



Center for Western Weather
and Water Extremes

SCRIPPS INSTITUTION OF OCEANOGRAPHY
AT UC SAN DIEGO

CW3E S2S Outlook: 9 Feb 2022

Prepared by: J. Wang, C. Castellano, M. DeFlorio, J. Kalansky

UC San Diego



SCRIPPS INSTITUTION OF
OCEANOGRAPHY

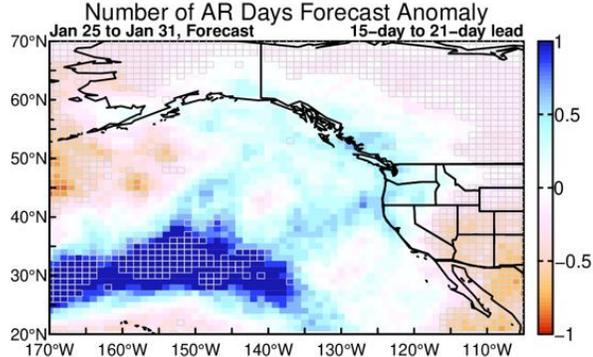
Summary

- **Week 2 forecasts (15–21 Feb):** Both models suggest very low possibilities (<10%) of landfalling ARs in California and slightly higher possibilities (<30%) of AR activity over British Columbia
- NCEP GEFS model predicts the MJO will be in the Indian Ocean during the next two weeks, which is consistent with the low probability of AR activity in California
- **Week 3 forecasts (22–28 Feb):** Models agree on the below-normal AR activity in California but disagree on the anomalous AR activity to the north
 - NCEP is predicting slightly above-normal AR activity over Northern CA and Oregon and significantly below-normal AR activity over British Columbia
 - ECMWF is predicting significantly below-normal AR activity over Northern CA and Oregon and near-normal AR activity over British Columbia
 - Both models show significantly below-normal AR activity in Central-to-Southern CA
- Both models show high confidence in the occurrence of the North-Ridge type during Weeks 1–2 and moderate confidence in the occurrence of the West-Ridge type during Weeks 3–4, which are associated with dry conditions in California
- CW3E statistical model based on January SST is predicting a dipole pattern of rainfall with drier than normal conditions in the southwestern US and wetter than normal conditions in the northwestern US during Feb–Apr

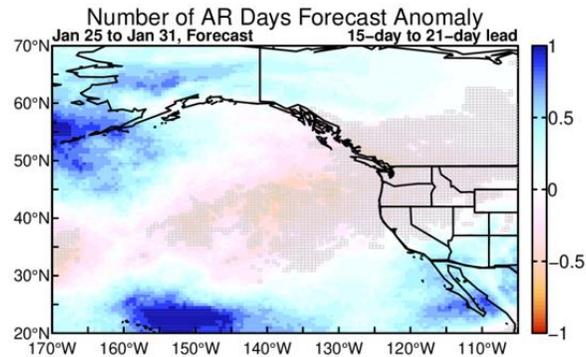
Looking Back: Week 3 AR Activity Forecasts

Valid: 25 – 31 Jan 2022

NCEP Experimental Forecast Initialized: Jan 10, 2022



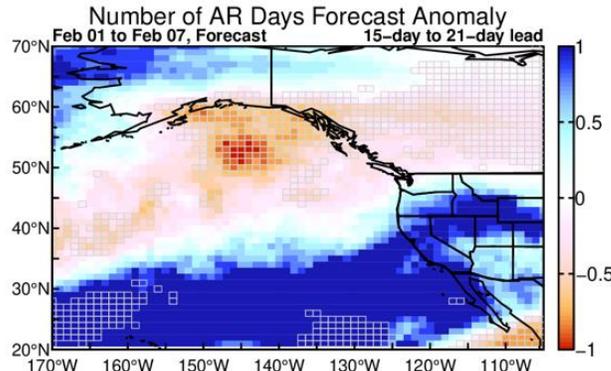
ECMWF Experimental Forecast Initialized: Jan 10, 2022



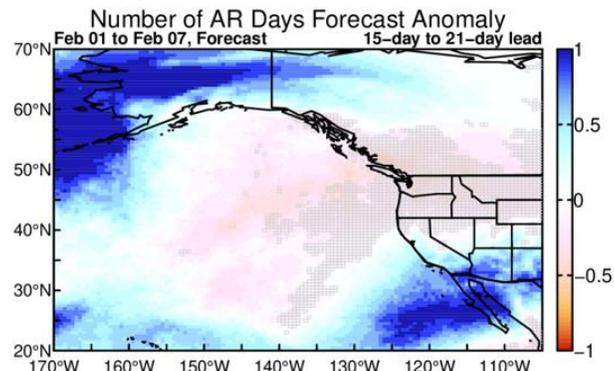
- NCEP: Slightly above-normal AR activity along the coast of British Columbia and northwestern US
- ECMWF: Below-normal AR activity along the coast of British Columbia and western US; Slightly above-normal AR activity over Southern California and the Baja Peninsula

