NE Drought Conditions CARC Update: November 29, 2012

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

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Current Conditions around Nebraska and the region…

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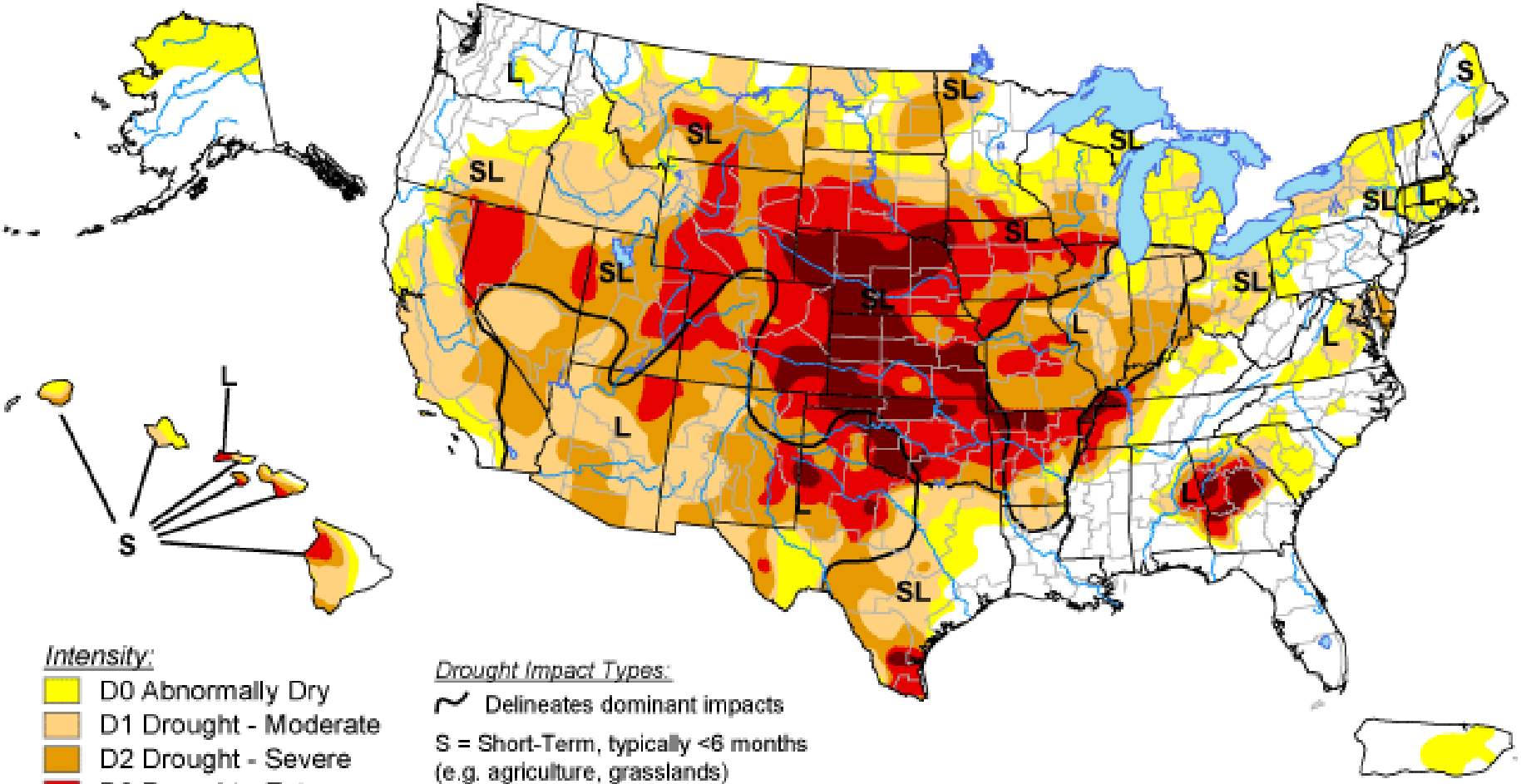
U.S. Drought Monitor

September 4, 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.

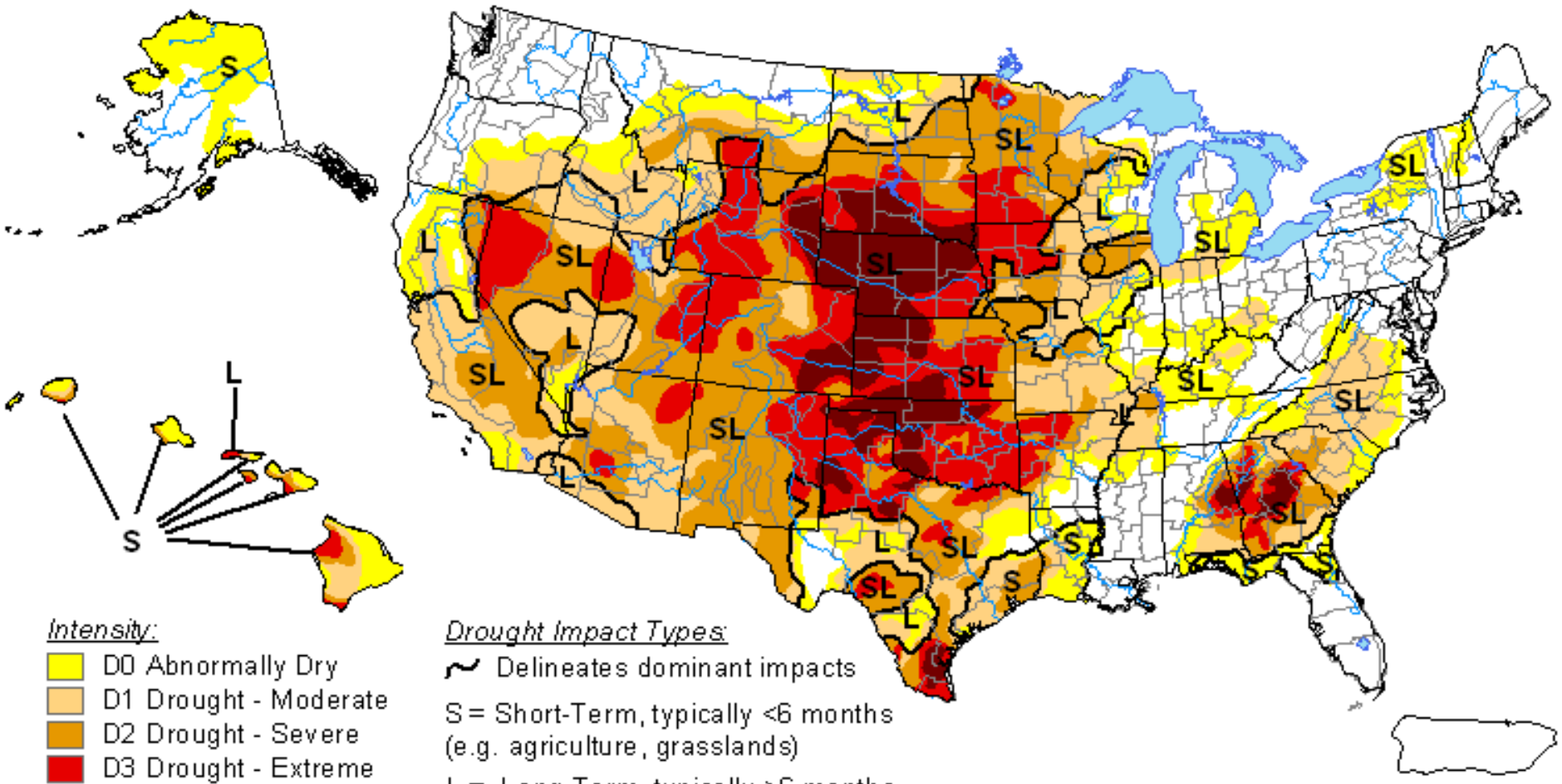
http://droughtmonitor.unl.edu/

Released Thursday, September 6, 2012

Author: Brian Fuchs, National Drought Mitigation Center

U.S. Drought Monitor

November 27, 2012
Valid 7 a.m. EST



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http://droughtmonitor.unl.edu/

Released Thursday, November 29, 2012

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

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	11/22/11	63.91	36.09	26.15	19.42	13.80	6.78
Start of Water Year	09/25/12	31.11	68.89	54.77	35.24	17.97	5.12
Start of Calendar Year	12/27/11	58.88	41.12	23.89	15.88	8.37	2.76
3 Months Ago	08/28/12	30.19	69.81	52.63	35.42	19.38	5.05
Last Week	11/20/12	33.44	66.56	50.30	31.67	15.93	5.23
Current	11/27/12	28.81	71.19	52.44	34.75	16.83	5.34

Conditions for the Contiguous U.S.

Week	Date	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
One Year Ago	11/22/11	56.96	43.04	31.18	23.20	16.51	8.11
Start of Water Year	09/25/12	23.41	76.59	65.45	42.12	21.48	6.12
Start of Calendar Year	12/27/11	50.89	49.11	28.49	18.95	10.01	3.31
3 Months Ago	08/28/12	22.31	77.69	62.89	42.34	23.18	6.04
Last Week	11/20/12	26.23	73.77	60.09	37.85	19.04	6.27
Current	11/27/12	24.03	75.97	62.65	41.54	20.12	6.39

