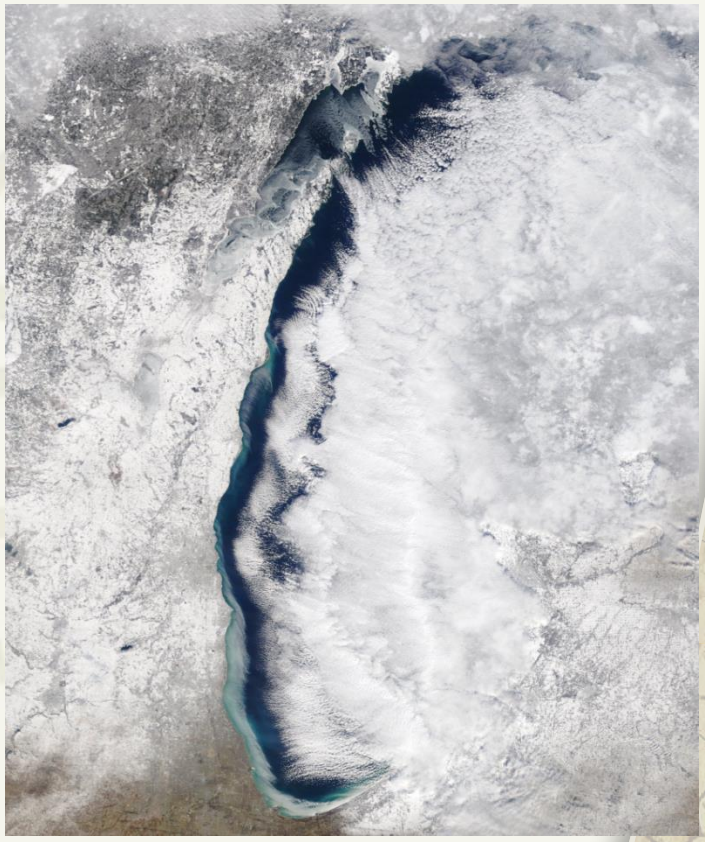
Great Plains and Midwest Climate Outlook January 21, 2016



Mark Svoboda, Climatologist
Monitoring Program Area Leader

National Drought Mitigation Center
Drought Risk Management Research Center
University of Nebraska-Lincoln
msvoboda2@unl.edu
402-472-8238

National Drought Mitigation Center

NOAA National Oceanic and Atmospheric Administration U.S. Department of Commerce

Regional Climate Centers

AASC American Association of State Climatologists

NIDIS National Integrated Drought Information System

University of Nebraska Lincoln

National Drought Mitigation Center

General Information

- **Providing climate services to the Central Region**
  - Collaborative activity between the usual suspects:
    - Dennis Todey (South Dakota State Climatologist), Mark Svoboda (NDMC), Doug Kluck (NOAA), State Climate Offices, Midwest Regional Climate Center, High Plains Regional Climate Center, NOAA's Climate Prediction Center and River Forecast Centers, US Army Corps of Engineers (USACE) and National Drought Mitigation Center

- **Next Climate/Drought Outlook Webinar**
  - **February 18, 2016**
- **Access to Future Climate Webinars and Information**
  - http://www.drought.gov/drought/content/regional-programs/regional-drought-webinars
- **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**

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Agenda

- Climate Recap + Current Conditions
- Regional Climate Updates
- Outlooks

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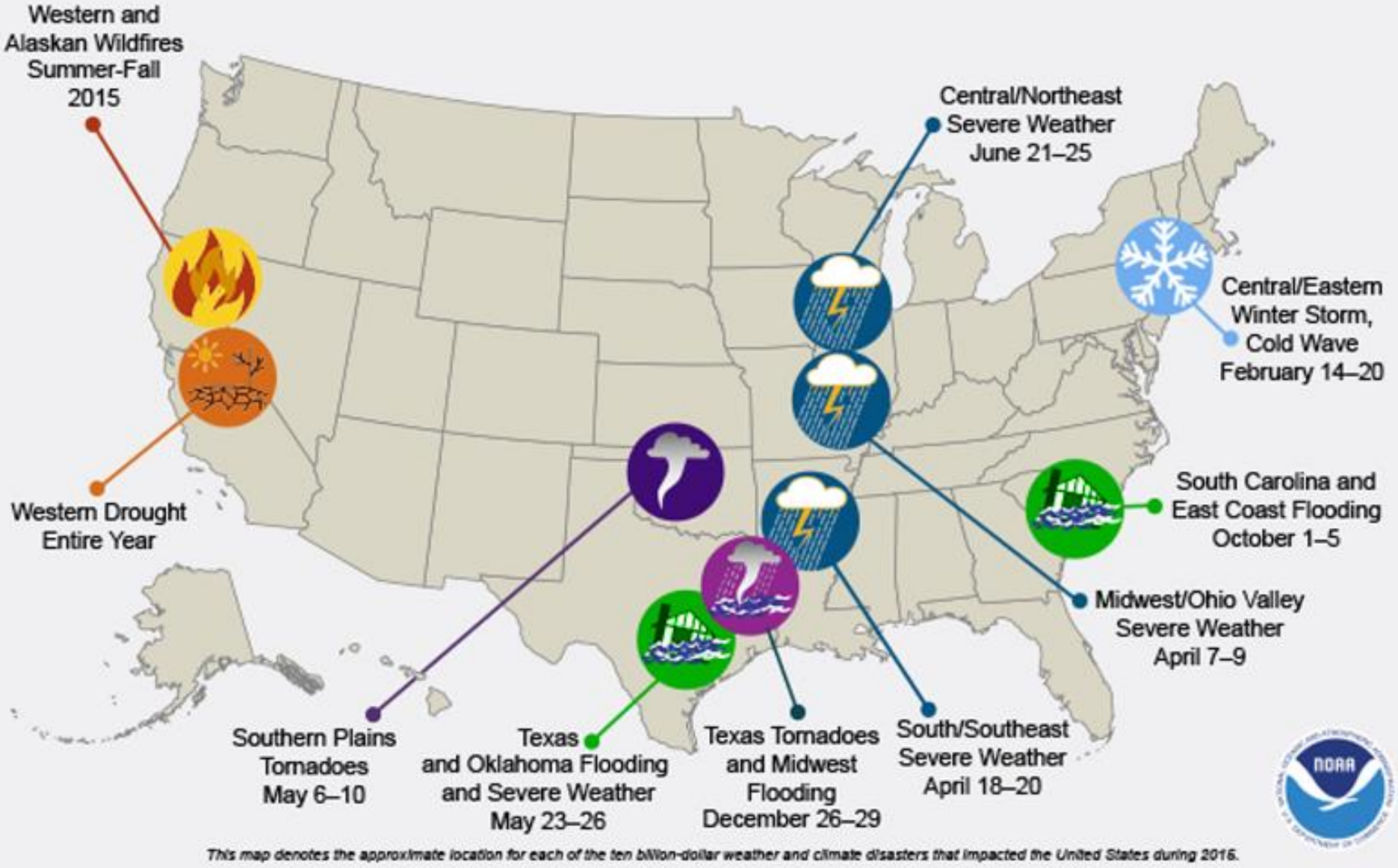
U.S. 2015 Billion-Dollar Weather and Climate Disasters



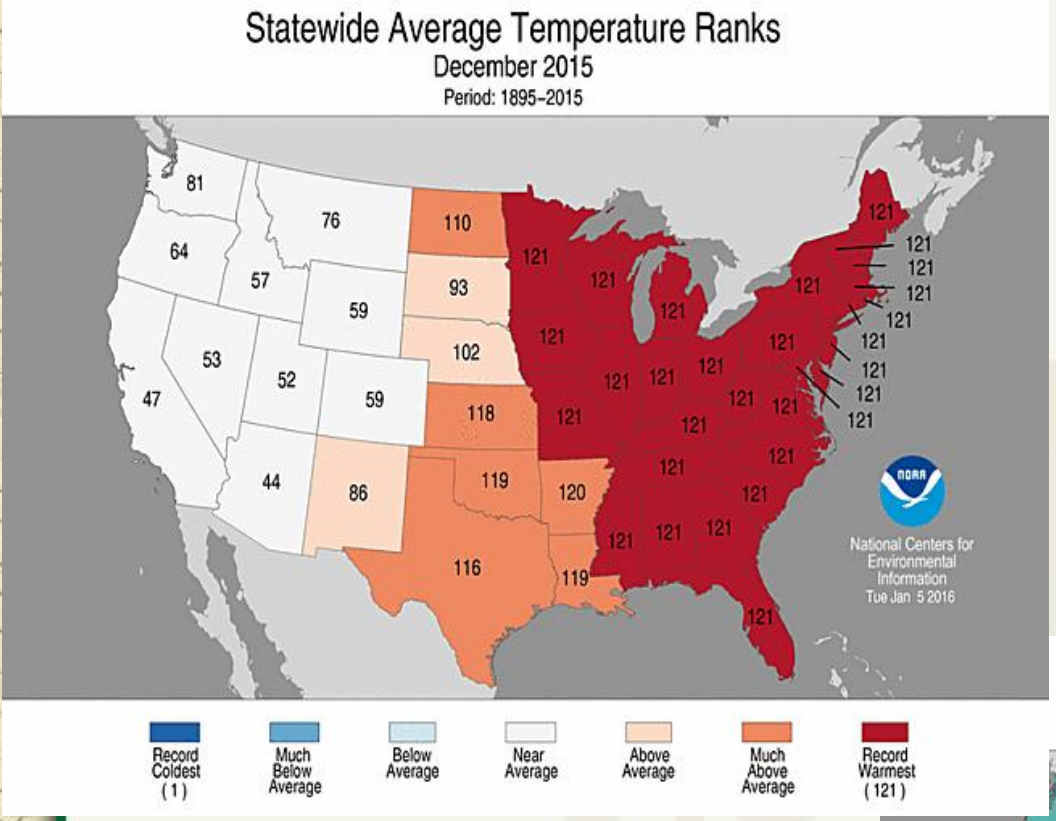
This map denotes the approximate location for each of the ten billion-dollar weather and climate disasters that impacted the United States during 2016.

