



Center for Western Weather  
and Water Extremes

SCRIPPS INSTITUTION OF OCEANOGRAPHY  
AT UC SAN DIEGO

# CW3E S2S Outlook: 3 Mar 2023

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

UC San Diego



SCRIPPS INSTITUTION OF  
OCEANOGRAPHY

# CW3E S2S Forecasts: Glossary & Context

- The outlooks are based on CW3E subseasonal to seasonal forecast products that can be found here: [https://cw3e.ucsd.edu/s2s\\_forecasts/](https://cw3e.ucsd.edu/s2s_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 GFS (US Model): Weeks 2–3
  - NCEP CFSv2 (US Model): Weeks 2–6
  - ECCO (Canadian Model): Weeks 2–3
  - ECMWF (European model): Weeks 2–6
- CW3E seasonal precipitation products are produced using statistical and machine learning models. The suite of models includes:
  - CCA (canonical correlation analysis) based statistical model
  - Machine learning model, which also includes comparison to NMME (North American Multi-Model Ensemble)
- *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*

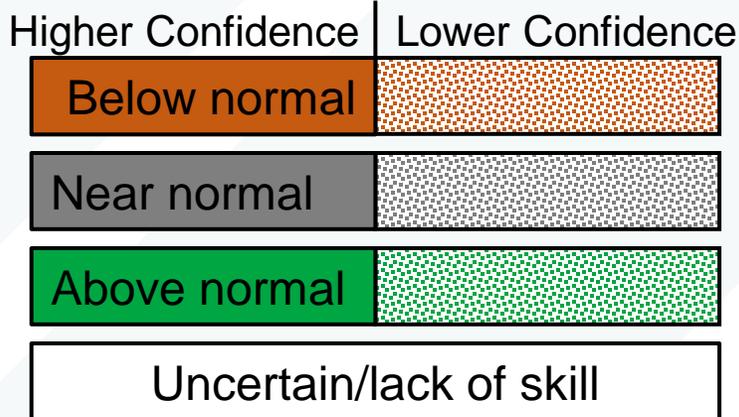
# Summary: Subseasonal Precipitation Outlook by Product & Model

This slide shows the CW3E synthesis of subseasonal products by product and model. Click [here](#) for a detailed explanation.

## Forecasts Initialized 2 Mar 2023

| Region      | Week 2 (10–16 Mar)    |                  |                   |                  |                      |     | Week 3 (17–23 Mar)    |                  |                   |                  |                      |     | Week 4 (24–30 Mar)  |                  |                    |                  |     |     |
|-------------|-----------------------|------------------|-------------------|------------------|----------------------|-----|-----------------------|------------------|-------------------|------------------|----------------------|-----|---------------------|------------------|--------------------|------------------|-----|-----|
|             | NCEP <sup>1,2,3</sup> |                  | ECCC <sup>1</sup> |                  | ECMWF <sup>1,2</sup> |     | NCEP <sup>1,2,3</sup> |                  | ECCC <sup>1</sup> |                  | ECMWF <sup>1,2</sup> |     | NCEP <sup>2,3</sup> |                  | ECMWF <sup>2</sup> |                  |     |     |
| WA/OR       | Higher Confidence     | Lower Confidence | Higher Confidence | Lower Confidence | N/A                  | N/A | Higher Confidence     | Lower Confidence | Higher Confidence | Lower Confidence | N/A                  | N/A | Higher Confidence   | Lower Confidence | Higher Confidence  | Lower Confidence | N/A | N/A |
| Northern CA | Higher Confidence     | Lower Confidence | Higher Confidence | Lower Confidence | N/A                  | N/A | Higher Confidence     | Lower Confidence | Higher Confidence | Lower Confidence | N/A                  | N/A | Higher Confidence   | Lower Confidence | Higher Confidence  | Lower Confidence | N/A | N/A |
| Central CA  | Higher Confidence     | Lower Confidence | Higher Confidence | Lower Confidence | N/A                  | N/A | Higher Confidence     | Lower Confidence | Higher Confidence | Lower Confidence | N/A                  | N/A | Higher Confidence   | Lower Confidence | Higher Confidence  | Lower Confidence | N/A | N/A |
| Southern CA | Higher Confidence     | Lower Confidence | Higher Confidence | Lower Confidence | N/A                  | N/A | Higher Confidence     | Lower Confidence | Higher Confidence | Lower Confidence | N/A                  | N/A | Higher Confidence   | Lower Confidence | Higher Confidence  | Lower Confidence | N/A | N/A |

Each box from left to right indicates each product that is available in that category. N/A indicates product is unavailable. Forecast confidence is assessed based on the level of ensemble agreement (high confidence:  $\geq 75\%$  agreement; low confidence:  $< 75\%$  agreement)



- Week 2 forecasts show low-to-moderate likelihood of AR activity over CA
- Week 3 forecasts show large model-to-model disagreement, with NCEP predicting above-normal AR activity in CA, and ECCC and ECMWF predicting near-normal AR activity in CA
- Low likelihood of persistent ridging activity near the US West Coast during Week 2, and some potential for ridging activity near the US West Coast during Weeks 3-4; Low confidence in West Coast Ridge conditions in Week 4

### Subseasonal products included in this Outlook:

<sup>1</sup>CW3E/JPL Atmospheric River Activity Forecasts ([DeFlorio et al. 2019](#)); first column under each model

<sup>2</sup>CW3E/JPL Ridging Forecasts ([Gibson et al. 2020](#)); second column under each model

<sup>3</sup>IRI North American Weather Regime Forecasts ([Robertson et al. 2020](#)); third column under each model

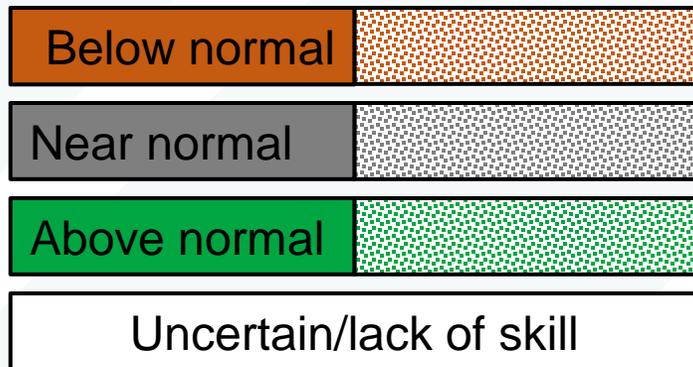
# Summary: Subseasonal Precipitation Outlook by Model

This slide shows the CW3E synthesis of subseasonal products by model

**Forecasts Initialized 2 Mar 2023**

| Region      | Week 2 (10–16 Mar)    |                   |                      | Week 3 (17–23 Mar)    |                   |                      | Week 4 (24–30 Mar)  |                    |
|-------------|-----------------------|-------------------|----------------------|-----------------------|-------------------|----------------------|---------------------|--------------------|
|             | NCEP <sup>1,2,3</sup> | ECCC <sup>1</sup> | ECMWF <sup>1,2</sup> | NCEP <sup>1,2,3</sup> | ECCC <sup>1</sup> | ECMWF <sup>1,2</sup> | NCEP <sup>2,3</sup> | ECMWF <sup>2</sup> |
| WA/OR       |                       | Below normal      |                      | Below normal          | Near normal       |                      | Below normal        |                    |
| Northern CA |                       | Below normal      |                      | Below normal          | Near normal       |                      | Below normal        |                    |
| Central CA  | Below normal          | Near normal       |                      | Below normal          | Near normal       |                      | Below normal        |                    |
| Southern CA | Below normal          | Near normal       |                      | Below normal          | Near normal       |                      | Below normal        |                    |

Higher Confidence | Lower Confidence



- Models disagree on the likelihood and location of precipitation over CA during Week 2
- Models disagree on the likelihood of precipitation over CA during Weeks 3-4; NCEP shows low confidence in above-normal precipitation in Week 3 and below-normal precipitation in Week 4

**Subseasonal products included in this Outlook:**

<sup>1</sup>CW3E/JPL Atmospheric River Activity Forecasts ([DeFlorio et al. 2019](#))

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

<sup>3</sup>IRI North American Weather Regime Forecasts ([Robertson et al. 2020](#))

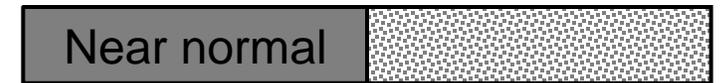
# Summary: Week 2 Precipitation Outlook

This slide shows the CW3E synthesis of subseasonal products by model for Week 2

## Forecasts Initialized 2 Mar 2023

| Region      | Week 2 (10–16 Mar)    |                    |                      |                      |
|-------------|-----------------------|--------------------|----------------------|----------------------|
|             | NCEP <sup>1,2,3</sup> | ECMWF <sup>1</sup> | ECMWF <sup>1,2</sup> | Multi-Model Forecast |
| WA/OR       |                       | Below normal       |                      |                      |
| Northern CA |                       | Below normal       |                      |                      |
| Central CA  | Above normal          | Near normal        |                      |                      |
| Southern CA | Above normal          | Near normal        |                      |                      |

Higher Confidence | Lower Confidence



- Week 2 forecasts show large uncertainty in the likelihood of AR activity

### Subseasonal products included in this Outlook:

<sup>1</sup>CW3E/JPL Atmospheric River Activity Forecasts ([DeFlorio et al. 2019](#))

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

<sup>3</sup>IRI North American Weather Regime Forecasts ([Robertson et al. 2020](#))

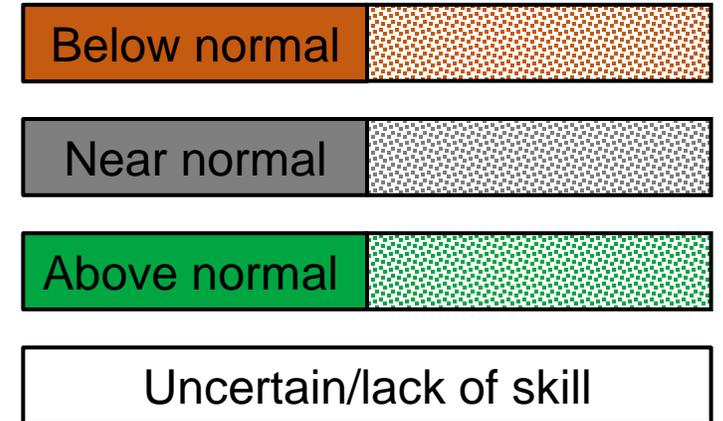
# Summary: Week 3 Precipitation Outlook

This slide shows the CW3E synthesis of subseasonal products by model for Week 3

## Forecasts Initialized 2 Mar 2023

| Region      | Week 3 (17–23 Mar)    |                    |                      |                      |
|-------------|-----------------------|--------------------|----------------------|----------------------|
|             | NCEP <sup>1,2,3</sup> | ECMWF <sup>1</sup> | ECMWF <sup>1,2</sup> | Multi-Model Forecast |
| WA/OR       | Below normal          | Near normal        |                      |                      |
| Northern CA | Below normal          | Near normal        |                      |                      |
| Central CA  | Below normal          | Near normal        |                      |                      |
| Southern CA | Below normal          | Near normal        |                      |                      |

Higher Confidence | Lower Confidence



- Week 3 forecasts show large uncertainty in the likelihood of AR activity

### Subseasonal products included in this Outlook:

<sup>1</sup>CW3E/JPL Atmospheric River Activity Forecasts ([DeFlorio et al. 2019](#))

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

<sup>3</sup>IRI North American Weather Regime Forecasts ([Robertson et al. 2020](#))

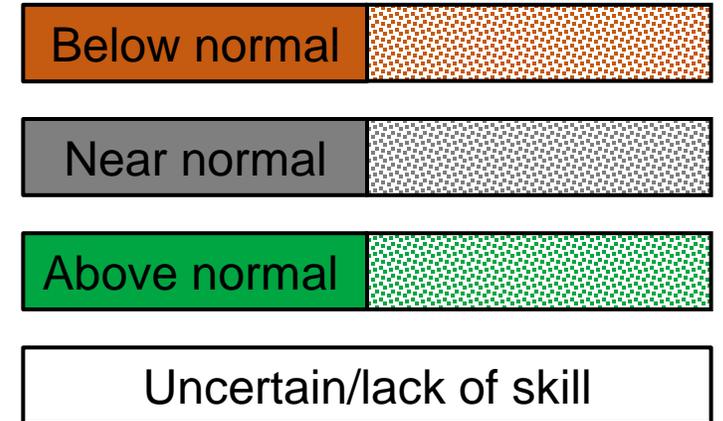
# Summary: Week 4 Precipitation Outlook

This slide shows the CW3E synthesis of subseasonal products by model for Week 4

## Forecasts Initialized 2 Mar 2023

| Region      | Week 4 (24–30 Mar)  |                    |                      |
|-------------|---------------------|--------------------|----------------------|
|             | NCEP <sup>2,3</sup> | ECMWF <sup>2</sup> | Multi-Model Forecast |
| WA/OR       | Below normal        |                    |                      |
| Northern CA | Below normal        |                    |                      |
| Central CA  | Below normal        |                    |                      |
| Southern CA | Below normal        |                    |                      |

