



Center for Western Weather
and Water Extremes

SCRIPPS INSTITUTION OF OCEANOGRAPHY
AT UC SAN DIEGO

CW3E Subseasonal Outlook: 3 March 2026

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UC San Diego



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CW3E Subseasonal Outlooks: Glossary & Context

- The outlooks are based on CW3E subseasonal forecast products that can be found here: https://cw3e.ucsd.edu/s_and_s_forecasts/
- CW3E subseasonal (2–6 weeks lead time) atmospheric river, ridging, and circulation regime products use three different global ensemble prediction systems to create these products:
 - NCEP CFSv2 (US Model): Weeks 2–4
 - ECCO (Canadian Model): Weeks 2–4
 - ECMWF (European model): Weeks 2–4
- *On the following slides, the term confidence refers to the forecasters' interpretation of the magnitude of the anomalies, the level of ensemble agreement, and the skill of the products used to generate the forecasts. All the tools used are shown in the outlook presentation.*
- *The thresholds for below-normal, near-normal, and above-normal conditions are determined by forecast product and noted on each forecast product slide*

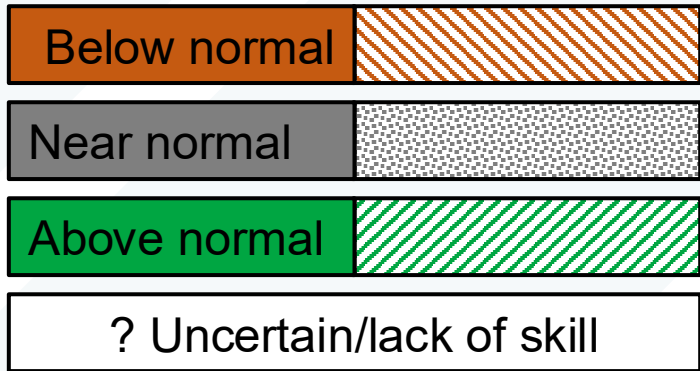
Summary: Subseasonal Precipitation Outlook by Model

This slide shows the CW3E synthesis of subseasonal products by model

Forecasts Initialized 2 Mar 2026

Region	Week 2 (9–15 Mar)				Week 3 (16–22 Mar)				Week 4 (23–29 Mar)			
	NCEP ^{1,2,4}	ECMWF ^{1,2}	ECMWF ^{1,2}	Multi-Model Forecast	NCEP ^{1,2,4}	ECMWF ^{1,2}	ECMWF ^{1,2}	Multi-Model Forecast	NCEP ^{1,2,4}	ECMWF ^{1,2}	ECMWF ^{1,2}	Multi-Model Forecast
WA/OR	Below normal	Above normal	Above normal	Above normal	Below normal	Above normal	Uncertain	Above normal	Below normal	Above normal	Uncertain	Uncertain
Northern CA	Below normal	Above normal	Below normal	Uncertain	Below normal	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain
Central CA	Below normal	Uncertain	Below normal	Below normal	Below normal	Below normal	Below normal	Below normal	Uncertain	Uncertain	Uncertain	Uncertain
Southern CA	Below normal	Uncertain	Uncertain	Uncertain	Below normal	Below normal	Below normal	Below normal	Uncertain	Uncertain	Uncertain	Uncertain

Higher Confidence | Lower Confidence



- Forecasts tilt the odds toward below-normal precipitation in Central CA during Week 2; more uncertainty in Northern and Southern CA
- Forecasts generally agree on below-normal precipitation in Central and Southern CA during Week 3; more uncertainty over Northern CA
- High degree of uncertainty during Week 4

Subseasonal products included in this Outlook:

¹CW3E/JPL Atmospheric River Activity Forecasts ([DeFlorio et al. 2019](#), [Zhang et al. 2023](#))

²CW3E/JPL Ridging Forecasts ([Gibson et al. 2020](#))

³IRI North American Weather Regime Forecasts ([Robertson et al. 2020](#)) – Unavailable This Week

⁴CW3E West Coast Weather Regime Forecasts (Guirguis et al. [2023a](#) and [2023b](#))

Summary

MJO/QBO Conditions

- MJO convection is currently located over the Maritime Continent (Phase 5); QBO is in the easterly phase
 - Without considering QBO/ENSO conditions, MJO in the Maritime Continent is associated with a decrease in extreme precipitation over California at lag times of 1–2 weeks
 - AR activity and precipitation forecasts based on MJO/QBO are unavailable
- NCEP is forecasting MJO convection to weaken slightly during Week 1, then re-strengthen and propagate eastward into the Western Pacific during Week 2
 - The statistical relationship between the MJO and extreme precipitation is consistent with the NCEP Week 2 AR activity forecasts

Week 2 Forecasts (9–15 Mar):

- Models disagree somewhat on AR activity over CA
 - In Northern CA, NCEP and ECMWF are forecasting slightly below-normal to below-normal AR activity with high confidence, whereas ECCO is forecasting slightly above-normal AR activity
 - In Central CA, NCEP is forecasting slightly below-normal to below-normal AR activity with high confidence, ECMWF is forecasting near-normal to slightly below-normal AR activity, and ECCO is forecasting near-normal to slightly above-normal AR activity
 - In Southern CA, NCEP is forecasting slightly below-normal AR activity with high confidence, whereas ECCO and ECMWF are forecasting near-normal AR activity
- Ridging outlooks show moderate-to-high likelihood of above-normal West-ridge activity (dry conditions in Central and Southern CA)
 - NCEP is showing moderate confidence in above-normal South-ridge activity (wet conditions in Northern CA and dry conditions in Southern CA)
 - ECMWF is showing moderate confidence in above-normal North-ridge activity (dry conditions over all of CA)
- IRI North American weather regime forecasts are unavailable for Weeks 2–4
- CW3E West Coast weather regime tool shows high likelihood of patterns associated with below-normal precipitation over all of CA

Summary

Week 3 Forecasts (16–22 Mar):

- Models generally agree on near-normal to slightly below-normal AR activity over Southern CA
 - In Northern CA, ECCO and ECMWF are forecasting near-normal AR activity, whereas NCEP is forecasting below-normal AR activity with high confidence
 - In Central CA, ECCO and ECMWF are forecasting near-normal to slightly below-normal AR activity with areas of higher confidence, whereas NCEP is forecasting slightly below-normal to below-normal AR activity with high confidence
- Ridging outlooks show moderate likelihood of above-normal North-ridge activity during Weeks 3–4
- CW3E West Coast weather regime tool shows moderate-to-high likelihood of patterns associated with below-normal precipitation over all of CA during Week 3

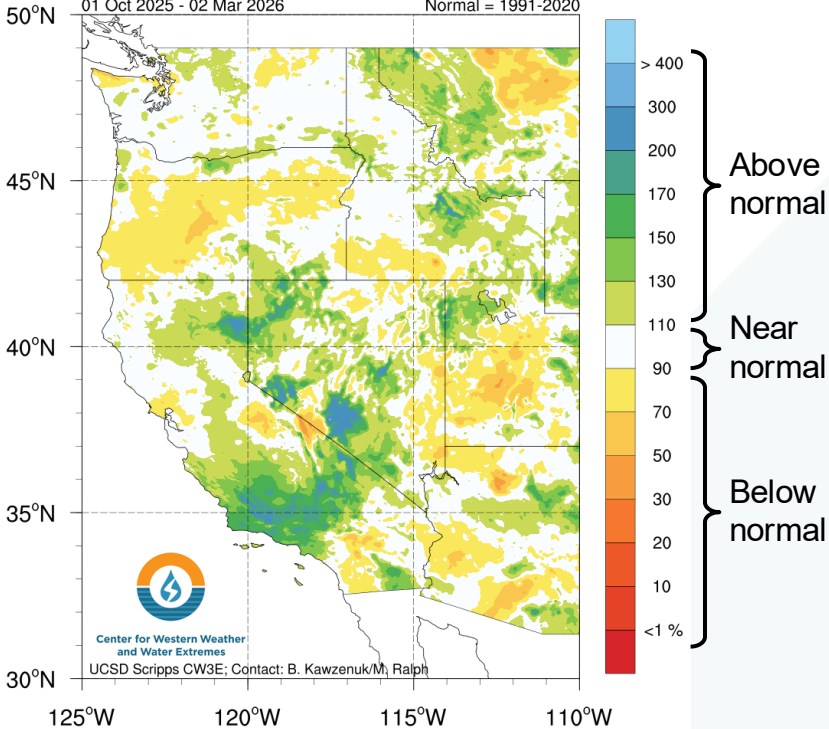
Week 4 Forecasts (23–29 Mar):

