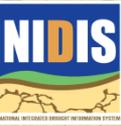
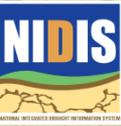


NE Drought Conditions CARC Update: June 24, 2014

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



Current Conditions around Nebraska and the region...

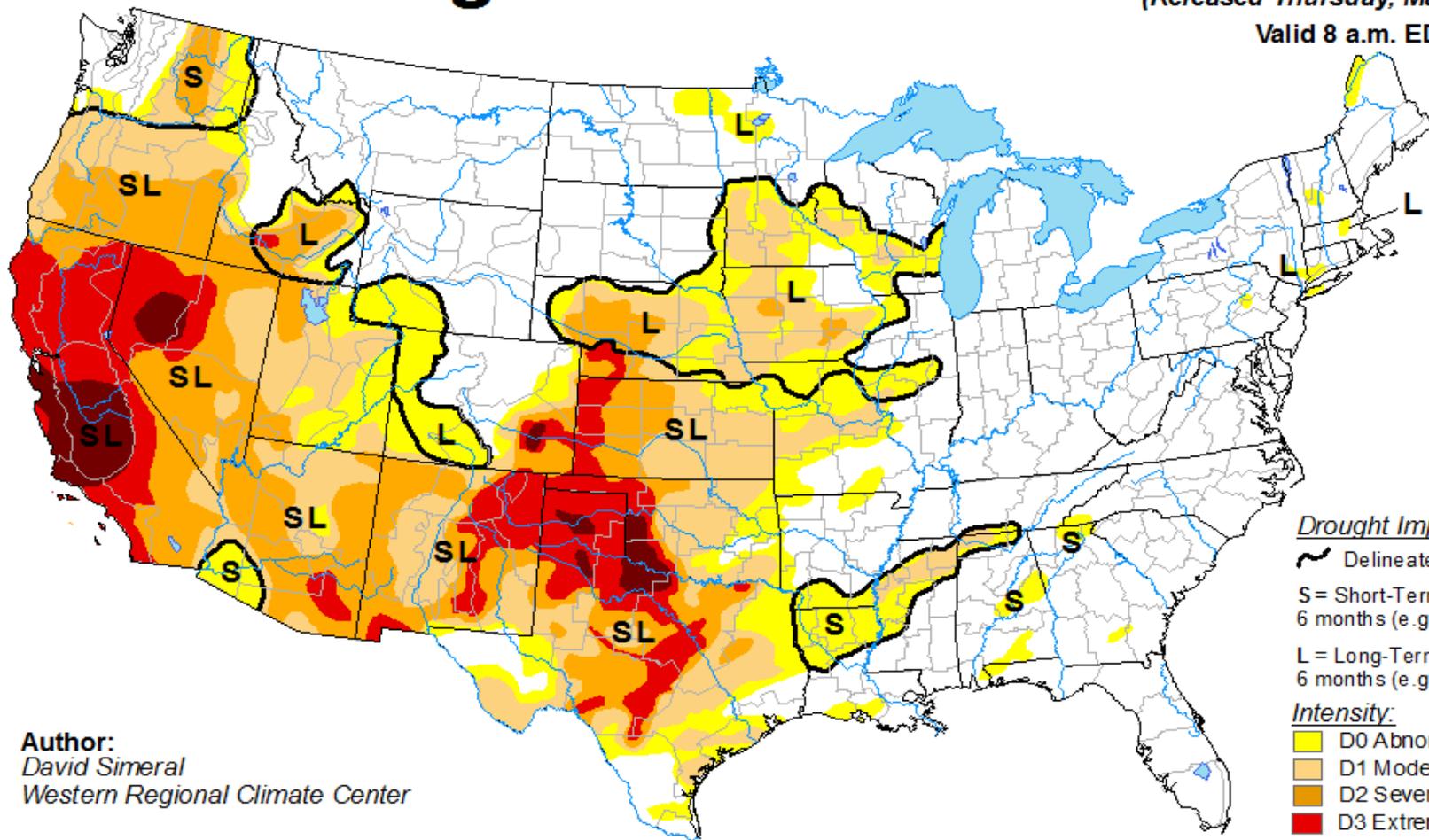


U.S. Drought Monitor

March 25, 2014

(Released Thursday, Mar. 27, 2014)

Valid 8 a.m. EDT



Author:
David Simeral
Western Regional Climate Center

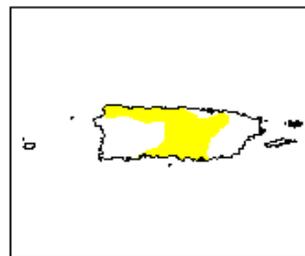
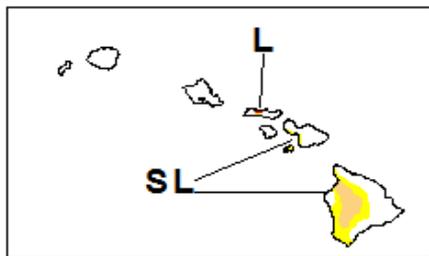
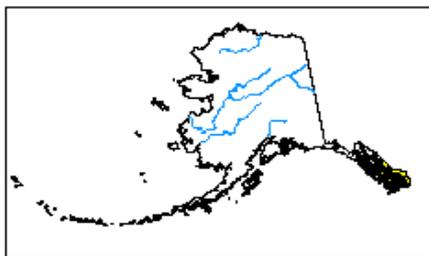
Drought Impact Types:

- 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.



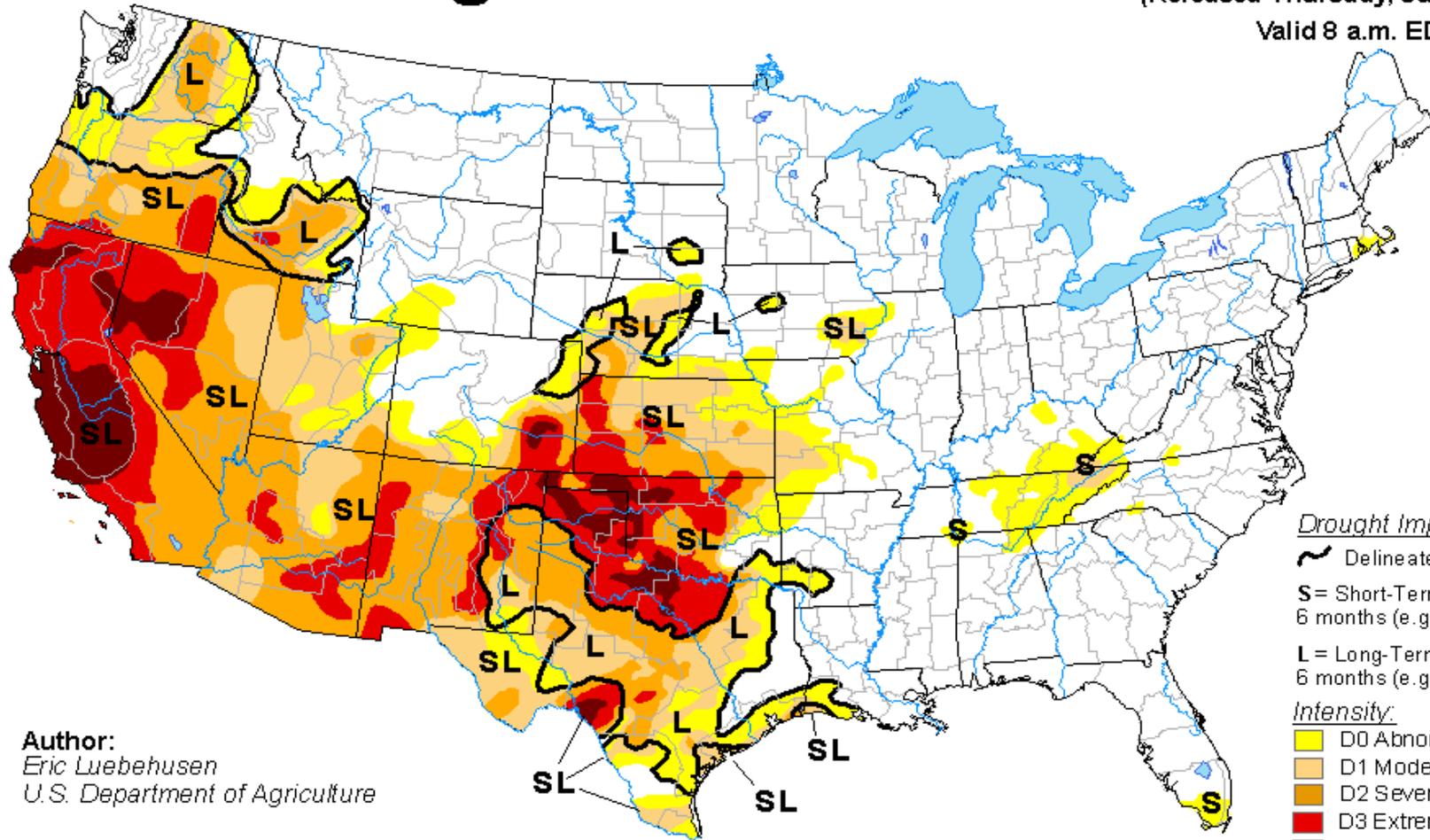
<http://droughtmonitor.unl.edu/>

U.S. Drought Monitor

June 17, 2014

(Released Thursday, Jun. 19, 2014)

