

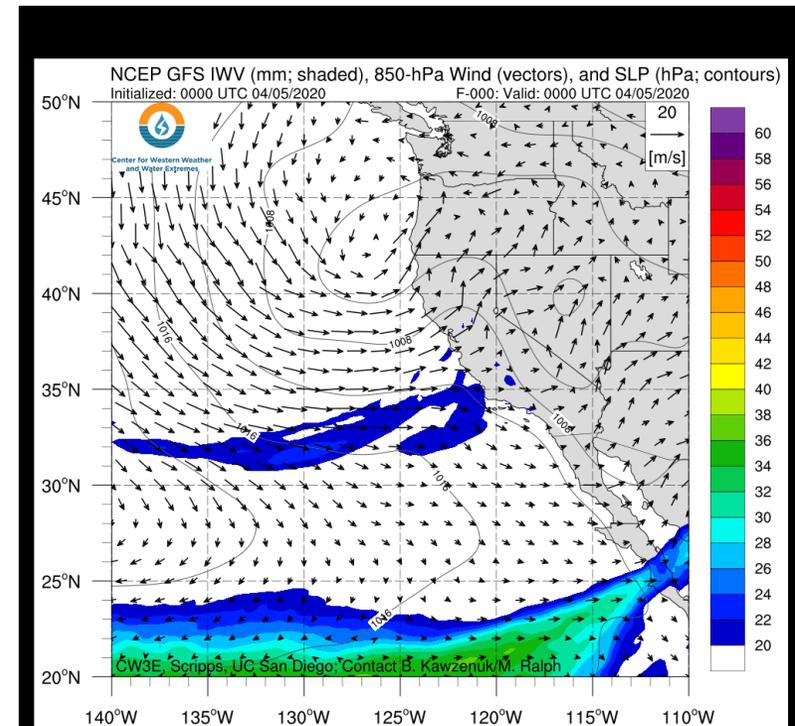
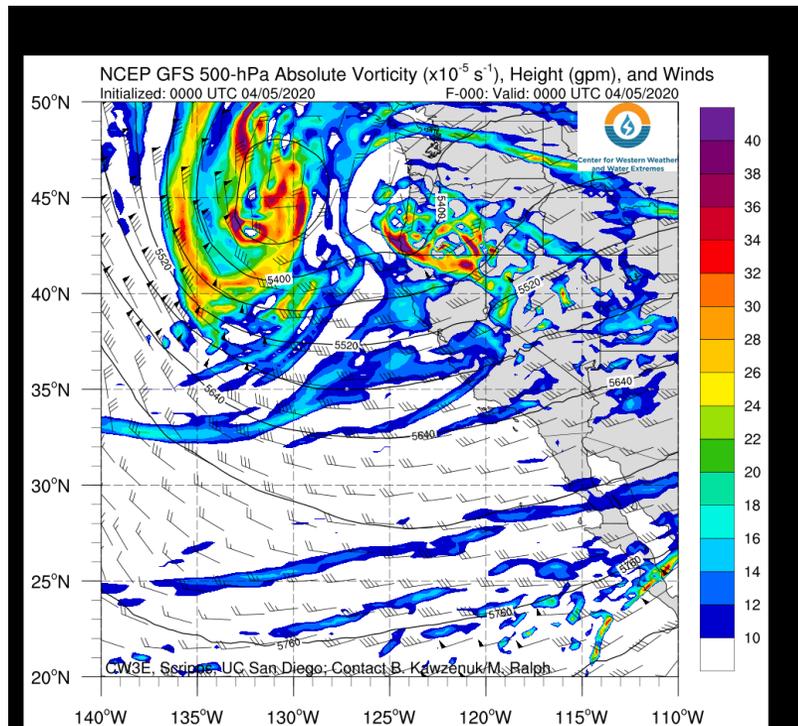
CW3E Event Summary: 5–10 Apr 2020



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AT UC SAN DIEGO

Unsettled weather pattern brings record precipitation to Southern California

- Multiple episodes of heavy rainfall during 5–10 Apr were associated with a cutoff low near the U.S. West Coast
- More than 2 inches of precipitation fell over a large portion of Southern California, with the highest amounts (> 6 inches) in the Transverse Ranges and northern San Diego County
- Significant snowfall (> 12 inches) occurred in the higher elevations of the Transverse Ranges
- Intense rainfall resulted in flash flooding throughout San Diego County on 10 Apr



