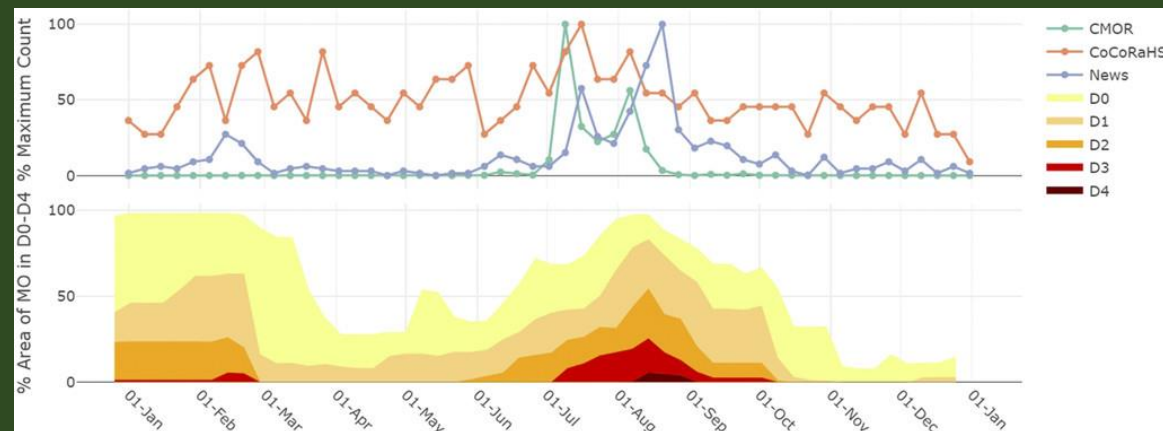


Tracking Drought Impacts – Lessons from the Field

Kelly Helm Smith, Ph.D.

IDMP Virtual Exchange, Dec. 13, 2022



go.unl.edu/MO2018_timeline



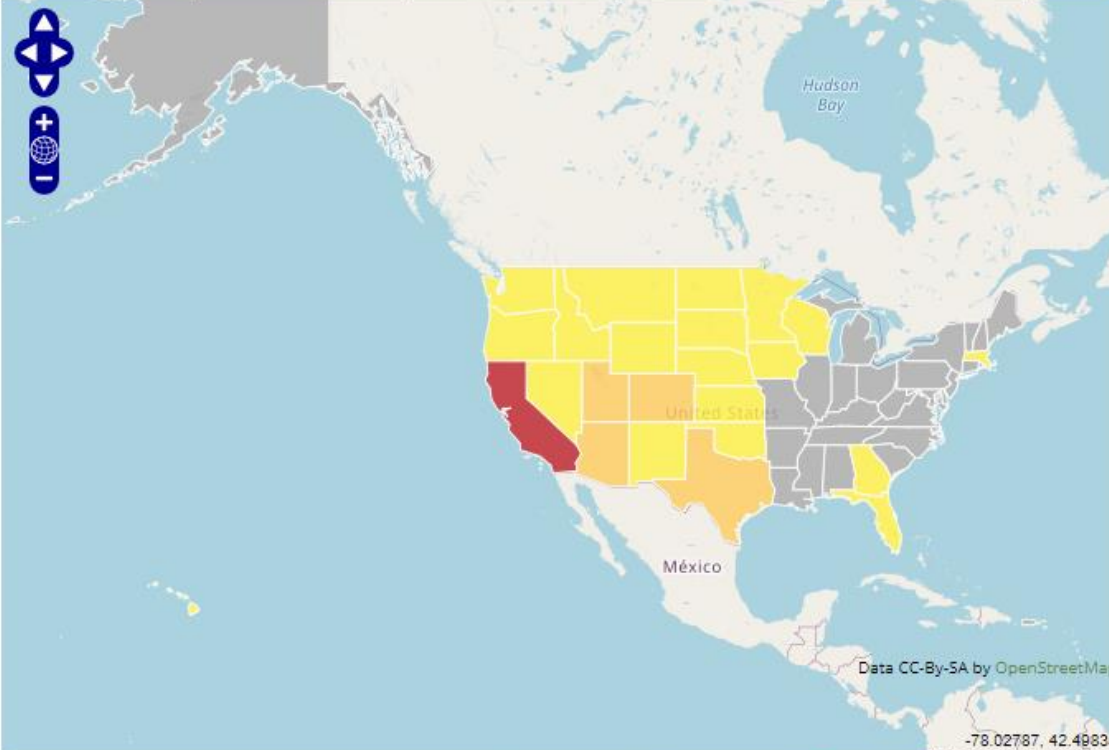
Map

Advanced Search

Submit a Report

About the DIR

Help



All States | 05-15-2022 - 06-15-2022 |

Impact Counts

Impacts List | Page 1/13

Report Counts

Reports List | Page 1/120

County Impacts | All States

127

Category

Agriculture	47	Business & Industry	8
Energy	2	Fire	23
Plants & Wildlife	28	Relief, Response & Restrictions	99
Society & Public Health	14	Tourism & Recreation	15
Water Supply & Quality	88		

Report Source

Media	127
-------	-----

Refresh

Impacts & Reports

Overlays

Scales

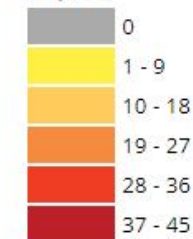
- ☐ National
- ☐ Multistate
- ☐ State
- ☒ County
- ☐ City