Valid 8 a.m. EDT



Author:
Eric Luebehusen
U.S. Department of Agriculture

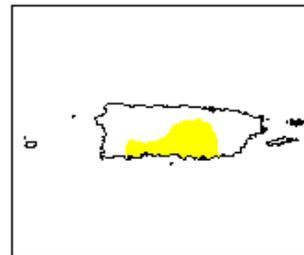
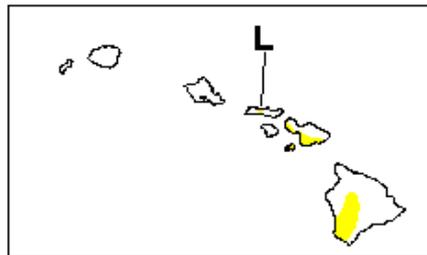
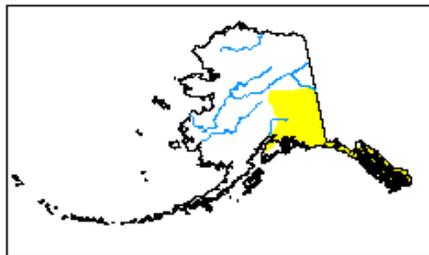
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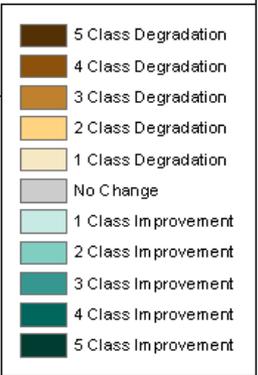
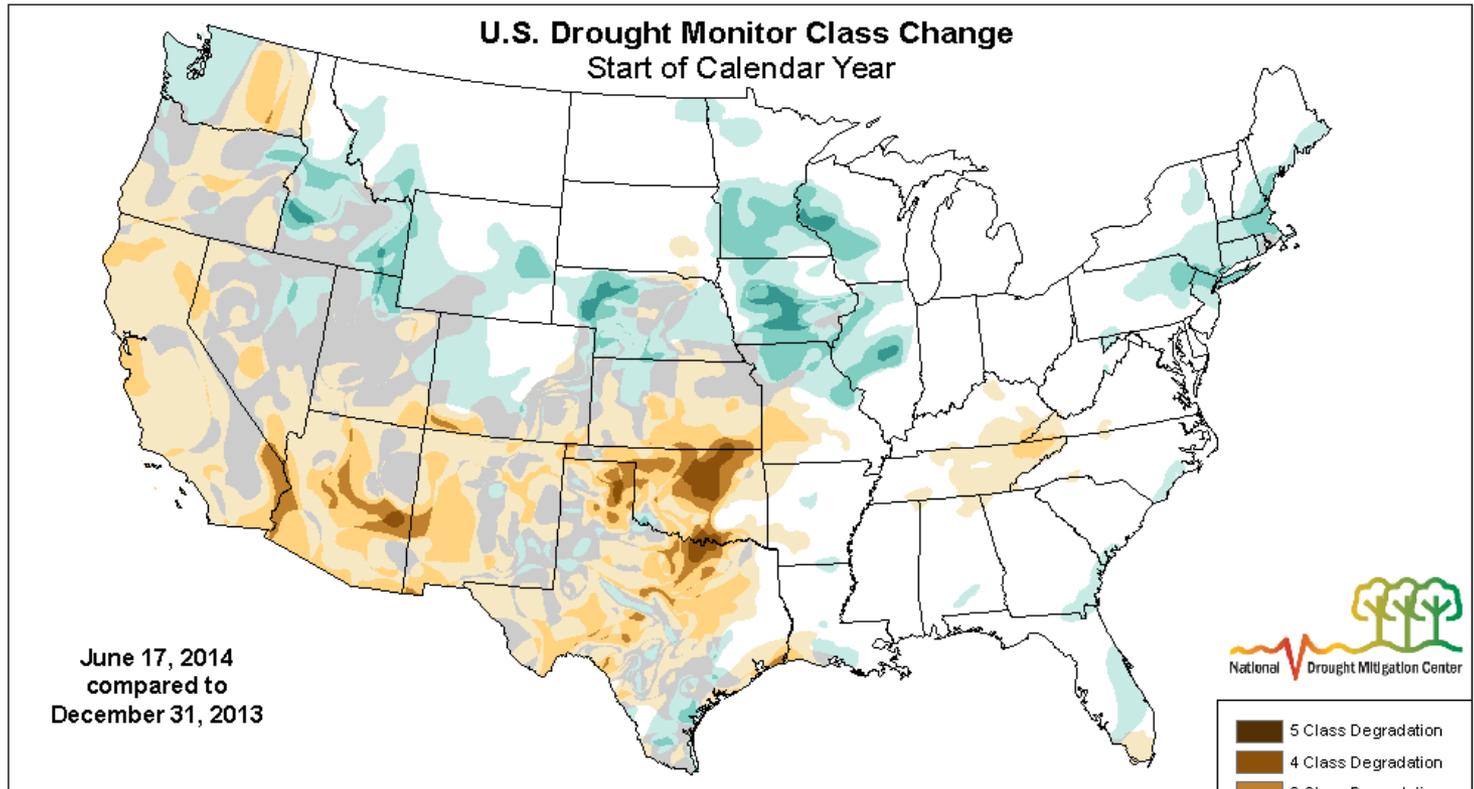


<http://droughtmonitor.unl.edu/>

U.S. Drought Monitor Class Change
1 Month

U.S. Drought Monitor Class Change
3 Months

U.S. Drought Monitor Class Change
Start of Calendar Year

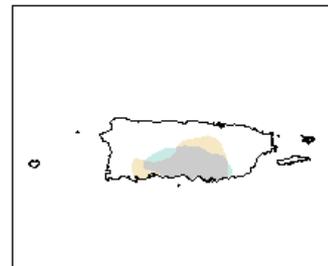
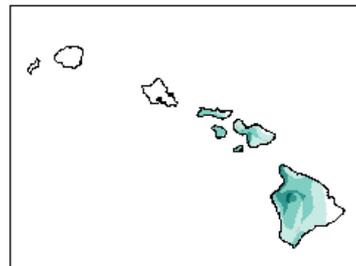
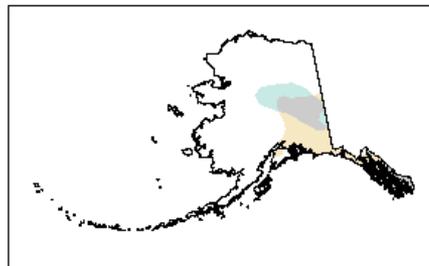


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<http://droughtmonitor.unl.edu>

