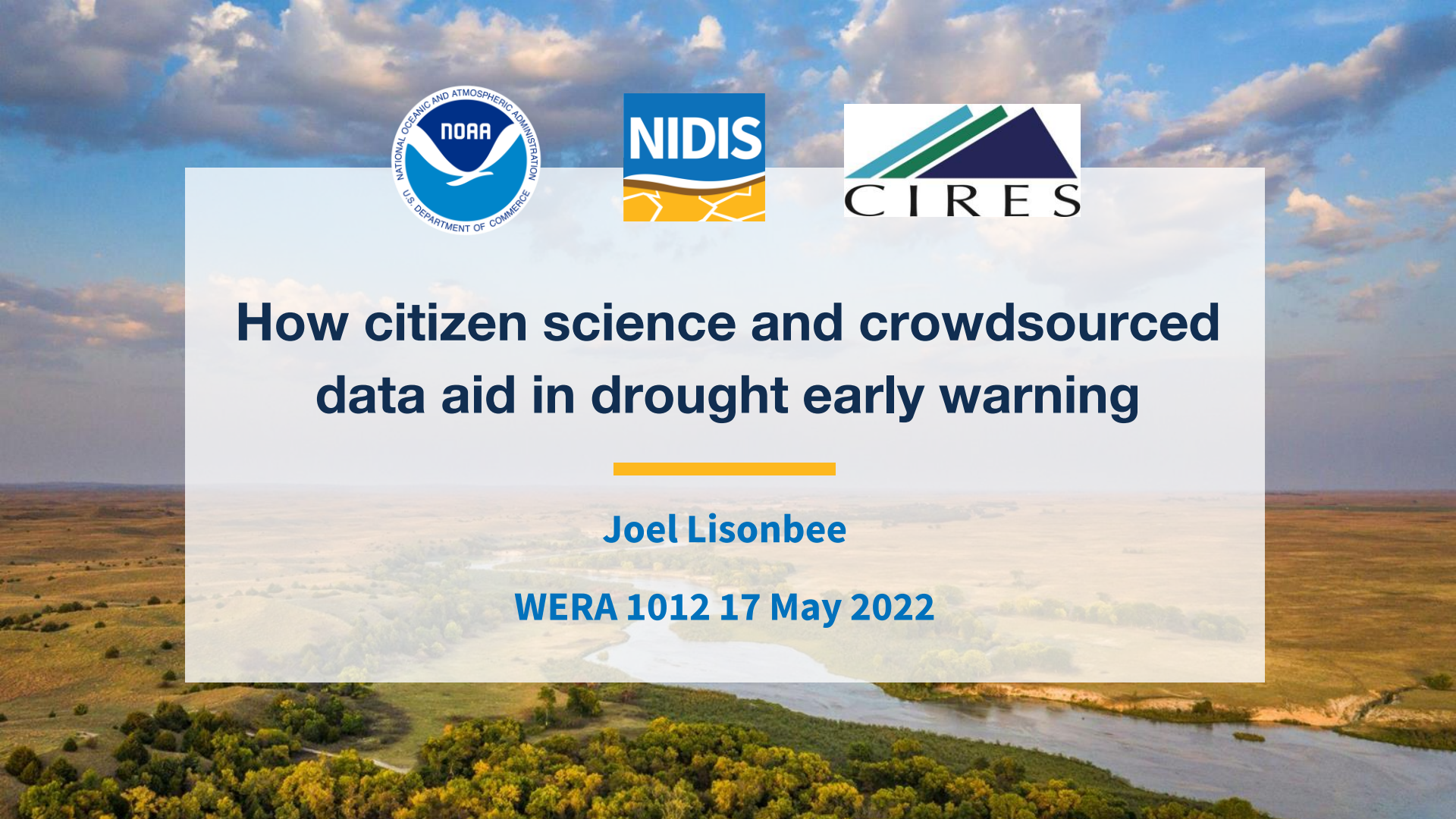


How citizen science and crowdsourced data aid in drought early warning

Joel Lisonbee

WERA 1012 17 May 2022

NATIONAL INTEGRATED DROUGHT INFORMATION SYSTEM (NIDIS)

Overview

- What is NIDIS?
- Drought Early Warning Systems (DEWS)
- Our Citizen Science efforts

Over the last 5 years drought in the US has cost about

$4.1 Billion

each year

What Is NIDIS?

