



Center for Western Weather
and Water Extremes

SCRIPPS INSTITUTION OF OCEANOGRAPHY
AT UC SAN DIEGO

CW3E S2S Outlook: 29 Mar 2022

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

UC San Diego



SCRIPPS INSTITUTION OF
OCEANOGRAPHY

Summary

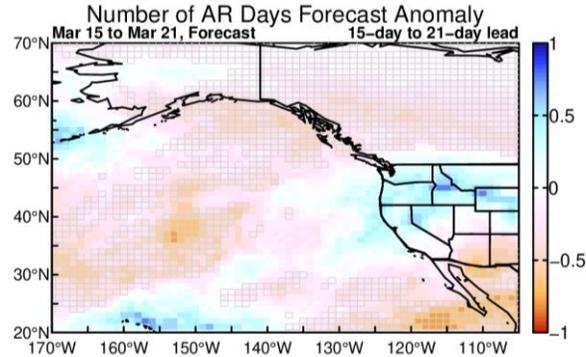
- **Forecast Verification (15–28 Mar):** NCEP Week 3 AR activity forecasts verified during 15–21 Mar; neither model's Week 3 AR activity forecasts verified during 22–28 Mar
 - Multiple ARs made landfall across the Pacific Northwest and Northern California during 15–21 Mar
- **Week 2 forecasts (5–11 Apr):** AR landfall tool and AR activity forecasts show the possibility of landfalling AR activity over the US West Coast during Week 2, but NCEP and ECMWF ensembles disagree on landfall location
 - ECMWF landfall tool is showing higher (lower) probabilities of AR conditions in coastal Washington (California) on 4–5 Apr
 - NCEP Week 2 AR activity forecasts also show potential for landfalling AR activity in the Pacific Northwest on 6–7 Apr
- MJO-related convection is currently very weak, and there is large forecast uncertainty in the evolution of the MJO during the next 2 weeks
- **Week 3 forecasts (12–18 Apr):** NCEP model is predicting below-normal AR activity across the entire western US, especially in California and Arizona
- NCEP model shows high confidence in the occurrence of persistent ridging west of California during Weeks 1-2
 - The West-Ridge type is typically associated with wet conditions in the Pacific Northwest and dry conditions in Central and Southern California

Note: ECMWF subseasonal AR activity and ridging forecasts are unavailable at this time

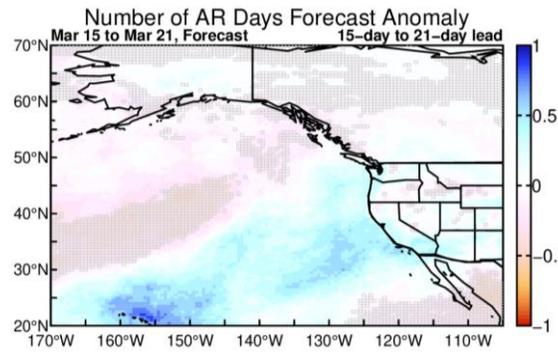
Looking Back: Week 3 AR Activity Forecasts

Valid: 15–21 Mar 2022

NCEP Experimental Forecast Initialized: Feb 28, 2022



ECMWF Experimental Forecast Initialized: Feb 28, 2022

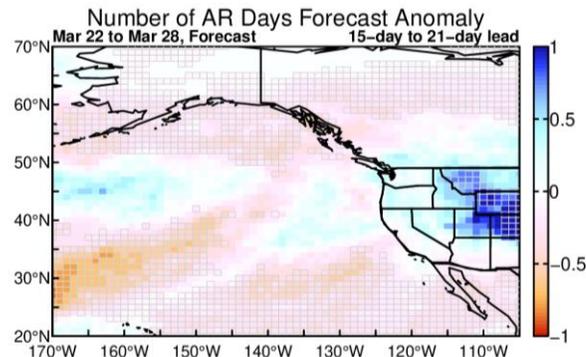


NCEP Week 3 Forecast Verified

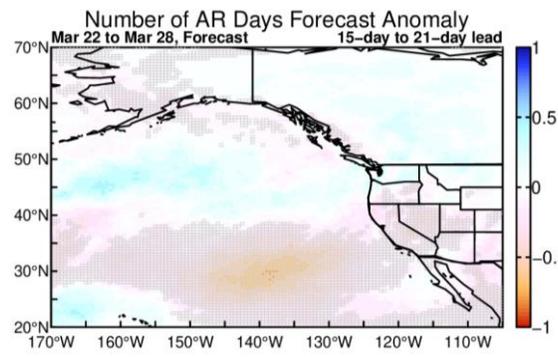
- NCEP: Above-normal AR activity over the Pacific Northwest and Northern California
- ECMWF: Above-normal AR activity over Central and Southern California

