

# CW3E Atmospheric River Outlook: 12 November 2025

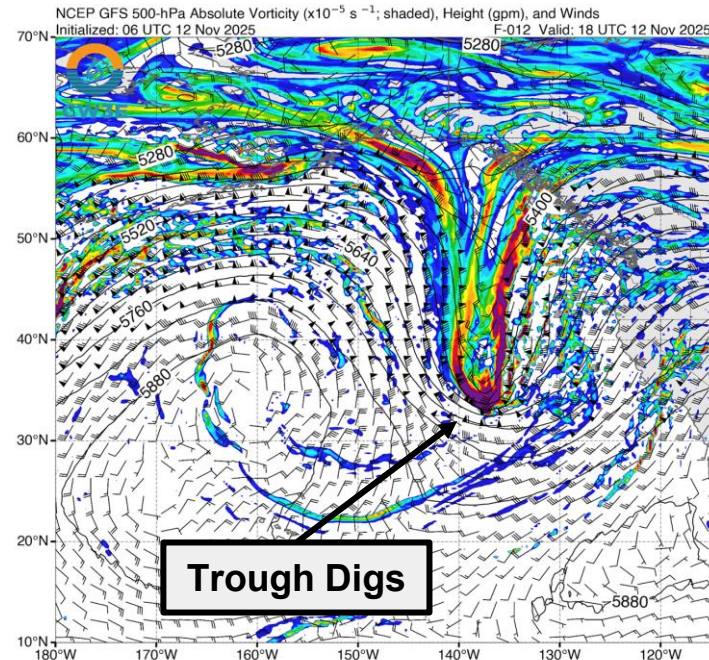
## Atmospheric River Forecast to Bring Heavy Precipitation to California Later this Week

- A strong atmospheric river (AR) that developed offshore today in association with a deep trough and area of enhanced subtropical moisture is forecast to move onshore with IVT  $>750 \text{ kg m}^{-1} \text{ s}^{-1}$  forecast over Northern California this evening.
- Recent model runs have slowed the progression of this system, leading to increased duration of AR conditions along the coast and enhancing the potential for high-impact precipitation over California through the rest of this week.
- The GEFS and ECMWF ensemble control members are forecasting AR 5/AR 3 conditions respectively along coastal Northern and Central California and AR 2/AR 3 conditions over coastal Southern California, although there is still uncertainty in the duration and intensity of AR conditions due to uncertainties in the progression of the cutoff low over the region.
- The NWS Weather Prediction Center (WPC) is forecasting a broad region of 2–4 in. of precipitation over much of California, with areas of  $>4$  in. forecast over the coastal ranges of Northern & Central California, along the Sierra Nevada, and in the Transverse Ranges. Model precipitation totals from the GFS and ECMWF are forecast to exceed 5-10% of annual rainfall over multiple catchments.
- The NWS WPC has issued **marginal risk** (level 1 of 4;  $\geq 5\%$  probability of flash flooding) and **slight risk** (level 2 of 4;  $\geq 15\%$  probability of flash flooding) excessive rainfall outlooks (EROs) over Northern & Central California for 4 AM Wed 12 Nov–4 AM Fri 14 Nov and for Central & Southern California for 4 AM Fri 14 Nov–4 AM Sun 16 Nov to highlight the potential for flash flooding from this AR.
- Freezing levels are forecast to remain relatively elevated during this AR due to the slow progression of the upper level cutoff and cold air behind the system, which will likely limit significant snowfall totals to the highest terrain along the Sierra Nevada.
- Although this AR will bring beneficial precipitation to areas of Southern California that are currently experiencing drought, there is also an increased chance of localized flash flooding due to short-duration high-intensity precipitation and multi-day rainfall totals particularly over recent burn scars.

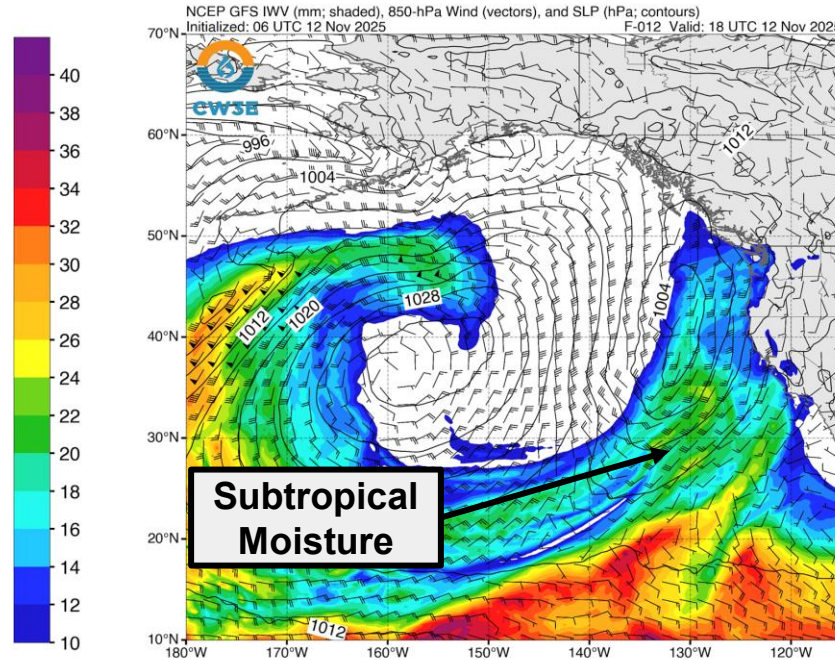
# CW3E AR Outlook: 12 November 2025

## GFS Model Forecast: Valid 10 AM PT 12 Nov 2025

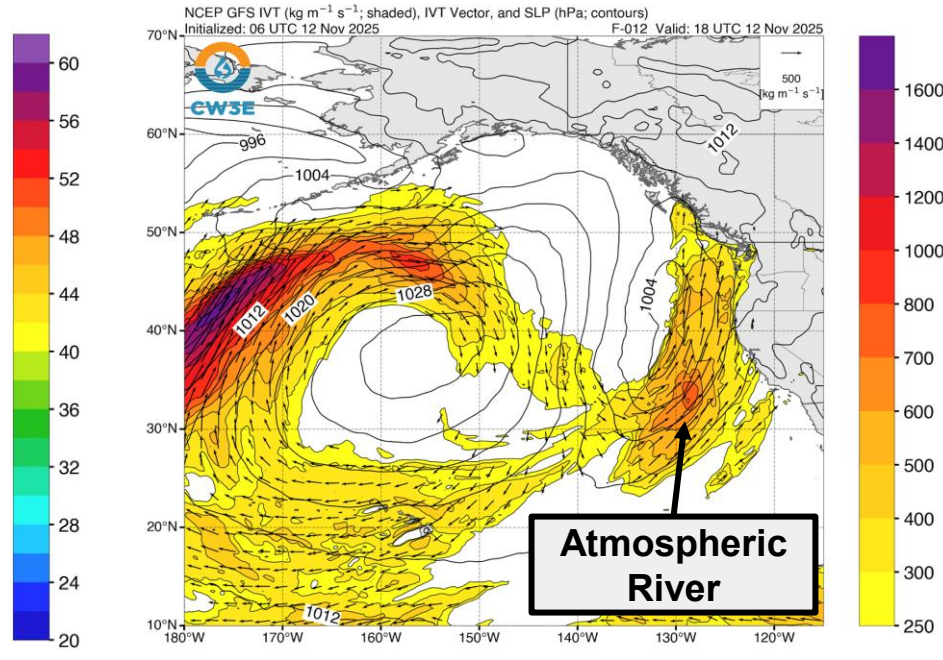
### GFS 500 hPa Abs Vort.



### GFS IWV



### GFS IVT & SLP



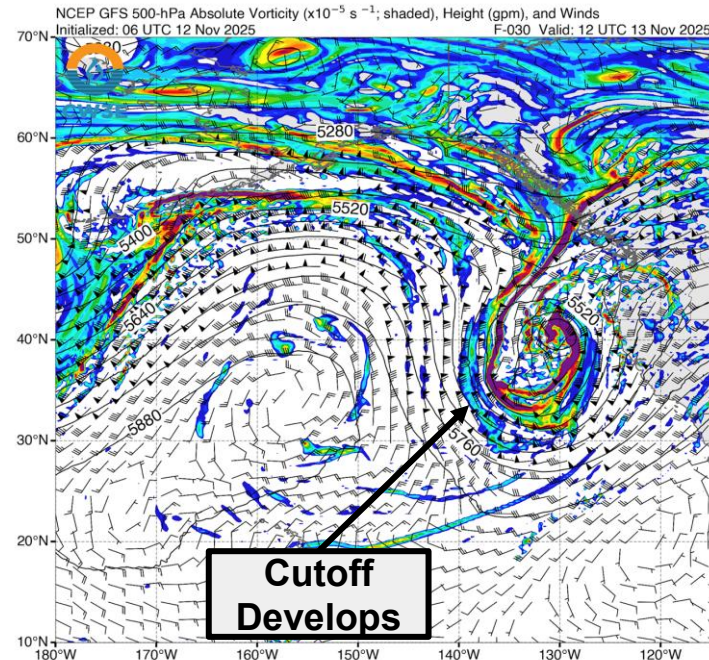
- An upper level trough that developed over the Gulf of Alaska has dug southward over the eastern North Pacific (left).
- An area of subtropical moisture is also present in this region, with a corridor of IWV values  $>32 \text{ mm}$  offshore (*center*) that was previously transported over the region by an antecedent cutoff low (*not shown*).
- As a result, an atmospheric river with IVT  $>600 \text{ kg m}^{-1} \text{ s}^{-1}$  has developed offshore and is forecast to move onshore over the US West Coast later today Wed 12 Nov. (*right*)



