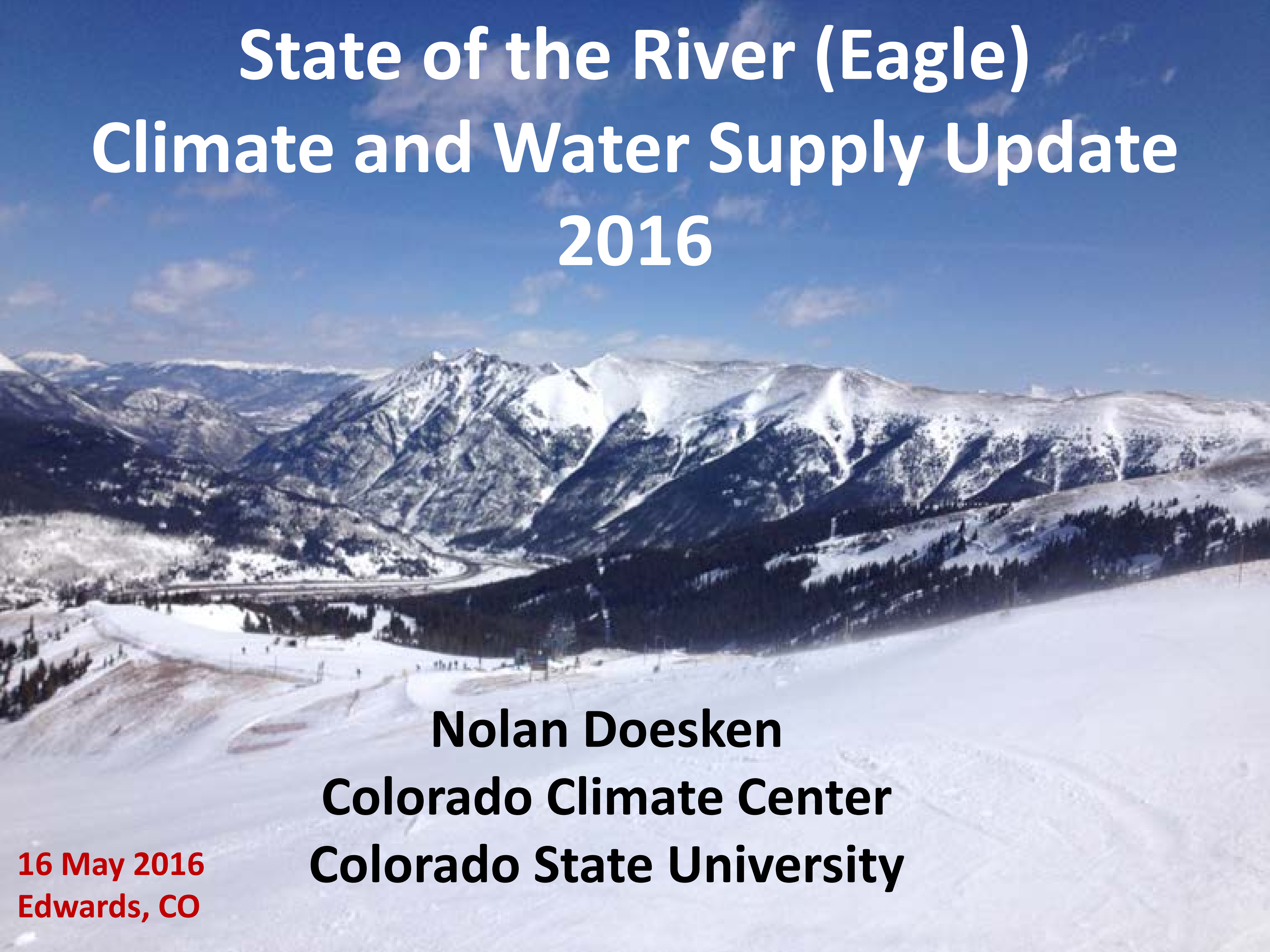


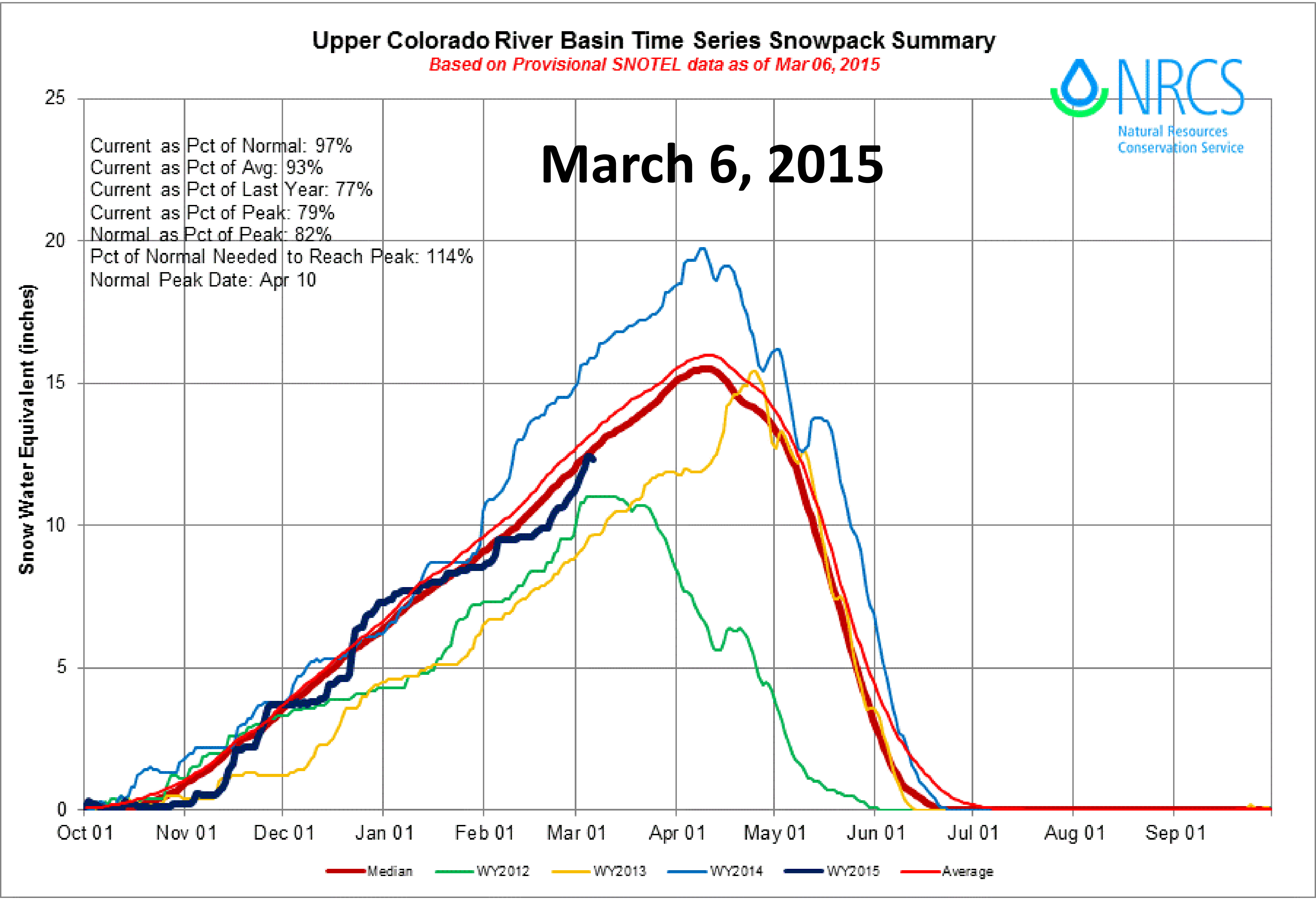
State of the River (Eagle)
Climate and Water Supply Update
2016

