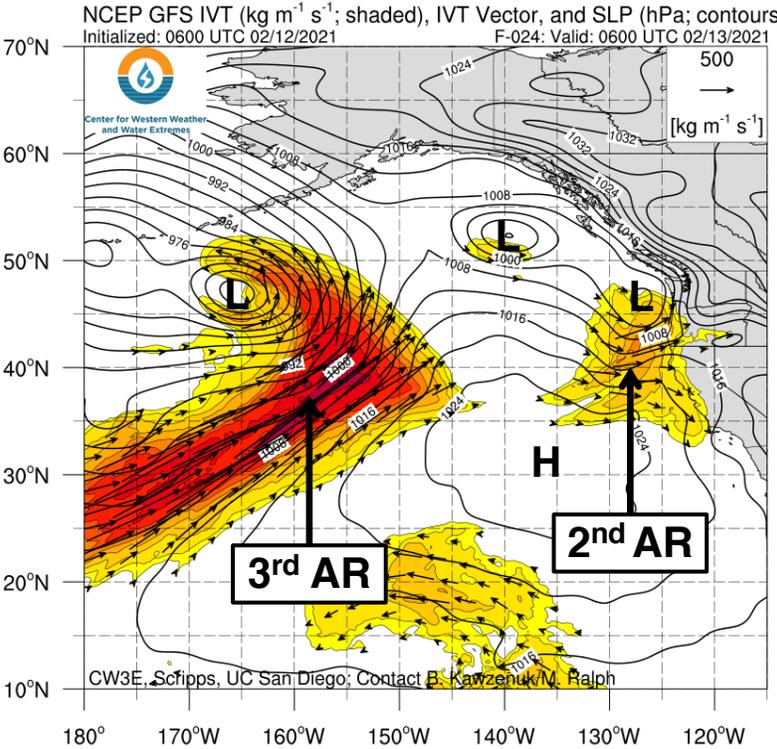


Multiple ARs forecast to impact the Western U.S. this weekend into early next week

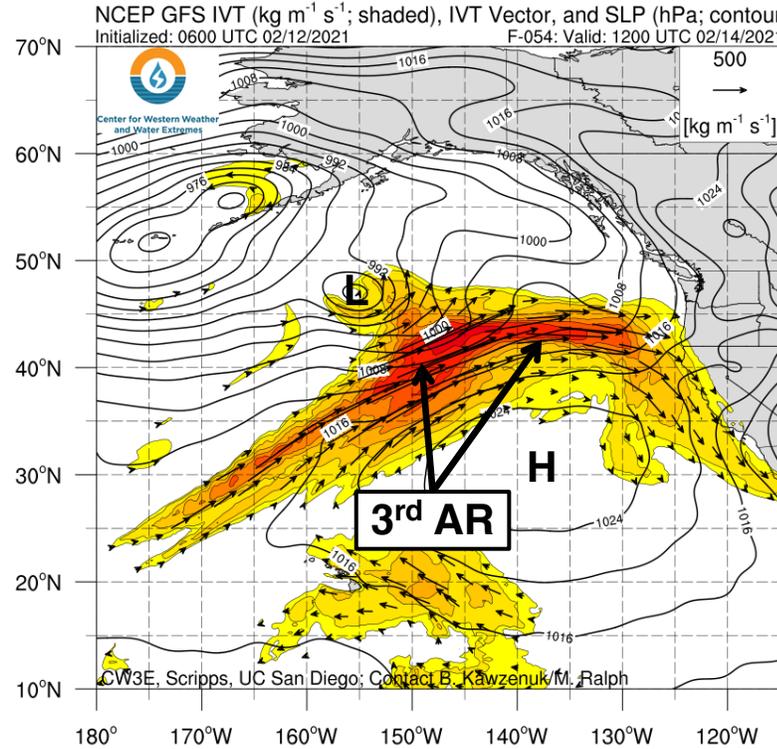
- A weak AR brought light-to-moderate precipitation to Northern and Central California yesterday
- A second AR and associated surface cyclone will approach the U.S. West Coast today, bringing hazardous winter weather to lower elevations in western Washington and northwestern Oregon
- A third and stronger AR is forecast to make landfall across California and Oregon on Sunday
- The third AR is forecast to bring AR 2/AR 3 conditions to portions of coastal California and Oregon, but the heaviest precipitation is expected to remain far north of the AR 3 area in California due to the unfavorable orientation of the IVT vectors (parallel to the coast)
- More than 5 inches of total precipitation are possible in portions of the Pacific Coast Ranges and Cascades during the next 5 days, with the highest amounts forecast in the Oregon Cascades