Valid: 01 – 07 Feb 2022

NCEP Experimental Forecast Initialized: Jan 17, 2022



ECMWF Experimental Forecast Initialized: Jan 17, 2022

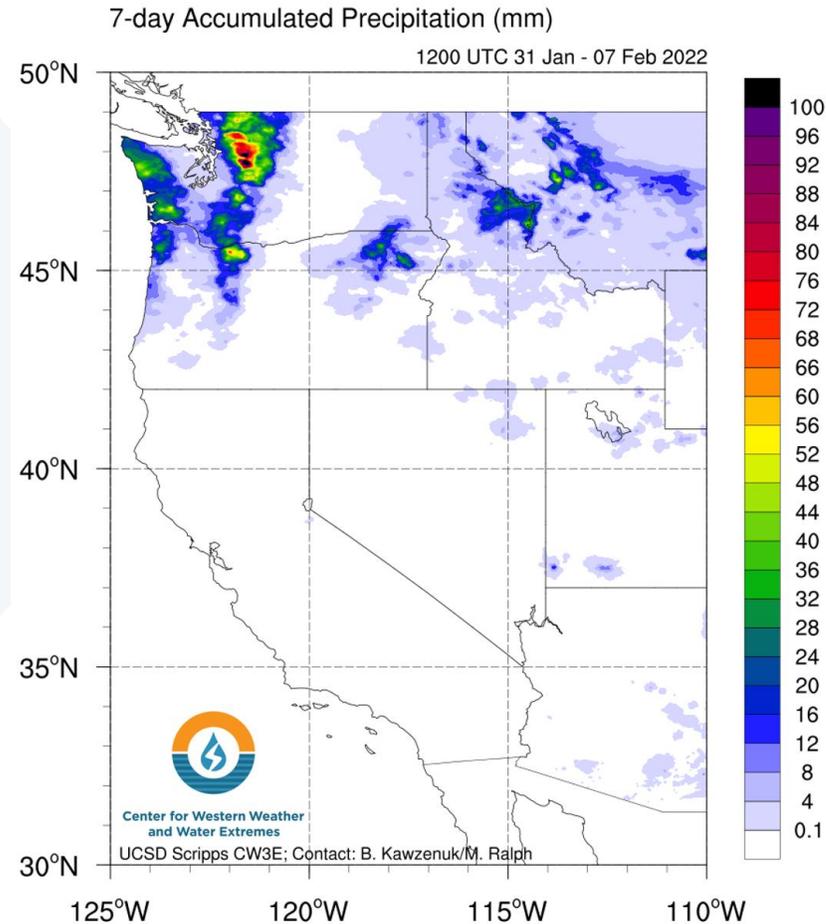
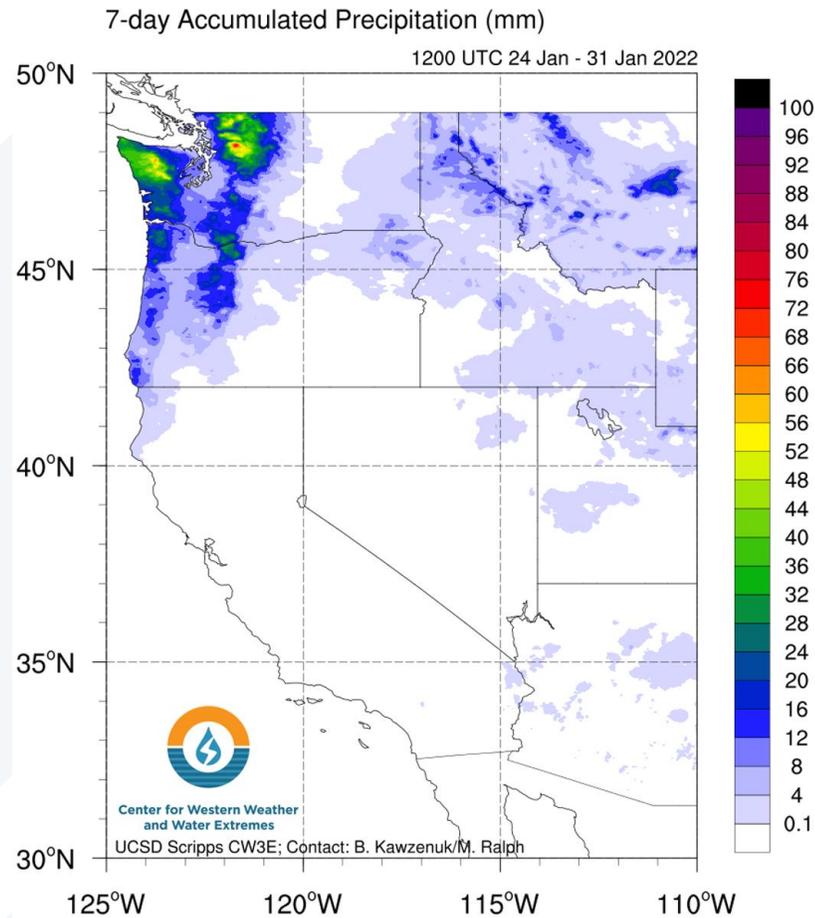


- NCEP: Below-normal AR activity over British Columbia; Above-normal AR activity over the western US and the Baja Peninsula
- ECMWF: Similar pattern with a southward shift and weaker magnitude



Center for Western Weather and Water Extremes
SCRIPPS INSTITUTION OF OCEANOGRAPHY
AT UC SAN DIEGO

Looking Back: Accumulated Precipitation (24 Jan – 07 Feb 2022)

