

Drought Monitoring and Planning in South Dakota, USA

Laura Edwards
SD State Climatologist
October 1, 2020



Key Messages

- U.S. Drought Monitor accuracy is essential for drought disaster assistance for agriculture
- Best, fastest response to drought occurs when partners have regular communication before the disaster
- Higher density of climate monitoring stations can serve multiple purposes



South Dakota Drought Plan and Response

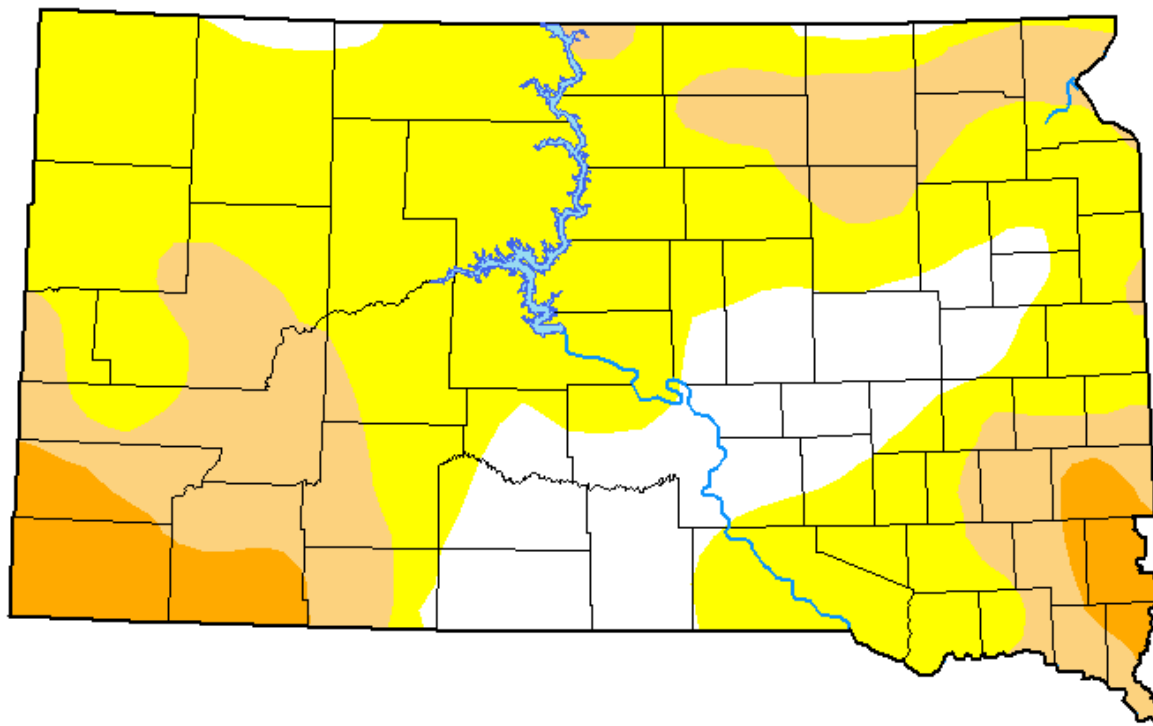
- Drought Task Force includes representatives of all state agencies, plus state climatologist
 - Co-chairs: departments of agriculture and public safety
 - D2 on USDM is an informal trigger
 - Governor responsible for activation of the task force, usually upon recommendation by state climatologist & state fire meteorologist
- State Drought Plan revised in 2015, appendix to state hazard plan
- “Incident Annex” is brief document that outlines responsibilities during drought
 - For myself: seasonal forecast/outlook each spring, weather/climate briefings during drought

SD recommendations to USDM







- Led by state climatologist
- Weekly email discussion during dry periods
- Group includes:
 - University Extension
 - State fire meteorologist
 - State department of environment and natural resources (water rights, some water data)
 - State geologist (stream gauges and well data)
 - National Weather Service, 3 offices
 - Reach out to locals & tribes for impacts and data as needed
- Coordinate with neighboring states