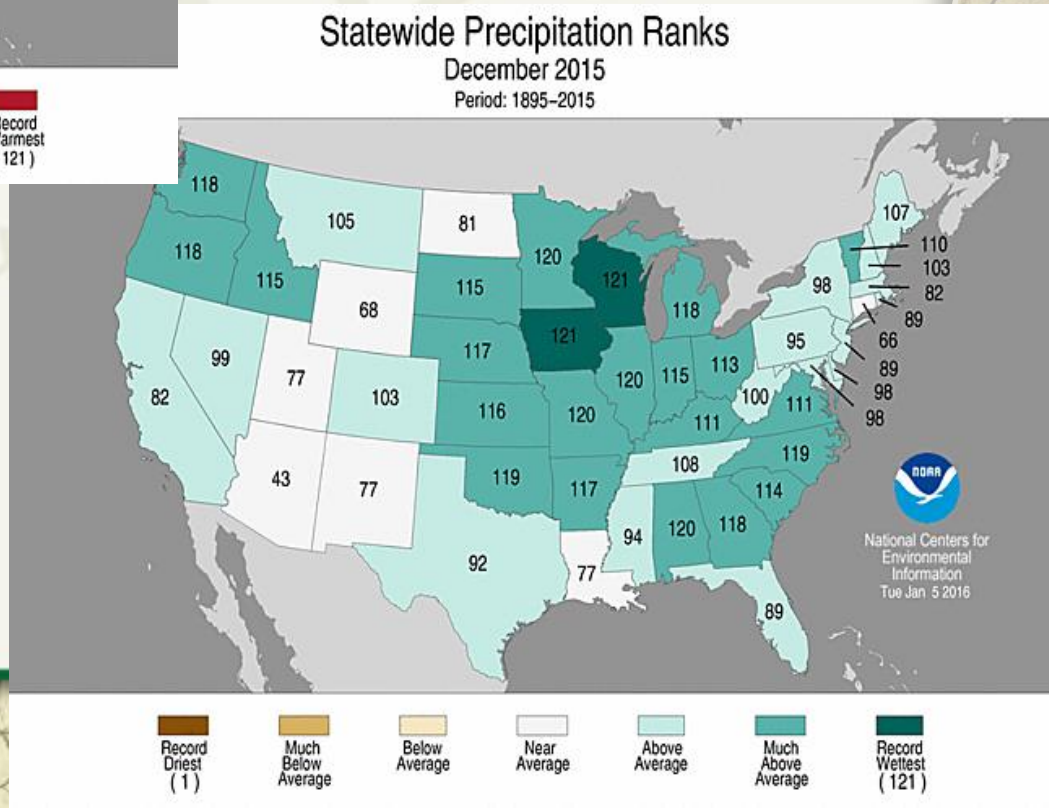
http://www.ncdc.noaa.gov/billions/

National Drought Mitigation Center

December 2015 Climate

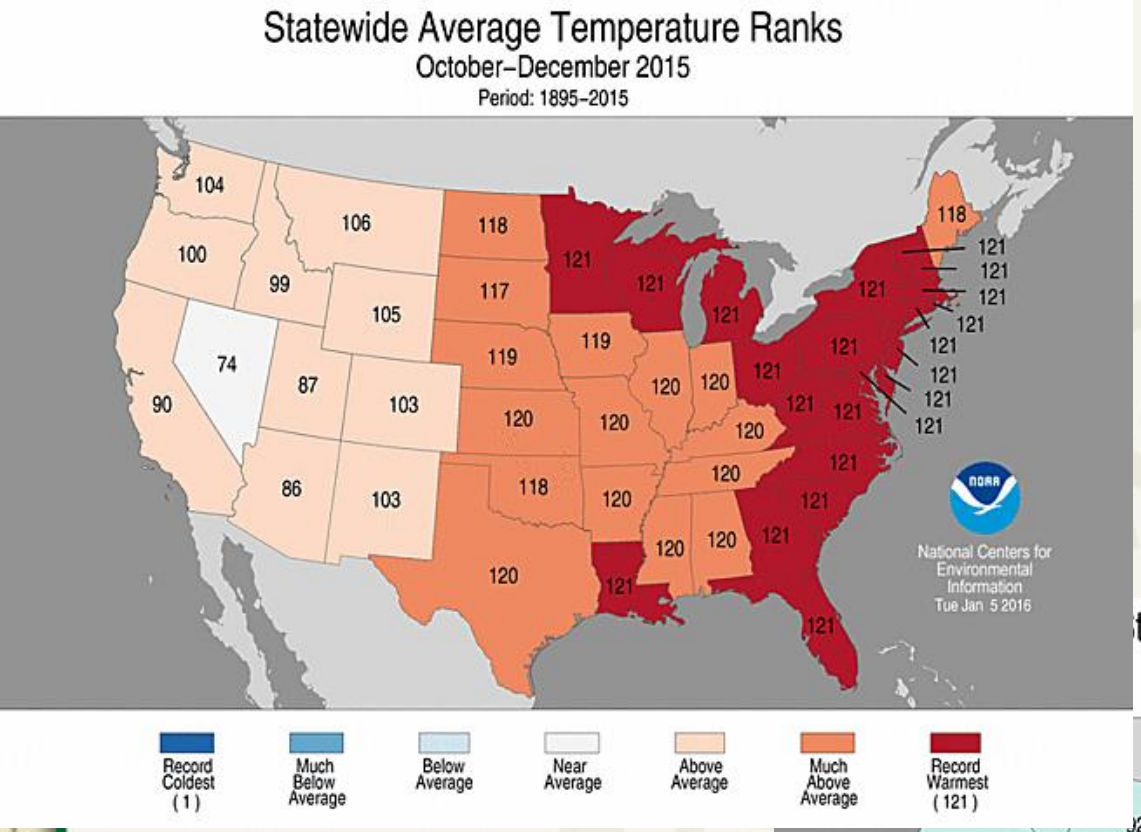
https://www.ncdc.noaa.gov/sotc/

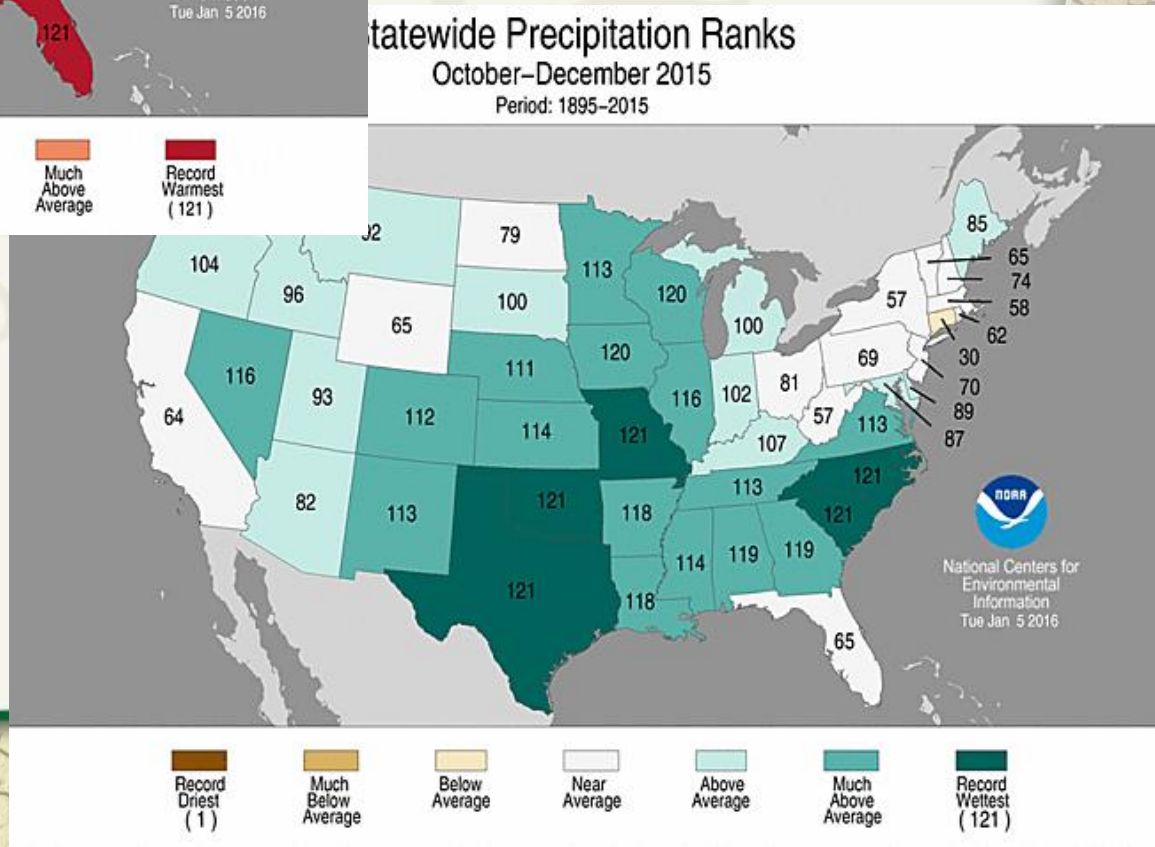




Oct.-Dec. 2015 Climate

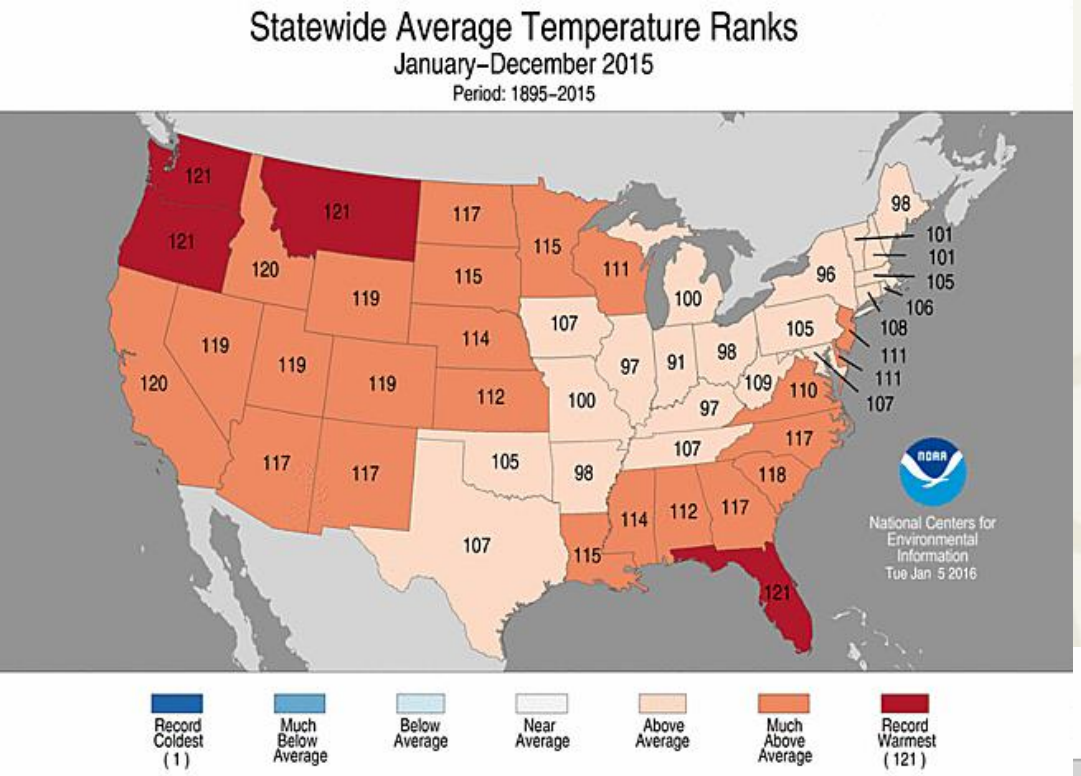
https://www.ncdc.noaa.gov/sotc/

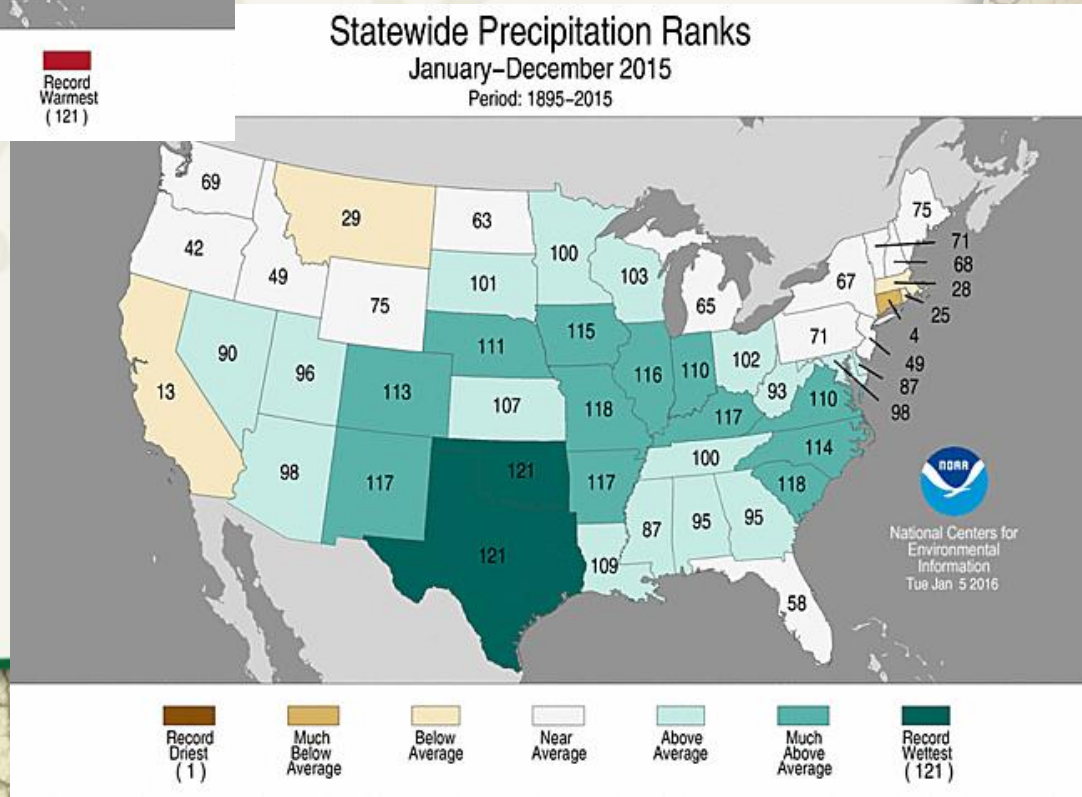




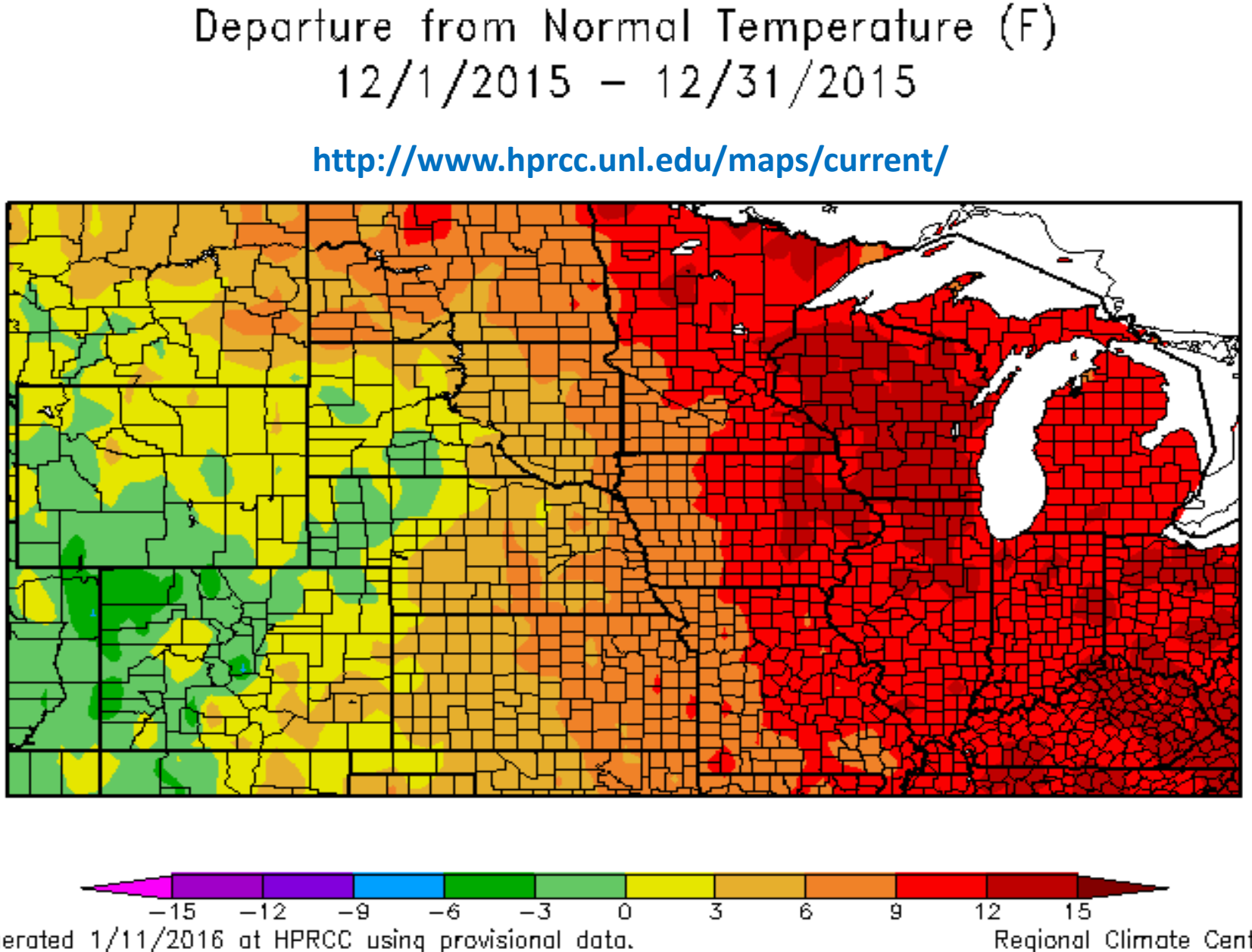
2015 Climate

https://www.ncdc.noaa.gov/sotc/



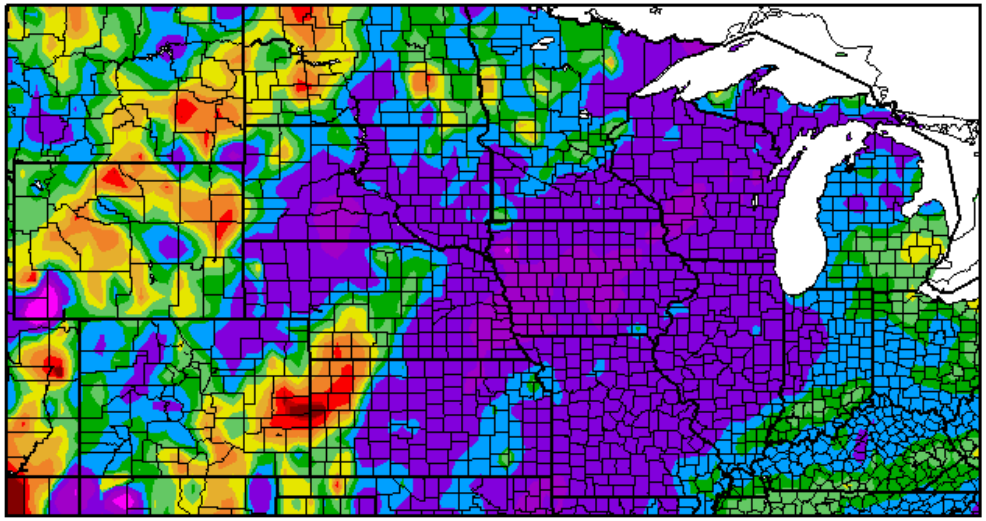


30-Day Temperature Departure



30-Day Precipitation

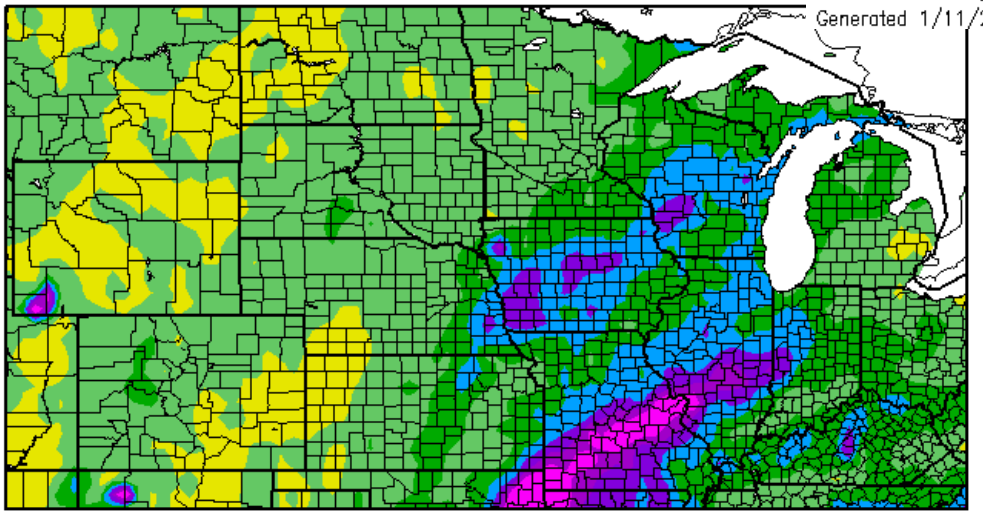
Percent of Normal Precipitation (%)
12/1/2015 – 12/31/2015



2 5 25 50 75 100 125 150 200 400 800

Generated 1/11/2016 at HPRCC using provisional data. Regional Climate Centers

Departure from Normal Precipitation (ir
12/1/2015 – 12/31/2015



−7.5 −6 −4.5 −3 −1.5 0 1.5 3 4.5 6 7.5

Generated 1/11/2016 at HPRCC using provisional data. Regional Climate Centers

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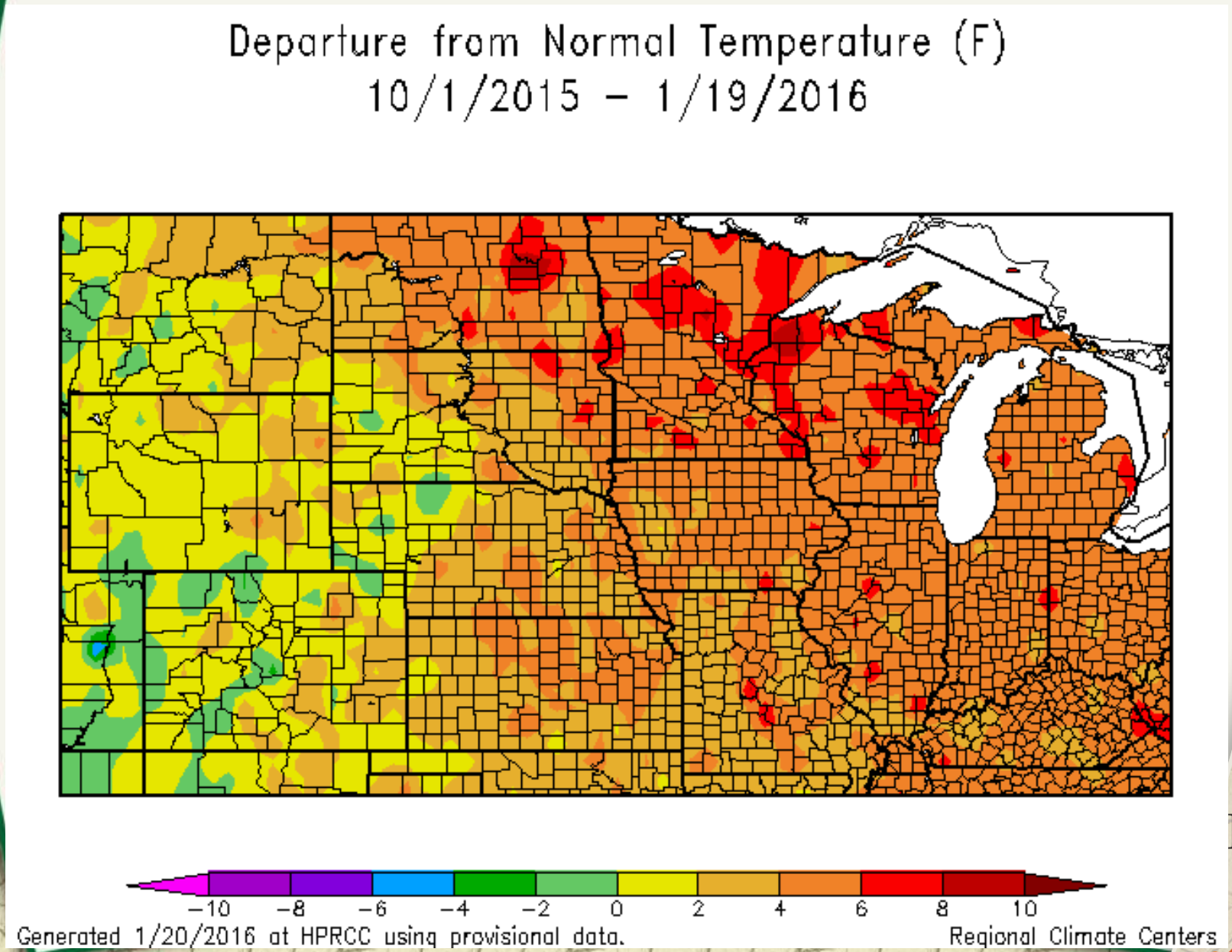
WYTD Temperature