U.S. Drought Monitor High Plains

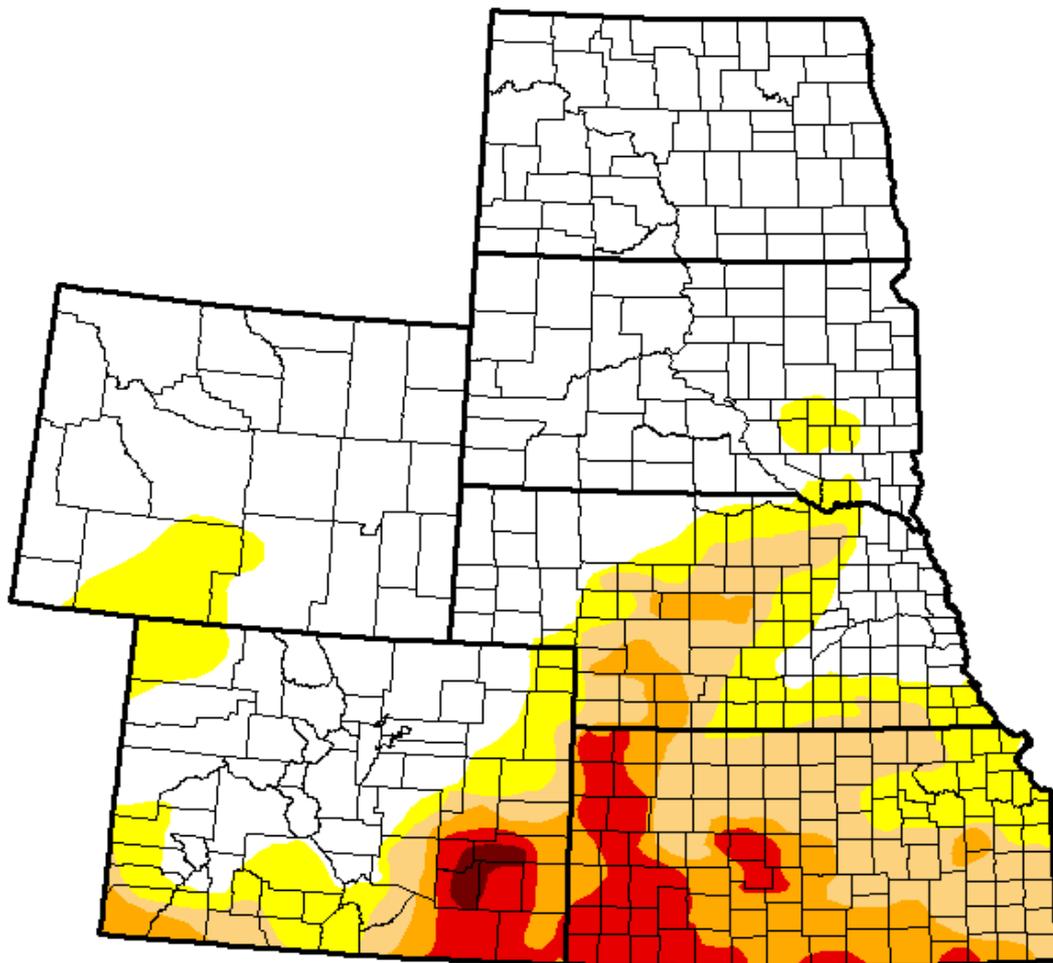
June 17, 2014

(Released Thursday, Jun. 19, 2014)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	62.91	37.09	23.90	12.36	5.34	0.39
Last Week <i>6/10/2014</i>	62.26	37.74	25.58	13.12	7.02	0.39
3 Months Ago <i>3/18/2014</i>	53.06	46.94	27.87	14.42	4.09	0.30
Start of Calendar Year <i>12/31/2013</i>	45.79	54.21	20.60	12.28	2.44	0.30
Start of Water Year <i>10/1/2013</i>	29.87	70.13	43.21	19.50	3.01	0.30
One Year Ago <i>6/18/2013</i>	20.55	79.45	69.76	45.46	21.27	8.03



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.

Author:
Eric Luebehusen
U.S. Department of Agriculture



U.S. Drought Monitor Weekly Comparison

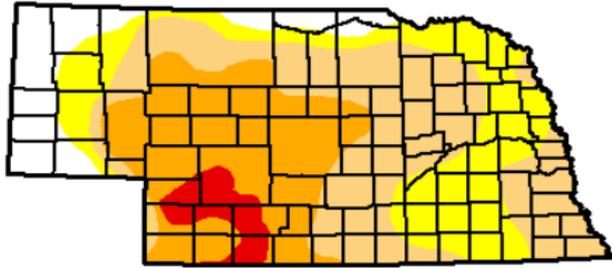
Nebraska

Drought Severity

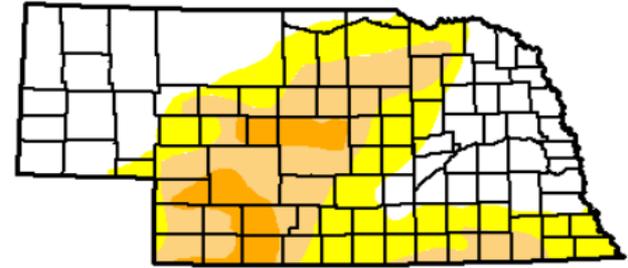
D0 - Abnormally Dry
 D1 Drought - Moderate

D2 Drought - Severe
 D3 Drought - Extreme

D4 Drought - Exceptional



March 18, 2014



June 17, 2014

Statistics

Time Series

Narrative

Statistics type: Traditional (D0-D4, D1-D4, etc.) Categorical (D0, D1, etc.)

Week	Nothing	D0-D4	D1-D4	D2-D4	D3-D4	D4
4/8/2014	9.15	90.85	74.21	30.67	4.39	0
6/17/2014	44.95	55.05	29.1	6.91	0.01	0

Percent of Normal Precipitation (%)

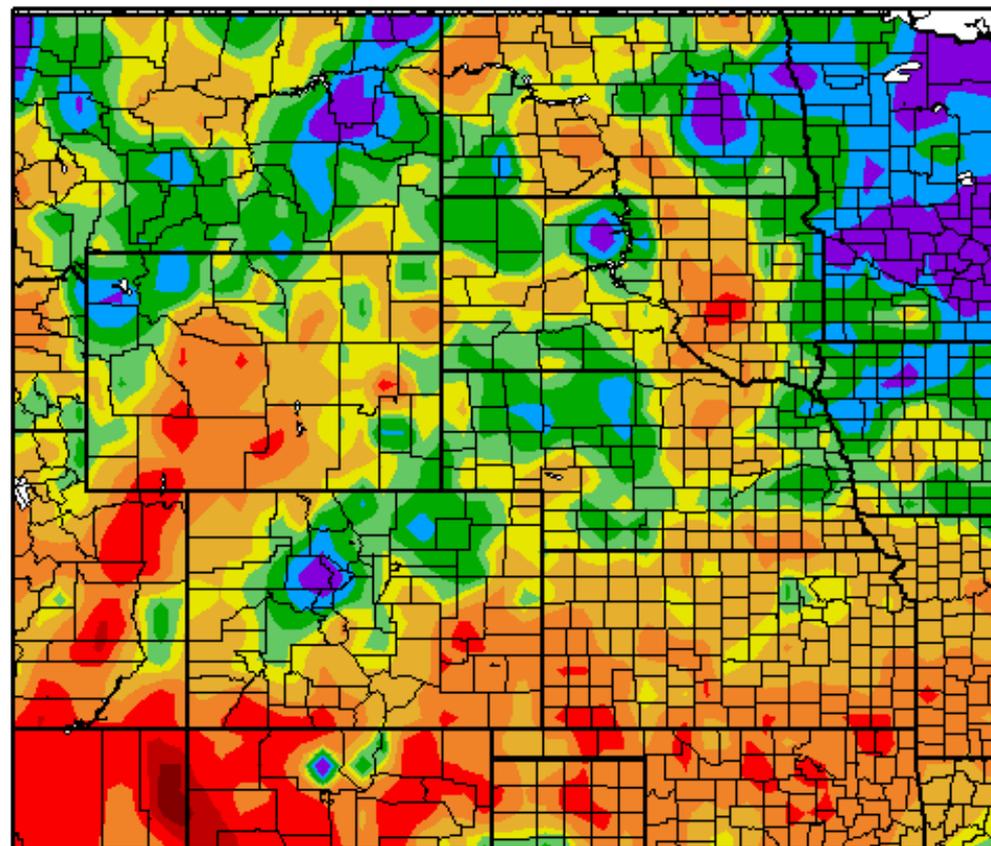
5/24/2014 - 6/22/2014

Percent of Normal Precipitation (%)

3/25/2014 - 6/22/2014

Percent of Normal Precipitation (%)

1/1/2014 - 6/22/2014



Generated 6/23/14

Generated 6/23/14

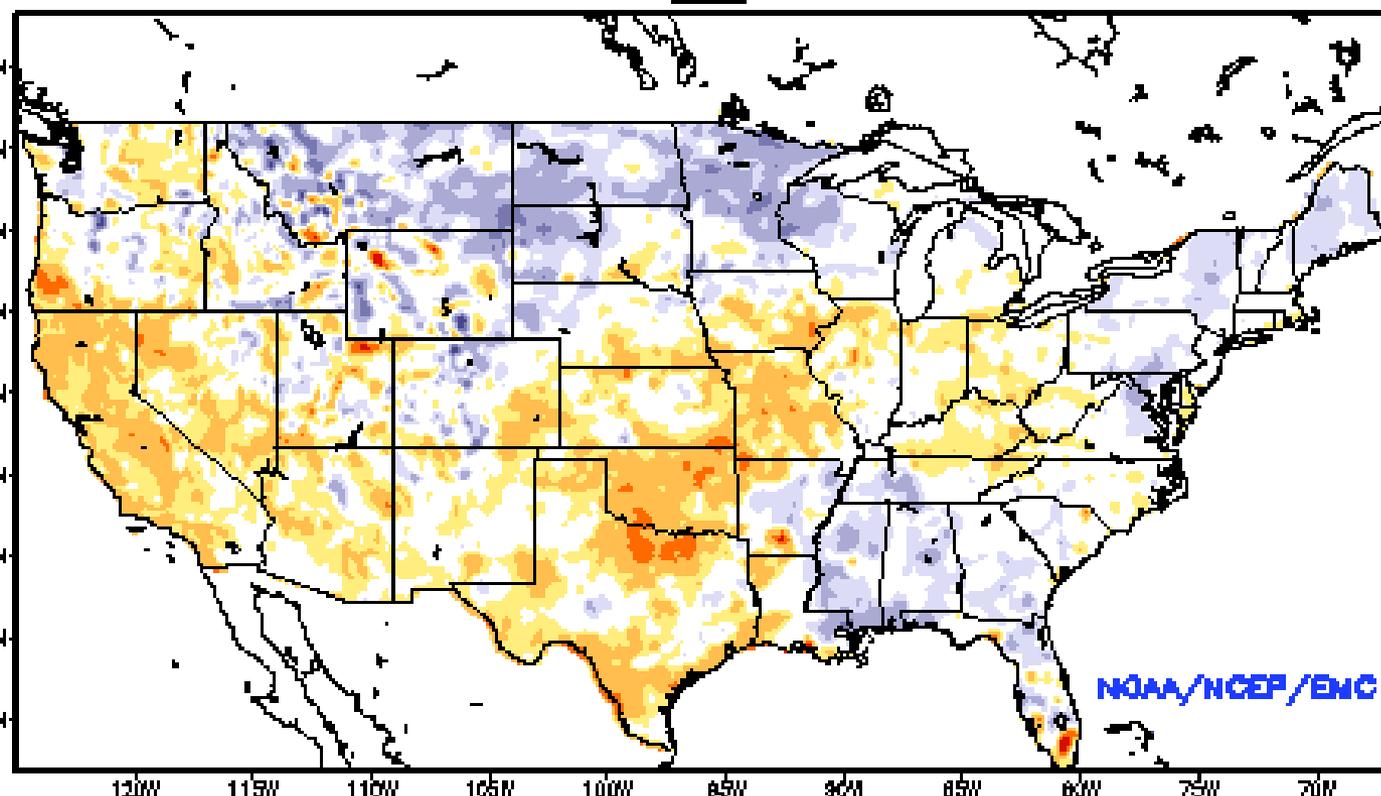
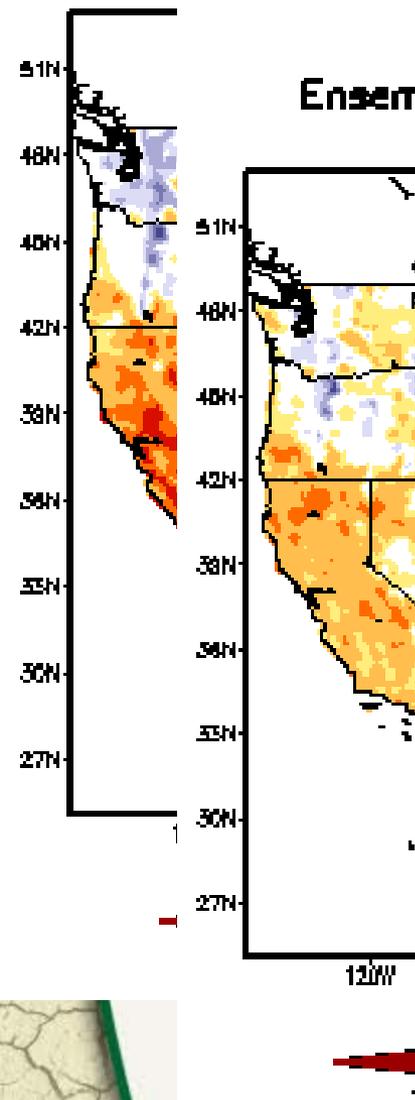
Generated 6/23/2014 at HPRCC using provisional data.