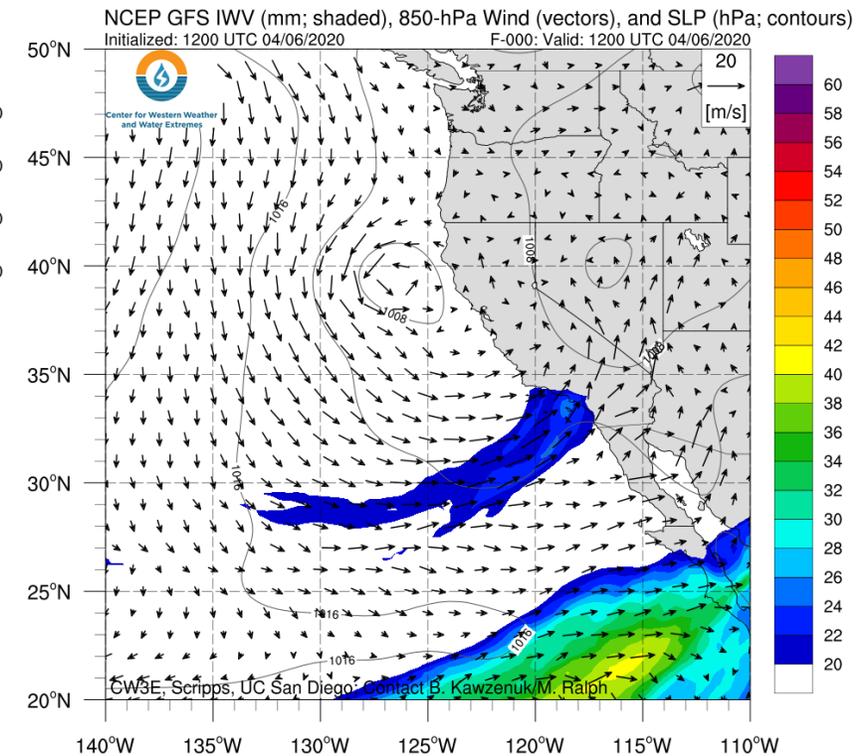
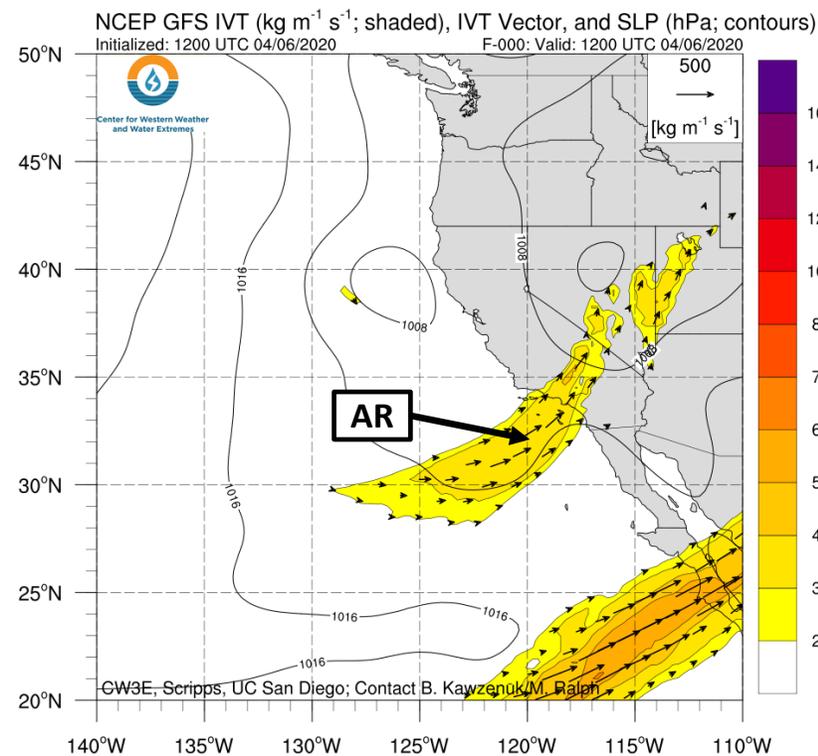
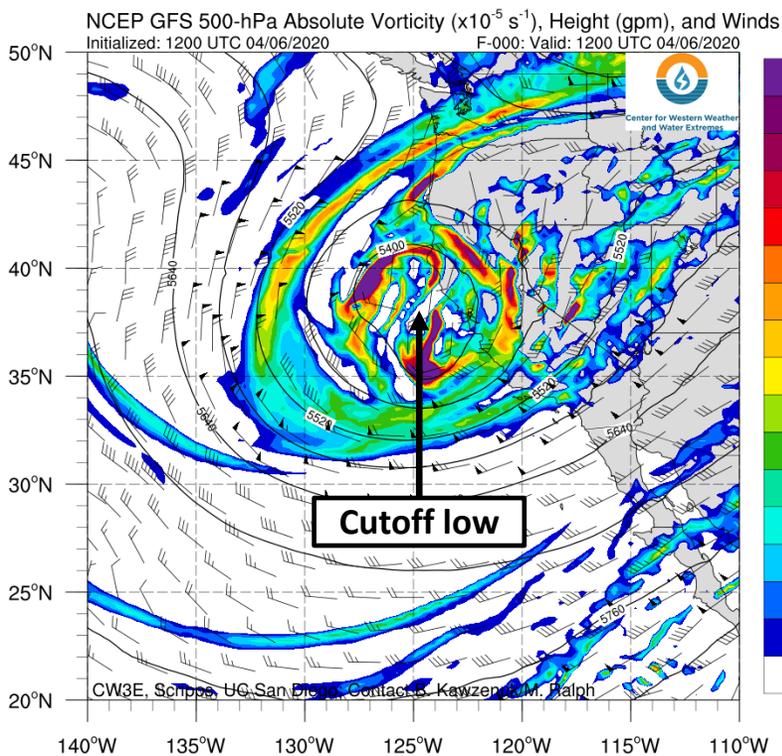
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GFS Analysis: Valid 1200 UTC 6 Apr



