NE Drought Conditions CARC Update: June 25, 2013

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

Current Conditions around Nebraska and the region…

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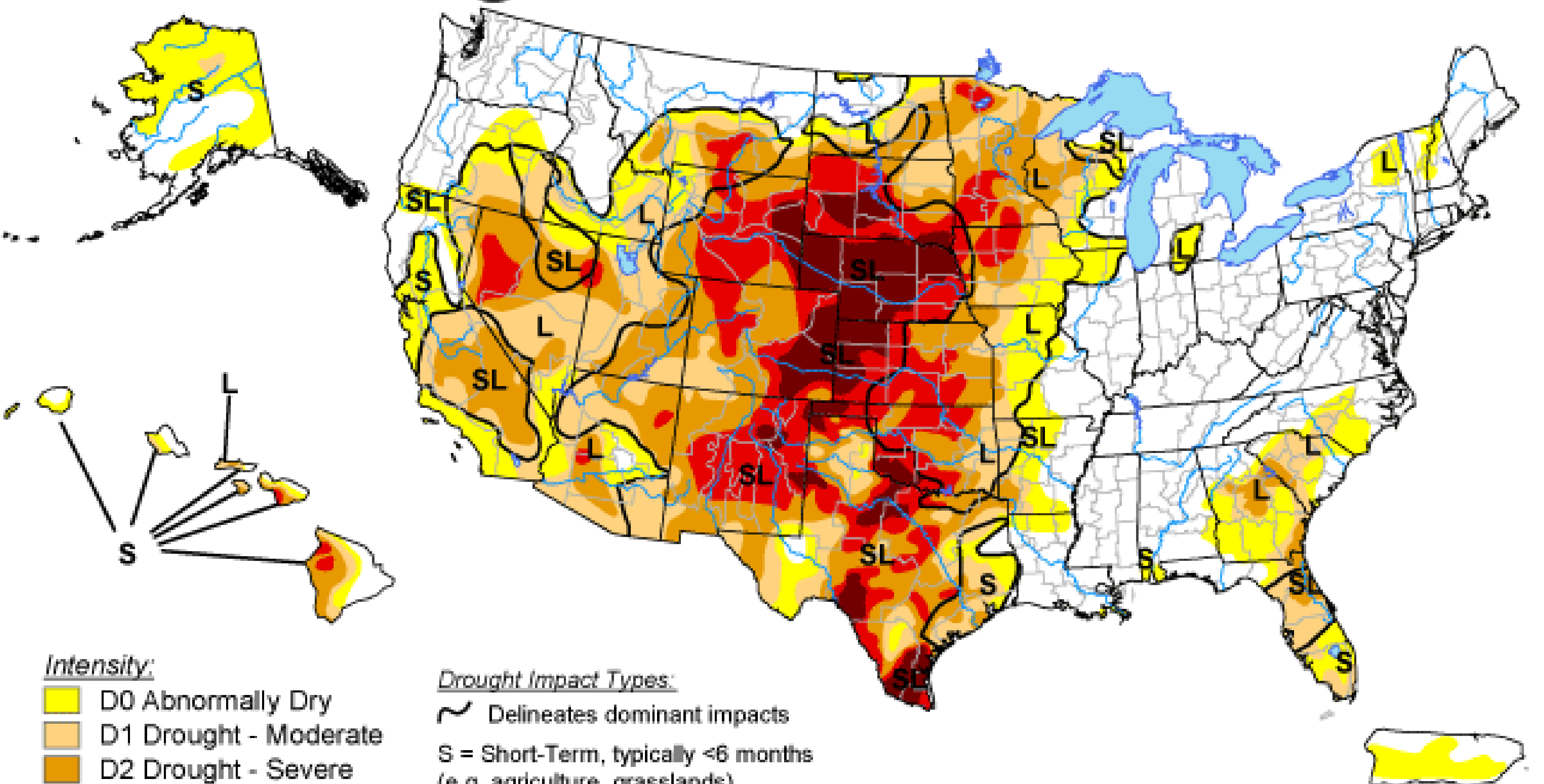
U.S. Drought Monitor

March 19, 2013
Valid 7 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

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

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

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

http://droughtmonitor.unl.edu/

USDA

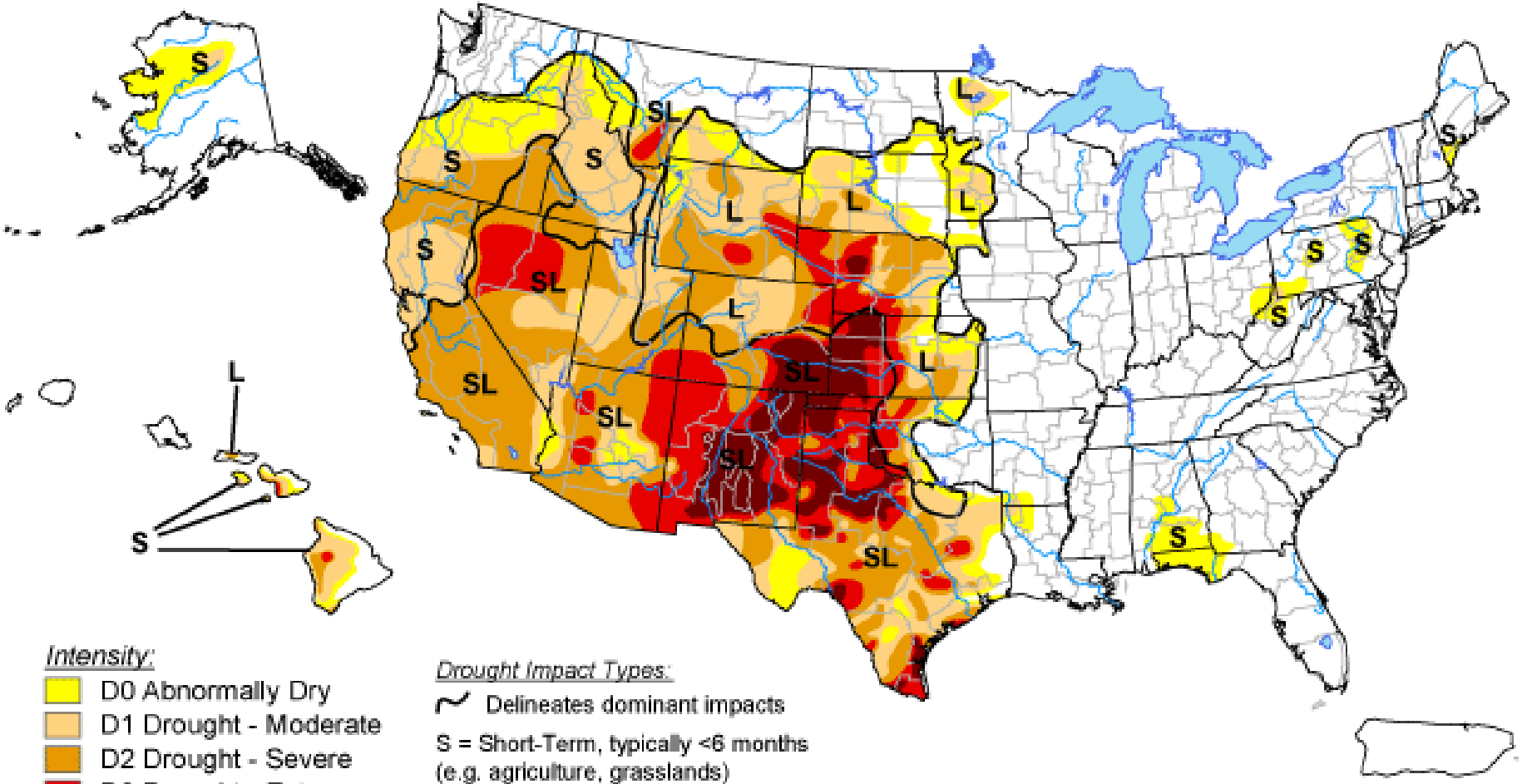
National Drought Mitigation Center

Released Thursday, March 21, 2013

Author: Anthony Artusa, NOAA/NWS/NCEP/CPC

U.S. Drought Monitor

June 18, 2013
Valid 7 a.m. EDT



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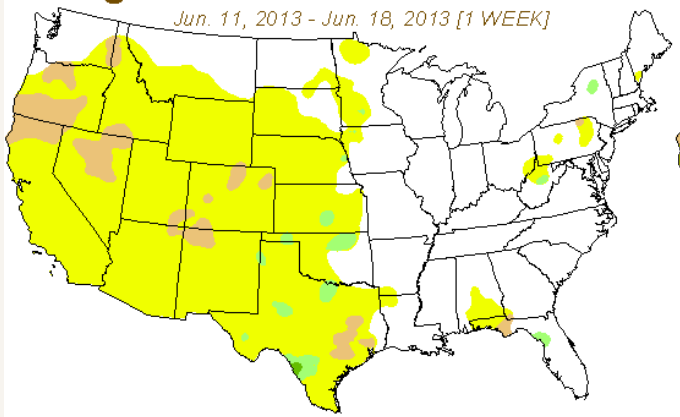
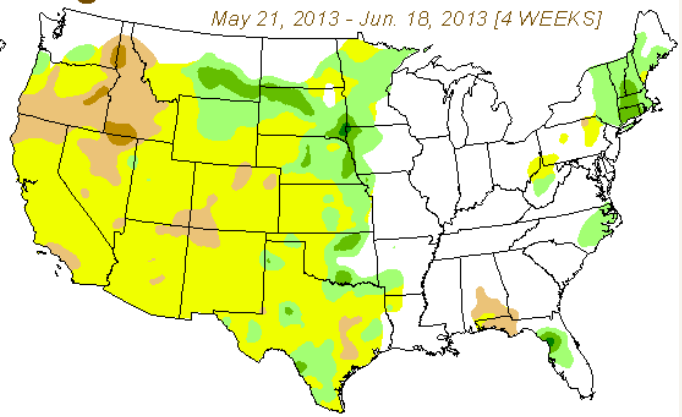
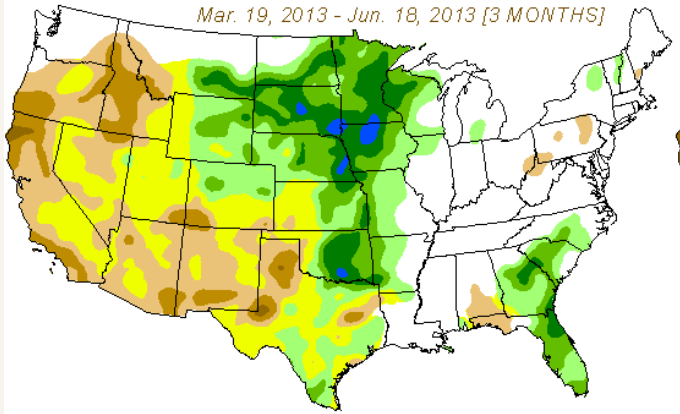
Released Thursday, June 20, 2013