Valid: 22–28 Mar 2022

NCEP Experimental Forecast Initialized: Mar 07, 2022



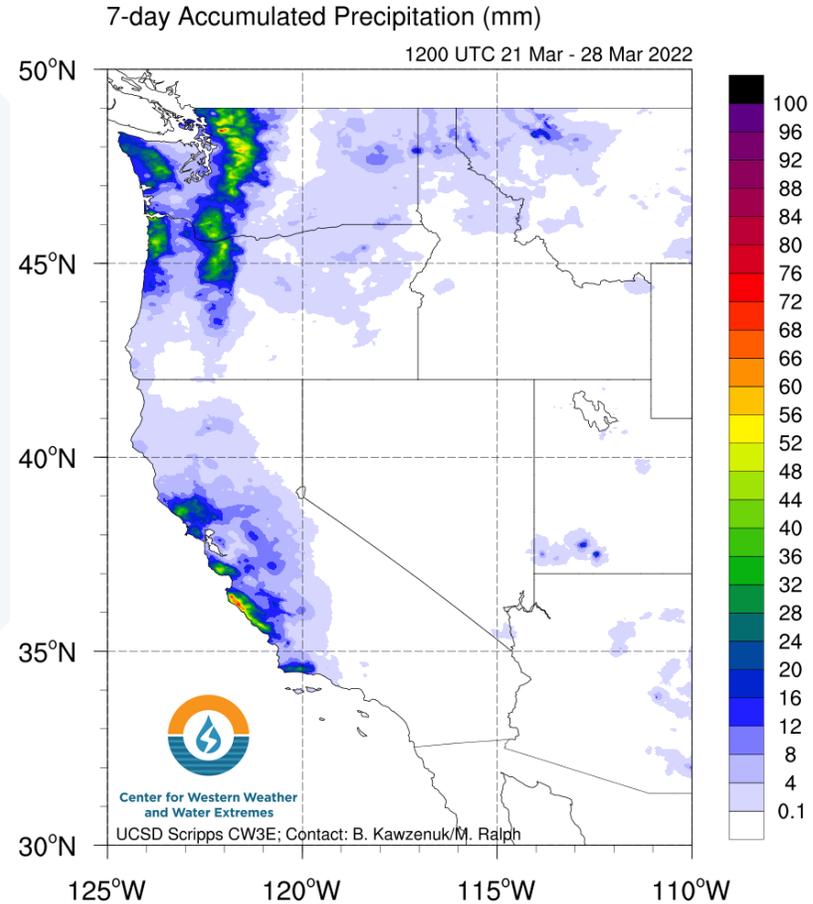
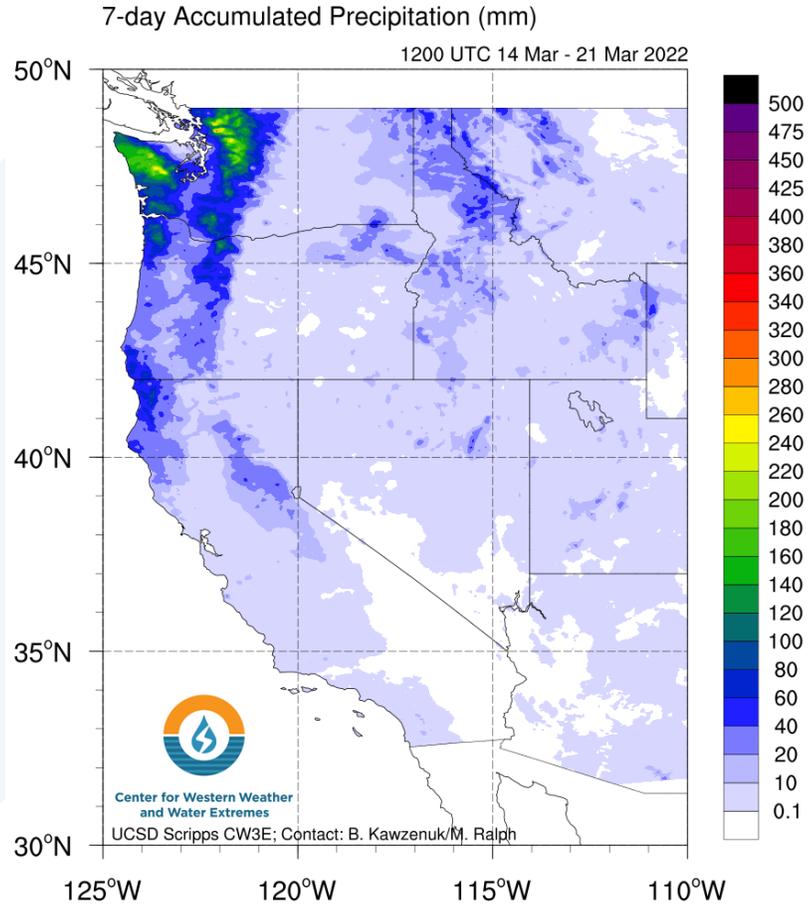
ECMWF Experimental Forecast Initialized: Mar 07, 2022



