

Quick Look at the AR Forecast to Bring Heavy Rainfall to Northern California

Updated: 19 November 2024

A strong AR will make landfall today and bring multiple days of heavy rain to Northern California, with the potential for flooding and heavy mountain snow.

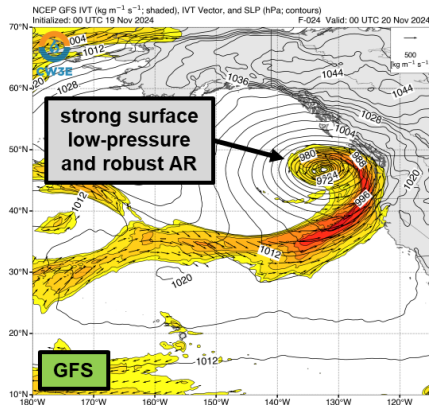
Forecast Highlights:

- A strong atmospheric river (AR) moved onshore over the Pacific Northwest and Northern California this morning. The AR is forecast to shift slightly to the south over the next 24 hours, then remain relatively stationary over Northern California until Fri 22 Nov.
- The GEFS and EPS are both forecasting a greater than 50% likelihood of AR4 conditions based on the Ralph et al. (2019) AR scale for coastal locations between the Bay Area and Eureka, CA. Both control members are predicting a maximum IVT $> 900 \text{ kg m}^{-1} \text{ s}^{-1}$ and > 72 hours of AR conditions at 40°N , 124°W .
- Upper level dynamics are forecast to be favorable for the development of a secondary low-pressure along the AR, which may increase the strength and duration of this AR.
- There is some uncertainty with the exact strength and location of this secondary cyclogenesis. The ECMWF is forecasting a stronger surface cyclone to develop as compared to the GFS, resulting in a stronger second IVT pulse over Northern California and Oregon late Thu 21 Nov into early Fri 22 Nov.
- The NWS Weather Prediction Center (WPC) is forecasting at least 5 inches of precipitation over Northern California over the next 5 days, with 10-15 inches of rain possible over the Coast Ranges, Klamath Mountains, Southern Cascades, and Northern Sierra Nevada.
- NWS WPC has issued a high risk (70%) risk excessive rainfall outlook (ERO) for Humboldt County, a moderate risk ($>40\%$) ERO for the rest of the Northern California Coast Ranges, and a slight risk ($>15\%$) ERO for the Northern Sierra Nevada. The most significant hydrologic impacts are expected Wed 20 Nov into early Fri 22 Nov.
- Three stream gages in Northern California are forecast to rise above flood stage. The Eel River at Fernbridge is forecast to rise 22 feet and crest at moderate flood stage on Fri 22 Nov.
- NWS 72-hour snowfall forecasts for the period between 4 AM Tue 19 Nov and 4 AM Fri 22 Nov range from 12-36 inches of snow over the Southern Cascades and Northern Sierra Nevada, with isolated areas of > 72 inches of snow over the Trinity Alps.
- The WPC Probabilistic Winter Storm Severity Index indicates high probabilities (80-90%) of “major” impacts over those areas, highlighting dangerous travel conditions.

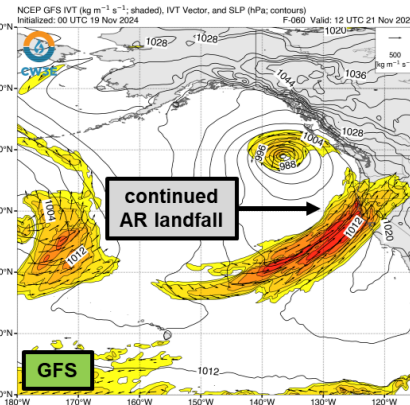
Stay alert to official NWS forecasts, watches, and warnings at [weather.gov](https://www.weather.gov) and follow guidance from local emergency management officials

