

The United States Drought Monitor Process: What is it and how is the map made?

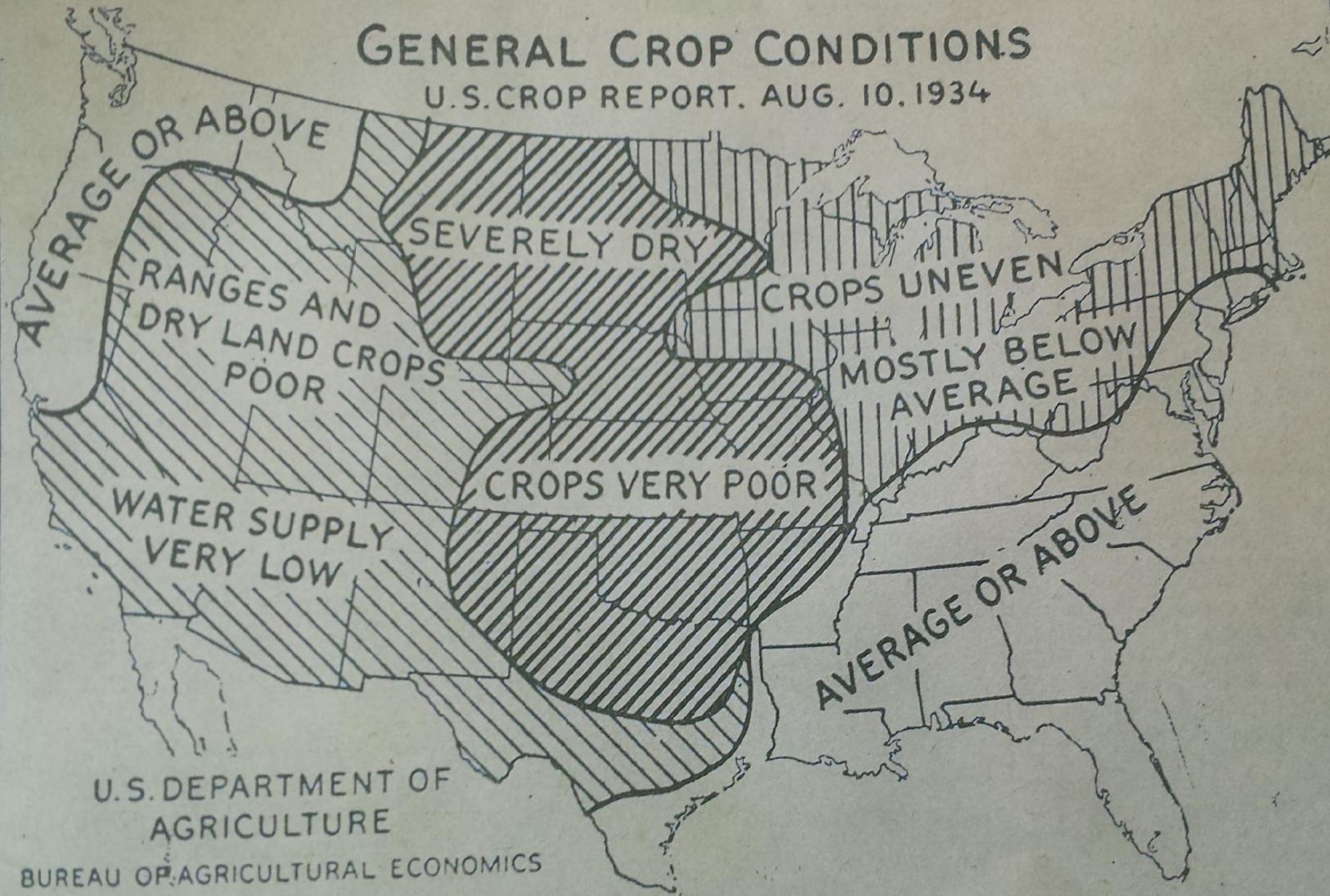
Brian Fuchs
National Drought Mitigation Center
University of Nebraska-Lincoln
School of Natural Resources



CROP EXPERTS MAKE MAP OF DROUTH AREAS

GENERAL CROP CONDITIONS

U.S. CROP REPORT, AUG. 10, 1934



U.S. DEPARTMENT OF
AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS

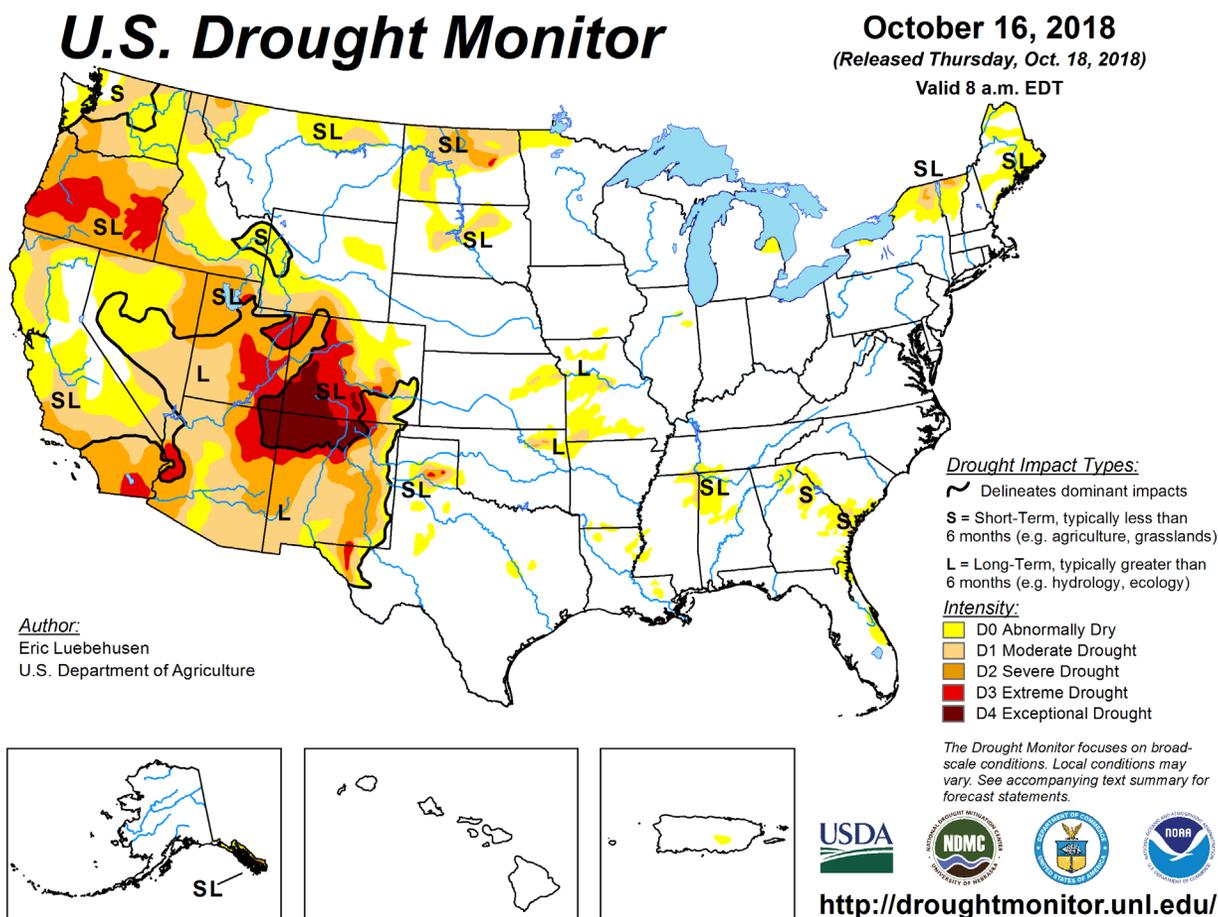
This chart, prepared by the United States Department of Agriculture, shows conditions in the different parts of the United States

Instead of using a single indicator/index, a Hybrid Approach is used: U.S. Drought Monitor (USDM)

Objective
indicators &
indices



Subjective
expertise

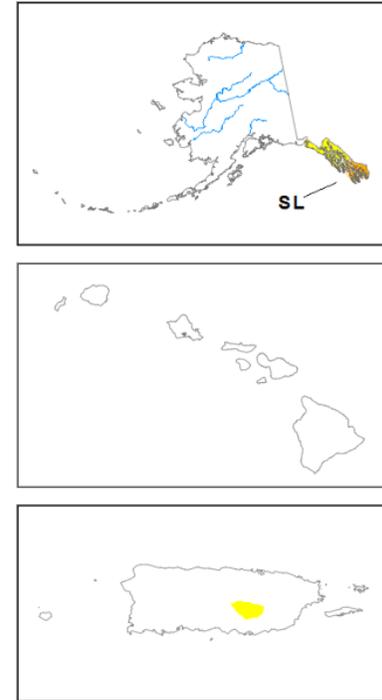
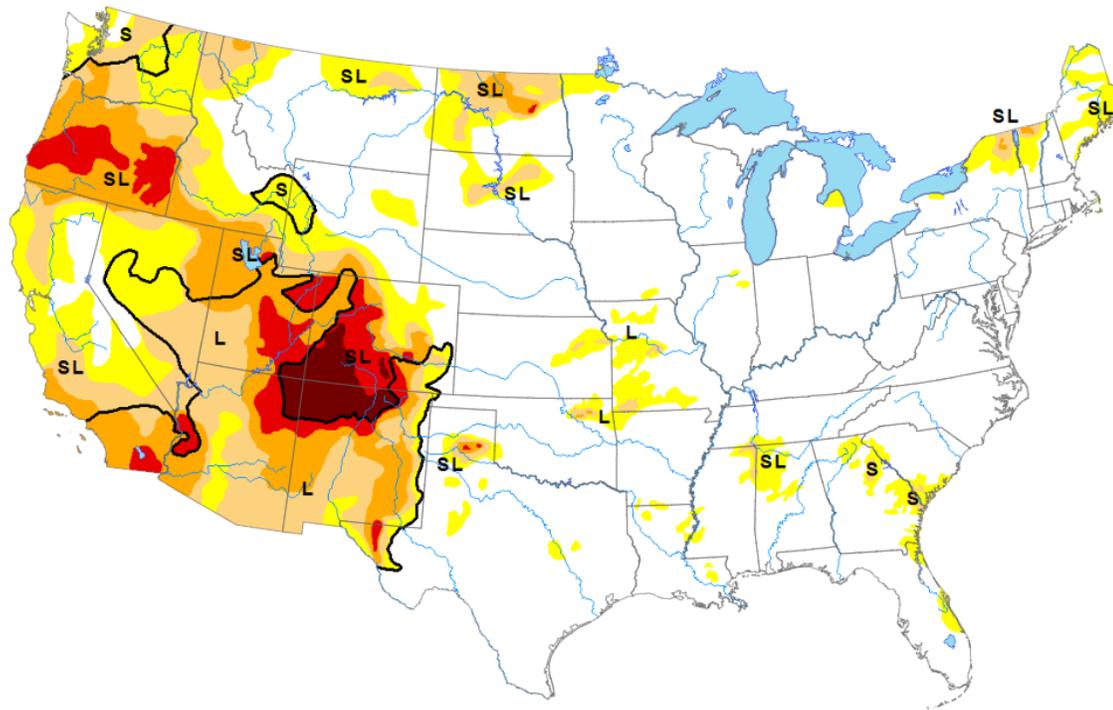


The United States Drought Monitor

- Hosted by the NDMC as part of a 3-way partnership with NOAA and USDA
- Over 12.5 million hits a year (more during significant drought events)
- Used in several USDA programs
- Used by the IRS for tax deferrals
- Many others !

Map released: October 18, 2018

Data valid: October 16, 2018 | Author: [Eric Luebehusen](#), U.S. Department of Agriculture



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.