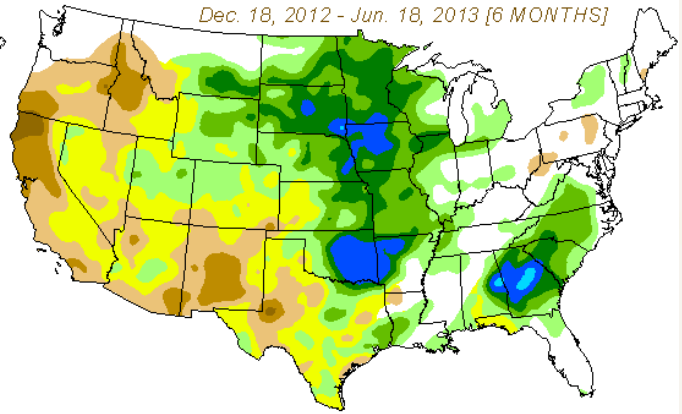
Author: Mark Svoboda, National Drought Mitigation Center

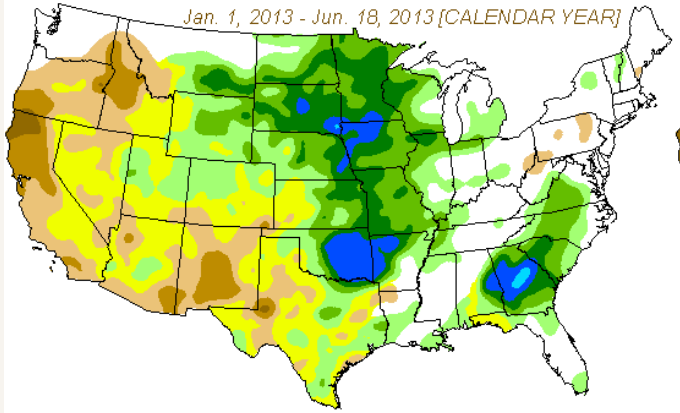
Drought Monitor Classification Changes for Selected Time Periods

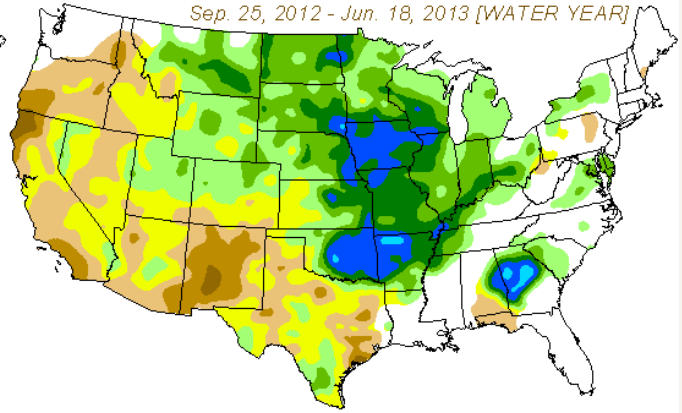












- 5 class improvement
- 4 class improvement
- 3 class improvement
- 2 class improvement
- 1 class improvement
- unchanged
- 1 class deterioration
- 2 class deterioration
- 3 class deterioration
- 4 class deterioration
- 5 class deterioration

These maps depict approximate changes in drought intensity from selected initial times to the current week, with no consideration given to intervening weeks. The change calculations are based on interpolated 4 km grids of the Drought Monitor depiction, and as a result, will be smoother than if based on the published version.

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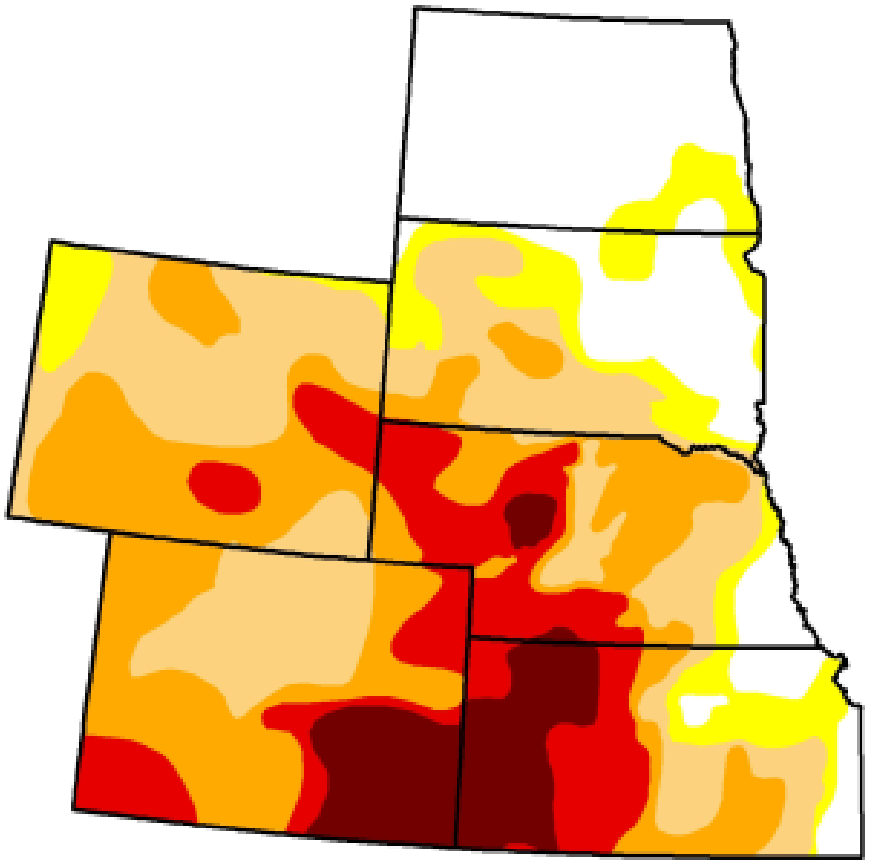
U.S. Drought Monitor

June 18, 2013
Valid 7 a.m. EST

High Plains

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	20.55	79.45	69.76	45.46	21.27	8.03
Last Week (06/11/2013 map)	20.30	79.70	68.45	45.80	19.43	7.73
3 Months Ago (03/19/2013 map)	4.65	95.35	91.29	81.46	55.52	24.37
Start of Calendar Year (01/01/2013 map)	1.54	98.46	93.01	86.20	60.25	26.99
Start of Water Year (09/25/2012 map)	0.00	100.00	98.91	83.80	61.28	24.35
One Year Ago (06/12/2012 map)	26.91	73.09	42.14	14.59	4.19	0.00



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http://droughtmonitor.unl.edu

USDA National Drought Mitigation Center

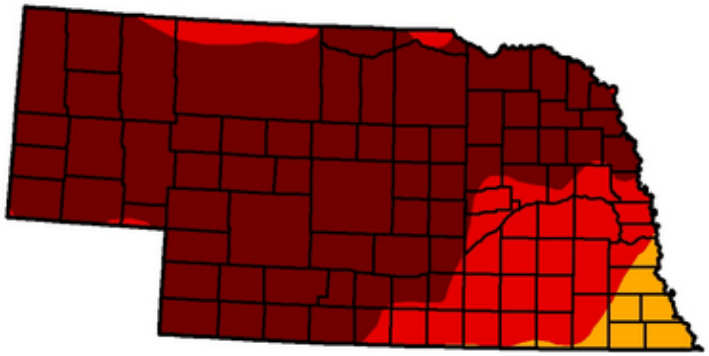
Released Thursday, June 20, 2013
National Drought Mitigation Center,

