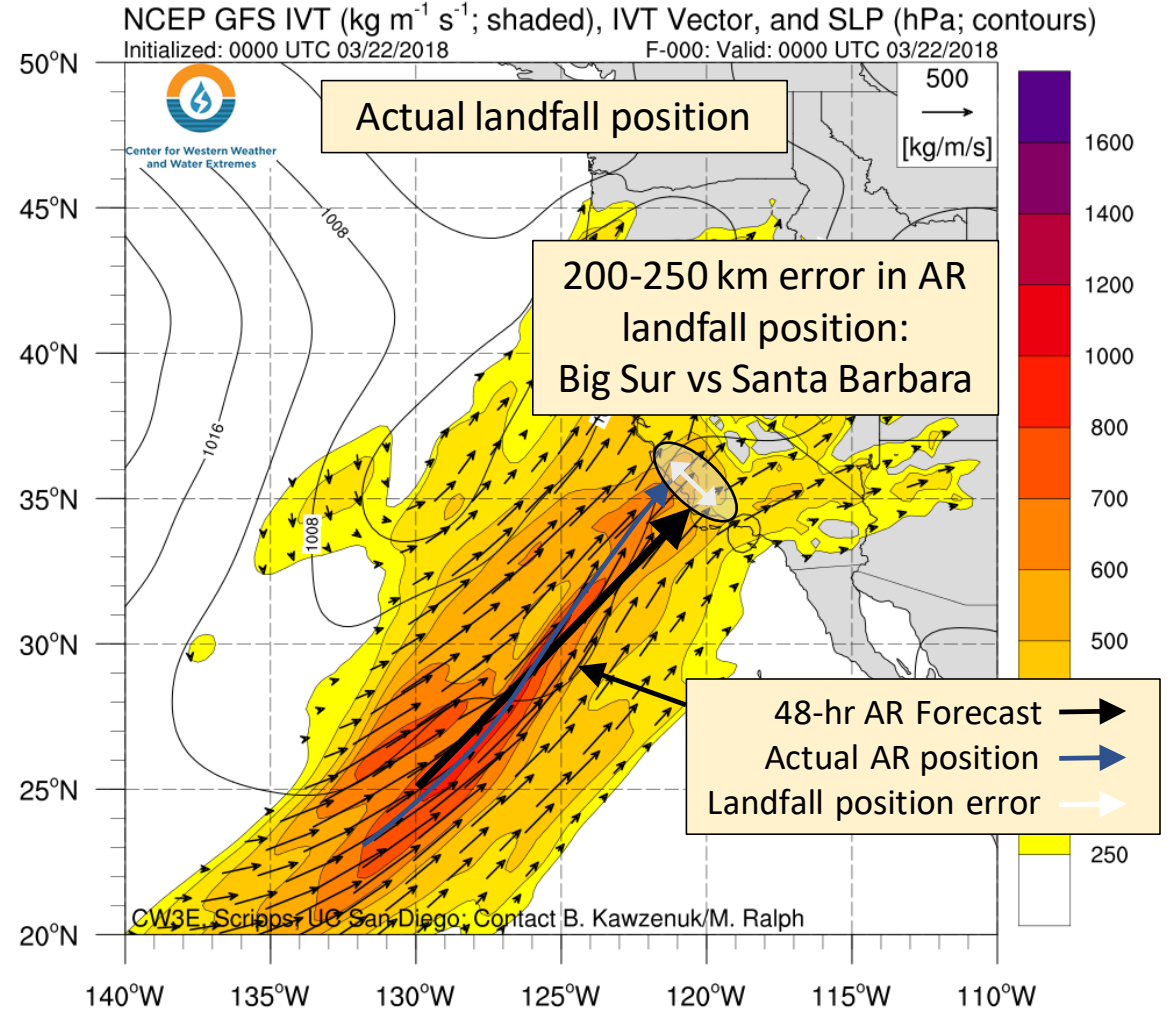
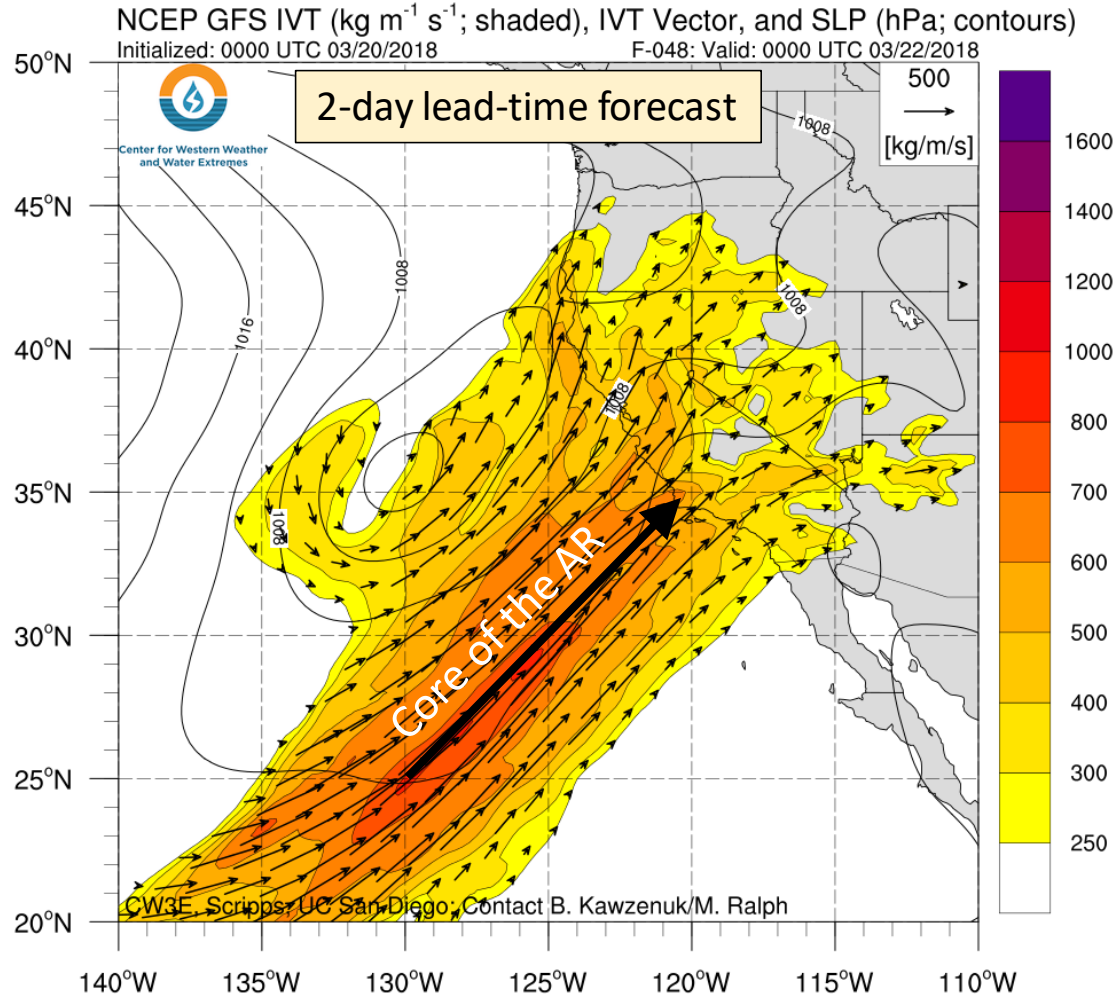
The 24-hr quantitative precipitation estimate (QPE) indicated that ~6 inches fell along the Coastal Mts. and ~2 inches fell over the Santa Ynez Mts.