GFS IVT & SLP Forecasts

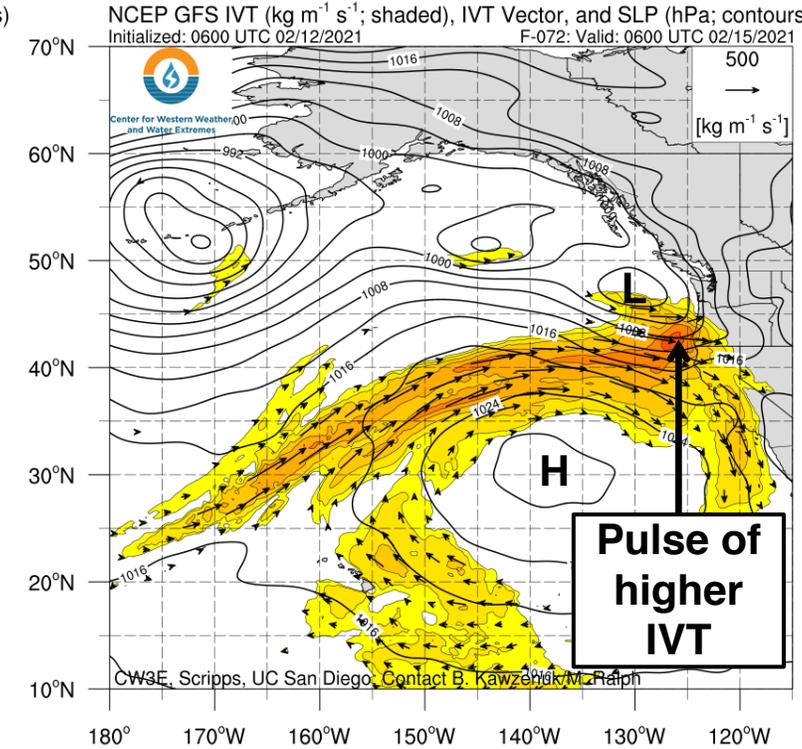
(A) Valid: 0600 UTC 13 Feb (F-24)



(B) Valid: 1200 UTC 14 Feb (F-54)

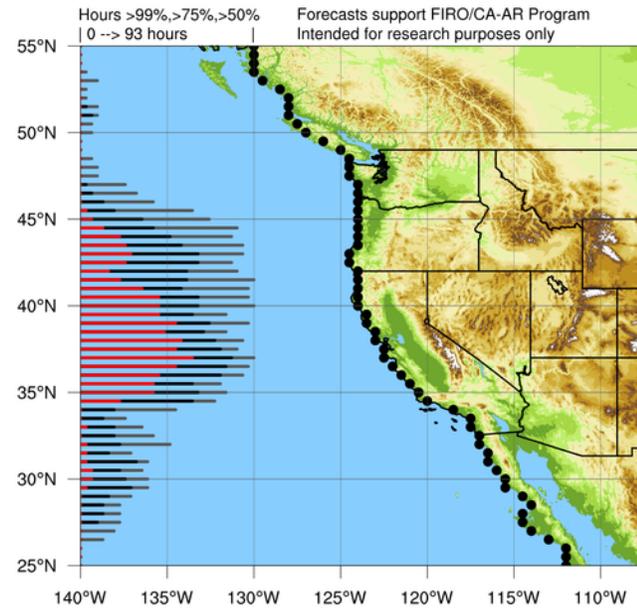
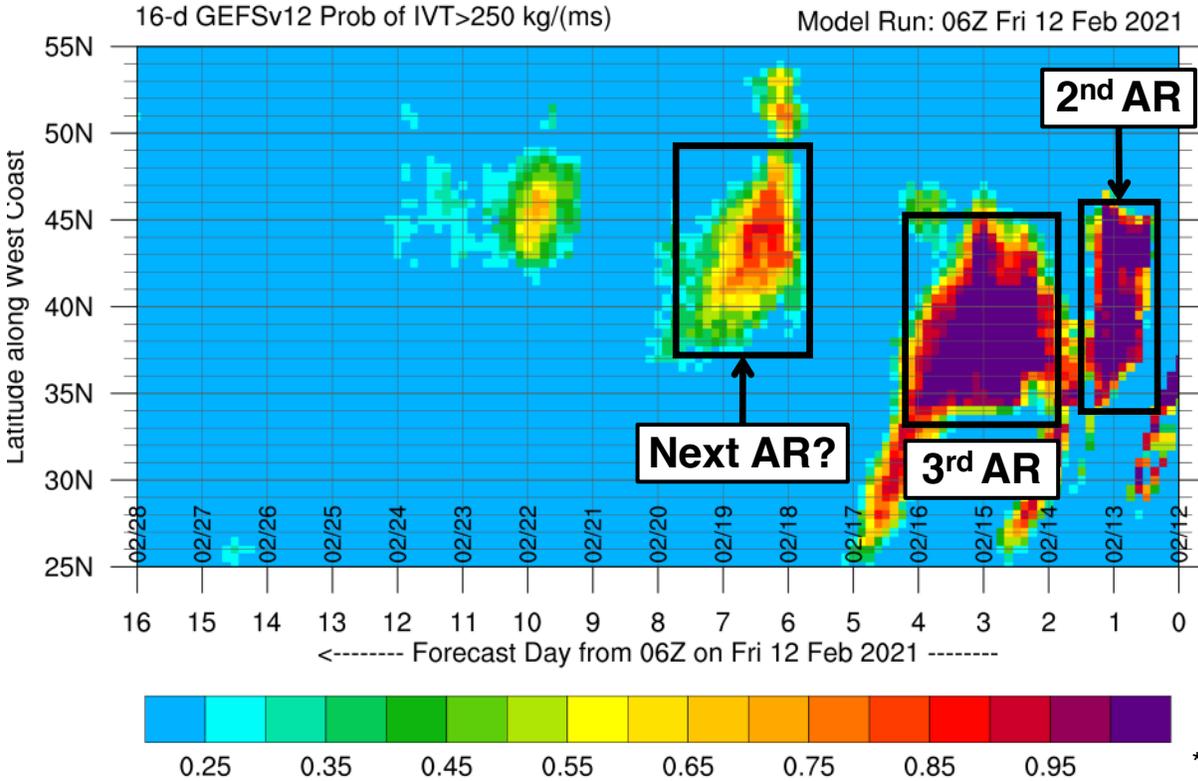