- First authorized by Congress in 2006; reauthorized in 2014 and 2018.
- Interagency mandate to develop and provide a **national drought early warning information system**
- Enable the Nation to move **from a reactive to a more proactive** approach to managing drought risks and impacts
- Authorizes NIDIS to **engage in partnerships** with federal, state, tribal, and local partners, as well as the private sector, academic institutions, and citizen scientists
- 2018 Reauthorization: directs NOAA to develop a strategy for a **national coordinated soil moisture monitoring network**

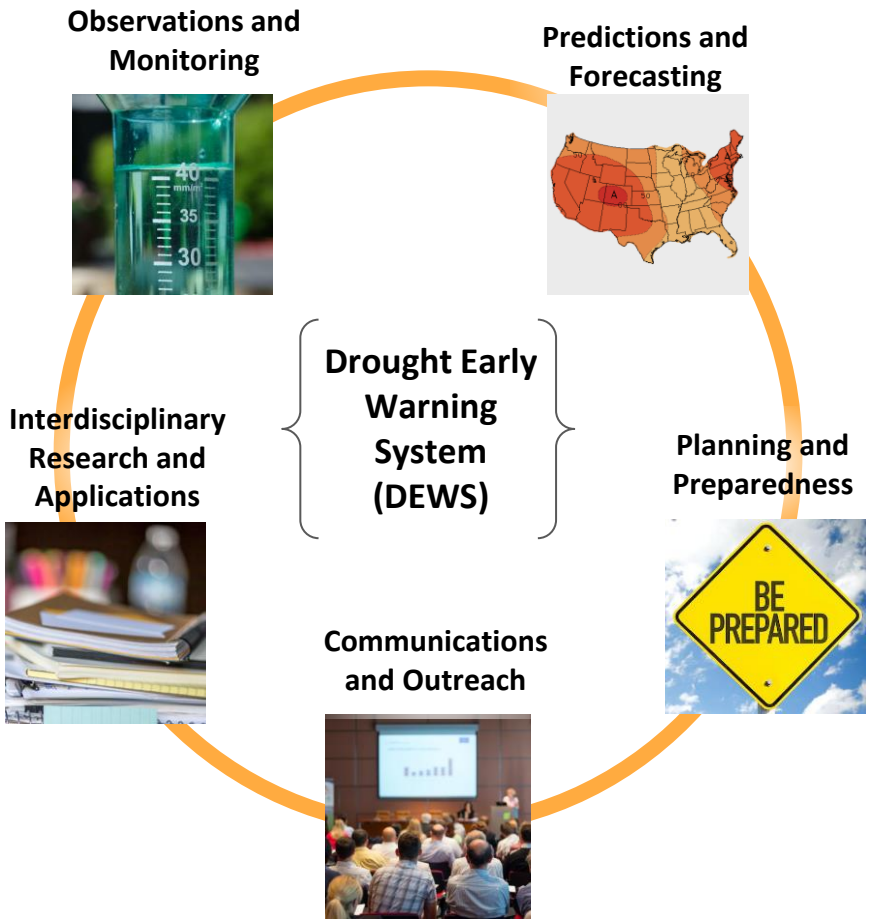
APPROACH

Drought Early Warning System (DEWS)

"A system that collects and i**ntegrates information** on the key indicators of drought in order to make usable, reliable, and timely drought forecasts and assessments of drought.....

...and **communicates drought forecasts, conditions, and impacts** on an ongoing basis to decision makers, the private sector, and the public."

