

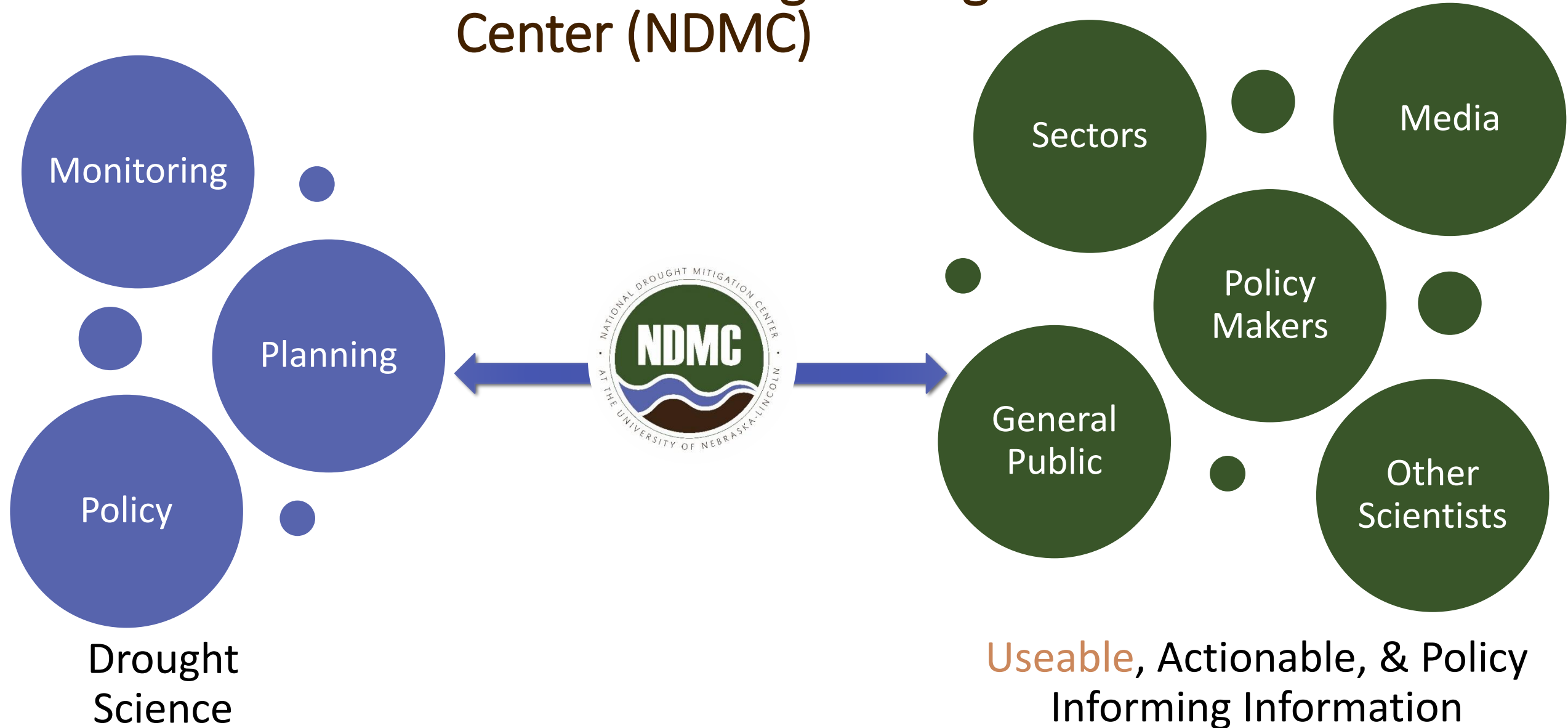


The U.S. Drought Monitor



Deborah Bathke & Curtis Riganti
National Drought Mitigation Center • School of Natural Resources
University of Nebraska-Lincoln
NW Drought Workshop
July 28, 2020

National Drought Mitigation Center (NDMC)



Monitoring

Planning

Policy

Drought
Science



Sectors

Media

Policy
Makers

General
Public

Other
Scientists

Useable, Actionable, & Policy
Informing Information

Outline

What's on the map?

What does it mean?

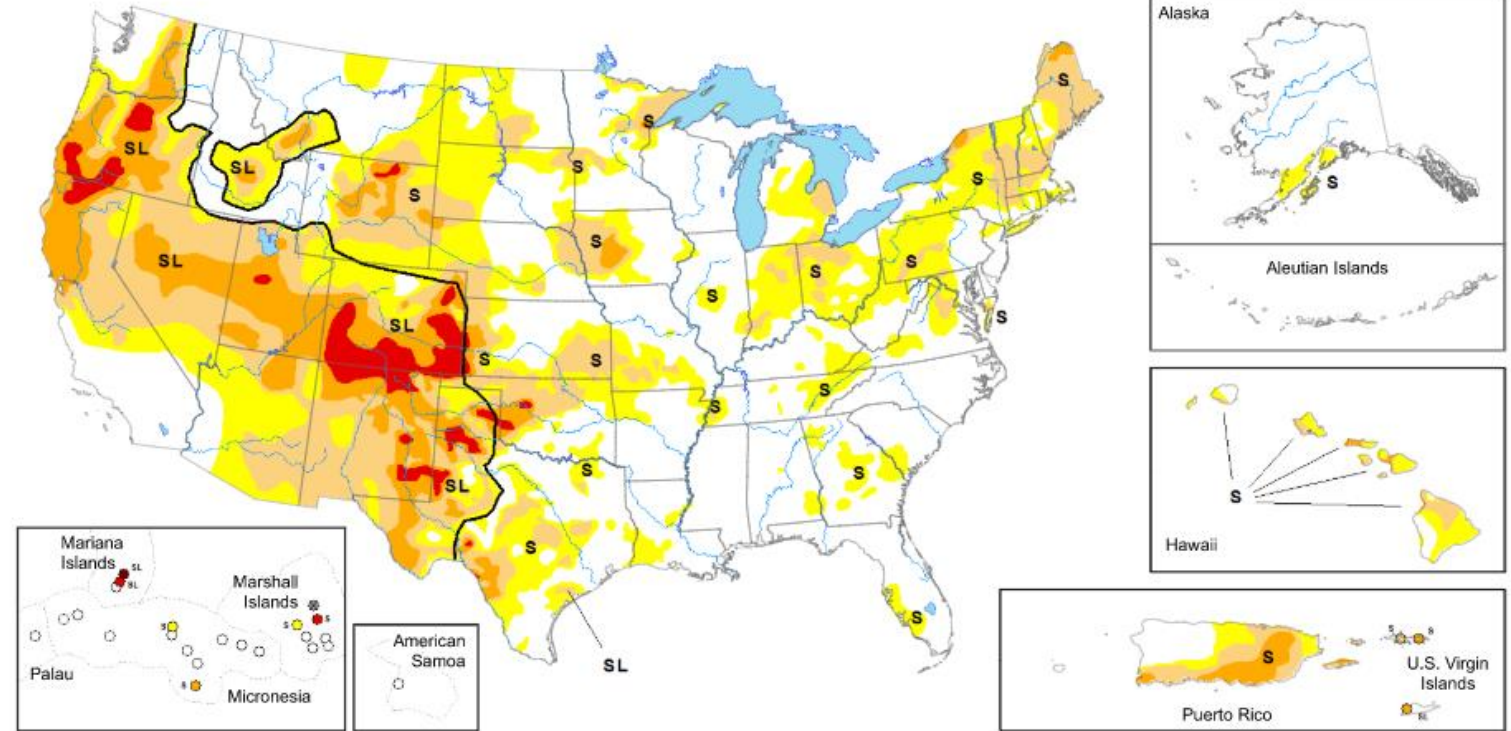
How is it made?

How can you participate?

Map released: July 23, 2020

Data valid: July 21, 2020

droughtmonitor.unl.edu



United States and Puerto Rico Author(s):
Richard Heim, NOAA/NCEI

U.S. Affiliated Pacific Islands and Virgin Islands Author(s):
Ahira Sanchez-Lugo, NOAA/NCEI

The data cutoff for Drought Monitor maps is each Tuesday at 8 a.m. EDT. The maps, which are based on analysis of the data, are released each Thursday at 8:30 a.m. Eastern Time.

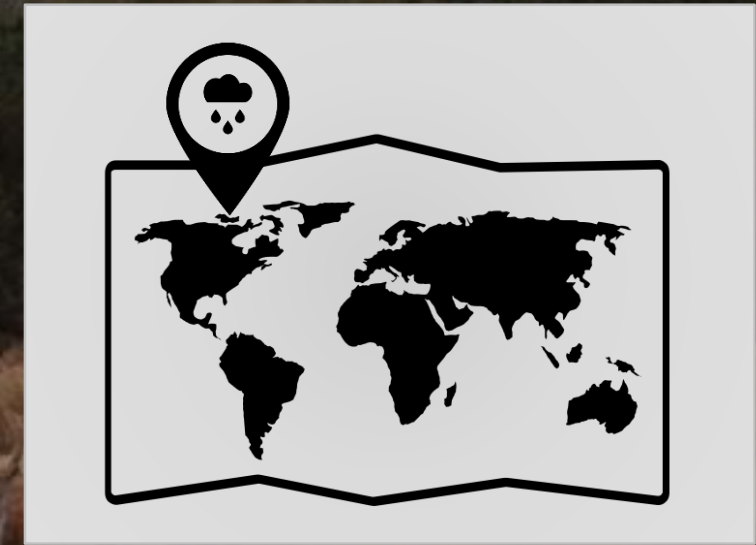
Intensity and Impacts

- None
- D0 (Abnormally Dry)
- D1 (Moderate Drought)
- D2 (Severe Drought)
- D3 (Extreme Drought)
- D4 (Exceptional Drought)
- No Data

- ~ - Delineates dominant impacts
- S - Short-Term impacts, typically less than 6 months (e.g. agriculture, grasslands)
- L - Long-Term impacts, typically greater than 6 months (e.g. hydrology, ecology)

Takeaway #1
The map synthesizes a lot of information.

A deficit of *expected*
water availability
that results in water
shortages for some
activity or group



What is drought?