Higher Confidence | Lower Confidence



- Week 4 forecasts show large uncertainty in the precipitation conditions

### Subseasonal products included in this Outlook:

<sup>1</sup>CW3E/JPL Atmospheric River Activity Forecasts ([DeFlorio et al. 2019](#))

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

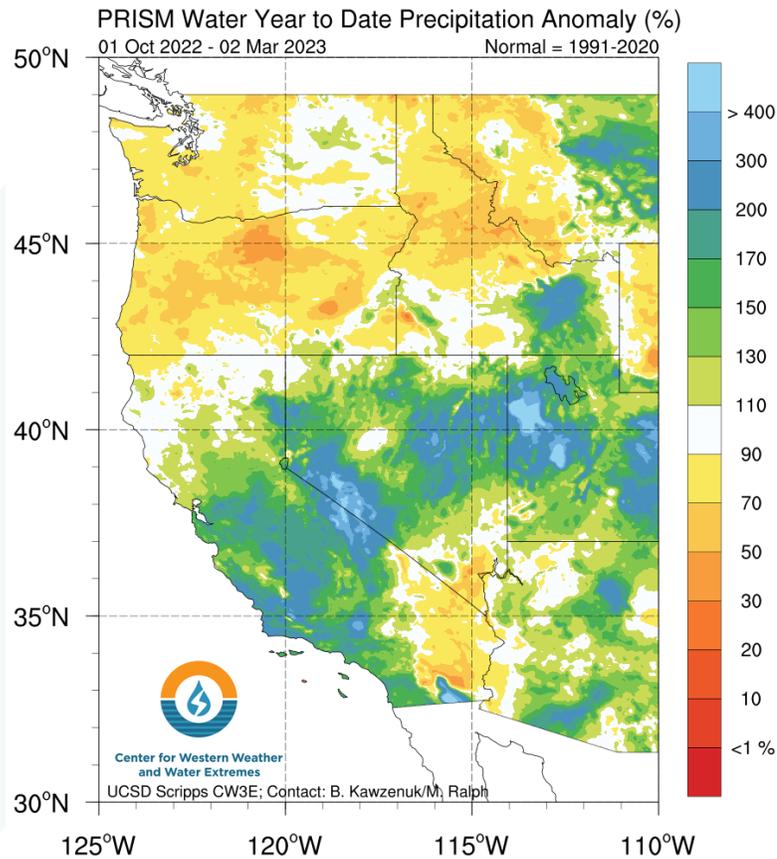
<sup>3</sup>IRI North American Weather Regime Forecasts ([Robertson et al. 2020](#))

# Summary

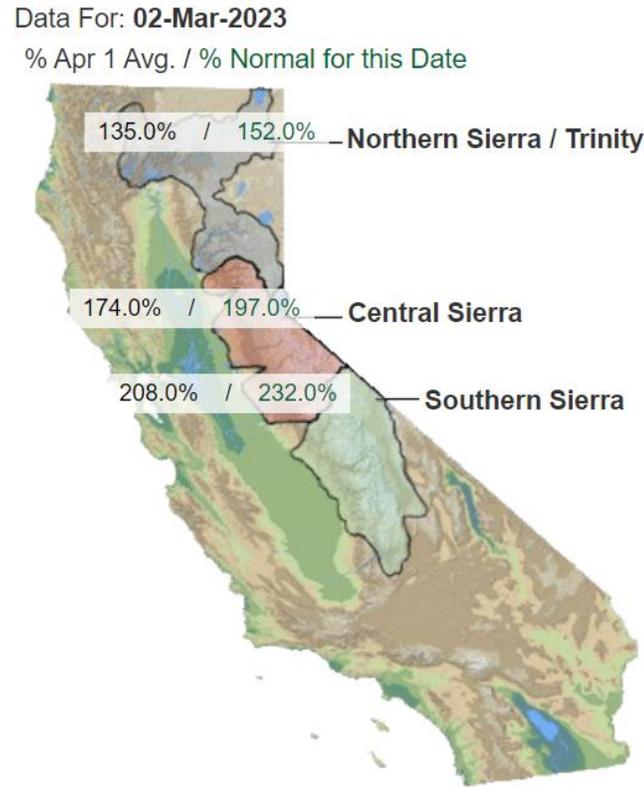
- **Week 2 forecasts (10–16 Mar):** Models agree on low-to-moderate likelihood (<70%) of AR activity over CA
  - NCEP is showing higher probabilities of AR activity over CA on 12 Mar and 16 Mar
- NCEP and ECMWF are forecasting strong MJO activity over the Western Pacific during Week 1, which is climatologically favorable for AR activity in the Northeast Pacific and near-normal AR activity over the Western US during Weeks 1–2
- Both NCEP and ECMWF are showing low likelihood of persistent ridging activity near the US West Coast during Weeks 1–2
- **Week 3 forecasts (17–23 Mar):** Model disagreement in predicted AR activity over CA
  - NCEP is predicting above-normal AR activity with low confidence
  - ECCO and ECMWF are predicting near-normal AR activity with low confidence
- Both NCEP and ECMWF are showing potential for persistent ridging activity near the US West Coast during Weeks 3-4
  - NCEP shows moderate likelihood (56% ensemble agreement) in above-normal ridging activity north of California during Weeks 3–4
  - ECMWF is predicting near-normal ridging activity, but the ensemble members disagree on the center of ridging activity

# Water Year Hydrologic Summary

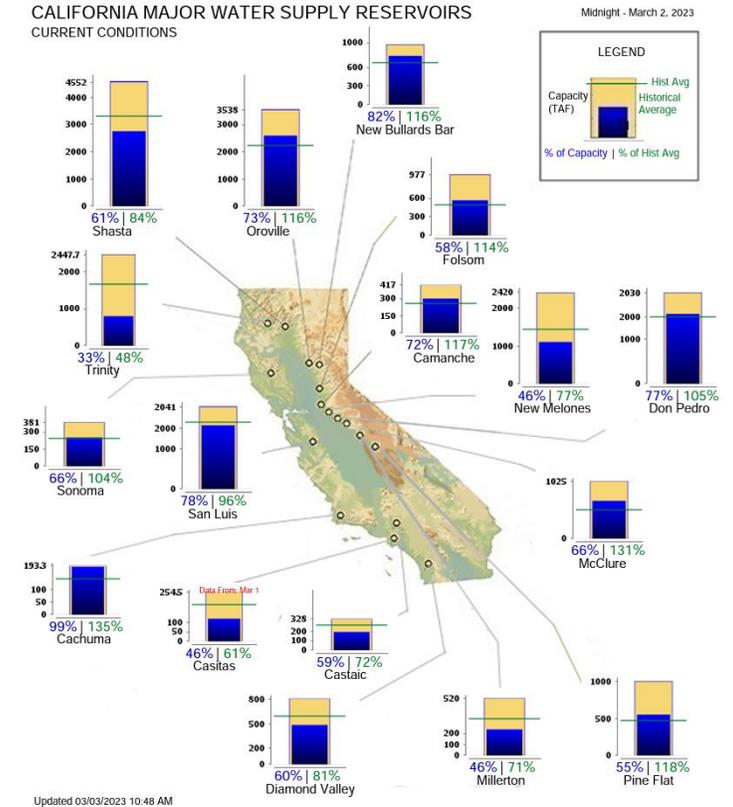
## Precipitation



## Snowpack Conditions



## Reservoir Storage

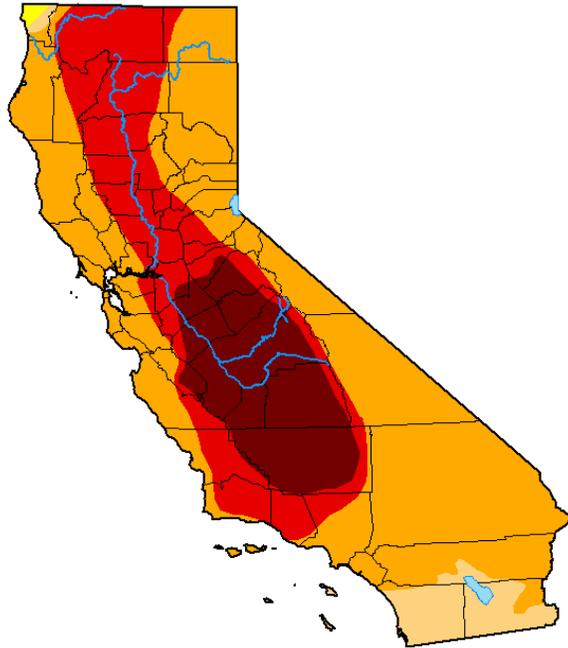


Source: California Department of Water Resources

- As of 02 Mar, water-year-to-date precipitation is above normal across much of the state
- Portions of Central CA have received > 200% of normal precipitation since 1 Oct
- Statewide snowpack is still well-above normal, especially in Southern Sierra Nevada, where current snowpack is 232% of normal for this date and 208% of normal for 1 Apr
- Very wet conditions during Dec–Feb led to a significant increase in water storage throughout the state
- Most large reservoirs in California are currently operating at greater than 50% storage capacity

# Drought Conditions

## U.S. Drought Monitor California



**September 27, 2022**  
(Released Thursday, Sep. 29, 2022)  
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

|   | None | D0-D4  | D1-D4  | D2-D4 | D3-D4 | D4    |
|---|------|--------|--------|-------|-------|-------|
| <b>Current</b>                              | 0.00 | 100.00 | 99.76  | 94.01 | 40.91 | 16.57 |
| <b>Last Week</b><br>09-20-2022              | 0.00 | 100.00 | 99.76  | 94.06 | 40.91 | 16.57 |
| <b>3 Months Ago</b><br>06-28-2022           | 0.00 | 100.00 | 99.79  | 97.48 | 59.81 | 11.59 |
| <b>Start of Calendar Year</b><br>01-04-2022 | 0.00 | 100.00 | 99.30  | 67.62 | 16.60 | 0.84  |
| <b>Start of Water Year</b><br>09-28-2021    | 0.00 | 100.00 | 100.00 | 93.93 | 87.88 | 45.66 |
| <b>One Year Ago</b><br>09-28-2021           | 0.00 | 100.00 | 100.00 | 93.93 | 87.88 | 45.66 |

Intensity:



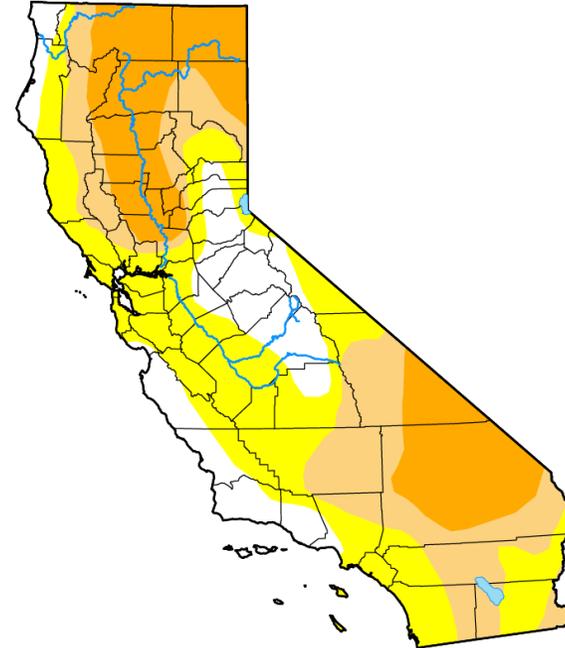
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

Author:  
Richard Heim  
NCEI/NOAA



[droughtmonitor.unl.edu](https://droughtmonitor.unl.edu)

## U.S. Drought Monitor California



**February 28, 2023**  
(Released Thursday, Mar. 2, 2023)  
Valid 7 a.m. EST

Drought Conditions (Percent Area)

|   | None  | D0-D4  | D1-D4  | D2-D4 | D3-D4 | D4    |
|---|-------|--------|--------|-------|-------|-------|
| <b>Current</b>                              | 16.71 | 83.29  | 49.13  | 24.96 | 0.00  | 0.00  |
| <b>Last Week</b><br>02-21-2023              | 0.61  | 99.39  | 84.60  | 32.62 | 0.00  | 0.00  |
| <b>3 Months Ago</b><br>11-29-2022           | 0.00  | 100.00 | 99.48  | 84.97 | 40.92 | 12.73 |
| <b>Start of Calendar Year</b><br>01-03-2023 | 0.00  | 100.00 | 97.93  | 71.14 | 27.10 | 0.00  |
| <b>Start of Water Year</b><br>09-27-2022    | 0.00  | 100.00 | 99.76  | 94.01 | 40.91 | 16.57 |
| <b>One Year Ago</b><br>03-01-2022           | 0.00  | 100.00 | 100.00 | 86.98 | 12.82 | 0.00  |

