NE Drought Conditions CARC Update: April 2012

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

Current Conditions around Nebraska and the region…

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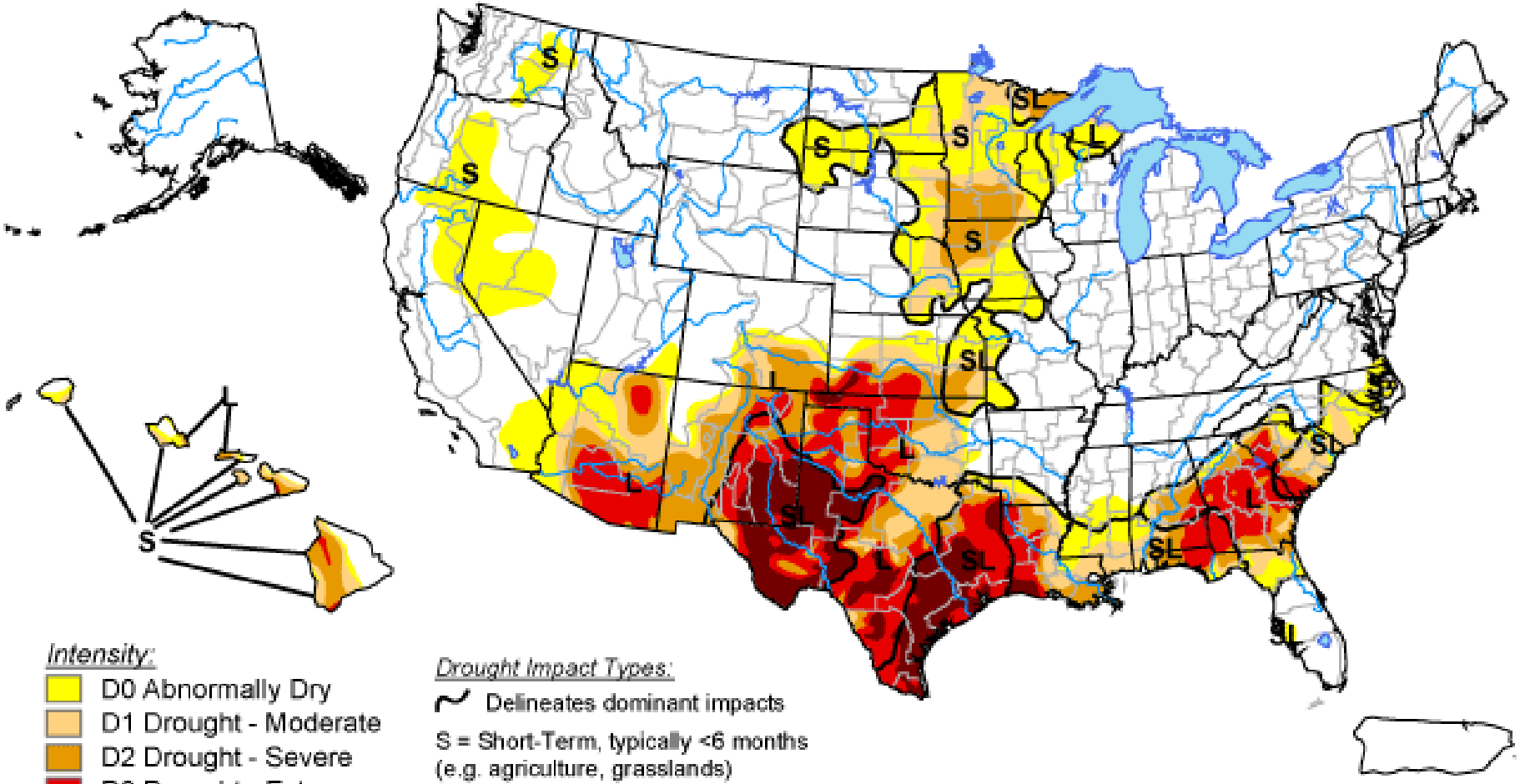
U.S. Drought Monitor

December 13, 2011
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.

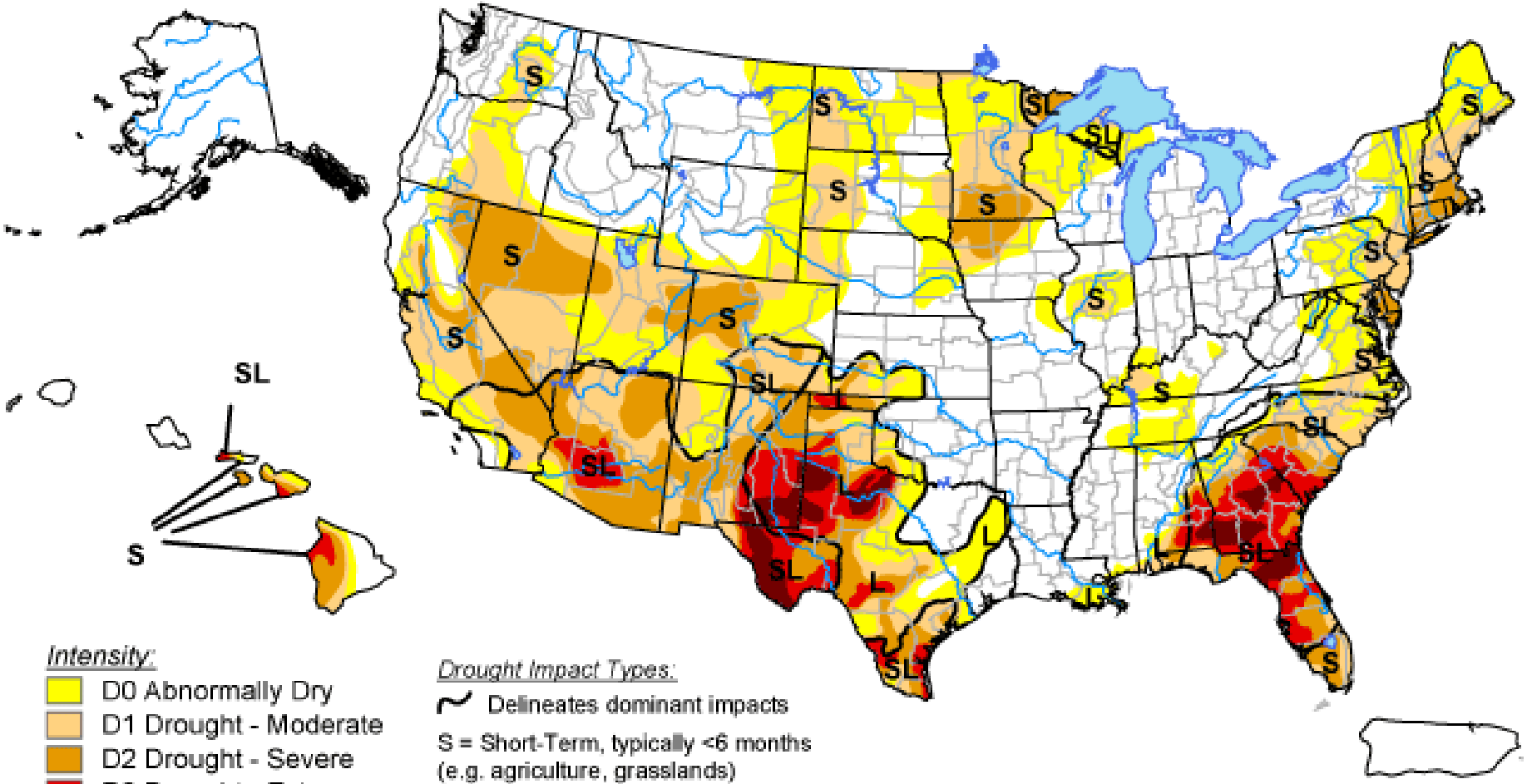
http://droughtmonitor.unl.edu/

Released Thursday, December 15, 2011

Author: Matthew Rosencrans, NOAA/NWS/NCEP/CPC

U.S. Drought Monitor

April 17, 2012
Valid 7 a.m. EDT



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http://droughtmonitor.unl.edu/

Released Thursday, April 19, 2012

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

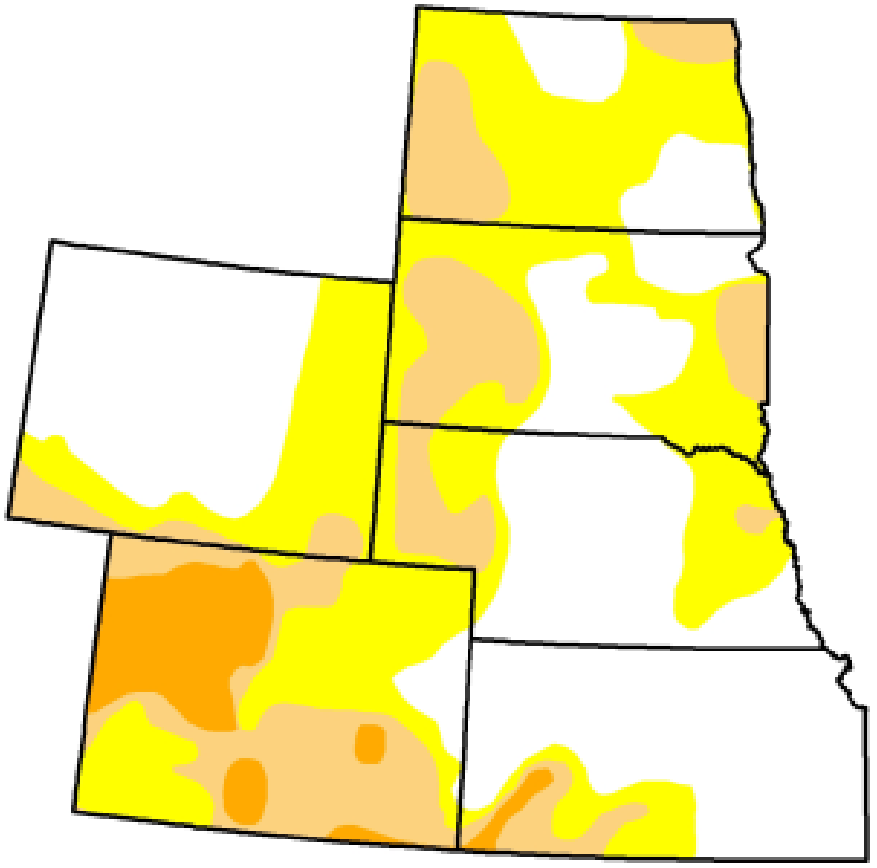
U.S. Drought Monitor

April 17, 2012
Valid 7 a.m. EST

High Plains

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	42.66	57.34	24.30	5.68	0.00	0.00
Last Week (04/10/2012 map)	37.71	62.29	23.92	4.25	0.00	0.00
3 Months Ago (01/17/2012 map)	46.59	53.41	18.52	6.33	2.22	0.04
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 (04/12/2011 map)	62.21	37.79	22.00	10.77	0.00	0.00