Nolan Doesken
Colorado Climate Center
Colorado State University

16 May 2016
Edwards, CO

Think back to last year

- A decent winter
- Warm spring (March-April)
- Snowmelt started early
- Western Drought Expanding
- Spring forecast called for cool and wet, but many doubted
- We were worried – a little.



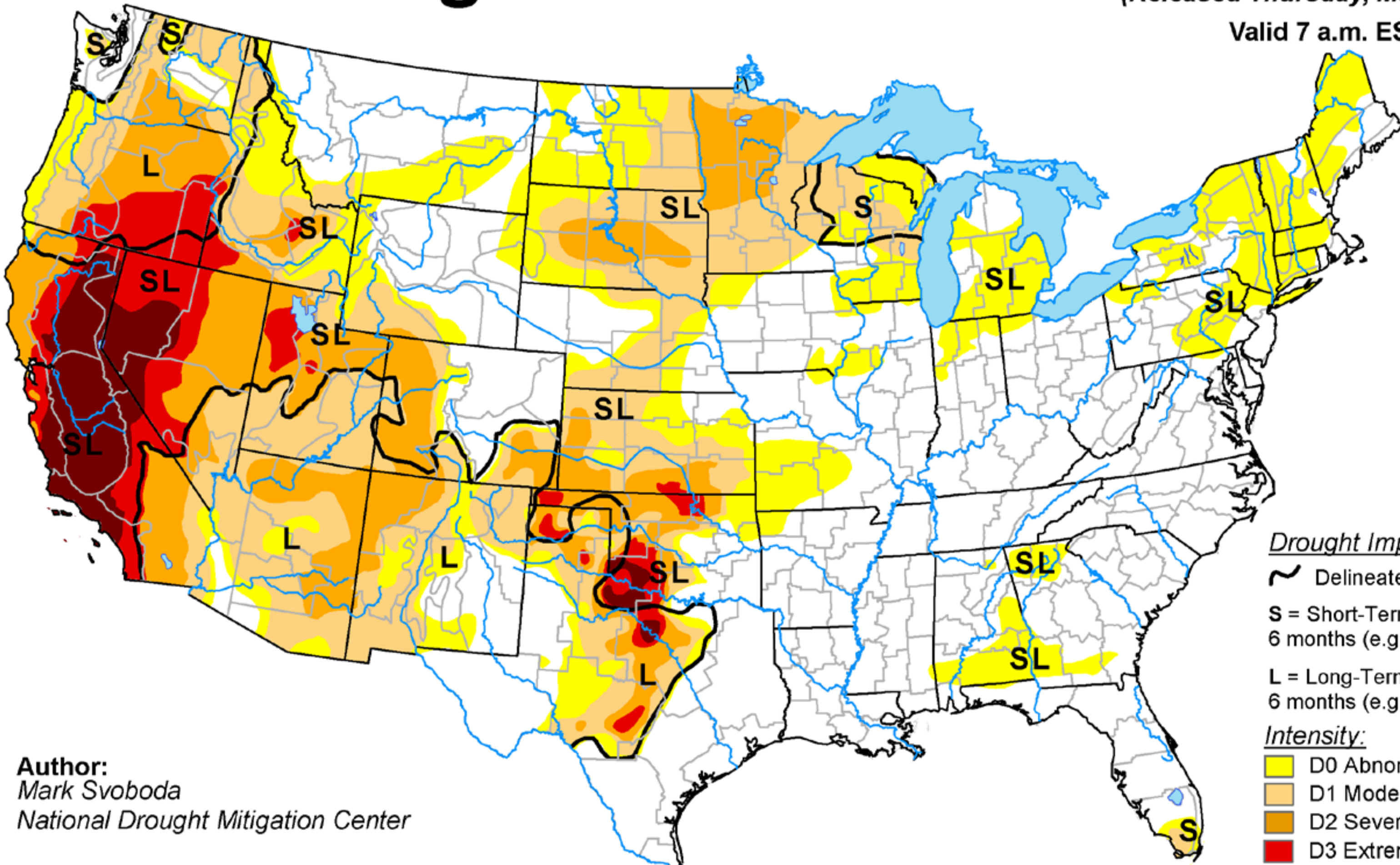
Upper Colorado River Basin Time Series Snowpack Summary
Based on Provisional SNOTEL data as of Mar 06, 2015
NRCS
Natural Resources Conservation Service
March 6, 2015
Current as Pct of Normal: 97%
Current as Pct of Avg: 93%
Current as Pct of Last Year: 77%
Current as Pct of Peak: 79%
Normal as Pct of Peak: 82%
Pct of Normal Needed to Reach Peak: 114%
Normal Peak Date: Apr 10
Snow Water Equivalent (inches)
25
20
15
10
5
0
Oct 01
Nov 01
Dec 01
Jan 01
Feb 01
Mar 01
Apr 01
May 01
Jun 01
Jul 01
Aug 01
Sep 01
Median
WY2012
WY2013
WY2014
WY2015
Average

U.S. Drought Monitor

May 5, 2015

(Released Thursday, May. 7, 2015)

Valid 7 a.m. EST



<u>*Drought Impact Types:*</u>

Delineates dominant impacts

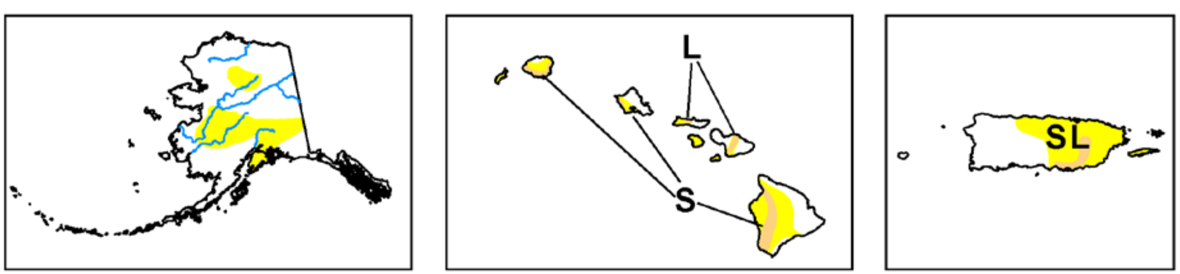
S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)

