

Welcome!

Three Minute Thesis Webinar on Drought

September 9, 2022



Regional Collaboration Network

Improving NOAA's service to the Nation through collaboration

Three Minute Thesis Webinar Outline

Welcome and Overview

The National Integrated Drought Information System: Not Your Typical Dry Topic - Veva Deheza

NOAA Funding for Drought Research - Molly Woloszyn

Implementing the NIDIS Tribal Engagement Strategy - Crystal Stiles

Audience Questions

U.S. Drought Monitor - Adam Hartman

Indicators, Information, Impact - Christa Peters-Lidard

NOAA Climate Prediction Center Drought Outlooks – Hailan Wang

Audience Questions

Flash Droughts - Jason Otkin

California Water, Drought, and Salmon Recovery - Evan Sawyer

Precipitation and Temperature Extremes within the Southwest Megadrought - Andy Hoell

Audience Questions

Webinar Concludes / Brief Survey

The National Drought Information System: Not Your Typical Dry Topic

Veva Deheza



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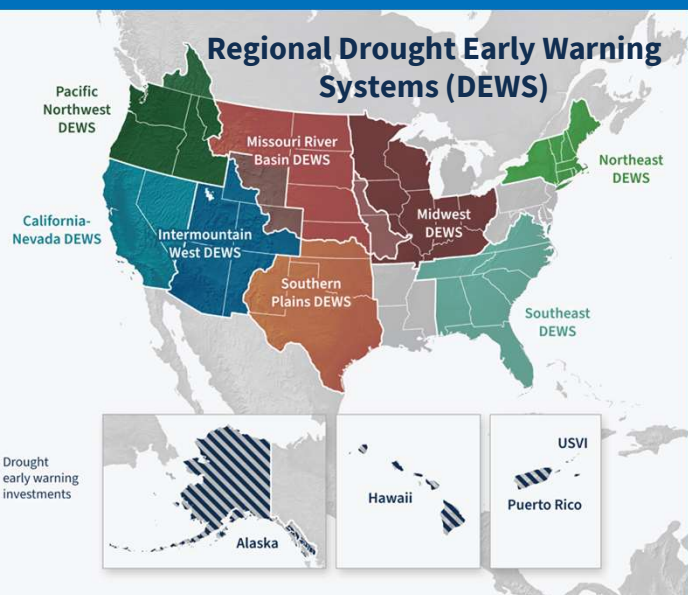


National Integrated Drought Information System

Advancing Drought Science and Preparedness Across the Nation



Monitoring · Prediction · Communication · Research · Planning



DROUGHT STATUS UPDATE August 29, 2022

Southern Plains Drought Status Update

DEWS Regions: Southern Plains
States: Kansas, New Mexico, Oklahoma, Texas
Update Status: NIDIS and its partners will issue further drought status updates as conditions evolve.

July 28, 2022

Share This Update

NATIONAL INTEGRATED DROUGHT INFORMATION SYSTEM

Dry Times

Drought and Heat in the West and Southern Plains

The West and Southern Plains are both facing drought and heat crises. Impacts are spreading, affecting agriculture, water supplies, energy production, and more.

Stay Connected!

Sign Up for NIDIS Newsletters

★ RETWEET @DroughtGov to tell the story of drought across the Nation ★

NIDIS Drought.gov @DroughtGov Follows you

NOAA's National Integrated Drought Information System (NIDIS). Follow us for info, outlooks, resources & research about #drought

📍 Boulder, Colorado 🌐 drought.gov 📅 Joined July 2012

838 Following 12K Followers

Drought.gov

National Integrated Drought Information System

NOAA Funding for Drought Research

Molly Woloszyn



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NOAA Funding for Drought Research



Competitive Research Opportunities

Coping with Drought Research Competition

60+ *Projects since 2007*

\$9M *Funding provided for FY20 & FY22*

FY22 *Tribal Resilience & Ecological Drought*

Modeling, Analysis, Predictions, and Projections (MAPP) Program

50+ *Drought projects since 2011*

*For every **\$1** of NIDIS funds, MAPP funds an add'l **\$1.55** in research advancing NIDIS goals*

Regional and State Research Projects

Support **co-production of applied research** to address stakeholder needs.