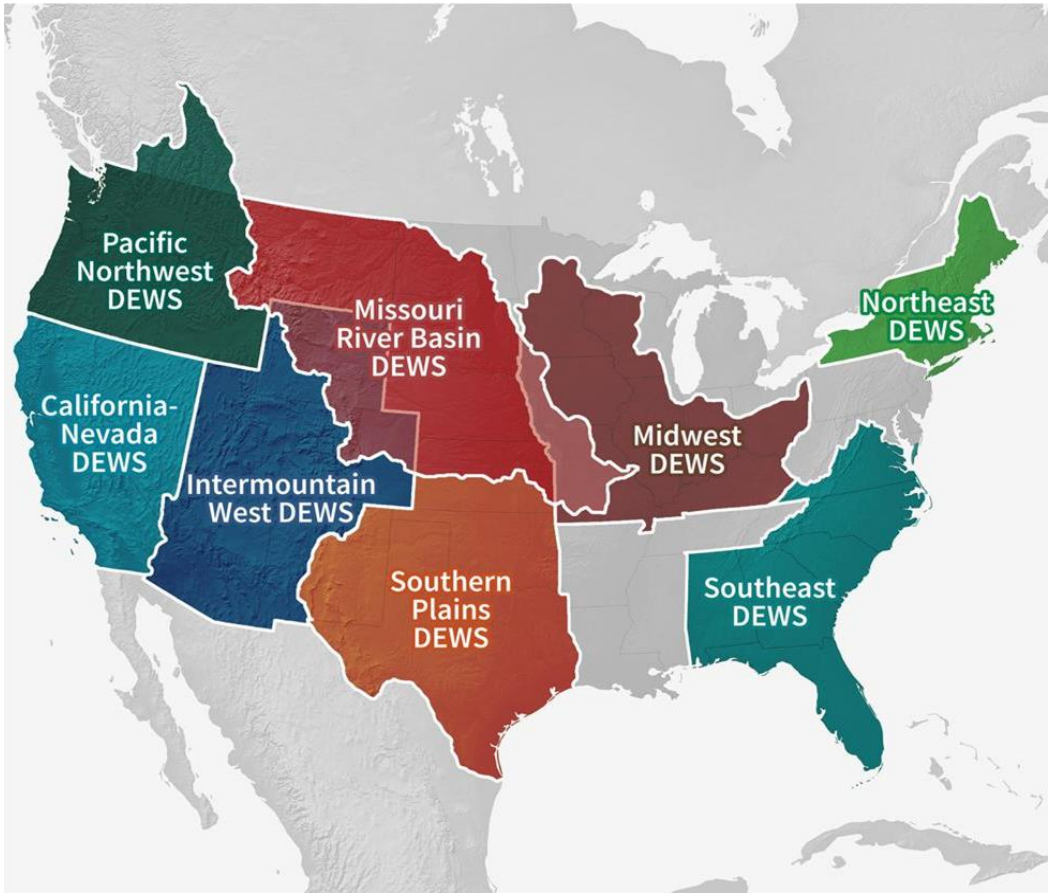
NIDIS Public Law 109-430



REGIONS

Drought Early Warning Systems

A Drought Early Warning System (DEWS) utilizes new and existing networks of federal, tribal, state, local and academic partners to make climate and drought science accessible and useful for decision makers.



