

CW3E AR Outlook

For California DWR's AR Program

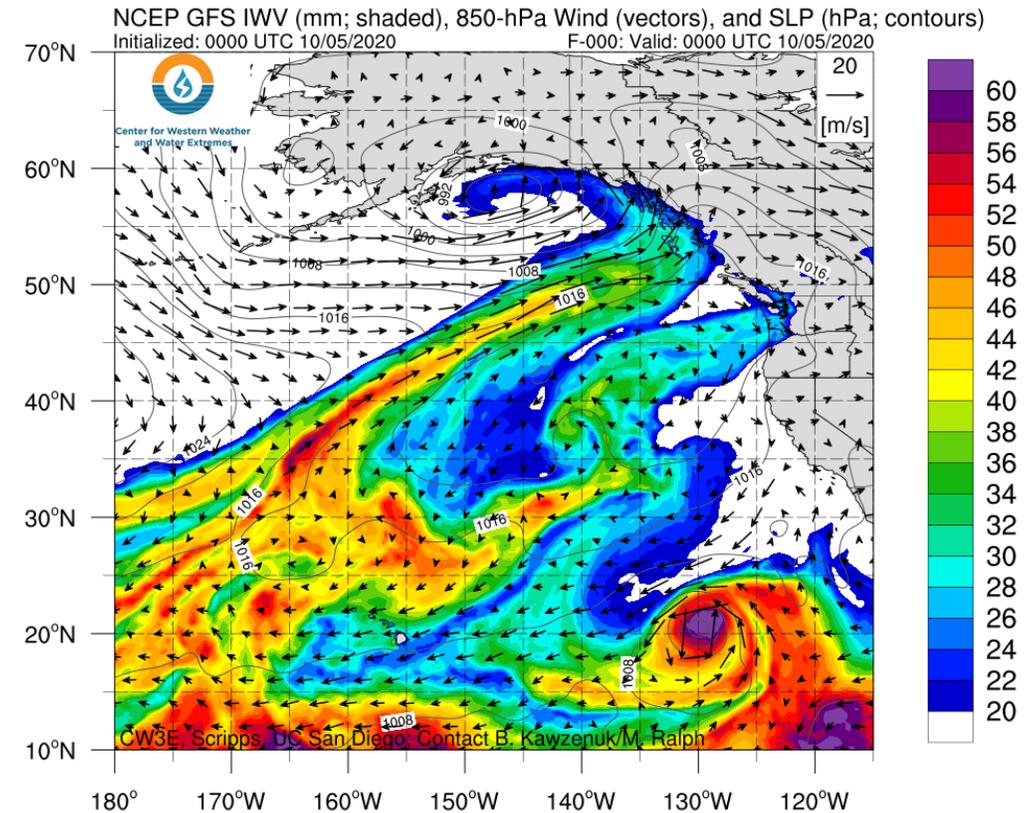
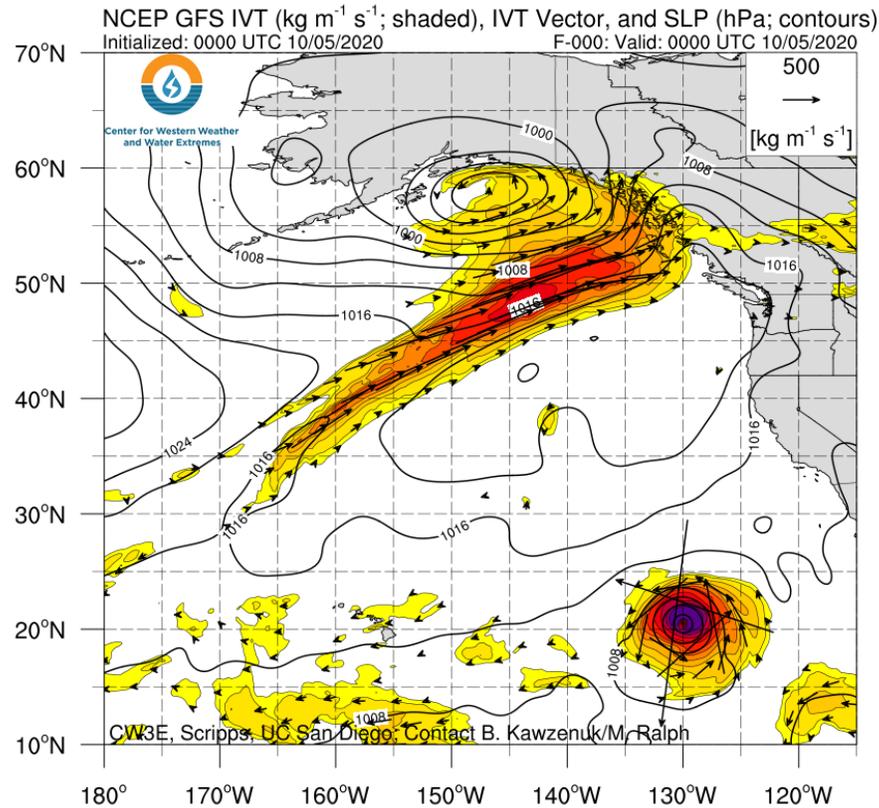


