

Great Plains and Midwest Climate Outlook

19 March 2015

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Grass fire in SE Nebraska 13 March 2015



General Information

- **Providing climate services to the Central Region**
 - Collaboration with Dennis Todey (South Dakota State Climatologist), Jim Angel (Illinois State Climatologist), Doug Kluck and John Eise (NOAA), State Climatologists and the Midwest Regional Climate Center, High Plains Regional Climate Center, NOAAs Climate Prediction Center, Iowa State University, National Drought Mitigation Center
- **Next Climate/Drought Outlook Webinar**
 - Dennis Todey – South Dakota State Climatologist
 - April 16, 2015
- **Access to Future Climate Webinars and Information**
 - <http://www.drought.gov/drought/content/regional-programs/regional-drought-webinars>
 - For 2015 you can sign up once to be registered for the entire year.
- **Past recorded presentations and slides can be found here:**
 - <http://mrcc.isws.illinois.edu/webinars.htm>
 - <http://www.hprcc.unl.edu/webinars.php>
- **There will be time for questions at the end**

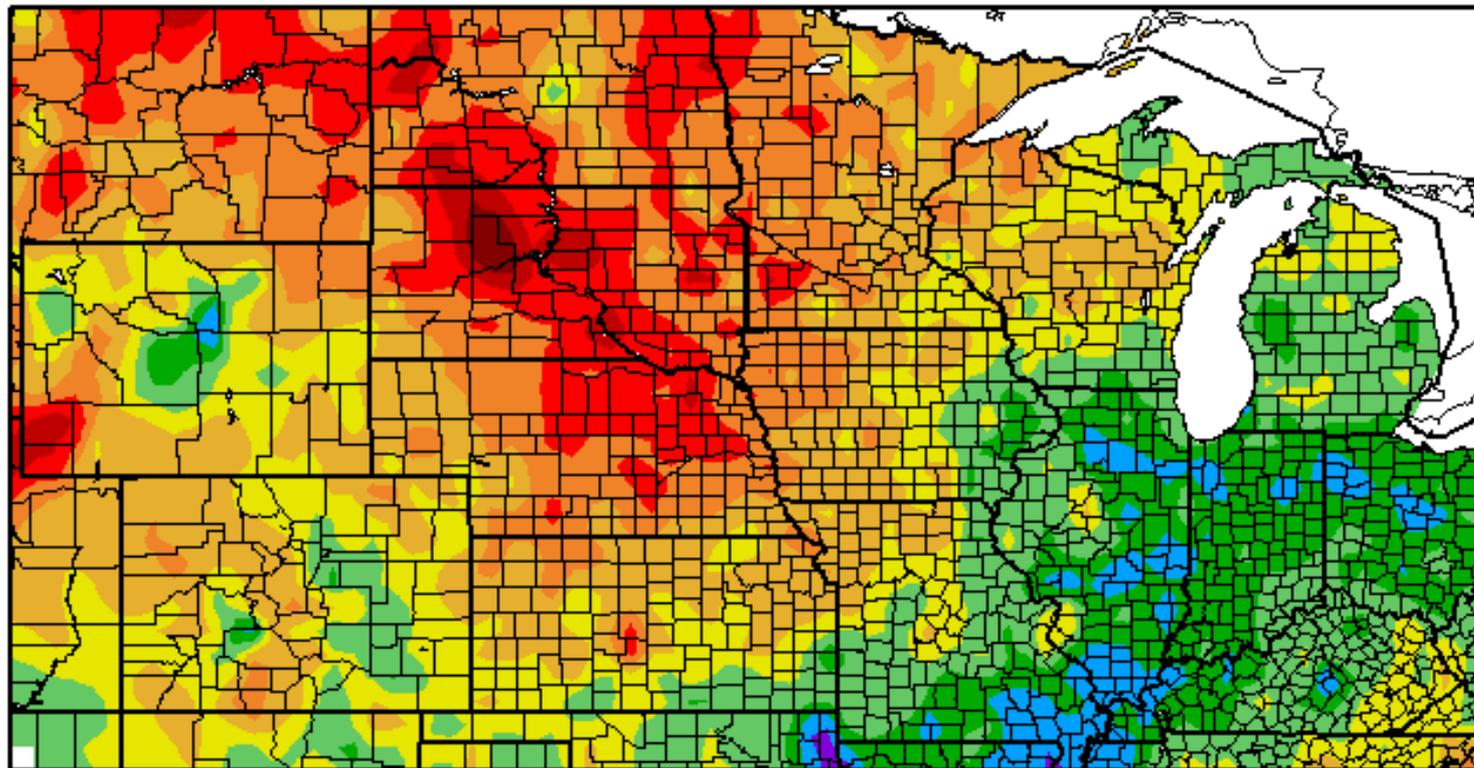
Agenda

- Current Conditions around the Region
 - Temperature
 - Precipitation
 - Snowpack
 - Soil Moisture
- Impacts in the Region
- Outlooks

Month to Date Temperature Departure

Departure from Normal Temperature (F)

3/1/2015 – 3/17/2015



Generated 3/18/2015 at HPRCC using provisional data.

Regional Climate Centers

<http://www.hprcc.unl.edu/>

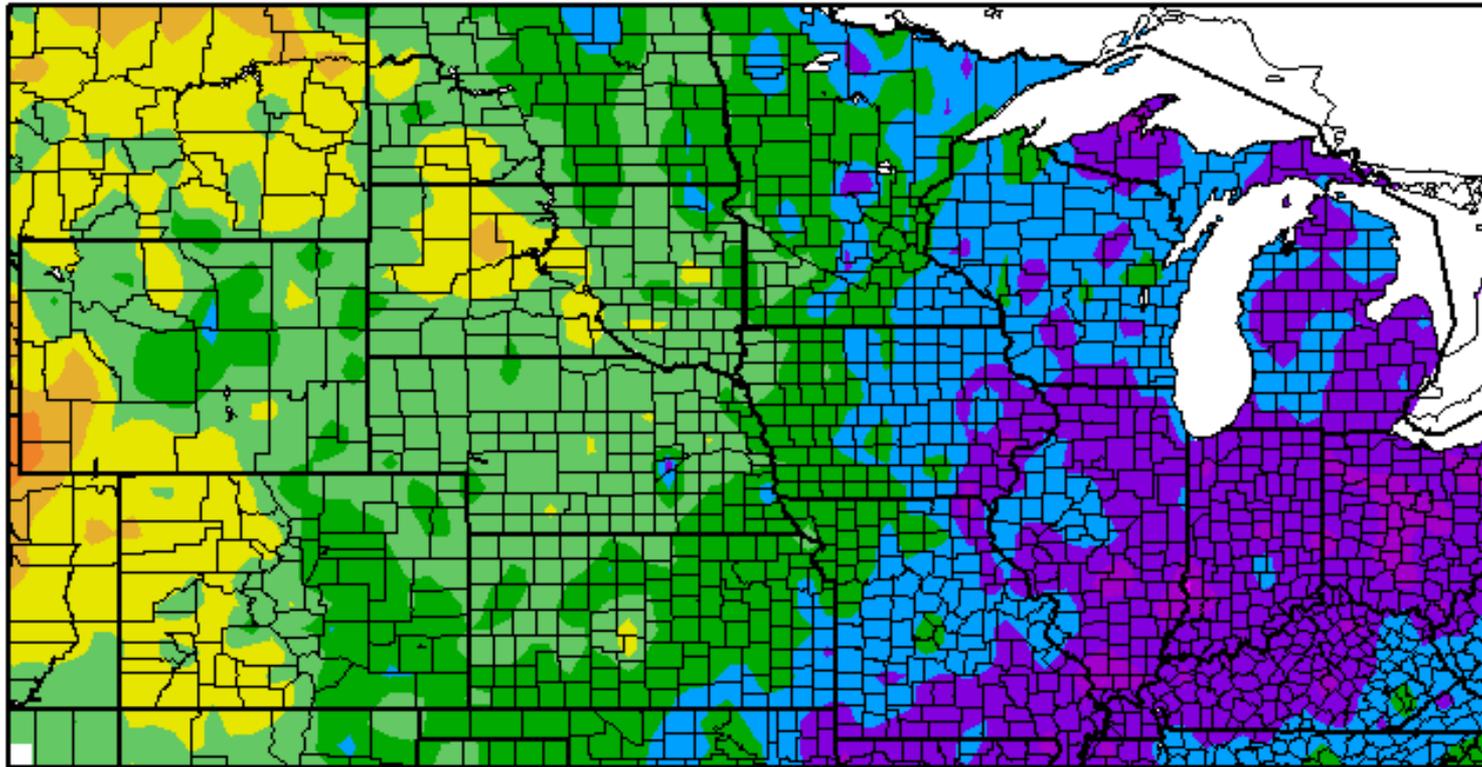
It has warmed up quickly!

- Highest all-time March temp:
 - Grand Island, NE: 90F on 3/16/15 (tied with many years)
 - Norfolk, NE: 92F on 3/16/15 (tied with 3/22/1910)
 - North Platte, NE: 91F on 3/16/15 (old record 88F on 3/31/1946)
 - Rapid City, SD: 84F on 3/15/15 (old record 83F 3/31/2012)
- Earliest 80 Degree Day set in Colorado on 3/16/15
 - Denver, Ft. Collins, Colorado Springs

30 Day Temperature Departure

Departure from Normal Temperature (F)

2/16/2015 – 3/17/2015



Generated 3/18/2015 at HPRCC using provisional data.

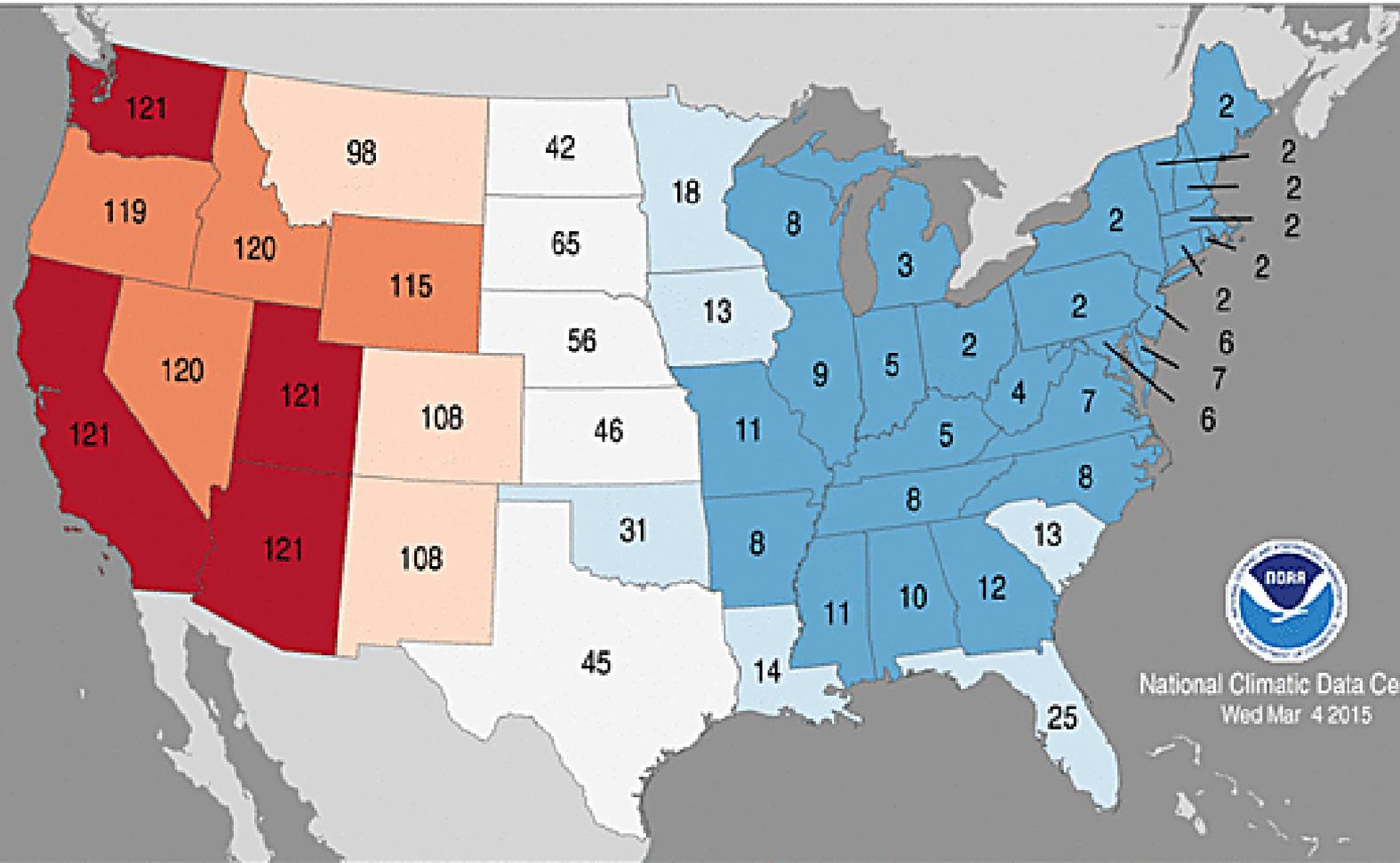
Regional Climate Centers

<http://www.hprcc.unl.edu/>

Statewide Average Temperature Ranks

February 2015

Period: 1895-2015



National Climatic Data Center
Wed Mar 4 2015

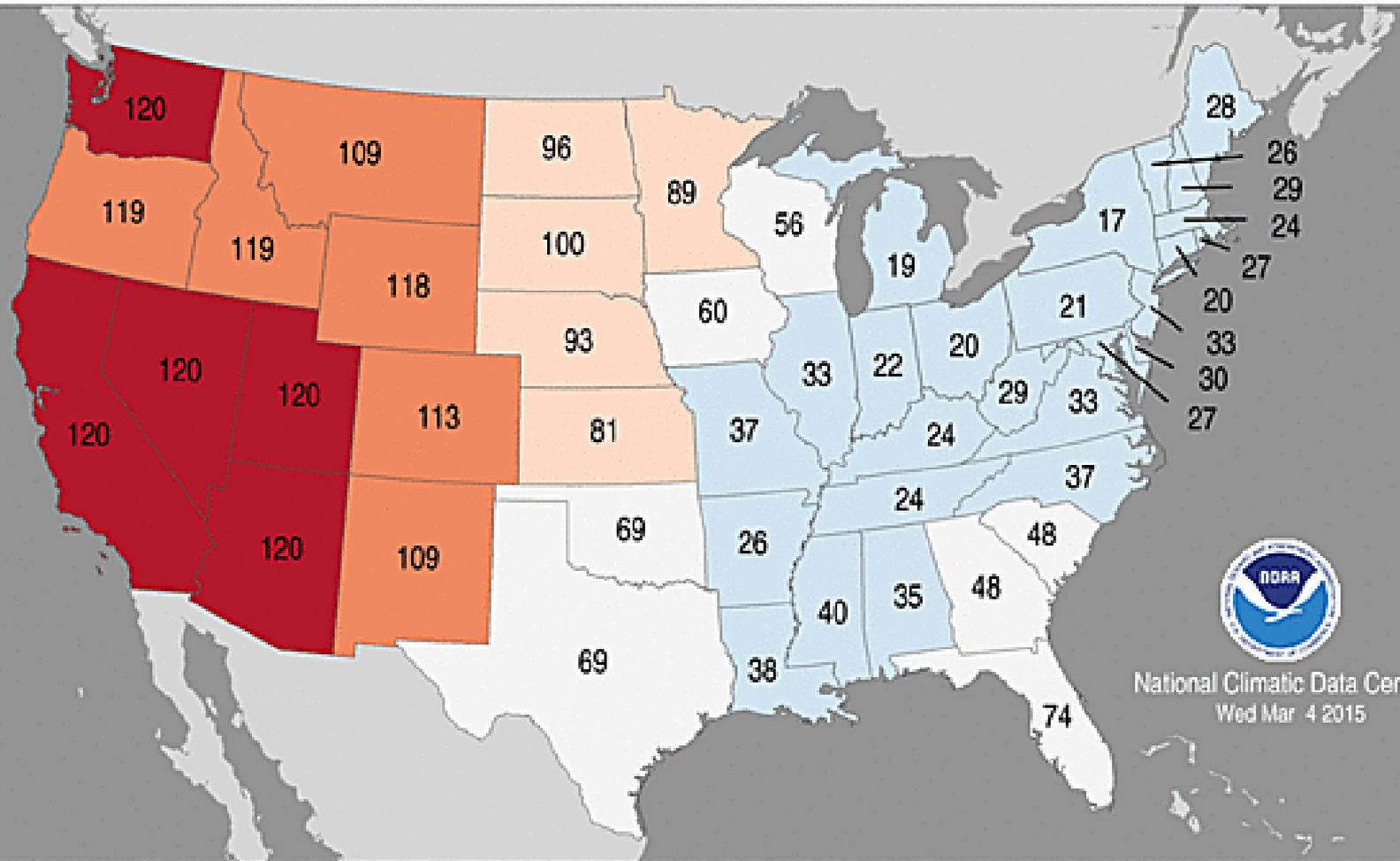


<http://www.ncdc.noaa.gov/temp-and-precip/maps.php>

Statewide Average Temperature Ranks

December 2014–February 2015

Period: 1895–2015



National Climatic Data Center
Wed Mar 4 2015

Record Coldest
(1)

