

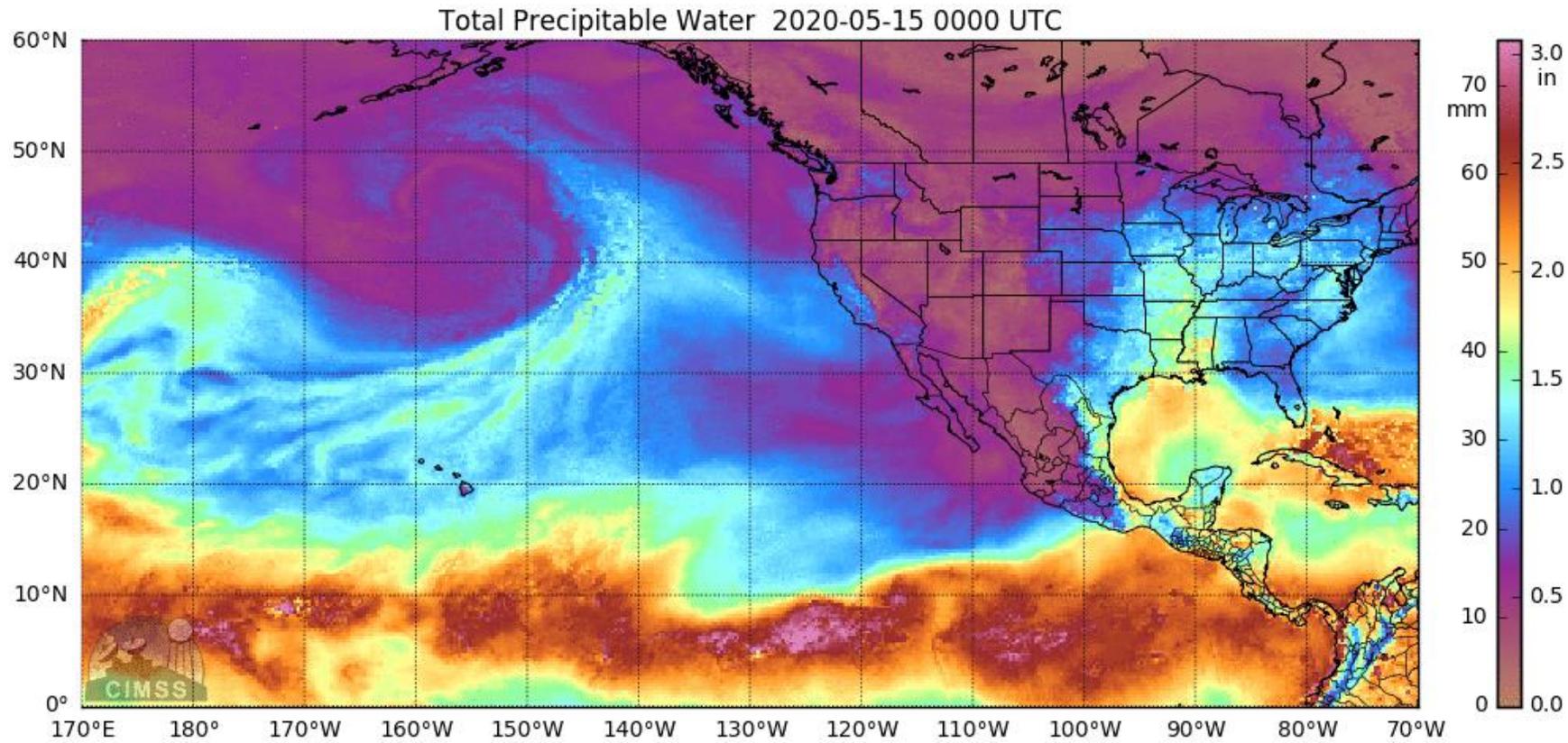
CW3E Post Event Summary: 16–19 April AR



Center for Western Weather
and Water Extremes
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AT UC SAN DIEGO

A moderate and seasonally anomalous atmospheric river brought precipitation to a large portion of the Western US

- Several coastal and inland locations across the Western US experienced AR 1 conditions on the Atmospheric River Scale
- As much as 6 inches of precipitation fell over high elevation locations in the Sierra Nevada, Cascade, and Rocky Mountains
- Coastal Sonoma County has only experienced IVT magnitudes greater than $650 \text{ kg m}^{-1} \text{ s}^{-1}$ during the later half of May twice since 2000
- While this AR brought much needed precipitation to drought stricken Northern California, the Northern Sierra 8-Station index has only received 64% of its normal precipitation during water year 2020