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Update on Atmospheric Rivers Forecast to Bring Precipitation to the US West Coast

- A unique large-scale flow regime is forecast to result in the landfall of two separate but concurrent ARs over the USWC
- Current forecasts suggest that IVT magnitudes over southern Oregon may reach $500 \text{ kg m}^{-1} \text{ s}^{-1}$ while AR conditions are forecast to last ~ 27 hours, resulting in AR 2 conditions
- There is currently a large amount of uncertainty in the forecast, which is resulting in a large spread of potential outcomes
- The GFS, ECMWF, and NBM are forecasting different precipitation accumulations from Washington to Northern CA
- Due to the numerous fires currently burning across California, this precipitation in the forecast may bring much needed relief to extremely dry conditions



AR Outlook: 05 Oct 2020

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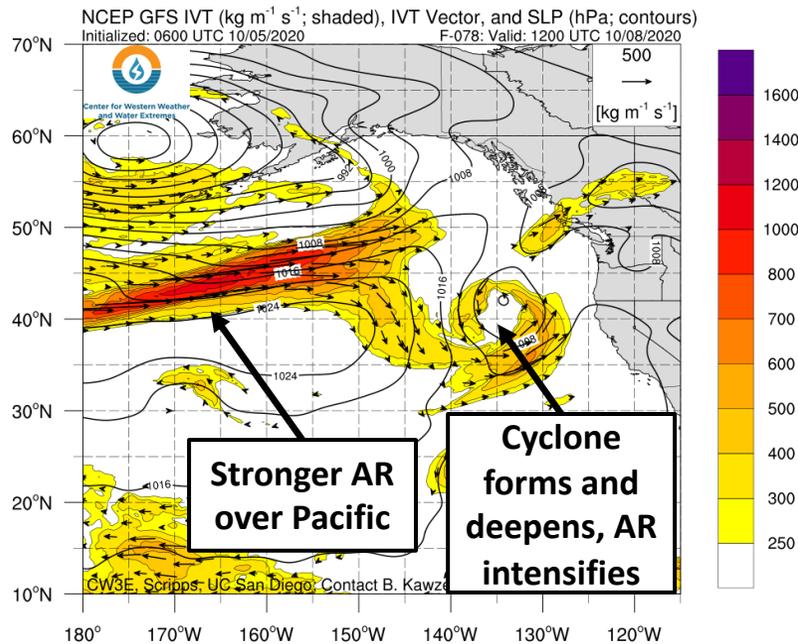


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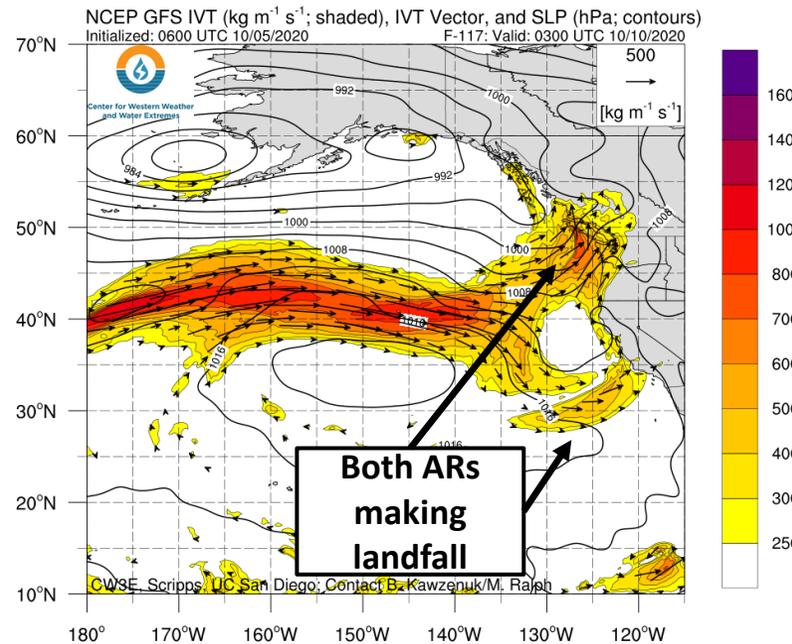
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GFS IVT & SLP Forecasts