Much Below Average

Below Average

Near Average

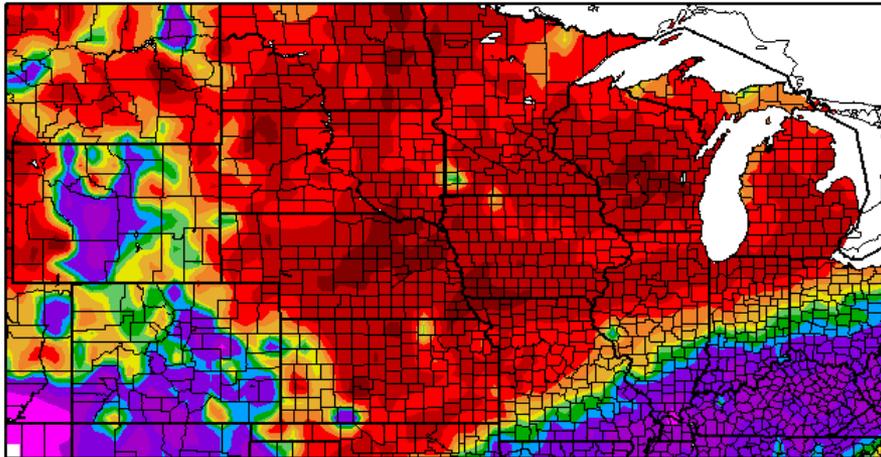
Above Average

Much Above Average

Record Warmest
(120)

30-Day Precipitation

Percent of Normal Precipitation (%)
2/16/2015 – 3/17/2015

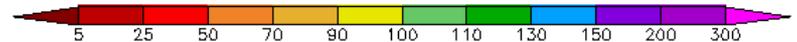
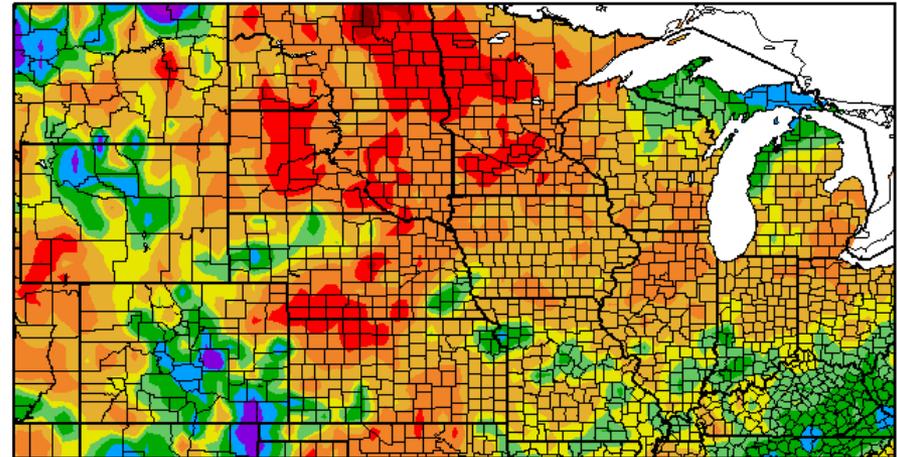


Generated 3/18/2015 at HPRCC using provisional data.

Regional Climate Centers

Water Year Precipitation

Percent of Normal Precipitation (%)
10/1/2014 – 3/17/2015



Generated 3/18/2015 at HPRCC using provisional data.

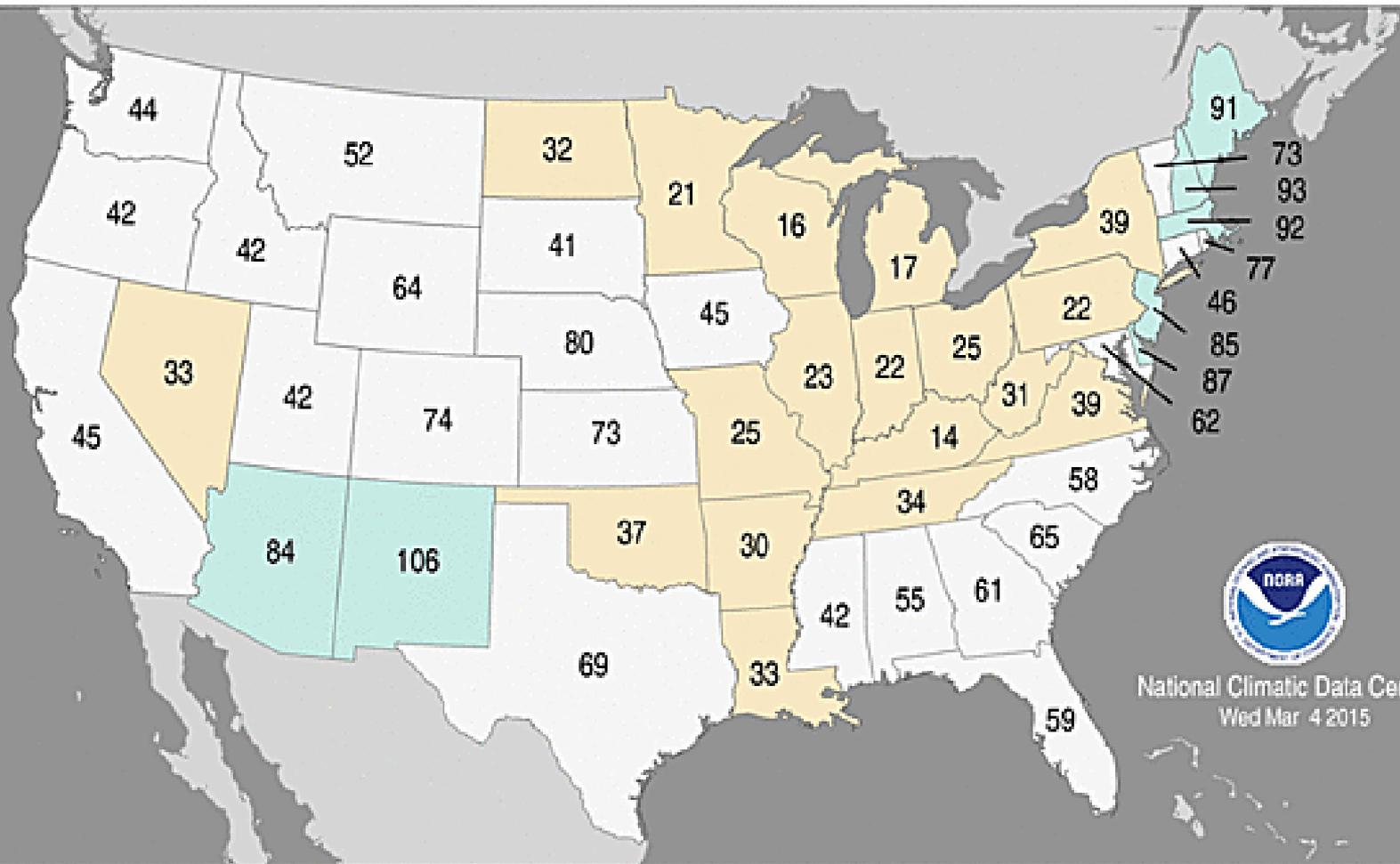
Regional Climate Centers

<http://www.hprcc.unl.edu/>

Statewide Precipitation Ranks

December 2014–February 2015

Period: 1895–2015



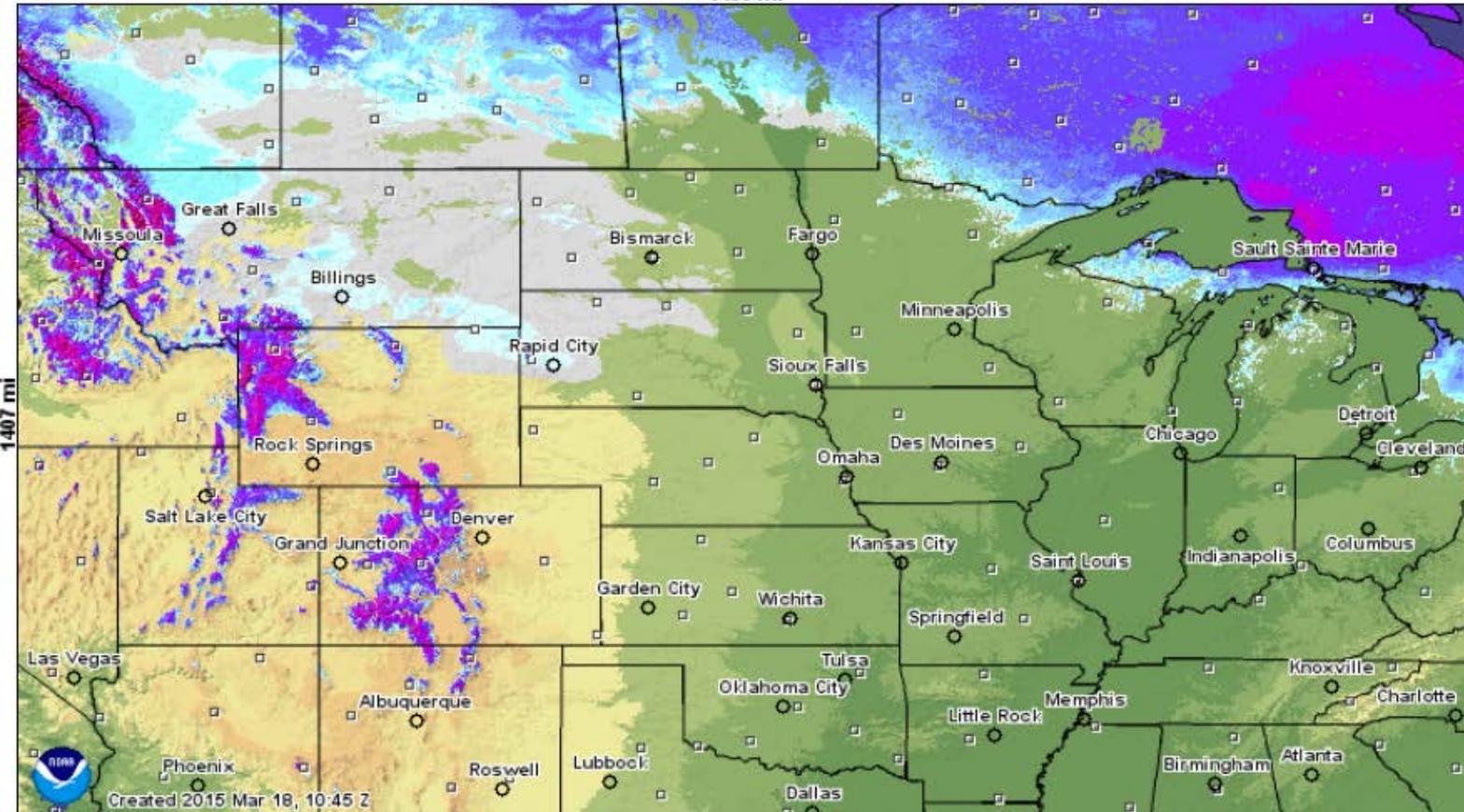
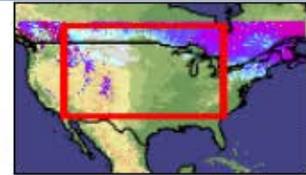
National Climatic Data Center
Wed Mar 4 2015



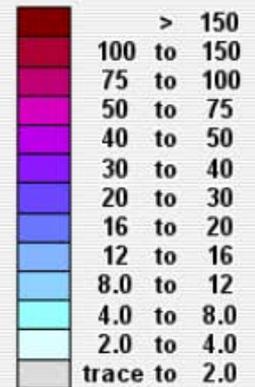
Modeled Snow Depth

Modeled Snow Depth for 2015 March 18, 6:00 UTC

1490 mi



Inches of depth



Not Estimated

Elevation in feet

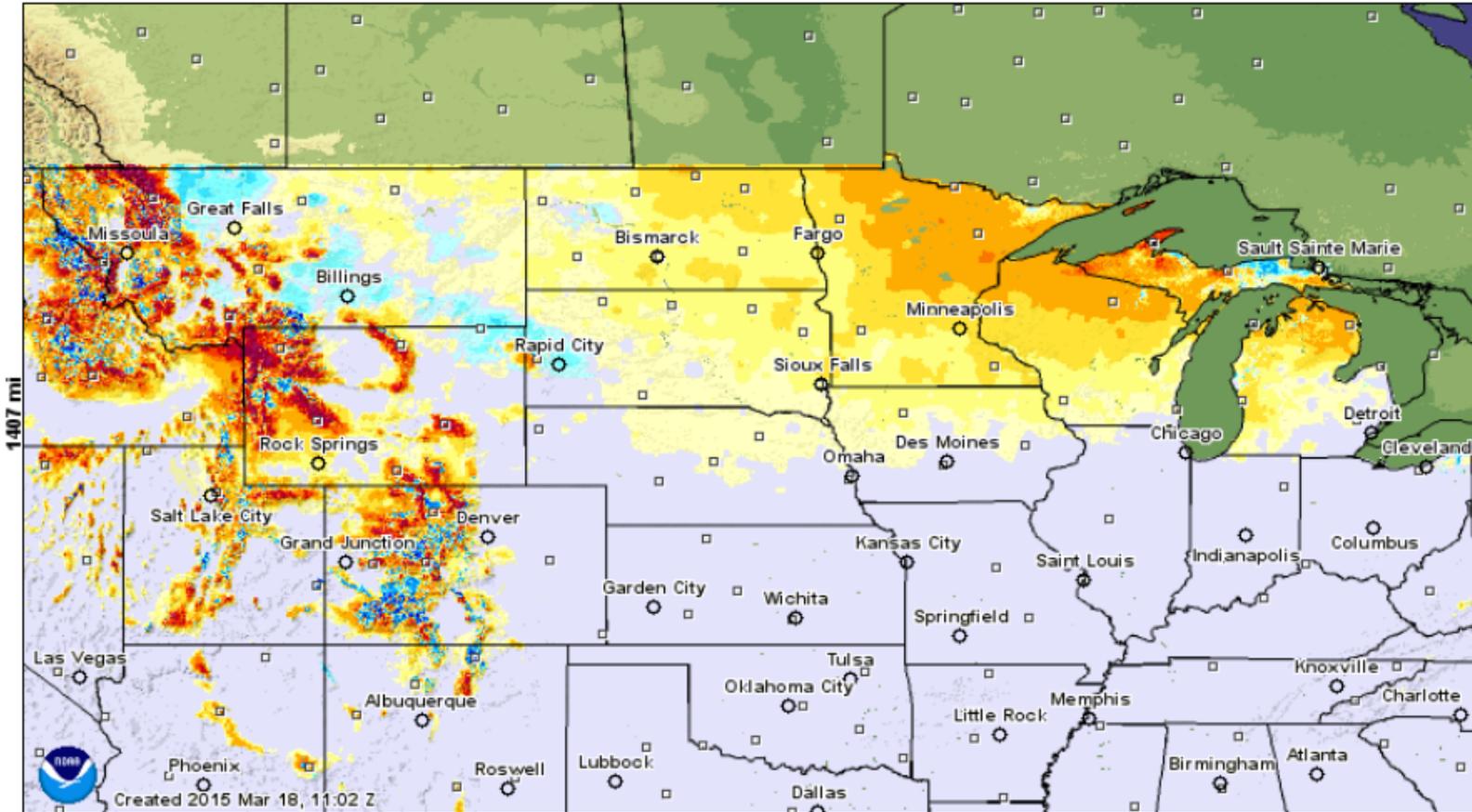
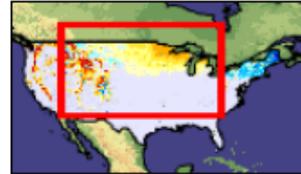