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

<u>*Intensity:*</u>

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

Author:
Mark Svoboda
National Drought Mitigation Center

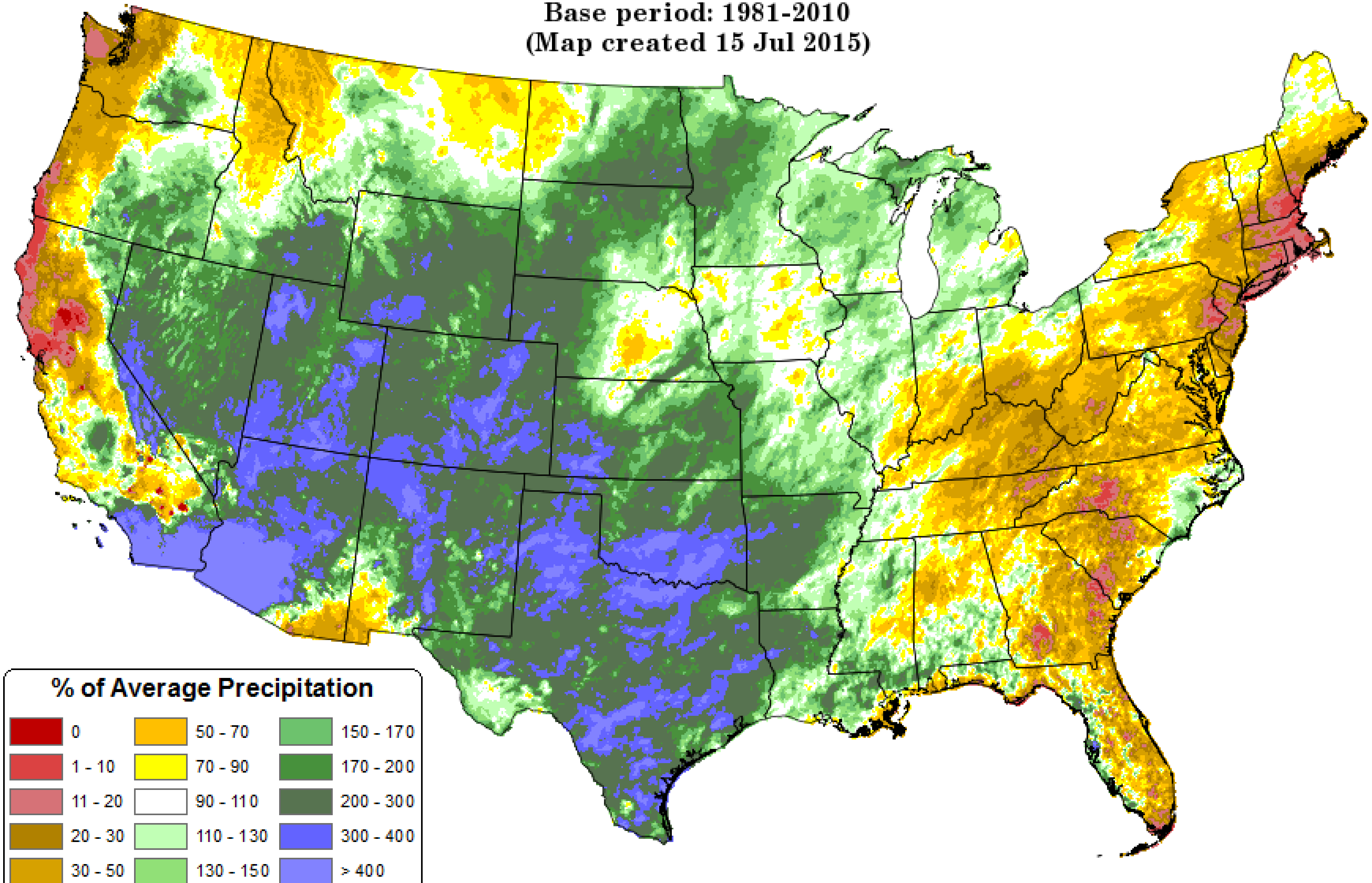