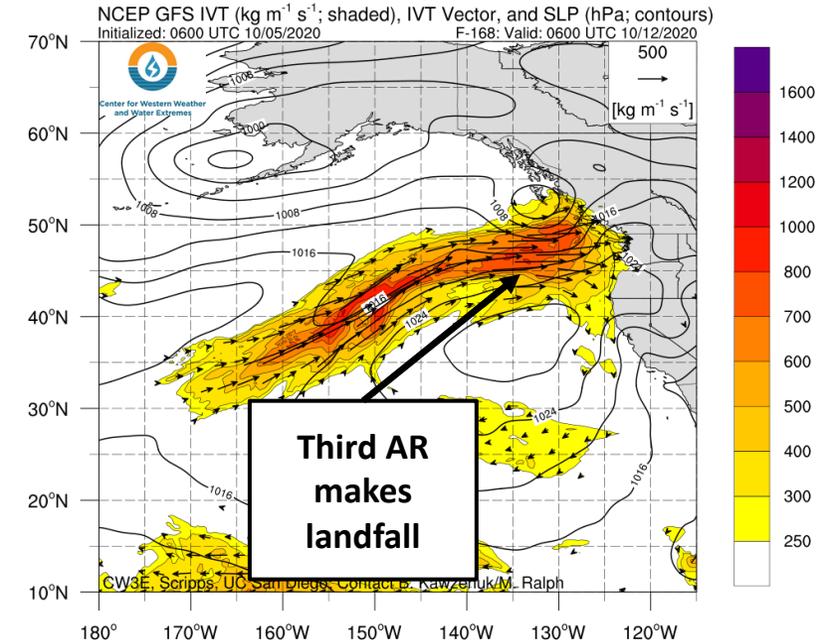
A) Valid: 1200 UTC 08 Oct (F-78)



B) Valid: 0300 UTC 10 Oct (F-117)



C) Valid: 0600 UTC 12 Oct (F-168)



At ~12 UTC 8 Oct., a cyclone is forecast to form and deepen just off the USWC, intensifying an AR as another AR over the central north Pacific is propagating towards the USWC

By ~03 UTC 10 Oct, both ARs are forecast to make landfall at different locations over the USWC

As the two ARs dissipate, there is the potential for another AR to make landfall over the Pacific Northwest at ~06 UTC 12 October