Stay tuned to the CW3E webpage for a full AR Update

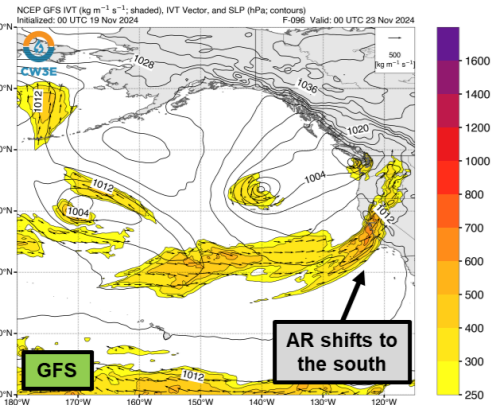
GFS IVT Valid: 4 PM Tue 19 Nov



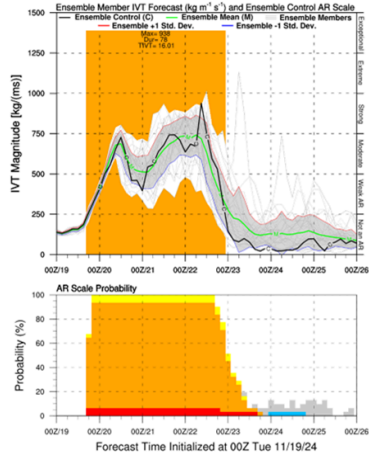
GFS IVT Valid: 4 AM Thu 21 Nov



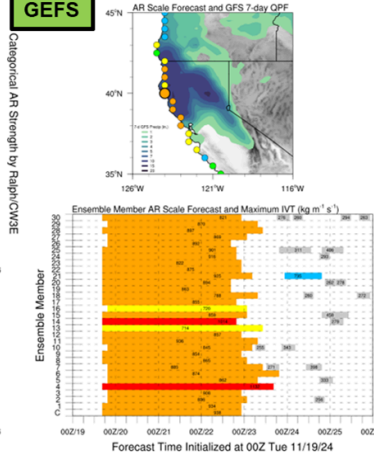
GFS IVT Valid: 4 PM Fri 22 Nov



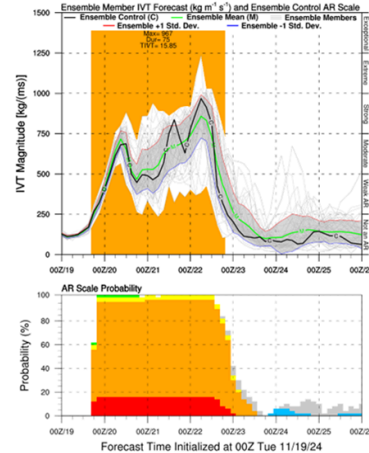
GFS Ensemble Initialized: 00Z Tue 11/19/24



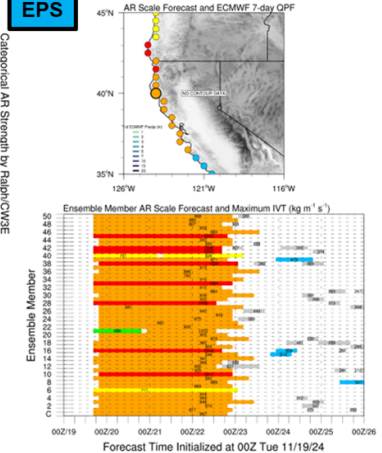
Location: 40°N 124°W



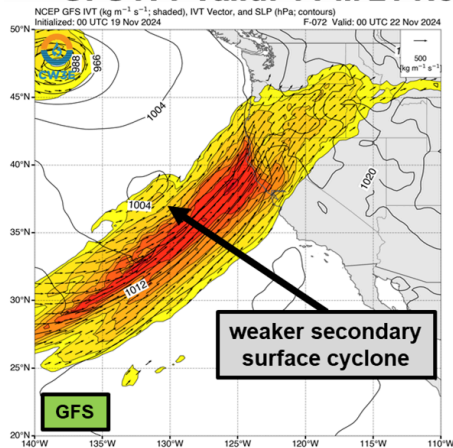
ECMWF Ensemble Initialized: 00Z Tue 11/19/24