Impacts

Opacity

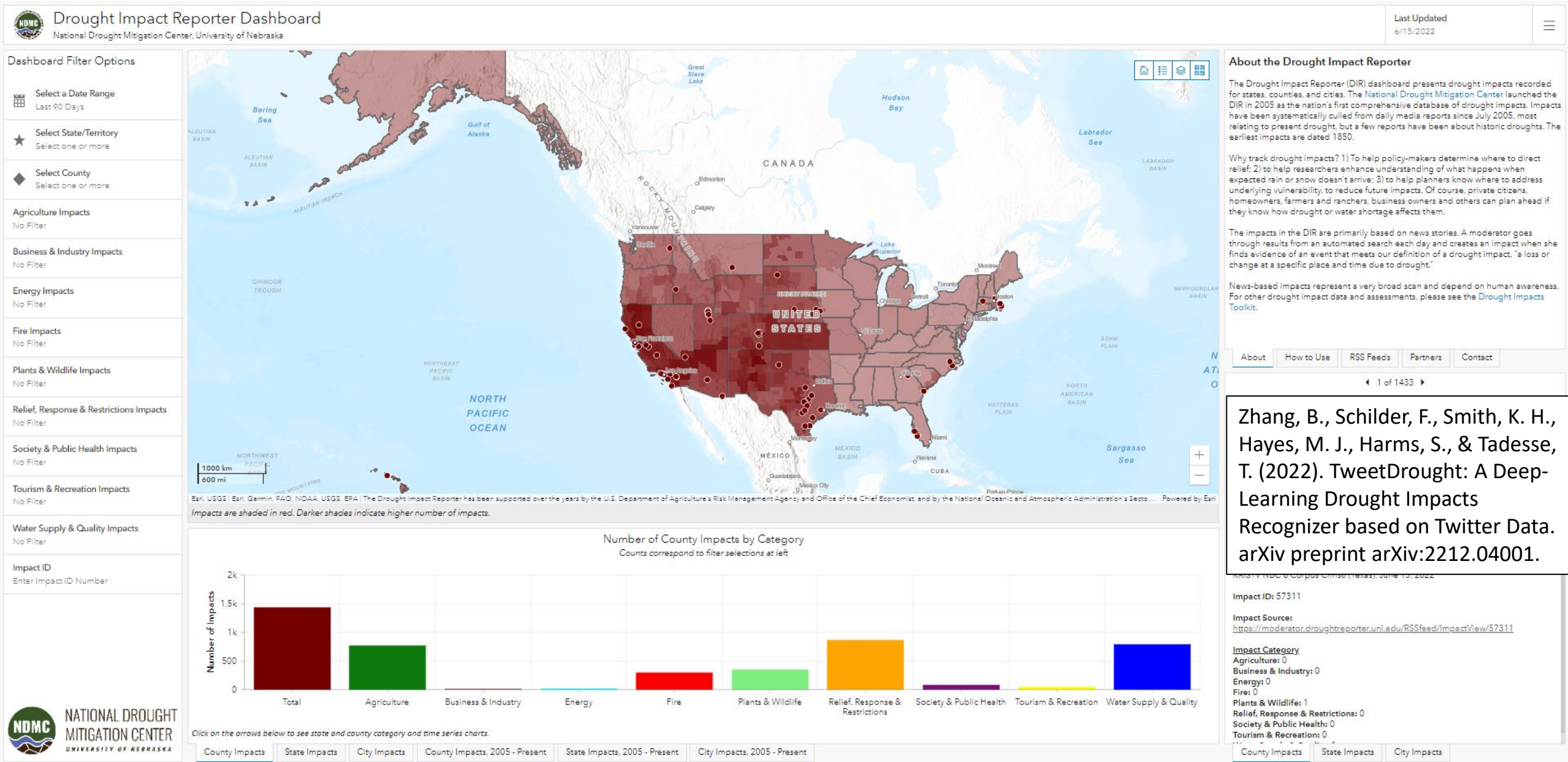
80%

Impacts



Wilhite, D. A., Svoboda, M. D., & Hayes, M. J. (2007). Understanding the complex impacts of drought: A key to enhancing drought mitigation and preparedness. *Water Resources Management*, 21(5), 763–774. <https://doi.org/10.1007/s11269-006-9076-5>

Drought Impact Reporter: go.unl.edu/DIRdash





Tools

Map-based tools track drought impacts:

- The Drought Impact Reporter Dashboard
- Condition Monitoring Observer Reports (CMOR)
- The Visual Drought Atlas
- The Media Drought Index
- Drought Tweets
- CoCoRaHS condition monitoring reports



Emerging Impacts

These resources are regularly updated sources of information on drought impacts or on other environmental conditions that may be related to drought.



Impact Assessments

State agencies, non-governmental organizations and others may conduct post-drought assessments to better understand how drought affected agriculture, health, food security, energy, communities and other areas of interest, and to document responses and outcomes.

Impact Assessments

State agencies, non-governmental organizations and others may conduct post-drought assessments to better understand how drought affected agriculture, health, food security, energy, communities and other areas of interest, and to document responses and outcomes. These assessments are extremely valuable for learning from one drought to the next, but they can be hard to find if you don't know that they are there. This archive is intended to become a permanent repository for post-drought assessments. To recommend additional resources for this list, please email ndmc@unl.edu.

- ### State-level
-
- #### Alabama
- Legislative response to drought, 1955: [Alabama's Water Resources, A Plan for the Creation of a Temporary Commission to Study the State's Water Resources and to Develop a Water Policy for the State](#)
- #### California
- Public Policy Institute of California, August 2015: [What if California's Drought Continues?](#)
- California Legislative Analyst's Office, February 2016: [The State's Drought Response](#)
- University of California-Davis, August 2015: [Economic Analysis of the 2015 Drought for California Agriculture](#)
- Pacific Institute, February 2016: Impacts of California's Ongoing Drought: [Hydro-electricity Generation 2015 Update](#)
- California Natural Resources Agency, 2021: [Report to the legislature on the 2012-2016 drought](#)

- ## Emerging Impacts
- The resources below are regularly updated sources of information on drought impacts or on other environmental conditions that may be related to drought. To recommend additional resources for this list, please email ndmc@unl.edu.
- ### Ag in Drought web tool
- This tool provides analysis based on which commodity production areas are in drought.
- ### U.S. Army Corps of Engineers Missouri River Basin Water Management News
- Regular press releases from the Corps detail the effects of drought on reservoir storage, releases of water for navigation, and hydropower production.
- ### National Interagency Fire Center
- Not all wildfires are due to drought, but drought can certainly be one of the underlying factors that makes fires more intense or more widespread. The National Interagency Fire Center publishes regularly updated statistics and situation reports.
- ### Crop Comments
- Farmers submit comments on how their crops are doing to Farm Journal's Ag Web. Many of their comments are about the effects of drought.
- ### U.S. Department of Agriculture Reports
- The USDA regularly analyzes and reports on agricultural production, and its myriad reports are archived at Cornell. Search the archive for "drought," or look for the Weekly Weather and Crop Bulletin or Crop Progress Reports.

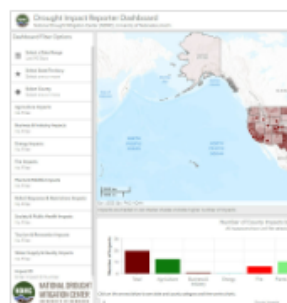
Drought Impacts Toolkit

[Home](#)[Tools](#)[Emerging Impacts](#)[Impact Assessments](#)

Tools

[Home](#) > [Tools](#)

Map-based tools track drought impacts: Condition Monitoring Observer Reports (CMOR), the Drought Impact Reporter, the Visual Drought Atlas, the Media Drought Index, Drought Tweets, and CoCoRaHS condition monitoring reports.