U.S. Drought Monitor South Dakota

September 22, 2020
(Released Thursday, Sep. 24, 2020)
Valid 8 a.m. EDT



Intensity:

-  None
-  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. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

Author:

Brad Rippey
U.S. Department of Agriculture



droughtmonitor.unl.edu

US Drought Monitor Forum 2017

Keystone, SD



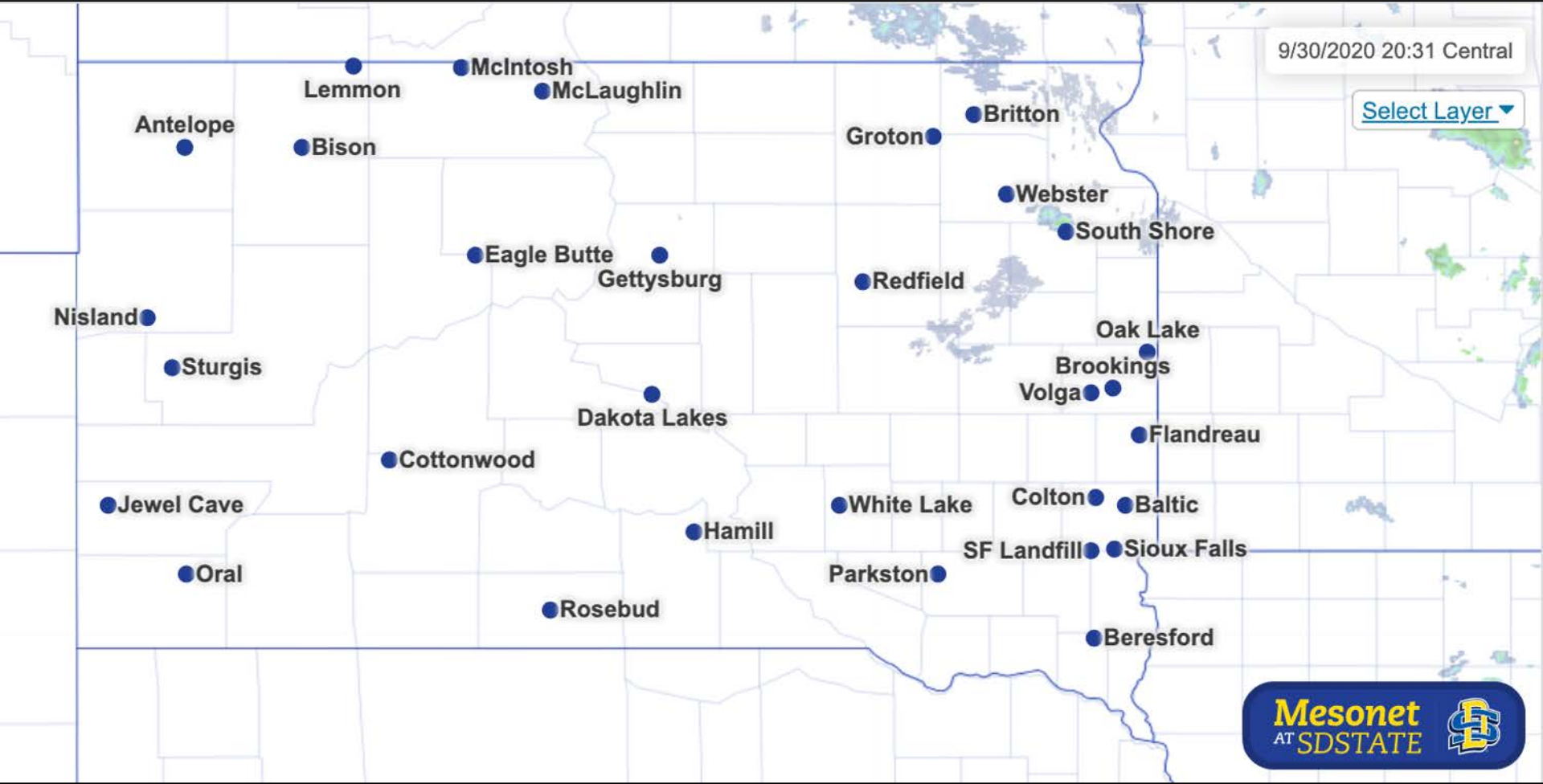
Challenges in SD drought monitoring

- Weather/climate station density
- Separating drought impacts from other damage (late spring freeze or frost, insects)
- Increasing reliance of farmers on drought disaster programs
- Lessons learned from 2017:
<https://journals.ametsoc.org/bams/article/doi/10.1175/BAMS-D-19-0272.1/354510/Lessons-Learned-from-the-2017-Flash-Drought-Across>