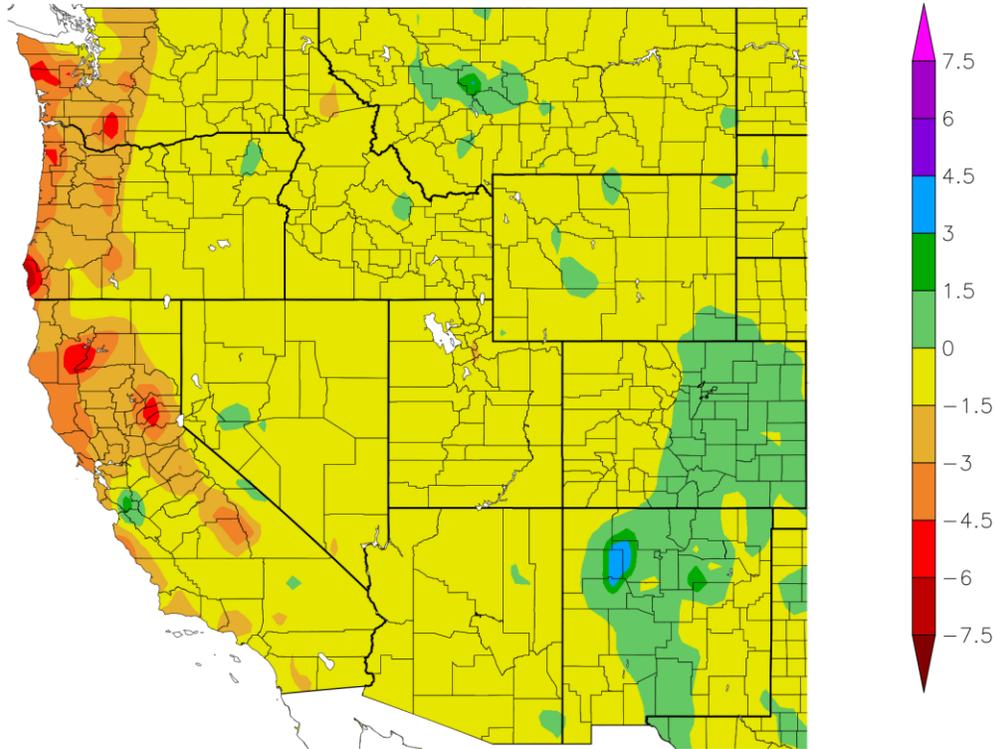


- Several ARs and the associated low-pressure system brought heavy precipitation to the Olympic Peninsula and North Cascades during 30 Jan-02 Feb
- Dry conditions were generally observed elsewhere (e.g., California) in the western US during the previous two weeks



Looking Back: 14-day Precipitation Anomaly (25 Jan – 07 Feb 2022)

Departure from Normal Precipitation (in)
1/25/2022 – 2/7/2022



- Abnormally dry conditions in western Washington, Oregon, the California Coast Ranges, and the Sierra Nevada

Generated 2/8/2022 at HPRCC using provisional data.

NOAA Regional Climate Centers

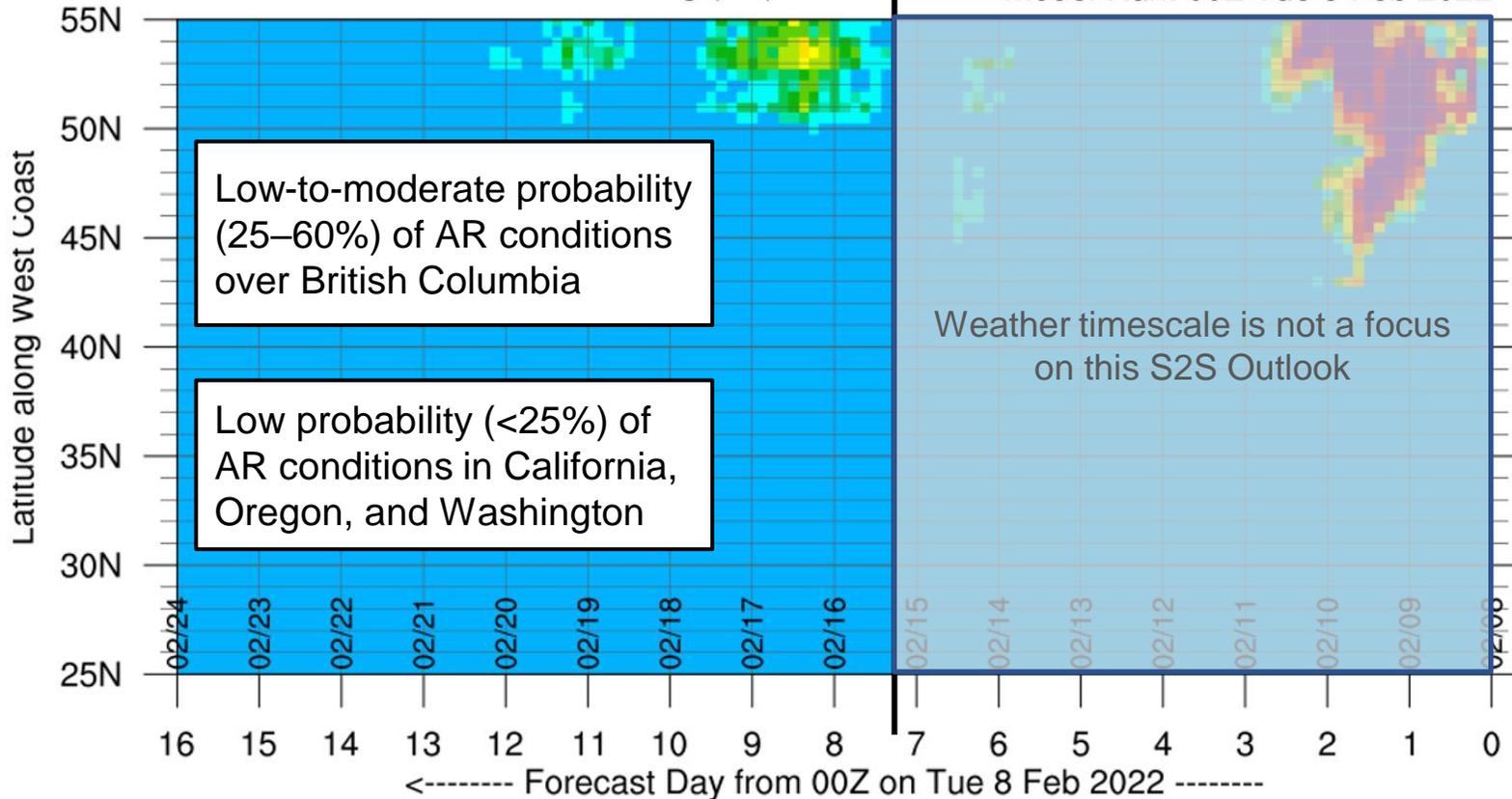
GEFS AR Landfall Tool: Valid 00Z 08–24 Feb