- Models generally agree on near-normal AR activity over all of CA
- CW3E West Coast weather regime tool shows moderate likelihood of patterns associated with below-normal precipitation in Northern and Central CA during Week 4

Hydrologic Summary

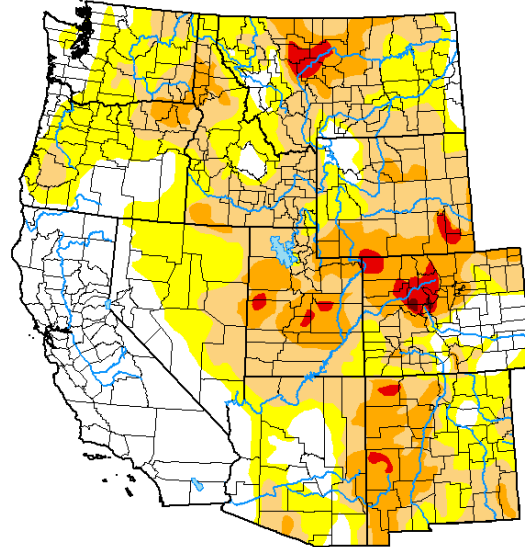
Precipitation

PRISM Water Year to Date Precipitation Anomaly (%)
01 Oct 2025 - 02 Mar 2026 Normal = 1991-2020



Drought Conditions

U.S. Drought Monitor Western U.S.



February 24, 2026
(Released Thursday, Feb. 26, 2026)
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	28.11	71.89	44.71	16.22	2.03	0.07
Last Week 02-17-2026	28.13	71.87	44.15	15.41	2.03	0.07
3 Months Ago 11-25-2025	31.51	68.49	51.79	23.43	2.26	0.00
Start of Calendar Year 01-06-2026	40.61	59.39	36.26	14.36	1.16	0.06
Start of Water Year 09-30-2025	18.15	81.85	64.82	44.12	12.00	0.69
One Year Ago 02-25-2025	32.67	67.33	47.97	26.70	12.64	0.26

Intensity

None	D2 Severe Drought
D0 Abnormally Dry	D3 Extreme Drought
D1 Moderate Drought	D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

Author:
Brad Rippey
U.S. Department of Agriculture



droughtmonitor.unl.edu

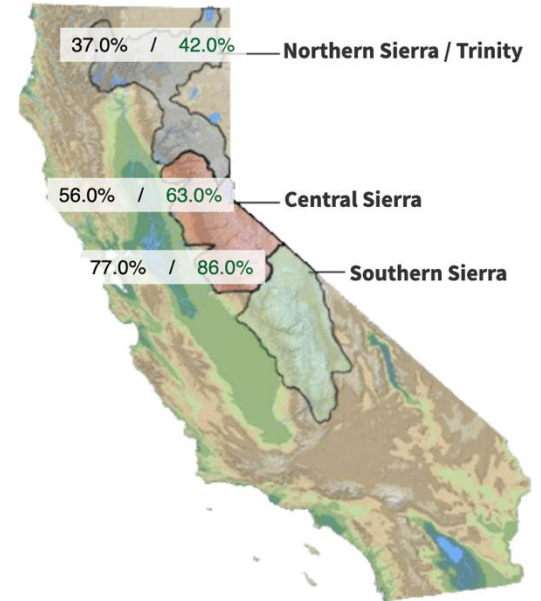
Disclaimer: In addition to climate indicators, the U.S. Drought Monitor also uses impact reports from local observers about crop failures or water restrictions to quantify drought.

Snowpack Conditions

Provided by the California Cooperative Snow Surveys

Data For: 02-Mar-2026

% Apr 1 Avg. / % Normal for this Date

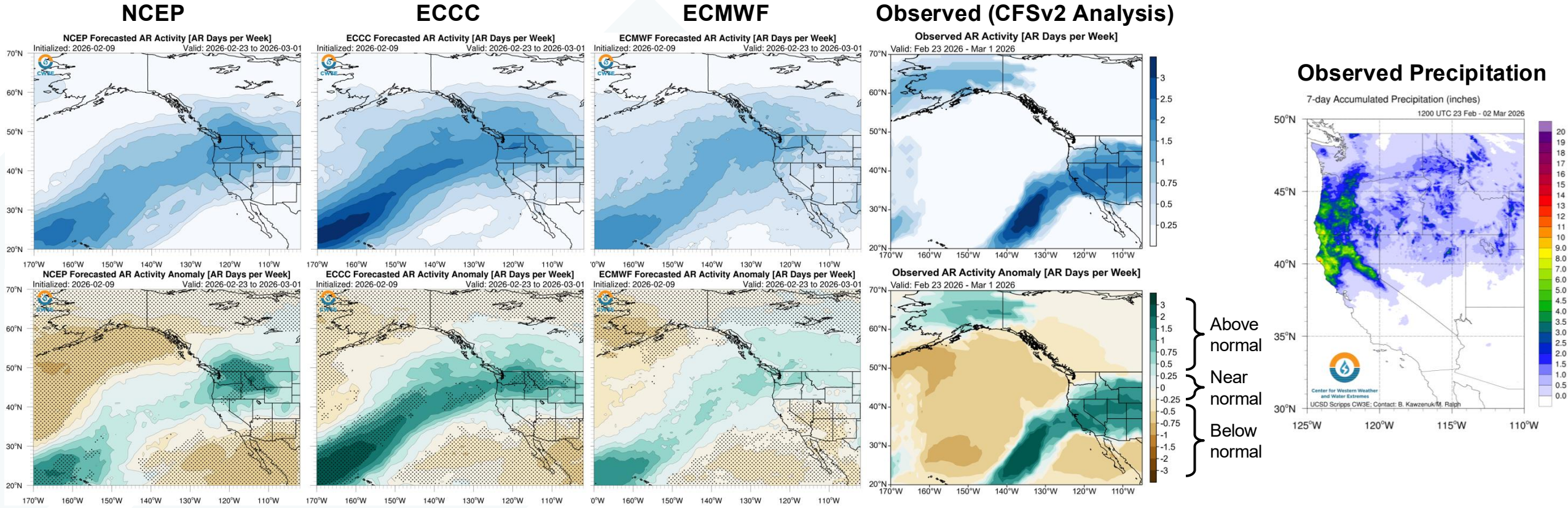


Source: California DWR

- As of 2 Mar, water-year-to-date precipitation is still running **well-above normal (>150% of normal)** in portions of Central and Southern CA and **slightly below normal to slightly above normal (70–130% of normal)** across most of the rest of the state
- The most recent drought monitor update is showing no drought over all of CA
- As of 2 Mar, estimated snowpack is well-below normal in the Northern Sierra Nevada/Trinity region (**42% of normal**), below normal in the Central Sierra Nevada (**63% of normal**), and slightly below normal in the Southern Sierra Nevada (**86% of normal**)

Looking Back: Week 3 AR Activity Forecasts

Forecasts Initialized 9 Feb 2026; Valid: 23 Feb – 1 Mar 2026



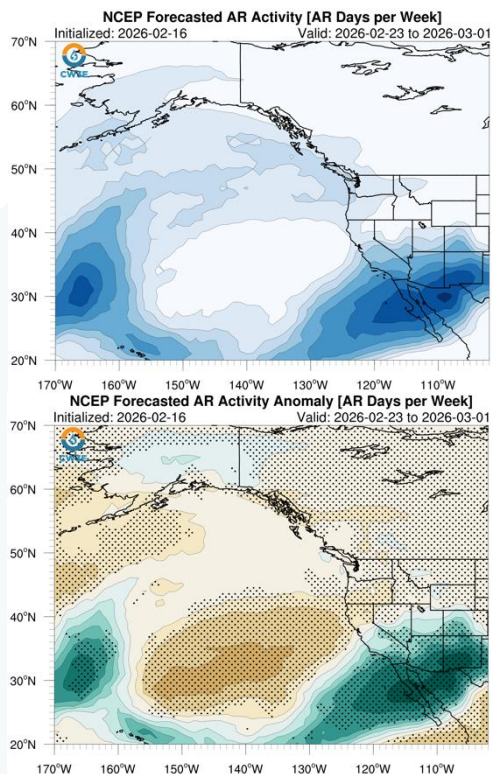
Shading: Fractional # of AR days forecast over a 7-day period (top) and forecast minus model climatology (bottom; green/blue = higher than climatology; brown = lower than climatology)