Drought Impact Reporter Dashboard

The Drought Impact Reporter Dashboard and the associated [Archive](#) display media-based drought impacts, which the National Drought Mitigation Center has been systematically collecting and recording since 2005. Our definition of a drought impact is “a loss or change at a specific place and time due to drought,” which encompasses a wide range.

Impacts by state and U.S. Drought Monitor status

The State Impacts tool sorts and displays impacts by state from the Drought Impact Reporter through 2021. Users can filter impacts by U.S. Drought Monitor status, season, weeks in drought, industry and date range. This may provide insight on what to expect when a state is experiencing a certain level of drought.



Condition Monitoring Observer Reports (CMOR)

Submit photos and report drought-related conditions and impacts within the U.S. This is a nation-wide service provided by the National Drought Mitigation Center, based at the University of Nebraska, in partnership with the National Integrated Drought Information System. Information submitted by this form appears on a map and becomes part of a permanent public record. Please note that this form is not part of the process to apply for assistance. To participate, you must legally be an adult, at least 18 years old in most states, 19 in Nebraska or Alabama, or 21 in Mississippi. By submitting information, you agree that it may be used in drought monitoring research. Questions? Please email DIRinfo@unl.edu.

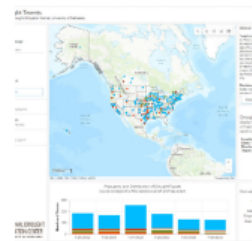
Visual Drought Atlas

Submit landscape photos that help people see what your area looks like in dry, wet and normal conditions. To capture images from different times of year, when volunteers may have a little more time, we especially encourage submissions over President's Day, Memorial Day, July 4, Labor Day. The Visual Drought Atlas map includes the photo archive inherited from the original Field Days project that CoCoRaHS and SCIPP led, as well as photos contributed through the form that is online here or to NDMC's CMOR reports (see below). Photos are mapped by USDM status, land use, and the same dry-to-wet scale that CoCoRaHS and CMOR reports use.



Media Drought Index

The Media Drought Index (MDI) compares the number of stories for each state in a week with the weekly number of stories for that state and month since 2011, and expresses the result as a standard deviation.



Drought Tweets

We search and map drought-related tweets each Monday as another way to understand how drought is affecting people. Tweets are placed on the map based on how users describe their location, so only tweets with sufficiently specific locations are used.



CoCoRaHS Condition Monitoring Reports

CoCoRaHS observers sign up through the Community Collaborative Rain, Hail & Snow Network, measure record precipitation every day, and benefit from lively educational support. Some observers opt to submit additional condition monitoring observations in addition to precipitation records.



Drought Impacts Multi-Tool


The Drought Impacts Multi-Tool allows you to display layers from the Drought Impact Reporter, Condition Monitoring Observer Reports, CoCoRaHS, Drought News, and Drought Tweets, as well as the U.S. Drought Monitor and state and county boundaries. CMOR and CoCoRaHS, the default view, is a particularly relevant comparison.

Related Publications

Read more about the tools in the Drought Impacts Tools kit, including scholarly publications.



Drought news and Media Drought Index -- go.unl.edu/droughtnews



Media Drought Index (MDI)
National Drought Mitigation Center, University of Nebraska

About the Media Drought Index

The Media Drought Index (MDI) compares the number of stories for each state in a week with the weekly number of stories for that state and month since 2011, and expresses the result as a standard deviation. States on the red side of the spectrum have more drought news than they normally do for this time of year, which is what we'd expect for places that are in drought. States on the blue end of the spectrum have less than they normally do for this time of year, which is what we'd expect for places not in drought, or dealing with other events.

The MDI is based on a search of news cataloged by the Meltwater service, and filtered to mostly in-state news, omitting headlines that appear all over the country, restricting repeating headlines to the state that they are about. The drought news layer displays news stories as points, by the cities in which they are published. For more control over the time interval of news on the map, please visit go.unl.edu/newsmap

Filter News Stories

★

Select a State
50 US States and D.C.