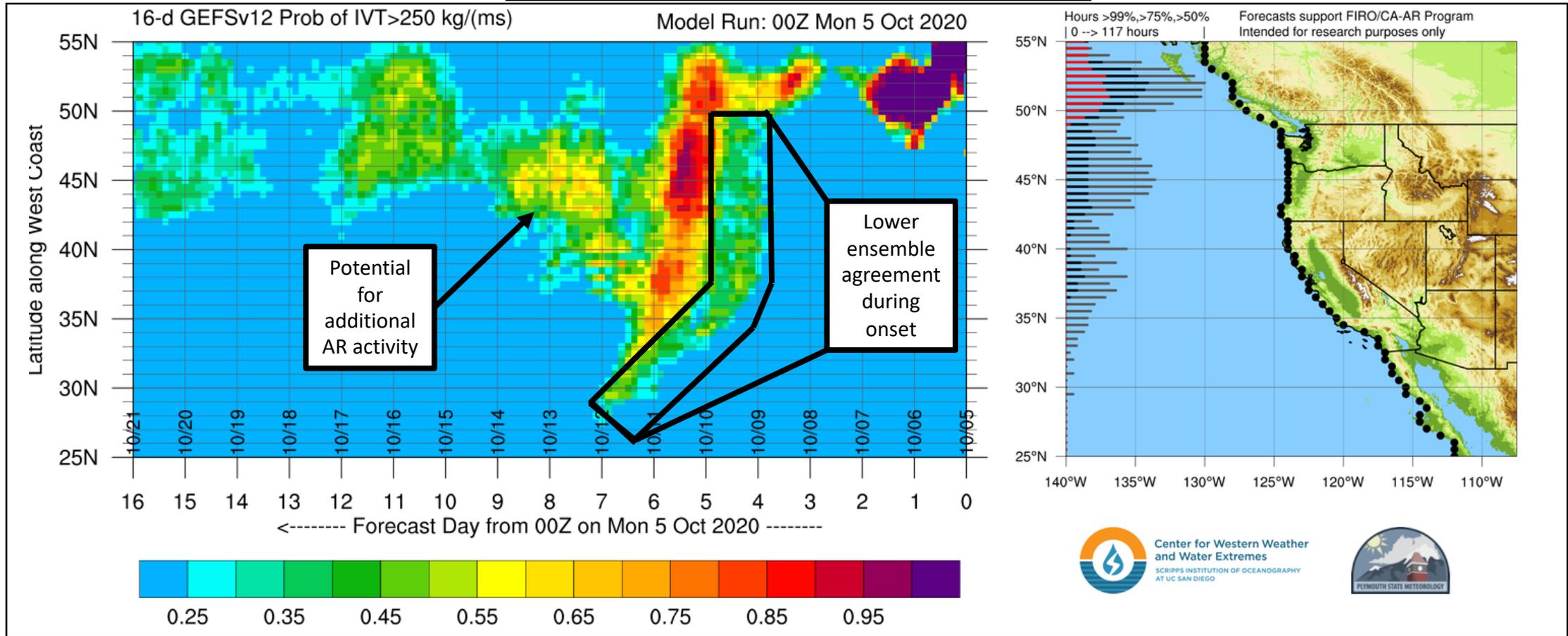
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Probability of AR Conditions Along Coast



- The GEFSv12 is currently highlighting an elevated probability (>75% of ensemble members) of AR conditions (IVT magnitude $\geq 250 \text{ kg m}^{-1} \text{ s}^{-1}$) over a large portion of the US West Coast between 00Z 10 Oct and 00Z 11 Oct