Intensity:



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:  
Richard Heim  
NCEI/NOAA



[droughtmonitor.unl.edu](https://droughtmonitor.unl.edu)

- A very wet Dec–Feb period brought substantial drought relief to much of California
- At the start of the water year, 94% of the state was experiencing severe or worse drought conditions, and 41% of the state was experiencing extreme or exceptional drought
- As of 28 Feb, only 25% of the state was experiencing severe drought conditions, and no areas are experiencing extreme or exceptional drought
- The greatest improvement in drought conditions has occurred over Central California

# Looking Back: Week 3 AR Activity Forecasts

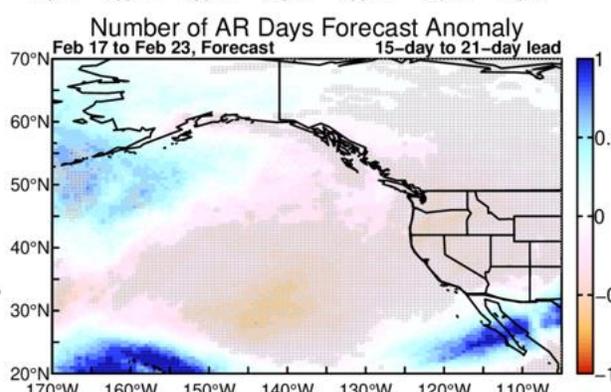
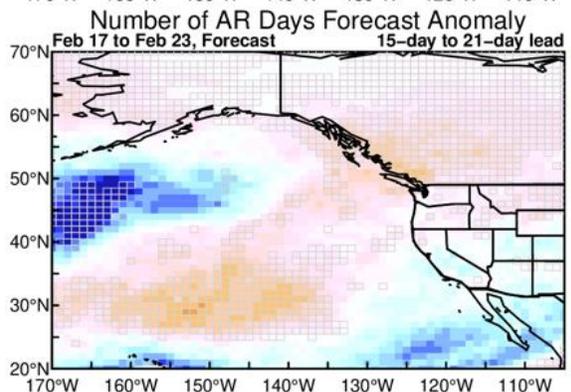
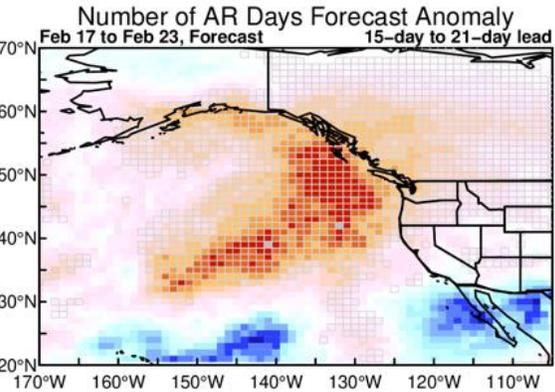
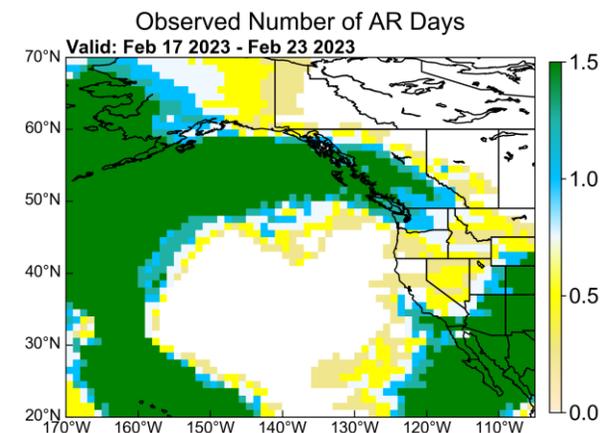
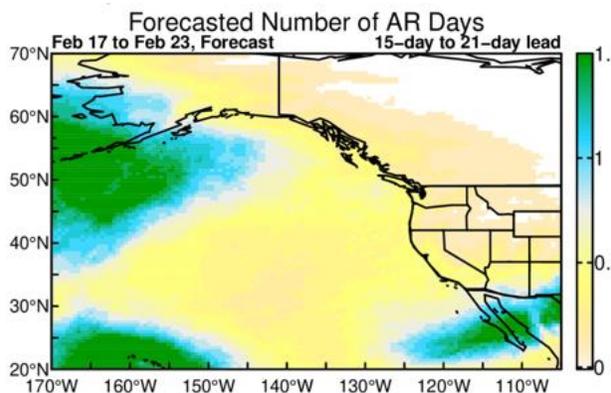
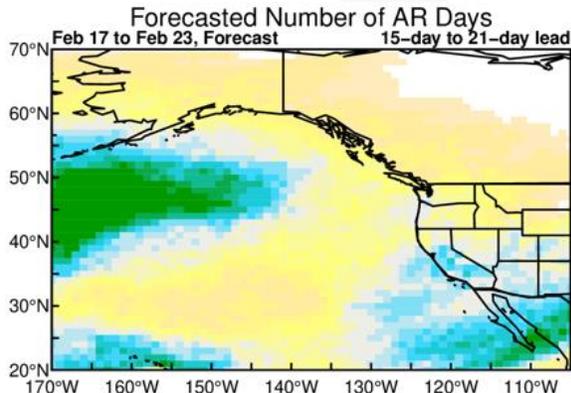
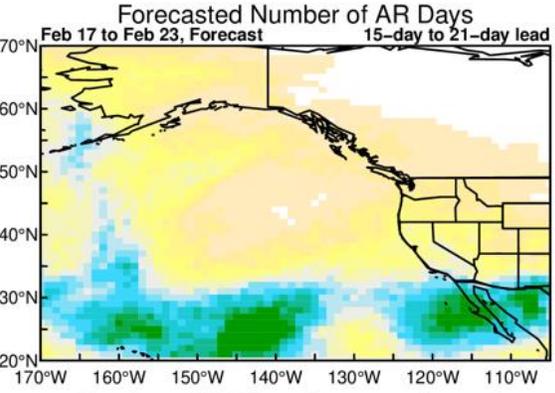
Forecasts Initialized 02 Feb 2023; Valid: 17 – 23 Feb 2023

**NCEP**

**ECCC**

**ECMWF**

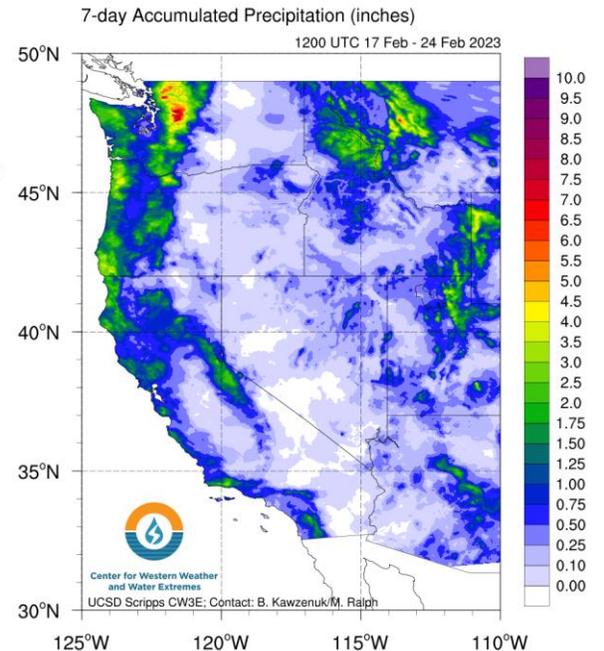
**Observed (GFS Analysis)**



Shading: Fractional # of AR days over a 7-day period (top) and forecast minus model climatology (bottom)  
Grey cells: >75% of ensemble members agree on sign of anomaly

- NCEP and ECMWF correctly predicted low AR activity over OR and much of CA
- None of the models predicted AR activity that impacted Southern CA, WA, and British Columbia
- Winter storm and multiple ARs brought heavy precipitation to the Pacific Northwest, Northern CA, and coastal Southern CA; Heavy snow was observed in the Washington Cascades and Sierra Nevada

**Observed Precipitation**



# Looking Back: Week 3 AR Activity Forecasts

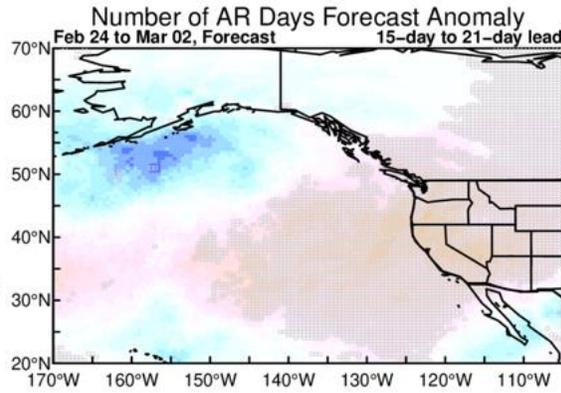
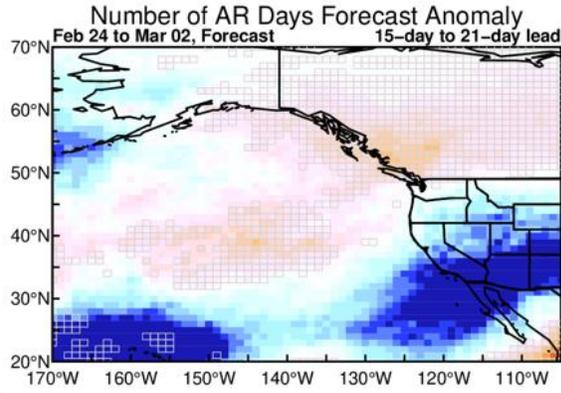
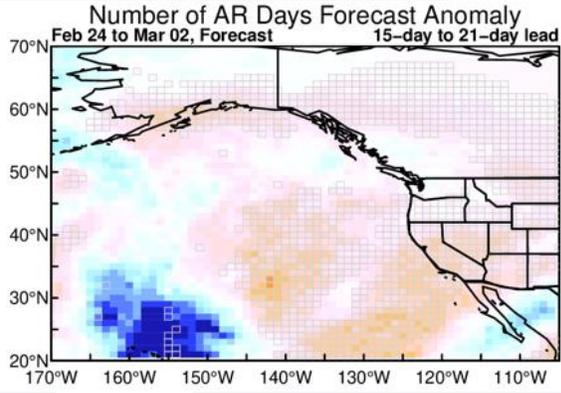
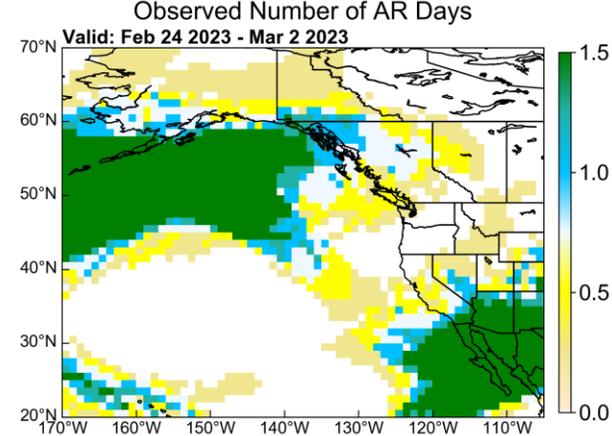
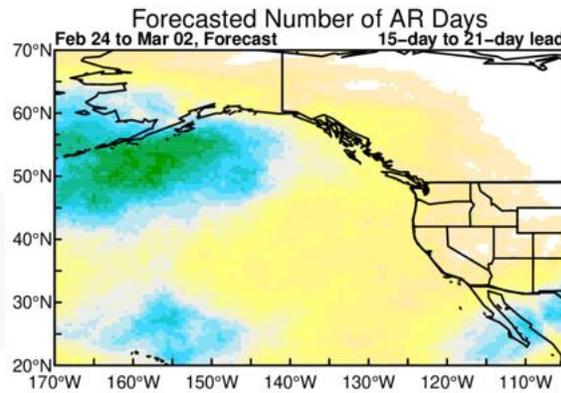
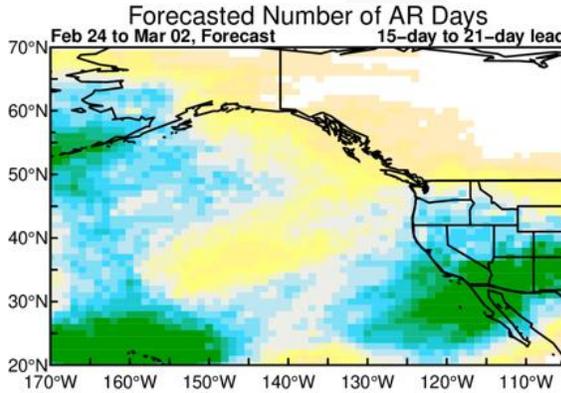
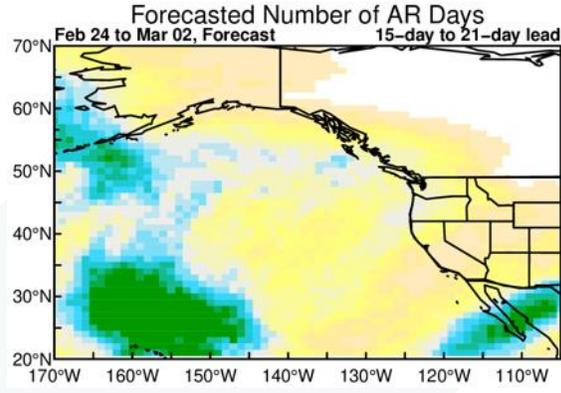
Forecasts Initialized 09 Feb 2023; Valid: 24 Feb – 02 Mar 2023