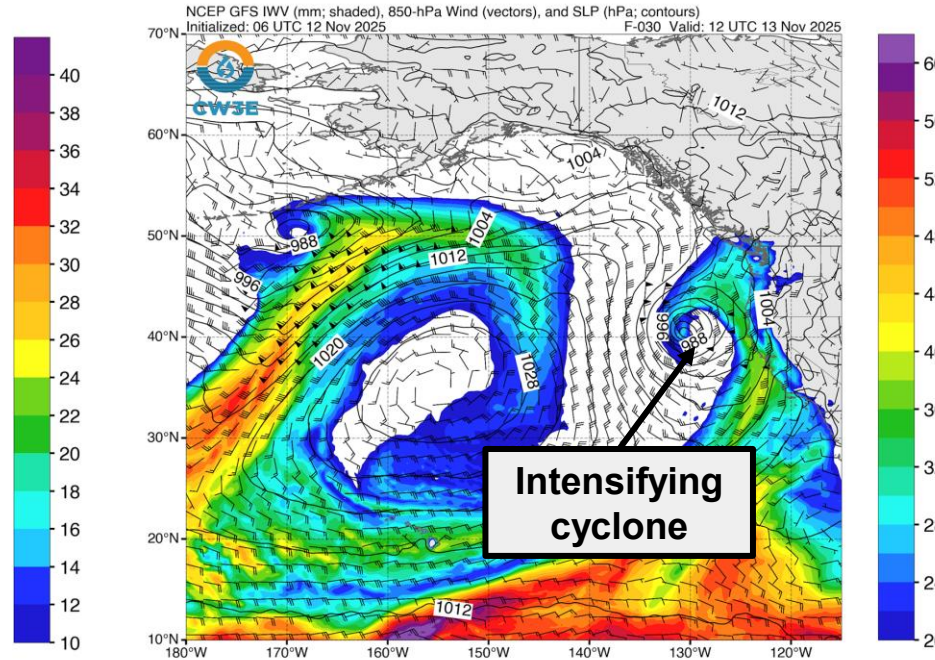
# CW3E AR Outlook: 12 November 2025

## GFS Model Forecast: Valid 4 AM PT 13 Nov 2025

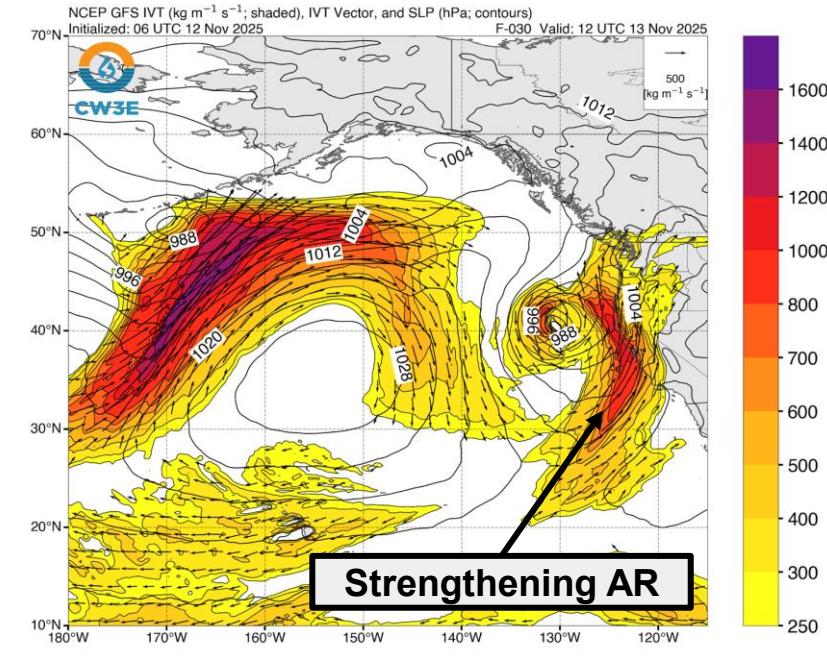
### GFS 500 hPa Abs Vort.



### GFS IWV



### GFS IVT & SLP



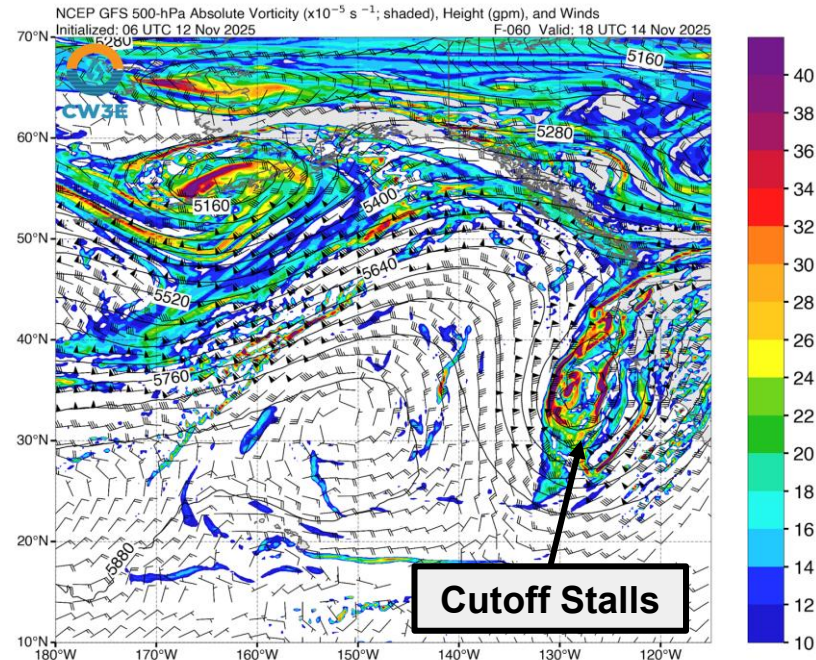
- The trough is forecast to amplify and propagate eastward, developing into a cutoff low that is forecast to stall offshore of CA (*left*).
- The area of subtropical moisture is forecast to narrow, with a corridor of IWV  $>32 \text{ mm}$  and southwesterly flow positioned off the US West Coast (*center*) in an area of favorable forcing for ascent to the east of the trough.
- The AR is forecast to strengthen with IVT  $>850 \text{ kg m}^{-1} \text{ s}^{-1}$  over Northern California and a deepening surface low offshore. The AR is forecast to shift progressively southward along coastal California throughout the day on Thu 13 Nov (*right*).



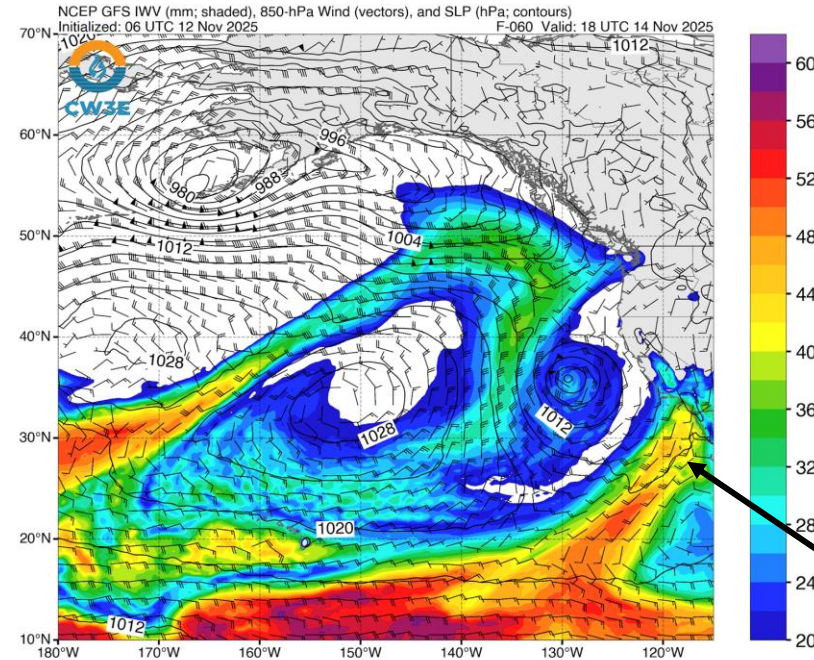
# CW3E AR Outlook: 12 November 2025

## GFS Model Forecast: Valid 10 AM PT 14 Nov 2025

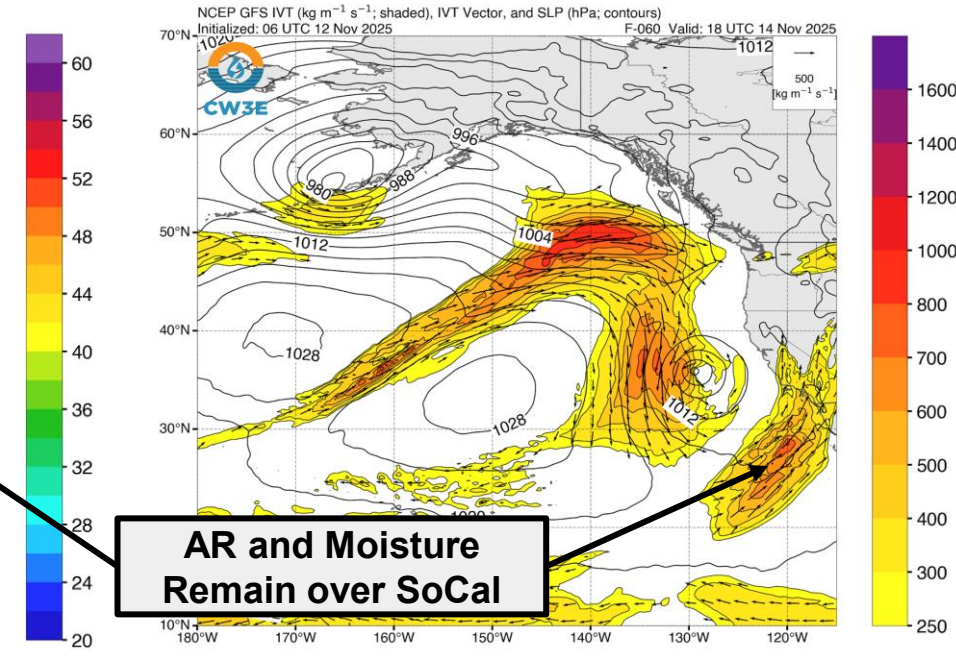
### GFS 500 hPa Abs Vort.



