
Center for Western Weather
and Water Extremes
SCRIPPS INSTITUTION OF OCEANOGRAPHY
AT UC SAN DIEGO
CW3E Seasonal Outlook: 9 Feb 2024
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CW3E S2S Forecasts: Glossary & Context

- **The outlooks are based on CW3E's and collaborating institutions' seasonal forecast products that can be found here: 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: Feb – Apr 2024 Seasonal Forecasts

- Experimental seasonal forecast products tilt the odds towards above-normal precipitation with some uncertainty over Southern California for the February – March – April 2024 period
  - CW3E's CCA model based on Jan SST favors above-normal precipitation over Southern CA (higher confidence) and above-normal precipitation over Northern and Central CA (lower confidence)
  - Most seasonal forecasts issued by other institutions are showing uncertain precipitation over Southern CA
- Experimental seasonal forecast products show uncertain precipitation over Northern and Central California
- Recent active ARs in early February have contributed to above-normal year-to-date precipitation across much of Southern and coastal California

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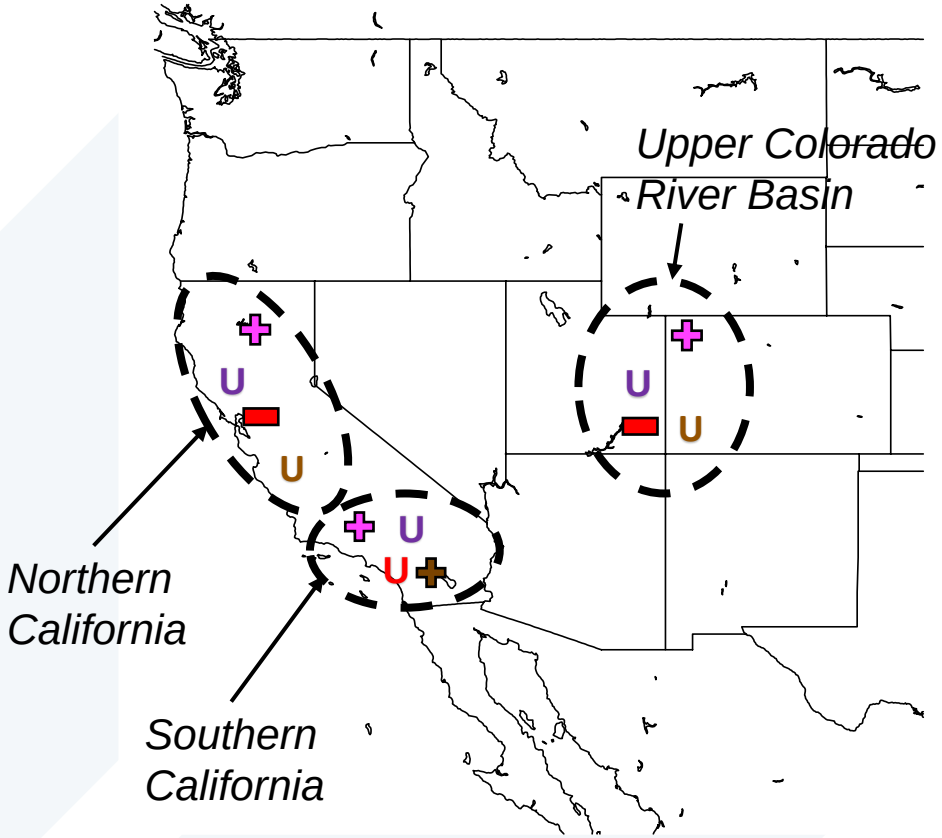
Seasonal Synthesis Precipitation Outlook: Feb – Apr 2024



Methods	Forecast Period	Organization(s)	Nor Cal	So Cal	Upper Colo
CCA Seasonal Precipitation Forecast (Gershunov et al.)	Feb-Apr	Center for Western Weather and Water Extremes, Scripps Institution of Oceanography at UC San Diego	+	+	+
IRI/CPC Forecast (Robertson et al.)	Feb-Apr	IRI	U	U	U
NMME Seasonal Forecast	Feb-Apr	The North American Multi-Model Ensemble	−	U	−
NOAA CPC Operational Outlook	Feb-Apr	NOAA	U	+	U