- There is lower ensemble agreement (<50%) on when AR conditions will begin and how long they will last, leading to large uncertainty in overall AR condition duration

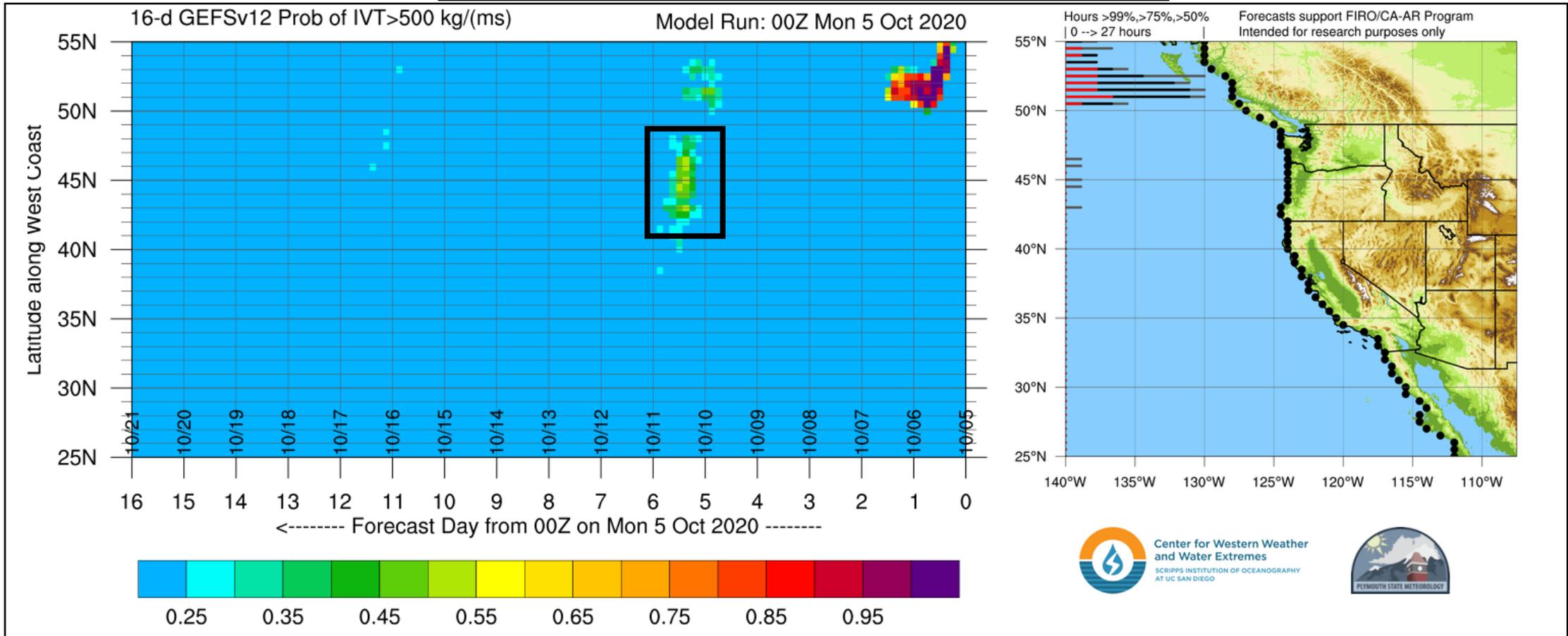
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Probability of Moderate AR Conditions Along Coast