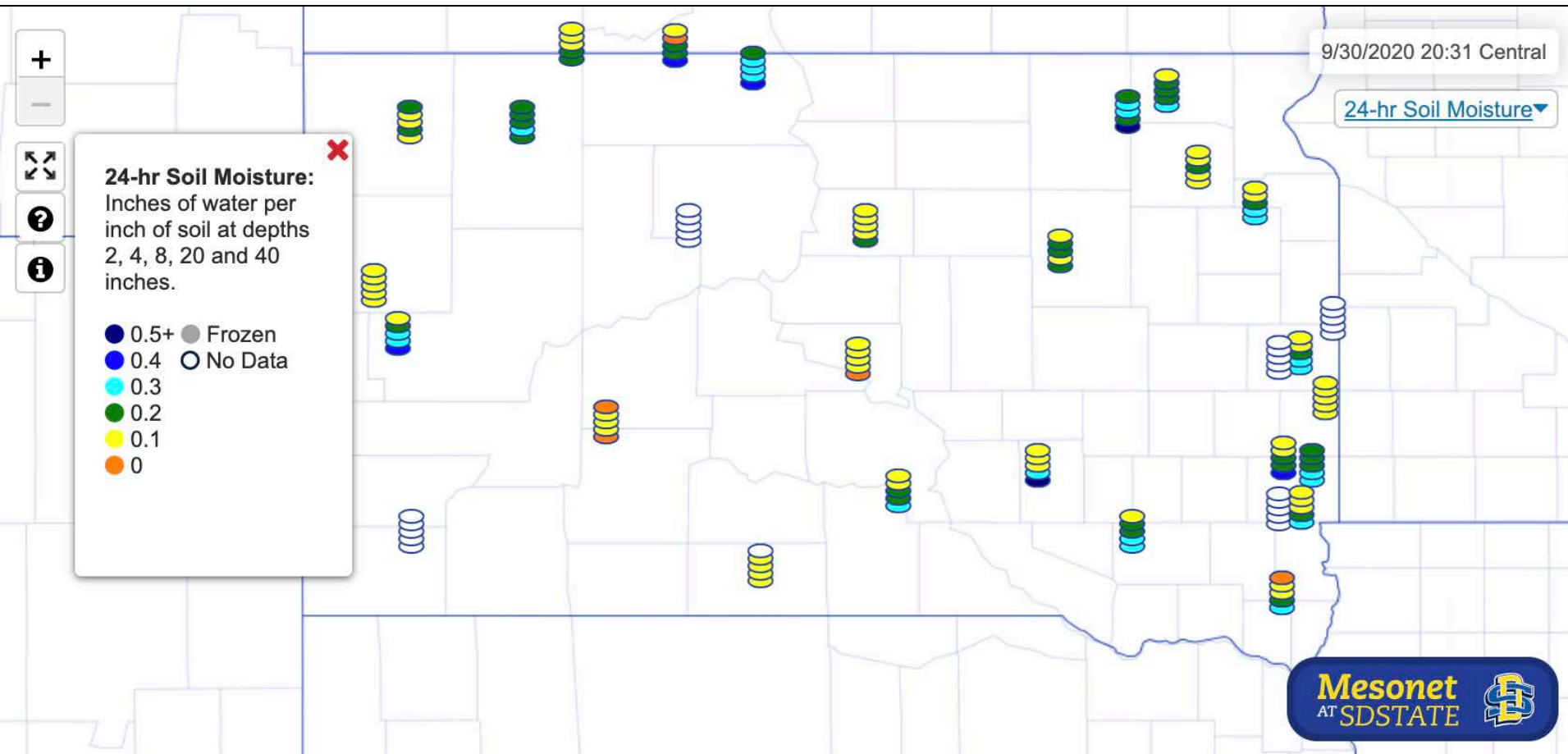


SD Mesonet

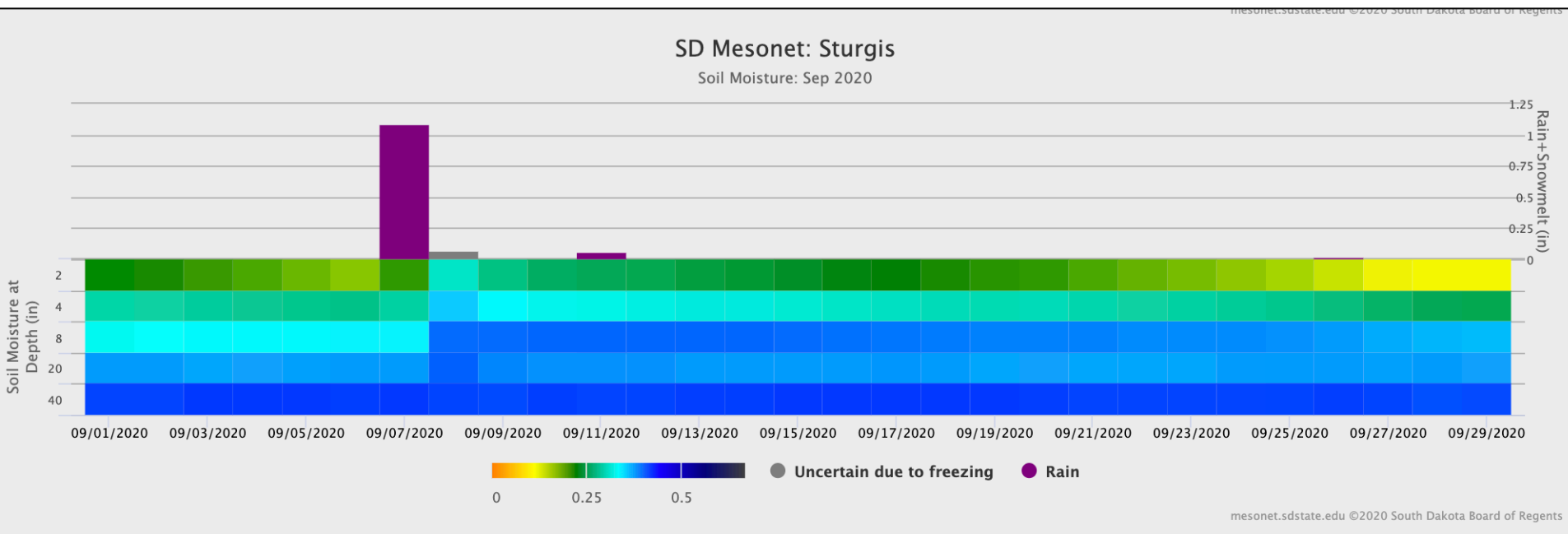
mesonet.sdstate.edu



Soil Moisture




Precipitation & Soil Moisture Response



<https://climate.sdstate.edu/archive/>

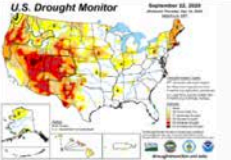
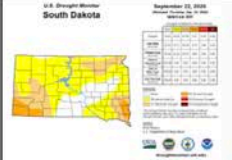
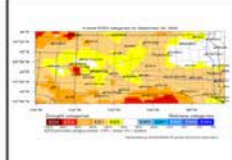

