

# **NE Drought Conditions CARC Update: September 7, 2012**

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





# ***Current Conditions around Nebraska and the region...***

National Drought Mitigation Center



UNIVERSITY OF  
**Nebraska**  
Lincoln

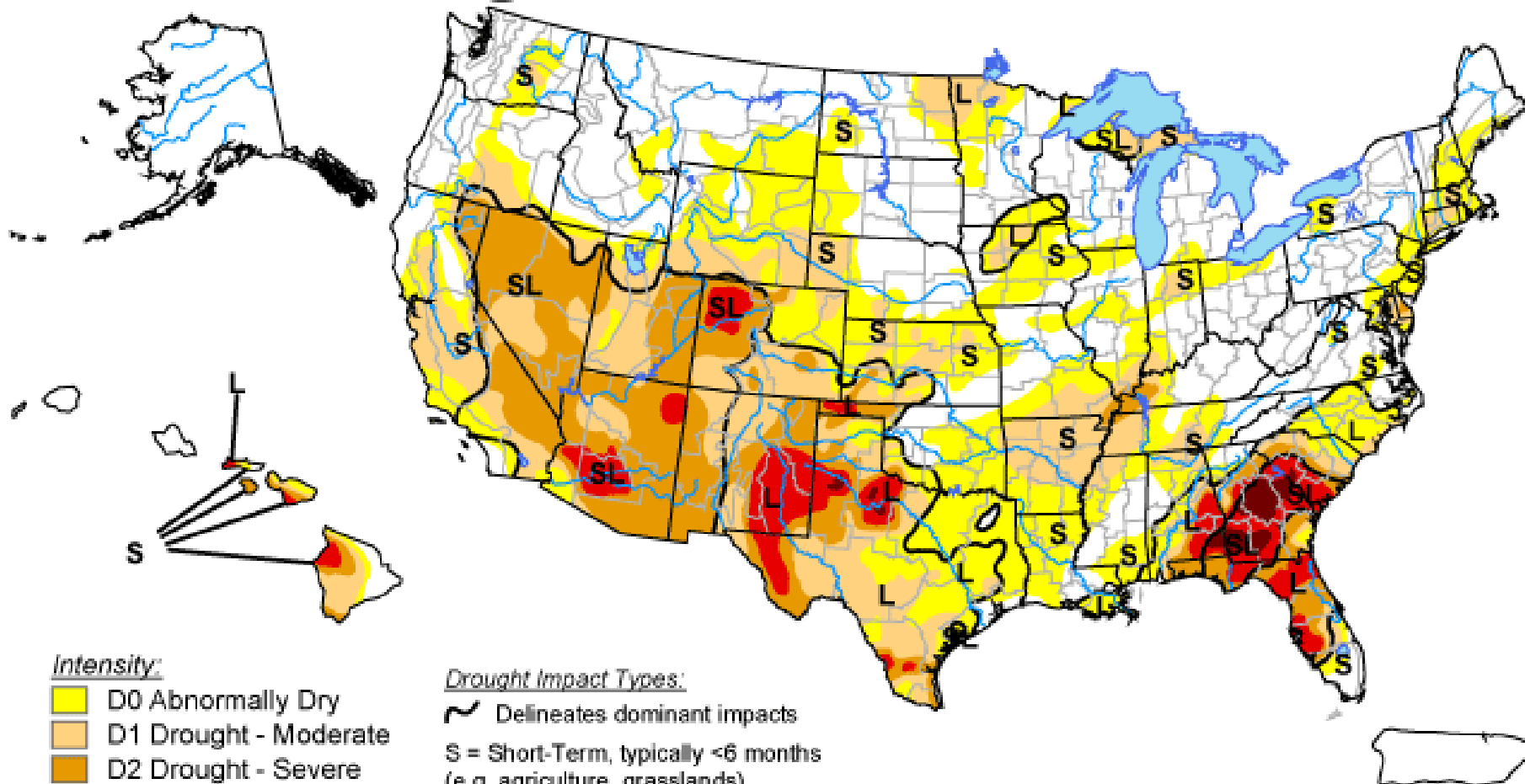




# U.S. Drought Monitor

May 29, 2012

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/>



Released Thursday, May 31, 2012

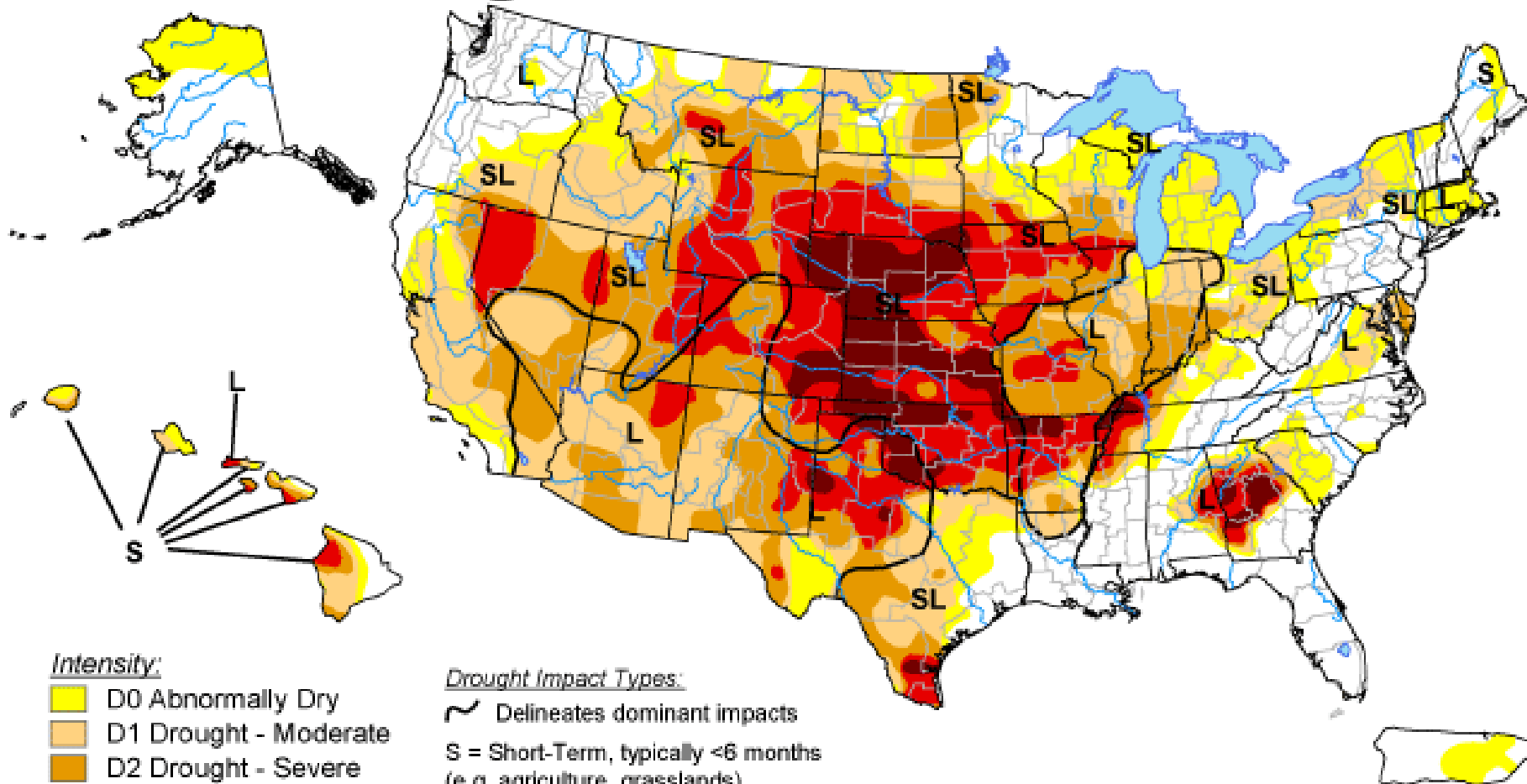
Author: Brad Rippey, U.S. Department of Agriculture



# U.S. Drought Monitor

September 4, 2012

Valid 7 a.m. EDT



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

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



Released Thursday, September 6, 2012

Author: Brian Fuchs, National Drought Mitigation Center



## Drought Condition (Percent Area): United States

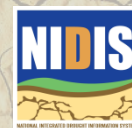
Conditions for the U.S., including Alaska, Hawaii and Puerto Rico

Week	Date	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
One Year Ago	08/30/11	59.26	40.74	27.51	20.68	15.26	9.37
Start of Water Year	09/27/11	63.45	36.55	24.42	19.61	14.87	9.50
Start of Calendar Year	12/27/11	58.88	41.12	23.89	15.88	8.37	2.76
3 Months Ago	06/05/12	46.40	53.60	32.33	15.85	3.86	0.50
Last Week	08/28/12	30.19	69.81	52.63	35.42	19.38	5.05
Current	09/04/12	30.37	69.63	53.06	35.53	17.93	5.13

## Conditions for the Contiguous U.S.

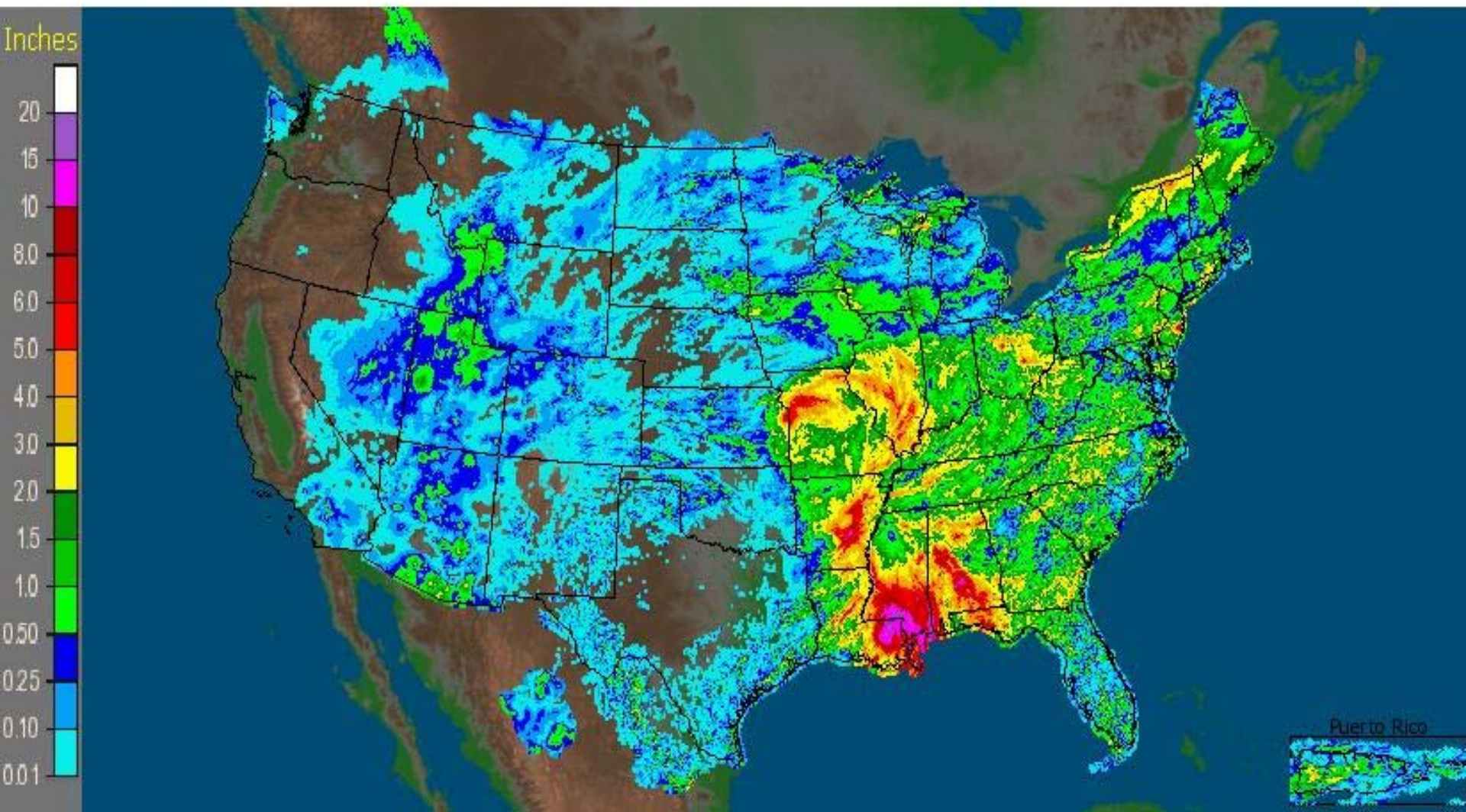
Week	Date	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
One Year Ago	08/30/11	54.07	45.93	32.83	24.75	18.27	11.21
Start of Water Year	09/27/11	56.45	43.55	29.13	23.44	17.80	11.37
Start of Calendar Year	12/27/11	50.89	49.11	28.49	18.95	10.01	3.31
3 Months Ago	06/05/12	36.01	63.99	38.60	18.92	4.60	0.60
Last Week	08/28/12	22.31	77.69	62.89	42.34	23.18	6.04
Current	09/04/12	22.54	77.46	63.39	42.48	21.45	6.14

National Drought Mitigation Center





CONUS + Puerto Rico: Current 7-Day Observed Precipitation  
Valid at 9/5/2012 1200 UTC- Created 9/5/12 19:38 UTC