<http://http://www.nohrsc.noaa.gov/interactive/html/map.html?>

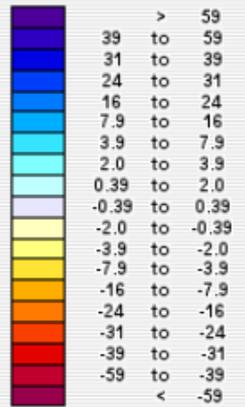
Modeled Snow Depth Anomaly

Modeled Snow Depth Departure from Normal (Daily) for 2015 March 18, 6:00 UTC

1490 mi



Inches of depth



Not Estimated

Elevation in feet

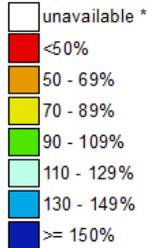


<http://http://www.nohrsc.noaa.gov/interactive/html/map.html?>

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

Mar 18, 2015

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).

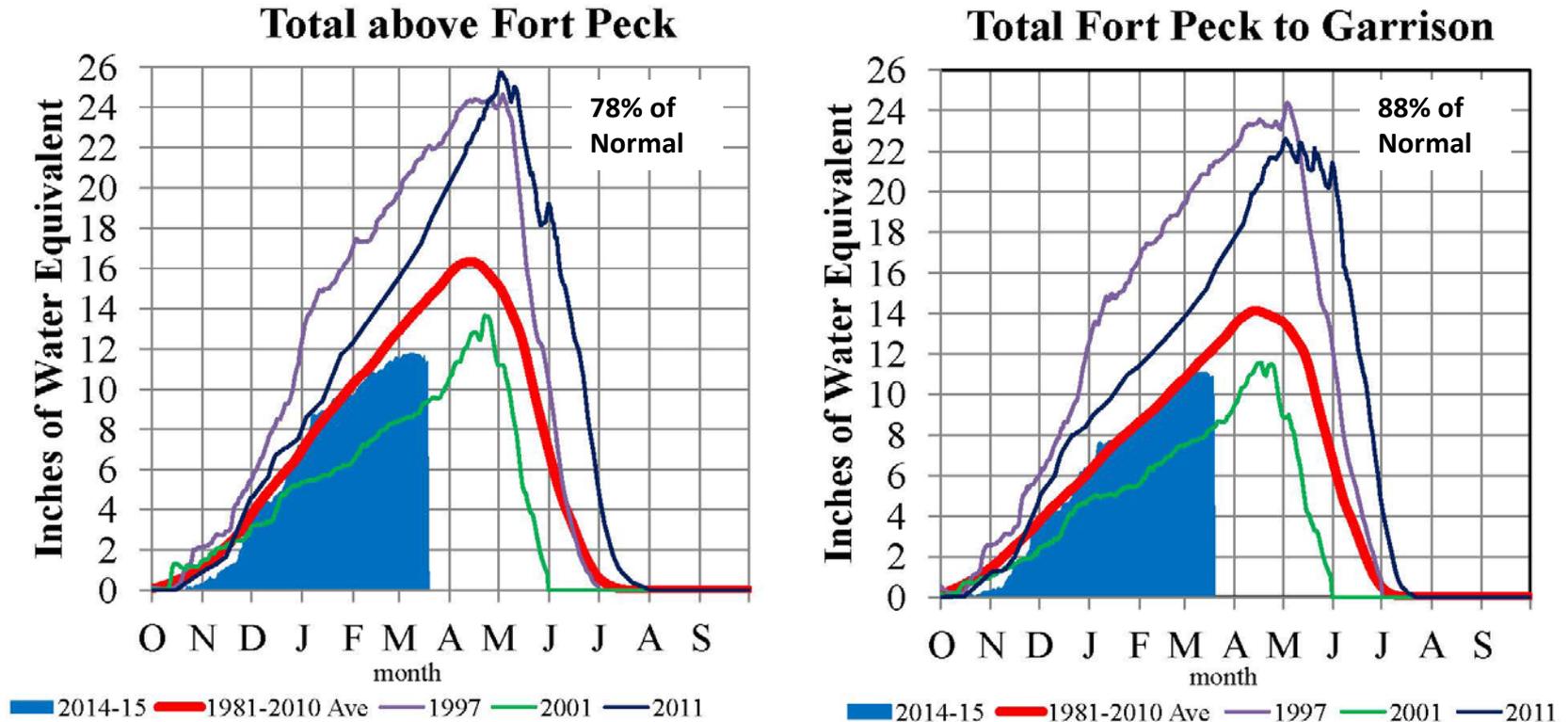
Prepared by:
USDA/NRCS National Water and Climate Center
Portland, Oregon
<http://www.wcc.nrcs.usda.gov>

- Current western U.S. snowpack conditions

http://www.wcc.nrcs.usda.gov/ftpref/gis/images/west_swepctnormal_update.png

Missouri River Basin – Mountain Snowpack Water Content 2014-2015 with comparison plots from 1997*, 2001*, and 2011

March 18, 2015



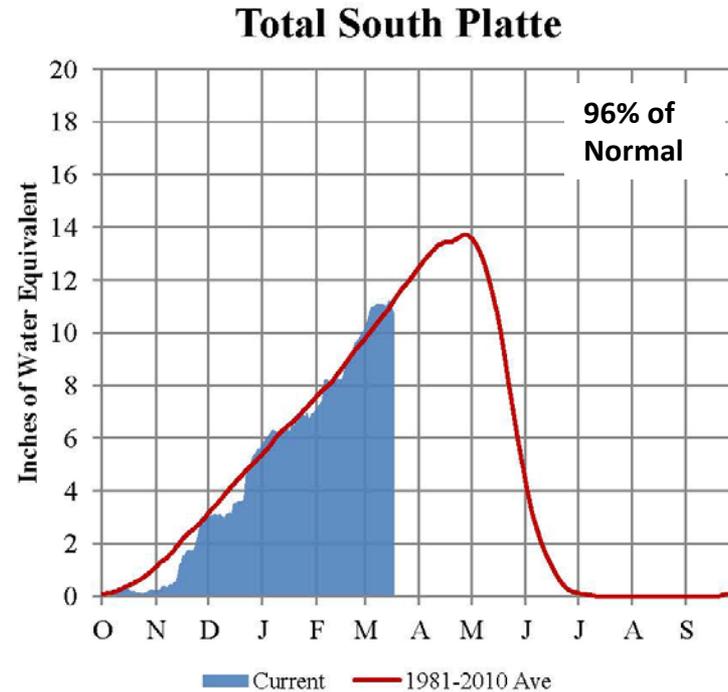
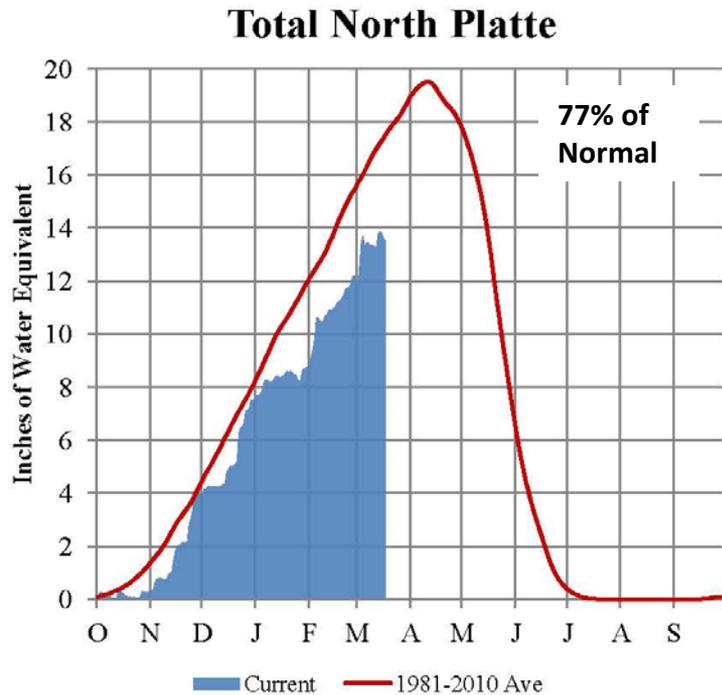
The Missouri River Basin mountain snowpack normally peaks near April 15. By March 15, normally 87% of the peak has accumulated. On March 18, 2015 the mountain snow water equivalent (SWE) in the “Total above Fort Peck” reach is currently 11.4”, 78% of average. The mountain SWE in the “Total Fort Peck to Garrison” reach is currently 10.9”, 88% of average.

*Generally considered the high and low year of the last 20-year period.

Provisional data. Subject to revision.

Platte River Basin - Mountain Snowpack Water Content Water Year 2014-2015

3/18/2015

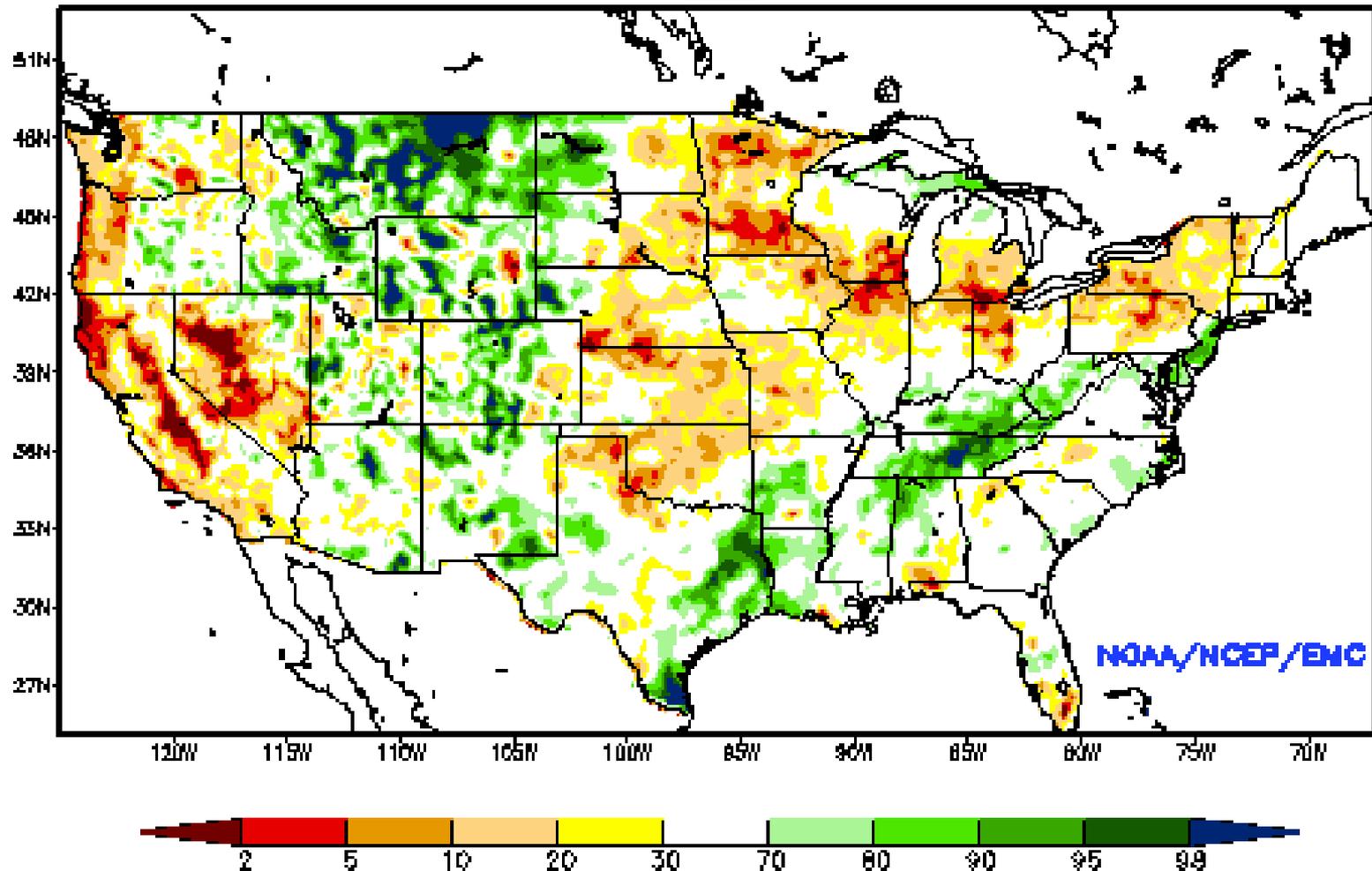


The North and South Platte River Basin mountain snowpacks normally peak near April 15. As of March 17, 2015, the mountain snowpack SWE in the "Total North Platte" reach is currently 13.5", 77% of average. The mountain snowpack SWE in the "Total South Platte" reach is currently 10.7", 96% of average.