National Drought Mitigation Center

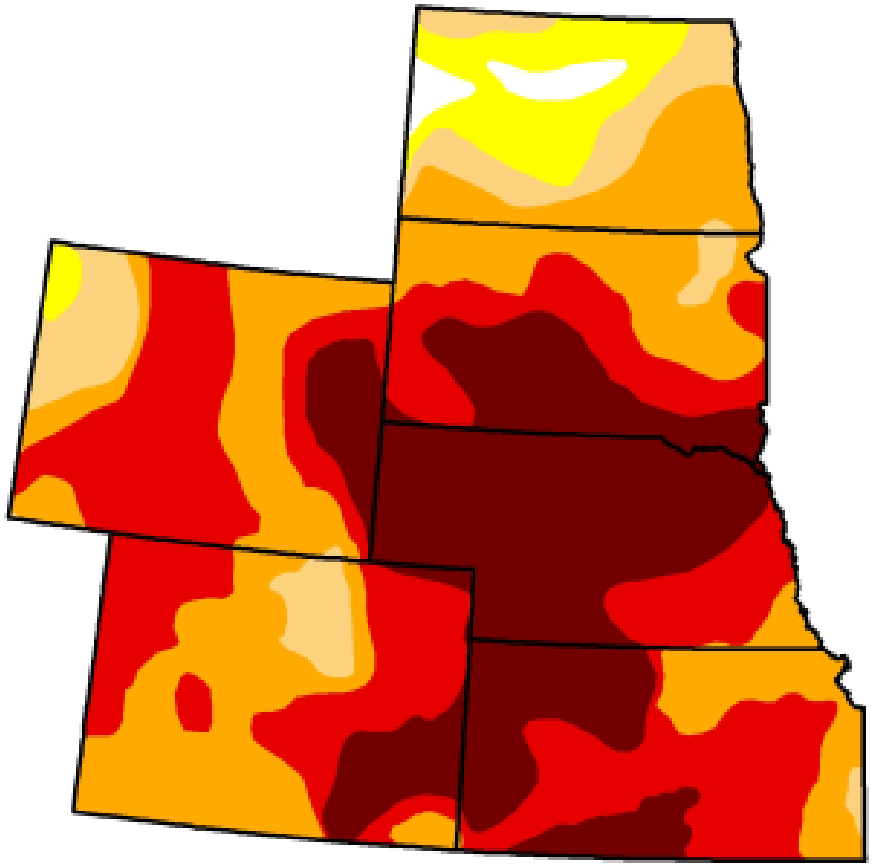
U.S. Drought Monitor

November 27, 2012
Valid 7 a.m. EST

High Plains

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	1.20	98.80	93.69	85.96	57.89	26.72
Last Week (11/20/2012 map)	1.20	98.80	93.88	84.32	55.94	26.28
3 Months Ago (08/28/2012 map)	1.25	98.75	88.07	79.12	54.19	14.97
Start of Calendar Year (12/27/2011 map)	61.66	38.34	18.12	7.22	2.07	0.04
Start of Water Year (09/25/2012 map)	0.00	100.00	98.91	83.80	61.28	24.35
One Year Ago (11/22/2011 map)	63.78	36.22	22.56	13.44	6.27	2.63



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http://droughtmonitor.unl.edu

USDA National Drought Mitigation Center

Released Thursday, November 29, 2012
National Drought Mitigation Center,

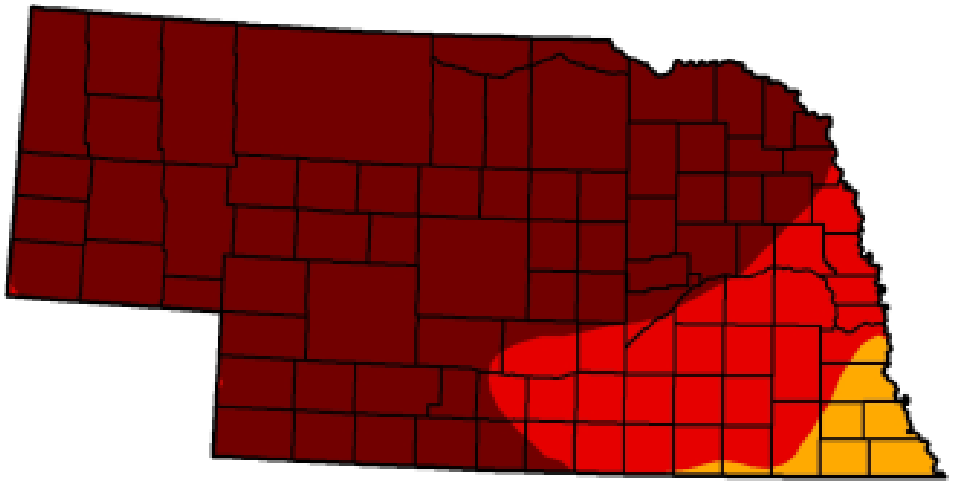
U.S. Drought Monitor

November 27, 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	96.15	77.46
Last Week (11/20/2012 map)	0.00	100.00	100.00	99.69	96.16	77.47
3 Months Ago (08/28/2012 map)	0.00	100.00	100.00	100.00	97.21	23.33
Start of Calendar Year (12/27/2011 map)	71.68	28.32	13.81	0.65	0.00	0.00
Start of Water Year (09/25/2012 map)	0.00	100.00	100.00	100.00	97.94	73.25
One Year Ago (11/22/2011 map)	64.51	35.49	20.69	2.03	0.00	0.00



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USDA National Drought Mitigation Center

Released Thursday, November 29, 2012
National Drought Mitigation Center,

Drought Monitor Archives

Nebraska

Drought Severity

- D0 - Abnormally Dry
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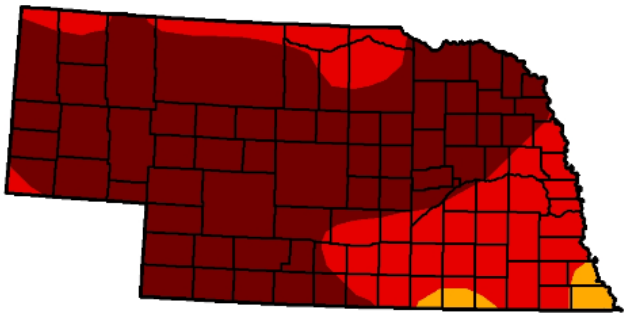

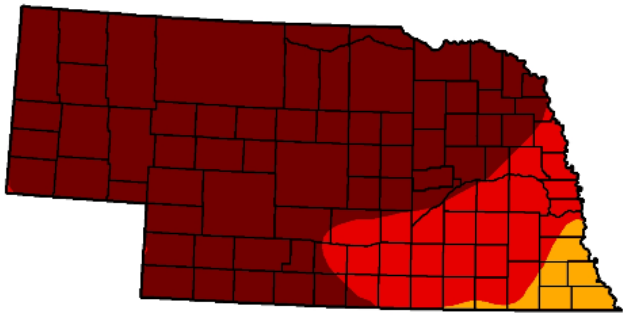

September 4, 2012

November 27, 2012

Week	Nothing	D0-D4	D1-D4	D2-D4	D3-D4	D4
September 4, 2012	0.00	100.00	100.00	100.00	97.94	70.58
November 27, 2012	0.00	100.00	100.00	100.00	96.15	77.46

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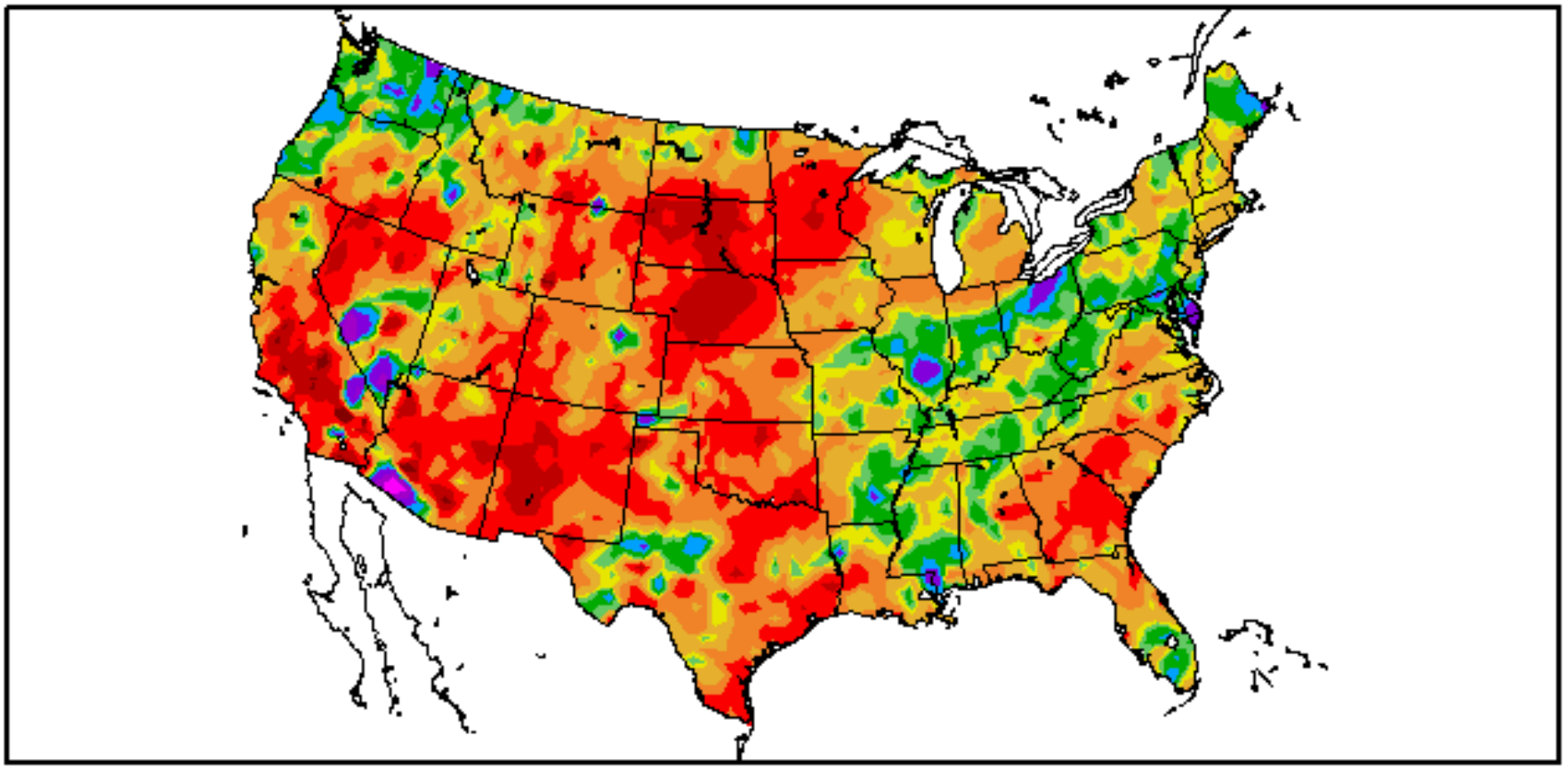
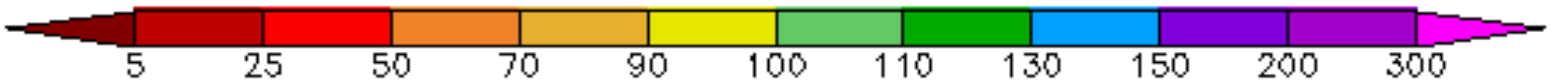
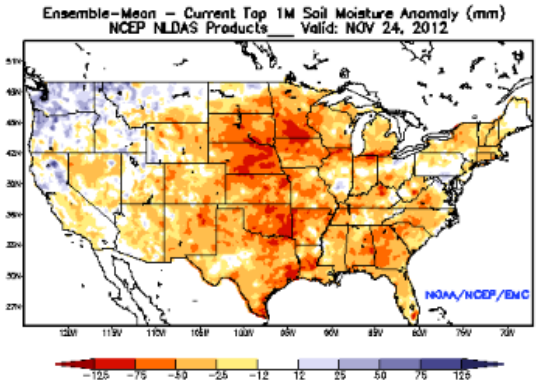
Percent of Normal Precipitation (%)
8/30/2012 – 11/27/2012





Generated 11/28/2012 at HPRCC using provisional data.