Week 2 (Subseasonal Time Scales)

Week 1 (Weather Time Scales)

16-d GEFSv12 Prob of IVT > 250 kg/(ms)

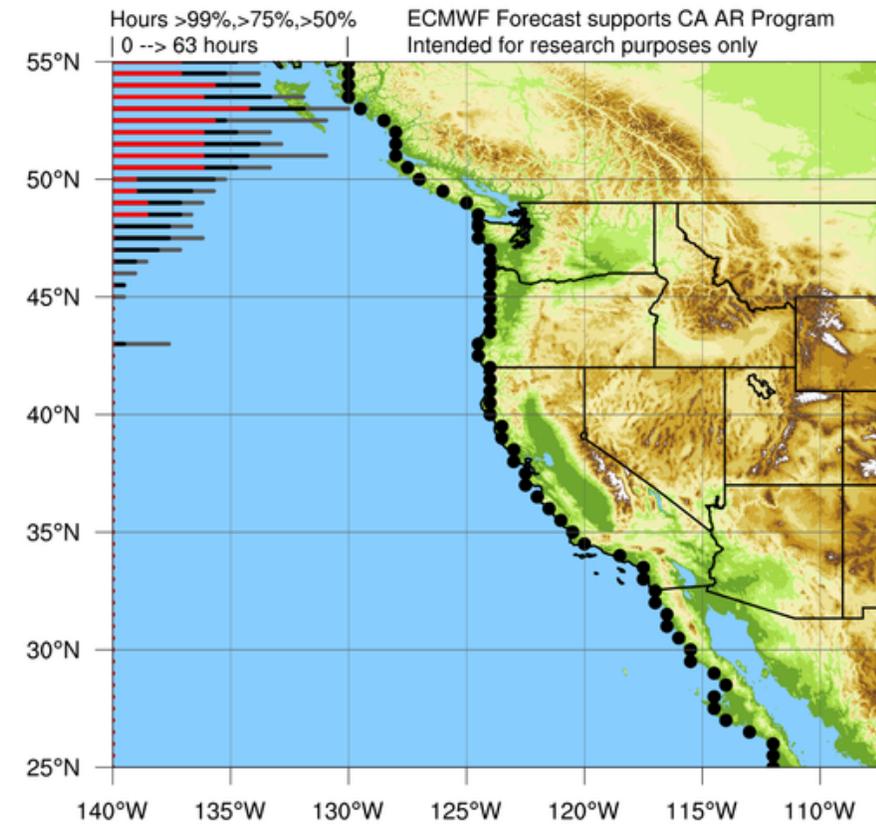
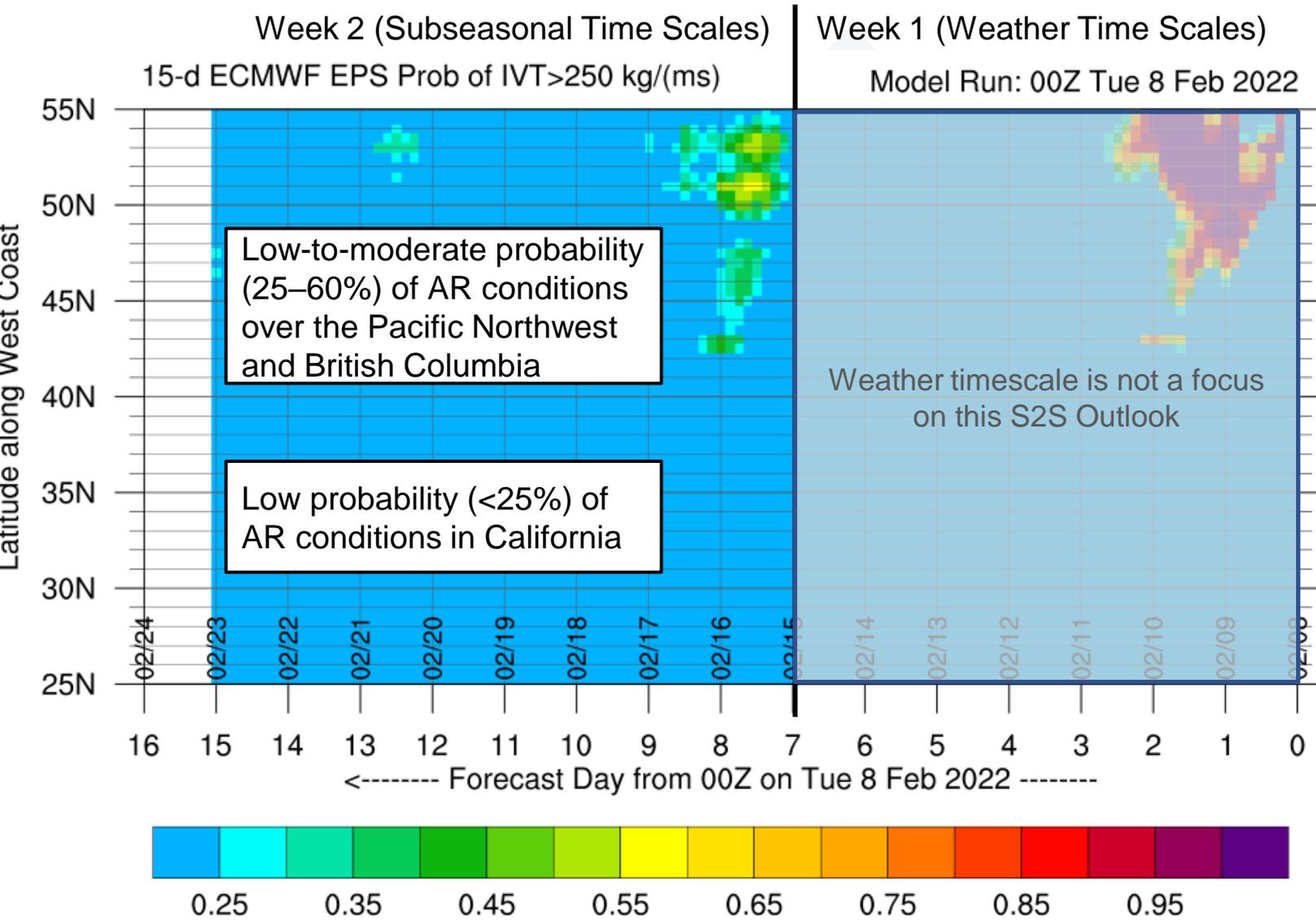
Model Run: 00Z Tue 8 Feb 2022