Neither Week 3 Forecast Verified

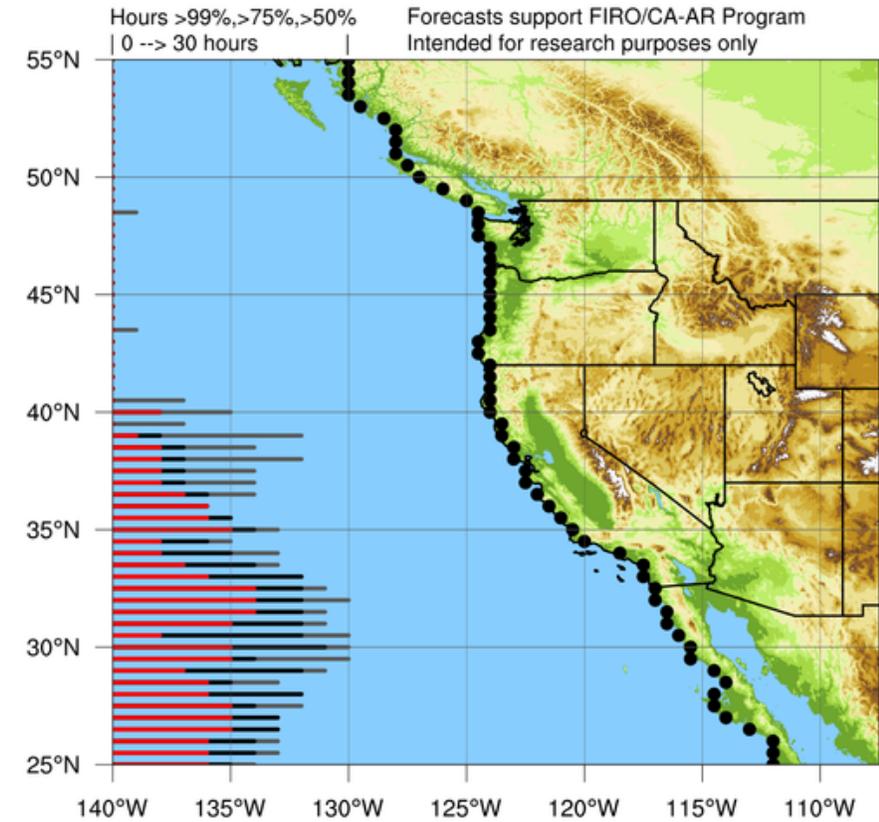
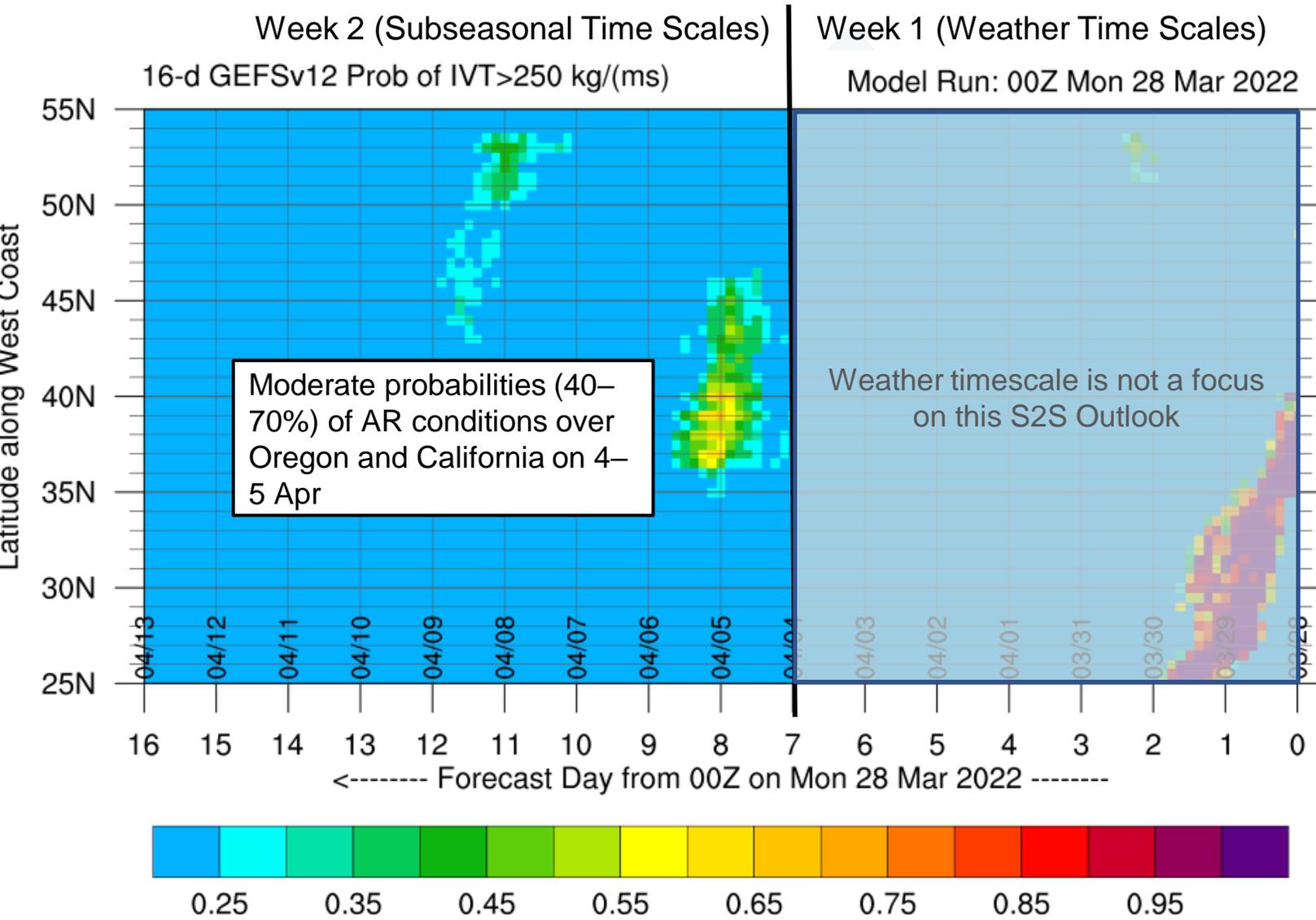
- NCEP: Slightly above-normal AR activity over the Pacific Northwest; slightly below-normal AR activity over Central and Southern California
- ECMWF: Below-normal AR activity much of the US West Coast, especially California

Looking Back: Accumulated Precipitation (14–28 Mar)