Provisional Data. Subject to Revision

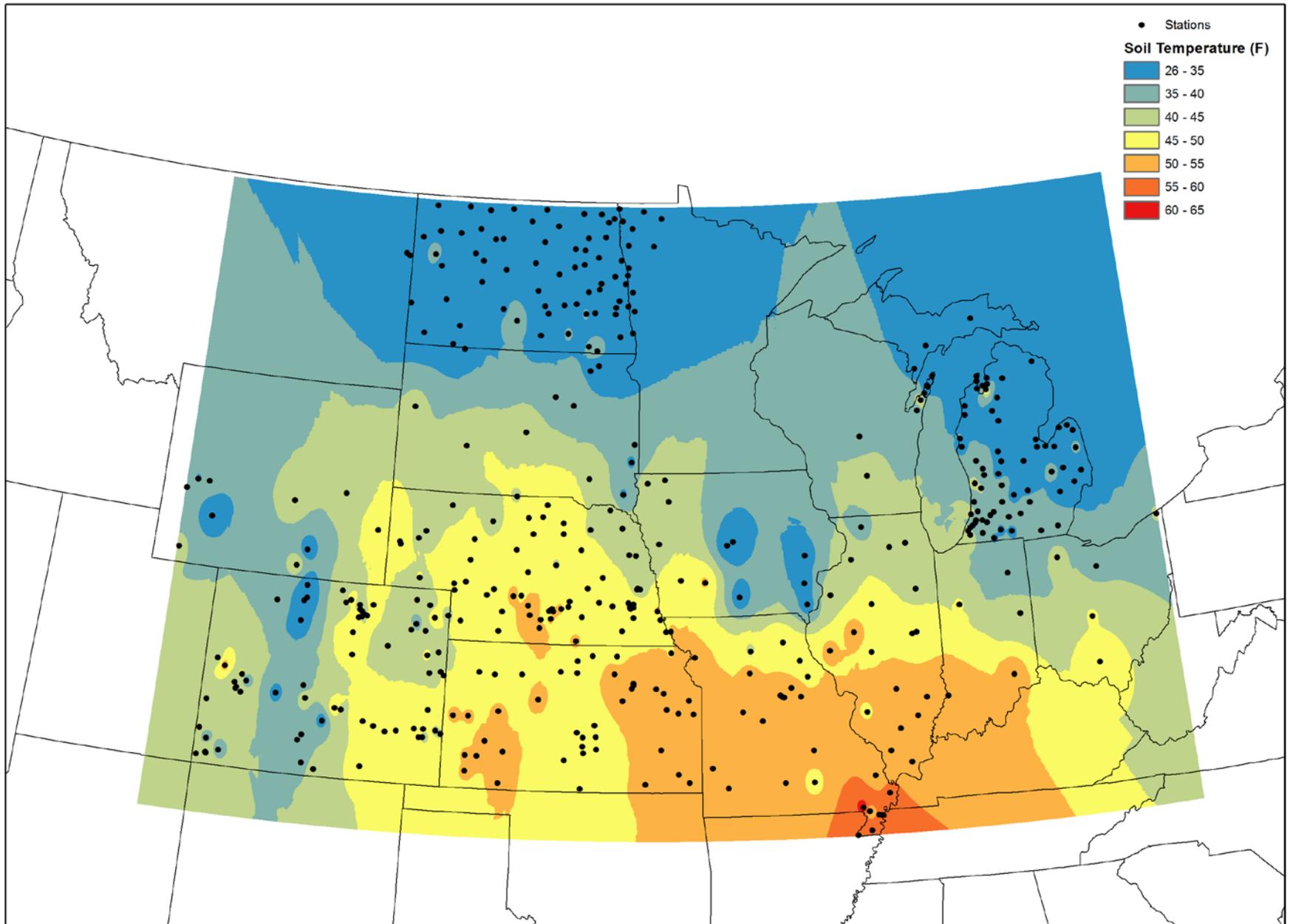
Modeled Soil Moisture

Ensemble-Mean – Current Total Column Soil Moisture Percentile
NCEP NLDAS Products Valid: MAR 13, 2015



<http://www.emc.ncep.noaa.gov/mmb/nldas/drought/>

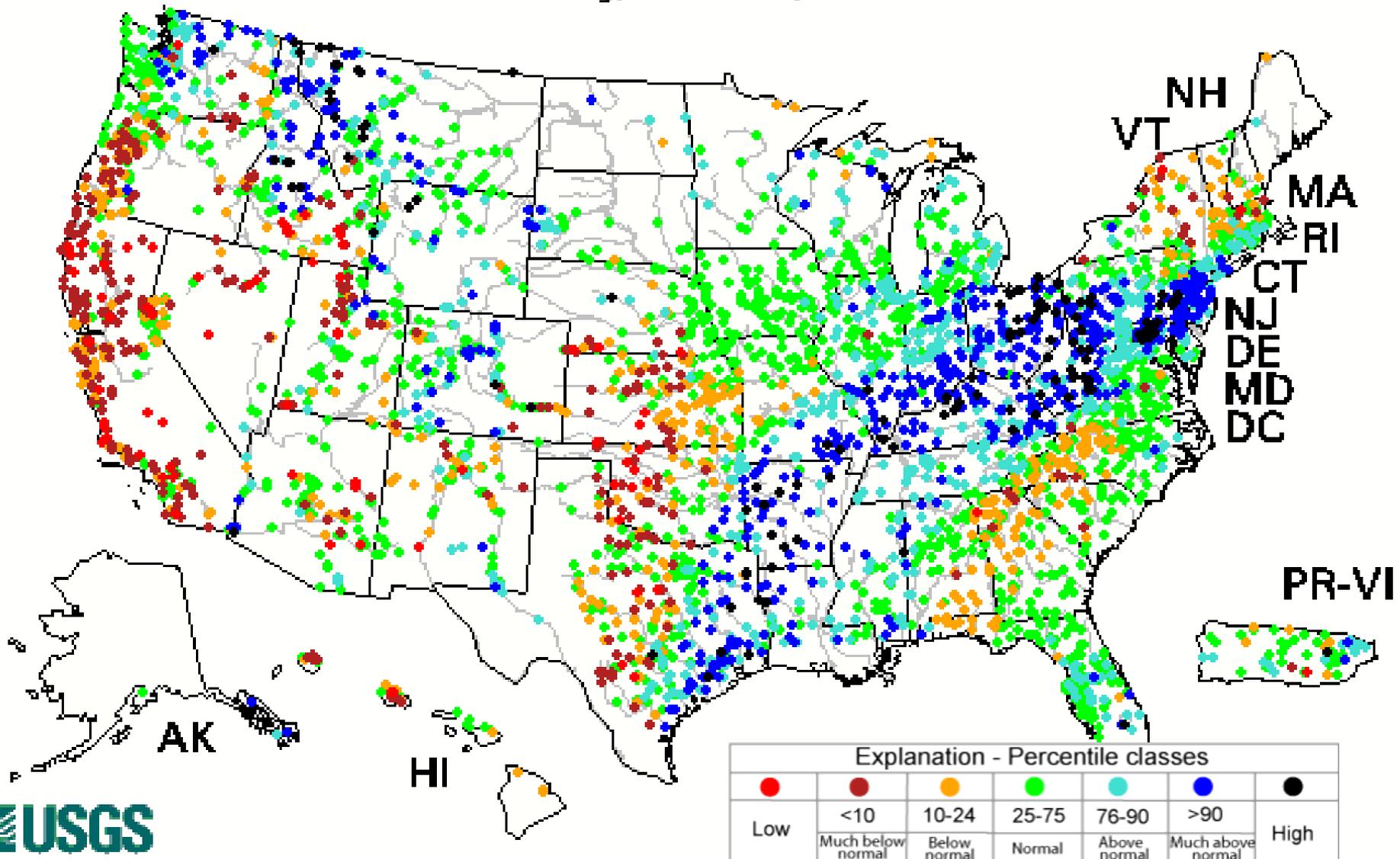
Soil Temperature (F) between 2 and 4"



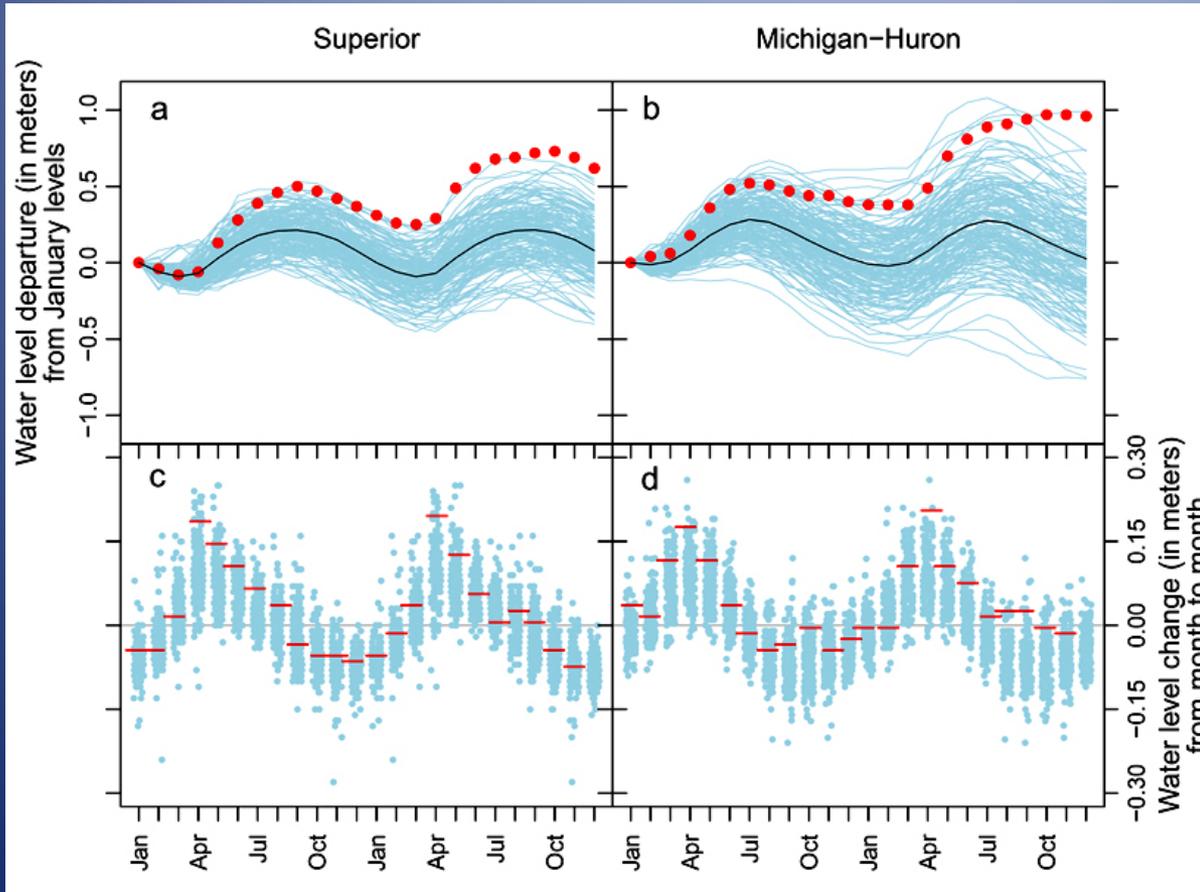
Map produced by Colorado Climate Center utilizing data from HPRCC, MRCC, SD and CO mesonets.

Current 7 Day Average Streamflow

Tuesday, March 17, 2015



Great Lakes Water Levels



From Jan 2013 to Dec 2014

- Superior rose 0.6 meters (~2ft), highest ever for the 24 month period.
- Michigan-Huron rose 1.0m (~3.3ft), nearly equal to 1950-1951 rise

<https://eos.org/project-updates/water-levels-surge-on-great-lakes>

<http://research.noaa.gov/News/NewsArchive/LatestNews/TabId/684/ArtMID/1768/ArticleID/10944/NOAA-and-partners-document-surge-in-Great-Lakes-water-levels.aspx>

Great Lakes Water Levels

- Abnormally high rises in water level are attributed to:
 - Superior: persistent near- to above-average rises in nearly every month, notably in spring/summer.
 - Michigan-Huron: near- to above-average rises in summer and fall months.
 - It is unusual to see water levels rise in the fall, only 11/154 years have seen levels rise from Sept to Oct.
- Impacts from high water
 - Shoreline flooding/erosion/property damage
 - Economic relief for commercial shipping, hydropower and recreation.



Coastal flooding on Lake Michigan,
Halloween 2014

Credit:

www.flickr.com/photos/joshuamellin/

GREAT LAKES SURFACE ENVIRONMENTAL ANALYSIS (GLSEA)



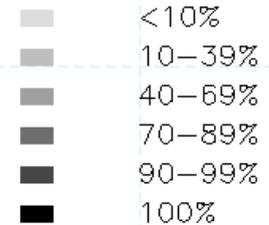
Analysis Date: JD 077 03/18/2015
Percent Pixels with Data within +/-10 Days: 62.9%

Date of last ice analysis: 3/18/2015 48°

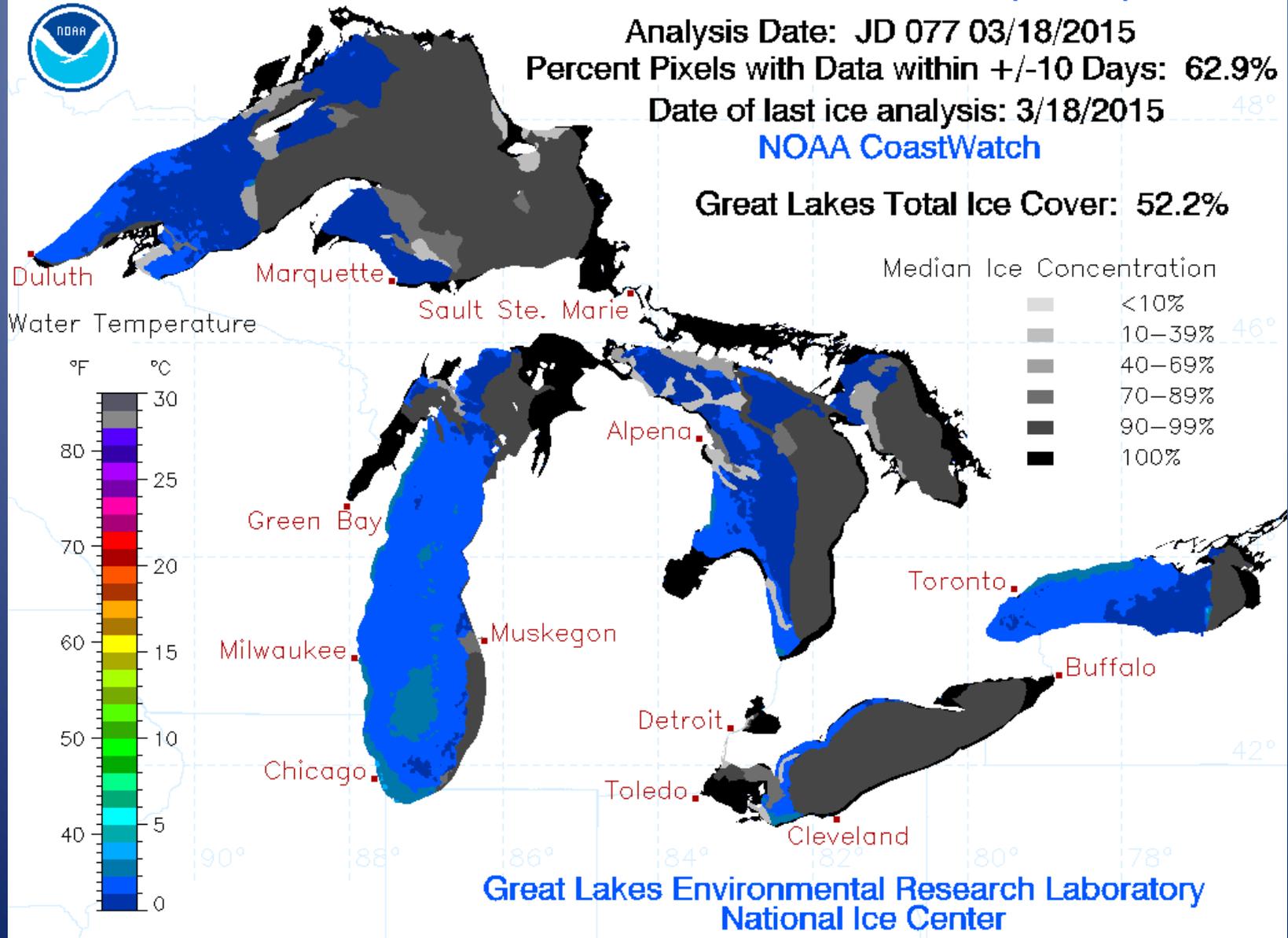
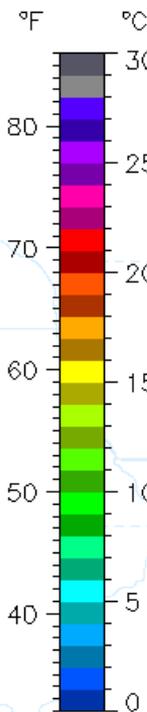
NOAA CoastWatch