**NCEP**

**ECCC**

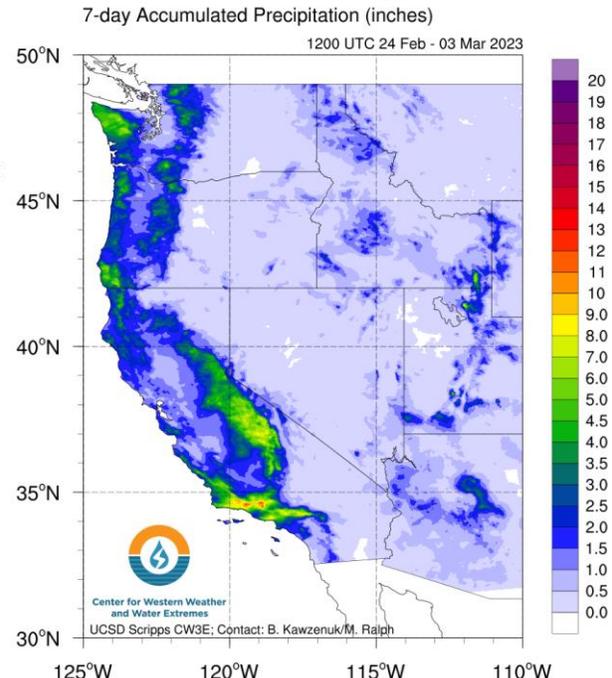
**ECMWF**

**Observed (GFS Analysis)**



Shading: Fractional # of AR days over a 7-day period (top) and forecast minus model climatology (bottom)  
Grey cells: >75% of ensemble members agree on sign of anomaly

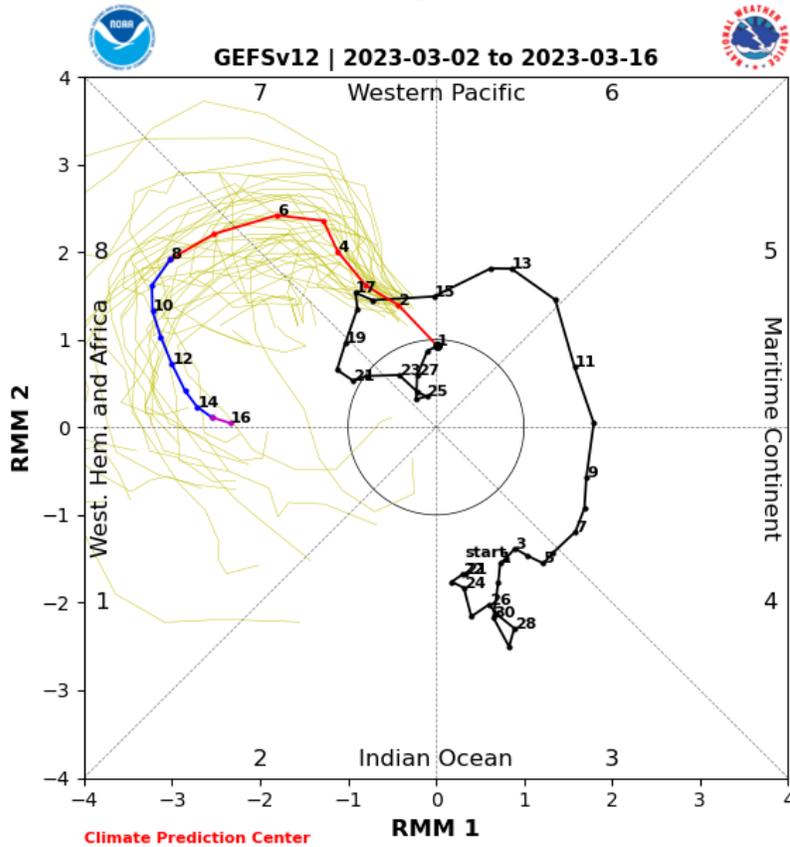
**Observed Precipitation**



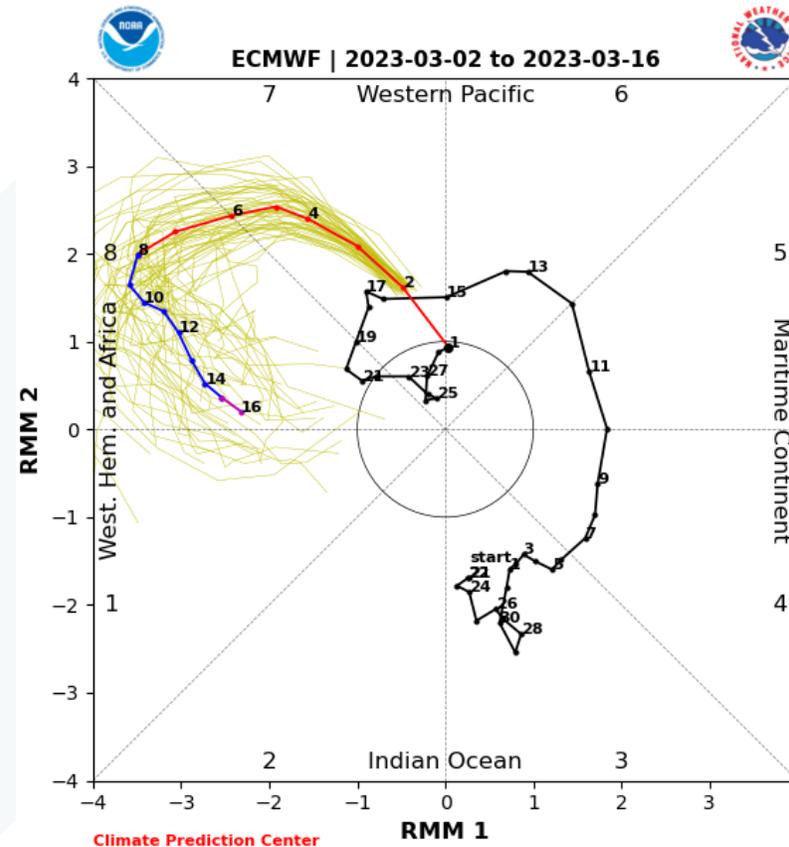
- Only ECCC verified over Southern CA although it predicted too much AR activity to the north
- NCEP and ECMWF correctly predicted below normal AR activity for WA, OR, and Northern CA
- Winter Storm and AR brought heavy rain and snow over the Transverse Ranges of Southern CA and the southern Sierra Nevada

# Dynamical Model MJO Forecasts (NCEP vs. ECMWF)

NCEP



ECMWF



Black line: Last 40 days of observations; Yellow lines: Ensemble members  
Forecast: (red: week 1, blue: week 2, purple: > week 2)

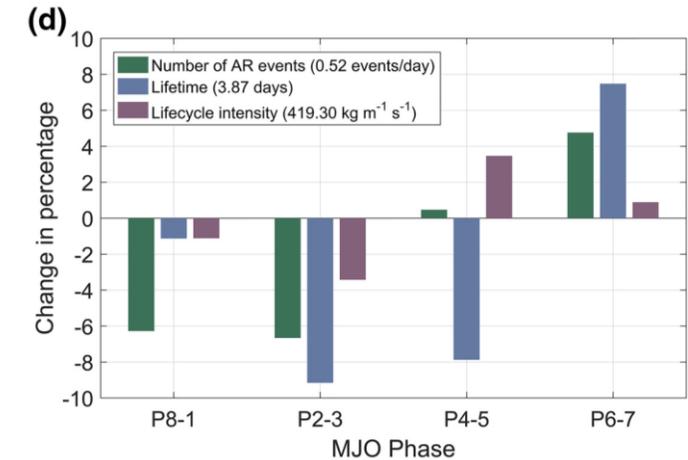


Figure 2d from Zhou et al. (2021)

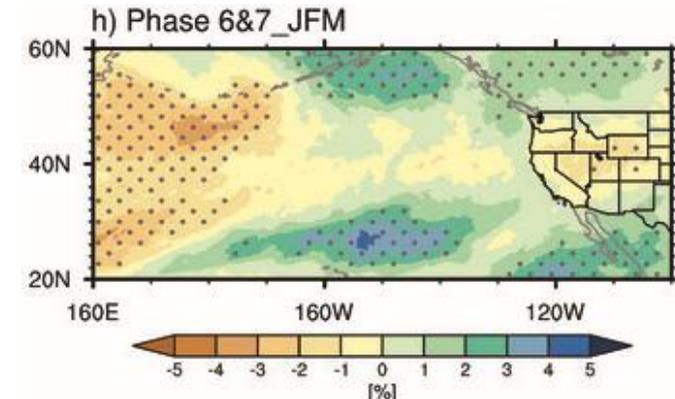
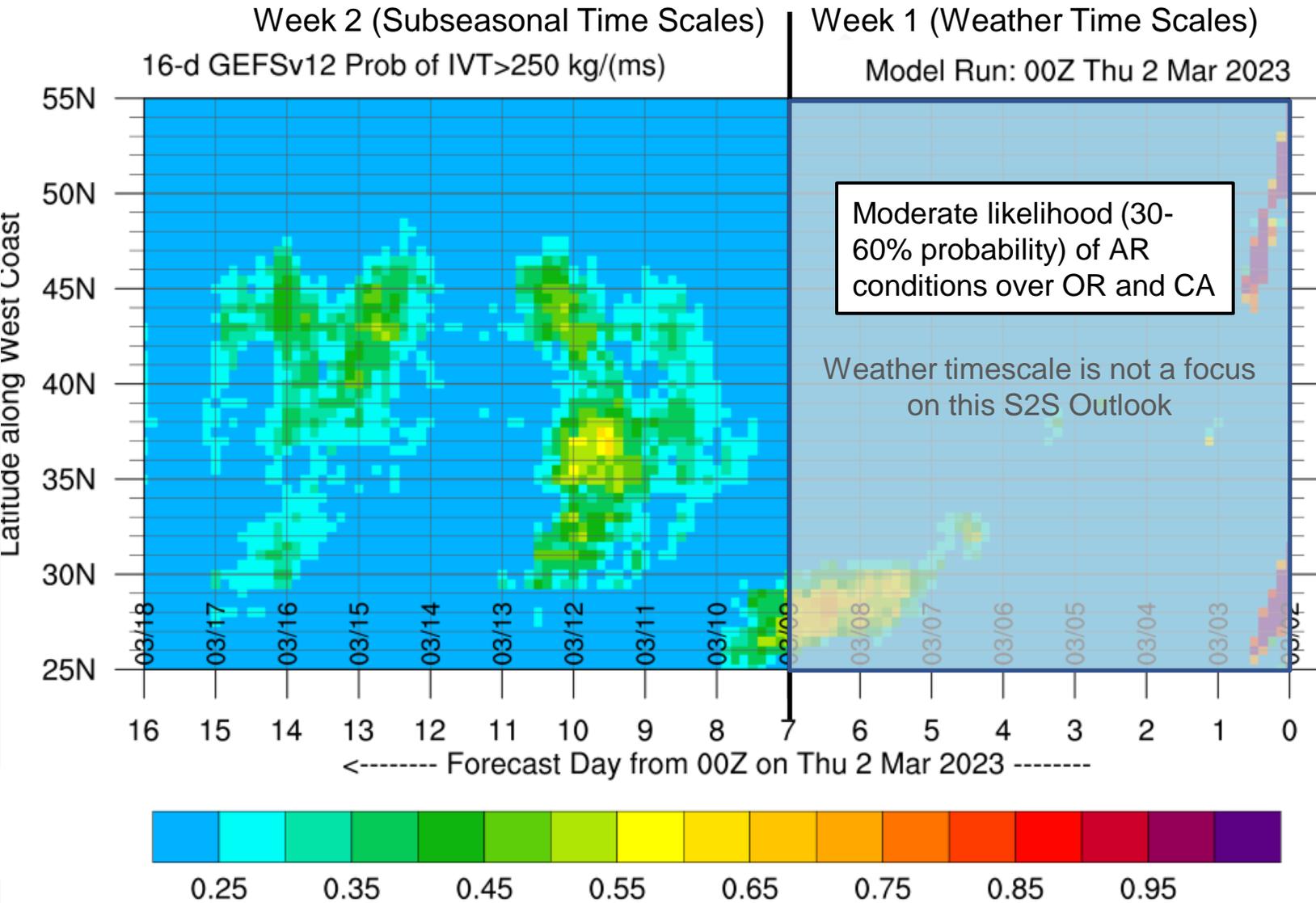


