



Center for Western Weather  
and Water Extremes

SCRIPPS INSTITUTION OF OCEANOGRAPHY  
AT UC SAN DIEGO

# CW3E Seasonal Outlook: 7 Mar 2024

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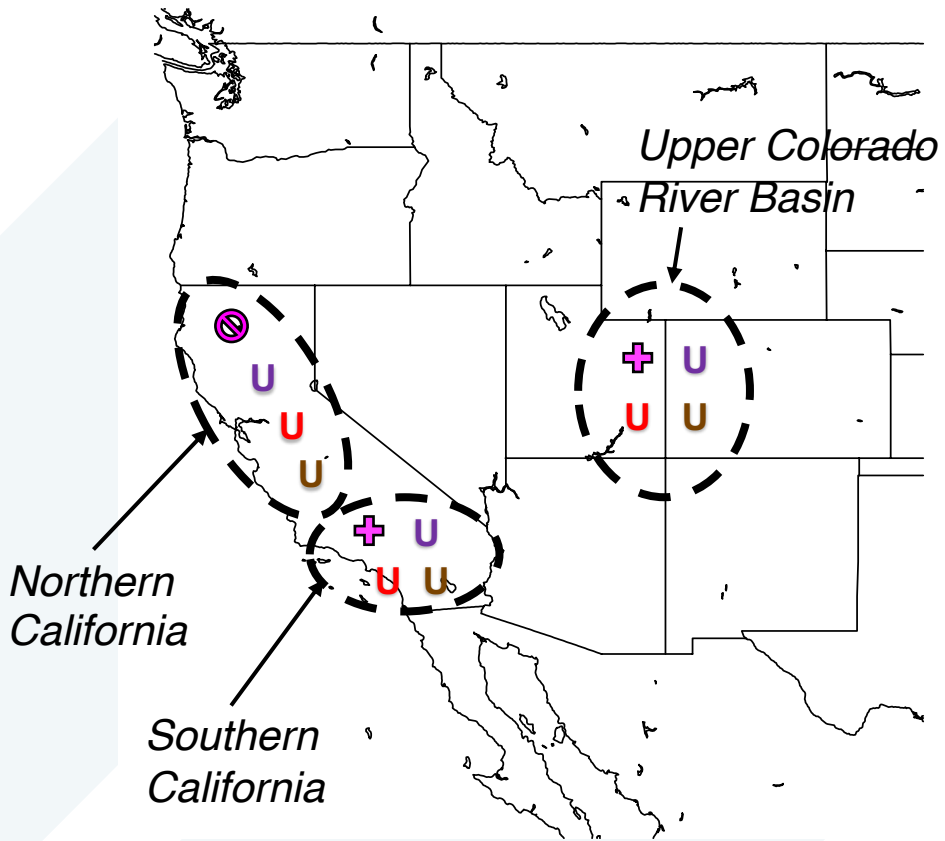
# CW3E S2S Outlooks: Glossary & Context



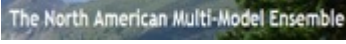

- The outlooks are based on CW3E's and collaborating institutions' subseasonal-to-seasonal (S2S) forecast products. CW3E's S2S products can be found here: [https://cw3e.ucsd.edu/s2s\\_forecasts/](https://cw3e.ucsd.edu/s2s_forecasts/).
- CW3E seasonal precipitation products are produced using statistical 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: Mar–May 2024 Seasonal Forecasts

- Experimental seasonal forecast products show a large degree of uncertainty regarding precipitation over California during Mar–May
  - CW3E’s CCA model based on February SST is predicting above-normal precipitation over Southern CA with moderate confidence and near-normal precipitation over Northern CA with low confidence
  - Seasonal forecasts issued by other institutions are showing equal chances of below-normal, near-normal, and above-normal precipitation over all of CA
- Odds of reaching normal water year (WY) precipitation have increased over much of CA since the start of Feb 2024, with some areas already exceeding their normal total WY precipitation