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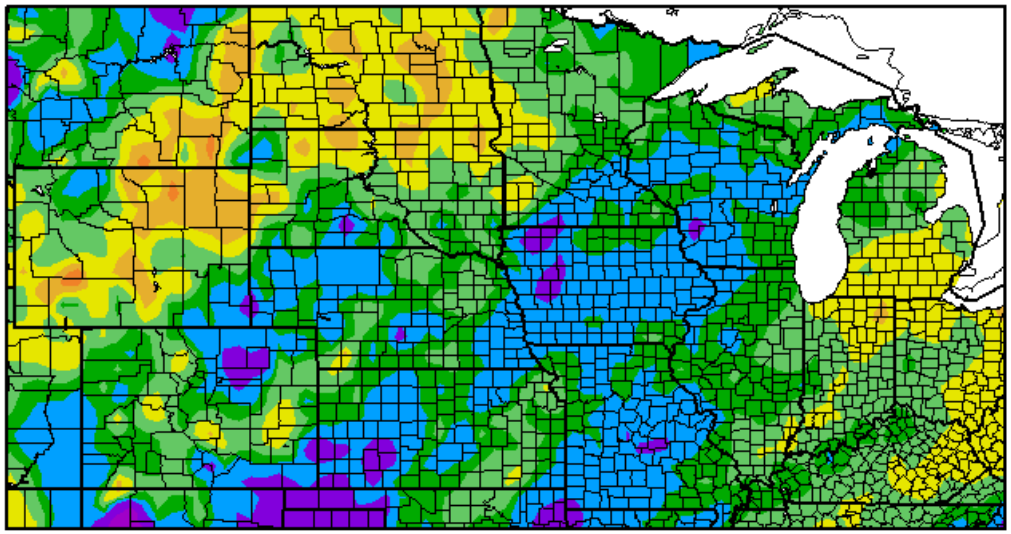
WYTD Precipitation

Percent of Normal Precipitation (%)
10/1/2015 – 1/19/2016



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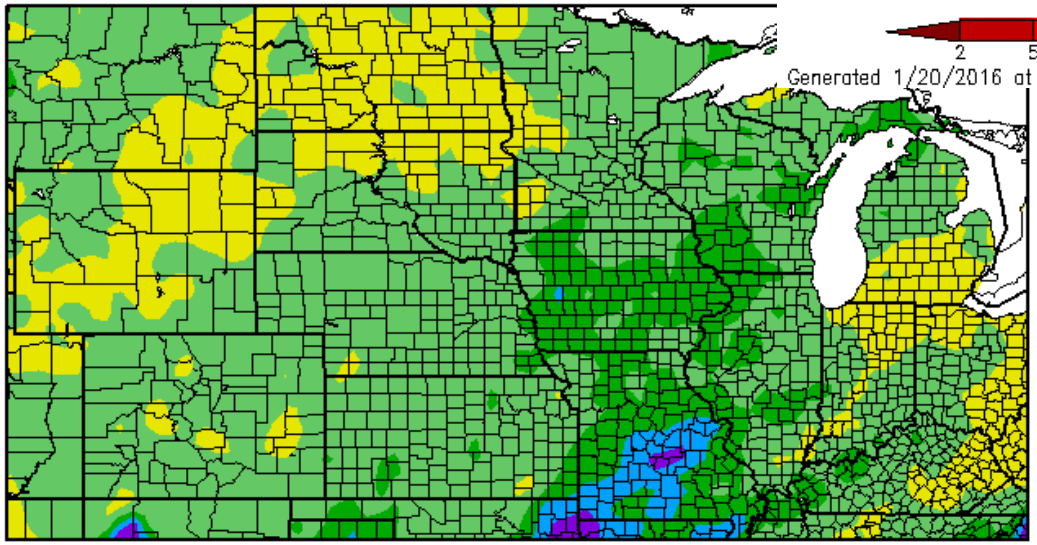
Generated 1/20/2016 at HPRCC using provisional data. Regional Climate Centers

Departure from Normal Precipitatio
10/1/2015 – 1/19/2016



−20 −16 −12 −8 −4 0 4 8 12 16 20

Generated 1/20/2016 at HPRCC using provisional data. Regional Climate Centers

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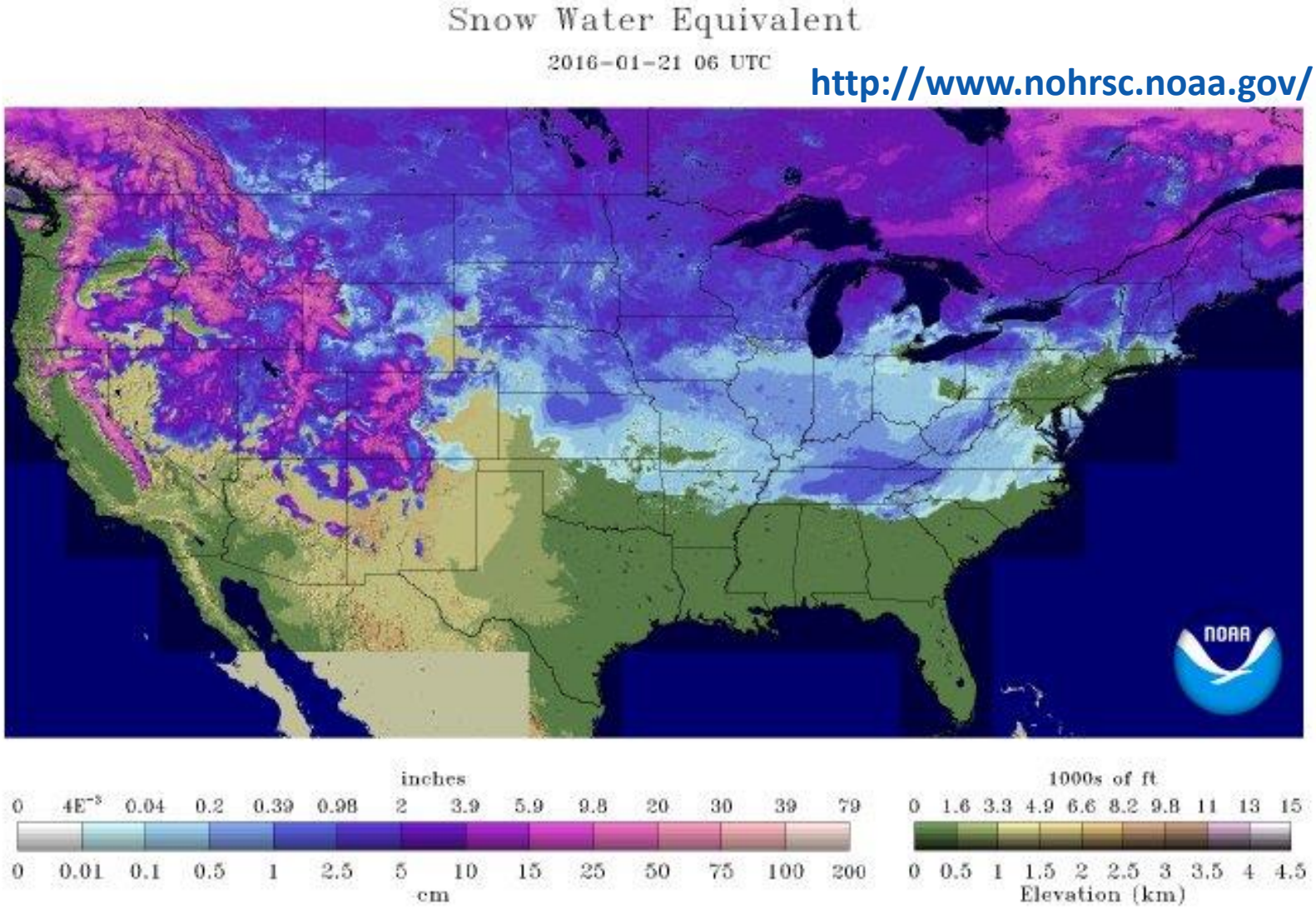
Current Conditions

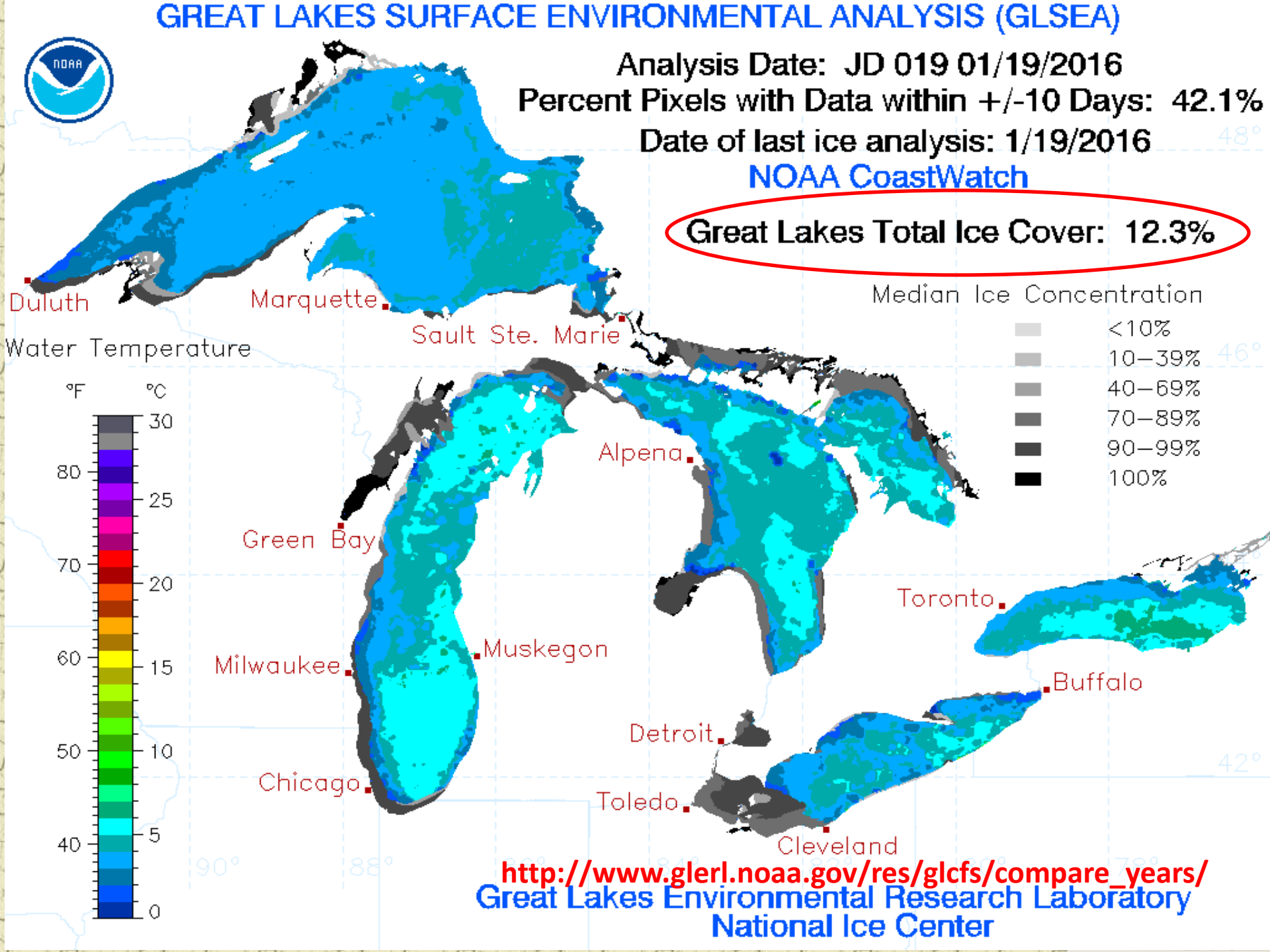
National Snow 2015-Analysis 2016

NWC | NATIONAL WATER CENTER



National Drought Mitigation Center

GREAT LAKES SURFACE ENVIRONMENTAL ANALYSIS (GLSEA)



http://www.glerl.noaa.gov/res/glcfs/compare_years/

Great Lakes Environmental Research Laboratory
National Ice Center

Great Lakes

http://www.glerl.noaa.gov/

Dashboard portal | HTML 5 | Great Lakes Water Level Dashboard | Screenshot | Download data

To feet | Toggle fullscreen | Contacts | About | ?

Superior | Michigan-Huron | St. Clair | Erie | Ontario

Surface water elevation (meters, IGLD 85)

Superior: 184.4, 183.8, 183.2, 182.6, 182.0

Michigan-Huron: 177.4, 176.8, 176.2, 175.6, 175.0

Erie: 175.6, 175.0, 174.4, 173.8, 173.2, 172.6

Ontario: 75.6, 75.0, 74.4, 73.8, 73.2

Zoom | Pan

1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017

Legend and menu | Clear all

Observations

- Lake-wide monthly average (1918-present)
- Provisional coordinated daily avgs (this month)
- Provisional coordinated avg for month to date
- Master gauge monthly average (1860-present)
- Lake-wide annual average (1918-present)
- Annual average (1860-1917)
- Master gauge annual average (1860-present)
- Average for period of record (1918-present)
- Month's average (1918-2013)
- Record highs (1918-2013)