### GFS IWV



### GFS IVT & SLP

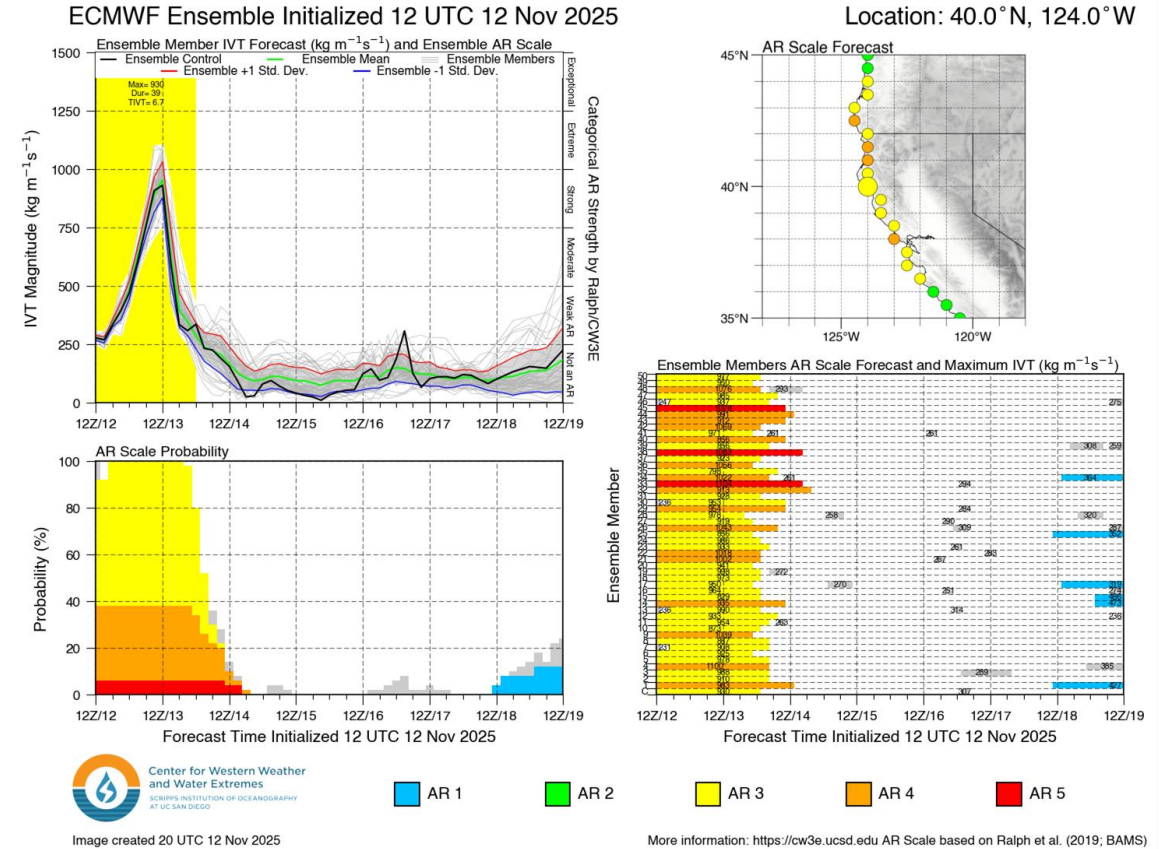
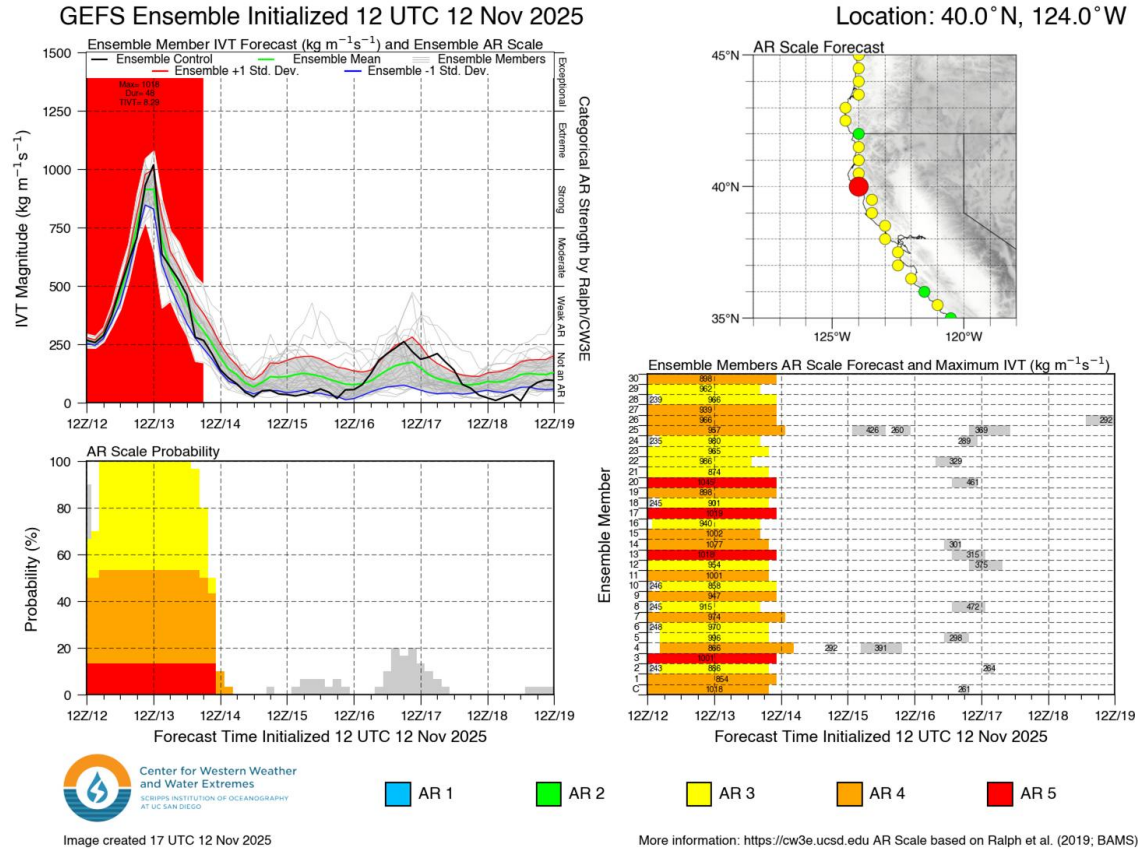


- The cutoff is forecast to remain relatively stationary offshore of California from early Fri 14 Nov into Sat 15 Nov (*left*).
- A narrow corridor of moist air with IWV  $>36$  mm associated with the AR is forecast to remain positioned just offshore of Southern California, tapping into additional subtropical moisture as it drifts southward (*center*).
- The AR and its associated southwesterly moisture transport is forecast to shift southward along California Thu 13 Nov into Fri 14 Nov and then remain over Southern California later during this period, facilitating additional precipitation over the region (*right*).



# CW3E Atmospheric River Outlook: 12 November 2025

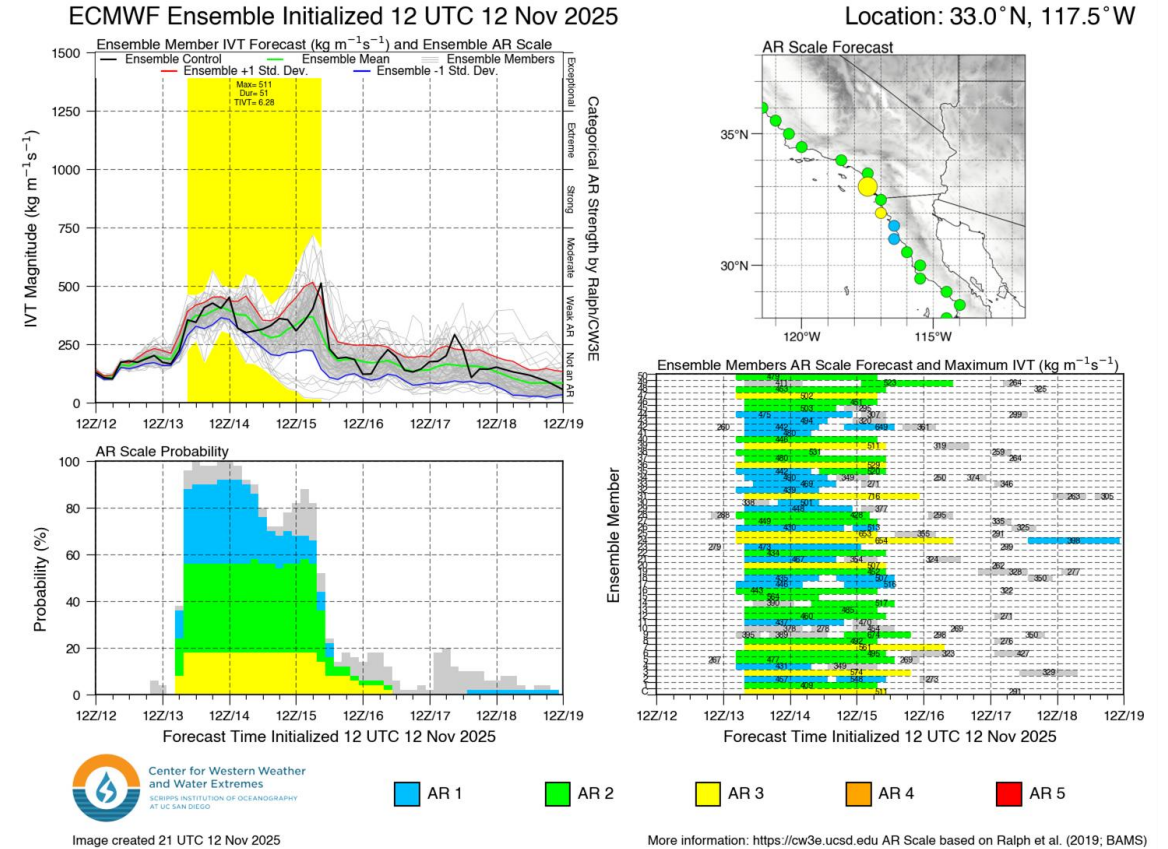
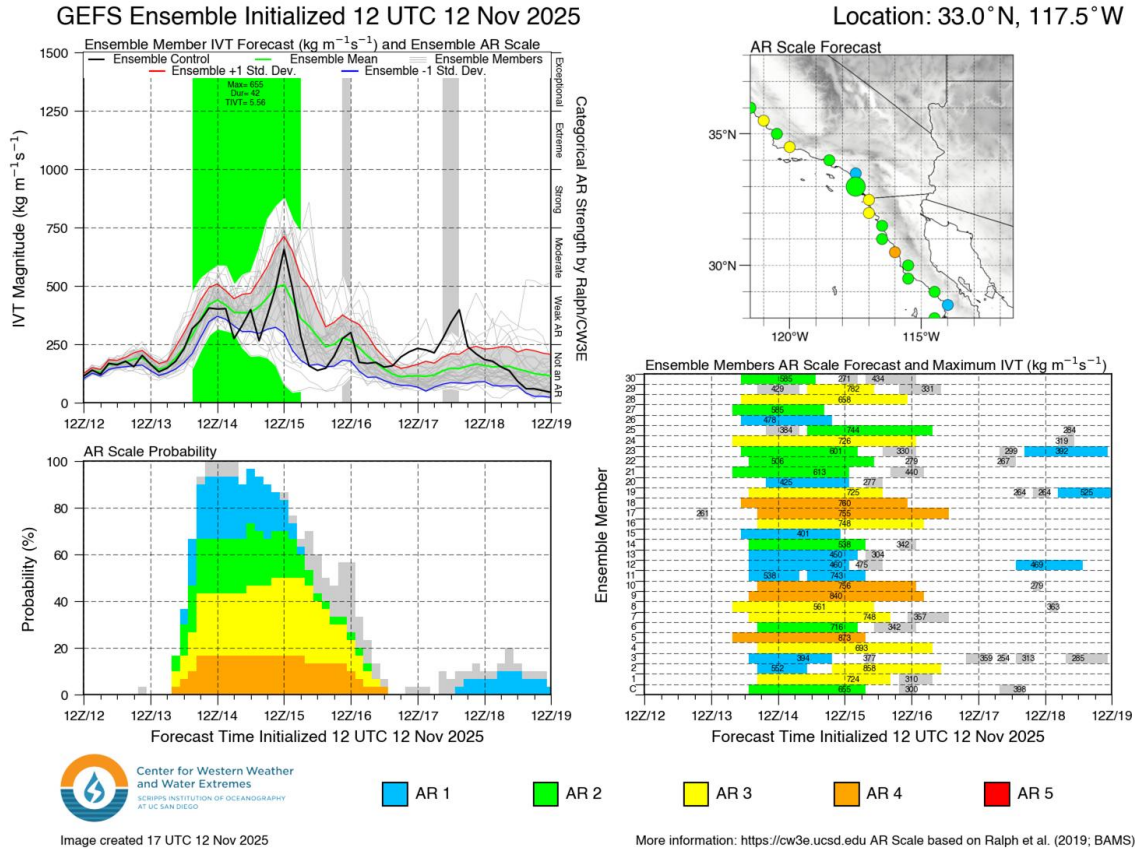
## GEFS vs ECMWF AR Scale: Northern California