# Seasonal Synthesis Precipitation Outlook: Mar–May 2024



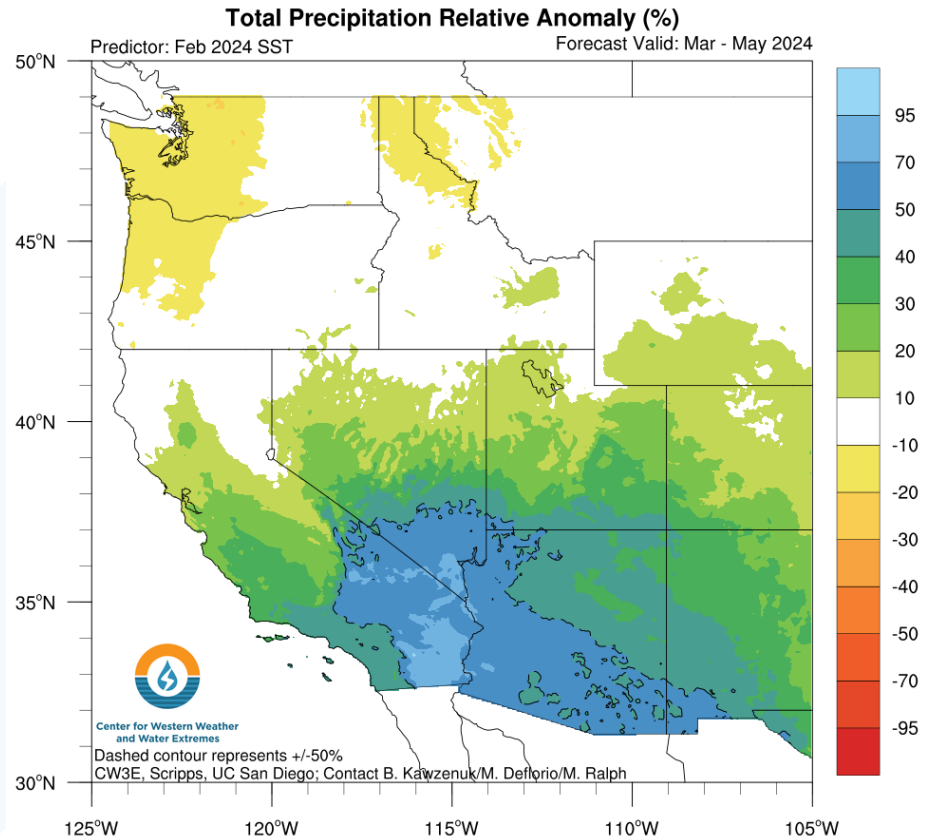
Methods	Forecast Period	Organization(s)	Nor Cal	So Cal	Upper Colo
CCA Seasonal Precipitation Forecast (Gershunov et al.)	Mar–May	 Center for Western Weather and Water Extremes SCRIPPS INSTITUTION OF OCEANOGRAPHY AT UC SAN DIEGO	⊗	+	+
IRI/CPC Forecast (Robertson et al.)	Mar–May		U	U	U
NMME Seasonal Forecast	Mar–May		U	U	U
NOAA CPC Operational Outlook	Mar–May		U	U	U