# U.S. Drought Monitor

September 4, 2012

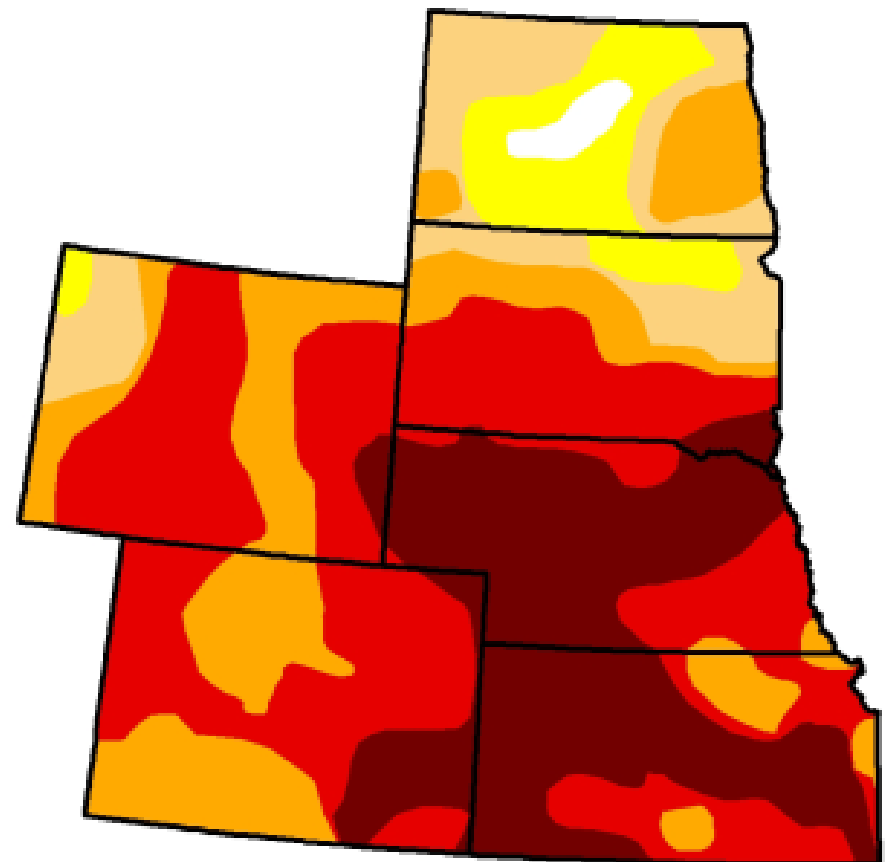
Valid 7 a.m. EST

## High Plains

*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.94	99.06	92.43	81.84	61.01	24.54
Last Week (08/28/2012 map)	1.25	98.75	88.07	79.12	54.19	14.97
3 Months Ago (06/05/2012 map)	29.16	70.84	36.18	8.77	2.28	0.00
Start of Calendar Year (12/27/2011 map)	61.66	38.34	18.12	7.22	2.07	0.04
Start of Water Year (09/27/2011 map)	70.09	29.91	17.44	11.97	6.22	2.96
One Year Ago (08/30/2011 map)	74.56	25.44	16.08	12.78	6.92	3.13

Intensity:



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

<http://droughtmonitor.unl.edu>



Released Thursday, September 6, 2012  
Brian Fuchs, National Drought Mitigation Center



# U.S. Drought Monitor

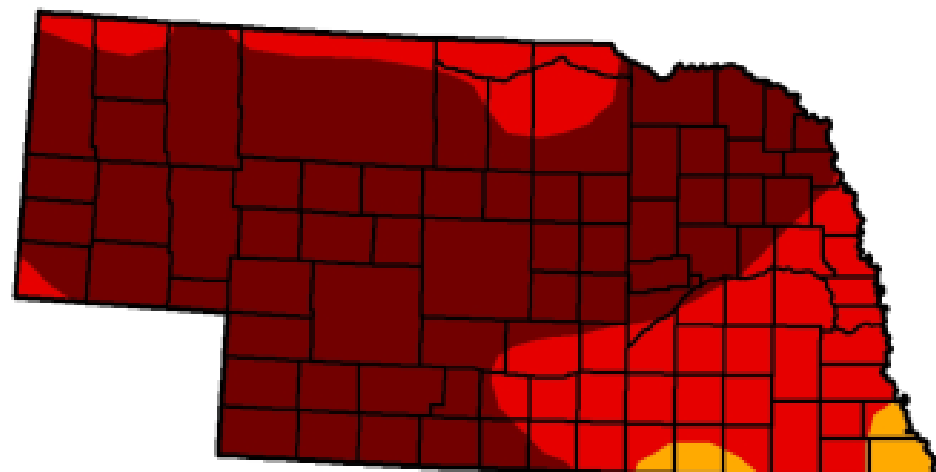
September 4, 2012

Valid 7 a.m. EST

## Nebraska

*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	100.00	100.00	97.94	70.58
Last Week (08/28/2012 map)	0.00	100.00	100.00	100.00	97.21	23.33
3 Months Ago (06/05/2012 map)	38.50	61.50	21.56	0.00	0.00	0.00
Start of Calendar Year (12/27/2011 map)	71.68	28.32	13.81	0.65	0.00	0.00
Start of Water Year (09/27/2011 map)	75.70	24.30	0.00	0.00	0.00	0.00
One Year Ago (08/30/2011 map)	94.21	5.79	0.00	0.00	0.00	0.00

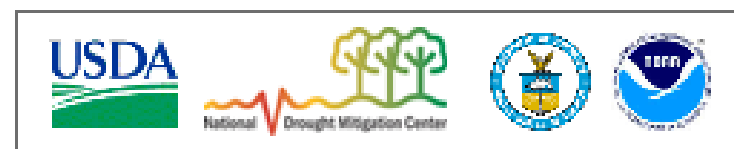


### Intensity:

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

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

<http://droughtmonitor.unl.edu>



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Brian Fuchs, National Drought Mitigation Center



## Drought Monitor Archives

Maps

Tables

Animations

1999 Archive

GIS Data

## Drought Severity

Nebraska



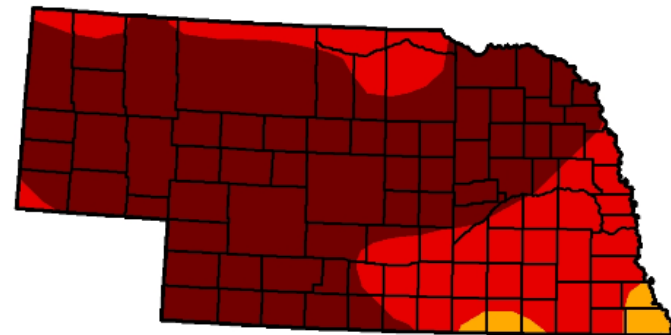
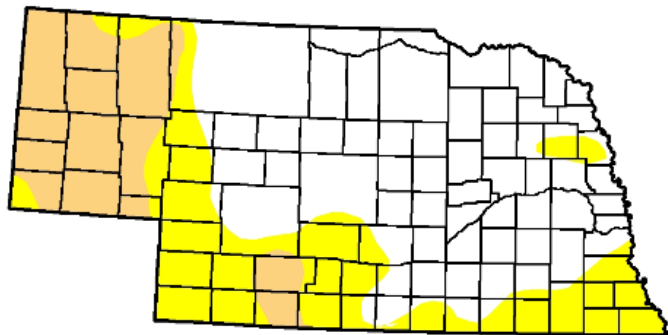
D0 - Abnormally Dry

D1 Drought - Moderate

D2 Drought - Severe

D3 Drought - Extreme

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May 29, 2012



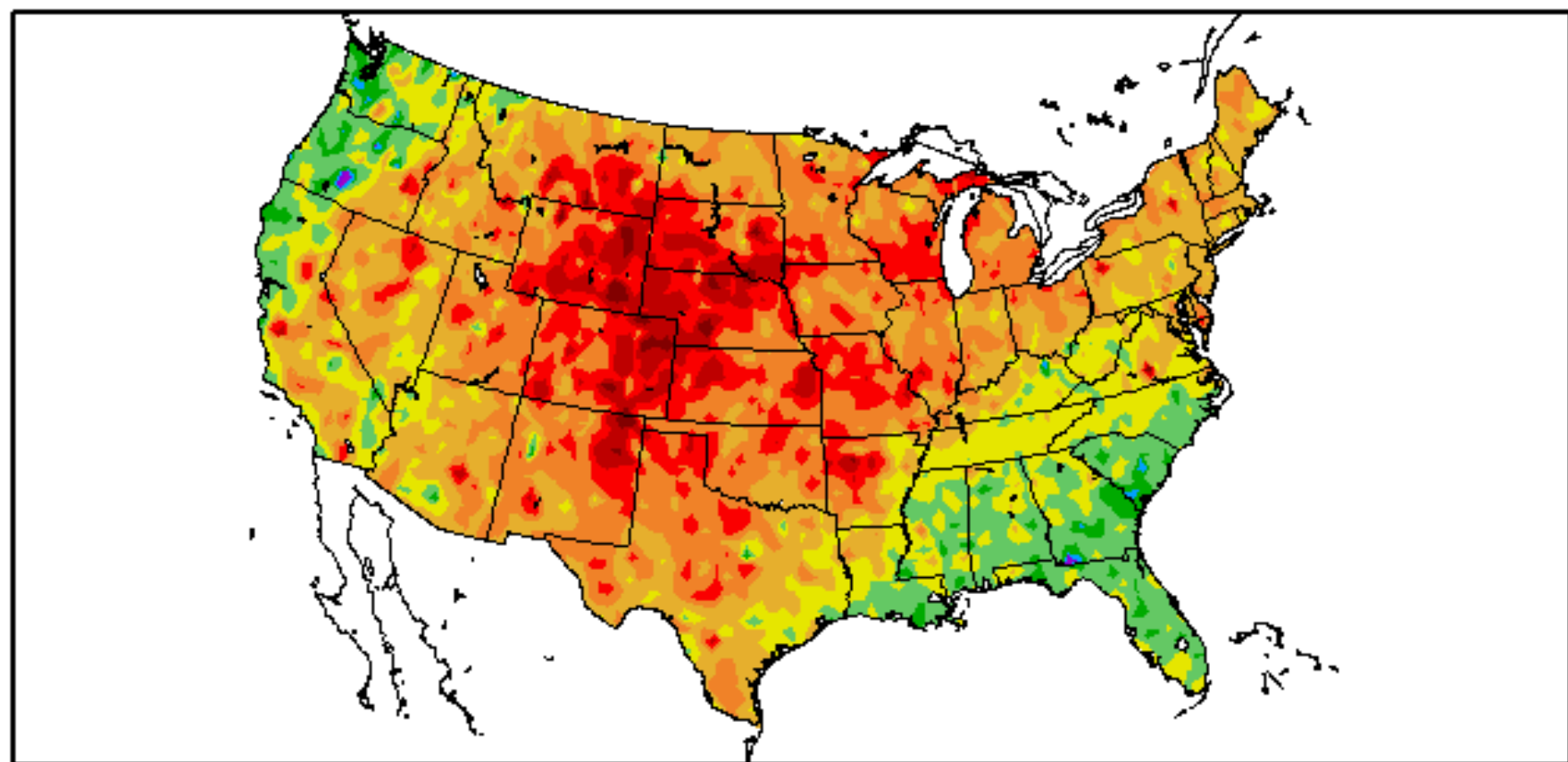
September 4, 2012



Week	Nothing	D0-D4	D1-D4	D2-D4	D3-D4	D4
May 29, 2012	56.19	43.81	18.79	0.00	0.00	0.00
September 4, 2012	0.00	100.00	100.00	100.00	97.94	70.58



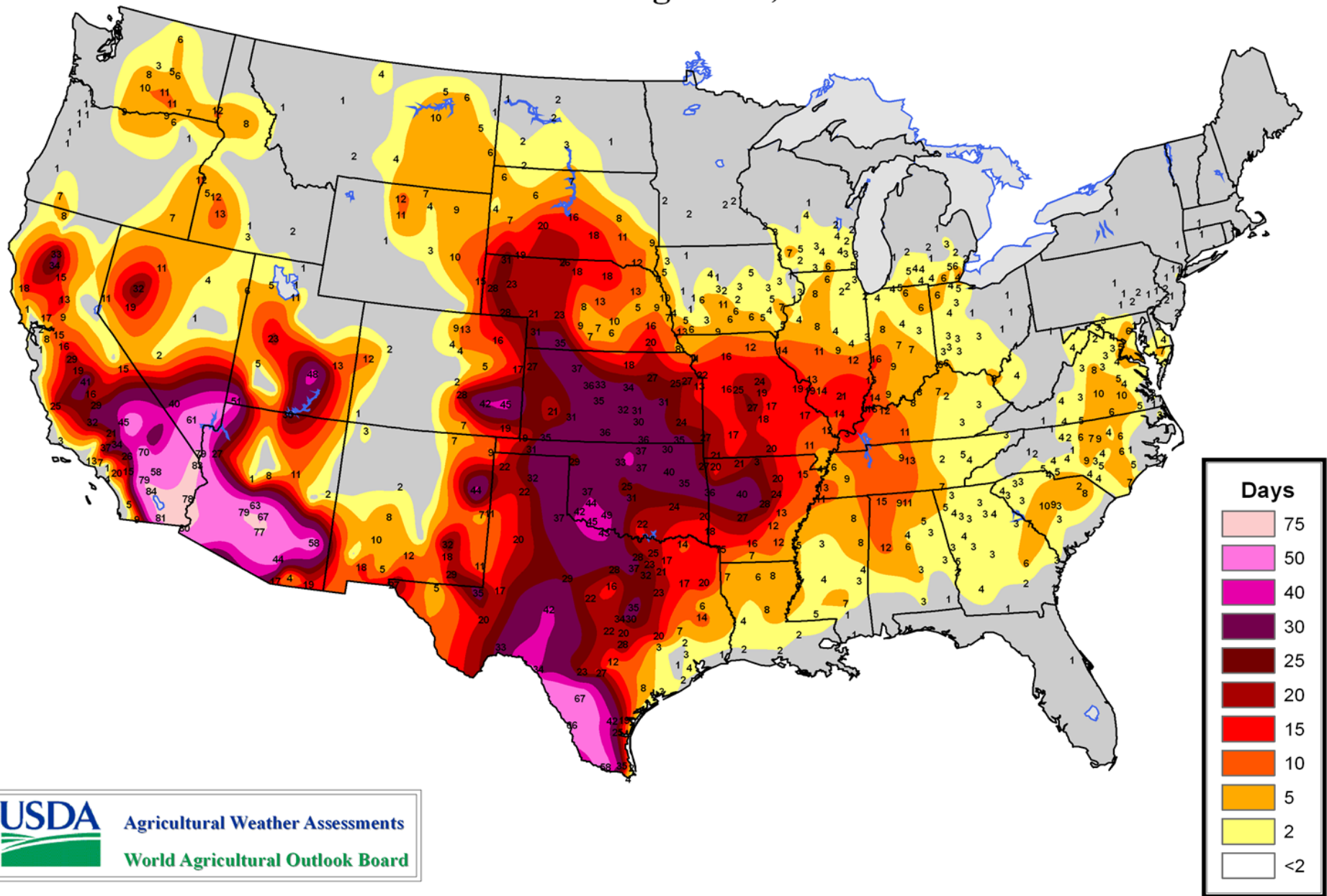
Departure from Normal Temperature (F)  
6/1/2012 – 8/31/2012