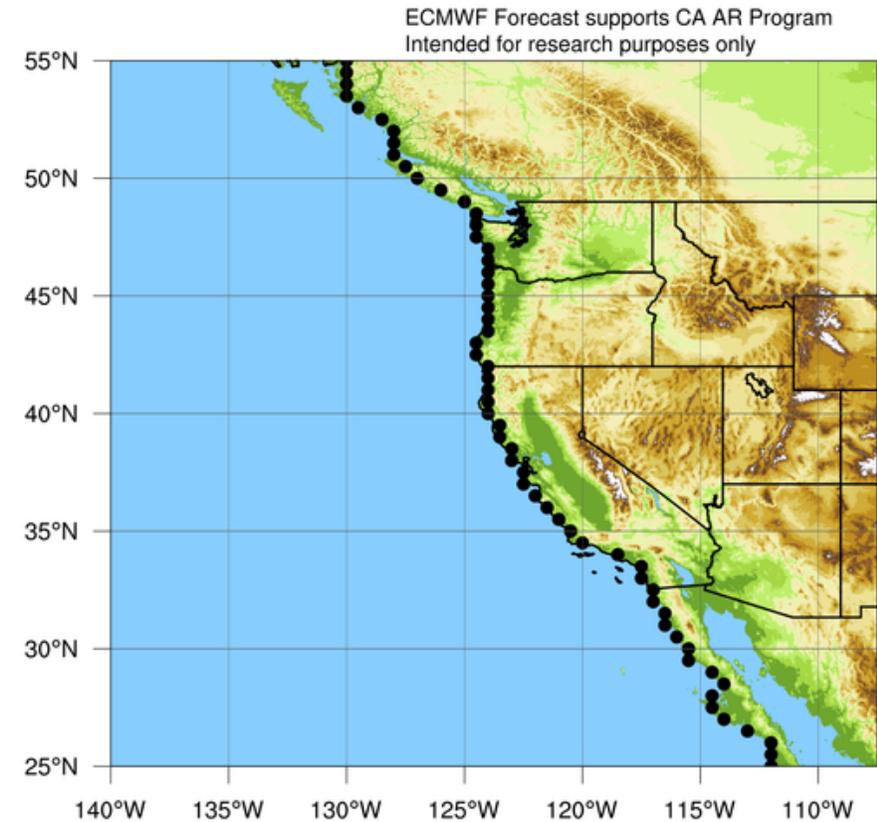
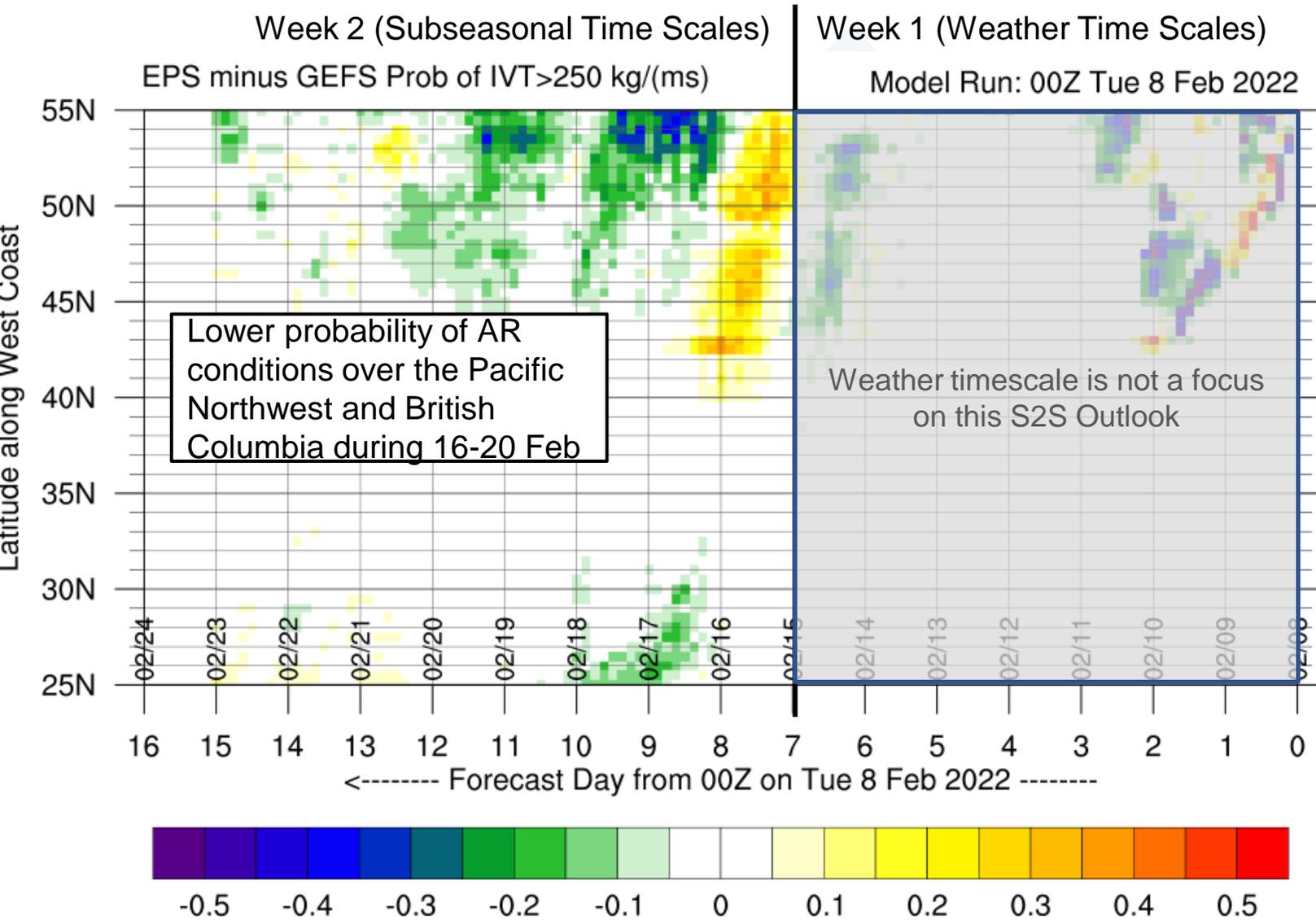
0.25 0.35 0.45 0.55 0.65 0.75 0.85 0.95