Map strives to represent different perspectives

Drought perspectives



Meteorological



Agricultural



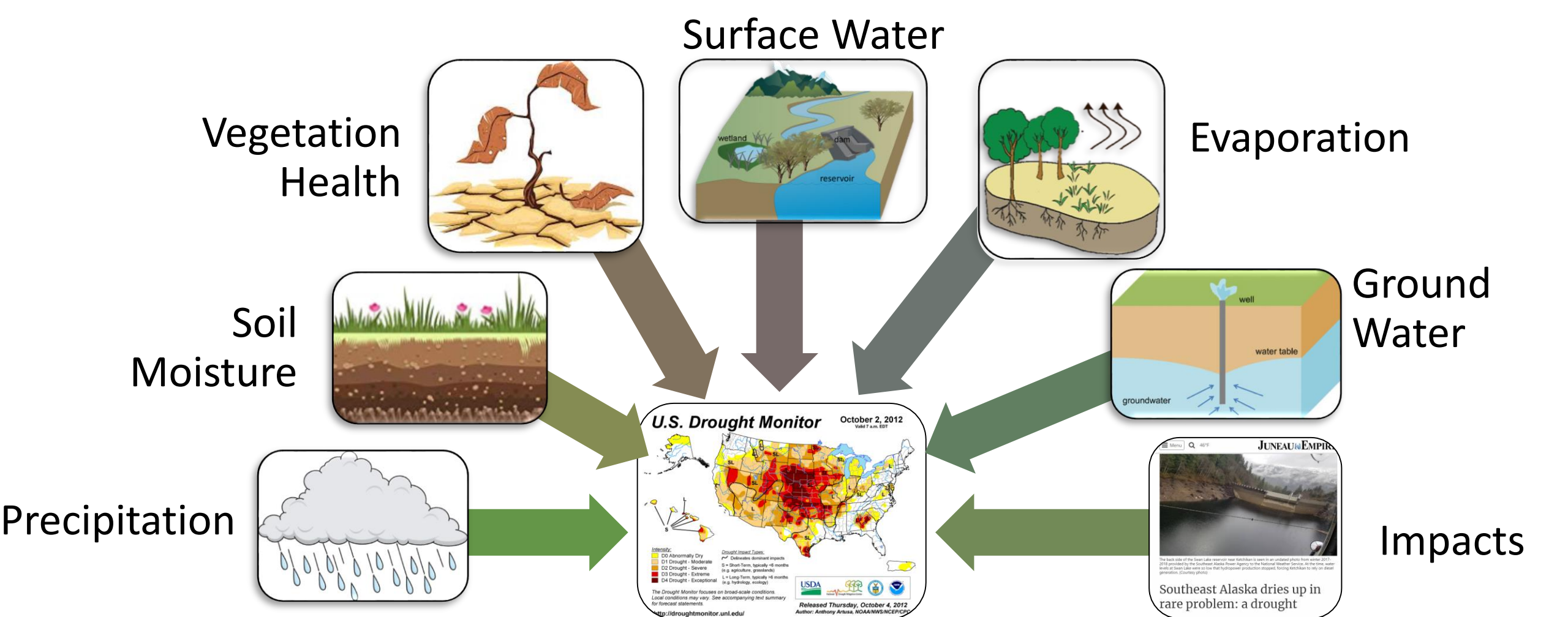
Hydrological



Ecological



Socio-economic



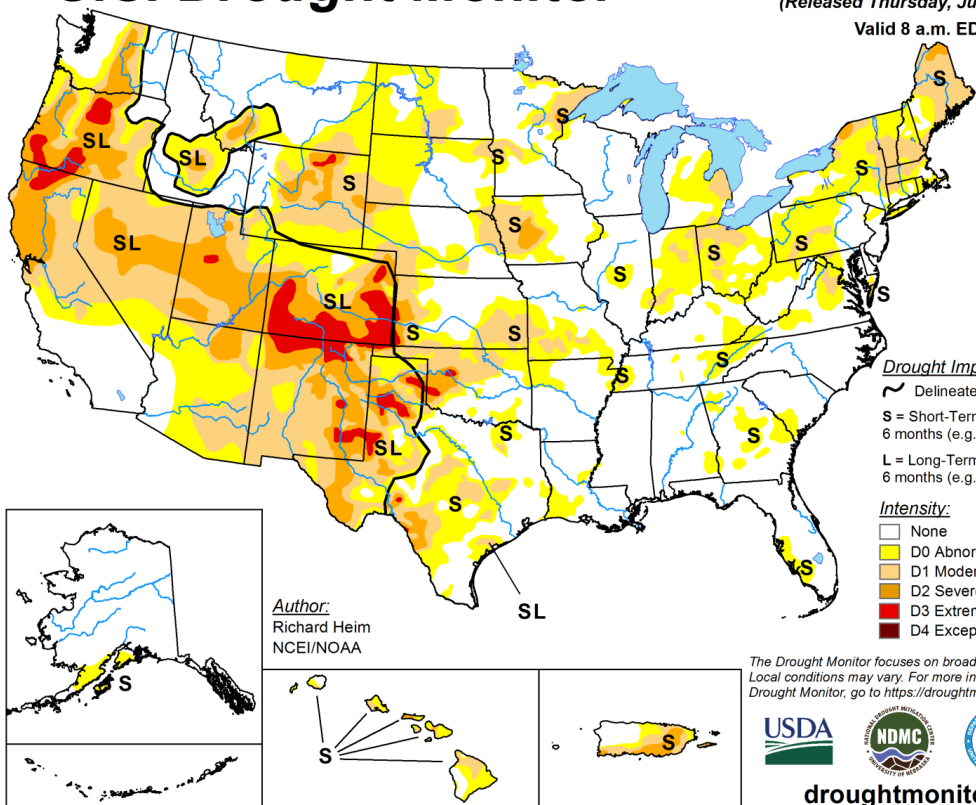
Map incorporates multiple types of data to capture the different perspectives



Map depicts multiple timescales

U.S. Drought Monitor

July 21, 2020
 (Released Thursday, Jul. 23, 2020)
 Valid 8 a.m. EDT



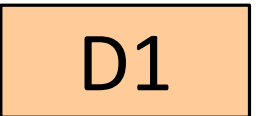
Not Drought



None



Abnormally Dry



Moderate Drought



Severe Drought



Extreme Drought



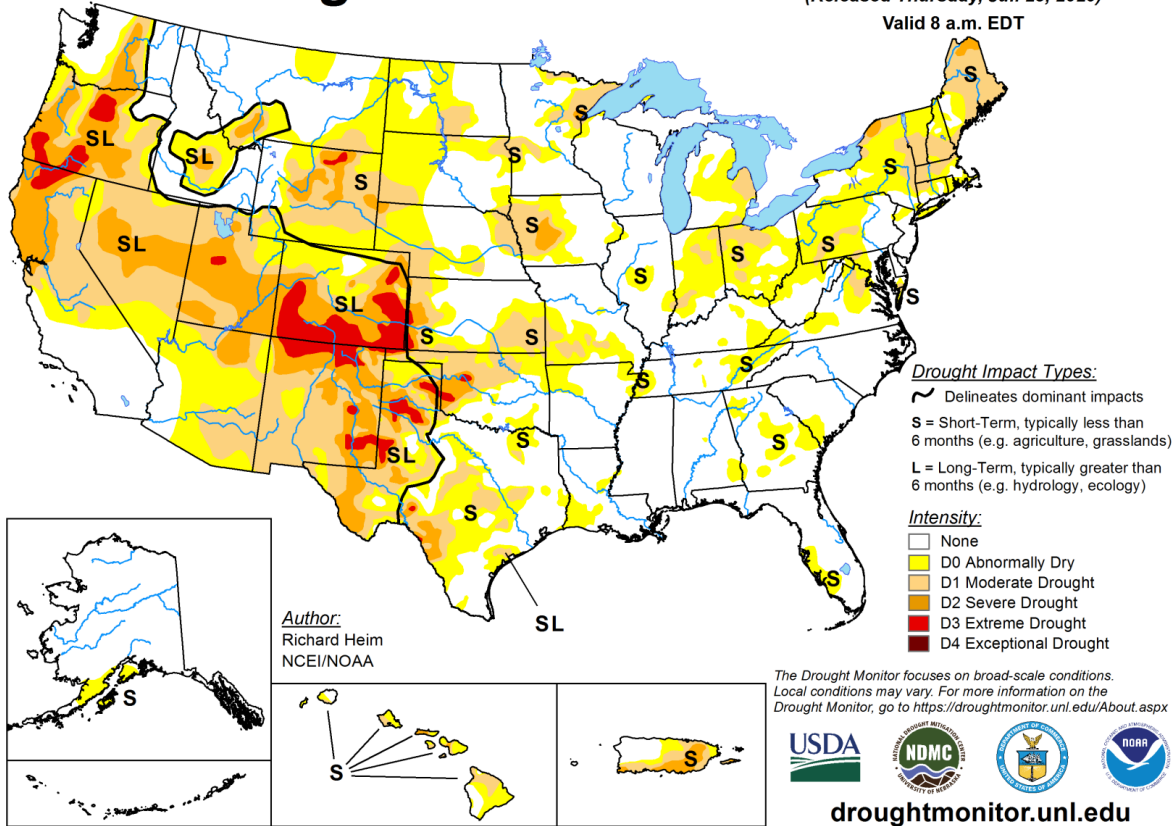
Exceptional Drought

Drought

Map colors indicate drought intensity

U.S. Drought Monitor

July 21, 2020
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S = short term
typically < 6 months

separates
drought
timescales

L = long term,
typically > 6 months

Map depicts short- and long-term conditions

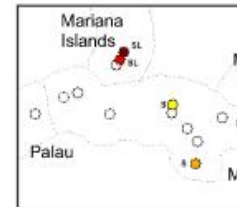
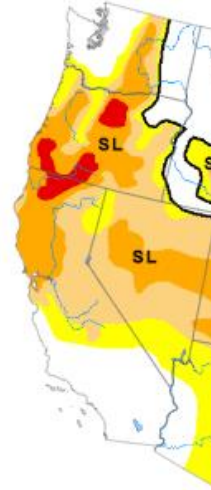
A narrative explains any changes

United States

Current Map Map

Map released: July 21, 2020

Data valid: July 21, 2020



United States and Puerto Rico
Richard Heim, NOAA/NCEP

The data cutoff for Drought is 5 a.m. Eastern Time.