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Released Thursday, April 19, 2012
Anthony Artusa, Climate Prediction Center/NCEP/NWS/NOAA

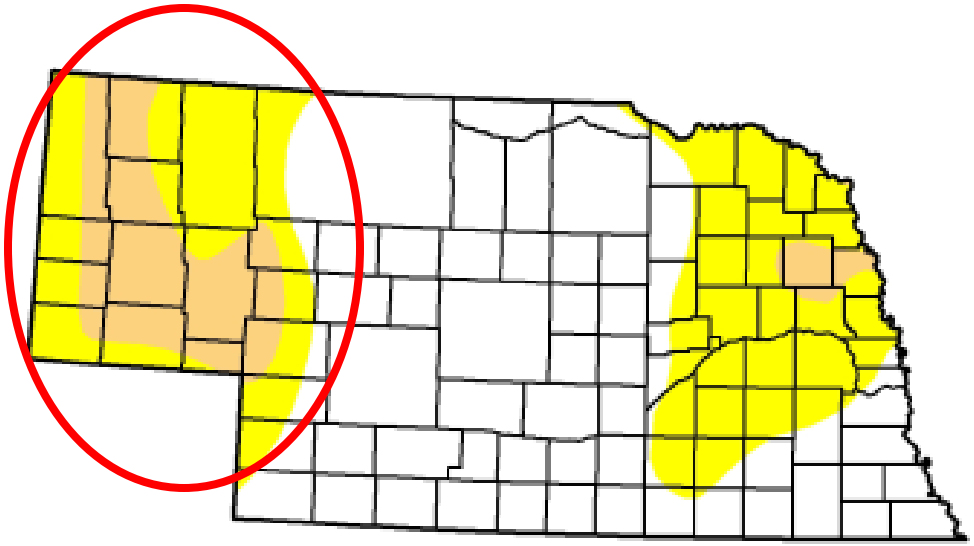
U.S. Drought Monitor

April 17, 2012
Valid 7 a.m. EST

Nebraska

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	57.82	42.18	11.93	0.00	0.00	0.00
Last Week (04/10/2012 map)	52.85	47.15	8.09	0.00	0.00	0.00
3 Months Ago (01/17/2012 map)	67.30	32.70	13.81	0.65	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 (04/12/2011 map)	46.27	53.73	15.21	0.01	0.00	0.00



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http://droughtmonitor.unl.edu

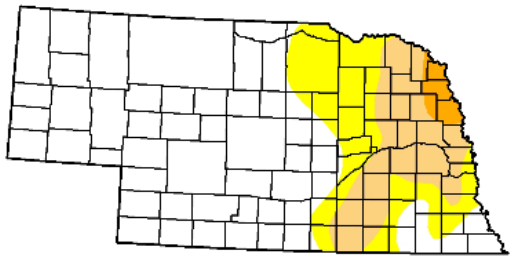
Released Thursday, April 19, 2012
Anthony Artusa, Climate Prediction Center/NCEP/NWS/NOAA

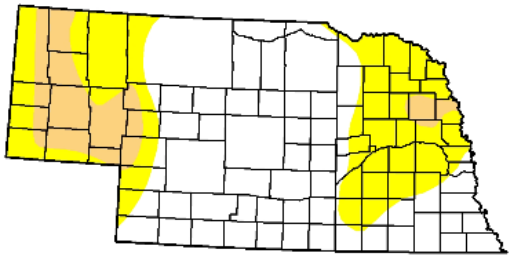
Drought Monitor Archives

Nebraska

Drought Severity

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



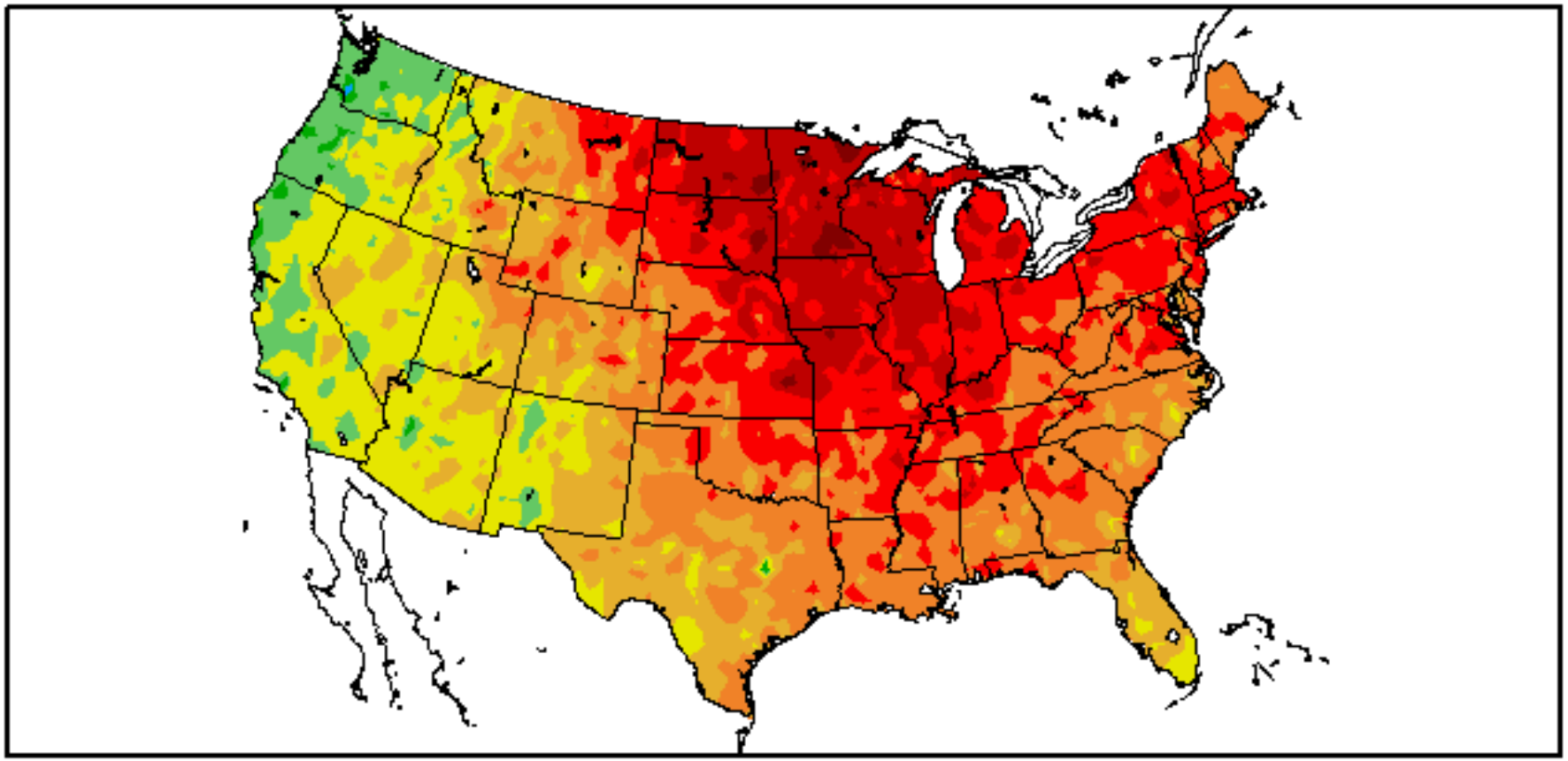


December 13, 2011

April 17, 2012

Week	Nothing	D0-D4	D1-D4	D2-D4	D3-D4	D4
December 13, 2011	68.47	31.53	15.50	1.91	0.00	0.00
April 17, 2012	57.82	42.18	11.93	0.00	0.00	0.00