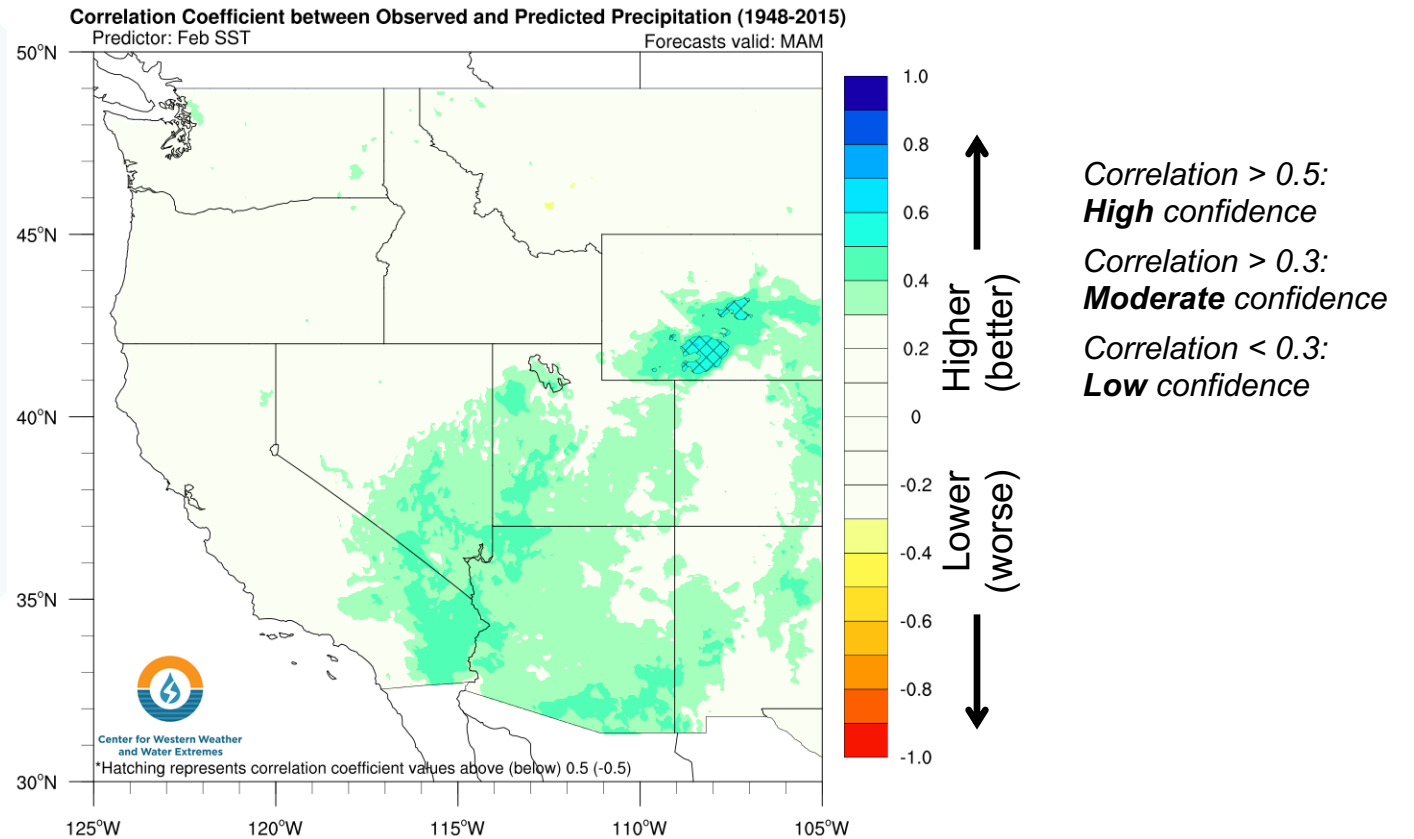
+	Above Normal
⊗	Normal
U	Uncertain/Equal Chances

# Seasonal Outlook: Mar–May 2024 Precipitation (CCA Model)

## MAM Precipitation Anomaly (% of Normal)



## MAM Historical Forecast Skill



- CW3E statistical model based on February SST is predicting near-normal precipitation in Northern CA with low confidence and above-normal precipitation in Southern CA with moderate confidence during Mar–May

**CCA:** Canonical correlation analysis relating seasonal precipitation anomalies to observed monthly Pacific SST anomalies (click [here](#) for more information)