Great Lakes Total Ice Cover: 52.2%

Median Ice Concentration



Water Temperature

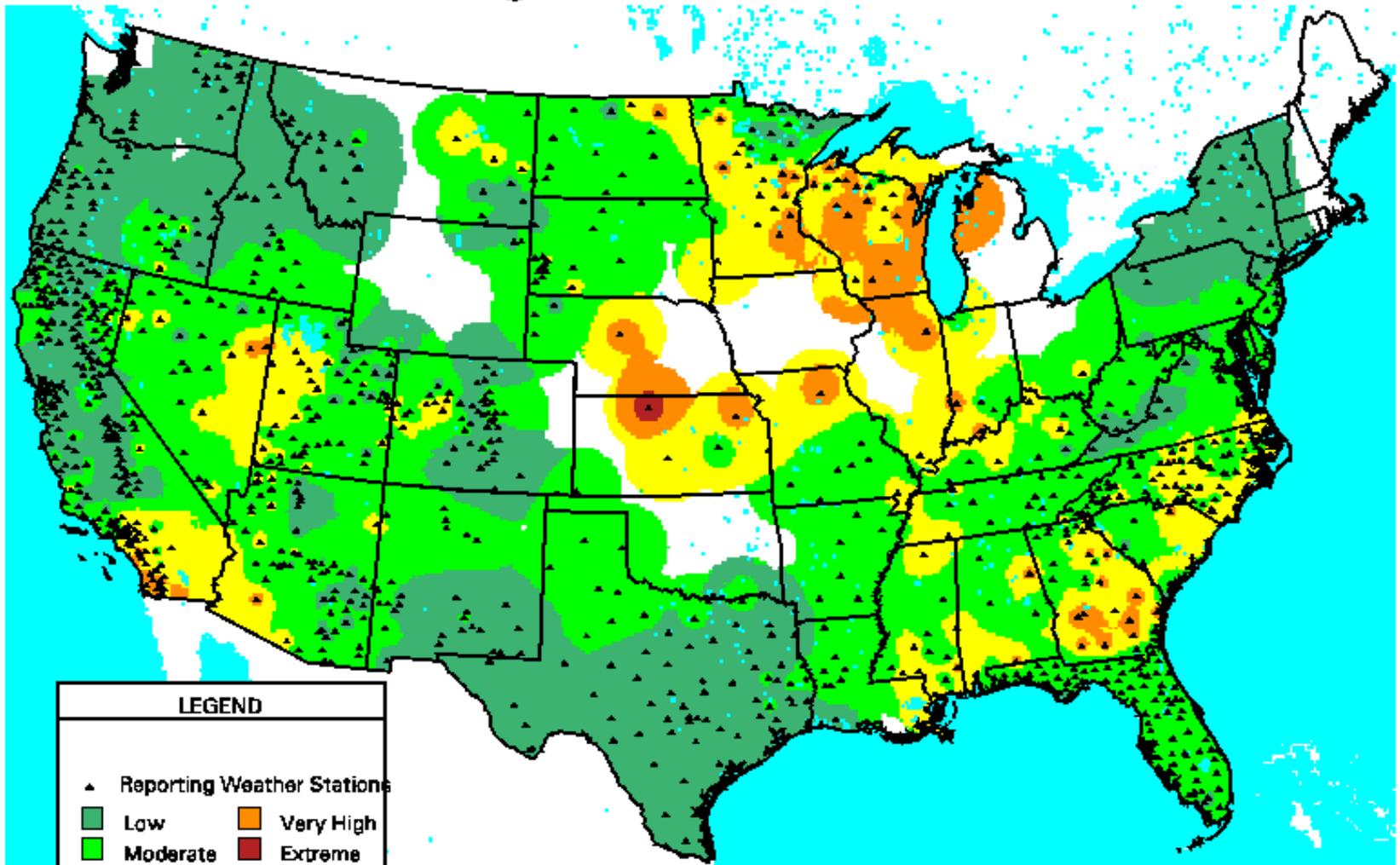


Last year at this time, ice cover was 82%

Regional Impacts

- Dry, warm and windy weather has dried out soils and grasses across NE, CO, KS and IA causing grass fires until green-up.
- Lack of snow on ground caused a rapid warm up over portions of the region (ND) and causes concerns for growing season soil moisture.
- Low stock pond levels (KS/NE)
- Lower than normal snowpack levels will likely result in lower than normal runoff and reduced reservoir storage levels.

Observed Fire Danger Class: 17-MAR-15



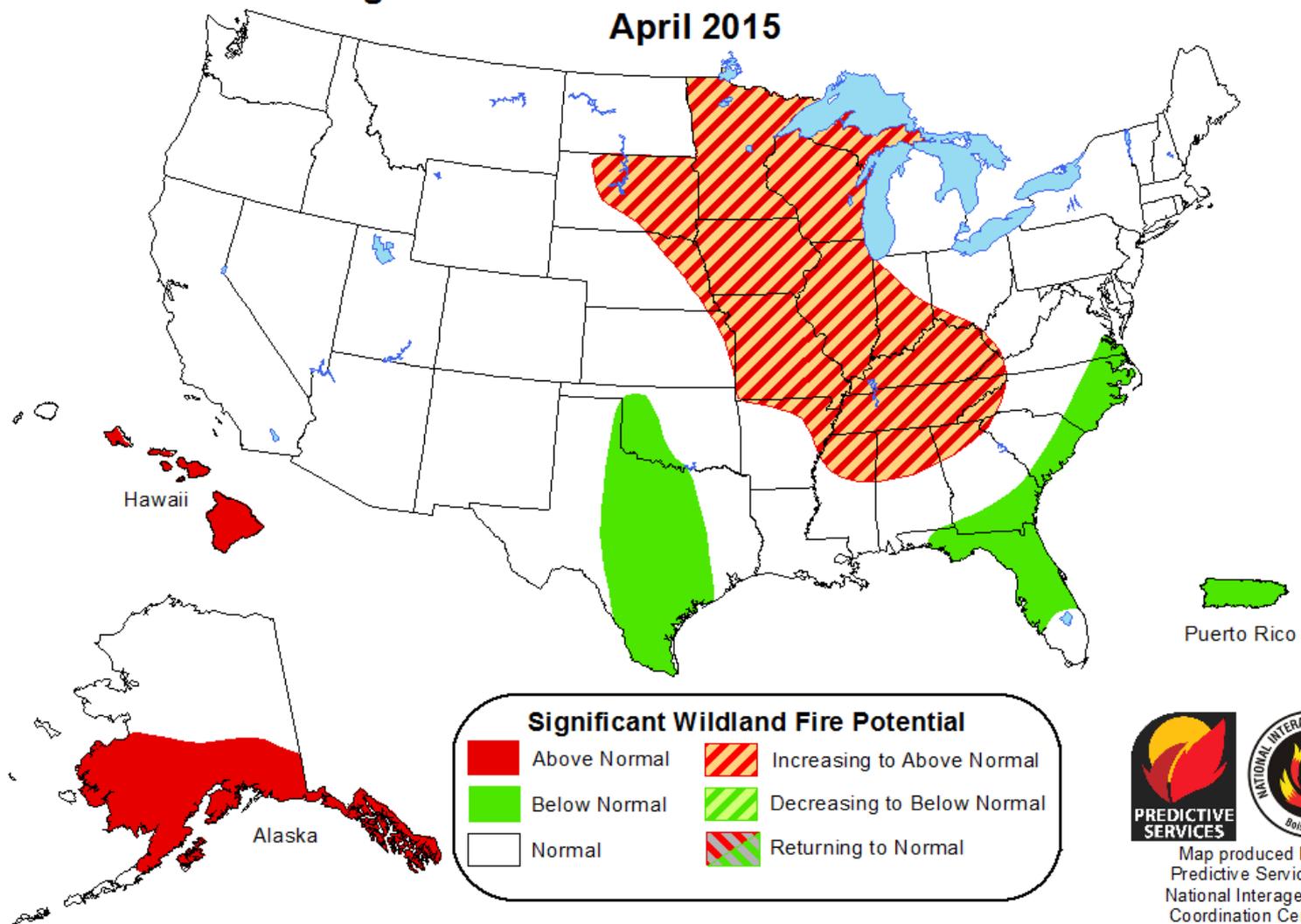
LEGEND	
▲ Reporting Weather Stations	
Low	Very High
Moderate	Extreme
High	Water

(Inv. Dist.² Interp.)

WFAS-MAPS Graphics FIRE BEHAVIOR RESEARCH MISSOULA, MT



Significant Wildland Fire Potential Outlook April 2015



Significant Wildland Fire Potential

 Above Normal	 Increasing to Above Normal
 Below Normal	 Decreasing to Below Normal
 Normal	 Returning to Normal



Map produced by
 Predictive Services,
 National Interagency
 Coordination Center
 Boise, Idaho
 Issued March 1, 2015
 Next issuance April 1, 2015

Above normal significant wildland fire potential indicates a higher than usual likelihood that wildland fires will occur and/or become significant events. Wildland fires are still expected to occur during forecasted normal conditions as would usually be expected during the outlook period. Significant wildland fires are still possible but less likely than usual during forecasted below normal periods.

Agricultural Impacts

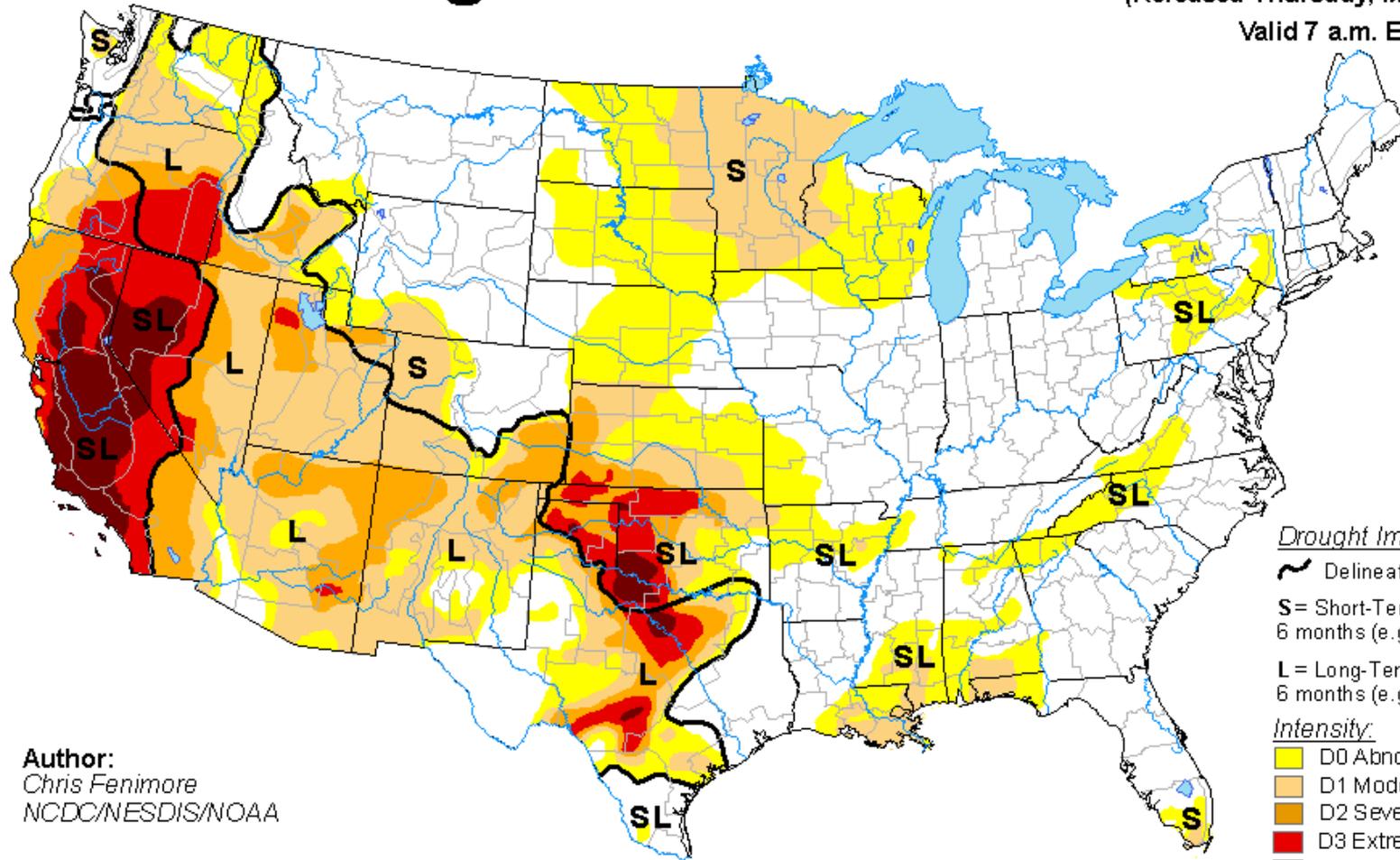
- Warmer and drier weather does have a few positive impacts...for now.
 - Good news for calving
 - Getting equipment into fields should be easier due to lack of snow on ground.
- Rangeland
 - No impacts at this time.
- Winter Wheat
 - Some wheat has emerged, drier areas are seeing damage from wind.
- Small grain planting has begun in SD.