Departure from Normal Temperature (F)
1/1/2012 – 4/22/2012

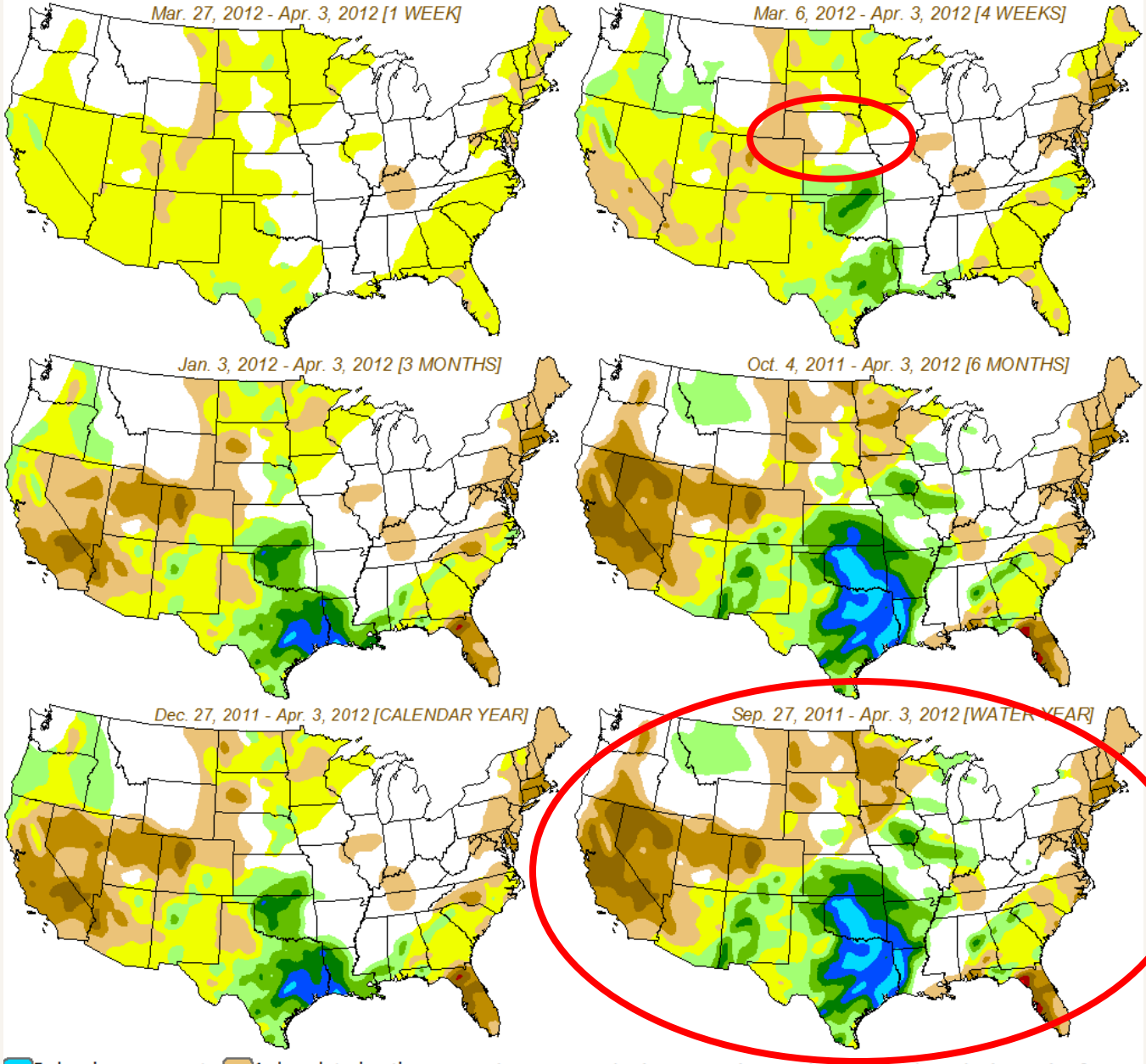


−10 −8 −6 −4 −2 0 2 4 6 8 10

Generated 4/23/2012 at HPRCC using provisional data.

Regional Climate Centers

Drought Monitor Classification Changes for Selected Time Periods



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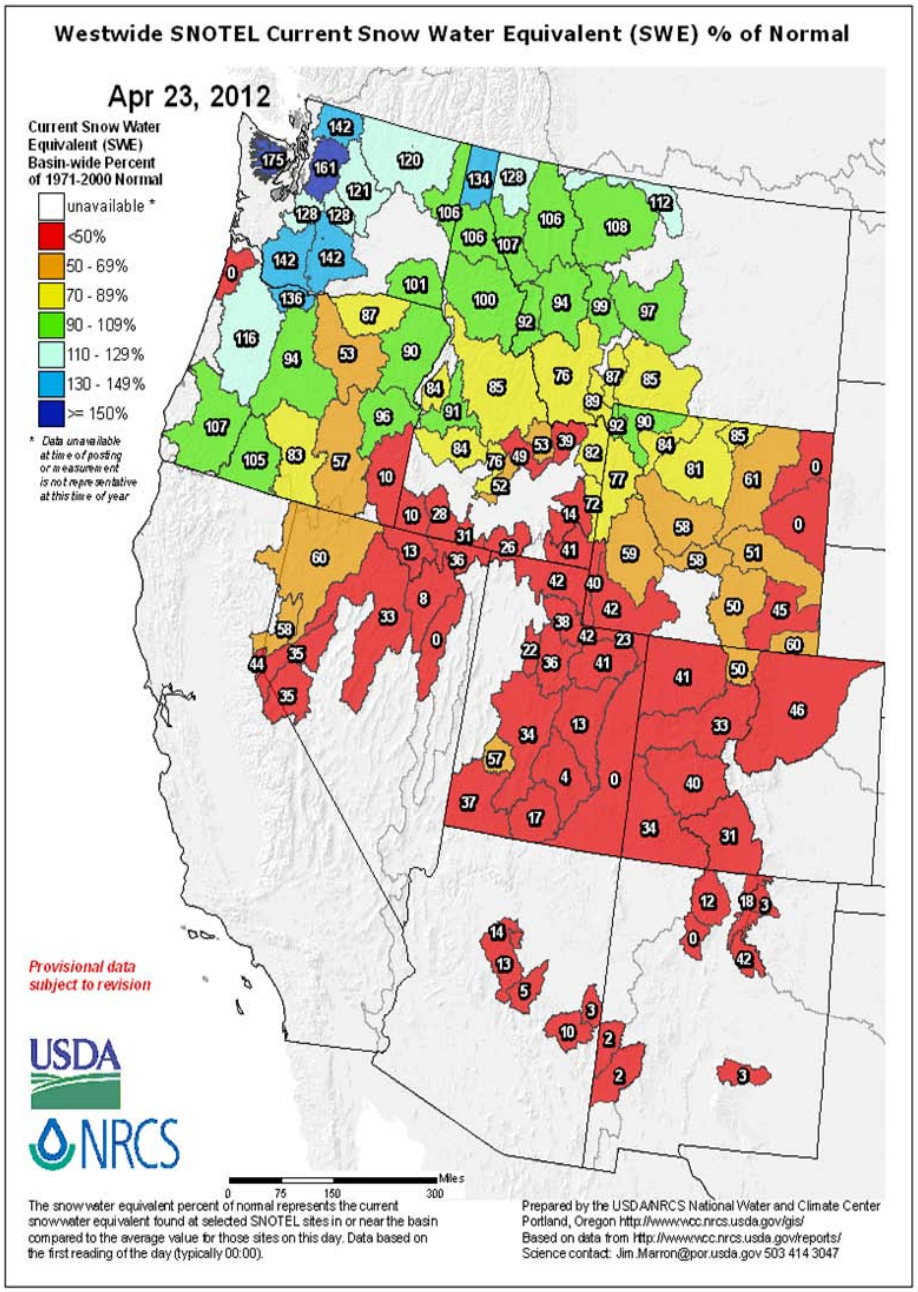
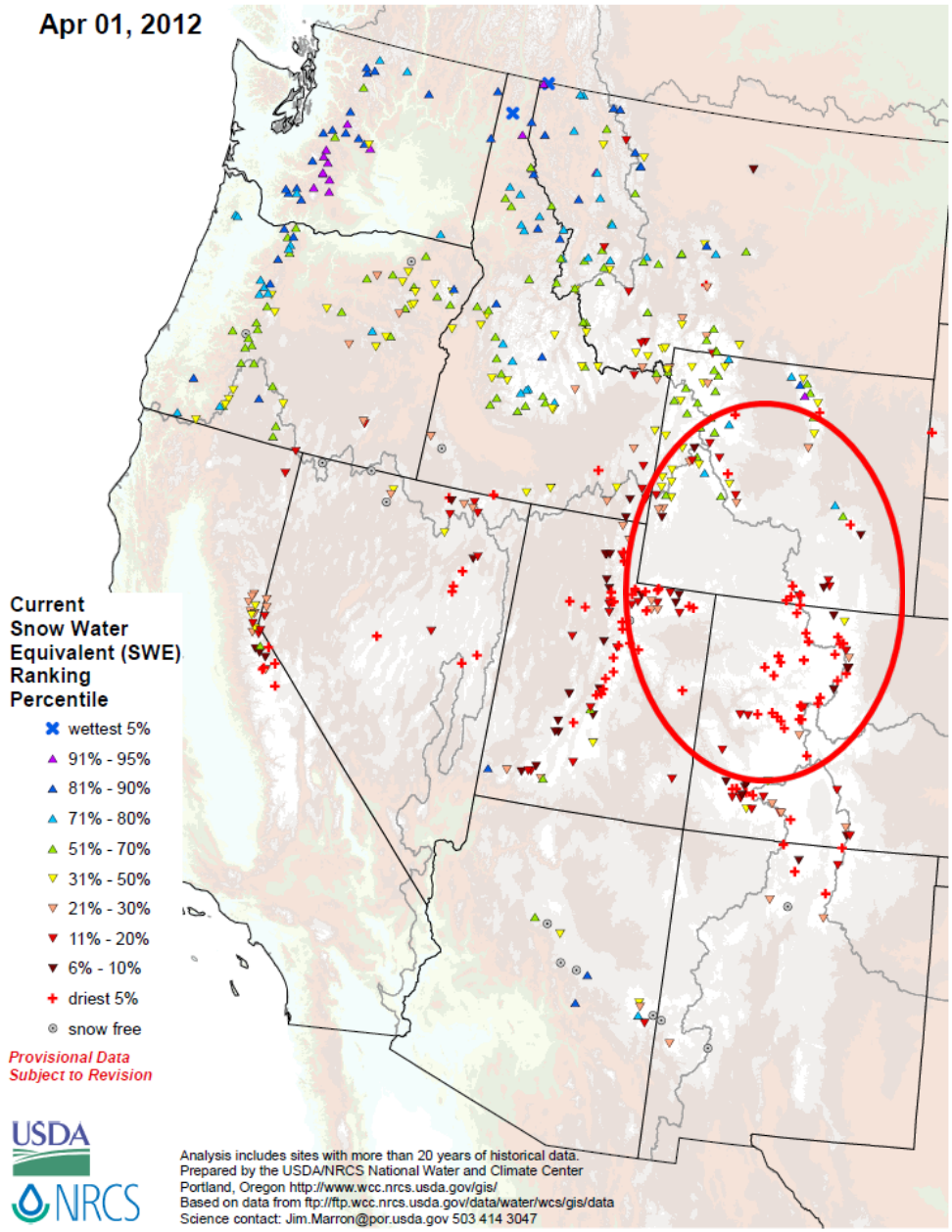
Westwide SNOTEL Current Snow Water Equivalent (SWE) % of Normal