# Number of Days $\geq 100^{\circ}\text{F}$

June 1 - August 31, 2012

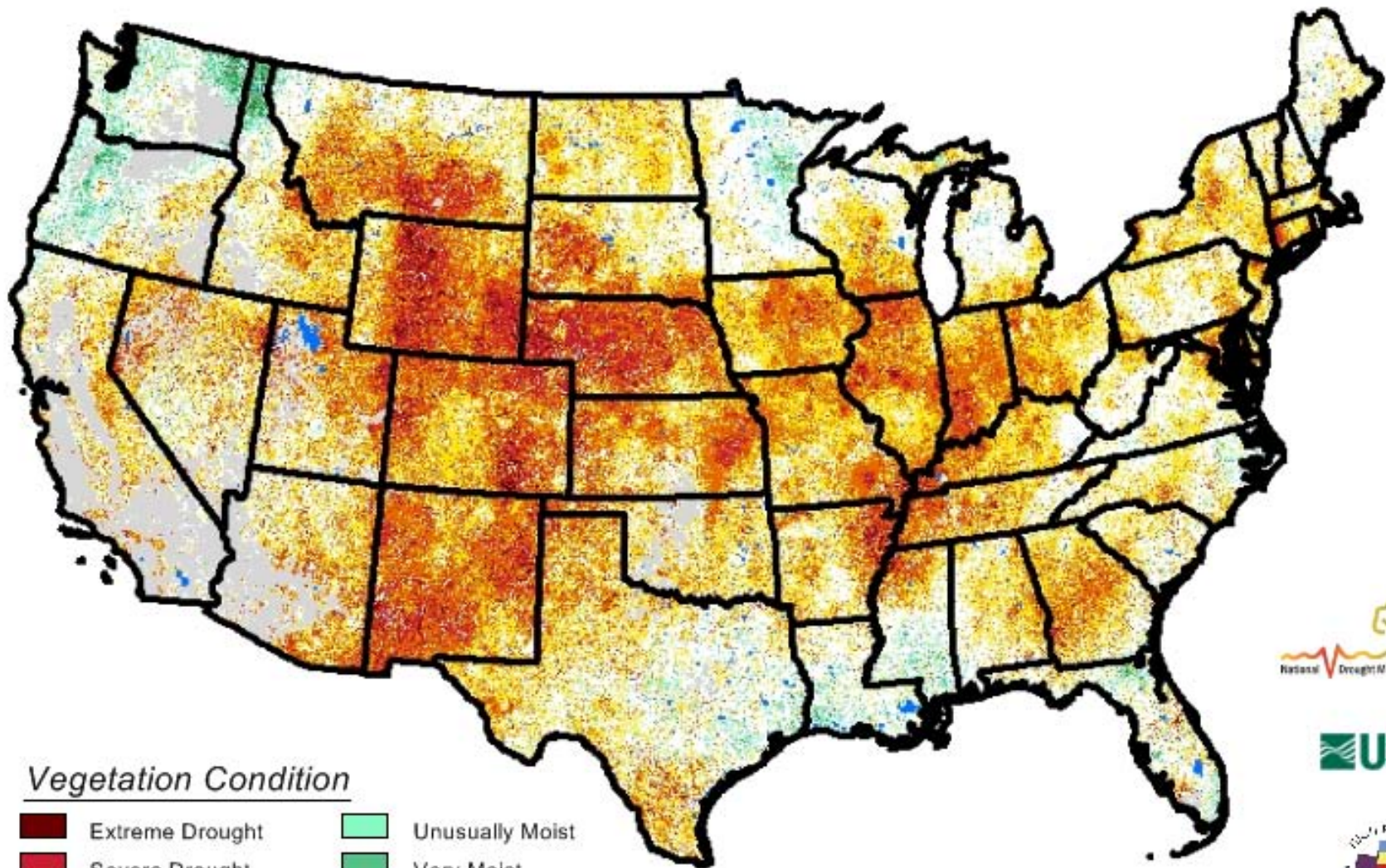






# Vegetation Drought Response Index

## Complete

September 3, 2012



### Vegetation Condition

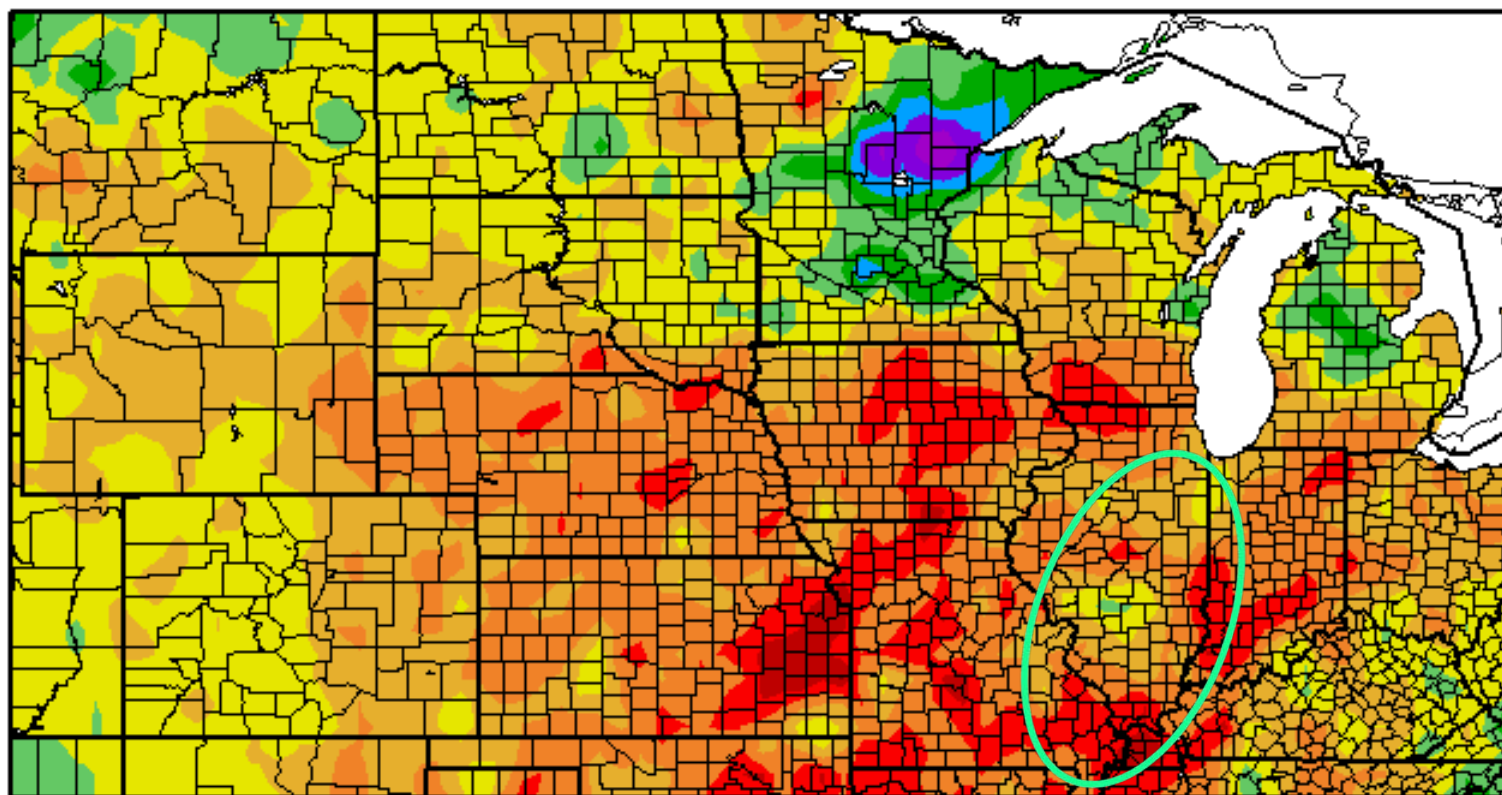
	Extreme Drought		Unusually Moist
	Severe Drought		Very Moist
	Moderate Drought		Extremely Moist
	Pre-Drought		Out of Season
	Near Normal		Water





# Growing Season ACIS Departure from Normal

Departure from Normal Precipitation (in)  
4/1/2012 - 9/5/2012



Generated 9/6/2012 at HPRCC using provisional data.

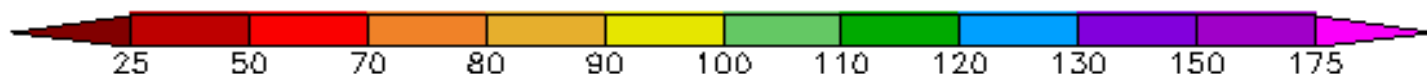
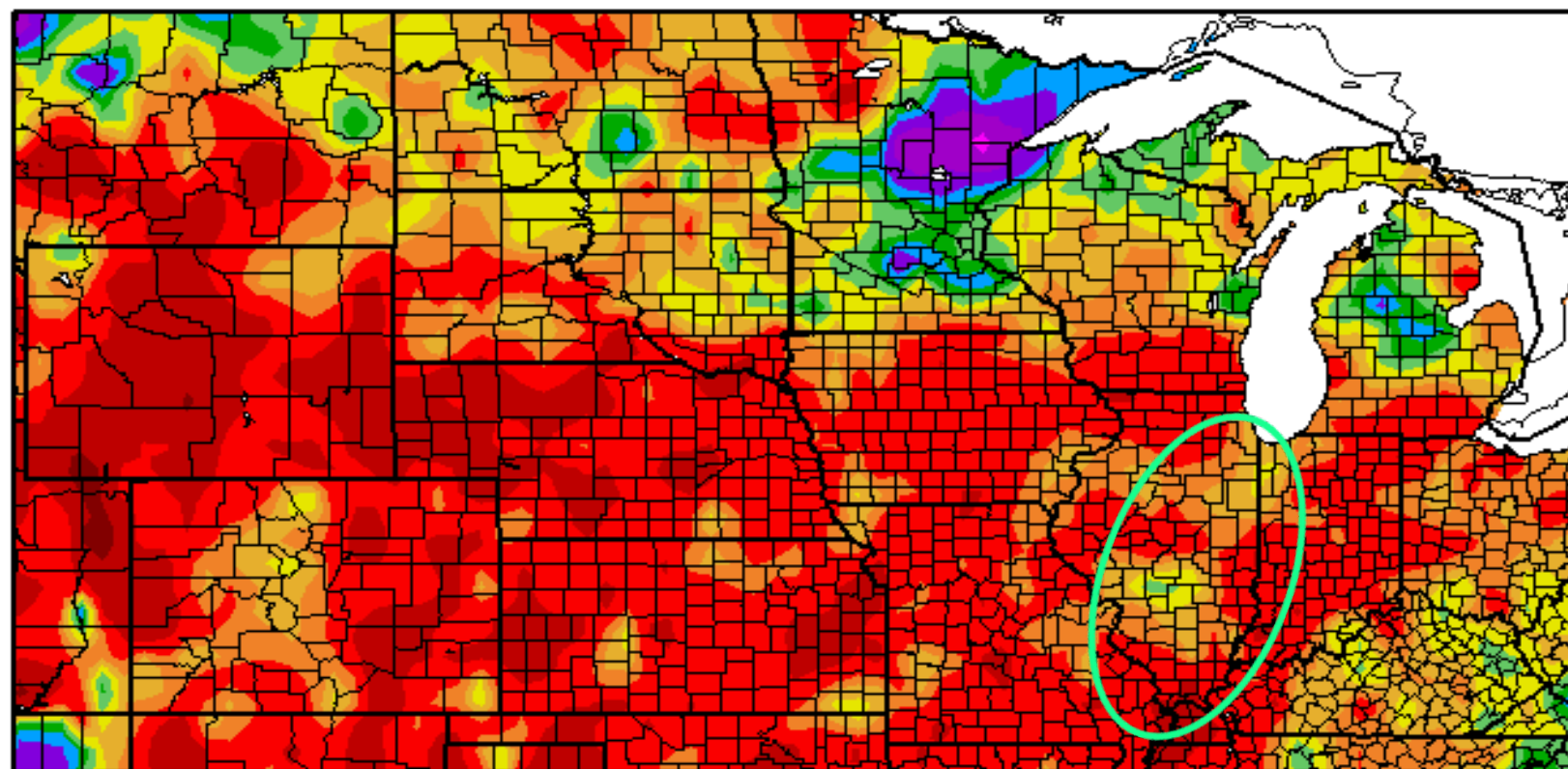
Regional Climate Centers