(C) Valid: 0600 UTC 15 Feb (F-72)

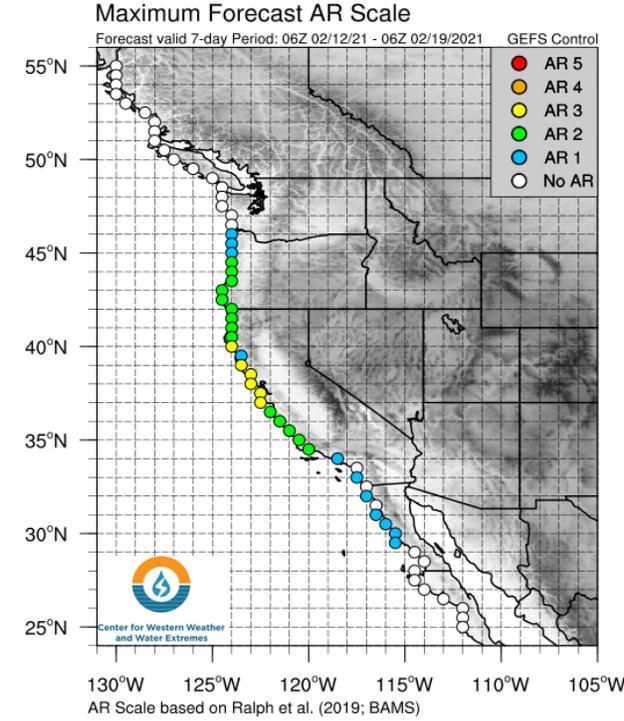


- The second AR in this series is forecast to weaken as it approaches the U.S. West Coast, but not before bringing a brief period of AR conditions to coastal Oregon and Northern California (Figure A)
- Meanwhile, the third and strongest AR in this series is forecast to move eastward and reach the U.S. West Coast around 12Z 14 Feb (Figure B)
- The strongest moisture transport ($IVT > 500 \text{ kg m}^{-1} \text{ s}^{-1}$) is forecast to occur in association with a mesoscale frontal wave (MFW) and possible cyclogenesis event on the northern periphery of the AR around 06Z 15 Feb (Figure C)

Probability of AR Conditions Along Coast



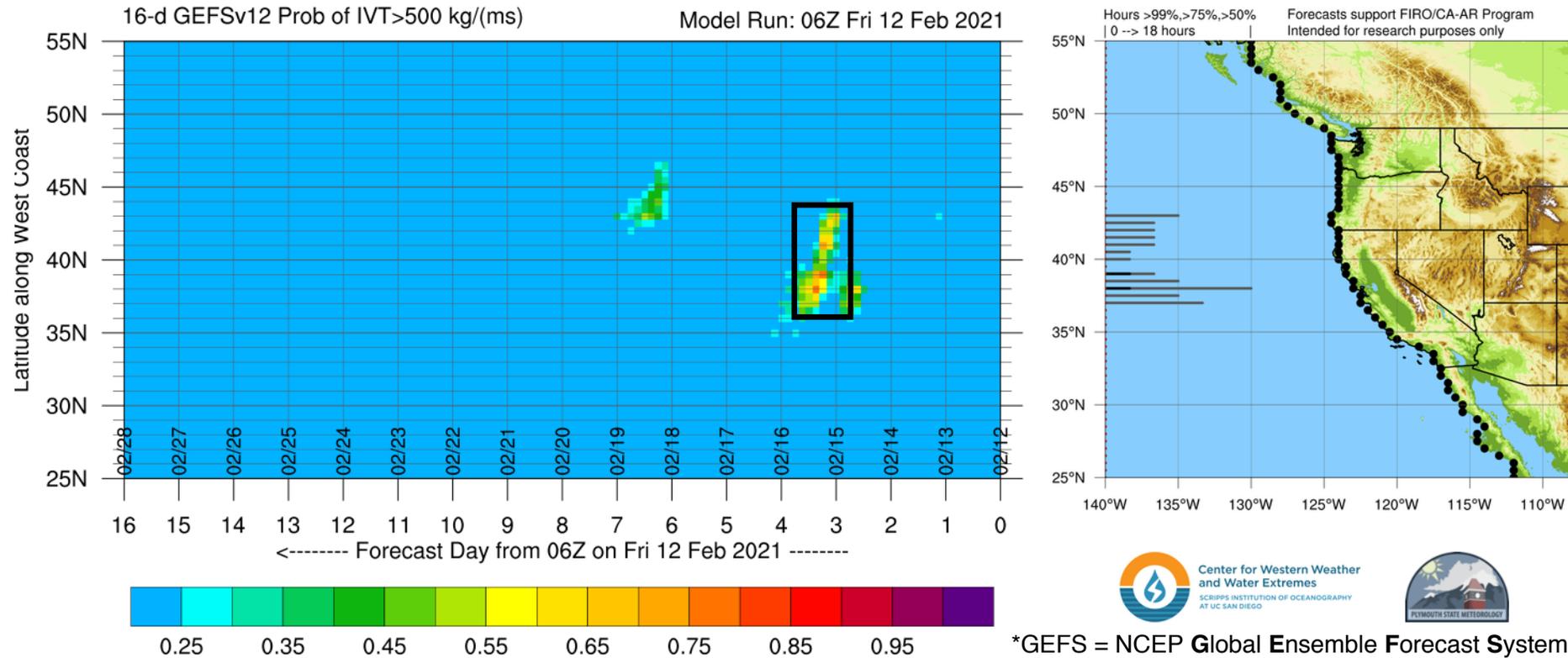
AR Scale



*GEFS = NCEP Global Ensemble Forecast System (United States)

