

Climate decision-support tools and resources

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Research Insights in Semiarid Ecosystems

Tucson, AZ

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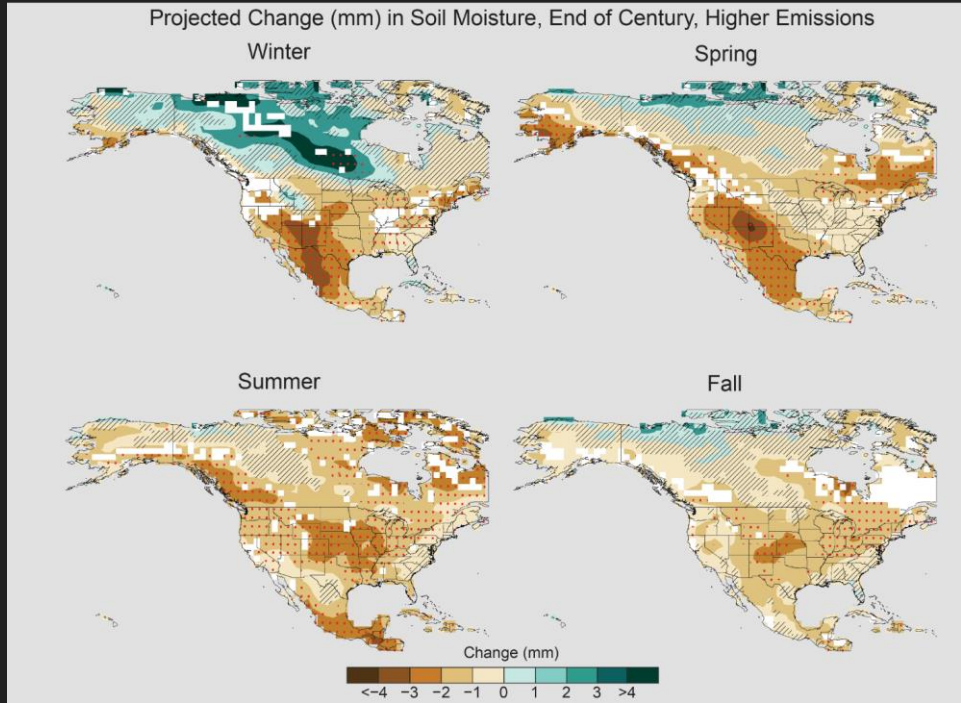
Vision: Agricultural production and natural resources maintained and strengthened under increasing climate variability and environmental change

Mission: Develop and deliver science-based, region-specific information and technologies to agricultural and natural resource managers; to enable climate-informed decision-making.

Three strategic objectives for the program:

- Science synthesis and assessment
 - **Technology transfer and tool development**
 - Outreach and education
-
- Dust Mitigation Handbook – on-line resource for dust mitigation
 - Grass-Cast – Grassland Productivity Forecast
 - “AgRisk Viewer” – a web-based tool for RMA crop loss insurance data
 - Drought monitor and LFP eligibility tool and impact reporter

Soil Moisture is Projected to Decrease

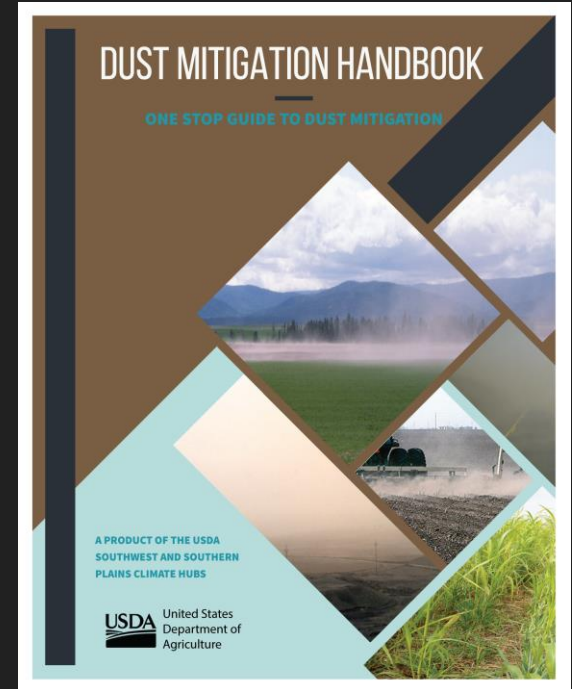


Fourth National Climate Assessment: Volume 1
Climate Science Special Report

Key Message: Future decreases in surface soil moisture from human activities over most of the United States are *likely* due to increased ET caused by higher temperatures