- The initial precipitation episode (5–6 Apr) was associated with a cutoff low near the California coast and a weak AR that formed south and east of the cutoff low
- Although precipitable water values were not exceptionally high, there was enough moisture ($> 20 \text{ mm}$) to support moderate-to-heavy precipitation across coastal Southern California
- Upslope moisture flux likely resulted in orographic enhancement of precipitation over the Transverse Ranges

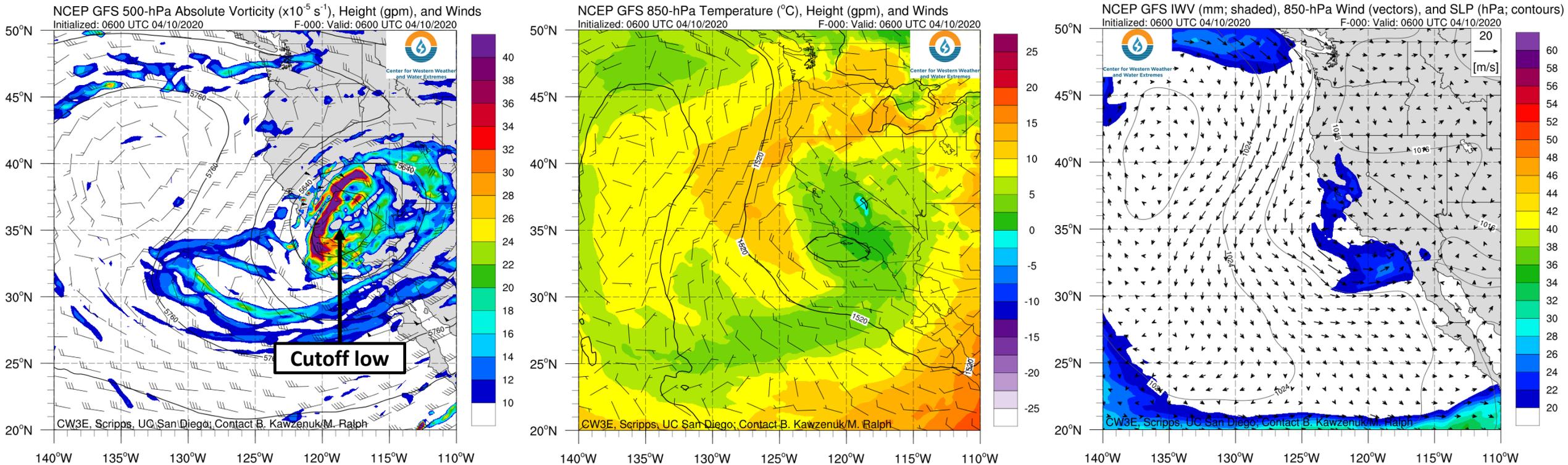
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GFS Analysis: Valid 0600 UTC 10 Apr