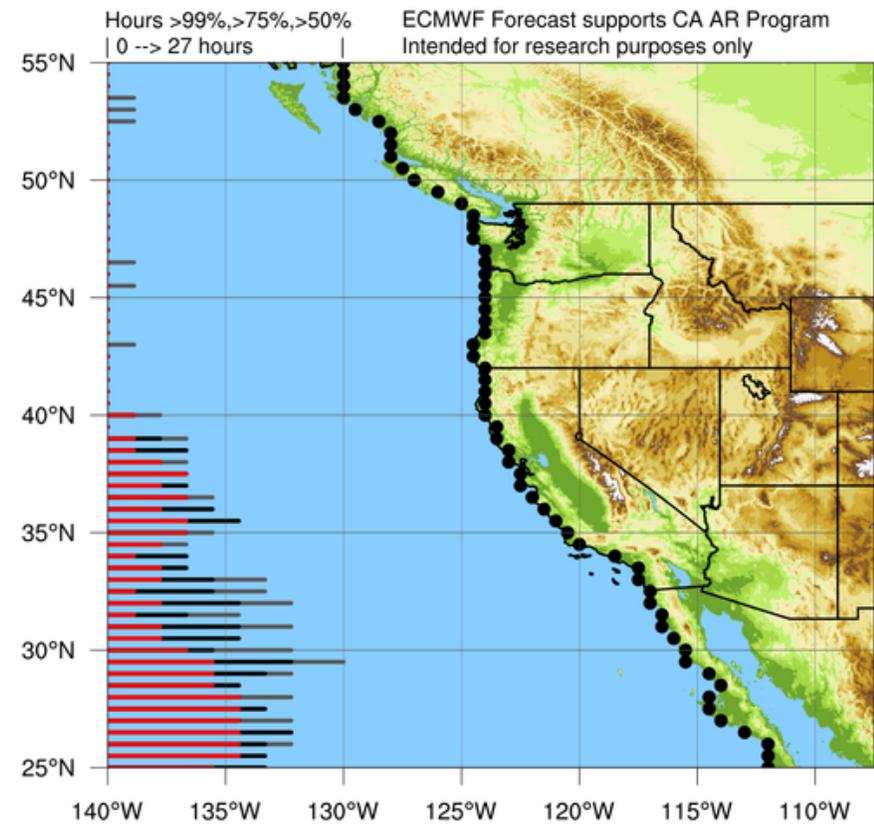
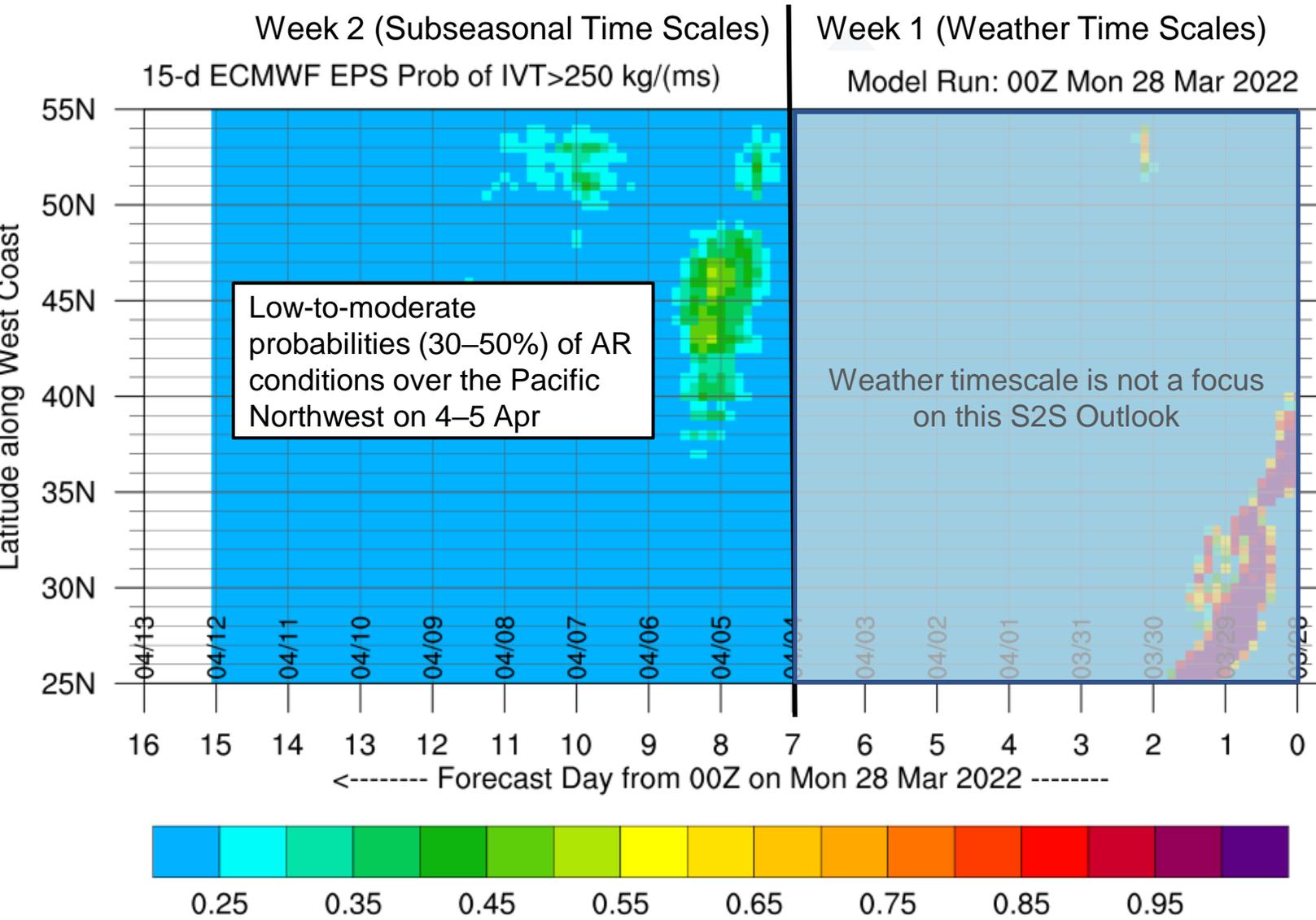


- Multiple weak ARs and shortwave troughs produced brought light-to-moderate precipitation in western Washington, western Oregon, and Northern California during 14–20 Mar
- A stronger AR that remained mostly offshore brought additional precipitation to western Washington and northwestern Oregon on 20–22 Mar
- Another AR brought about 1–3 inches of precipitation to portions of coastal California and the Sierra Nevada on 27–29 Mar
- Observed precipitation during 14–21 Mar is generally consistent with the NCEP Week 3 AR activity forecasts valid during the same period