Center for Western Weather and Water Extremes
Scripps Institution of Oceanography at UC San Diego

Jet Propulsion Laboratory
California Institute of Technology

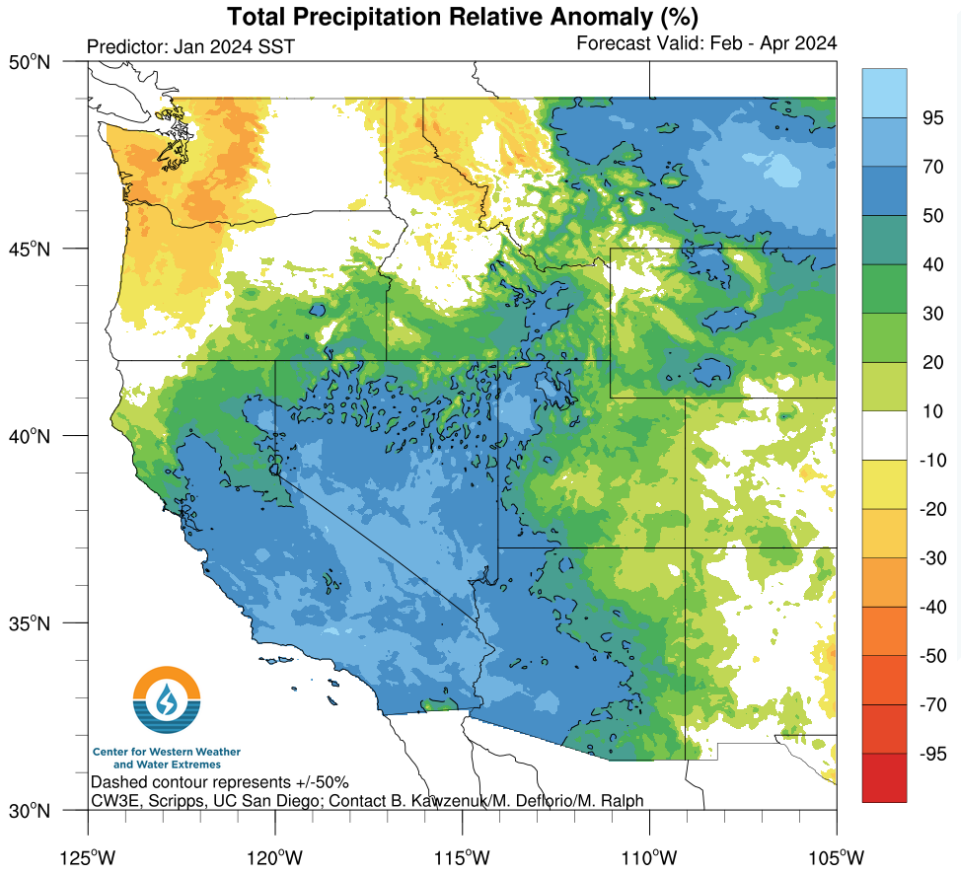
IRI

+ Above Normal
− Below Normal
⊘ Normal
U Uncertain/Equal Chances

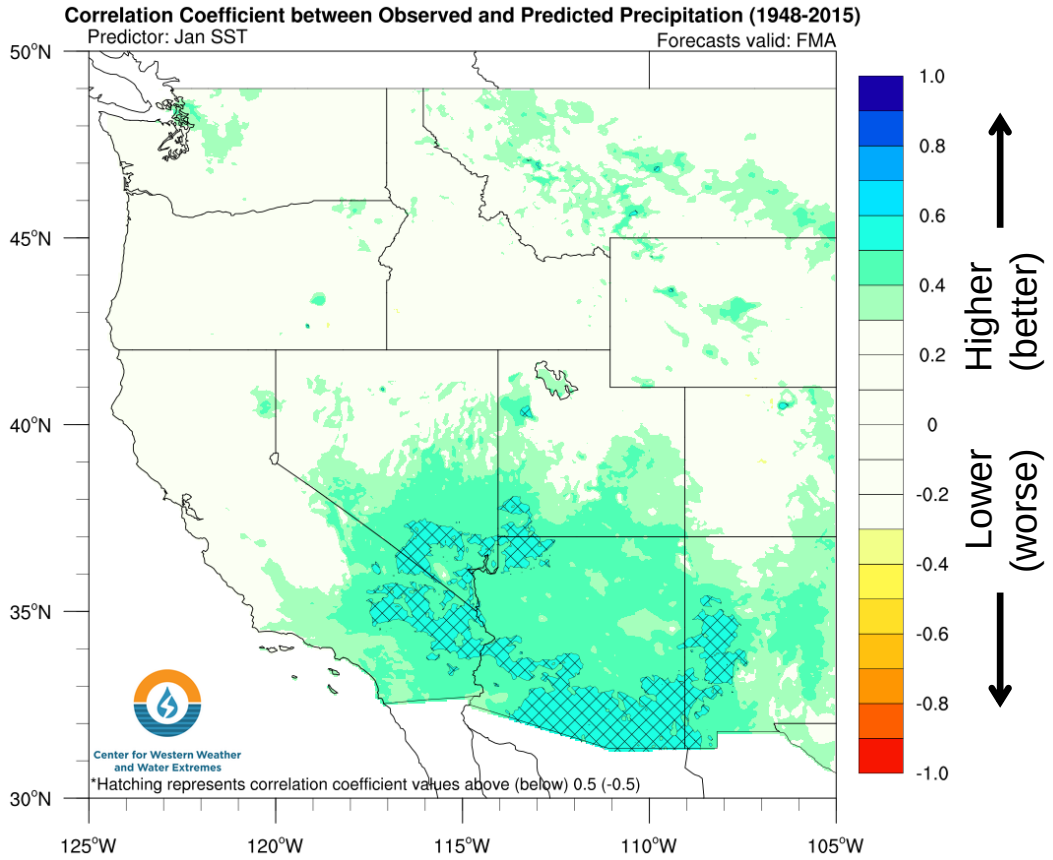
DeFlorio et al. (2023, BAMS)

Seasonal Outlook: Feb–Apr 2024 Precipitation (CCA Model)

FMA Precipitation Anomaly (% of Normal)



FMA Historical Forecast Skill



Correlation > 0.5 (hatching): ***High*** *confidence*

Correlation > 0.3 (Blue): ***Moderate*** *confidence*

Correlation < 0.3: ***Low*** *confidence*

- CW3E statistical model based on January SST favors above-normal precipitation in Northern and Central CA (lower confidence) and above-normal precipitation in Southern CA (higher confidence) during Feb–Apr