Regional Climate Centers



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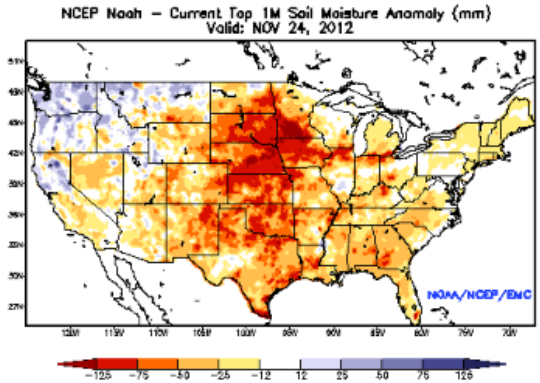
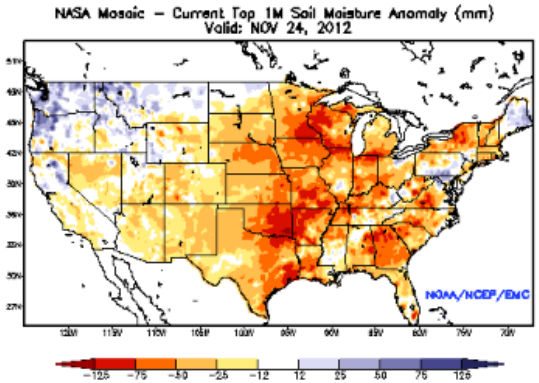
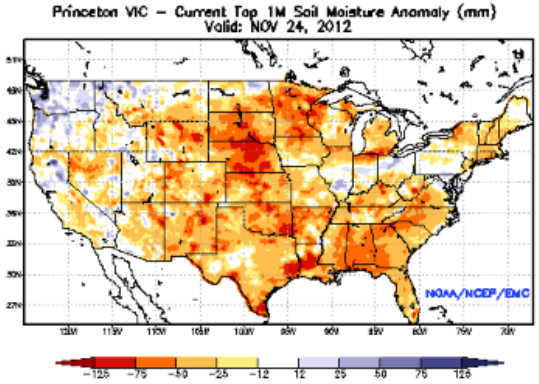


MOSAIC LSM OUTPUT:



SAC LSM OUTPUT:

VIC LSM OUTPUT:



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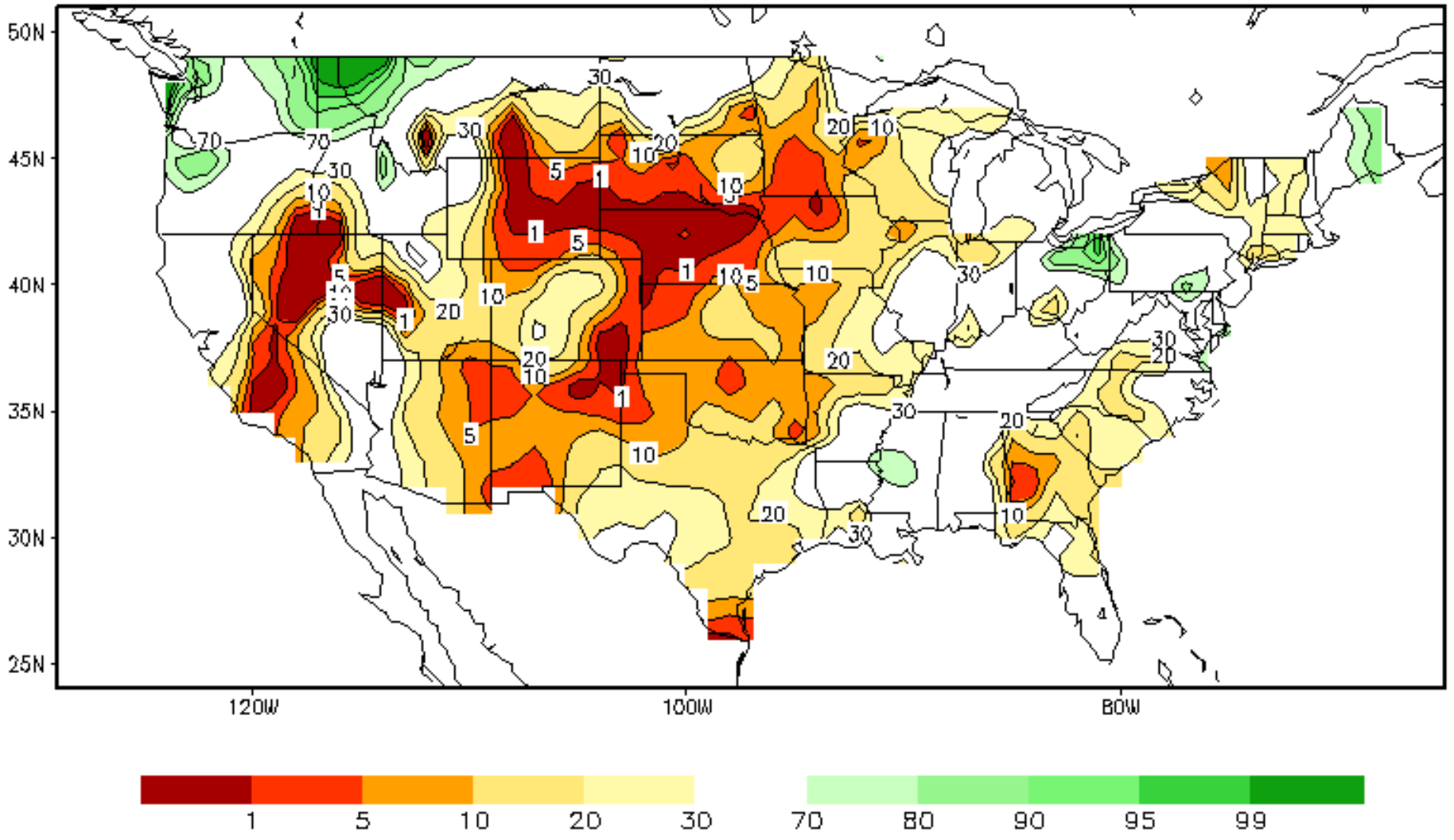
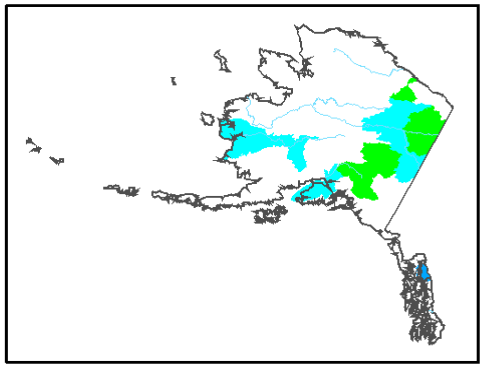
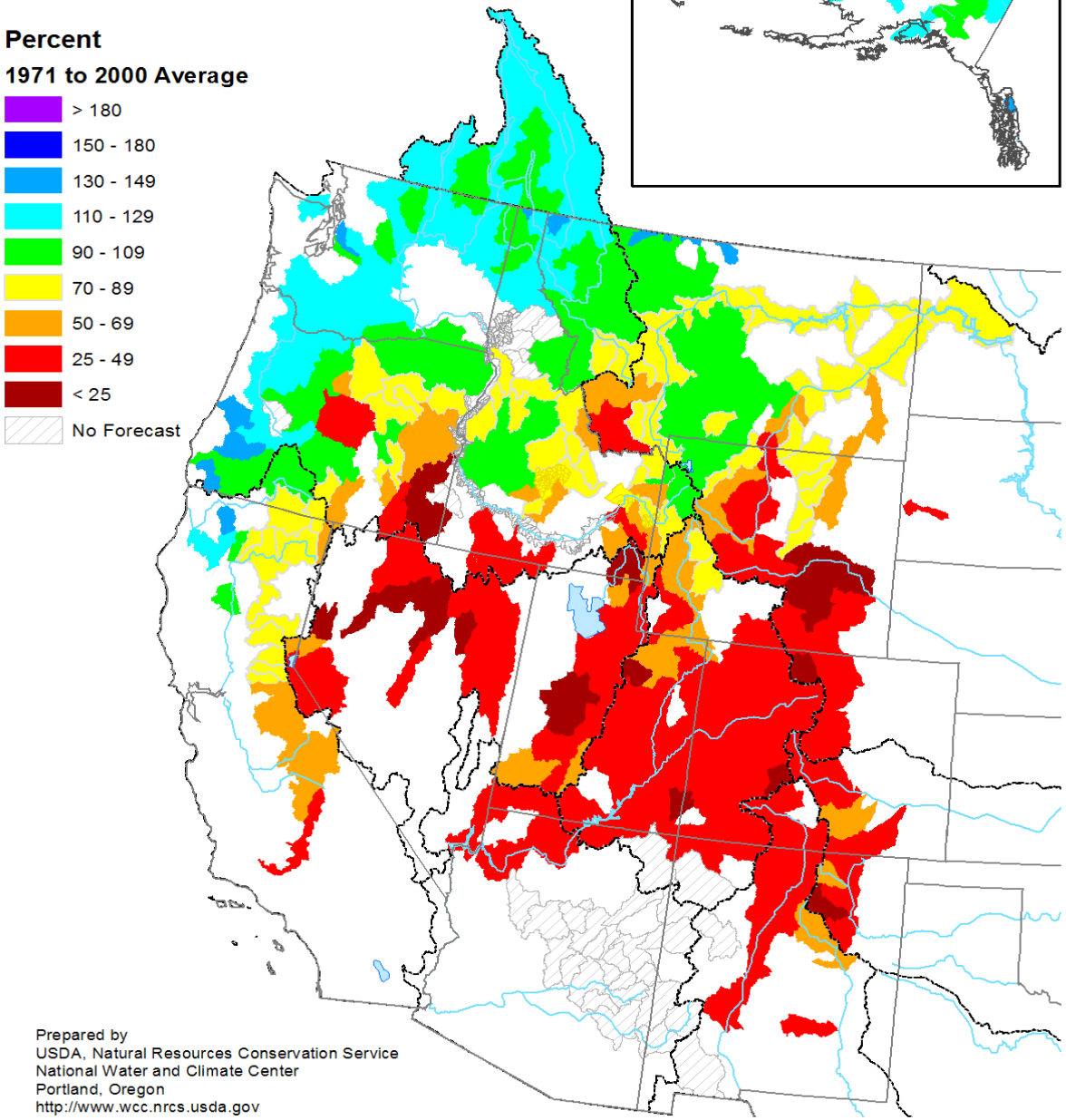
Calculated Soil Moisture Ranking Percentile
NOV 27, 2012