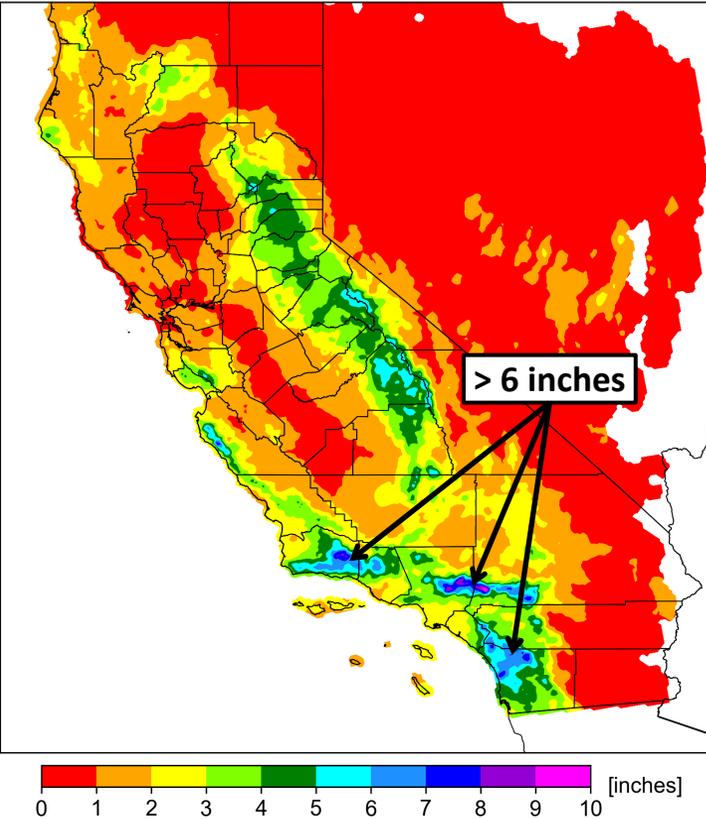
- Over the next several days, the cutoff low continued to impact Southern and Central California, slowly moving southward, then eastward, and then retrograding back toward the California coast
- The last precipitation episode, which primarily impacted San Diego and Orange Counties, occurred as the cutoff low began to retrograde westward
- Upward vertical motion was supported by differential cyclonic vorticity advection and weak instability (due to cold air aloft)

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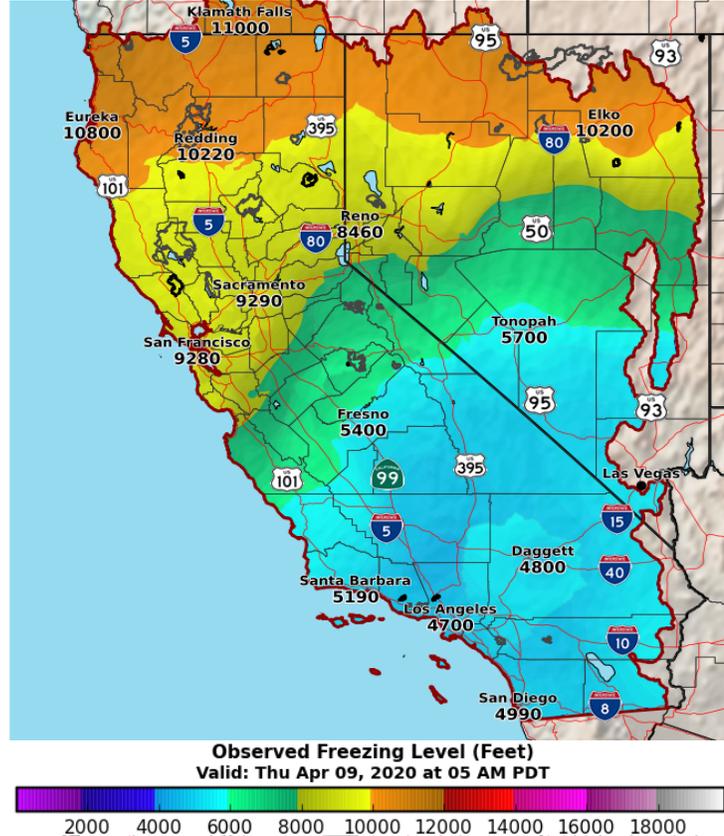
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CNRF 7-day Observed Precipitation:
 Valid 1200 UTC (5 AM PDT) 11 Apr