- The 06Z GEFS is showing very high confidence (> 95% probability) in AR conditions (IVT > 250 kg m⁻¹ s⁻¹) over coastal Oregon and California in association with the second and third ARs
- The third AR is forecast to bring a prolonged period of AR conditions (> 48 hours) to portions of coastal California
- While AR 3 conditions (based on the Ralph et al. 2019 AR Scale) are possible near the Bay Area, the northwesterly orientation of the IVT vectors (parallel to the coast) suggests that precipitation impacts will be minimal
- AR 2 conditions are forecast over southern Oregon and far northern California, where some of the heaviest precipitation is expected
- There is also increasing forecast confidence in another landfalling AR event over the Pacific Northwest during 17–19 Feb

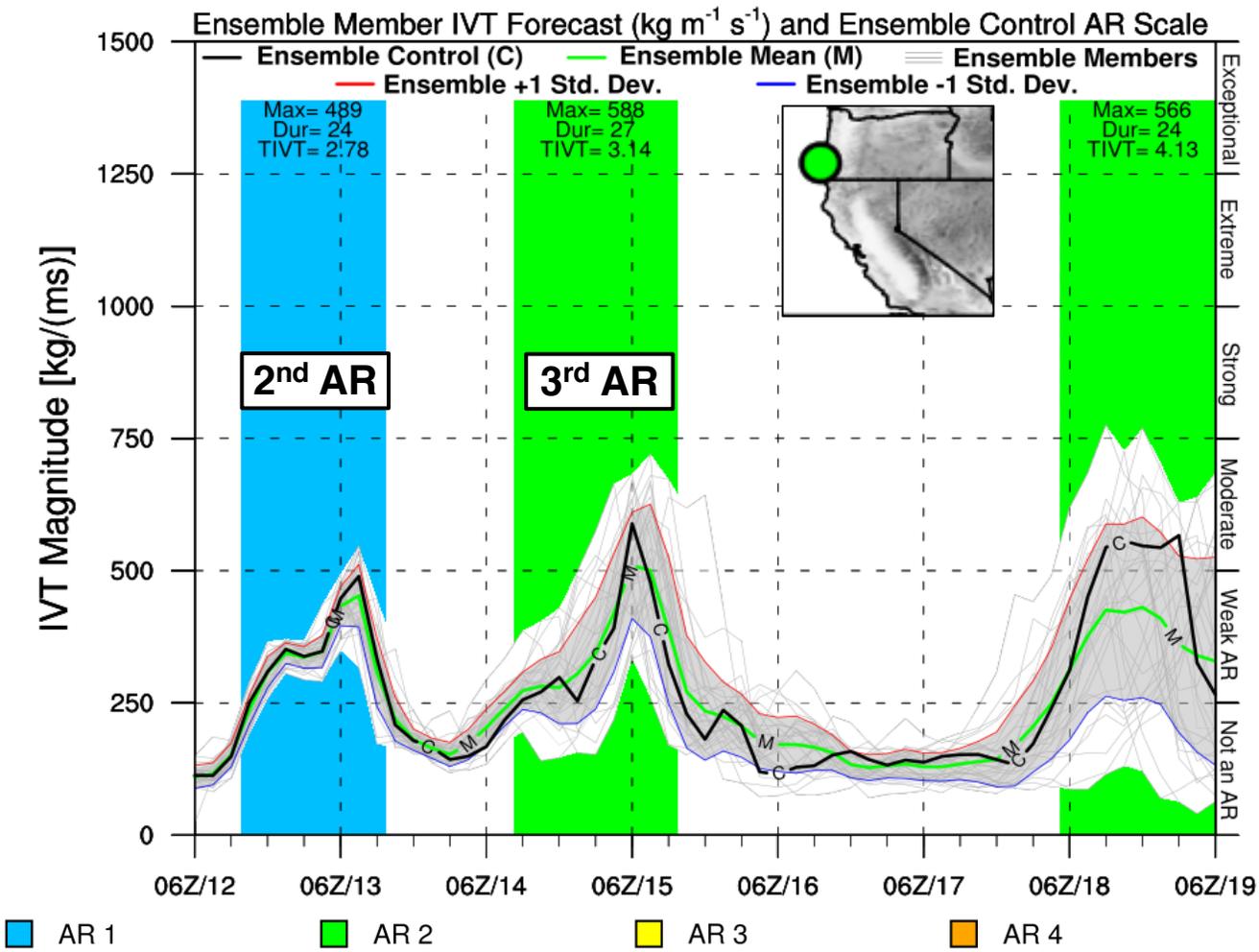
Probability of Moderate AR Conditions Along Coast