Regional Climate Centers

Ensemble-Mean - Current Top 1M Soil Moisture Anomaly (mm)
NCEP NLDAS Products Valid: MAR 22, 2014

Ensemble-Mean - Current Top 1M Soil Moisture Anomaly (mm)
NCEP NLDAS Products Valid: JUN 18, 2014

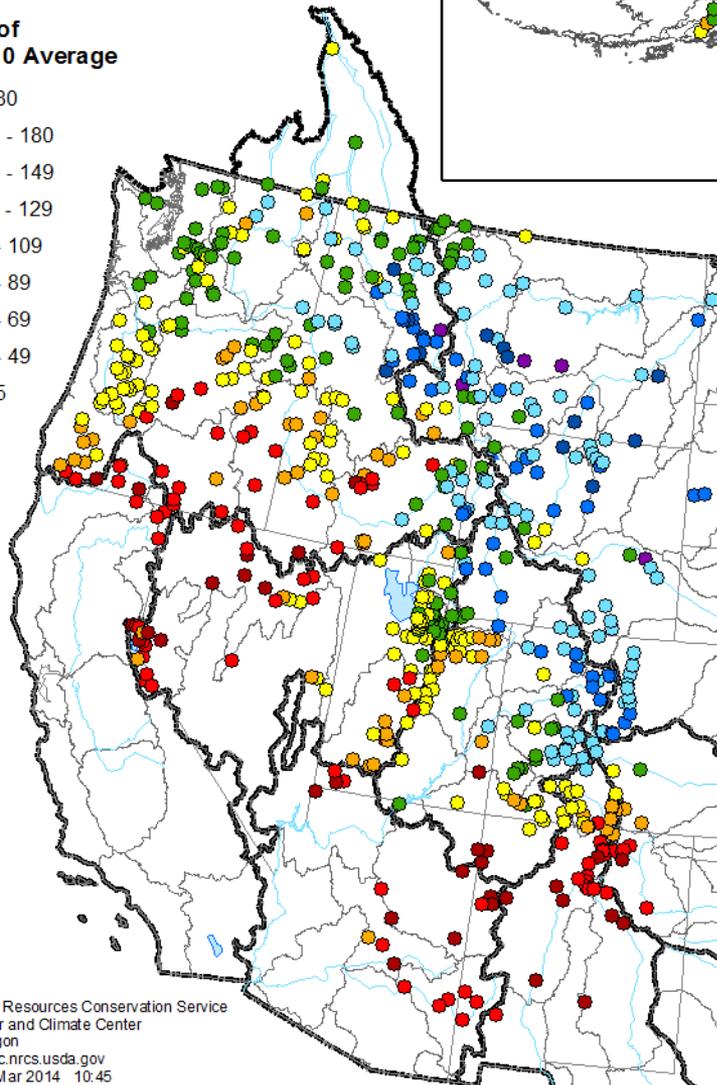
Ensemble-Mean - Current Total Column Soil Moisture Anomaly (mm)
NCEP NLDAS Products Valid: JUN 18, 2014



Spring and Summer Streamflow Forecasts as of March 1, 2014

Percent of 1981-2010 Average

- > 180
- 150 - 180
- 130 - 149
- 110 - 129
- 90 - 109
- 70 - 89
- 50 - 69
- 25 - 49
- < 25

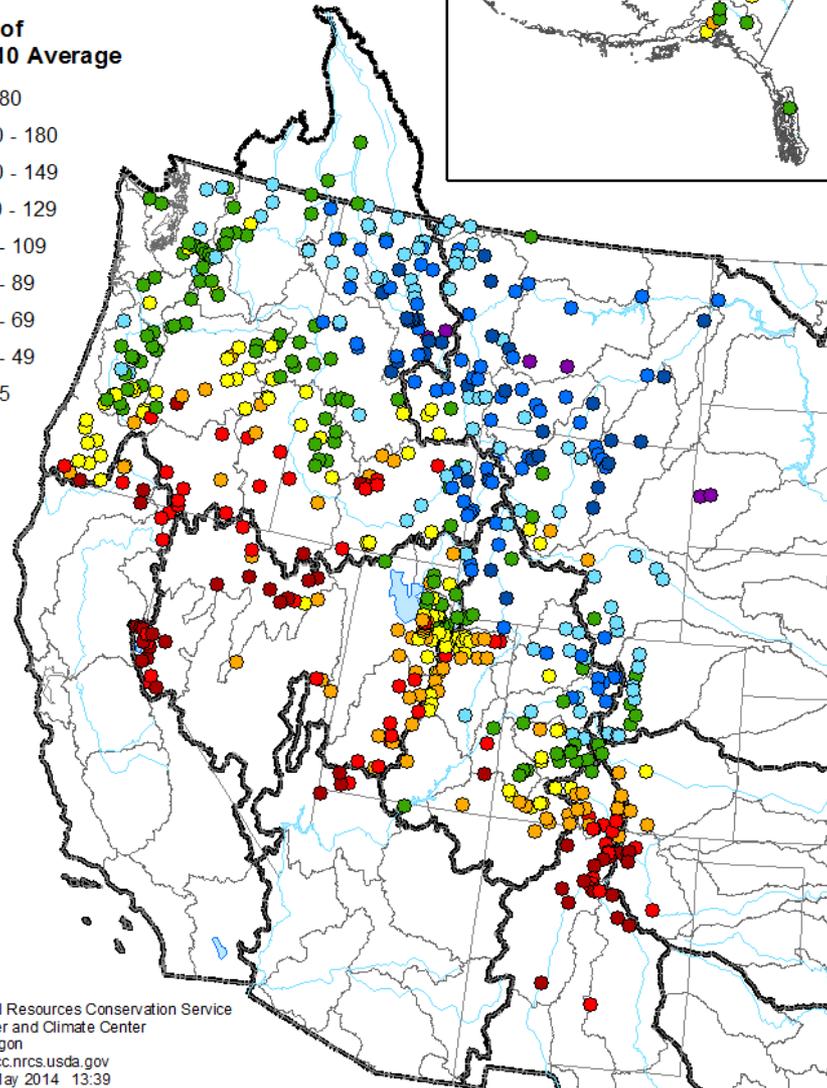


Prepared by:
USDA Natural Resources Conservation Service
National Water and Climate Center
Portland, Oregon
<http://www.wcc.nrcs.usda.gov>
Created: 10 Mar 2014 10:45

Spring and Summer Streamflow Forecasts as of May 1, 2014

Percent of 1981-2010 Average

- > 180
- 150 - 180
- 130 - 149
- 110 - 129
- 90 - 109
- 70 - 89
- 50 - 69
- 25 - 49
- < 25



Prepared by:
USDA Natural Resources Conservation Service
National Water and Climate Center
Portland, Oregon
<http://www.wcc.nrcs.usda.gov>
Created: 8 May 2014 13:39