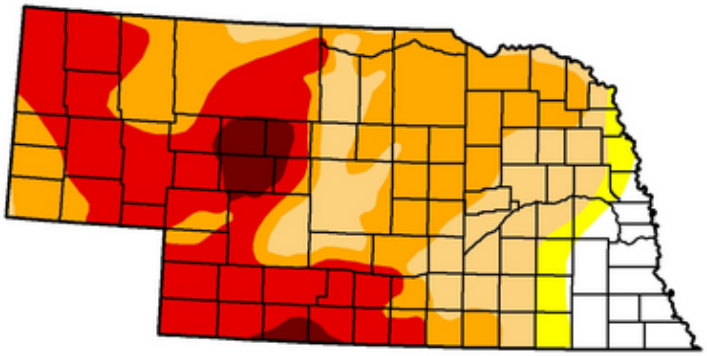
Drought Monitor Archives

Nebraska

Drought Severity

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



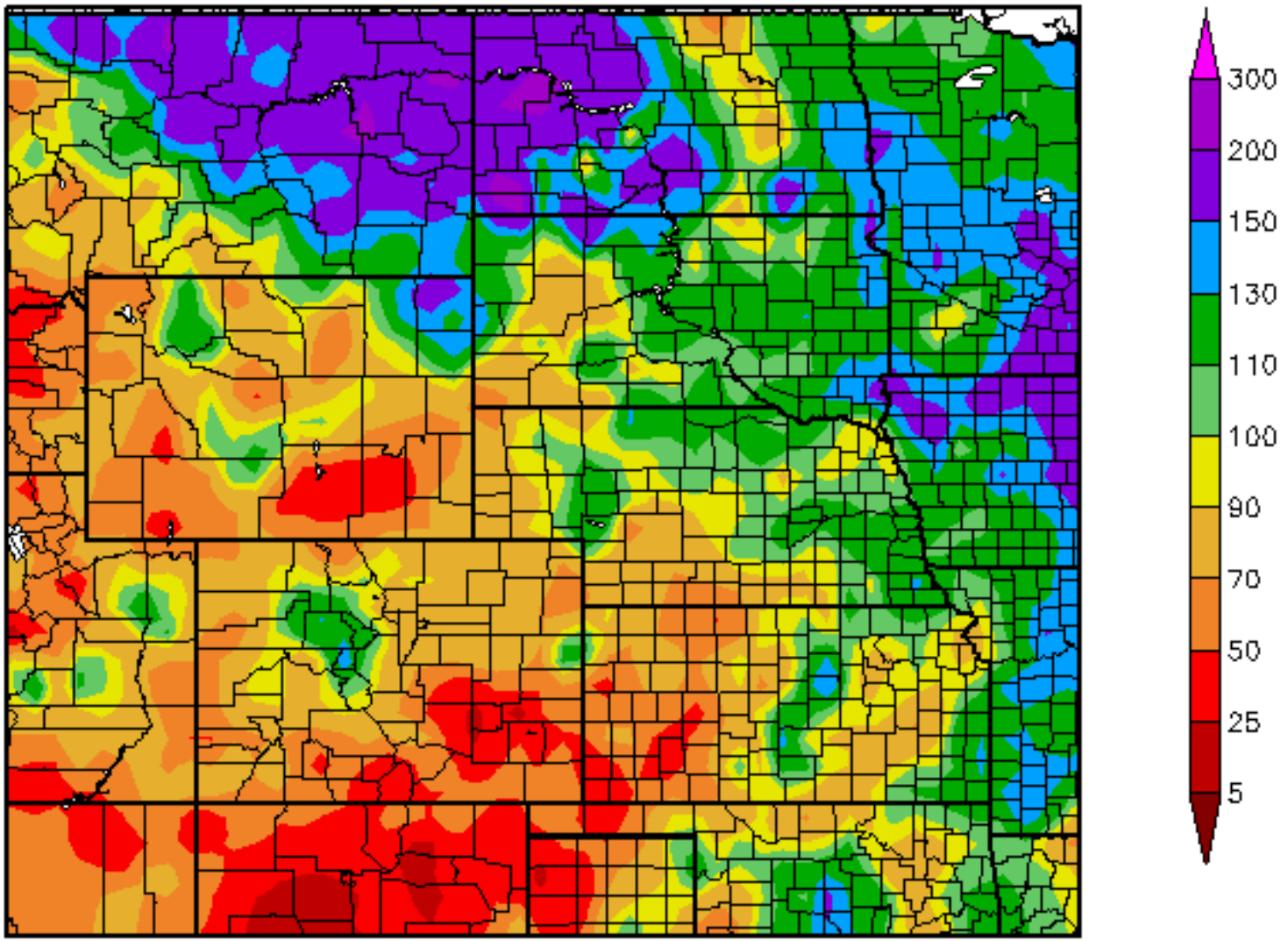


March 19, 2013

June 18, 2013

Week	Nothing	D0-D4	D1-D4	D2-D4	D3-D4	D4
March 19, 2013	0.00	100.00	100.00	100.00	96.13	76.41
June 18, 2013	7.85	92.15	88.36	67.77	34.66	3.64

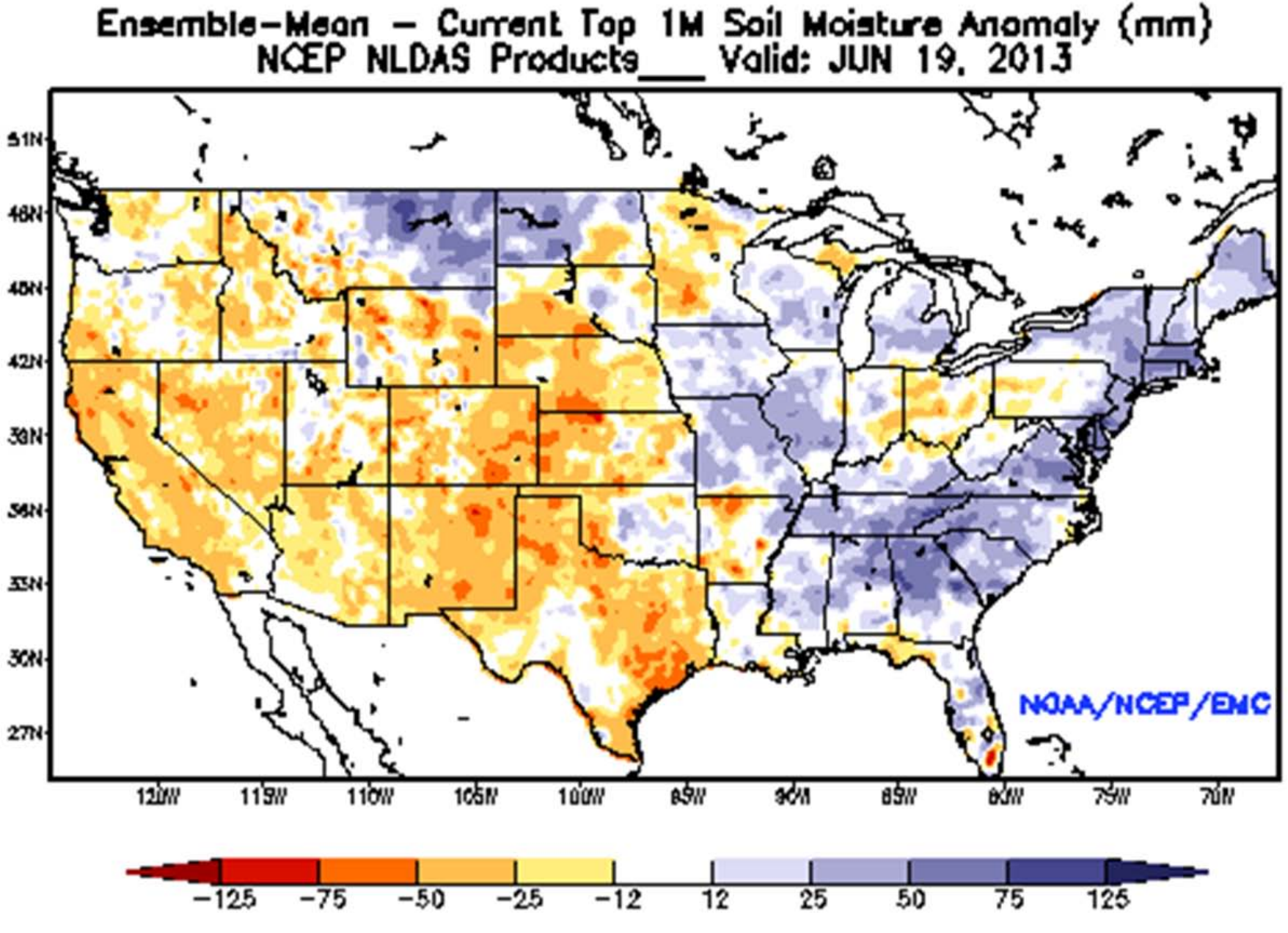
Percent of Normal Precipitation (%)
1/1/2013 – 6/24/2013



Generated 6/25/2013 at HPRCC using provisional data.

Regional Climate Centers

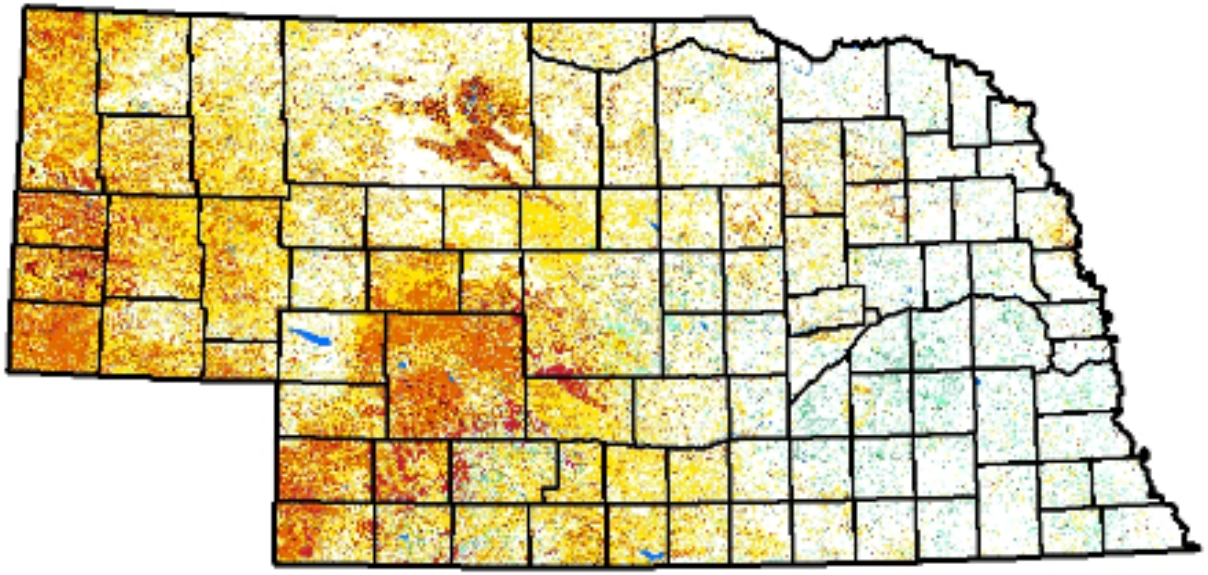
Generated 6/25/2013 at HPRCC using provisional data.
Regional Climate Centers


Ensemble-Mean – Current Top 1M Soil Moisture Anomaly (mm)
NCEP NLDAS Products___ Valid: JUN 19, 2013
51N
48N
45N
42N
39N
36N
33N
30N
27N
120W
115W
110W
105W
100W
95W
90W
85W
80W
75W
70W
NOAA/NCEP/EMC
−125
−75
−50
−25
−12
12
25
50
75
125

Vegetation Drought Response Index

Complete: Nebraska

June 17, 2013



Vegetation Condition

- Extreme Drought
- Severe Drought
- Moderate Drought
- Pre-Drought
- Near Normal
- Unusually Moist
- Very Moist
- Extremely Moist
- Out of Season
- Water

