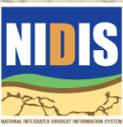


NE Drought Conditions CARC Update: March 25, 2013

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

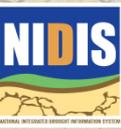
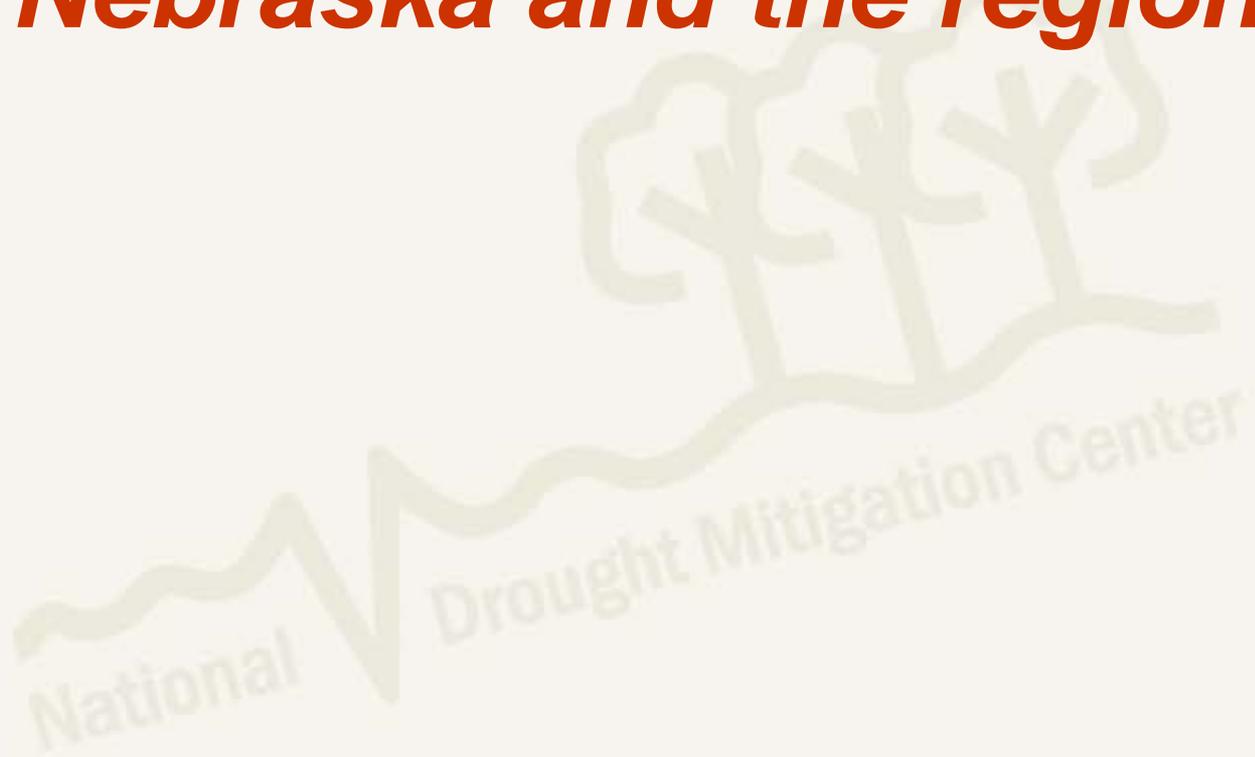


Standard Raininguage

New Nebraska Raininguage



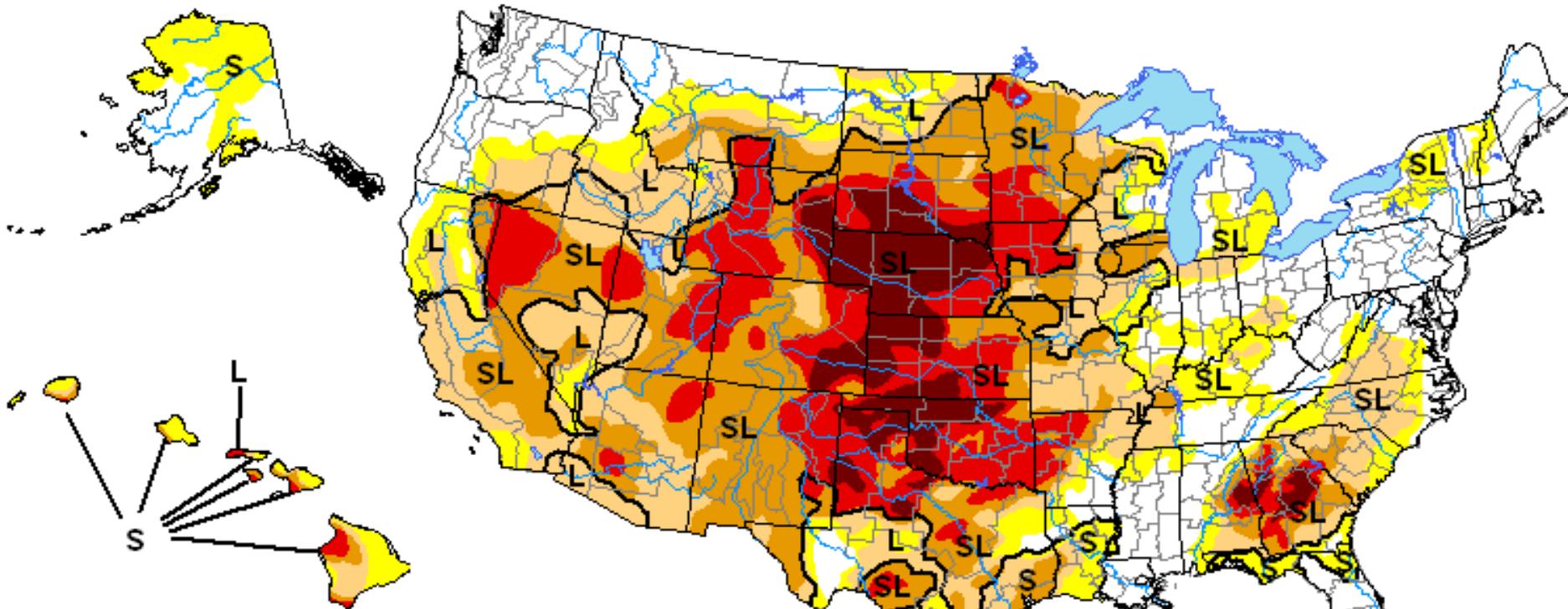
Current Conditions around Nebraska and the region...



U.S. Drought Monitor

November 27, 2012

Valid 7 a.m. EST



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/>

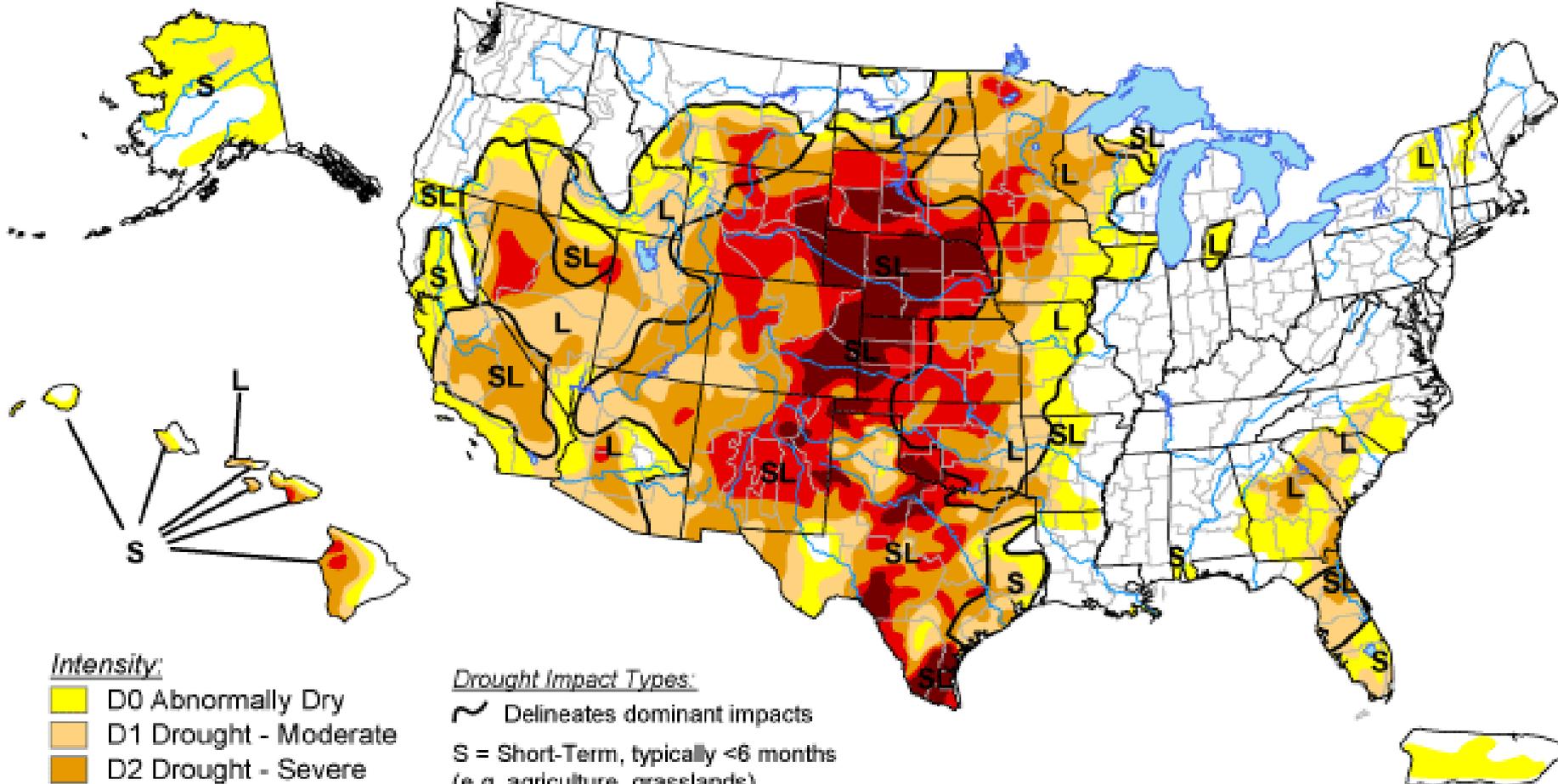
Released Thursday, November 29, 2012

Author: Eric Luebehusen, U.S. Department of Agriculture

U.S. Drought Monitor

March 19, 2013

Valid 7 a.m. EDT



Intensity:

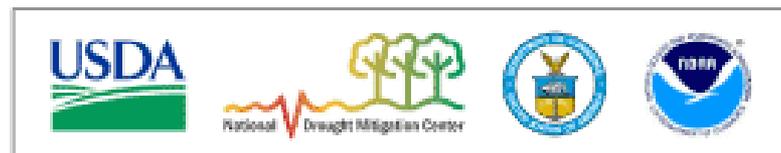
-  D0 Abnormally Dry
-  D1 Drought - Moderate
-  D2 Drought - Severe
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<http://droughtmonitor.unl.edu/>