Spring and Summer Streamflow Forecasts as of May 1, 2012





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

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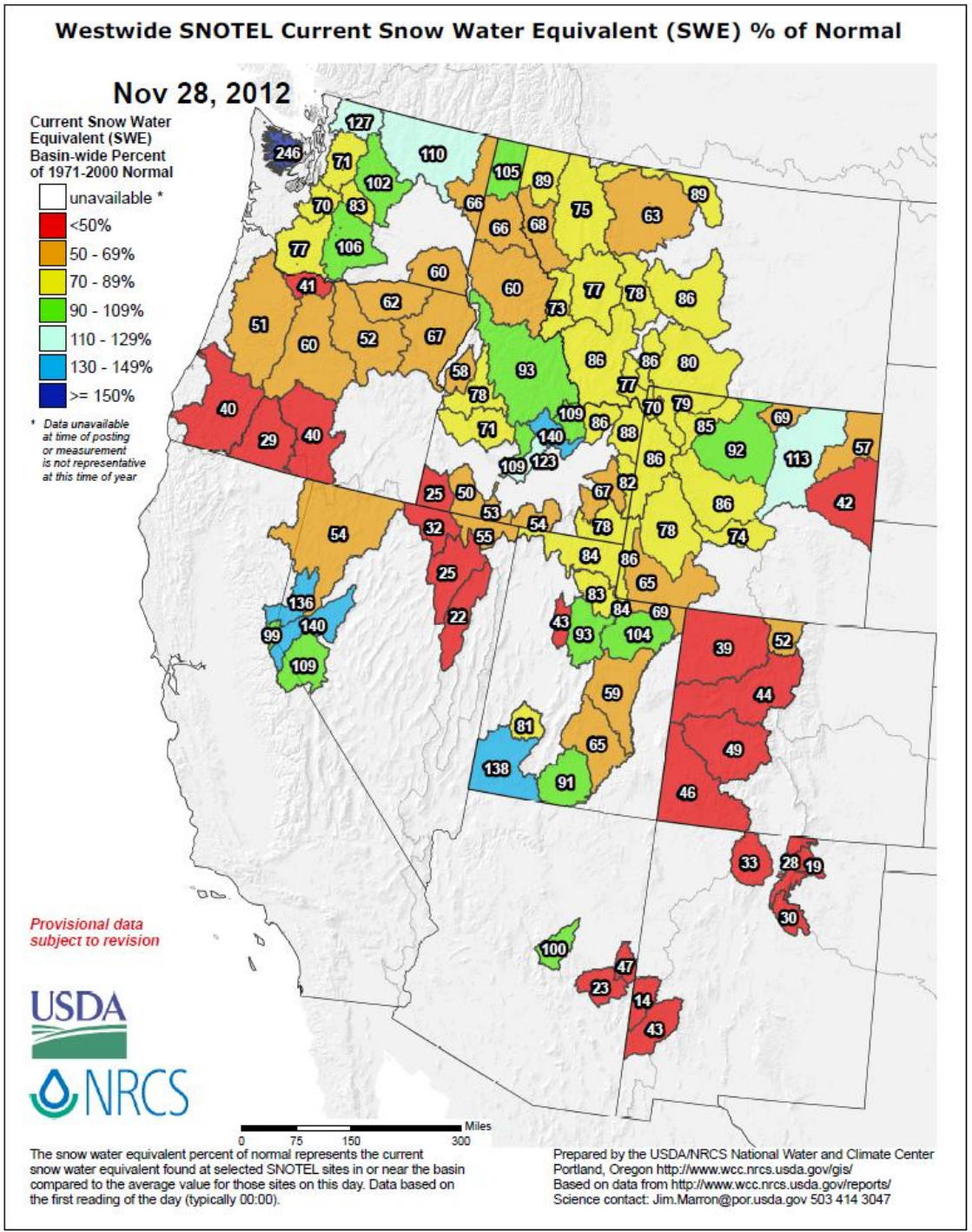

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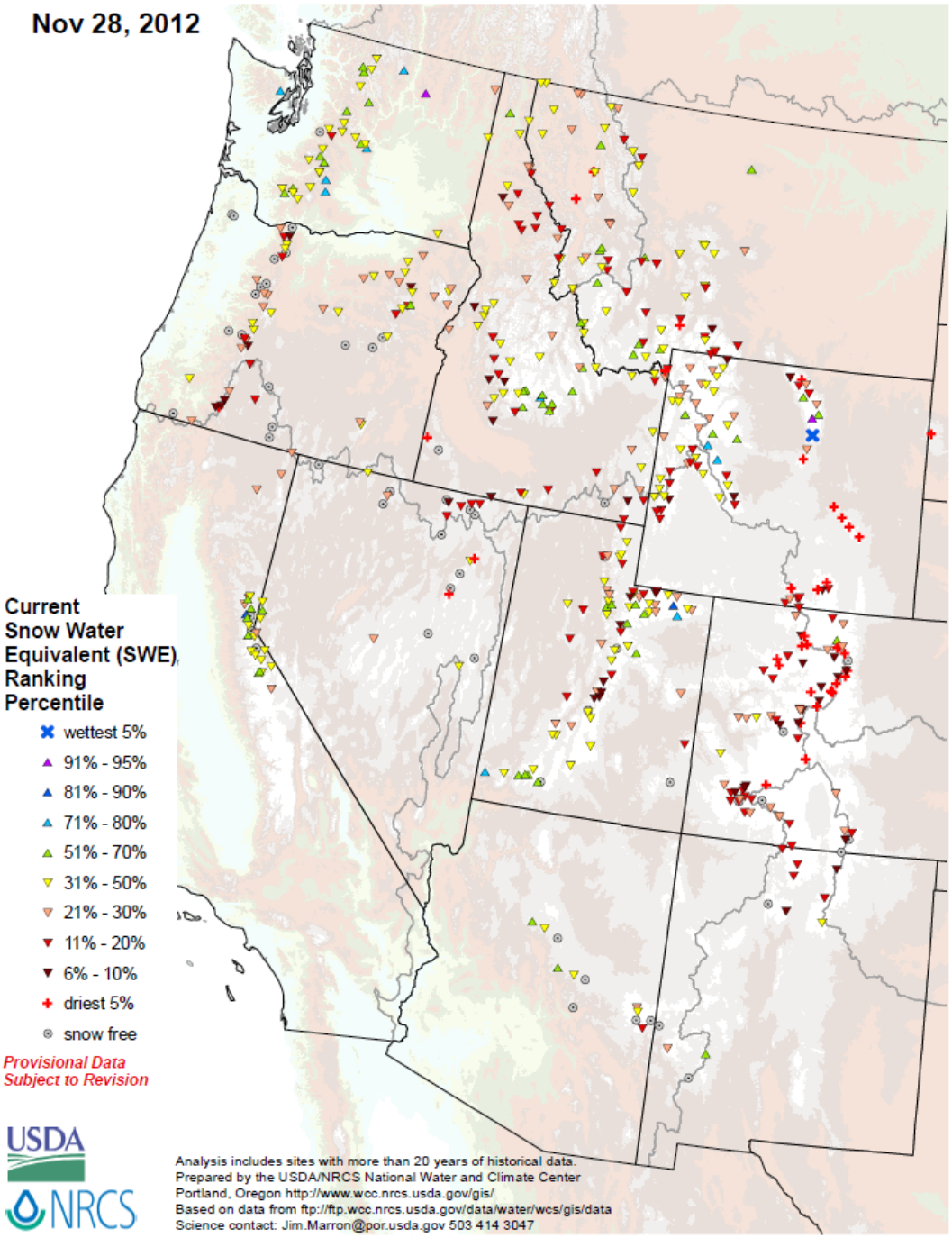
SNOTEL Current Snow Water Equivalent (SWE) Ranking Percentile

Nov 28, 2012



USDA NRCS

Analysis includes sites with more than 20 years of historical data.
Prepared by the USDA/NRCS National Water and Climate Center
Portland, Oregon http://www.wcc.nrcs.usda.gov/gis/
Based on data from ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/data
Science contact: Jim.Marron@por.usda.gov 503 414 3047

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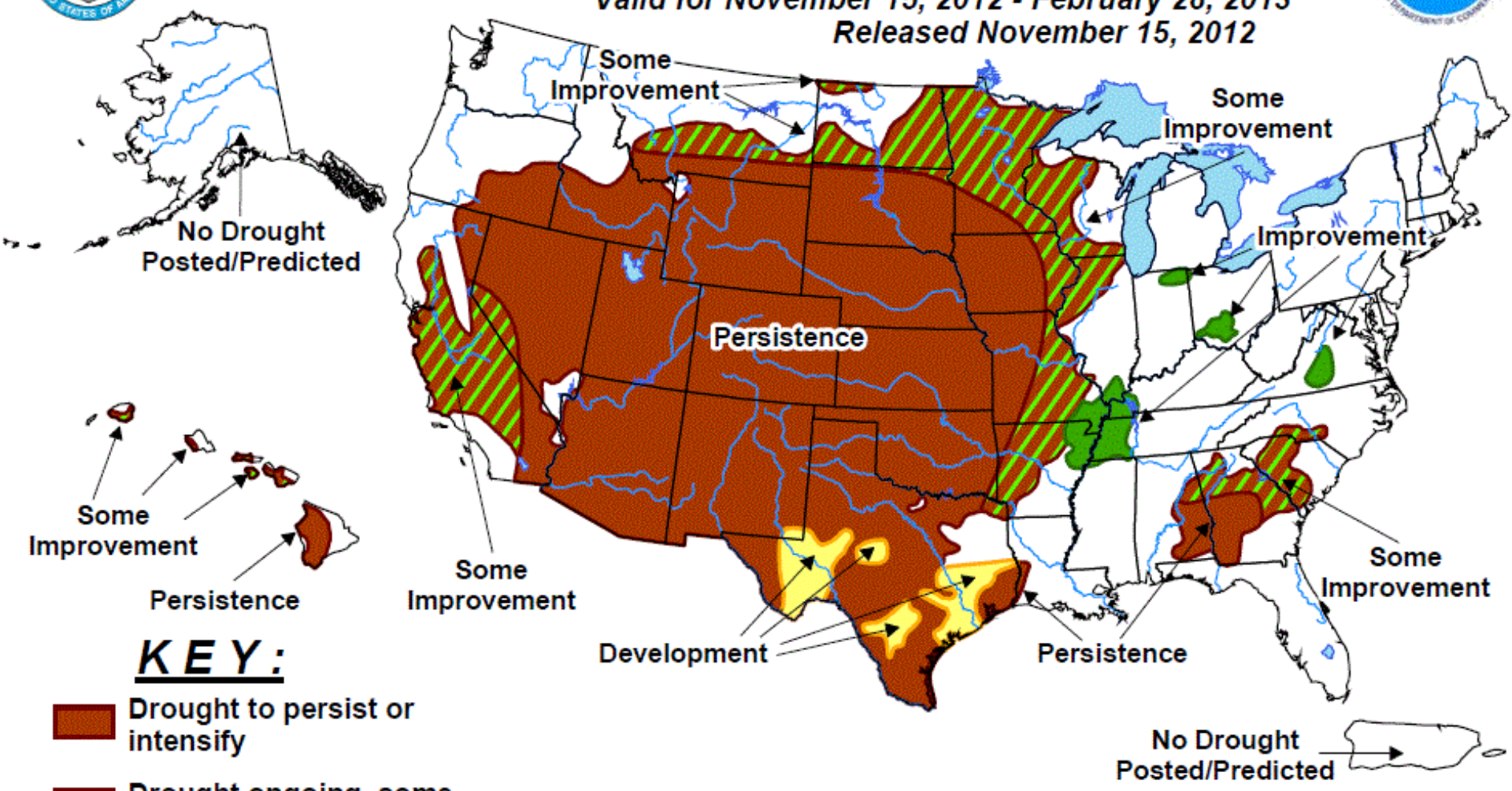
U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for November 15, 2012 - February 28, 2013