◆

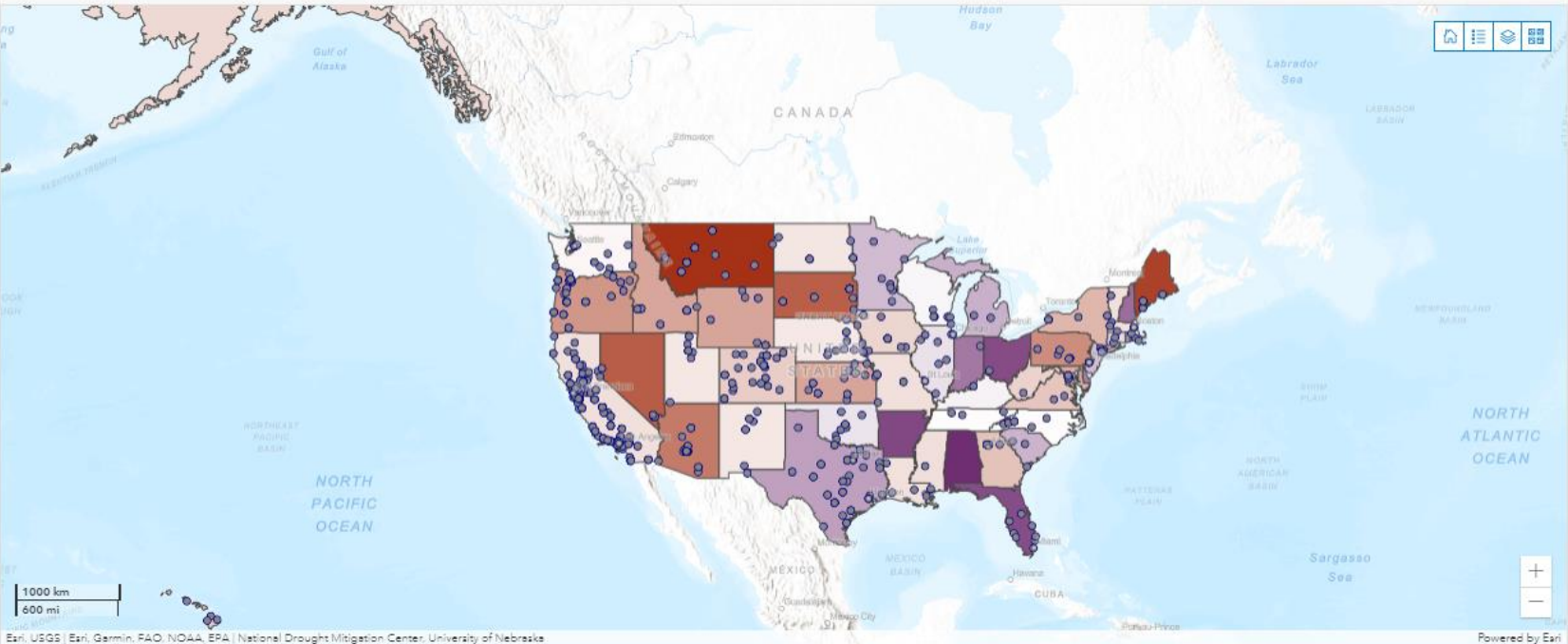
Select a City
Select a State First

■

Select a Source
Select a State First

📅

Select a Date
Last Week

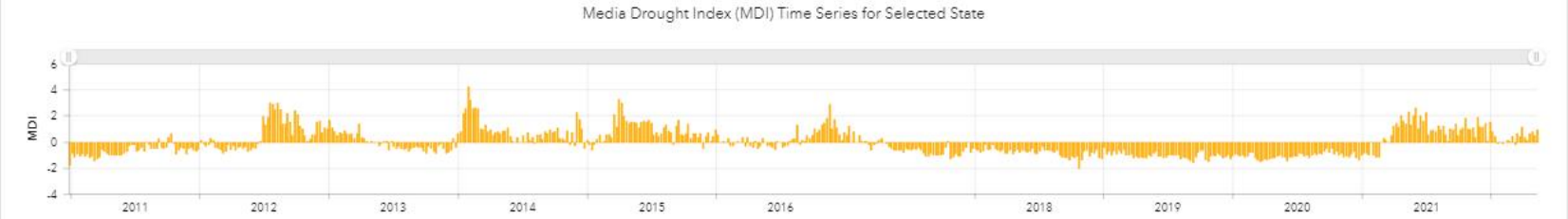


1000 km
600 mi

Esri, USGS | Esri, Garmin, FAO, NOAA, EPA | National Drought Mitigation Center, University of Nebraska

Powered by Esri

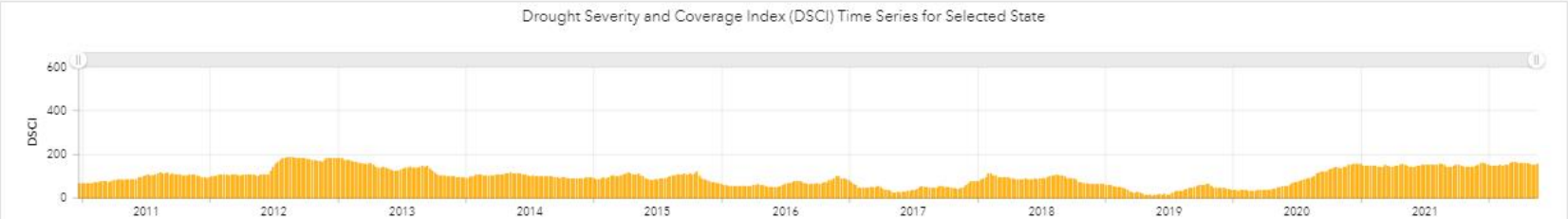
Media Drought Index (MDI) Time Series for Selected State



MDI

2011 2012 2013 2014 2015 2016 2018 2019 2020 2021

Drought Severity and Coverage Index (DSCI) Time Series for Selected State



DSCI

2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021

1 of 10

State with highest MDI

4.5

Montana

From week 5/9/2022 to 5/15/2022.

1 of 10

Most stories per million people

47

Montana

From week 5/9/2022 to 5/15/2022.

1 of 10

News stories added for the week

1.1k

50 US States and D.C.

From week 5/9/2022 to 5/15/2022.

MDI Details

50 US States and D.C.

State: 50 US States and D.C.

From week: 5/9/2022 to 5/15/2022

State MDI: 0.98

News stories per million people: 3.3

Number of news stories for week: 1,100

MDI Details

News Stories

Drought tweets -- Go.unl.edu/droughttweets



Drought Tweets
National Drought Mitigation Center, University of Nebraska

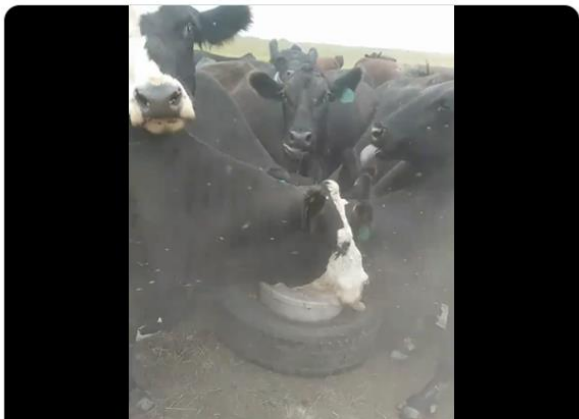
Filter



Predefin



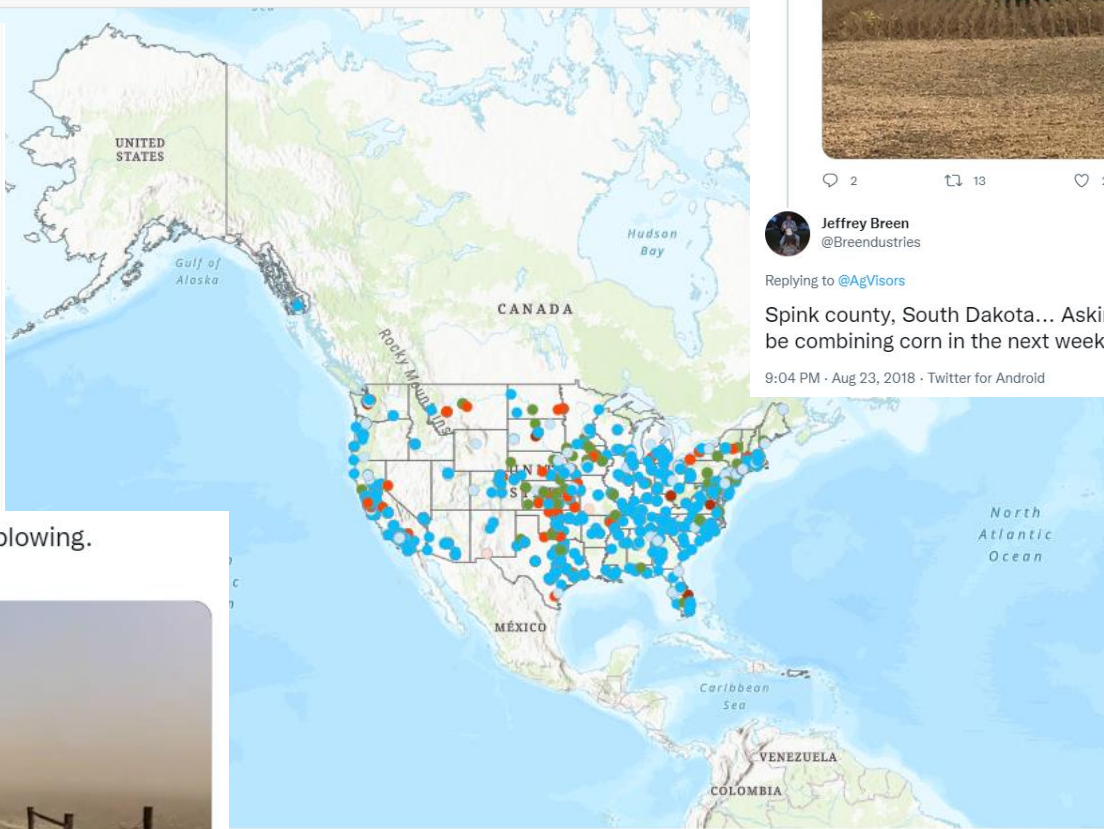
A sure sign the grass is going to shit is when they go after the mineral like this.