RESEARCH to ACTION

Implementing the NIDIS Tribal Engagement Strategy

Crystal Stiles



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Implementing the NIDIS Tribal Engagement Strategy

Hiring a Tribal Engagement Coordinator



Holding a Funding Competition
“Coping with Drought: Building
Tribal Drought Resilience”



Conducting a Northern
Plains/Missouri Basin Tribal
Drought Webinar Series

Ensuring Tribal Input into the
2020-21 U.S. Northern Plains-
Canadian Prairies Drought
Assessment



Photo by Dennis Longknife

Questions?

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U.S. Drought Monitor

Adam Hartman



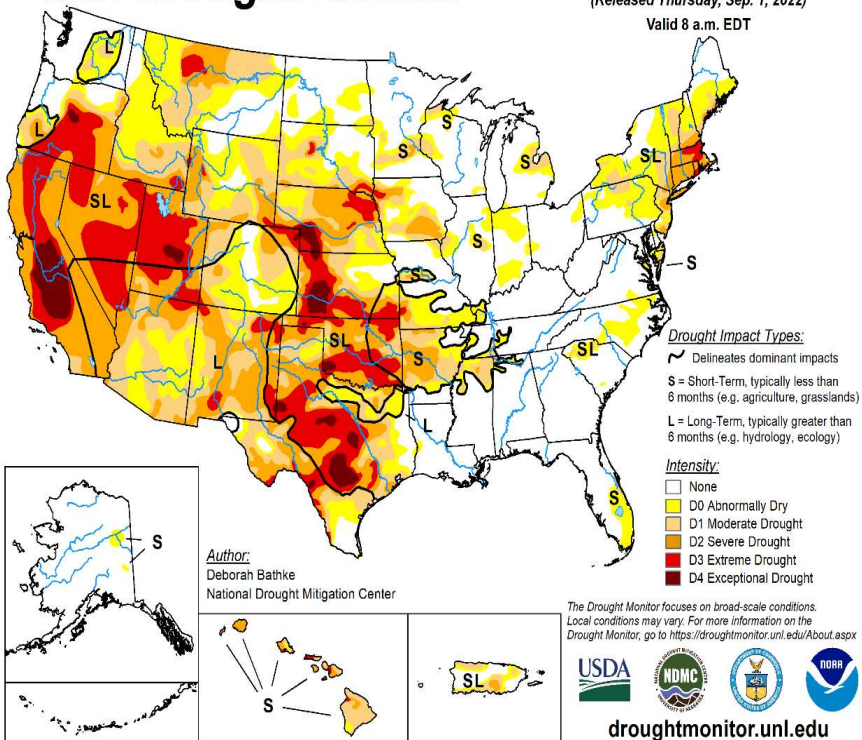
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U.S. Drought Monitor

U.S. Drought Monitor

August 30, 2022
(Released Thursday, Sep. 1, 2022)
Valid 8 a.m. EDT



What is the U.S. Drought Monitor?

A weekly map depicting parts of the U.S. that are in drought, released every Thursday. **It is NOT a forecast.**

Who uses it?