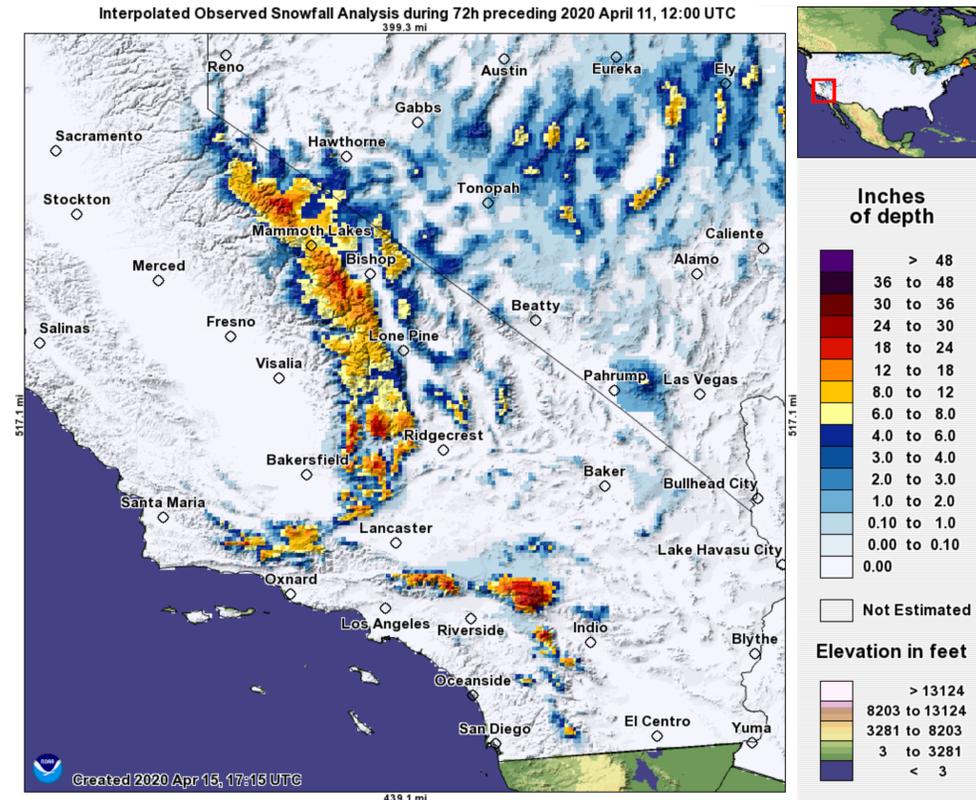


Source: NOAA/NWS CNRFC, <https://www.cnrfc.noaa.gov/>

CNRF Observed Freezing Level:
 Valid 1200 UTC (5 AM PDT) 9 Apr



72-h Interpolated Snowfall: Valid 1200 UTC 11 Apr



Source: NOAA/NWS NOHRSC, <https://www.nohrsc.noaa.gov/>

- More than 2 inches of storm-total precipitation fell over a large portion of Southern California
- The highest precipitation amounts (> 6 inches) were observed over the Transverse Ranges and northern San Diego County
- Low freezing levels supported significant snowfall accumulations at higher elevations (> 6 inches in the western Transverse Ranges, Tehachapi Mountains, and Peninsular Ranges; > 12 inches in the eastern Transverse Ranges)

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Station	Event Precip (in)	Avg Annual Precip (in)	% of Avg Annual Precip	Previous April Record (in)
Barstow-Daggett Airport	2.21	4.06	54%	1.83
Carlsbad McClellan-Palomar Airport	6.18	11.84	52%	1.80
Bakersfield Municipal Airport	2.51	6.47	39%	2.65
Oceanside Municipal Airport	4.76	13.66	35%	2.63
San Diego International Airport	3.58	10.34	35%	5.37
San Diego Montgomery-Gibbs Airport	3.84	12.51	31%	1.89
Lancaster Fox Field	2.23	7.38	30%	2.05
Sandberg Airport	3.69	12.33	30%	4.11
Van Nuys Airport	3.71	13.02	28%	N/A
San Diego Brown Field Municipal Airport	3.27	12.37	26%	2.90
Ramona Airport	3.99	16.04	25%	3.65
Long Beach Airport	3.03	12.26	25%	4.42
Palmdale Regional Airport	2.03	8.30	24%	2.47
Ontario International Airport	3.42	15.04	23%	5.95
Riverside Municipal Airport	2.63	12.40	21%	3.64
John Wayne Airport	2.72	13.33	20%	1.69