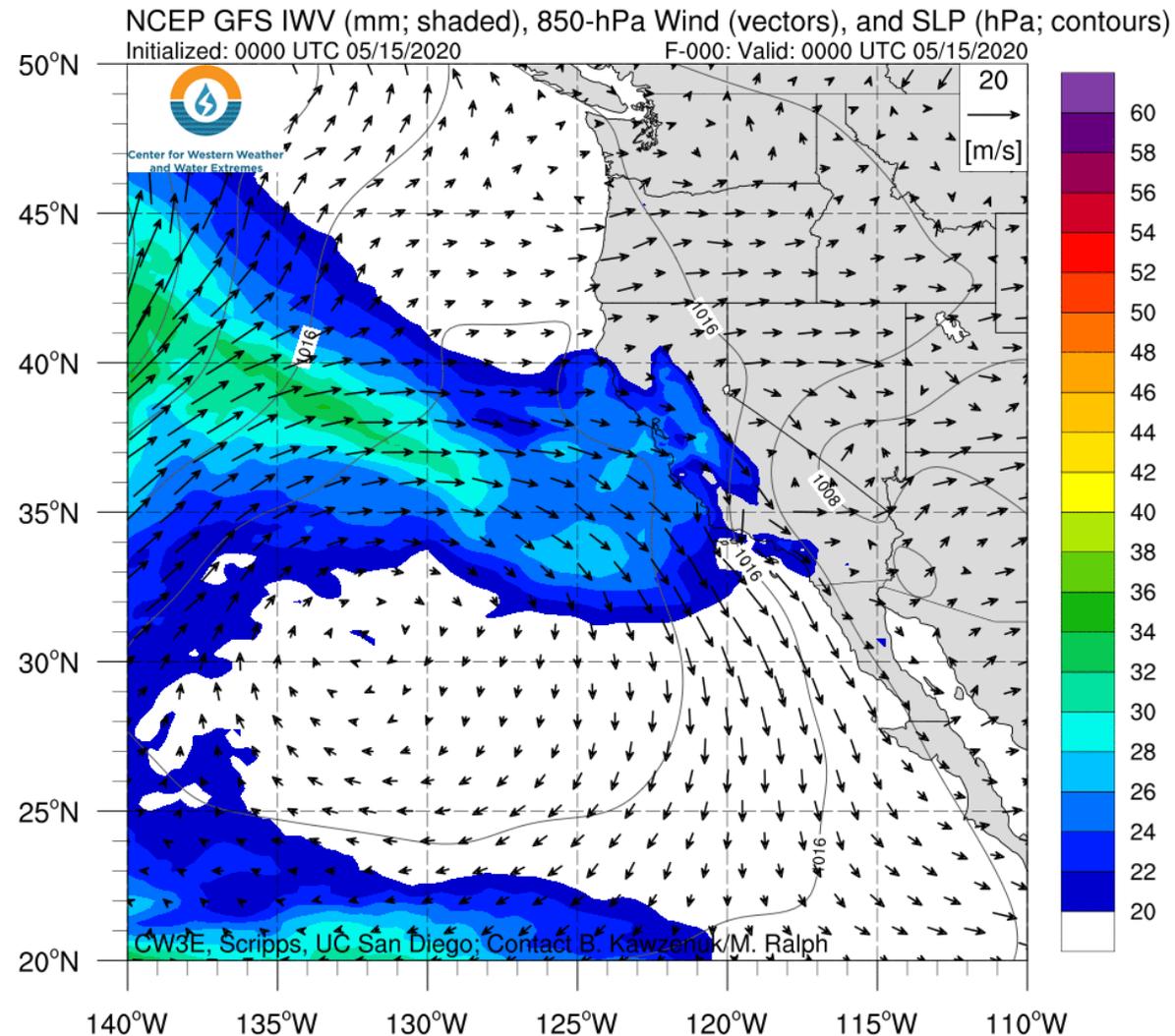
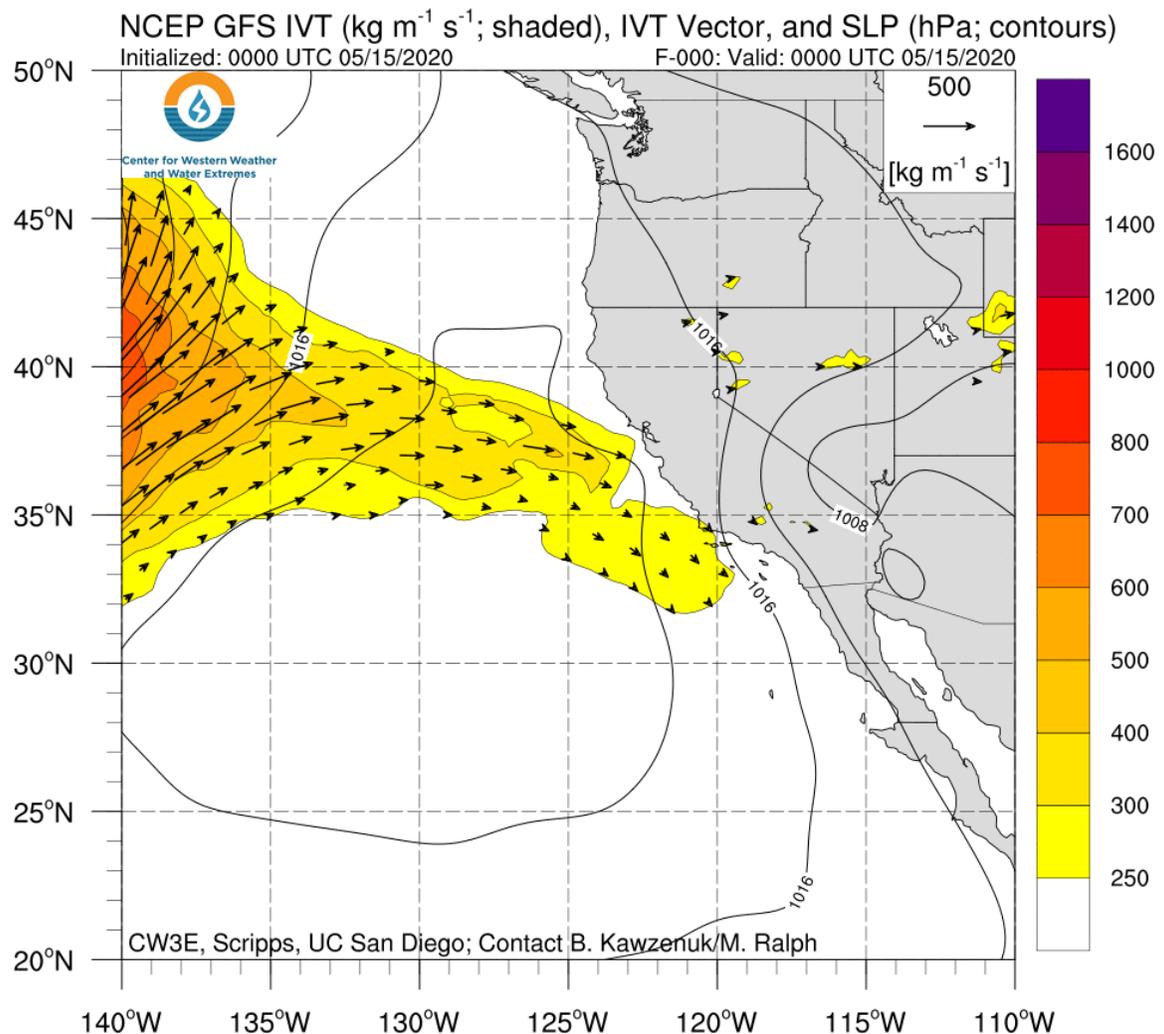