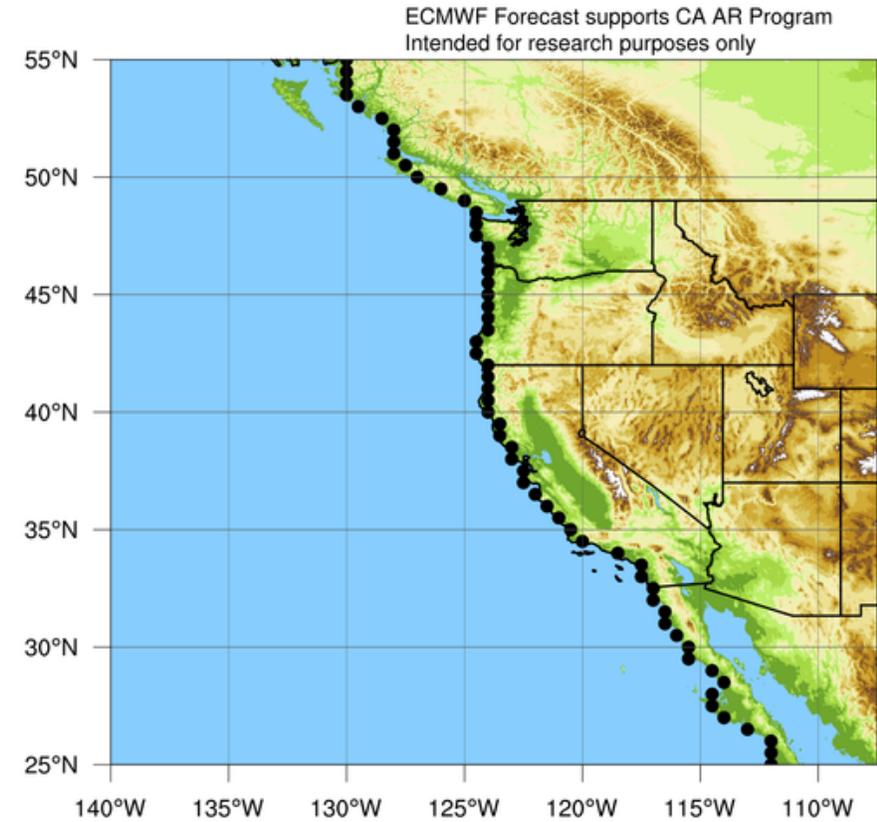
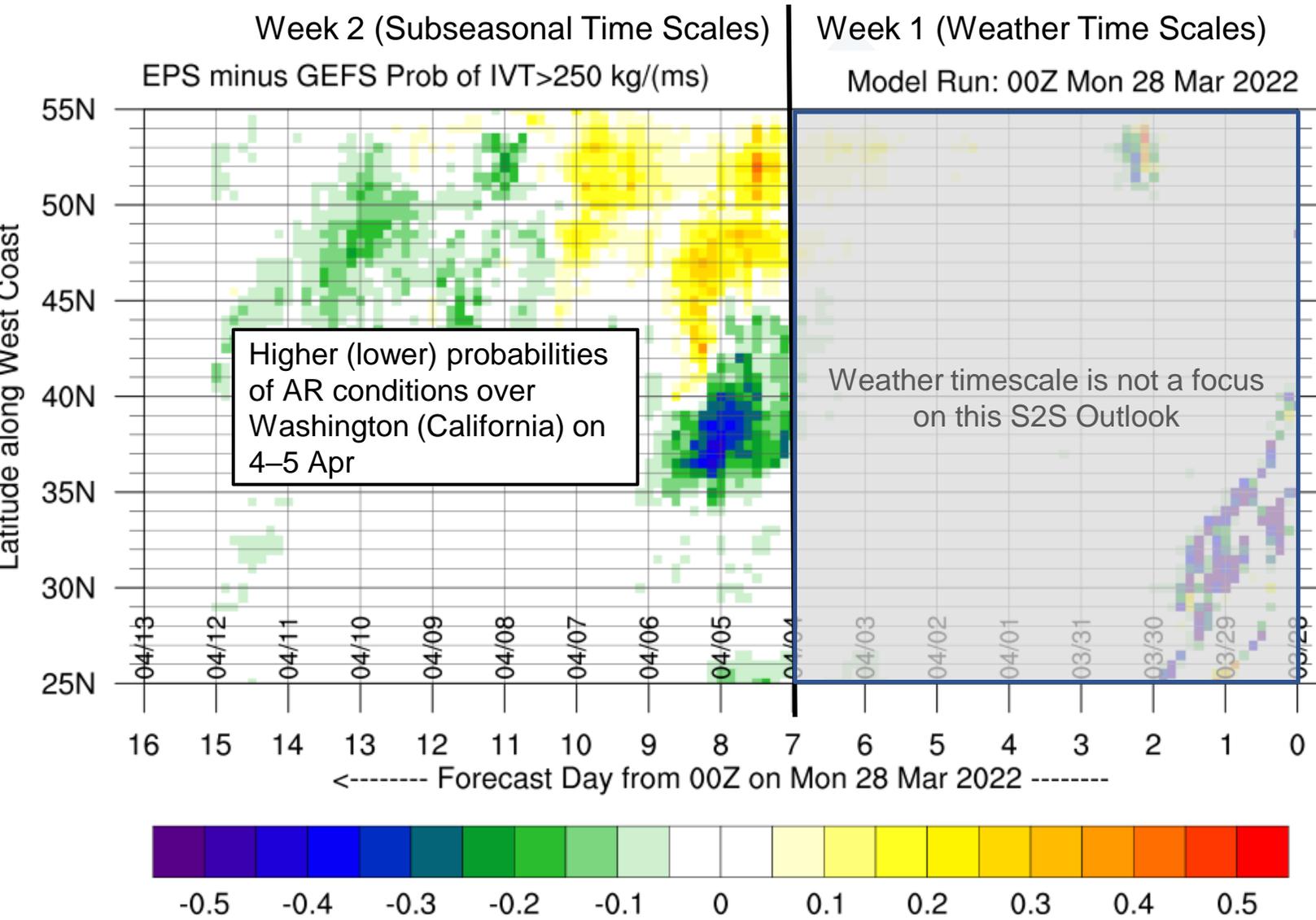
GEFS AR Landfall Tool: Valid 00Z 28 Mar – 13 Apr