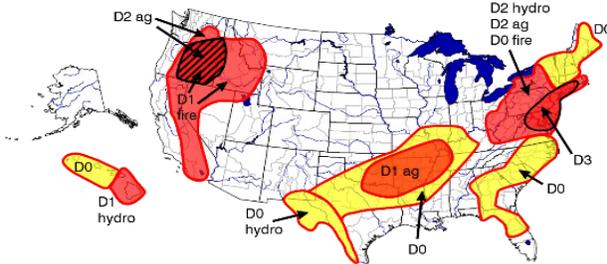
The U.S. Drought Monitor

Since 1999, NOAA (CPC, NCEI, WRCC), USDA, and the NDMC in an EQUAL Partnership

have produced a weekly composite drought map -- the U.S. Drought Monitor -- with input from numerous federal and non-federal agencies

- **12** current authors and 2 legacy authors
- **Western Region Climate Center** on board 2008 (David Simeral)
- **Incorporate** relevant information and products from all entities (and levels of government) dealing with drought (RCC's, SC's, federal/state agencies, etc.) **(450+ experts)**

August 3, 1999
Experimental U.S. Drought Monitor

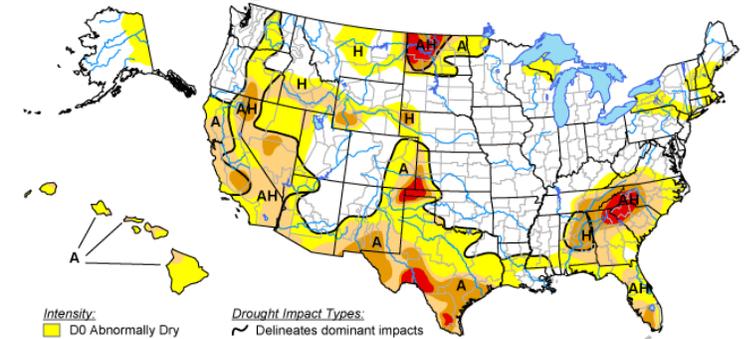


"Drought" means moisture shortages leading to damaged crops or pastures, high wildfire risk, or water shortages. The map is based on information from many sources, including both satellite and surface data, and it focuses on widespread drought. Local conditions may vary.

Yellow (D0) = Drought Watch Area (abnormally dry but not full drought status)
Red (D1-D4) = Current drought ranging in severity from standard (D1) to severe (D2-D3) to extreme (D4)
 Crosshatching () = Overlapping drought type areas
 Drought type: Used when impacts differ
 Ag = agricultural (crops, grasslands)
 Fire = forestry (wildfire potential)
 Hydro = hydrological (rivers, wells, reservoirs)
 Plus (+) = Forecast to intensify
 Minus (-) = Forecast to diminish



U.S. Drought Monitor June 10, 2008
Valid 8 a.m. EDT



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

Drought Impact Types:
 ~ Delineates dominant impacts
 A = Agricultural (crops, pastures, grasslands)
 H = Hydrological (water)

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

<http://drought.unl.edu/dm>

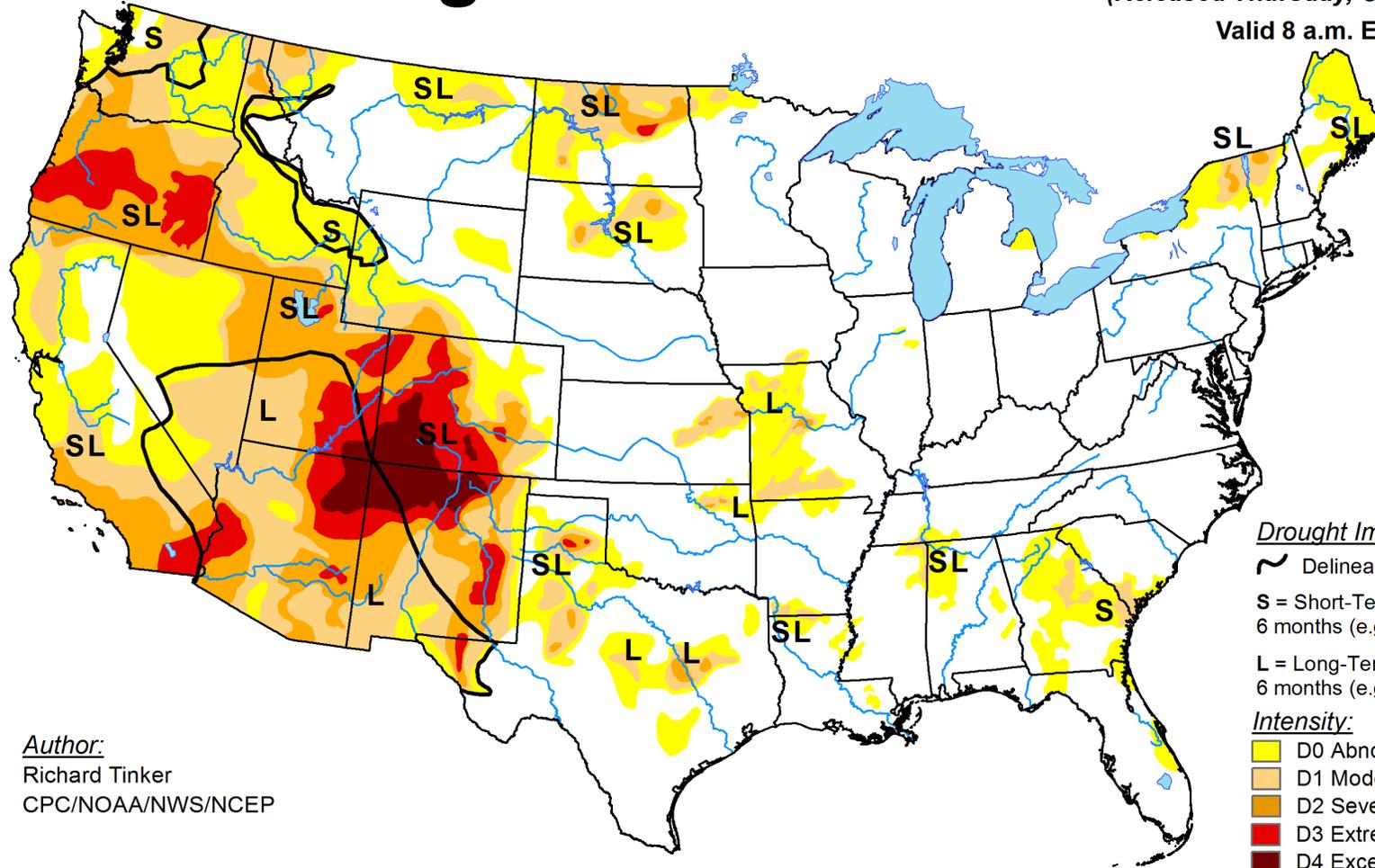


Released Thursday, June 12, 2008
Author: Mark Svoboda, National Drought Mitigation Center

U.S. Drought Monitor

October 9, 2018
(Released Thursday, Oct. 11, 2018)

Valid 8 a.m. EDT



Timescales
of potential
impacts
delineated

Drought Impact Types:

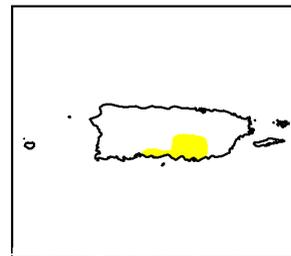
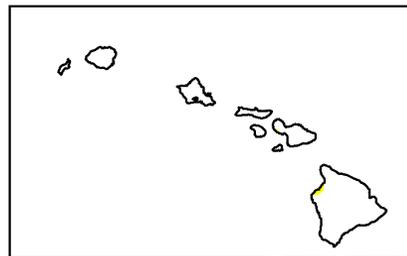
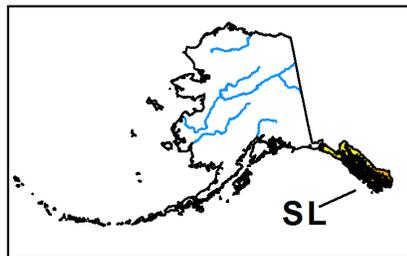
- ~ Delineates dominant impacts
- S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
- L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

Intensity:

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

Author:
Richard Tinker
CPC/NOAA/NWS/NCEP

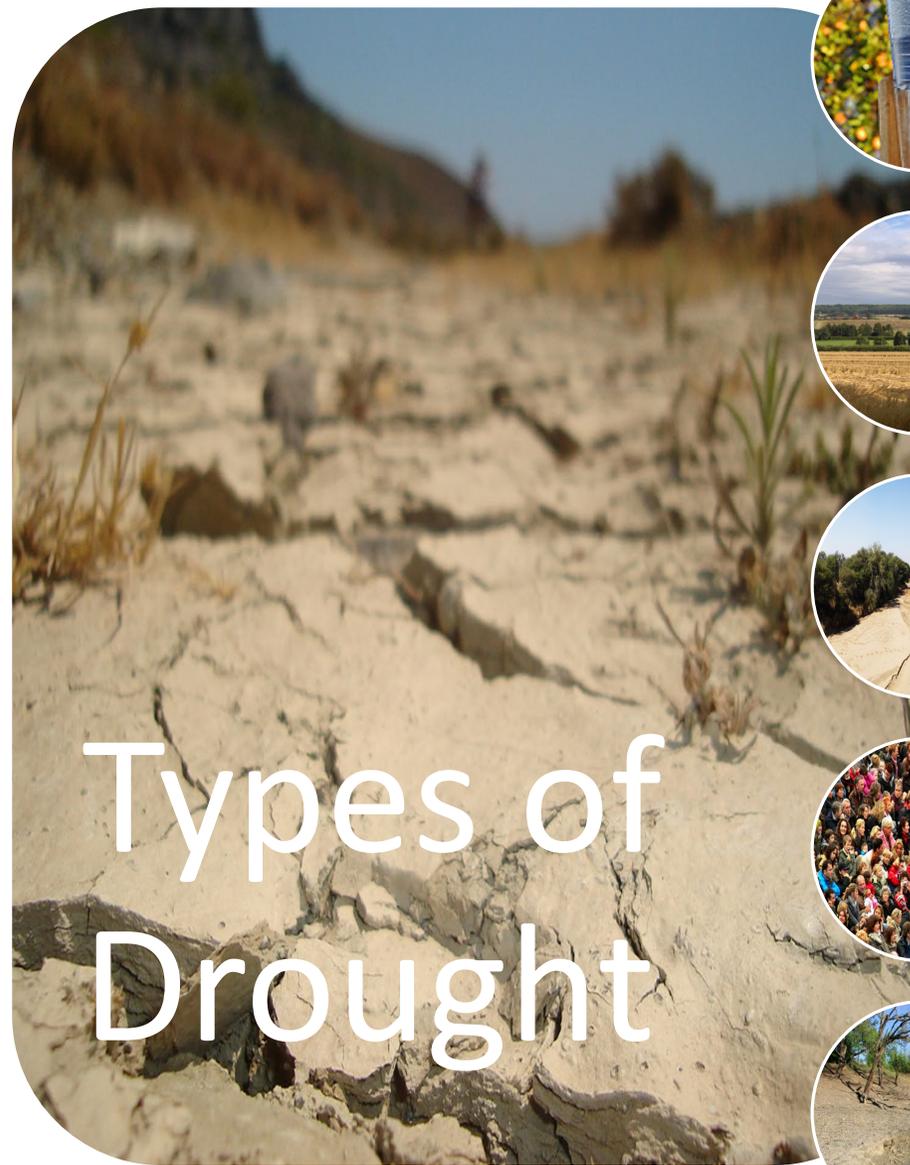
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<http://droughtmonitor.unl.edu/>

The map is...