Dust mitigation handbook

- Problem identification
- Team meeting (Feb 2018)
- Southern U.S. Dust Monitoring and Mitigation Symposium (Aug 2018)
 - Science outcomes and presentations posted
- On-line handbook completion (Sep 2019)
 - <https://dust.swclimatehub.info/>
- Conservation webinar (Sep 2019)
 - Estimated participation: 179 people, 39 states, 67 professional CEU.



DUST MITIGATION HANDBOOK



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[Chapter 1](#)

[Chapter 2](#)

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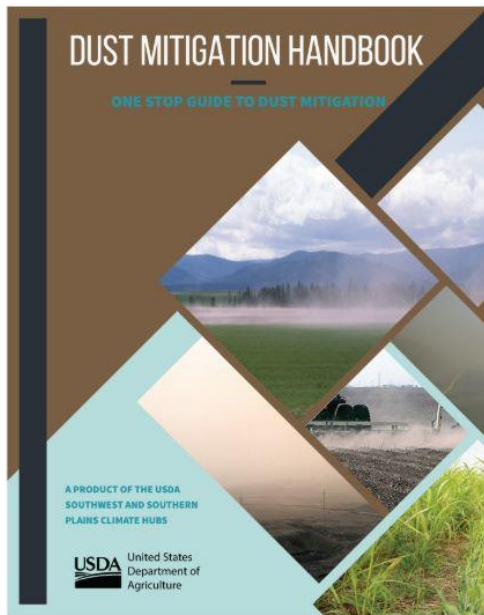
[Chapter 7](#)

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[Cover Photo Credits](#)

Download the entire manual [here](#) or individual chapters below.

Dust Mitigation Handbook

[Cover and Front Pages](#)

[Chapter 1 – Hazards and Concerns of Airborne Particulates](#)

[Chapter 2 – Understanding Wind Erosion](#)

[Chapter 3 – Modeling and Predicting Wind Erosion](#)

[Chapter 4 – Measuring Airborne Particulates](#)

[Chapter 5 – Conservation Planning for Wind Erosion Resource Concerns](#)

[Chapter 6 – Wind Erosion Abatement on Cropland](#)

[Chapter 7 – Controlling Wind Erosion on Rangeland, Natural Areas and Unpaved Surfaces](#)

[Chapter 8 – USDA Programs to Address Wind Erosion](#)

[Glossary of Commonly Used Terms in Wind Erosion and Natural Resources Conservation](#)

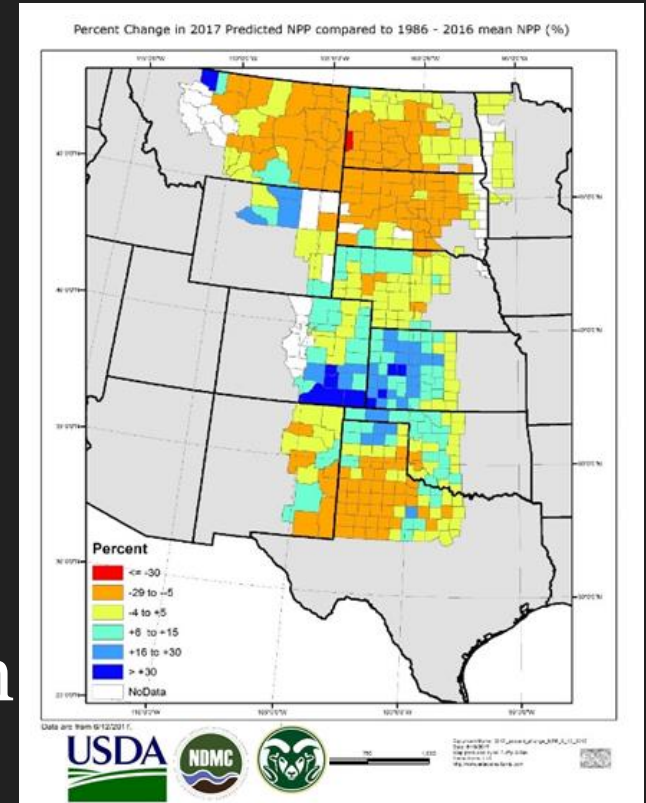
[Appendix A: References Cited](#)

[Appendix B: Exhibits Referenced in Text](#)

[Appendix C: NRCS T-Charts for Conservation Practices](#)

Grass-Cast - Grassland Productivity Forecast

“Based on **observed weather** this spring & past years + **seasonal wx forecast...** we expect **grassland productivity** in *your* area... to be **X%** **higher** or **lower** than the 30-year average.”