Intensity and Impact

- None
- D0 (Abnormally Dry)
- D1 (Moderate Drought)
- D2 (Severe Drought)

This Week's Drought Summary

High pressure dominated the southern half of the contiguous U.S. (CONUS) during this U.S. Drought Monitor (USDM) week. Upper-level weather systems tracked across the U.S.-Canadian border, dragging surface lows and fronts along with them. The frontal systems tapped Gulf of Mexico moisture to drop locally heavy rain across parts of the Plains to Midwest, while convective thunderstorms peppered coastal areas of the Gulf. The high-pressure ridge inhibited precipitation across much of the southern Plains to Southeast, and across most of the West. It also kept temperatures unusually hot, with daily maximums exceeding 90 degrees F across the South throughout the week and across much of the West for most of the week. The excessive heat spread into the northern Plains, Midwest, and into the Northeast as the week wore on. The persistent heat increased evapotranspiration, which dried soils and stressed crops and other vegetation. The locally heavy rains brought temporary relief from the heat and dryness, but only for those areas in the Plains and Midwest lucky enough to receive the rain.

Northeast

Half an inch to locally more than 2 inches of rain fell from northwestern Pennsylvania to parts of Maine, while coastal areas of the Northeast received smaller amounts. Moderate drought expanded in parts of Pennsylvania and Maryland. No change in the drought status occurred across the rest of the region, with abnormal dryness and moderate to patches of severe drought continuing.

Southeast

Convective storms peppered parts of the Gulf Coast and North Carolina with half an inch to locally over 2 inches of rain. But the showers were scattered and mostly hit or miss. Moderate drought was introduced in northern Virginia where persistent dryness and heat were taking their toll on crops. Areas of abnormal dryness were added to Alabama, Georgia, Florida, South Carolina, and other parts of Virginia.

South

Two to locally over 5 inches of rain fell across parts of the Texas panhandle and northwest Oklahoma, and along parts of the Texas to Mississippi coast. But it was another dry week across much of Texas to eastern Oklahoma to northern Mississippi and Tennessee. Moderate to extreme drought contracted in the wet panhandles of Texas and Oklahoma, but moderate to severe drought expanded in other parts of Texas, with pockets of extreme drought added to southwestern Texas and southwestern Oklahoma. Abnormal dryness or moderate drought expanded further east across parts of Arkansas, Louisiana, and Tennessee.

Midwest

Two or more inches of rain spread across northern Missouri and southern Iowa, swathed Illinois into Indiana, and stretched across parts of Minnesota to Michigan. But other parts of Iowa, Minnesota, eastern Indiana, and especially Ohio missed out on the rain. Thunderstorms peppered Kentucky, except in the southeast. Drought and abnormal dryness contracted in northern Minnesota, northern Missouri to southern Iowa, and parts of Illinois, but expanded in northwestern Iowa, southern Missouri, central Illinois, southeastern Michigan, parts of Indiana, eastern Kentucky, and especially across Ohio.

High Plains

Areas of 2+ inches of rain were widespread across Kansas, eastern North Dakota, and parts of Nebraska, with locally over 5 inches in northeast Kansas and southeast Nebraska. But the spigot remained off across most of Wyoming and western and northern parts of Colorado. Drought contracted where the beneficial rains fell, including southeast Colorado, western Kansas to parts of Nebraska, northeast Wyoming, and parts of North Dakota. But drought and abnormal dryness expanded where it continued dry, including eastern Kansas, northeastern Colorado to adjoining parts of Nebraska, northeastern Nebraska, parts of the Dakotas, and especially in Wyoming. Moderate to severe drought expanded in, and extreme drought was added to, Wyoming.

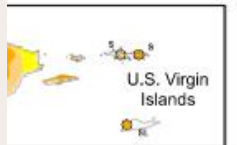
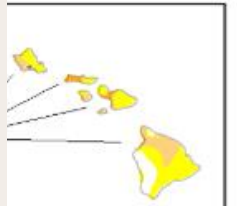
West

Eastern Montana and parts of New Mexico received notable amounts of rain (half an inch or more), with scattered light showers over parts of Arizona, but most of the West was bone dry this week. Drought or abnormal dryness contracted in northeastern Montana and parts of eastern and southern New Mexico. But the weak Southwest Monsoon otherwise left the Four Corners States bereft of significant rainfall, so drought and abnormal dryness expanded in central, western, and southern New Mexico; across much of Arizona; and in parts of Nevada, Utah, and Oregon.

Alaska, Hawaii, and Puerto Rico

With widespread 2+ inches of rain, and locally 5+ inches, over much of western Puerto Rico, drought improved in the southwestern part of the island. But abnormal dryness to severe drought continued in the southern and central to eastern portions. Windward areas of the Hawaiian Islands have been getting some trade wind shower activity, but overall precipitation has been below average. Drought expanded where pasture and vegetation conditions deteriorated and water departments requested the public to reduce water consumption. No change was made to the depiction in Alaska.

Login



s):

each Thursday at 8:30

g, agriculture,

(e.g. hydrology, ecology)

Outline

What's on the map?

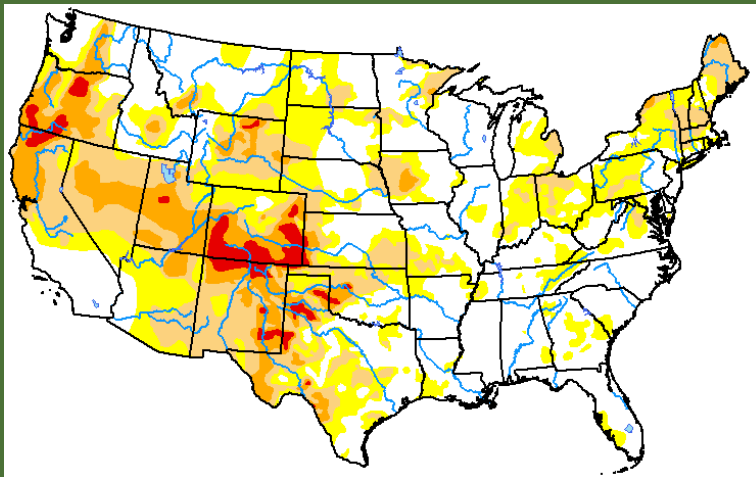
What does it mean?

How is it made?

How can you participate?