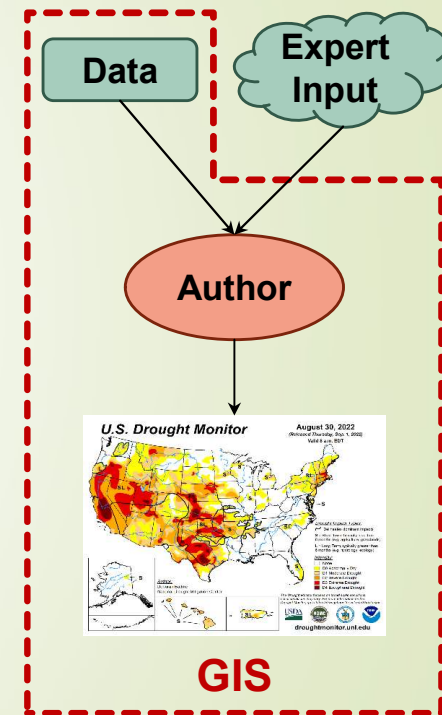
National, state, local, and tribal governments and authorities.

Who draws the map?

Several authors from the NDMC, NOAA, and USDA who typically take turns, usually two weeks at a time.

Who/What informs where drought designations are drawn?

Authors receive input from experts nationwide and use scientific data and a **convergence of evidence** approach when performing analyses.



Indicators, Information, Impact

Christa Peters-Lidard



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Indicators, Information, Impact

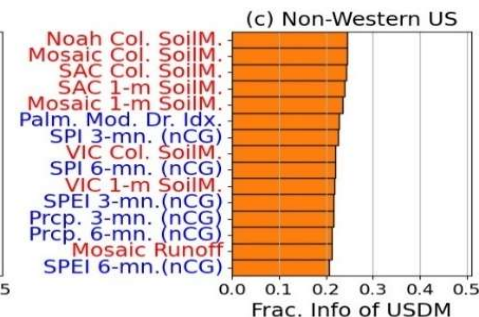
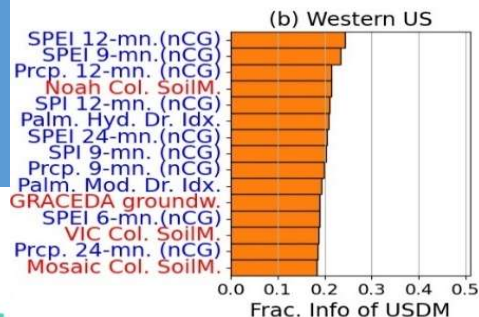


Indicators are variables or parameters used to describe drought conditions, e.g., precipitation, temperature, streamflow, groundwater and reservoir levels, soil moisture and snowpack.



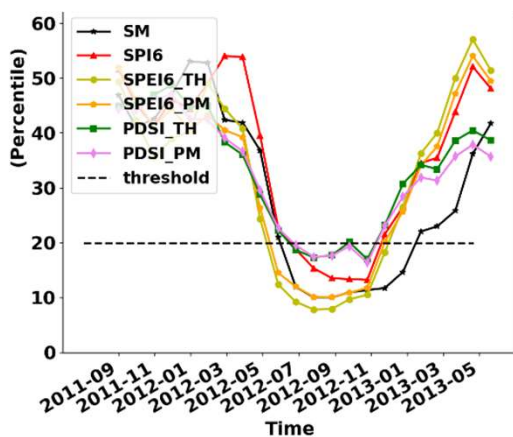
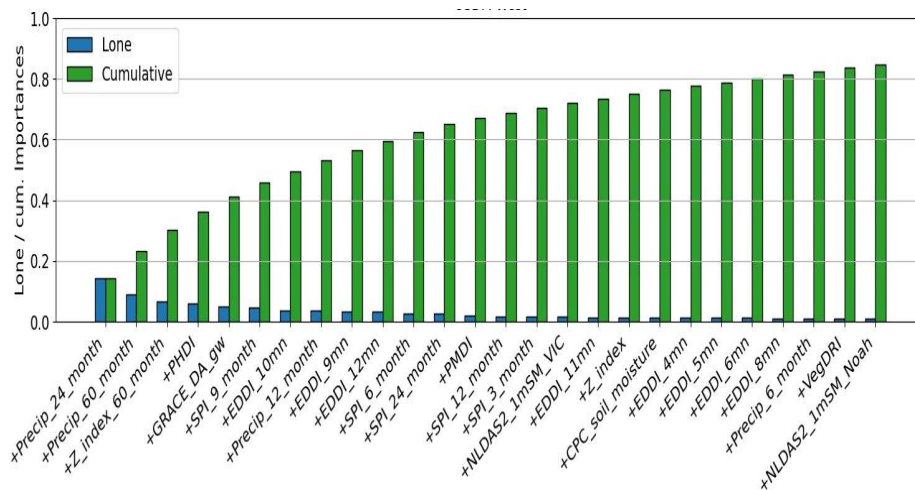
What is an Indicator?