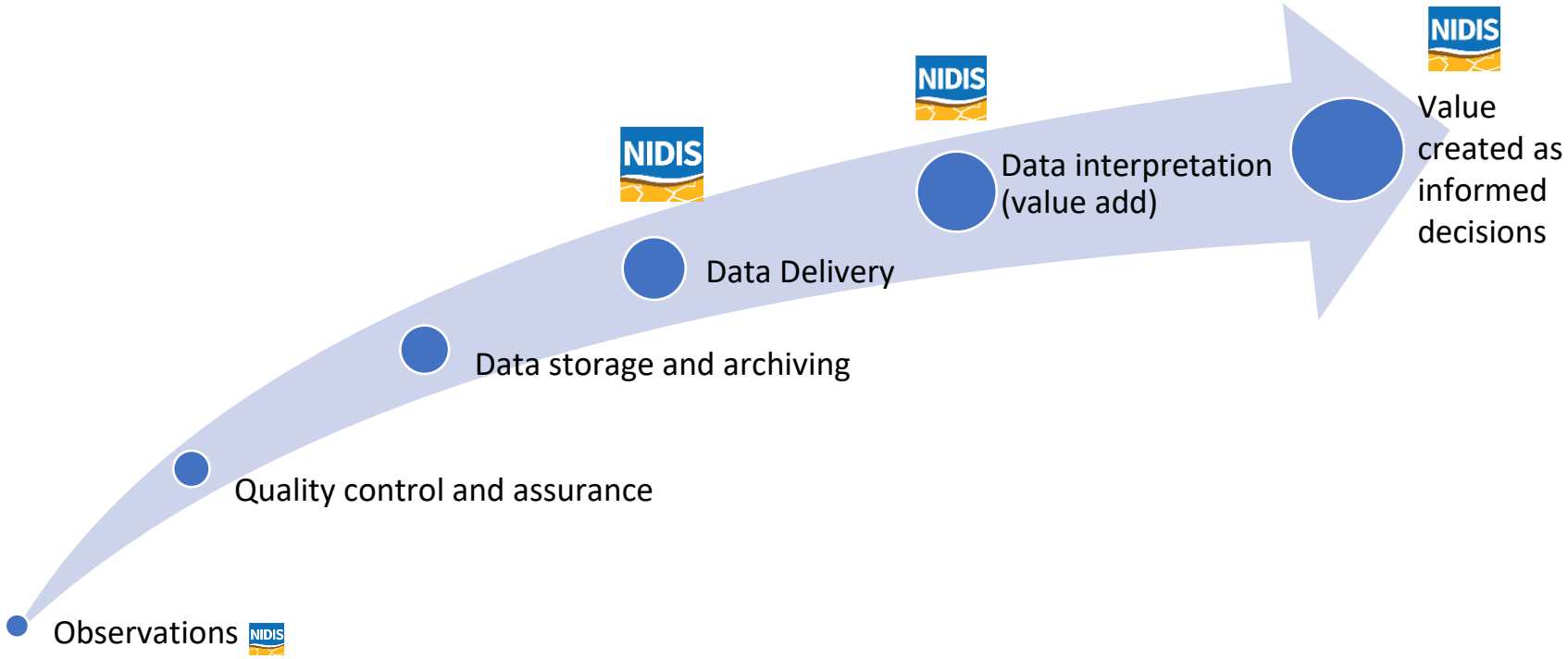
NIDIS DROUGHT + Citizen Science

Public Law No: 115-423 (01/07/2019)
National Integrated Drought Information System Reauthorization Act of 2018