U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for March 20 - June 30, 2014

Released March 20, 2014

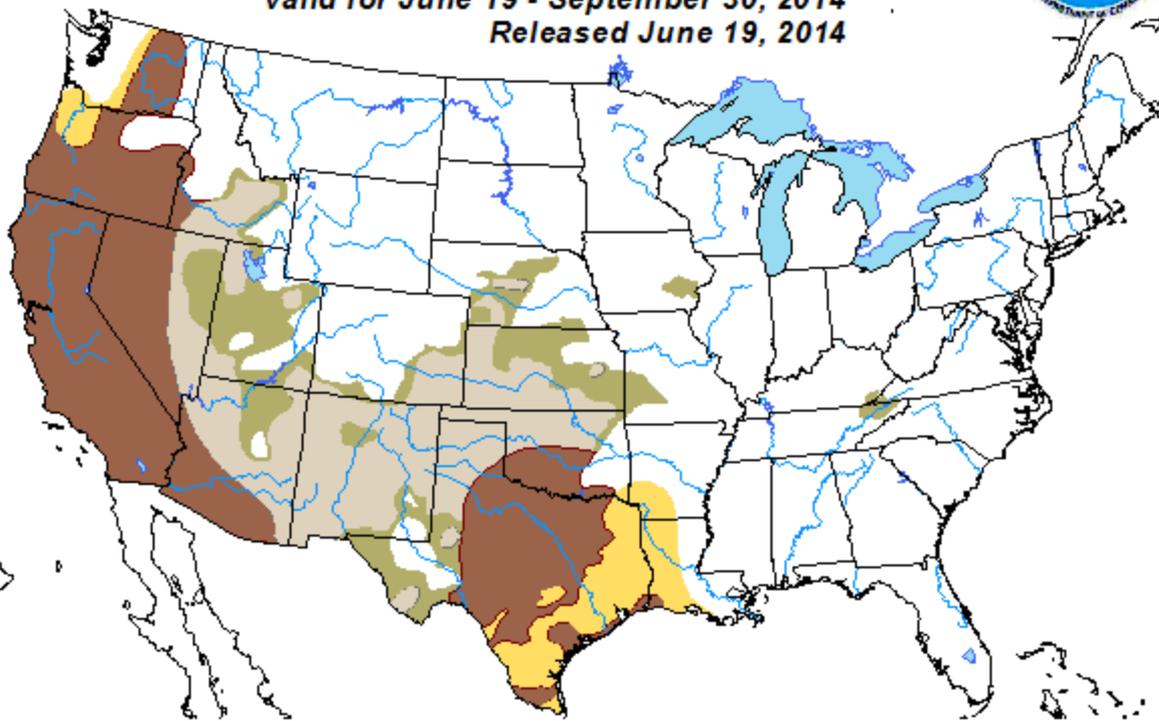
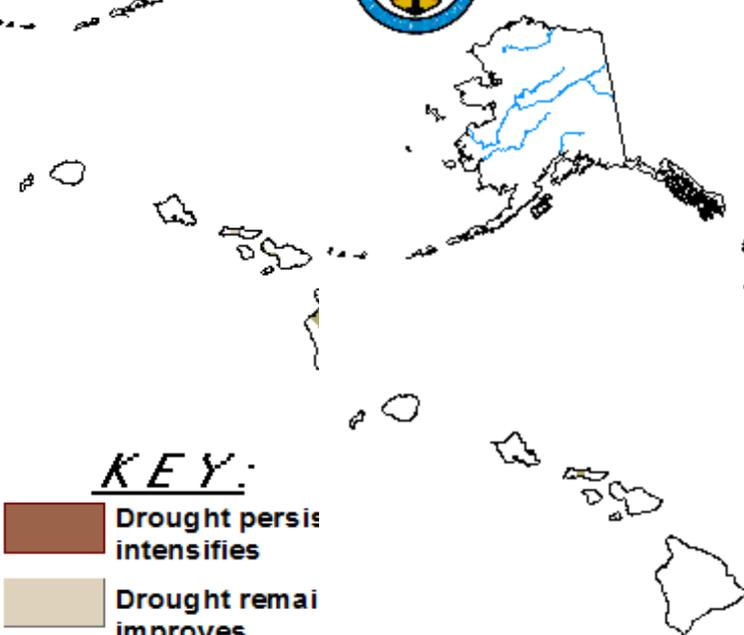


U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for June 19 - September 30, 2014

Released June 19, 2014



KEY:

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

KEY:

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

Author: David Miskus, Climate Prediction Center, NOAA

http://www.cpc.ncep.noaa.gov/products/expert_assessment/season_drought.html

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).

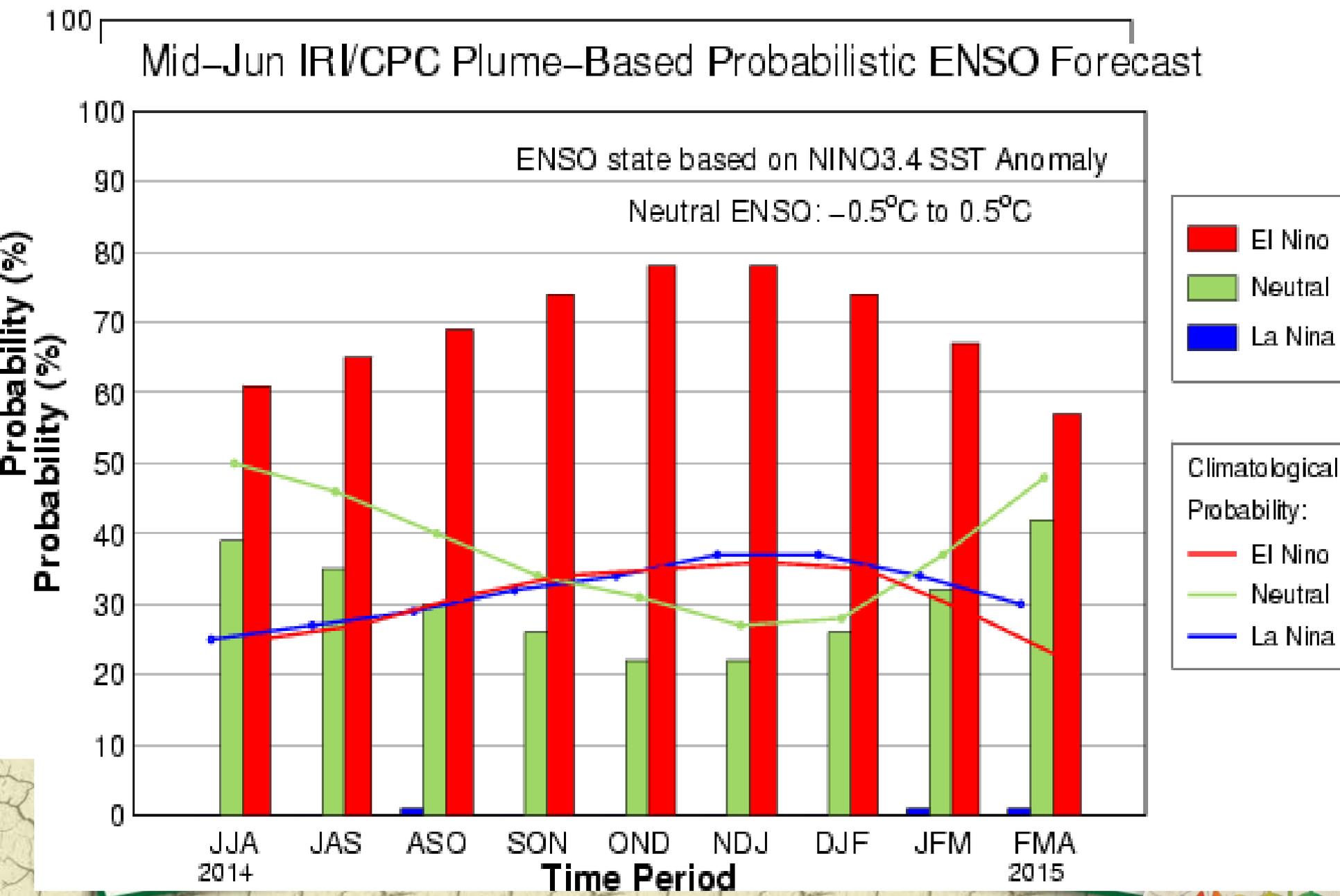
For weekly drought updates, see the latest U.S. Drought Monitor.