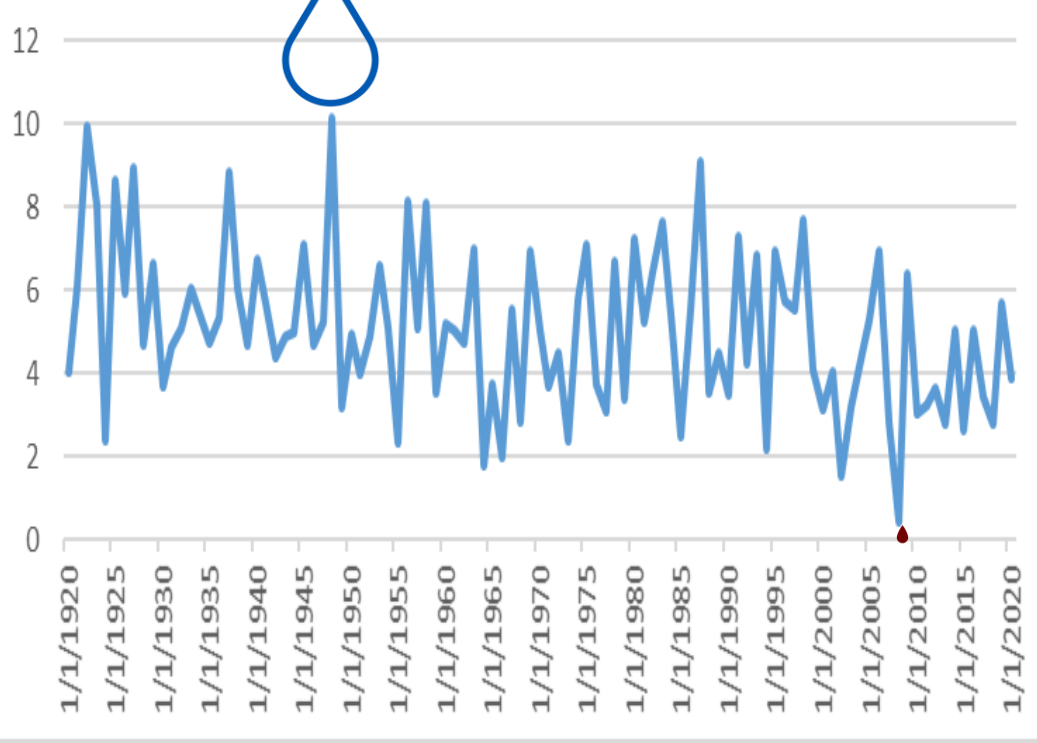
Takeaway #2

Categories are based on historical likelihood

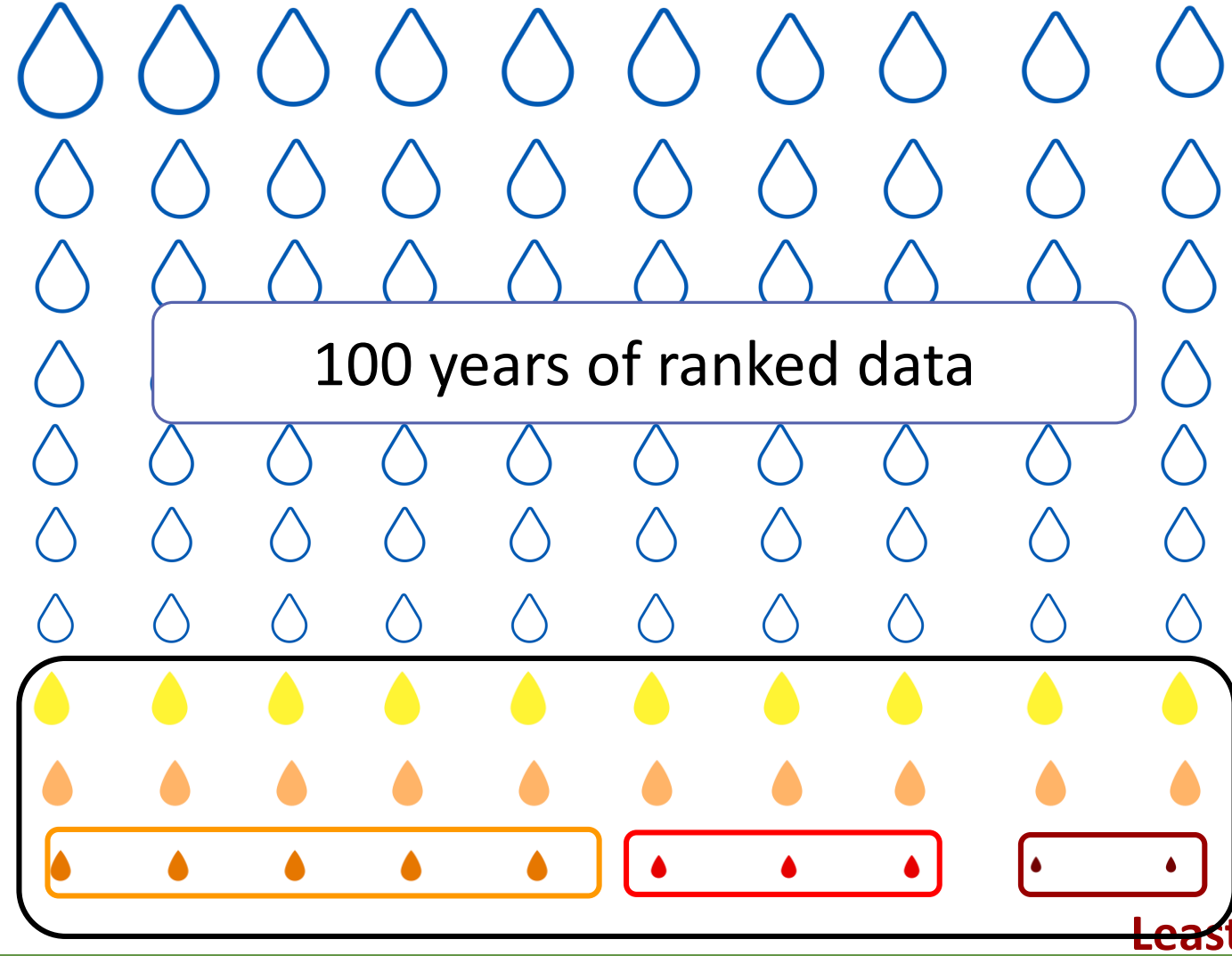


		Percentile	Frequency
	None	31-100	Once per 1 to 3 years
D0	Abnormally dry	21-30	Once per 3 to 5 years
D1	Moderate drought	11 - 20	Once per 5 to 10 years
D2	Severe drought	6 - 10	Once per 10 to 20 years
D3	Extreme drought	3 - 5	Once per 20 to 50 years
D4	Exceptional drought	1 - 2	Once per 50 to 100 years

Total Precipitation
(January to July)



Most



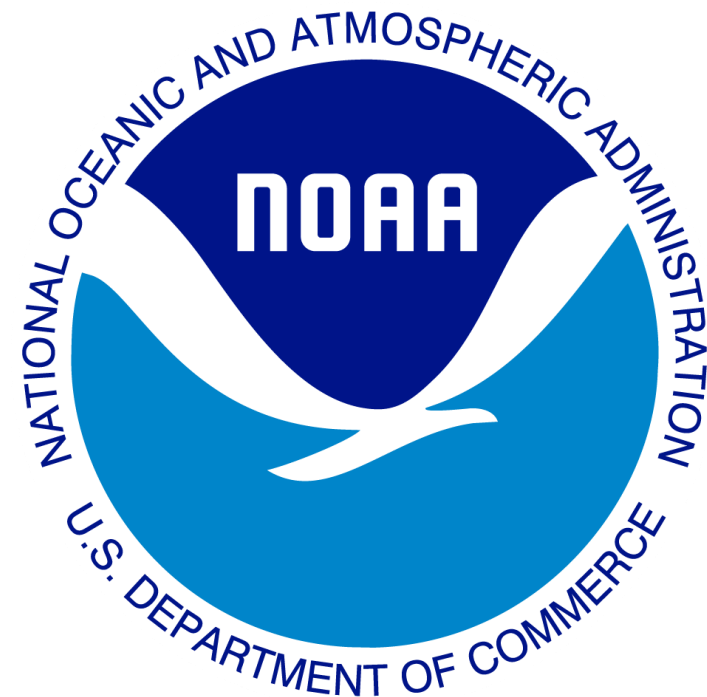
Outline

What's on the map?

What does it mean?

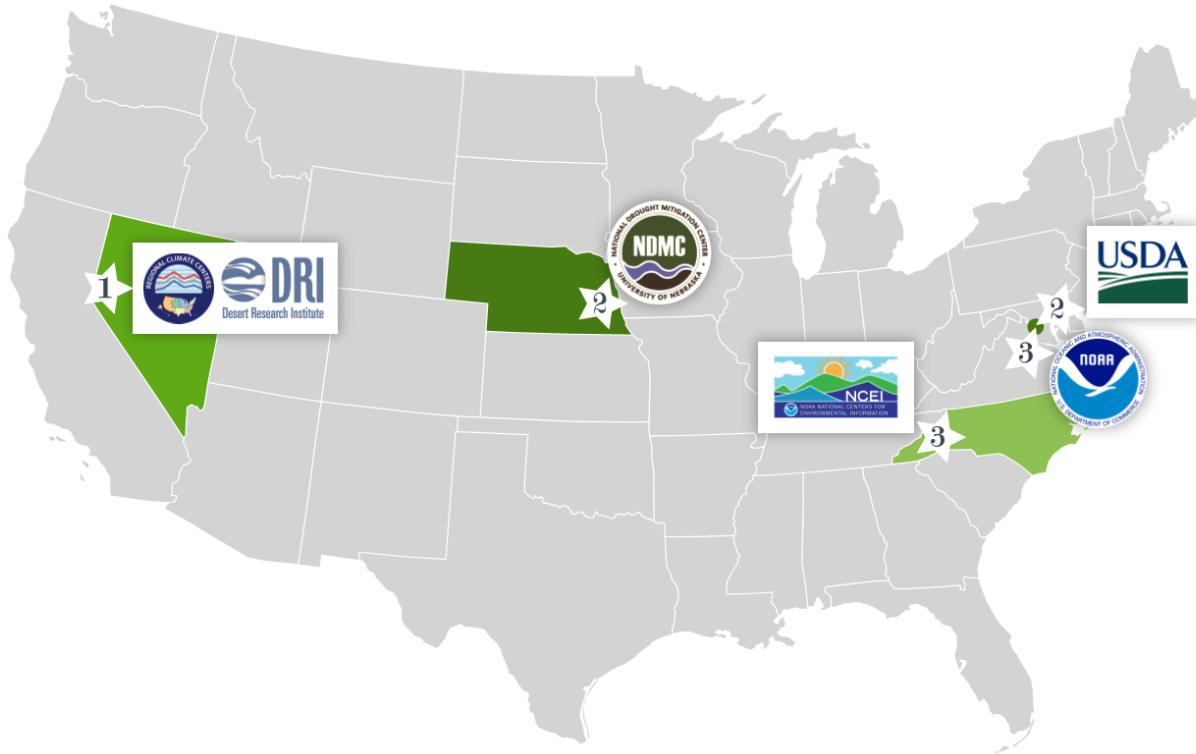
How is it made?

How can you participate?

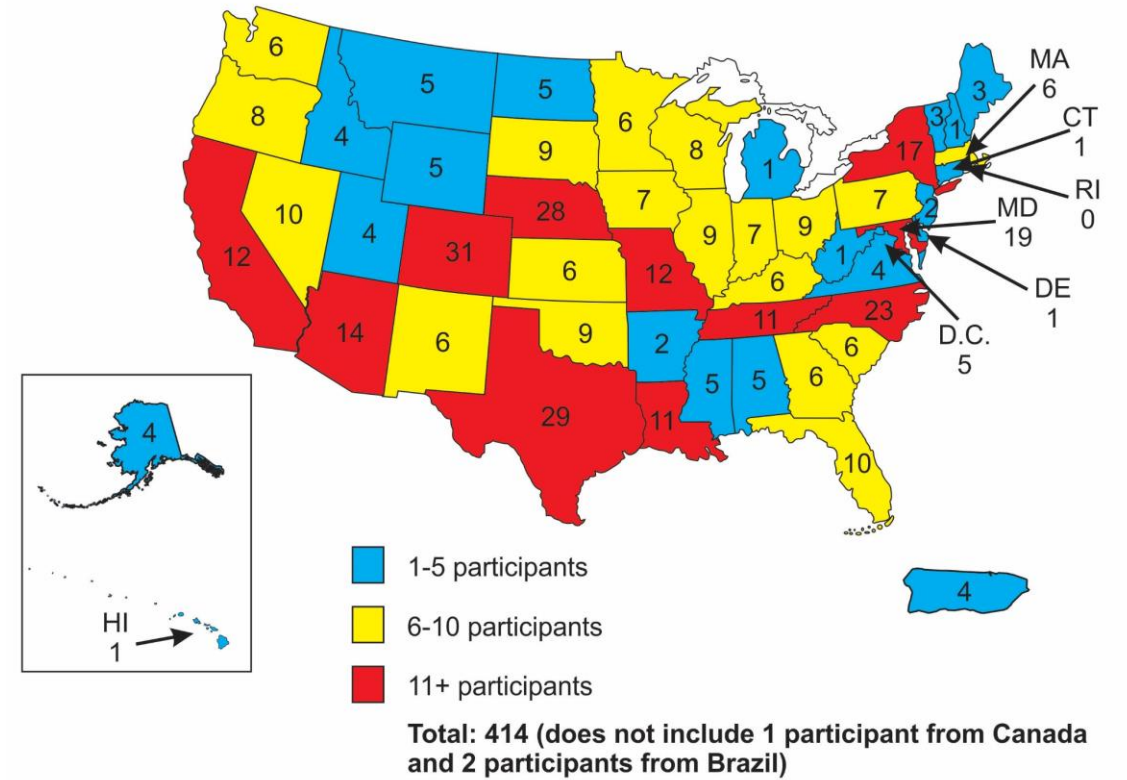


Takeaway #3: The map is a participatory process.
Partners collaborate on map standards & methodology