Overview of Grass-Cast Procedure

1. Observed weather + Forecasted weather



2. ET for the growing season

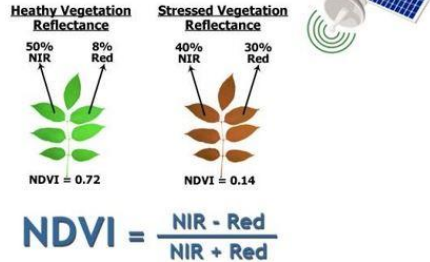


Evapotranspiration

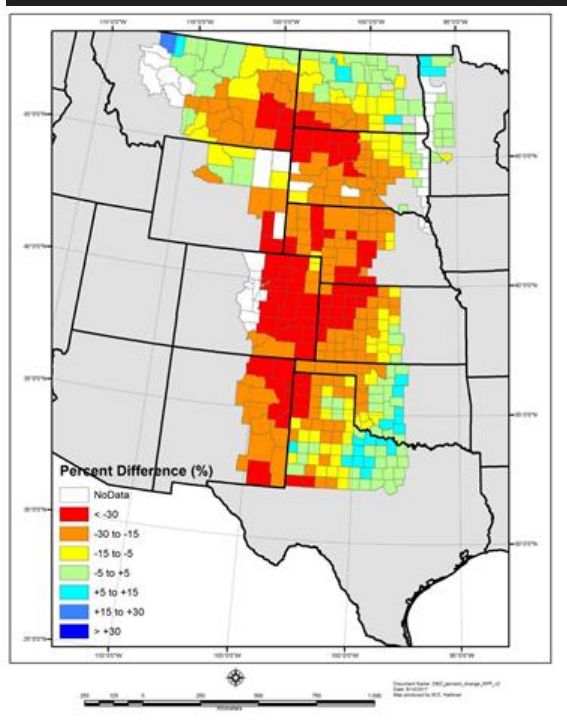
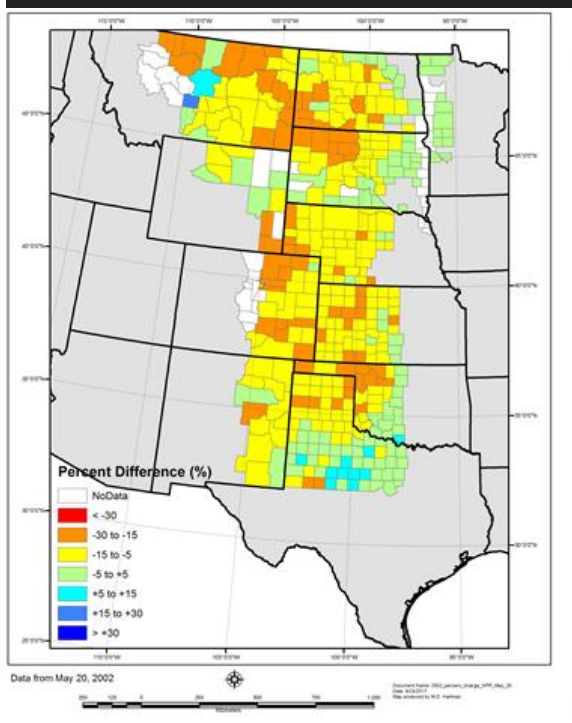
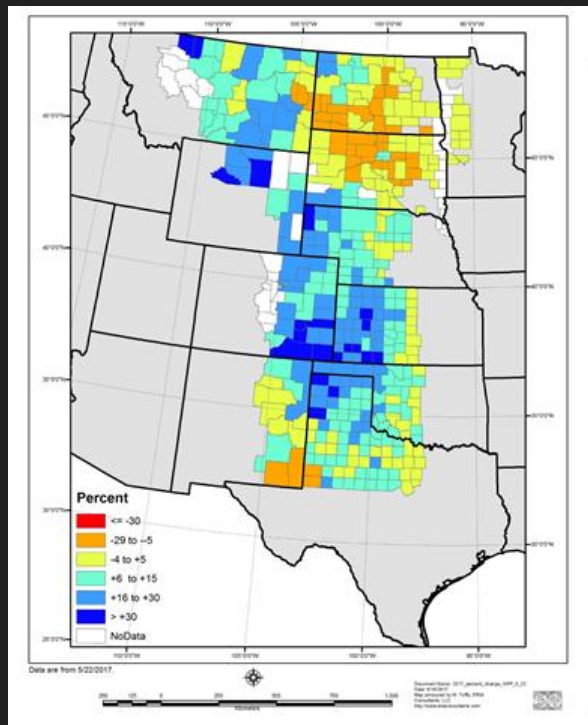
3. Greenness for the season