- Parts of coastal Oregon and Northern California may likely experience a brief period of moderate AR conditions ($IVT > 500 \text{ kg m}^{-1} \text{ s}^{-1}$) during the third AR
- The highest probability of moderate AR conditions coincides with a pulse of stronger moisture transport as the MWF/secondary cyclone approaches the U.S. West Coast

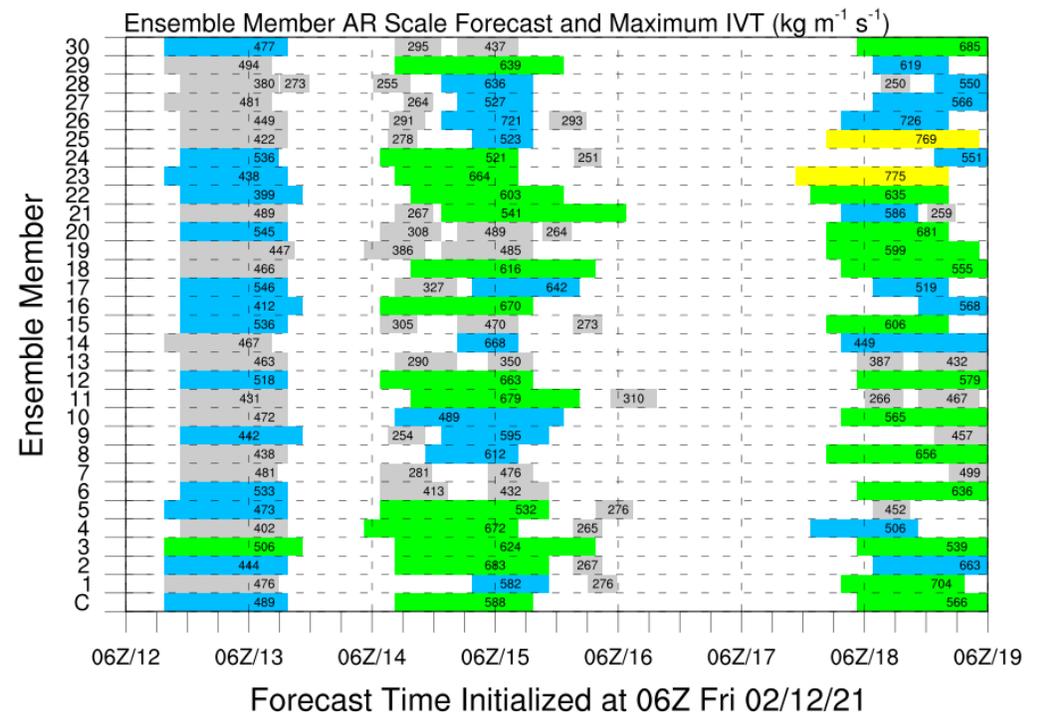
GEFS AR Scale and IVT Forecasts

GFS Ensemble Initialized: 06Z Fri 02/12/21



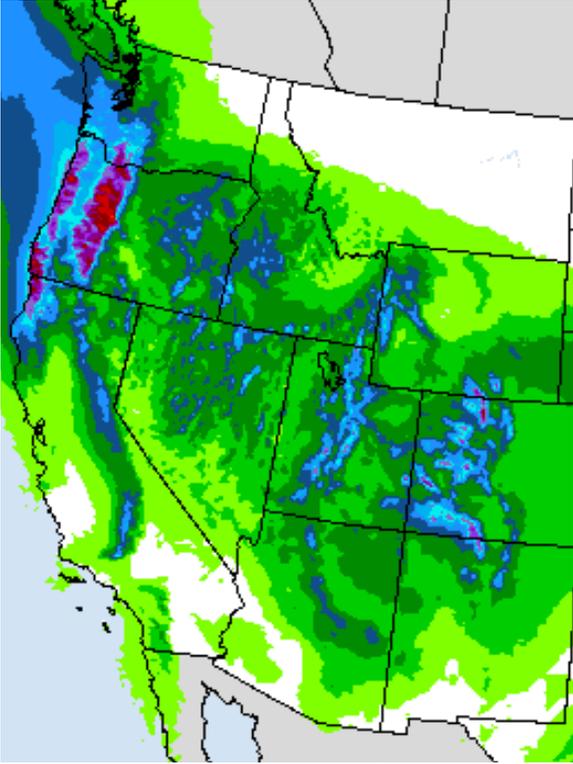
Categorical AR Strength by Ralph/CW3E

- The 06Z GEFS control run is forecasting AR 1 conditions at 43°N , 124.5°W (southwestern Oregon) in association with the second AR
- An AR 2 is currently forecast in association with the third AR, but there is a large degree of uncertainty in the timing, magnitude, and duration of AR conditions
- 14/31 GEFS members (45%) are forecasting an AR 2 at this location