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%

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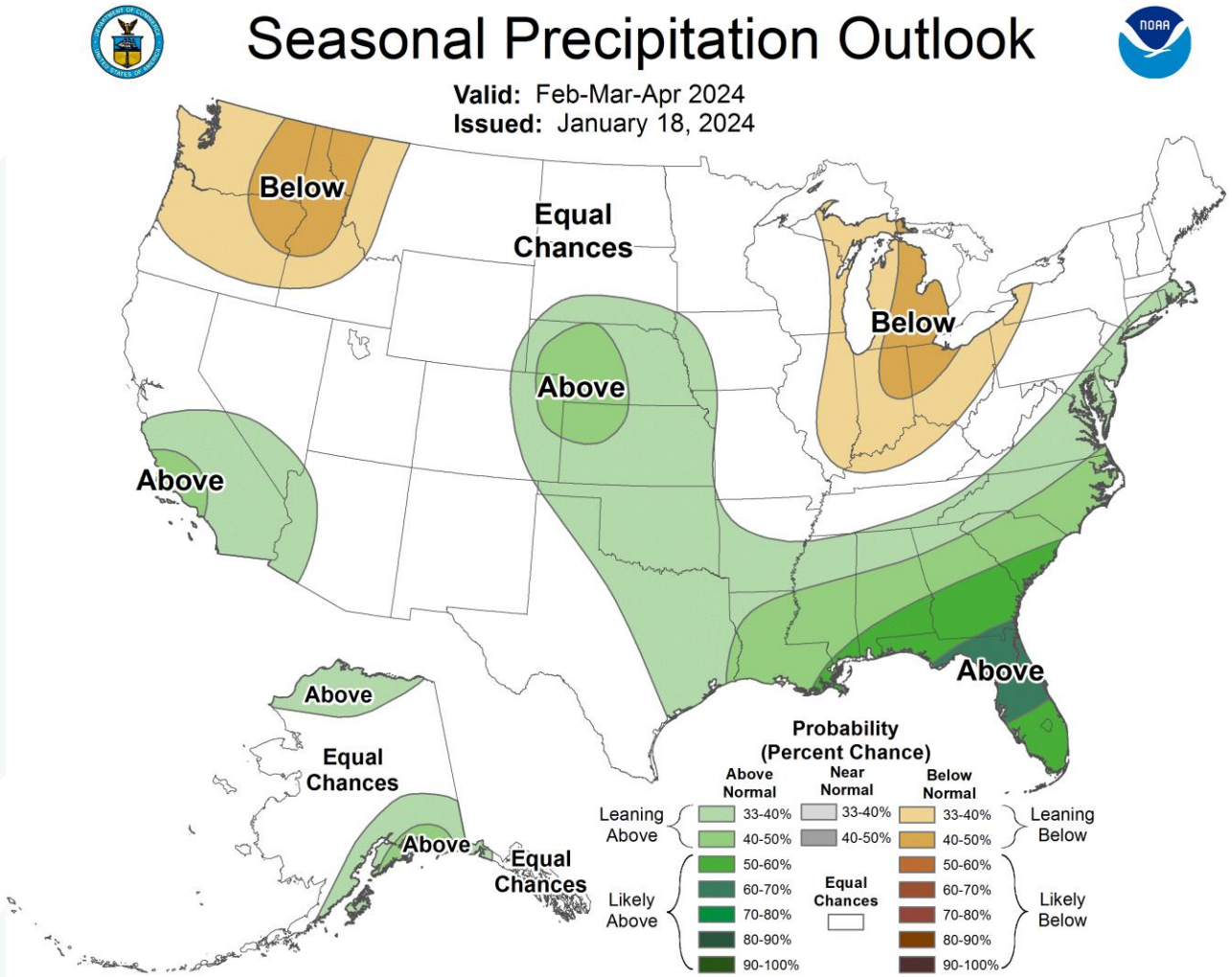
Seasonal Outlooks: CPC 3-Month Precipitation Outlook



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.