An attempt to
represent different
types of drought all
on one map



Types of Drought



Meteorological



Agricultural



Hydrological



Socio-
economic



Ecological

5 levels of intensity on the map, 4 are considered drought, 1 is not

Intensity:

-  D0 Abnormally Dry } Not Drought
-  D1 Moderate Drought
-  D2 Severe Drought
-  D3 Extreme Drought
-  D4 Exceptional Drought

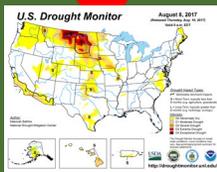
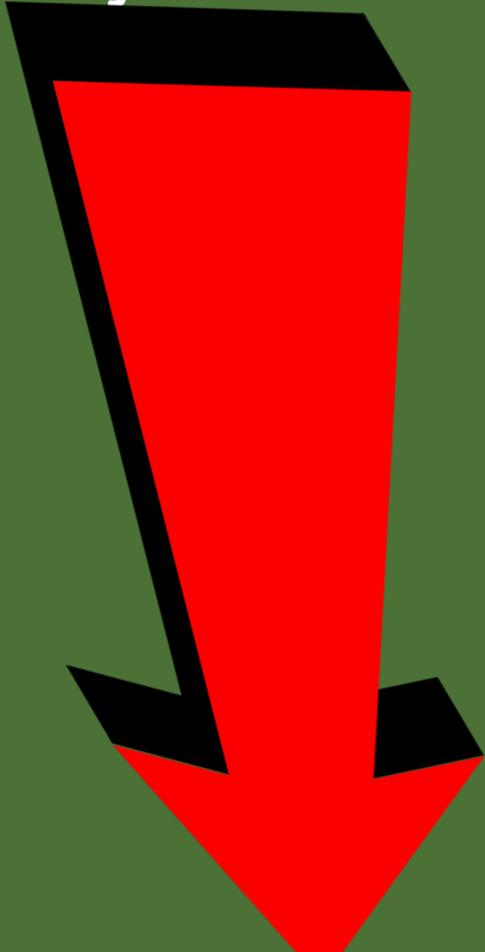
4 Drought intensities

U.S. Drought Monitor Approach

“Convergence of Evidence”

- Many types of drought “information” can be collectively analyzed
 - ***Determining if the majority of information is ‘converging’ (telling the same story)*** about the accuracy, or inaccuracy, of the drought as depicted by the U.S. Drought Monitor
 - Several **dozen** inputs are considered in any given week
- Authors need to ***look at 100% of the data, BUT don’t believe in any one piece of data input 100%*** in making a decision...
- ***Multiple indicators and many types of information are part of the analysis***
 - These data will identify different climatic and hydrologic parameters which are needed to understand the complete picture of a drought indicator’s performance and how they interact in each part of the country
- ***Impacts are the “ground truth”***, yet aren’t monitored to the extent which other data are....**you can’t measure what you don’t monitor!**

U.S. Drought Monitor Objectives



- Assessment of **current** conditions and **current** impacts
- The U.S. Drought Monitor is **NOT** a model
 - The map is made manually each week based off the previous week's map
- The U.S. Drought Monitor is **NOT** interpreting only precipitation
- The U.S. Drought Monitor is **NOT** a forecast or drought declaration
 - Can be used by decision makers in this way though
- Identifying **impacts**
 - “**S**” short-term impacts, “**L**” long-term impacts or “**SL**” for a combination of both
 - “**S**”-6 month time scales or less, “**L**”-greater than 6 month time scales
- Incorporate **local expert** input
 - Accomplished via email and impact reports
 - Validation of Objective Indicators
- Authors try to be as **objective** as possible (using the percentiles methodology) and the **“Convergence of evidence”** approach
 - The physical data, drought indices/ indicators **must** support the depiction on the map
 - Impact data validates physical data

Percentiles and the U.S. Drought Monitor

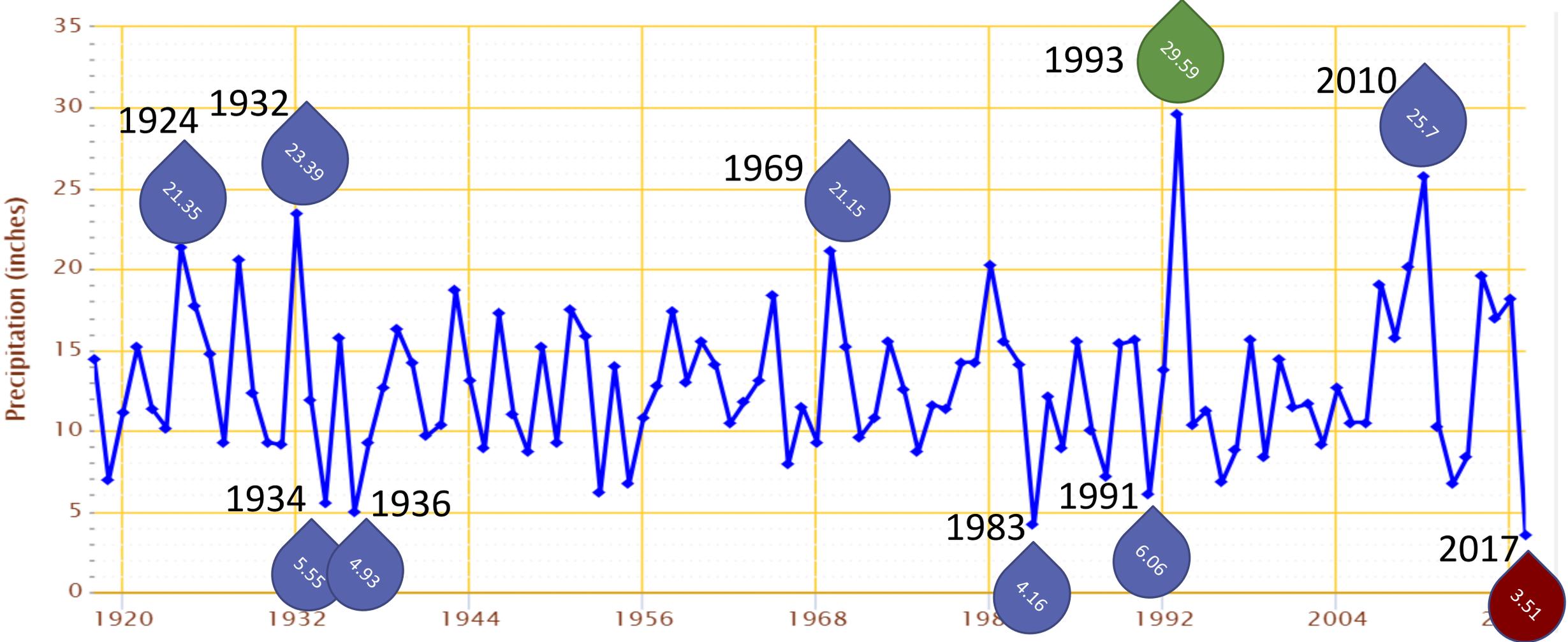
Every input can be put into percentiles to compare current data to historical records

Advantages of percentiles:

- Can be applied to any parameter used in the drought analysis
- Can be used for indicators of any length of data record
- Puts drought in historical perspective:

How many occurrences in a given period of time

D4: Exceptional Drought		(<i>1st-2nd</i> percentile)
D3: Extreme Drought		(<i>3rd-5th</i> percentile)
D2: Severe Drought		(<i>6th-10th</i> percentile)
D1: Moderate Drought		(<i>11th-20th</i> percentile)
D0: Abnormally Dry		(<i>21st-30th</i> percentile)



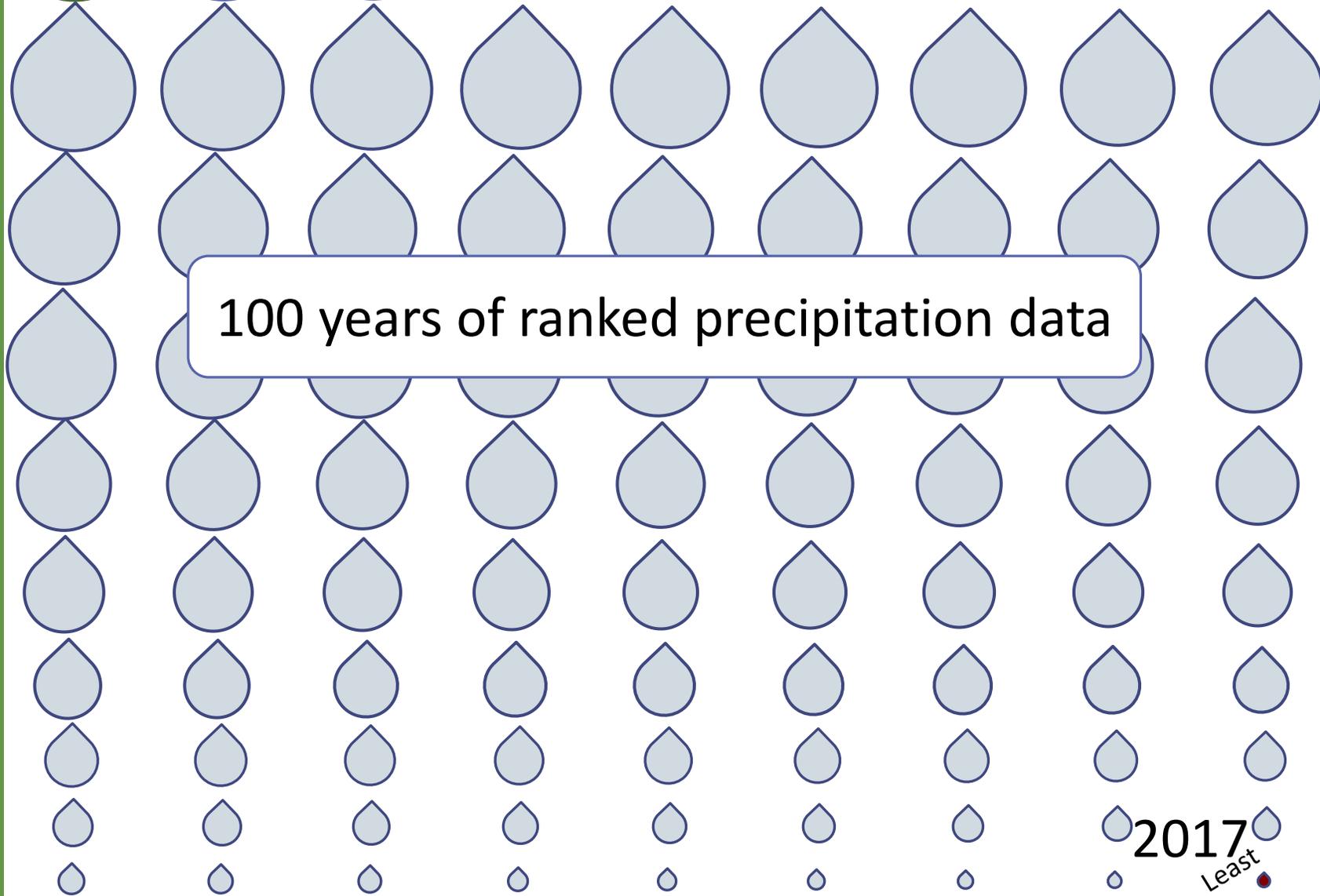
June-July-August Precipitation Fairfield, IA 1919-2018

Categories based on historical likelihood

1993



100 years of ranked precipitation data

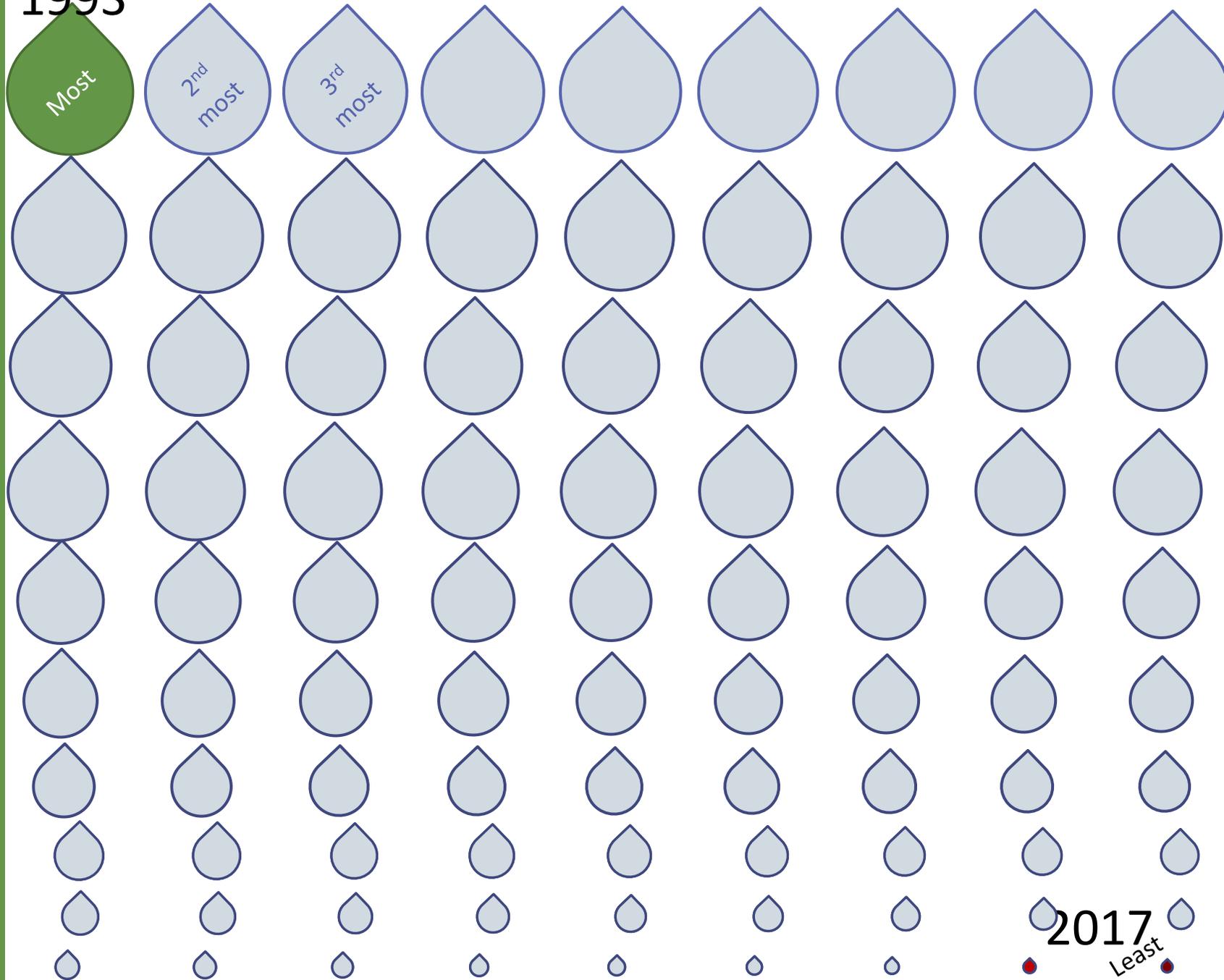


2017
Least

			Percentile
	D0	Abnormally Dry	21-30
	D1	Moderate Drought	11-20
	D2	Severe Drought	6-10
	D3	Extreme Drought	3 - 5
	D4	Exceptional Drought	1 - 2