- Approximately 45–60% of GFSv12 ensemble members are predicting a brief period of moderate AR conditions (IVT magnitude 500–750 $\text{kg m}^{-1} \text{s}^{-1}$) over Coastal Oregon



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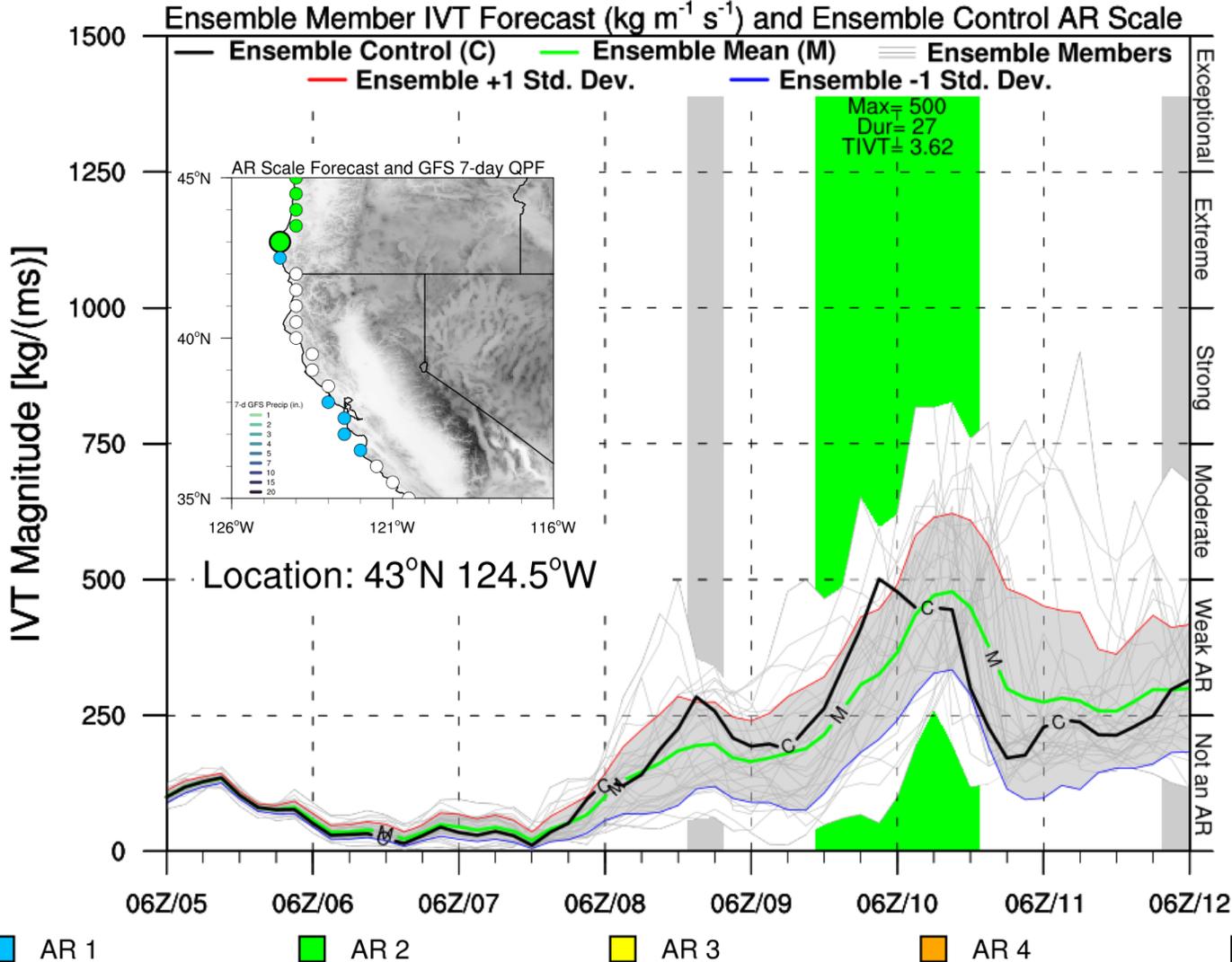
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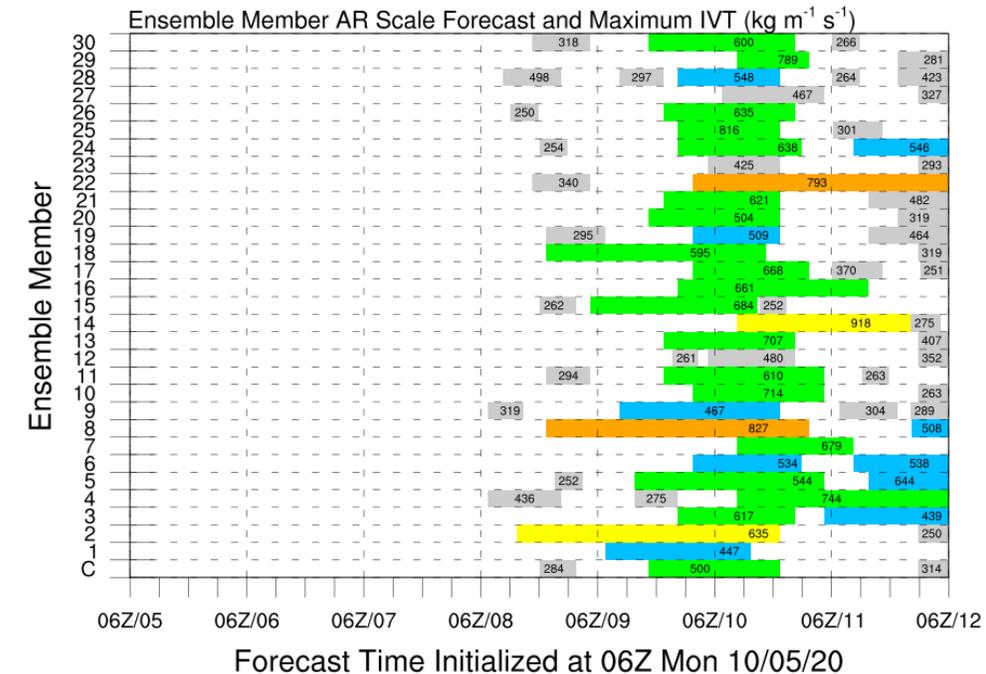
GEFS AR Scale & IVT Forecasts