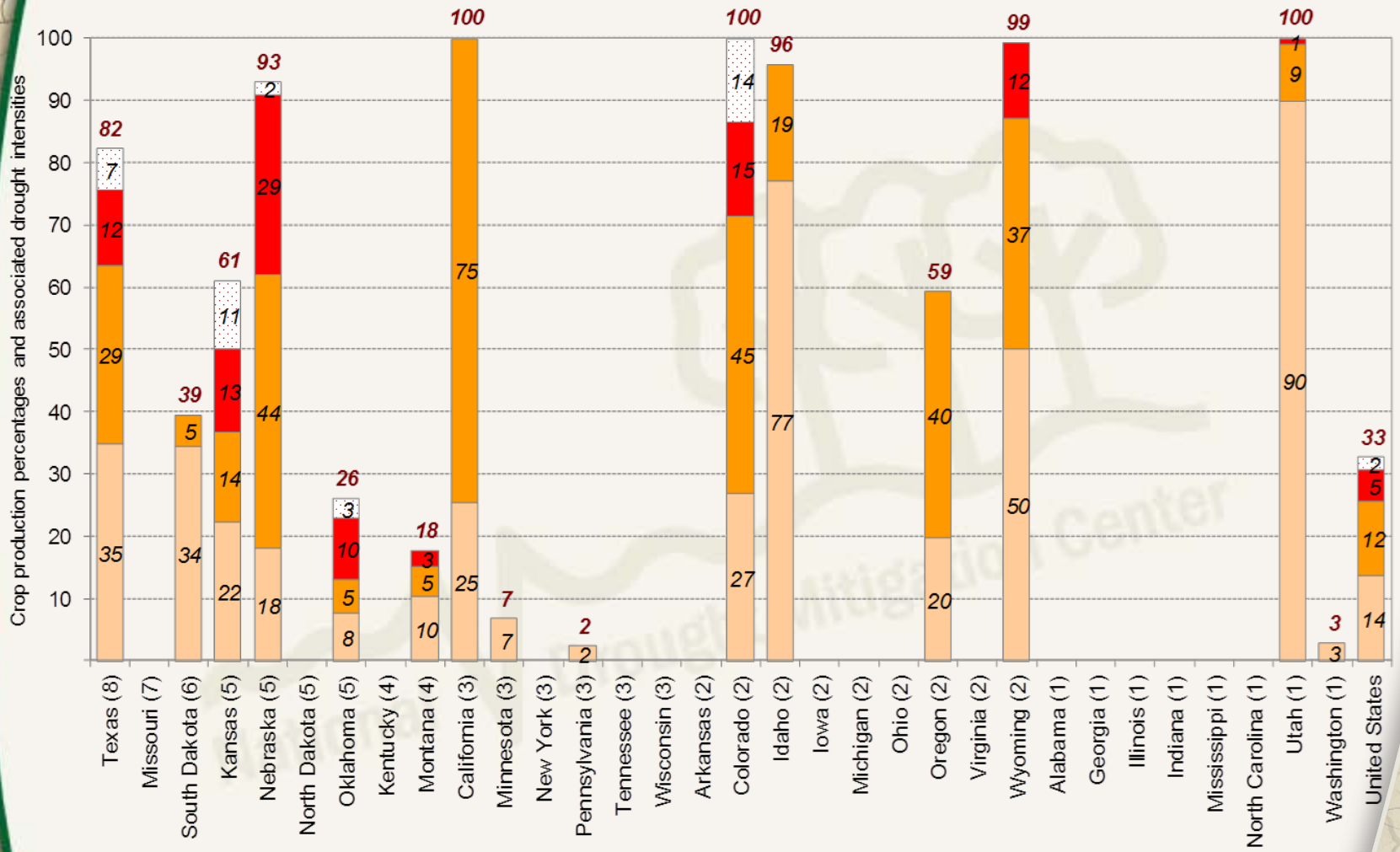
National Drought Mitigation Center

USGS

RMA

Approximate Percentage of Hay Located in Drought *

June 18, 2013



* Drought percentages were calculated from U.S. Drought Monitor (USDM) data for the above date. More information on the USDM is available at http://droughtmonitor.unl.edu/.

State contributions to national production (percentages in parentheses) are based upon National Agricultural Statistics Service (NASS) 2007 Census of Agriculture data. More information on NASS data can be found at http://www.nass.usda.gov/.

USDA **Agricultural Weather Assessments**

World Agricultural Outlook Board

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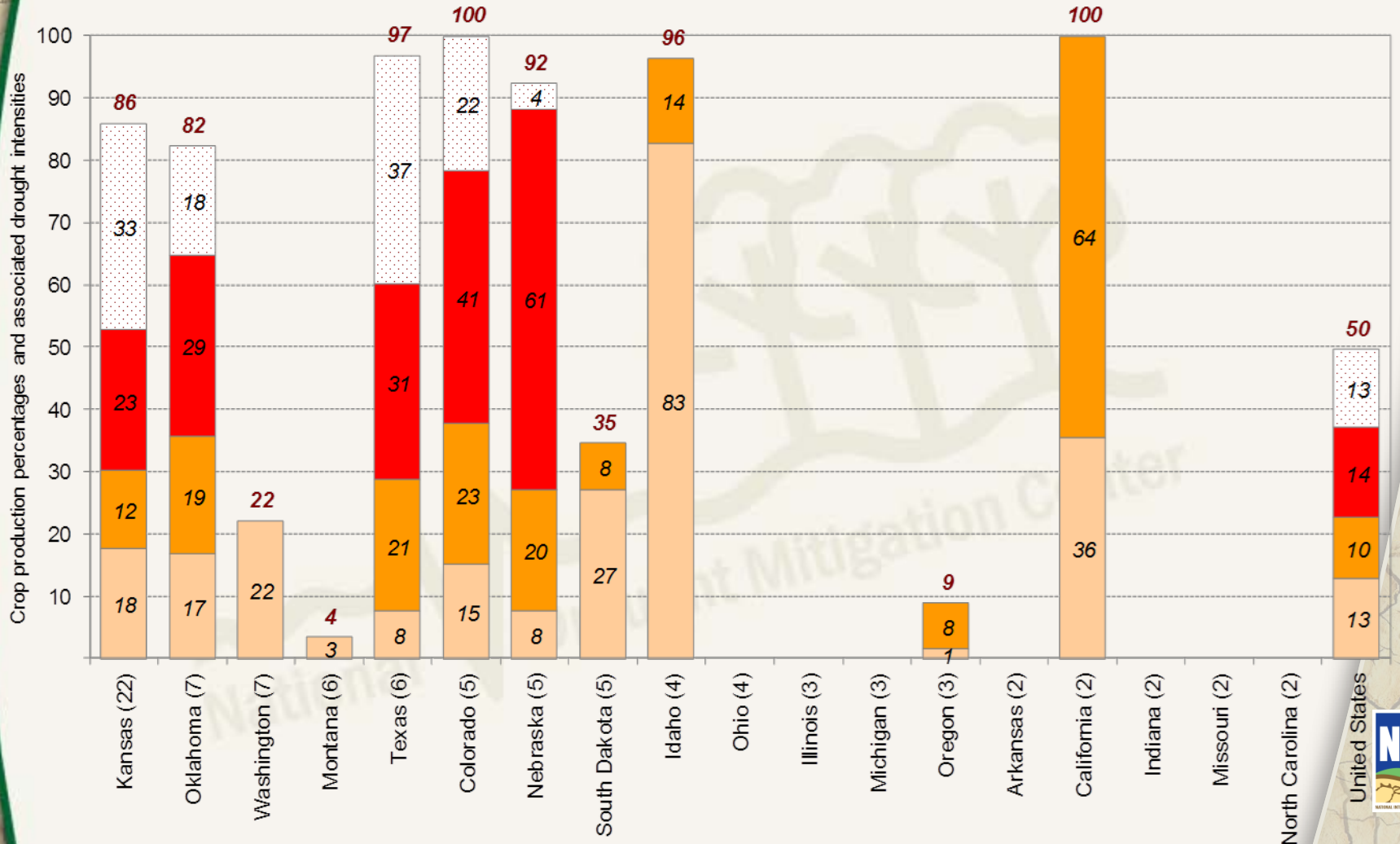
Approximate Percentage of Winter Wheat Located in Drought *

June 18, 2013



* Drought percentages were calculated from U.S. Drought Monitor (USDM) data for the above date. More information on the USDM is available at http://droughtmonitor.unl.edu/.

Percent in Moderate Drought (D1)
Percent in Severe Drought (D2)
Percent in Extreme Drought (D3)
Percent in Exceptional Drought (D4)

State contributions to national production (percentages in parentheses) are based upon National Agricultural Statistics Service (NASS) 5-year averages from 2006-2010. More information on NASS data can be found at http://www.nass.usda.gov/.