Released Thursday, March 21, 2013
Author: Anthony Artusa, NOAA/NWS/NCEP/CPC

U.S. Drought Monitor

March 19, 2013

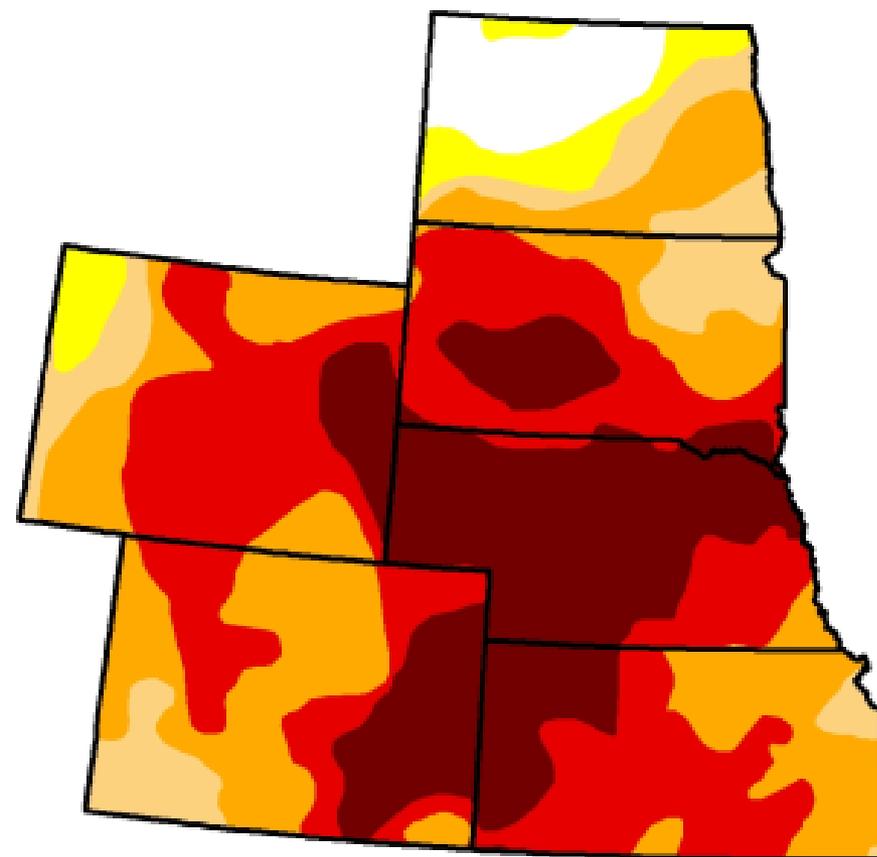
Valid 7 a.m. EST

High Plains

Drought Conditions (Percent Area)

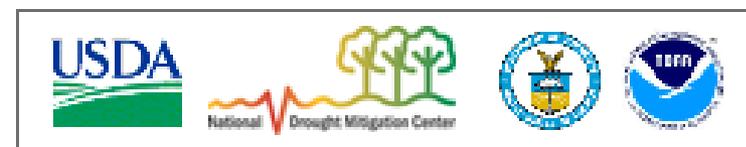
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	4.65	95.35	91.29	81.46	55.52	24.37
Last Week (03/12/2013 map)	4.65	95.35	91.29	81.46	55.58	24.37
3 Months Ago (12/18/2012 map)	1.54	98.46	93.01	86.20	59.98	26.99
Start of Calendar Year (01/01/2013 map)	1.54	98.46	93.01	86.20	60.25	26.99
Start of Water Year (09/25/2012 map)	0.00	100.00	98.91	83.80	61.28	24.35
One Year Ago (03/13/2012 map)	42.17	57.83	21.23	5.06	1.56	0.04

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, March 21, 2013
National Drought Mitigation Center,

Drought Monitor Archives

Maps

Tables

Animations

1999 Archive

GIS Data

Drought Severity

Nebraska

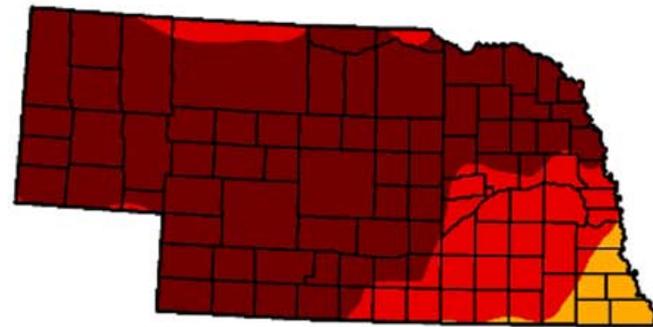
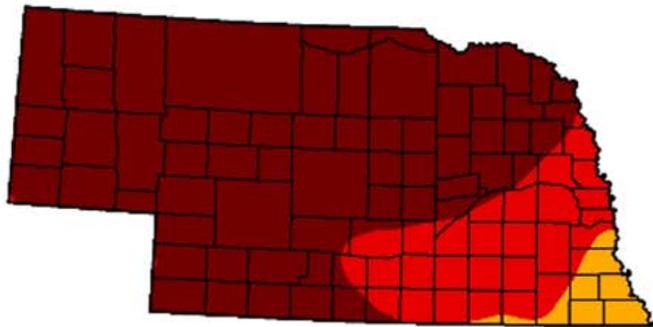
D0 - Abnormally Dry

D1 Drought - Moderate

D2 Drought - Severe

D3 Drought - Extreme

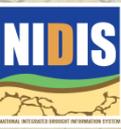
D4 Drought - Exceptional



November 27, 2012

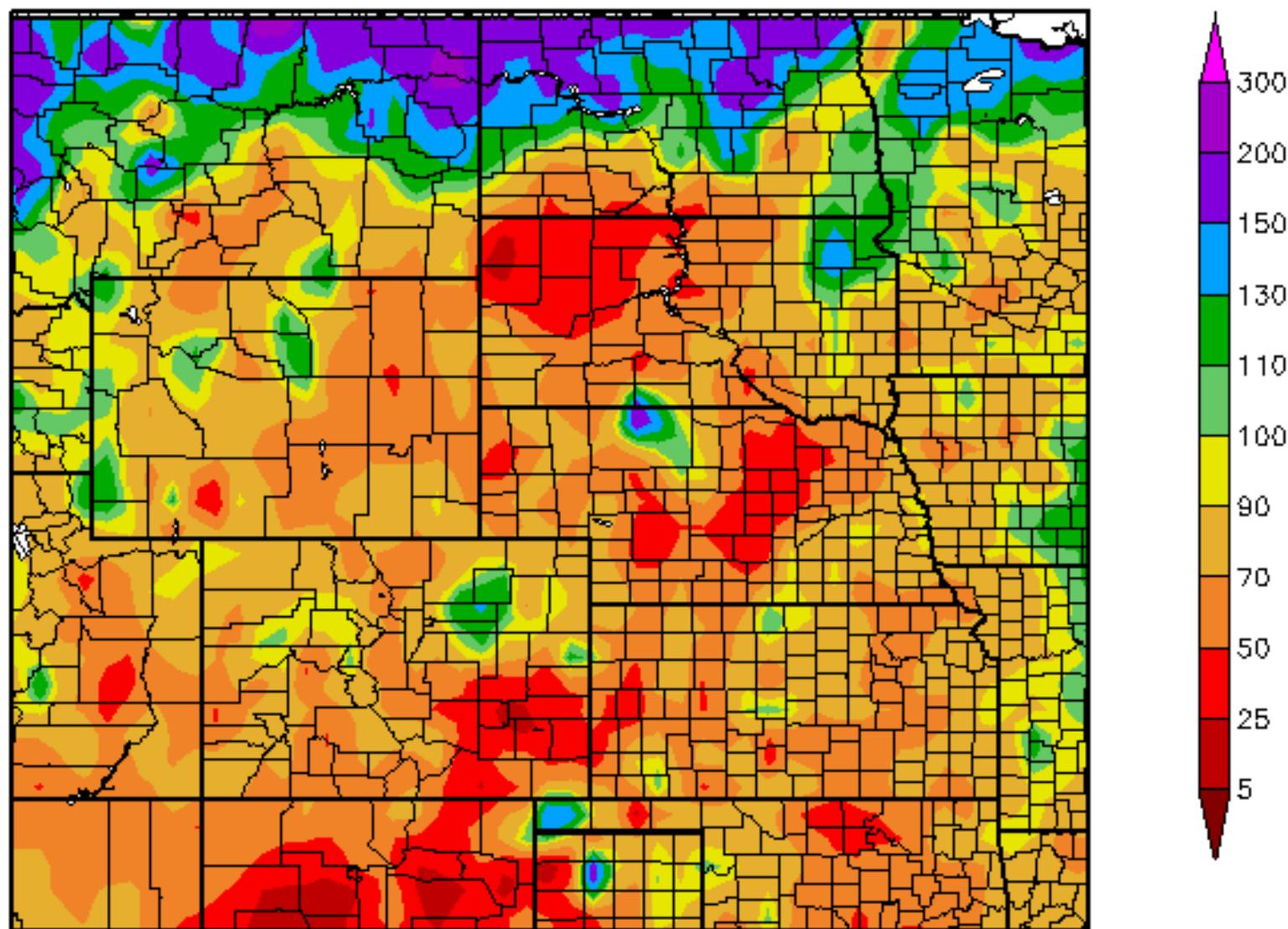
March 19, 2013

Week	Nothing	D0-D4	D1-D4	D2-D4	D3-D4	D4
November 27, 2012	0.00	100.00	100.00	100.00	96.15	77.46
March 19, 2013	0.00	100.00	100.00	100.00	96.13	76.41