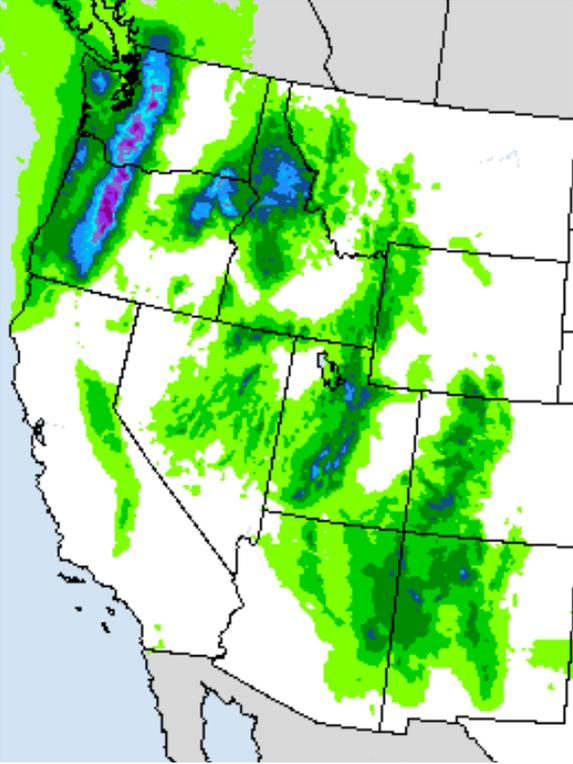


WPC Quantitative Precipitation Forecasts (QPFs)