- At 3-week lead times, all models struggled to capture the large-scale pattern (i.e., ridging south of Alaska and a trough/closed low west of California)
- All models showed a northward displacement of the axis of AR activity over land, leading to an overestimation of AR activity over the Pacific Northwest and underestimation of AR activity over CA, particularly in Central and Southern CA
- A strong AR produced 4–8 inches of precipitation over portions of Northern CA and southern OR during 23–25 Feb

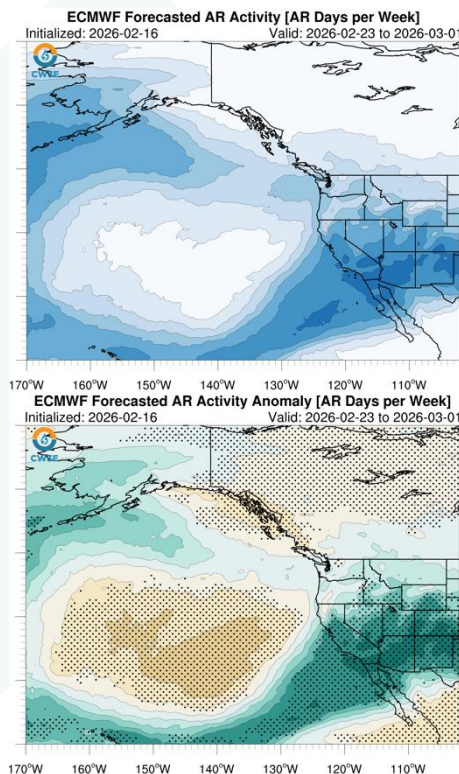
Looking Back: Week 2 AR Activity Forecasts

Forecasts Initialized 16 Feb 2026; Valid: 23 Feb – 1 Mar 2026

NCEP

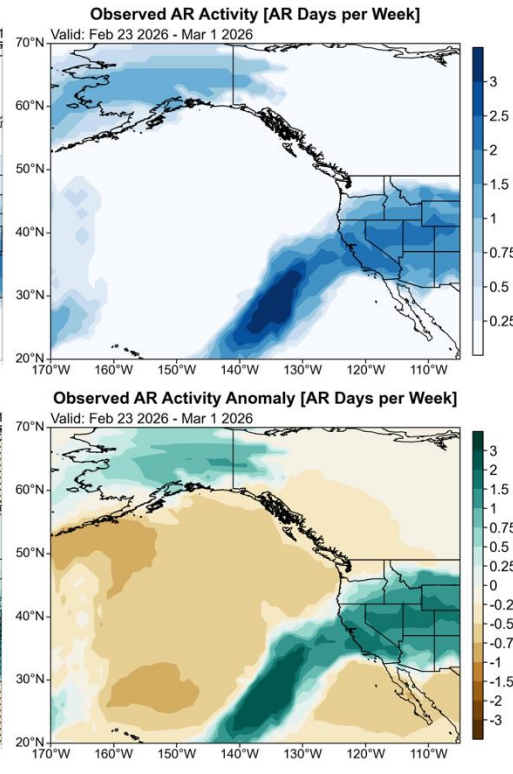


ECMWF

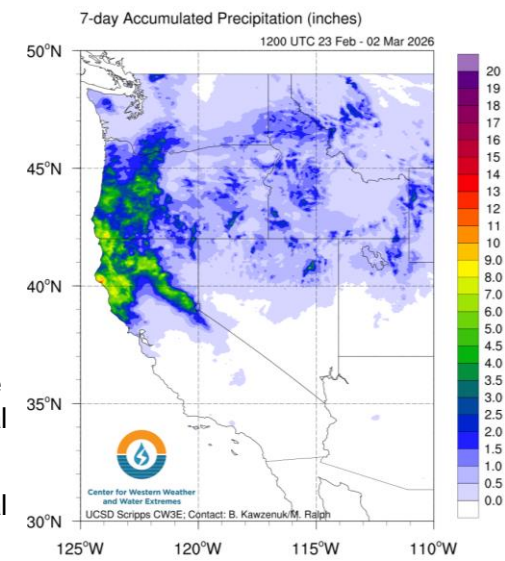


ECCC
Unavailable

Observed (CFSv2 Analysis)



Observed Precipitation



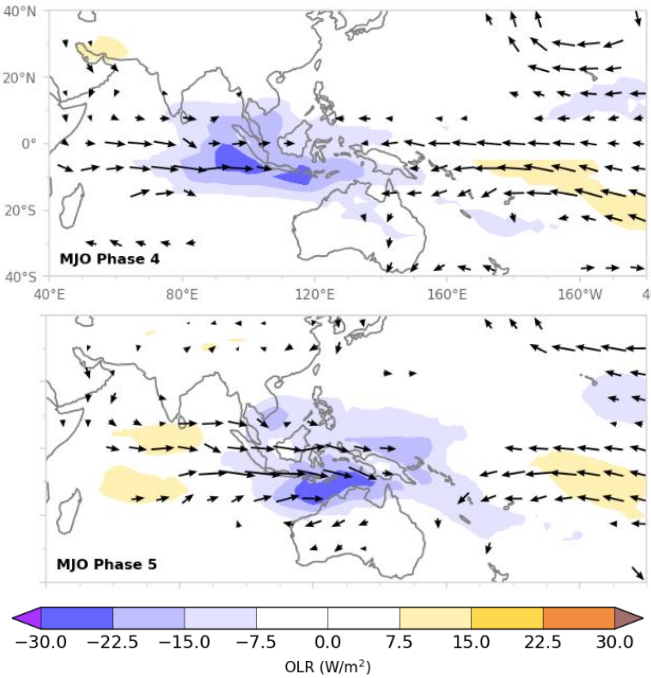
Shading: Fractional # of AR days forecast over a 7-day period (top) and forecast minus model climatology (bottom; green/blue = higher than climatology; brown = lower than climatology)

- At 2-week lead times, NCEP and ECMWF better captured the large-scale pattern (ECCC was unavailable)
- NCEP predicted the center of ridging to be too far east, leading to an underestimation of AR activity over Northern and Central CA
- A strong AR produced 4–8 inches of precipitation over portions of Northern CA and southern OR during 23–25 Feb

Dynamical Model MJO Forecasts (NCEP)

Observed MJO

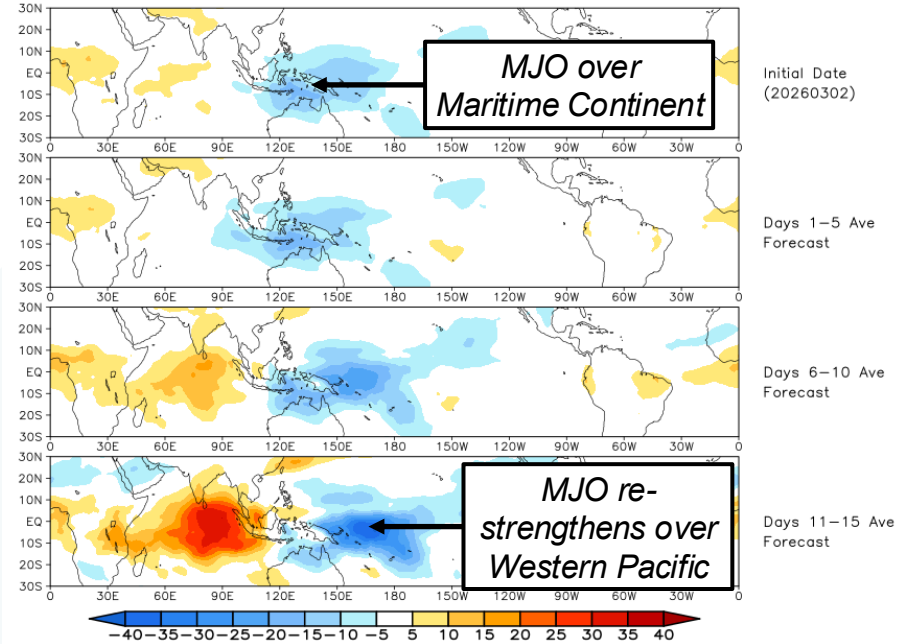
Phases 4&5 (Maritime Continent)



OLR = Outgoing longwave radiation

Weeks 1–2 MJO Prediction

OLR prediction of MJO-related anomalies using GFS model reconstruction by RMM1 & RMM2 (20260302)