**Above-normal:** >+30%; **Below-normal:** <-30%

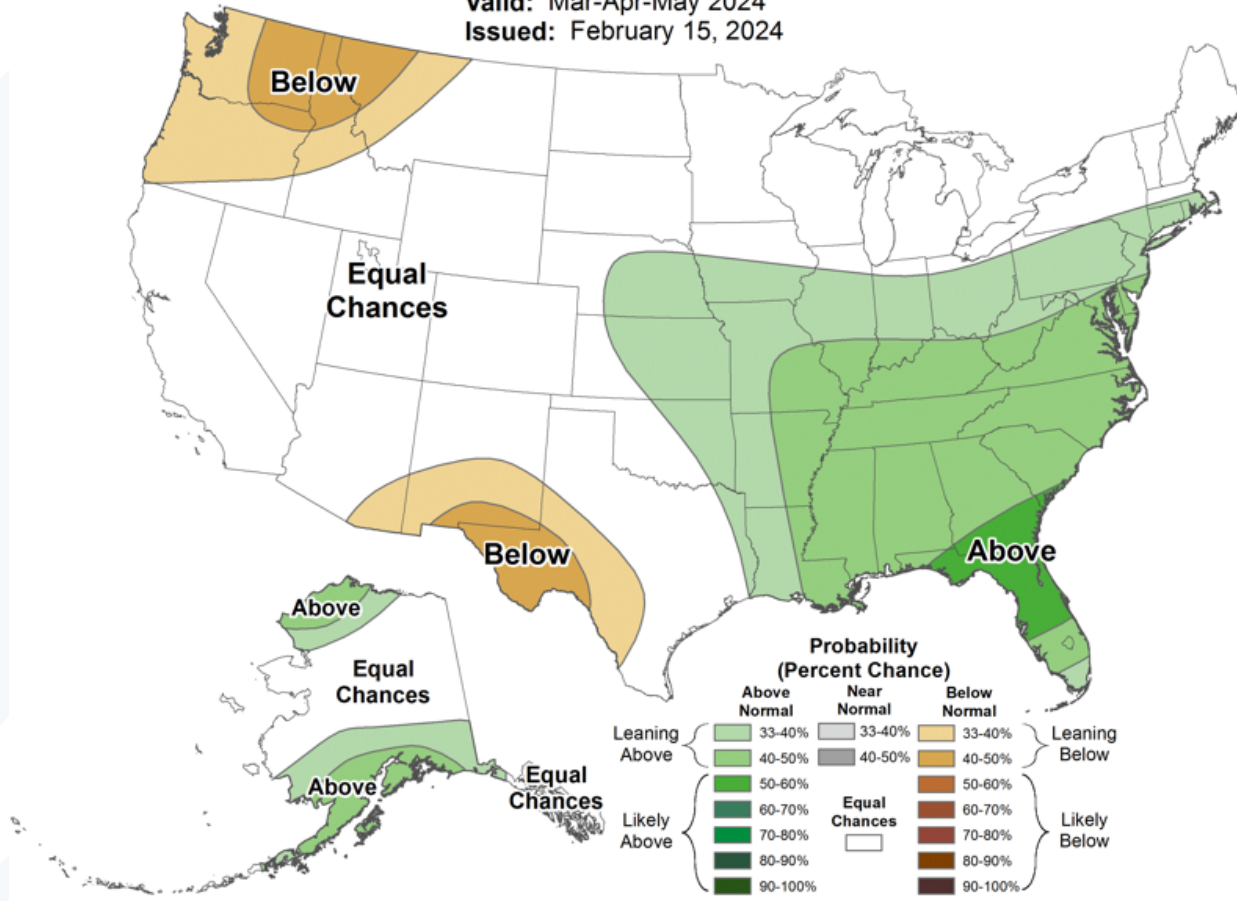
# Seasonal Outlook: CPC 3-Month Precipitation Outlook