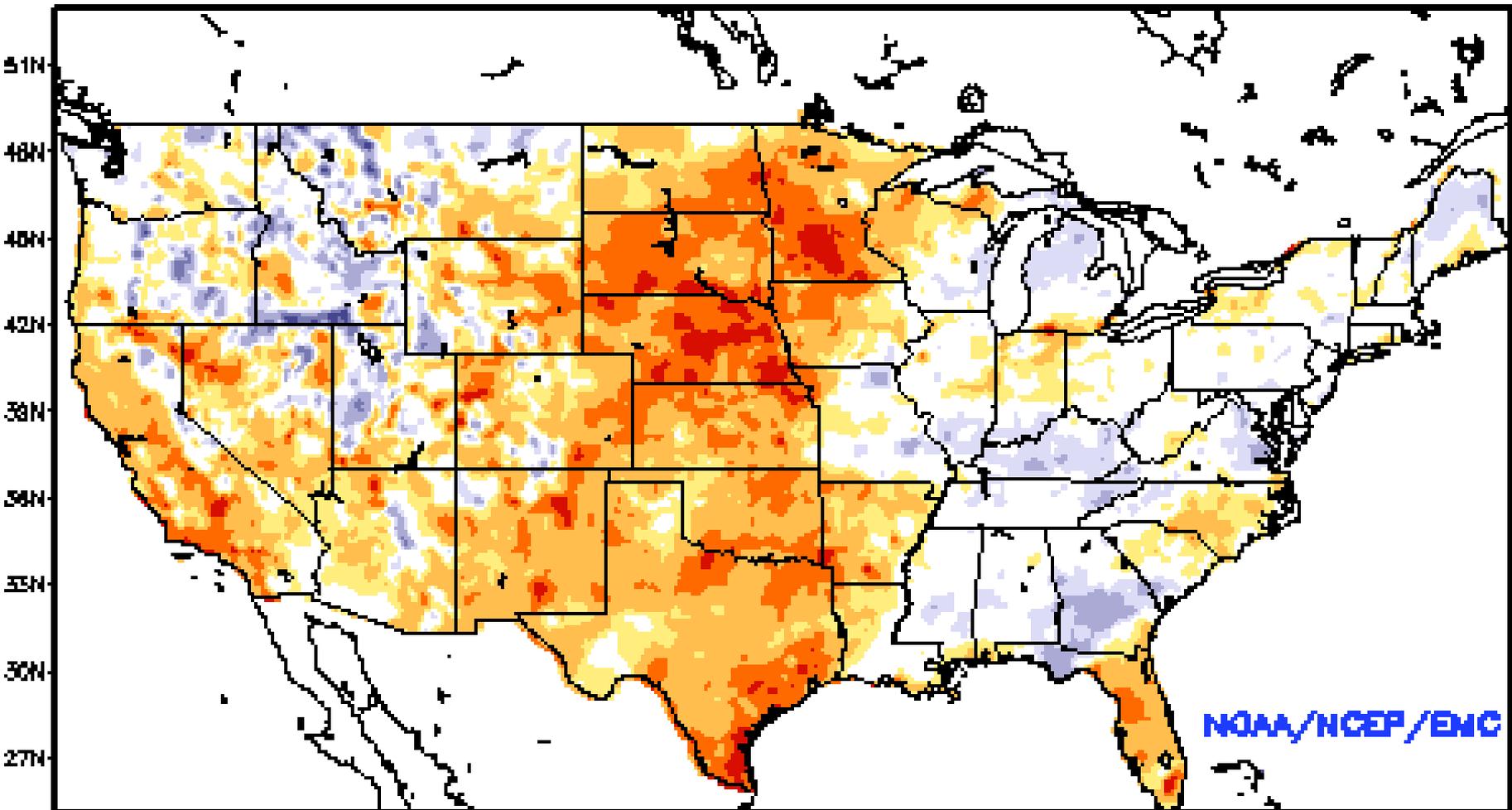


Percent of Normal Precipitation (%)

10/1/2012 – 3/24/2013



Ensemble-Mean - Current Top 1M Soil Moisture Anomaly (mm) NCEP NLDAS Products Valid: MAR 20, 2013



NOAA/NCEP/EMC



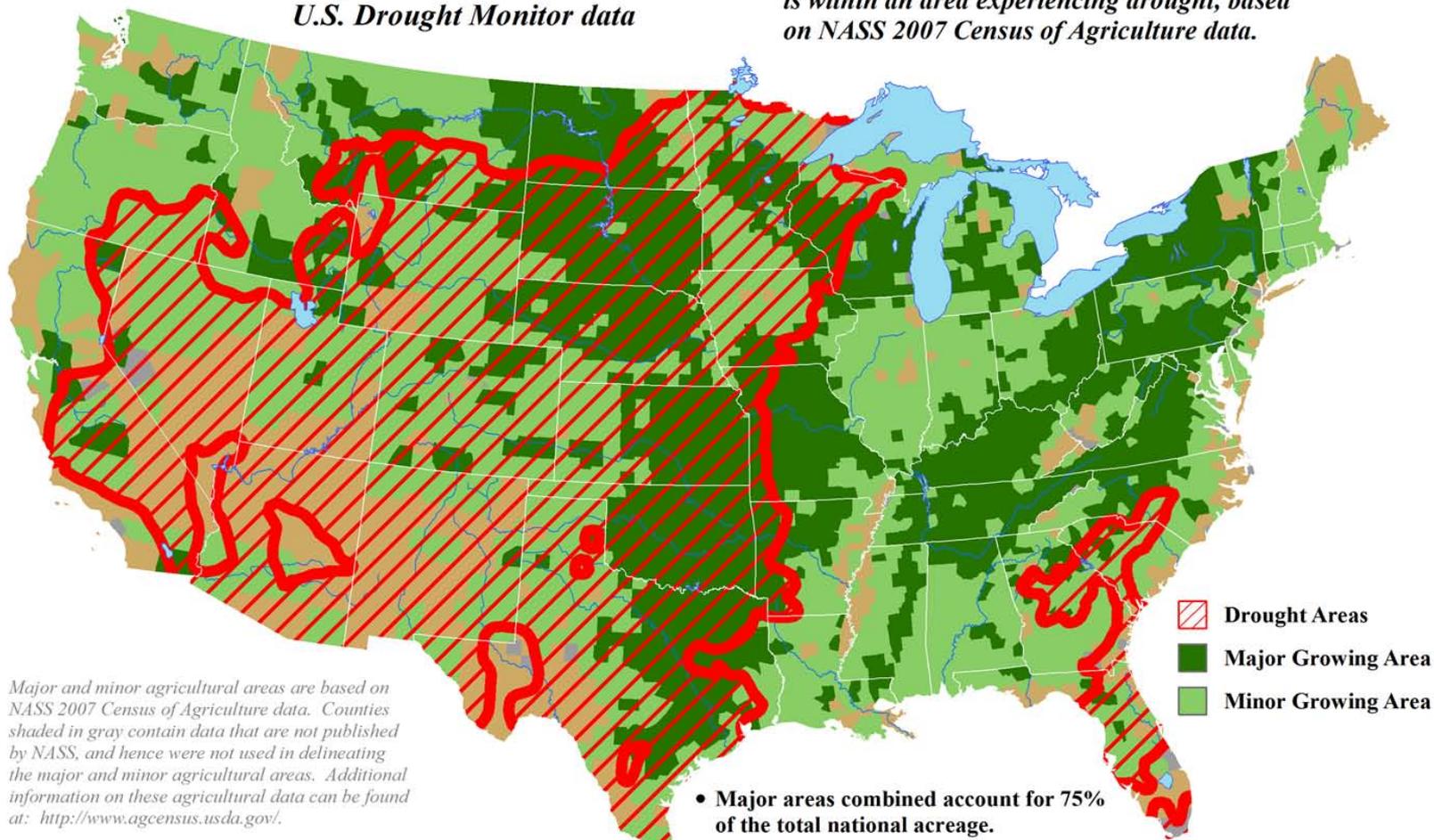
U.S. Winter Wheat Areas Experiencing Drought

U.S. Cattle Areas Experiencing Drought

U.S. Hay Areas Experiencing Drought

Reflects March 19, 2013
U.S. Drought Monitor data

Approximately 51% of the domestic hay acreage is within an area experiencing drought, based on NASS 2007 Census of Agriculture data.



 Drought Areas
 Major Growing Area
 Minor Growing Area

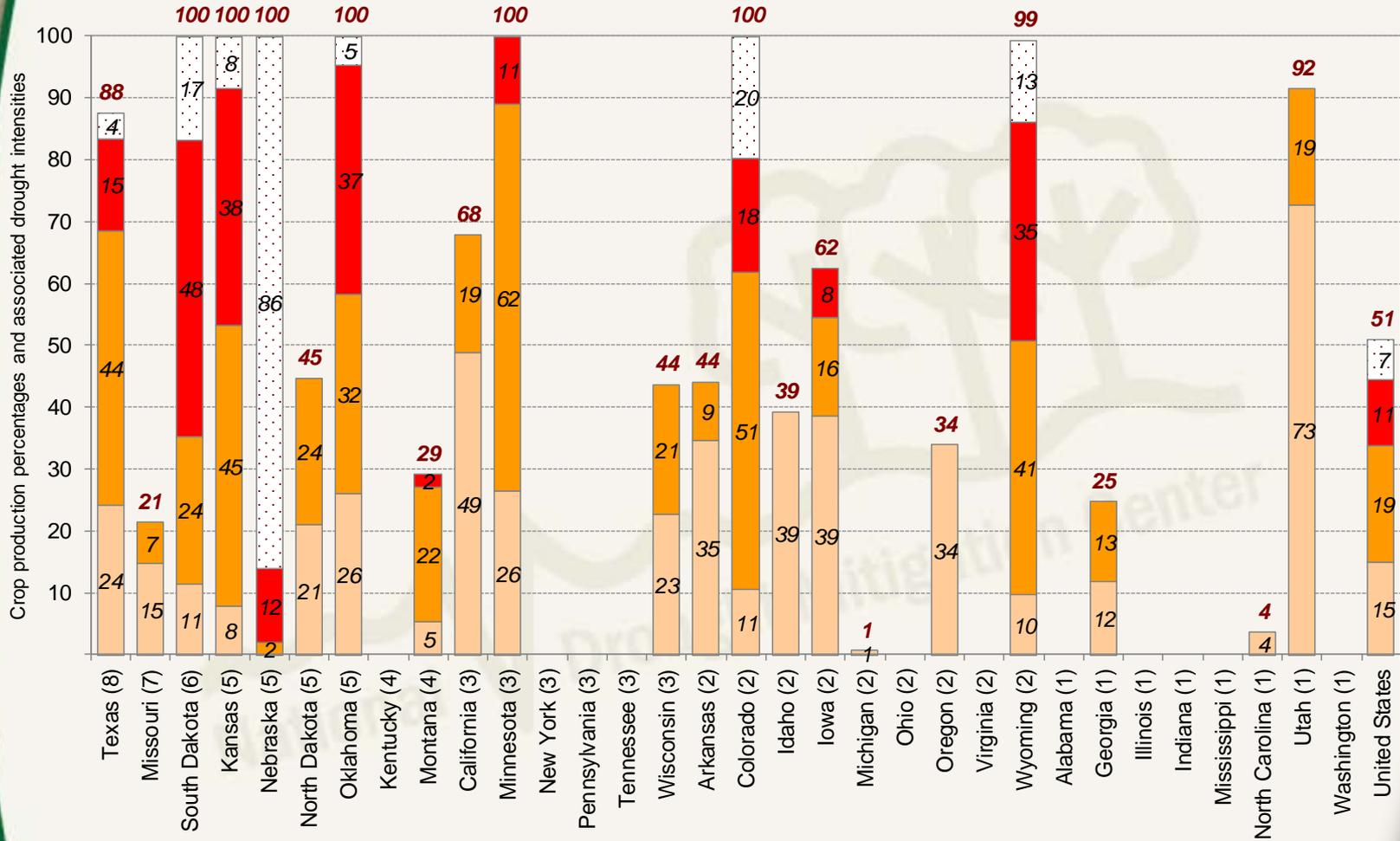
- Major areas combined account for 75% of the total national acreage.
- Major and minor areas combined account for 99% of the total national acreage.

Major and minor agricultural areas are based on NASS 2007 Census of Agriculture data. Counties shaded in gray contain data that are not published by NASS, and hence were not used in delineating the major and minor agricultural areas. Additional information on these agricultural data can be found at: <http://www.agcensus.usda.gov/>.