The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

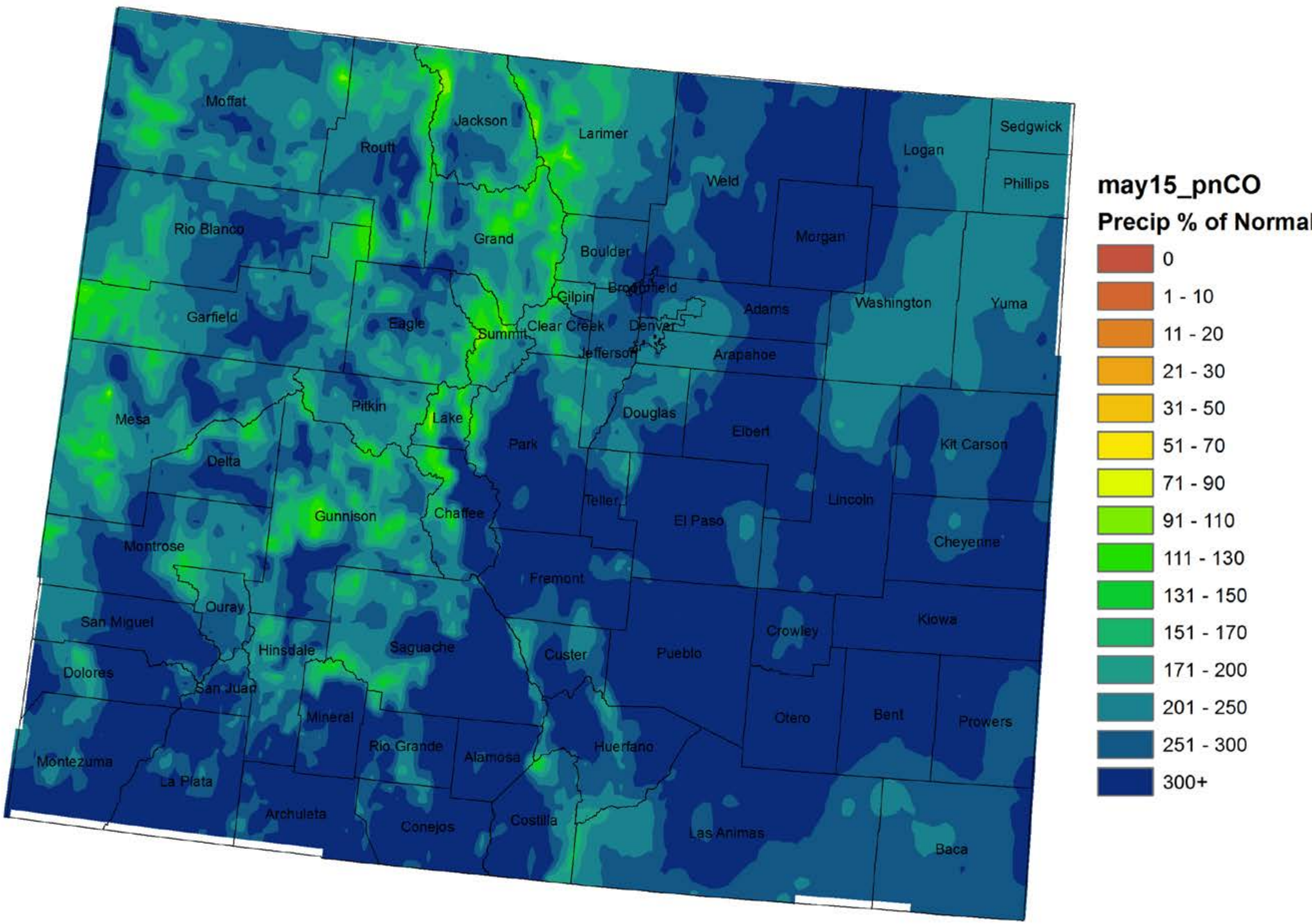
http://droughtmonitor.unl.edu/

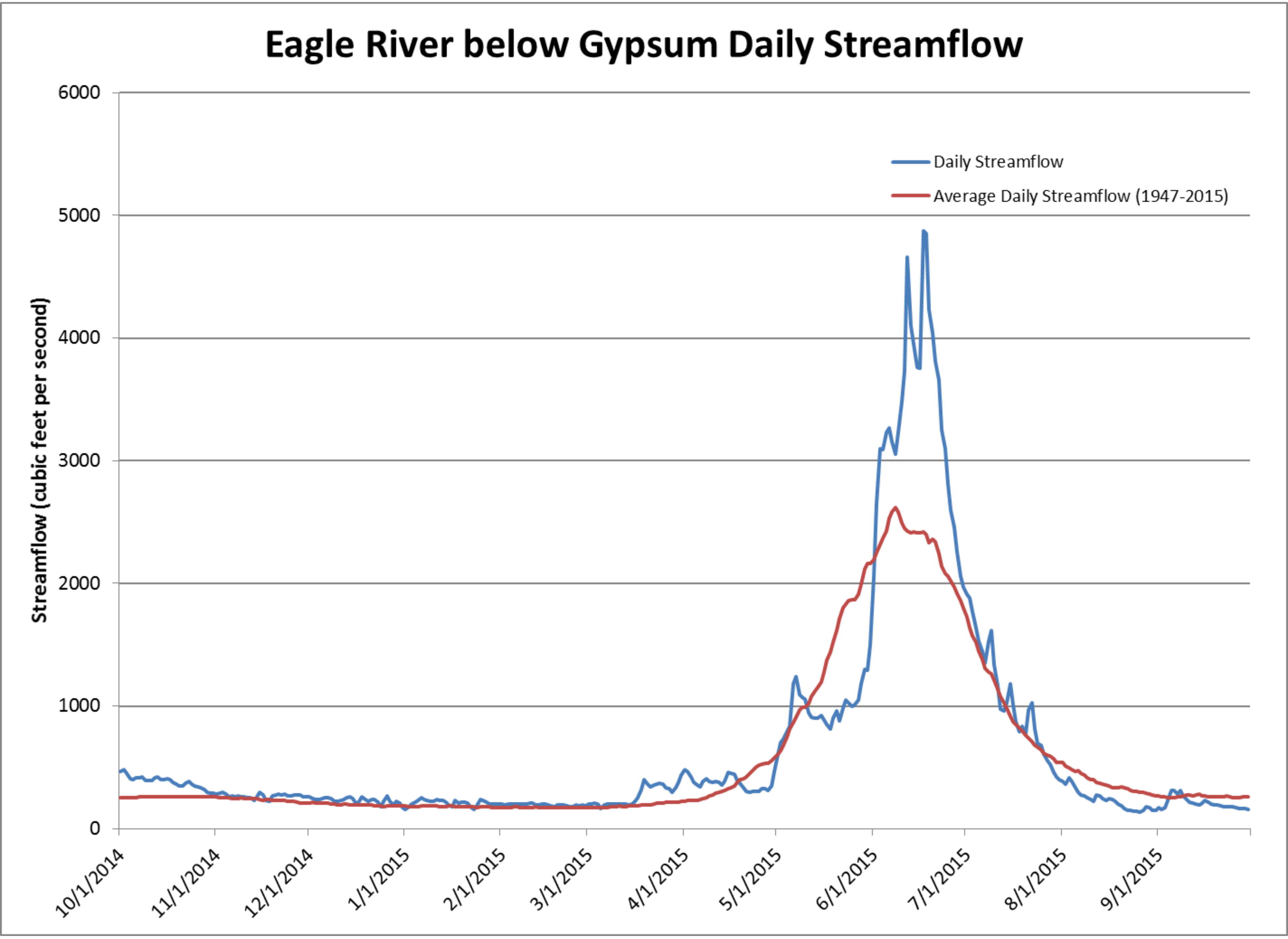
Total Precipitation Anomaly: May 2015

Period ending 31 May 2015
Base period: 1981-2010
(Map created 15 Jul 2015)