Circulation and Moisture Transport Anomalies

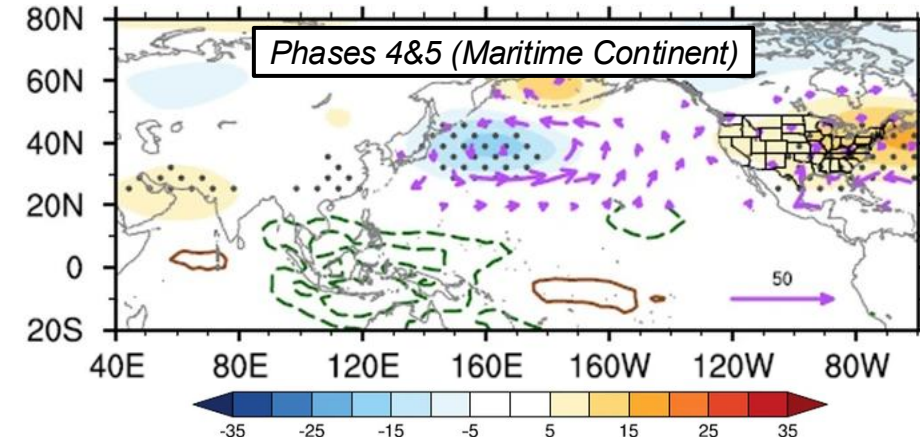


Figure 5 from Wang et al. (2024)

Composite Z500 anomalies (shading; orange = positive; blue = negative), IVT anomalies (vectors); and OLR anomalies (brown = suppressed convection; green = enhanced convection)

Extreme Precipitation Frequency

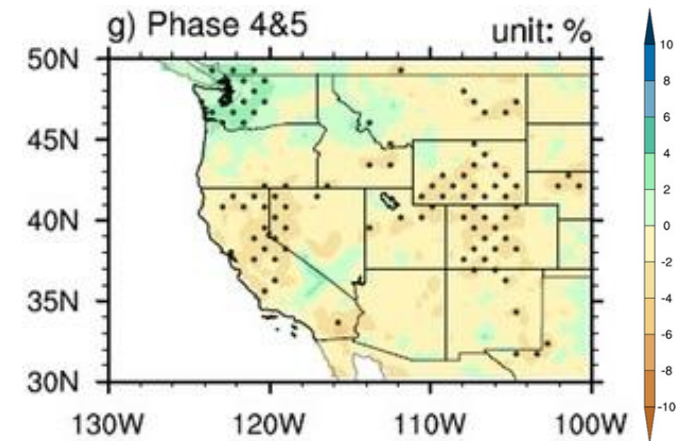


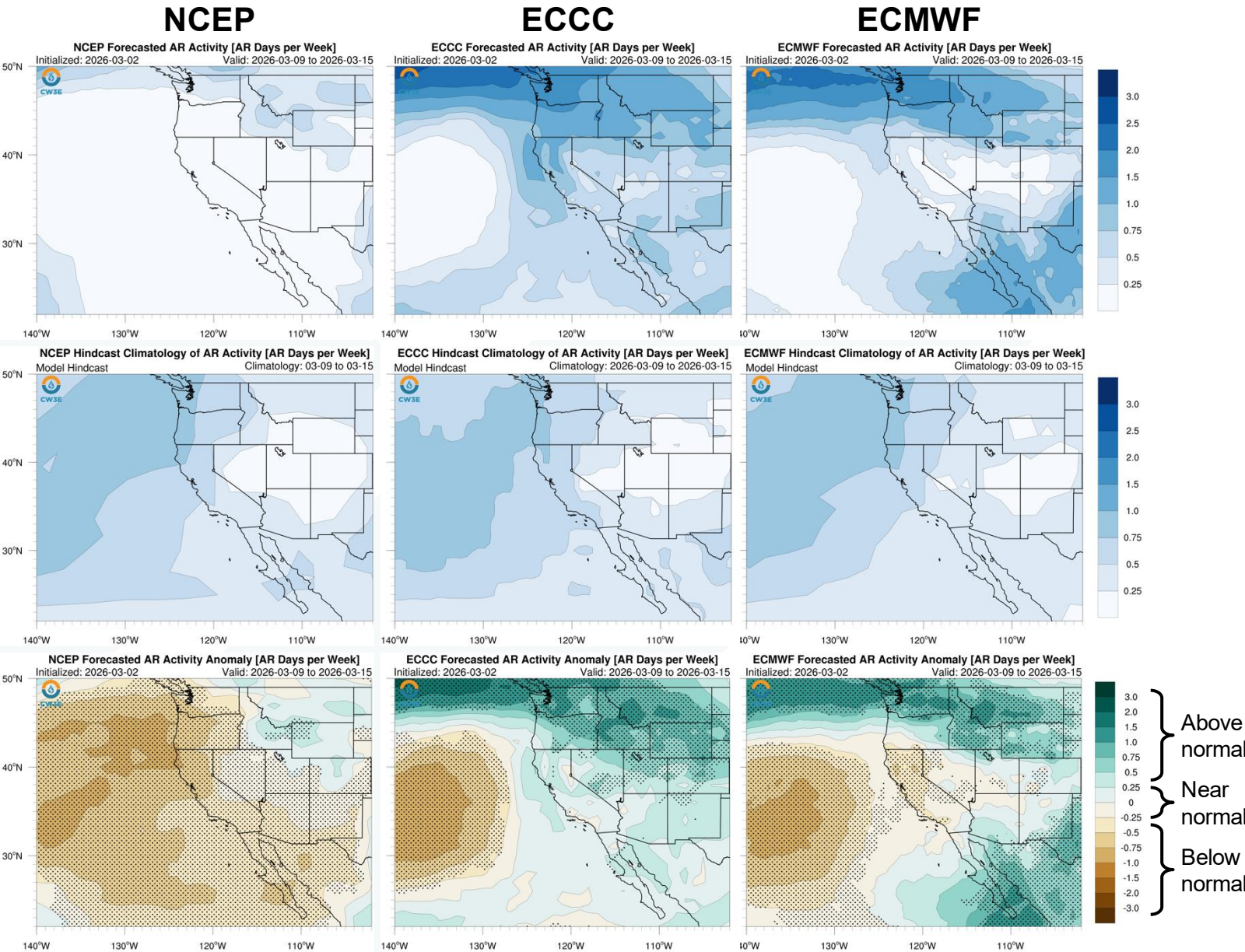
Figure 3 from Wang et al. (2023)

Percent Change in frequency of extreme precipitation (brown = decreased frequency; green/blue = increased frequency)

- As of 2 Mar, MJO convection is currently located over the Maritime Continent (Phase 5)
- NCEP is forecasting MJO convection to weaken slightly during Week 1, then re-strengthen and propagate eastward into the Western Pacific during Week 2
- MJO activity over the Maritime Continent is associated with a weak ridge over the western US at lag times of 1–2 weeks, leading to decreased moisture transport into California and a decrease in extreme precipitation frequency

AR Activity Forecasts: Week 2 (NCEP vs. ECCC vs. ECMWF)