Monthly level forecas

Forecasts (multi-decadal

Paleoclimate reconstructior

Default colors | Flip series

Chart background color

Timespan | 1997 | 2017

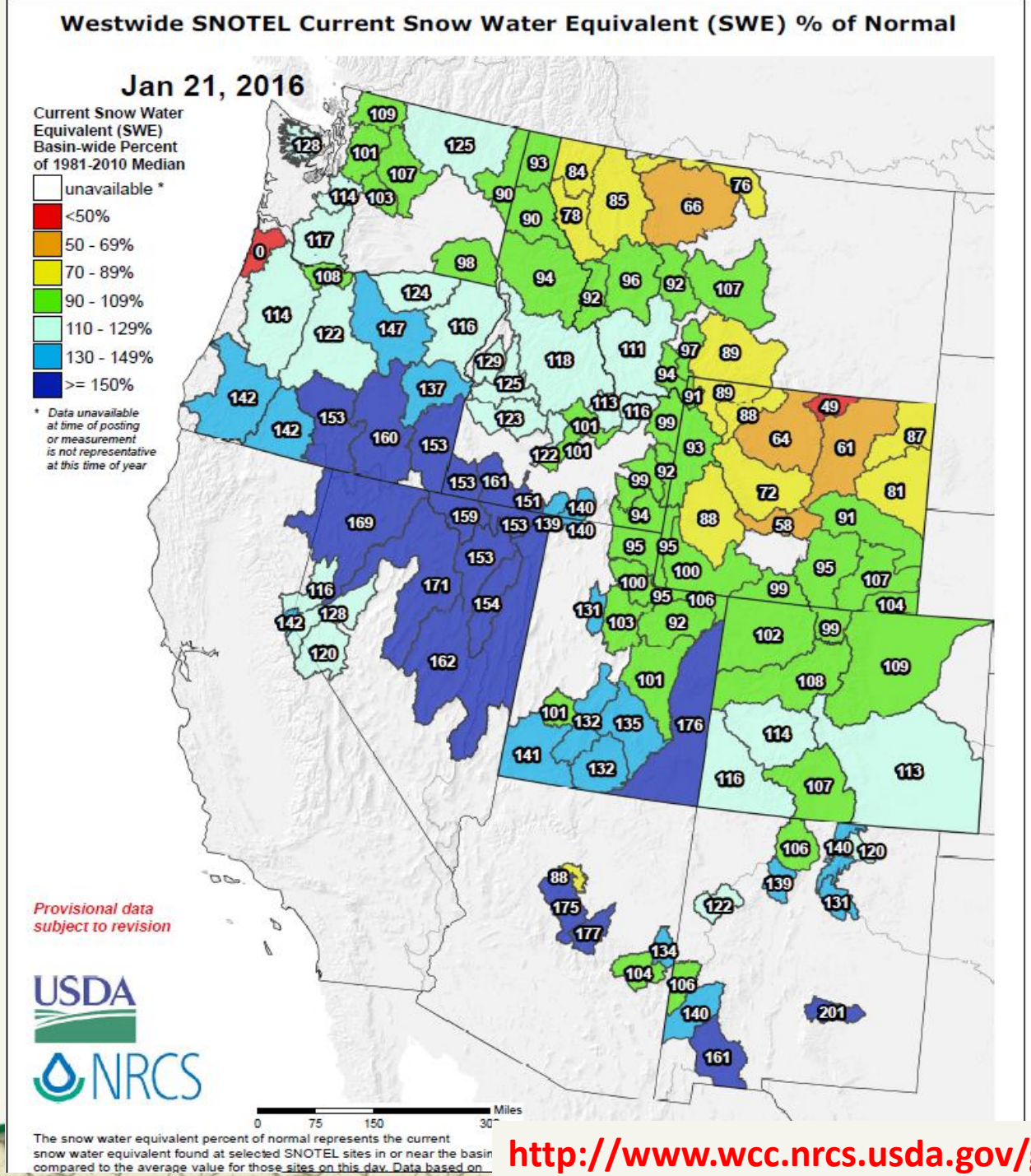
Wed Jan 20 2016 02:52:04 PM

3 Equalize vertical scale

www.glerl.noaa.gov/data/wldb

Hide URL

GLERL | Great Lakes RESTORATION | CILER



http://www.wcc.nrcs.usda.gov/gis/snow.html

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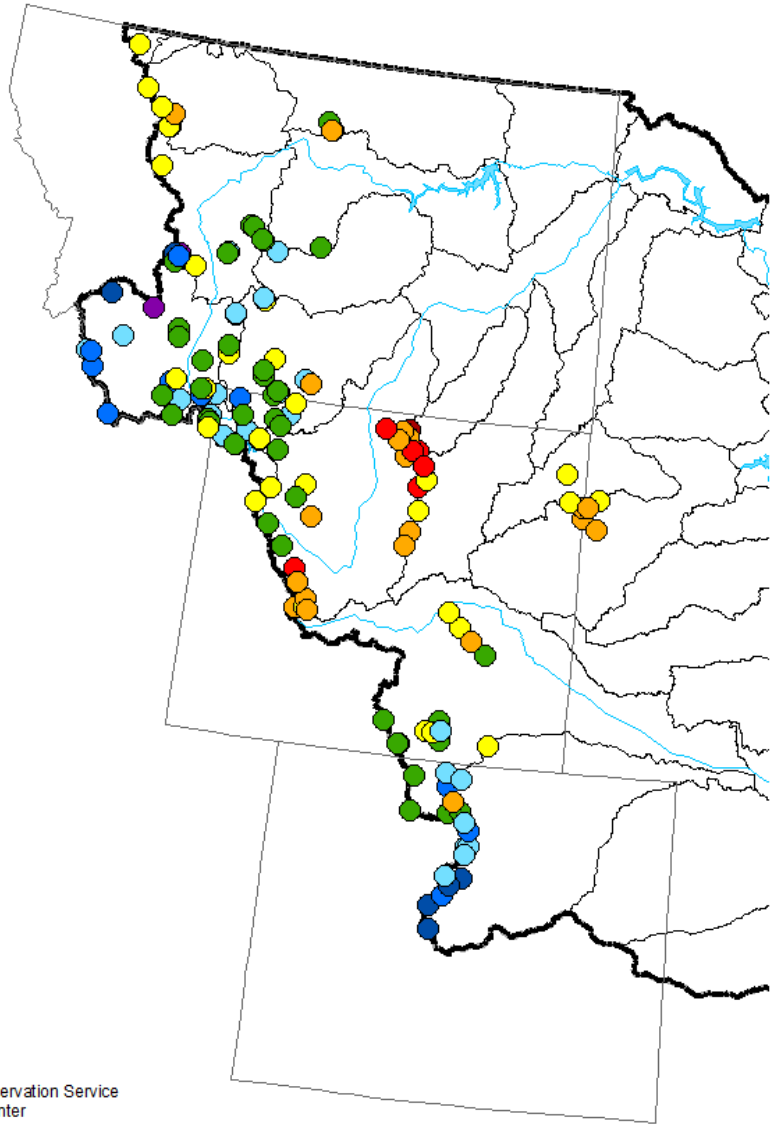
Missouri River Basin Mountain Snowpack as of January 1, 2016



Percent of
1981-2010 Median

- > 180
- 150 - 180
- 130 - 149
- 110 - 129
- 90 - 109
- 70 - 89
- 50 - 69
- 25 - 49
- < 25

Prepared by:
USDA Natural Resources Conservation Service
National Water and Climate Center
Portland, Oregon
http://www.wcc.nrcs.usda.gov
Created: 8 Jan 2016 08:05

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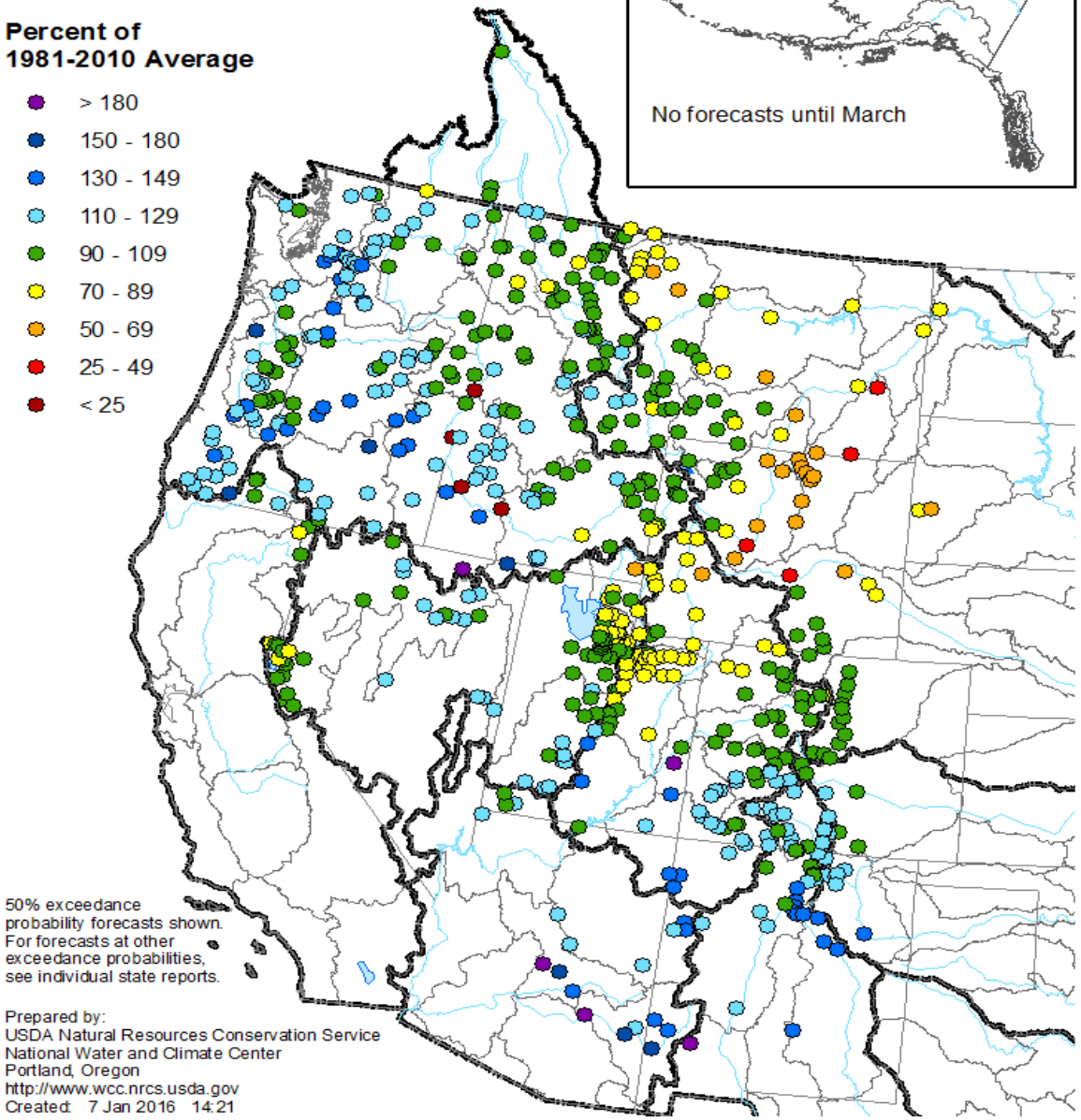
National Drought Mitigation Center

Spring and Summer Streamflow Forecasts as of January 1, 2016



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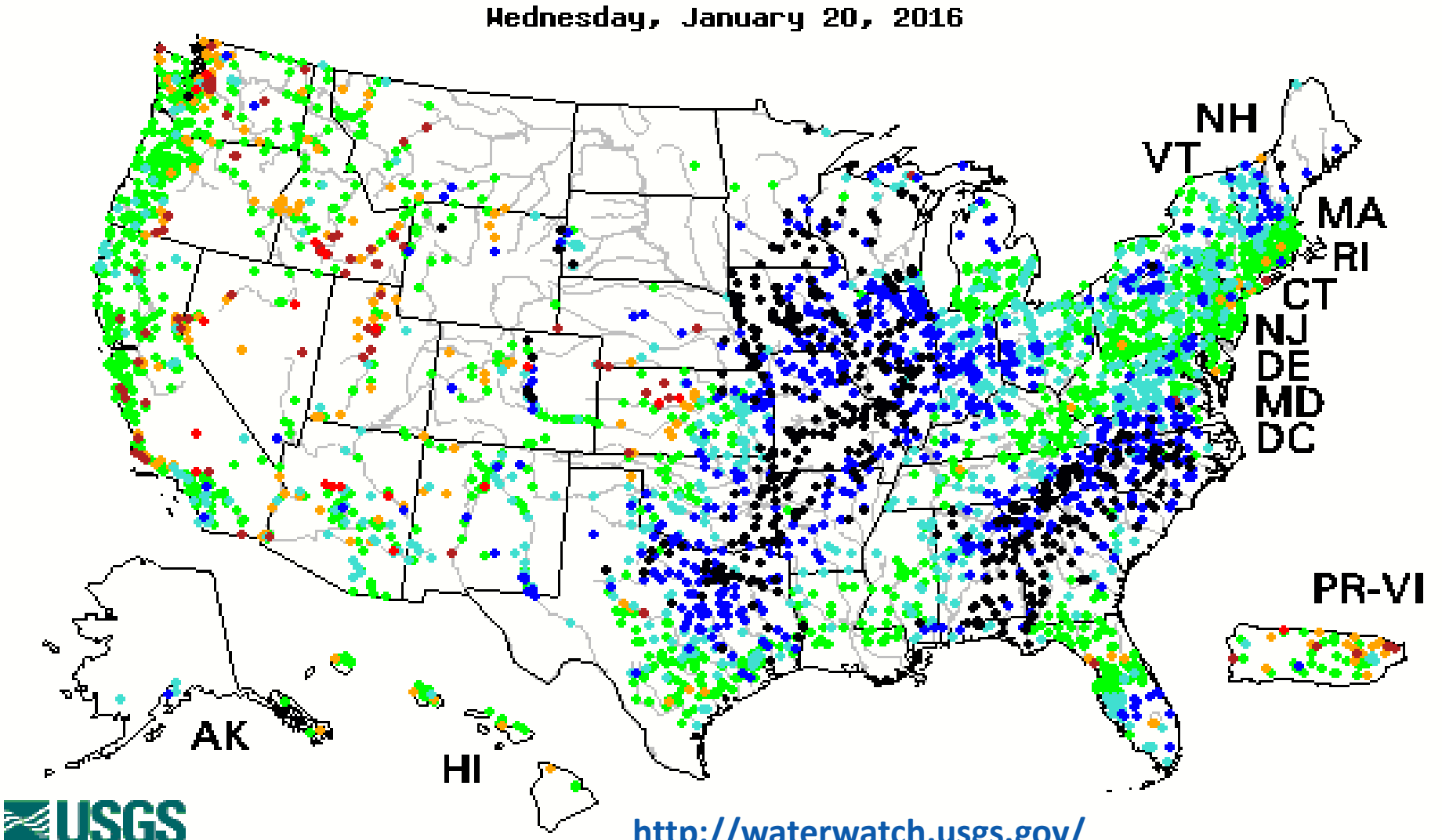
28-Day Average Streamflow



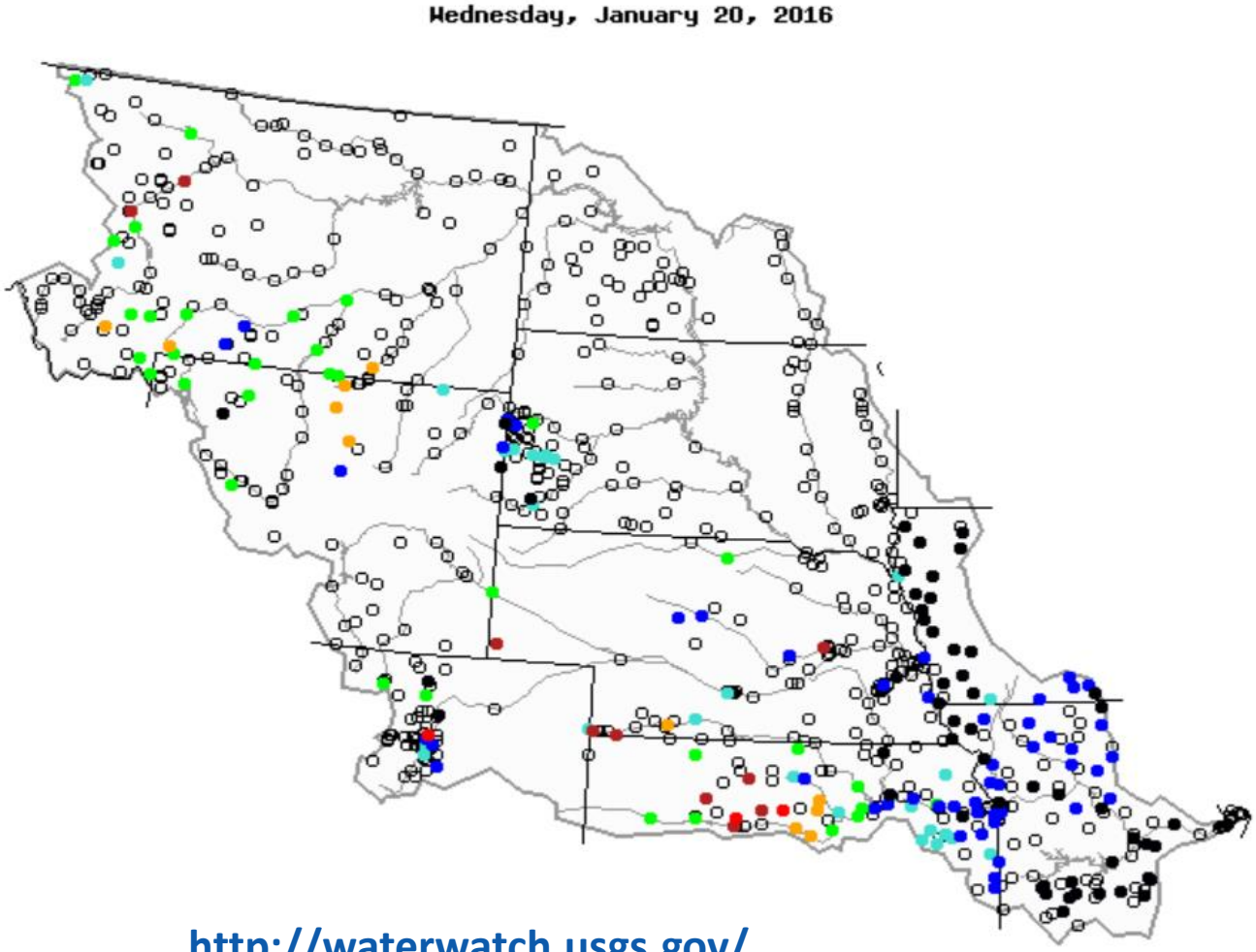
USGS

http://waterwatch.usgs.gov/

Explanation - Percentile classes						
Low	<10	10-24	25-75	76-90	>90	High
	Much below normal	Below normal	Normal	Above normal	Much above normal	