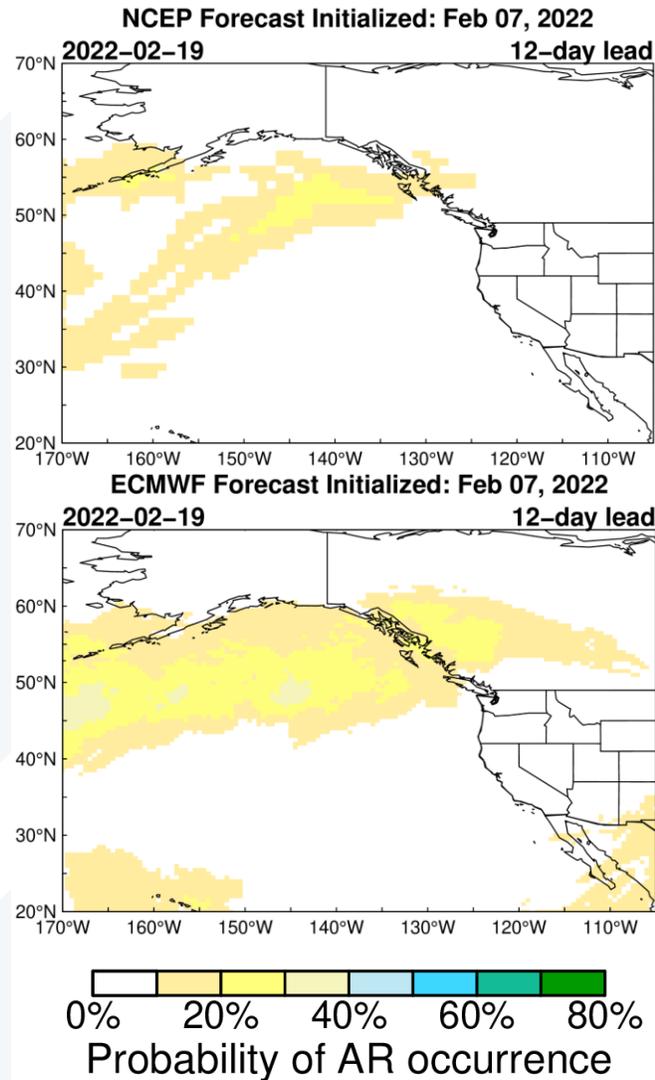
ECMWF EPS AR Landfall Tool: Valid 00Z 08–23 Feb



ECMWF Minus GEFS AR Landfall Tool: Valid 00Z 08–23 Feb



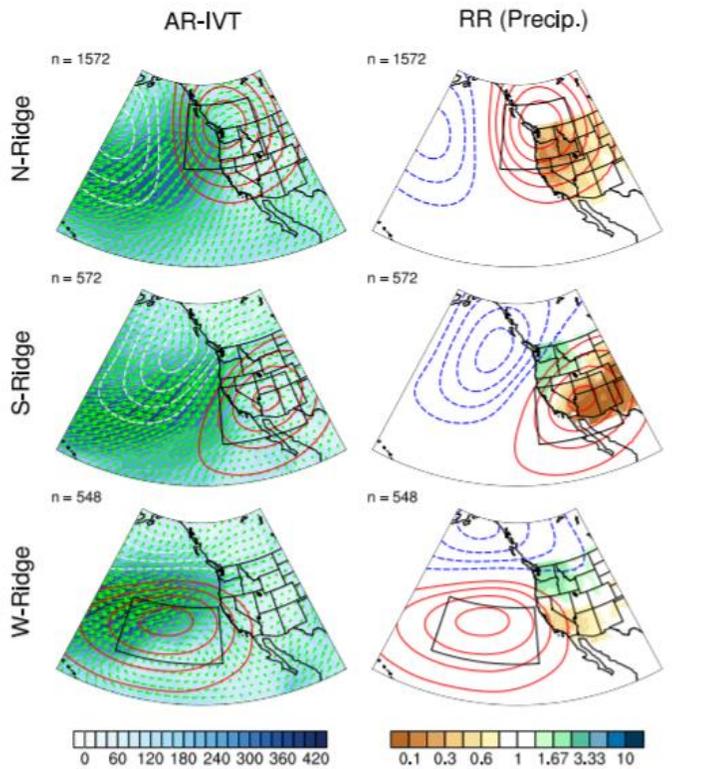
Subseasonal Outlooks: Week 2 AR Activity (NCEP vs. ECMWF)



- NCEP model is suggesting low probabilities (<20%) of AR activity near the Coast of North America on 19 Feb.
- ECMWF model is showing slightly higher probabilities (< 30%) of AR activity over the West Coast