16–19 May Atmospheric River

For California DWR's AR Program



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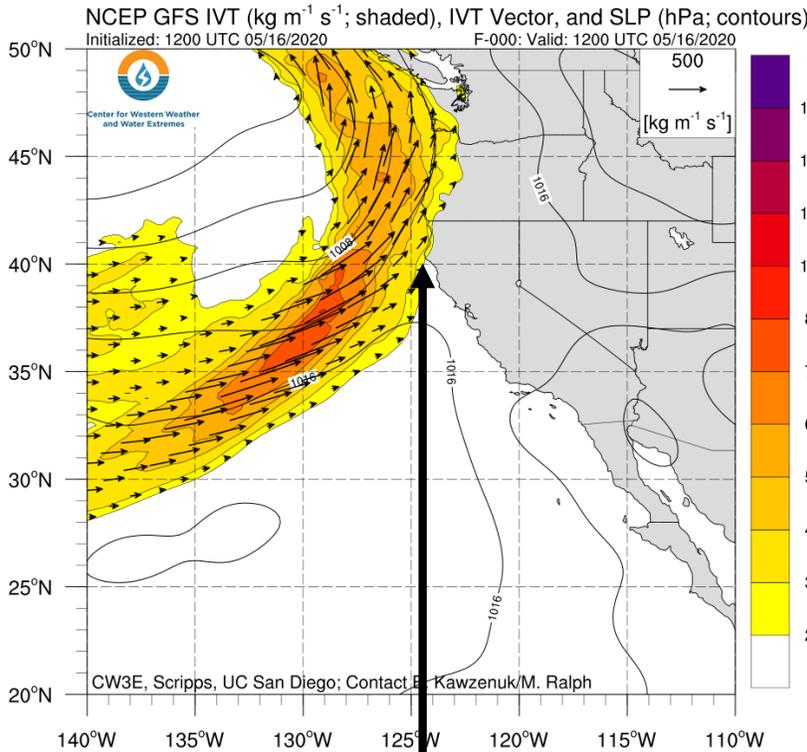
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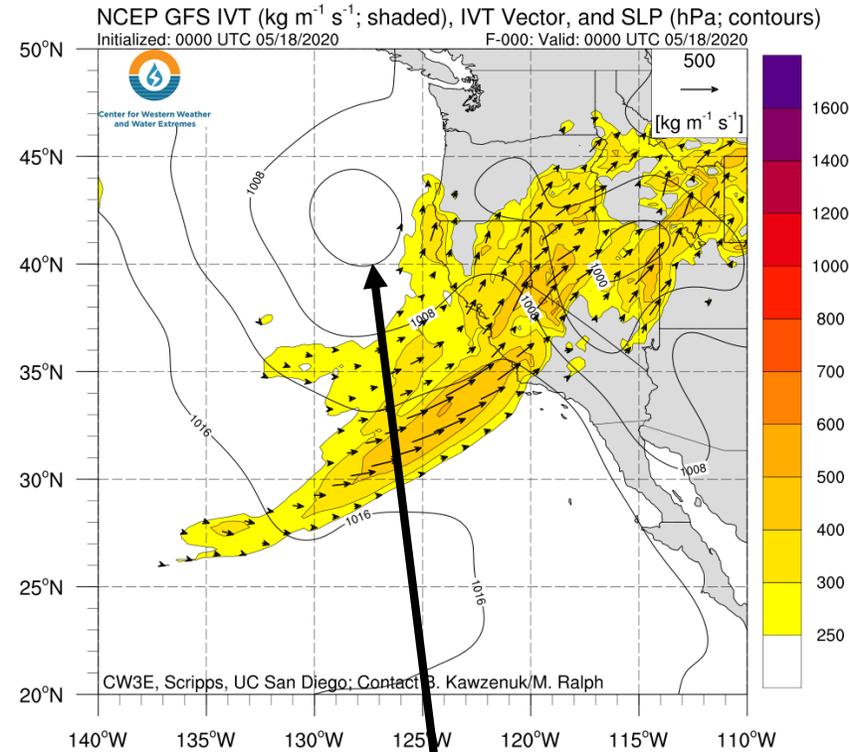