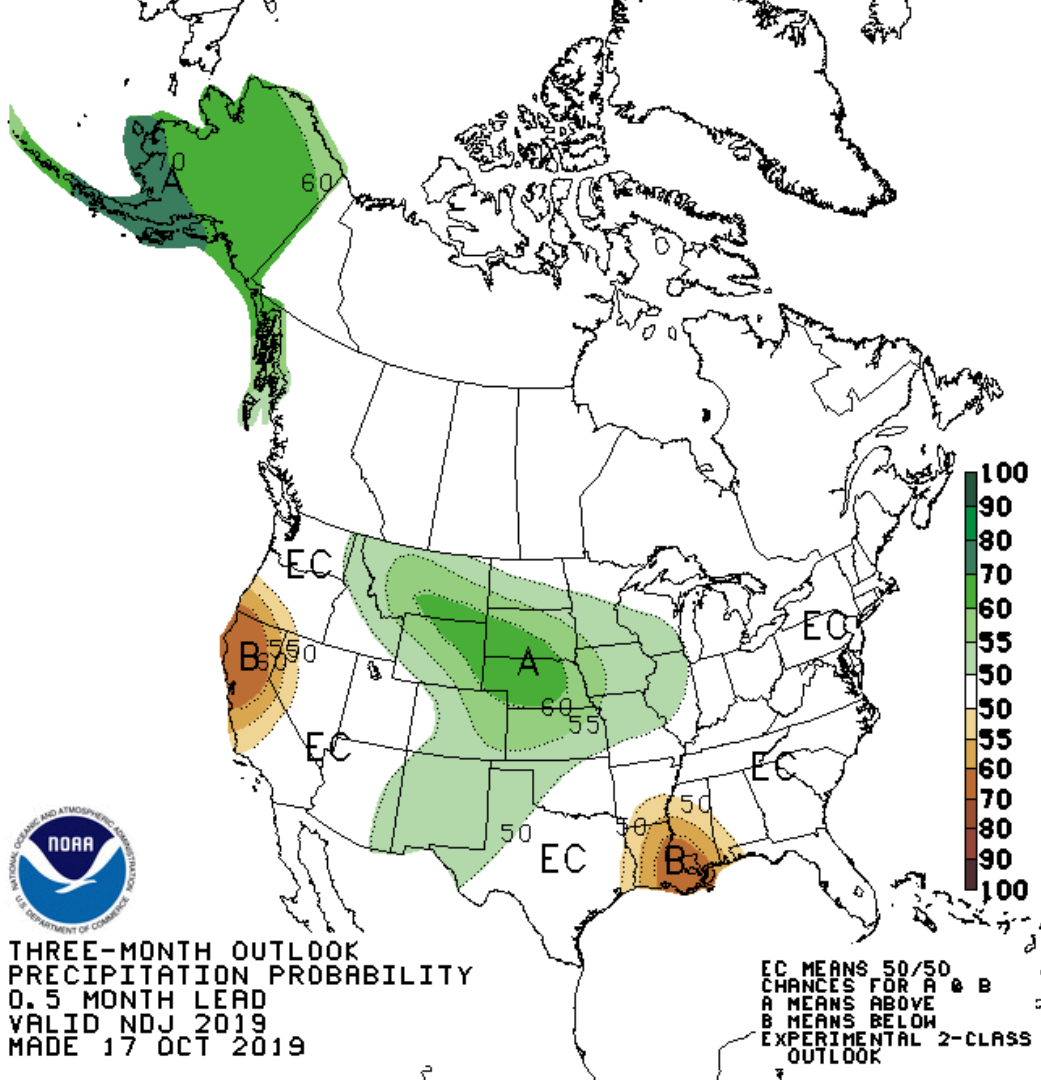


4. Lbs/Acre of Veg for season



Instead of using a forecast, Grass-Cast provides three simple 'what if' scenarios.