Categories based on historical likelihood

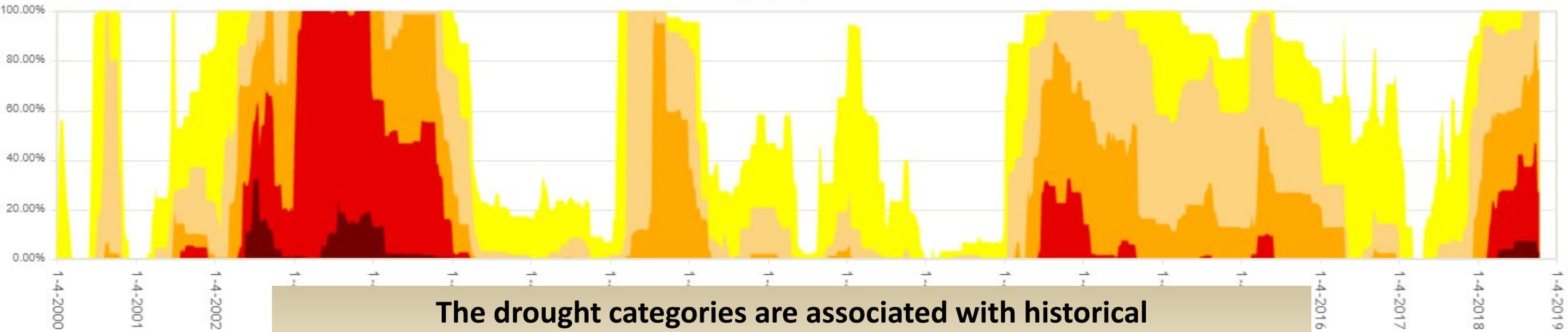
1993



Percentile

D0	Abnormally Dry	21-30
D1	Moderate Drought	11-20
D2	Severe Drought	6-10
D3	Extreme Drought	3 - 5
D4	Exceptional Drought	1 - 2

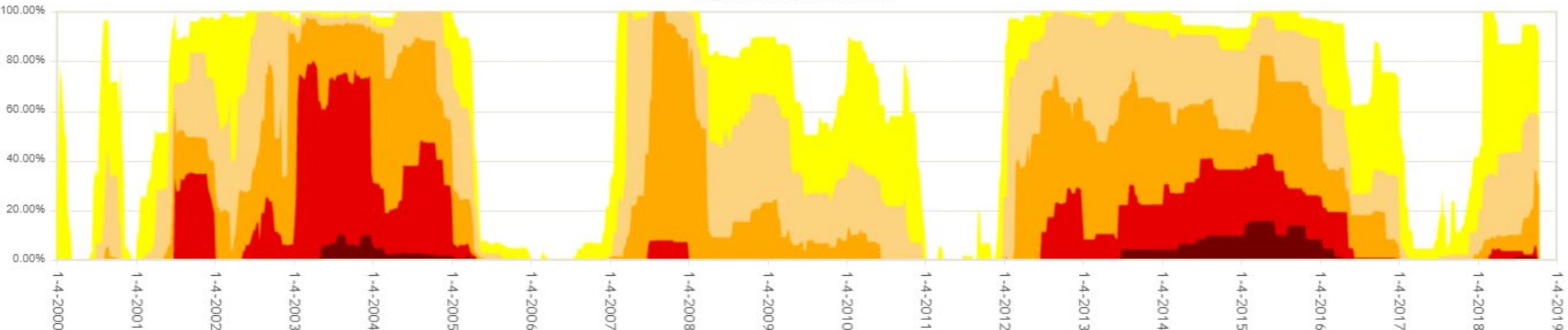
Utah Percent Area



The drought categories are associated with historical occurrence/likelihood (percentile ranking)

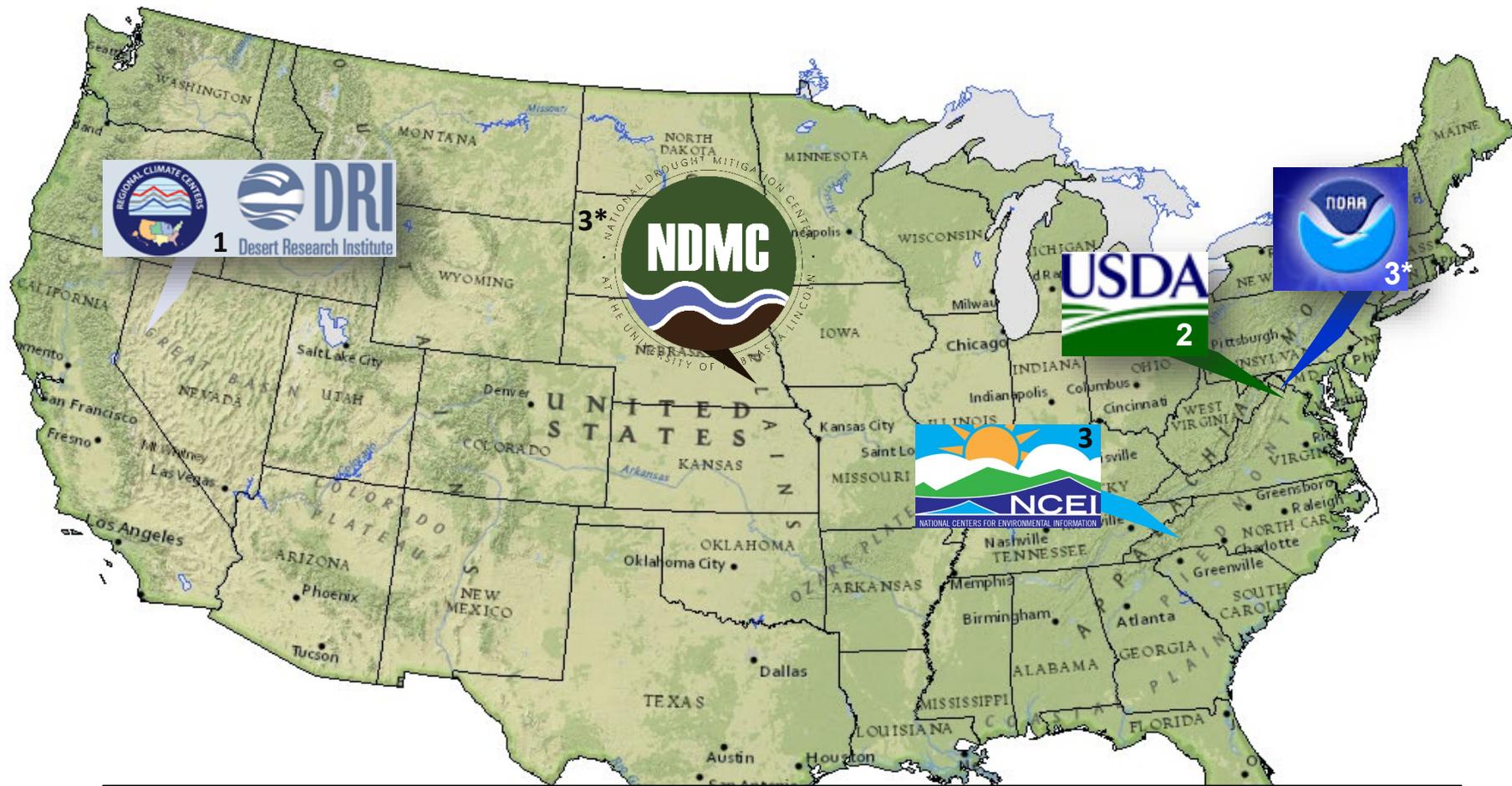
It is not anecdotal or subjective, like “It’s really, really dry!!” ...or, “I don’t remember it ever being this dry, we have to be D4!!”

16 (Great Basin) Percent Area



How is all of this done?

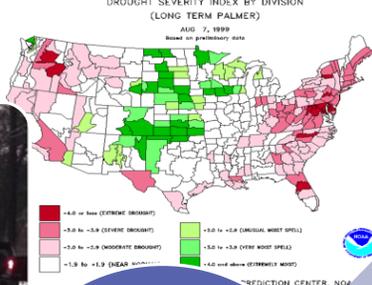




Requirement: Authors must work at a regional or national “center”, government or academia/research

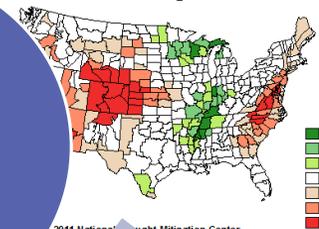
There are currently 12* authors, and all are volunteers





Indices:
SPI/PDSI

12-month SPI through the end of September 2002

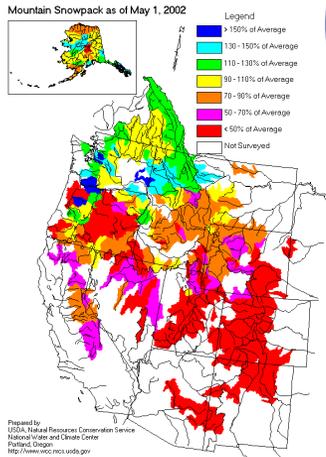
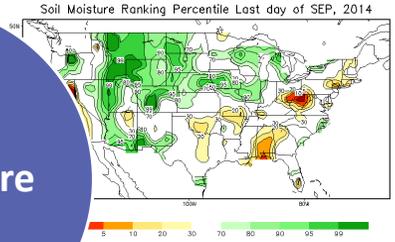


Precipitation
and Snow

Soil Moisture

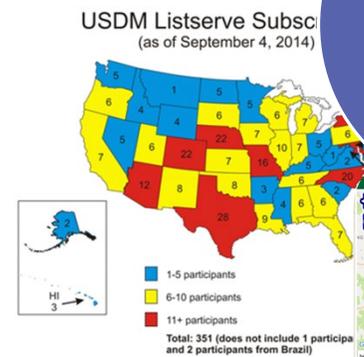
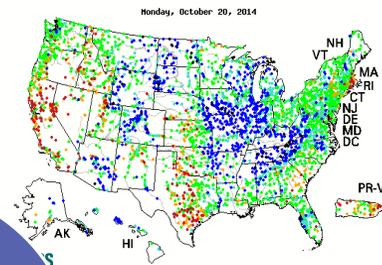
Most of the information analyzed each week falls into one of these categories.

Authors now use roughly **40-50 unique indicators** while creating the U.S. Drought Monitor map, but not all areas are represented equally by all pieces of data.