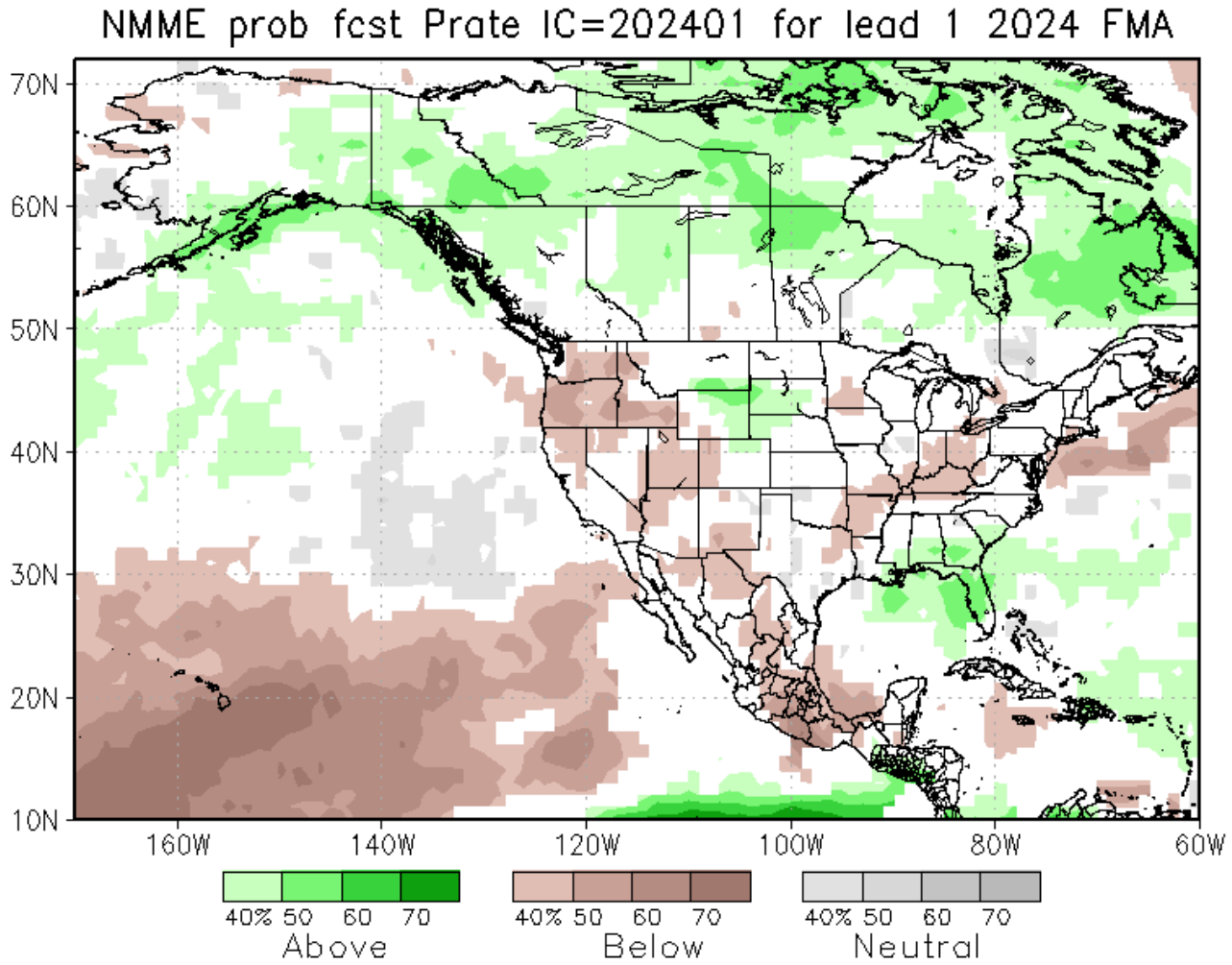
Forecast Issued Jan 2024

- 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 January tilts the odds towards above-normal precipitation in central and Southern CA during Feb–Apr 2024, but with low confidence (< 50% probability)
- The forecast is also showing uncertain precipitation in Northern CA

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.