THREE-MONTH OUTLOOK
 PRECIPITATION PROBABILITY
 0.5 MONTH LEAD
 VALID NDJ 2019
 MADE 17 OCT 2019

EC MEANS 50/50
 CHANCES FOR A & B
 A MEANS ABOVE
 B MEANS BELOW
 EXPERIMENTAL 2-CLASS
 OUTLOOK

Grass-Cast

What? Grassland Productivity Forecast: “How well will your rangelands grow this season?”

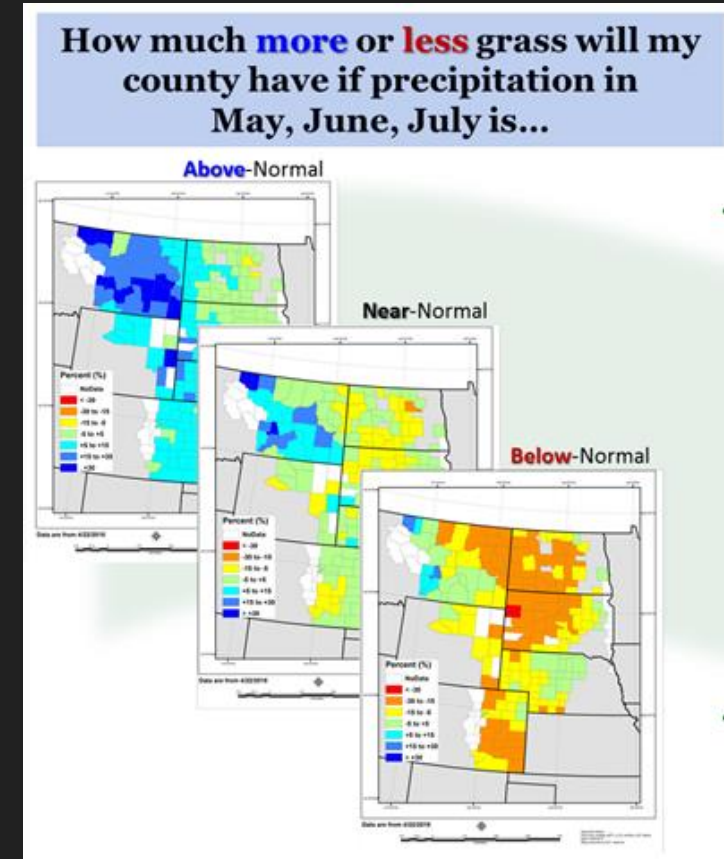
How? Combines current weather data and seasonal climate outlooks (NOAA CPC) with grassland model (DayCent) to predict total biomass (#/acre) for individual locations compared to their 30+ year average

For whom? For livestock producers, Extension professionals, NRCS, and other rangeland managers

By whom? NPCH, CSU, NDMC, UA, SPCH and SWCH

Access? <http://grasscast.agsci.colostate.edu/>

Next Steps: Expand to Southwest (2020), science meeting, stakeholder meeting, ANPP.



AgRisk Viewer



Interactive data viewer and on-the-fly analysis to view crop loss information

- Insurance payments, acres affected
- Cause of loss (e.g., drought, hail, excess moisture)
- Commodity (crop)
- Spatial unit: county, state, nation
- Temporal resolution: monthly

GAO
Highlights

Highlights of [GAO-15-215](#), a report to congressional requesters

February 2015

CROP INSURANCE

In Areas with Higher Crop Production Risks, Costs Are Greater, and Premiums May Not Cover Expected Losses

September 2017

CLIMATE CHANGE

Information on Potential Economic Effects Could Help Guide Federal Efforts to Reduce Fiscal Exposure