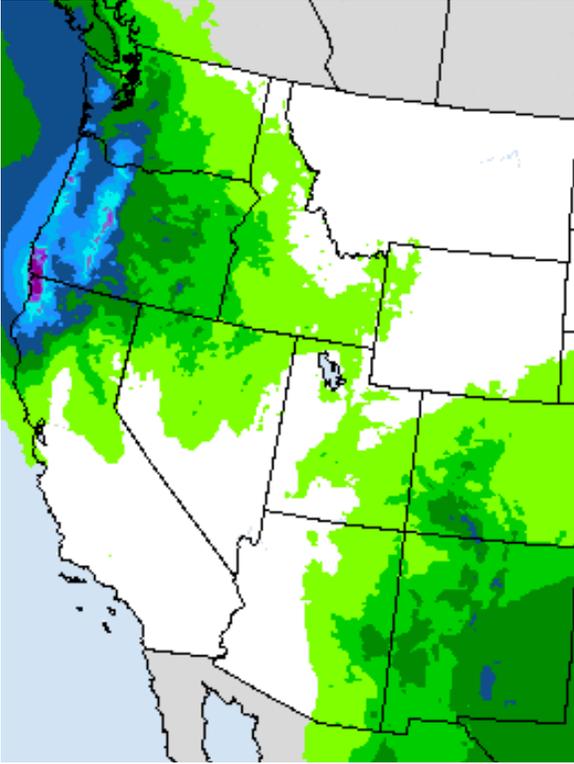
48-h QPF: Valid 12Z 12–14 Feb



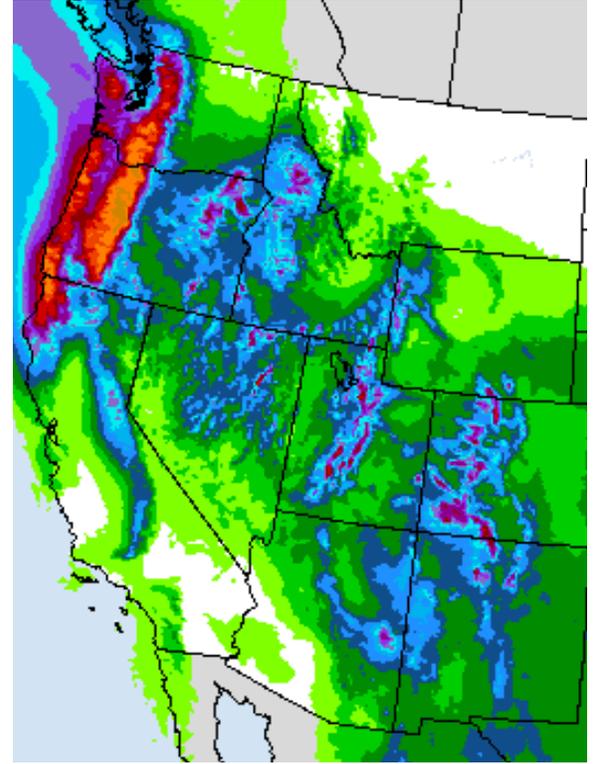
24-h QPF: Valid 12Z 14–15 Feb



24-h QPF: Valid 12Z 15–16 Feb



5-day QPF: Valid 12Z 12–17 Feb

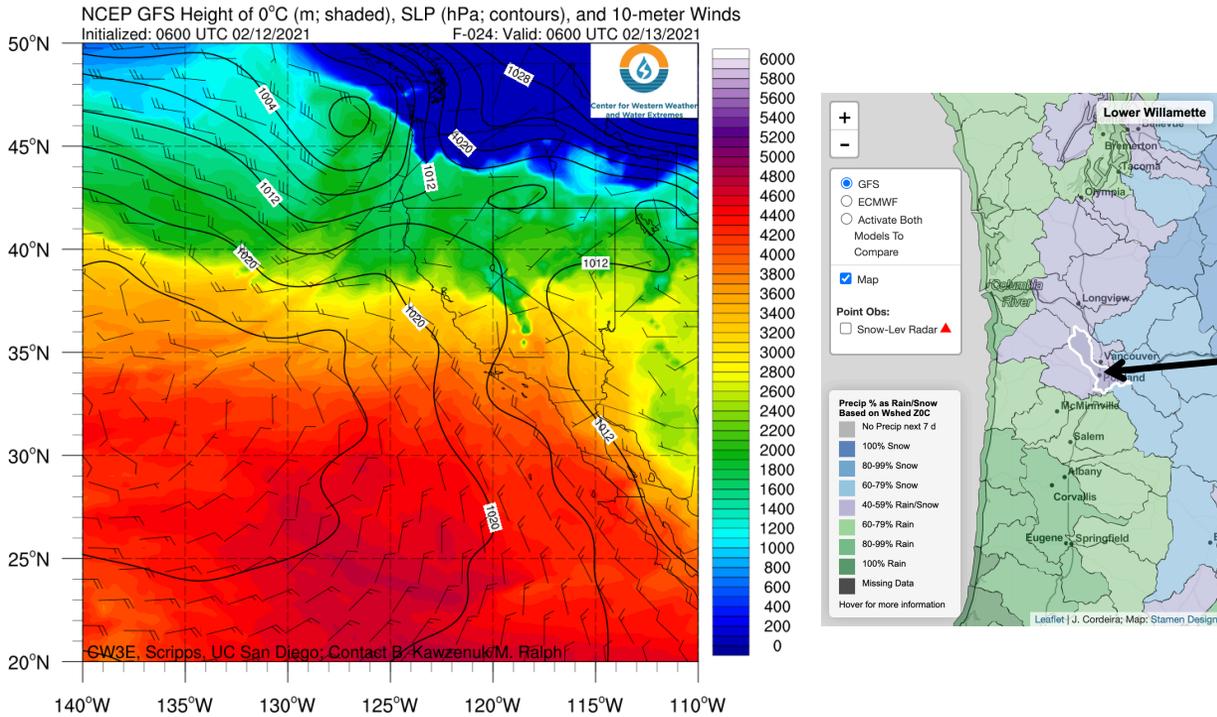


Source: NOAA/NWS Weather Prediction Center, <https://www.wpc.ncep.noaa.gov/>

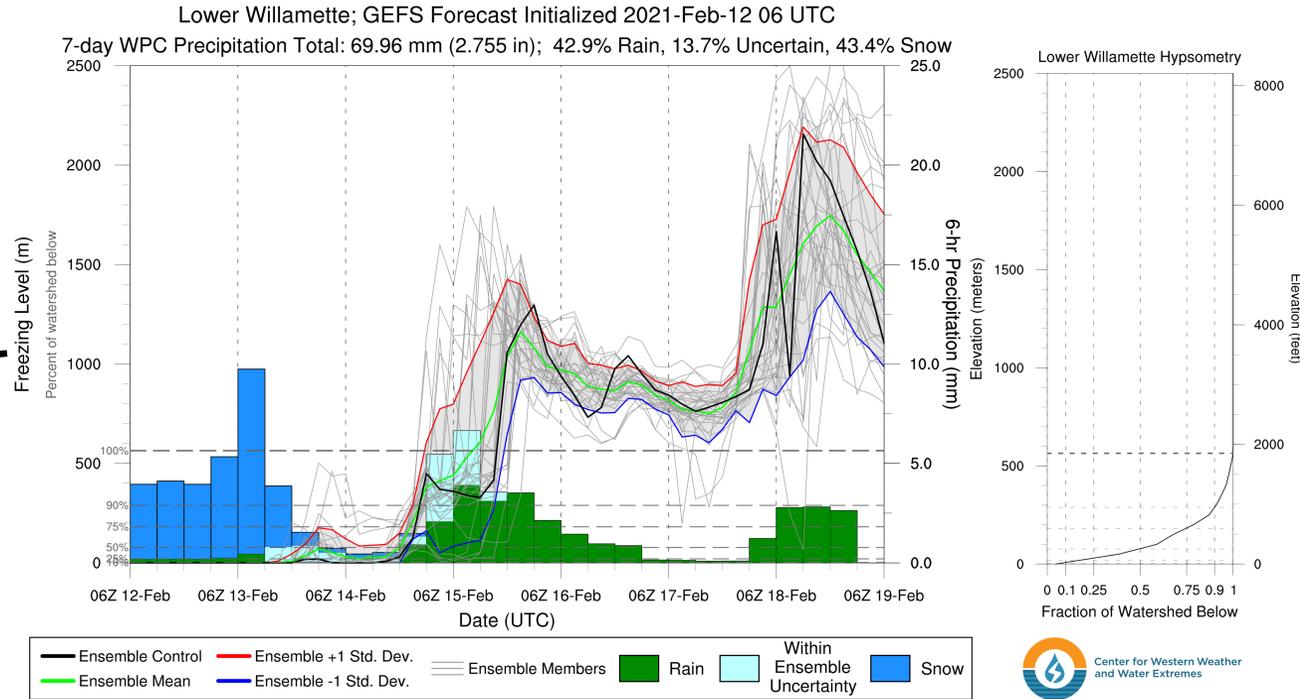
- The NWS Weather Prediction Center (WPC) is forecasting at least 1–4 inches of precipitation in portions of the Pacific Coast Ranges, Cascades, and Rocky Mountains over the next two days, with the highest amounts expected in the Oregon Cascades
- Another 1–4 inches is forecast across western Washington, western Oregon, and northwestern California in association with the third AR
- More than 7 inches of total precipitation are possible in the Oregon Cascades over the next 5 days

GFS Freezing-Level Forecasts

Valid: 0600 UTC 13 Feb (F-24)