National Drought Mitigation Center

28-Day Average Streamflow



http://waterwatch.usgs.gov/

USGS

Explanation - Percentile classes						
Low	<10	10-24	25-75	76-90	>90	High
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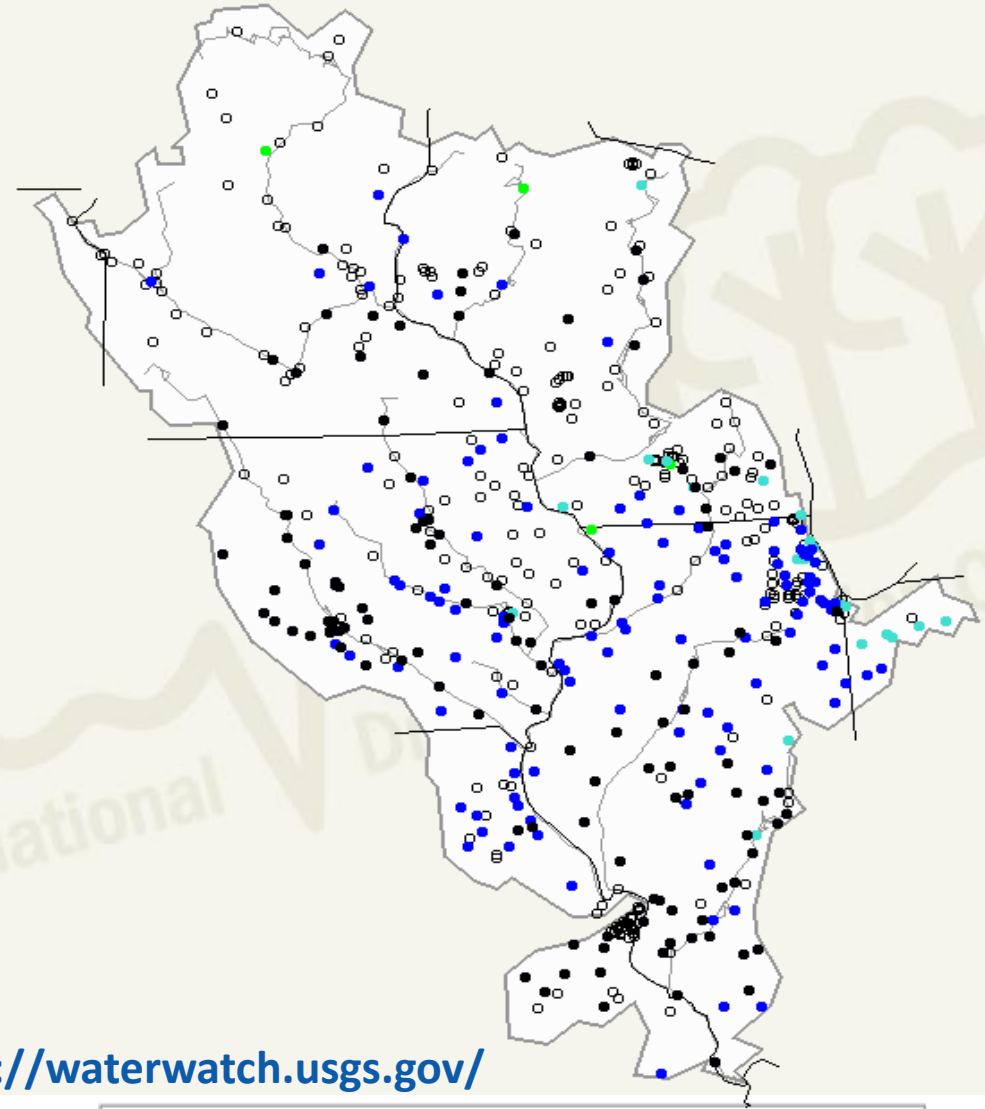
National Drought Mitigation Center

28-Day Average Streamflow

Wednesday, January 20, 2016



http://waterwatch.usgs.gov/

USGS

Explanation - Percentile classes						
Low	<10	10-24	25-75	76-90	>90	High
	Much below normal	Below normal	Normal	Above normal	Much above normal	

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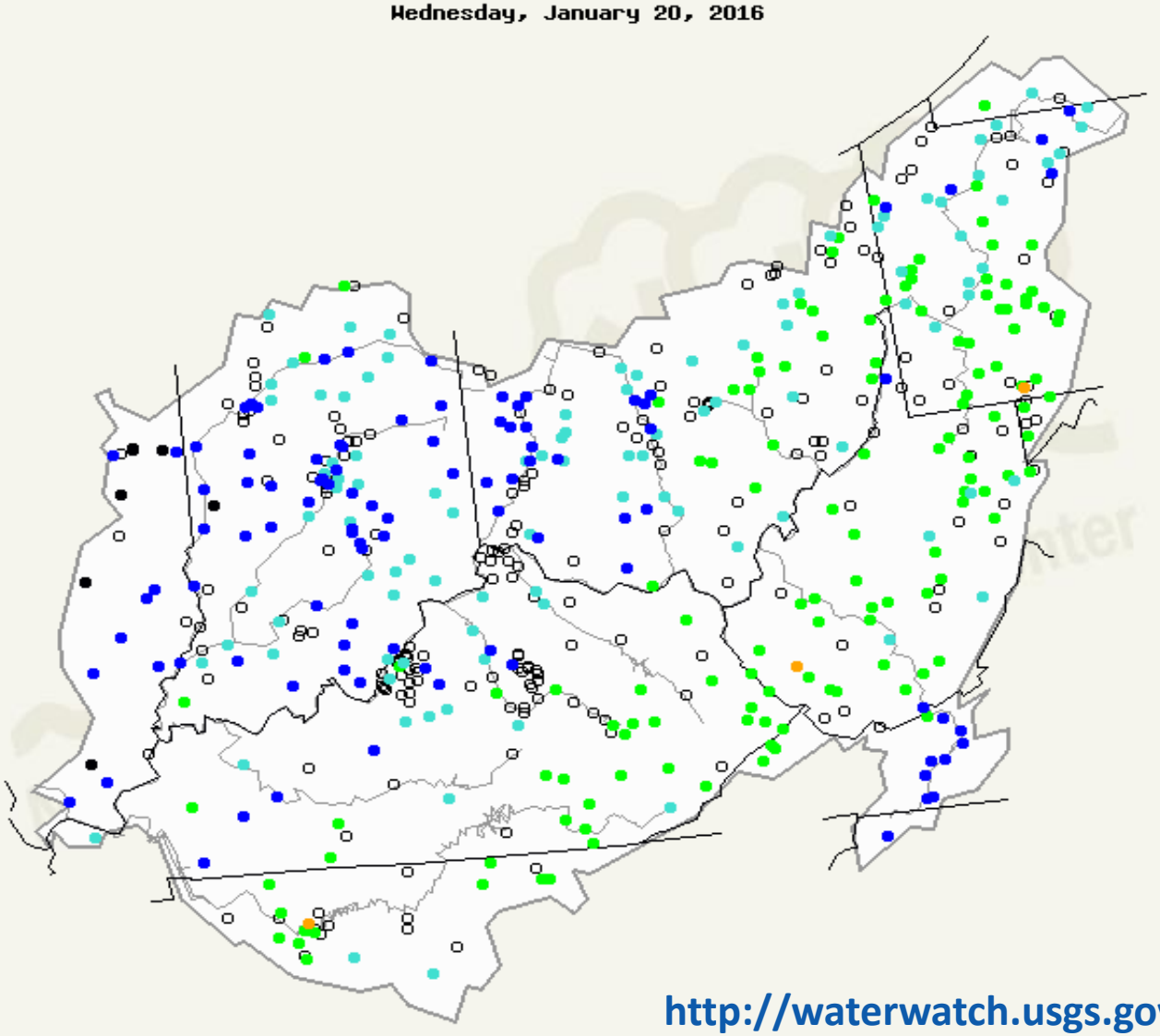
28-Day Average Streamflow



http://waterwatch.usgs.gov/

USGS

Explanation - Percentile classes						
Low	<10	10-24	25-75	76-90	>90	High
	Much below normal	Below normal	Normal	Above normal	Much above normal	

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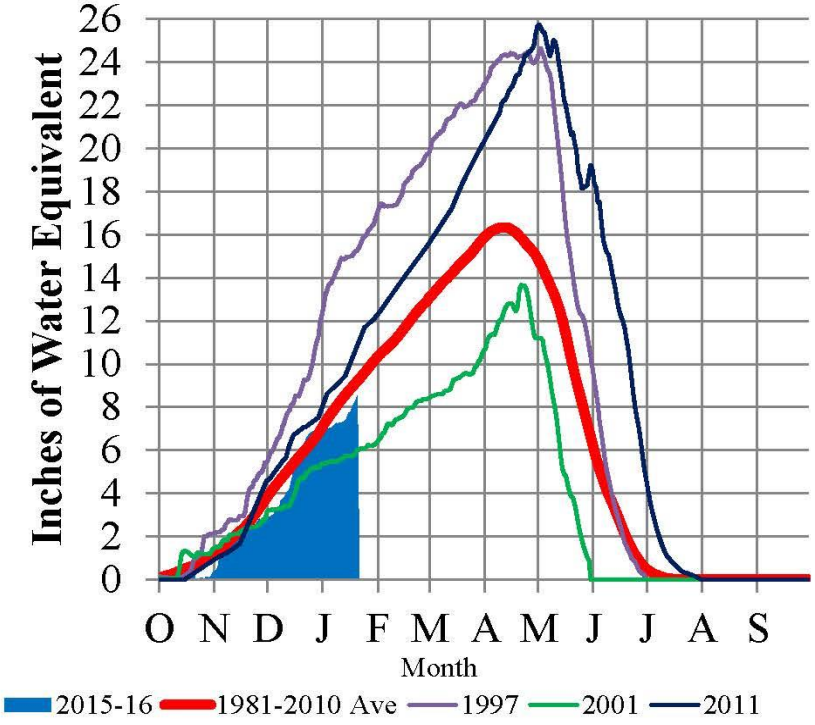
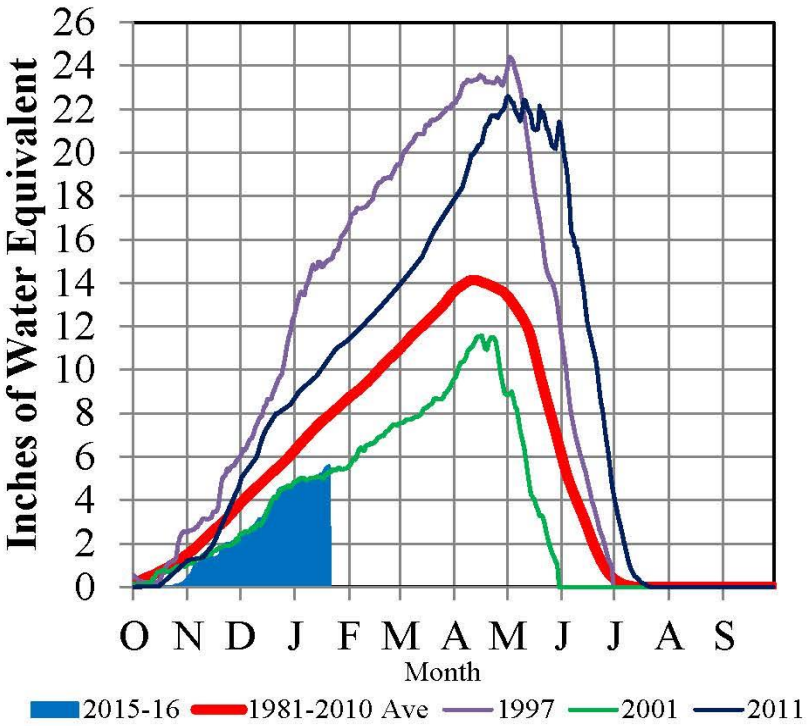
Missouri River Basin – Mountain Snowpack Water Content
2015-2016 with comparison plots from 1997*, 2001*, and 2011

January 20, 2016

Total above Fort Peck



Total Fort Peck to Garrison



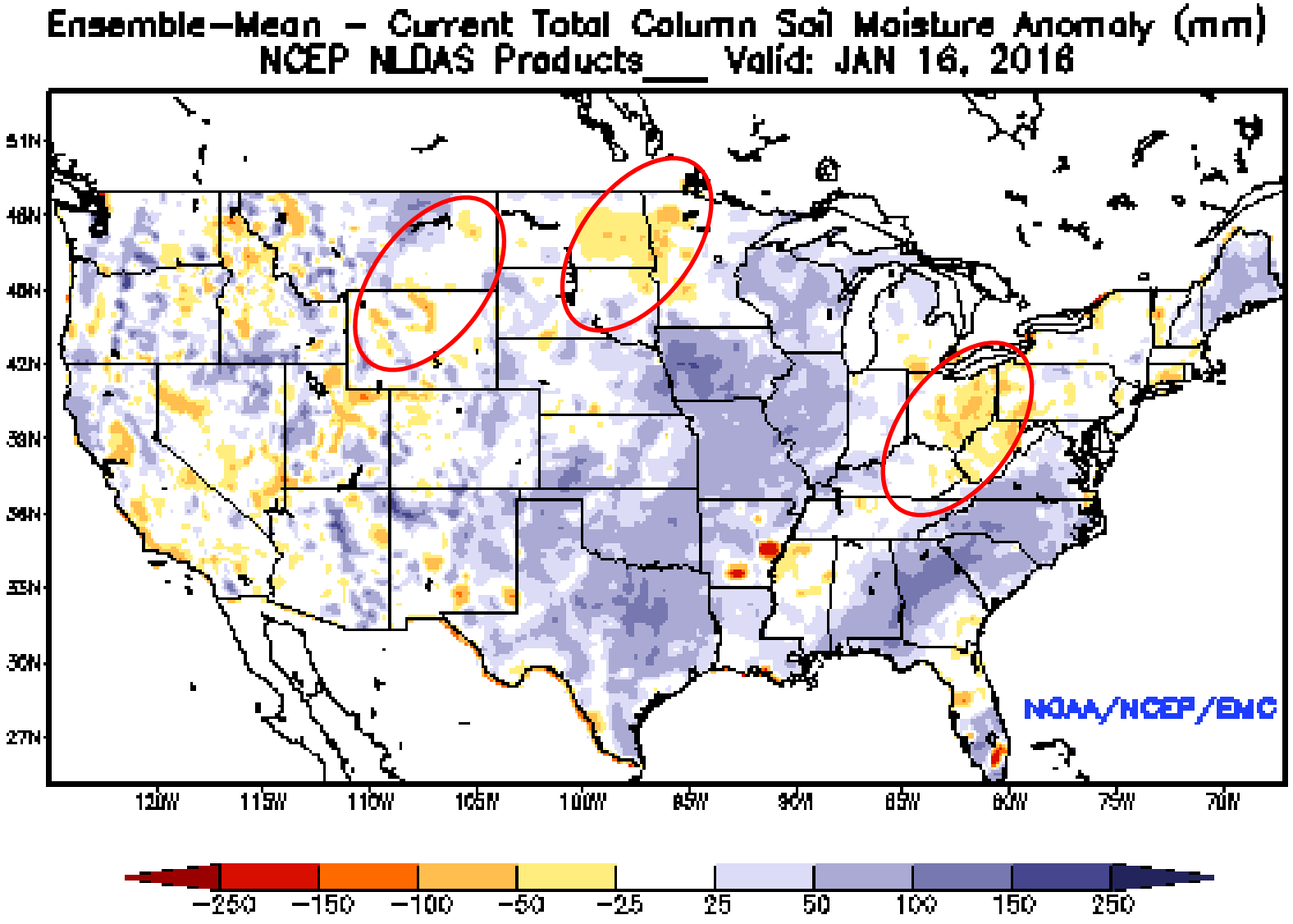
The Missouri River Basin mountain snowpack normally peaks near April 15. By January 15, normally 54% of the peak has accumulated. On January 20, 2016 the mountain snowpack Snow Water Equivalent (SWE) in the "Total above Fort Peck" reach is currently 8.5", 93% of average. The mountain snowpack SWE in the "Total Fort Peck to Garrison" reach is currently 5.6", 71% of average.

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

Provisional data. Subject to revision.