Indicator Importance Varies by Location



Information Content Varies in Time

Combining Indicators Improves Drought Information



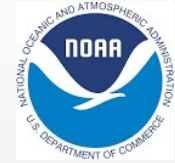
NOAA Climate Prediction Center Drought Outlooks

Hailan Wang



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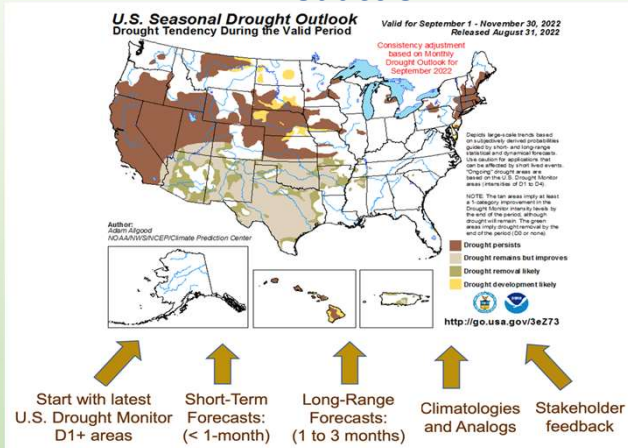


NOAA Climate Prediction Center (CPC) Drought Outlooks (DOs)

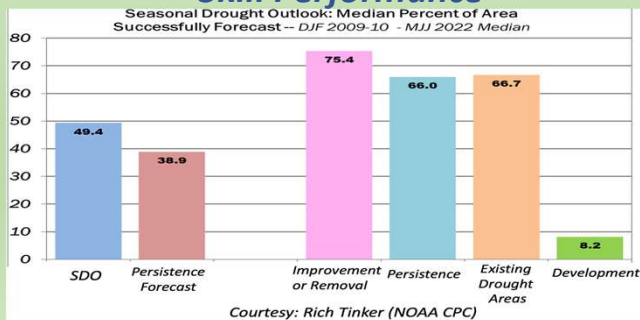


CPC Operational Drought Outlooks

Production



Skill Performance



<https://www.cpc.ncep.noaa.gov/products/Drought/>

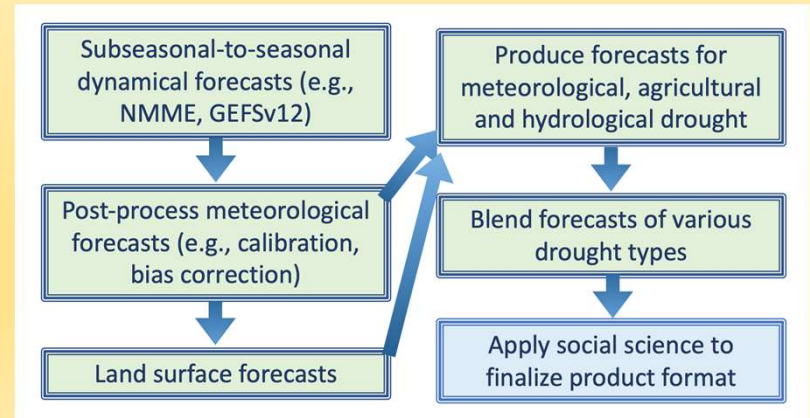
CPC produces Seasonal DO (SDO) and Monthly DO (MDO) each month to predict drought conditions in the upcoming season and month. The DOs