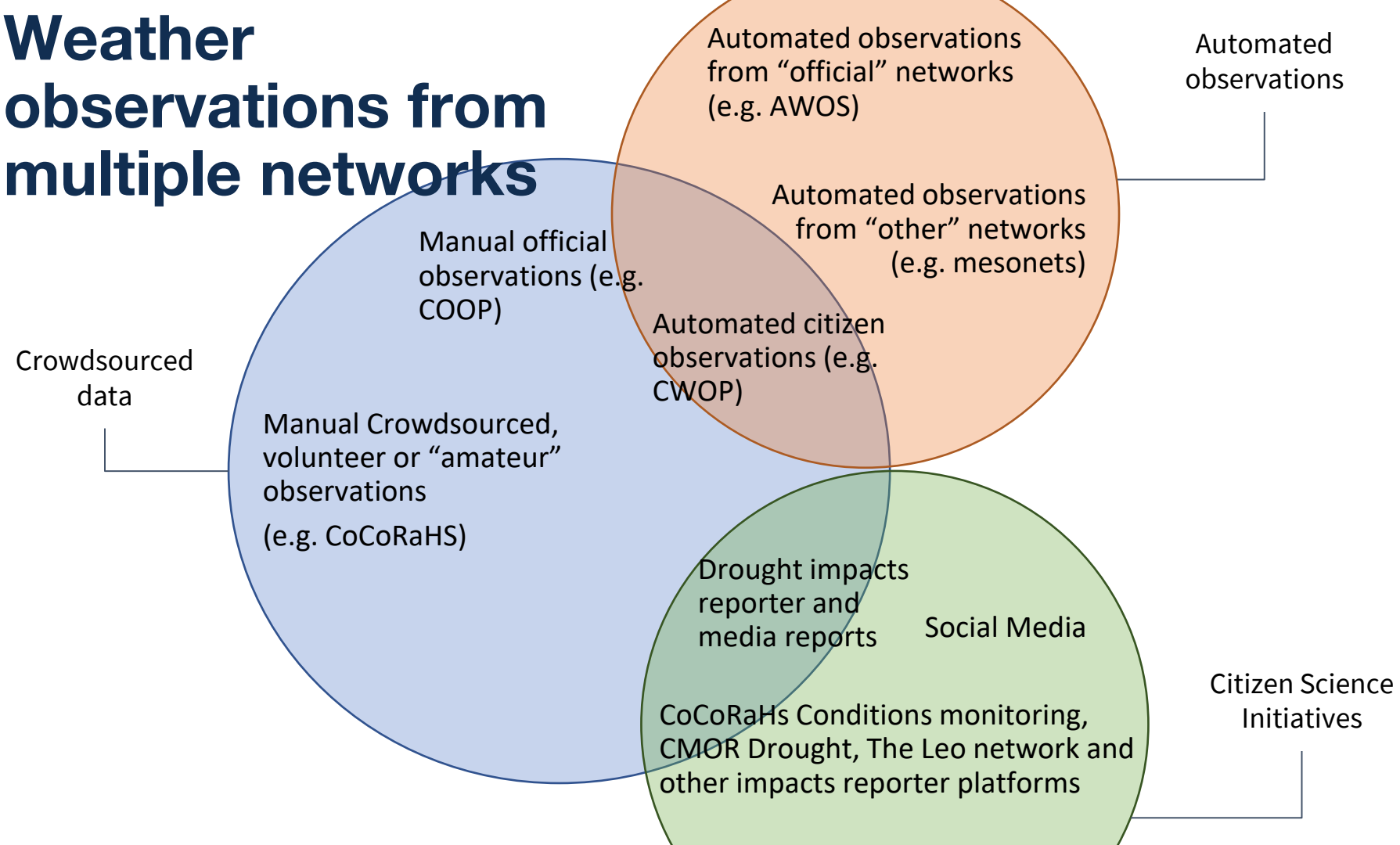
“NIDIS may

- engage with the private sector to improve drought monitoring, forecast, and communication if the National Oceanic and Atmospheric Administration (NOAA) determines such partnership is appropriate, cost-effective, and beneficial to the public and certain decision-makers;
- facilitate the development of academic cooperative partnerships to assist with NIDIS functions; and
- utilize and support monitoring by citizen scientists, including by developing best practices to facilitate maximum integration of data.”

Data Value Chain



Weather observations from multiple networks



How do Citizen Observations help in Drought Early Warning?