GFS Ensemble Initialized: 06Z Mon 10/05/20



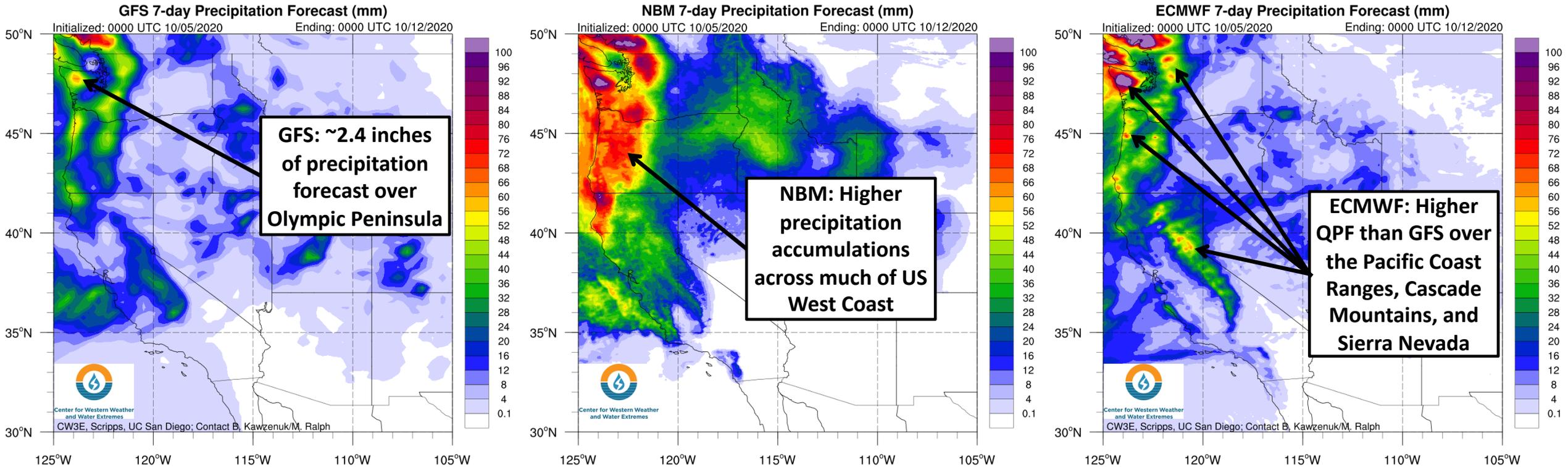
Categorical AR Strength by Ralph/CW3E

- The GEFSv12 control member is currently suggesting that this AR will bring a maximum IVT magnitude of $500 \text{ kg m}^{-1} \text{ s}^{-1}$ and a duration of AR conditions of 27 hours to South-Coastal Oregon
- This combination of maximum AR magnitude and duration would result in an AR 2 on the AR Scale (Ralph et al. 2019)
- This forecast is exhibiting large ensemble spread in the timing, duration, and magnitude of AR conditions, resulting in scenarios ranging from no AR to AR 4





Model 7-day QPF: Valid 0000 UTC 05-12 October



*GFS = NCEP Global Forecast System (United States)

*NBM = National Blend of Models (Blend of NWS and non-NWS models)

*ECMWF = European Center for Medium-Range Weather Forecasts (Europe)

- GFS, NBM, and ECMWF are all forecasting >2 inches of precipitation over certain locations from Washington to Northern California
- The NBM is predicting much higher accumulations over the US West Coast, with the largest differences of >+1 inch ranging from Coastal Oregon to far Northern California
- The ECMWF is predicting higher QPF than the GFS over the Pacific Coast Ranges, Cascade Mountains, and Sierra Nevada

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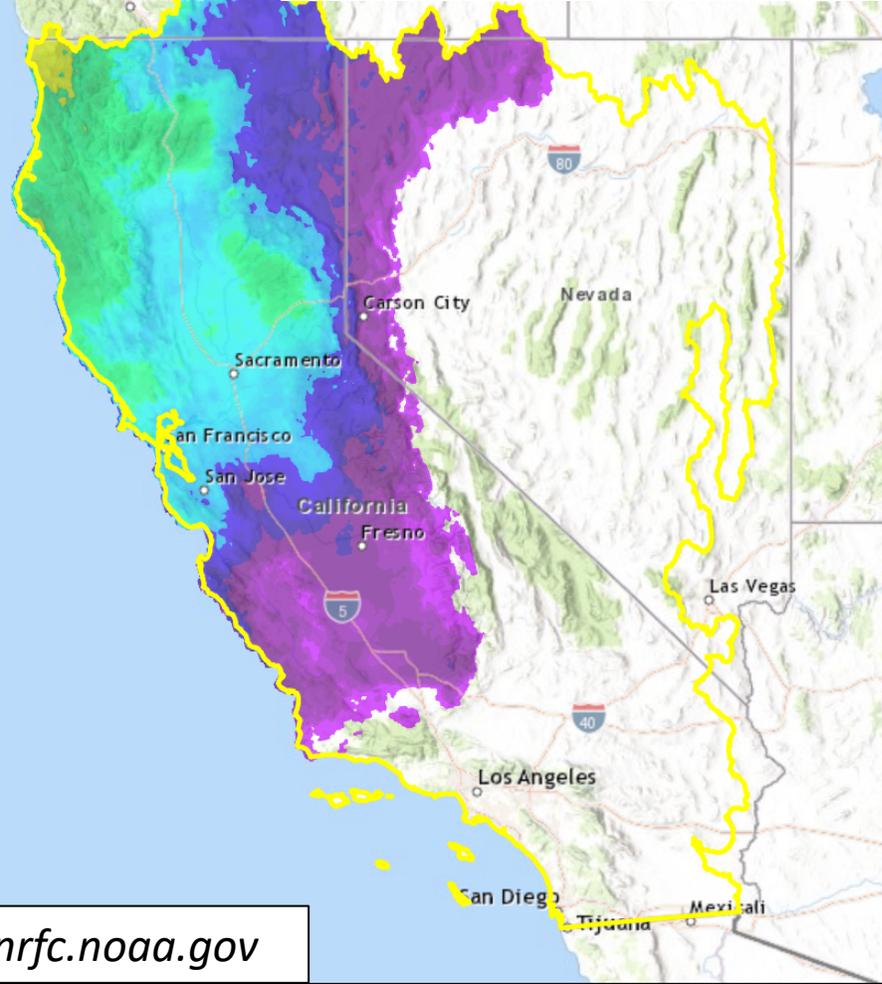