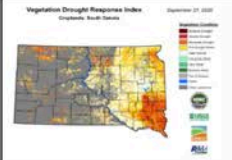
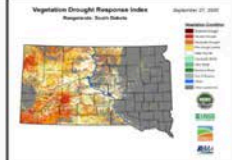
Drought Dashboard

<https://climate.sdstate.edu/tools/dashboard/>

Mesonet AT SDSTATE 
Current ▾ Archives ▾ Tools ▾ Climatologist ▾ About ▾

Current
Forecasts/Outlooks
Collapse All

▸ General Drought Information

<p style="text-align: center;">Latest U.S. Drought Monitor?</p> 	<p style="text-align: center;">Latest South Dakota Drought Monitor?</p> 	<p style="text-align: center;">4-week EDDI for SD</p> 
Vegetation Drought Response Index?		
<p style="text-align: center;">Current Complete</p> 	<p style="text-align: center;">Current Croplands</p> 	<p style="text-align: center;">Current Rangelands</p> 

Links: [The National Drought Mitigation Center](#) | [Earth Systems Research Laboratory](#) | [The National Drought Mitigation Center\(VegDri\)](#)

▸ Temperature

▸ Precipitation

▸ Standardized Precipitation Index (SPI)?

▸ Hydrologic Information

▸ Agricultural Information

▸ Soil Moisture

Mesonet Expansion

09.29.20

Rounds, Thune, Johnson: Army Corps Announces Major Step Toward Implementation of Snowpack Monitoring System

SDSU One of Four Schools Chosen to Lead the Upper Missouri River Snowpack Monitoring System, Awarded \$12.8 Million Contract

WASHINGTON—U.S. Sens. Mike Rounds (R-S.D.) and John Thune (R-S.D.) and Rep Dusty Johnson R-S.D.) today praised the news that the U.S. Army Corps of Engineers (USACE) has awarded major contracts to four universities, including South Dakota State University (SDSU), to establish a network of stations to monitor snowpack and soil moisture throughout the plains area of the Upper Missouri River Basin. SDSU will receive a \$12.8 million contract, and earlier today the first task issue was issued for the first 10 sites to be installed in South Dakota. The project is expected to be completed by 2025.

“Following the flooding events of 2011 and 2019, it’s abundantly clear that we need more accurate weather monitoring throughout the Missouri Basin,” said Rounds. “Since coming to the Senate nearly six years ago, I’ve been working to implement a snowpack monitoring system, which will allow the Corps to make better, more accurate decisions with regard to river management. While there is more work ahead, today’s announcement is a huge first step toward better river system management.”

“When it comes to weather related events, having the most accurate, up to date information is one of the best tools we have to help mitigate potentially devastating consequences,” said Thune. “As we approach the 10th anniversary of historic flooding of 2011 in the Missouri River Basin, this important system will build on our work to improve forecasting and information sharing in an effort to ensure reliable information is available to state and local governments and residents as

<https://www.rounds.senate.gov/newsroom/press-releases/rounds-thune-johnson-army-corps-announces-major-step-toward-implementation-of-snowpack-monitoring-system>



Laura Edwards

SDSU Extension State Climatologist



Office: 605.626.2870



laura.edwards@sdstate.edu



Aberdeen Regional Center
13 Second Ave. SE
Aberdeen, SD 57401



[SDSUExtClimate](https://www.facebook.com/SDSUExtClimate)



[@SDSUClimate](https://twitter.com/SDSUClimate)

[iGrow.org](https://www.iGrow.org)