USDA

Agricultural Weather Assessments

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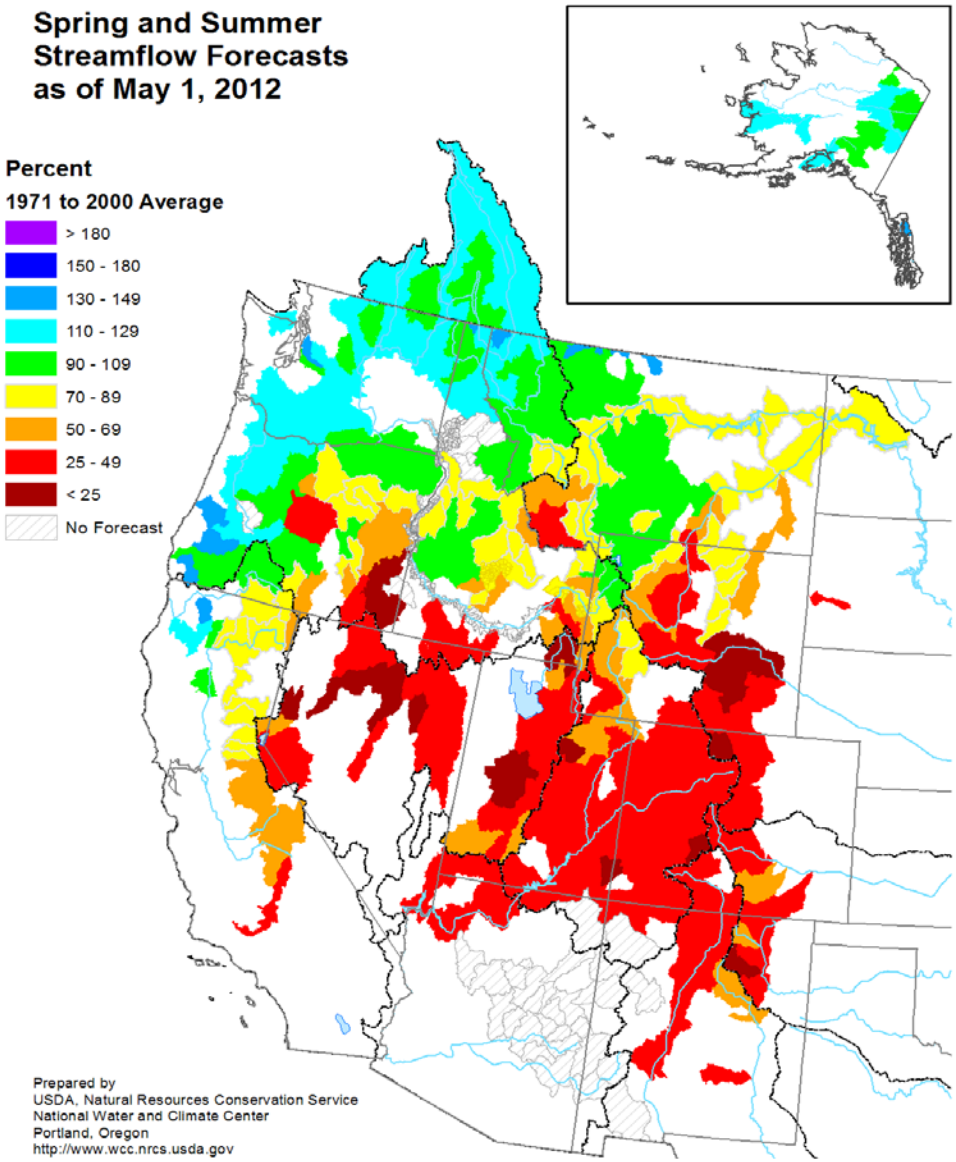
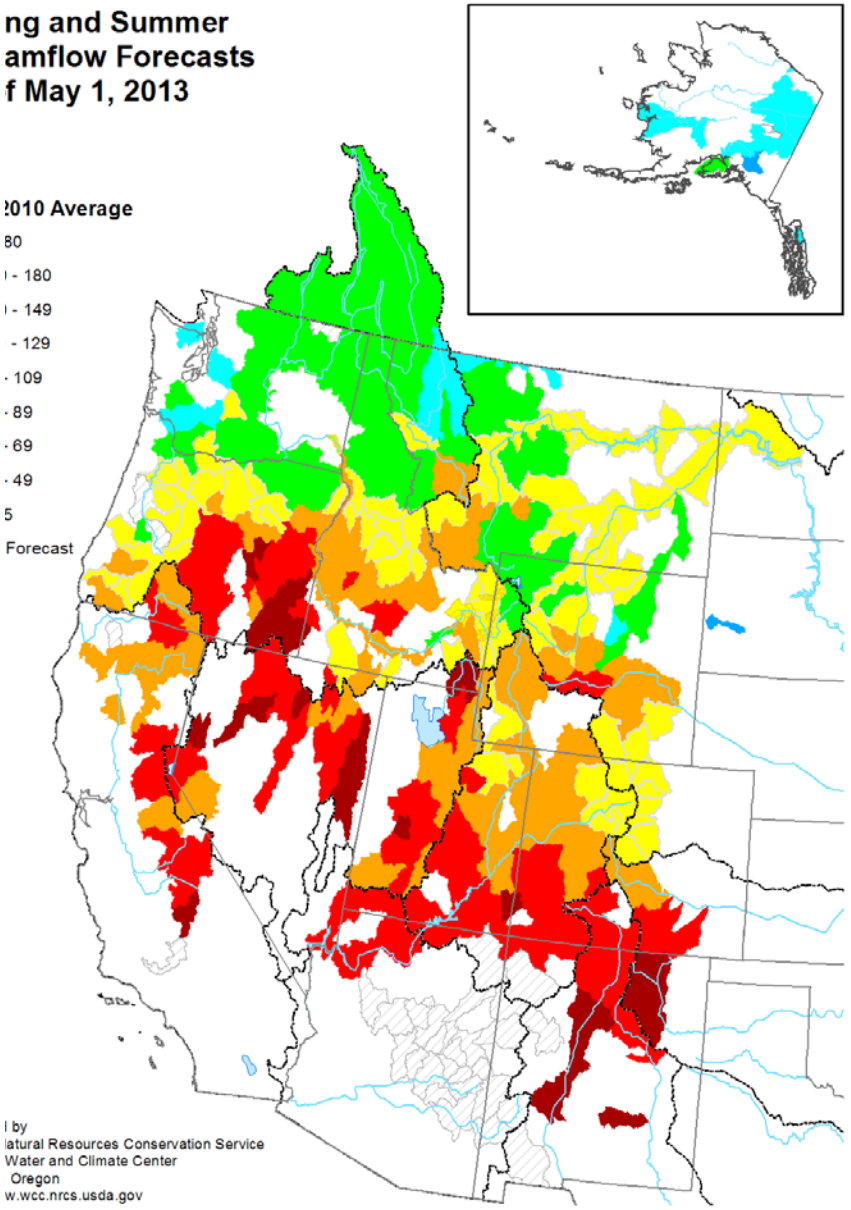

Spring and Summer
Streamflow Forecasts
as of May 1, 2012
Percent
1971 to 2000 Average
> 180
150 - 180
130 - 149
110 - 129
90 - 109
70 - 89
50 - 69
25 - 49
< 25
No Forecast
Prepared by
USDA, Natural Resources Conservation Service
National Water and Climate Center
Portland, Oregon
http://www.wcc.nrcs.usda.gov

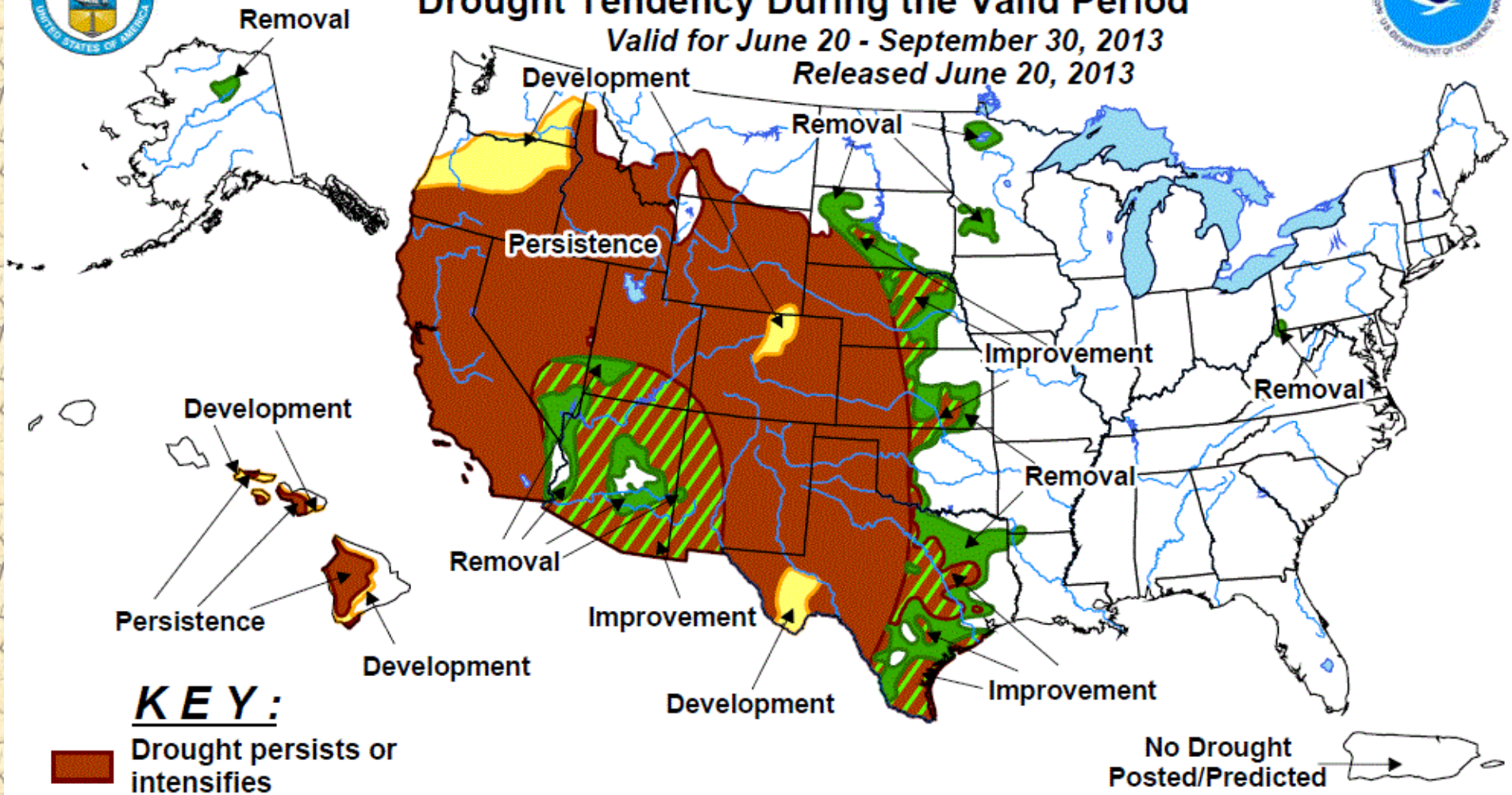

ng and Summer
amflow Forecasts
f May 1, 2013
2010 Average
80
- 180
- 149
- 129
· 109
· 89
· 69
· 49
5
Forecast
l by
atural Resources Conservation Service
Water and Climate Center
Oregon
w.wcc.nrcs.usda.gov

U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for June 20 - September 30, 2013

Released June 20, 2013



K E Y :

- Drought persists or intensifies
- Drought remains but improves
- Drought removal likely
- Drought development likely

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Short-term events -- such as individual storms -- cannot be accurately forecast more than a few days in advance. Use caution for applications -- such as crops -- that can be affected by such events. "Ongoing" drought areas are approximated from the Drought Monitor (D1 to D4 intensity). For weekly drought updates, see the latest U.S. Drought Monitor.