Seasonal Outlooks: NMME 3-Month Precipitation Outlook

Forecast Issued Jan 2024

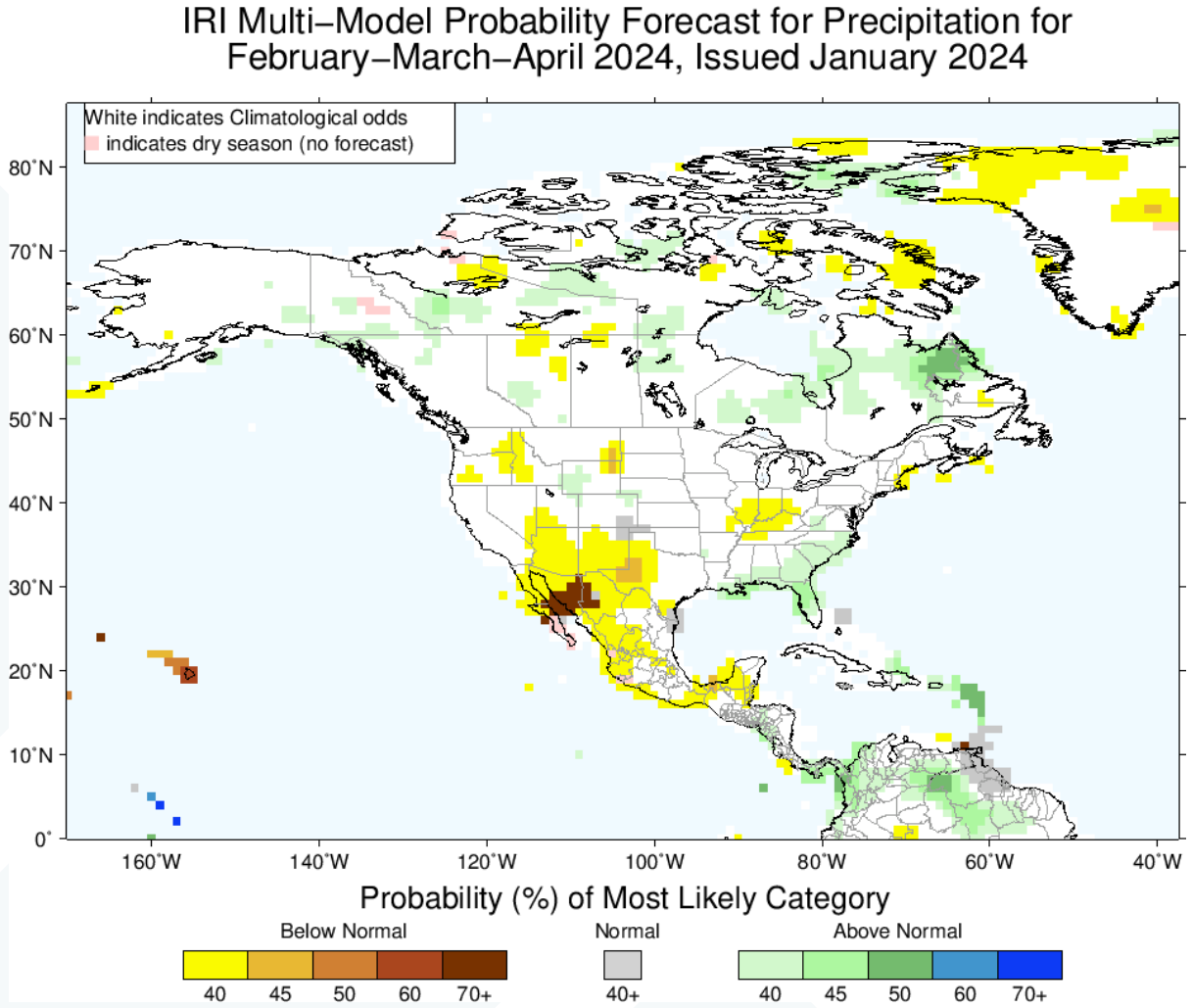


This graphic shows the probability of below-normal (brown), near-normal (grey), and above-normal (green) precipitation during a 3-month period. Regions without shading indicate where the forecasts are more uncertain.

- 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 January favors below-normal precipitation in Northern CA during Feb–Apr 2024, but with low confidence (< 50% probability)
- The forecast is also showing uncertain precipitation in central and Southern CA

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 Outlooks: IRI/CPC 3-Month Precipitation Forecast



Forecast Issued Jan 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 January is showing uncertain precipitation in CA during Feb–Apr 2024