NOTE: The tan area 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)

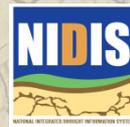
Mid-Mar IRI/CPC Plume-Based Probabilistic ENSO Forecast

Mid-Jun IRI/CPC Plume-Based Probabilistic ENSO Forecast



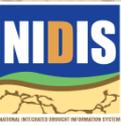
Climate/Drought Summary

- ▶ We have had a **good/great late spring/early summer** rainfall-wise across most of the region...
 - 125-150% of normal over the past 90 days
 - Too much moisture in some places...leading to **flooding concerns** along w/ **severe weather outbreaks**
- ▶ **35.6% of the contiguous U.S.** is currently in drought (D1 or worse) as of 6/17/2014
 - This time last year it was at **44.8%**.
 - **Down nearly 6%** on the year
- ▶ Current USDM (6/17) for **NE** shows **29%** of the state in drought (**D1-D4**), **down nearly 36% (65%) since March 18, 2014!**
 - **Currently: 6.9%** of NE in severe drought (**D2**)
 - **Currently: 0.01%** of NE in **D3/D4**
 - **88% of NE** was in **D1 or worse** a year ago this time
 - **Southwest** NE still recovering from long-term drought
 - Soil moisture reserves have improved substantially, still **pockets of soil moisture deficits** in the southern tier counties of NE (along the NE/KS border in particular)

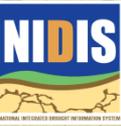


Climate/Drought Summary

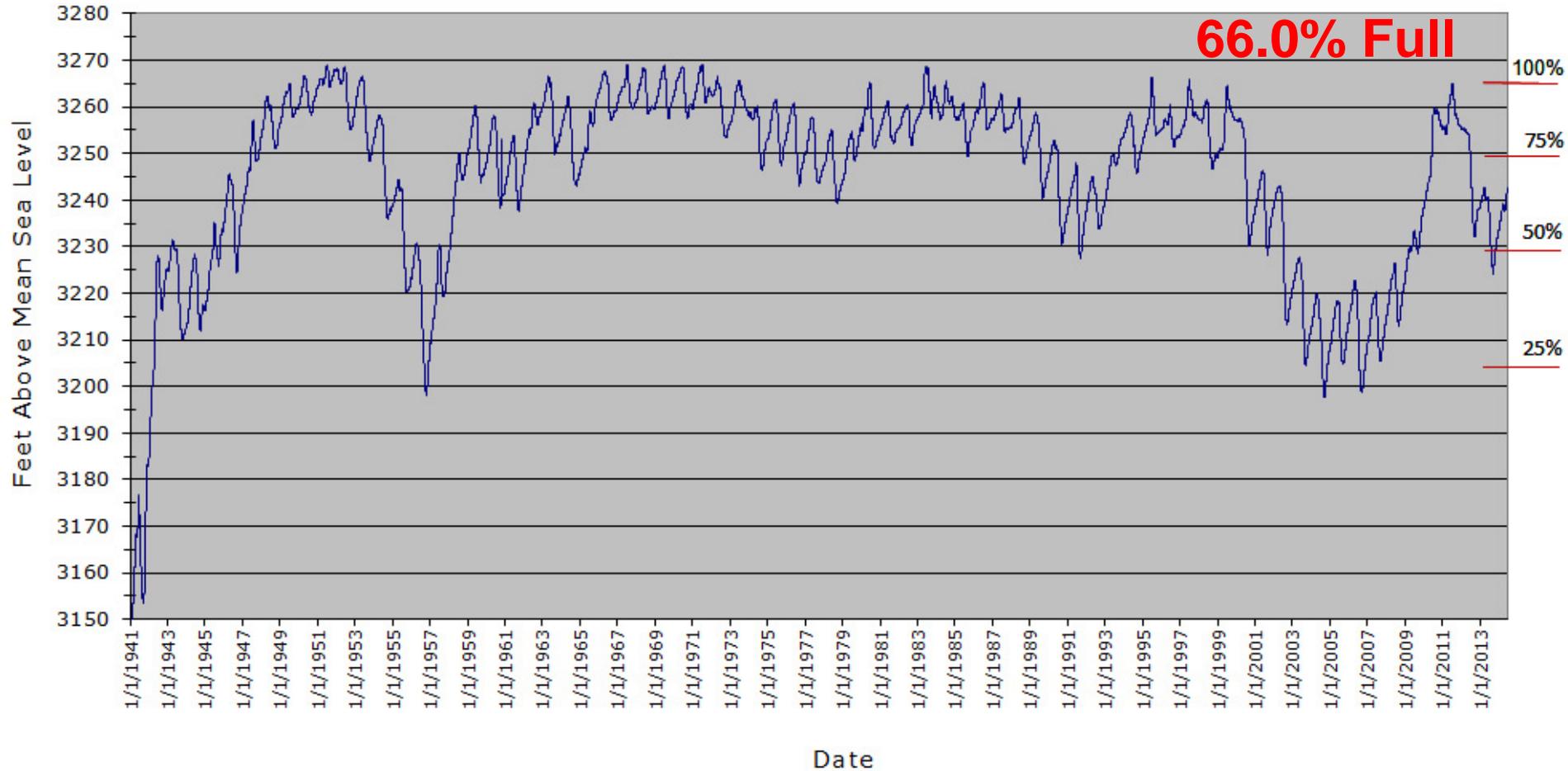
- ▶ The Climate Prediction Center's Seasonal Drought Outlook ***calls for improvement or removal of drought*** across the ***entire state*** by the end of September
 - **Large fetch** of moisture from the eastern Pacific region is expected to move into the SW U.S.
 - **Moderate to High** confidence
- ▶ ***El Niño*** or bust! Looking very likely (~80%):
 - More important for **southern Plains in winter**
 - Influence on **Tropical Storm/Hurricane season** (reduced activity/reduced rains)
 - **Monsoon?** Onset timing/intensity the key



Nebraska Water Supply Update...



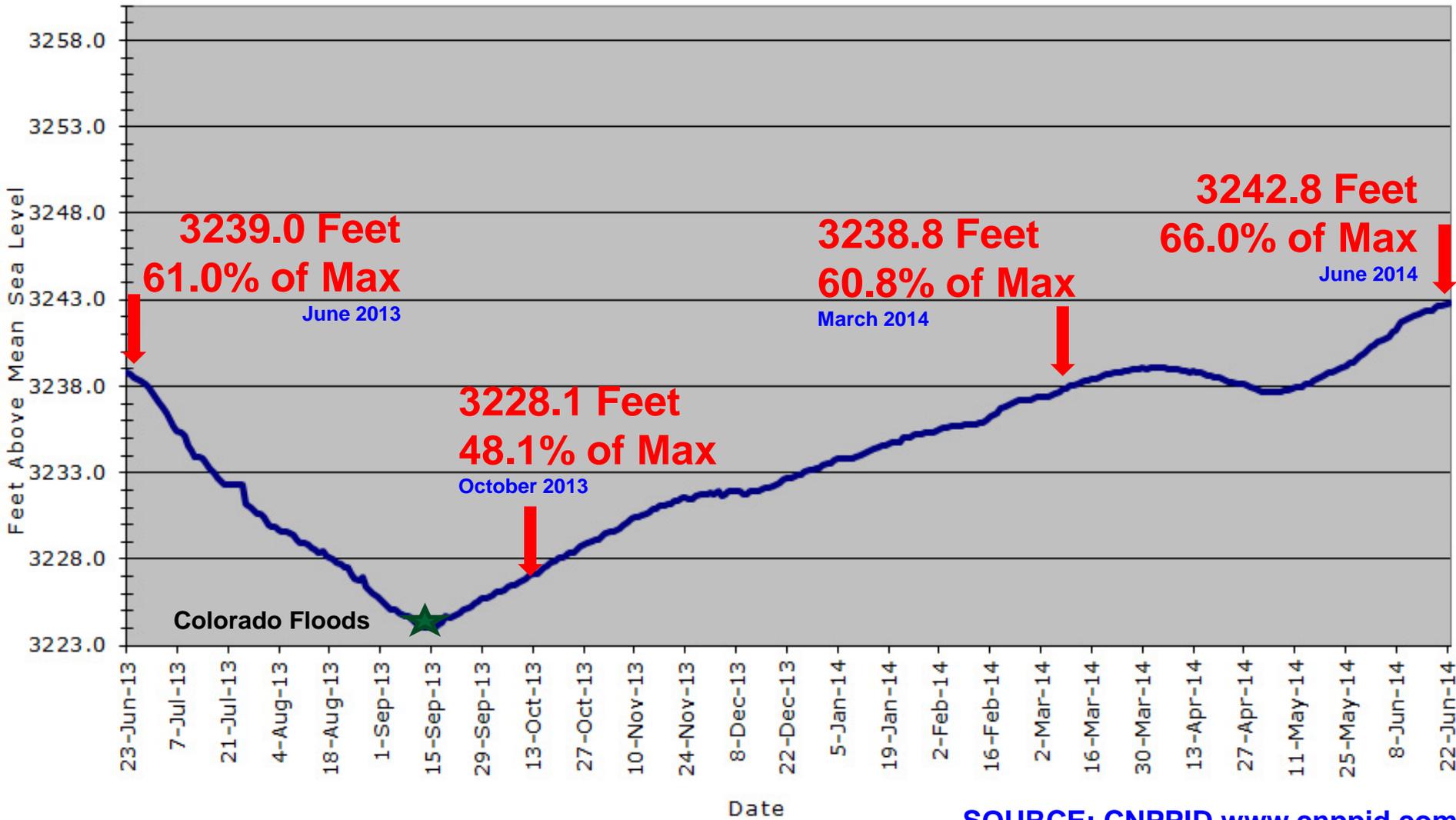
Lake McConaughy Elevation 1941 to Present