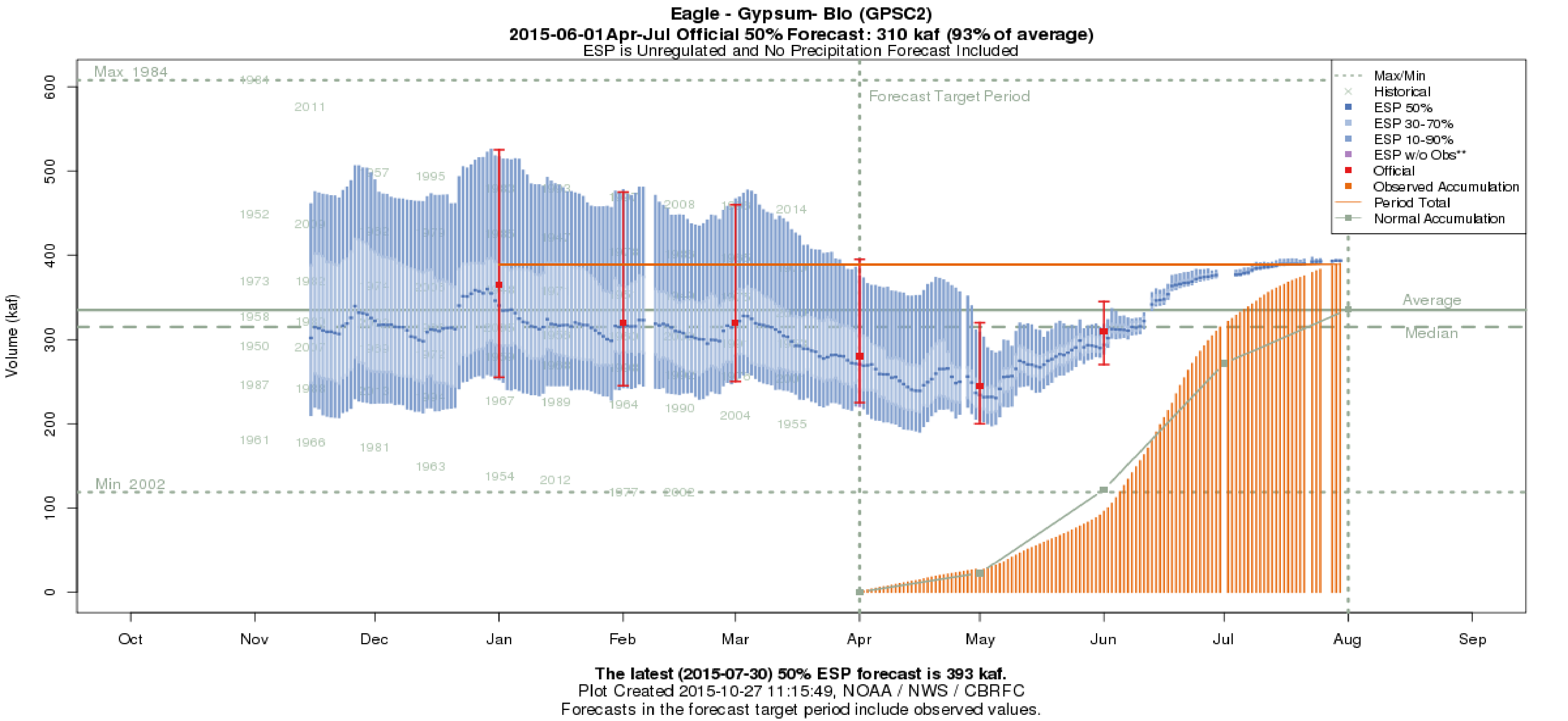
Colorado May 2015 Precipitation as a Percentage of Normal



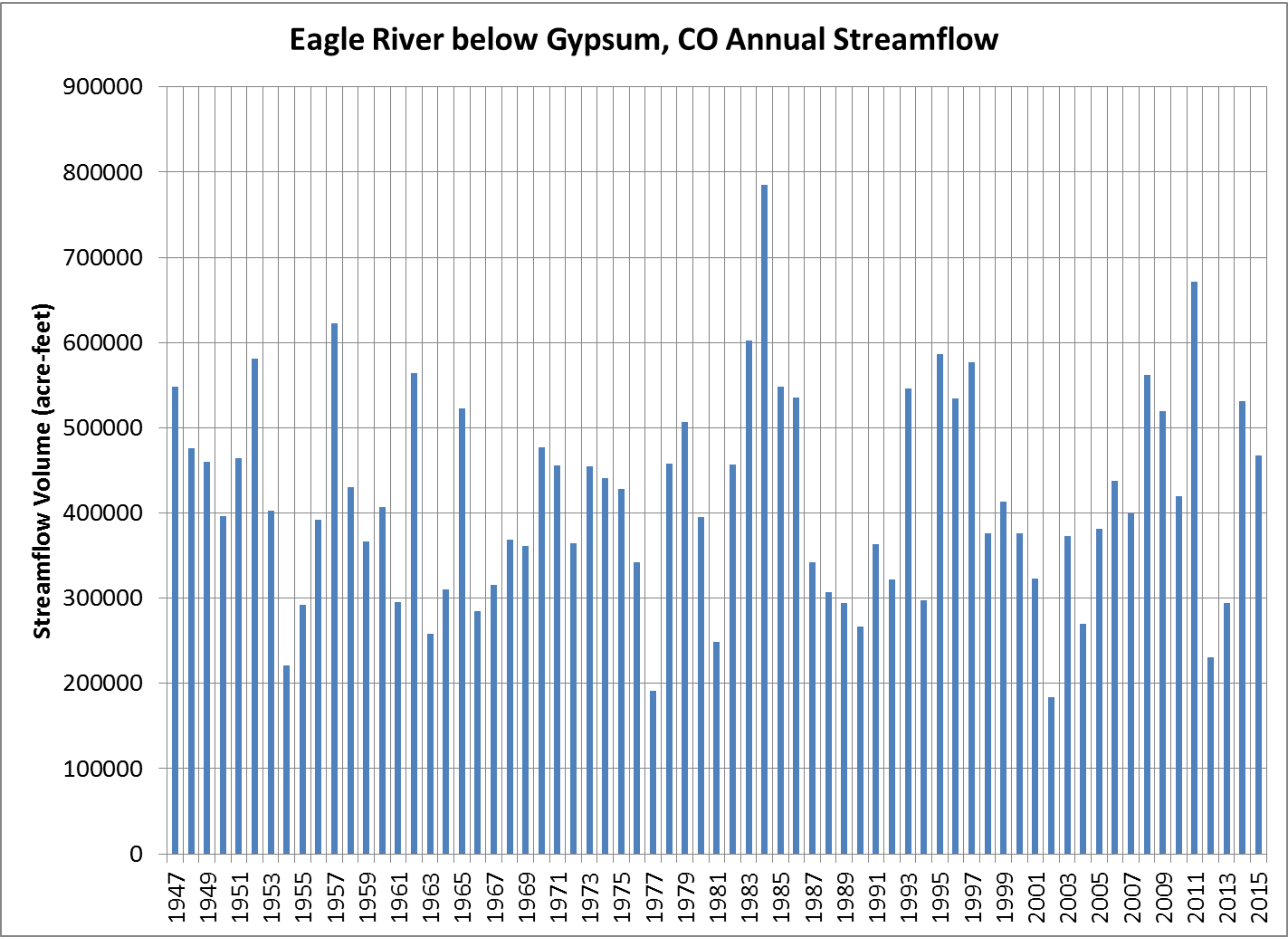


Eagle River below Gypsum Daily Streamflow
Streamflow (cubic feet per second)
6000
5000
4000
3000
2000
1000
0
10/1/2014
11/1/2014
12/1/2014
1/1/2015
2/1/2015
3/1/2015
4/1/2015
5/1/2015
6/1/2015
7/1/2015
8/1/2015
9/1/2015
Daily Streamflow
Average Daily Streamflow (1947-2015)

Eagle River at Gypsum 2015 Streamflow Volume Forecast An unexpected good year for water