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://droughtmonitor.unl.edu/>.

Approximate Percentage of Hay Located in Drought *

March 19, 2013



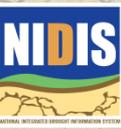
* Drought percentages were calculated from U.S. Drought Monitor (USDM) data for the above date. More information on the USDM is available at <http://droughtmonitor.unl.edu/>.

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

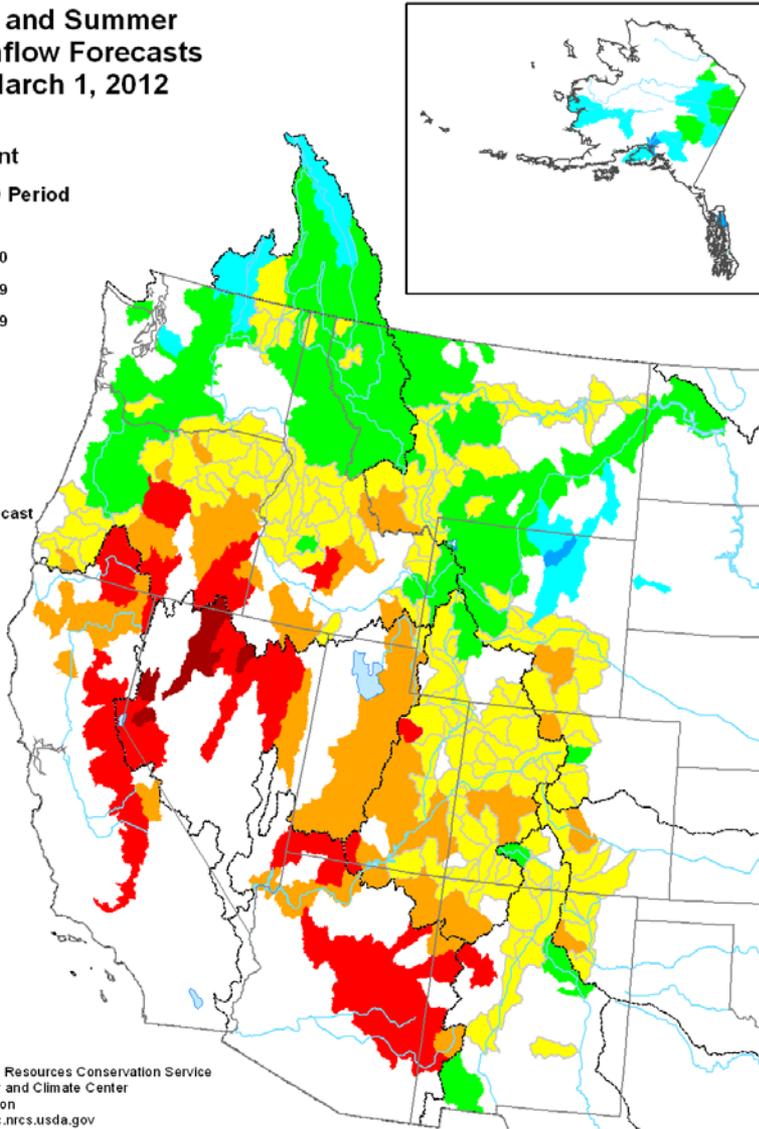
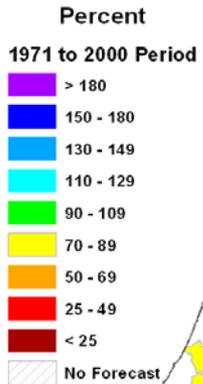
State contributions to national production (percentages in parentheses) are based upon National Agricultural Statistics Service (NASS) 2007 Census of Agriculture data. More information on NASS data can be found at <http://www.nass.usda.gov/>.



Agricultural Weather Assessments
World Agricultural Outlook Board



Spring and Summer Streamflow Forecasts as of March 1, 2012

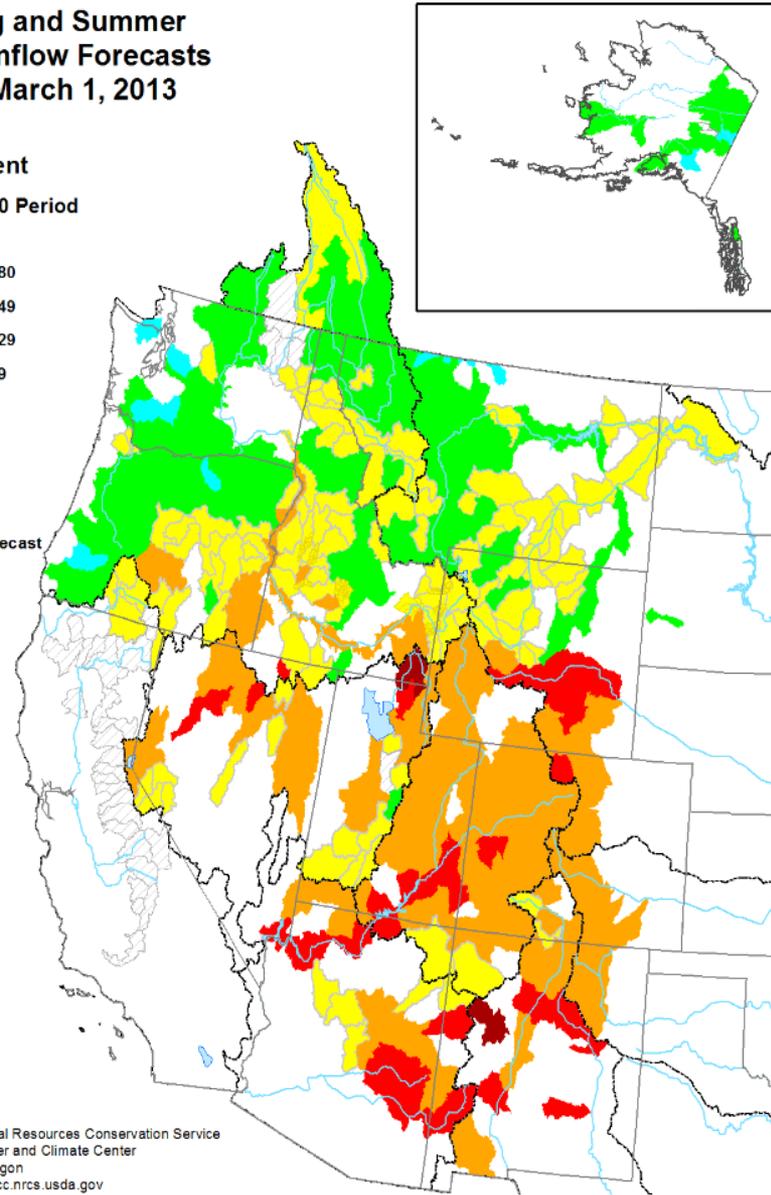
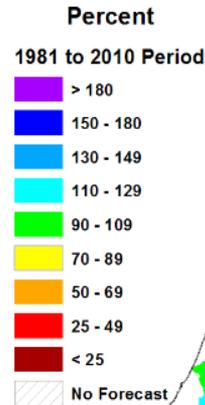


Prepared by
 USDA, Natural Resources Conservation Service
 National Water and Climate Center
 Portland, Oregon
<http://www.wcc.nrcs.usda.gov>

compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

Based on data from <http://www.wcc.nrcs.usda.gov/reports/>
 Science contact: Jim.Marron@por.usda.gov 503 414 3047

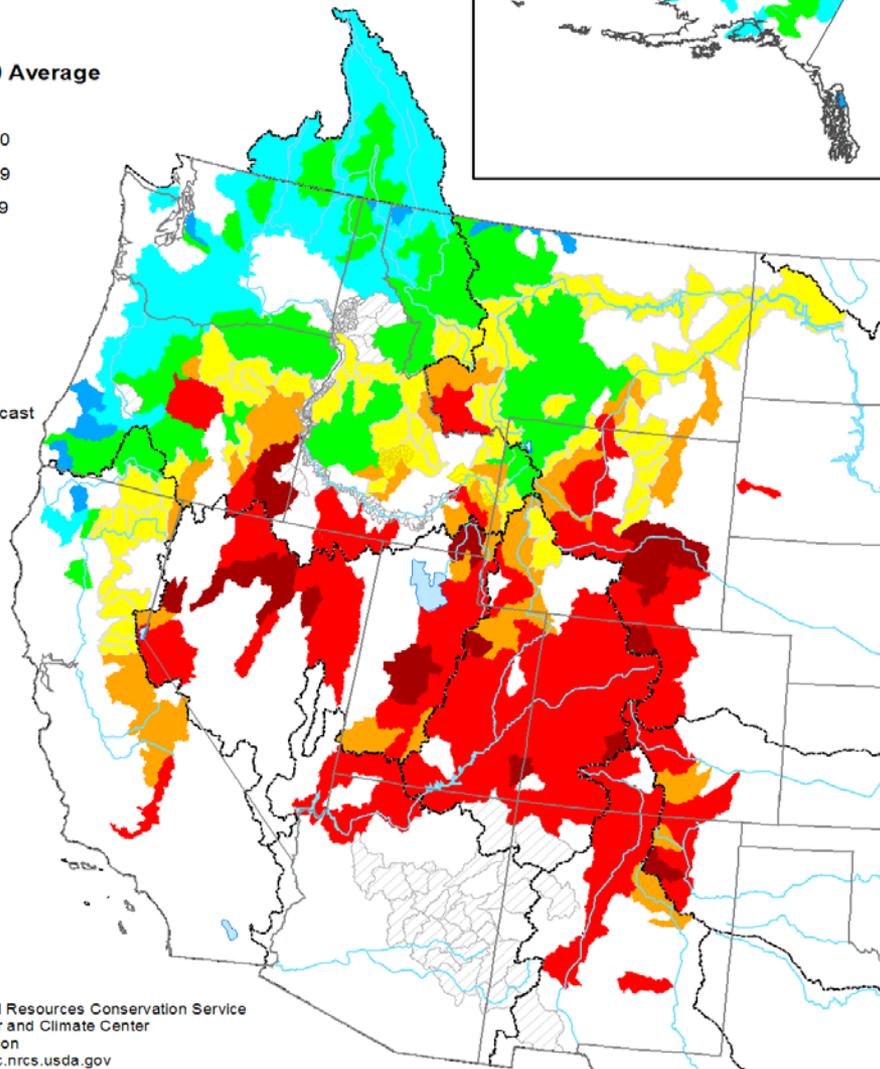
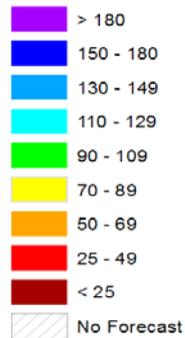
Spring and Summer Streamflow Forecasts as of March 1, 2013



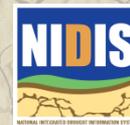
Prepared by
 USDA, Natural Resources Conservation Service
 National Water and Climate Center
 Portland, Oregon
<http://www.wcc.nrcs.usda.gov>