NOTE: The Green and Brown hatched areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period although drought will remain. The Green areas imply drought removal by the end of the period (D0 or none)

Climate Summary

- The 2012-13 Spring and early summer has generally been good for U.S. (contiguous) drought relief **down 16%** on the year with a **20% decrease** in areal drought coverage since its peak (65%) last September, but we still have **45% of the U.S. in drought**
- USDM currently shows **88% of the state in drought (D1-D4), down 12% since January 1**
  - **D3 has improved from 96% to 35% since January 1**
  - **D4 has been reduced from 77% to 4% since January 1**
- **Low snow pack leads to second consecutive year of low streamflow forecasts** out of the central Rockies
  - Still a concern for the MO Basin/Platte Basin (N.Platte in particular)
- As of late June, Nebraska's winter wheat crop has **51% rated poor to very poor** and 18% was rated good to excellent (USDA-NASS)
  - Range and pasture is a little better off but **hay and forage supplies are low** (USDA-NASS)
- Climate Prediction Center's Seasonal Drought Outlook calls for ***continued improvement to likely removal of drought across the eastern half of Nebraska*** and along the eastern reaches of the Great Plains between now and the end of September.
- ***Many areas in the region/state are still vulnerable to a quick relapse (kinda an equivalent to a drought hangover)!***

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Nebraska Water Supply Update…

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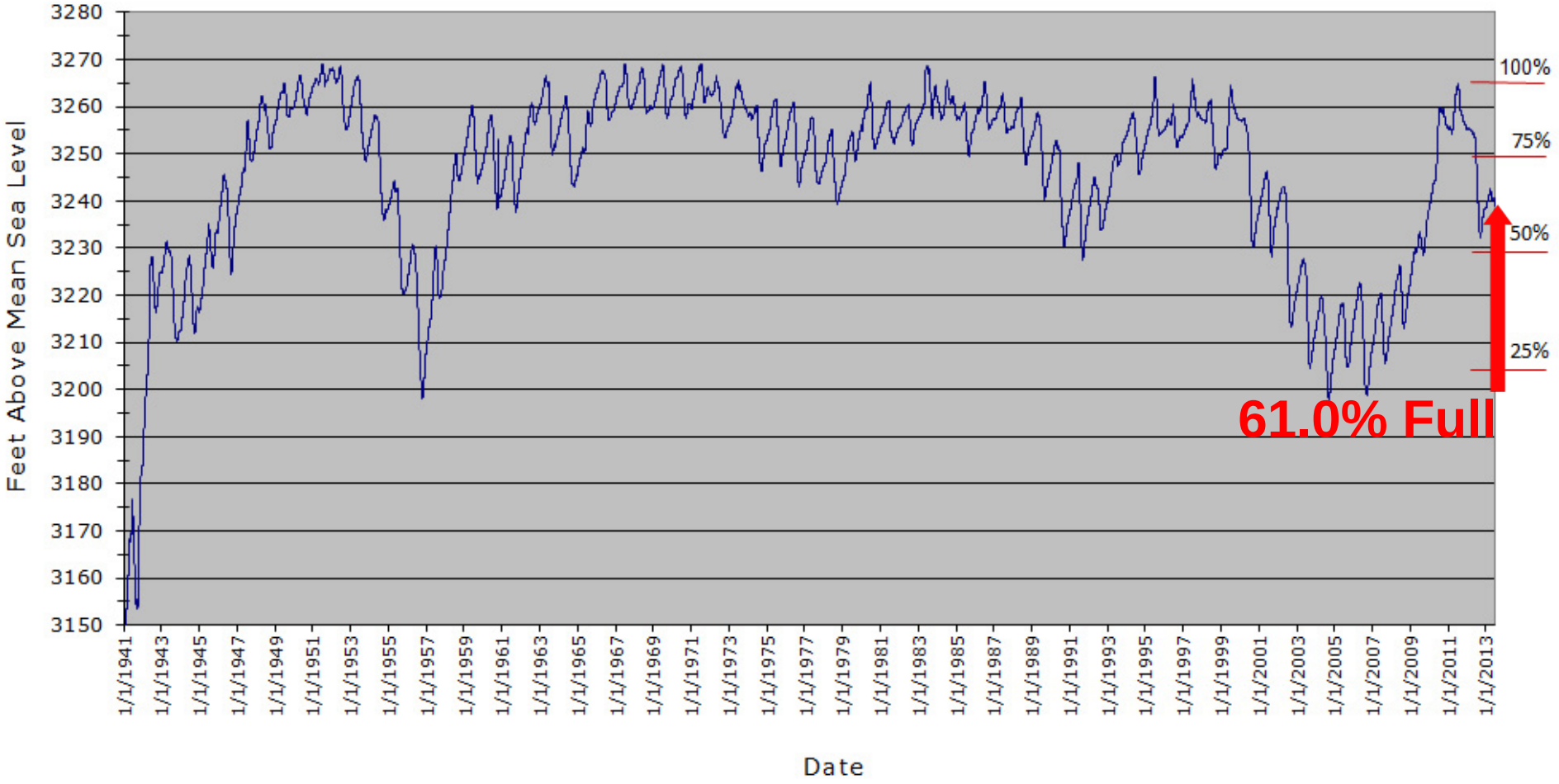
Lake McConaughy Elevation
1941 to Present

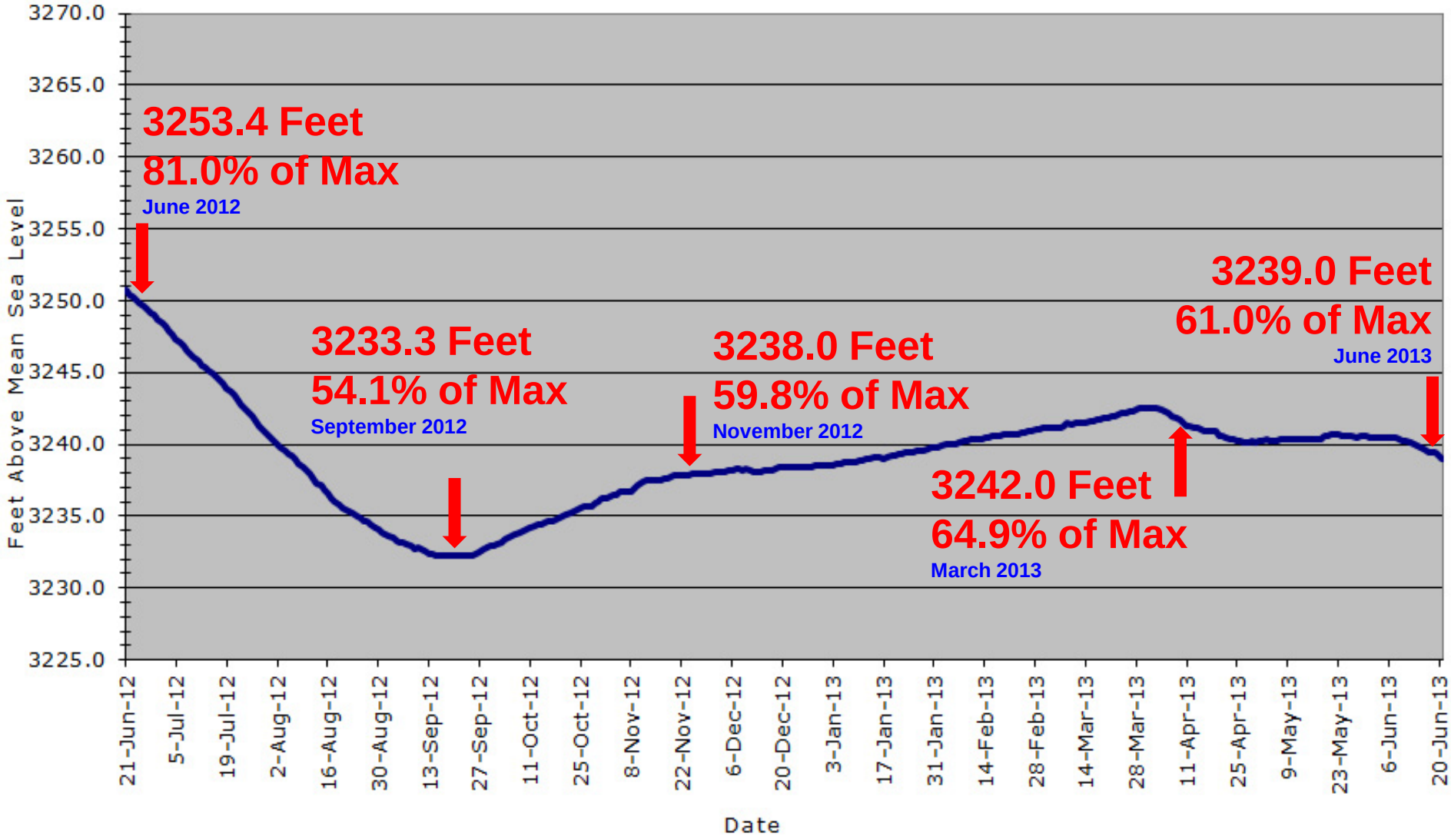


SOURCE: CNPPID www.cnppid.com

University of Nebraska Lincoln
National Drought Mitigation Center

Lake McConaughy Elevation

June 21, 2012 to June 21, 2013



SOURCE: CNPPID www.cnppid.com

National Drought Mitigation Center

March 2013 CARC Meeting

Stream flow in cubic feet per second (cfs). Spot reading for current day; daily average for week, month, and year ago.

	Today (7 a.m.)	Week Ago	Month Ago	Year Ago
Inflows to Lake McConaughy (Current, Average & Median Inflow graph)	736	906	1,000	921
Total Lake McConaughy Outflow	450	726	312	334
North Platte below Keystone Dam	11	10	10	23
Keystone Dam Diversion	0	427	463	646
North Platte at North Platte	344	285	167	497
South Platte at Roscoe	29	47	N/A#	329
South Platte at North Platte	227	250	231	471
Diversion to CNPPID Supply Canal	623	847	526	1,458
Platte River at Overton	486	1,508	770	1,949
Platte River at Kearney	337	955	950	1,779
Platte River at Grand Island	542	1,028	800	2,229

** Percent of capacity is dependent upon maximum elevations/operating levels at different times of the year. Lower maximum levels were established in 1974 after a 1972 storm caused damage to the dam's face. The limits are in effect for periods when high winds and waves are most likely to occur. (See Lake McConaughy Maximum Operating Levels table)*

*** Flow too low for gauge to measure*

@ - Yesterday's average flow

≠ - Ice affecting stream gauges; readings may not be accurate

N/A - Data temporarily unavailable (data not reported from gauge)

SOURCE: CNPPID www.cnppid.com

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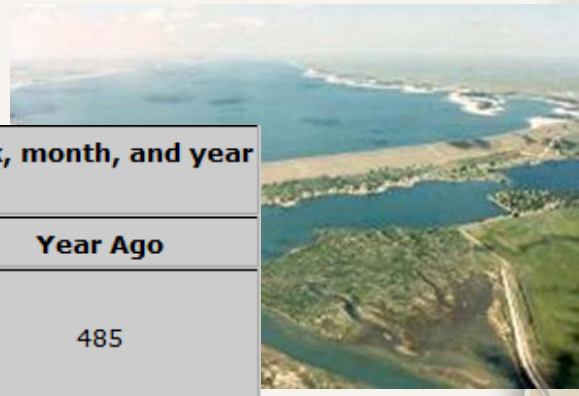
National Drought Mitigation Center

June 2013 CARC Meeting



Stream flow in cubic feet per second (cfs). Spot reading for current day; daily average for week, month, and year ago.