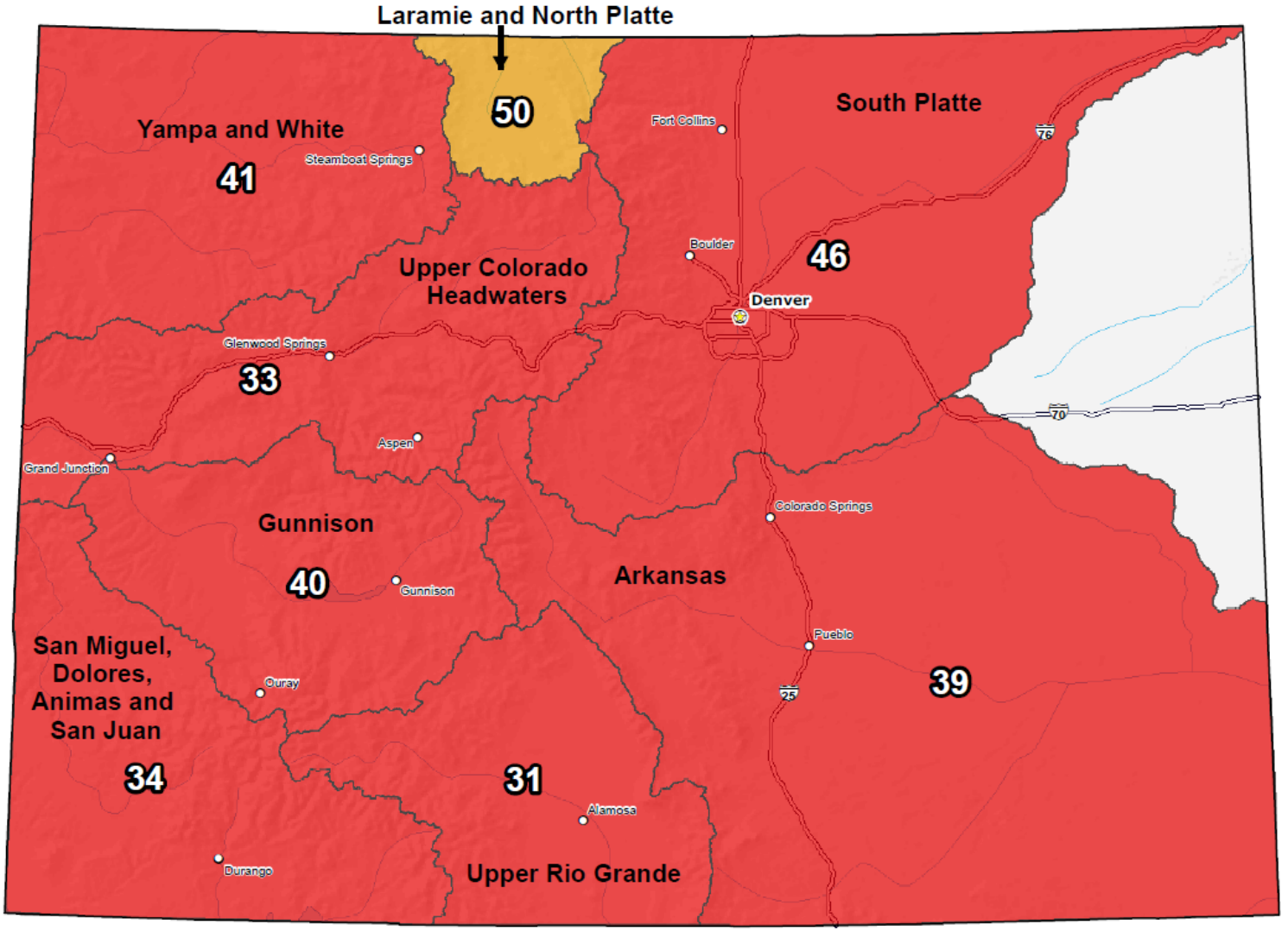


SNOTEL Current Snow Water Equivalent (SWE) Ranking Percentile



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

Apr 23, 2012



Current Snow Water Equivalent (SWE) Basin-wide Percent of 1971-2000 Normal

- unavailable *
- <50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- >=150%

* *Data unavailable at time of posting or measurement is not representative at this time of year*

Provisional Data Subject to Revision

Miles
0 10 20 40 60 80 100

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

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

Apr 23, 2012

Current Snow Water Equivalent (SWE) Basin-wide Percent of 1971-2000 Normal

- unavailable *
- <50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
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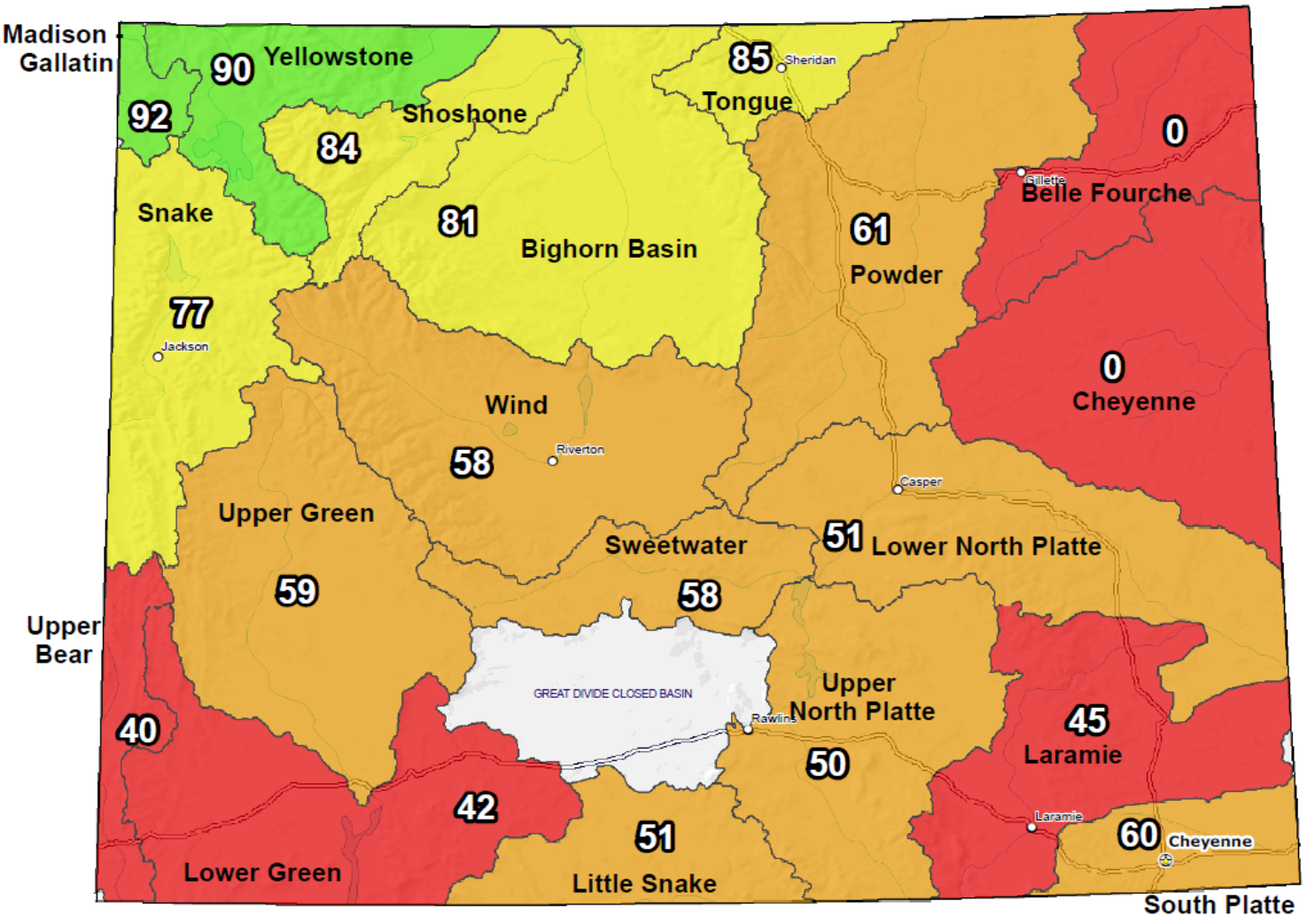