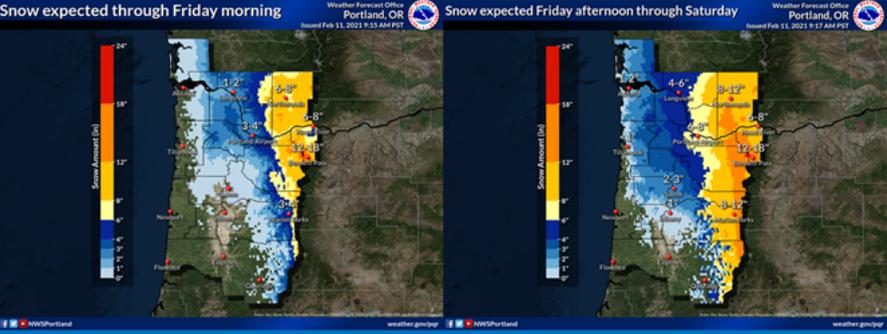


GEFS 7-day Watershed Forecasts: Lower Willamette Watershed

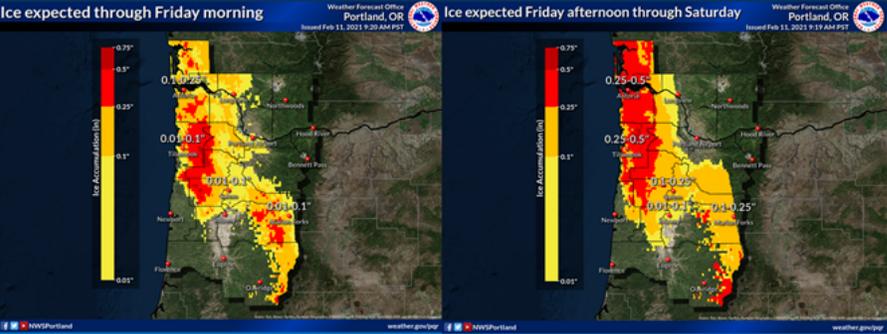


- Arctic high pressure over British Columbia has allowed very cold air to spread across much of the Pacific Northwest
- As the next surface cyclone approaches the U.S. West Coast, cold-air damming (note the easterly/northeasterly surface winds across Washington) will reinforce cold air near the surface and set the stage for accumulating snow and freezing rain at lower elevations in western Washington and northwestern Oregon
- Freezing levels in the Lower Willamette watershed are expected to remain near sea-level during the majority of this event and then rise as the third AR approaches the U.S. West Coast

Back-to-Back Storms ...Snowfall...



Back-to-Back Storms ...Ice Accumulation...



Lowland Snow Forecast: Tonight-Saturday Morning

KEY POINTS

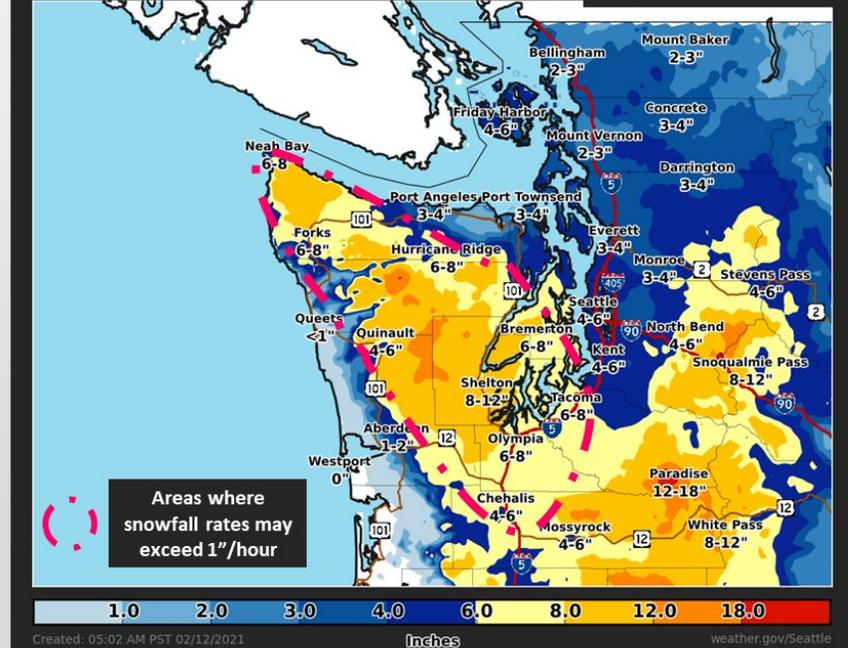
Heavier, more widespread snow.
Some uncertainty remains in
the exact snow amounts.

Strong easterly winds through the Cascade gaps
may limit snowfall amounts east of I-5 and I-405
compared to what is seen on this map. Weaker
winds may allow for higher snowfall totals.

Likely noticeable differences in snow amounts
from areas across the South Sound to areas
north of Everett.

NWS Seattle

Most Likely Snow Forecast



Source: NWS Portland, <https://www.weather.gov/pdx/>

Source: NWS Seattle, <https://www.weather.gov/sew/>

- Freezing rain may result in significant icing over coastal northwestern Oregon and southwestern Washington today and tomorrow
- Significant snowfall accumulations are also possible across the southern Puget Sound and at lower elevations east of the Coast Ranges in southwestern Washington and northwestern Oregon