## Seasonal Precipitation Outlook



Valid: Mar-Apr-May 2024  
Issued: February 15, 2024



Forecast Issued Feb 2024

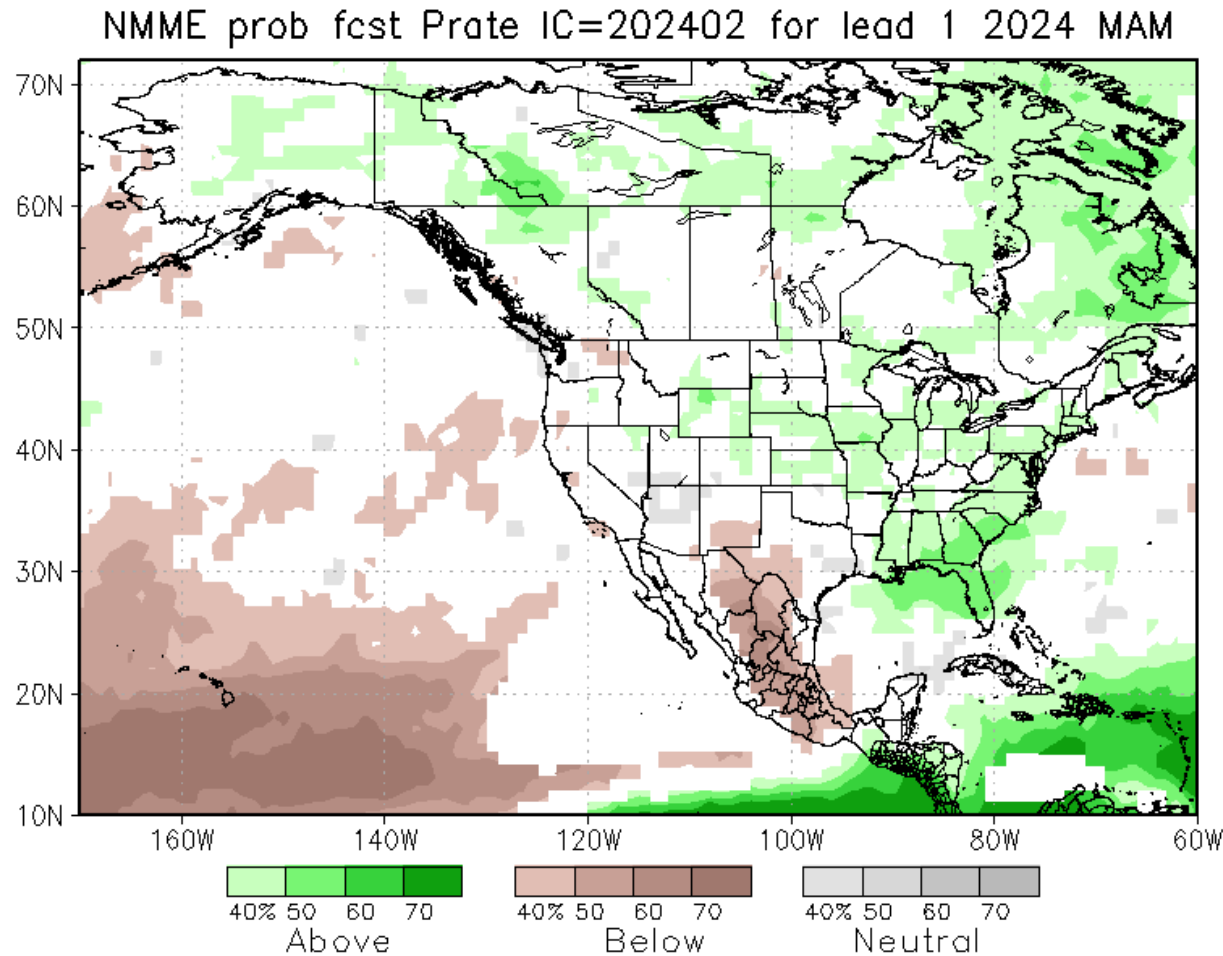
- The NOAA Climate Prediction Center (CPC) issues probabilistic 3-month precipitation outlooks for the CONUS and Alaska every month
- These outlooks are based on a combination of dynamical and statistical models
- The forecast issued in February is showing equal chances of above-normal, near-normal, and below-normal precipitation over CA during Mar–May

This graphic shows the probability of below-normal (brown), near-normal (grey), and above-normal (green) precipitation during a 3-month period. Regions without shading indicate where the forecasts are more uncertain.