Both models show very low possibilities (<10%) of landfalling ARs in California on 19 Feb

Subseasonal Outlooks: Weeks 1–2 Ridging Forecasts (NCEP)

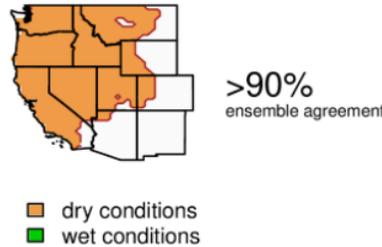


How each ridge type typically influences precipitation

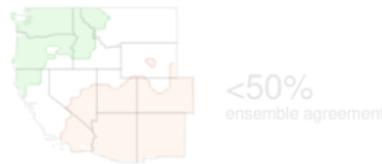
Left: Maps showing the average influence of each ridge type (red contours) on integrated vapor transport (IVT, blue shading indicates greater moisture transport, arrows indicate direction) during atmospheric river events

Right: Maps showing the 'Relative Risk' (RR) of precipitation under each ridge type. Brown shading indicates a reduced chance of precipitation when ridging occurs. For example, a RR value of 0.2 indicates a 5-fold reduction in the likelihood of precipitation

North-Ridge



South-Ridge



[weak south-ridge signal, <50% agreement]

West-Ridge



[weak west-ridge signal, <50% agreement]

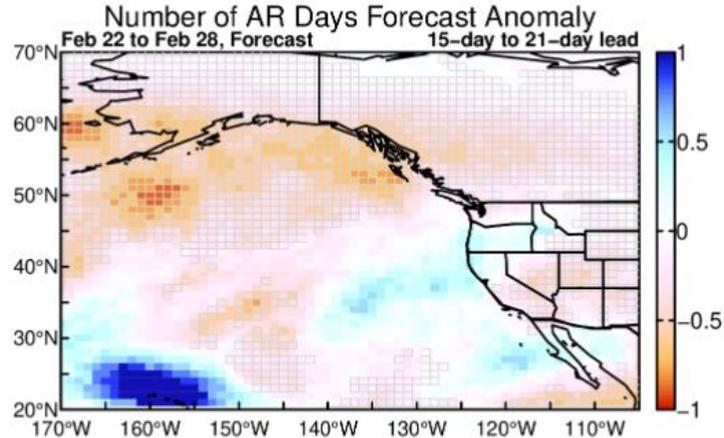
- NCEP model shows high confidence (> 90% ensemble agreement) in the occurrence of the North-Ridge type during Weeks 1–2 (07–21 Feb)
- ECMWF model also shows high confidence (> 90% ensemble agreement) in the occurrence of the North-Ridge type during Weeks 1–2 (not shown)

There is high confidence between models in the North-Ridge type forecasts, suggesting a high likelihood of dry conditions in California and other regions over the western US

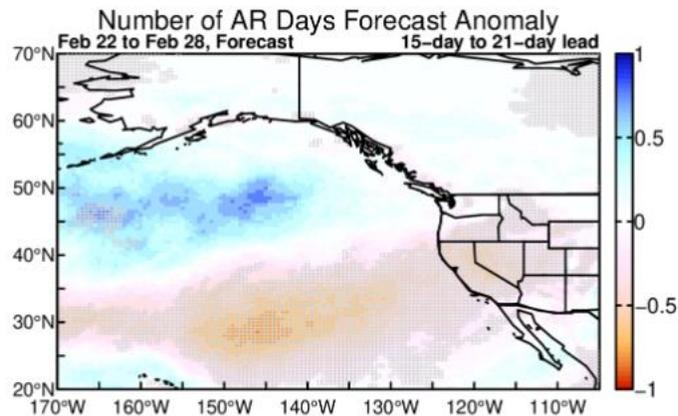


Subseasonal Outlooks: Week 3 AR Activity (NCEP vs. ECMWF)

NCEP Experimental Forecast Initialized: Feb 07, 2022



ECMWF Experimental Forecast Initialized: Feb 07, 2022



- NCEP model is predicting significantly below-normal AR activity over Central-to-Southern CA and British Columbia and slightly above-normal AR activity over Northern CA and Oregon during Week 3 (22–28 Feb)
- ECMWF model is predicting overall significantly below-normal AR activity over the western US and near-normal AR activity over British Columbia

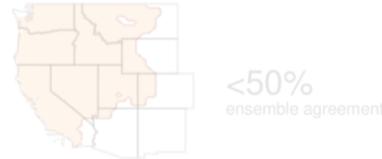
Both models are suggesting significantly below-normal AR activity over much of California during 22–28 Feb



Center for Western Weather
and Water Extremes
SCRIPPS INSTITUTION OF OCEANOGRAPHY
AT UC SAN DIEGO

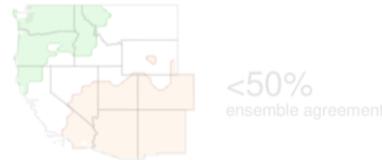
Subseasonal Outlooks: Weeks 3–4 Ridging Forecasts (NCEP)