CNRFc 24-hr Verification (QPF-QPE) Valid 5 AM PDT 21 to 22 March 2018



The QPE accumulations resulted in an over forecast of ~3 in. over the Santa Ynez Mts. and an under forecast of ~3 in. over Big Sur

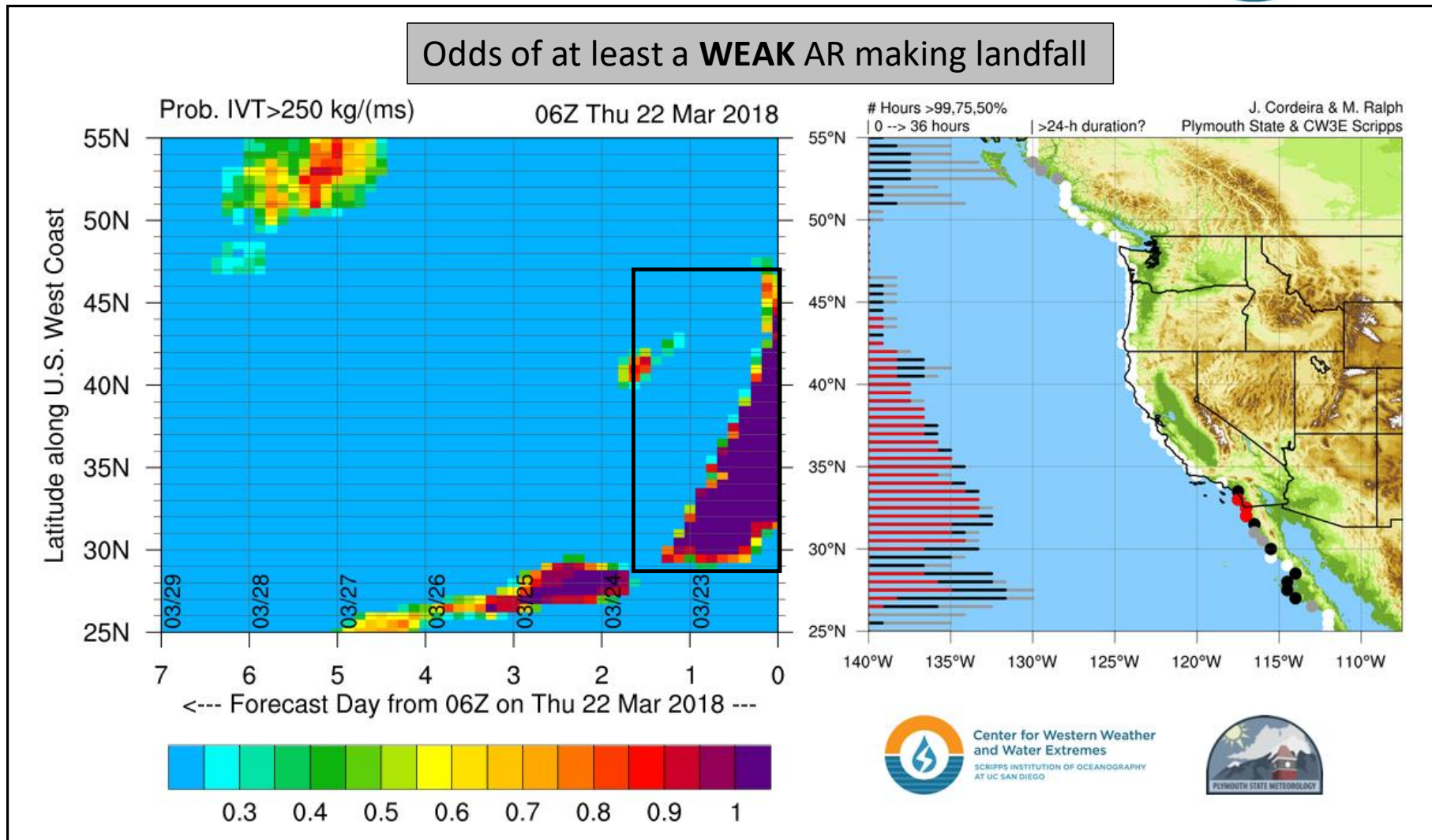
AR Outlook: 22 March 2018



- The errors in the precipitation forecasts were partly driven by errors in weather model forecast of AR landfall location
- The forecast issued at 5 PM PT on Mon. 19 March predicted that the core of the AR 2 days later would be located just west of Santa Barbara at 5 PM PT Wed. 21 March, and would have produced up to 10 inches of rain in the mountains above Santa Barbara
- However, the observations (GFS analysis) showed that the core of the AR was instead over Big Sur (~200-250 km from the predicted position). Big Sur did receive up to 9-10 inches of rain, while mountains above Santa Barbara 4-5 inches



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



There is currently a low probability of AR landfall over CA in the next week once the current AR ends