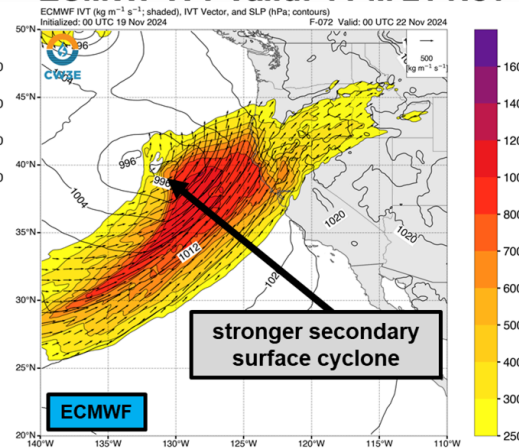
Location: 40°N 124°W



GFS IVT Valid: 4 PM 21 Nov



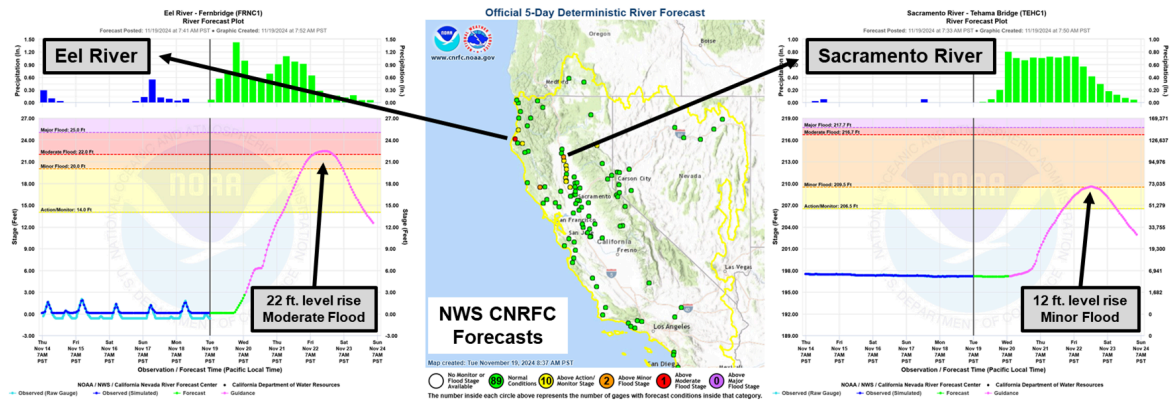
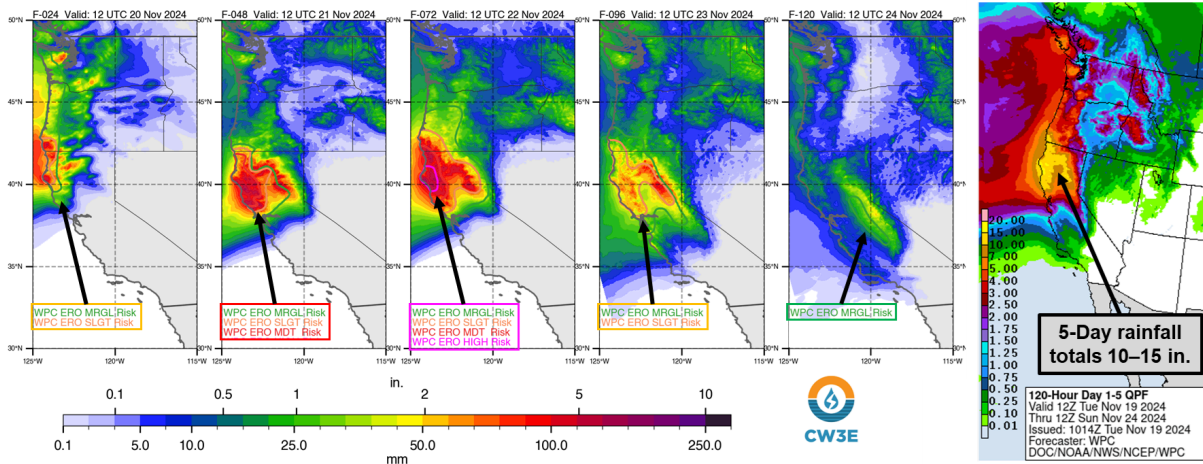
ECMWF IVT Valid: 4 PM 21 Nov



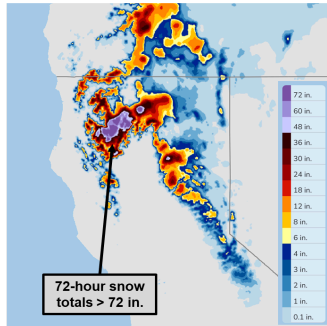
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WPC Days 1-5 24-h QPF: Valid for the Periods Ending 4 AM 20-24 Nov

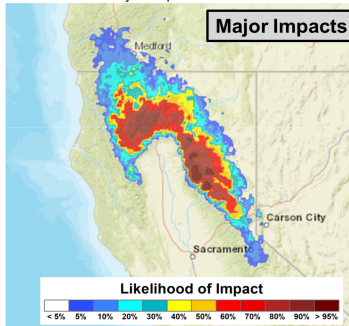
WPC Days 1-5 Total QPF



NWS 72-hour Snowfall Forecast 4 AM Tue 19 Nov – 4 AM Fri 22 Nov



NWS Probabilistic Winter Storm Severity Index Likelihood of Major Impacts Valid 4 AM Thu 21 Nov



Additional Considerations:

- Visit <https://www.weather.gov/nwrfc/> and <https://www.weather.gov/cnrfc/> for specific river and stream forecasts and <https://www.weather.gov/> for point specific forecasts.

In-depth AR forecasts products can be found here:

<http://cw3e.ucsd.edu/iwv-and-ivt-forecasts/>

Update by S. Bartlett

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