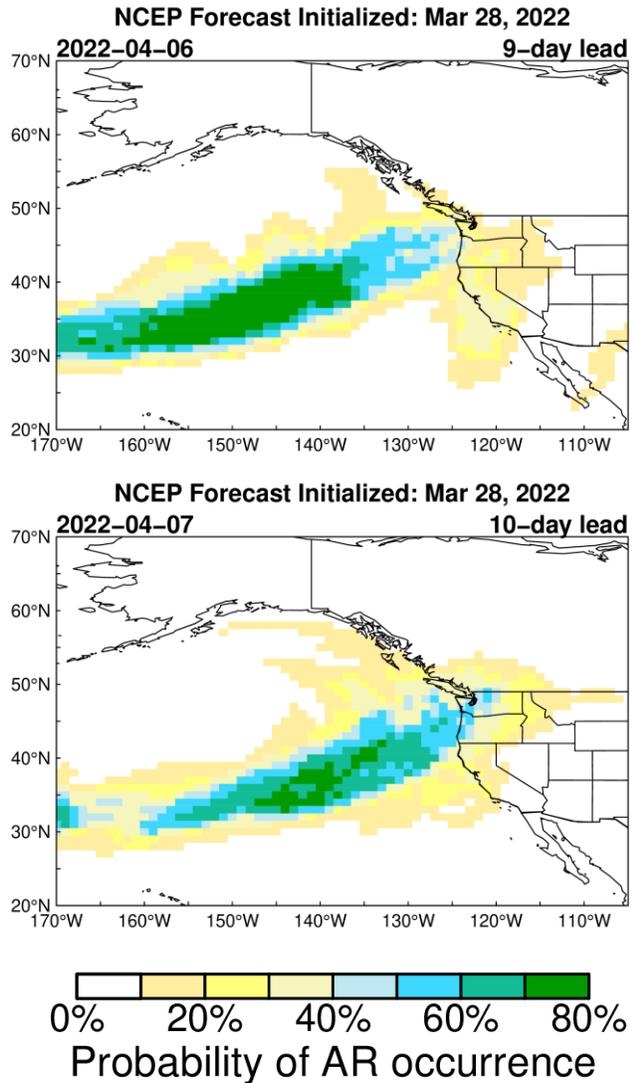
ECMWF EPS AR Landfall Tool: Valid 00Z 28 Mar – 12 Apr



EPS Minus GEFS AR Landfall Tool: Valid 00Z 28 Mar – 12 Apr

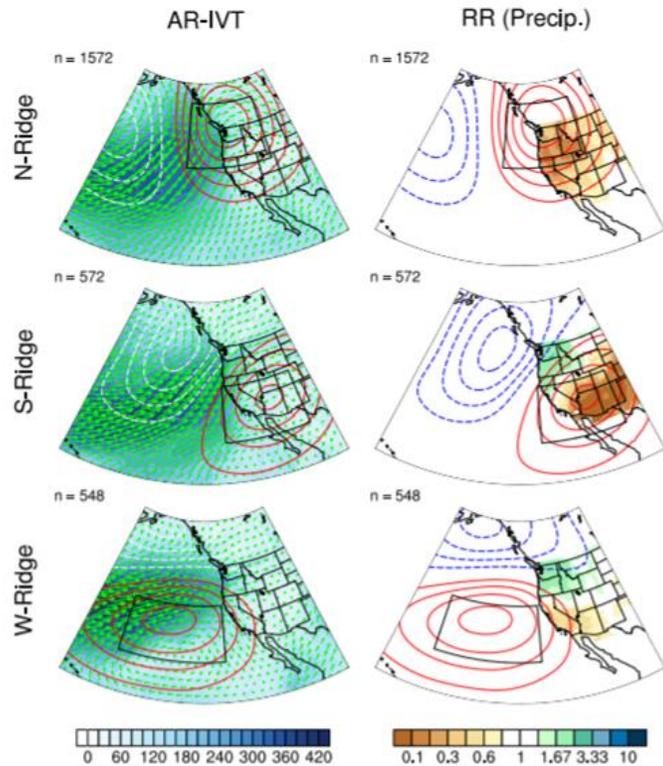


Subseasonal Outlooks: Week 2 AR Activity (NCEP)



- NCEP is showing the possibility of landfalling AR activity along the US West Coast on 6–7 Apr
- Likelihood of AR activity is highest in the Pacific Northwest (30–60% probability)
- NCEP is showing low probabilities of AR activity along the US West Coast during the remainder of Week 2 (5–11 Apr)