Forecasts Initialized 2 Mar 2026



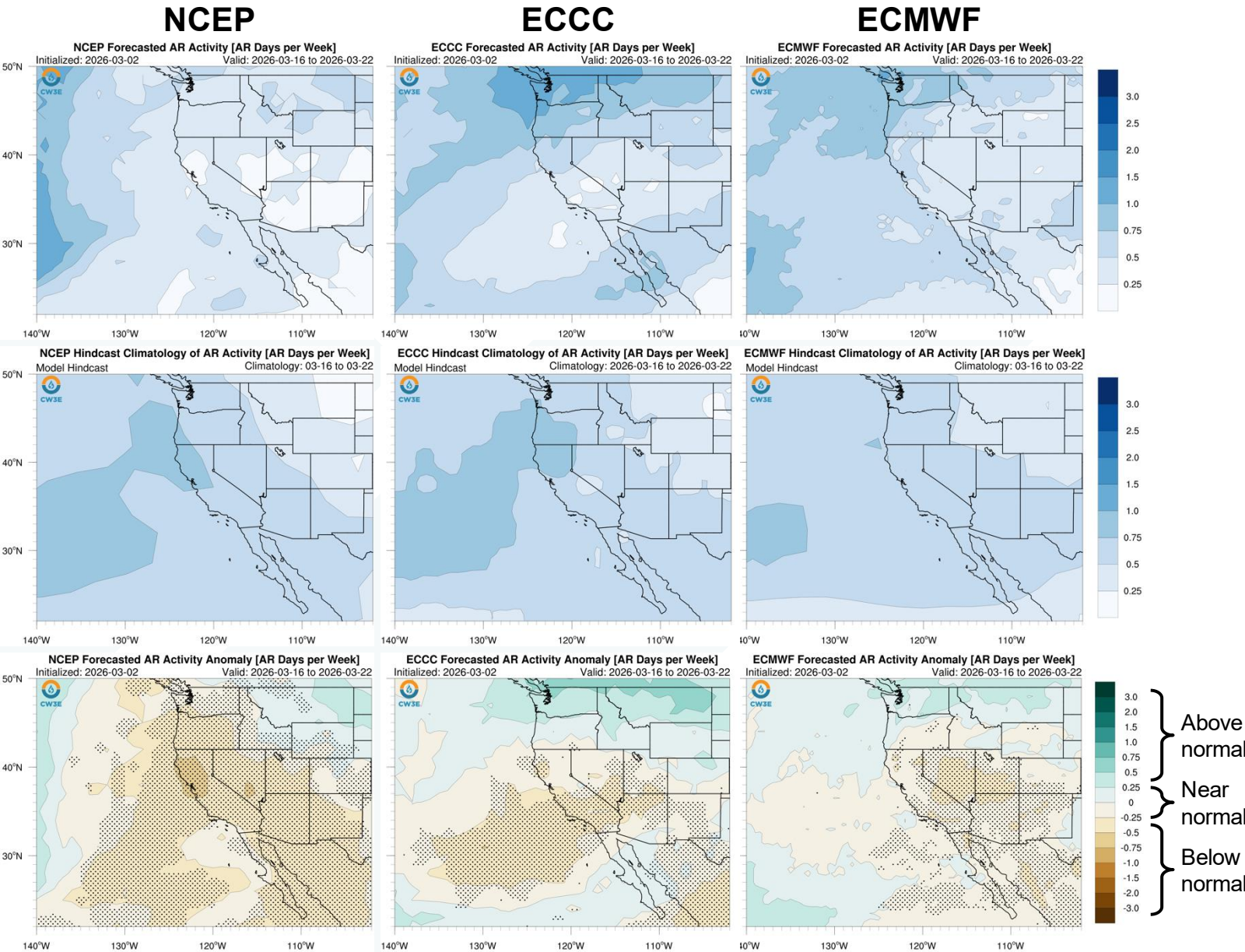
- In Northern CA, NCEP and ECMWF are forecasting slightly below-normal to below-normal AR activity with high confidence during Week 2 (9–15 Mar), whereas ECCC is forecasting slightly above-normal AR activity
- In Central CA, NCEP is forecasting slightly below-normal to below-normal AR activity with high confidence, ECMWF is forecasting near-normal to slightly below-normal AR activity with areas of higher confidence, and ECCC is forecasting near-normal to slightly above-normal AR activity
- In Southern CA, NCEP is forecasting slightly below-normal AR activity with high confidence, whereas ECCC and ECMWF are forecasting near-normal AR activity

Models disagree somewhat on AR activity over CA during Week 2 (9–15 Mar)

Shading: Fractional # of AR days forecast over a 7-day period (top), model climatology (middle), and forecast minus model climatology (bottom; green/blue = higher than climatology; brown = lower than climatology)

AR Activity Forecasts: Week 3 (NCEP vs. ECCC vs. ECMWF)

Forecasts Initialized 2 Mar 2026



- All models are forecasting near-normal to slightly below-normal AR activity with high confidence over Southern CA during Week 3 (16–22 Mar)
- In Northern CA, ECCC and ECMWF are forecasting near-normal AR activity, whereas NCEP is forecasting below-normal AR activity with high confidence
- In Central CA, ECCC and ECMWF are forecasting near-normal to slightly below-normal AR activity with areas of higher confidence, whereas NCEP is forecasting slightly below-normal to below-normal AR activity with high confidence

Models generally agree on near-normal to slightly below-normal AR activity over Southern CA during Week 3 (16–22 Mar)

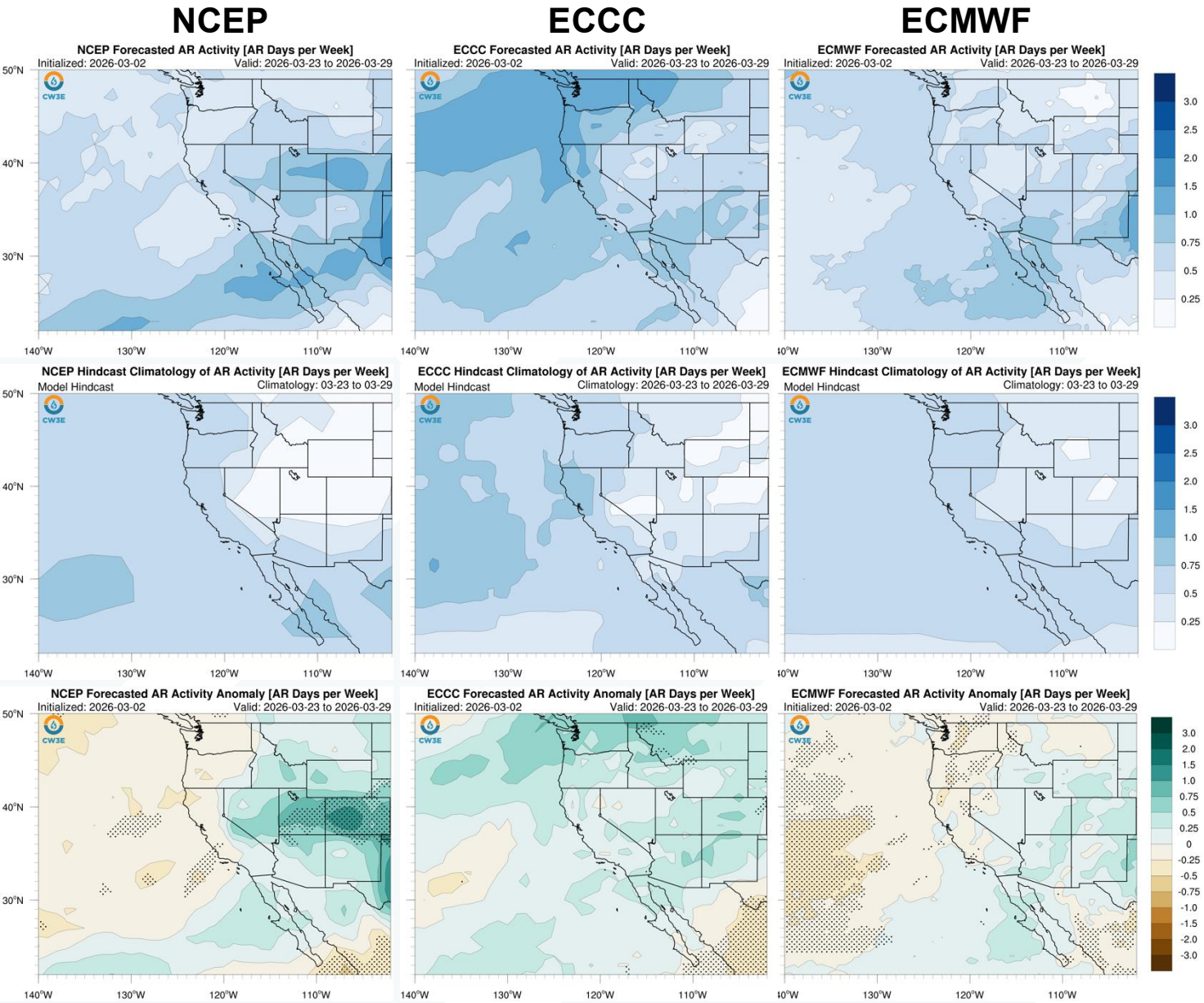
Shading: Fractional # of AR days forecast over a 7-day period (top), model climatology (middle), and forecast minus model climatology (bottom; green/blue = higher than climatology; brown = lower than climatology)

AR Activity Forecasts: Week 4 (NCEP vs. ECCC vs. ECMWF)

Forecasts Initialized 2 Mar 2026

- All models are forecasting near-normal AR activity over all of CA during Week 4 (23–29 Mar)
- ECCC is favoring slightly higher AR activity over Northern and Central CA