# Growing Season ACIS

## Percent of Normal

Percent of Normal Precipitation (%)  
4/1/2012 – 9/5/2012

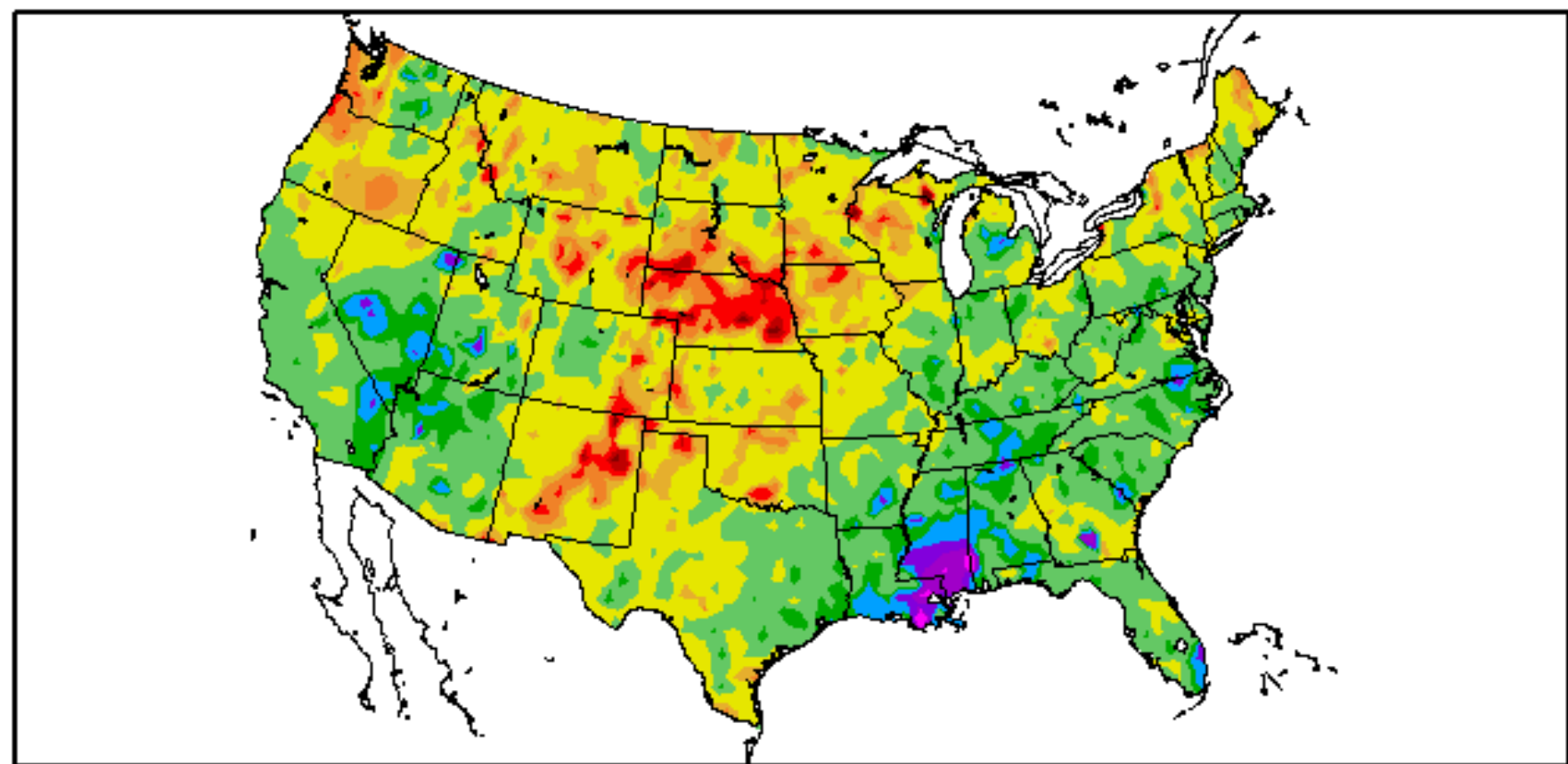


Generated 9/6/2012 at HPRCC using provisional data.

Regional Climate Centers

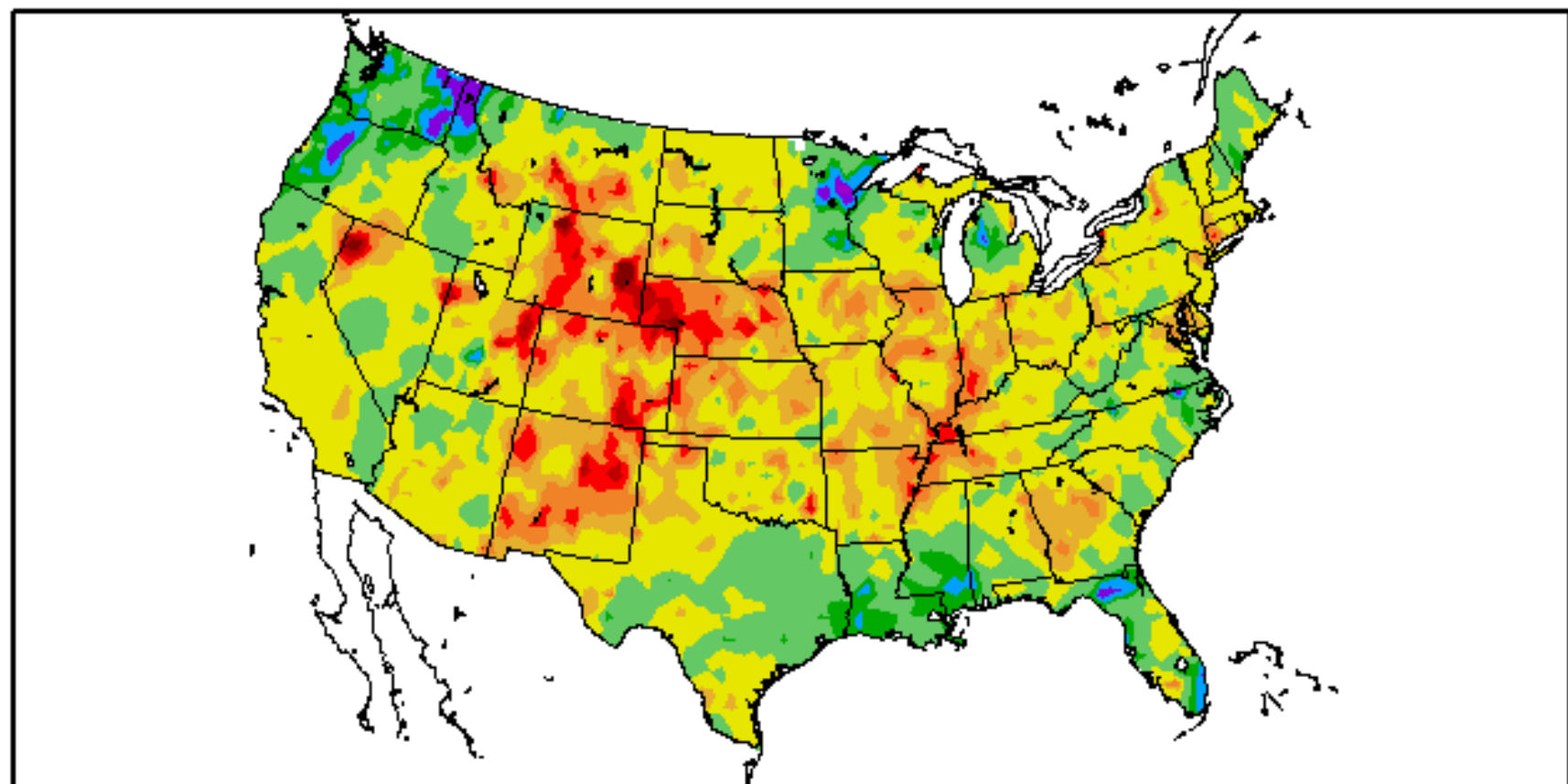


60 Day SPI  
7/8/2012 - 9/5/2012





Year-to-date SPI  
1/1/2012 - 9/5/2012



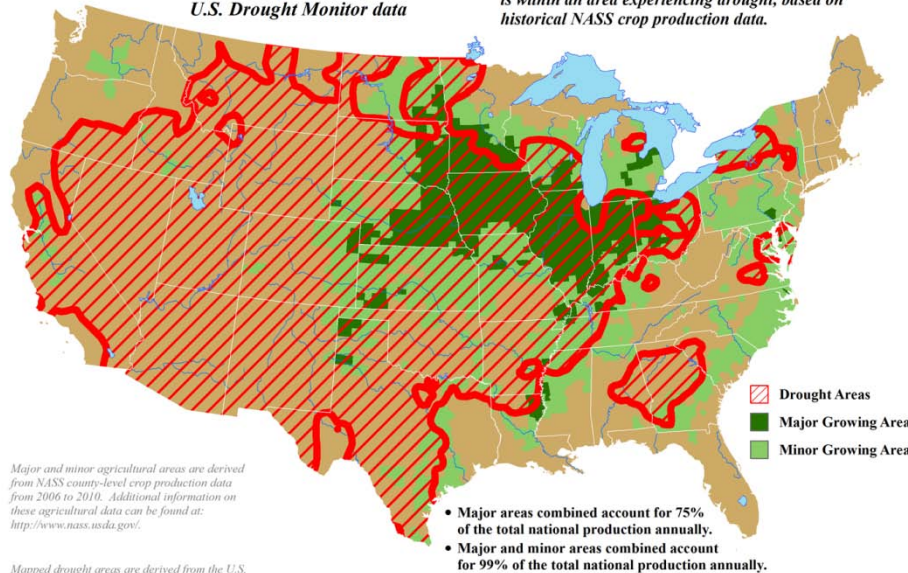


# Drought Impacts: Agriculture

## U.S. Corn Areas Experiencing Drought

Reflects September 4, 2012  
U.S. Drought Monitor data

Approximately 83% of the corn grown in the U.S. is within an area experiencing drought, based on historical NASS crop production data.



Mapped drought areas are derived from the U.S. Drought Monitor product and do not depict the intensity of drought in any particular location. More information on the Drought Monitor can be found at: <http://www.drought.unl.edu/dm/monitor.html>.

USDA Agricultural Weather Assessments  
World Agricultural Outlook Board

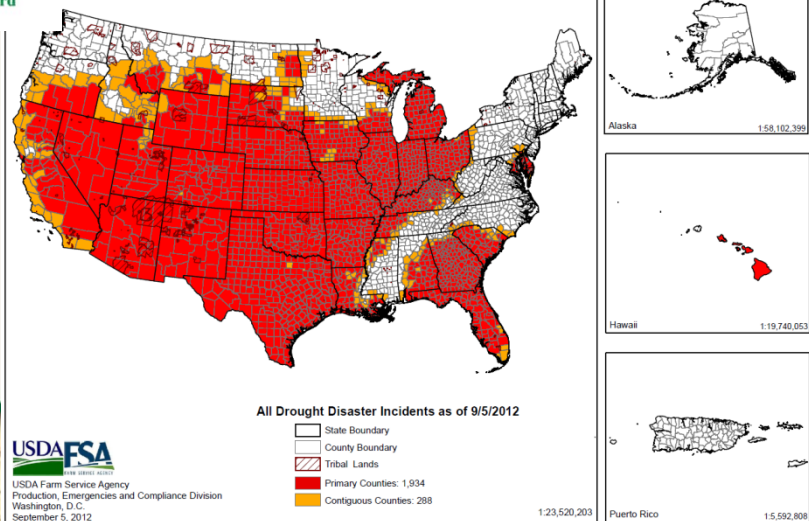
On July 11, USDA's World Agricultural Outlook Board **cut the estimate for the 2012 U.S. corn crop by 1.82 billion bushels.** The **12% cut** left the projected U.S. corn production at **12.97 billion bushels.**

On August 10, 2012 USDA/WAOB adjusted the crops **down again by 2.17 billion bushels (16.7%):**