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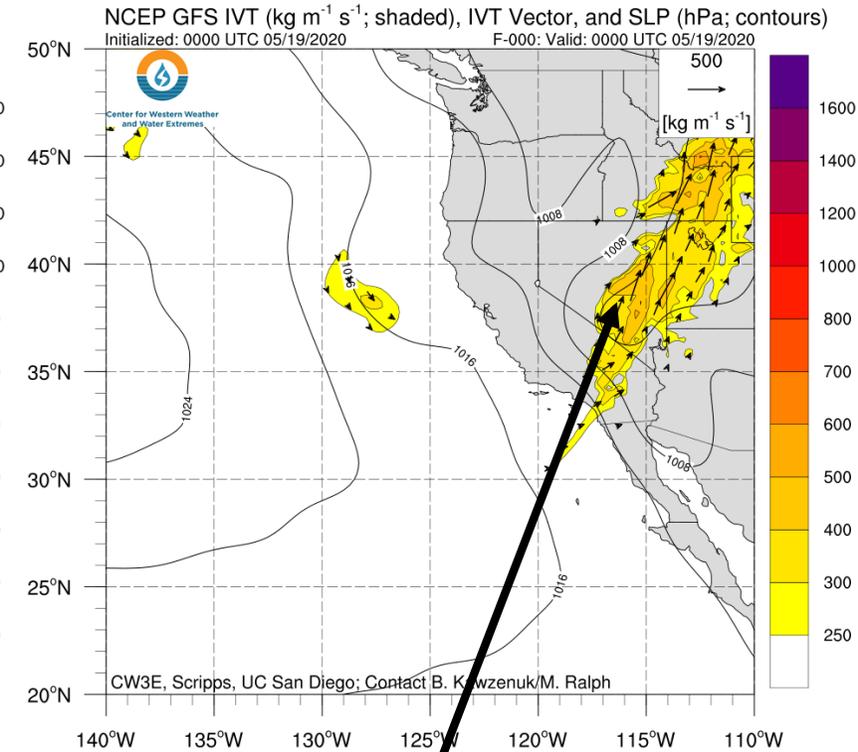
GFS Analysis IVT and Sea-Level Pressure



The southwesterly AR made landfall over Coastal Washington and Oregon at ~12 UTC 16 May 2020



A secondary low developed along the cold front of the primary AR providing additional lift for precipitation and enhancement of IVT magnitudes over Central California



As the AR progressed southward down the California Coast, IVT magnitudes began to weaken but continued to penetrate inland and bring AR conditions to the Intermountain West

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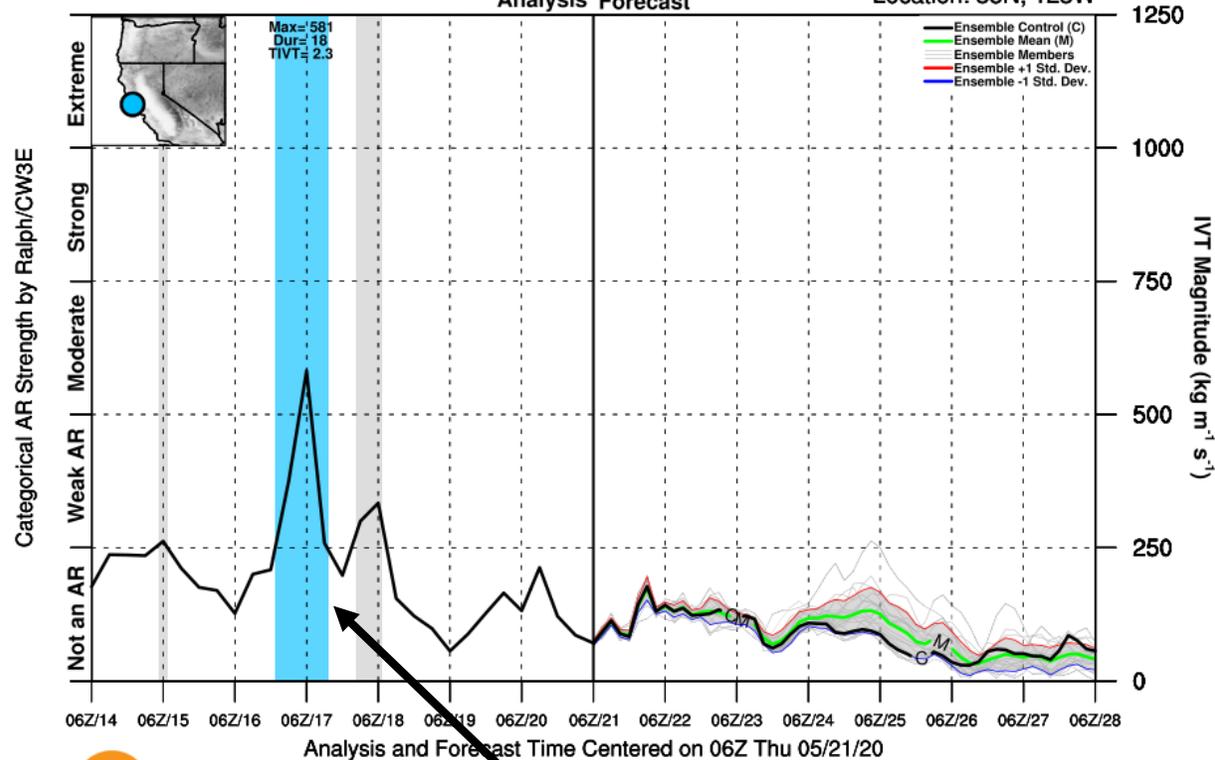