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

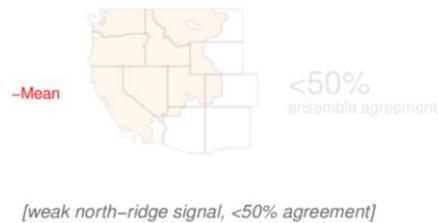


How each ridge type typically influences precipitation

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

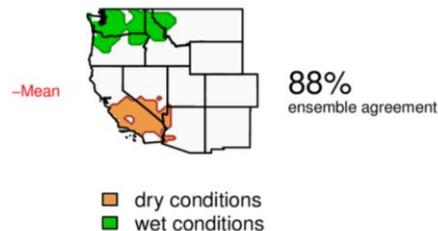
North-Ridge



South-Ridge



West-Ridge

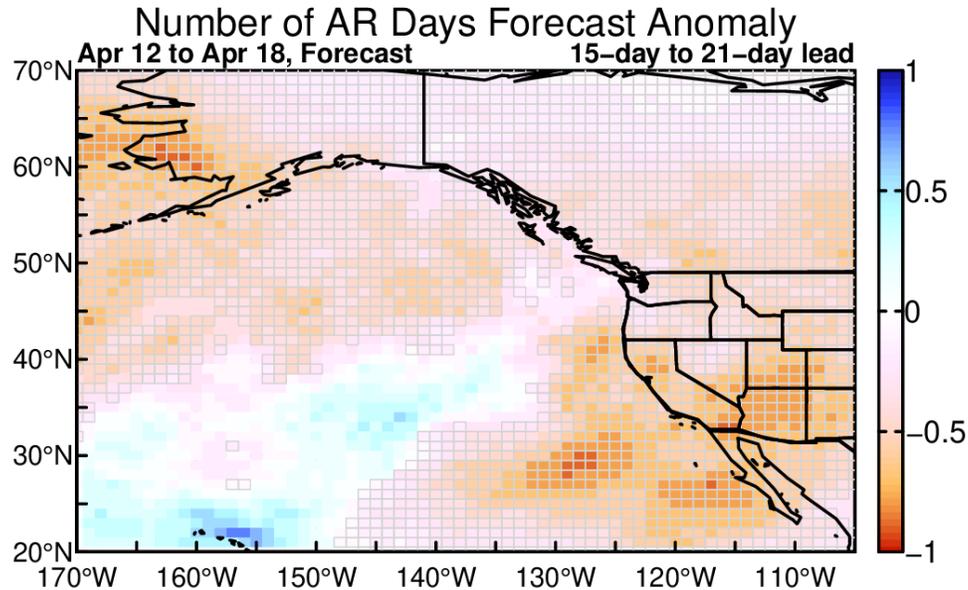


- NCEP is showing high confidence (88% ensemble agreement) in the occurrence of the West-Ridge type during Weeks 1–2 (28 Mar – 11 Apr)
- The West-Ridge type is typically associated with wet conditions over the Pacific Northwest and dry conditions over Central and Southern California

Note: ECMWF Weeks 1–2 ridging forecasts are unavailable at this time

Subseasonal Outlooks: Week 3 AR Activity (NCEP)

NCEP Experimental Forecast Initialized: Mar 28, 2022



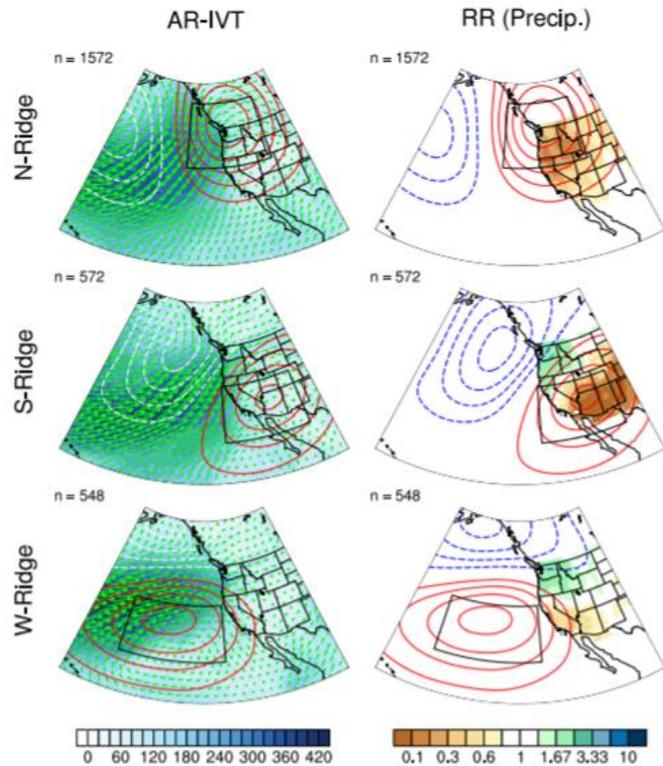
- NCEP is forecasting below-normal AR activity over the entire western US during Week 3 (12–18 Apr), especially in California and Arizona



Note: ECMWF Week 3 AR activity forecasts are unavailable at this time



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

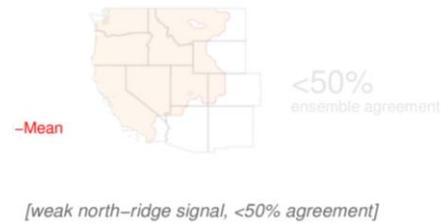


How each ridge type typically influences precipitation

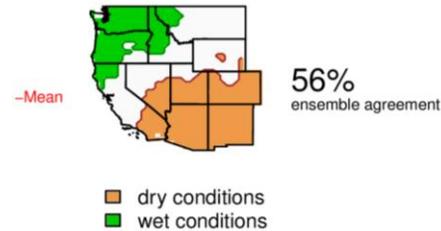
Left: Maps showing the average influence of each ridge type (red contours) on integrated vapor transport (IVT, blue shading indicates greater moisture transport, arrows indicate direction) during atmospheric river events