Spring and Summer Streamflow Forecasts as of May 1, 2012

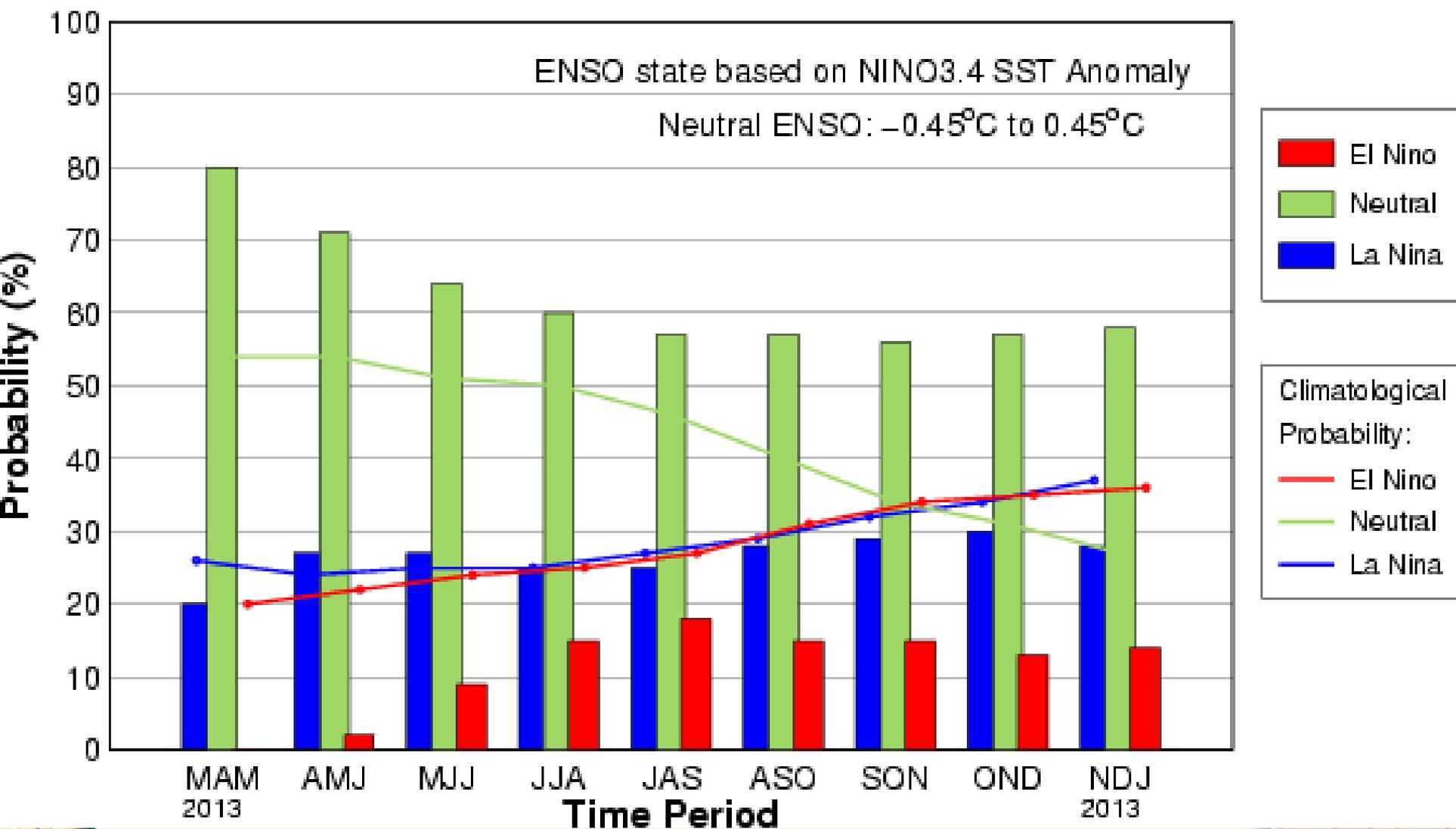
Percent
1971 to 2000 Average



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



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



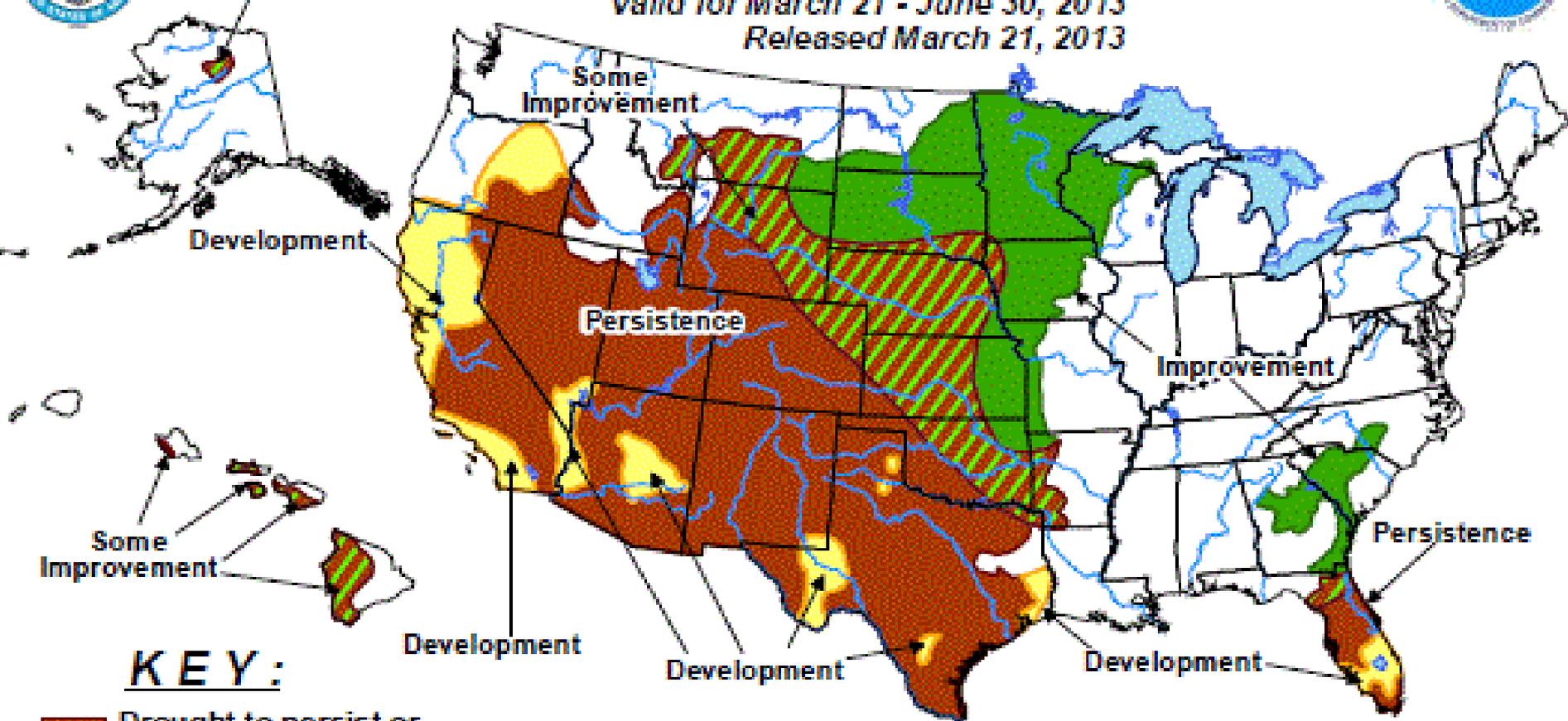


U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for March 21 - June 30, 2013

Released March 21, 2013



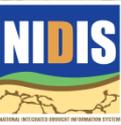
KEY:

-  Drought to persist or intensify
-  Drought ongoing, some improvement
-  Drought likely to improve, impacts ease
-  Drought development likely

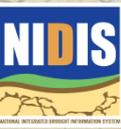
Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Short-term events – such as individual storms – cannot be accurately forecast more than a few days in advance. Use caution for applications – such as crops – that 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.

Climate Summary

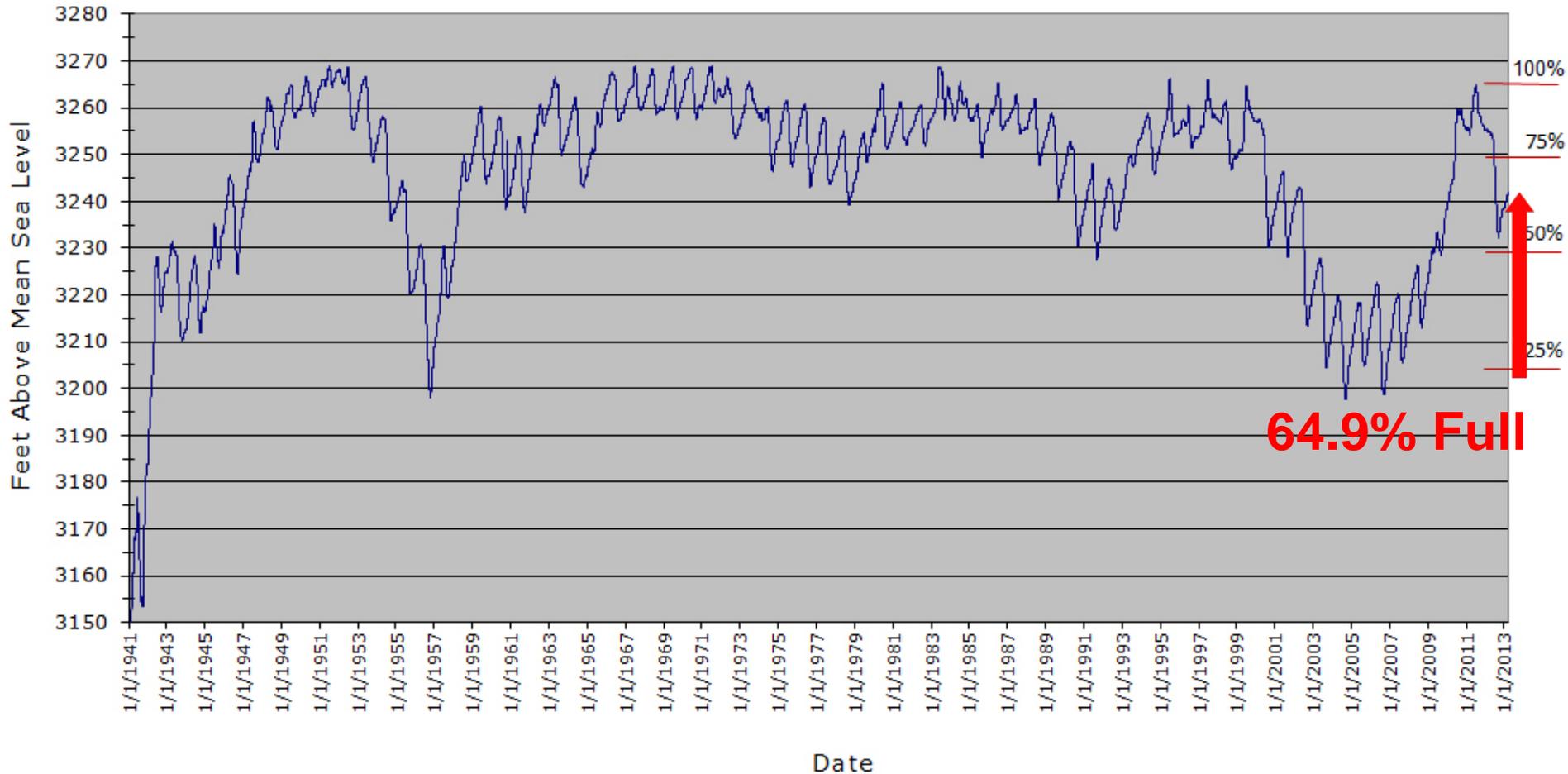
- ❑ 2012-13 Fall and Winter **none-too-kind** for most thus far!
 - U.S. (contiguous) has seen a **13% decrease** in areal drought coverage since its peak (65%) last September, but we still have **52% of the U.S. in drought** heading into Spring as compared to 30% last year this time
 - Most improvement has been seen in the **Southeast and eastern Corn Belt**
 - **Snow pack** (lack thereof) in the Rockies is a big concern (MO Basin)
 - So, recent storms have helped, **but.....**
- ❑ As of the end of February, Nebraska's winter wheat crop has **50 percent rated poor to very poor** and only 12 percent rated good to excellent. A year ago, only 6 percent of the State's crop rated poor to very poor and 65 percent was rated good to excellent.
 - Winter wheat conditions are **also worse this year than last** in Oklahoma (54%P/VP), South Dakota (66% P/VP), Kansas (36% P/VP), and Texas (45% P/VP) at the end of February 2013. **SOURCE: USDA Wheat Outlook**
- ❑ **Spring rains will be critical** for soil moisture recharge
 - grain/forage prospects tied to this
- ❑ **No buffer/carryover coming into 2013**, unlike 2012...will be living rain event to event much earlier...heat waves likely again if below-normal soil moisture recharge plays out
- ❑ Climate Prediction Center's Seasonal Drought Outlook calls for **general drought persistence, but some improvement of drought in NE and the Central Plains along with improvement in the northern Plains** between now and the end of June.



