

How citizen science and crowdsourced data aid in drought early warning

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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 integrates 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.”

Observations and Monitoring



Predictions and Forecasting



Interdisciplinary Research and Applications



Drought Early Warning System (DEWS)

Communications and Outreach



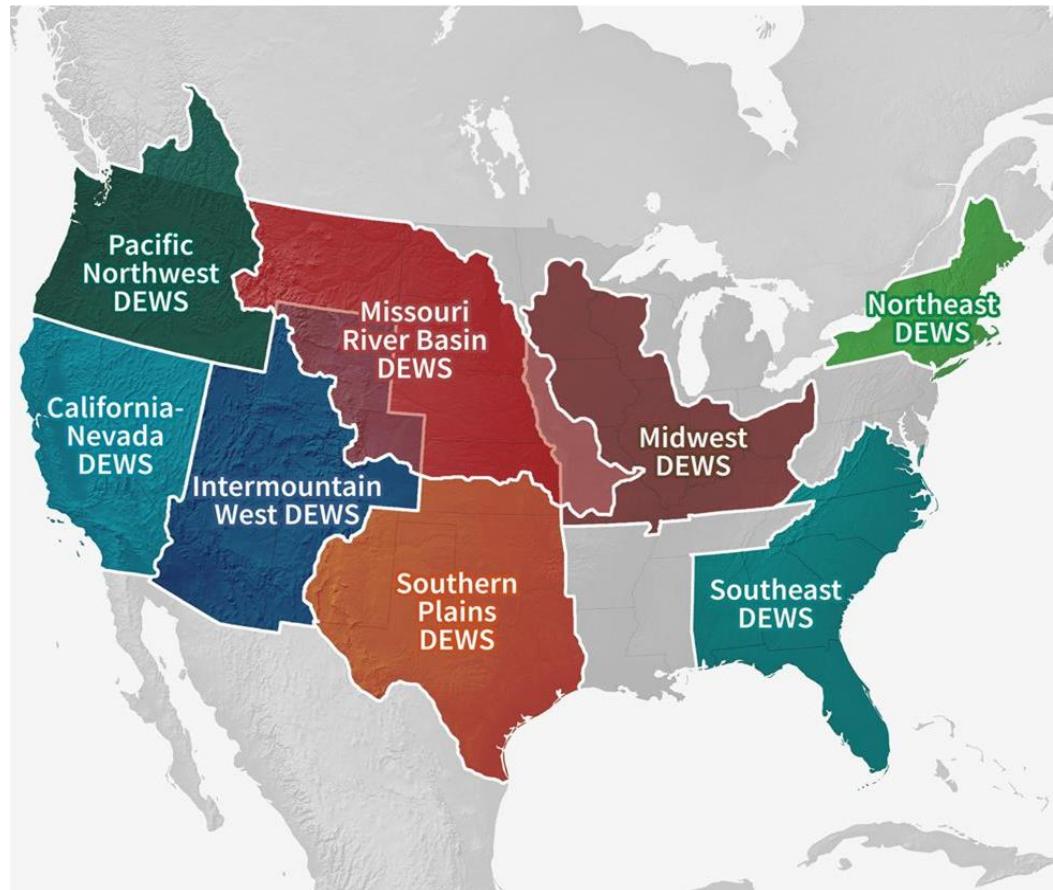
Planning and Preparedness



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)