Released November 15, 2012

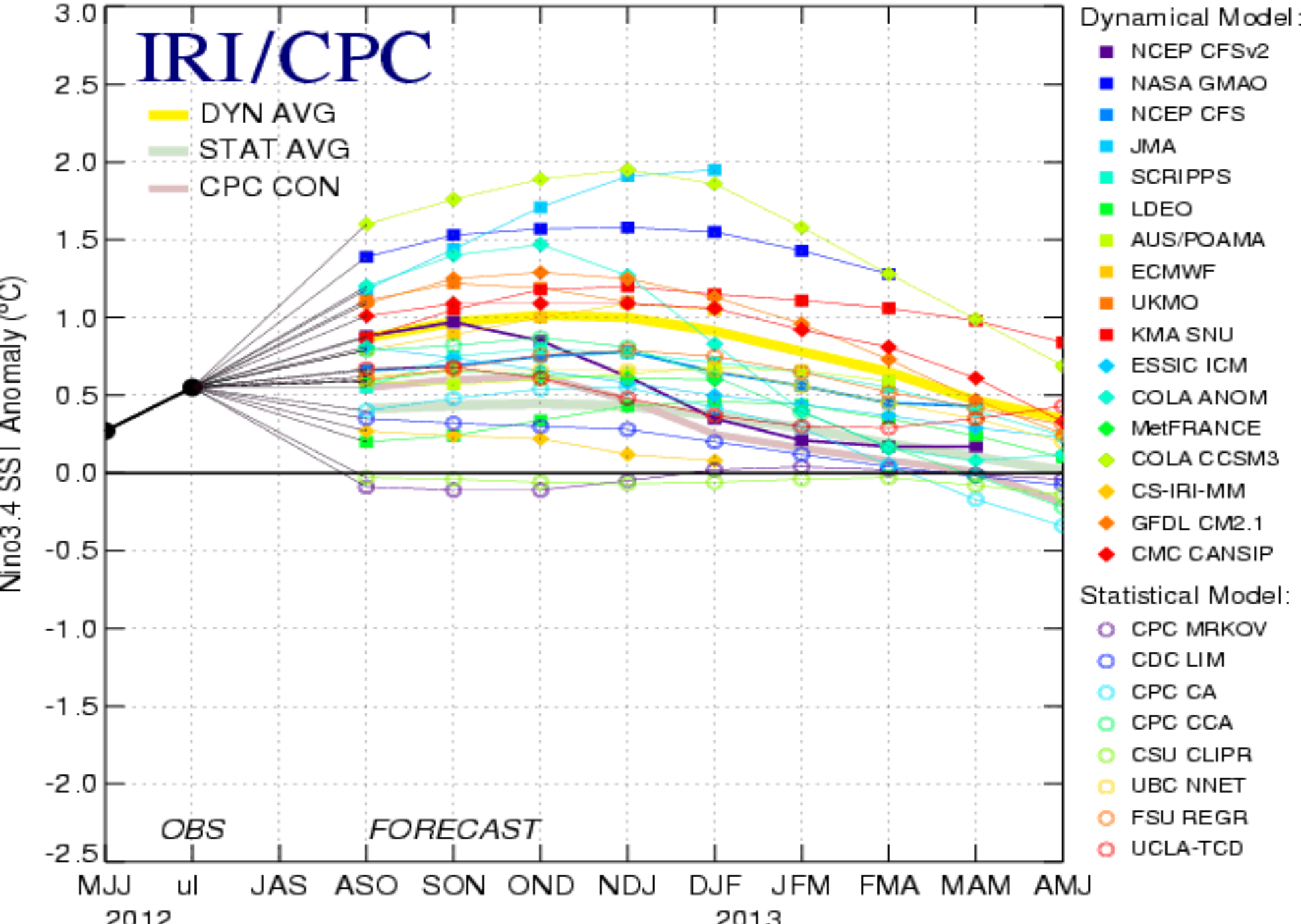


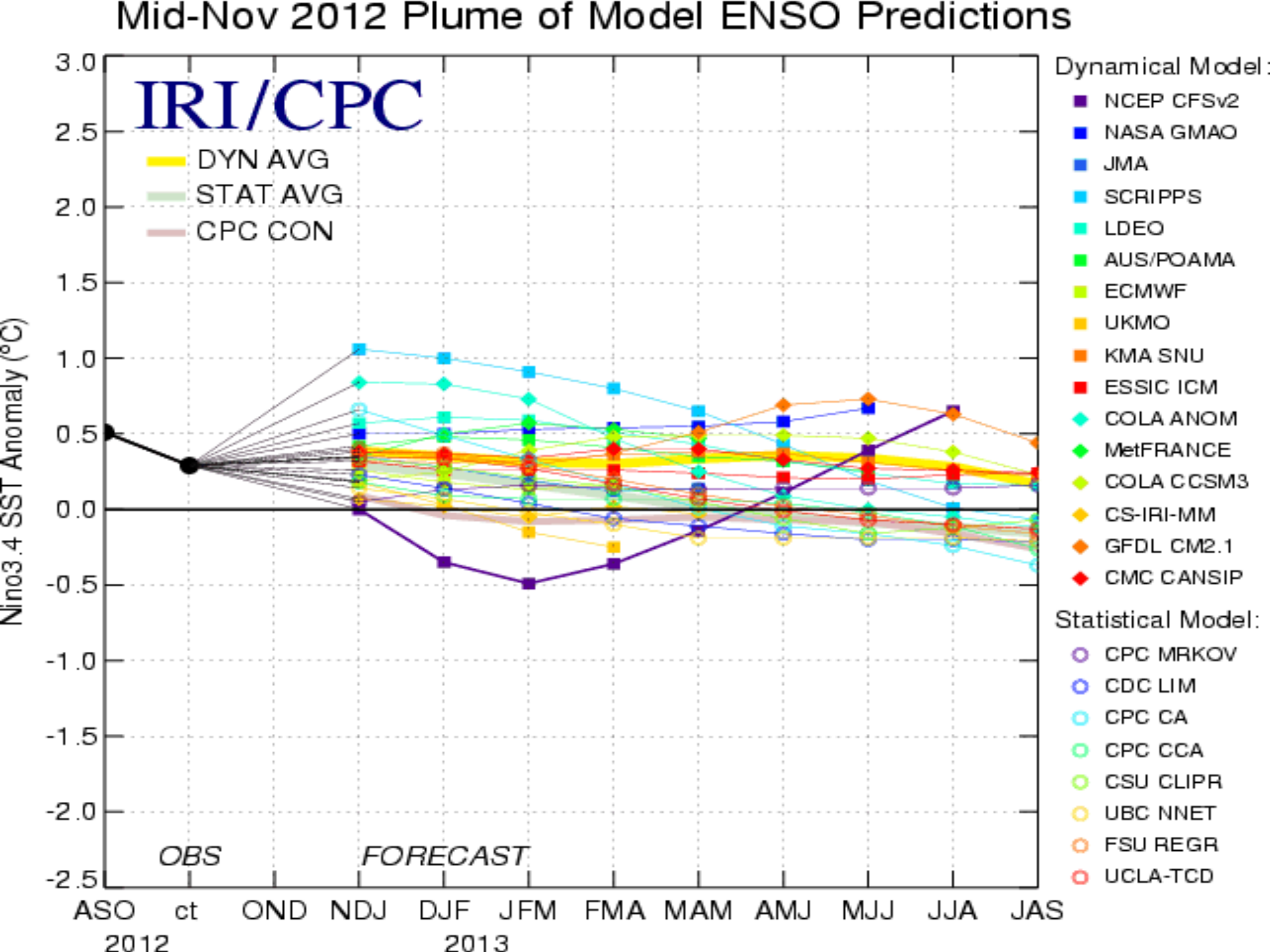
KEY:

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

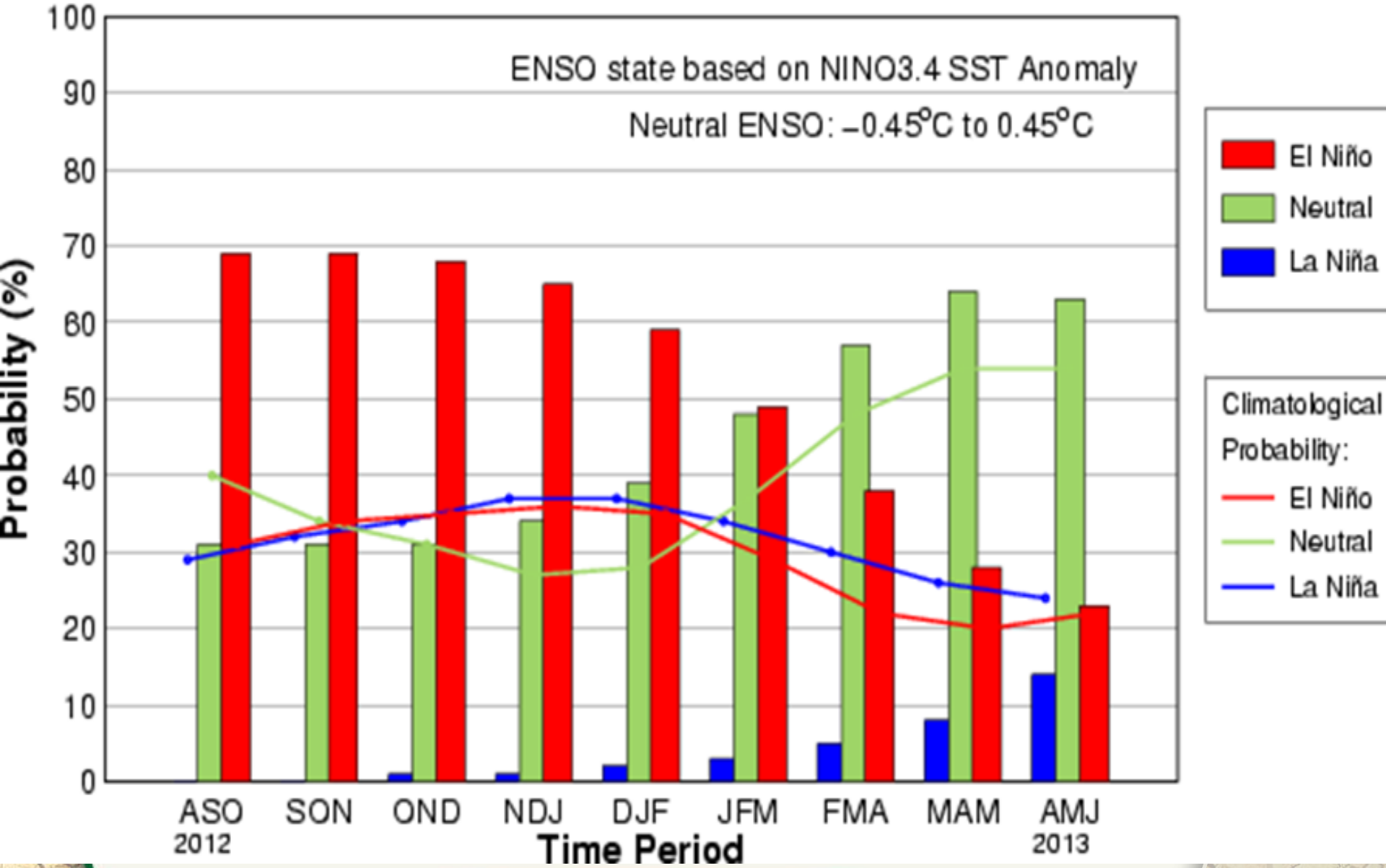
Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Short-term events -- such as individual storms -- cannot be accurately forecast more than a few days in advance. Use caution for applications -- such as crops --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

Mid-Aug 2012 Plume of Model ENSO Predictions




Mid-Nov 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
ASO
ct
OND
NDJ
DJF
JFM
FMA
MAM
AMJ
MJJ
JJA
JAS
2012
2013
Dynamical Model:
NCEP CFSv2
NASA GMAO
JMA
SCRIPPS
LDEO
AUS/POAMA
ECMWF
UKMO
KMA SNU
ESSIC ICM
COLA ANOM
MetFRANCE
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

Early–Sep CPC/IRI Consensus Probabilistic ENSO Forecast



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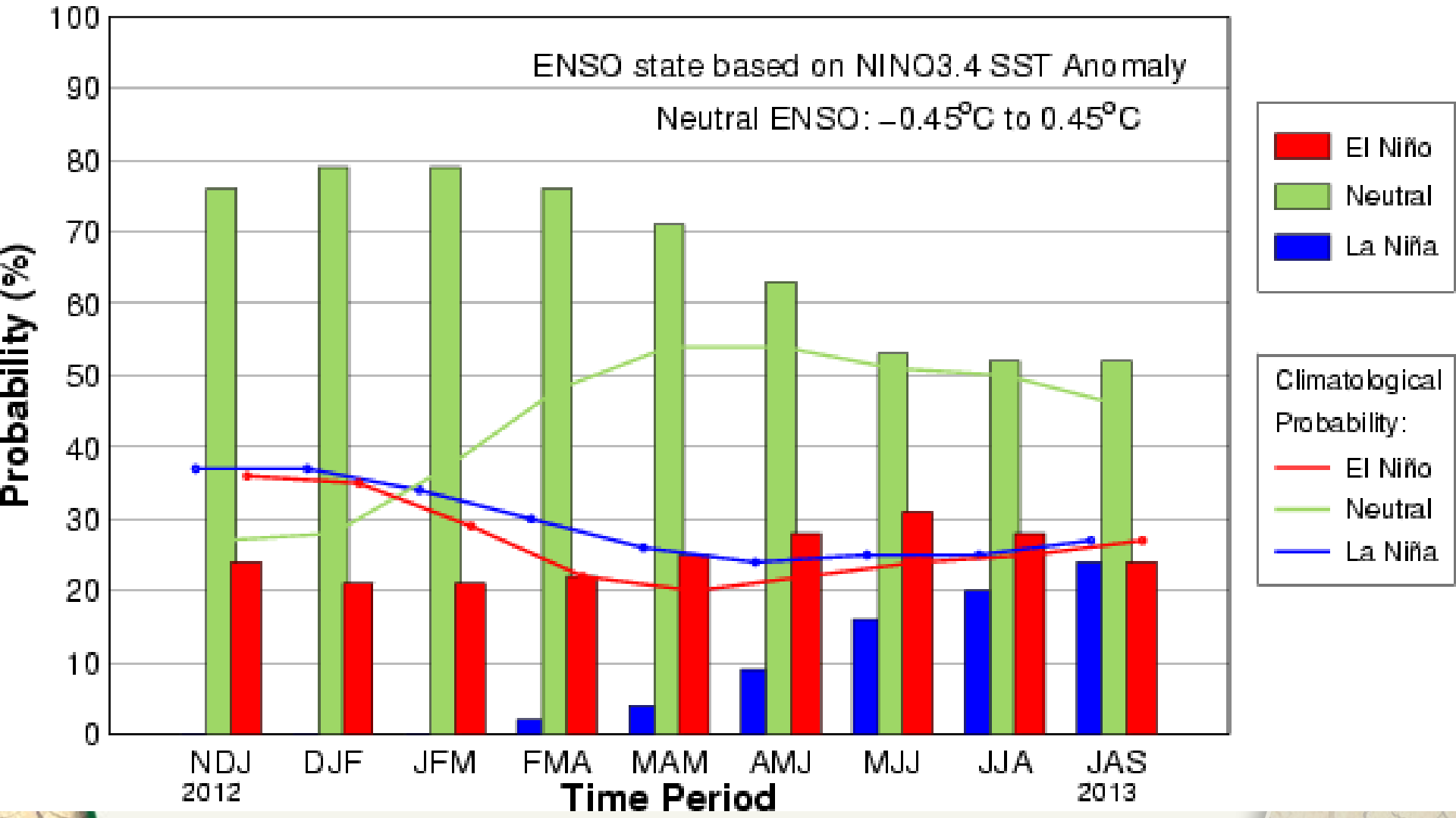
Mid–Nov IRI/CPC Plume–Based Probabilistic ENSO Forecast



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Climate Summary

- **Strong persistence of dryness this fall region-wide**
  - ***100% of NE in D1-D4 as of the end of November 2012***
  - ***This fall marked the most amount of D4 (78%) depicted in NE since the USDM began production in 1999.***
- **Pacific SSTs and Models have flipped from *El Niño (~70%)* to "Neutral" (~75%) (IRI/CPC)**
- **Water supply concerns and impacts continue to grow**
  - **Missouri and Mississippi Rivers**
  - **Community water supply concerns linger and develop**
- **Upcoming *winter critical* for snowpack/water supply and soil moisture recharge….**
- **For most of the Hard Red Winter Wheat Belt, from South Dakota to Texas, U.S. winter wheat conditions are the worst at this time of year since records of this type were initiated in the mid-1980s.**
  - **More than one-quarter (26 percent) of the U.S. winter wheat was rated in very poor to poor condition on November 25—a list topped by South Dakota (64% very poor to poor), Nebraska (46%), Oklahoma (44%), Texas (40%), Colorado (34%), and Kansas (25%).**
- **Climate Prediction Center's Seasonal Drought Outlook calls for *general persistence of drought in NE and the Central Plains* between now and the end of February.**

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Nebraska Water Supply Update…

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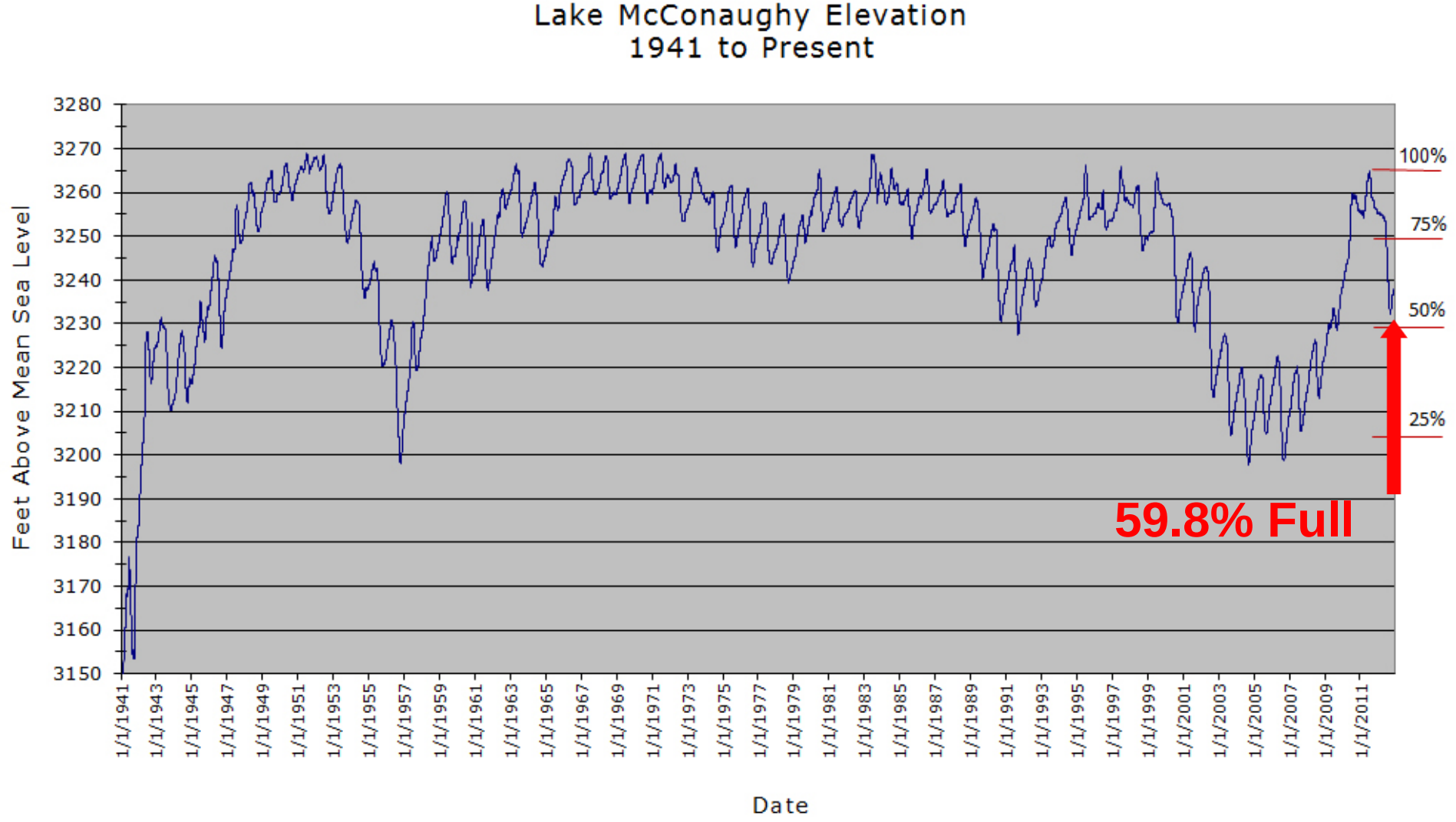