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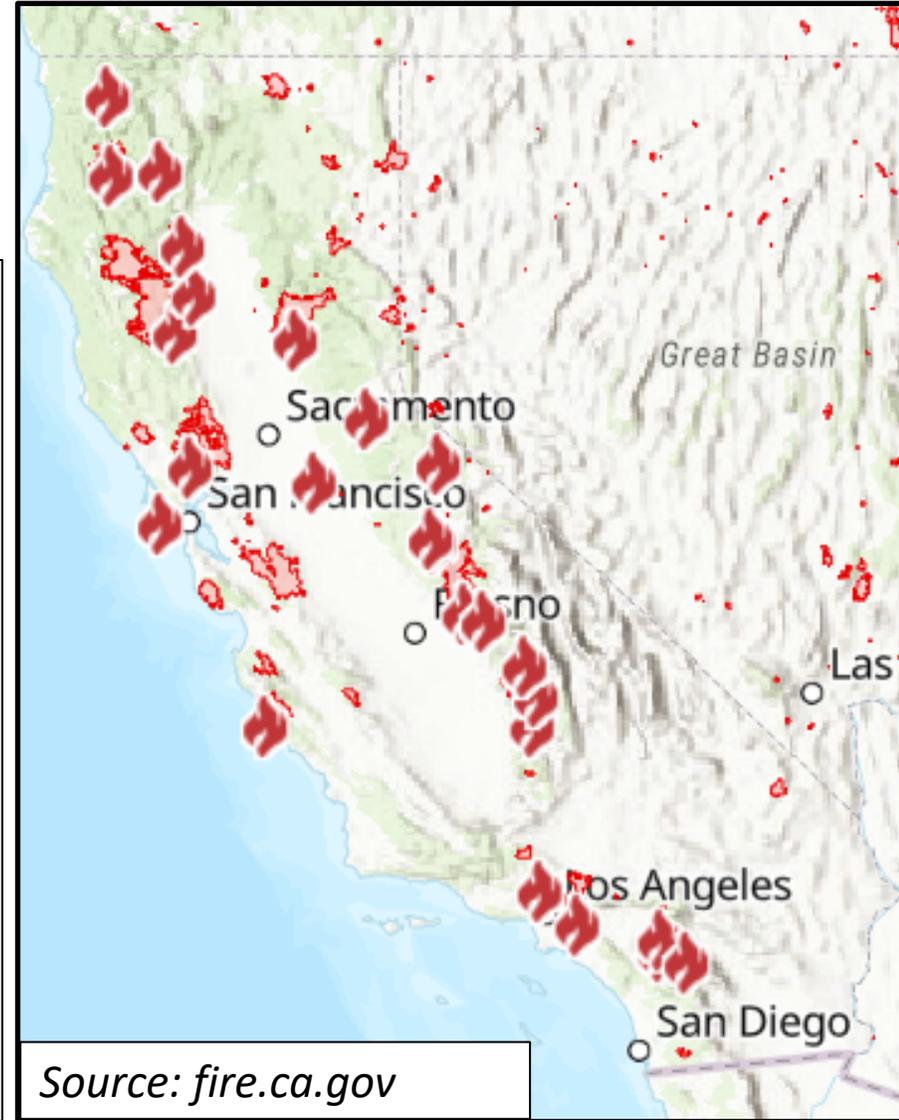


6-Day Gridded QPF
Sun Oct 04 05 AM PDT (04/12Z) through
Sat Oct 10 05 AM PDT (10/12Z)



Source: cnrfc.noaa.gov

- The CNRFC is currently forecasting 0.25–1.50 inches of precipitation from Central to Northern California
- This precipitation is forecast to come at time when numerous fires are currently burning across the state and dry conditions are making for the potential development of new fires
- There are currently 19 large fires actively burning across CA



Source: fire.ca.gov