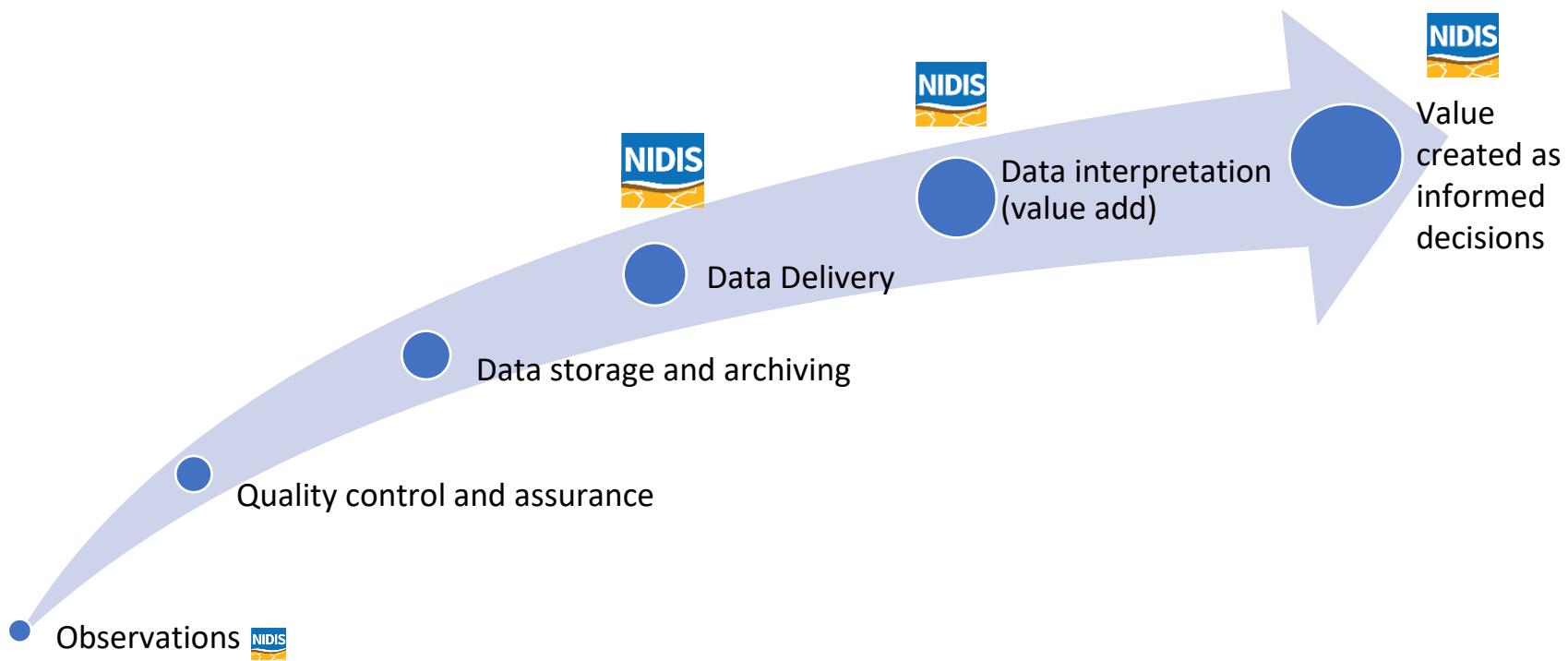
National Integrated Drought Information System Reauthorization Act of 2018

“NIDIS may

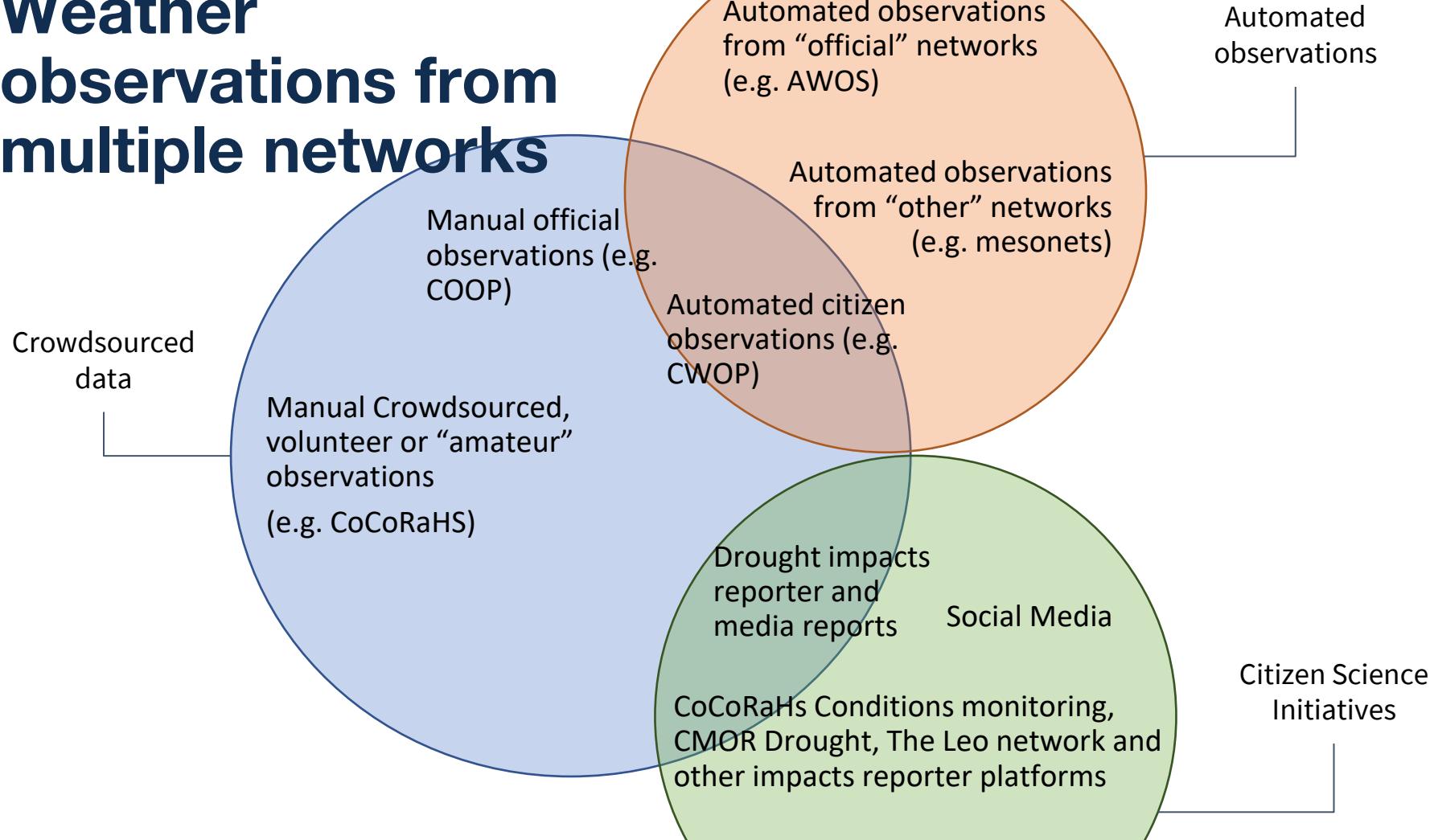
- engage with the private sector to improve drought monitoring, forecast, and communication if the National Oceanic and Atmospheric Administration (NOAA) determines such partnership is appropriate, cost-effective, and beneficial to the public and certain decision-makers;
- facilitate the development 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