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GEFS AR Scale & IVT Analysis/Forecast Initialized 06Z Thu 05/21/20

Analysis Forecast

Location: 38N, 123W



Analysis and Forecast Time Centered on 06Z Thu 05/21/20



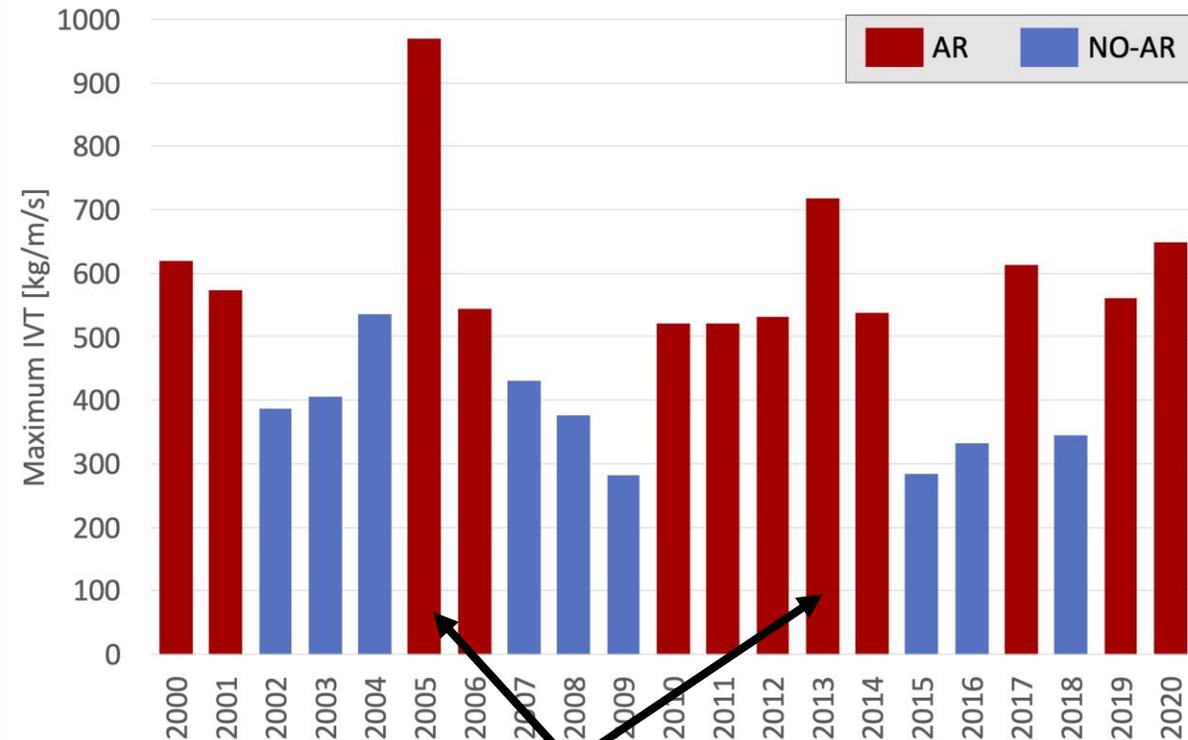
AR 1 AR 2 AR 3 AR 4 AR 5

Image created: 15 UTC 05/21/2020

More information: <http://cw3e.ucsd.edu> AR Scale based on Ralph et al. (2019; BAMS), contact M. Ralph

- Coastal Sonoma County experienced a maximum IVT magnitude of $\sim 581 \text{ kg m}^{-1} \text{ s}^{-1}$ at $\sim 06\text{Z}$ on 17 May
- AR conditions ($\text{IVT} > 250 \text{ kg m}^{-1} \text{ s}^{-1}$) lasted ~ 18 hours
- The combination of AR duration and maximum IVT magnitude resulted in AR 1 conditions on the atmospheric river scale (Ralph et al. 2019)

Maximum IVT in Late May (May 16–31) at Location [38N 123W]



- Based on the Climate Forecast System Reanalysis (CFSR), Sonoma County experienced a maximum IVT magnitude of $649 \text{ kg m}^{-1} \text{ s}^{-1}$ at 6 UTC on 17 May 2020
- Since 2000, Sonoma County has only experienced IVT magnitudes $> 649 \text{ kg m}^{-1} \text{ s}^{-1}$ twice during the later portion of May in 2005 and 2013