Soil Moisture Anomaly

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



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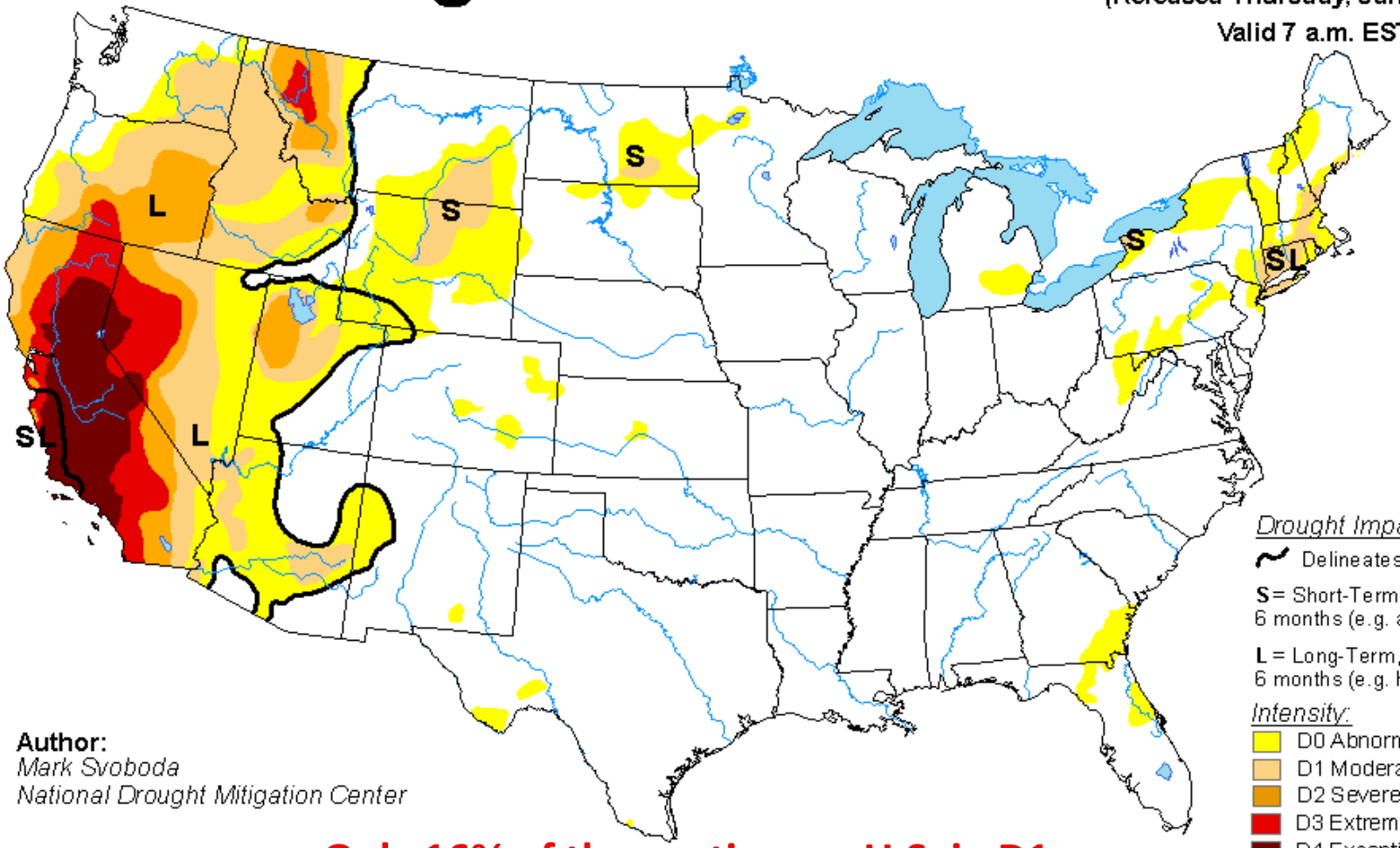
U.S. Drought Monitor

January 19, 2016

(Released Thursday, Jan. 21, 2016)

Valid 7 a.m. EST



Author:
Mark Svoboda
National Drought Mitigation Center

Only 16% of the contiguous U.S. in D1 or worse

Drought Impact Types:

Delineates dominant impacts

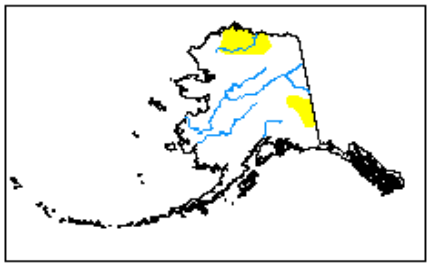
S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)

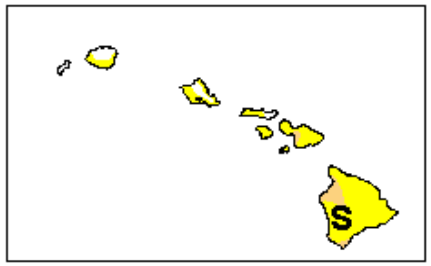
L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

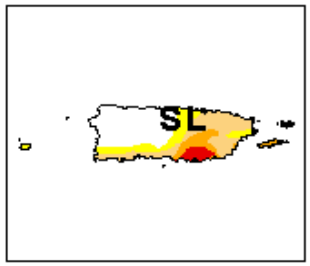
Intensity:

- 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.







USDA National Drought Mitigation Center

http://droughtmonitor.unl.edu/

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
Current	2016-01-19	74.10	25.90	13.74	7.13	4.05	2.02
Last Week	2016-01-12	73.51	26.49	14.49	8.35	4.32	2.16
3 Months Ago	2015-10-20	46.98	53.02	29.10	19.44	12.06	3.14
Start of Calendar Year	2015-12-29	70.64	29.36	15.70	9.67	5.25	2.26
Start of Water Year	2015-09-29	47.02	52.98	26.82	16.82	9.58	2.51
One Year Ago	2015-01-20	61.05	38.95	23.63	14.18	7.42	2.43

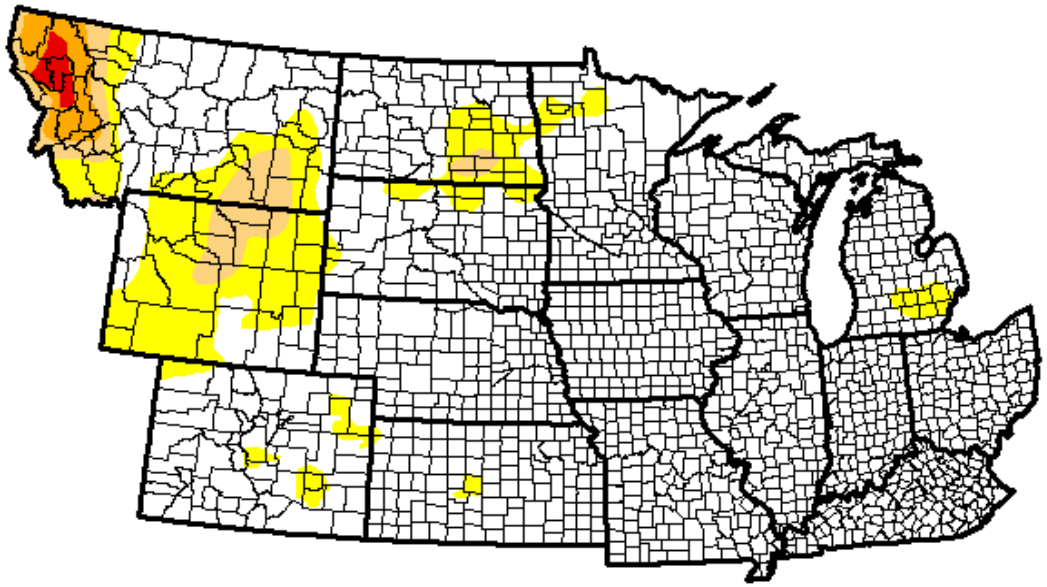
Conditions for the Contiguous U.S.

Week	Date	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	2016-01-19	71.24	28.76	16.37	8.51	4.84	2.42
Last Week	2016-01-12	70.46	29.54	17.28	9.98	5.16	2.59
3 Months Ago	2015-10-20	41.04	58.96	34.78	23.23	14.42	3.76
Start of Calendar Year	2015-12-29	66.99	33.01	18.74	11.56	6.28	2.70
Start of Water Year	2015-09-29	44.91	55.09	31.36	20.09	11.45	3.00
One Year Ago	2015-01-20	53.60	46.40	28.18	16.97	8.88	2.91

National Drought Mitigation Center | 3310 Holdrege Street | P.O. Box 830988 | Lincoln, NE 68583–0988
e: (402) 472–6707 | fax: (402) 472–2946 | Contact Us

U.S. Drought Monitor

NWS Central Region



January 19, 2016

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Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	82.63	17.37	5.19	1.84	0.45	0.00
Last Week *1/12/2016*	82.11	17.89	6.07	2.31	0.45	0.00
3 Months Ago *10/20/2015*	52.53	47.47	10.84	3.55	2.15	0.00
Start of Calendar Year *12/29/2015*	78.96	21.04	5.65	2.67	0.45	0.00
Start of Water Year *9/29/2015*	71.52	28.48	5.67	3.66	2.15	0.00
One Year Ago *1/20/2015*	72.22	27.78	5.56	2.43	0.13	0.00

Intensity:

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

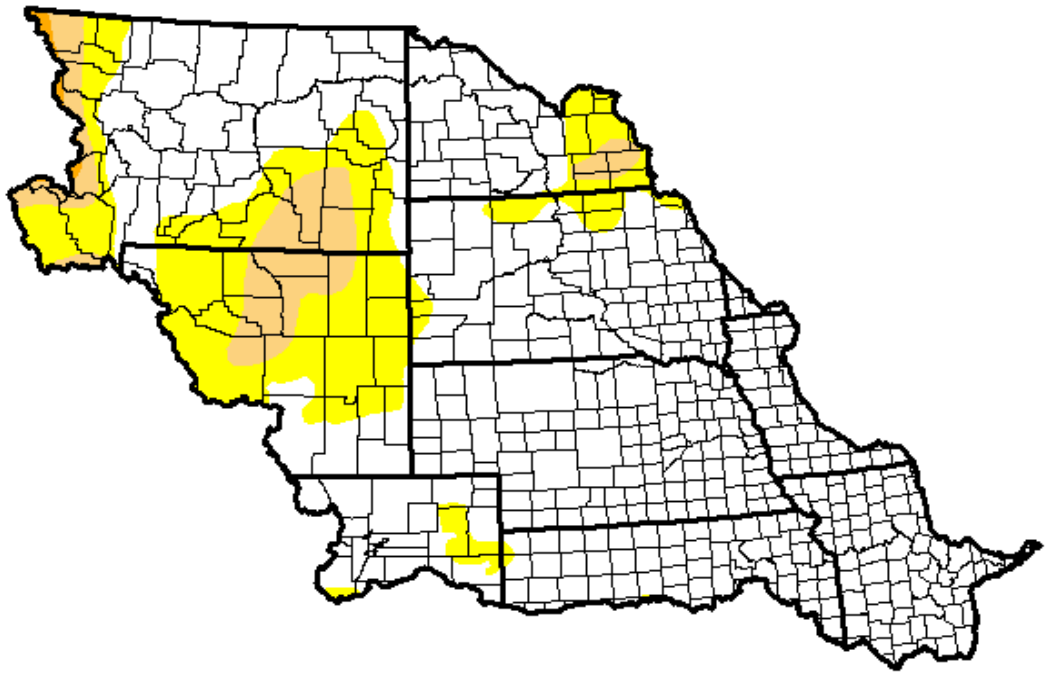
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
Mark Svoboda
National Drought Mitigation Center

http://droughtmonitor.unl.edu/

U.S. Drought Monitor

Missouri Watershed



January 19, 2016

(Released Thursday, Jan. 21, 2016)

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	75.02	24.98	6.82	0.33	0.00	0.00
Last Week *1/12/2016*	74.10	25.90	8.80	1.28	0.00	0.00
3 Months Ago *10/20/2015*	54.69	45.31	9.46	3.12	0.66	0.00
Start of Calendar Year *12/29/2015*	76.44	23.56	5.55	1.28	0.00	0.00
Start of Water Year *9/29/2015*	65.65	34.35	6.75	3.42	0.66	0.00
One Year Ago *1/20/2015*	74.80	25.20	2.01	0.72	0.00	0.00

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.

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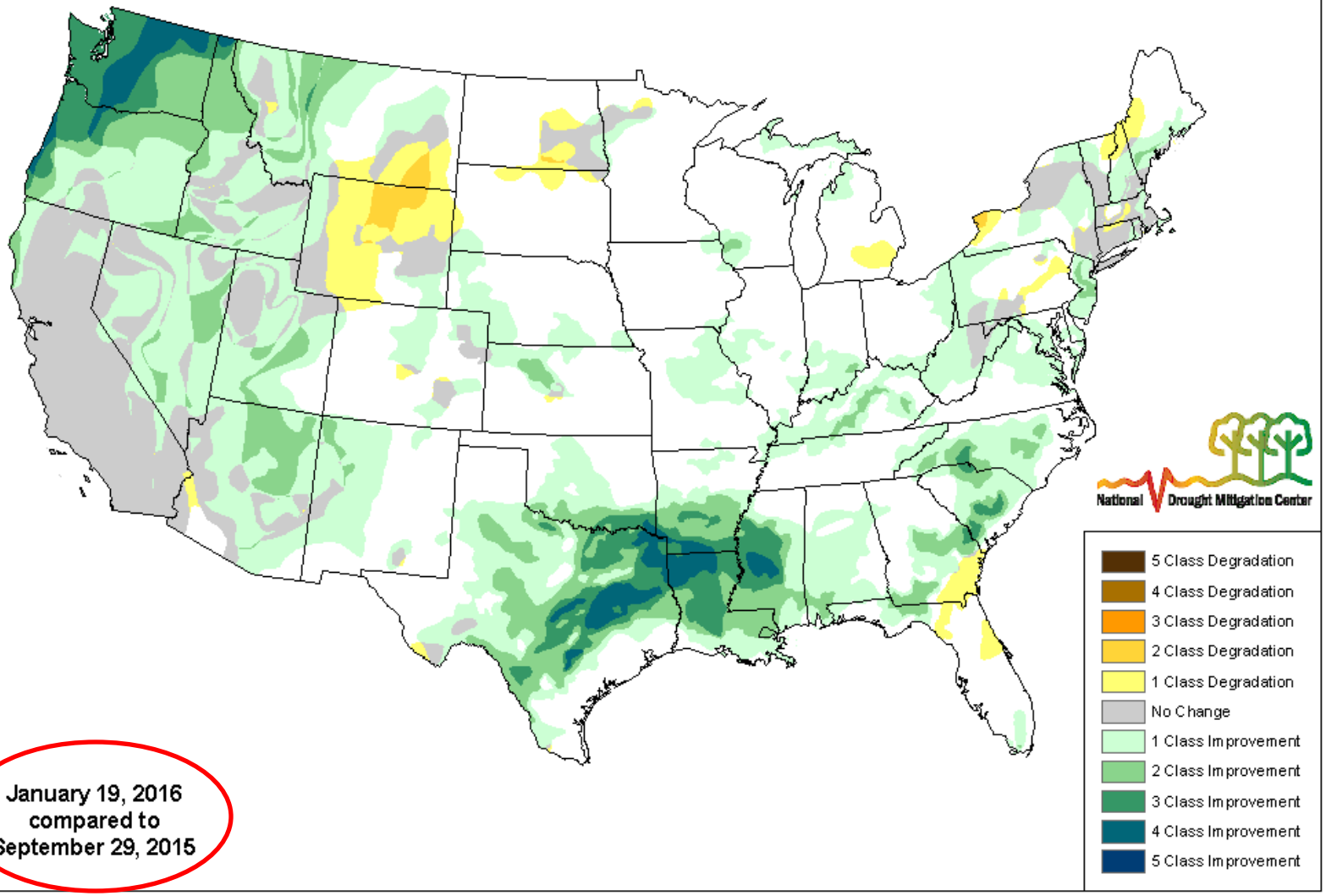
National Drought Mitigation Center

http://droughtmonitor.unl.edu/

U.S. Drought Monitor Class Change

Start of Water Year



January 19, 2016
compared to
September 29, 2015

http://droughtmonitor.unl.edu

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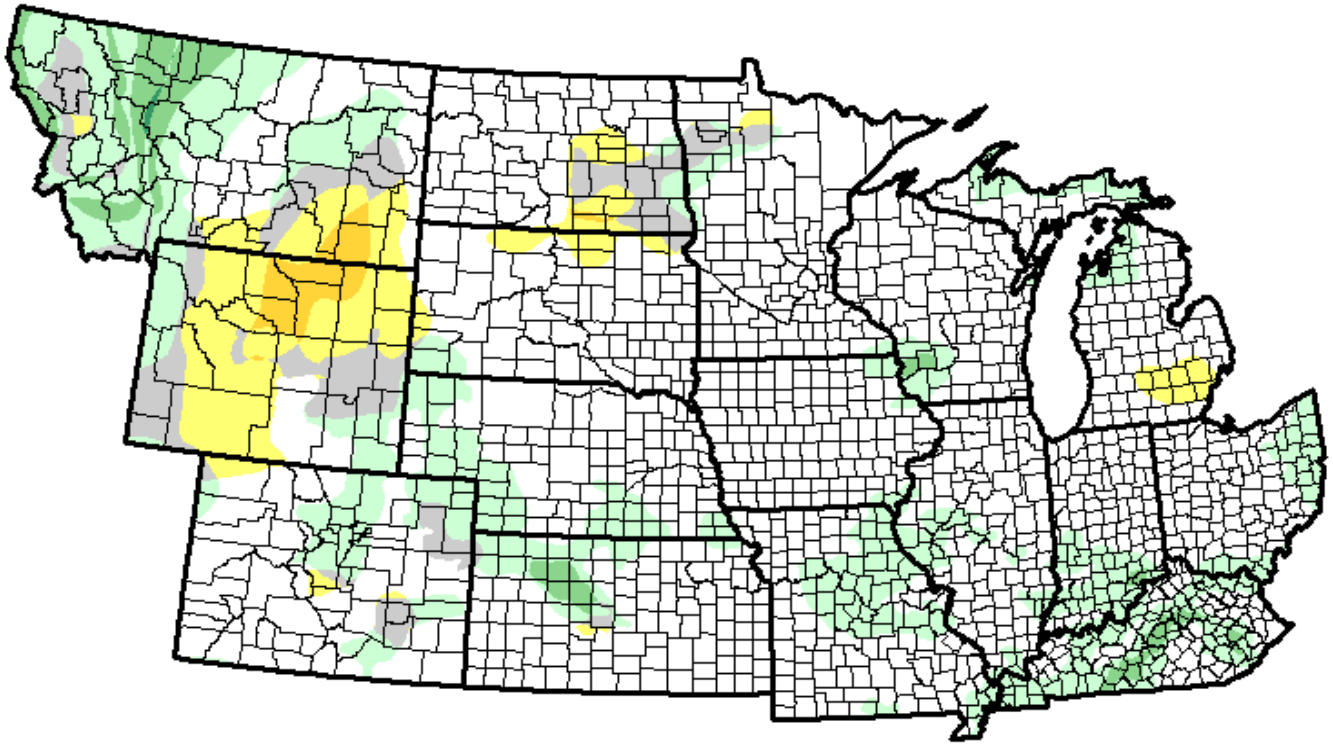
U.S. Drought Monitor Class Change - NWS Central Region