- show drought tendency
- use consistent messaging between SDO and MDO
- are deterministic and subjective
- have the greatest challenge in predicting drought development

CPC is working on making the DOs more objective and automated

New Probabilistic Drought Outlooks

- Under development by CPC and NIDIS
- Include
 - Probabilistic SDO (lead time: 2-6 months)
 - Probabilistic MDO (lead time: 1 month)
 - Probabilistic flash drought outlooks (lead time: 2-5 weeks)
- Sources of probability
 - Chaos in Earth's climate system
 - Uncertainties in forecast tools (e.g., GCMs, LSMs)
- Methodology



Questions?

U.S. Drought Monitor - Adam Hartman

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Flash Droughts

Jason Otkin



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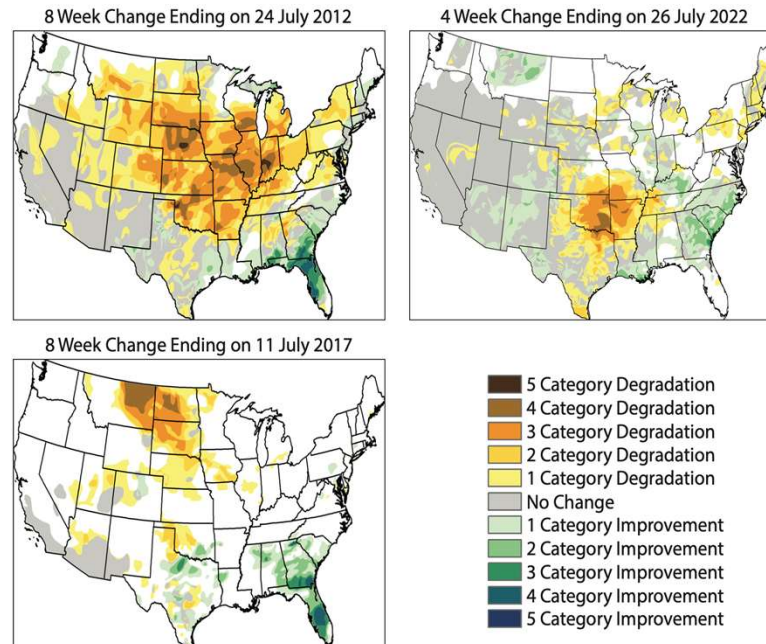
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What are flash droughts? They are a subset of all droughts that are distinguished by their rapid rate of intensification. They are an extreme (rapid intensification) of an extreme (drought).

What causes them? Typically caused by a combination of extreme heat and below normal rainfall.



Native grasslands rapidly browned during the 2012 flash drought in north-central Oklahoma (top panels), compared to the continued greenness in 2014



Changes in the U.S. Drought Monitor during three flash drought events. Some locations went from drought-free to extreme drought conditions in only one or two months.

Accurate monitoring and prediction are vital for flash droughts because their rapid intensification means that there is less time to prepare for their onset and to mitigate their impacts

NIDIS recently formed a Flash Drought Technical Working Group that brings together researchers working on this topic