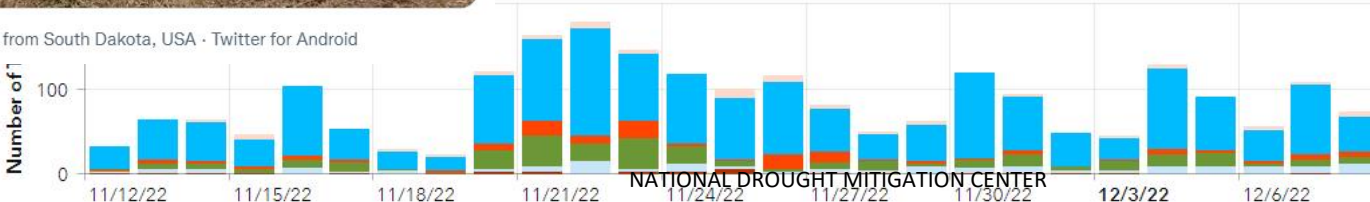
#dustbowl22. Tilled soybean ground blowing. Minnehaha County, South Dakota.



1:36 PM · Apr 23, 2022 from South Dakota, USA · Twitter for Android



Frequency and Distribution of Drought Tweets
Counts correspond to filter selections at left and map extent



Jeffrey Breen
@Breedustries
Replying to @AgVisors
Spink county, South Dakota... Asking for a friend ... I'll be combining corn in the next week or 2 #drought18
9:04 PM · Aug 23, 2018 · Twitter for Android

About

Tweets are placed on the map based on how users describe their location, so we only use tweets with sufficiently specific user locations. We filter out obvious international and out-of-state content. Tweets are mostly geolocated to cities and slightly jittered so that if you zoom in far enough you can click on each one individually. This also means that locations are only accurate to the city, not the location within the city.

Disclaimers: Mapping search results does not mean endorsement of content. We filter out tweets that include certain terms but some offensive or political content may still get through. Please notify ksmith2@unl.edu if you see

"It's so dry you don't want to drop a wrench in the wheat stubble, you'll never find it in the cracks"

I never believed that quote till now. My brother didn't want to loose his leatherman tool so he used a wheat plant instead.

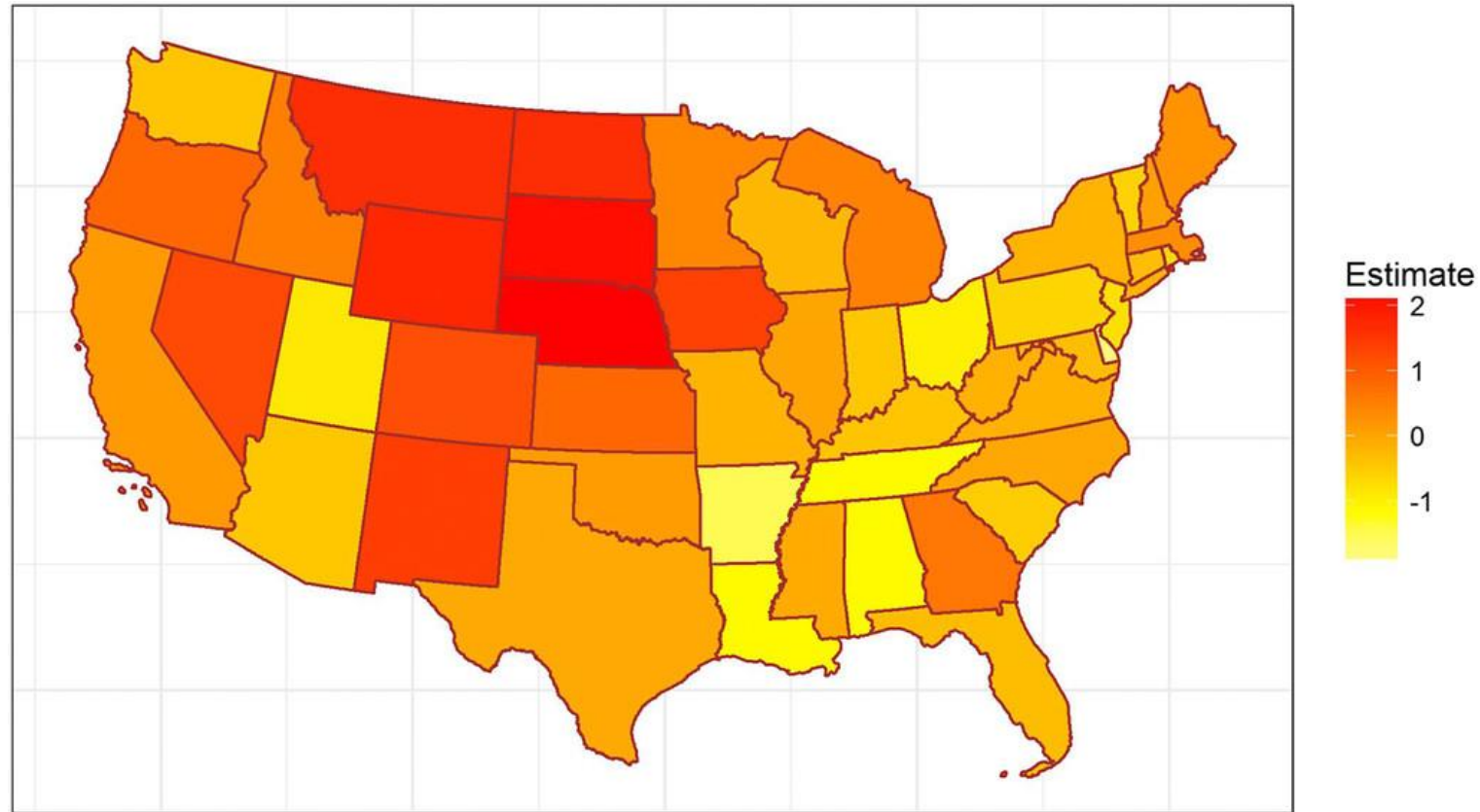
At least it'll reduce soil compaction. #SDwx