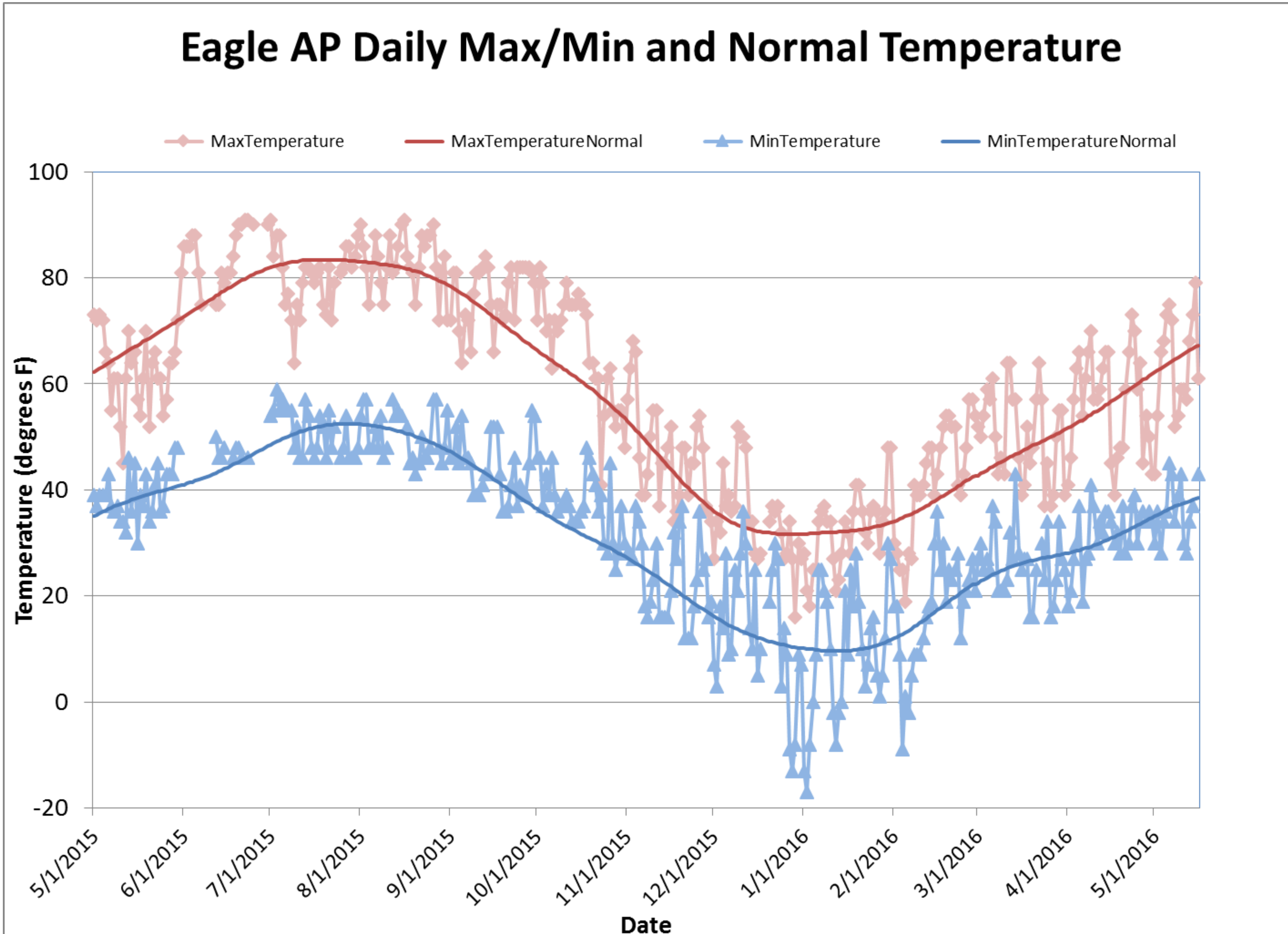


From Colorado River Basin Forecast Center

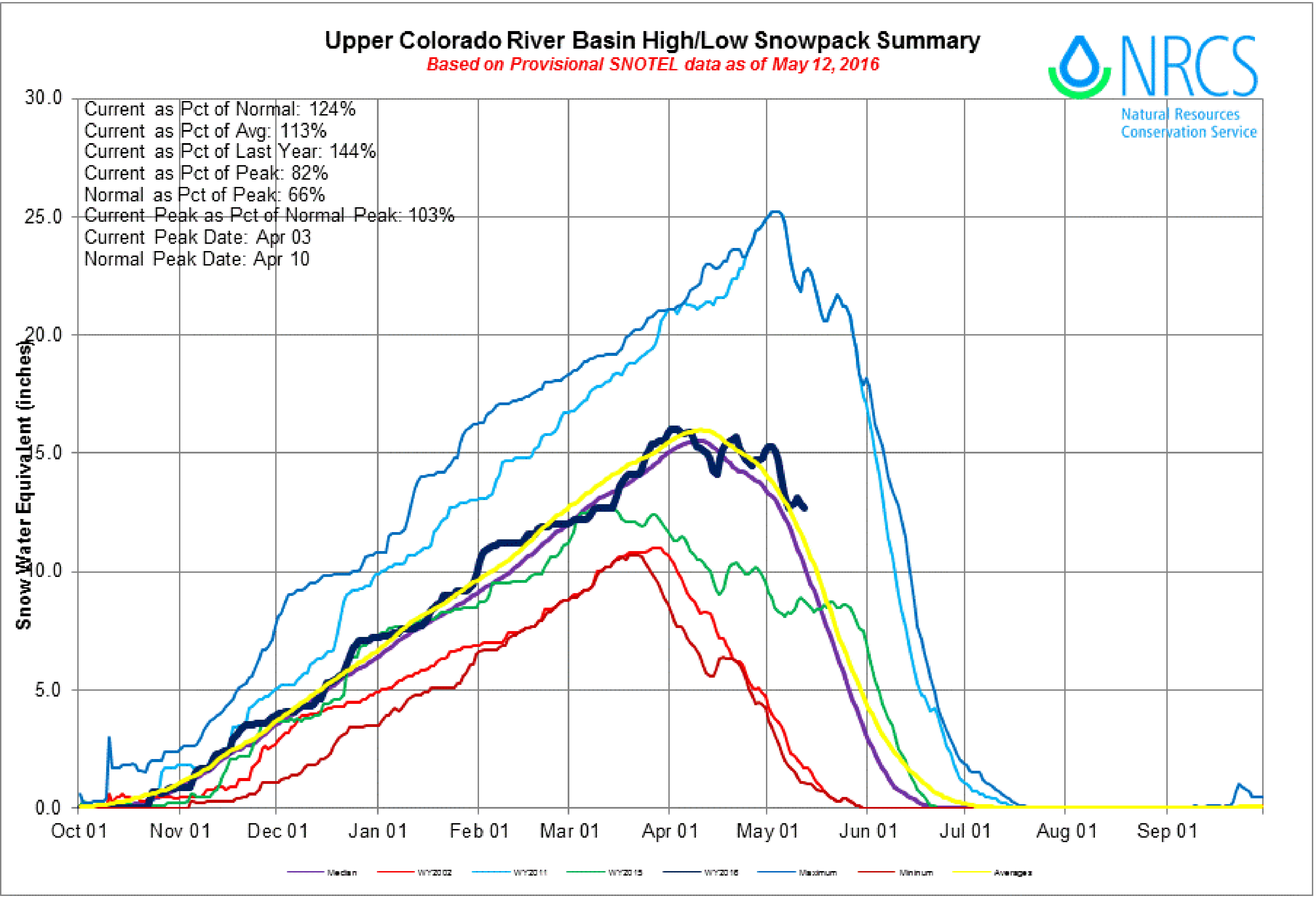


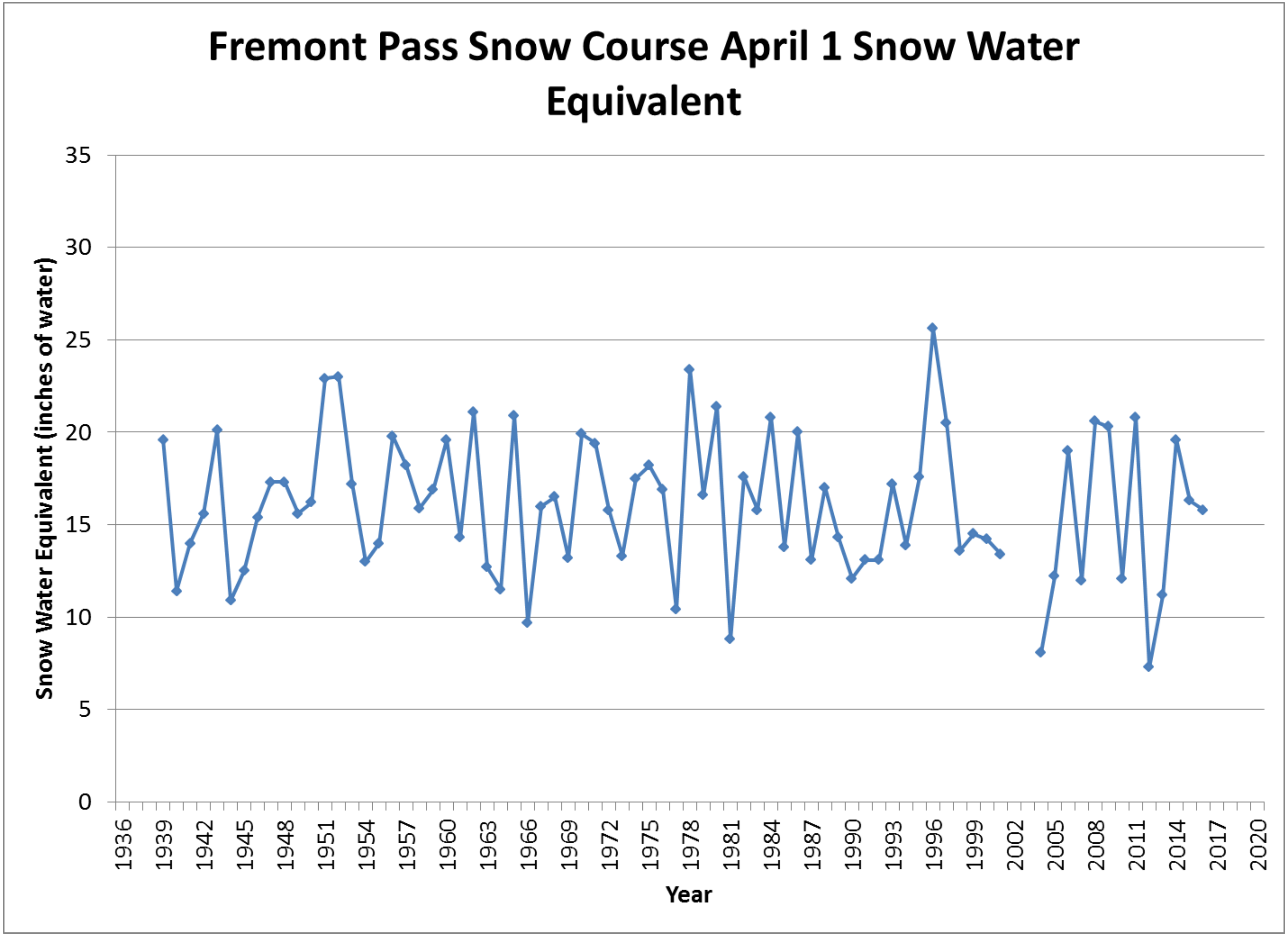
Eagle River below Gypsum, CO Annual Streamflow
Streamflow Volume (acre-feet)
900000
800000
700000
600000
500000
400000
300000
200000
100000
0
1947
1949
1951
1953
1955
1957
1959
1961
1963
1965
1967
1969
1971
1973
1975
1977
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015