- The 12Z GEFS control member is forecasting an AR 5 (based on the Ralph et al. 2019 AR Scale), whereas the ECMWF ensemble control member is forecasting an AR 3 at 40.0 N, 124.0 W (Humboldt County, CA), due to a slightly lower maximum IVT forecast for this location.
- The GEFS ensemble is forecasting >60% probability of AR4 or greater and the ECMWF ensemble is forecasts ~40% probability.

# CW3E Atmospheric River Outlook: 12 November 2025

## GEFS vs ECMWF AR Scale: Southern California



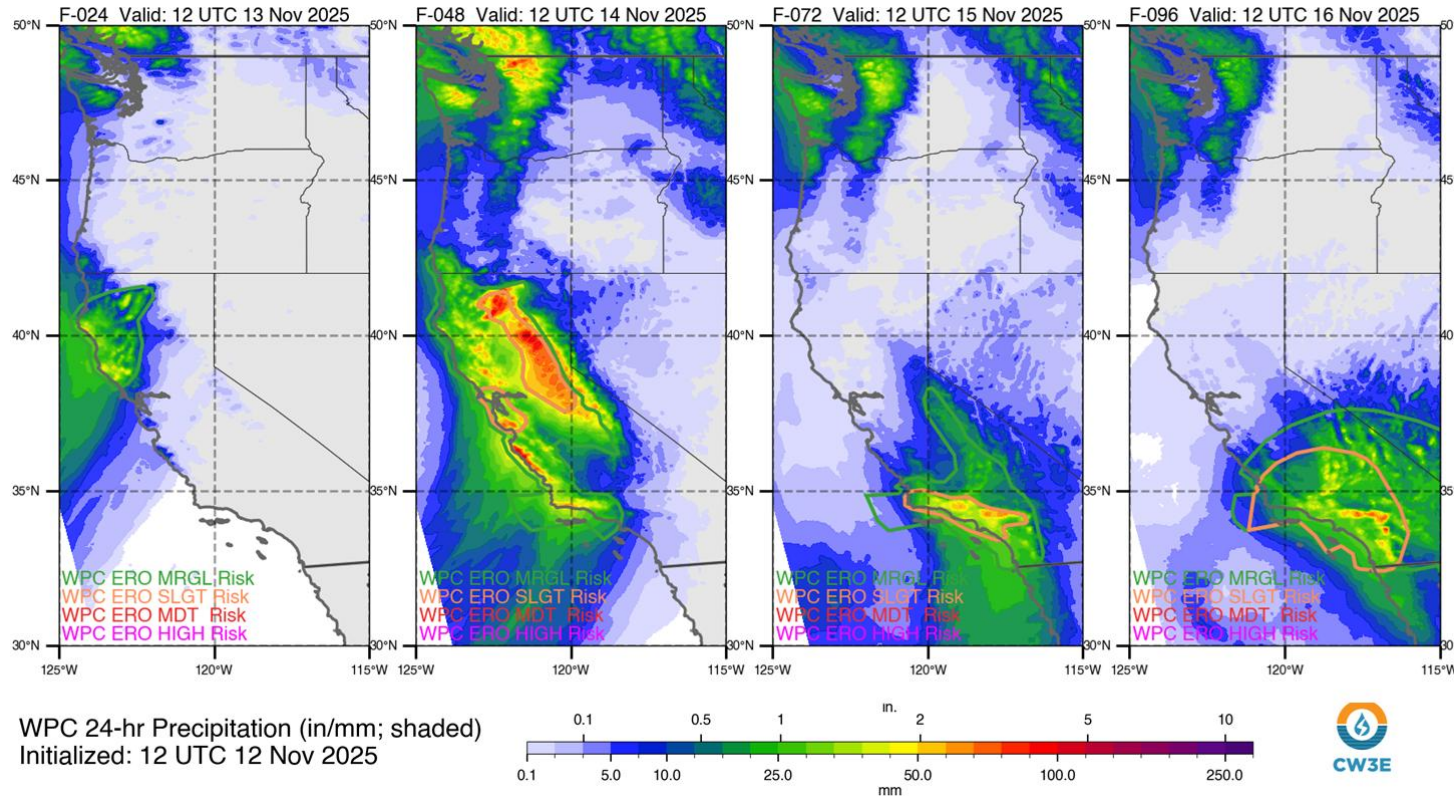
- The GEFS control member is forecasting an AR 2 over coastal Southern California while the ECMWF ensemble control member is forecasting an AR3. There are still significant model differences as to the exact duration and intensity of the AR over this region.
- Models are also suggesting a dual peak in IVT magnitude at this location associated with the AR stalling over Southern California, which would increase the AR Scale ranking at this location due to a longer AR duration.
- ~40% of GEFS members and only ~20% of ECMWF members are forecasting at least an AR 3.



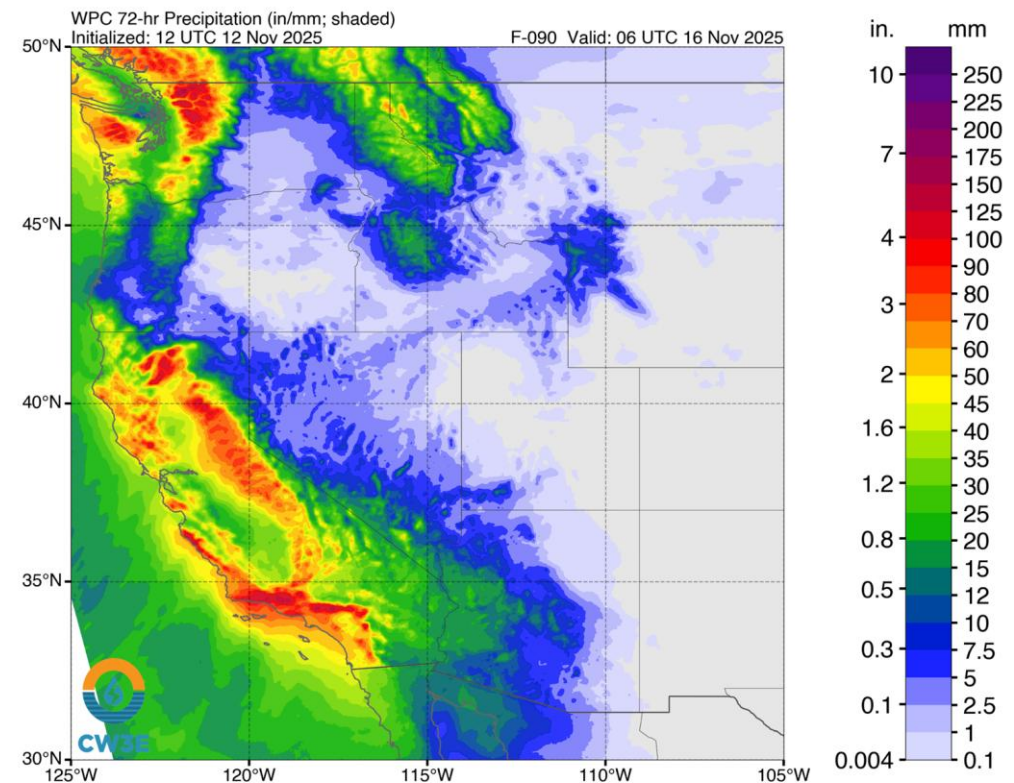
# CW3E Atmospheric River Outlook: 12 November 2025