Provisional Data Subject to Revision

USDA NRCS

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Prepared by the USDA/NRCS National Water and Climate Center
Portland, Oregon http://www.wcc.nrcs.usda.gov/gis/
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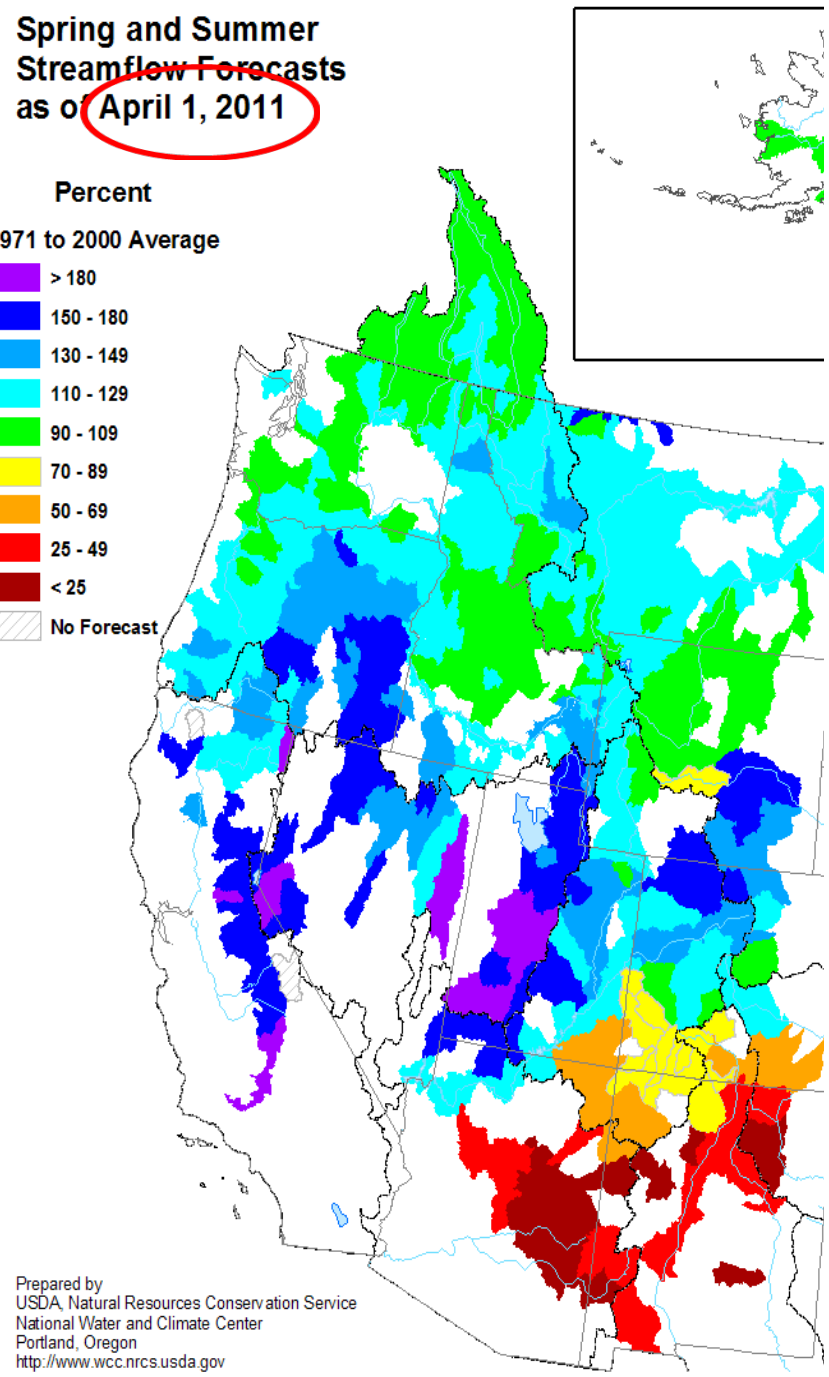
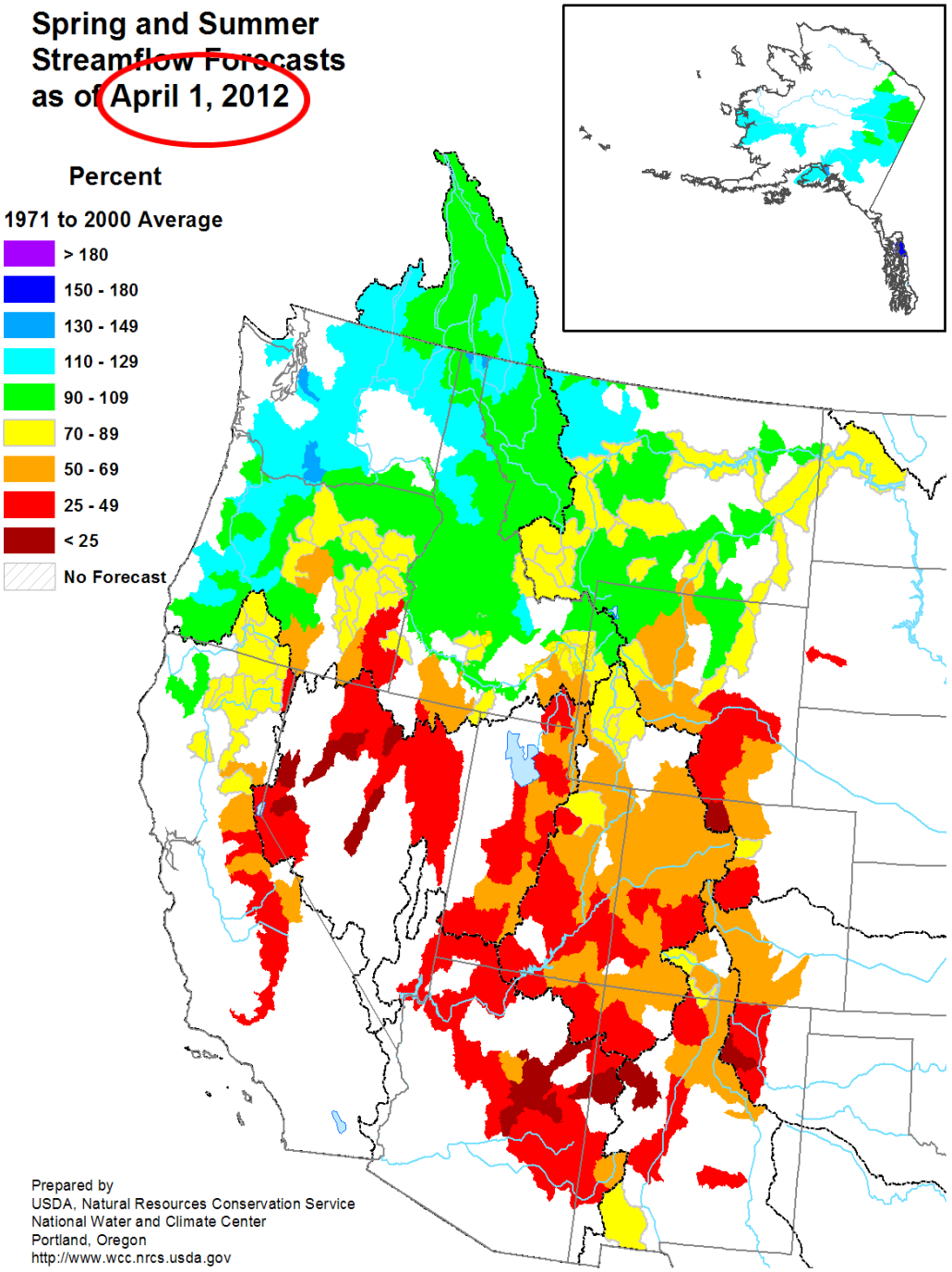

Spring and Summer
Streamflow Forecasts
as of April 1, 2011
Percent
1971 to 2000 Average
> 180
150 - 180
130 - 149
110 - 129
90 - 109
70 - 89
50 - 69
25 - 49
< 25
No Forecast
Prepared by
USDA, Natural Resources Conservation Service
National Water and Climate Center
Portland, Oregon
http://www.wcc.nrcs.usda.gov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Prepared by
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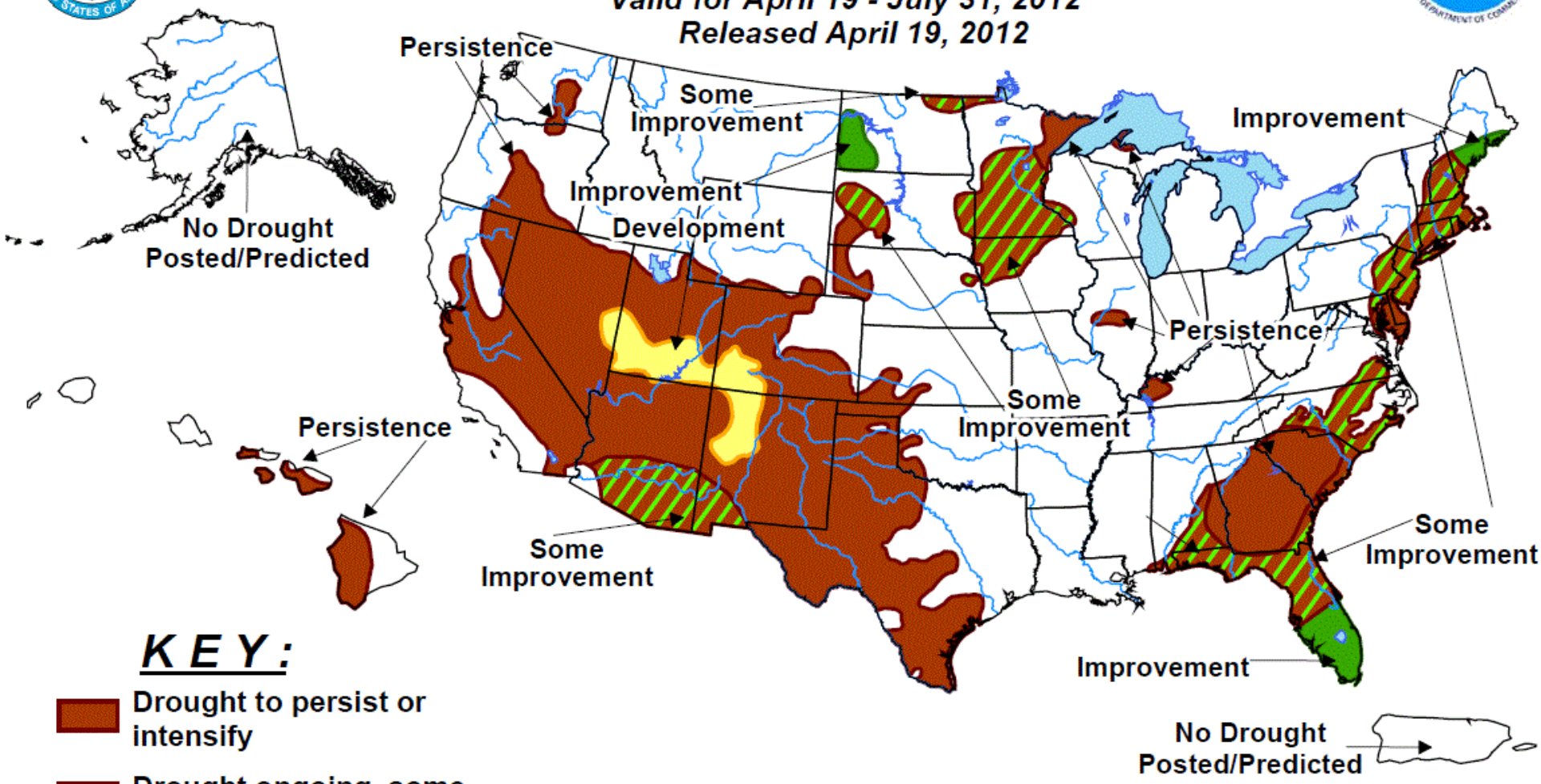
U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for April 19 - July 31, 2012