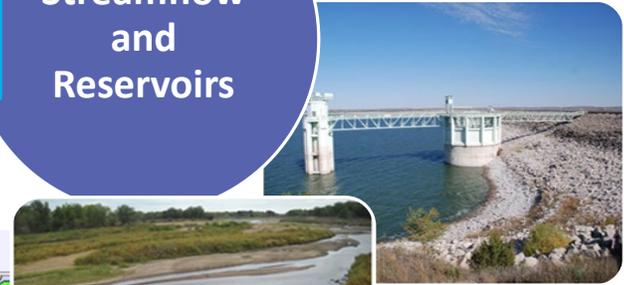
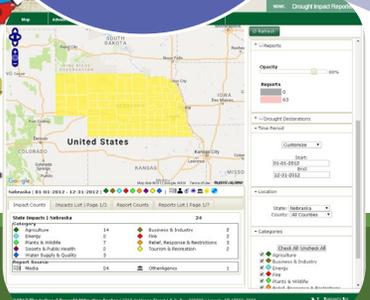


Expert Local
Input and
Impacts

Streamflow
and
Reservoirs



Remote
Sensing



U.S. Drought Monitor

Integrates Key Drought Indicators:

- Palmer Drought Index
- SPI
- SPEI
- KBDI
- Modeled Soil Moisture
 - NLDAS
- 7-14 Day Avg. Streamflow
- Precipitation Anomalies
- AHPS Precipitation
- Other data which are available

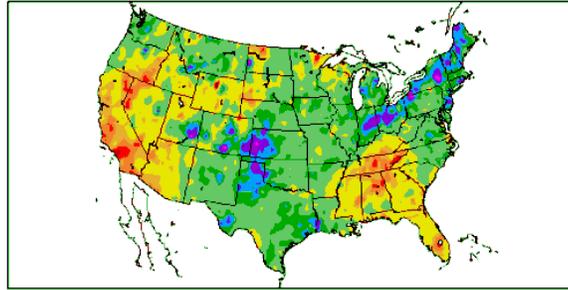
Growing Season:

- Crop Moisture Index
- Sat. Veg. Health Index
- VegDRI/ESI/etc.
- Soil Moisture
- Mesonets
- State/Regional data

In The West:

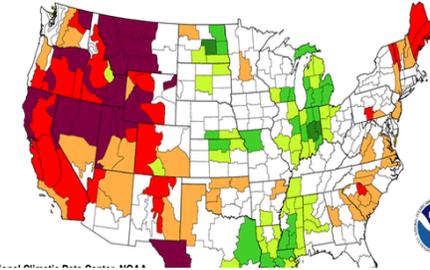
- SWSI
- Reservoir levels
- Snowpack (SNOTEL)
- SWE
- Streamflow

Water Year SPI
10/1/2006 - 4/19/2007

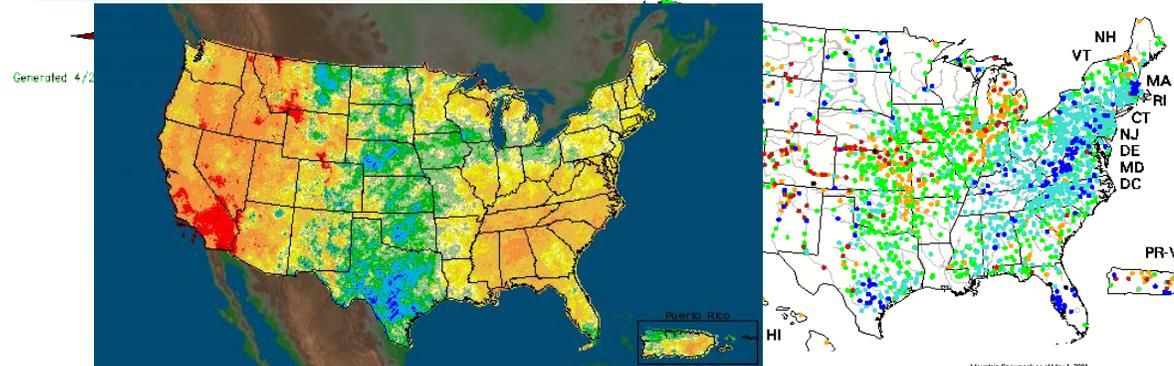


Palmer Drought Index
Long-Term (Meteorological) Conditions

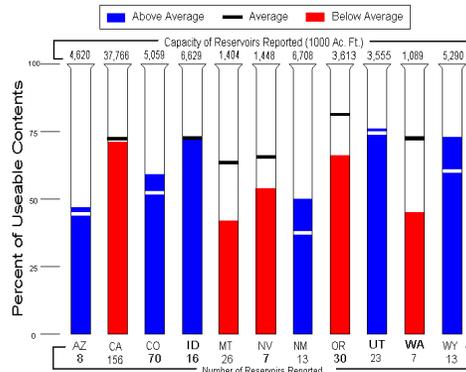
October 21, 2001 - October 27, 2001



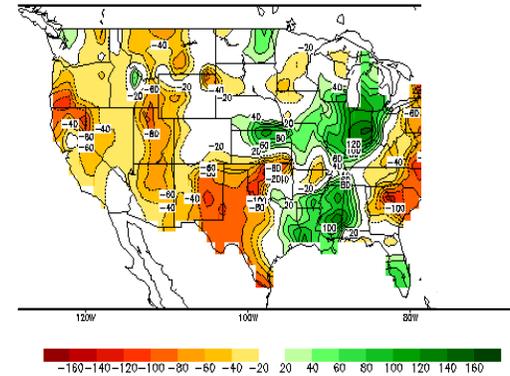
Sunday, December 22, 2002



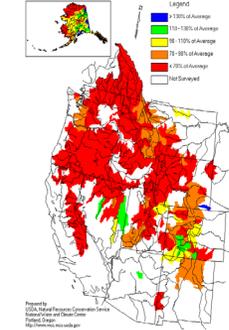
Reservoir Storage as of May 1, 2001



Calculated Soil Moisture Anomaly (mm)
OCT 31, 2001



Mountain Snowpack as of May 1, 2001

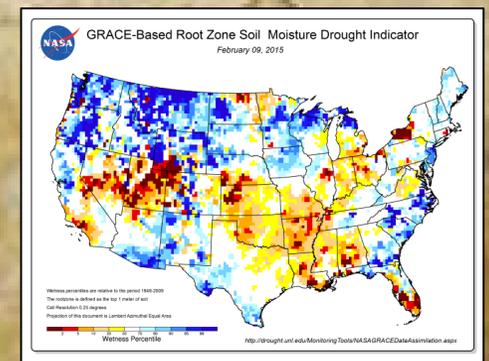
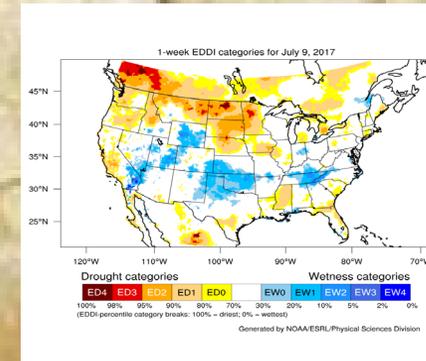
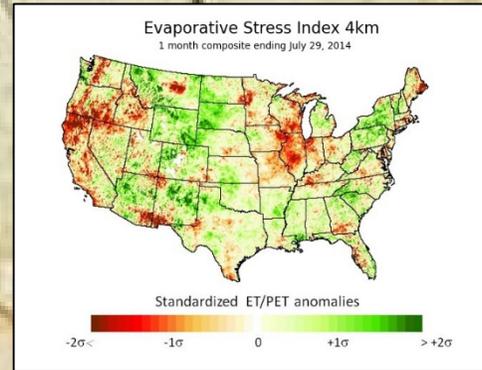
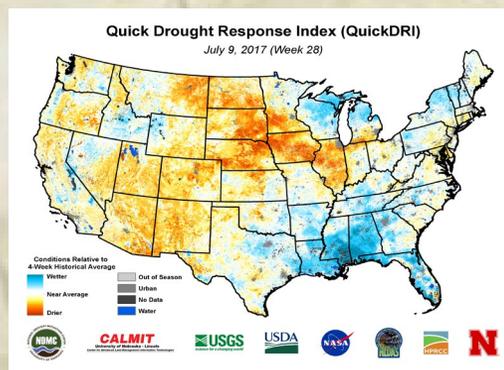
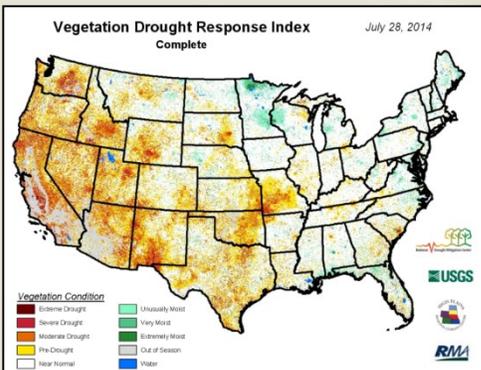
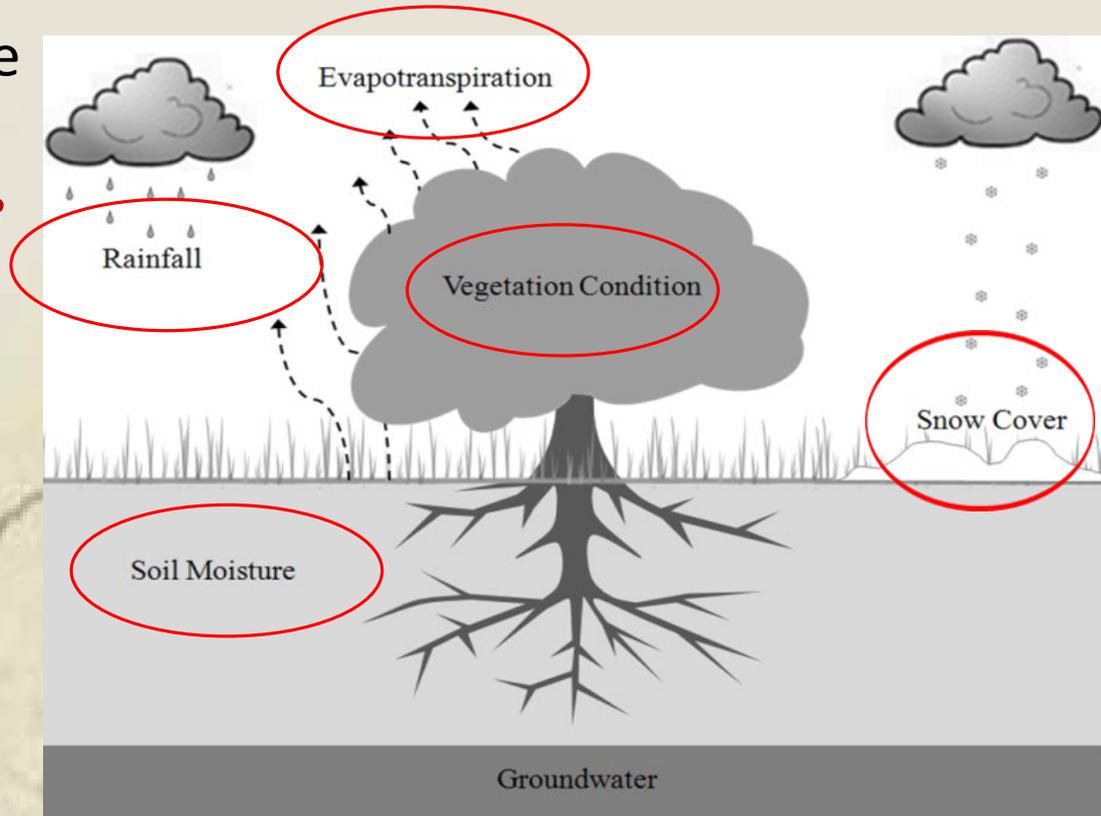


Emerging Satellite-based Observations and Products

Over the past 10+ years, a number of satellite remote sensing-based tools and **products characterizing different parts of the hydrologic cycle that influence drought conditions** allowing new composite drought indicators to be developed.

Examples

- Evaporative Stress Index (ESI)
- Quick Drought Response Index (QuickDRI)
- Evaporative Demand Drought Index (EDDI)
- GRACE soil moisture and groundwater anomalies
- Vegetation Drought Response Index (VegDRI)



Authorship
rotates:
2 week shifts

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

*Also Western Regional Climate Center

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

7:00 AM

Data for the map released on 6/29

29

Data Cutoff : 12Z (7 AM CDT)

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

7:00 AM

Data for the map released on 6/29

Draft 1
4:00 PM

Draft 2

Near Final Draft

Input Cuto

Final files &
narrative se
5:00 PM

Map
Released
7:30 AM



Times in CDT

Once the map is completed and published for the week, the map is final and no changes will be made retroactively!