SOURCE: CNPPID www.cnppid.com

Lake McConaughy Elevation

June 23, 2013 to June 23, 2014



SOURCE: CNPPID www.cnppid.com

March 2014 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)	782	890	842	801
Total Lake McConaughy Outflow	200	657	0	0
North Platte below Keystone Dam	7	3	0	13
Keystone Dam Diversion	N/A	162	185	0
North Platte at North Platte	422	402	250	348
South Platte at Roscoe	515	N/A	N/A	34
South Platte at North Platte	559	846	1,041	270
Diversion to CNPPID Supply Canal	1,005	1,273	1,316	623
Platte River at Overton	1,460	906	1,675	1,371
Platte River at Kearney	1,190	1,155	1,550	518
Platte River at Grand Island	746	1,753	1,300	444

* 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](#))

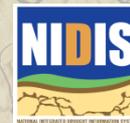
SOURCE: CNPPID www.cnppid.com

** Flow too low for gauge to measure

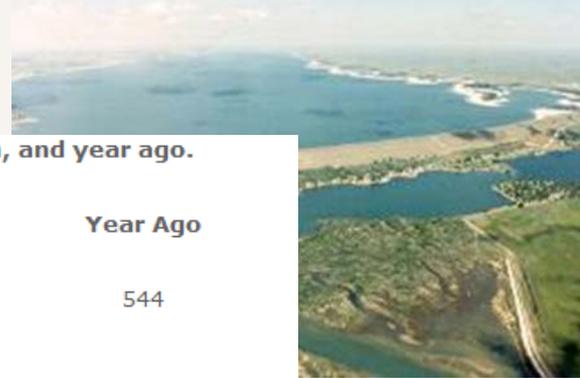
@ - Yesterday's average flow

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

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



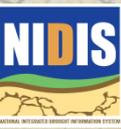
June 2014 CARC Meeting



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)	—	932	2,766	544
Total Lake McConaughy Outflow	250	173	1,123	1,278
North Platte below Keystone Dam	46	5	4	341
Keystone Dam Diversion	282	260	938	1,200
North Platte at North Platte	—	291	186	280
South Platte at Roscoe****	—	4,890	224	59
South Platte at North Platte	—	4,058	399	267
Diversion to CNPPID Supply Canal	2,257	2,268	1,295	1,222
Platte River at Overton	2,750	5,148	147	177
Platte River at Kearney	3,830	6,234	86	81
Platte River at Grand Island	3,590	6,612	198	235

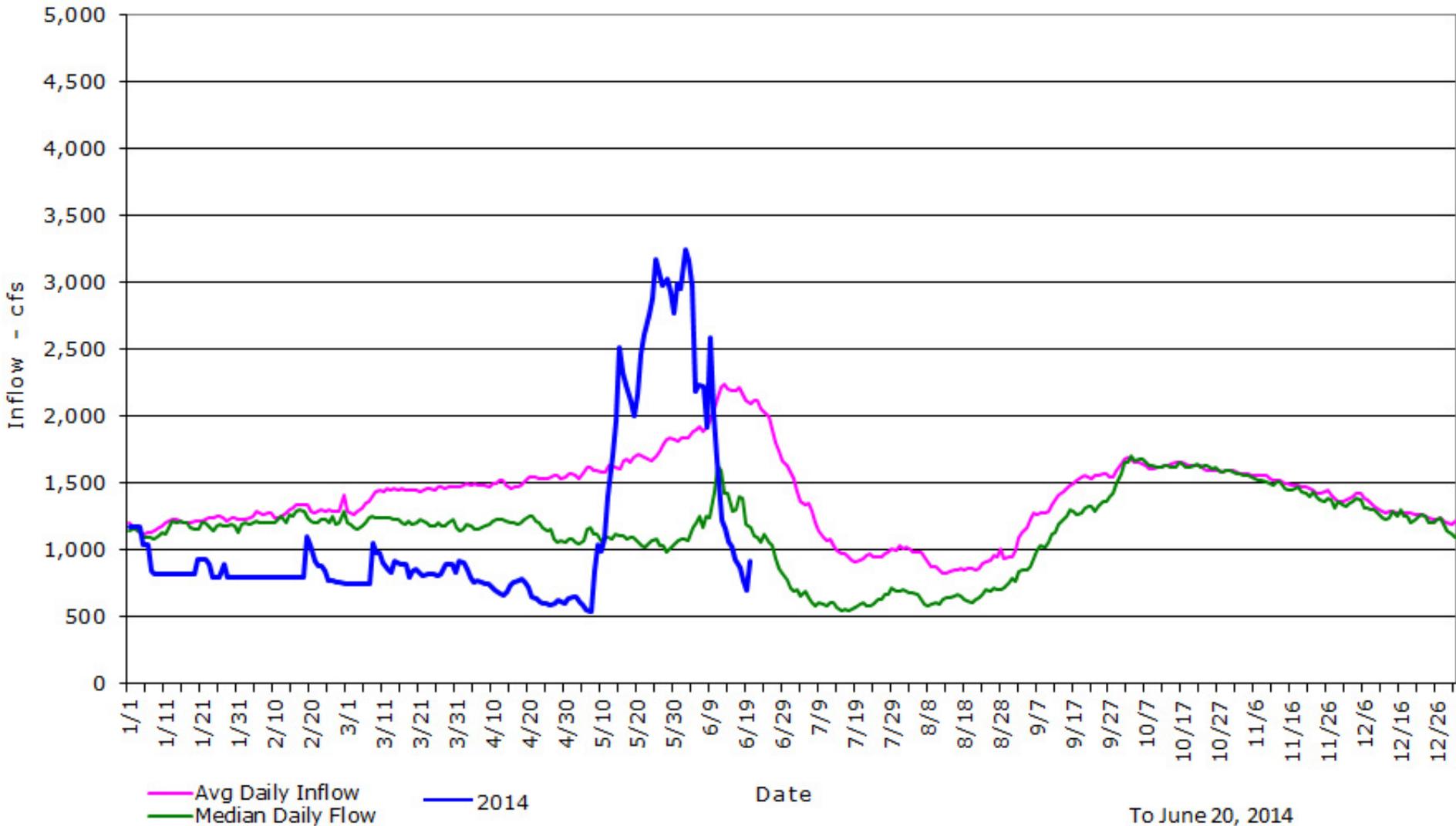
SOURCE: CNPPID www.cnppid.com



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 June 20, 2014

Lake McConaughy

June 2, 2014 Board Meeting Notes

❖ Civil engineer Cory Steinke reported that **Lake McConaughy continues to gain in elevation after apparently reaching its spring peak in early April.**

The reservoir's elevation as of Monday morning was 3240.5 feet. The reservoir had reached elevation 3239.1 feet a month ago and then began to decline until unexpectedly high inflows caused a rebound in lake levels.

❖ **Heavy snowfall and precipitation above Glendo Reservoir in Wyoming occurred after the U.S. Bureau of Reclamation had moved water** from its upper North Platte River reservoirs in preparation for the irrigation season in the Nebraska Panhandle. The precipitation and runoff raised Glendo Reservoir's storage level into the flood pool, which prompted releases down the North Platte River.

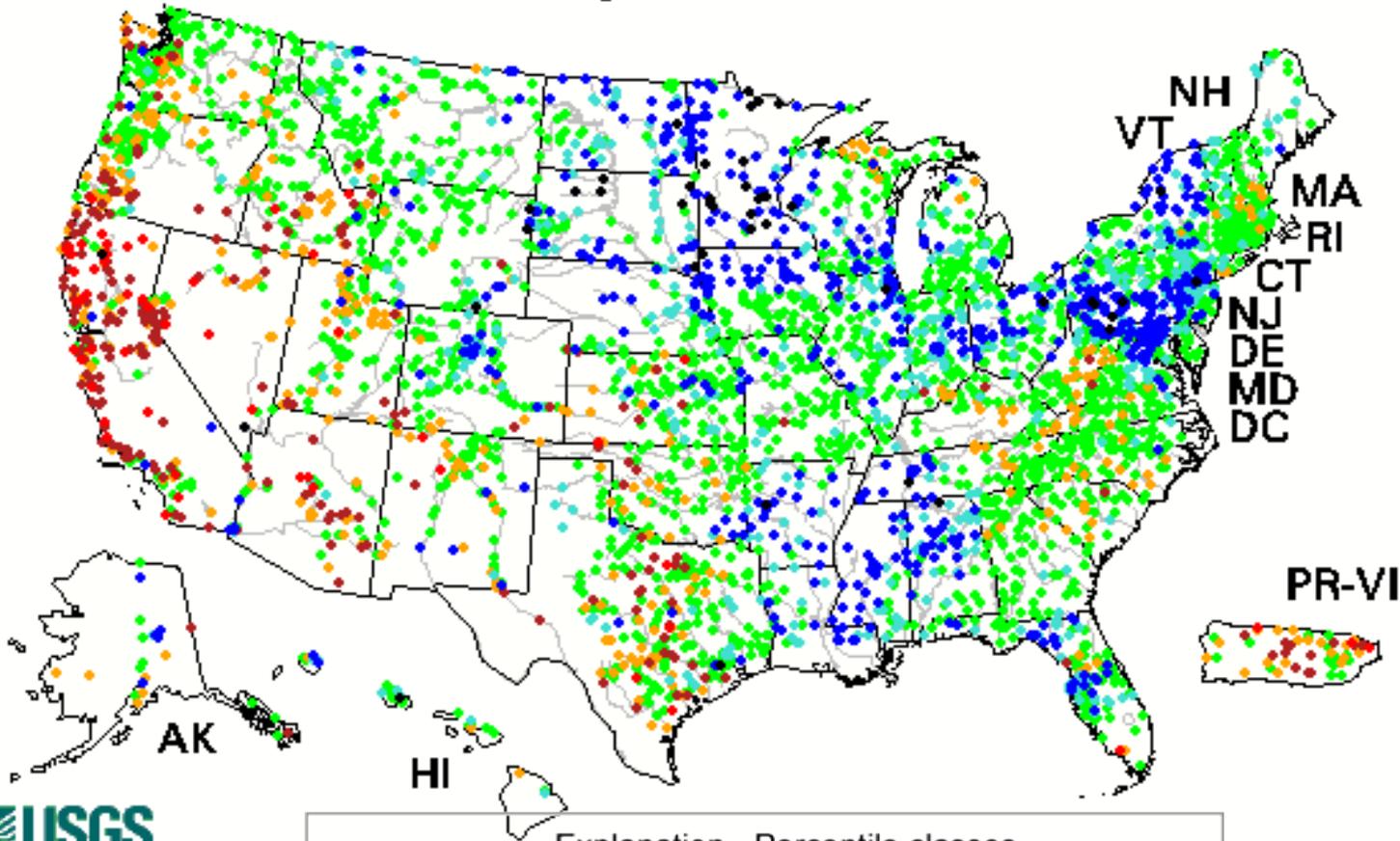
❖ Inflows have been above normal for the past two weeks and are expected to continue for a while longer, Steinke said. **In addition, snowpack runoff and precipitation in Colorado's South Platte Basin are raising flows in the South Platte River in Nebraska, enabling Central to divert water from that river instead of making releases from Lake McConaughy.**