## WPC Quantitative Precipitation Forecasts and Excessive Rainfall Outlooks

NWS WPC 24-hour QPF: 4 AM Wed 13 Nov - 4 AM Sun 16 Nov

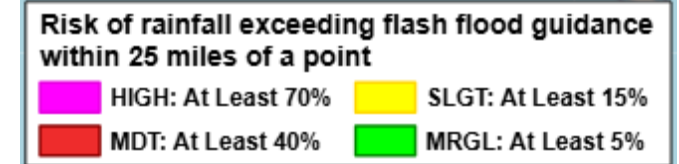
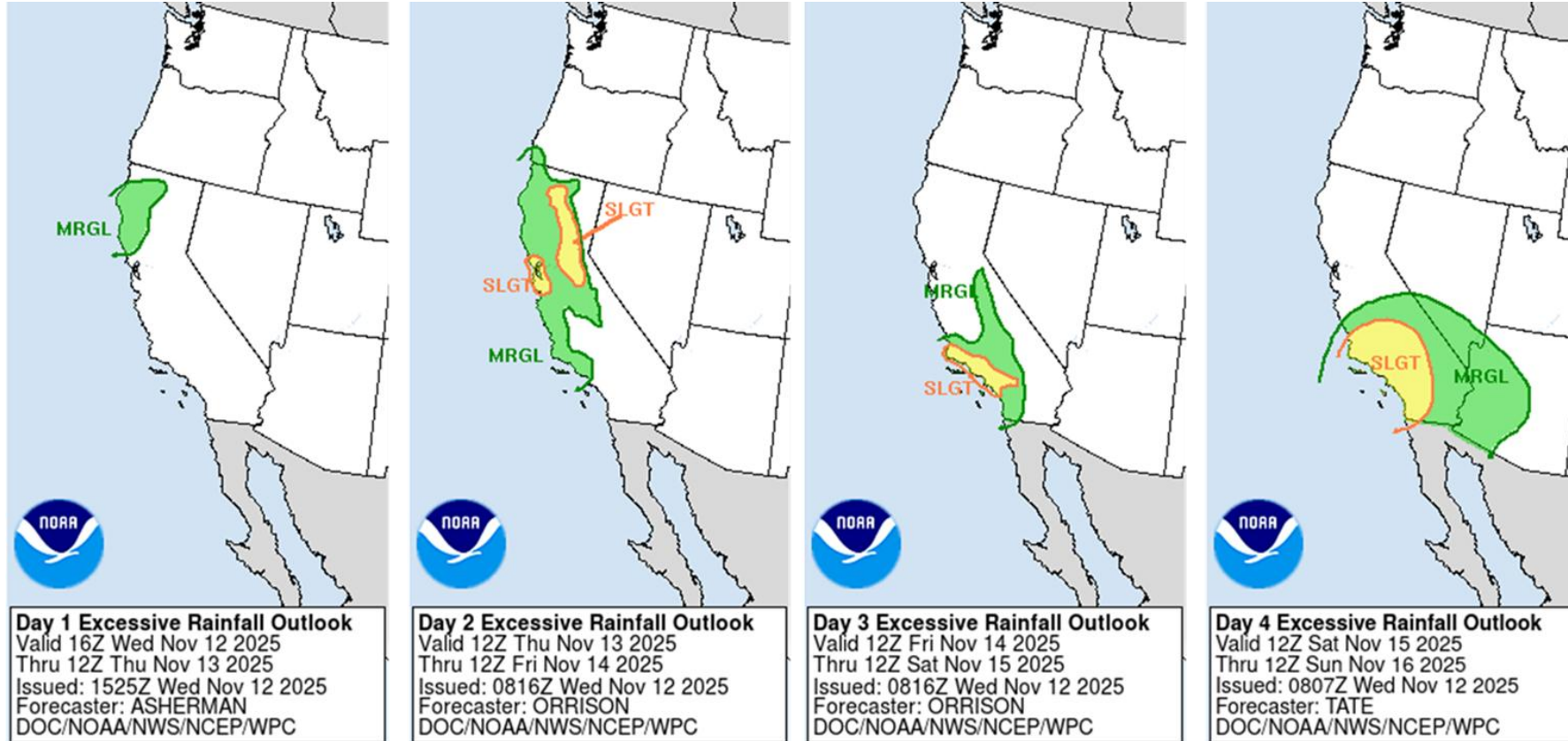


NWS WPC 72-hour QPF: 10 PM Sat 15 Nov



- The highest 24-hour precipitation amounts of >2 inches are forecast over Northern and Central California in the coastal ranges and northern Sierra Nevada between 4 AM Wed–4 AM Fri, with the greatest amounts over the Transverse Ranges and Southern California between 4 AM Fri–4 AM Sun.
- 72-hour precipitation totals of 2–5 in. are forecast from this AR over the coastal ranges of Northern & Central California, the Sierra Nevada, and the Transverse ranges for the period ending at 10 PM on Sat 15 Nov.

## NWS WPC Excessive Rainfall Outlooks

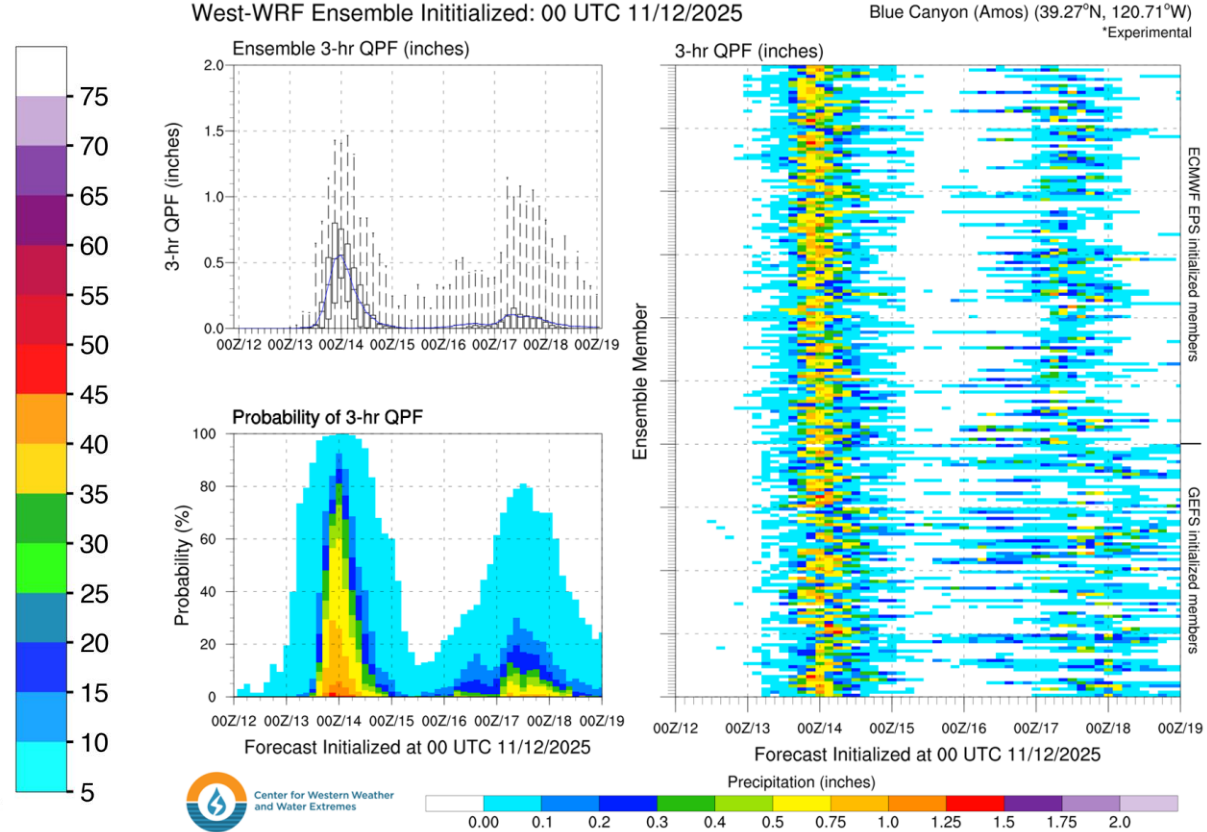
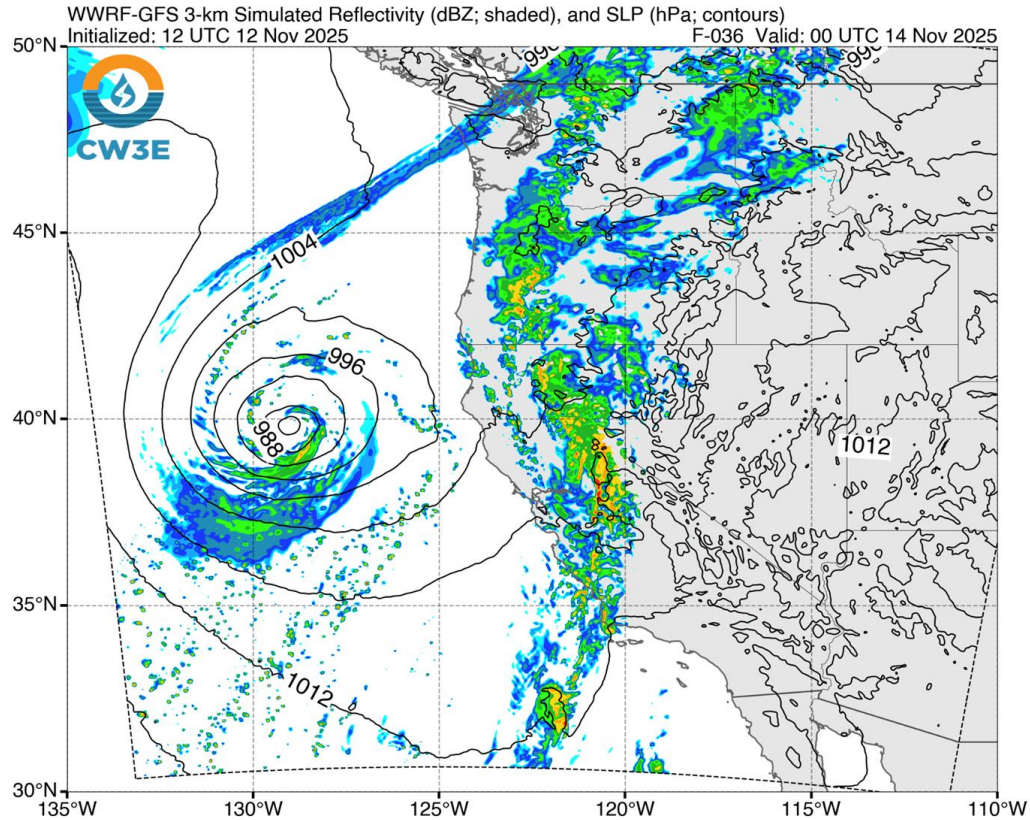


- The NWS WPC has issued **marginal risk** (level 1 of 4;  $\geq 5\%$  probability of flash flooding) and **slight risk** (level 2 of 4;  $\geq 15\%$  probability of flash flooding) excessive rainfall outlooks (EROs) over CA for Wed 12 Nov–Sat 15 Nov in association with the AR, with the elevated **slight risk** areas focused over the Bay Area & N. Sierra Nevada Thu-Fri and over the Transverse Ranges Fri-Sat.
- WPC has also issued **marginal** and **slight risk** EROs broadly over southern California, Nevada, and western Arizona as the remnant AR and its moisture move onshore with the associated cutoff, leading to additional rainfall Sat 15 Nov–Sun 16 Nov.