California Water, Drought, and Salmon Recovery

Evan Sawyer

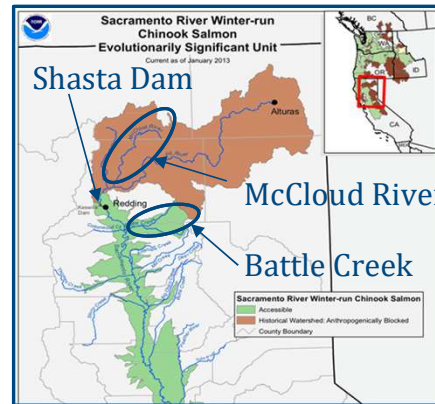
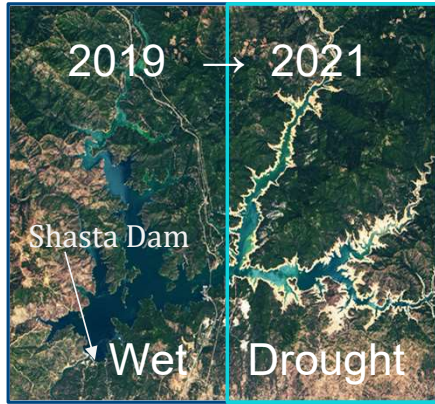
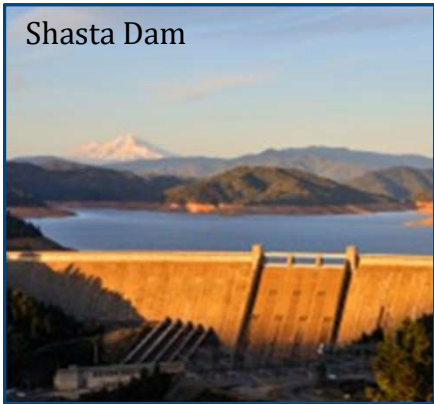


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California Water, Drought, and Salmon Recovery



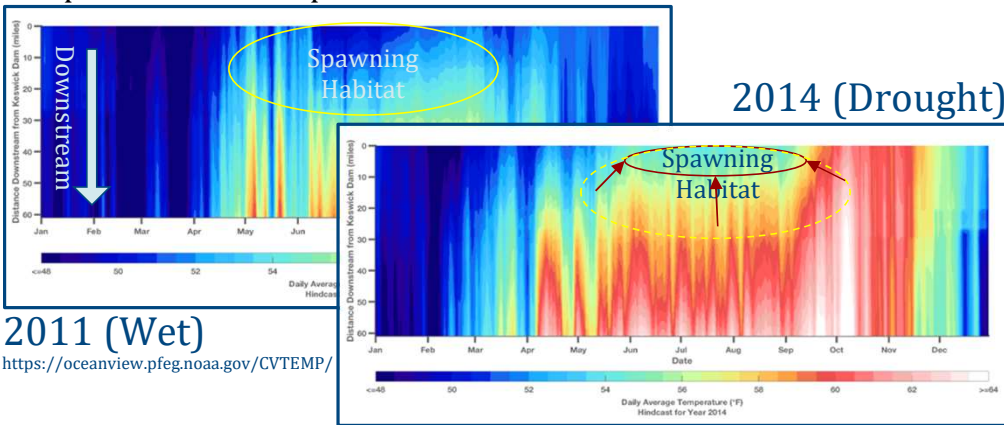
Partners

Results

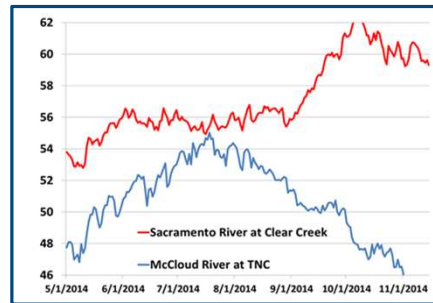
First winter-run Chinook eggs in the McCloud River in 70 years!