USDM Authors

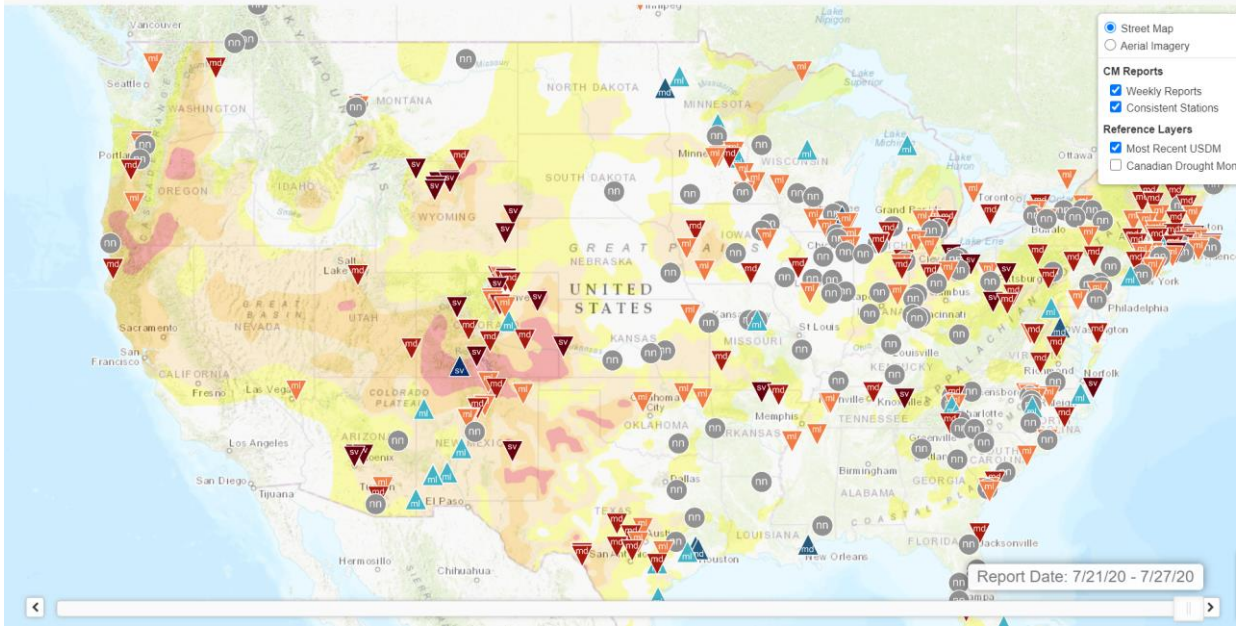


Local Experts



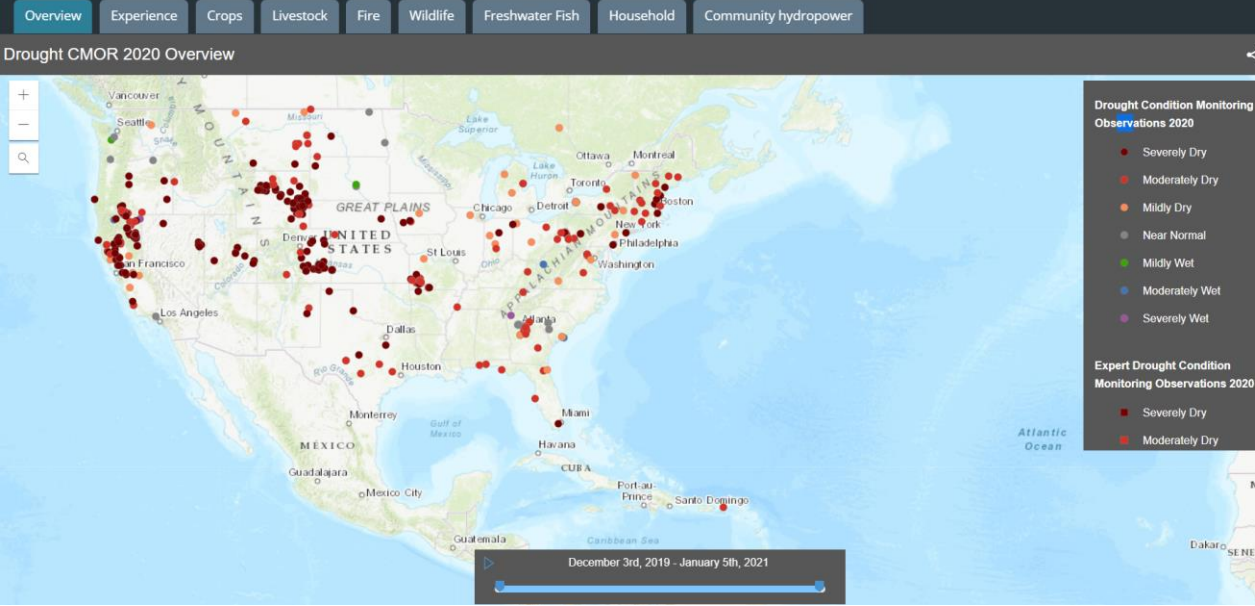
Authors interpret data & involve local experts in discussion

Condition Monitoring



cocorahs.org

Drought Condition Monitoring Observer Reports (CMOR) 2020



droughtimpacts.unl.edu

The public reports impacts to provide information on the effects of drought

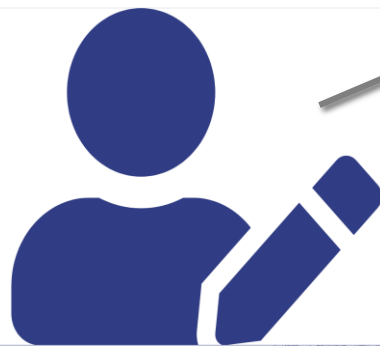
USDM

Convergence of Evidence

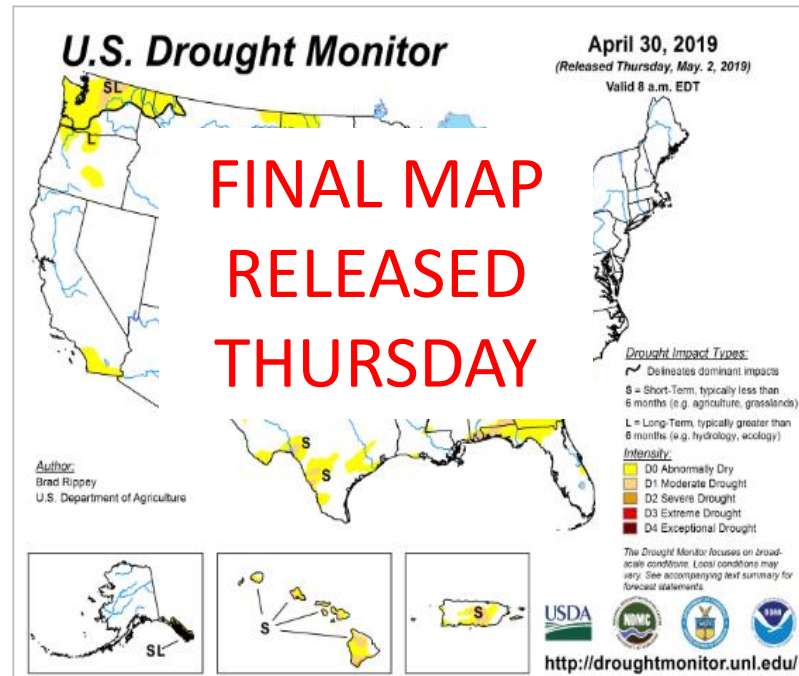
Objective data



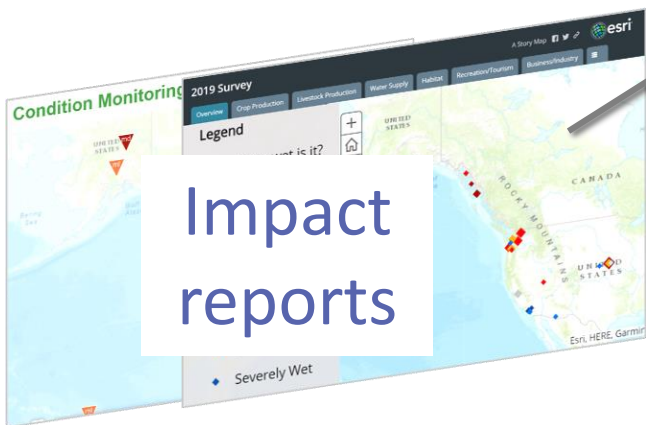
Author



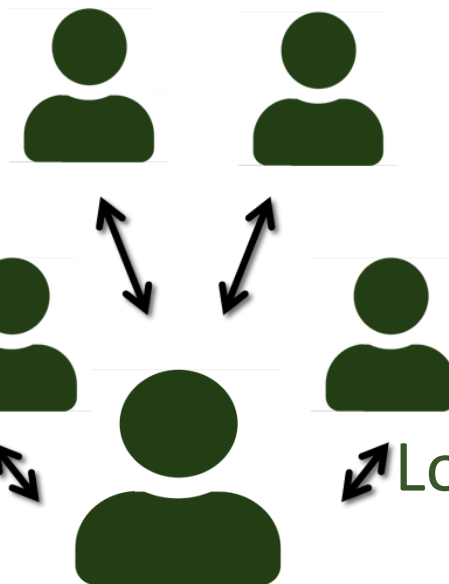
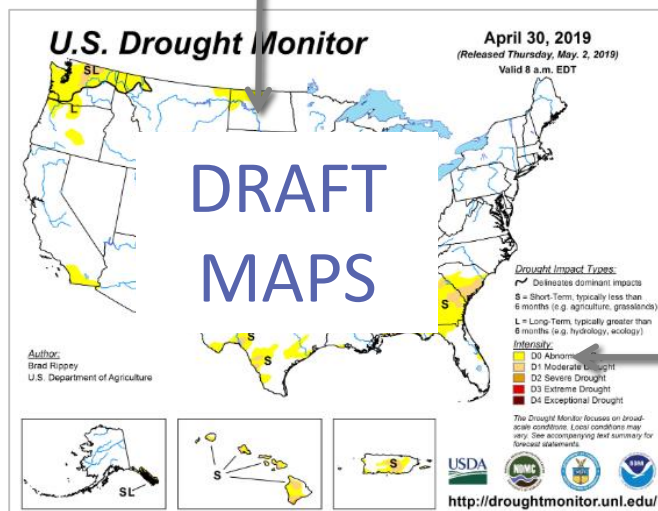
FINAL MAP
RELEASED
THURSDAY