As a result, **Steinke said, Lake McConaughy could continue to rise for two or three more weeks**, a welcome change from **the last two years when the reservoir began to decline in early April (in 2013) and early May (in 2012)**



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

Sunday, June 22, 2014



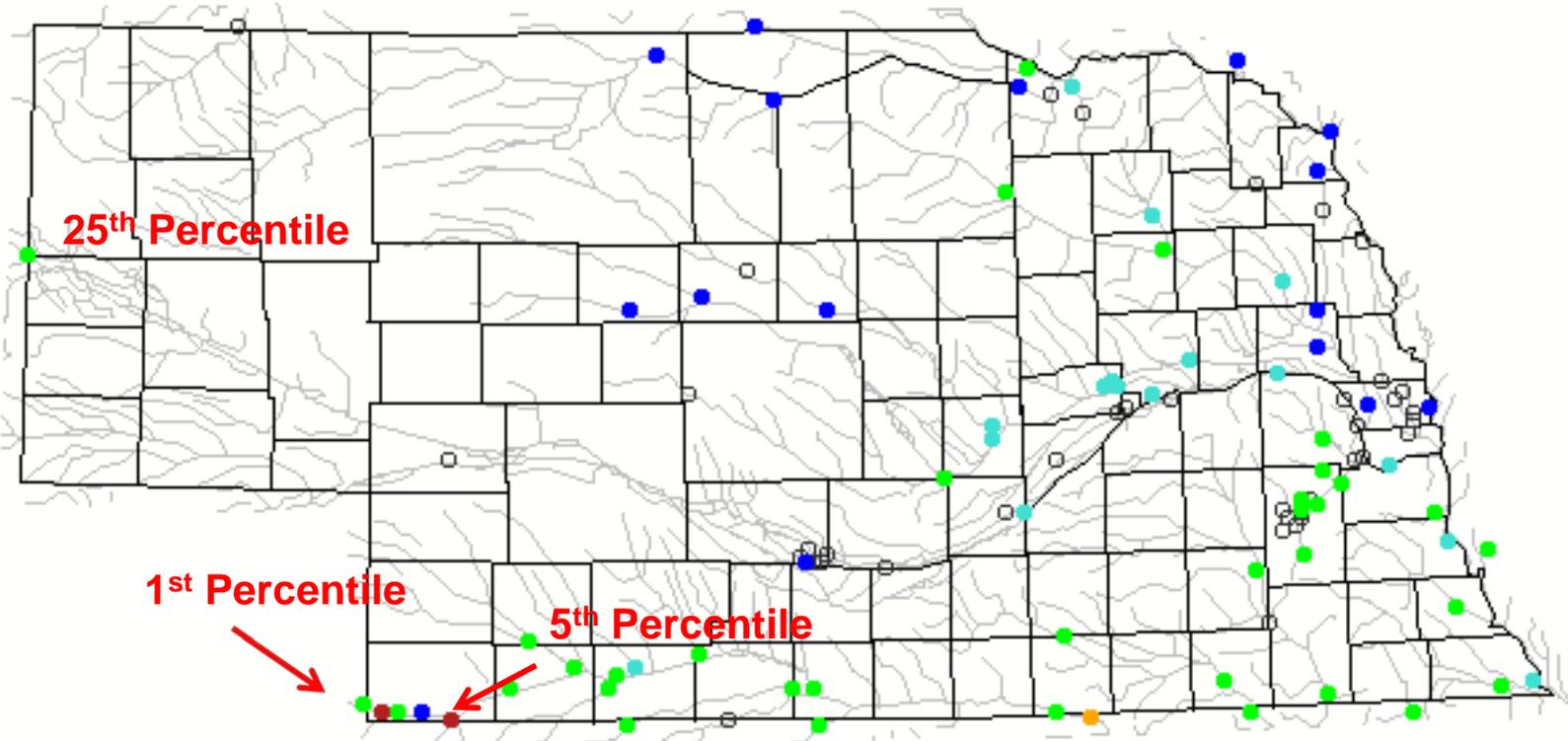
Explanation - Percentile classes

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



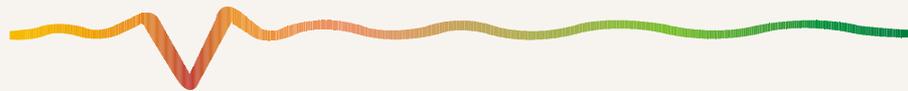
14-day average streamflow compared to historical streamflow for the day of year

Sunday, June 22, 2014



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

Republican River Basin

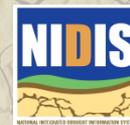


- ▶ **Hugh Butler:** 19.7% (**19.4%**) of conservation pool
- ▶ **Enders:** 21.0% (**31.1%**) of conservation pool
- ▶ **Harry Strunk:** 62.7% (**57.8%**) of conservation pool
- ▶ **Swanson:** 27.9% (**26.3%**) of conservation pool

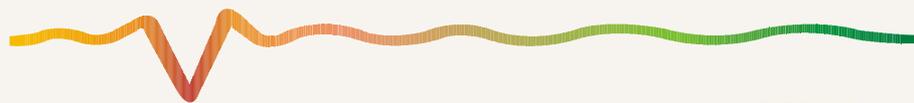


*Values in red are from the last CARC meeting in March 2014

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

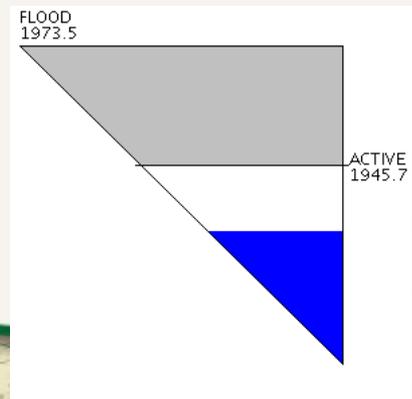


Republican River Basin

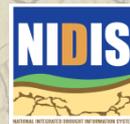


Harlan County Current Conditions

- ✓ Conservation Pool is 53.7% full (**43.2%**)
- ✓ **Currently, 168,622 Acre-Feet** in storage compared to **135,729** Acre-Feet of water in storage during March 2014
- ✓ Last year at this time **209,935 AF** was in storage
- ✓ Historical storage for this time of the year is **262,219 AF**

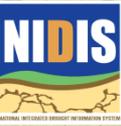


Source: BOR http://www.usbr.gov/gp/lakes_reservoirs/



Water Supply Summary

- ❖ The hydrologic drought conditions have continued to ease in the region. ***Good snow conditions in the Rocky Mountains and ample fall/spring precipitation*** has allowed for a better hydrological/water supply situation, especially in the Platte Basin
- ❖ **Lake McConaughy** is currently:
 - ❖ **4 feet HIGHER (66% of MAX)** than it was during the last CARC meeting (March 2014)
 - ❖ Lake McConaughy ***continues to GAIN in elevation*** after apparently reaching its spring peak back in April
 - ❖ Inflows have surprisingly ***increased and will continue to do so for the next few weeks...***
- ❖ Overall, storage in the **Republican River basin** has improved slightly over the last 3 months compared to levels at the end of March 2014
 - ❖ Harlan County is currently:
 - ❖ **~33,000 Acre-Feet HIGHER** than in March 2014 (last CARC meeting)
 - ❖ **BUT, still ~94,000 AF lower** than the historical average for this time of year



Contact Information:

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402-472-8238

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bfuchs2@unl.edu
402-472-6775

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