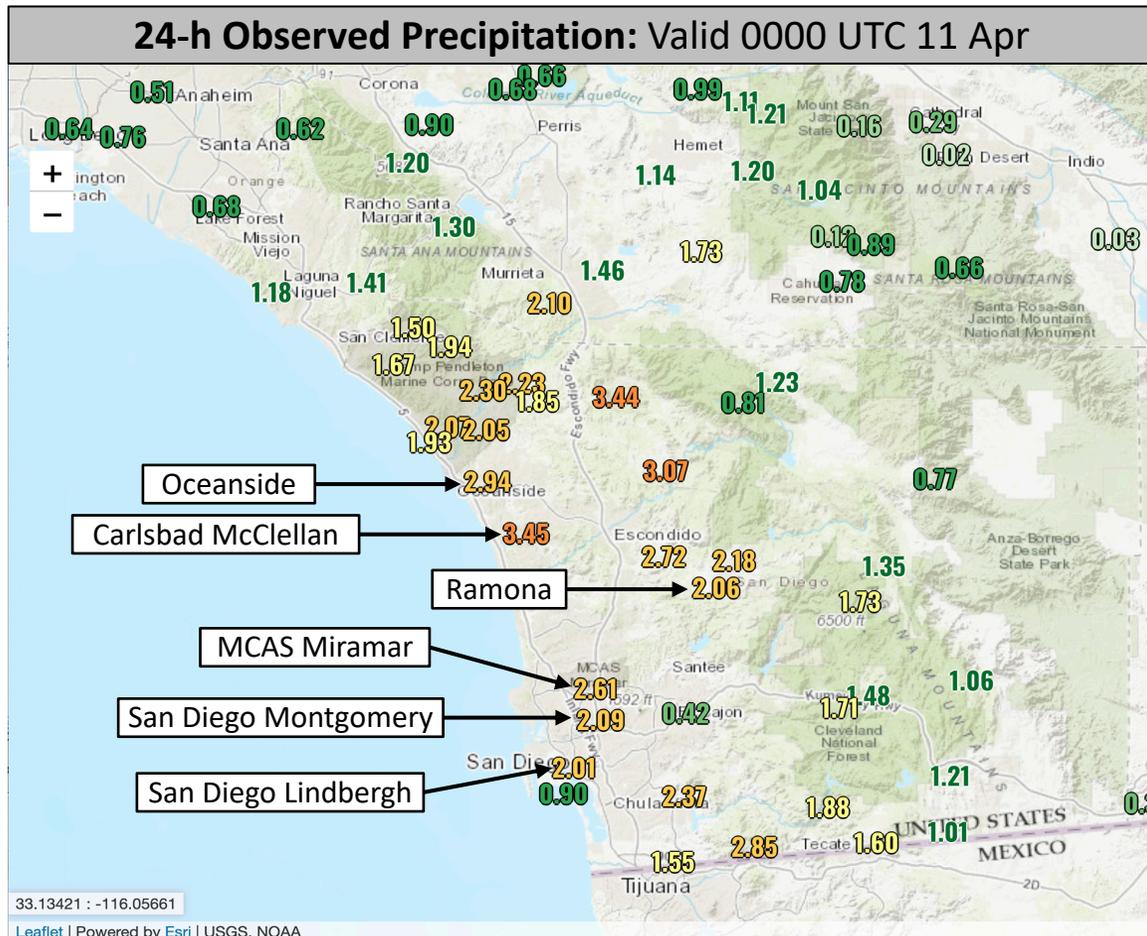
- Many stations in Southern California recorded more than 20% of their average annual precipitation during this event
- Carlsbad McClellan-Palomar Airport and Barstow-Daggett Airport received more than 50% of their average annual precipitation
- Several stations also set new records for total April precipitation