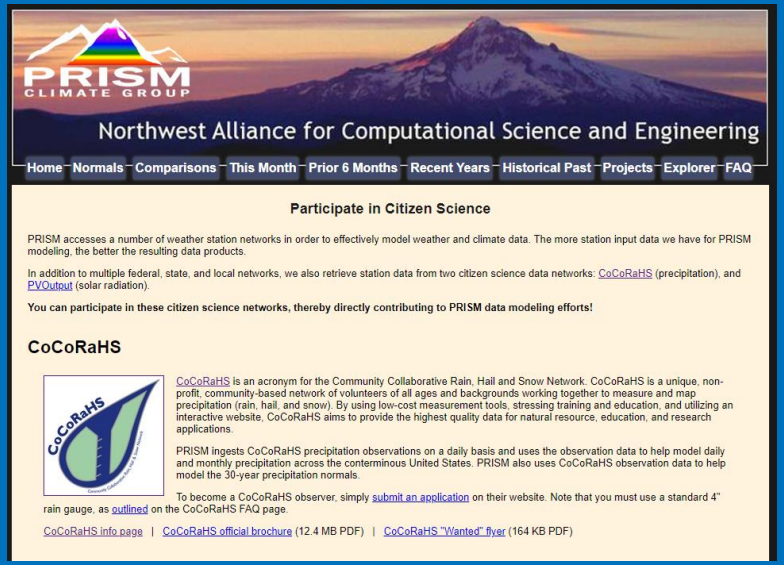
1. More complete data picture

1. Storytelling

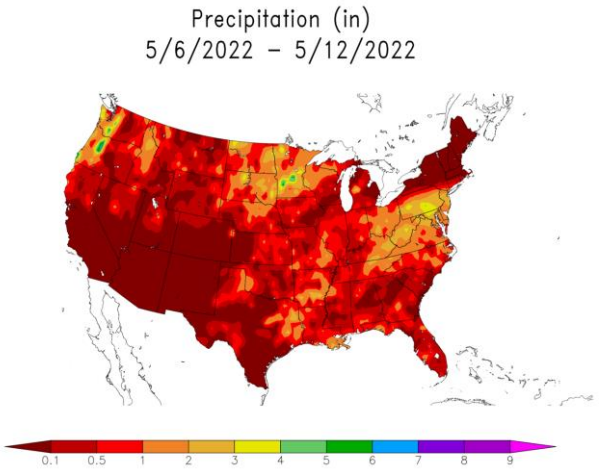
1. Community engagement and ownership of the information

1. Actionable Information

More complete data picture



ACIS



Map Description

Generated 5/13/2022 at HPRCC using provisional data. NOAA Regional Climate Centers

The ACIS Climate Maps are produced daily using data from the Applied Climate Information System (ACIS). Station data in ACIS primarily come from the following networks:

- National Weather Service Cooperative Observer Program (NWS COOP)
- Weather-Bureau-Army-Navy/Automated Surface Observing System (WBAN/ASOS)
- Snow Telemetry (SNOTEL)
- Community Collaborative Rain, Hail, & Snow (CoCoRaHS) Network
- Remote Automatic Weather Stations (RAWS)

For more information, please see the documentation on the ACIS main page.

All near-real-time data are considered preliminary and should be used responsibly. "Normal" refers to the 1991-2020 climate normal for the selected product, for any product generated after May 4 2021. Maps generated before this date use the 1981-2010 climate normal.

HPRCC also produces a GIS suite containing the same data as the maps. For more information, visit our GIS Portal.

Looking for how to cite our climate maps? Check out our Citing HPRCC page.

The Standardized Precipitation Evapotranspiration Index was developed in cooperation with the National Drought Mitigation Center. It uses a log-logistic distribution, with a modified version of Thornthwaite for PET.