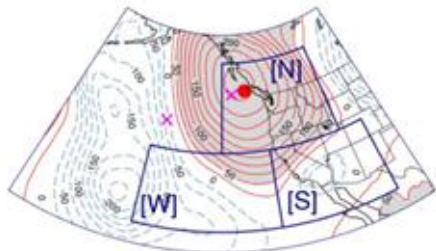
Models generally agree on near-normal AR activity over all of CA during Week 4 (23–29 Mar)



3.0 } Above normal
 2.5 }
 2.0 }
 1.5 }
 1.0 }
 0.75 }
 0.5 }
 0.25 }
 0 } Near normal
 -0.25 }
 -0.5 }
 -0.75 } Below normal
 -1.0 }
 -1.5 }
 -2.0 }
 -3.0 }

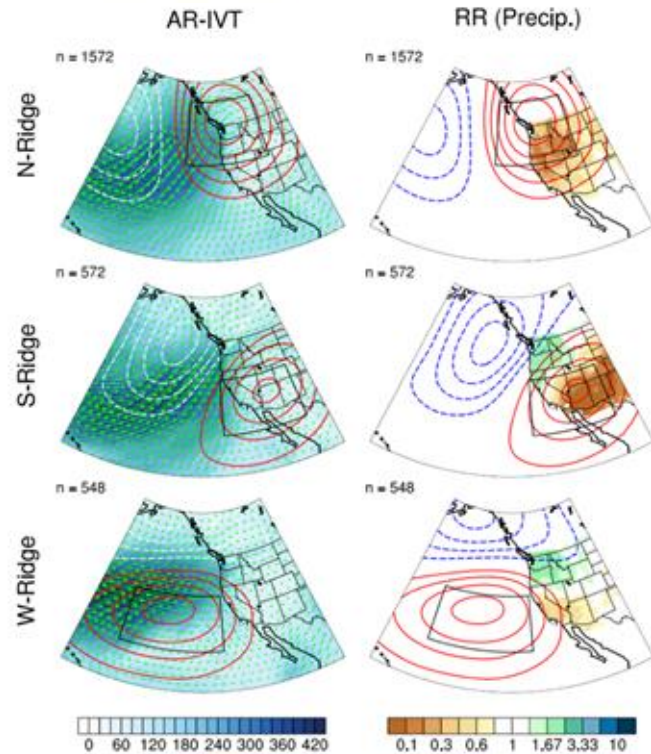
Shading: Fractional # of AR days forecast over a 7-day period (top), model climatology (middle), and forecast minus model climatology (bottom; green/blue = higher than climatology; brown = lower than climatology)

Background Info: Subseasonal Ridging Outlooks



N = North Ridge
S = South Ridge
W = West Ridge

This slide contains background information about the three different ridge types in CW3E's subseasonal ridging outlook tool



- The North-Ridge type is typically associated with widespread dry conditions across the entire western US
- The South-Ridge type is typically associated with dry conditions in Southern CA and the Colorado River Basin and wet conditions in the Pacific Northwest
- The West-Ridge type is typically associated with dry conditions over Central and Southern CA and wet conditions over the Pacific Northwest

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

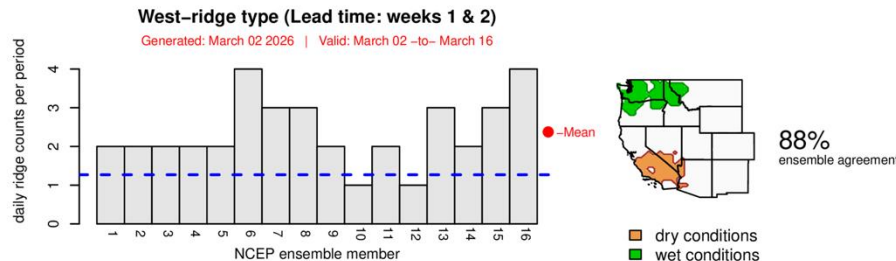
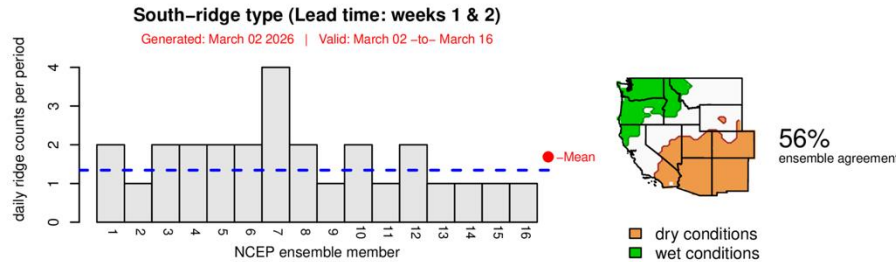
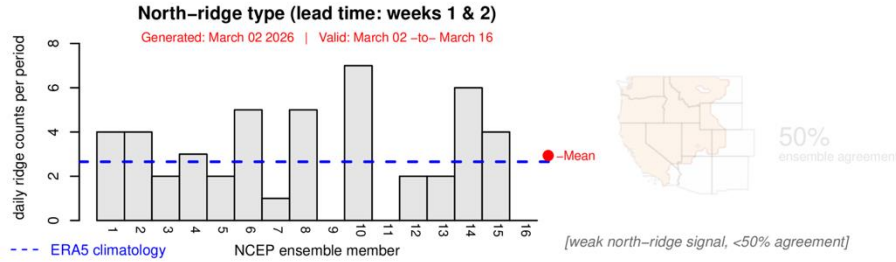


Contact: pgibson@ucsd.edu
Reference: Gibson et al. (2020)
Journal of Climate

Ridging Forecasts: Weeks 1–2 (NCEP vs. ECMWF)

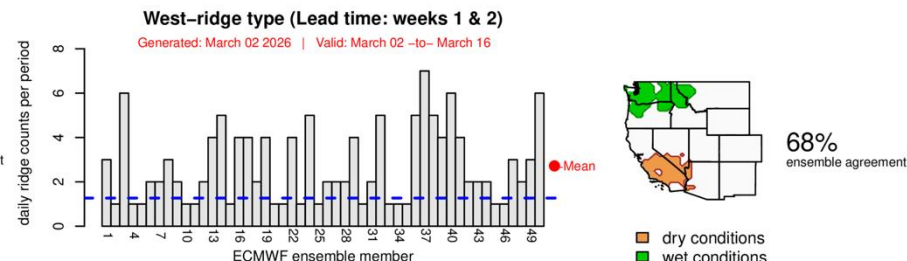
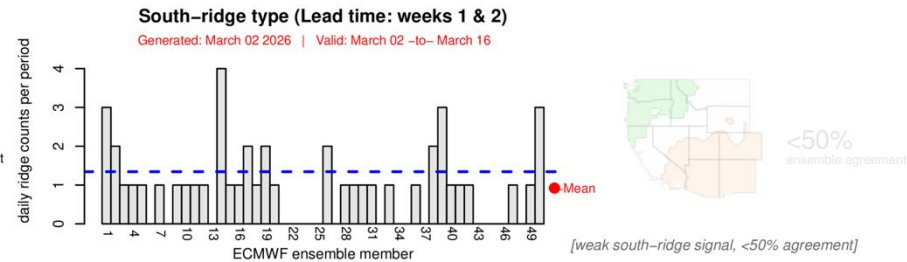
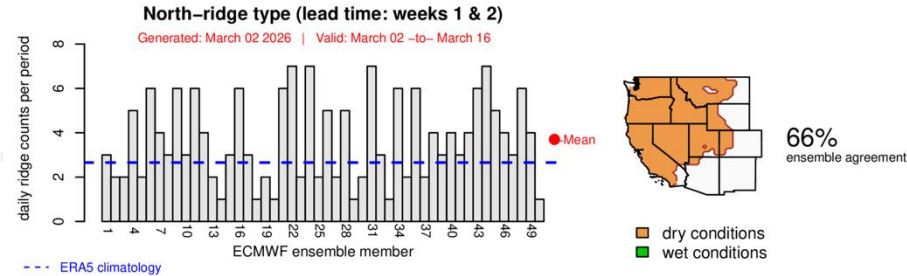
NCEP

CW3E Subseasonal Ridging Forecast (Uses NCEP CFSv2 model)



ECMWF

CW3E Subseasonal Ridging Forecast (Uses ECMWF model)