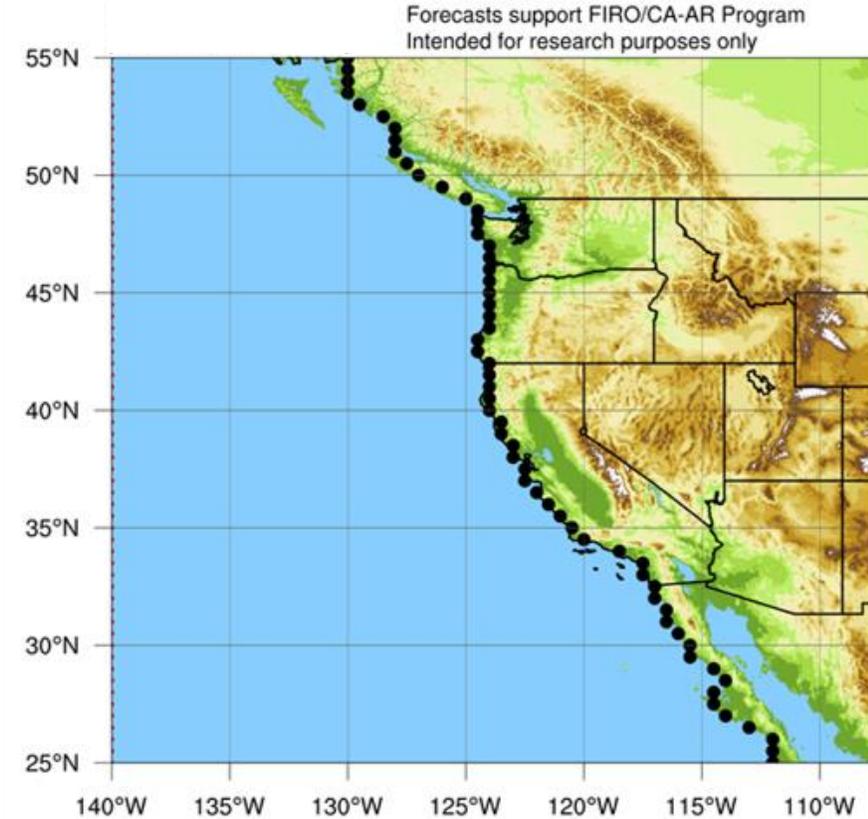
Figure 10h from Wang et al. (2023)

- Both NCEP and ECMWF are forecasting strong MJO activity over the Western Pacific during Week 1 which propagates further east during Week 2
- MJO activity over the Western Pacific is generally associated with increases in AR activity over the subtropical Northeast Pacific and near-normal AR activity over the Western US; While MJO located further east is associated with decreases in AR events

# NCEP GEFS AR Landfall Tool: Valid 00Z 2 Mar – 00Z 18 Mar

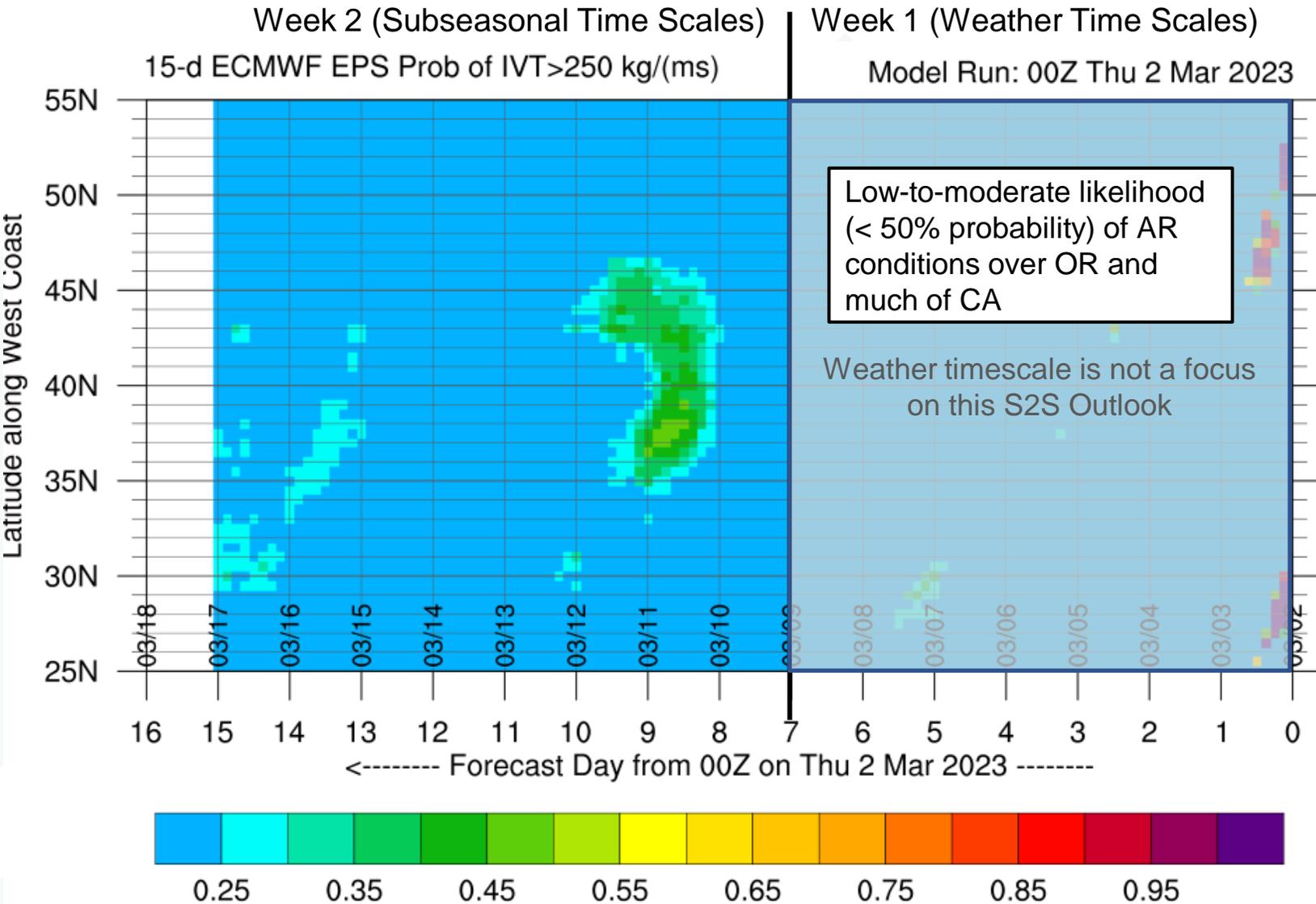


## Forecasts Initialized 2 Mar 2023

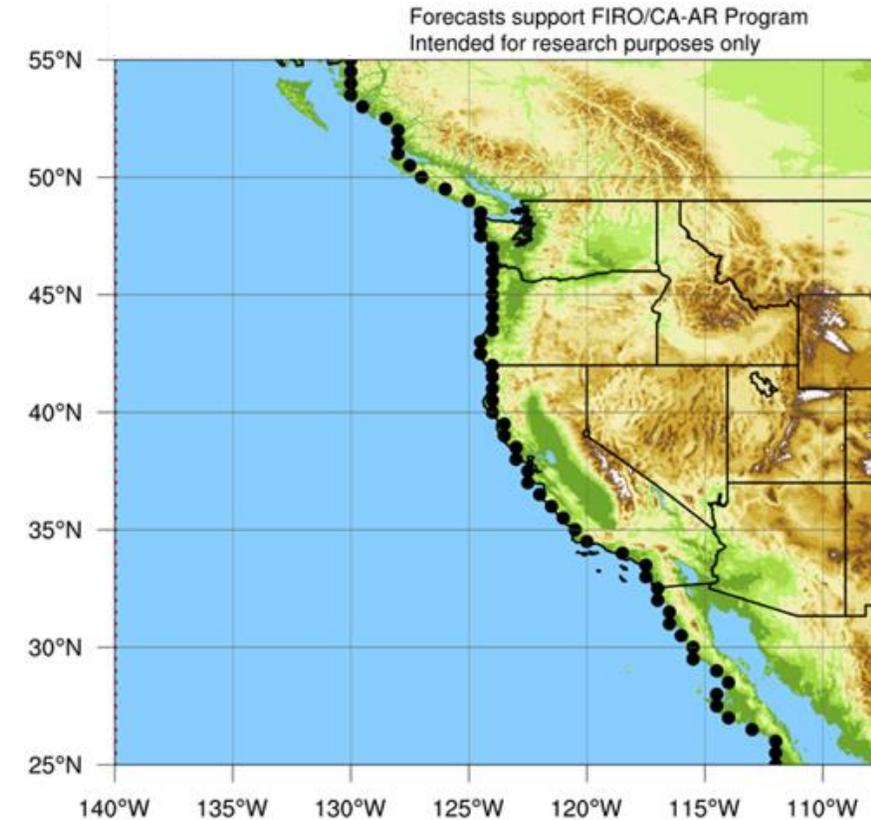


- NCEP is forecasting moderate likelihood of AR conditions over California in Week 2, with strong MJO activity over the Western Pacific during Week 1

# ECMWF EPS AR Landfall Tool: Valid 00Z 2 Mar – 00Z 17 Mar



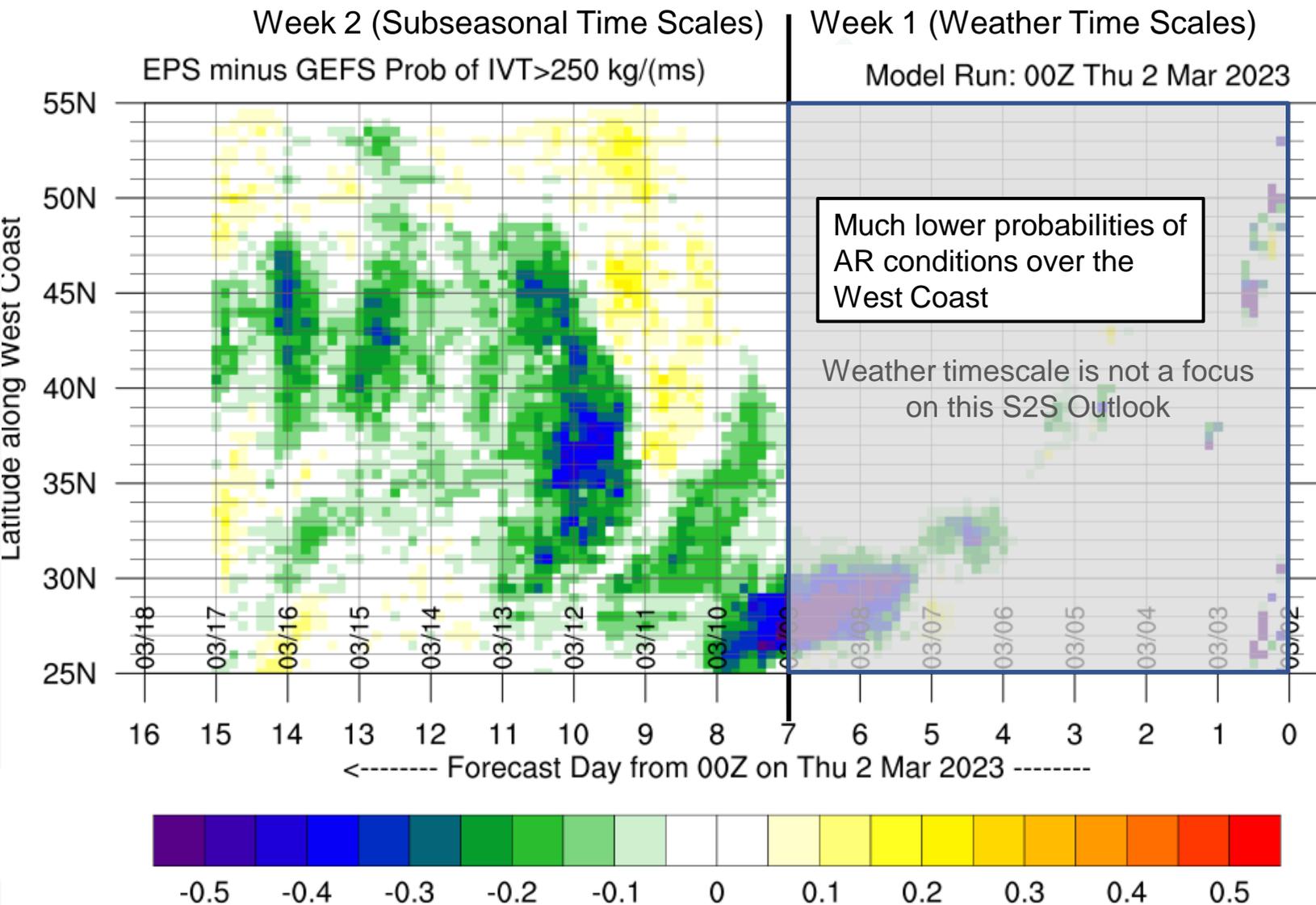
Forecasts Initialized 2 Mar 2023



- ECMWF is forecasting low-to-moderate likelihood of AR conditions over California during Week 2, with strong MJO activity over the Western Pacific during Week 1