16–19 May Atmospheric River

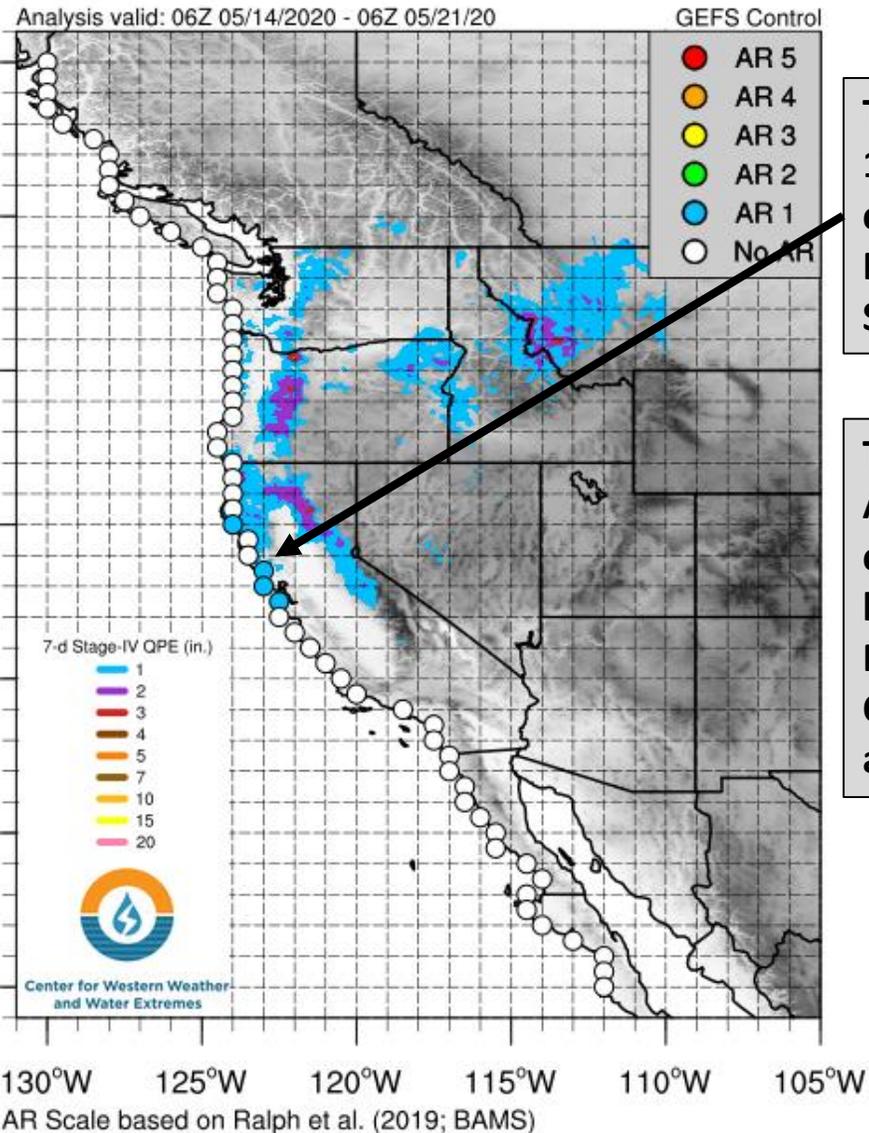
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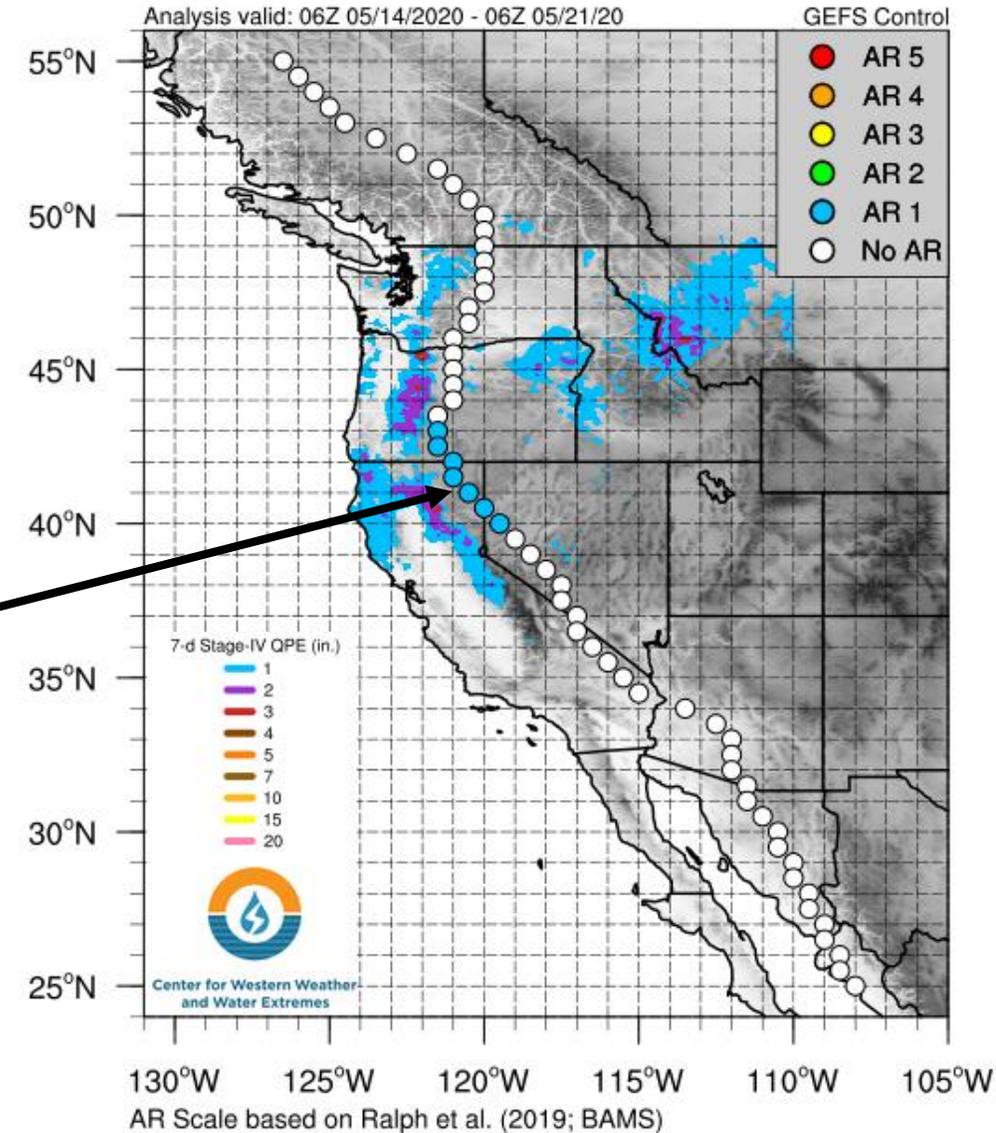
Maximum Observed AR Scale