SOURCE: CNPPID www.cnppid.com

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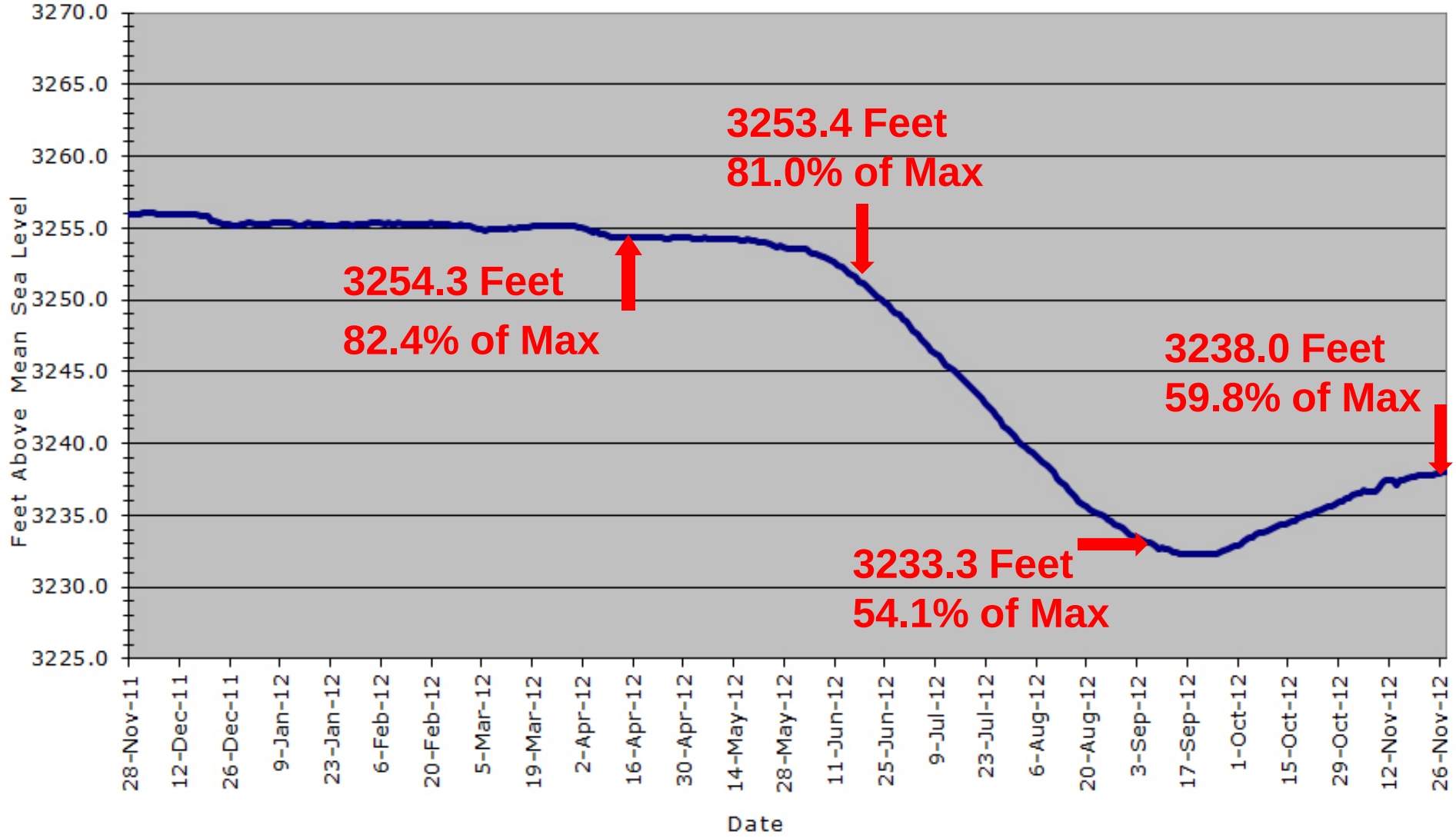
Lake McConaughy Elevation

Nov. 28, 2011 to Nov. 28, 2012



SOURCE: CNPPID www.cnppid.com

National Drought Mitigation Center

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 (Current, Average & Median Inflow graph)	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)*

*** 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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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

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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

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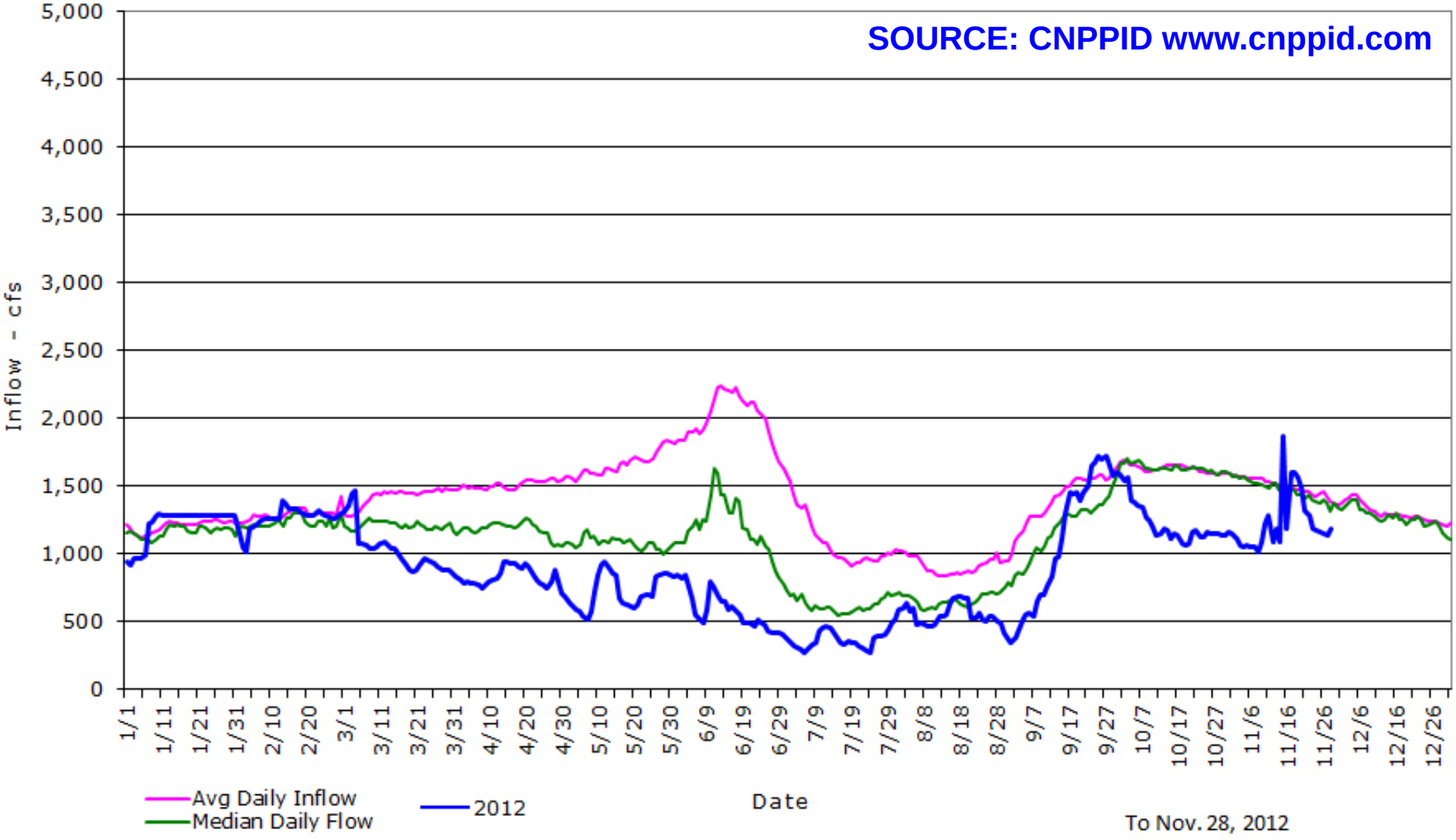
Daily Inflows - Lake McConaughy
Current, Average & Median Flows since 1941

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



To Nov. 28, 2012

National Drought Mitigation Center

Lake McConaughy

Civil engineer Cory Steinke reported that Lake McConaughy is at elevation 3236.6 feet, just over 1 million acre-feet in storage. He said that inflows have been in the range of 1,100 cubic feet per second, which is about 70 percent of normal for this time of year.

The lake should continue to its steady rise until mid-November when the maintenance outage at the Kingsley Hydroplant is complete and releases begin for the Nebraska Public Power District's system and to meet Federal Energy Regulatory Commission minimum requirements at the North Platte Diversion Dam. At that point, he said, increases in the lake's elevation will depend upon the rate of inflow.