U.S. Drought Monitor

October 9, 2018
Tuesday, Oct. 11, 2018
10:00 a.m. EDT



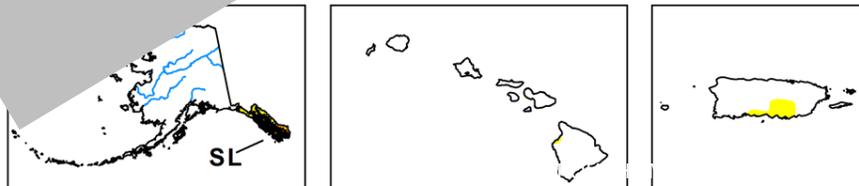
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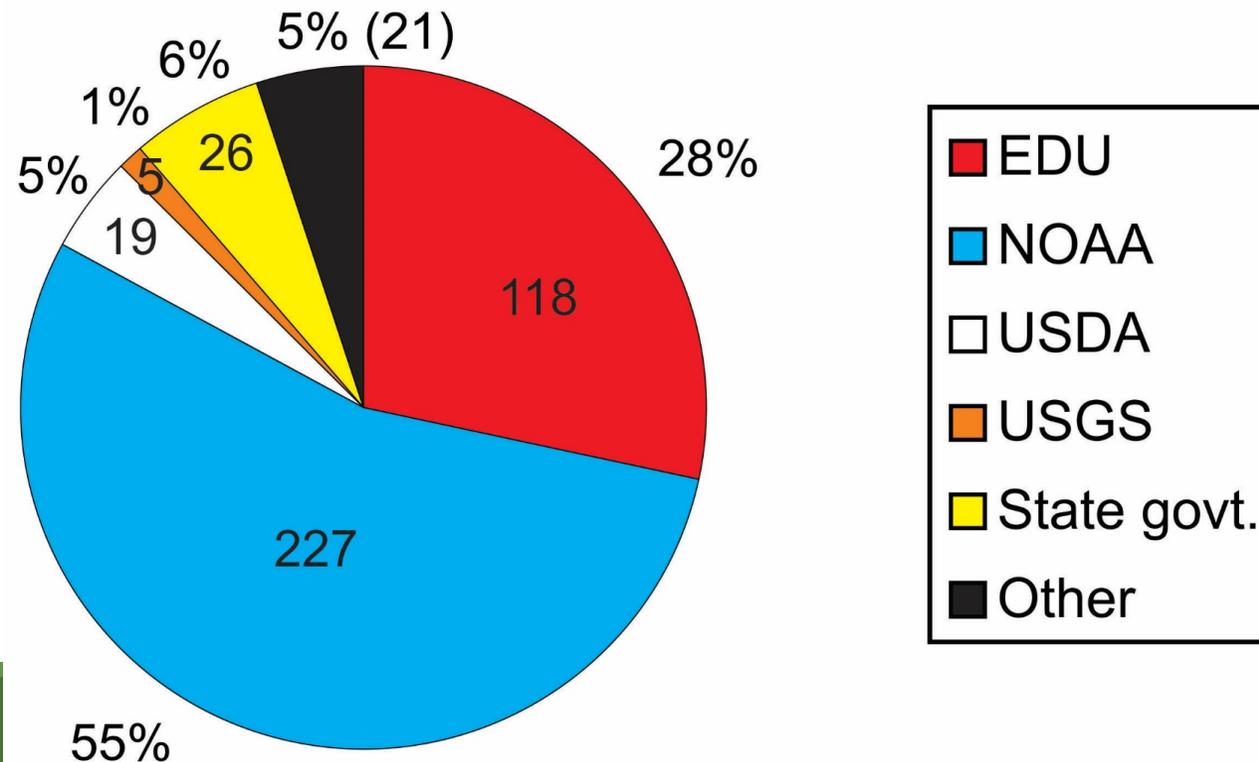
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<http://droughtmonitor.unl.edu/>

How can you participate in the USDM Process?

USDM Listserve Subscribers (as of June 22, 2018)



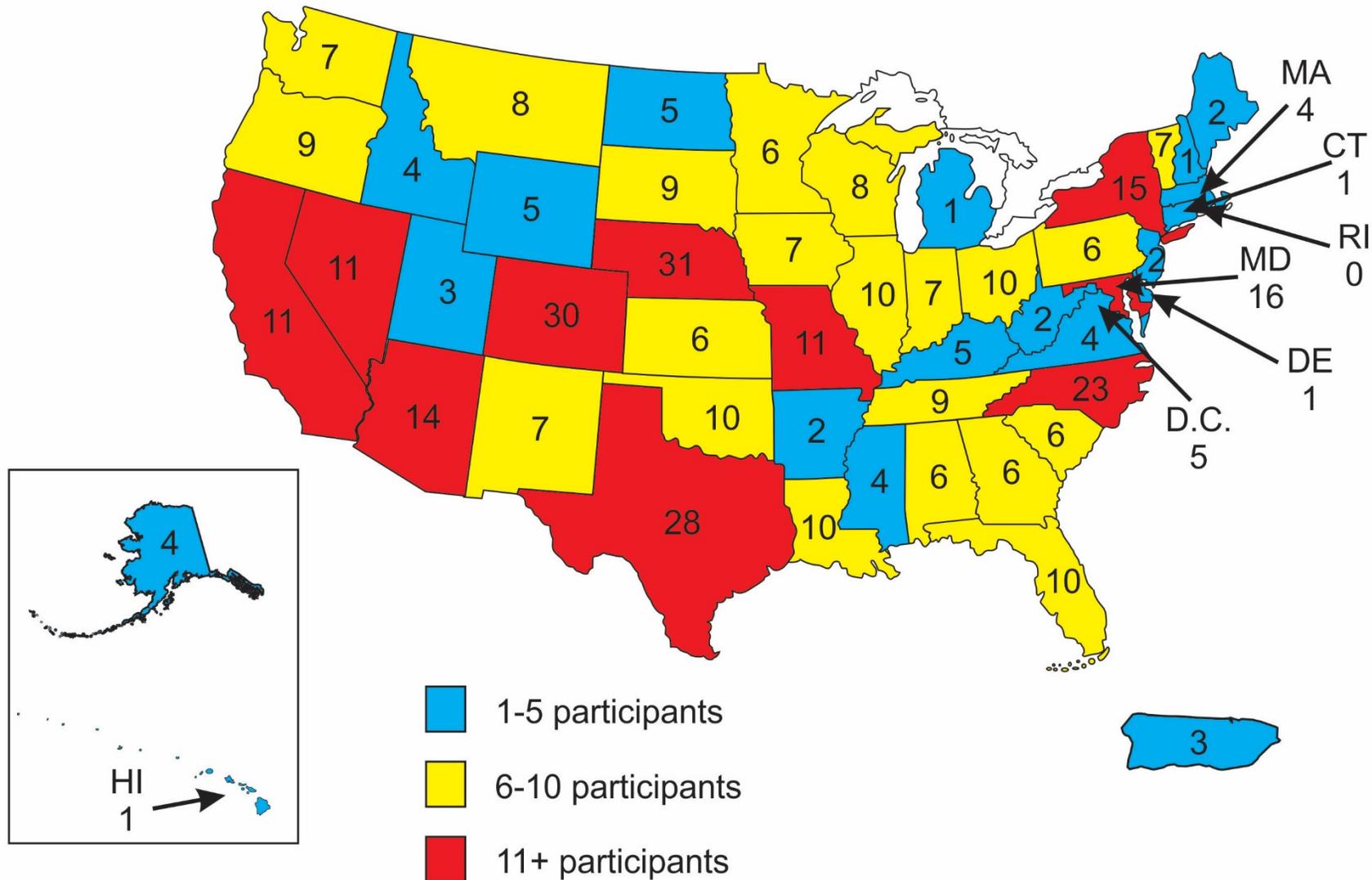
Regional and Local Feedback/Input Process

- Annual User **Feedback Forums** (USDN/NADM) since 2000
- Various webinars/telecons/reports/data/products
- **Regional Climate Centers** and NOAA **Regional Climate Service Directors and Coordinators along w/ Weather Forecast Offices (WFOs)**
- **State Climatologists**
- **USDA FSA/NRCS**
- **Native American Tribal input**
- **CoCoRaHS (impacts)**
- National Integrated Drought Information System (**NIDIS**) **Pilot RDEWS** basin webinars:
 - UCRB (Upper Colorado River Basin)
 - ACF (Apalachicola-Chattahoochee-Flint)
 - Southern Plains
 - MORB (Missouri River Basin)
 - California/Nevada
 - Pacific Northwest/Midwest (both coming online)
- **Drought Task Forces**: North Carolina, Hawaii, Oklahoma, Texas, New Mexico, Alabama, Florida, South Dakota, Kentucky, Arizona, Montana, and California

• **And MANY OTHERS !**

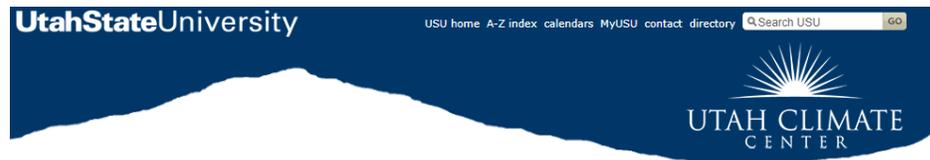
USDM Listserve Subscribers

(as of June 22, 2018)



Total: 413 (does not include 1 participant from Canada and 2 participants from Brazil)

Your observations can contribute to the making of the drought map. Here's how:



Contact Us



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Email: jonathan.meyer@aggiemail.usu.edu
Phone:



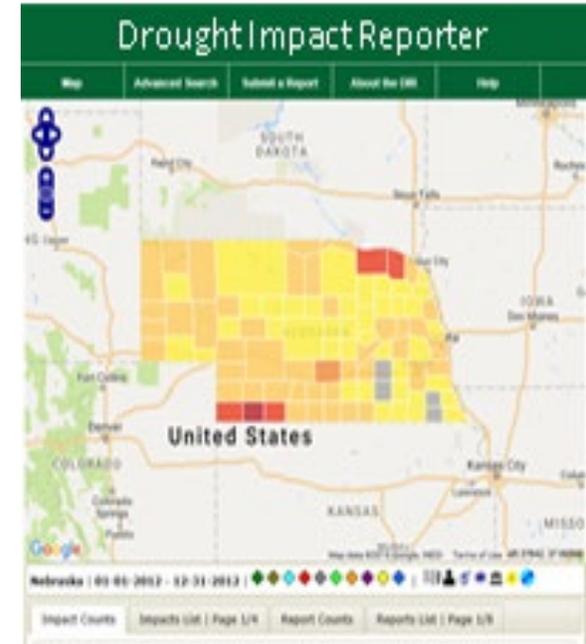
Bob Clawson
Utah Climate Center
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Logan, UT 84322-4825
Email: bob.clawson@usu.edu
Phone:



Dalek
Mascot



Join CoCoRaHS &
report rain &
drought information
<http://cocorahs.org>



Submit reports to the Drought
Impact Reporter
<http://droughtreporter.unl.edu>

Some Examples of Decision Making and Policy Using the USDM (*Science before Policy*)

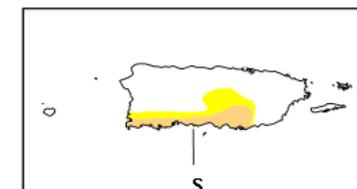
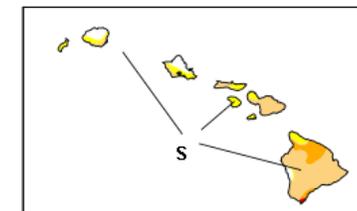
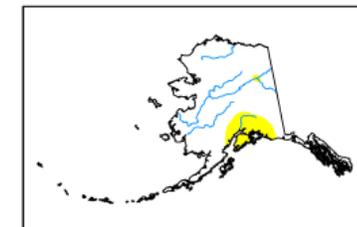
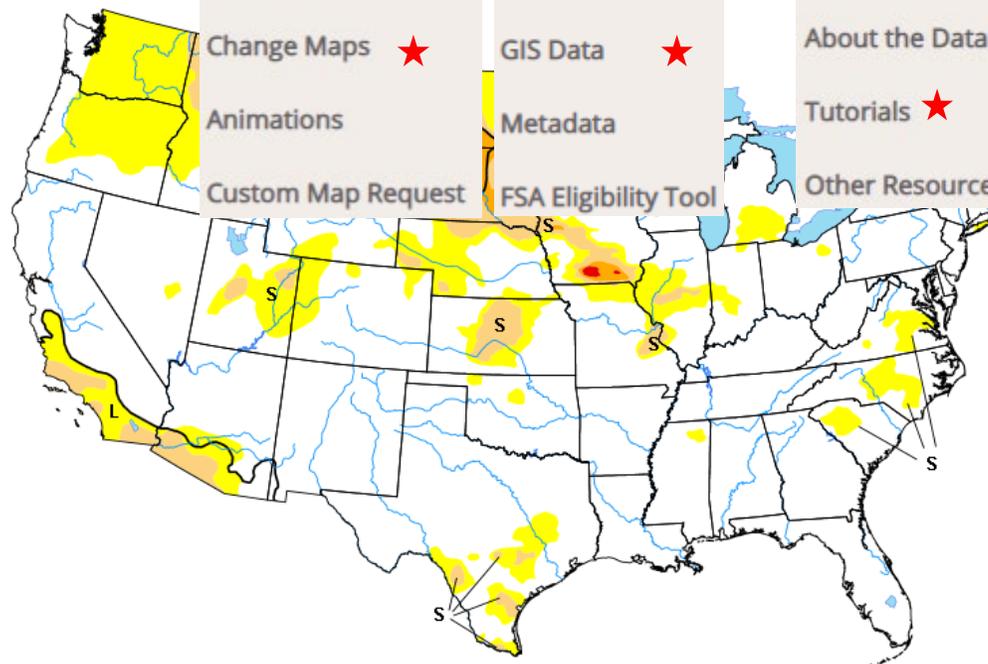
Policy:

- **2008/2014 Farm Bill**
 - USDA Farm Service Agency, Natural Resources Conservation Service, Risk Management Agency
- **Internal Revenue Service**
 - Livestock tax deferral program
- **U.S. Department of Agriculture**
 - Secretarial *"Fast Track"* Drought Designations
- **NOAA National Weather Service**
 - Drought Information Statements
- **Environmental Protection Agency**
 - Water quality monitoring
- **Centers for Disease Control and Prevention**
 - Public health
- **Bureau of Land Management**
- **Several States use in their monitoring/plans**
- **Many others**

- Compare Two Weeks ★
- Time Series ★
- What is the USDM
- Comparison Slider
- Data Tables ★
- Permission
- Map Archive ★
- Data Download
- Contact Us
- Change Maps ★
- GIS Data ★
- About the Data
- Animations
- Metadata
- Tutorials ★
- Custom Map Request
- FSA Eligibility Tool
- Other Resources

Map for August

Data valid: August 22



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)

- ~ 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)

The United States Drought Monitor

A summary narrative of changes made each week, by region, can be found in the **[“Drought Summary”](#)**

October 16, 2018

Updated Thursday, Oct. 18, 2018)

Valid 8 a.m. EDT

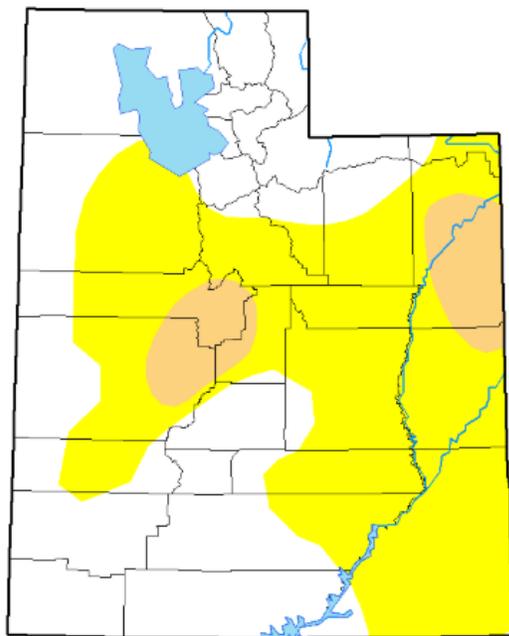
Compare Two Weeks

Maps > Compare Two Weeks

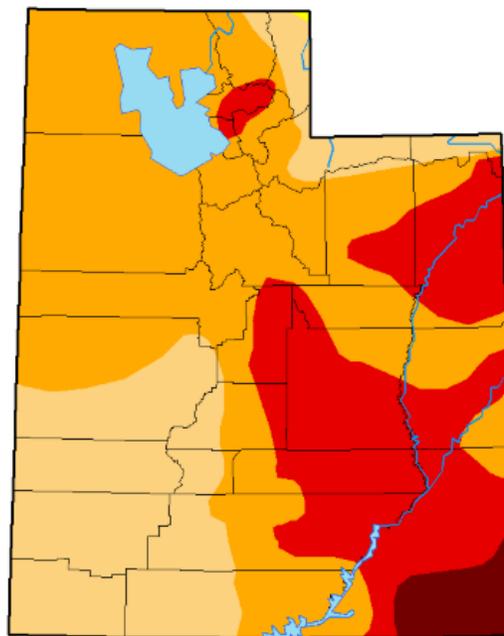
Area type: State Area: Utah Statistics type: Cumulative Percent Area

Drought Classification

None D0 (Abnormally Dry) D1 (Moderate Drought) D2 (Severe Drought) D3 (Extreme Drought) D4 (Exceptional Drought)



October 17, 2017



October 16, 2018



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
2017-10-17	6.80	93.20	70.99	38.74	12.52	4.47
2018-10-16	6.10	93.90	72.98	41.30	15.61	4.98
Change	6.95	93.05	70.92	51.00	32.21	7.17
2017-10-17	30.60	69.40	41.73	9.36	0.00	0.00
2018-10-16	4.39	95.61	74.84	49.75	22.74	5.92
Change	72.76	27.24	5.29	0.00	0.00	0.00

Abnormally Dry D3 Extreme Drought
 Moderate Drought D4 Exceptional Drought
 Severe Drought

The monitor focuses on broad-scale conditions. Conditions may vary. See accompanying text summary for details.

Department of Agriculture

Statistics Comparison

Week	None	D0-D4	D1-D4	D2-D4	D3-D4	D4	DSCI
2017-10-17	48.76	51.24	6.98	0.00	0.00	0.00	58
2018-10-16	0.00	100.00	99.96	76.13	26.84	3.01	306
Change	-48.76	48.76	92.98	76.13	26.84	3.01	248



[/droughtmonitor.unl.edu/](http://droughtmonitor.unl.edu/)

U.S. Drought Monitor Class Change Maps

At various time-scales of:

1 week

4 weeks

8 weeks

12 weeks

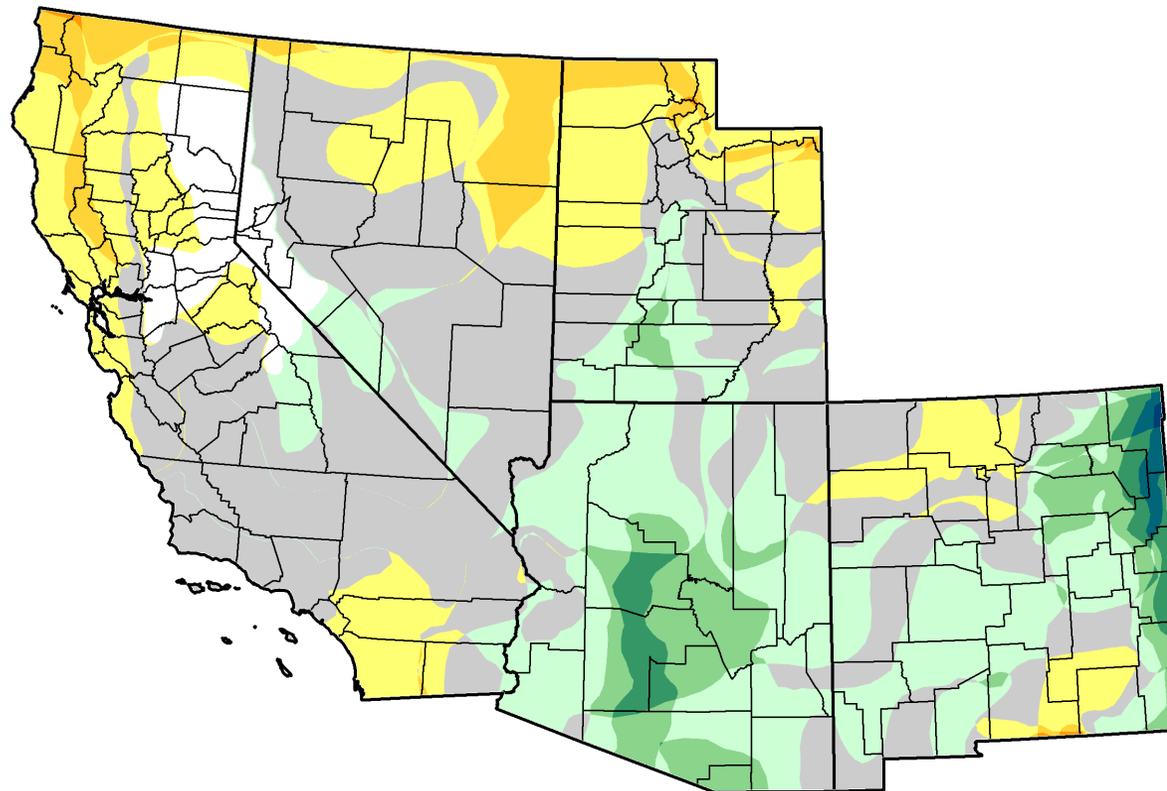
24 weeks

1 year

Calendar year

Water year

**U.S. Drought Monitor Class Change - USDA Southwest Climate Hub
6 Months**



**October 16, 2018
compared to
May 1, 2018**

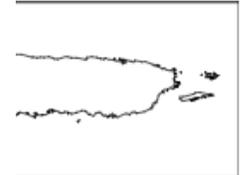
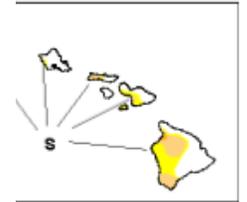
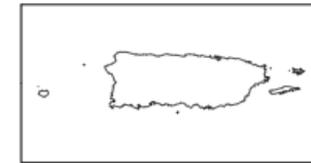
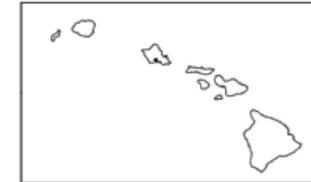
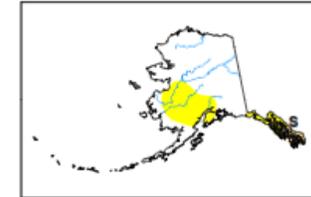
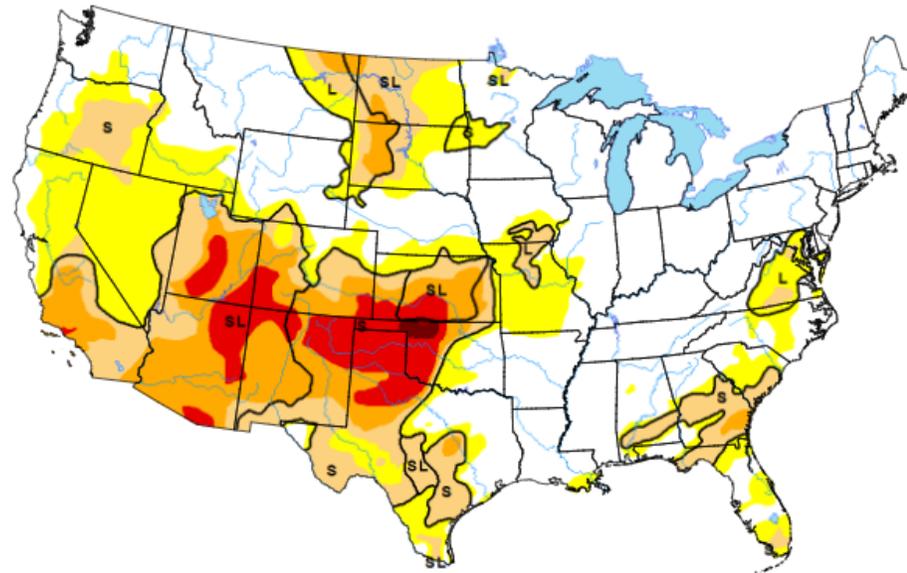
<http://droughtmonitor.unl.edu>



- 5 Class Degradation
- 4 Class Degradation
- 3 Class Degradation
- 2 Class Degradation
- 1 Class Degradation
- No Change
- 1 Class Improvement
- 2 Class Improvement
- 3 Class Improvement
- 4 Class Improvement
- 5 Class Improvement

Mapa para marzo 15, 2018

Datos válidos: marzo 13, 2018 | Autor: [Richard Tinker](#), NOAA/NWS/NCEP/CPC



El límite de datos para los mapas de Monitor de Sequía es cada martes a las 8 a.m. EDT. Los mapas, que se basan en el análisis de los datos, se publican cada jueves a las 8:30 am Hora del Este.

Thursday at 8:30 a.m.