The Landfalling AR brought AR 1 conditions to multiple coastal locations over the San Francisco Bay Area and Southern Humboldt County

The inland penetration of the AR also brought AR 1 conditions to locations in the lee of the Cascade and Sierra Nevada Mountains in Southern Oregon, Northern California and Northwestern Nevada

Maximum Observed AR Scale



16–19 May Atmospheric River

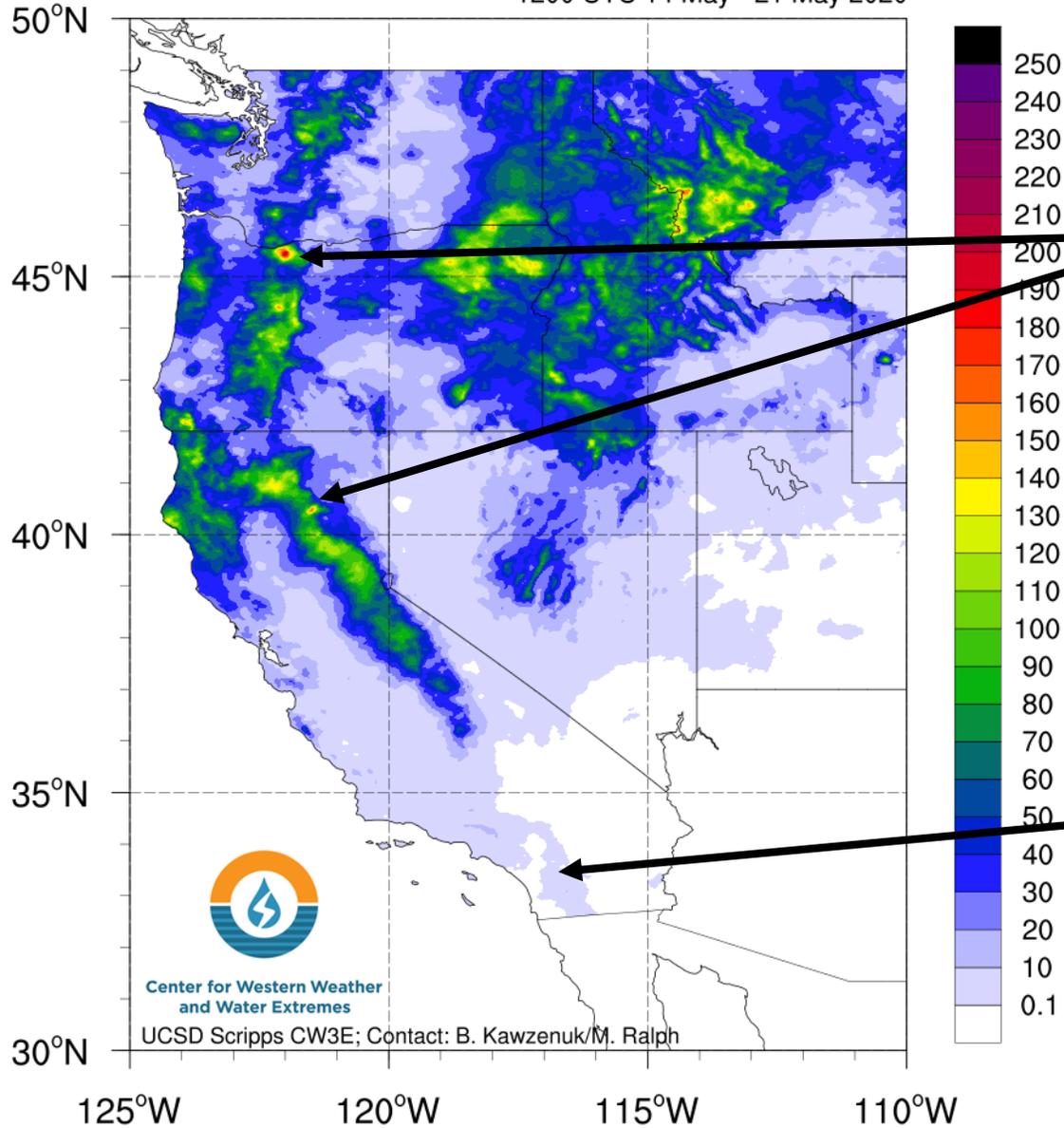
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7-day Accumulated Precipitation (mm)