SOURCE: CNPPID News Release, November 5, 2012

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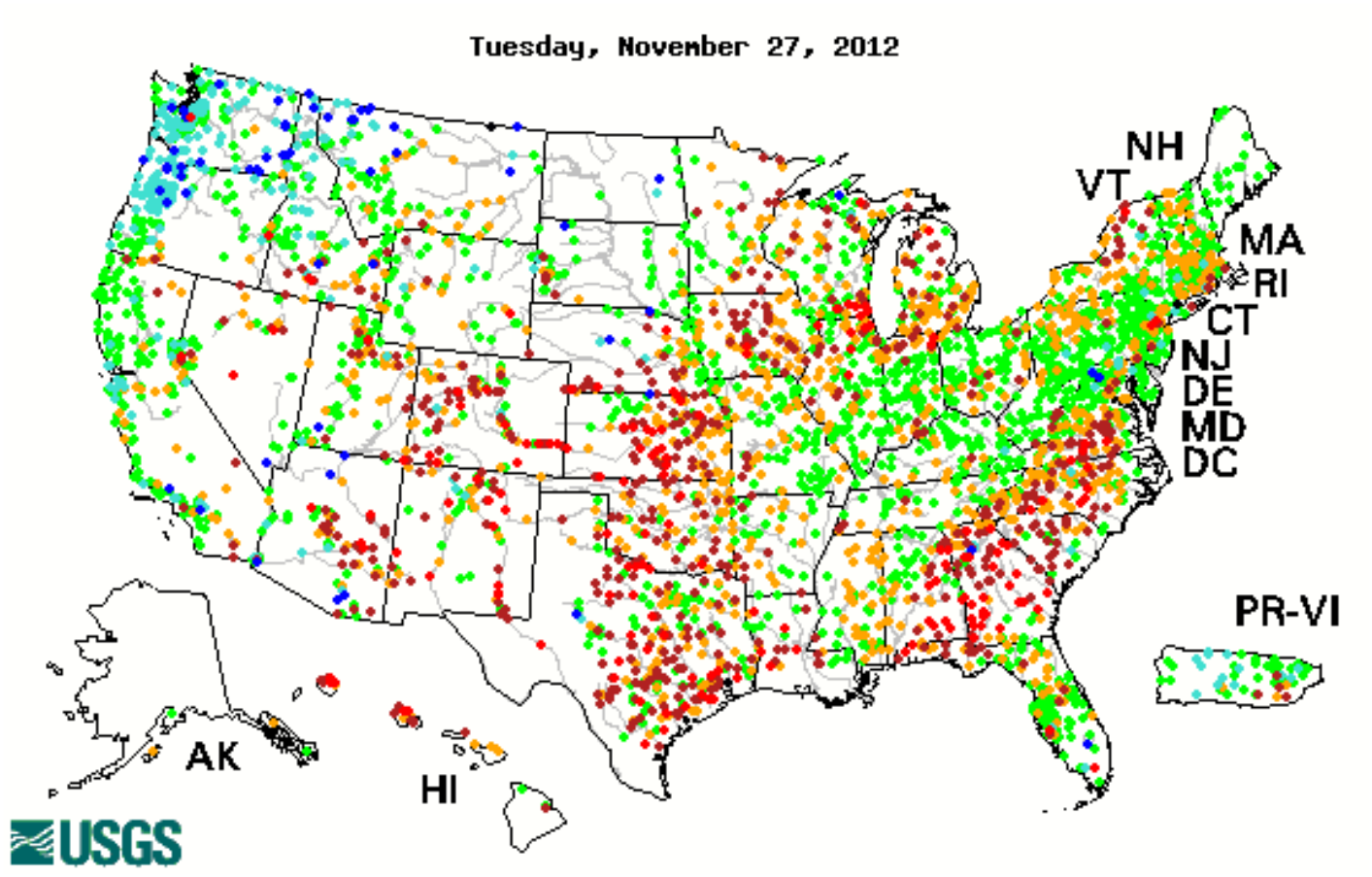
Map of 14-day average streamflow compared to historical streamflow for the day of year



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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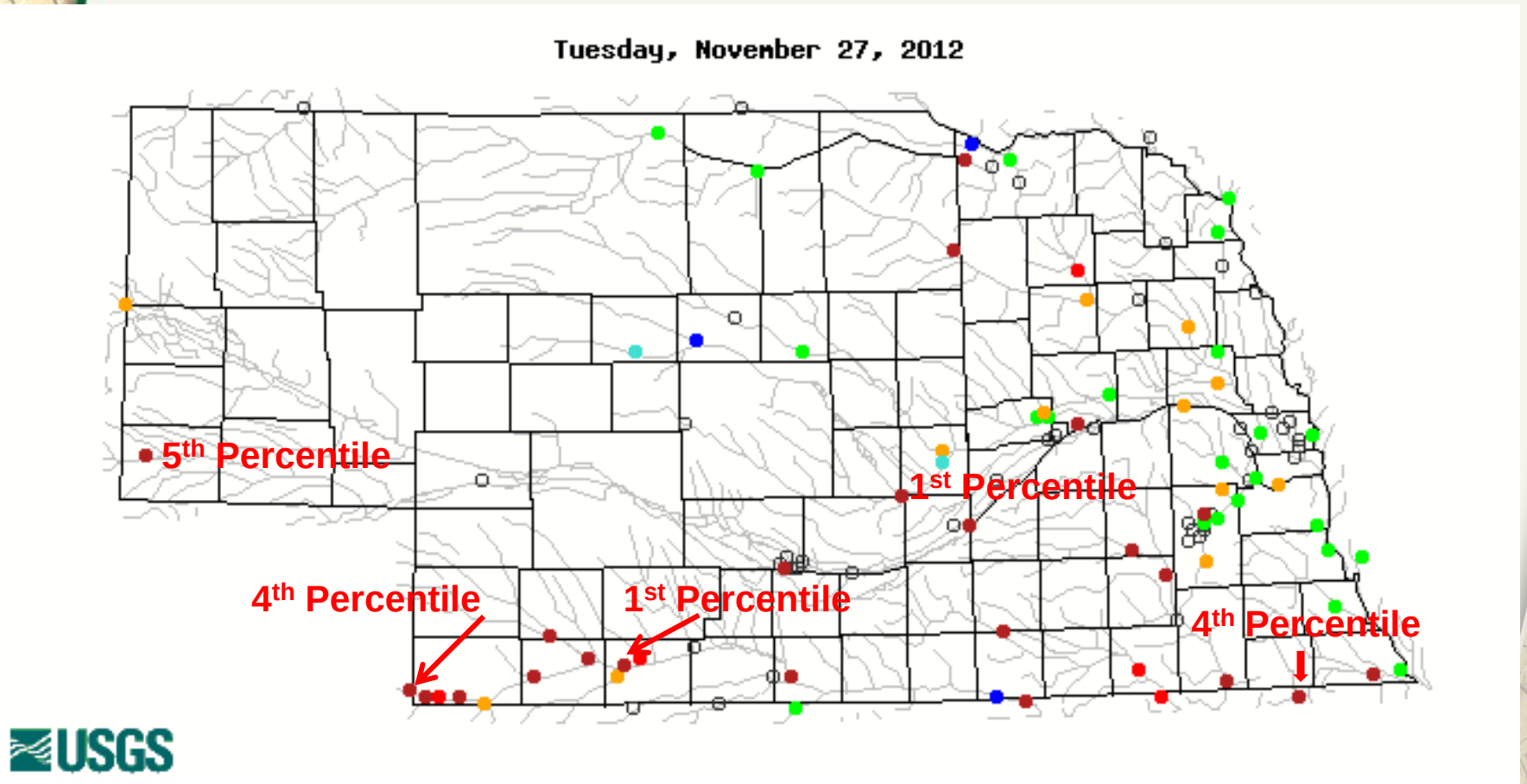

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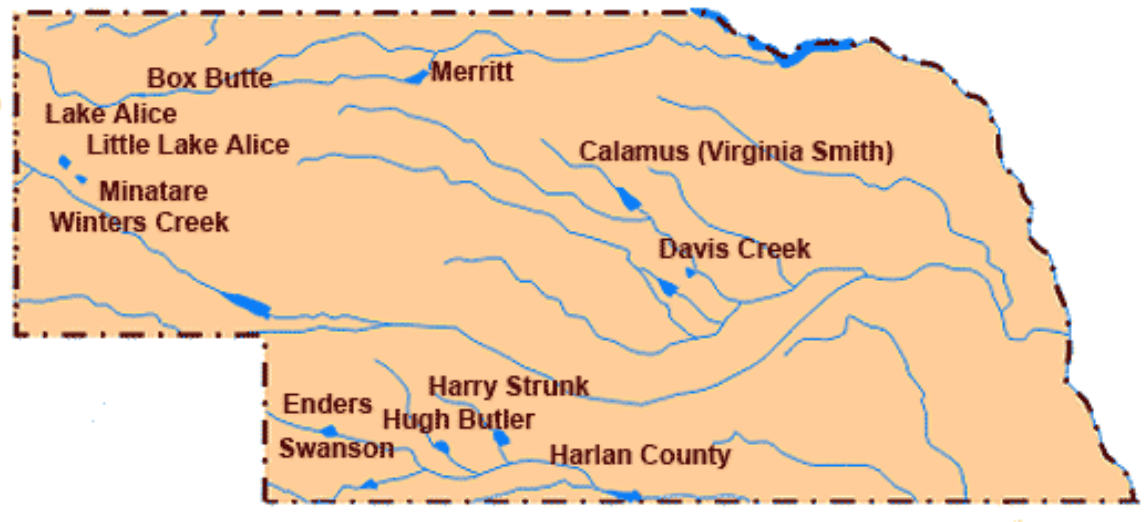
Republican River Basin

- **Hugh Butler:** 15.2%(14.0%) of conservation pool
- **Enders:** 34.9% (36.7%) of conservation pool
- **Harry Strunk:** 48.7%(37.0%) of conservation pool
- **Swanson:** 33.7% (35.6%) of conservation pool

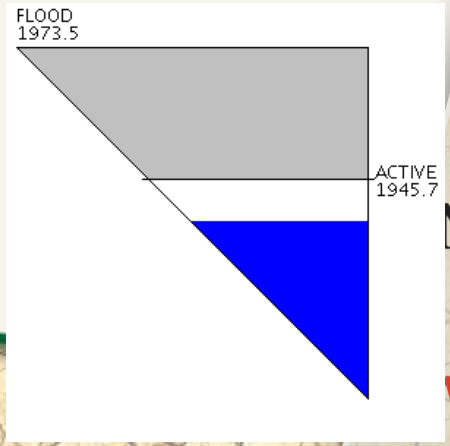


Source: BOR http://www.usbr.gov/gp/lakes_reservoirs/

Republican River Basin

Harlan County Current Conditions

- ✓ Conservation Pool is 60.9% full (64.3%)
- ✓ 191,330 Acre-Feet in storage compared to 201,994 Acre-Feet of water in storage in September
- ✓ Last year at this time, 321,746 AF was in storage.
- ✓ Historical storage for this time of the year is 217,415 AF



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

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Water Supply Summary

- The Drought of 2012 has continued to impact water supply across the state and the depleted soil moisture across Nebraska will lead to less available runoff potential.
- The Hydrologic impacts due to drought will increase in magnitude in 2013 without any significant changes as the 2012 drought becomes a multi-year event.
- Lake McConaughy has stabilized in elevation but any continued increase in storage will be dependent on upstream events. Winter snowpack upstream in the Rocky Mountains will need to be monitored closely moving forward.
- Storage in the Republican River has continued with declines in storage throughout the fall. Harlan County is over 130,000 Acre-Feet lower than in November 2011 and is 26,000 AF lower than the historical average for this time of year.

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Any Questions ?