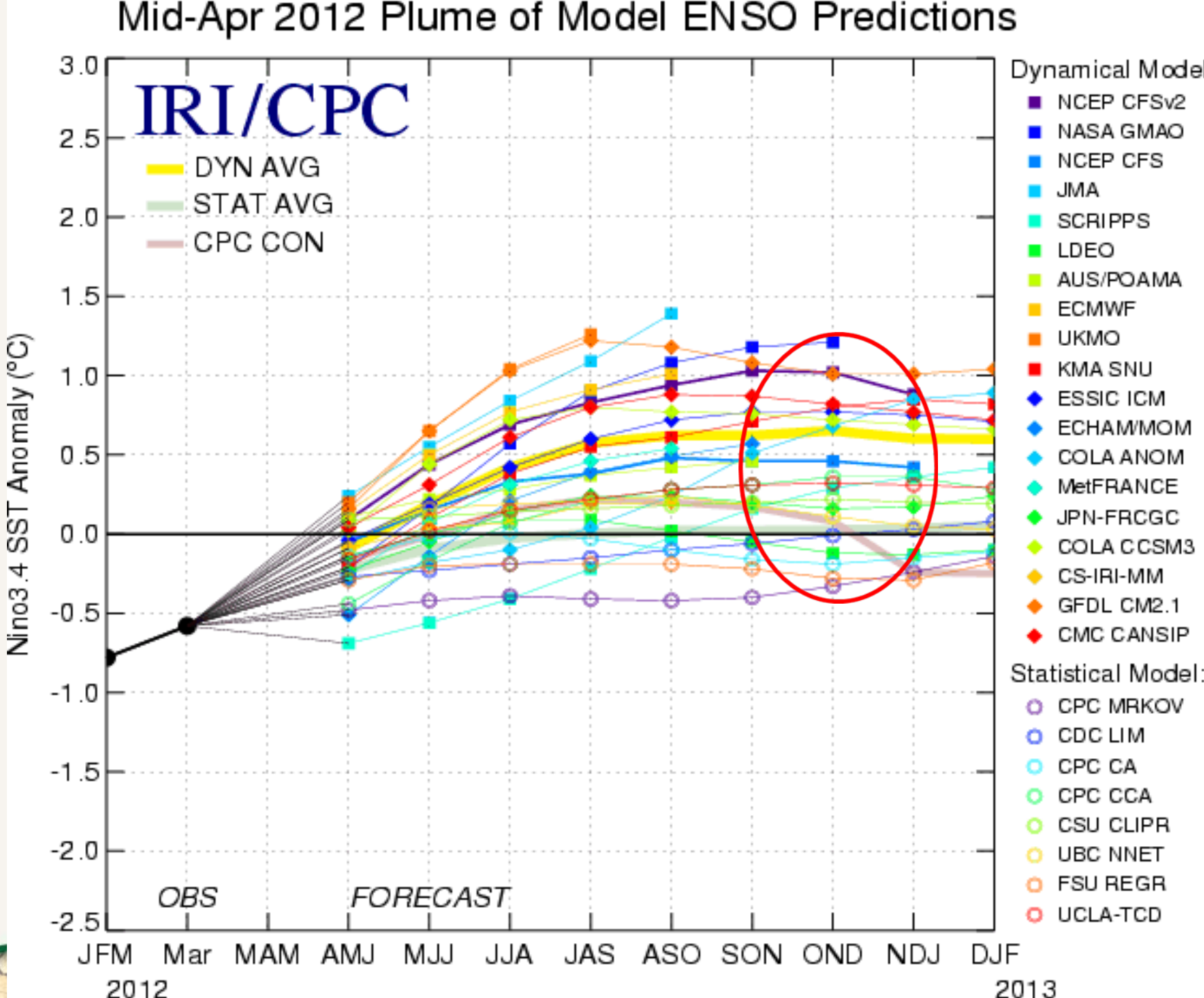
Released April 19, 2012



K E Y :

- 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.


Mid-Apr 2012 Plume of Model ENSO Predictions
IRI/CPC
DYN AVG
STAT AVG
CPC CON
Nino3.4 SST Anomaly (°C)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
OBS
FORECAST
JFM
Mar
MAM
AMJ
MJJ
JJA
JAS
ASO
SON
OND
NDJ
DJF
2012
2013
Dynamical Model:
NCEP CFSv2
NASA GMAO
NCEP CFS
JMA
SCRIPPS
LDEO
AUS/POAMA
ECMWF
UKMO
KMA SNU
ESSIC ICM
ECHAM/MOM
COLA ANOM
MetFRANCE
JPN-FRCGC
COLA CCSM3
CS-IRI-MM
GFDL CM2.1
CMC CANSIP
Statistical Model:
CPC MRKOV
CDC LIM
CPC CA
CPC CCA
CSU CLIPR
UBC NNET
FSU REGR
UCLA-TCD

Climate Summary

- **Relatively dry heading into Spring/Summer 2012**
  - ***12% of NE in D0-D1*** **(no D2-D4 at present)**
  - ***Recharge*** **season has been** ***hit and miss***
  - ***Hot and dry March*** **was a big story region-wide ramping up demand early**
  - **Models trending toward** ***Neutral/El Nino (~90%)*** **later this summer into fall (IRI).....**
- **Rockies snow pack** ***NOT*** **good and needs a "miracle" end to April and May**
  - **Most basins feeding the North and South Platte basins are at** ***< 50% of snow water equivalent*** **and resultant** ***streamflow forecasts*** **are generally** ***around 50% of normal***
- **Climate Prediction Center's Seasonal Drought Outlook calls for** ***"Some Improvement" to the USDM in ne NE and "Persistence" in the Panhandle*** **between now and the end of July**

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Nebraska Water Supply Update…