	Today (7 a.m.)	Week Ago	Month Ago	Year Ago
Inflows to Lake McConaughy (Current, Average & Median Inflow graph)	284	265	643	485
Total Lake McConaughy Outflow	1,850	1,540	1,164	2,469
North Platte below Keystone Dam	245	139	250	1,071
Keystone Dam Diversion	1,591	1,268	716	1,732
North Platte at North Platte	221	272	540	691
South Platte at Roscoe***	N/A	N/A	N/A	N/A
South Platte at North Platte	260	250	326	150
Diversion to CNPPID Supply Canal	1,280	1,371	1,143	2,186
Platte River at Overton	191	170	196	190
Platte River at Kearney	133	75	242	197
Platte River at Grand Island	230	298	330	358

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SOURCE: CNPPID www.cnppid.com

*** Flow too low for gauge to measure*

**** River gauge for South Platte at Roscoe is out of use until further notice due to federal budget cuts.*

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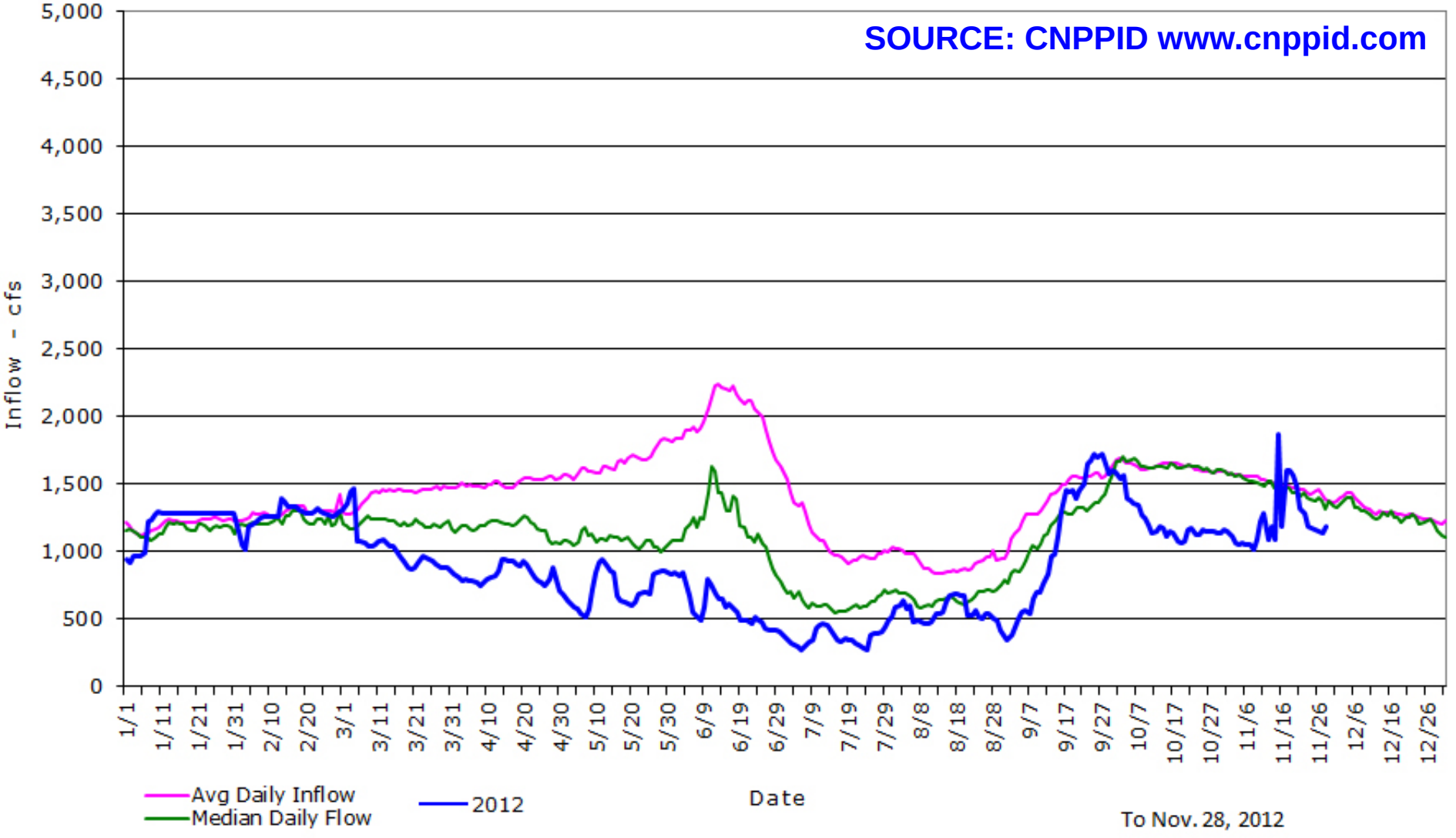
2012

Daily Inflows - Lake McConaughy
Current, Average & Median Flows since 1941

Example to assist with reading graph: The average inflow for March 1 (measurements on every March 1 since 1941) is 1,308 cfs.
Similarly, the median flow for March 1 (the middle value in the range of every March 1 reading since 1941) is 1,210 cfs.



To Nov. 28, 2012

National Drought Mitigation Center

Daily Inflows - Lake McConaughy
Current, Average & Median Flows since 1941

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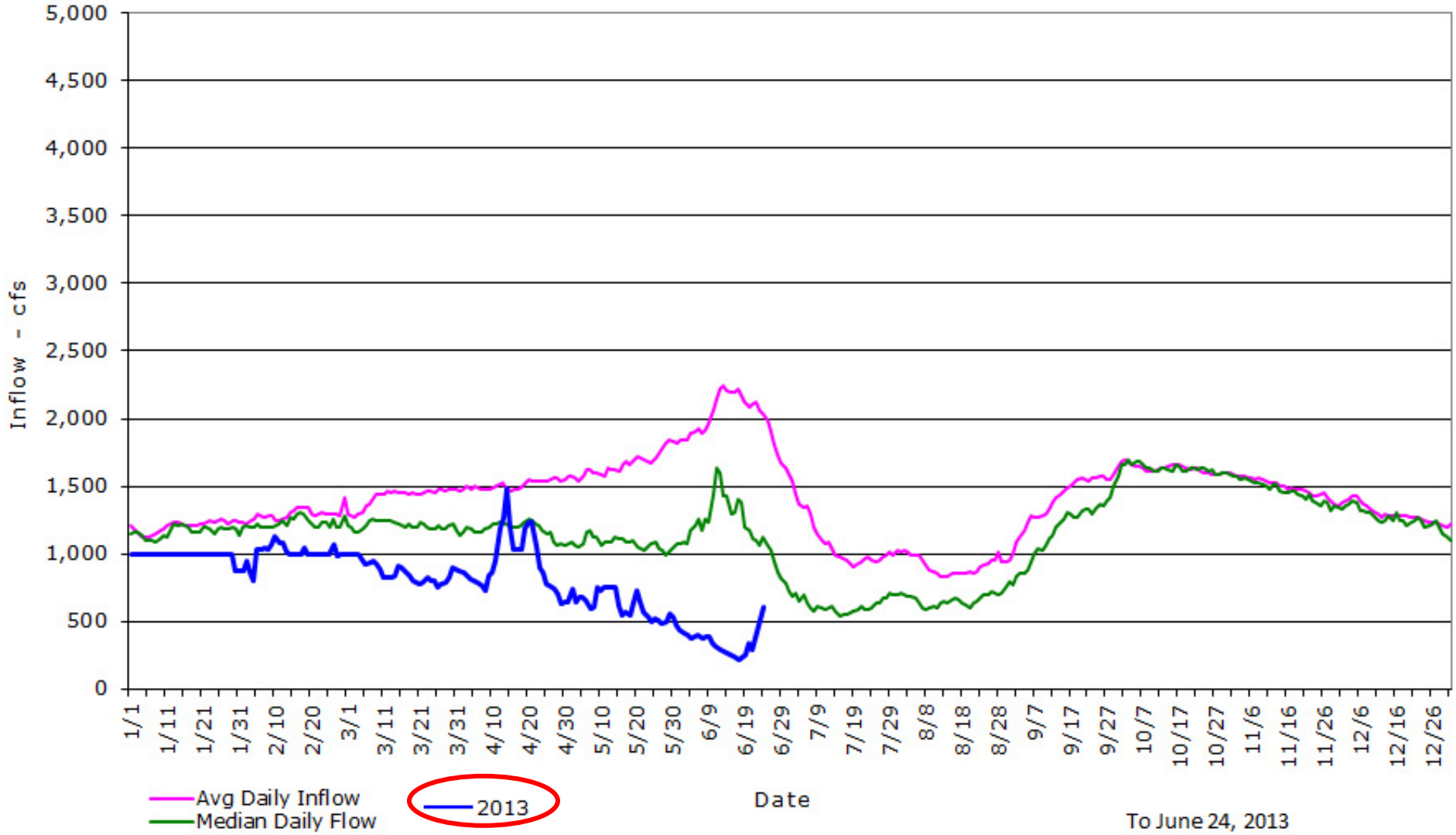


To June 24, 2013

National Drought Mitigation Center

Lake McConaughy

Dave Ford, CNPPID Irrigation Division Manager, said “While there's been some improvement since early spring and the area in which drought conditions persist has grown smaller -- particularly in areas east of us -- *we still have a way to go before we catch up to normal precipitation levels*," Ford said. Ford said quite a few pivots in the area have been applying water and he expects to see more demand for water over the next couple weeks as irrigation season begins in earnest.