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



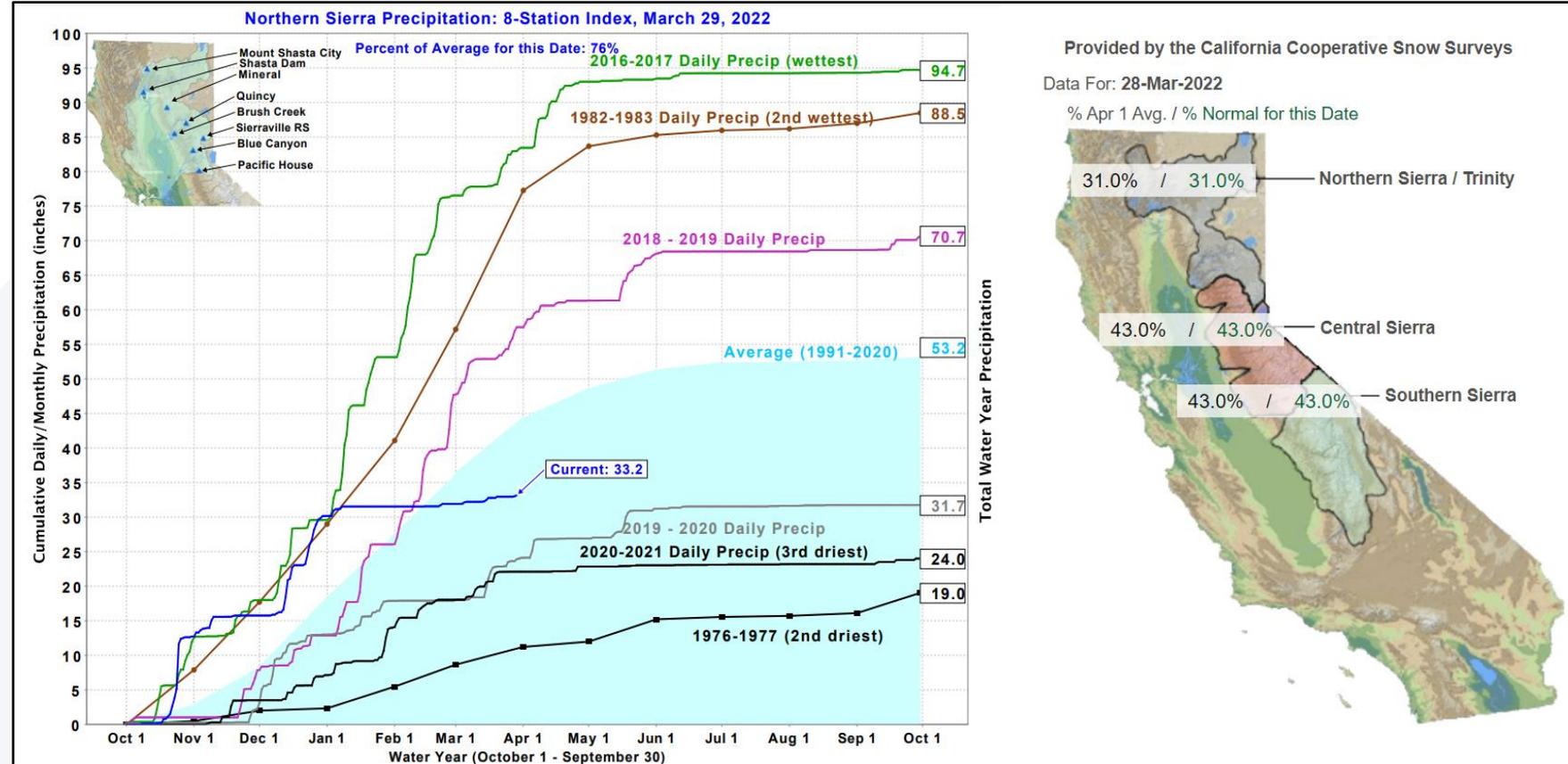
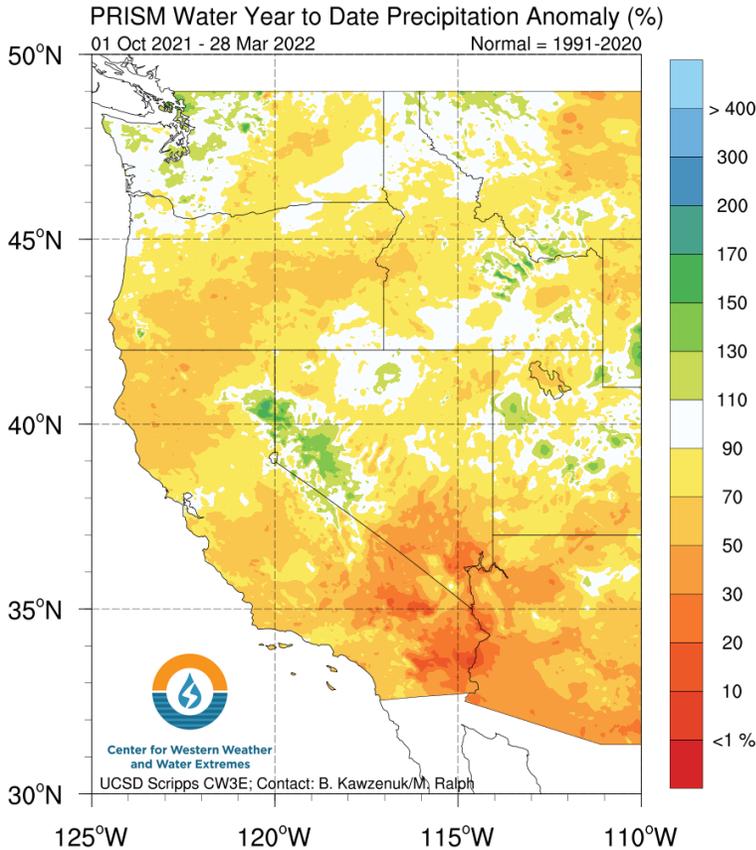
West-Ridge



- NCEP is showing moderate confidence (56% ensemble agreement) in the occurrence of the South-Ridge type during Weeks 3–4 (11–25 Apr)
- The South-Ridge type is typically associated with wet conditions in the Pacific Northwest and widespread dry conditions throughout the southwestern US

Note: ECMWF Weeks 3–4 ridging forecasts are unavailable at this time

Water Year Precipitation Summary



Source: California Department of Water Resources

- Water-year-to-date precipitation is below normal across much of the western US, especially in California, southern Nevada, and Arizona
- Water-year-to-date precipitation is near-normal in western Washington and above-normal in western Nevada
- Total water year precipitation in the Northern Sierra Nevada is currently 76% of normal
- Northern Sierra Nevada snowpack is only 31% of normal