**Corn:** 123.4 bushels/acre (**10.8 billion bushels**), down from 146.0 in July and 166.0 in June.

**Soybeans:** 36.1 bushels/acre (**83.4 million tons**), down from 40.5 in July and 43.9 in June.

## 2012 Secretarial Drought Designations - All Drought

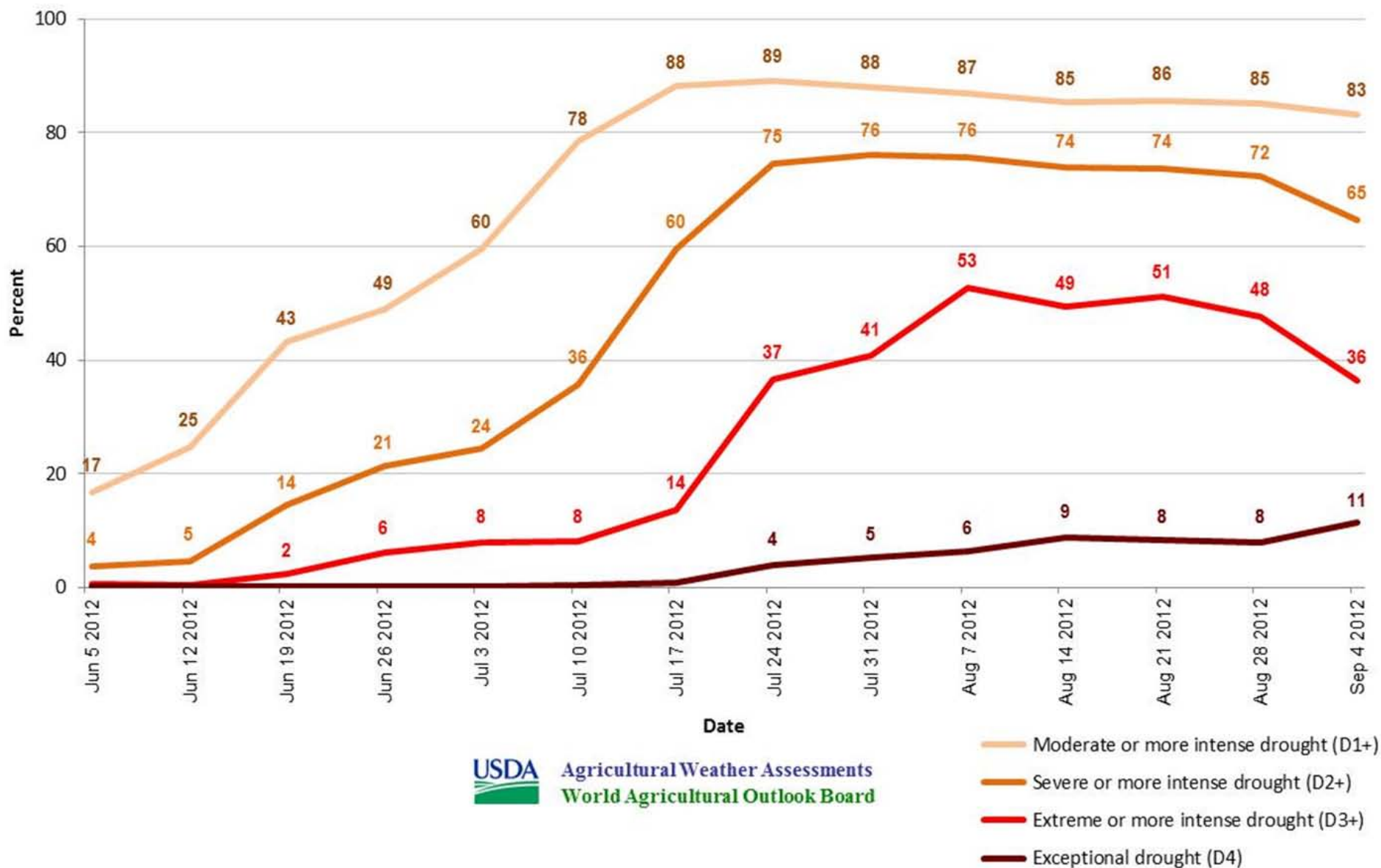


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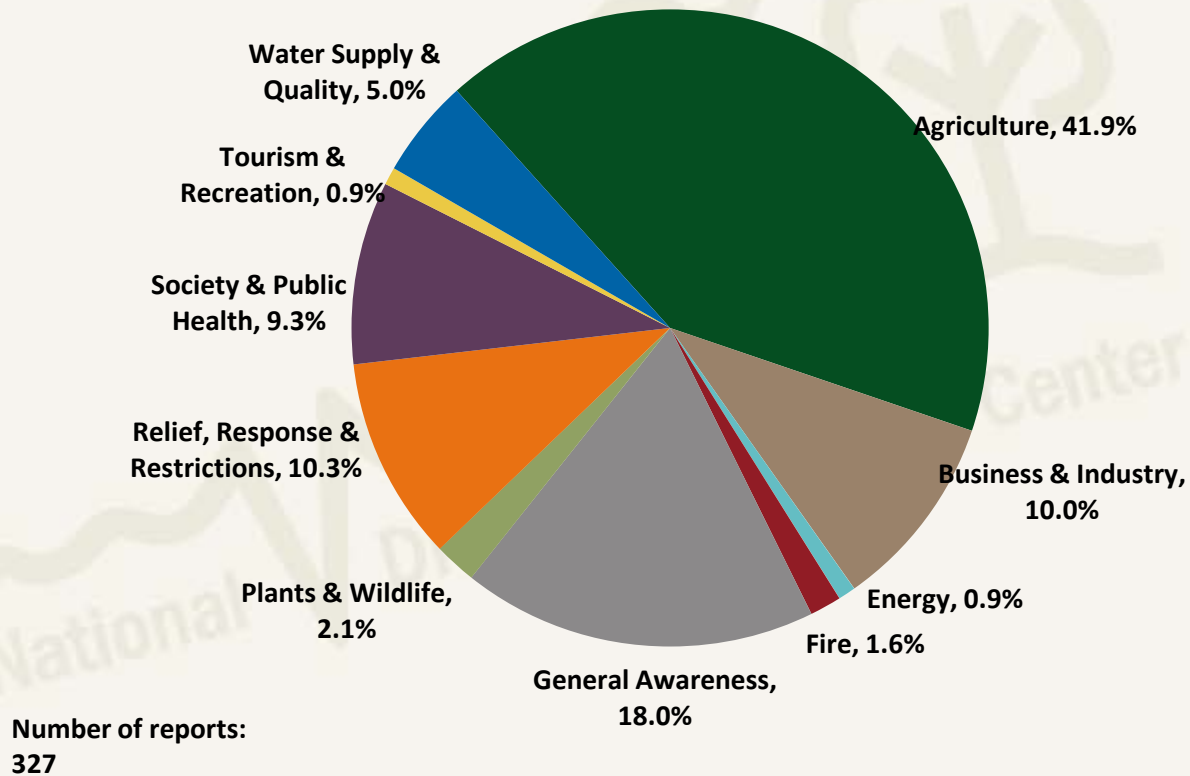


# United States Corn Areas Located in Drought



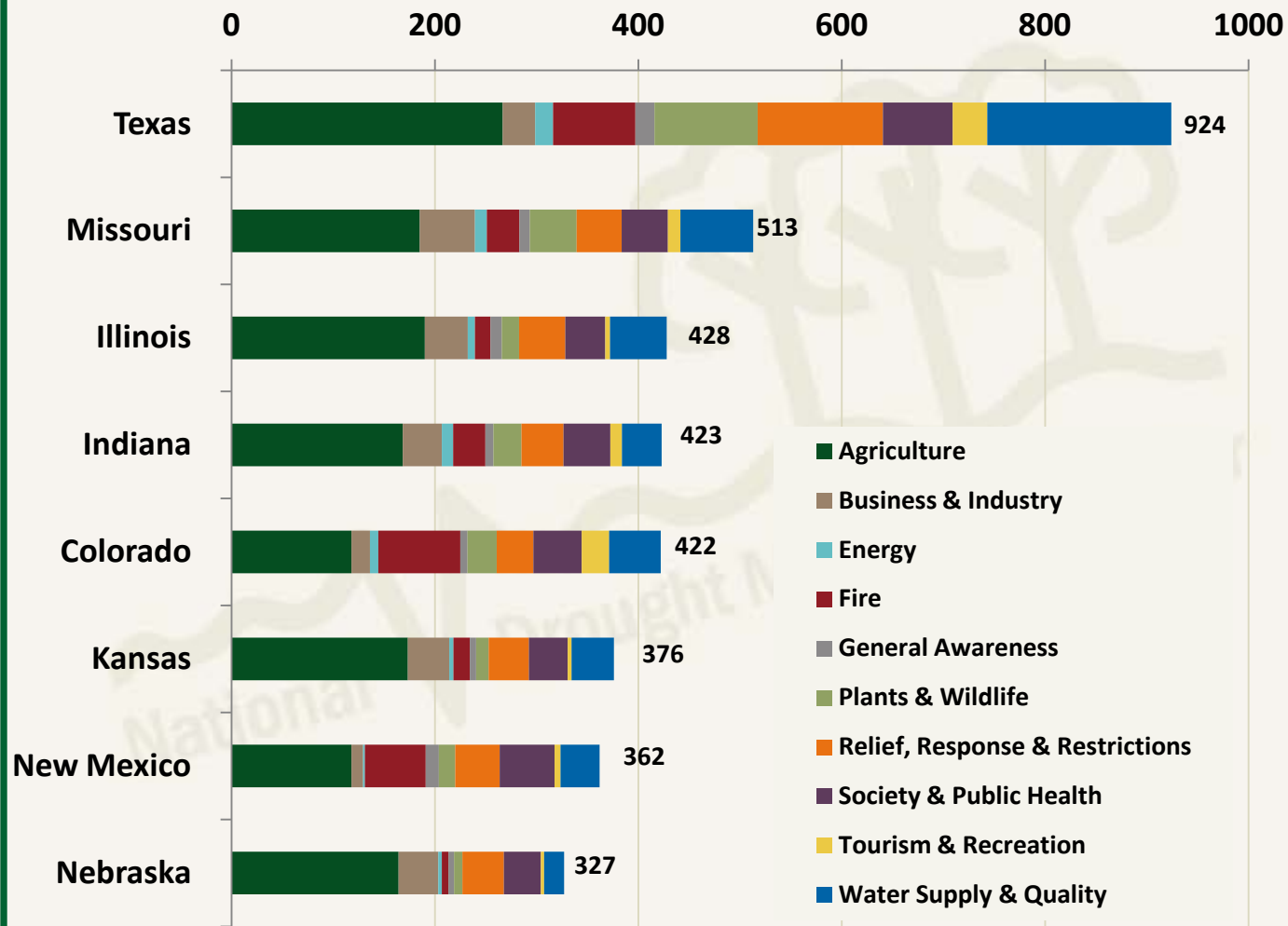


## Reports for Nebraska in the Drought Impact Reporter, January - August 2012





## Reports by state in the Drought Impact Reporter, January - August 2012





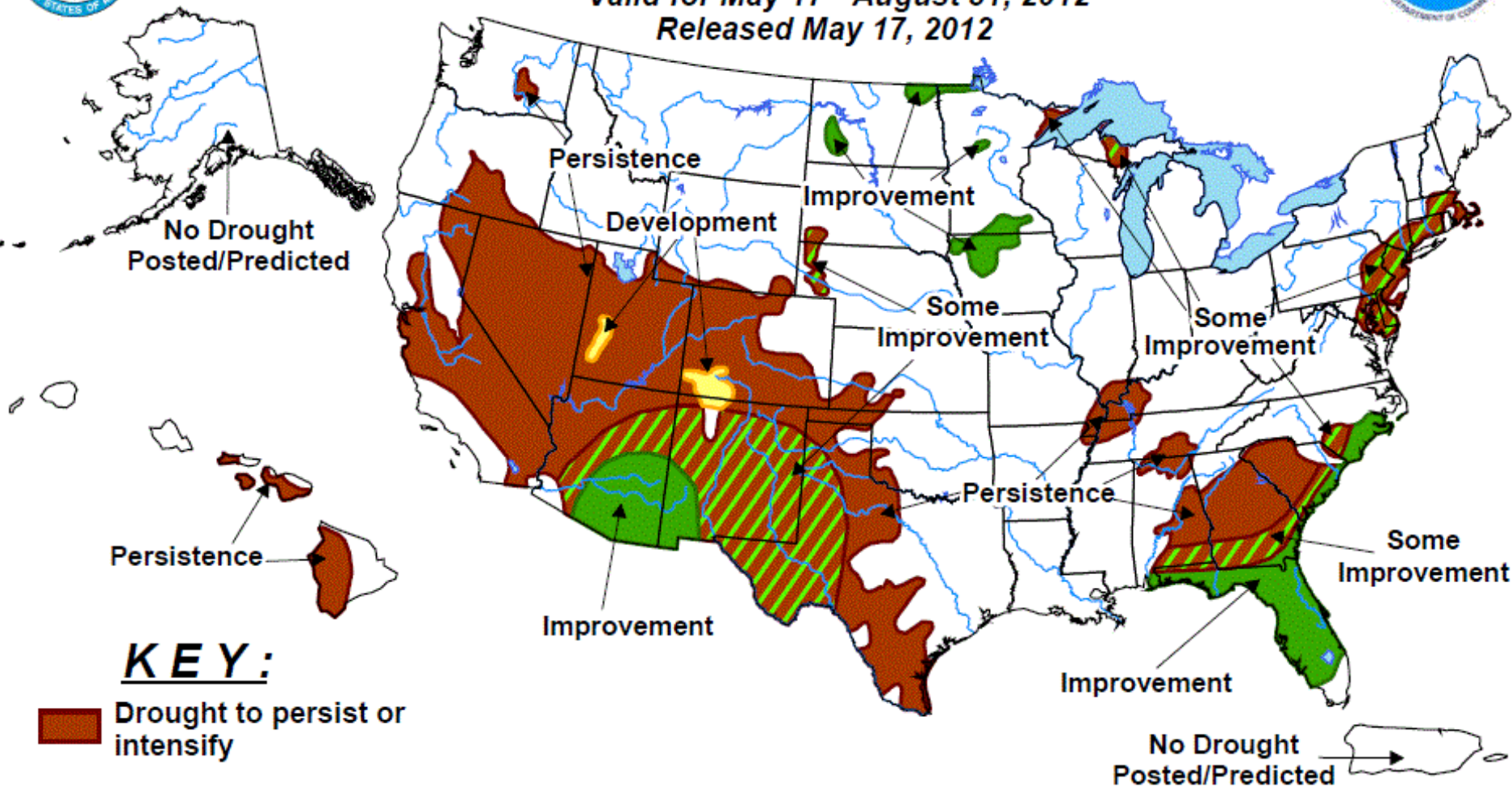


# U.S. Seasonal Drought Outlook





Drought Tendency During the Valid Period

Valid for May 17 - August 31, 2012

Released May 17, 2012



## KEY:

-  Drought to persist or intensify
-  Drought ongoing, some improvement
-  Drought likely to improve, impacts ease
-  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 improvement areas imply at least a 1-category improvement in the Drought Monitor intensity levels, but do not necessarily imply drought elimination.