8:41 PM · Jun 29, 2021 · Twitter for iPhone



Finding: Geographic differences in tweeting behavior



Bulletin of the American Meteorological Society 101, 10; [10.1175/BAMS-D-19-0342.1](https://journals.ametsoc.org/view/journals/bams/101/10/bamsD190342.1)

Smith, K. H., Tyre, A. J., Tang, Z., Hayes, M. J., & Akyuz, F. A. (2020). Calibrating Human Attention as Indicator Monitoring #drought in the Twittersphere, *Bulletin of the American Meteorological Society*, 101(10), E1801-E1819. Retrieved May 20, 2022, from <https://journals.ametsoc.org/view/journals/bams/101/10/bamsD190342.x>

Condition Monitoring Observer Reports (CMOR)

Go.unl.edu/CMOR_drought

Condition Monitoring Observer Reports (CMOR)

National Drought Mitigation Center, University of Nebraska

- Dashboard Year to Date
- Dashboard 2018 - Yesterday
- Detail Year to Date
- Detail 2021
- Detail 2020
- Detail 2019
- Detail 2018
- About/How To Use

Filter Options

Map

Select Date Range

Predefined

Calendar

Year to Date

Past 30 Days

Past 7 Days

Reset

★

Select State

Select one or more

◆

Select County

Select State First

☀️

Select How Dry or Wet

Select one or more

📷

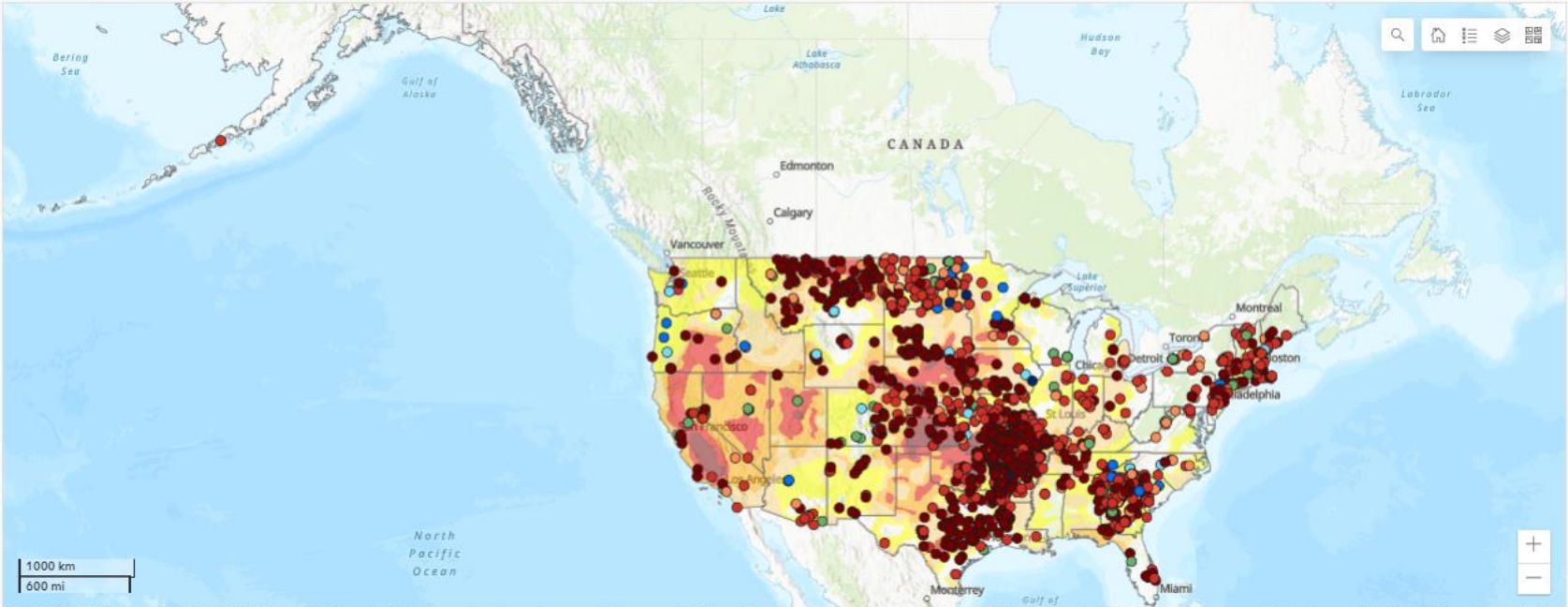
Reports with Photos

Show All Reports

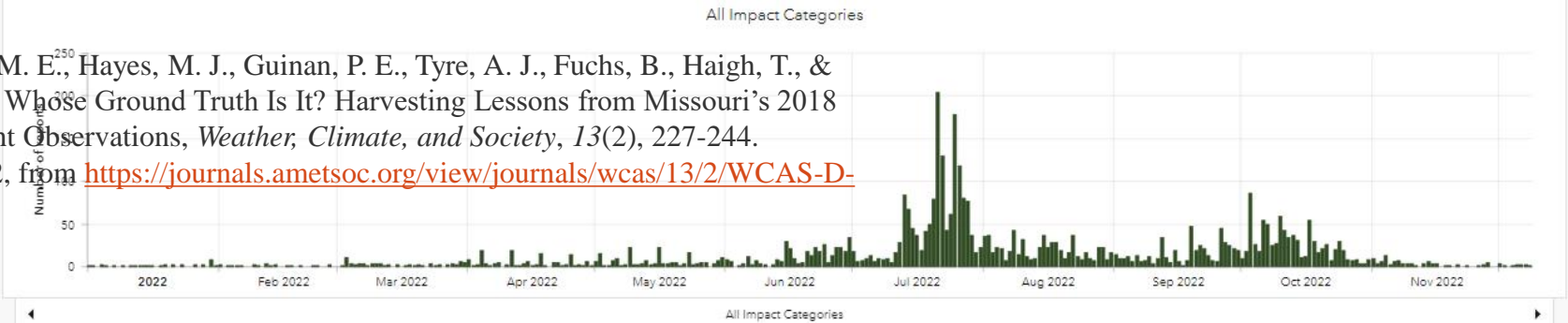
👤

Display Name

Select one or more



Esri, USGS | Esri, Garmin, FAO, NOAA, USGS, EPA | The U.S. Drought Monitor is produced through a partnership between the National Drought Mitigation Center at the University of Nebraska-Lincoln, the United States Department of Agriculture, and the National Oceanic and Atmospheric Administration. Powered by Esri. Click on the Layer icon at the top-right of the map to view reports by impact category.