# CW3E Atmospheric River Outlook: 12 November 2025

## CW3E West-WRF Precipitation Analysis

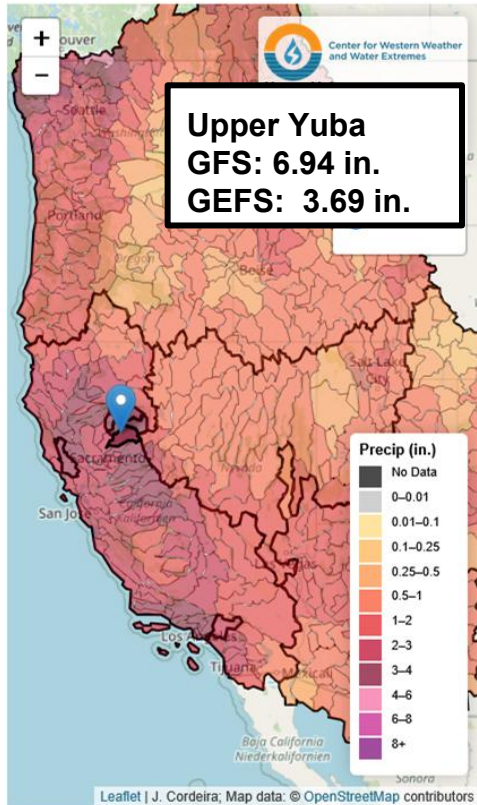


- As the AR moves onshore, a band of strong frontal precipitation is forecast to cross over the coastal ranges of Central California and move into the Central Valley and the foothills of the Sierra Nevada late in the day on Thu 13 Nov.
- CW3E's West-WRF ensemble is highlighting the potential for short-duration high-intensity precipitation in this region, with ~60% of members forecasting peak 3-hour QPF >0.5 in. and ~30% of members forecasting peak 3-hour QPF > 0.75 in. at Blue Canyon on Thu 13 Nov. Six members have 3-hr QPF >1.25 in.

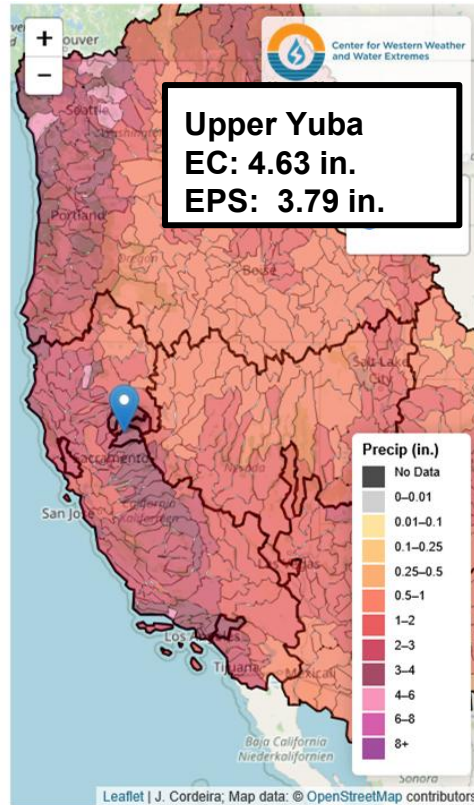
# CW3E Atmospheric River Outlook: 12 November 2025

## Watershed Precipitation Forecasts: Upper Yuba

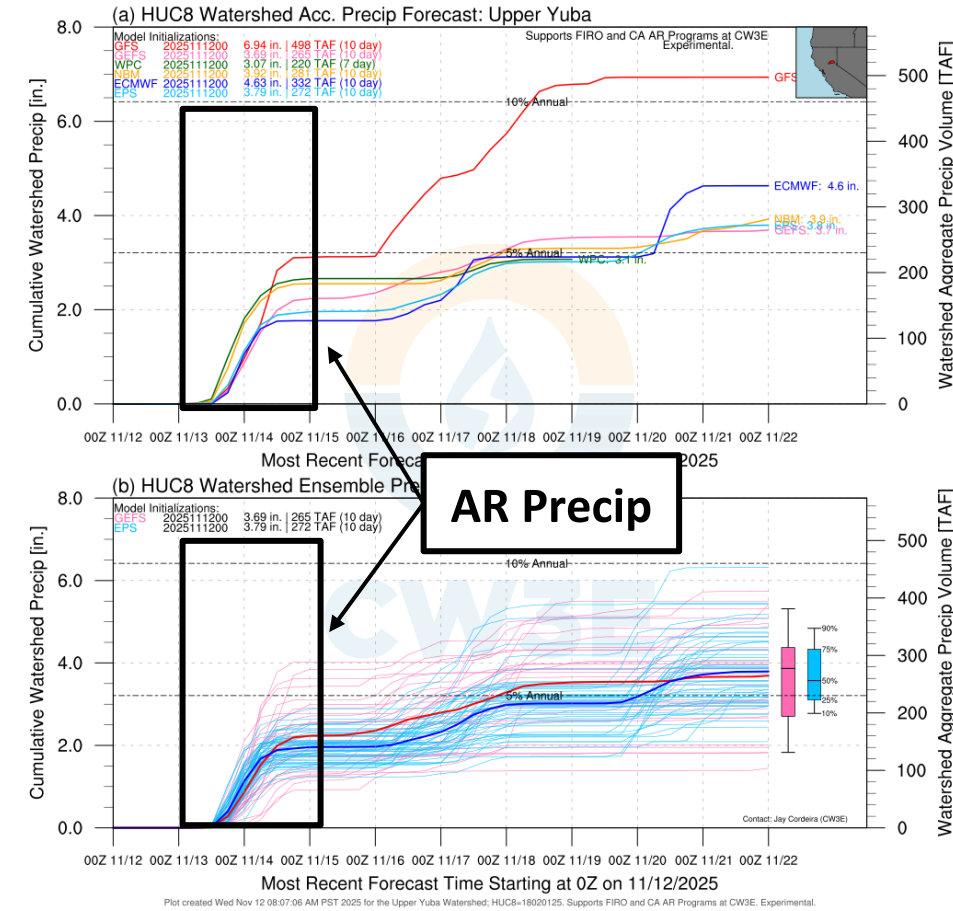
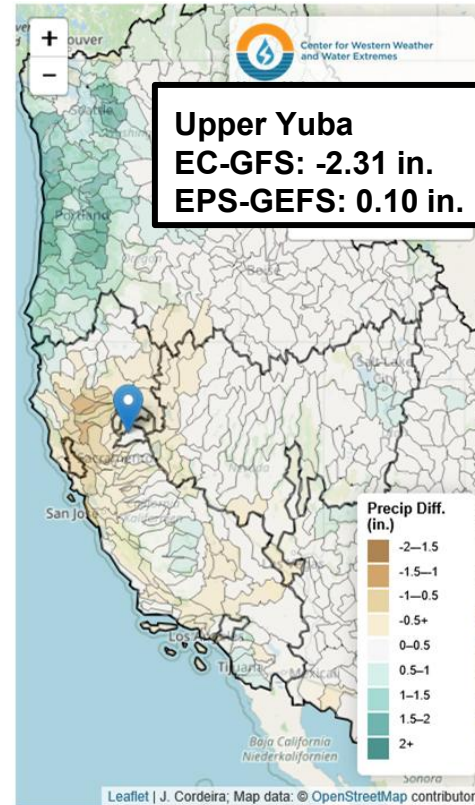
### GEFS



### EPS



### EPS minus GEFS



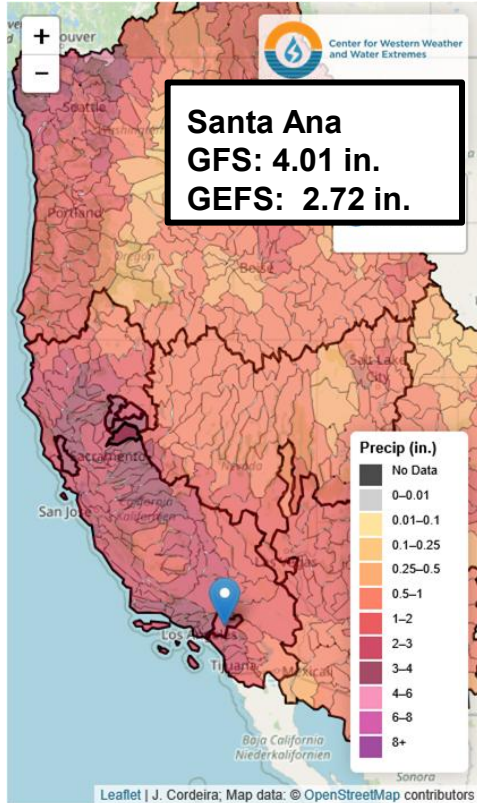
- The 00Z ECMWF and GFS ensembles are forecasting similar precipitation totals over the Sierra Nevada through 4 PM PT Fri 14 Nov. The GEFS ensemble mean is ~2.2 in. and the EPS ensemble mean is ~2.0 in. by Friday evening.
- The GEFS is indicating a wider spread of precipitation totals through Fri over the Upper Yuba watershed, with 5 members  $\leq 1.25$  in. and 4 members  $\geq 3.25$  in. (5% normal annual precipitation).



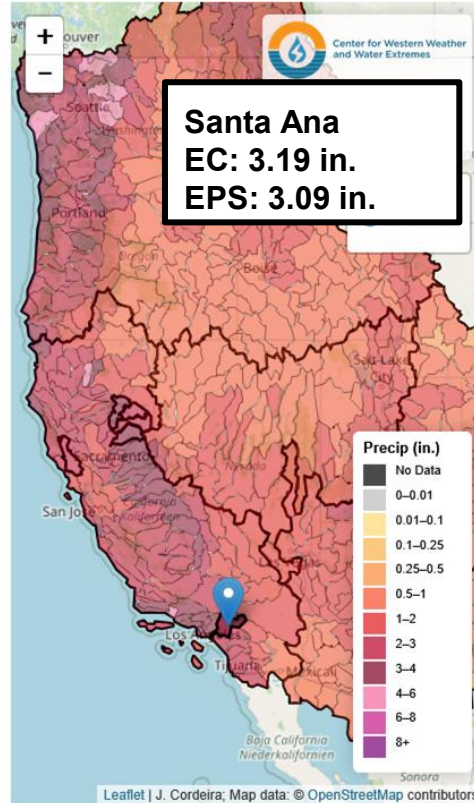
# CW3E Atmospheric River Outlook: 12 November 2025