Impact reports



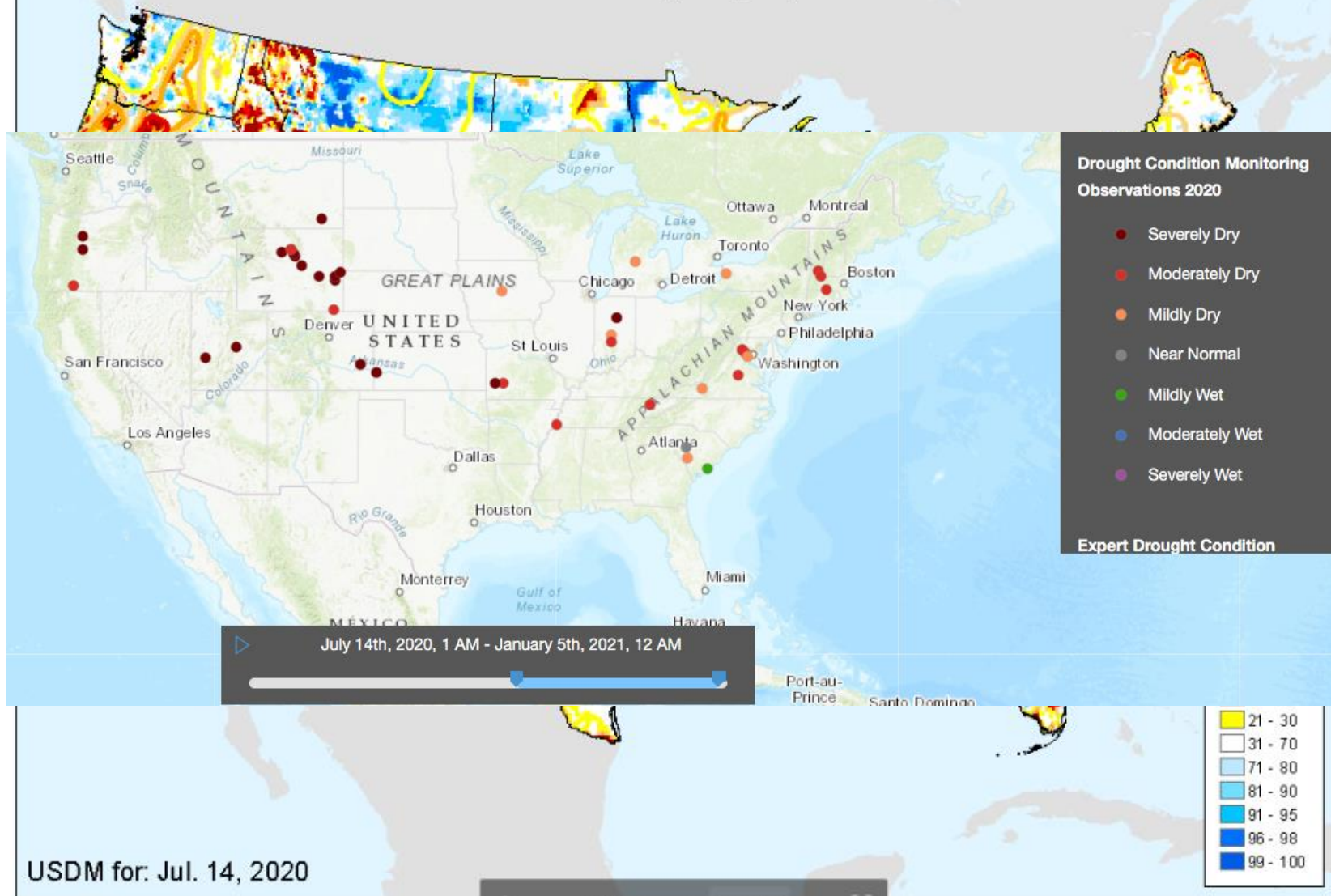
DRAFT
MAPS



Local experts

GRACE-Based Shallow Groundwater Drought Indicator

As of: Tuesday, July 21, 2020



What does this look like?
The author reviews the data.

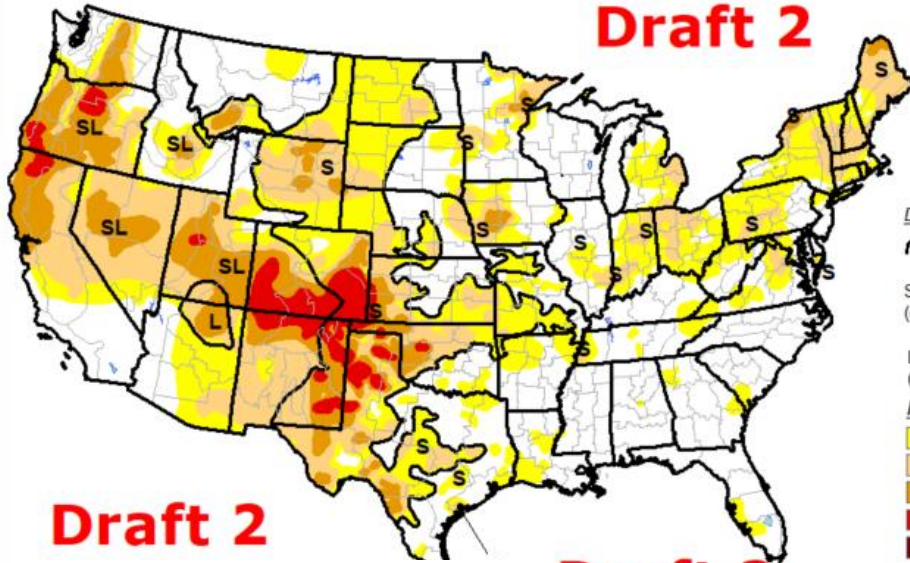
U.S. Drought Monitor

July 21, 2020

Valid 8 a.m. EDT

Released Thursday, July 23, 2020

Draft 2



Drought Impact Types:

~ Delineates dominant impacts

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

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

Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

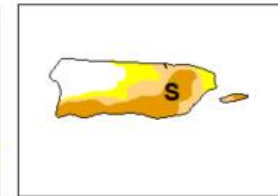
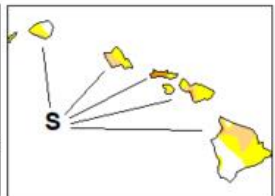
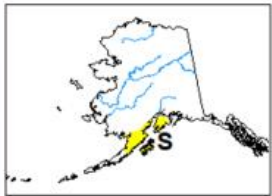
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.



<http://droughtmonitor.unl.edu/>

Draft 2

Draft 2



Draft 2 changes:

- 1) AR-LA-TX: expanded D0 in northwest and northeast AR using 30-day (tempered by 60-day) AHPS percent of normal precip as a guide. Joined the D0 in southwest LA and expanded the D0 in central to northeast LA, again using 30-day AHPS precip pon as a guide (thanks, Kyle); the sw LA D0 spread into adjacent southeast TX.
- 2) OK-TX: expanded D0/joined old D0 spots in southeast OK and northeast TX, using 30-day AHPS pcp pon (tempered by 60-90-day) as a guide.
- 3) MN-WI: AHPS radar-based precip showed locally 4+ inches of rain from the storm system that moved through northeast MN. ACIS SPI (which haven't as of mid-afternoon been updated through 7/19 yet) still showed D3 station SPI values at 90 days to 6 months. I generally made a 1-cat improvement in ne MN and adjacent WI where the heaviest rains fell, using AHPS 7-day precip through 90-day pcp pon as a guide.
- 4) VA: introduced D1 in northern VA where 30-90-day AHPS pcp pon is dry and ACIS SPI shows D1 or worse stations, and where agricultural impacts are being seen (thanks, Brad).
- 5) MD-PA: added a new spot of D1 along the MD-PA border, and expanded the southwest PA D1, using the same VA criteria (7-day precip tempered the sw PA expansion).
- 6) OH-IN-MI: expanded D1 and D0 in OH pretty much per recommendations (thanks, Aaron and state team). Also expanded D1 in IN based on 30-90 day precip deficits and introduced D1 into Lower MI based on 90-day deficits tempered by 7-day rainfall.

Other:

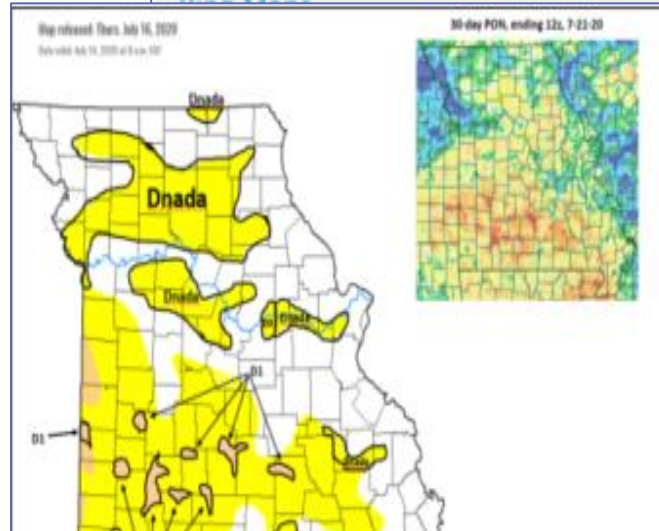
- A) NJ: status quo (thanks Dave & Chris).
- B) VT-NY: status quo in VT and northern NY (thanks John).
- C) ME: status quo (thanks for the input, Corey).