Graphics provided by the NOAA NWS Climate Prediction Center. For more information about this forecast product:  
[https://www.cpc.ncep.noaa.gov/products/predictions/long\\_range/seasonal\\_info.php](https://www.cpc.ncep.noaa.gov/products/predictions/long_range/seasonal_info.php)

# Seasonal Outlook: NMME 3-Month Precipitation Outlook

**Forecast Issued Feb 2024**



- The CPC also issues probabilistic 3-month precipitation products every month using precipitation output from the North American Multi-Model Ensemble (NMME)
- The forecast issued in February is showing equal chances of above-normal, near-normal, and below-normal precipitation over CA during Mar–May

This graphic shows the probability of below-normal (brown), near-normal (grey), and above-normal (green) precipitation during a 3-month period. Regions without shading indicate where the forecasts are more uncertain.

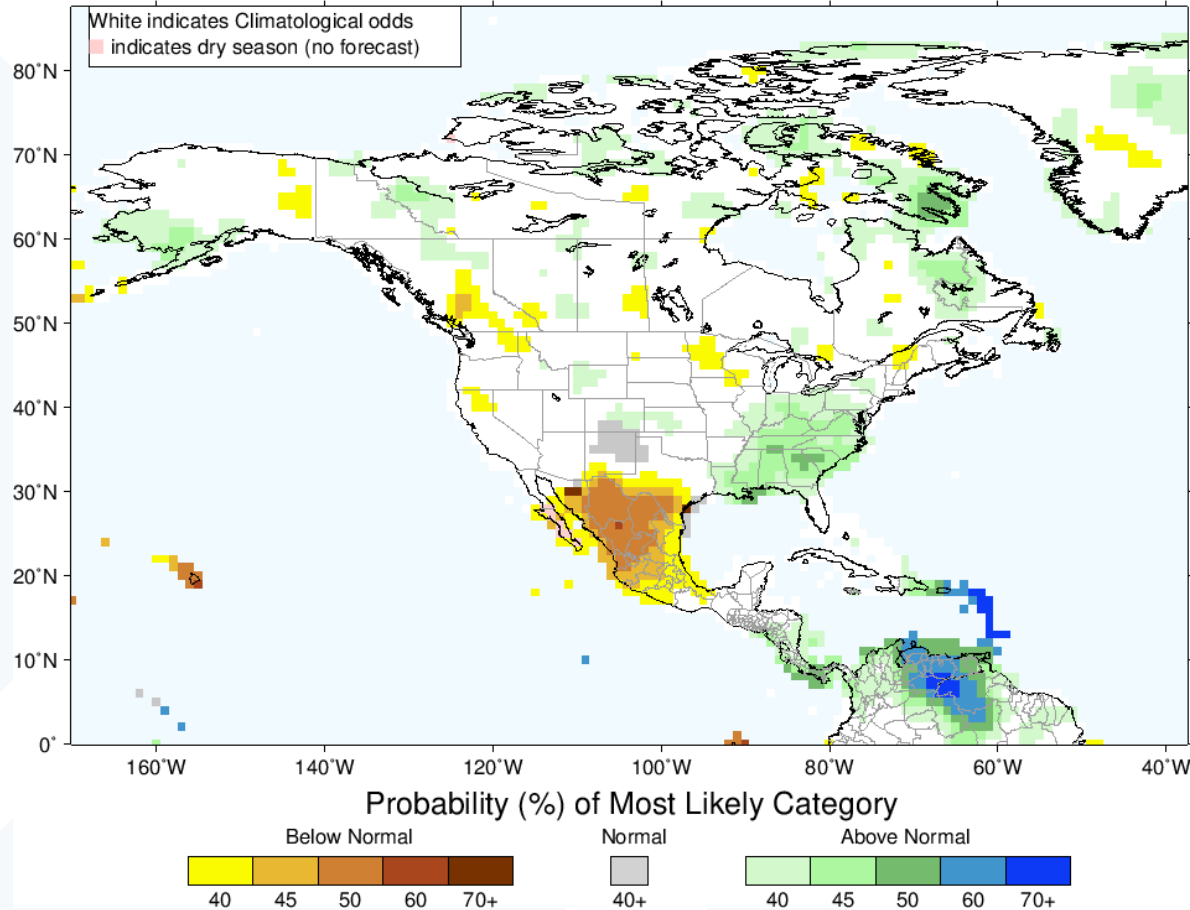
Graphics provided by the NOAA NWS Climate Prediction Center. For more information about the forecast product:

<https://www.cpc.ncep.noaa.gov/products/NMME/about.html>.