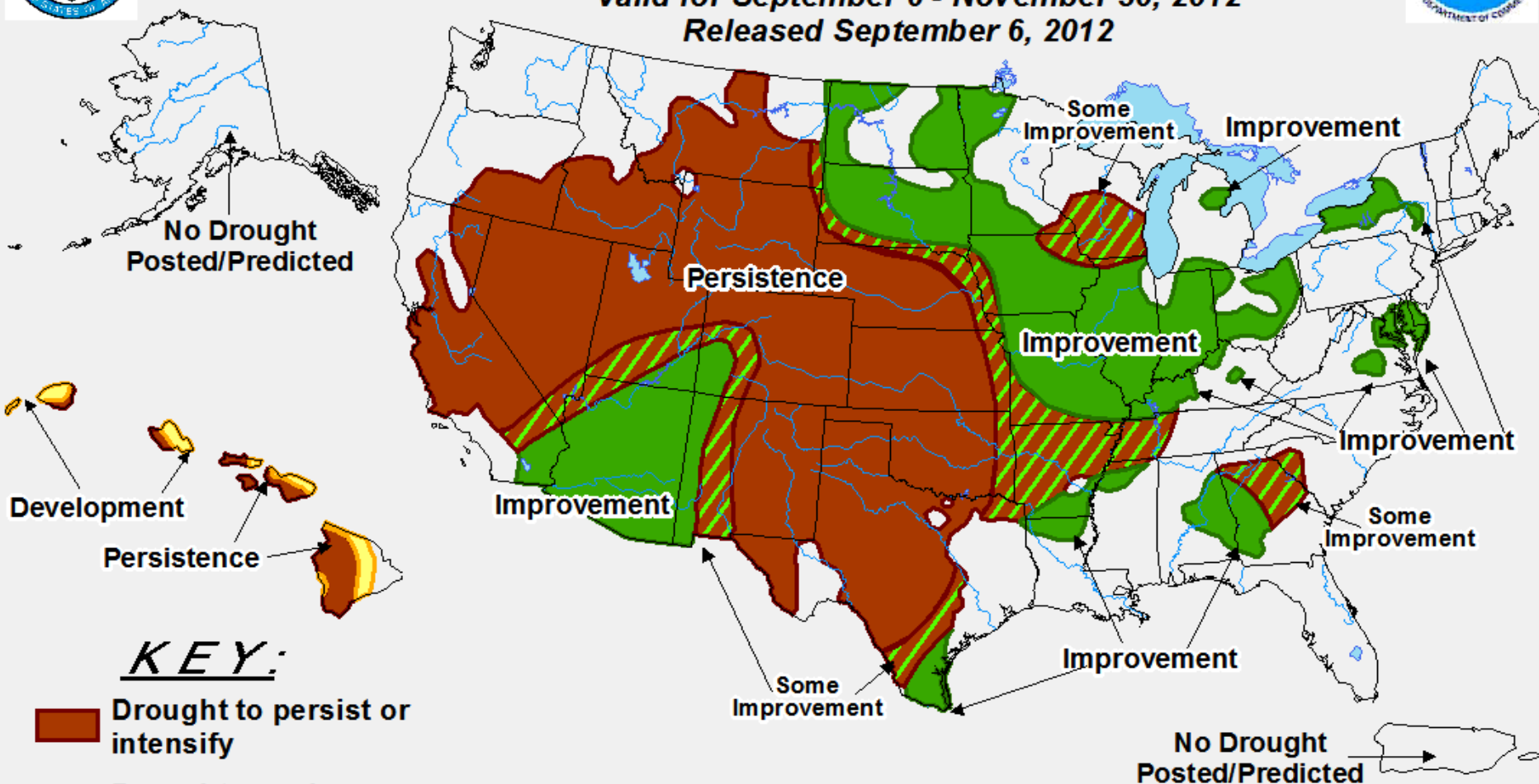


# U.S. Seasonal Drought Outlook

## Drought Tendency During the Valid Period

Valid for September 6 - November 30, 2012

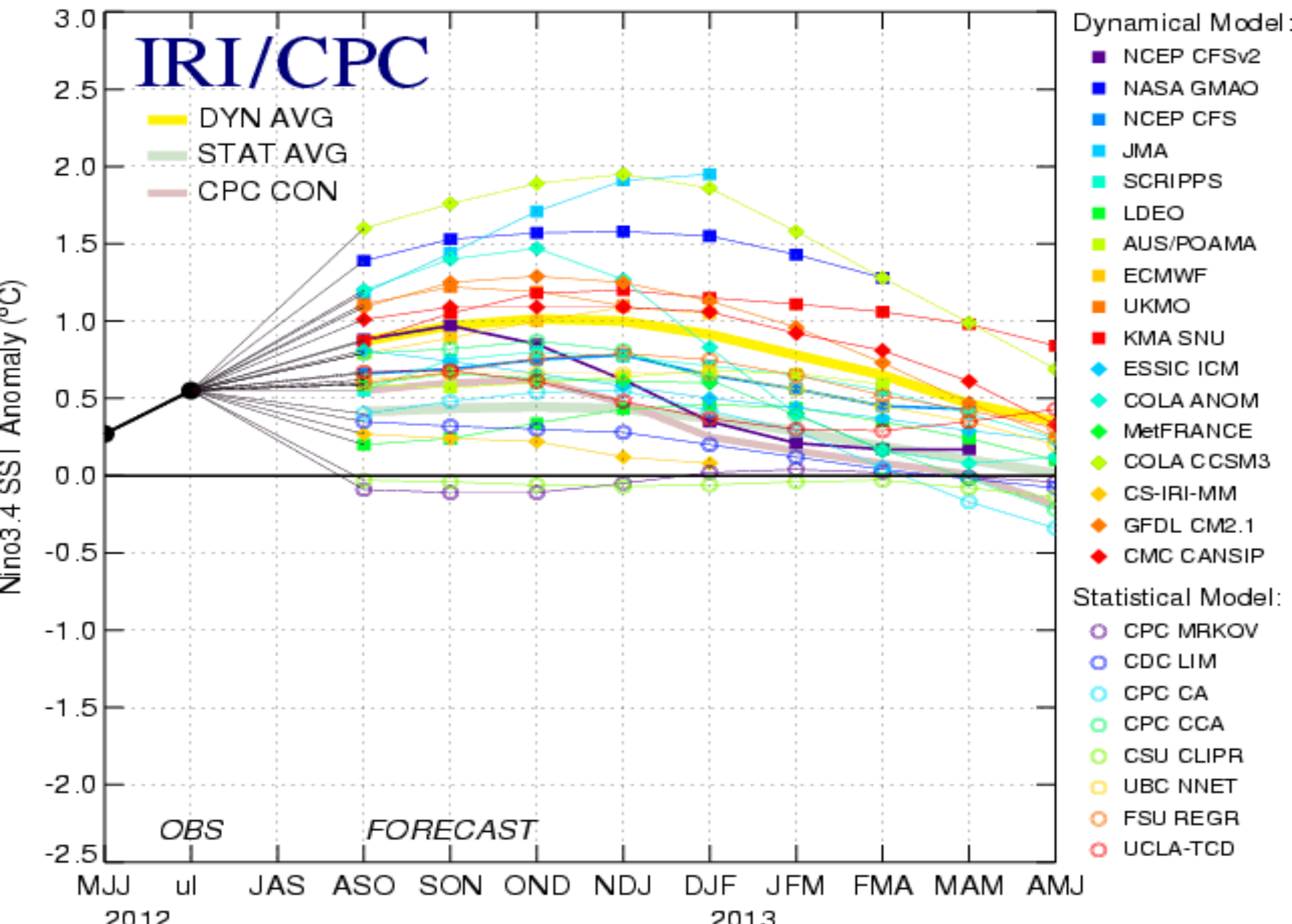
Released September 6, 2012



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 improvement areas imply at least a 1-category improvement in the Drought Monitor intensity levels, but do not necessarily imply drought elimination.