Nebraska Water Supply Update...



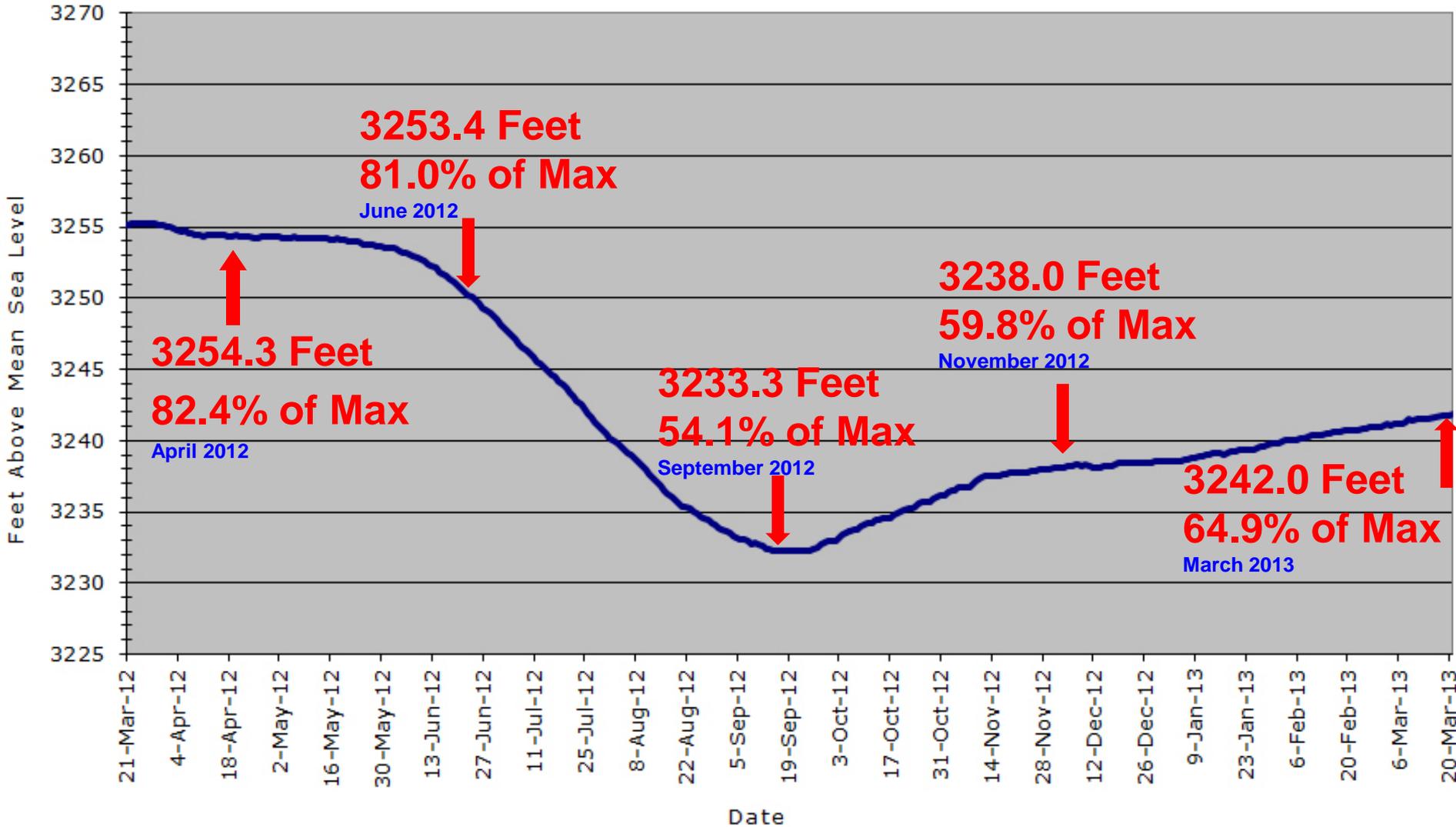
Lake McConaughy Elevation 1941 to Present



SOURCE: CNPPID www.cnppid.com

Lake McConaughy Elevation

March 21, 2012 to March 21, 2013



SOURCE: CNPPID 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 (Current, Average & Median Inflow graph)	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](#))

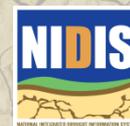
** Flow too low for gauge to measure

@ - 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



December 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 (Current, Average & Median Inflow graph)	1,178	1,313	1,150	1,374
Total Lake McConaughy Outflow	0	925	0	1,447
North Platte below Keystone Dam	9	10	18	194
Keystone Dam Diversion	694	719	0	1,322
North Platte at North Platte	361	391	220	577
South Platte at Roscoe	1.3	5.3	21	316
South Platte at North Platte	168	166	101	459
Diversion to CNPPID Supply Canal	410	407	400	2,155
Platte River at Overton	301	203	1,477	2,950
Platte River at Kearney	1,040	219	870	2,760
Platte River at Grand Island	340	239	46	2,380

* 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](#))

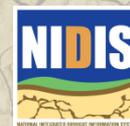
** Flow too low for gauge to measure

@ - 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



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](#))

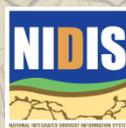
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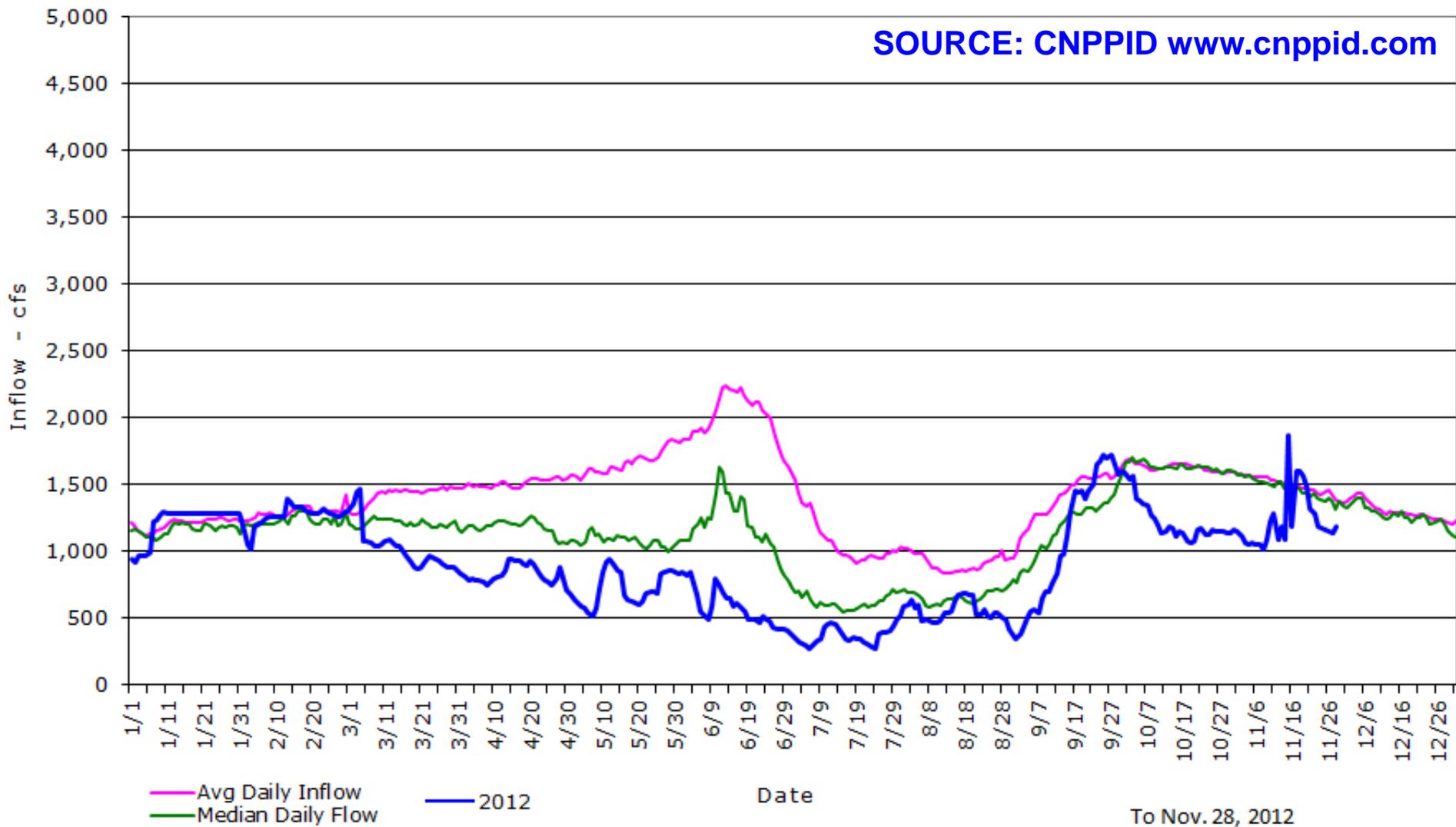
SOURCE: CNPPID www.cnppid.com



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.