North-Ridge



Weak north-ridge signal, <50% agreement

South-Ridge

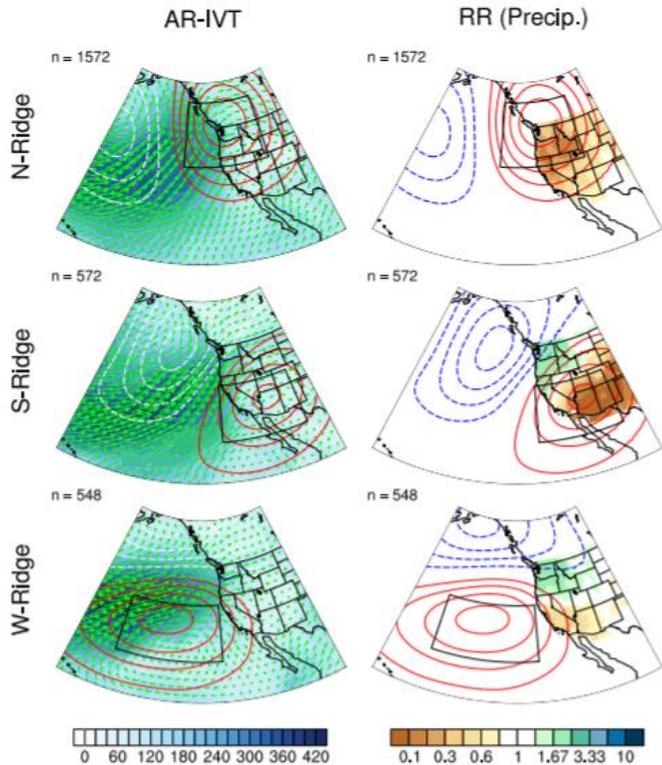


Weak south-ridge signal, <50% agreement

West-Ridge



- dry conditions
- wet conditions



How each ridge type typically influences precipitation

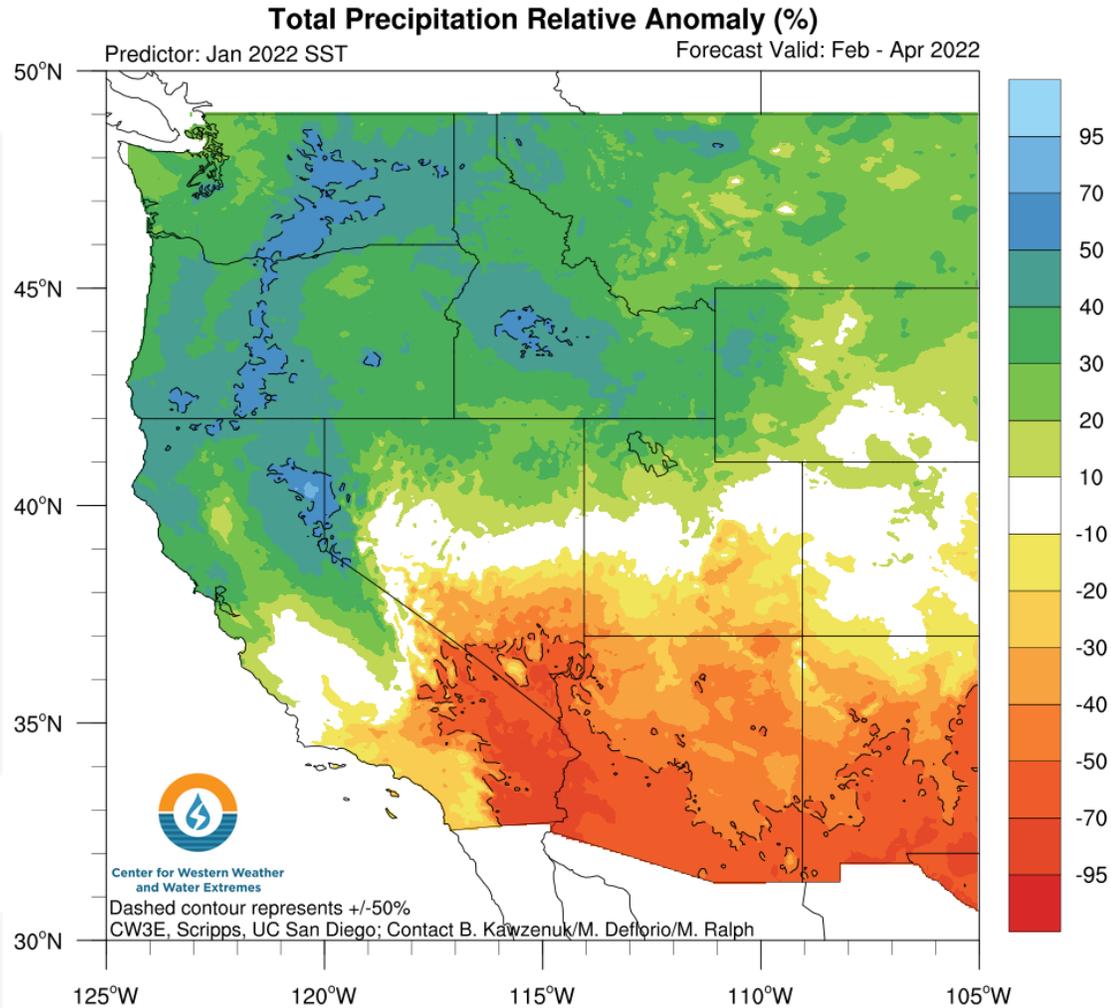
Left: Maps showing the average influence of each ridge type (red contours) on integrated vapor transport (IVT, blue shading indicates greater moisture transport, arrows indicate direction) during atmospheric river events

Right: Maps showing the 'Relative Risk' (RR) of precipitation under each ridge type. Brown shading indicates a reduced chance of precipitation when ridging occurs. For example, a RR value of 0.2 indicates a 5-fold reduction in the likelihood of precipitation

- NCEP model shows moderate confidence (56% ensemble agreement) in the occurrence of the West-Ridge type during Weeks 3–4 (21 Feb–07 Mar)
- ECMWF model also shows moderate confidence (60% ensemble agreement) in the occurrence of the West-Ridge type (not shown)

There is moderate confidence between models in the West-Ridge type forecasts, which are associated with dry conditions across Southern California and wet conditions across the northern Pacific Northwest

Seasonal CCA Outlooks: Feb–Apr 2022 Precipitation



- CW3E statistical model based on January SST is predicting significantly below-normal ($> 50\%$ below normal) Feb–Apr precipitation over southern California and southern Arizona
- Significantly above-normal precipitation is predicted across portions of Northern CA and the northwestern US