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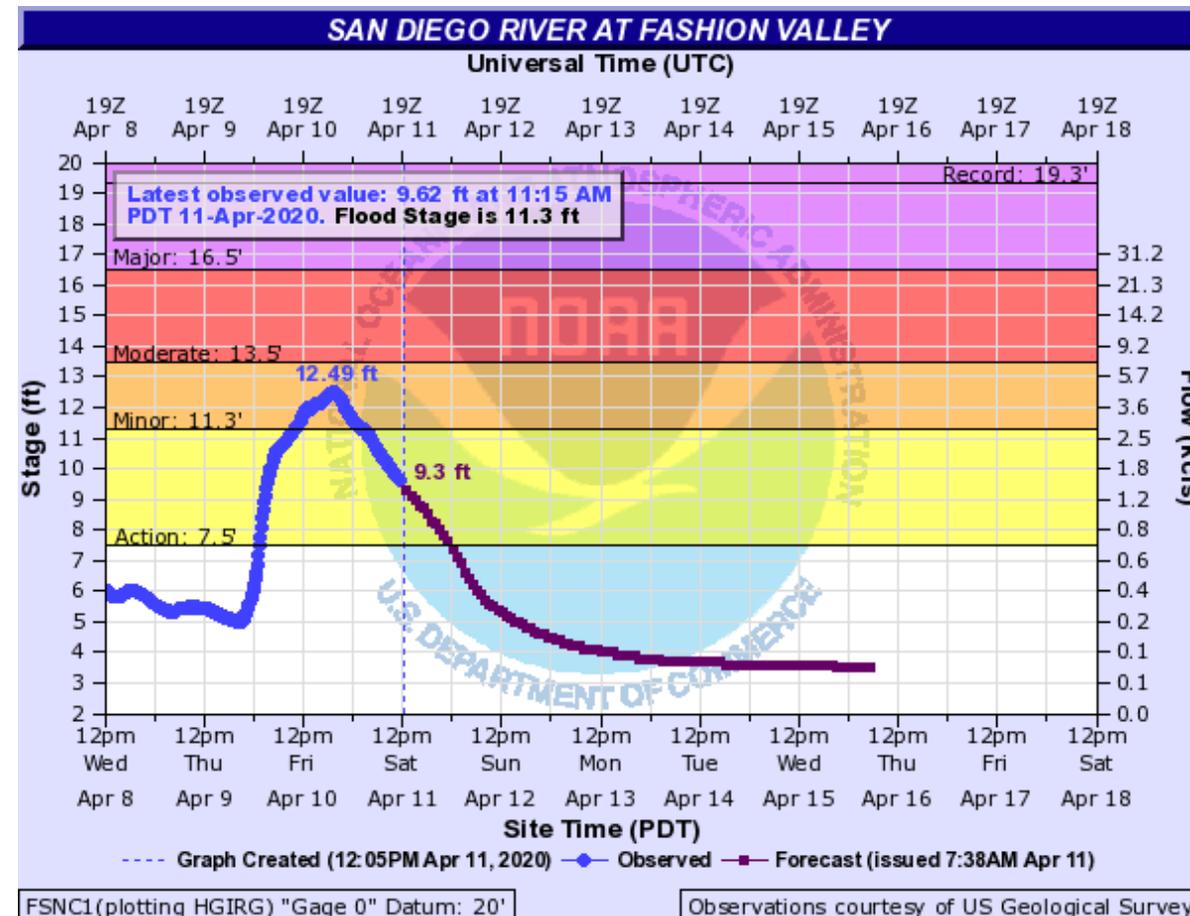
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33.13421 ; -116.05661
Leaflet | Powered by Esri | USGS, NOAA

Source: NOAA/NWS Western Region Headquarters, <https://www.weather.gov/wrh/>



Source: NOAA/NWS Advanced Hydrologic Prediction Service, <https://water.weather.gov/ahps/>

- Portions of western San Diego County received 2–4 inches of rainfall during the 24-hour period ending 0000 UTC 11 Apr
- Intense rainfall caused the San Diego River at Fashion Valley to rise above flood stage on 11 Apr
- The peak stage height (12.49 ft) and discharge (4,460 cfs) were the 3rd highest recorded over the past 10 water years (since 1 Oct 2010)