Start of Water Year



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- 5 Class Degradation
- 4 Class Degradation
- 3 Class Degradation
- 2 Class Degradation
- 1 Class Degradation
- No Change
- 1 Class Improvement
- 2 Class Improvement
- 3 Class Improvement
- 4 Class Improvement
- 5 Class Improvement

January 19, 2016
compared to
September 29, 2015

http://droughtmonitor.unl.edu

Climate Outlooks

- 7-day precipitation forecast
- 8-14 day outlook
- ENSO Outlook
- Monthly/Seasonal
- Spring Outlook (Mar-May)
- Seasonal Drought Outlook

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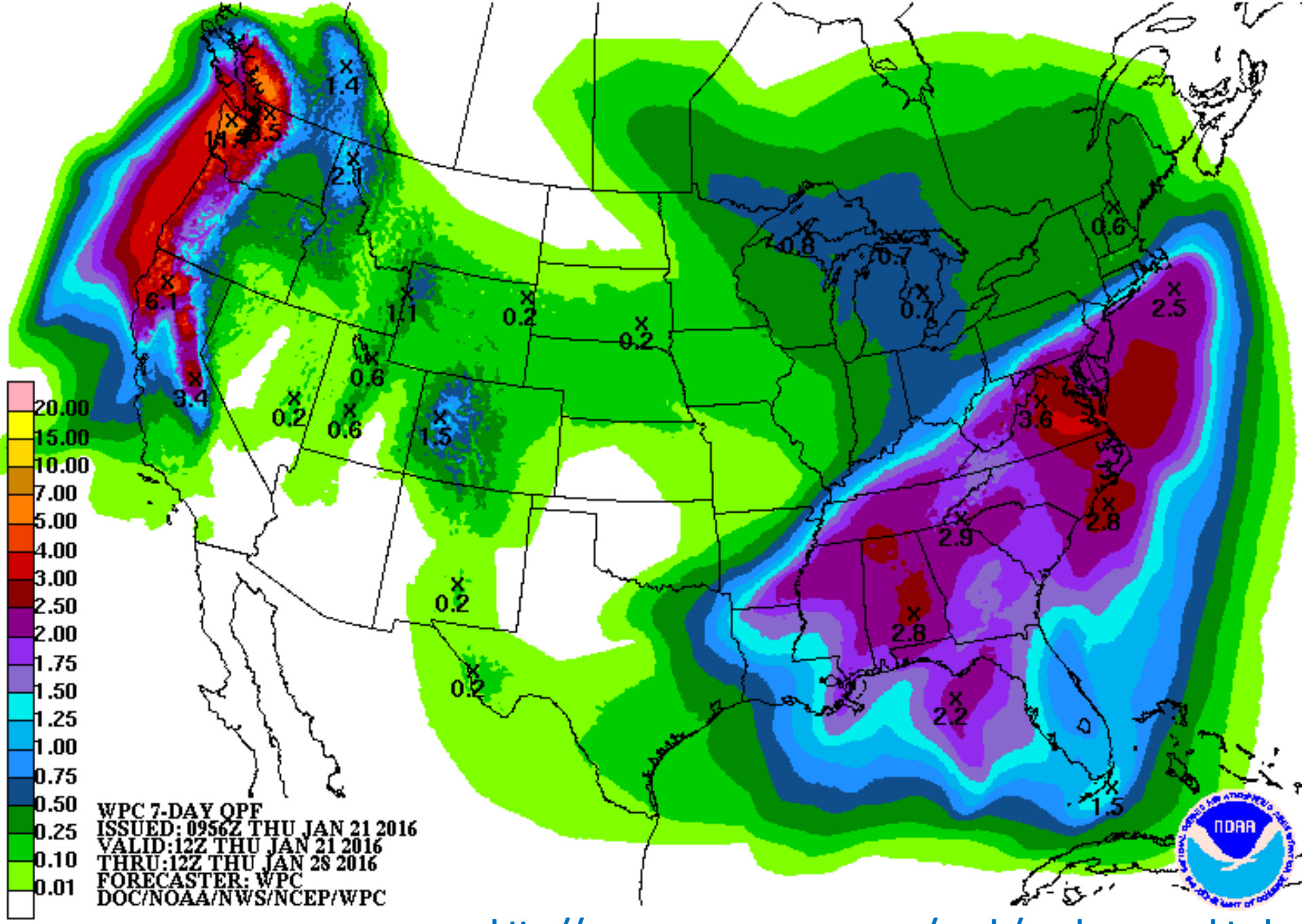
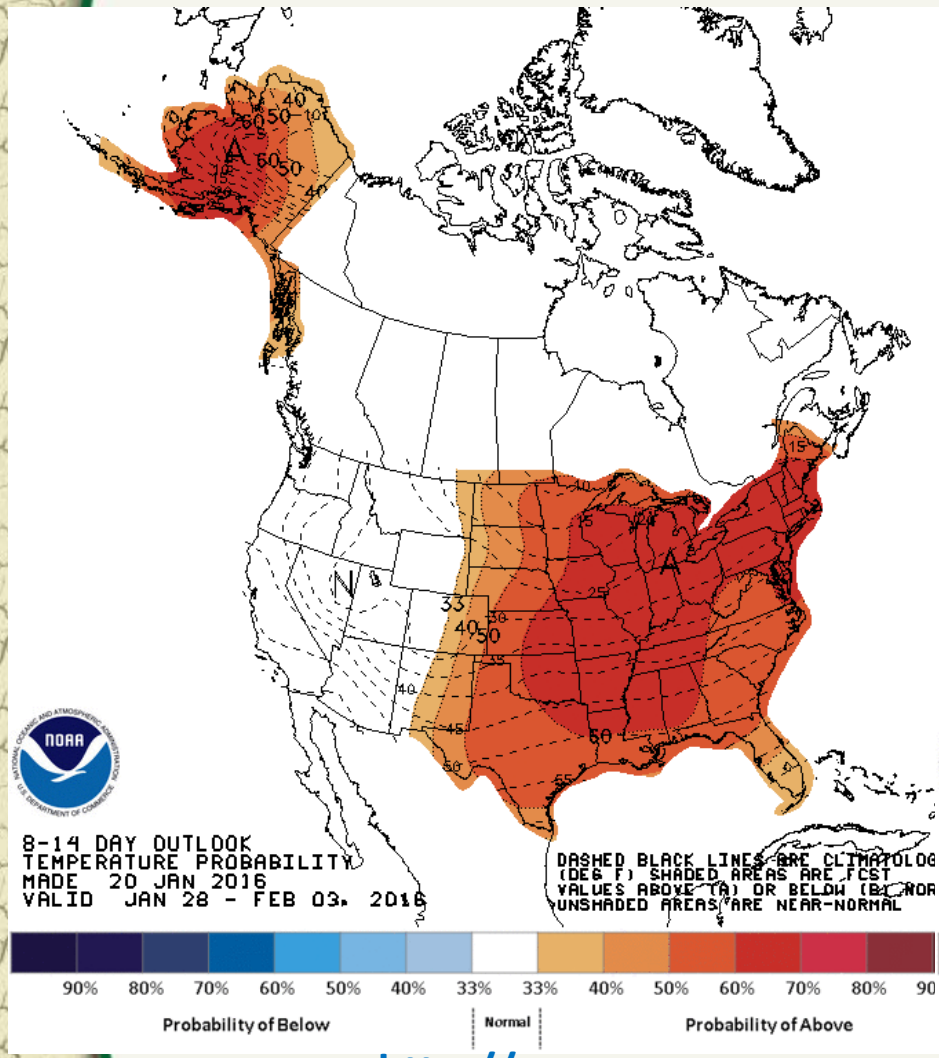
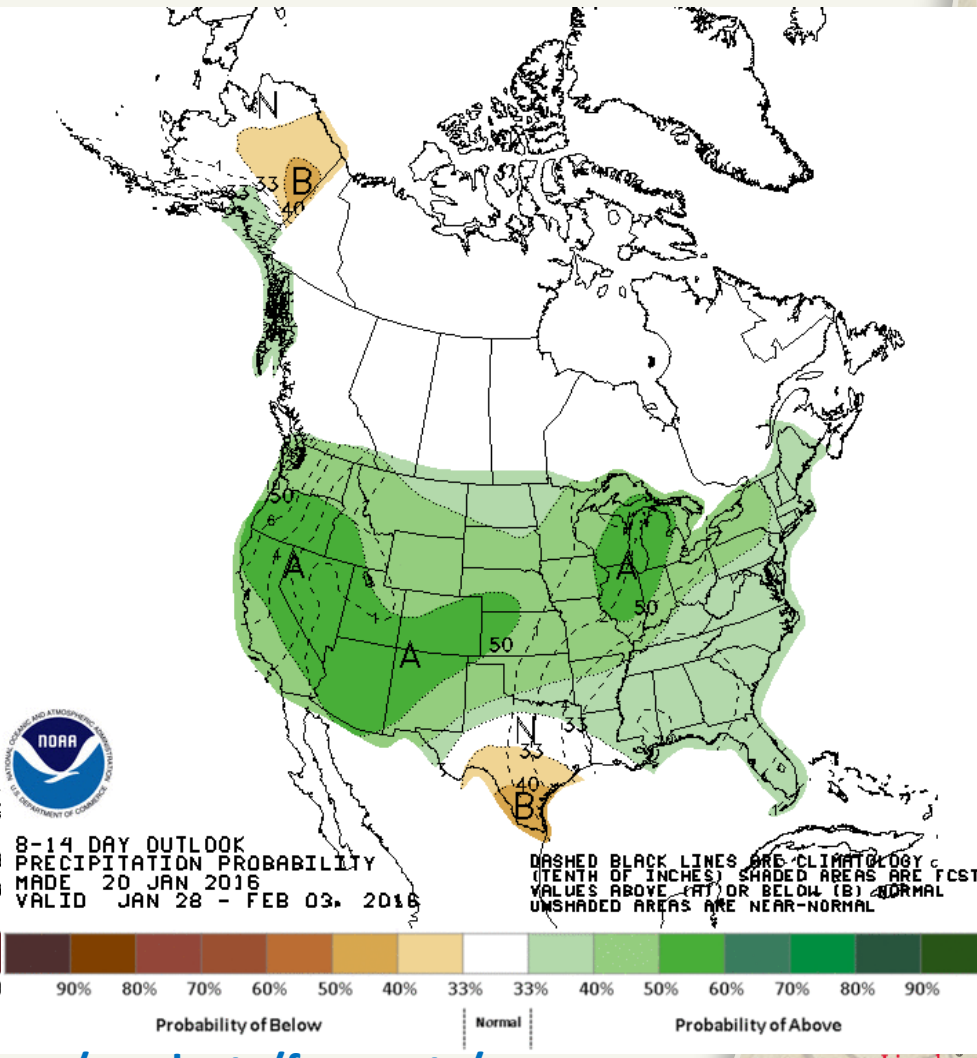


http://www.wpc.ncep.noaa.gov/medr/medr_mean.shtml

8-14 day Outlook





http://www.cpc.ncep.noaa.gov/products/forecasts/

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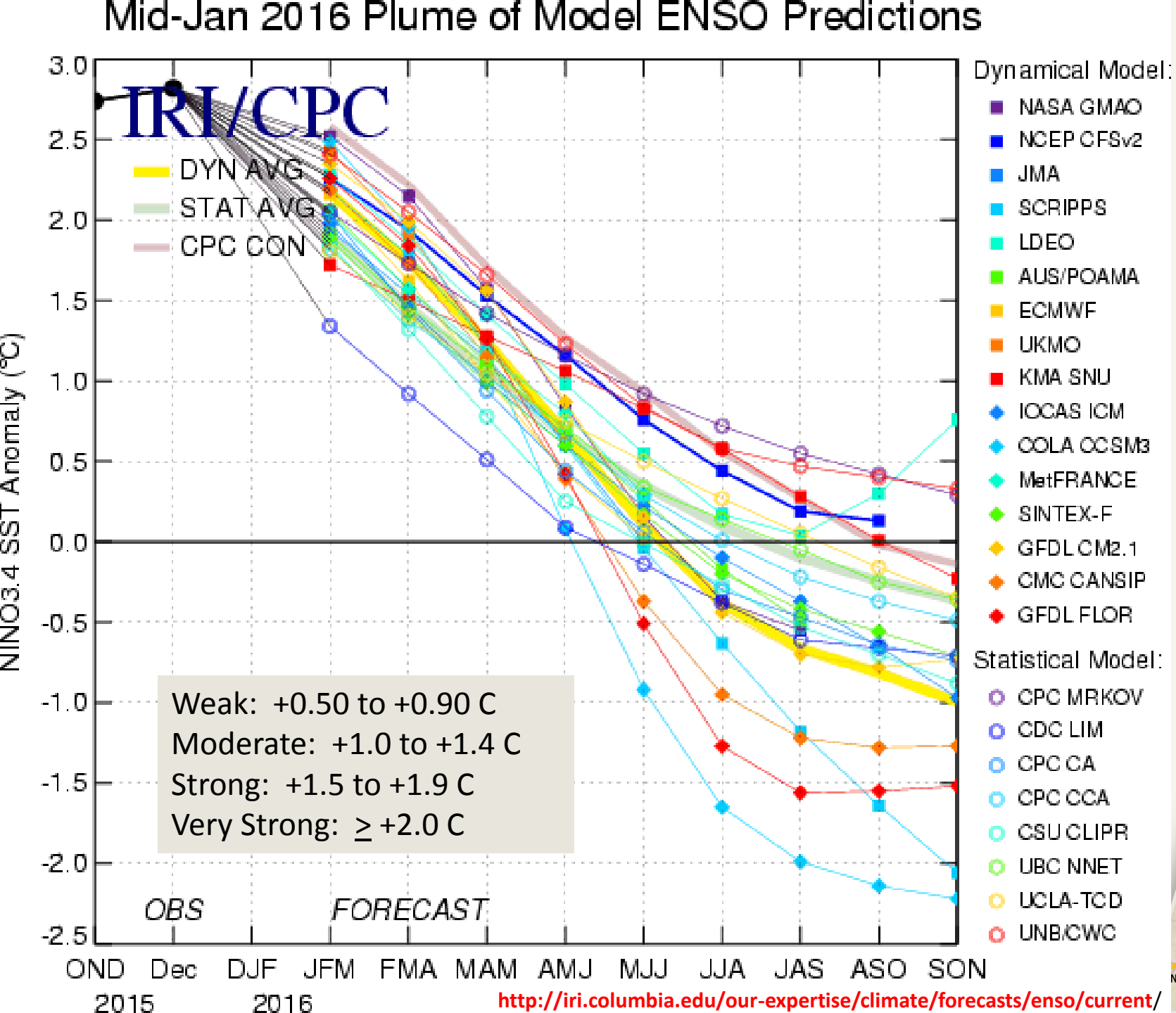
Mid-Jan 2016 Plume of Model ENSO Predictions