# EPS Minus GEFS AR Landfall Tool: Valid 00Z 2 Mar – 00Z 17 Mar

Forecasts Initialized 2 Mar 2023



- ECMWF is forecasting much lower likelihood of AR conditions over CA during 11-12 Mar compared to NCEP

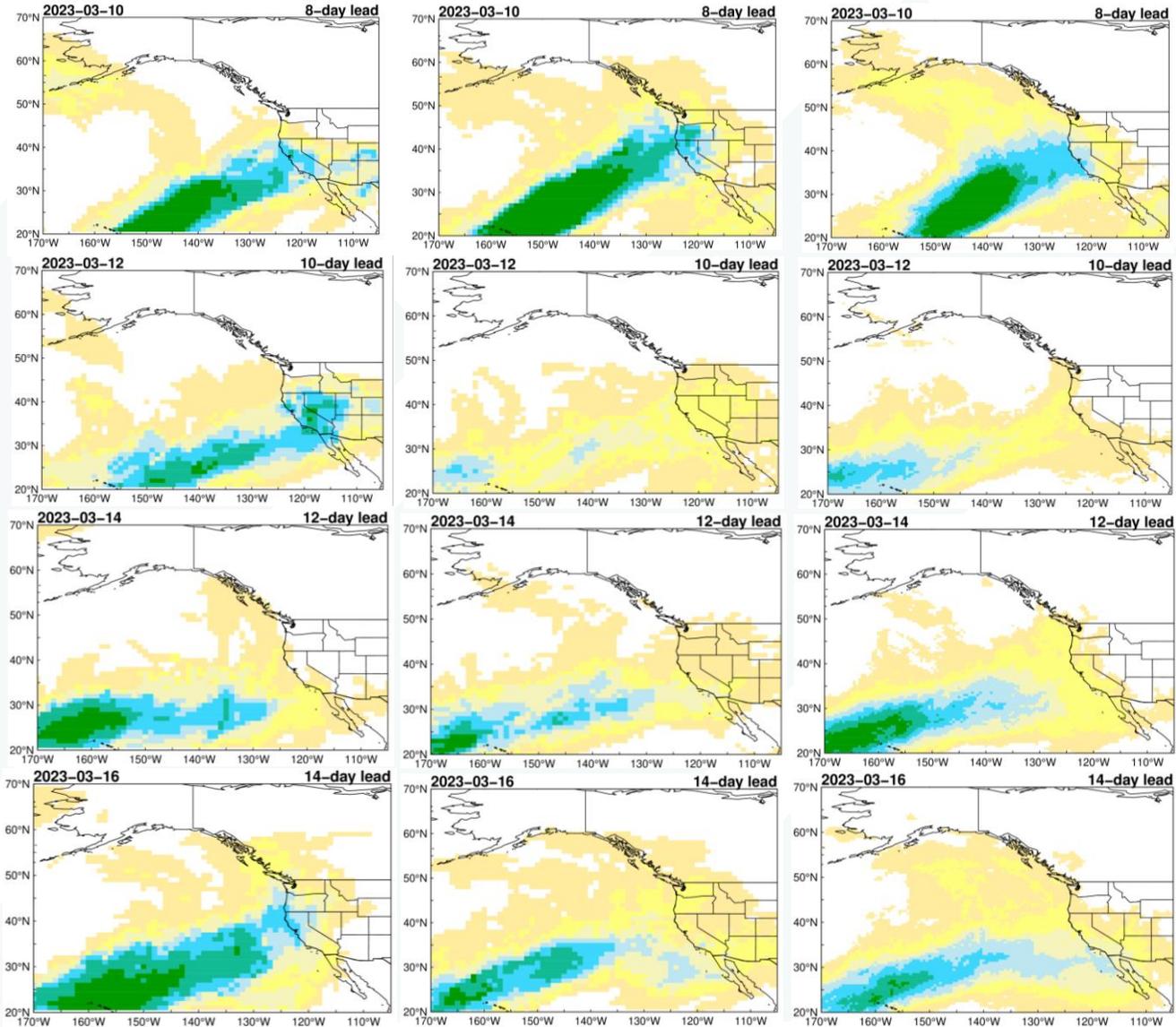
# Subseasonal Outlooks: Week 2 AR Activity (NCEP vs. ECCC vs. ECMWF)

Forecasts Initialized 2 Mar 2023

NCEP

ECCC

ECMWF



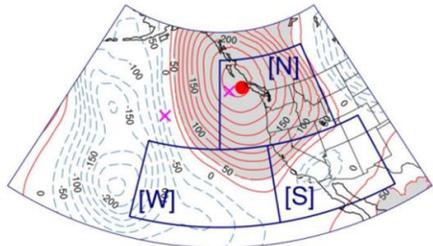
0% 20% 40% 60% 80%  
Probability of AR occurrence



- All models are showing low-to-moderate probabilities (<70%) of AR activity over CA (10–16 Mar)
- ECCC and ECMWF are showing lower probabilities of AR activity over CA on 12 Mar and 16 Mar

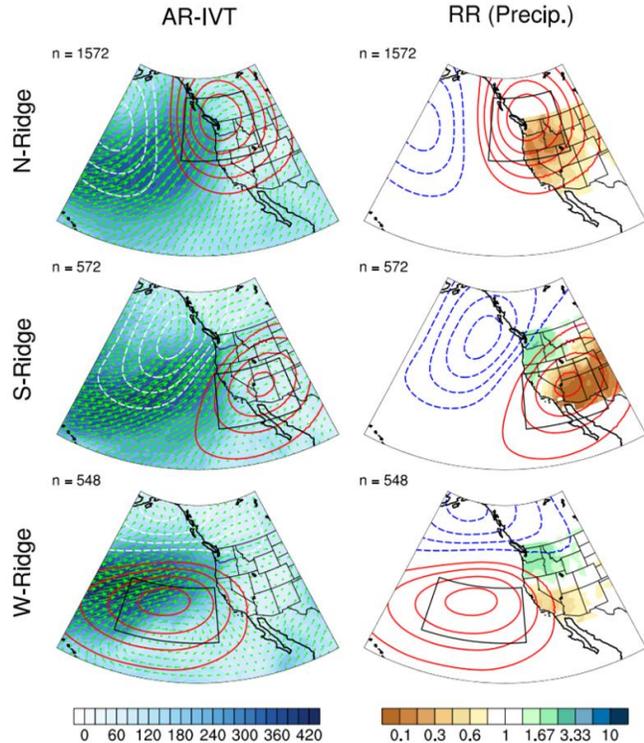
Models agree on low-to-moderate likelihood of AR activity over CA during Week 2 (10–16 Mar) with higher probability predicted by NCEP

# 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 California 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 California 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



Jet Propulsion Laboratory  
California Institute of Technology



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

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

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

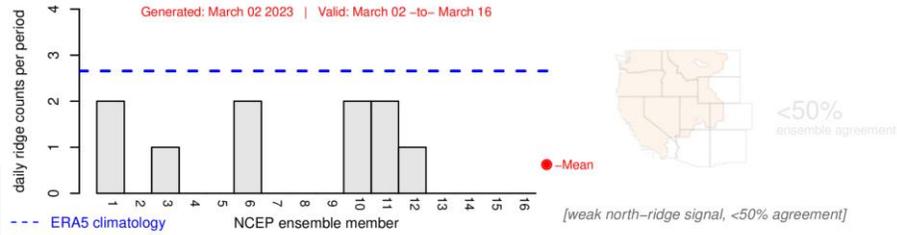
Forecasts Initialized 2 Mar 2023

## NCEP

### CW3E Subseasonal Ridging Forecast (Uses NCEP CFSv2 model)

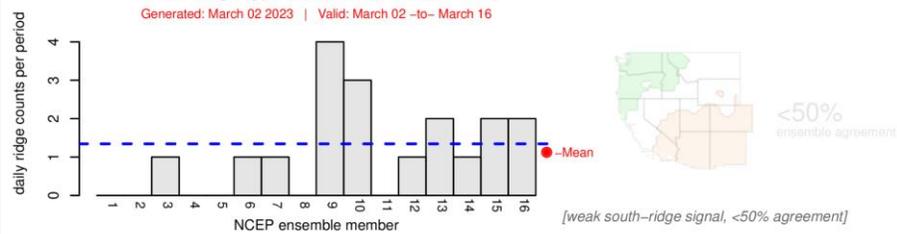
#### North-ridge type (lead time: weeks 1 & 2)

Generated: March 02 2023 | Valid: March 02 –to– March 16



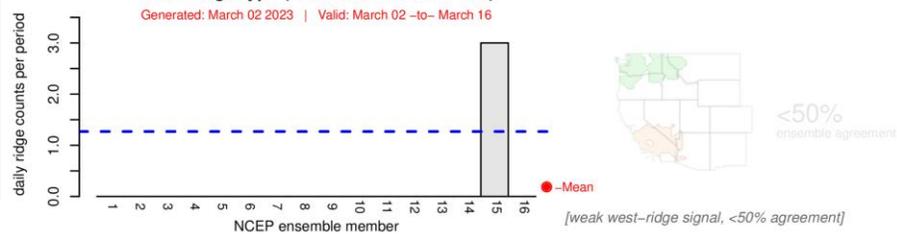
#### South-ridge type (Lead time: weeks 1 & 2)

Generated: March 02 2023 | Valid: March 02 –to– March 16



#### West-ridge type (Lead time: weeks 1 & 2)

Generated: March 02 2023 | Valid: March 02 –to– March 16

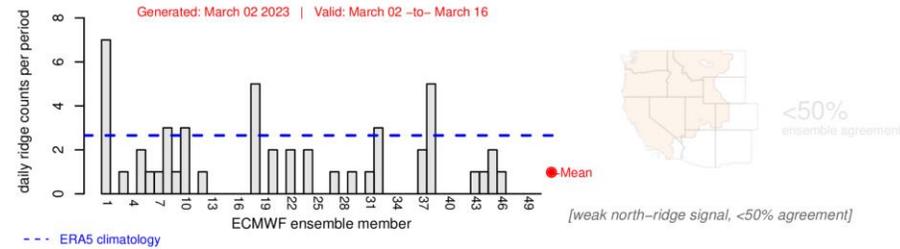


## ECMWF

### CW3E Subseasonal Ridging Forecast (Uses ECMWF model)

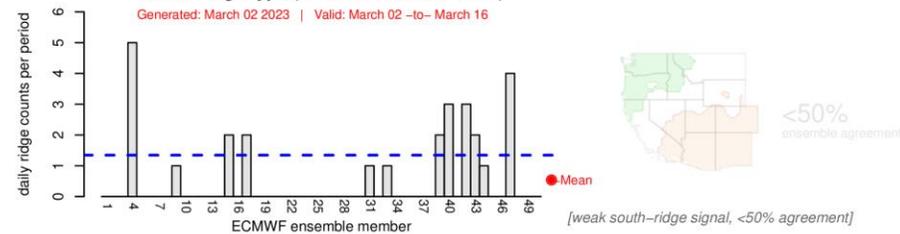
#### North-ridge type (lead time: weeks 1 & 2)