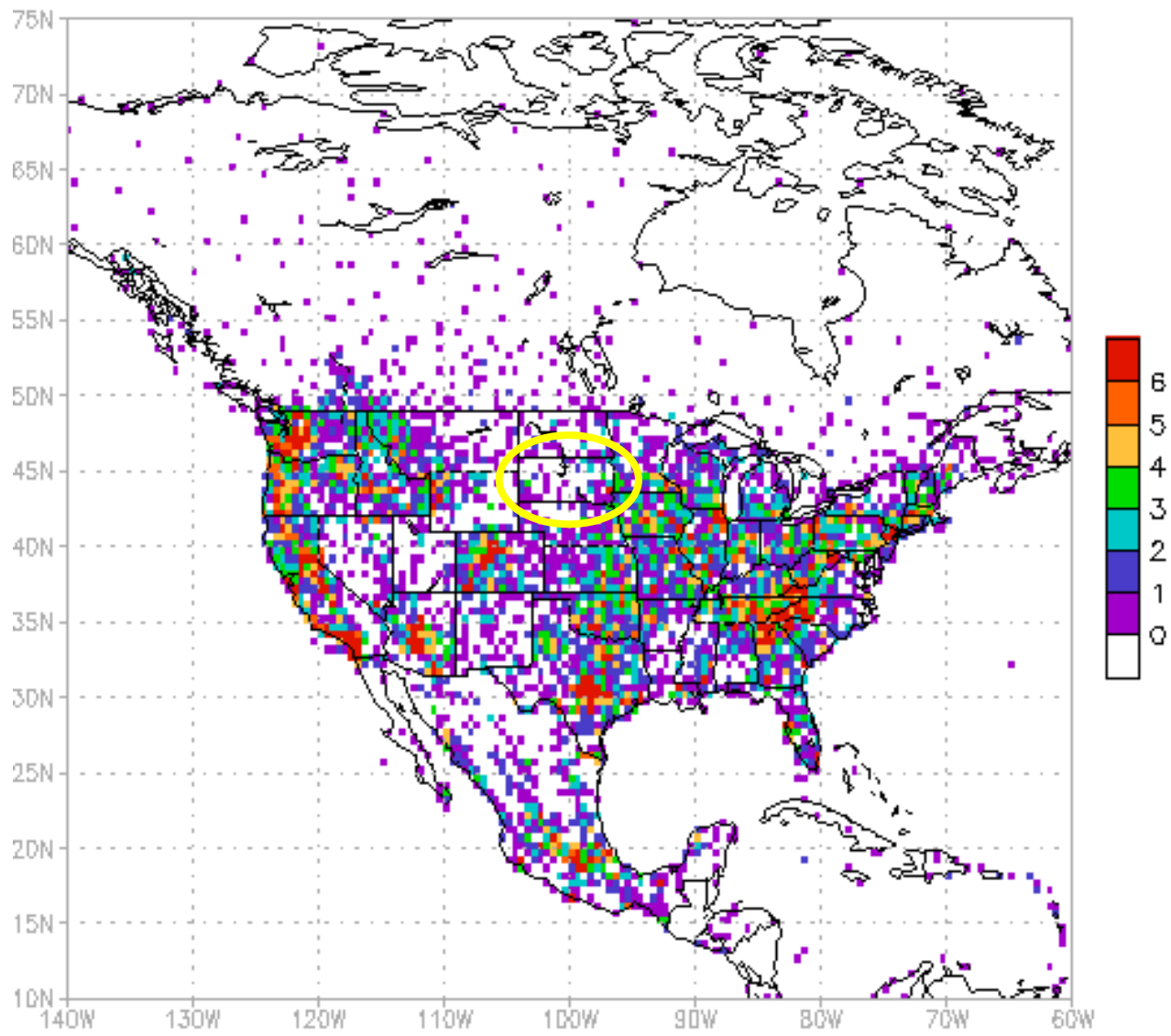
SDSU iGrow



Pasture-Range-Forage Rainfall Index Insurance

- Insures against lack of precipitation for pasture/grass/forage for grazing livestock (no actual production data are used)
- USDA Risk Management Agency chose CPC Unified Precipitation product to verify for this insurance product
- Nationwide:
 - 2014 = 52.8 million acres, \$965 million indemnities
 - 2015 = 54.7 million acres, \$1 billion +
- For South Dakota:
 - 2017 (Jan-Oct) = 3.1 million acres, \$17.1 million indemnities