Intensidad e impactos

□ Ninguna

□ D0 (Anormalmente Seco)

□ D1 (Sequía moderada)

□ D2 (Sequía severa)

□ D3 (Sequía extrema)

□ D4 (Sequía excepcional)

~ - Delimita impactos dominantes

S - Período corto, típicamente menos de 6 meses (ej. agricultura, pastizales)

L - Período largo, típicamente más de 6 meses (e.g. hidrología, ecología)

agriculture, grasslands)

(e.g. hydrology, ecology)

Descargar mapa

Mapa corriente: [PNG](#) [PDF](#) [JPG](#)

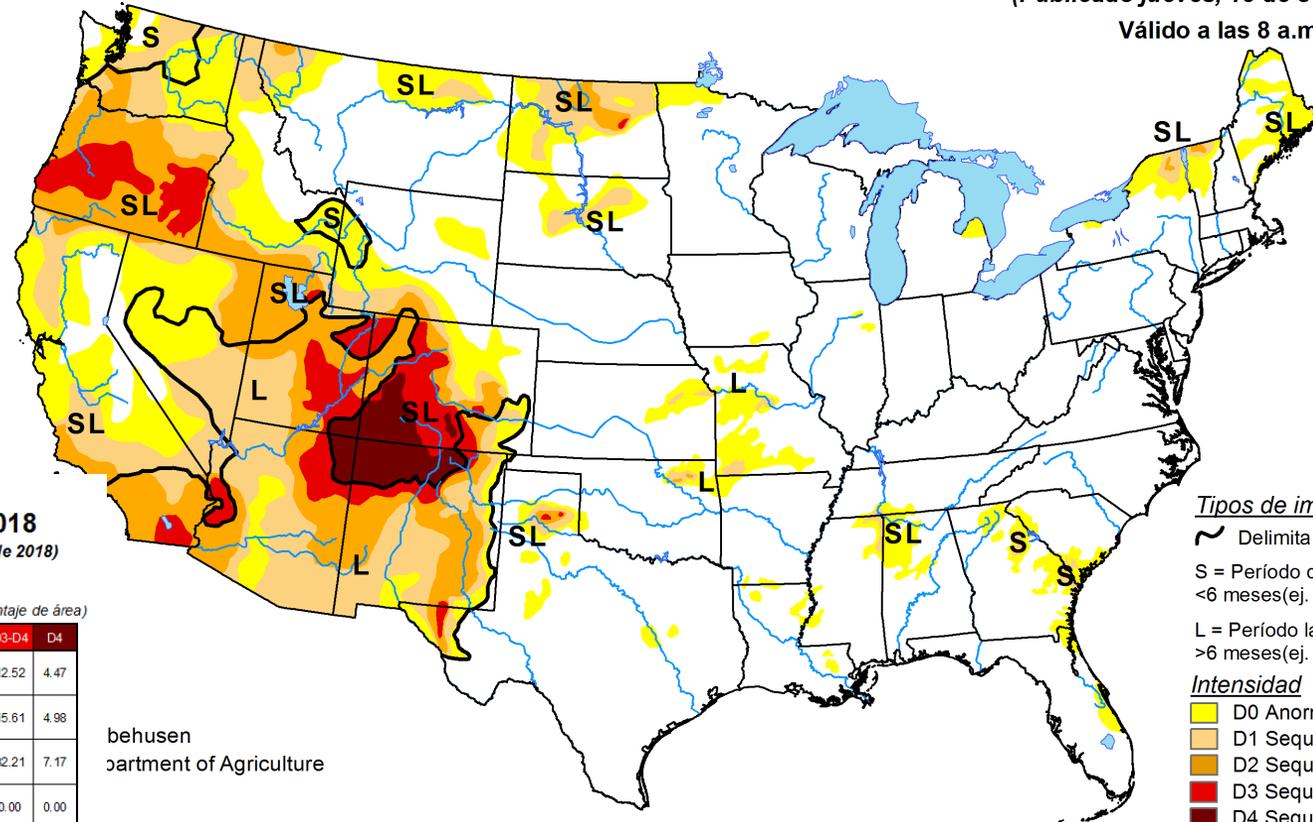
Mapa anterior: [PNG](#) [PDF](#) [JPG](#)

New USDM
maps in Spanish

Monitor de Sequía de los Estados Unidos octubre 16, 2018

(Publicado jueves, 18 de octubre de 2018)

Válido a las 8 a.m. EDT



Tipos de impacto de la Sequía

- ~ Delimita impactos dominantes
- S = Período corto, típicamente <6 meses (ej. agricultura, pastizales)
- L = Período largo, típicamente >6 meses (ej. hidrología, ecología)

Intensidad

- D0 Anormalmente Seco
- D1 Sequía moderada
- D2 Sequía severa
- D3 Sequía extrema
- D4 Sequía excepcional

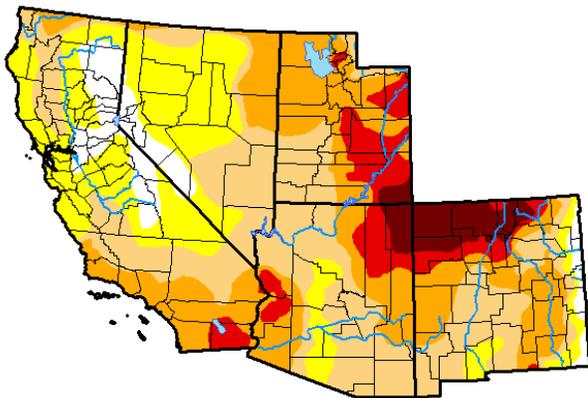
El Monitor de Sequía analiza condiciones a gran escala, por lo que las condiciones locales pueden variar. Para una mejor interpretación se recomienda ver el texto anexo.



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

New USDM maps in Spanish

Monitor de Sequía de los Estados Unidos Centro Climático del Suroeste del USDA



16 de octubre de 2018

(Publicado jueves, 18 de octubre de 2018)

Válido a las 8 a.m. EDT

Condiciones de sequía (Porcentaje de área)

	Ninguna	D0-D4	D1-D4	D2-D4	D3-D4	D4
Actualmente	6.80	93.20	70.99	38.74	12.52	4.47
La semana pasada 10-09-2018	6.10	93.90	72.98	41.30	15.61	4.98
Hace tres meses 07-17-2018	6.95	93.05	70.92	51.00	32.21	7.17
Inicio del año civil 01-02-2018	30.60	69.40	41.73	9.36	0.00	0.00
Inicio del Año del Agua 09-25-2018	4.39	95.61	74.84	49.75	22.74	5.92
Hace un año 10-17-2017	72.76	27.24	5.29	0.00	0.00	0.00

behusen
partment of Agriculture

Intensidad

- D0 Anormalmente seco
- D1 Sequía moderada
- D2 Sequía severa
- D3 Sequía extrema
- D4 Sequía excepcional

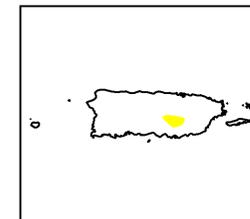
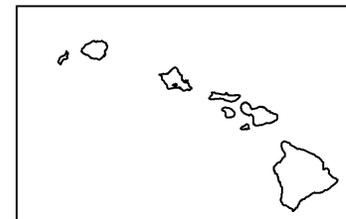
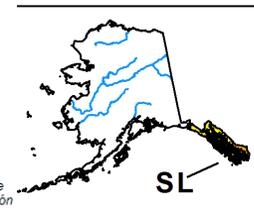
El Monitor de Sequía analiza condiciones a gran escala, por lo que las condiciones locales pueden variar. Para una mejor interpretación se recomienda ver el texto anexo.

Autor

Eric Luebehusen
U.S. Department of Agriculture



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



NAL DROUGHT MITIGATION CENTER

What is next.....

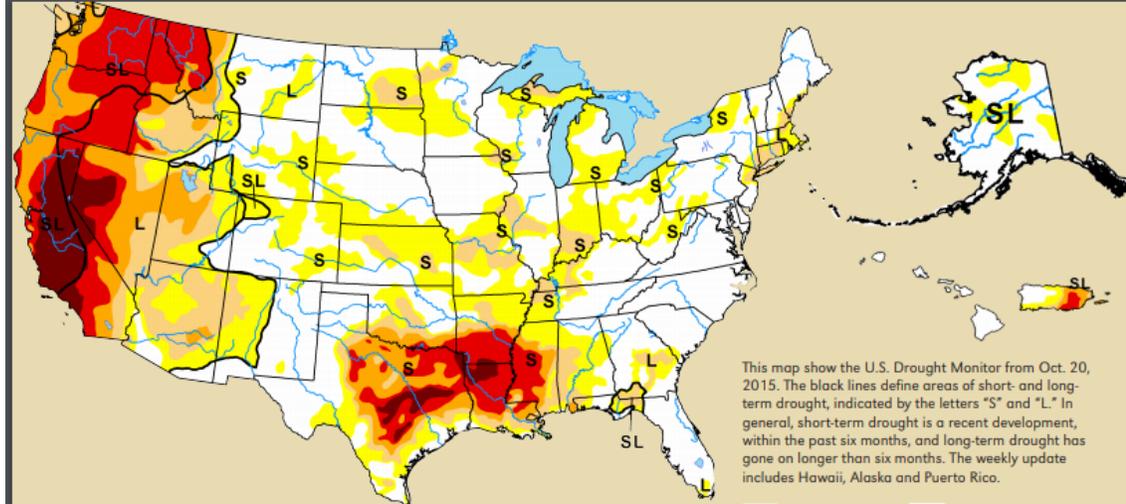
- ❖ Continue to work with partners on data sets/availability
- ❖ Transition to a ESRI based portal for the development of the weekly map
- ❖ USDAM tutorials
 - ❖ http://drought.unl.edu/archive/Tutorials/USDAM_Tutorial/
- ❖ Transition to operational “Objective Blends” based on gridded data
- ❖ New “potential impacts” tables being developed **for each state** based upon data collected in the Drought Impact Reporter (DIR)
- ❖ Expansion of the USDAM to the U.S. Virgin Islands (USVI) and the U.S. Affiliated Pacific Islands (USAPI)

US Drought Monitor Brochure

https://droughtmonitor.unl.edu/data/docs/what_is_usdm.pdf

Also available in Spanish

NATIONAL DROUGHT MITIGATION CENT



This map shows the U.S. Drought Monitor from Oct. 20, 2015. The black lines define areas of short- and long-term drought, indicated by the letters "S" and "L." In general, short-term drought is a recent development, within the past six months, and long-term drought has gone on longer than six months. The weekly update includes Hawaii, Alaska and Puerto Rico.



What is the U.S. Drought Monitor?

Maybe you've seen it in the media: that map of the U.S. painted with blobs of yellow, orange and red. It shows drought — but how do we know which colors go where? Who decides? What does it mean for you?

A USDM Q&A

The U.S. Drought Monitor is a map released every Thursday, showing parts of the U.S. that are in drought. The map uses five classifications: abnormally dry (D0), showing areas that may be going into or are coming out of drought, and four levels of drought: moderate (D1), severe (D2), extreme (D3) and exceptional (D4).

What agencies or organizations are responsible for the USDM?

The Drought Monitor has been a team effort since its implementation in 1999, produced jointly by the National Drought Mitigation Center at the University of Nebraska-Lincoln, the National Oceanic and Atmospheric Administration, and the U.S. Department of Agriculture. The NDMC hosts the web site of the drought monitor and the associated data, and provides the map and data to NOAA, USDA and other agencies. It is freely available at droughtmonitor.unl.edu.

Who uses it, and what do they do with it?

The USDA uses the drought monitor to trigger disaster declarations and eligibility for low-interest loans. The Farm Service Agency uses it to help determine eligibility for their Livestock Forage Program, and the Internal Revenue Service uses it for tax deferral on forced livestock sales due to drought. State, local, tribal and basin-level decision makers use it to trigger drought responses, ideally along with other more local indicators of drought.

How does drought affect the country?

Drought is a normal part of the climate cycle. It is a slow-moving hazard, which causes people to underestimate the damage it can do, but losses from drought are as substantial as those from hurricanes, tornados and other faster-moving disasters. Drought causes losses to agriculture; affects domestic water supply, energy production, public health, and wildlife; and contributes to wildfire, to name a few of its effects.

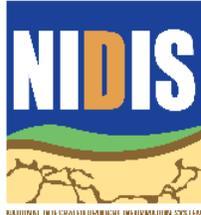
No single federal agency is in charge of water or drought policy; response and mitigation fall to an assortment of federal authorities. The USDA leads response efforts; NOAA, through the National Integrated Drought Information System (drought.gov), leads monitoring; agencies such as the U.S. Geological Survey and NASA contribute data; and the Environmental Protection Agency regulates water quality. The National Drought Resilience Partnership, launched in the aftermath of widespread drought in 2012, is an effort to unify federal drought response and policy. Drought response efforts, planning, and water law vary from state to state.

How do we know when we're in a drought?

Recognizing drought before it intensifies can reduce impacts and save money. How you recognize it depends on how it affects you. Traditional ways to measure drought are by comparing observed precipitation with what's normal (climatologic), by comparing soil moisture and crop conditions with what's normal (agricultural), or by looking at how much water is contained in snow, the level

droughtmonitor.unl.edu

OUR PARTNERS



Any Questions ?



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National Drought Mitigation Center
School of Natural Resources
University of Nebraska-Lincoln