



CIROH DevCon

Research to Operational Realities

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Office of Water Prediction | National Weather Service

National Oceanic & Atmospheric Administration

U.S. Department of Commerce

Three Defining Challenges



Drought



Water Scarcity



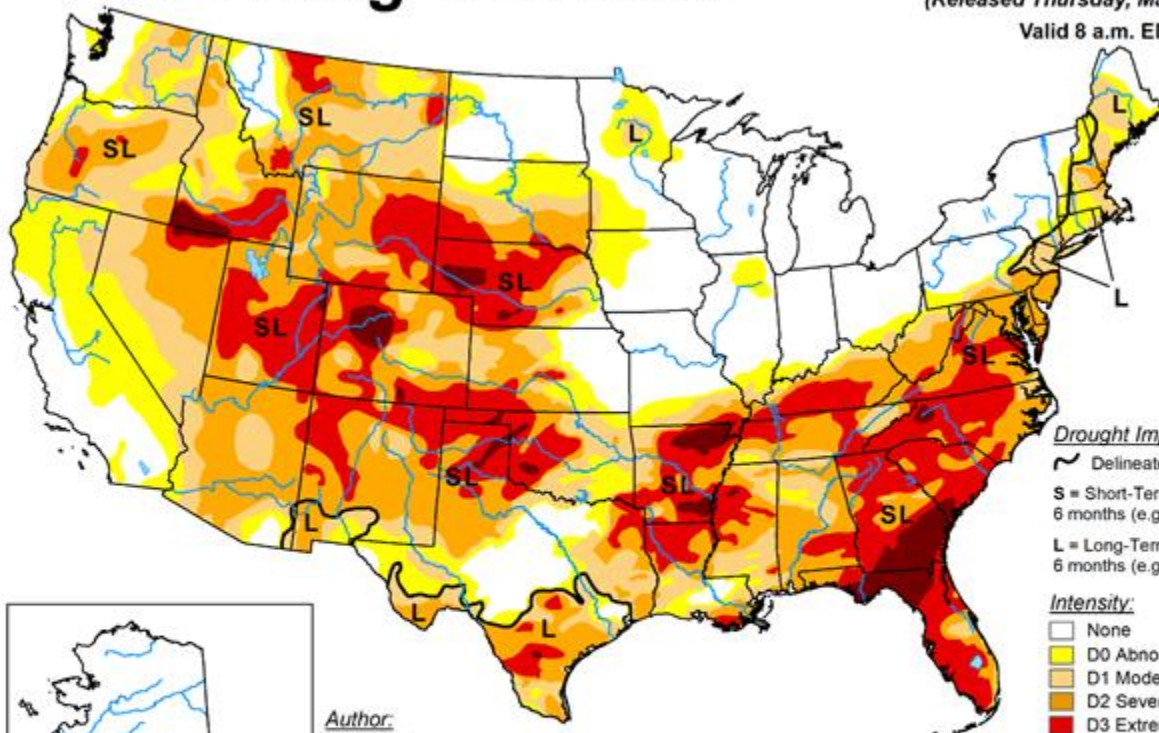
Extreme Flooding

U.S. Drought Monitor

May 19, 2026

(Released Thursday, May. 21, 2026)

Valid 8 a.m. EDT



Drought Impact Types:

~ Delineates dominant impacts

S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)

L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

Intensity:

None

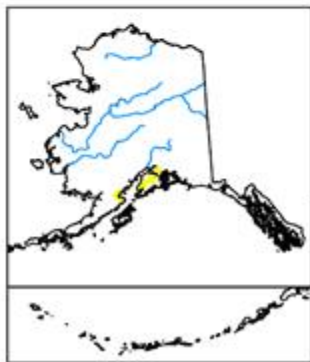
D0 Abnormally Dry

D1 Moderate Drought

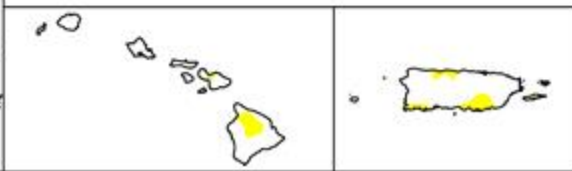
D2 Severe Drought

D3 Extreme Drought

D4 Exceptional Drought



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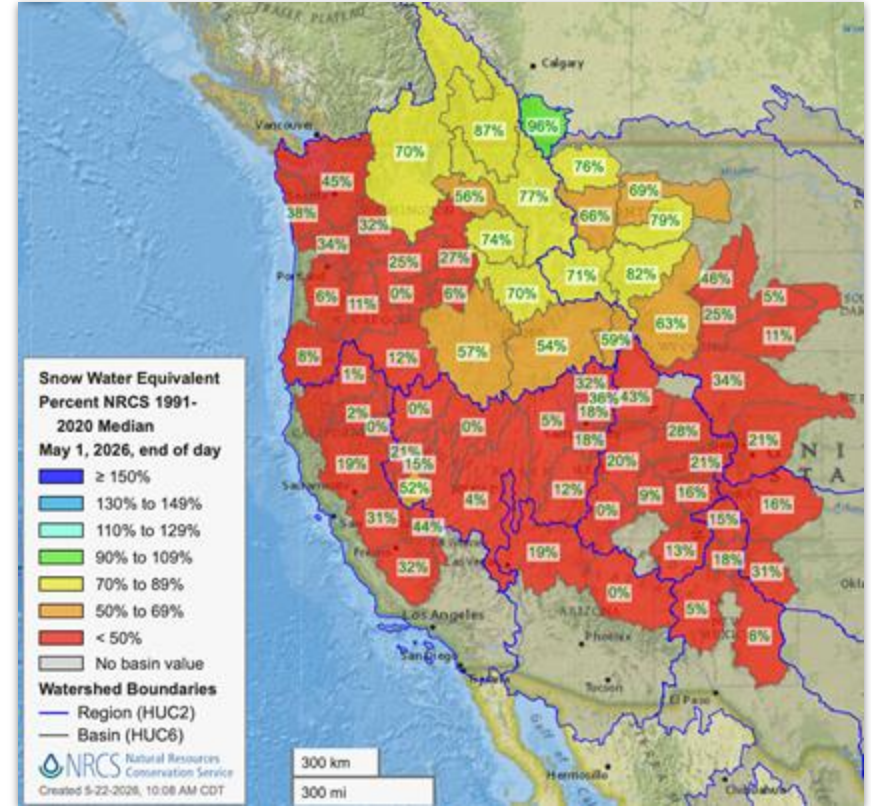
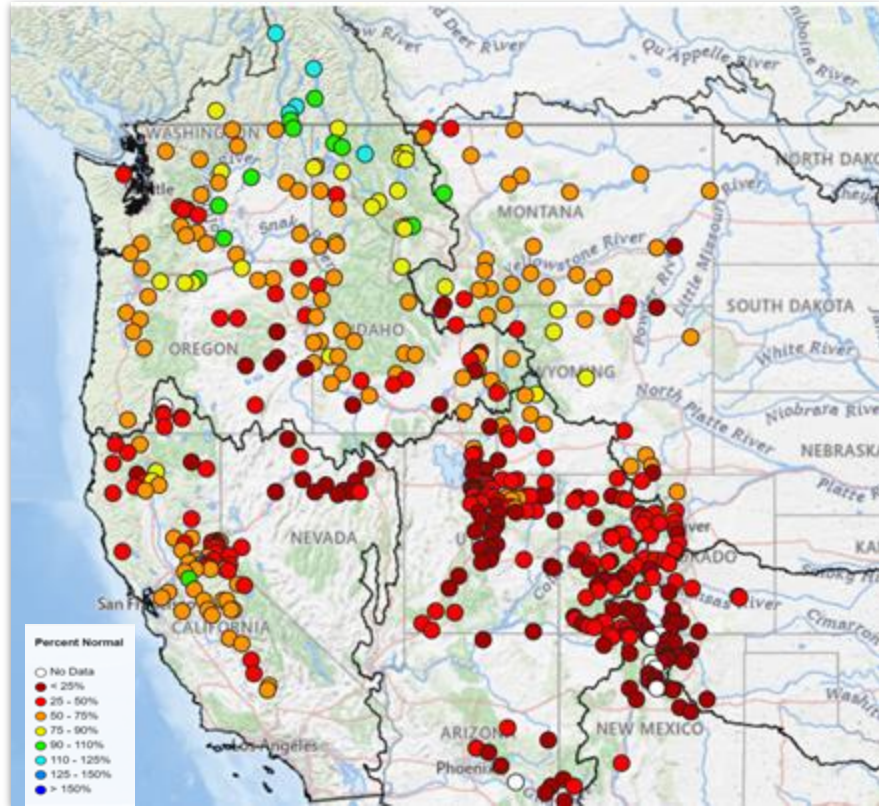