SOURCE: CNPPID www.cnppid.com



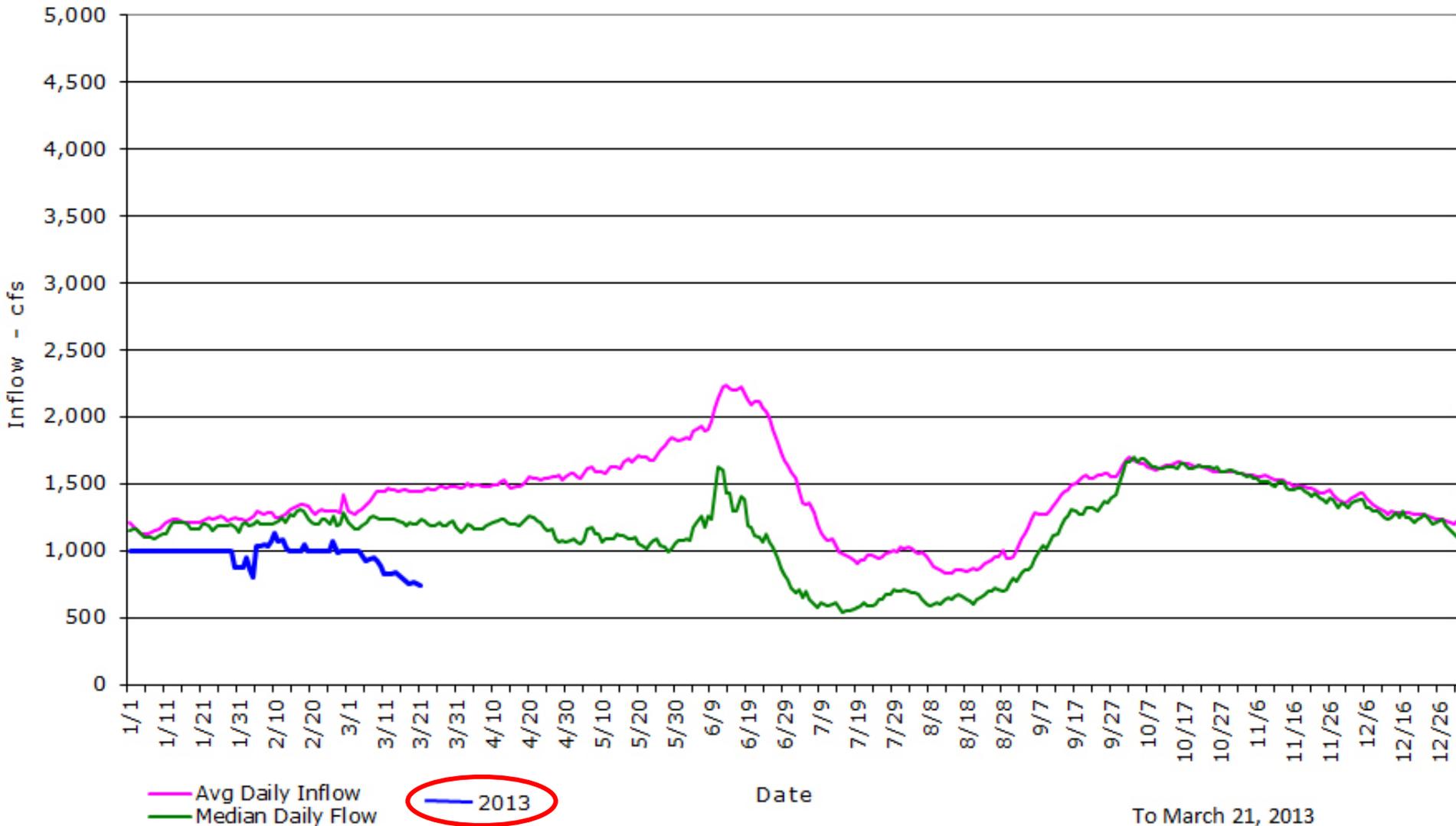
To Nov. 28, 2012



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.



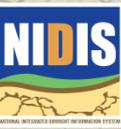
To March 21, 2013

Lake McConaughy

Civil engineer Cory Steinke reported that snowpack accumulation in the Upper North Platte River Basin is currently **79 percent (81%)** of normal, **66 percent (66%)** in the Lower North Platte Basin, and **73 percent (82%)** in the South Platte Basin. Lake McConaughy is at elevation 3241.2 feet and a volume of 1,113,800 acre-feet (**64 percent of capacity**). Recent inflows have been about 1,000 cubic feet per second, or **86 percent** of normal.

Note: Values in (%) are current as of 3/22/13

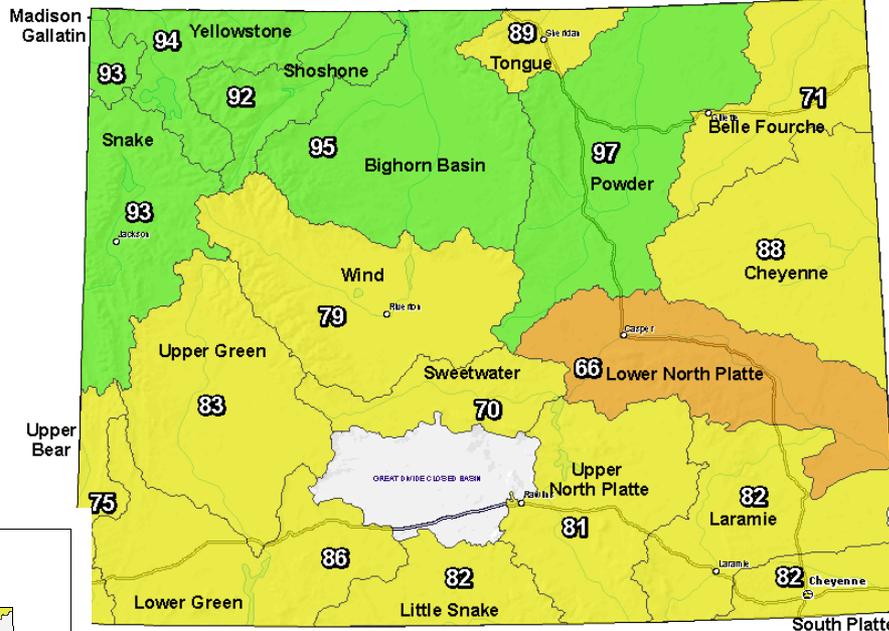
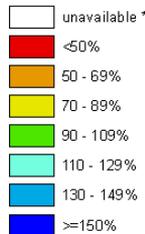
SOURCE: CNPPID News Release, March 4, 2013



Wyoming SNOTEL Current Snow Water Equivalent (SWE) % of Normal

Mar 22, 2013

Current Snow Water Equivalent (SWE) Basin-wide Percent of 1981-2010 Median



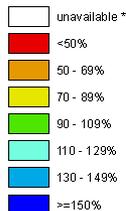
Percent of normal represents the current SNOTEL sites in or near the average value for those sites on this day. Reading of the day (typically 00:00).

Prepared by the USDA NRCS National Water and Climate Center, Portland, Oregon <http://www.wcc.nrcs.usda.gov/gis/>. Based on data from <http://www.wcc.nrcs.usda.gov/reports/>. Science contact: Jim Marron@por.usda.gov 503 414 3047

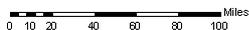
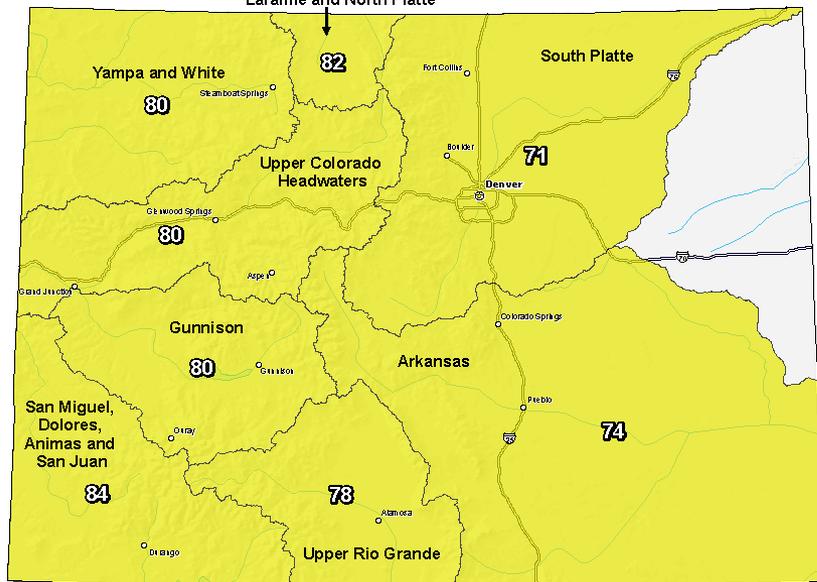
Colorado SNOTEL Current Snow Water Equivalent (SWE) % of Normal Laramie and North Platte

Mar 22, 2013

Current Snow Water Equivalent (SWE) Basin-wide Percent of 1981-2010 Median

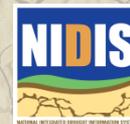


* Data unavailable at time of posting or measurement is not representative at this time of year.
Provisional Data Subject to Revision



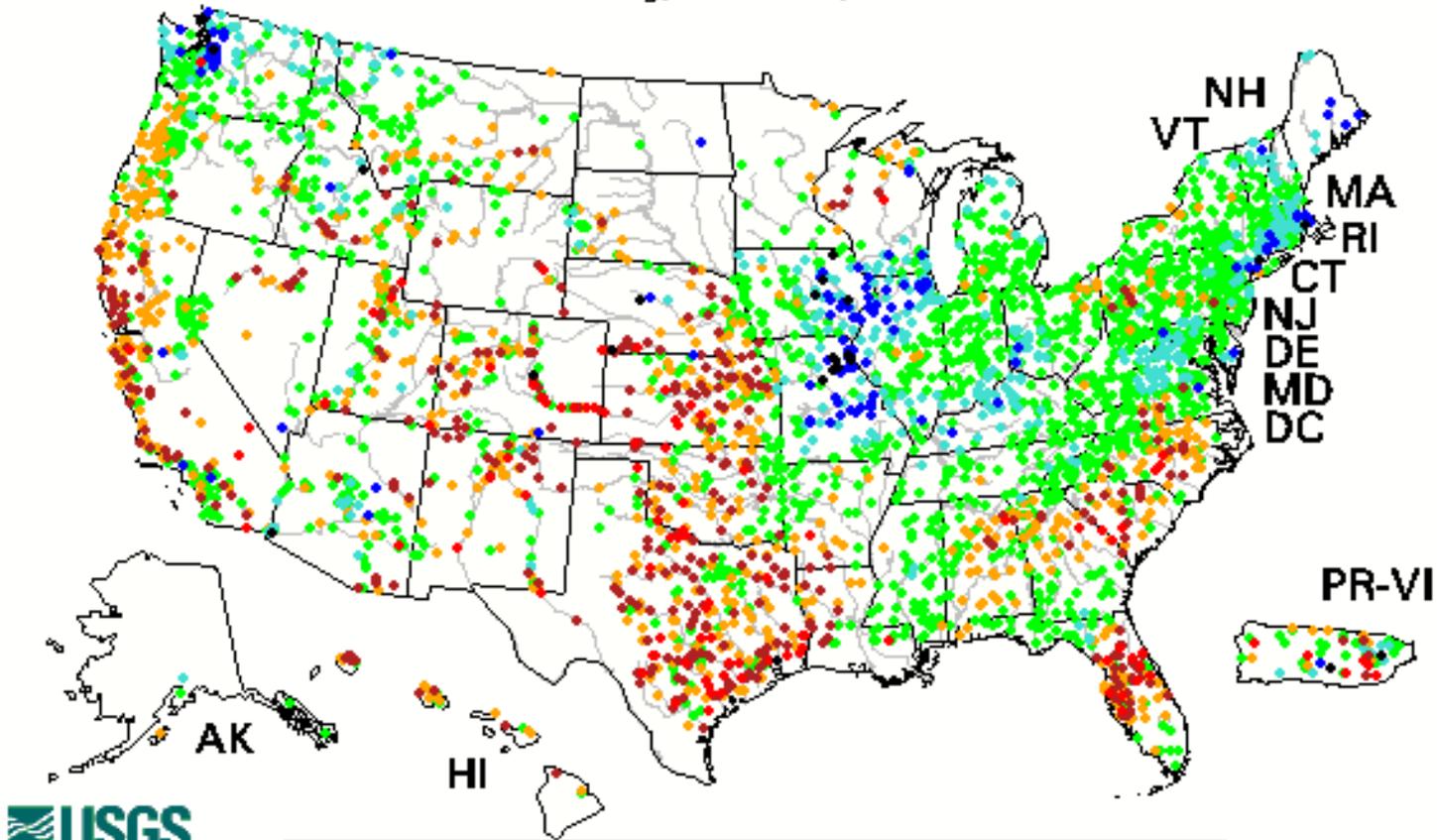
The snow water equivalent percent of normal represents the current snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