Forecasts Initialized 2 Mar 2026

- Both models are forecasting above-normal West-ridge activity during Weeks 1–2 (2–16 Mar), but confidence is higher in NCEP (88% ensemble agreement) than in ECMWF (68% ensemble agreement)
- ECMWF is forecasting above-normal North-ridge activity with moderate confidence (66% ensemble agreement), whereas NCEP is forecasting near-normal North-ridge activity
- NCEP is forecasting above-normal South-ridge activity with moderate confidence (56% ensemble agreement), whereas ECMWF is forecasting slightly below-normal South-ridge activity

Models show moderate-to-high likelihood of persistent ridging activity over the southwestern US during Weeks 1–2 (2–16 Mar)

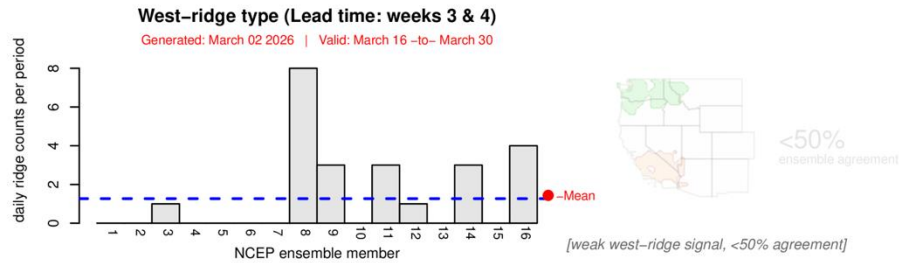
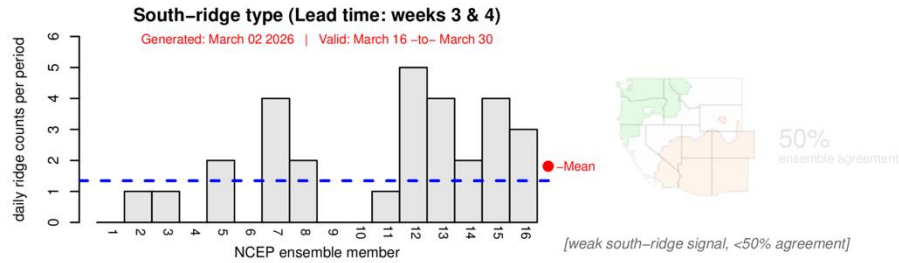
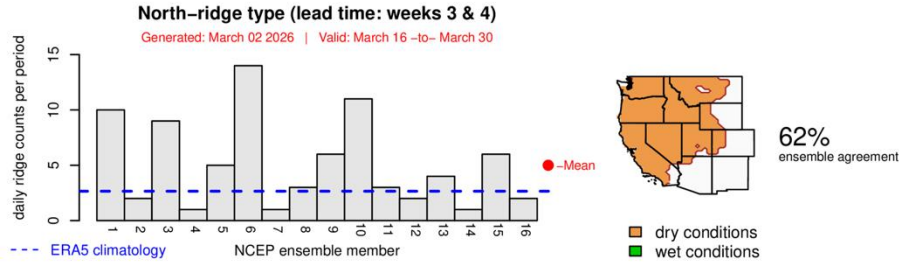


Ridging Forecasts: Weeks 3–4 (NCEP vs. ECMWF)

Forecasts Initialized 2 Mar 2026

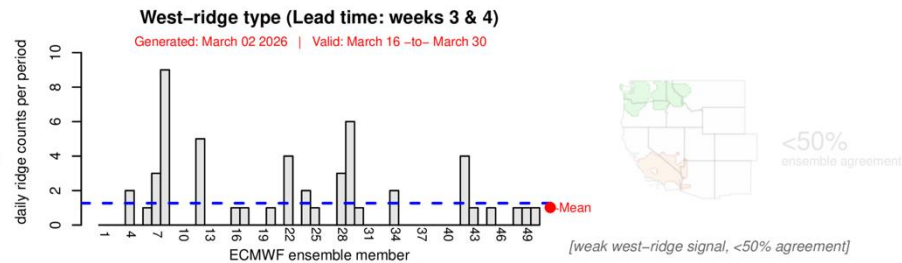
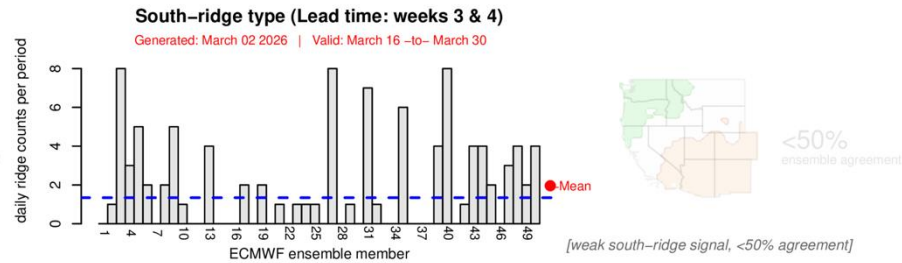
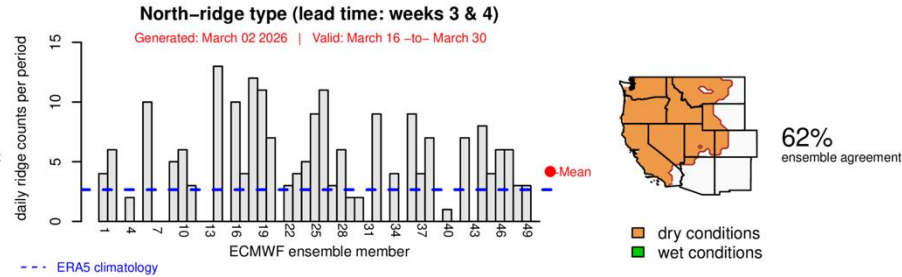
NCEP

CW3E Subseasonal Ridging Forecast (Uses NCEP CFSv2 model)



ECMWF

CW3E Subseasonal Ridging Forecast (Uses ECMWF model)



- Both models are forecasting above-normal North-ridge activity with moderate confidence (62% ensemble agreement in both NCEP and ECMWF) during Weeks 3–4 (16–30 Mar)
- Both models are also forecasting slightly above-normal South-ridge activity with low confidence (<50% ensemble agreement) and near-normal West-ridge activity

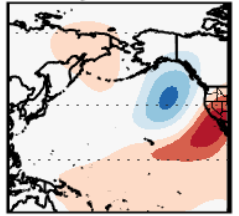
Models show moderate likelihood of persistent ridging activity over the Pacific Northwest during Weeks 3–4 (16–30 Mar)



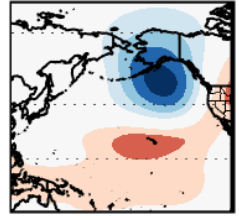
Background Info: Hybrid Weather Regime Impacts Forecast

a) NP4 Mode

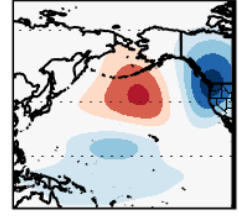
Patterns



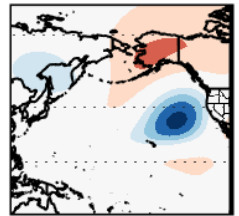
Alaskan-Pacific



Canadian-Pacific



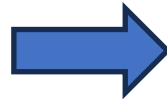
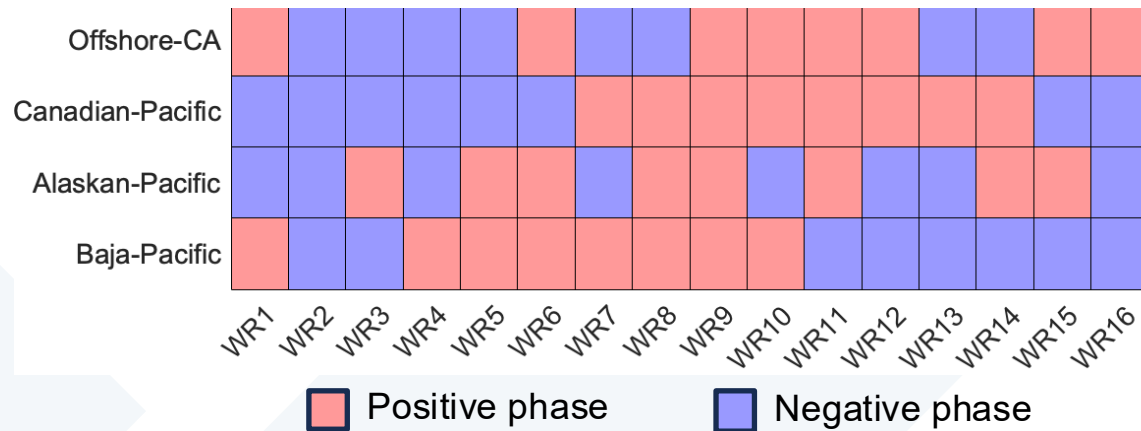
Offshore-CA