The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

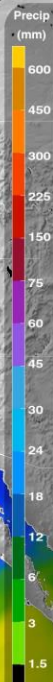
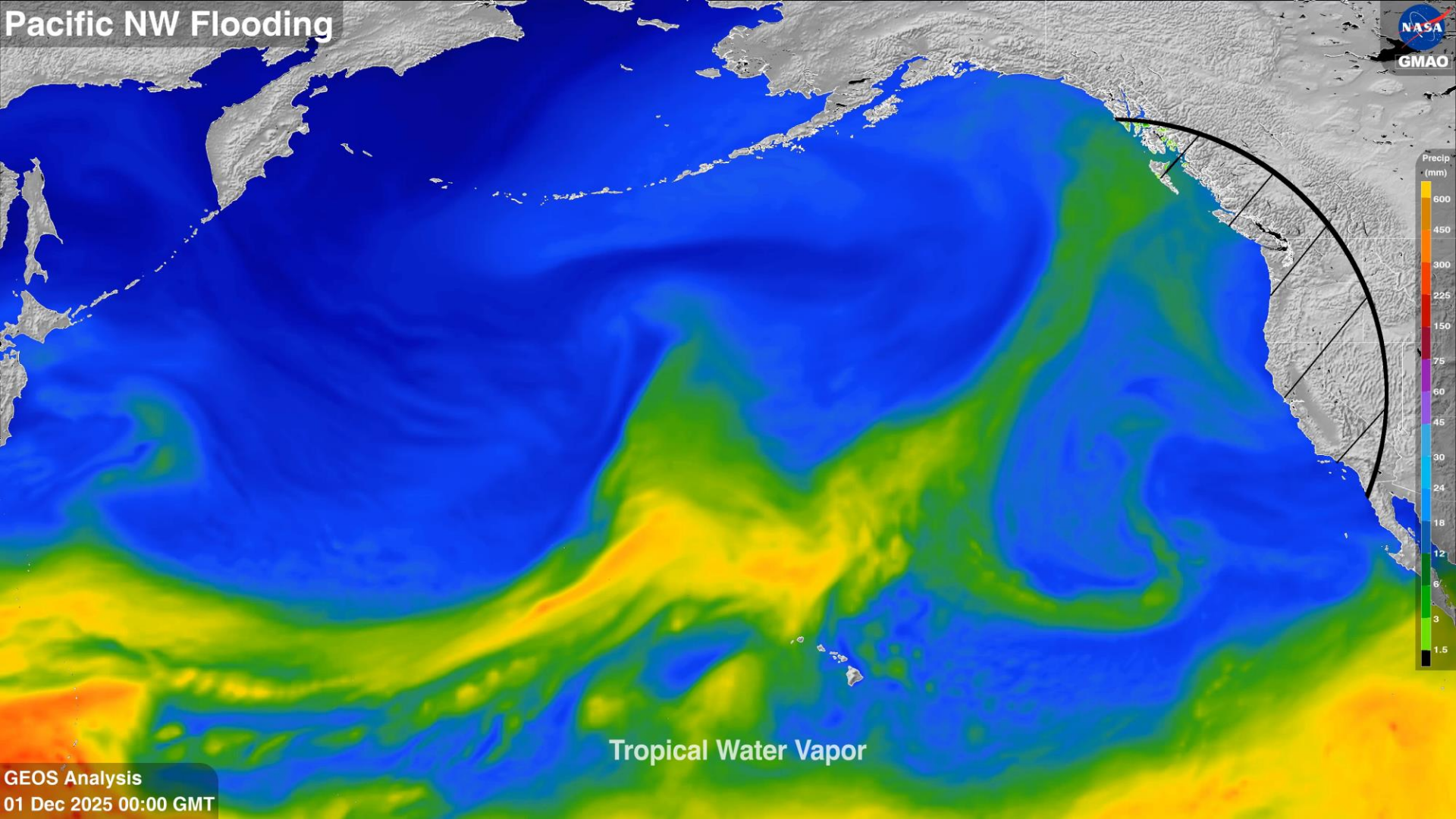


droughtmonitor.unl.edu

Drought | Colorado River Crisis



Pacific NW Flooding



Tropical Water Vapor

GEOS Analysis
01 Dec 2025 00:00 GMT



The Need for Ensembles Everywhere

The Central Call to Action

Move toward ensemble-based water prediction across all hydrologic forecasts—not just flooding, but everything.

Comprehensive Hydrologic Focus

- Floods & Water Supply
- Reservoir Operations & Navigation
- Drought Response & Hydropower
- Agriculture

Stakeholders Already Lead the Way

Decision-makers already operate probabilistically:

USACE & Reclamation: Managing complex infrastructures.

Utility Companies: Balancing supply and demand.

Insurance: Quantifying risk and consequence.

Actuarial Hydrology

Tying risk characterization directly to consequence. Forecasting must align with the reality of economically defensible, risk-informed operational decisions.



Bridging the gap between operational hydrology and stakeholder risk reality.

How CIROH Supports the Enterprise

Experimental NWM v4

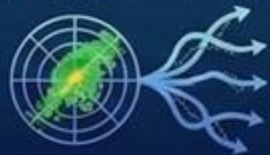


AI/ML Hydrologic



Models

WoFS Driven Ensembles



Multi-Model FIM, TWL and Depth Predictions



NextGen in a Box



AWIPS in the Cloud

NWPS and Water Supply



Likelihood FIM



δ
Models



Upstream Tech
CRADA



FIMPact
(Buildings, Bridges, Roads)

A New Operational Paradigm

The grand challenge before us is not simply improving forecasts.
It is making uncertainty operationally usable.

The Pillars of Trust

- **Forecasters**
Must trust the systems.
- **Operators**
Must trust the probabilities.
- **Stakeholders**
Must trust the consequences being communicated.

Evolving Together

Trust only emerges when the research community and operational community evolve together.

CIROH has helped create exactly that kind of ecosystem.



Fostering collaboration between research and operations for a trusted future.



OWP | OFFICE OF
WATER
PREDICTION



Thank You!



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<https://water.noaa.gov>