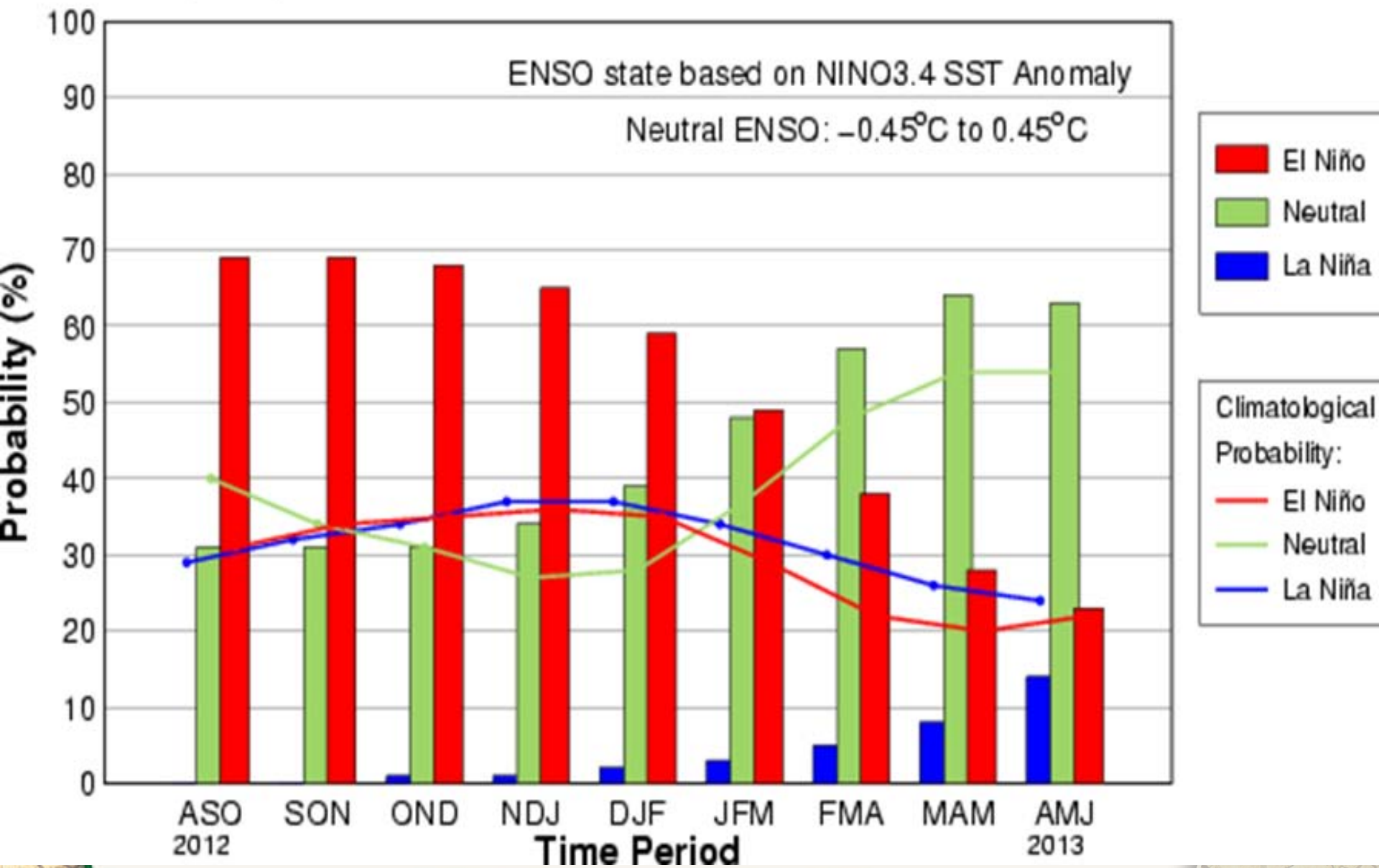


# Mid-Aug 2012 Plume of Model ENSO Predictions





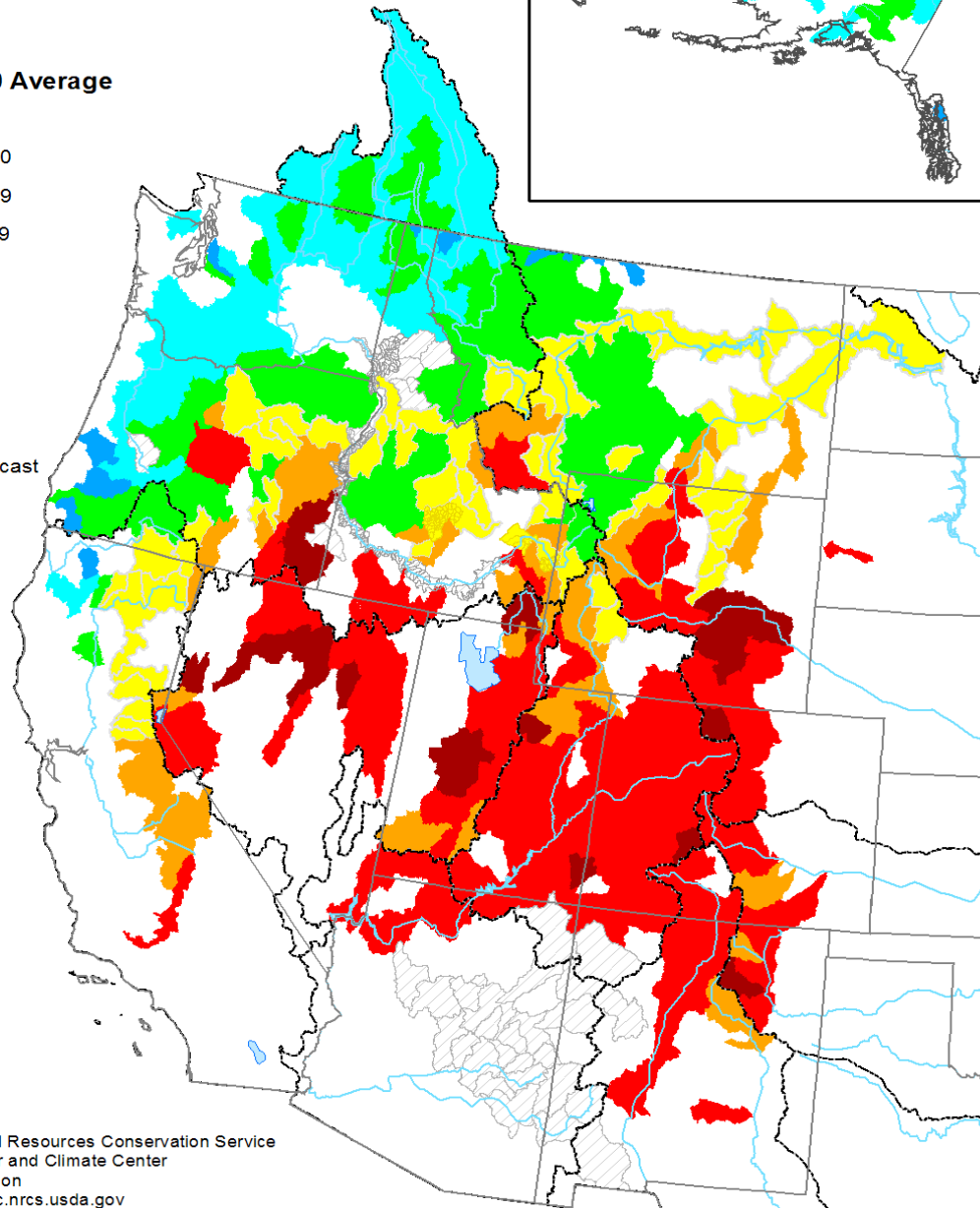
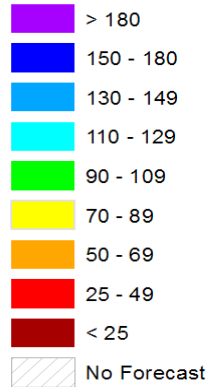
# Early-Sep CPC/IRI Consensus Probabilistic ENSO Forecast





# Spring and Summer Streamflow Forecasts as of May 1, 2012

Percent  
1971 to 2000 Average



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



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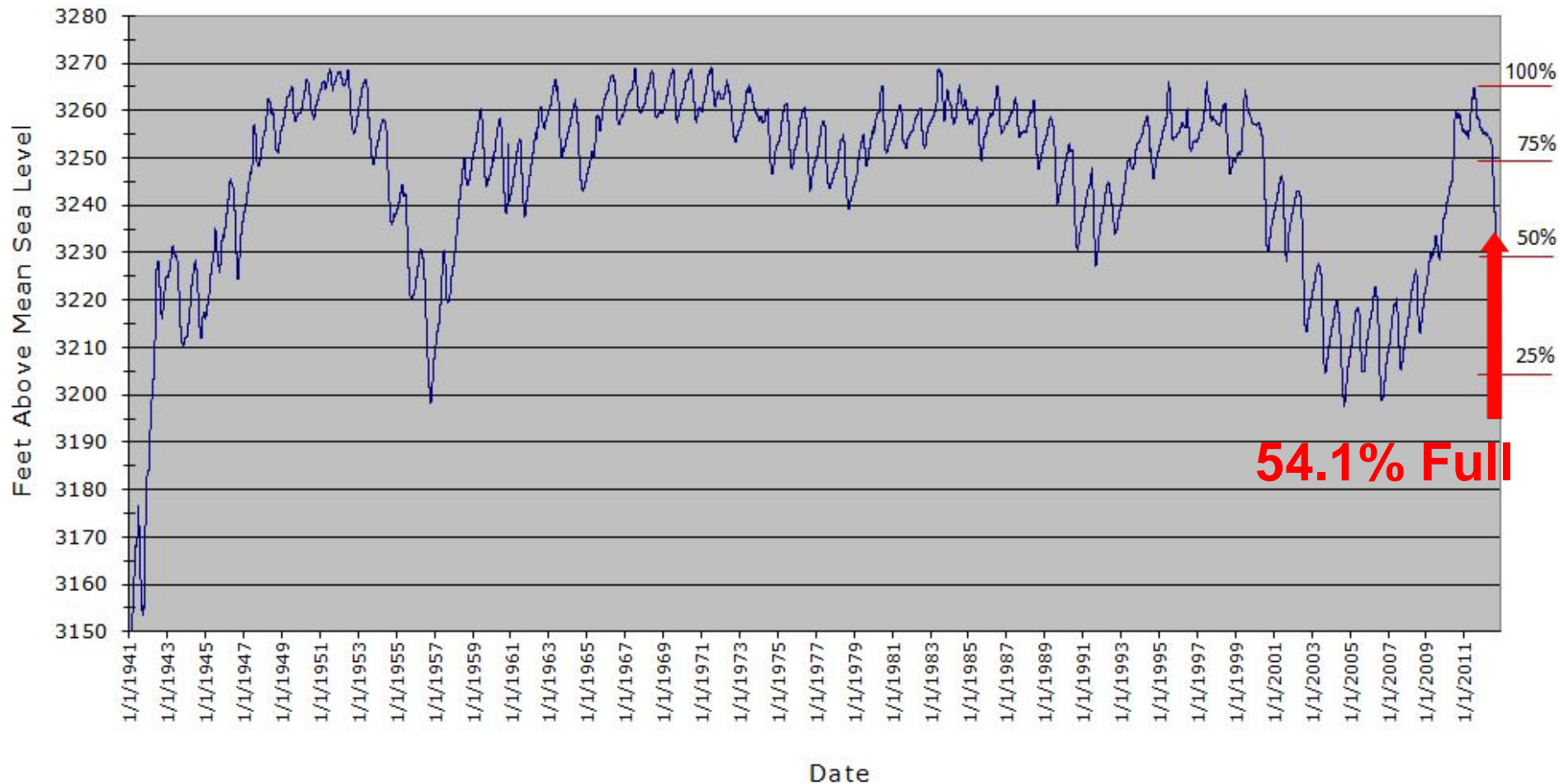
# Climate Summary

- ▶ After a relatively dry/warm winter/spring, heat and dryness persisted into NE during the summer
  - *19% of NE in D0-D1 as of June*
  - *100% of NE in D1-D4 as of September*
  - *This is the most amount of D3 (98%)/D4 (71%) in NE since the USDM began production in 1999.*
  - *Heat waves* in June/July led to rapid expansion over NE...classic "flash drought" (timing, timing, timing)
  - Models trending toward *El Niño (~70%)* later this fall/winter (IRI/CPC).....
- ▶ Pasture/range conditions took a beating too
- ▶ Upcoming *winter critical* for snowpack/water supply and soil moisture recharge....
- ▶ Climate Prediction Center's Seasonal Drought Outlook calls for *general persistence of drought in NE* between now and the end of November.





## Lake McConaughy Elevation 1941 to Present

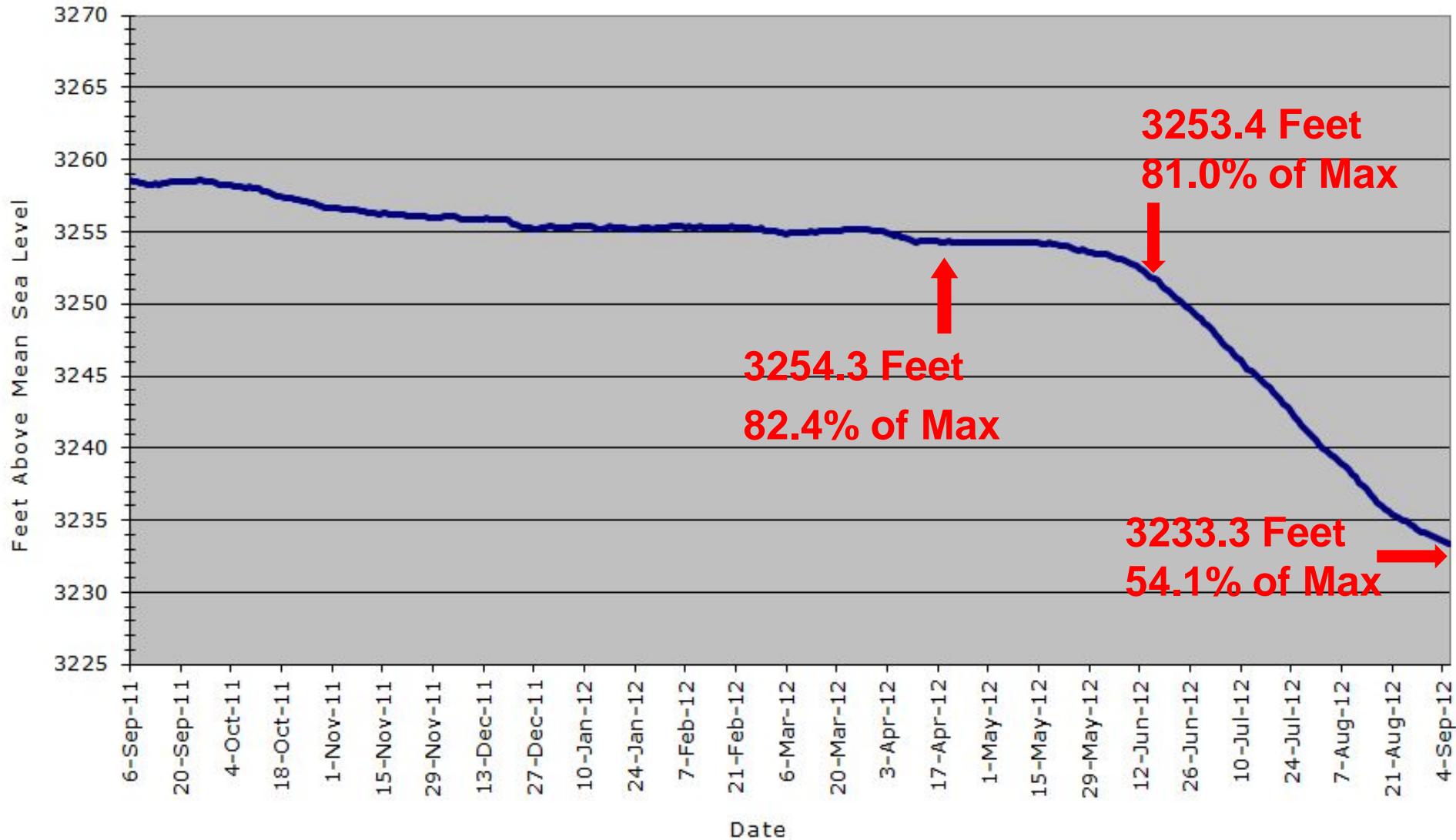


SOURCE: CNPPID [www.cnppid.com](http://www.cnppid.com)



# Lake McConaughy Elevation

Sept. 6, 2011 to Sept. 6, 2012



SOURCE: CNPPID [www.cnppid.com](http://www.cnppid.com)



# April 2012 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 ( <a href="#">Current, Average &amp; Median Inflow graph</a> )	773	932	965	5,259
Total Lake McConaughy Outflow	1,061	596	930	2,871
North Platte below Keystone Dam	934	849	23	1,228
Keystone Dam Diversion	127	30	649	1,722
North Platte at North Platte	1,116	1,330	512	1,906
South Platte at Roscoe	185	230	338	178
South Platte at North Platte	187	223	470	236
Diversion to CNPPID Supply Canal	1,466	1,989	1,477	2,189
Platte River at Overton	2,140	2,376	1,878	3,981
Platte River at Kearney	1,530	2,250	1,724	3,691
Platte River at Grand Island	1,760	2,173	1,827	5,219

\* 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](#))

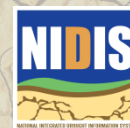
\*\* Flow too low for gauge to measure

@ - 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](http://www.cnppid.com)**





# June 2012 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 ( <a href="#">Current, Average &amp; Median Inflow graph</a> )	773	856	591	7,314
Total Lake McConaughy Outflow	1,357	1,227	631	7,929
North Platte below Keystone Dam	153	163	808	5,801
Keystone Dam Diversion	1,204	1,209	126	1,752
North Platte at North Platte	50	455	929	5,387
South Platte at Roscoe	92	92	147	804
South Platte at North Platte	184	195	193	1,069
Diversion to CNPPID Supply Canal	1,075	1,250	1,227	2,192
Platte River at Overton	671	992	1,323	6,713
Platte River at Kearney	740	564	1,176	7,657
Platte River at Grand Island	819	651	1,534	7,607

\* 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](#))

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SOURCE: CNPPID [www.cnppid.com](http://www.cnppid.com)





# September 2012 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 ( <a href="#">Current, Average &amp; Median Inflow graph</a> )	521	415	476	4,500
Total Lake McConaughy Outflow	1,575	1,978	2,342	4,627
North Platte below Keystone Dam	330	430	721	3,250
Keystone Dam Diversion	1,245	1,549	1,705	1,613
North Platte at North Platte	356	356	490	3,240
South Platte at Roscoe	0	0	0	203
South Platte at North Platte	65	60	84	398
Diversion to CNPPID Supply Canal	1,129	1,800	1,590	2,206
Platte River at Overton	2,100	609	138	4,310
Platte River at Kearney	1,950	758	465	4,350
Platte River at Grand Island	189	205	0	4,130

\* 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](#))

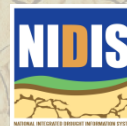
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**SOURCE: CNPPID [www.cnppid.com](http://www.cnppid.com)**



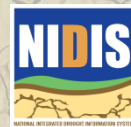


# Lake McConaughy

Civil engineer Cory Steinke reported that he expects releases from Lake McConaughy for several other irrigation canals with supplemental storage water in the reservoir to continue for about another week. At that point, releases will be significantly reduced, with only water from the U.S. Fish and Wildlife Service's environmental account being released over the next six weeks.