Creates and sends out multiple drafts to a listserv

Local experts provide feedback



Indiana Drought Team Recommendations July 21 2020 USDM.pdf
539 KB



Reply Reply All Forward

Tue 7/21/2020 2:13 PM

Drought Monitor Discussion Group <DROUGHT@LISTSERV.UNL.EDU>

Re: [DROUGHT] draft 2 map 7-21 USDM

To: DROUGHT@LISTSERV.UNL.EDU

This item will expire in 7 days. To keep this item longer apply a different Retention Policy.

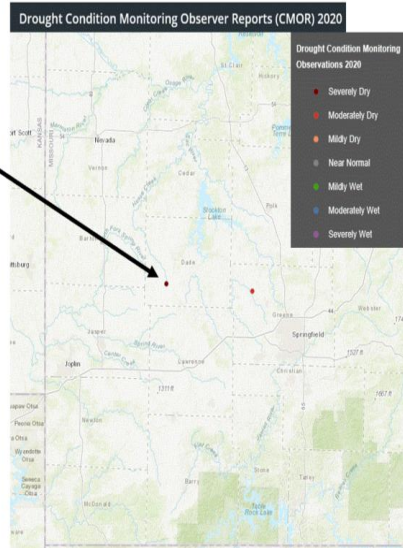
Mo Recs_7-21-20.gif
189 KB

CMOR_Dade Co Missouri.gif
291 KB

Condition Monitoring Observer Report from southwestern Dade Co., Missouri, 7-17-20

How widespread are the conditions you are reporting?

"Very localized and near a swath 15 miles north, 10 miles west, 5 miles east and 14 miles south of Lockwood Missouri 65682 and even drier Southwest and southeast of Lockwood Missouri where little to no precipitation has been observed since June 3, 2020. Already watering cattle, prairie hay burned up, soybean crop is struggling to survive. The corn crop is lost. The ground is cracked and very little precipitation 2-3 tenths of an inch since June 3, 2020."



<https://droughtimpacts.unl.edu/ConditionMonitoringObservations.aspx>

The first attachment contains Missouri recs. The 2nd attachment is a CMOR from southwestern MO, Dade County.

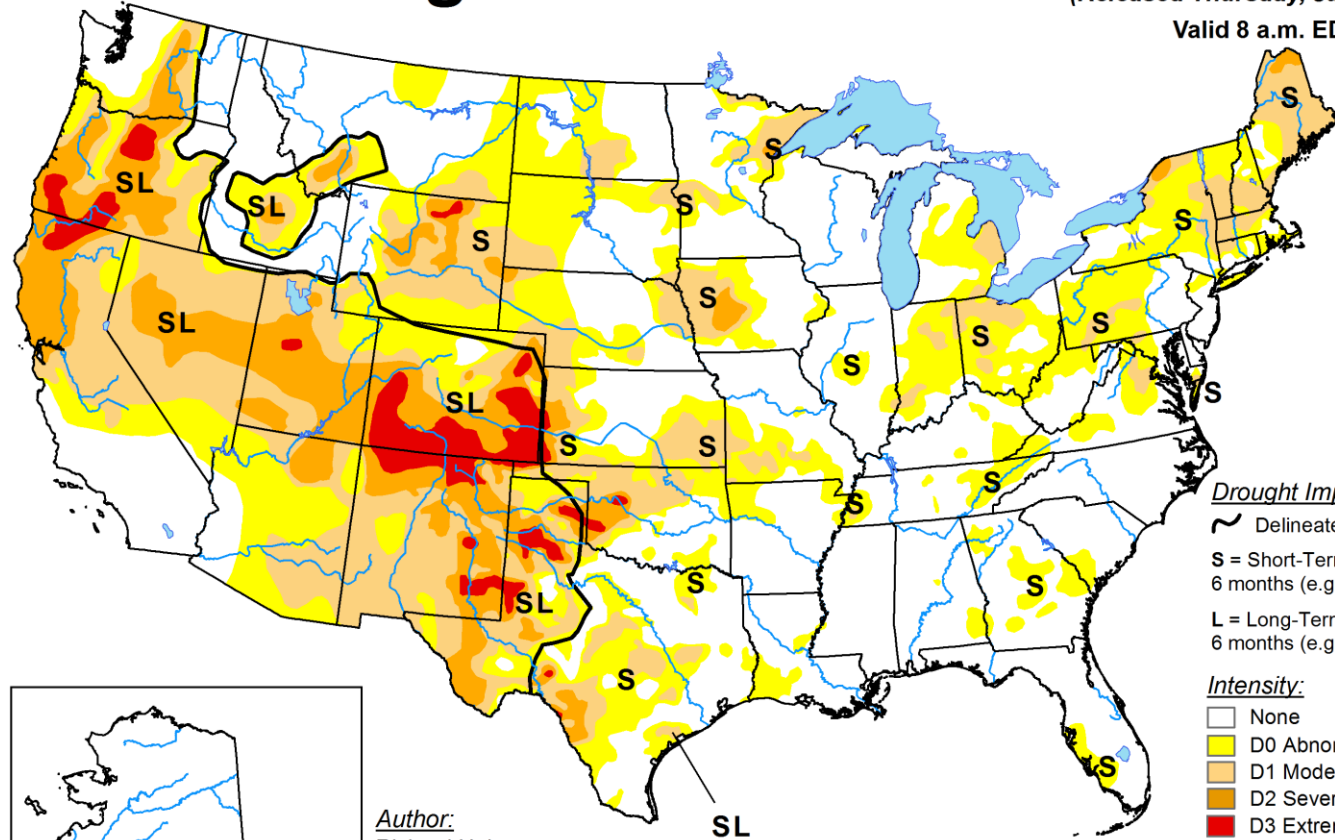
- We're thinking D0 can be eliminated near and north of the Missouri River. The only exception is a small island of D0 in southeastern Callaway Co and northeastern Osage Co. I leaned heavily on AHPS's 30-day PON for guidance as well as recs from NWS LSX.
- The southern half of Missouri is challenging (I have eyestrain) with the highly localized nature of convection over the past several weeks. There are recs for some D1 islands, using AHPS 30-day, $\leq 25\%$ of norm.
- The 2nd attachment is a Condition Monitoring Report from southwestern Dade Co, MO, submitted on 7/17, and it's one reason why there are recs for D1 islands. If you happen to be living in an area that keeps missing out, it may be a small area but the impacts are big.

Thanks for considering and for all your hard work.

Final map
released on
Thursday
mornings

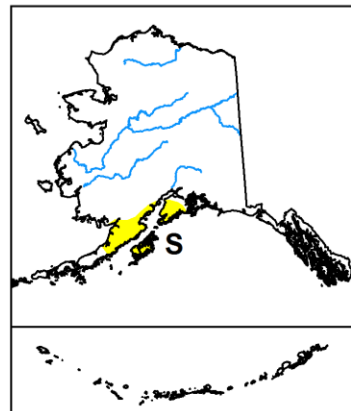
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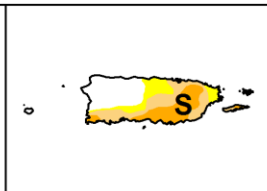
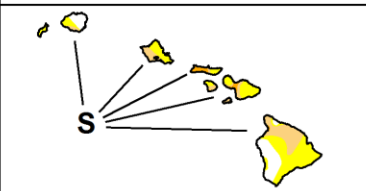


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Intensity:
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 D1 Moderate Drought
 D2 Severe Drought
 D3 Extreme Drought
 D4 Exceptional Drought



Author:
Richard Heim
NCEI/NOAA



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droughtmonitor.unl.edu

Wk	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
29 Jul-13 Jul-19	13	14	15	16	17	18	19
30 Jul-20 Jul-26	20	21	22	23	24	25	26
31 Jul-27 Aug-2	27	28	29	30	31	1	2
32 Aug-3 Aug-9	3	4	5	6	7	8	9
33 Aug-10 Aug-16	10	11	12	13	14	15	16
34 Aug-17 Aug-23	17	18	19	20	21	22	23

7:00 AM

Data for the map released on 7/30

30

Data Cutoff : 12Z (7 AM CDT)

Wk	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
29 Jul-13 Jul-19	13	14	15	16	17	18	19
30 Jul-20 Jul-26	20	21	22	23	24	25	26
31 Jul-27 Aug-2	27	28	29	30	31	1	2
32 Aug-3 Aug-9	3	4	5	6	7	8	9
33 Aug-10 Aug-16	10	11	12	13	14	15	16
34 Aug-17 Aug-23	17	18	19	20	21	22	23

7:00 AM

Data for the map released on 7/30

30

Draft 1
4:00 PM

Draft

Near Final Draft
Noon,
Input Cutoff
2:00 PM,
Final files +
narrative sent

Map
Released
7:30 AM



Times in CDT

Outline

What's on the map?

What does it mean?

How is it made?

How can you participate?