Total CMOR Reports
4,283

◀ 9 of 2000 ▶

Report Details
Display limited to 2,000 reports in order of most recent. Displayed reports correspond to filter selections.

Would volunteer as a monitor for this area.

Submitted by: MTCattleCo

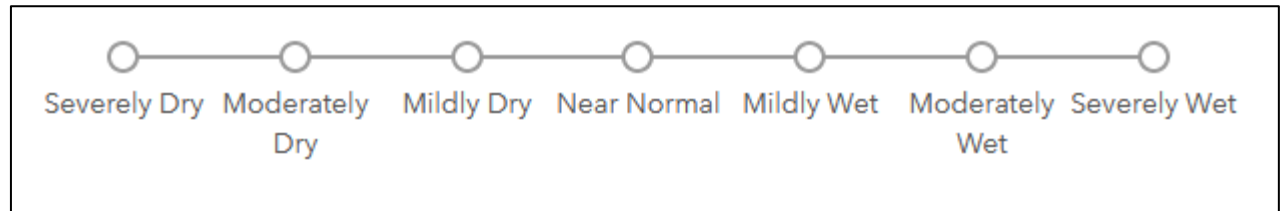


Smith, K. H., Burbach, M. E., Hayes, M. J., Guinan, P. E., Tyre, A. J., Fuchs, B., Haigh, T., & Svoboda, M. D. (2021). Whose Ground Truth Is It? Harvesting Lessons from Missouri's 2018 Bumper Crop of Drought Observations, *Weather, Climate, and Society*, 13(2), 227-244. Retrieved May 20, 2022, from <https://journals.ametsoc.org/view/journals/wcas/13/2/WCAS-D-19-0140.1.xml>

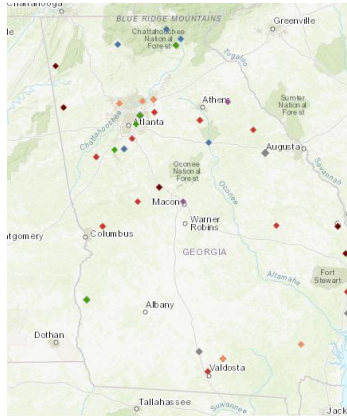
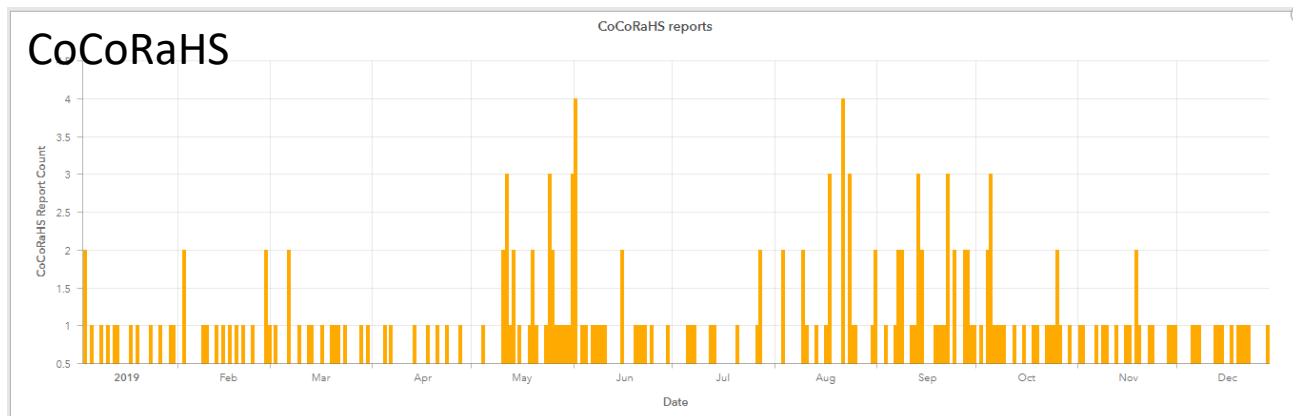
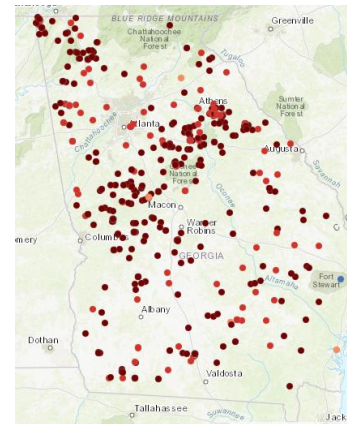
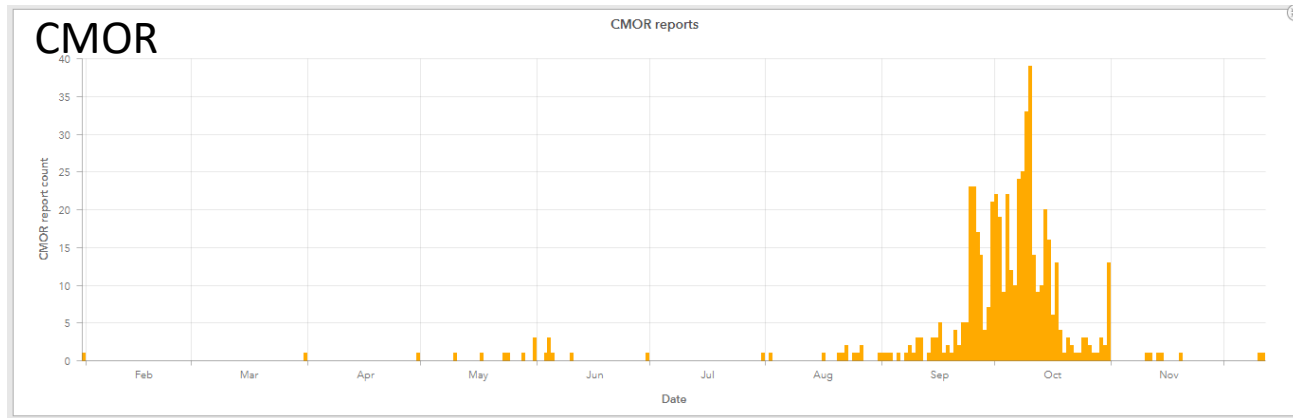
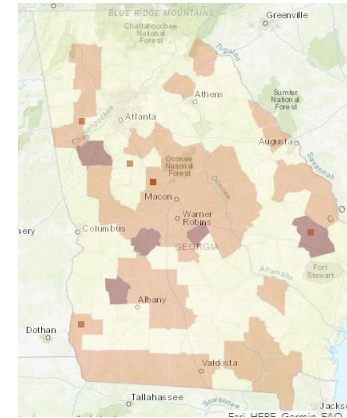
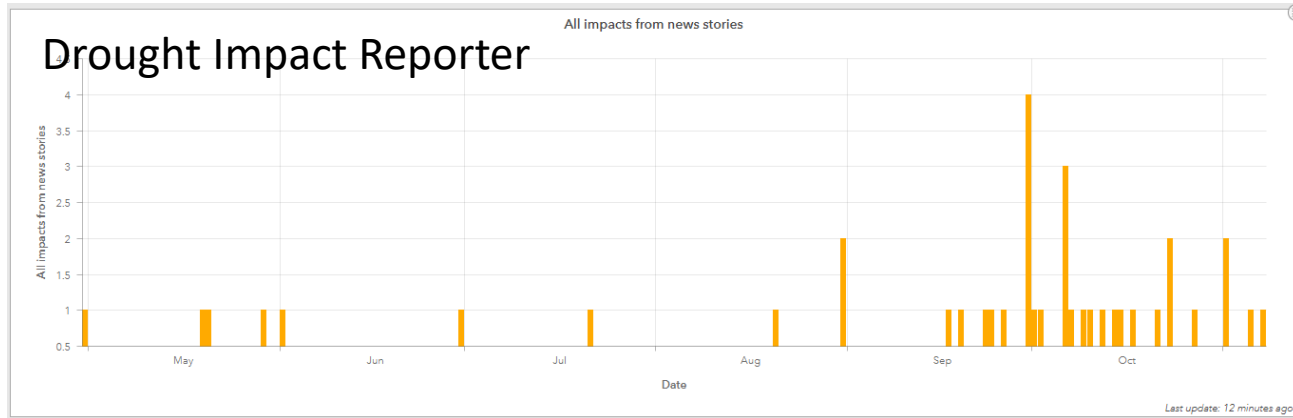