1200 UTC 14 May - 21 May 2020



>4 inches of precipitation fell over the Northern Sierra Nevada and the Cascade Mountains of Northern California and Oregon with localized amounts up to 6 inches

Other locations across Washington, Oregon, and Northern to Central California received 1 to 3 inches

The inland penetration of the AR into the Intermountain West result in orographic precipitation >3 inches over Eastern Oregon, Idaho, Montana, and Northern Nevada

Locations across Southern California received <1 inch of precipitation from the dissipating AR

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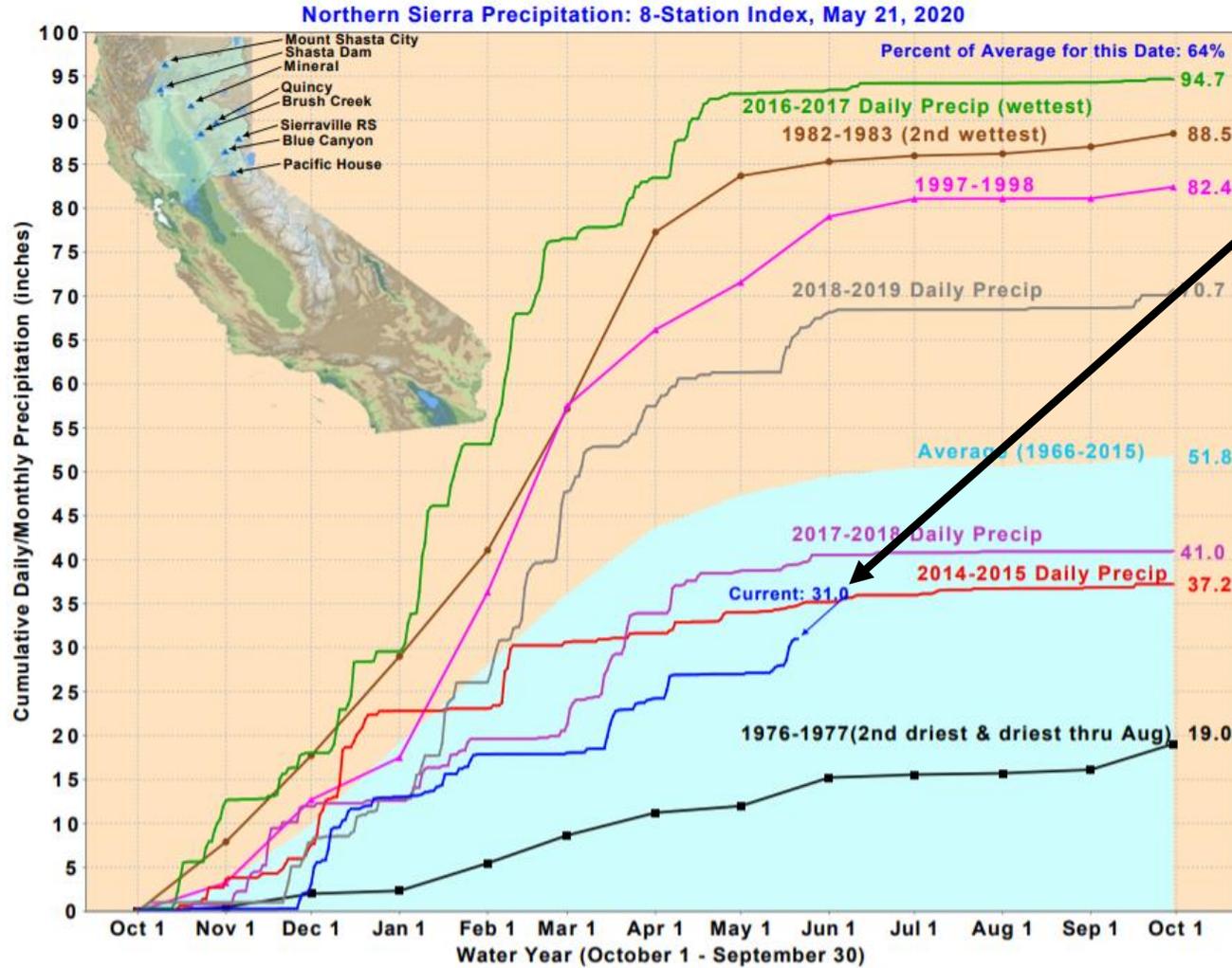
UCSD Scripps CW3E; Contact: B. Kawzenuk/M. Ralph

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- The Northern Sierra 8-Station Index has received well below normal precipitation during Water Year (WY) 2020 (beginning in October)
- While the recent and late season AR brought some much needed precipitation to Northern California, the 8-Station Index is still at 64% of normal precipitation for this date
- Due to the lack of precipitation during WY 2020 Northern and Central CA are experiencing moderate or greater drought conditions while far Northern CA is currently in extreme drought

Total Water Year Precipitation

Source: California Department of Water Resources, <https://water.ca.gov/>