U.S. Drought Monitor

March 17, 2015

(Released Thursday, Mar. 19, 2015)

Valid 7 a.m. EST



Author:
Chris Fenimore
NCDC/NESDIS/NOAA

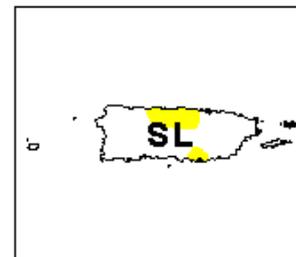
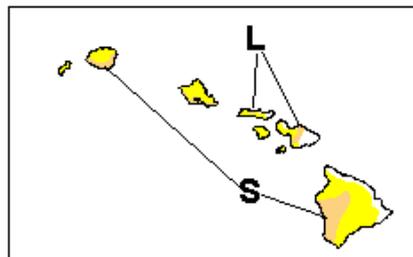
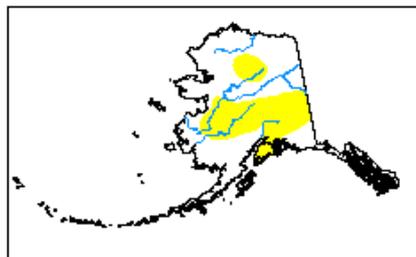
Drought Impact Types:

- ~ Delineates dominant impacts
- S** = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
- L** = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

Intensity:

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

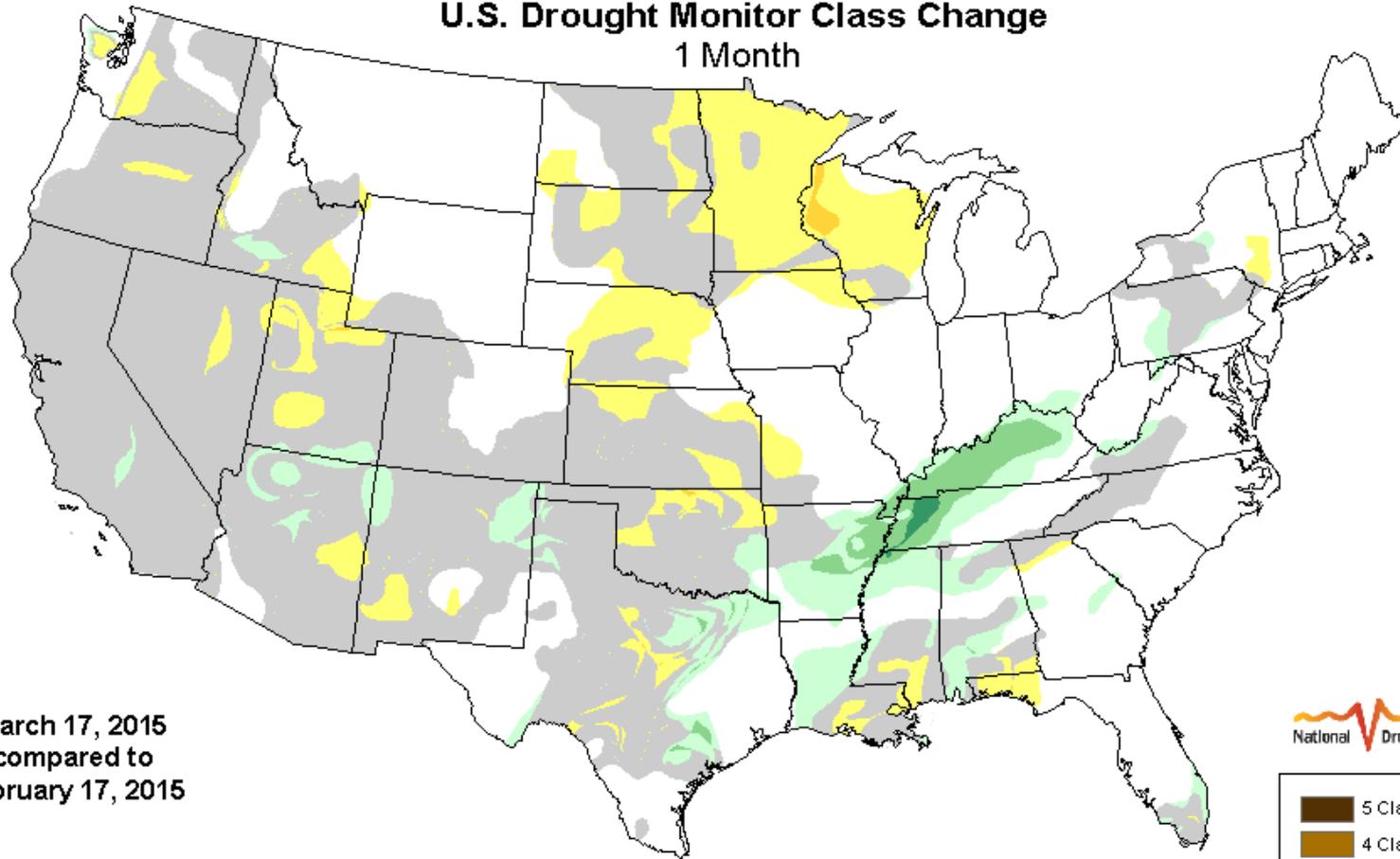
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.



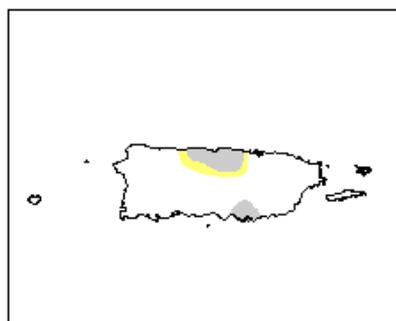
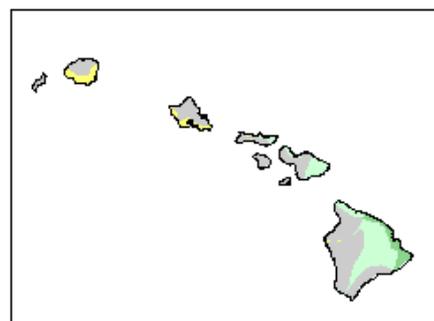
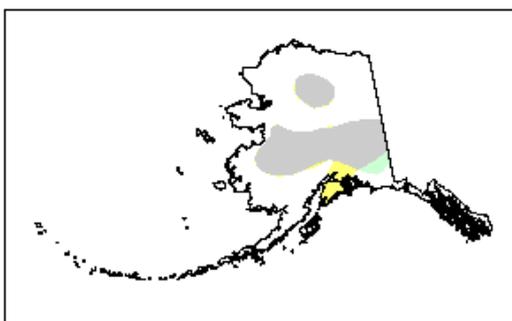
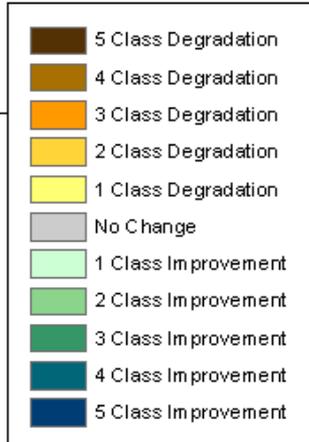
<http://droughtmonitor.unl.edu/>

U.S. Drought Monitor Class Change 1 Month

March 17, 2015
compared to
February 17, 2015



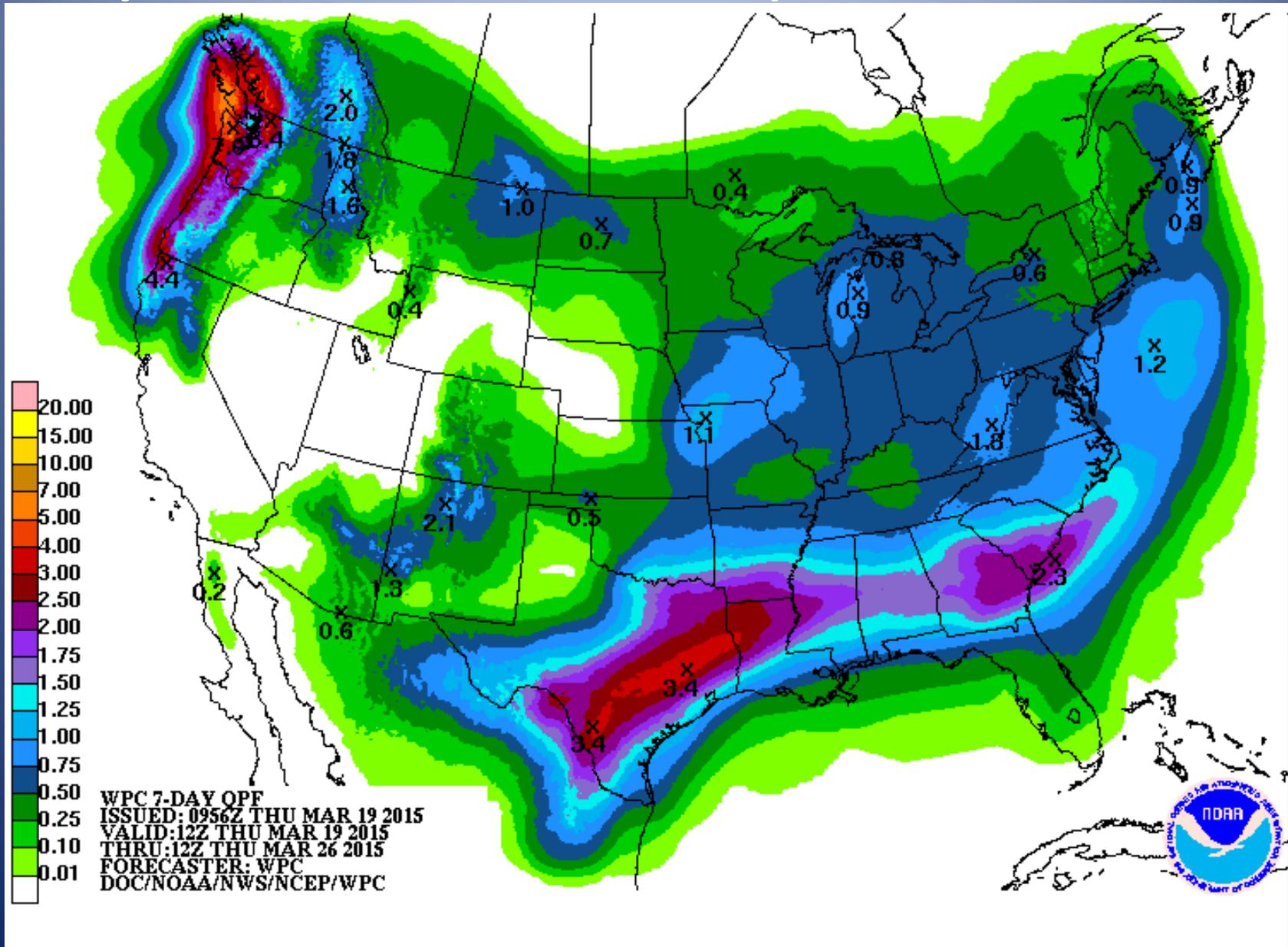
National Drought Mitigation Center



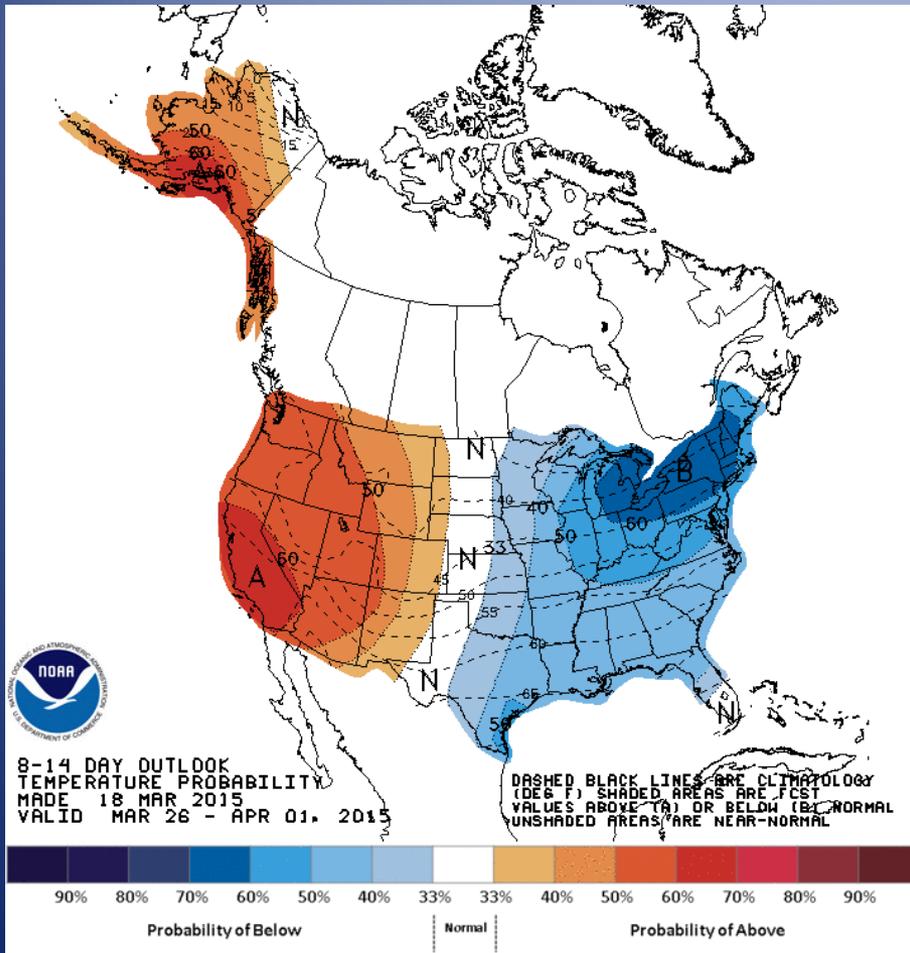
Climate Outlooks

- **7-day precipitation forecast**
- **8-14 day outlook**
- **April**
- **Spring Outlook**
- **Summer Outlook**
- **Seasonal Drought Outlooks**

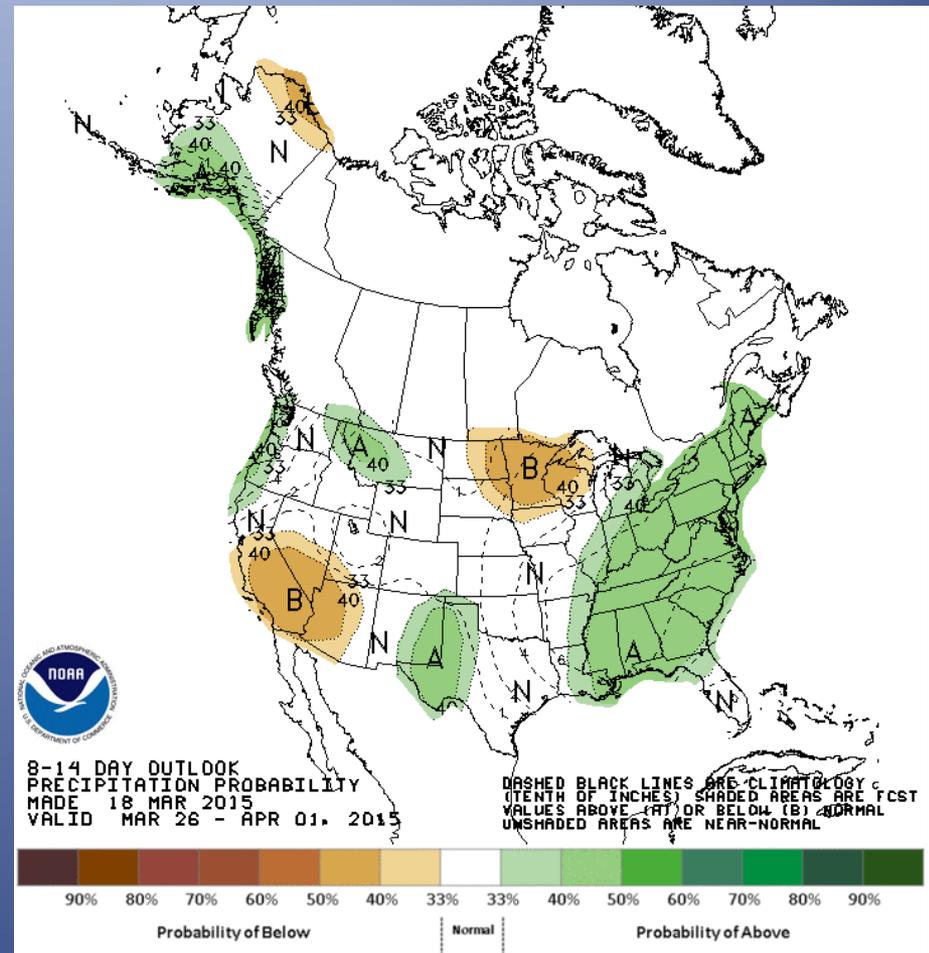
7-Day Quantitative Precipitation Forecast