Temperature Riverscape

<https://earthobservatory.nasa.gov/>



2011 (Wet)
<https://oceanview.pfeg.noaa.gov/CVTEMP/>



2014 Temperatures **Below** and **Above** Shasta Dam



Precipitation and Temperature Extremes within the Southwest Megadrought

Andy Hoell



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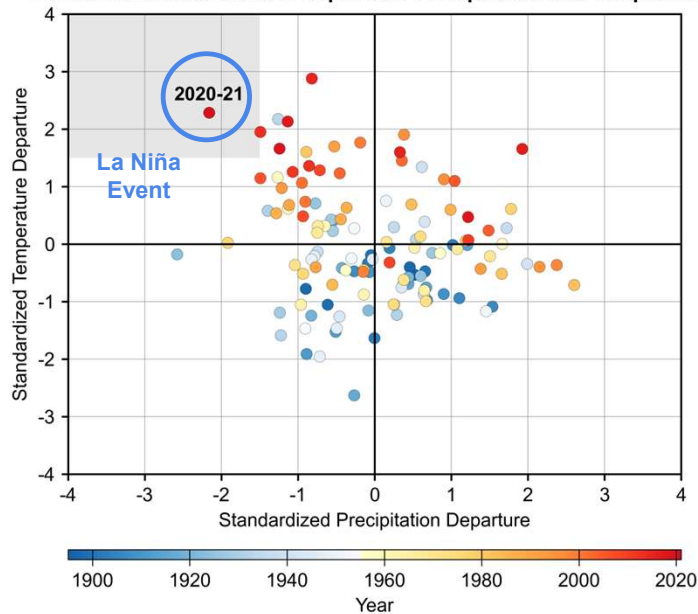
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Climate Change and La Niña Increase the Risk of Compound Heat and Dryness in California and Nevada

October 2020 to September 2021 was the first time since 1895 that observed precipitation fell below -1.5 standardized departures and temperature exceeded 1.5 standardized departures

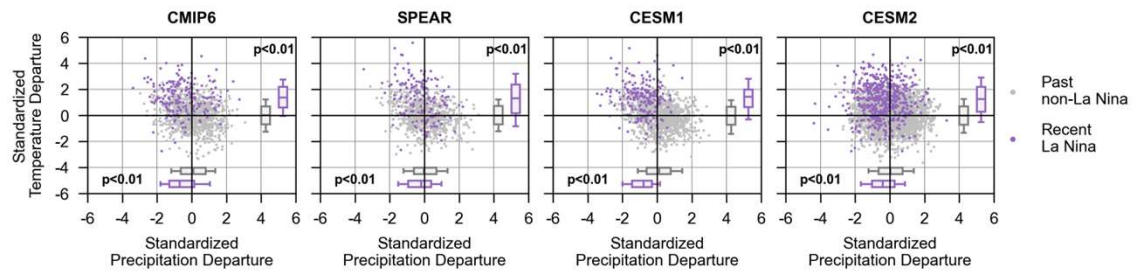
Climate model ensembles indicate that climate change leads to higher temperatures and La Niña leads to lower precipitation

California/Nevada October-September Precipitation and Temperature

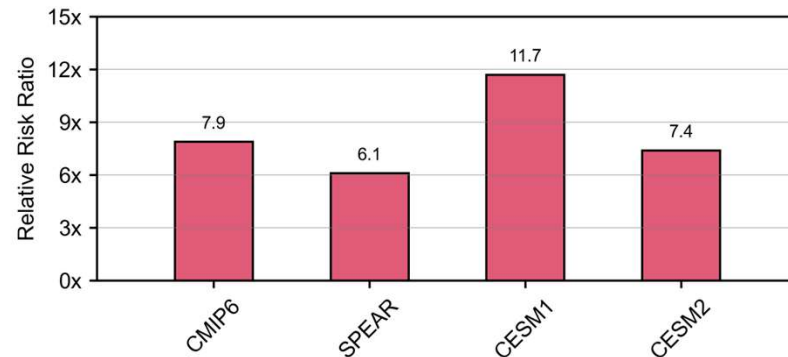


Hoell et al. (2022): Water Year 2021 Compound Precipitation and Temperature extremes in California and Nevada, *BAMS* (in press)

California/Nevada October-September Precipitation and Temperature in a Recent Compared to Past Climate



The joint occurrence of climate change and La Niña led to a 6-12-fold increase in the risk of high temperatures and low precipitation observed in 2020-2021



Questions?

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