Generated: March 02 2023 | Valid: March 02 –to– March 16



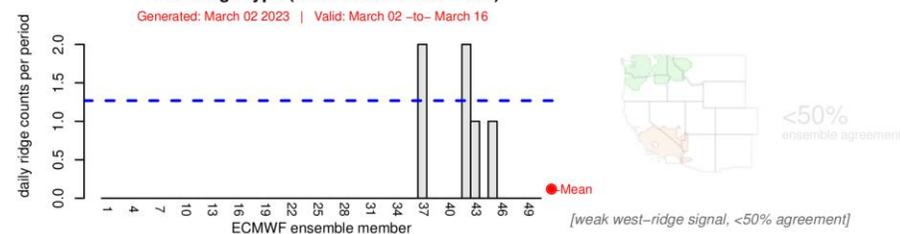
#### South-ridge type (Lead time: weeks 1 & 2)

Generated: March 02 2023 | Valid: March 02 –to– March 16



#### West-ridge type (Lead time: weeks 1 & 2)

Generated: March 02 2023 | Valid: March 02 –to– March 16



- Both models are showing low confidence (< 50% ensemble agreement) in any one particular ridge type during Weeks 1–2 (2–16 Mar)
- NCEP is predicting near-normal ridging activity south of California

There is low confidence in any one particular ridge type over the US West Coast during Weeks 1–2 (2-16 Mar) but patterns in NCEP ensemble more resemble the South-ridge type

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

Forecasts Initialized 2 Mar 2023

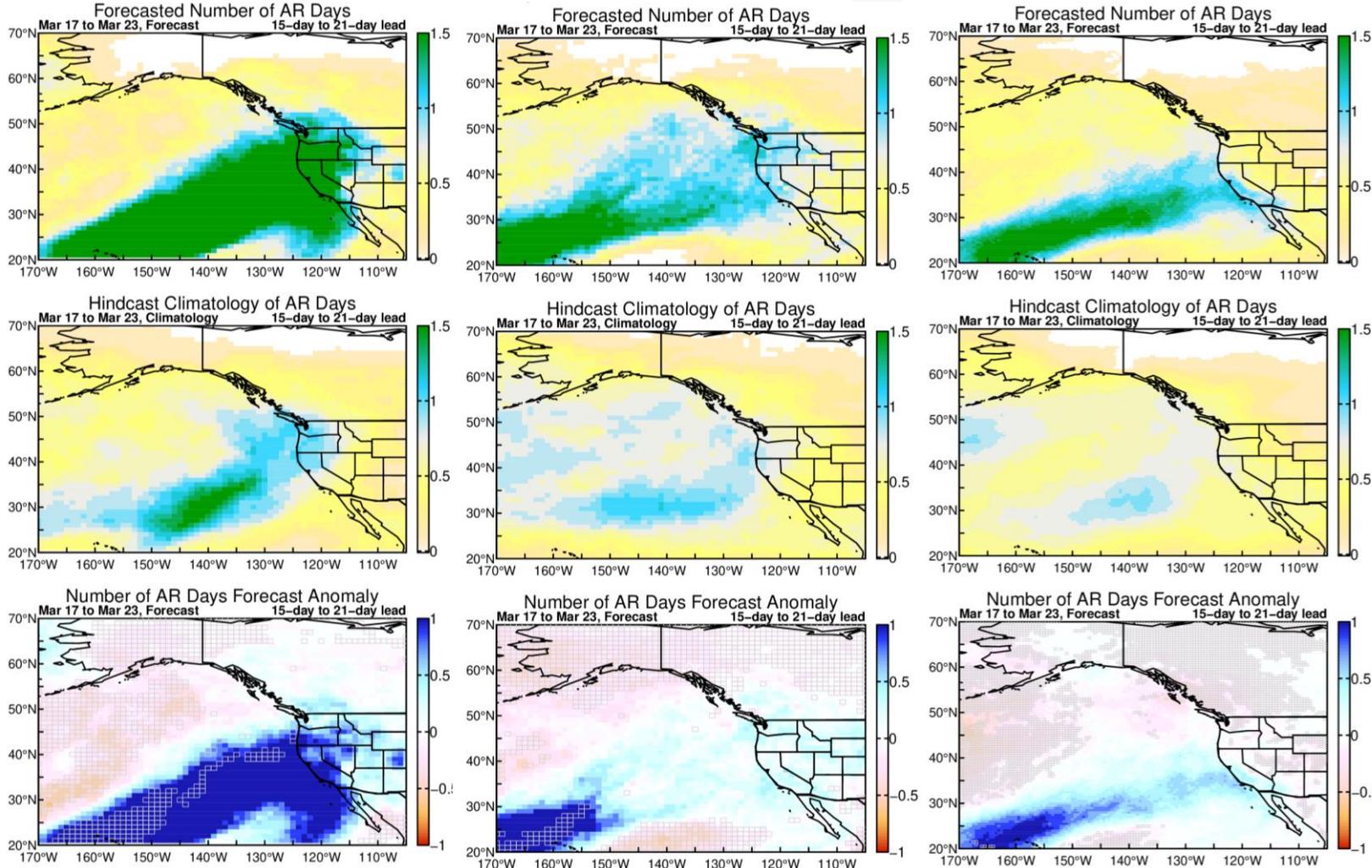
**NCEP**

**ECCC**

**ECMWF**

- ECCC and ECMWF are predicting near-normal AR activity over CA during Week 3 (17 – 23 Mar) with low confidence (< 75% ensemble agreement)
- NCEP is predicting above-normal AR activity over CA with low confidence (< 75% ensemble agreement)

There is a likelihood of AR activity over CA in Week 3 (17 – 23 Mar) with the highest probability in NCEP



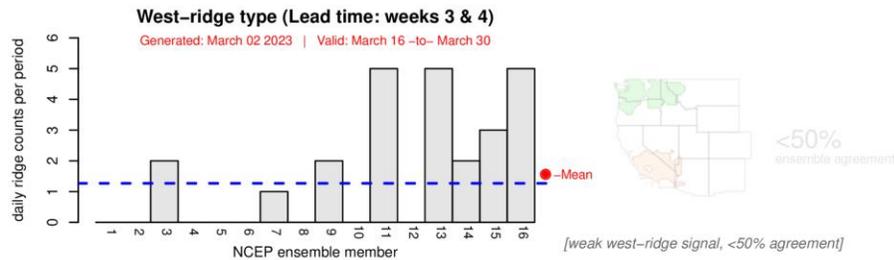
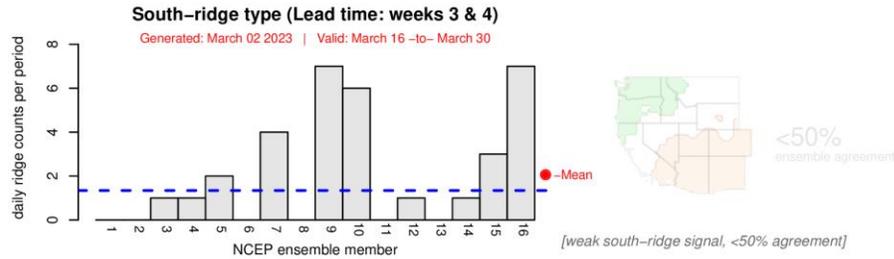
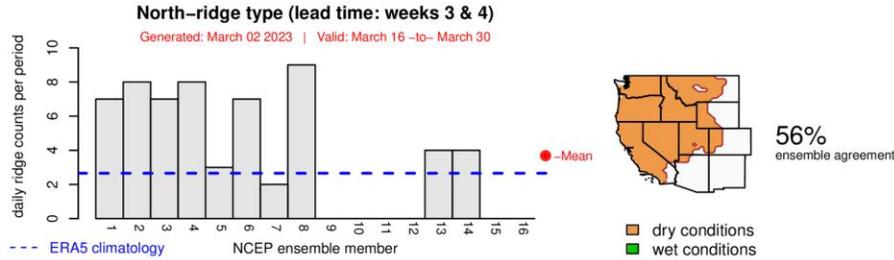
Shading: Fractional # of AR days forecast over a 7-day period (top), model climatology (middle), and forecast minus model climatology (bottom)  
 Grey cells: >75% of ensemble members agree on sign of anomaly

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

Forecasts Initialized 2 Mar 2023

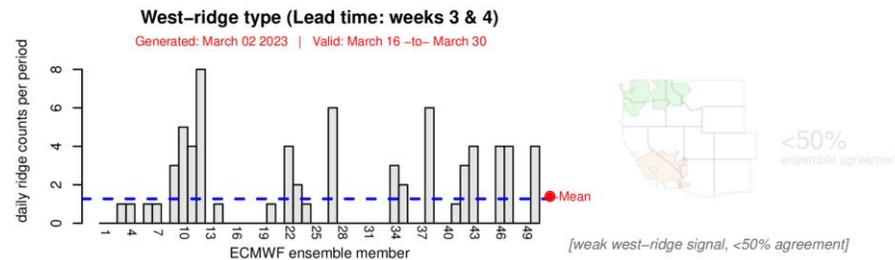
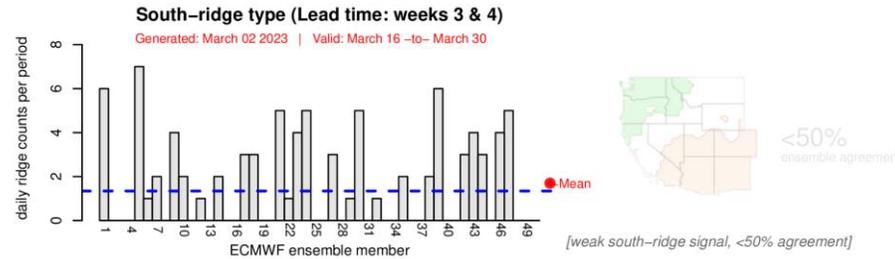
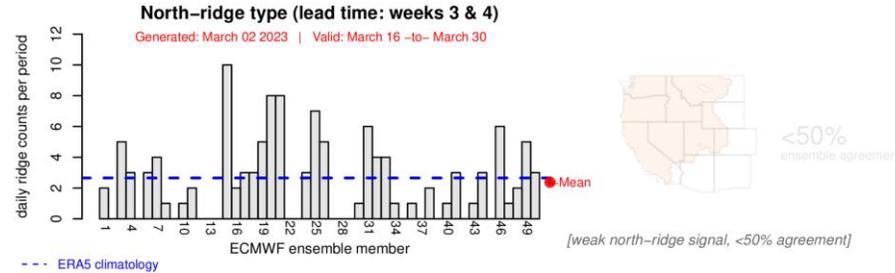
## NCEP

### CW3E Subseasonal Ridging Forecast (Uses NCEP CFSv2 model)



## ECMWF

### CW3E Subseasonal Ridging Forecast (Uses ECMWF model)



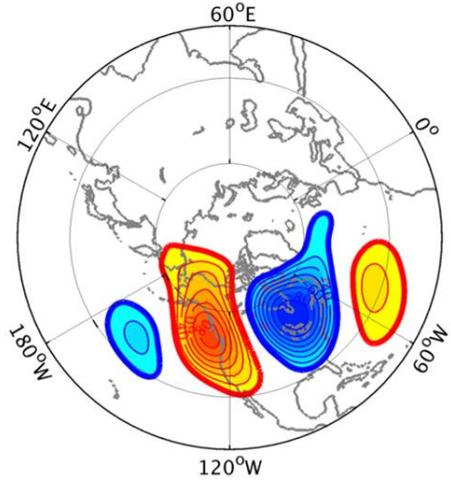
- NCEP shows moderate likelihood (56% ensemble agreement) in above-normal ridging activity north of California during Weeks 3–4 (16 - 30 Mar)
- Both models are predicting near-normal ridging activity during Weeks 3–4 near the US West Coast



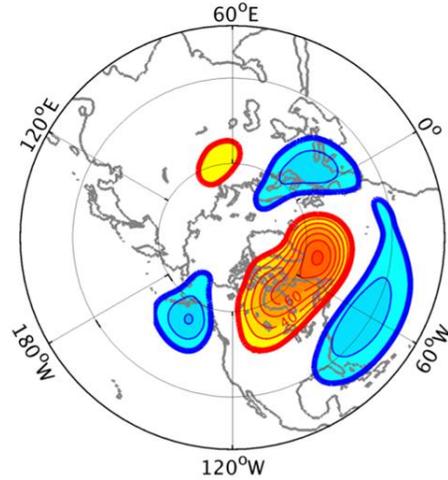
Both models are showing potential for persistent ridging activity near the US West Coast during Weeks 3–4 (16–30 Mar)