## Watershed Precipitation Forecasts: Santa Ana

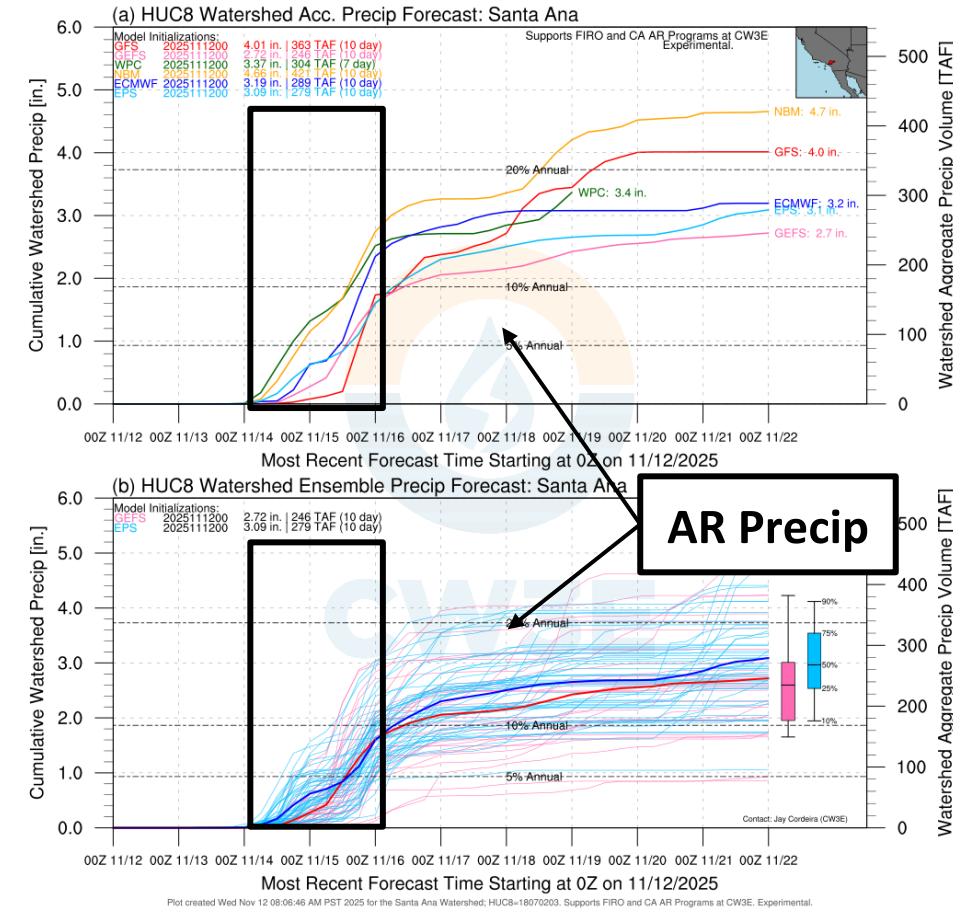
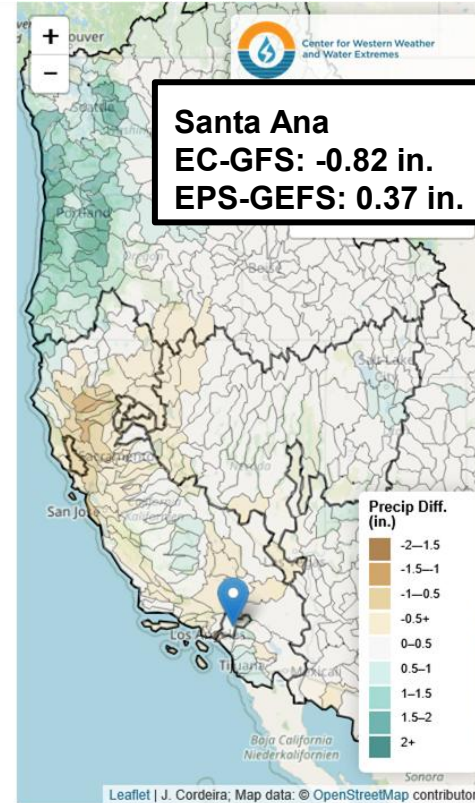
GEFS



EPS

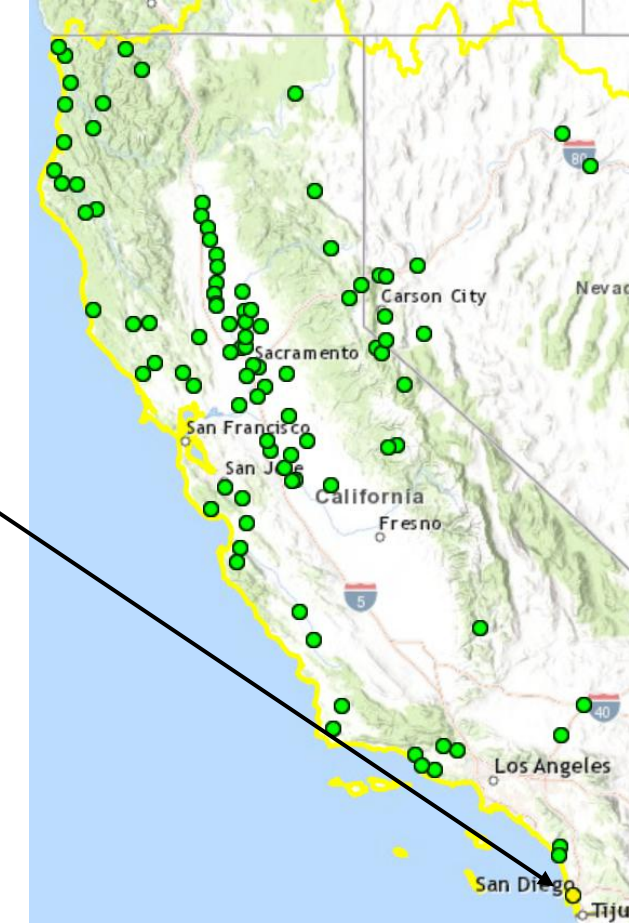
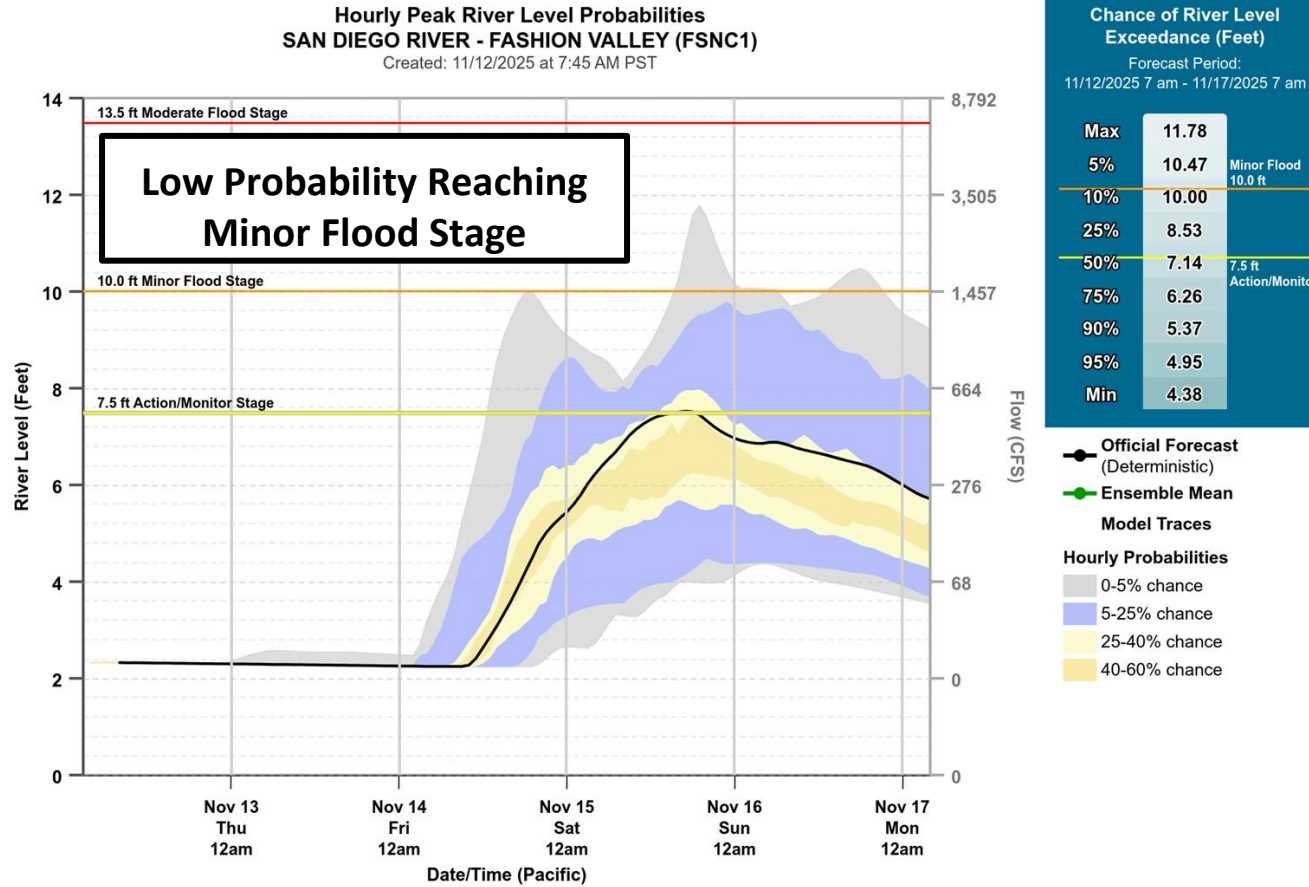


EPS minus GEFS



- The 00Z ECMWF and GFS ensembles are both indicating the potential for heavy precipitation over Southern California through Sun 16 Nov.
- All but four EPS members and three GEFS members are forecasting >5% normal annual precipitation (0.95 in.) over the Santa Ana watershed by 4 PM PT Sat 15 Nov. By that same time, 15 EPS and 8 GEFS members are forecasting >10% normal annual precipitation (1.85 in.).

## CNRFC Streamflow Forecast

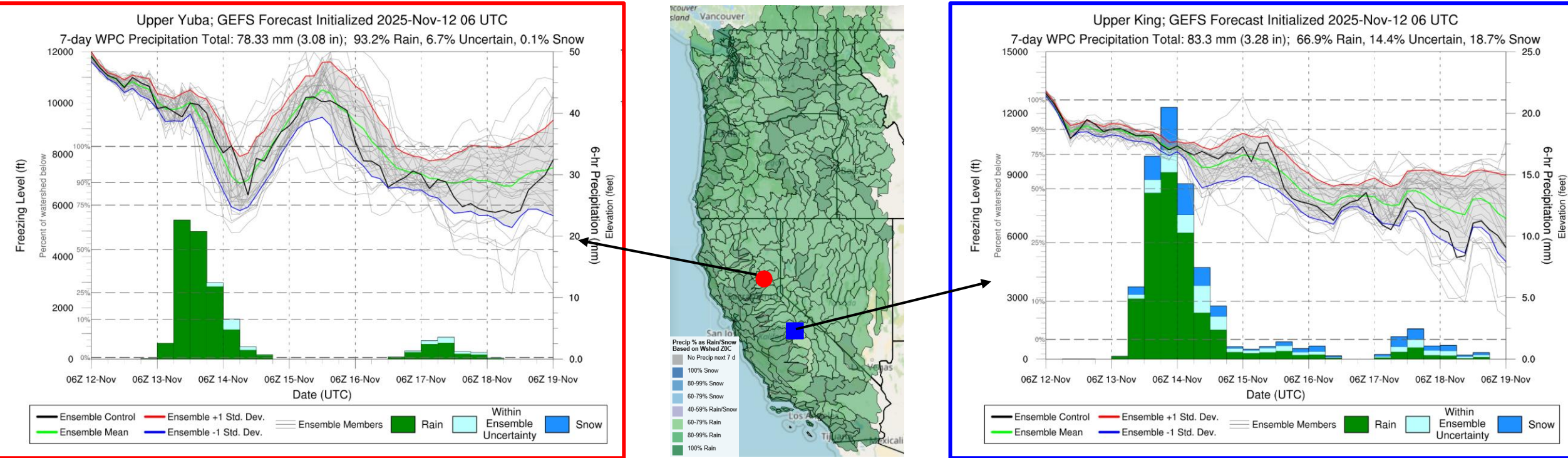


- The California-Nevada River Forecast Center (CNRFC) deterministic streamflow forecasts show river stage rises across the state with one gauge reaching Action/Monitor stage (San Diego River at Fashion Valley, right).
- Ensemble streamflow forecasts are showing the possibility of much greater river stage increases in coastal Southern California. ~40% of ensemble members are forecasting the stream gage at Fashion Valley along the San Diego River to reach Action Stage.