Number of Gauges Inside Each 0.5x0.5 Grid Box on 22SEP2019

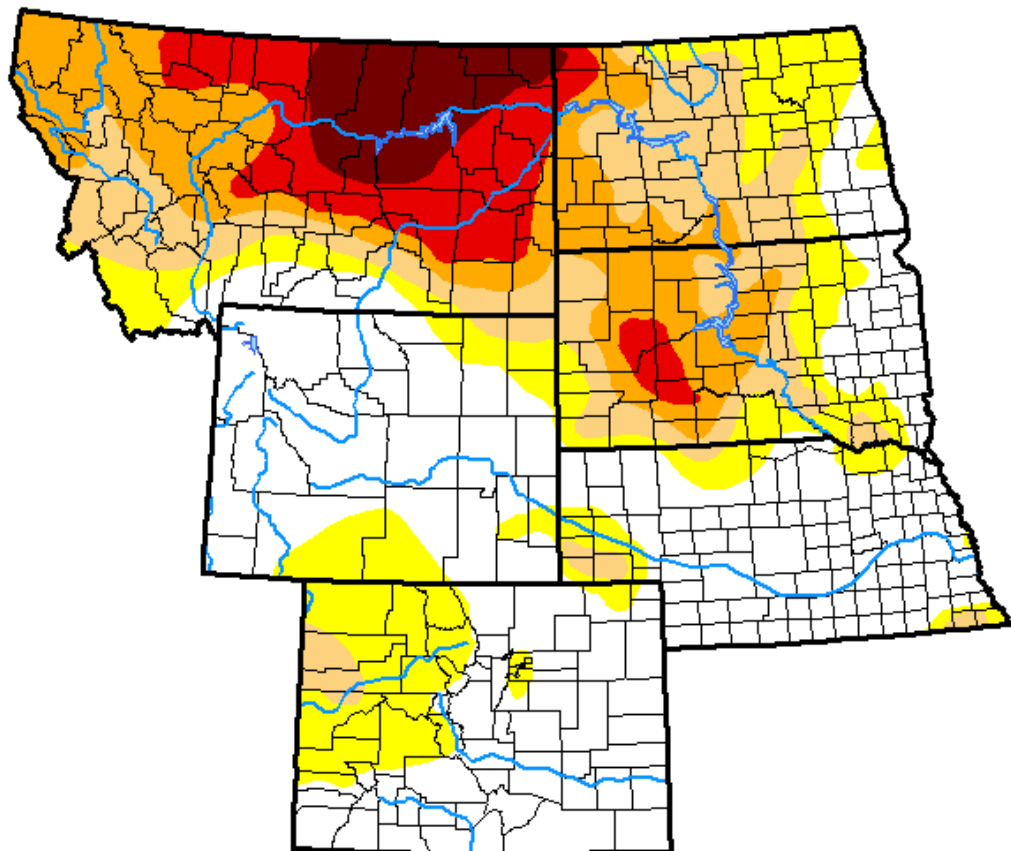


Data Source: CPC Unified (gauge-based & 0.5x0.5 deg resolution) Precipitation Analysis

U.S. Drought Monitor

USDA Northern Plains Climate Hub

September 26, 2017
 (Released Thursday, Sep. 28, 2017)
 Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	42.89	57.11	39.34	25.07	12.12	4.54
Last Week <i>09-19-2017</i>	33.88	66.12	44.57	27.33	12.13	4.54
3 Months Ago <i>06-27-2017</i>	51.26	48.74	26.99	16.44	5.10	0.00
Start of Calendar Year <i>01-03-2017</i>	61.47	38.53	15.95	1.47	0.00	0.00
Start of Water Year <i>09-27-2016</i>	62.66	37.34	14.21	3.88	0.23	0.00
One Year Ago <i>09-27-2016</i>	62.66	37.34	14.21	3.88	0.23	0.00

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