# Seasonal Outlook: IRI 3-Month Precipitation Forecast

IRI Multi-Model Probability Forecast for Precipitation for March–April–May 2024, Issued February 2024

**Forecast Issued Feb 2024**



- The International Research Institute (IRI) issues probabilistic 3-month precipitation forecasts every month based on calibrated forecasts from the NMME
- The forecast issued in February is showing equal chances of above-normal, near-normal, and below-normal precipitation over CA during Mar–May

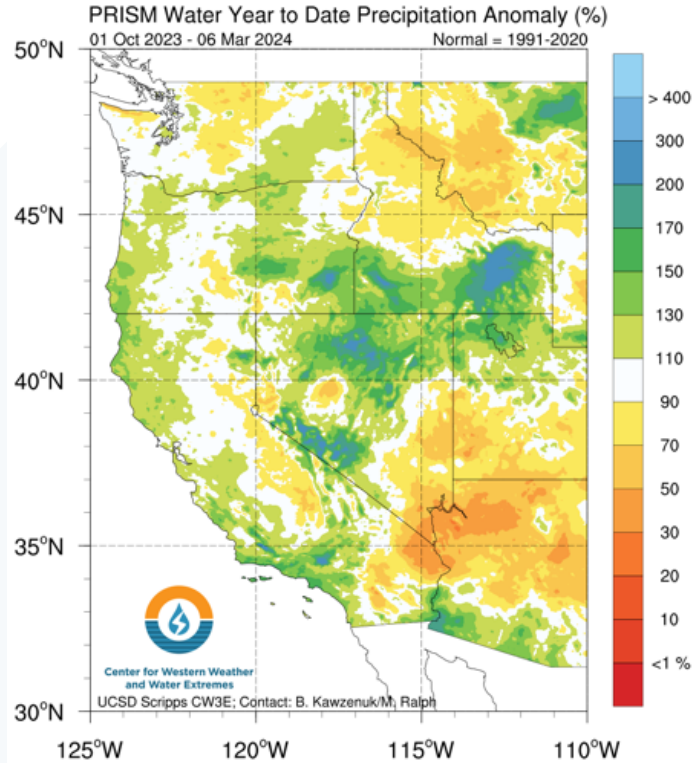
This graphic shows the probability of below-normal (yellow/brown), near-normal (grey), and below-normal (green/blue) precipitation during a 3-month period. Regions without shading indicate where the forecasts are more uncertain.

Graphics provided by the International Research Institute for Climate and Society, Columbia University, <https://iri.columbia.edu>. See [Kirtman et al. \(2014\)](#) for more information about the NMME.