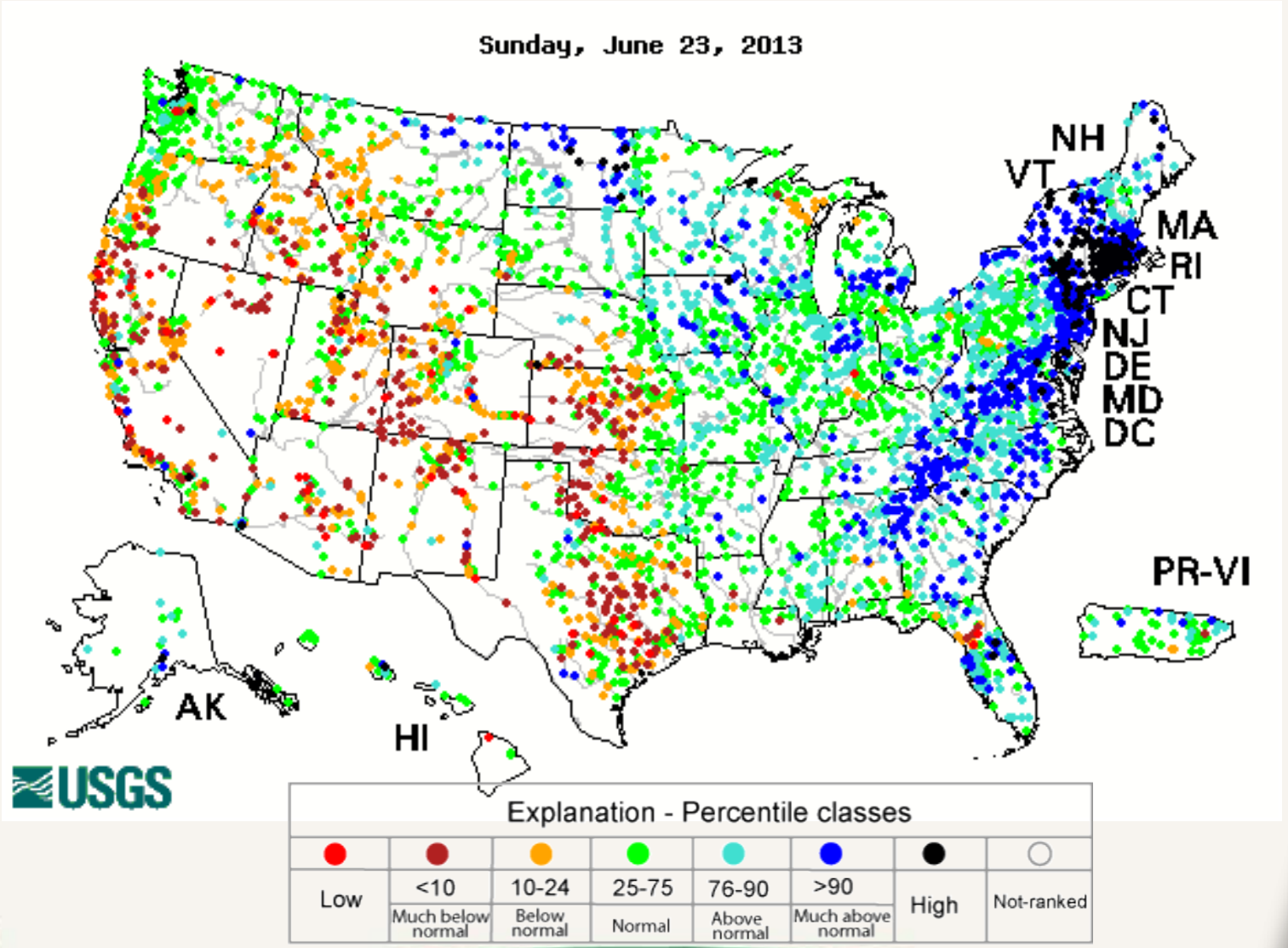
At Lake McConaughy, inflows have dropped to about 350 cubic feet per second (cfs), far below the 1,100 cfs inflows that are normal for this time of year. The lake contained about 1.1 million acre-feet of water, which is **63 percent** of capacity.

"We're concerned that inflows are so far below normal for this time of year," said civil engineer Cory Steinke. "This is typically when we see the highest inflows of the year, not numbers that are more likely to occur in late July."

Note: Values in (%) are current as of 6/3/13

SOURCE: CNPPID News Release, June 3, 2013

14-day average streamflow compared to historical streamflow for the day of year



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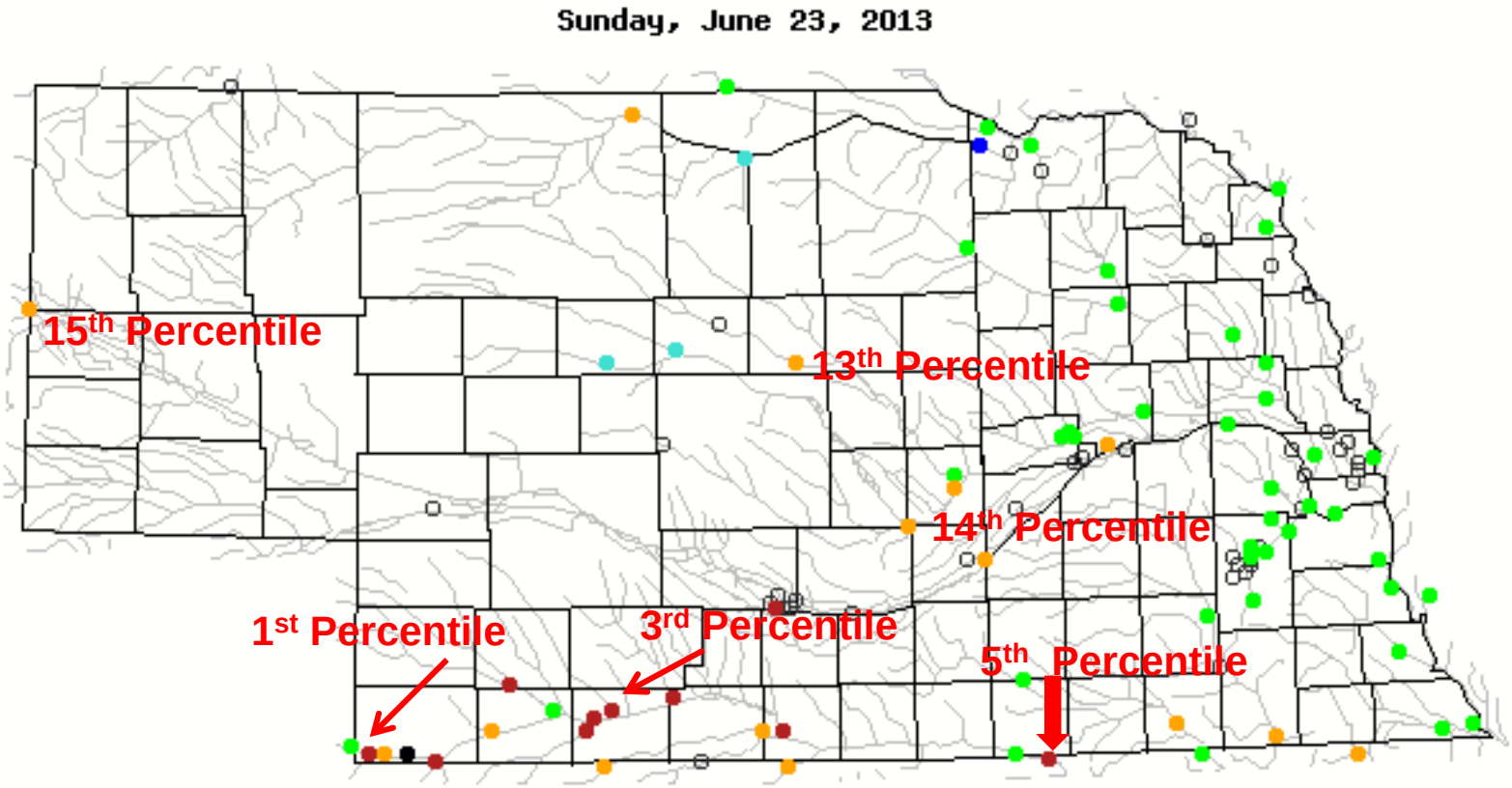
14-day average streamflow compared to historical streamflow for the day of year



USGS

Explanation - Percentile classes							
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		

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Republican River Basin

- **Hugh Butler:** 18.0%(21.7%) of conservation pool
- **Enders:** 35.0% (36.1%) of conservation pool
- **Harry Strunk:** 69.4%(74.6%) of conservation pool
- **Swanson:** 35.8% (34.5%) of conservation pool

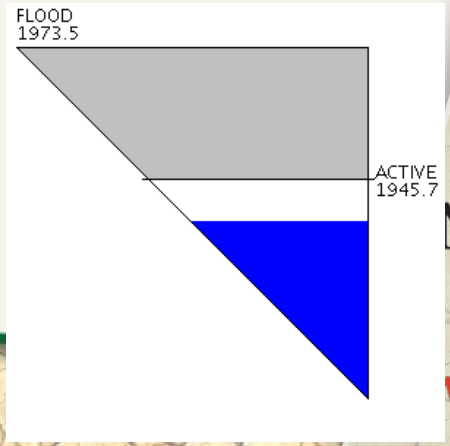
*values in red are from the last CARC meeting in March 2013

Source: BOR http://www.usbr.gov/gp/lakes_reservoirs

Republican River Basin

Harlan County Current Conditions

- ✓ Conservation Pool is 66.8% full (62.2%)
- ✓ 209,935 Acre-Feet in storage compared to 195,434 Acre-Feet of water in storage on March 25, 2013.
- ✓ Last year at this time, 297,357 AF was in storage.
- ✓ Historical storage for this time of the year is 270,779 AF



Source: BOR http://www.usbr.gov/gp/lakes_reservoirs/

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Water Supply Summary

- The Drought of 2012-2013 will continue to impact water supplies across the state. Even as snow accumulated in the Rocky Mountains into May, the depleted soil moisture across the region and below normal reservoir storage upstream has led to less available runoff and is reflected in the low inflows currently coming into Lake McConaughy.

- Lake McConaughy is currently14.4 feet lower than it was in June,2012 and 3 feet lower than it was in March 2013. The inflows at the beginning of June were at levels more typical of July. Irrigation challenges will be evident for the 2013 growing season.

- Overall, storage in the Republican River basin has declined over the last 3 months compared to levels at the end of March 2013. Harlan County is currently14,501 Acre-Feet higher than in March 2013 but is 87,422 AF lower than June of 2012 and is 60,844 AF lower than the historical average for this time of year.

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Any Questions ?

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