CoCoRaHS Citizen Science cocorahs.org

CoCoRaHS, the Carolinas Integrated Sciences and Assessment (CISA) and NDMC collaborated to develop “condition monitoring” and the 7-point dry-to-wet scale.



Comparison of CMOR, CoCoRaHS and Drought Impact Reporter for Georgia in 2019



CoCoRaHS and CMOR reports

Go.unl.edu/multi-tool



Drought Impacts Multi-Tool

Multi-Tool Dashboard

The Drought Impacts Multi-Tool allows you to display layers from the Drought Impact Reporter, Condition Monitoring Observer Reports, CoCoRaHS, Drought News, and Drought Tweets, as well as the U.S. Drought Monitor and state and county boundaries. CMOR and CoCoRaHS, the default view, is a particularly relevant comparison.

Drought Impact Reporter

CMOR

Visual Drought Atlas

Media Drought Index & News

Drought Tweets

CoCoRaHS Condition Monitoring Map

Filter Options

Select a Date Range

Past 7 Days

Past 30 Days

Year to Date

Period of Record

Reset

Select State

No State Selected

Select State for DSCI Chart

50 US States and D.C.

Select County

Select a State First

CMOR Reports with Photos

Show All

Lackstrom, K., Farris, A., Eckhardt, D., Doesken, N., Reges, H., Turner, J., Smith, K. H., & Ward, R. (2017). CoCoRaHS Observers Contribute to “Condition Monitoring” in the Carolinas: A New Initiative Addresses Needs for Drought Impacts Information, *Bulletin of the American Meteorological Society*, 98(12), 2527-2531. Retrieved May 20, 2022, from <https://journals.ametsoc.org/view/journals/bams/98/12/bams-d-16-0306.1.xml>

NDMC

NATIONAL DROUGHT MITIGATION CENTER
UNIVERSITY OF NEBRASKA

Map of the United States showing drought severity and coverage index (DSCI) data points. The map includes state boundaries and major cities. A legend on the right indicates the color coding for drought severity: Severely Dry (dark red), Moderately Dry (red), Mildly Dry (orange), Near Normal (grey), Mildly Wet (light blue), Moderately Wet (blue), Severely Wet (dark blue), and No Data (white). The map is titled "Map Legend" and "CMOR Reports 2018 - Yesterday".

Condition Monitoring Observer Reports (CMOR)

Number of reports

2022

Feb

Mar

Apr

May

Jun

Jul

Aug

Sep

Oct

Nov

CMOR

CoCoRaHS

News Stories

Drought Tweets

DIR City

DIR County

DIR State

Drought Severity and Coverage Index (DSCI)

DSCI

Feb

Mar

Apr

May

Jun

Jul

Aug

Sep

Oct

Nov

Show all

Map Legend

CMOR Reports 2018 - Yesterday

How Dry or Wet is it?

Severely Dry

Moderately Dry

Mildly Dry

Near Normal

Mildly Wet

Moderately Wet

Severely Wet

No Data

CoCoRaHS

Condition

Severely Dry

Moderately Dry

Mildly Dry

Near normal

Map legend

About

1 of 2000

Display limited to 2,000 impacts in order of most recent. Displayed impacts correspond to filter selections.

CMOR Reports

State/Territory: IN

County: LaPorte

Date: 12/8/2022

How dry or wet is it? Moderately Dry

How much experience do you have with conditions there? 20_or_more_years

How many times in the past have you seen it like this? never

How localized or widespread are the conditions you are reporting? North Central Indiana

Click on left or right arrows below to scroll through different data sources.

CMOR

Go.unl.edu/droughtnews

Go.unl.edu/droughttweets

Go.unl.edu/CMOR_drought

Kelly Helm Smith

ksmith2@unl.edu

Go.unl.edu/multi-tool