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

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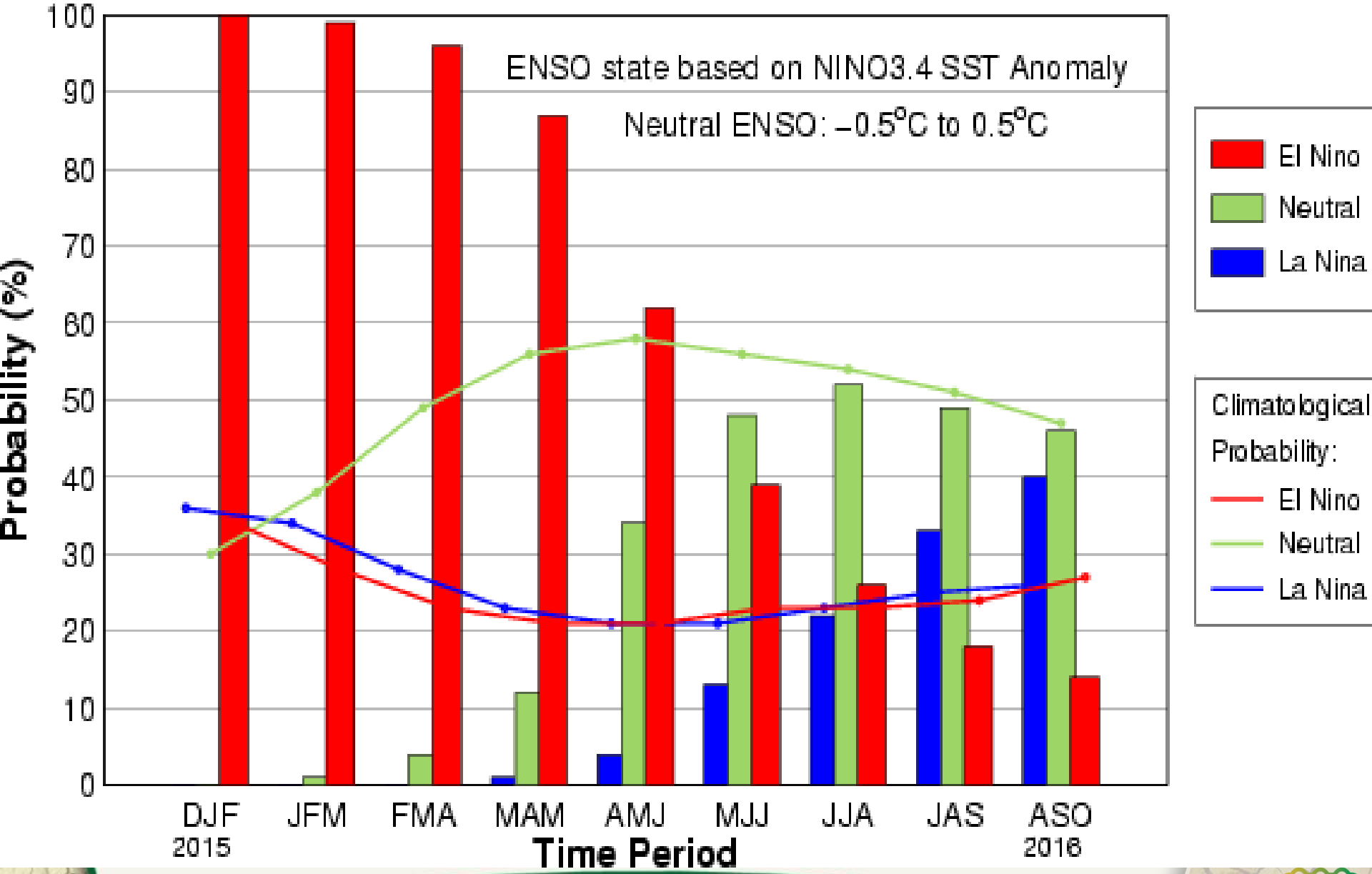
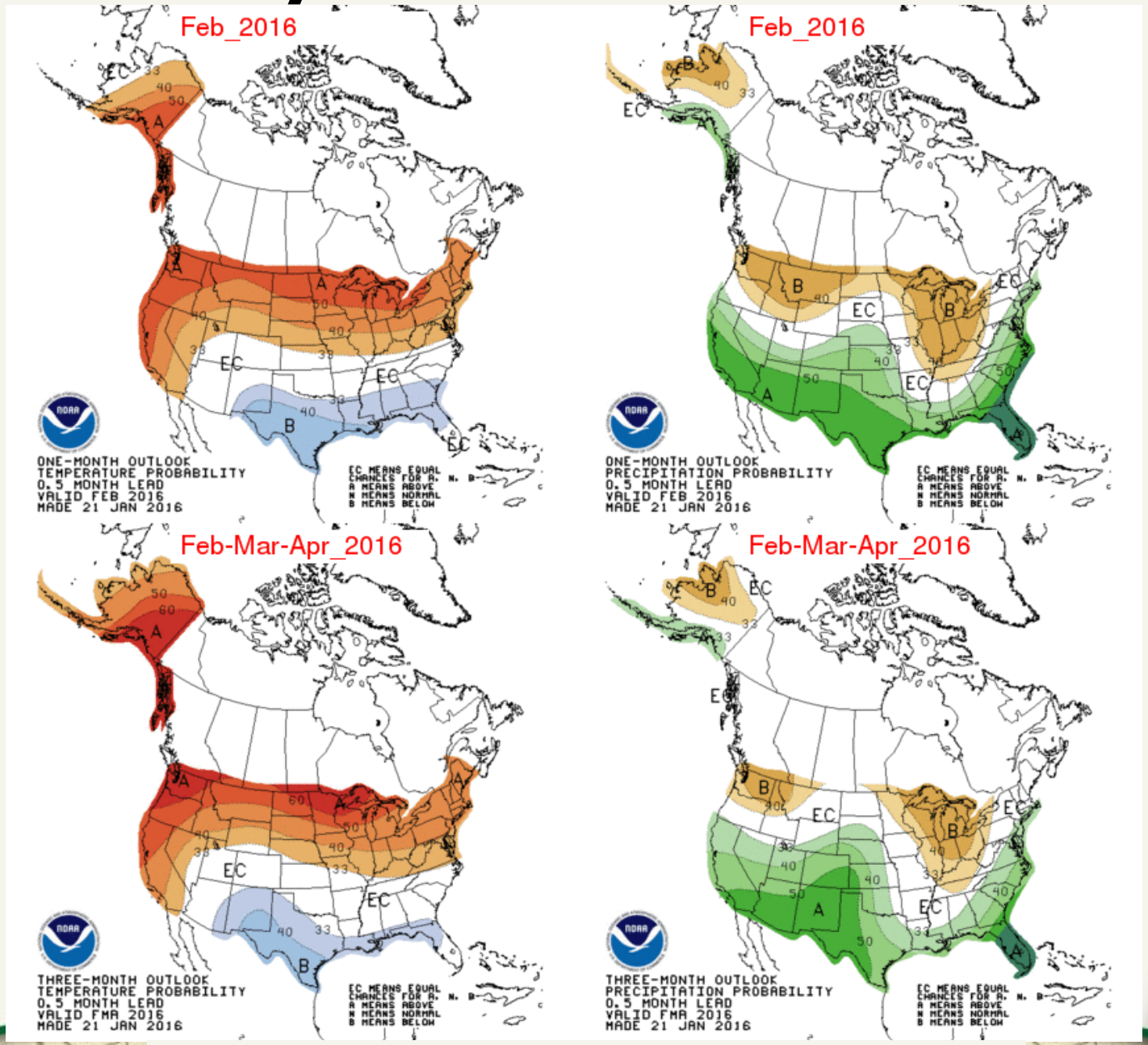
Early–Jan CPC/IRI Consensus Probabilistic ENSO Forecast



Monthly and Seasonal Outlook



http://www.cpc.ncep.noaa.gov/products/forecasts/

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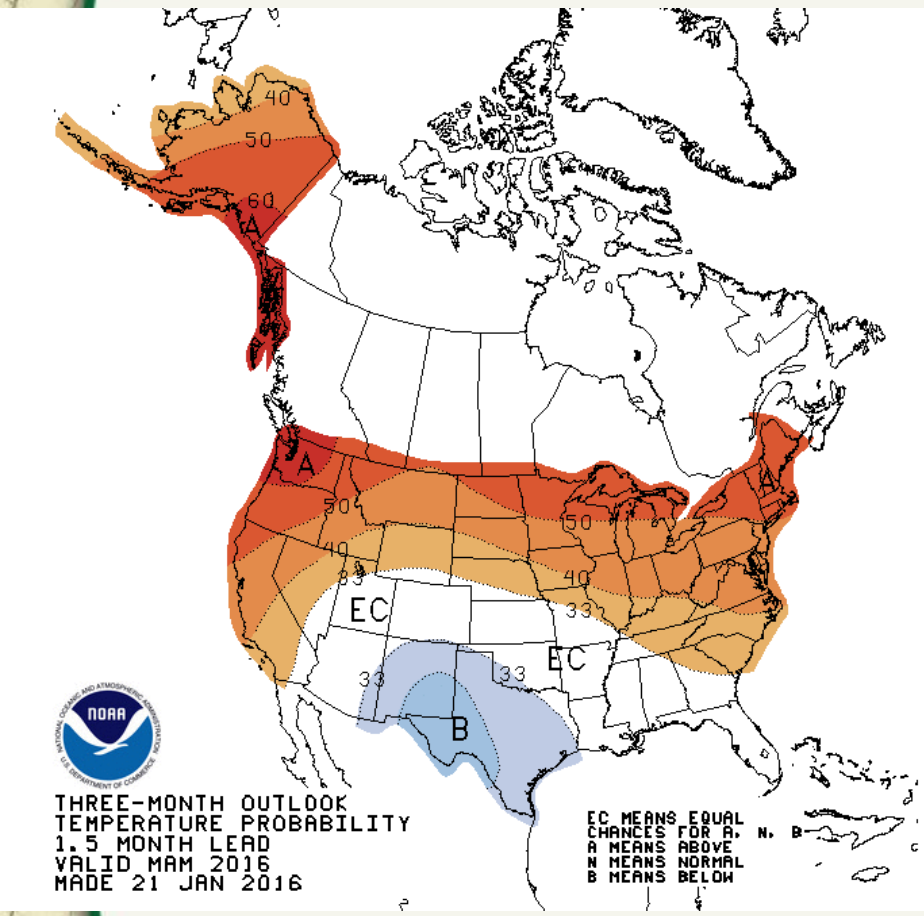
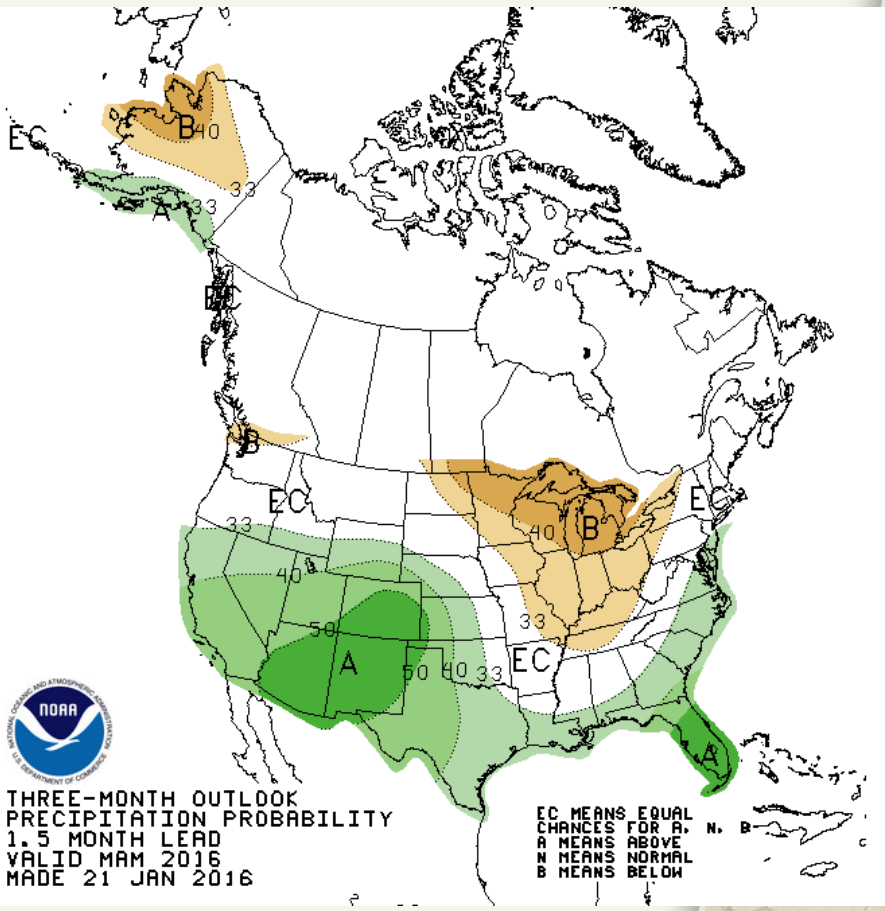
Spring Outlook MAM





http://www.cpc.ncep.noaa.gov/products/forecasts/

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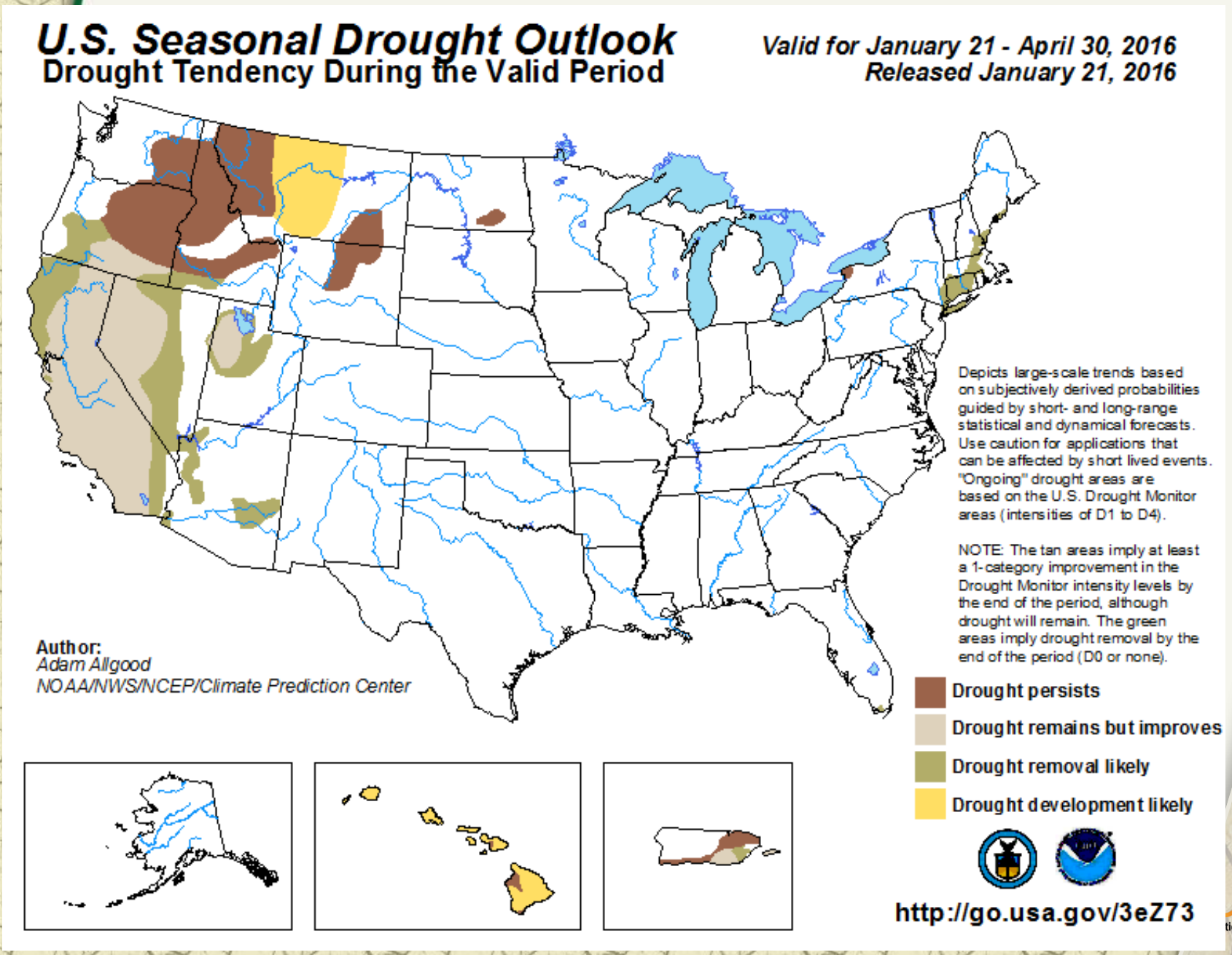
Seasonal Drought Outlook



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Summary

- "Most" of the region has been very warm and very wet on the Water Year.
- Great Lake annual average water levels all finished above average for 2015
- USACE just about done evacuating stored flood waters from 2015 and will head into 2016 w/ all 16.3 MAF of flood control storage available
- Very wet conditions and saturated soils in the lower basins is of concern heading into spring
- Mountain snow pack/SWE concerns for parts of the Missouri Basin

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Summary

- Drought is not a major issue in the region at present, but some development is anticipated in eastern Montana over the next 2 months
  - Missouri headwaters region being the exception in southwestern Montana
- El Niño has likely reached its peak and will continue to weaken w/ increased odds of developing into a La Niña by next fall/winter
  - Peak impacts coming on now though
- Most of the region looks to remain warm thru spring. Dryness could develop in western Montana and the Great Lakes region over the same time frame.

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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

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Thank You! Any questions?

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