"I expect the lake to drop about another one and a half feet to around elevation 3232 feet before stabilizing and then starting to come back up," Steinke said. "How quickly it rises depends on what kind of inflows we see over the next several months."

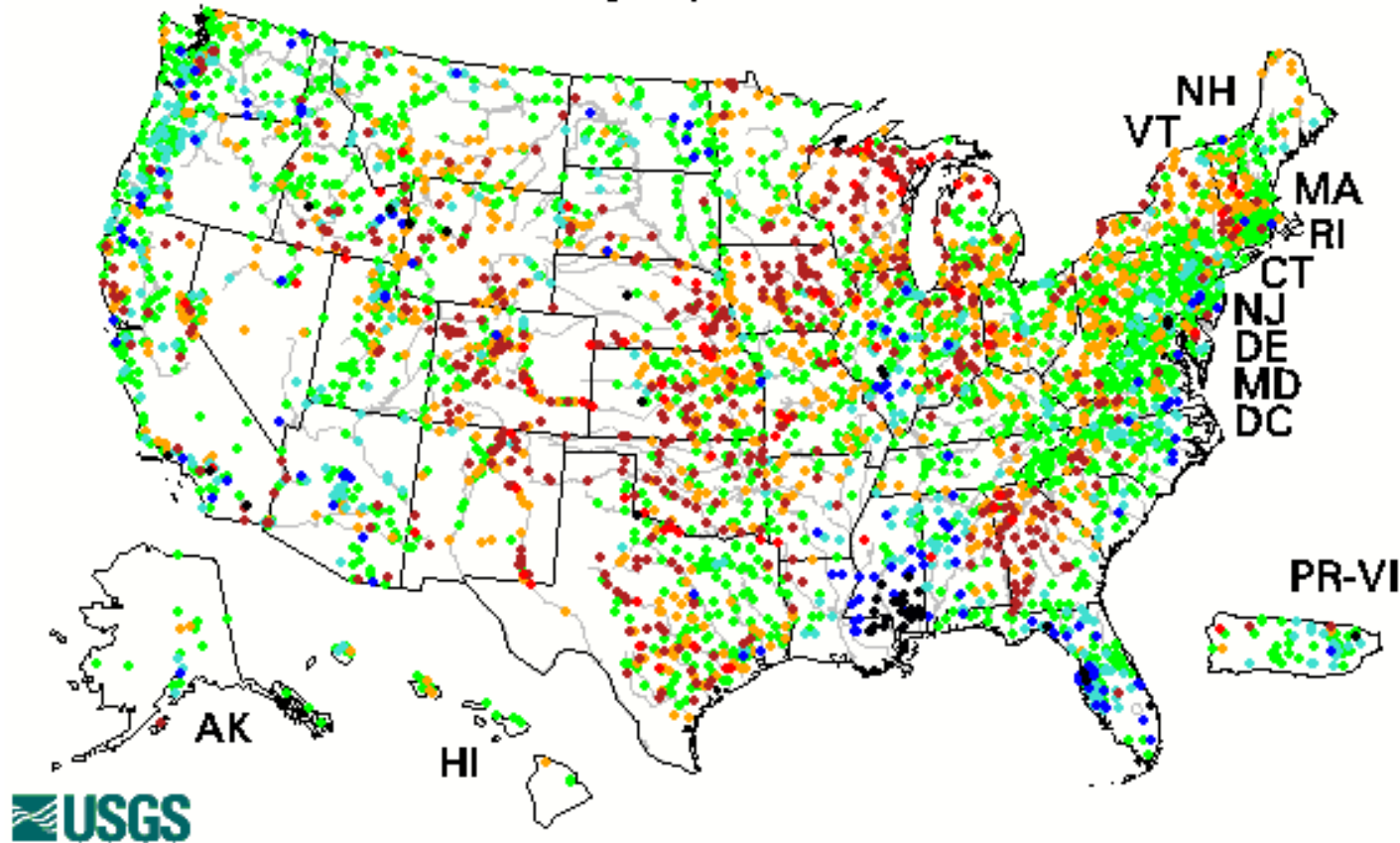
**SOURCE: CNPPID News Release, September 4, 2012**





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

Wednesday, September 05, 2012

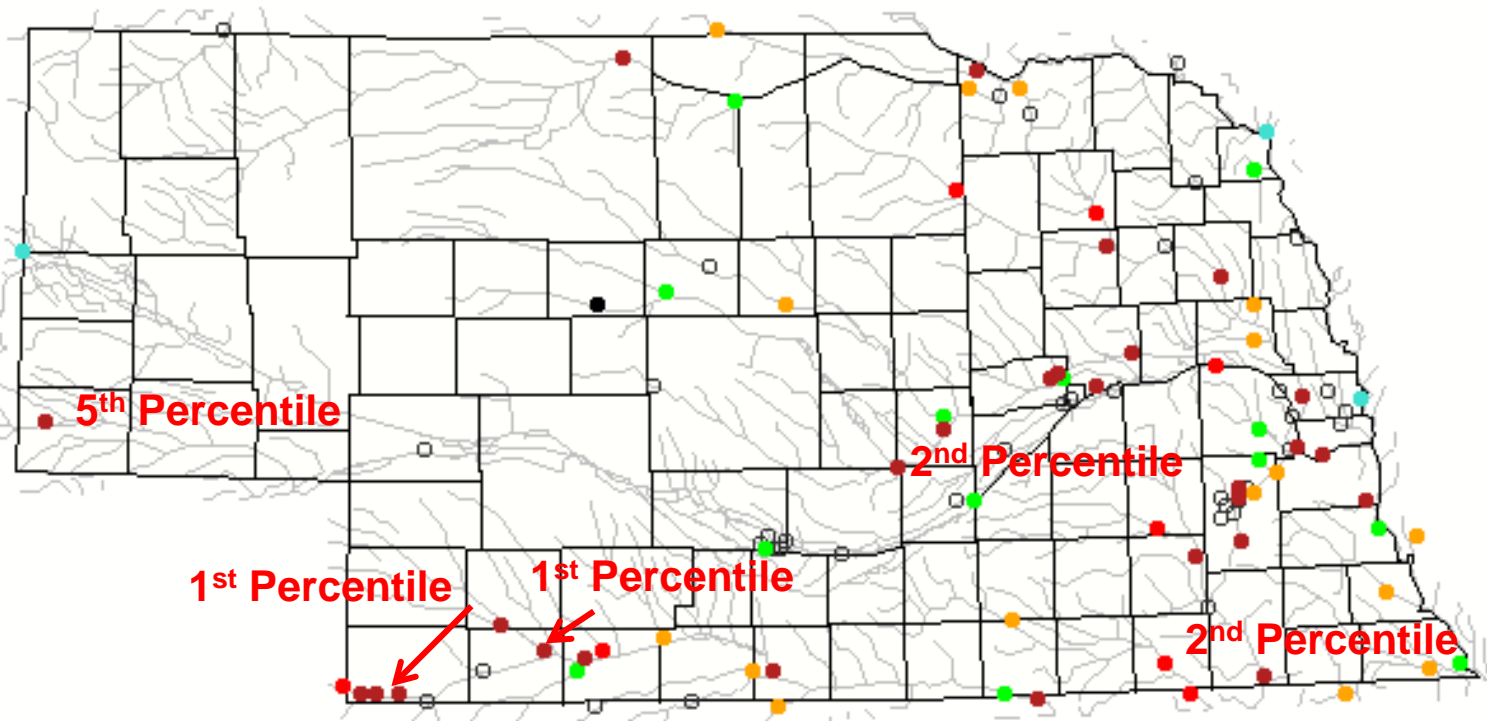


Explanation - Percentile classes							
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		



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

Wednesday, September 05, 2012



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		

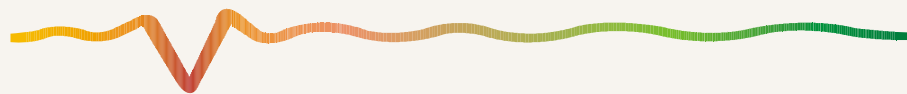


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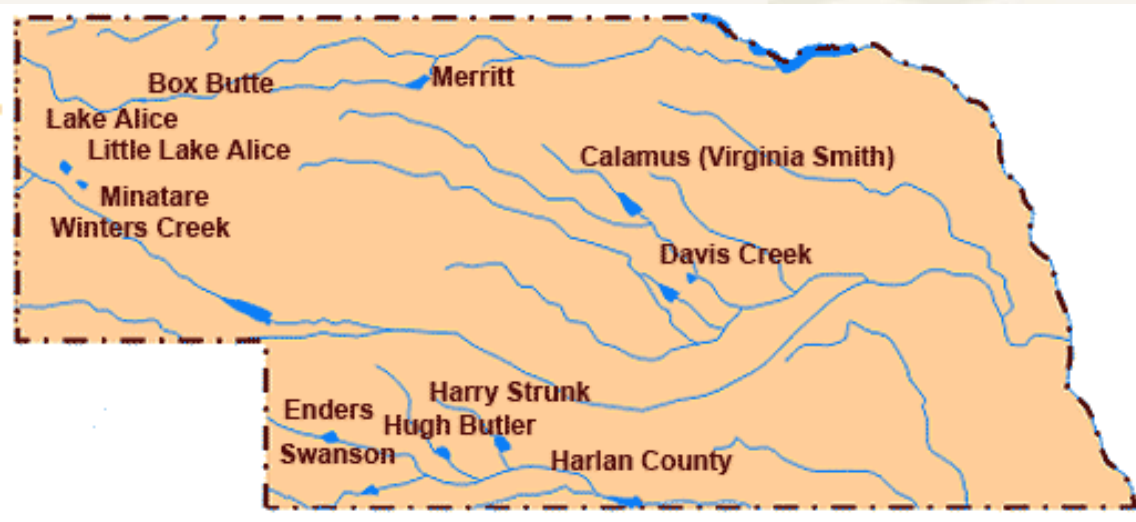




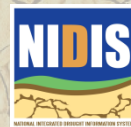
# Republican River Basin



- **Hugh Butler**: 14.0% of conservation pool
- **Enders**: 36.7% of conservation pool
- **Harry Strunk**: 37.0% of conservation pool
- **Swanson**: 35.6% of conservation pool



Source: BOR [http://www.usbr.gov/gp/lakes\\_reservoirs/](http://www.usbr.gov/gp/lakes_reservoirs/)





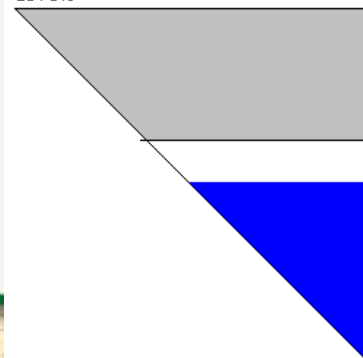
# Republican River Basin



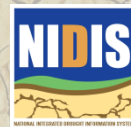
## Harlan County Current Conditions

- ✓ Conservation Pool is 64.3 % full was 100% full in June.
- ✓ 201,994 Acre-Feet in storage compared to 315,833 Acre-Feet of water in storage in June.
- ✓ Last year at this time, 305,507 AF was in storage.

FLOOD  
1973.5



Source: BOR [http://www.usbr.gov/gp/lakes\\_reservoirs/](http://www.usbr.gov/gp/lakes_reservoirs/)



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# Water Supply Summary

- ▶ The Drought of 2012 has impacted water supply across the state and we will continue to see declines into the Fall.
  - **Lake McConaughy has dropped 27%** in total elevation since June 2012. This decline will continue and recovery is based upon the winter snowpack upstream in the Rocky Mountains.
  - Storage in the Republican River has declined steadily all summer and Harlan County over 100,000 Acre-Feet lower than in September 2011 and **has dropped 36%** of total elevation since June 2012.
  - Dry soils across the state and in upstream states will severely impact runoff until the soil moisture levels recover.
  - Some irrigation districts are already contemplating reductions for 2013 deliveries and these decisions will be made in the next few months.





# Any Questions ?





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