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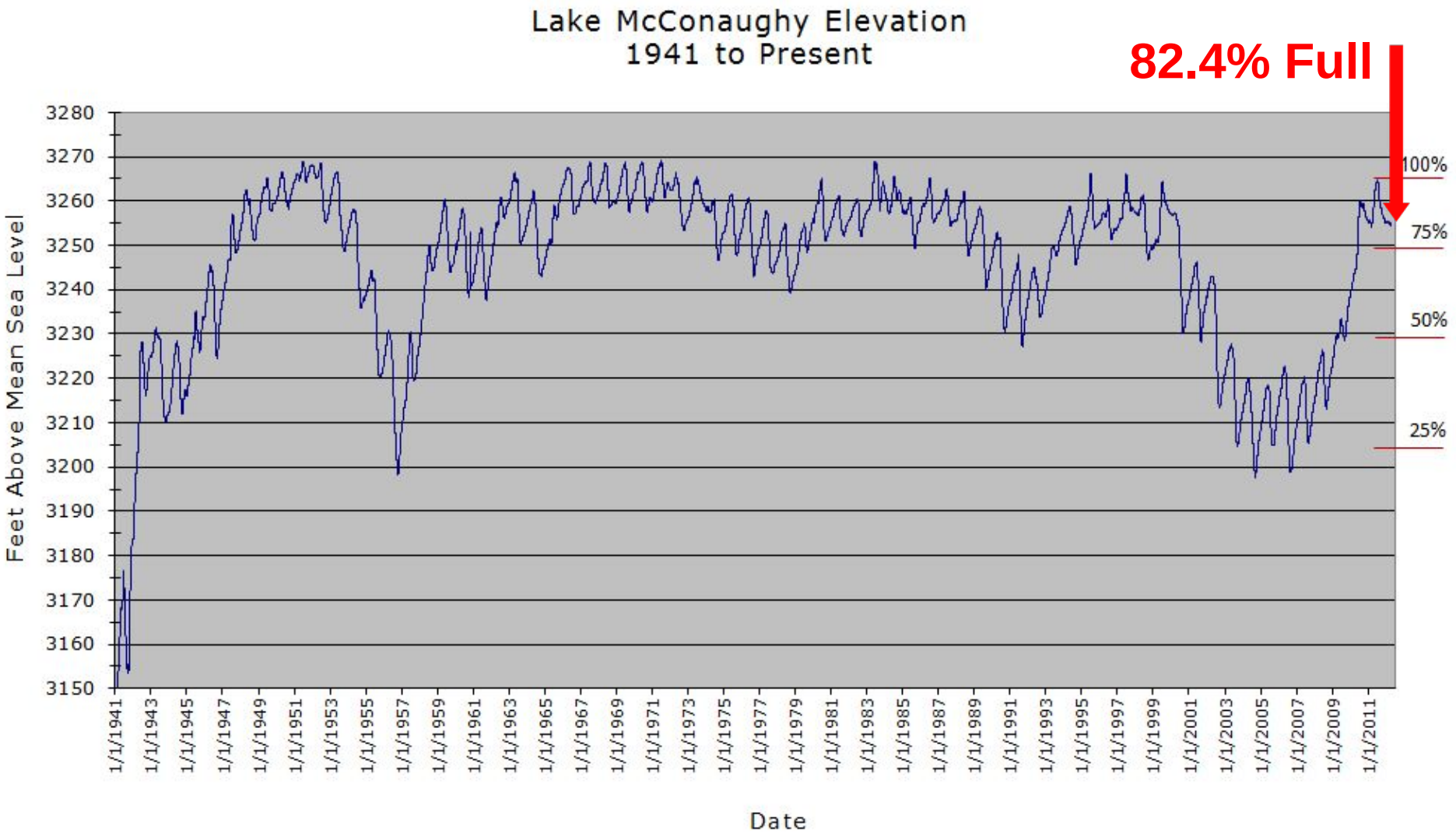
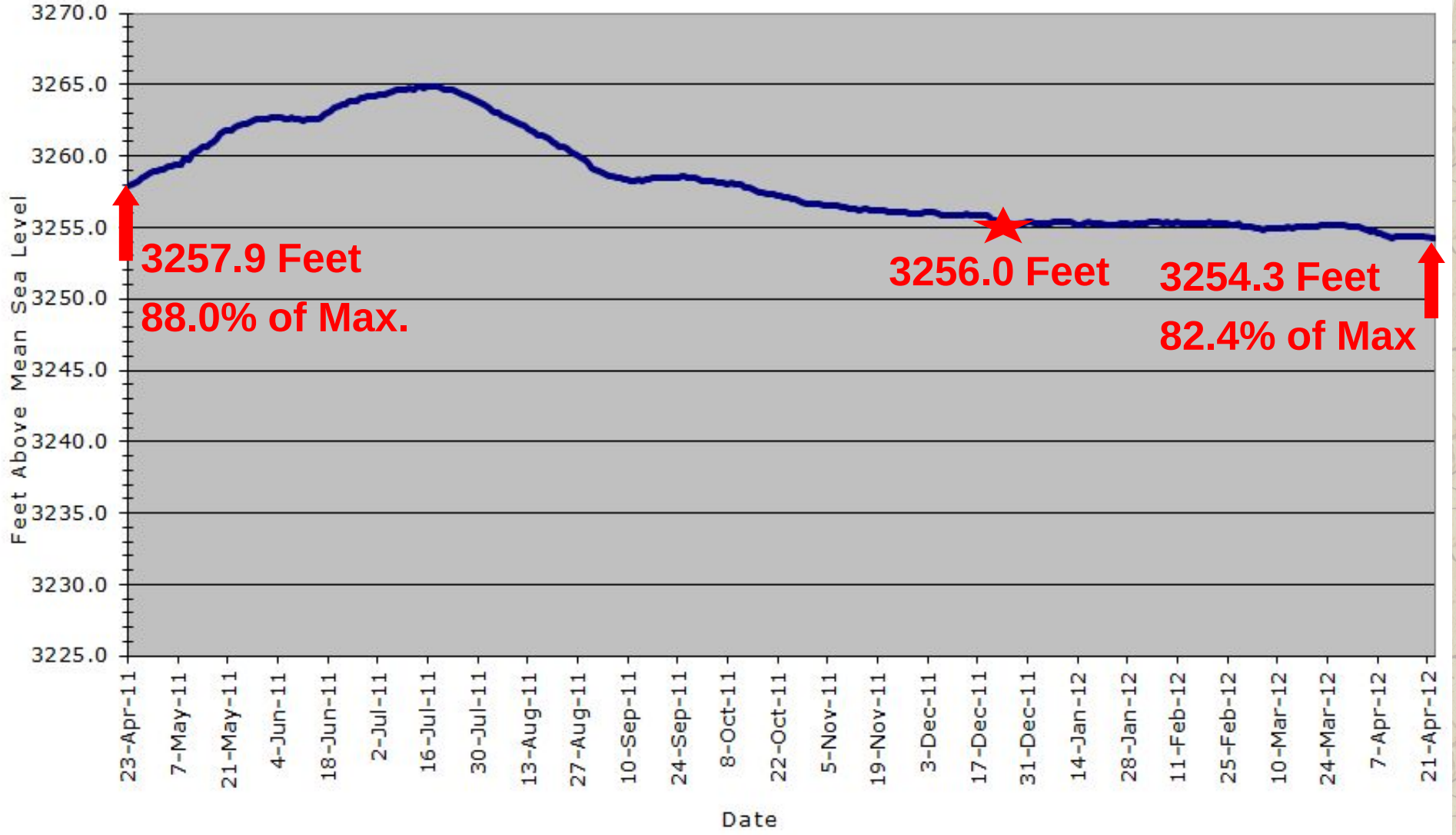


SOURCE: CNPPID www.cnppid.com

Lake McConaughy Elevation

April 23, 2011 to April 23, 2012



SOURCE: CNPPID www.cnppid.com

National Drought Mitigation Center

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)	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

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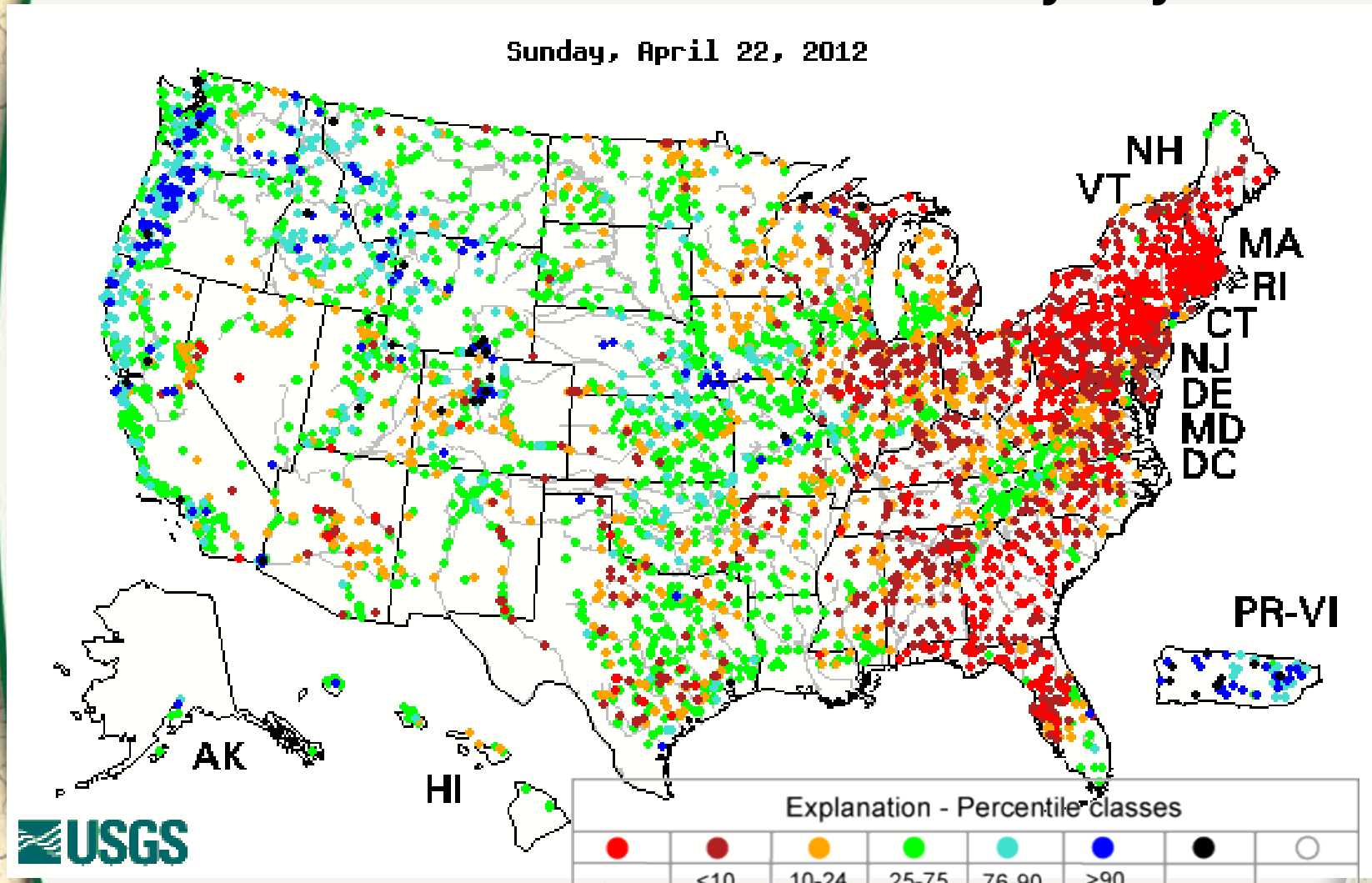
Lake McConaughy

Civil engineer Cory Steinke reported that ***snowpack*** accumulation in the Rocky Mountains of Colorado and Wyoming are ***below normal***. Snowpack is currently 49 percent of normal in the upper North Platte River Basin, 69 percent in the lower basin, and 60 percent in the South Platte River Basin. "Current inflows to Lake McConaughy are 718 cubic feet per second," Steinke said, "while average inflows for this time of year are around 1,480 cfs. With the ongoing releases of water necessary to meet the flow requirements of Central's federal license, the lake's elevation is slowly dropping." Depending upon spring precipitation amounts, he said, ***Lake McConaughy may have already reached its peak elevation for the year.*** Steinke added that the U.S. Bureau of Reclamation is no longer projecting a spill of excess water from its Wyoming reservoirs. As recently as a month ago, he said, the Bureau had been anticipating that storage conditions in its North Platte River reservoirs would result in at least a small release of water that exceeded storage capacity. ***The Wyoming reservoirs are currently 86 percent full.***