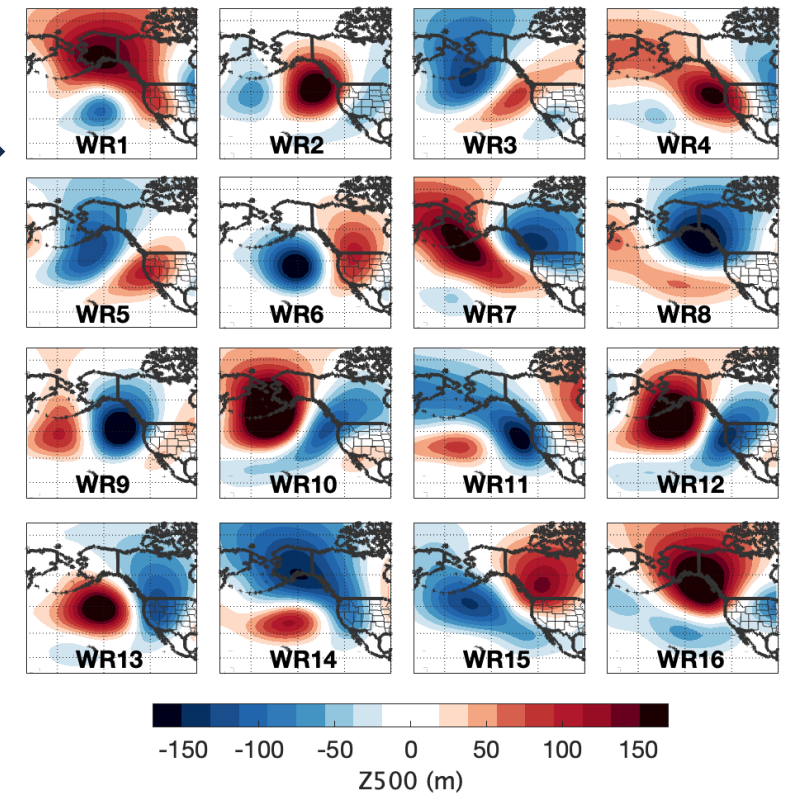
Z500 rEOFs



b) NP4 Mode Phase Combinations



c) Daily Weather Regimes



a) NP4 Mode Patterns

Four key modes of atmospheric variability over the North Pacific (called the “NP4 Modes”, shown in the positive phase) capture most of the variance in atmospheric circulation in this region.

b) NP4 Mode Phase Combinations

The day-to-day changes in the amplitude and phase of the NP4 modes control ridge-trough positioning over the West Coast.

c) Daily Weather Regimes

Sixteen daily weather regimes are defined by the joint phase state of the four NP4 modes. These represent short-duration daily weather patterns.

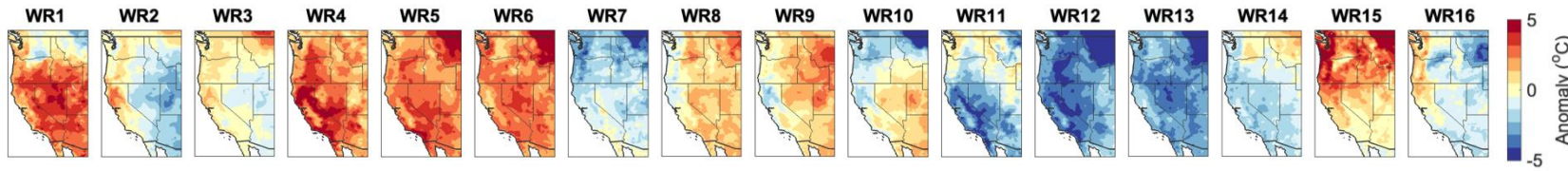
Relevance to West Coast Weather

These regimes are historically linked to impactful West Coast weather, including AR landfalls, precipitation and flooding, temperature extremes, Santa Ana winds, and wildfire conditions.

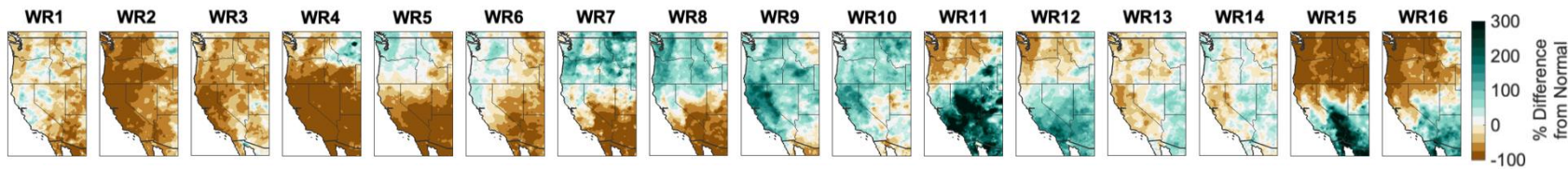
This slide contains background information about CW3E’s hybrid weather regimes forecast product.
Reference:
 Guirguis et al. [2023a](#) and [2023b](#)

Hybrid Weather Regime Impacts Forecast

a) Temperature Anomaly Associated With Each Weather Regime

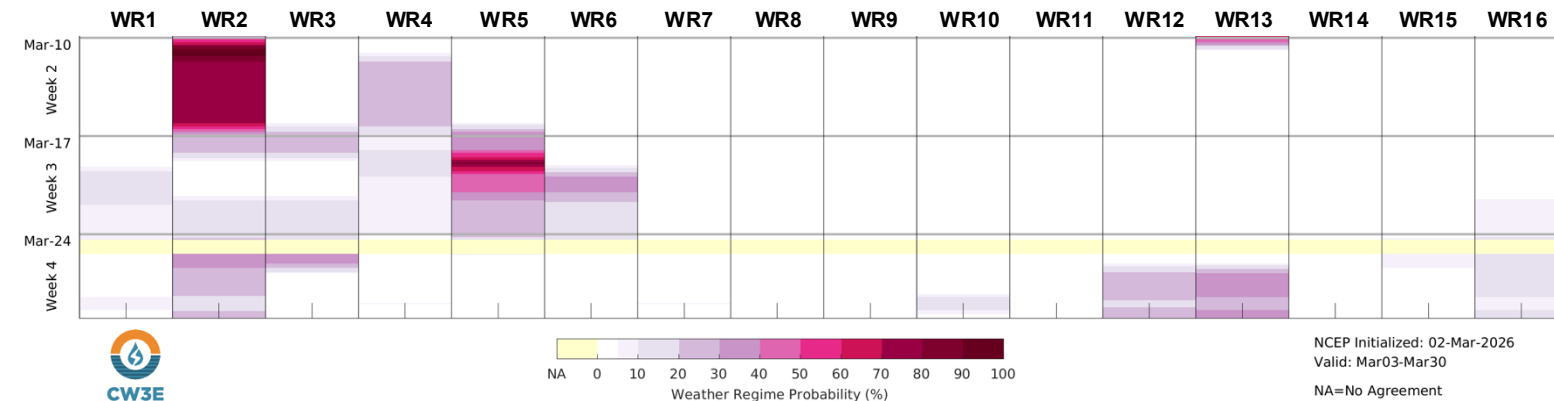


b) Precipitation Anomaly Associated With Each Weather Regime



Valid 10–30 Mar

c) Weather Regime Forecast



Forecasts Initialized 2 Mar 2026

Week 2 (10–16 Mar): Dominated by WR 2 during Week 2, which is associated with below-normal precipitation in all of CA and above-normal temperature in Northern CA.

Week 3 (17–23 Mar): More uncertainty in exact WR during Week 3, but a majority of ensemble members are forecasting WRs associated with below-normal precipitation over all of CA and above-normal temperature in Northern CA. High likelihood of WRs associated with above-normal temperature in Central and Southern CA during 18–20 Mar.

Week 4 (24–30 Mar): Some uncertainty in WR, but a majority of ensemble members are forecasting WRs associated with below-normal precipitation in Northern and Central CA during 26–30 Mar.

NA=No Agreement/Uncertain

a-b: Weather regime impacts based on historical relationships
 c: Forecast weather regime probability based on the NCEP dynamical model