Prepared by the USDA NRCS National Water and Climate Center, Portland, Oregon <http://www.wcc.nrcs.usda.gov/gis/>. Based on data from <http://www.wcc.nrcs.usda.gov/reports/>. Science contact: Jim Marron@por.usda.gov 503 414 3047

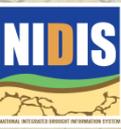


14-day average streamflow compared to historical streamflow for the day of year

Thursday, March 21, 2013

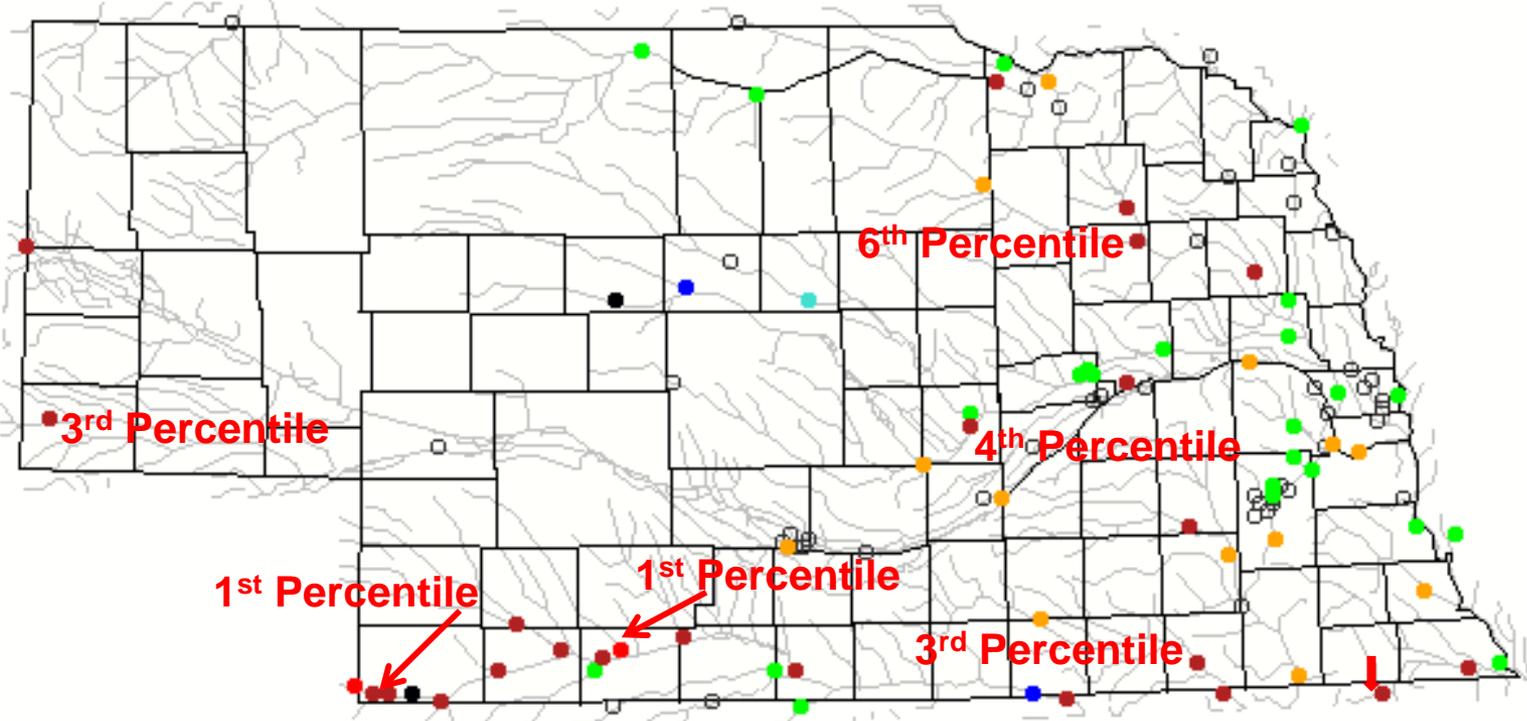


Explanation - Percentile classes							
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		



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

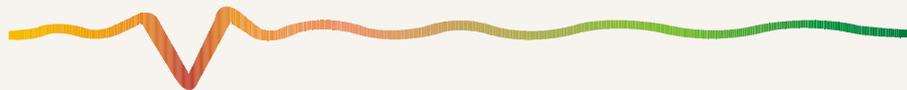
Thursday, March 21, 2013



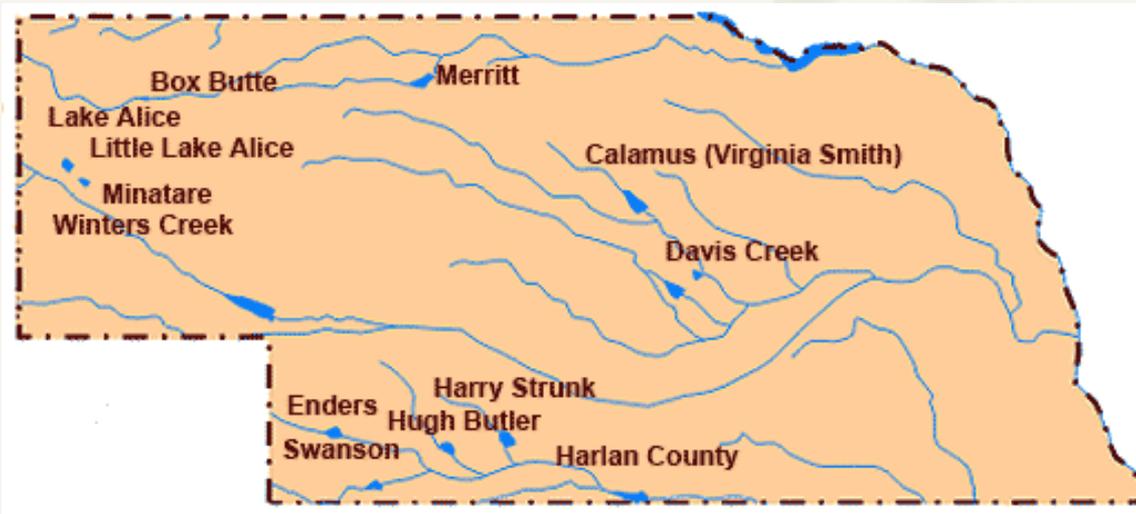
Explanation - Percentile classes							
Low	<10 Much below normal	10-24 Below normal	25-75 Normal	76-90 Above normal	>90 Much above normal	High	Not-ranked



Republican River Basin

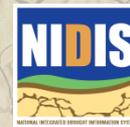


- ▶ **Hugh Butler:** 21.7% (15.2%) of conservation pool
- ▶ **Enders:** 36.1% (34.9%) of conservation pool
- ▶ **Harry Strunk:** 74.6% (48.7%) of conservation pool
- ▶ **Swanson:** 34.5% (33.7%) of conservation pool

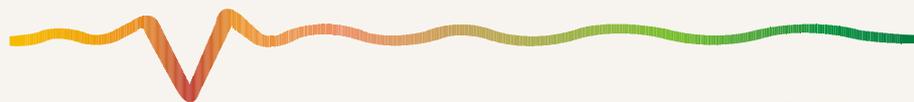


*values in red are from the last CARC meeting in November 2012

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

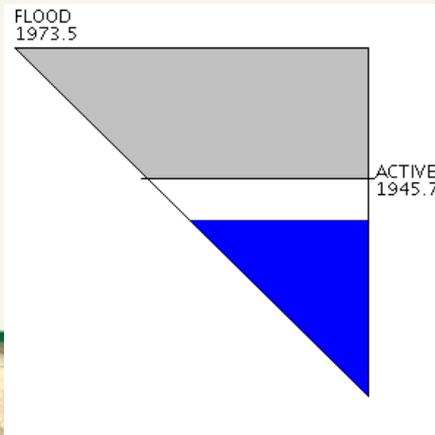


Republican River Basin

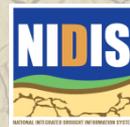


Harlan County Current Conditions

- ✓ Conservation Pool is 62.2% full (60.9%)
- ✓ 195,434 Acre-Feet in storage compared to 191,330 Acre-Feet of water in storage on November 28, 2012.
- ✓ Last year at this time, 321,475 AF was in storage.
- ✓ Historical storage for this time of the year is 248,689 AF



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



Water Supply Summary

- ❖ The Drought of 2012-2013 will continue to impact water supply across the state and the depleted soil moisture across Nebraska will lead to less available runoff potential and little recovery anticipated to reservoirs in the state at this time.
- ❖ We anticipate more hydrologic impacts developing due to drought in 2013 without any significant changes this spring as the 2012 drought becomes a multi-year event.
- ❖ Lake McConaughy has increased in elevation but is still 13 feet below where it was in March 2012. Winter snowpack upstream in the Rocky Mountains has been well below normal this winter and the drought conditions in Wyoming and Colorado will likely mean less available runoff and water coming into Nebraska in 2013.
- ❖ Storage in the Republican River has stabilized and improved over the winter months compared to levels at the end of November 2012. Harlan County is over 126,000 Acre-Feet lower than in March 2012 and is 53,000 AF lower than the historical average for this time of year.



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