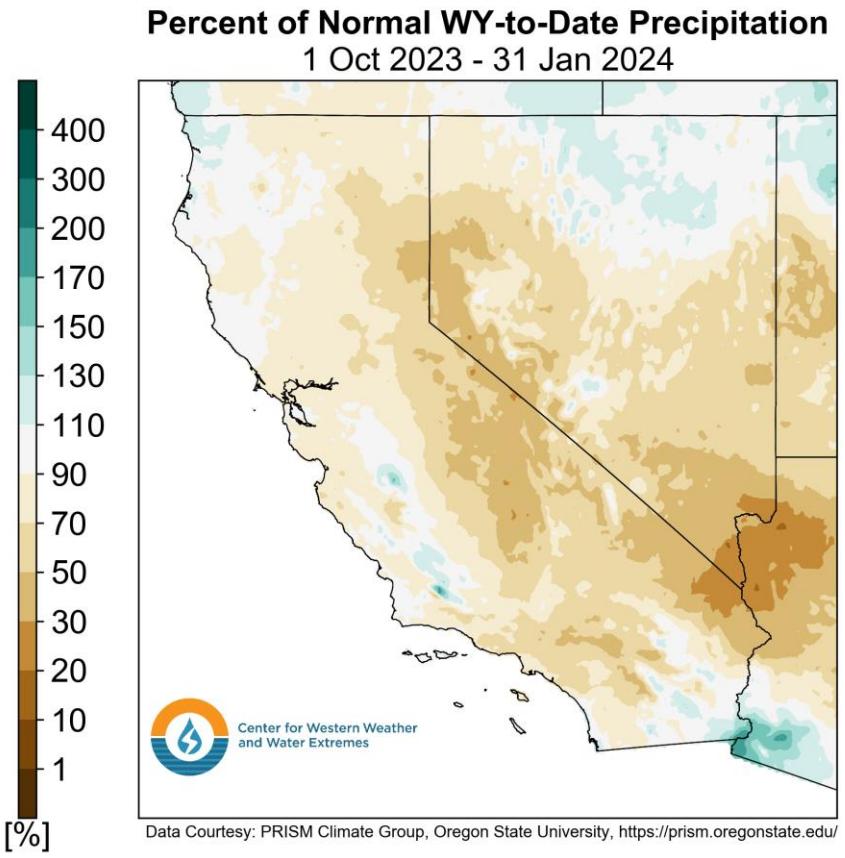
This graphic shows the probability of below-normal (yellow/brown), near-normal (grey), and below-normal (green/blue) precipitation during a 3-month period. Regions without shading indicate where the forecasts are more uncertain.

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: Percent of Normal Water Year Precipitation

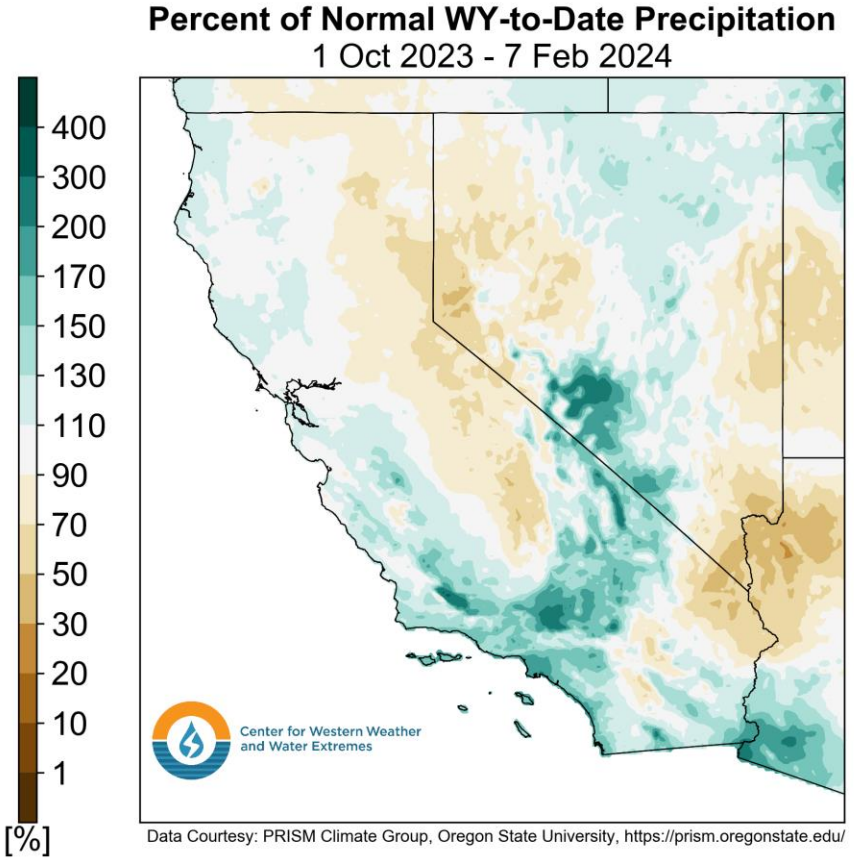
Before storms:

WY-to-Date Precipitation Anomaly (% of Normal)



After storms:

WY-to-Date Precipitation Anomaly (% of Normal)



- WY 2024 started off with drier-than-normal conditions across much of California
- Recent storms have brought WY-to-date precipitation to above-normal over much of Southern and coastal CA

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