8-14 Day Outlook: 26 Mar – 1Apr 2015

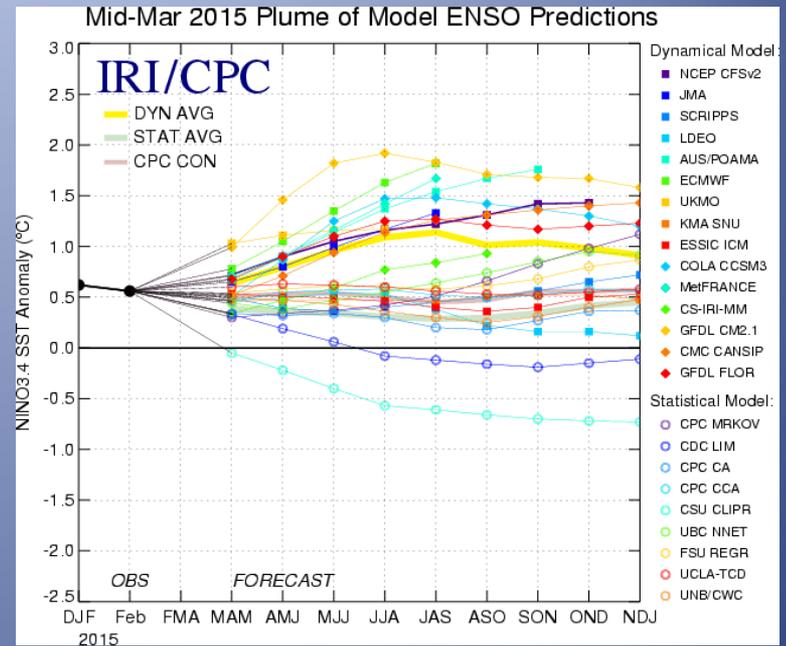
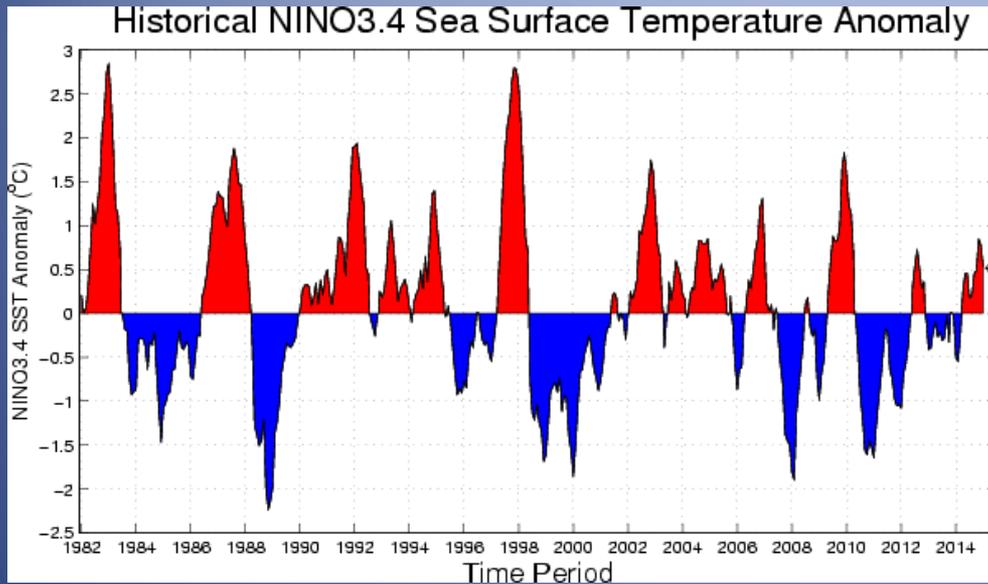


Temperature



Precipitation

El Nino Update



- El Niño has been officially declared, but it is weak and developing at an abnormal time of year.
 - Relationships are stronger in fall/winter
- Statistical and dynamical models in disagreement about future SST's.
- El Niño events can suppress tornado activity.
 - There is a **slight** tendency for El Niño years to have less extremes across this region
- True impacts for summer are complicated and still be discussed.

<http://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/>

<http://www.wfaa.com/story/weather/2015/03/16/el-nino-la-nina-tornadoes/24853273/>

El Niño Resources

U2U Decision Support Tools - Climate Patterns Viewer

Welcome to Climate Patterns Viewer – connecting global climate conditions to local climate impacts.

This product provides a historical look at how the El Niño Southern Oscillation (ENSO) and Arctic Oscillation (AO) can influence local climate conditions and corn yield across the Corn Belt. You can use these simple maps and charts to show when and where specific phases of ENSO or AO have influenced:

- average monthly temperatures and precipitation,
- deviations of temperature and precipitation from 1981-2010 climate normals, and
- deviations of yield (in percent) from the de-trended 1981-2010 average yields.

This tool is not intended to be a forecast. Rather, this tool uses historical data (1981-2010) to highlight locations where ENSO and AO can potentially impact climate conditions over the course of the year, which can help you make more informed farm management decisions.

CURRENT CLIMATE PHASE
ENSO: El Niño
AO: Positive

ENSO ALERT STATUS
El Niño Advisory

Feedback? About CPV

Click on the map to view a chart of the data for that location; chart will appear below the maps.

Four Maps

ENSO Average Observed Monthly Precipitation (inches)

ENSO Average Observed Monthly Mean Temperature (°F)

Change Month

Link map

El Niño Impacts and Outlook

Midwest Region

September 2014

Typical El Niño Winter Pattern

El Niño Winter Tendencies

El Niño is a particular pattern in the Pacific Ocean that affects weather downstream to the United States. It has its most notable impacts in the winter, when wind patterns in the atmosphere are strongest. When El Niño is present, it provides some predictable effects to weather patterns. While no two El Niño events are alike, the typical winter weather pattern (left) brings the polar jet stream farther north than usual, across Canada, while the Pacific jet stream remains in the southern U.S. As a result, the upper Midwest to Great Lakes area can be warmer than normal, with drier-than-normal conditions across the Great Lakes toward the Ohio River Valley, and with less snow than usual in the upper Midwest. Confidence in these patterns is higher with stronger El Niño events.

El Niño Outlook and Climate Connections

Winter Temperature and Precipitation

Departure from Average Temperature (°F) in Winter During Past El Niños

Percent of Average Precipitation (%) in Winter During Past El Niños

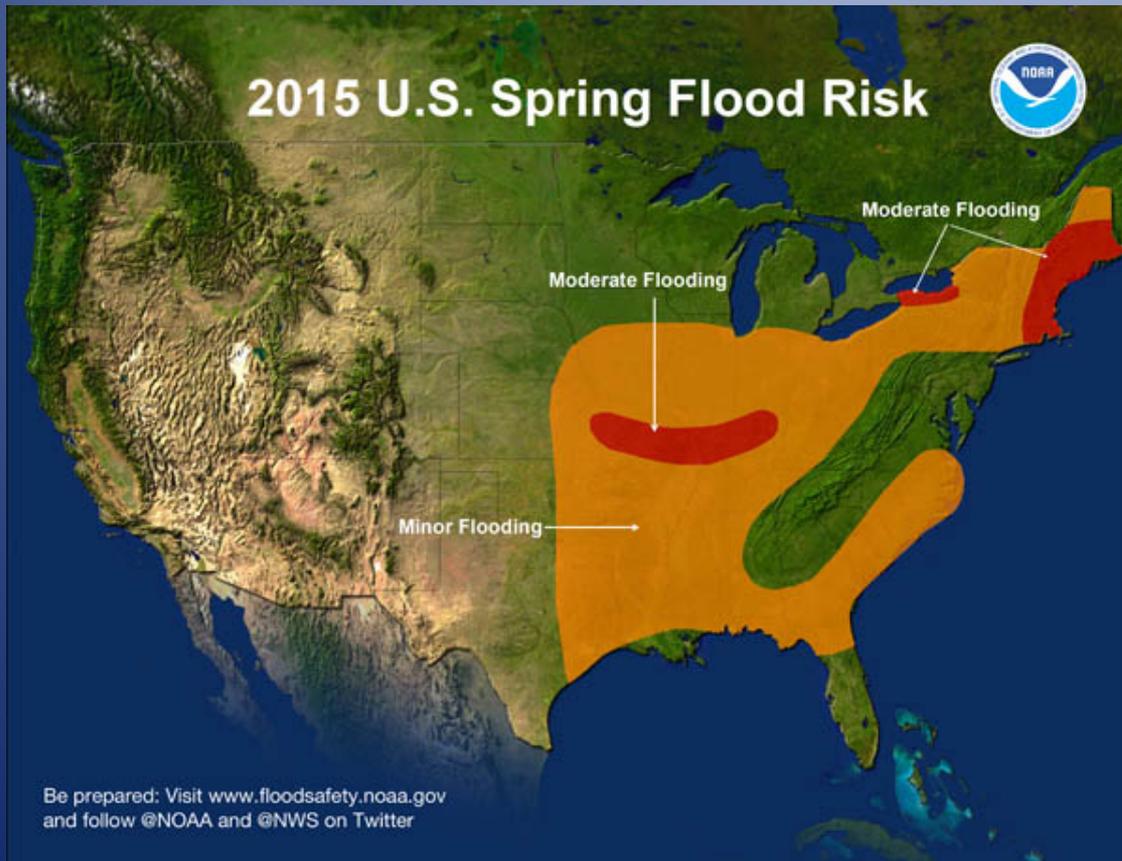
El Niño Likely
Highest Potential for Weak to Moderate El Niño

<http://mrcc.isws.illinois.edu/pubs/pubsElNino.jsp>

<https://mygeohub.org/groups/u2u/cpv>

- The above resources inform what El Niño (and other patterns) mean for your part of the country.

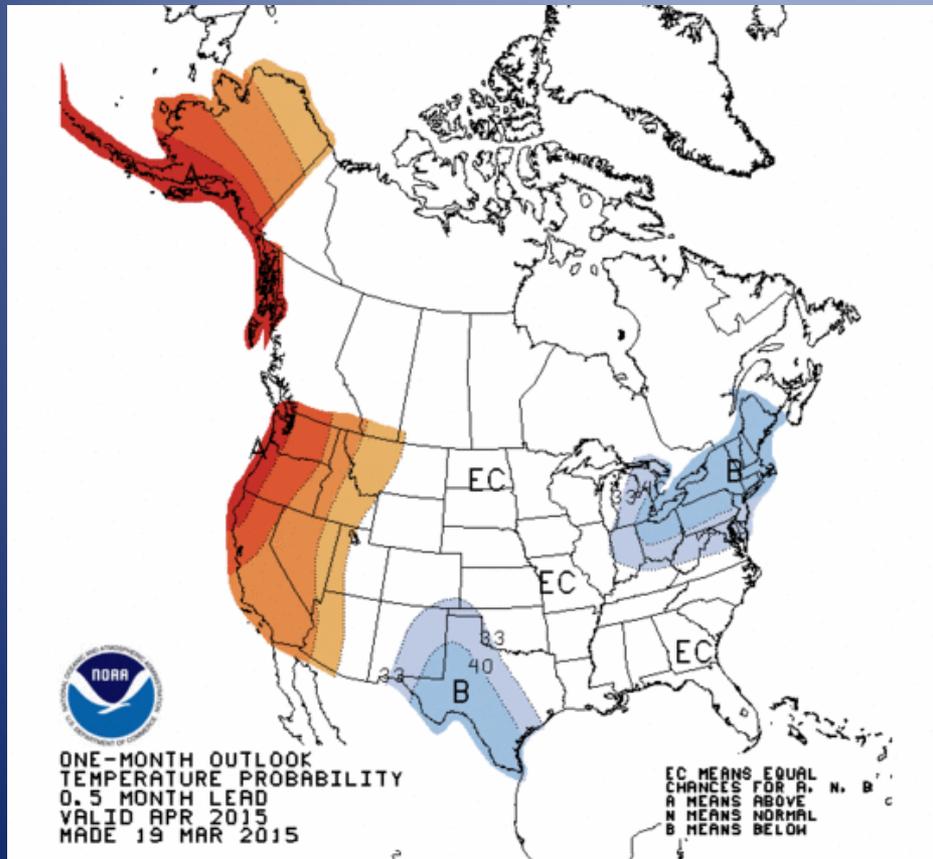
Spring Flood Outlook



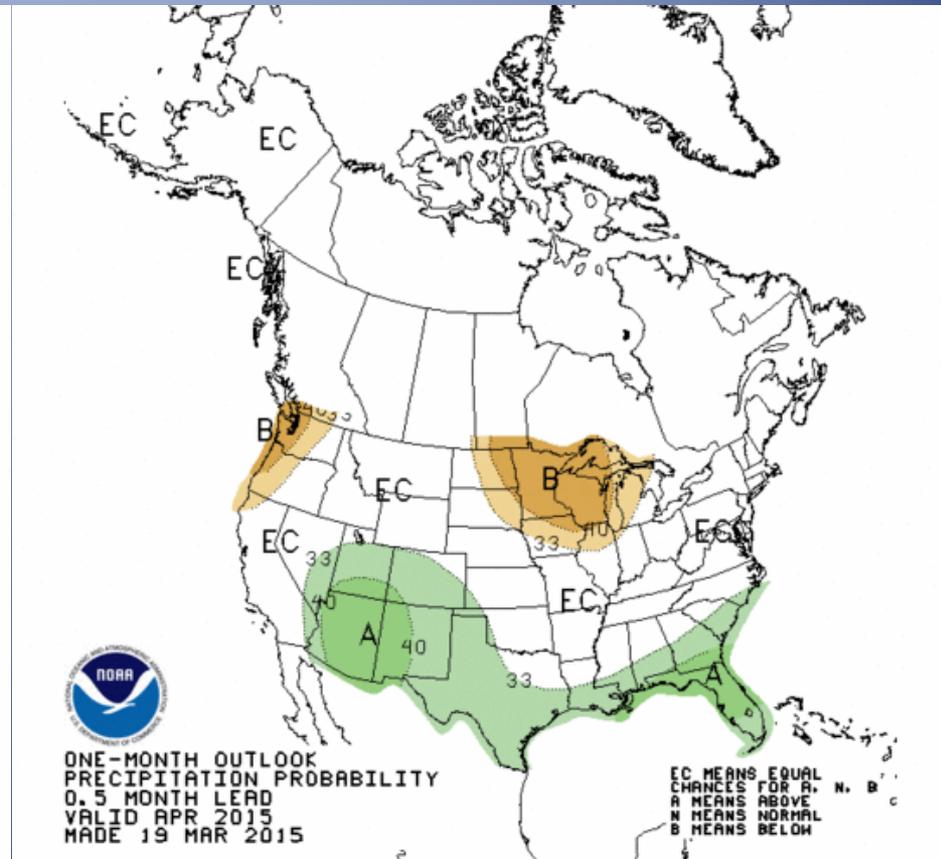
- 50% chance of exceeding moderate flood levels Eastern Kansas and Missouri
 - Rain/T-storm driven
 - These streams typically receive minor spring flooding from T-storms
- Moderate flooding expected in lower Ohio River basin from melting snow and heavy rains.
 - Primed soils and streams for flood risk to persist in Kentucky, southern IL and SW IN.