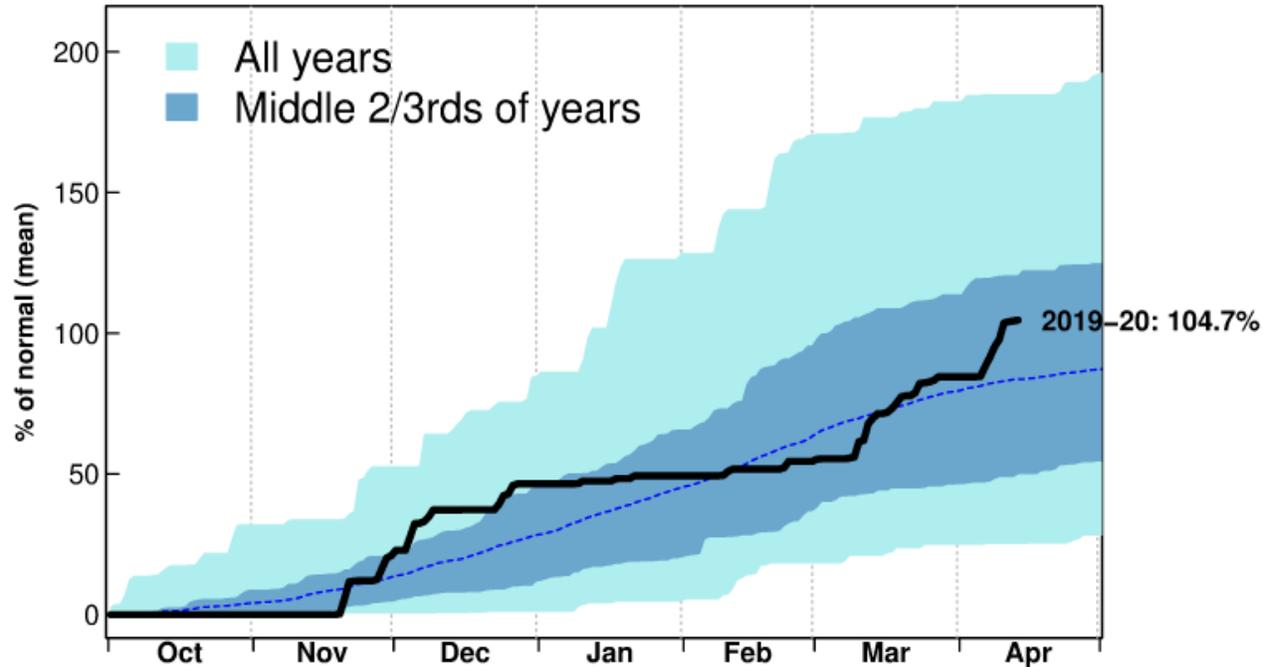
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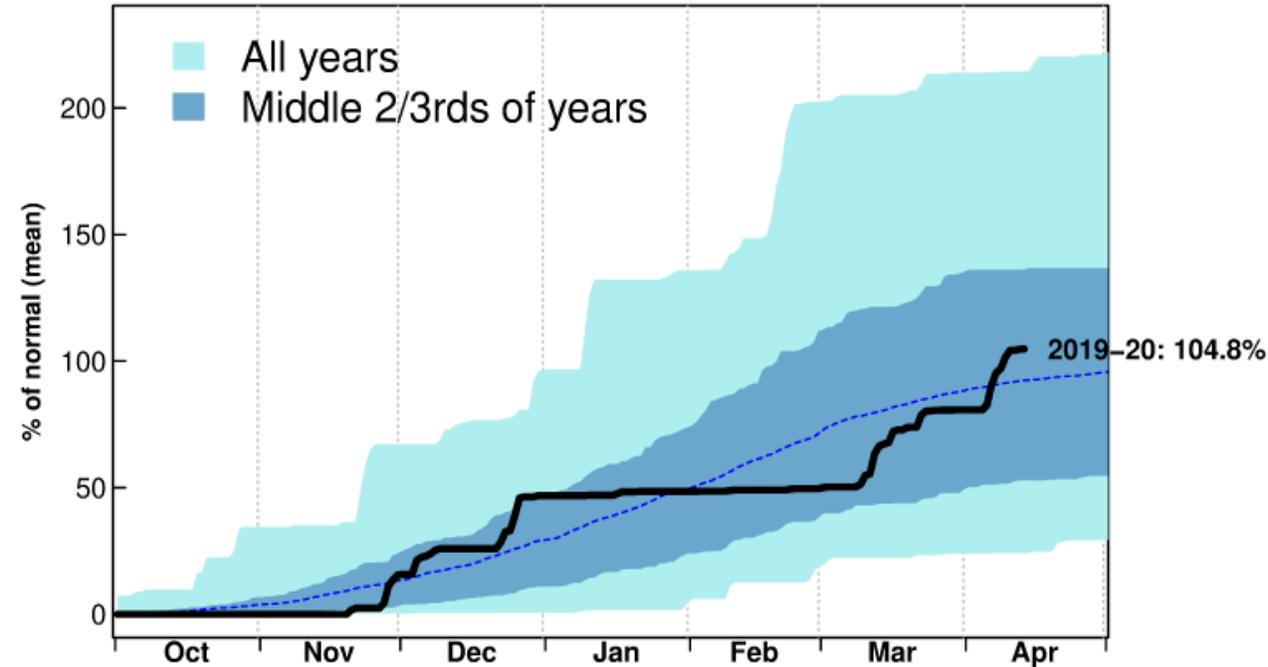
San Diego County Precipitation Tracking

SD_county precip for all years, data through 2020/04/13



Greater Los Angeles Precipitation Tracking

LA_basin precip for all years, data through 2020/04/13



Source: California–Nevada Applications Program, <https://scripps.ucsd.edu/programs/cnap/>

- As of 13 Apr, San Diego County and the Greater Los Angeles area have received more than 100% of the normal total water year (Oct–Sep) precipitation
- The accumulated precipitation curves illustrate how recent precipitation events have eliminated the precipitation deficit that developed after a prolonged period of dry conditions between early January and early March

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Fashion Valley Road at San Diego River



Source: NOAA/NWS San Diego, <https://www.weather.gov/sgx/>

Highway 78 at Buena Vista Creek



Source: NBC San Diego, <https://www.nbcsandiego.com/>

- NWS San Diego received numerous reports of flash flooding in San Diego County on 10 Apr
- Highway 78 near El Camino Real was closed for more than 12 hours due to flooding from Buena Vista Creek