PRISM
CLIMATE GROUP

Northwest Alliance for Computational Science and Engineering

[Home](#) [Normals](#) [Comparisons](#) [This Month](#) [Prior 6 Months](#) [Recent Years](#) [Historical Past](#) [Projects](#) [Explorer](#) [FAQ](#)

Participate in Citizen Science

PRISM accesses a number of weather station networks in order to effectively model weather and climate data. The more station input data we have for PRISM modeling, the better the resulting data products.

In addition to multiple federal, state, and local networks, we also retrieve station data from two citizen science data networks: [CoCoRaHS](#) (precipitation), and [PVOutput](#) (solar radiation).

You can participate in these citizen science networks, thereby directly contributing to PRISM data modeling efforts!

CoCoRaHS

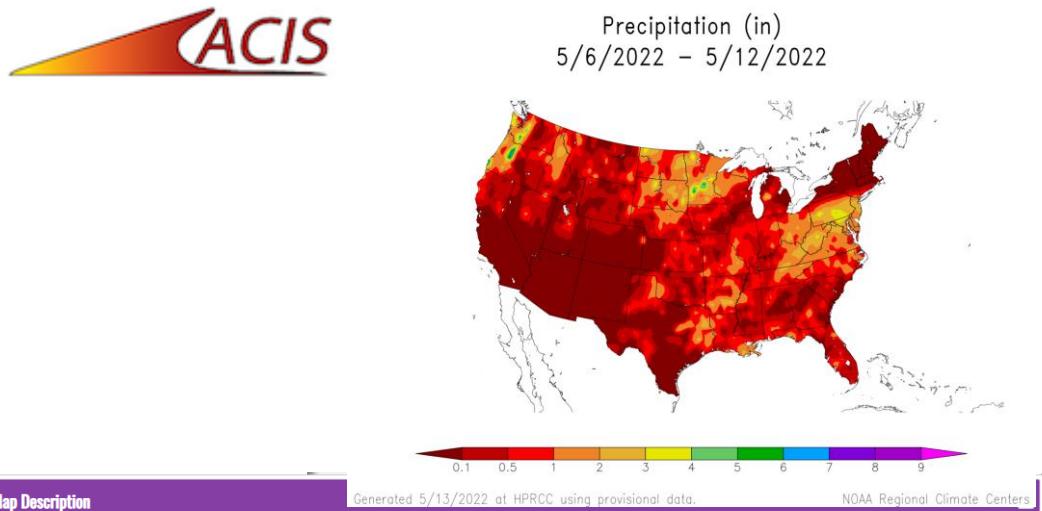


CoCoRaHS is an acronym for the Community Collaborative Rain, Hail and Snow Network. CoCoRaHS is a unique, non-profit, community-based network of volunteers of all ages and backgrounds working together to measure and map precipitation (rain, hail, and snow). By using low-cost measurement tools, stressing training and education, and utilizing an interactive website, CoCoRaHS aims to provide the highest quality data for natural resource, education, and research applications.

PRISM ingests CoCoRaHS precipitation observations on a daily basis and uses the observation data to help model daily and monthly precipitation across the conterminous United States. PRISM also uses CoCoRaHS observation data to help model the 30-year precipitation normals.

To become a CoCoRaHS observer, simply [submit an application](#) on their website. Note that you must use a standard 4" rain gauge, as outlined on the CoCoRaHS FAQ page.