<http://www.nws.noaa.gov/hic/nho/>

1 Month Outlook: April 2015

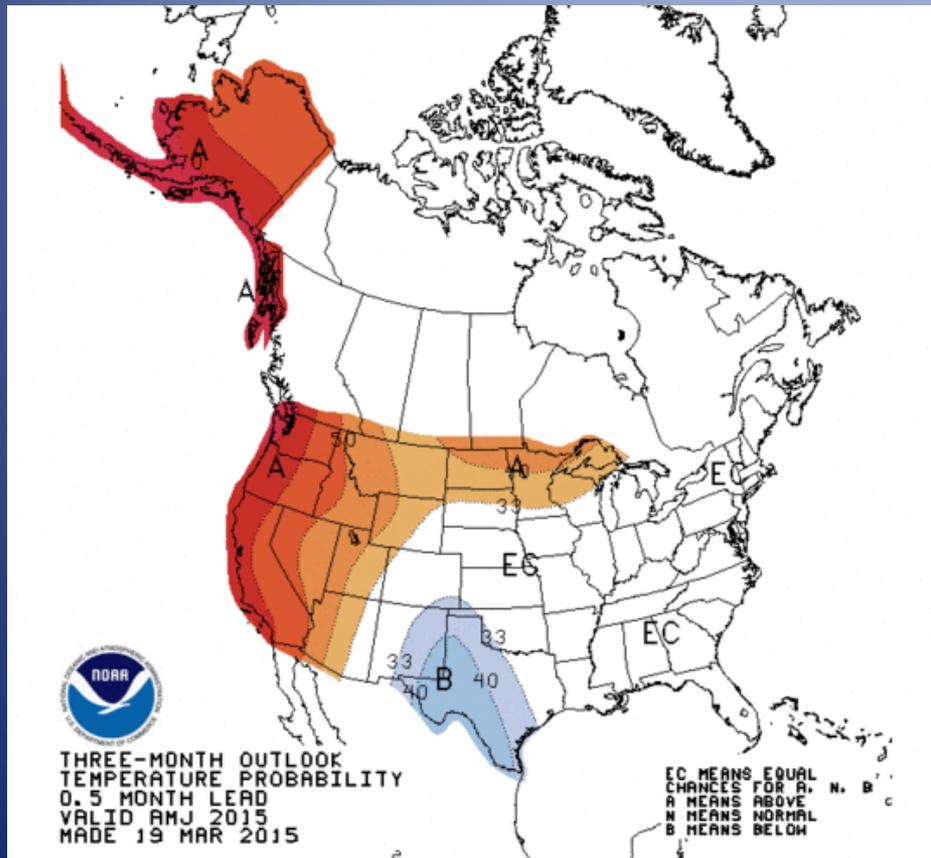


Temperature

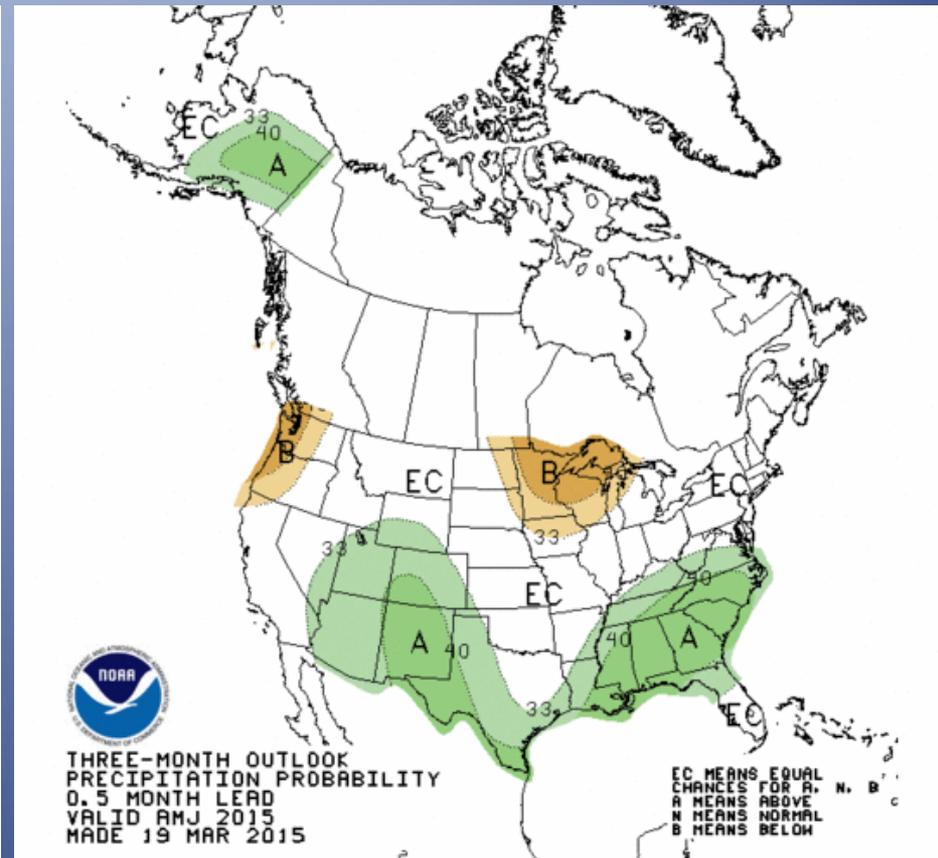


Precipitation

3 Month Outlook: AMJ 2015

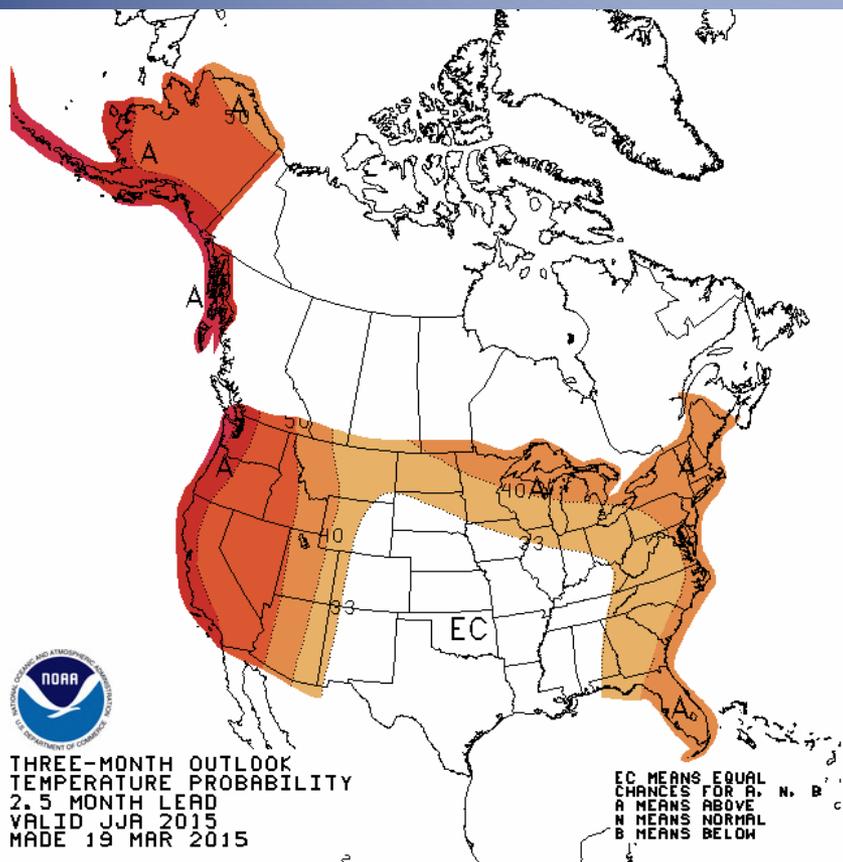


Temperature

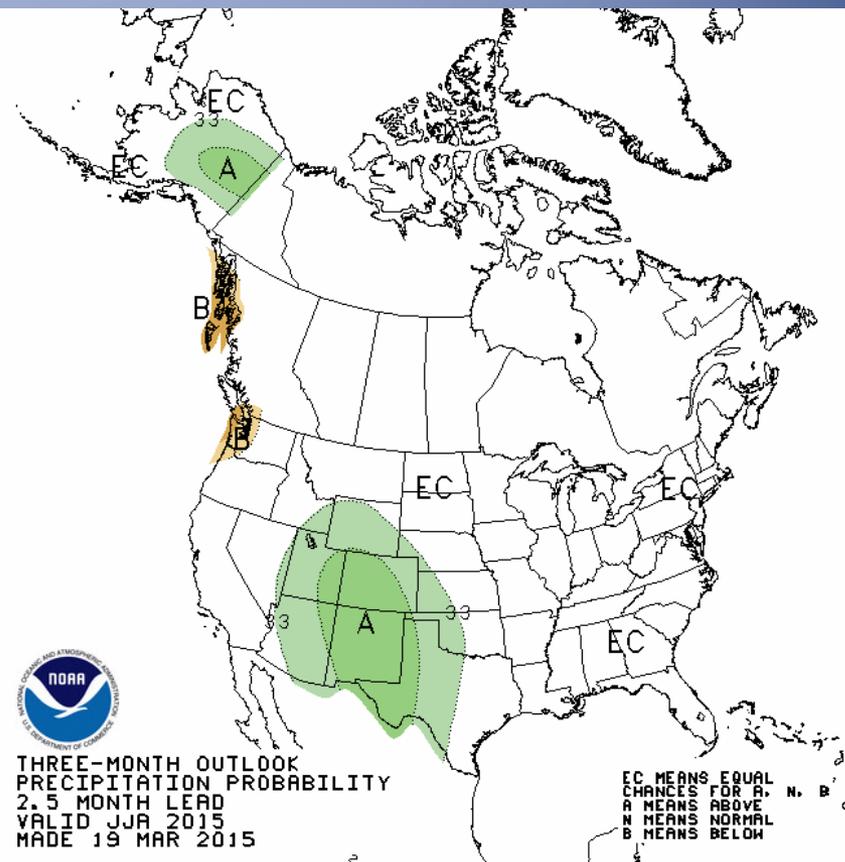


Precipitation

JJA 2015 Outlook



Temperature

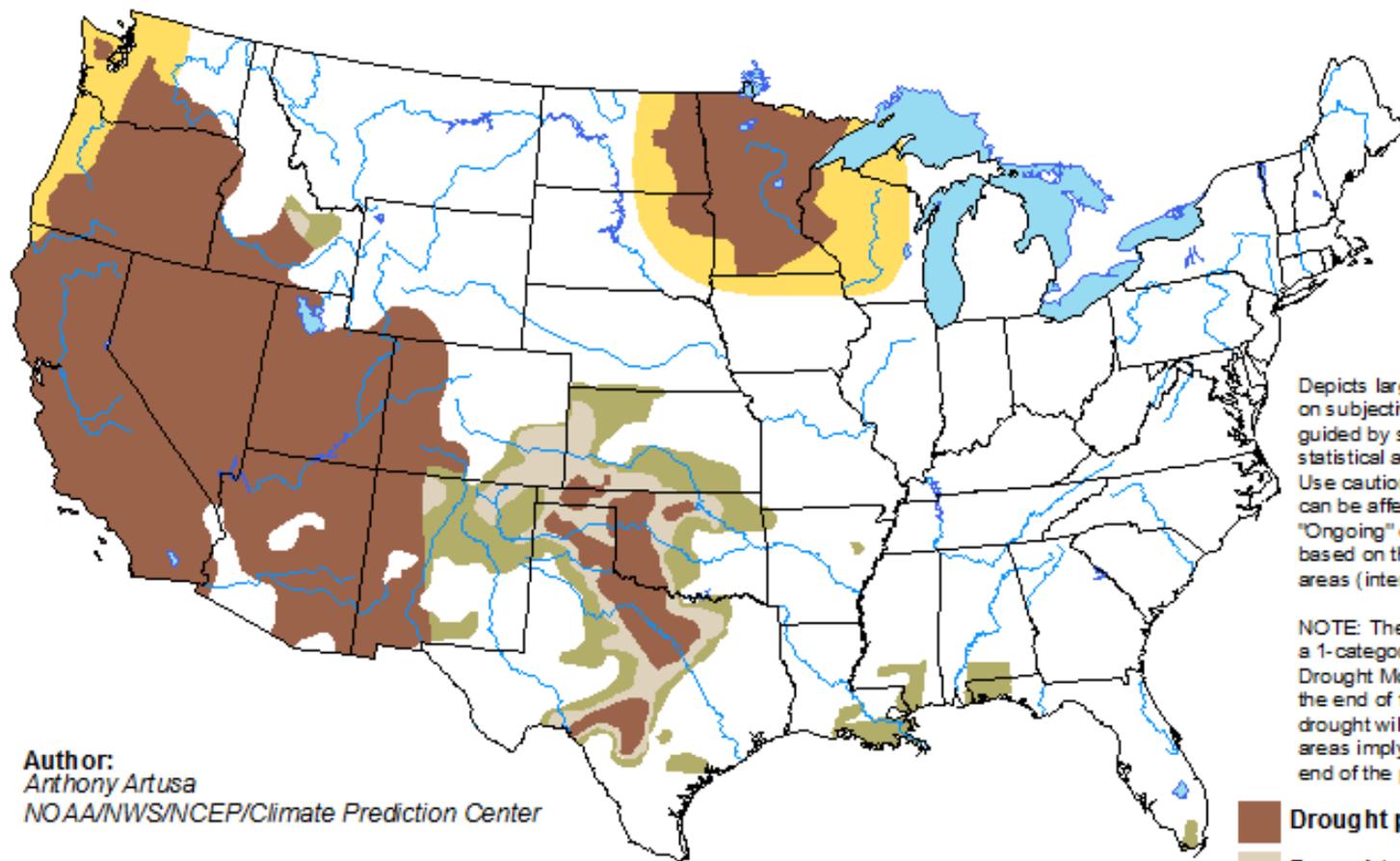


Precipitation

U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for March 19 - June 30, 2015
Released March 19, 2015

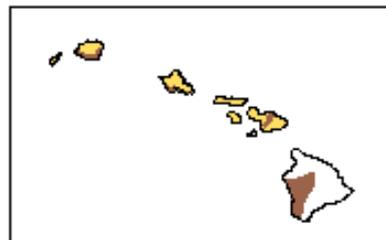
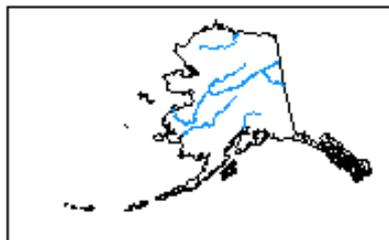


Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

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



<http://go.usa.gov/hHTe>

Summary of Recent Conditions

- Recent warm and dry across much of the region is still short lived.
 - Still time to recover with some spring storms.
 - Fire danger will persist until green-up.
- Lack of snow cover on the plains from warm temperatures melting off snow quickly.
 - USACE noted mid-winter runoff from plains snowmelt.
- Below normal snowpack will likely result in below normal runoff season.

Summary - Outlooks

- El Nino declared
 - Higher chances for warm and dry conditions are forecast over the northern portion of the region.
 - Drought in this area (newly added) is expected to persist and potentially expand.
 - Colorado and Wyoming have highest chances for above average moisture through the summer.
 - Drought in SE Colorado and Kansas is expected to improve.
 - Drought west of the divide in CO expected to persist/intensify.
 - Spring flood potential highest in the lower MO river basin and lower Ohio River valley.

Further Information - Partners

- Today's and Past Recorded Presentations and :
- <http://mrcc.isws.illinois.edu/webinars.htm>
- <http://www.hprcc.unl.edu>
- NOAA's National Climatic Data Center: www.ncdc.noaa.gov
 - Monthly climate reports (U.S. & Global): www.ncdc.noaa.gov/sotc/
- NOAA's Climate Prediction Center: www.cpc.ncep.noaa.gov
- Climate Portal: www.climate.gov
- U.S. Drought Portal: www.drought.gov
- National Drought Mitigation Center: <http://drought.unl.edu/>
- State climatologists
 - <http://www.stateclimate.org>
- Regional climate centers
 - <http://mrcc.isws.illinois.edu>
 - <http://www.hprcc.unl.edu>

Thank You and Questions?

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