# CW3E Atmospheric River Outlook: 12 November 2025

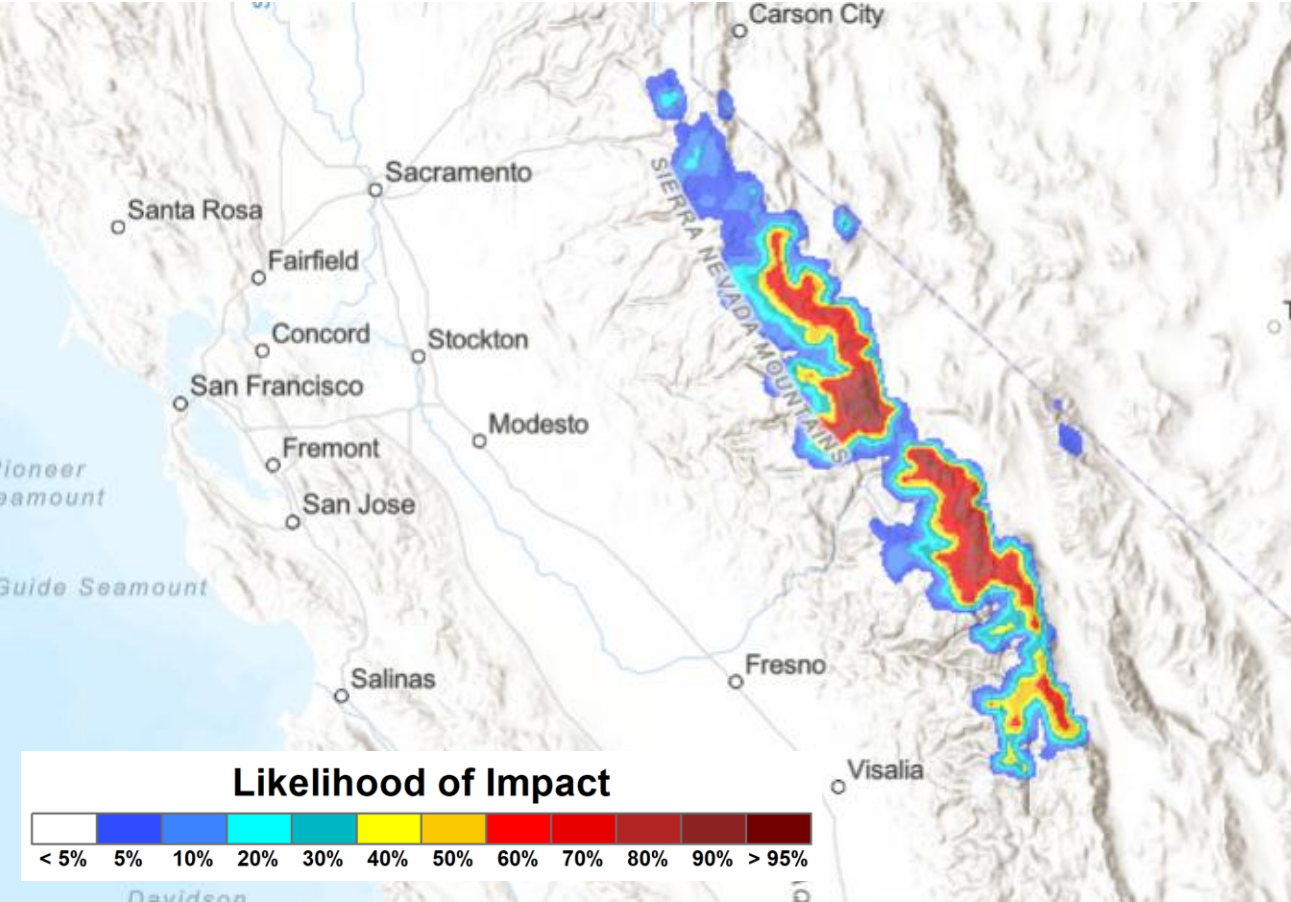
## GEFS Watershed Freezing Level Forecast Comparison



- The upper level trough and its associated cold air is forecast to stall offshore during the period of heaviest precipitation over the region, allowing warm air out ahead of the system to keep freezing levels relatively high.
- Compared to earlier model runs, the most recent ensemble freezing level forecasts are indicative of primarily liquid precipitation over the Sierra Nevada, with heavy snowfall forecast primarily over the highest terrain generally above 6,000–8,000 feet.

## NWS WPC Probabilistic Winter Storm Severity Index

24-hr Forecast Valid: 10 AM PT 14 Nov 2025



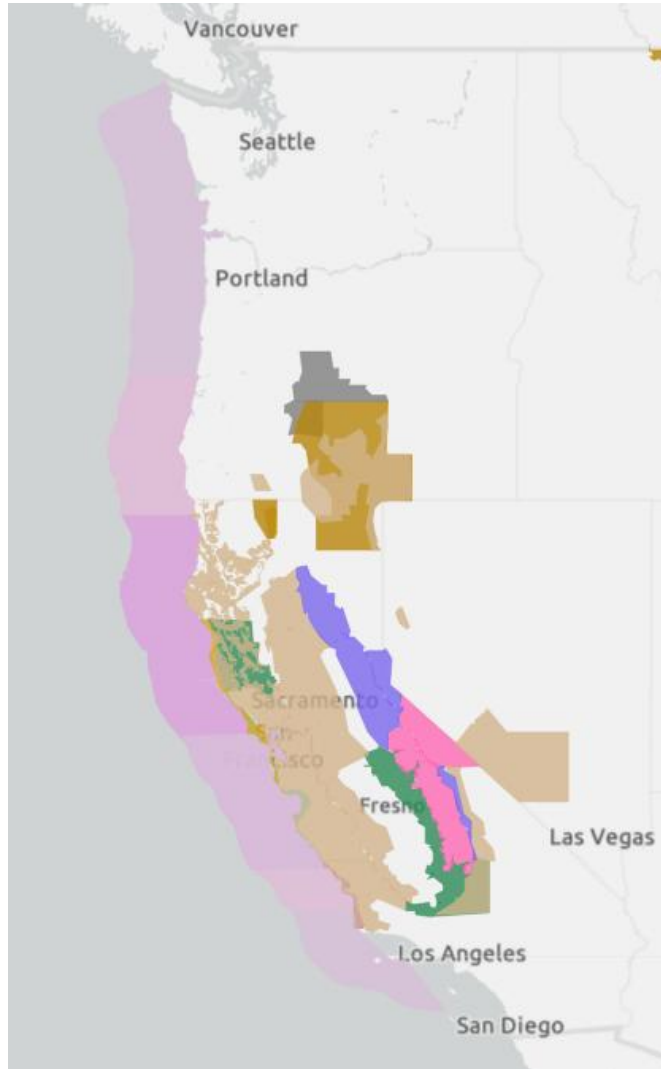
Potential Winter Storm Impacts
<b>Winter Weather Area</b> Expect Winter Weather. <ul style="list-style-type: none"><li>Winter driving conditions. <b>Drive carefully.</b></li></ul>
<b>Minor Impacts</b> Expect a few inconveniences to daily life. <ul style="list-style-type: none"><li>Winter driving conditions. <b>Use caution while driving.</b></li></ul>
<b>Moderate Impacts</b> Expect disruptions to daily life. <ul style="list-style-type: none"><li>Hazardous driving conditions. <b>Use extra caution while driving.</b></li><li>Closures and disruptions to infrastructure may occur.</li></ul>
<b>Major Impacts</b> Expect considerable disruptions to daily life. <ul style="list-style-type: none"><li>Dangerous or impossible driving conditions. <b>Avoid travel if possible.</b></li><li>Widespread closures and disruptions to infrastructure may occur.</li></ul>
<b>Extreme Impacts</b> Expect substantial disruptions to daily life. <ul style="list-style-type: none"><li>Extremely dangerous or impossible driving conditions. <b>Travel is not advised.</b></li><li>Extensive and widespread closures and disruptions to infrastructure may occur.</li><li>Life-saving actions may be needed.</li></ul>

- The NWS Weather Prediction Center is forecasting >80% likelihood of **moderate** winter storm impacts along the highest terrain in the central and southern Sierra Nevada for the 24-hour period ending 10 AM Fri 14 Nov.



# CW3E Atmospheric River Outlook: 12 November 2025

## National Weather Service Watches, Warnings, and Advisories



### NWS Hazards & Warnings

Updated: Wed Nov 12, 2025 2:03 PM PST

Small Craft Advisory  
Lake Wind Advisory  
Flood Watch  
Gale Warning  
High Wind Warning  
Wind Advisory  
Winter Storm Warning  
Gale Watch  
High Surf Advisory  
Air Quality Advisory  
High Wind Watch  
Beach Hazards Statement  
Winter Weather Advisory  
Heavy Freezing Spray Warning



- NWS Weather Forecast Offices (WFOs) across the Western US have begun issuing watches, warnings, and advisories for a variety of impacts with this AR.
- Winter Weather Advisories and Winter Storm Warnings have been issued for high elevation along the Sierra Nevada
- Flood Watches have been issued for the coastal ranges in Northern California and along the foothills of the southern Sierra Nevada
- Wind related products including High Wind Warnings and Gale Warnings have been issued over coastal waters and along terrain in California.

**Stay alert official watches, warnings, and advisories from your local NWS office by visiting [weather.gov](https://www.weather.gov)**