[CoCoRaHS info page](#) | [CoCoRaHS official brochure \(12.4 MB PDF\)](#) | [CoCoRaHS "Wanted" flyer \(164 KB PDF\)](#)



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 (SNOWTELE)
- 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.

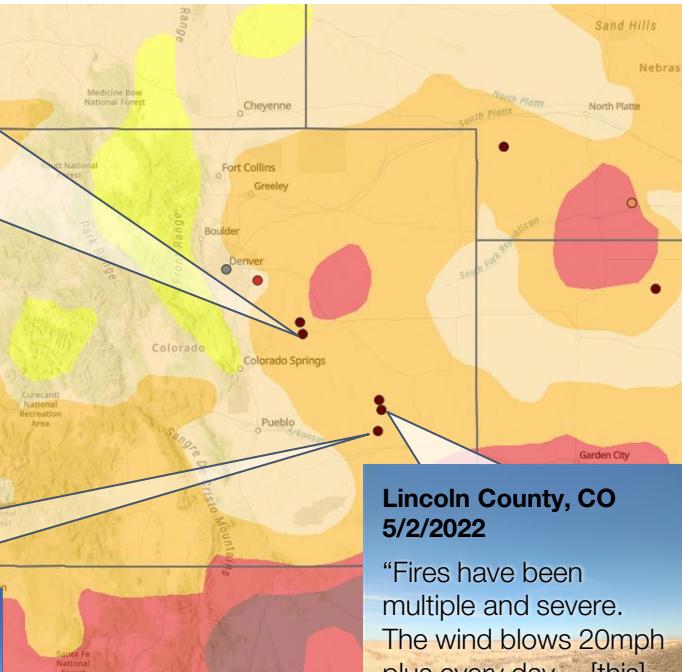
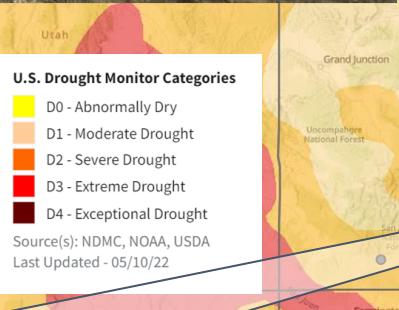
Bent County, CO 4/15/2022

“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...”



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.”

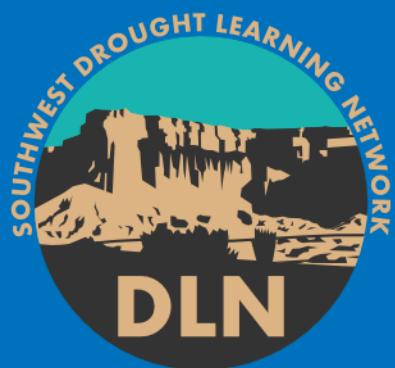


Lincoln County, CO 5/2/2022

“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](#)

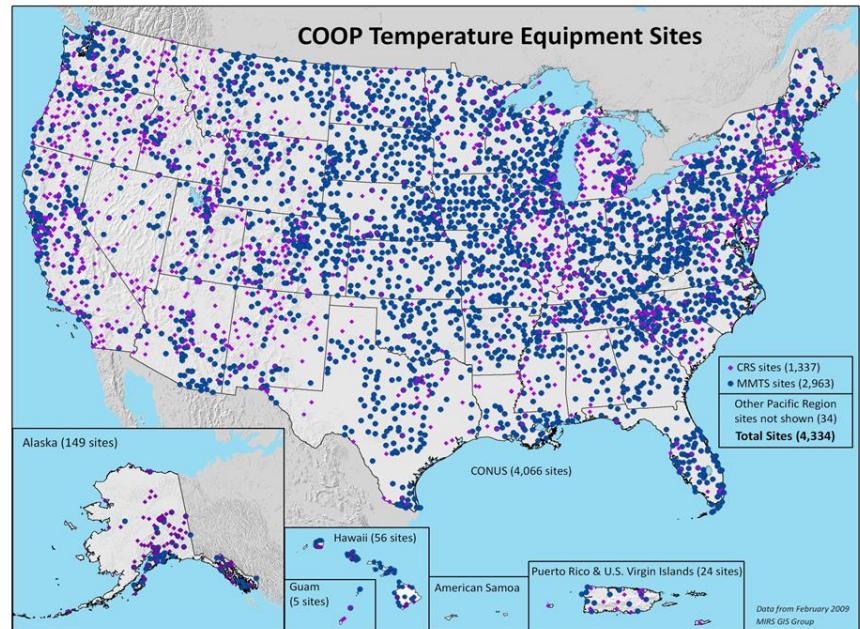
[Developing Tools for Improved Water Supply Forecasting in the Rio Grande Headwaters](#)

[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



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National Integrated Drought
Information System