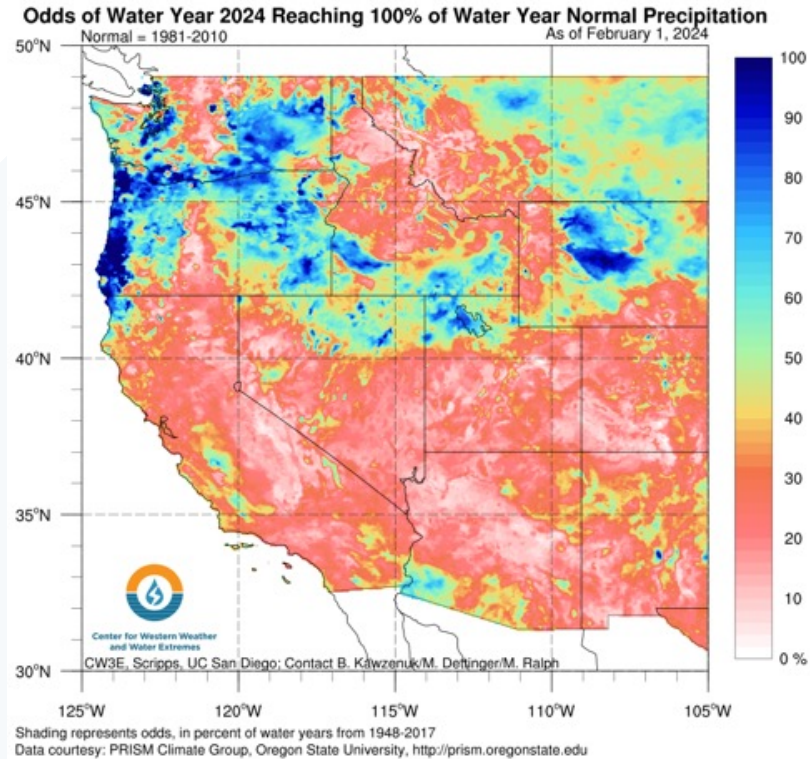


# Seasonal Outlook: Odds of Reaching Normal Water Year Precipitation

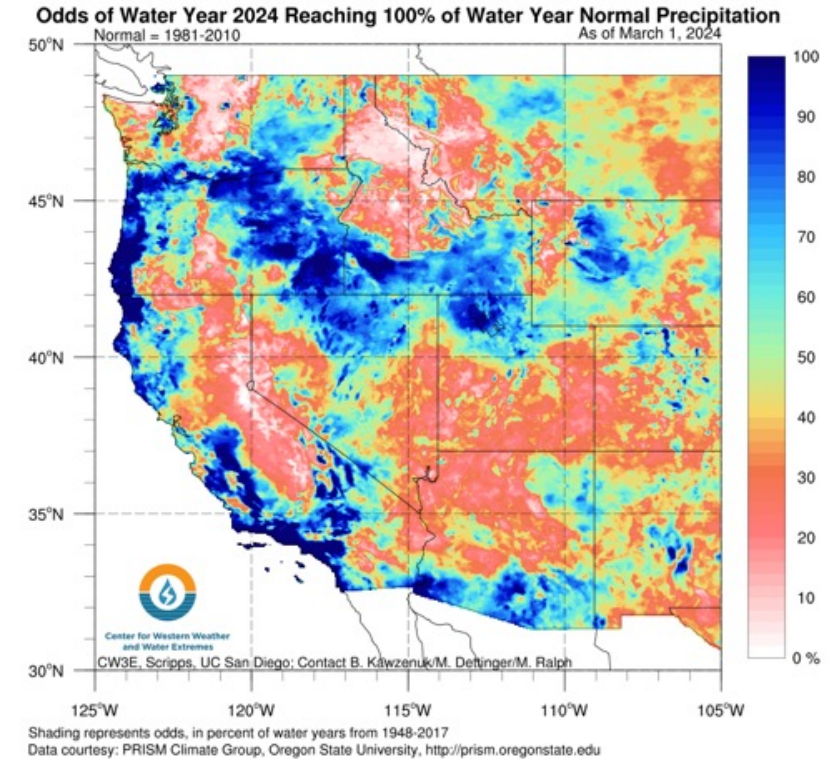
## WY-to-Date Precipitation Anomaly (% of Normal): 6 Mar 2024



## Start of Feb 2024 Odds



## Start of Mar 2024 Odds



- As of 6 Mar, water-year-to-date precipitation is above-normal in coastal Southern CA, slightly above-normal in coastal Northern and Central CA, near-normal over the Northern and Central Sierra Nevada, and slightly below-normal over the Southern Sierra Nevada.
- Odds of reaching normal WY precipitation increased throughout much of the state between 1 Feb and 1 Mar due to a very wet February
- Much of coastal Southern CA has already exceeded its normal total WY precipitation