SOURCE: CNPPID News Release, April 9, 2012

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



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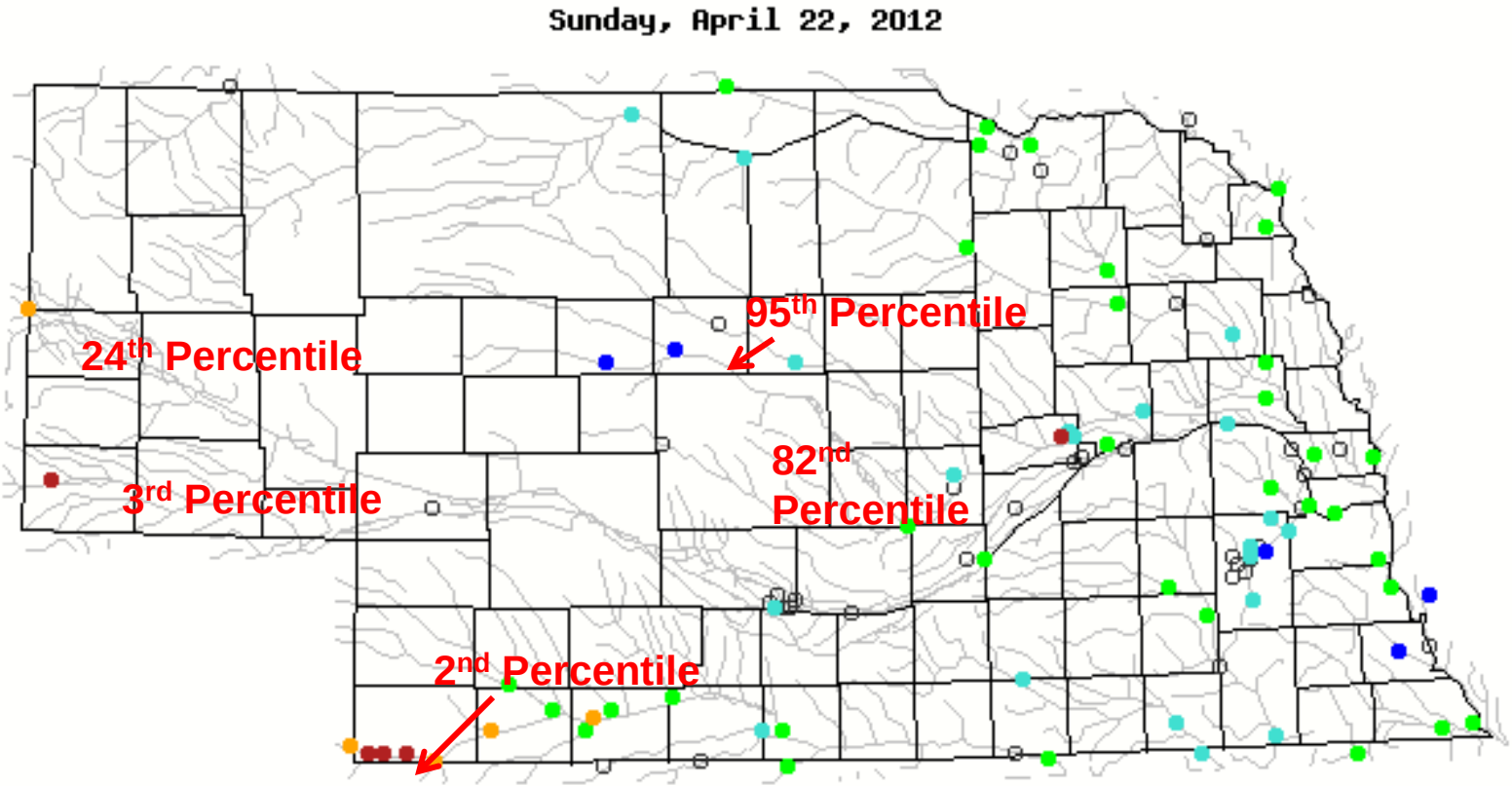

USGS

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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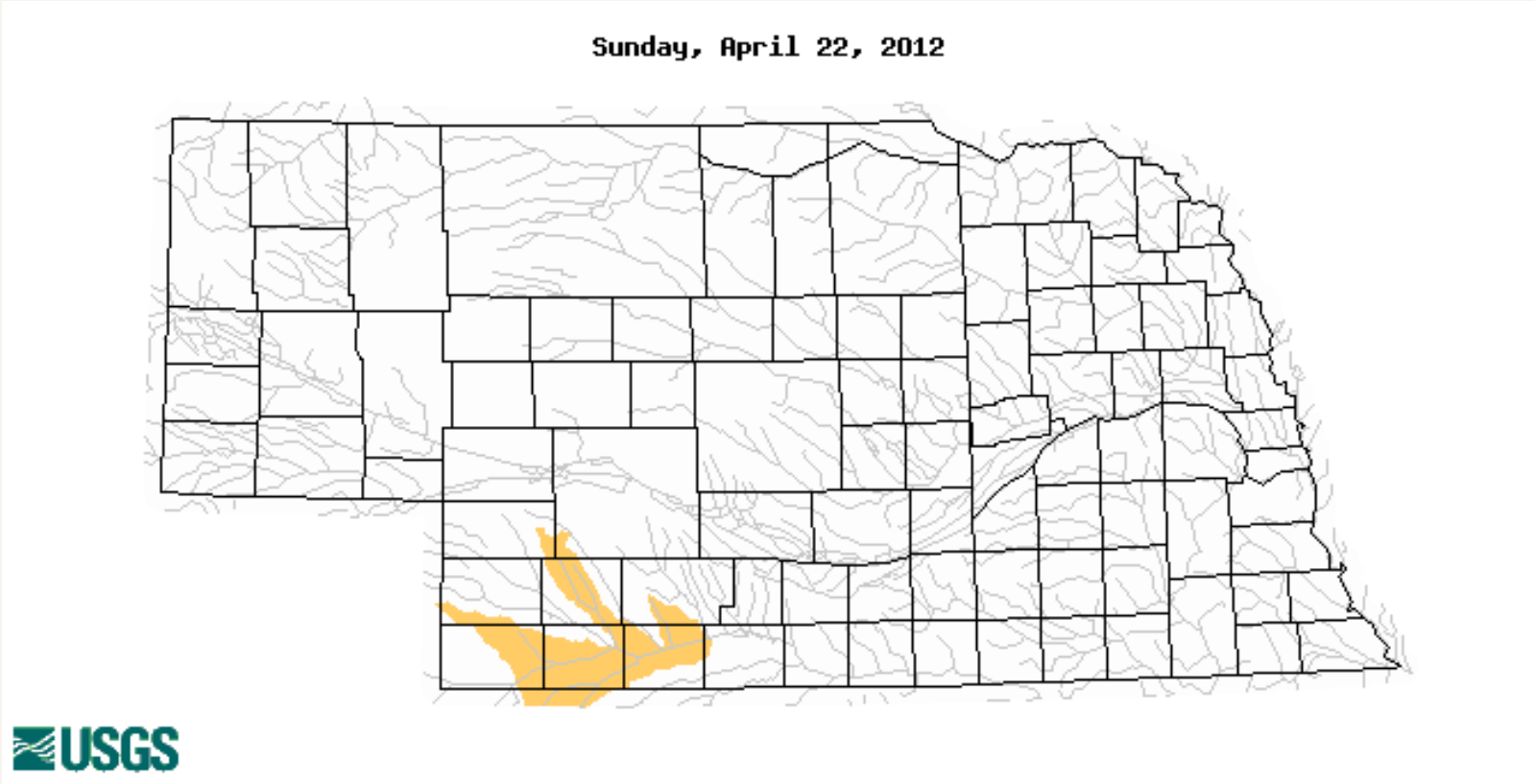
Map of below normal 7-day average streamflow compared to historical streamflow for the day of year



Explanation - Percentile classes

Low	<=5	6-9	10-24	Insufficient data for a hydrologic region
Extreme hydrologic drought	Severe hydrologic drought	Moderate hydrologic drought	Below normal	

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Republican River Basin

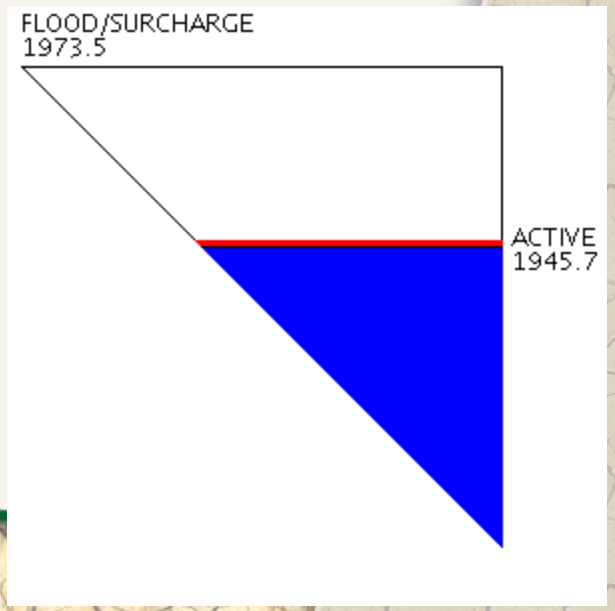
- **Hugh Butler:** 16.3% of conservation pool
- **Enders:** 42.9% of conservation pool
- **Harry Strunk:** 97.3% of conservation pool
- **Swanson:** 67.4% of conservation pool

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

Republican River Basin

Harlan County Current Conditions

- ✓ Conservation Pool is 100% Full
- ✓ 320,664 Acre-Feet of water in storage compared to 324,994 AF last year at this time



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

Water Supply Summary

- Supply is stable for now, but may have reached seasonal peaks in many basins
  - Lake McConaughy has a lower elevation and reduced inflows already compared to last year and storage may have peaked for the year
  - Storage in the Republican River system is comparable to what it was last year at this time with Harlan County 100% full
  - A combination of reduced run-off, dry soils, and higher irrigation demand will impact water supply over the next several months. Most systems are currently in good shape due to favorable conditions over the last 2 growing seasons but more than likely will see reductions during this growing season

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Questions?

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