# Background Info: IRI Subseasonal Weather Regime Forecasts

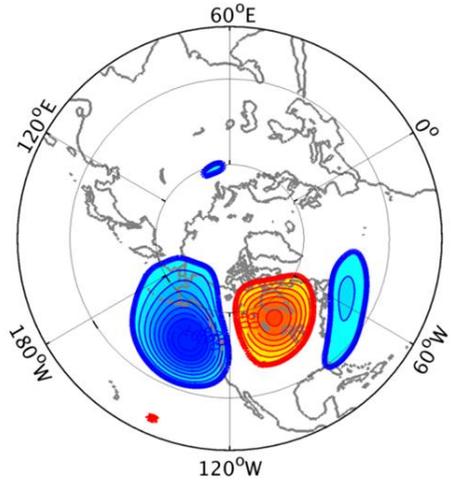
a) WR 1: West Coast Ridge



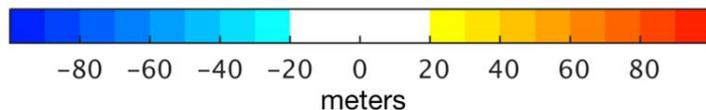
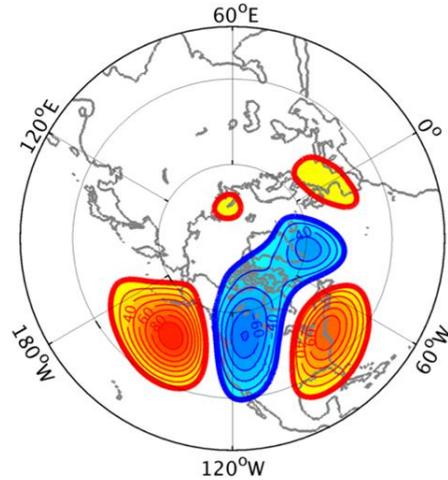
b) WR 2: Greenland High



c) WR 3: Pacific Trough



d) WR 4: Pacific Ridge



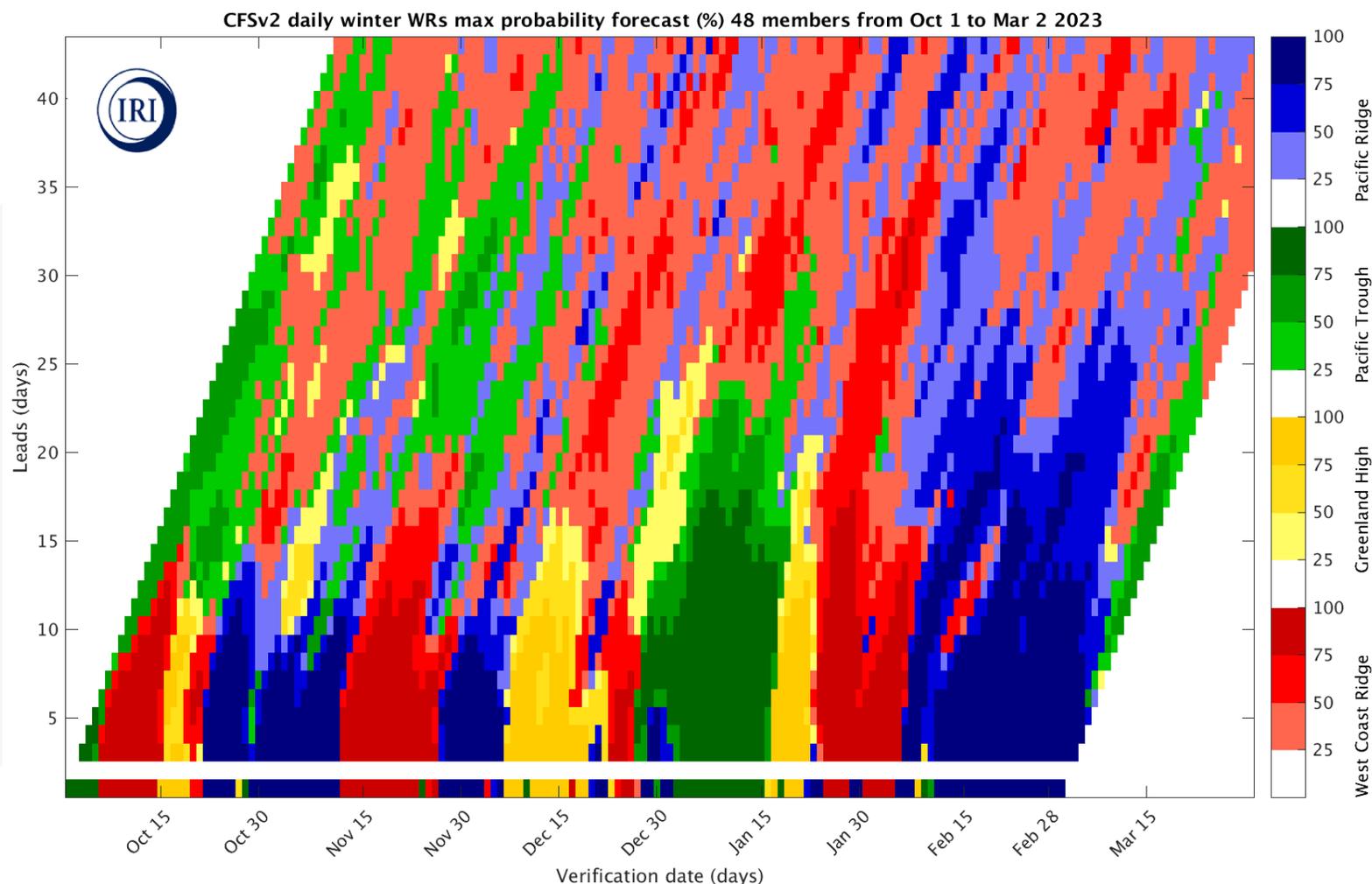
This slide contains background information about IRI's North American weather regime forecast product

- Four dominant weather regimes identified using cluster analysis on daily 500-hPa geopotential height anomalies from MERRA data (1981–2015)

More info: <https://wiki.iri.columbia.edu/index.php?n=Climate.S2S-WRs>

# Subseasonal Outlooks: IRI North American Weather Regime Forecasts

Forecast Initialized 2 Mar 2023

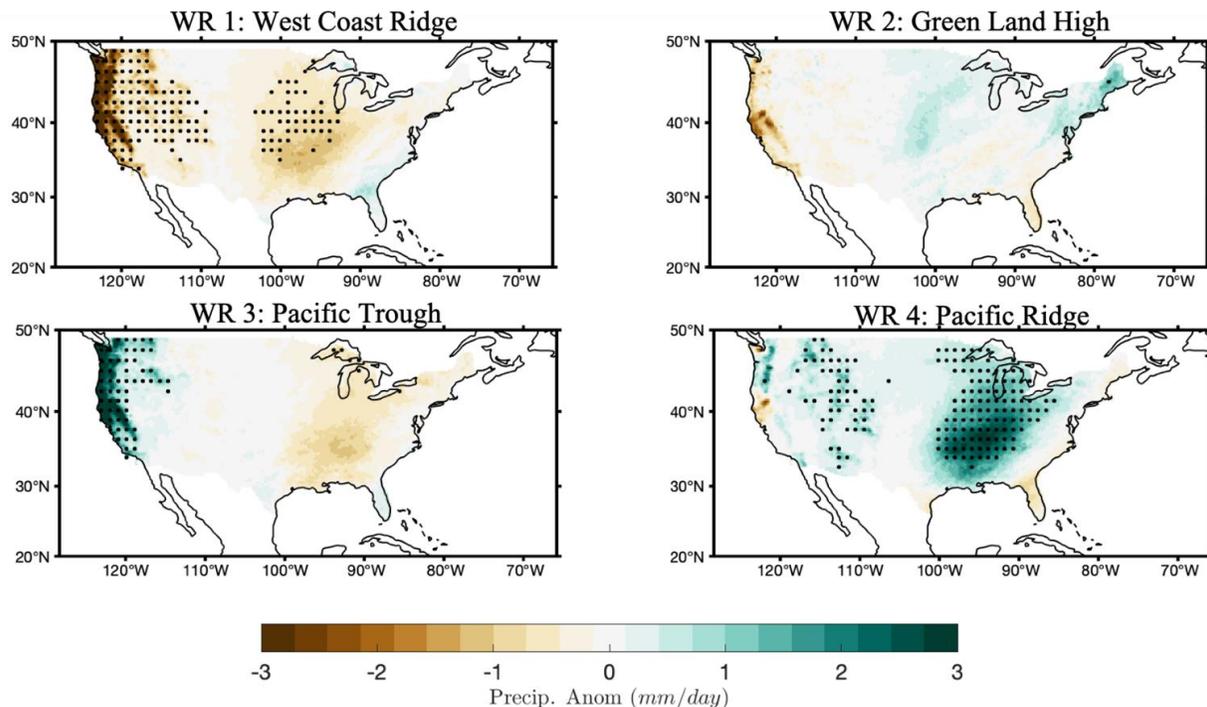


- Daily forecast out to 45-day lead time based on NCEP CFSv2 ensemble
- High likelihood (> 75%) of Pacific Ridge conditions during Week 1
- Low-to-moderate likelihood (25-75%) of Pacific Trough conditions during Weeks 2-3
- West Coast Ridge forecast in Week 4, but with low confidence (< 50% ensemble agreement)

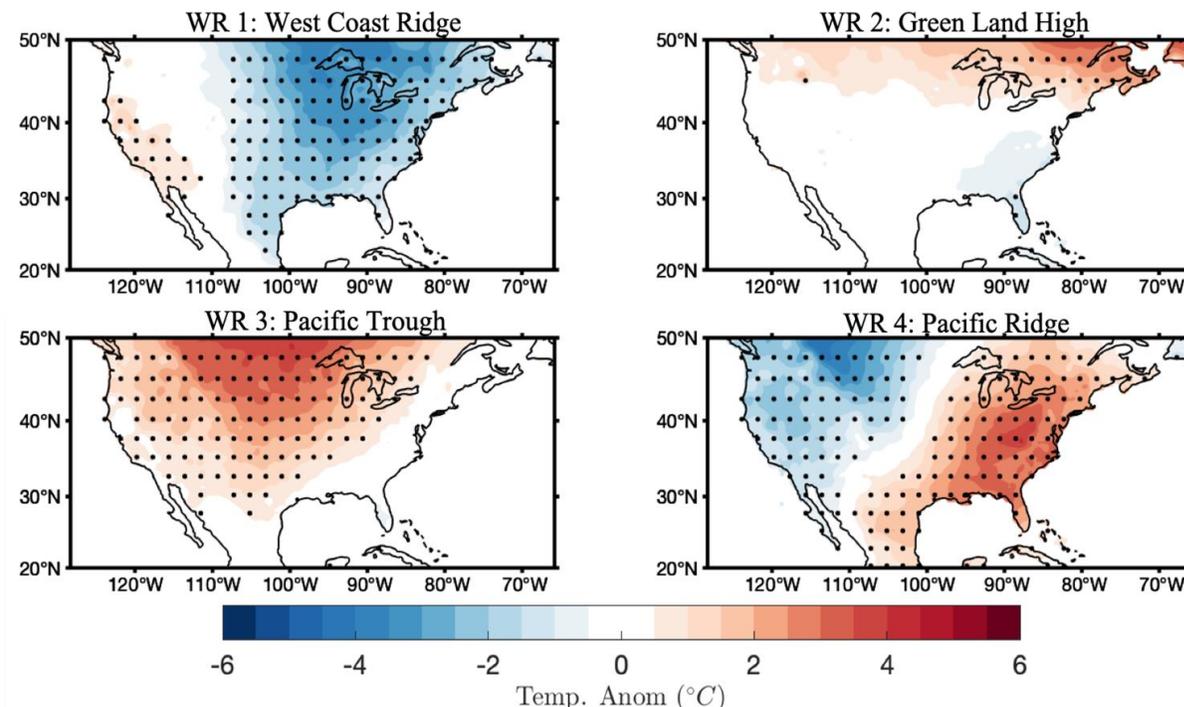
This graphic shows the which of the four North American weather regimes (different colors) is most likely to occur over the next 45 days. Darker (lighter) shading denotes higher (lower) probability of a particular regime.

# Subseasonal Outlooks: IRI North American Weather Regime Forecasts

## Precipitation



## Temperature



Historical precipitation (left) and temperature (right) composites associated with each regime

- Anomalously cold conditions and near-normal precipitation are predicted over California in early March with high confidence
- Anomalously warm conditions and above-normal precipitation are predicted over California in mid-March with low-to-moderate confidence
- Anomalously warm conditions and below-normal precipitation are predicted over California in late March with low confidence