More complete data picture

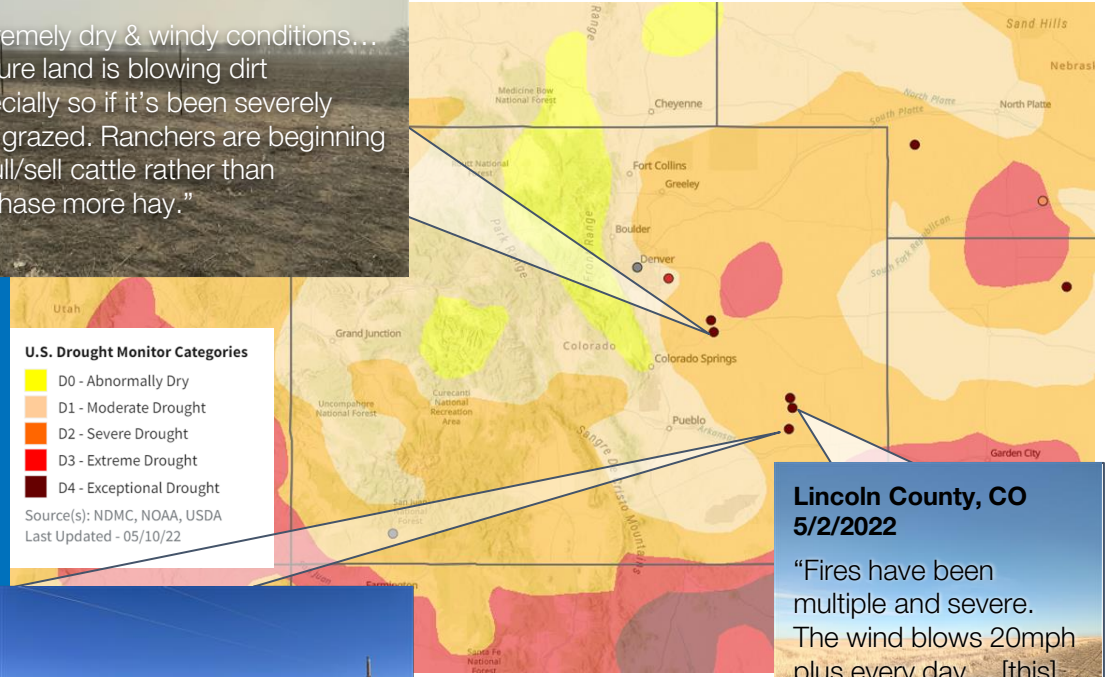
An indication of local changes

Storytelling

Data is great, but storytelling is powerful.

Elbert County, CO
5/12/2022

"Extremely dry & windy conditions… Pasture land is blowing dirt especially so if it's been severely over grazed. Ranchers are beginning to cull/sell cattle rather than purchase more hay."



Bent County, CO
4/15/2022

"Multiple fires…thousands of acres damaged by fire. Miles of fence lost or damaged…dust pneumonia in young cattle…expected irrigation supplies from canals very limited. High winds…"

Lincoln County, CO
5/2/2022

"Fires have been multiple and severe. The wind blows 20mph plus every day… [this] picture shows last year's wheat stubble being filled with blown dirt from this year's wheat crop"

Community Engagement and Information Ownership

A peer-to-peer network for sharing drought resilience best-practices

DLN Sharing Management Practices Team: Drought Management Case Studies
Collaborative Conservation and Adaptation Strategy Toolbox (CCAST)

An Analysis of Drought Exposure, Impacts, and Adaptation in the South-Central U.S.

Rancher to Rancher: Building a Community for Conservation in Montana

(2 page summary)

Decision-Making in Snow-Fed Arid-Land River Systems

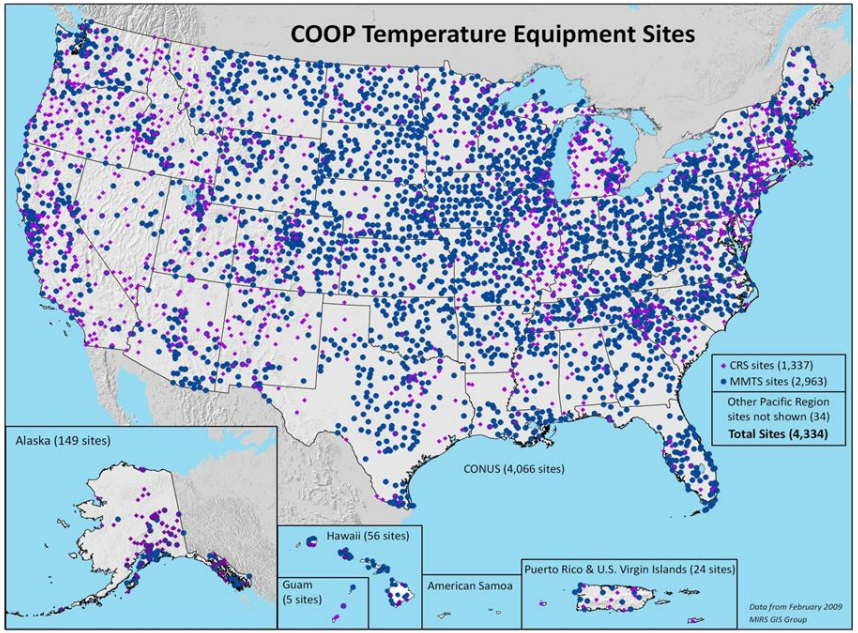
Rangeland Restoration Following the Martin Fire in Reno, Nevada

Developing Tools for Improved Water Supply Forecasting in the Rio Grande Headwaters

Heritage Genetics to Increase Cattle Resilience during Drought

(2 page summary)

Actionable Information



Thank You

For more information, email nidis.program@noaa.gov.

www.drought.gov

@DroughtGov

@DroughtGov

National Integrated Drought Information System