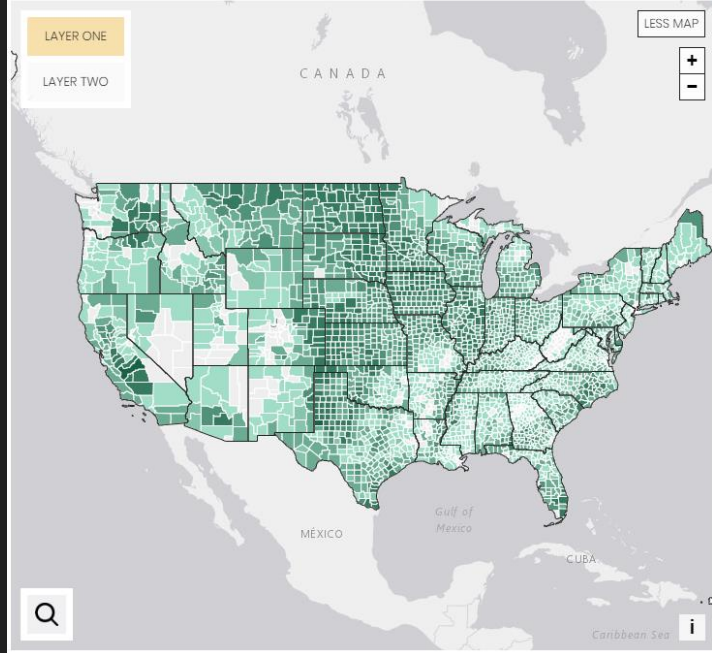
<https://swclimatehub.info/rma/>

AgRisk Viewer

USDA SOUTHWEST CLIMATE HUB

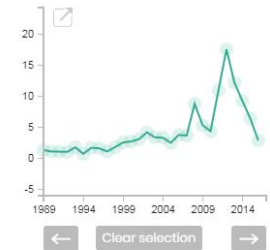


Now Viewing Risk Management Agency Payments

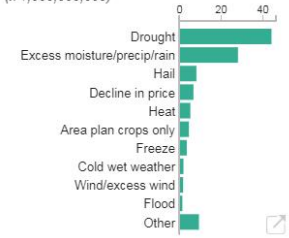


Payment indemnity by cause of loss

All causes of loss
(x 1,000,000,000)



1989–2016 totals by cause of loss
(x 1,000,000,000)



\$321billion



Value of insured crops for the Nation through the federal crop insurance program from 2001 to 2016

TOP **5** CAUSES OF LOSS

- Drought
- Excess moisture
- Hail
- Heat
- Freeze



\$1.6 billion



Value of insured crops for the 4-state region through the federal crop insurance program from 2001 to 2016

TOP **5** CAUSES OF LOSS

Failure in irrigation supply, drought, freeze, hail, & heat



2012

Peak year of indemnities totaling \$16.2 billion mostly due to drought and heat (88%)



\$76.8
billion

Amount of indemnities for the top five causes of loss over the Nation from 2001 to 2016, representing nearly 86% of total indemnities

2013

Peak year of indemnities totaling \$76.8 million mostly due to drought and failure in irrigation supply



\$446
million

Amount of indemnities for the top five causes of loss from 2001 to 2016, representing over 80% of total indemnities

3,031,813

Number of policies nationwide receiving an indemnity due to drought from 2001 to 2016



78%

Percent of crop loss indemnities attributed to corn, wheat, soybeans, and cotton. Drought and excess moisture were the top causes of loss for these top 4 crops