Providing Input into the USDM

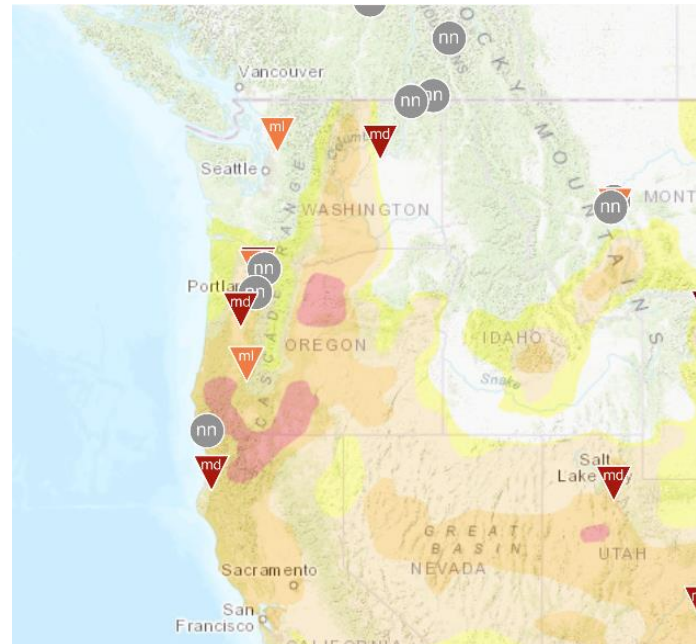
LOCAL CONTACTS

- Join the USDM listserv
- Contact your state climatologist

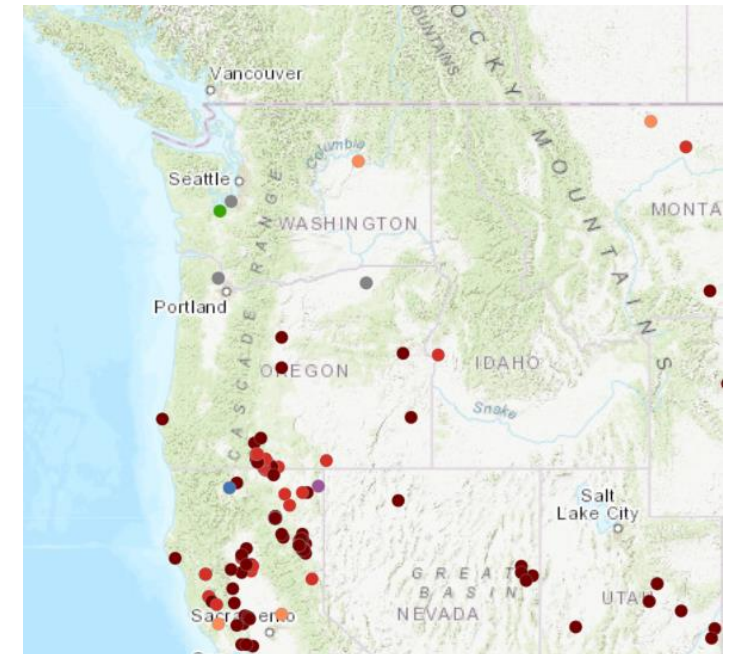
NATIONAL DROUGHT MITIGATION CENTER



cocorahs.org

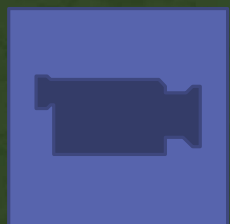


Droughtimpacts.unl.edu



Condition Monitoring Observer Reports (CMOR) on Drought: "See More Drought"

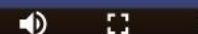
Kelly Helm Smith



NATIONAL DROUGHT
MITIGATION CENTER
UNIVERSITY OF NEBRASKA

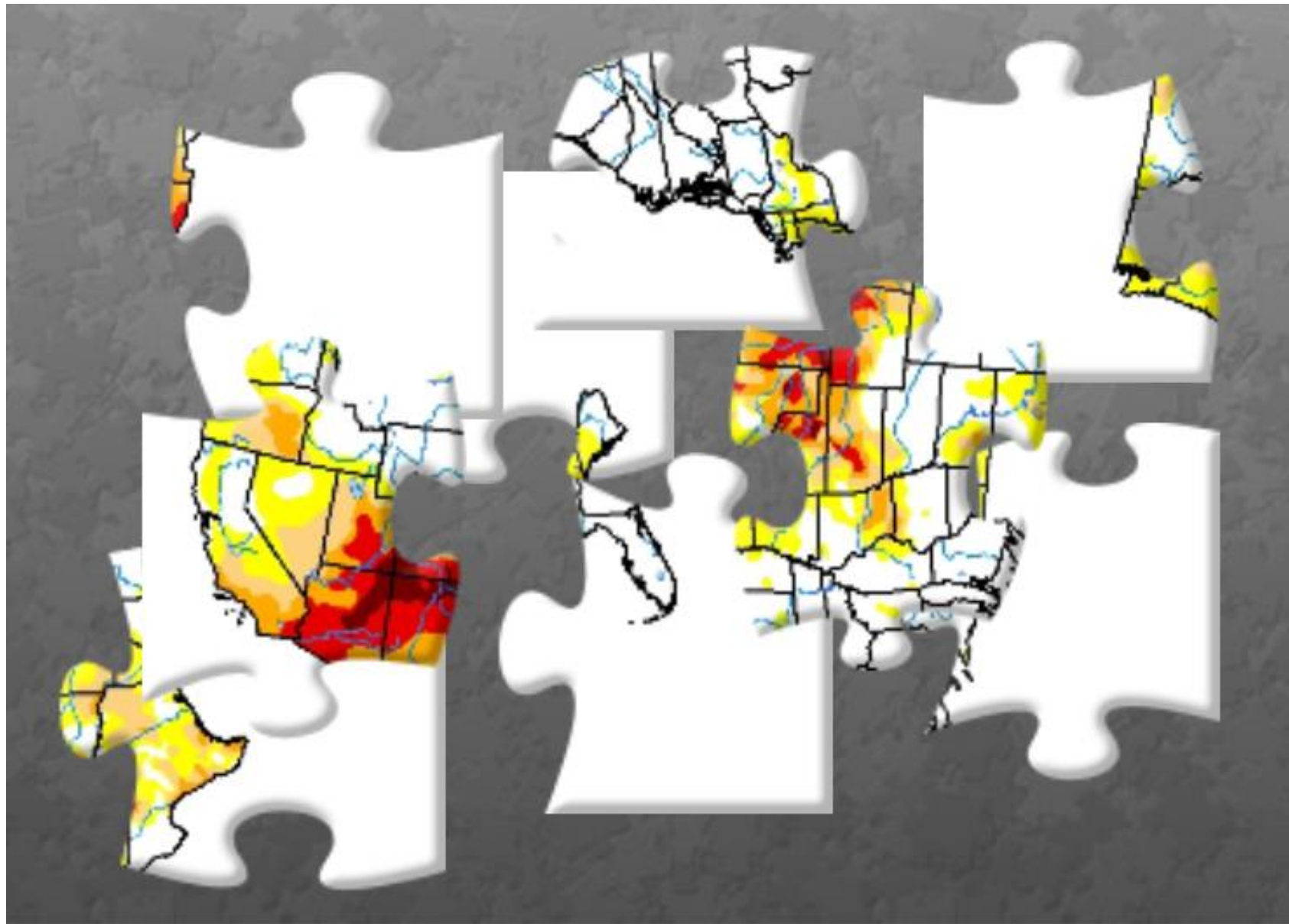
Pacific Northwest DEWS webinar

▶ 0:04 / 10:45



April 27, 2020

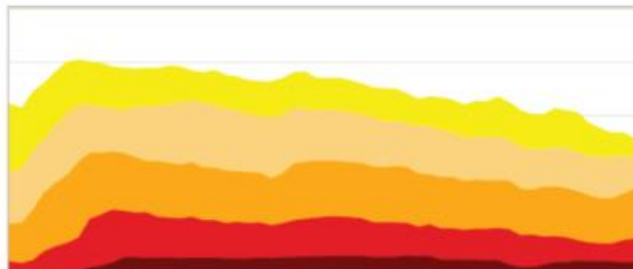
Impacts are a piece of the drought puzzle.



Takeway #5

It's more than just a map

<https://droughtmonitor.unl.edu>



Time Series

View a graph of the U.S. Drought Monitor statistics for a chosen area.

Week	Name	D0-D4	D1-D4	D2-D4	D3-D4	D4
2017-06-06	83.04	16.96	7.80	1.23	0.50	0.00
2017-05-30	81.09	18.91	5.28	1.12	0.28	0.00
2017-05-23	85.73	14.27	4.92	1.23	0.41	0.00
2017-05-16	83.42	16.58	5.01	1.39	0.43	0.00
2017-05-09	84.99	15.11	5.71	1.30	0.38	0.00
2017-05-02	85.94	14.07	4.90	1.30	0.73	0.00
2017-04-25	78.33	21.67	6.11	1.07	0.55	0.00
2017-04-18	73.04	26.96	6.30	1.44	0.00	0.00
2017-04-11	73.01	26.99	5.77	1.44	0.00	0.00
2017-04-04	70.27	29.73	6.83	1.30	0.10	0.00
2017-03-28	64.47	35.53	14.20	2.62	0.21	0.00
2017-03-21	63.78	36.22	15.87	3.74	0.43	0.00

Tabular Data Archive

View the U.S. Drought Monitor data in tabular format for a selected area.



GIS Data Files

Get GIS data files for each week including shapefiles, kmz, wms and more.

2017-06-06	83.04	16.96	7.80	1.23	0.50	0.00
2017-05-30	81.09	18.91	5.28	1.12	0.28	0.00
2017-05-23	85.73	14.27	4.92	1.23	0.41	0.00
2017-05-16	83.42	16.58	5.01	1.39	0.43	0.00
2017-05-09	84.99	15.11	5.71	1.30	0.38	0.00
2017-05-02	85.94	14.07	4.90	1.30	0.73	0.00
2017-04-25	78.33	21.67	6.11	1.07	0.55	0.00
2017-04-18	73.04	26.96	6.30	1.44	0.00	0.00
2017-04-11	73.01	26.99	5.77	1.44	0.00	0.00
2017-04-04	70.27	29.73	6.83	1.30	0.10	0.00
2017-03-28	64.47	35.53	14.20	2.62	0.21	0.00
2017-03-21	63.78	36.22	15.87	3.74	0.43	0.00

Data Download

Download U.S. Drought Monitor statistics.



Metadata

Information about the GIS data and other U.S. Drought Monitor data file formats.

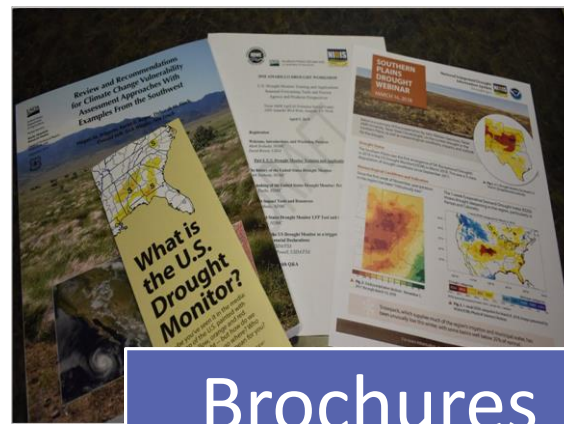


FSA Eligibility Tool

Tool to determine if an area qualifies for disaster payments from the Farm Service Agency.



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Additional information



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