12124

Number of policies receiving an indemnity due to drought from 2001 to 2016



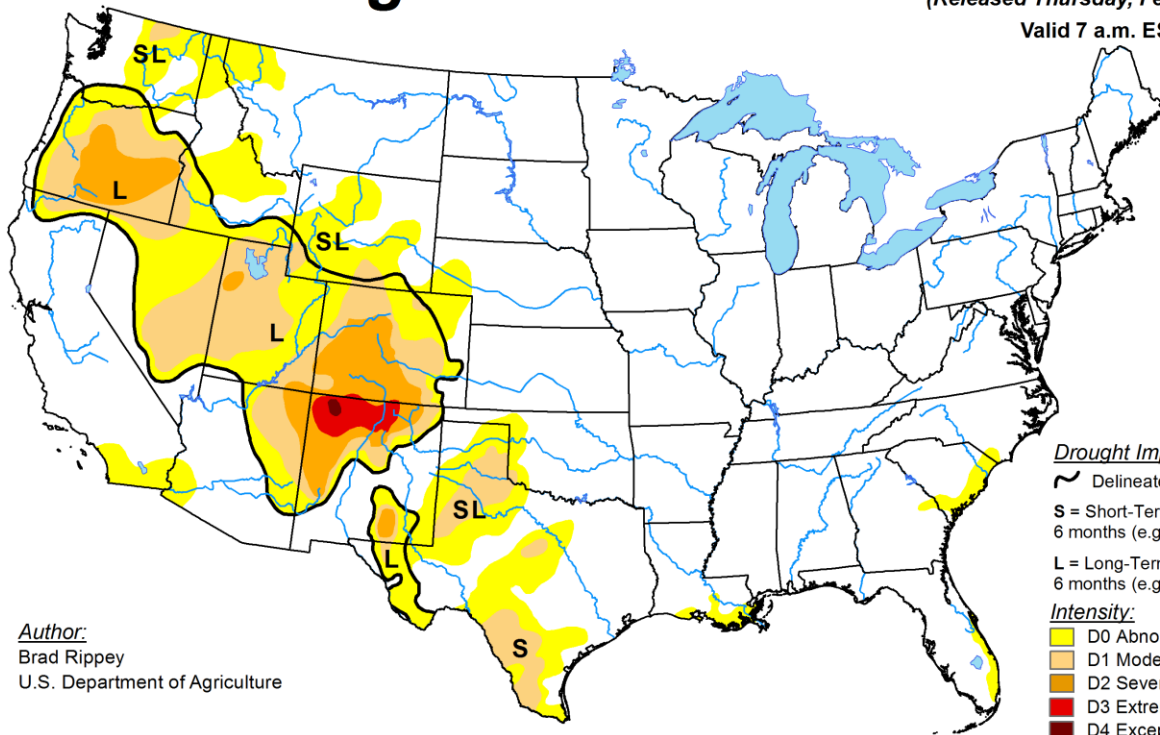
80%

Fraction of indemnities attributed to failure in irrigation supply (i.e., lack of water) during May



U.S. Drought Monitor

February 26, 2019
 (Released Thursday, Feb. 28, 2019)
 Valid 7 a.m. EST



Author:
 Brad Rippey
 U.S. Department of Agriculture

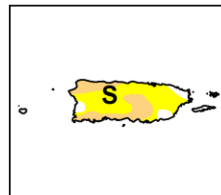
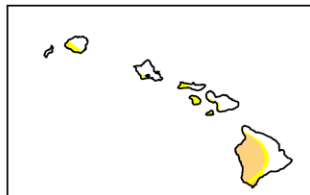
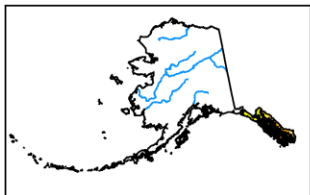
Drought Impact Types:

- ~ 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

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



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

NDMC's LFP Eligibility Tool

FSA Livestock Forage Disaster Program Eligibility Tool

Login

Home

Help

U.S. Drought Monitor

Welcome! If you grow forage for livestock and have recently gone through drought, this website can help you find out whether you qualify for assistance. Qualifying for assistance is based on the U.S. Drought Monitor and on your county's designated grazing periods. To use this tool, you will need to know your county's grazing period. If you are not sure what it is, please consult your [local Farm Service Agency representative](#).

2014 Farm Bill Criteria

Is my county eligible?

Which counties are eligible?

2008 Farm Bill Criteria

Is my county eligible?

Which counties are eligible?

The FSA Eligibility Tool does not guarantee any financial aid. It simply estimates which U.S. counties meet the criteria, based on the U.S. Drought Monitor. Eligibility will be confirmed by the FSA once the signup period has begun. Please contact your [local FSA agent](#) for more details and to verify eligibility after the start of the signup period.

To read about the Livestock Forage Disaster Program, please refer to the FSA factsheet: [2014 version](#) | [2008 version](#)

To learn more about the U.S. Drought Monitor, please visit the [web site](#).

To apply for assistance, please contact your [local FSA office](#).

For help with this tool, please visit the [FSA Eligibility Tool Help](#) pages.

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<http://droughtmonitor.unl.edu/fsa/Home.aspx>



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