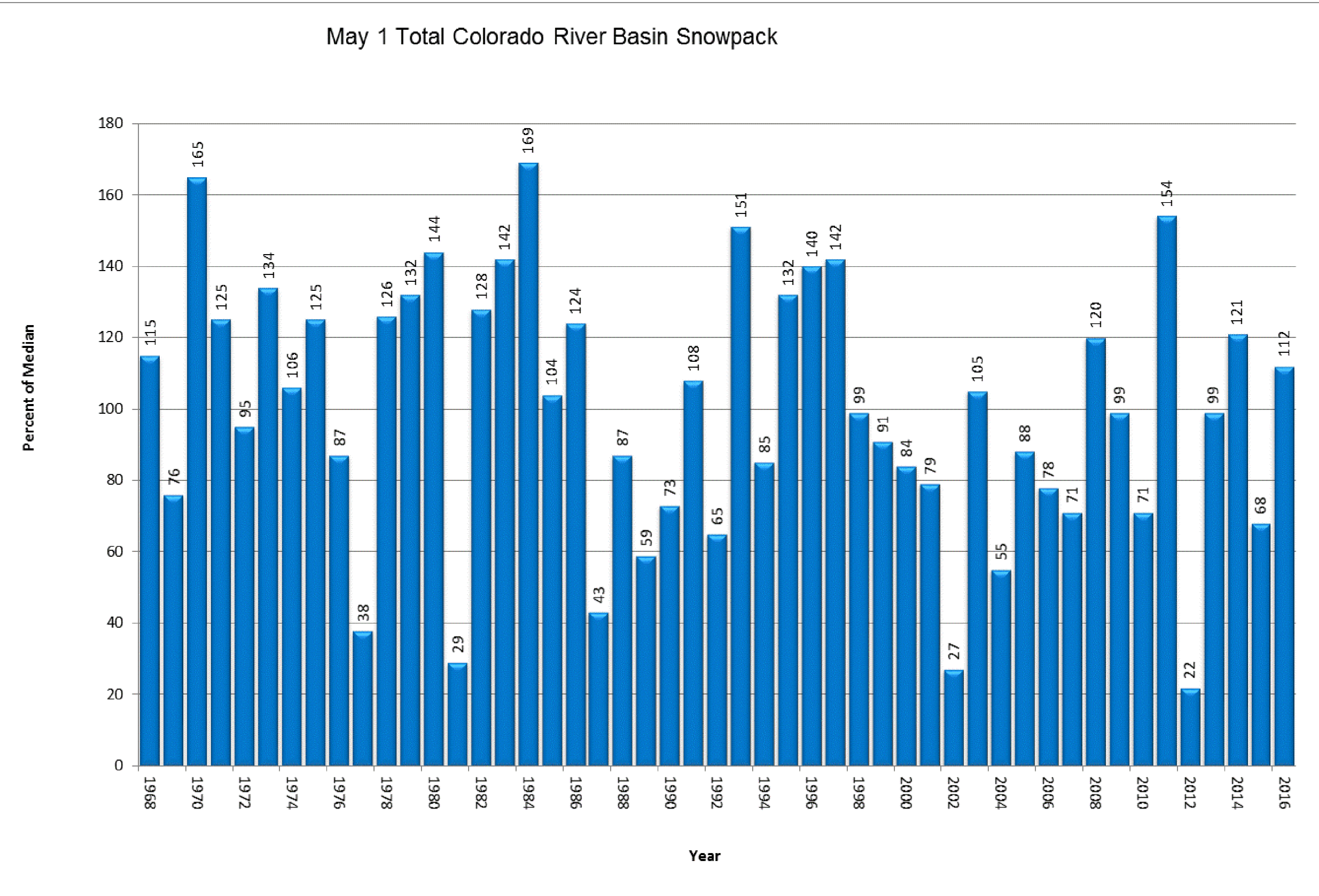

How about this year

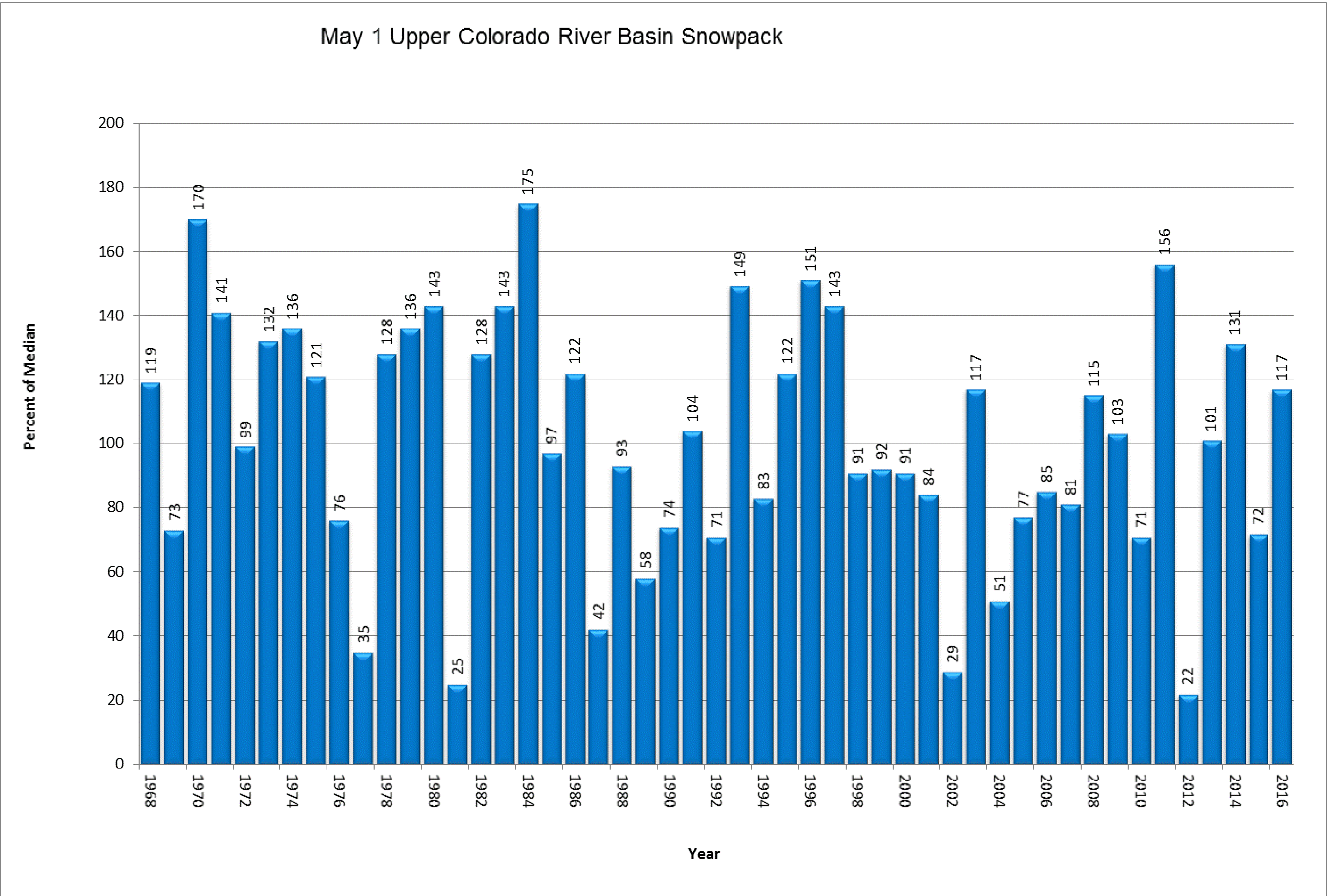


Eagle AP Daily Max/Min and Normal Temperature
MaxTemperature
MaxTemperatureNormal
MinTemperature
MinTemperatureNormal
Temperature (degrees F)
100
80
60
40
20
0
-20
5/1/2015
6/1/2015
7/1/2015
8/1/2015
9/1/2015
10/1/2015
11/1/2015
12/1/2015
1/1/2016
2/1/2016
3/1/2016
4/1/2016
5/1/2016
Date


Upper Colorado River Basin High/Low Snowpack Summary
Based on Provisional SNOTEL data as of May 12, 2016
NRCS
Natural Resources Conservation Service
Current as Pct of Normal: 124%
Current as Pct of Avg: 113%
Current as Pct of Last Year: 144%
Current as Pct of Peak: 82%
Normal as Pct of Peak: 66%
Current Peak as Pct of Normal Peak: 103%
Current Peak Date: Apr 03
Normal Peak Date: Apr 10
Snow Water Equivalent (inches)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Oct 01
Nov 01
Dec 01
Jan 01
Feb 01
Mar 01
Apr 01
May 01
Jun 01
Jul 01
Aug 01
Sep 01
Median
WY2002
WY2011
Maximum
Minimum
Averages

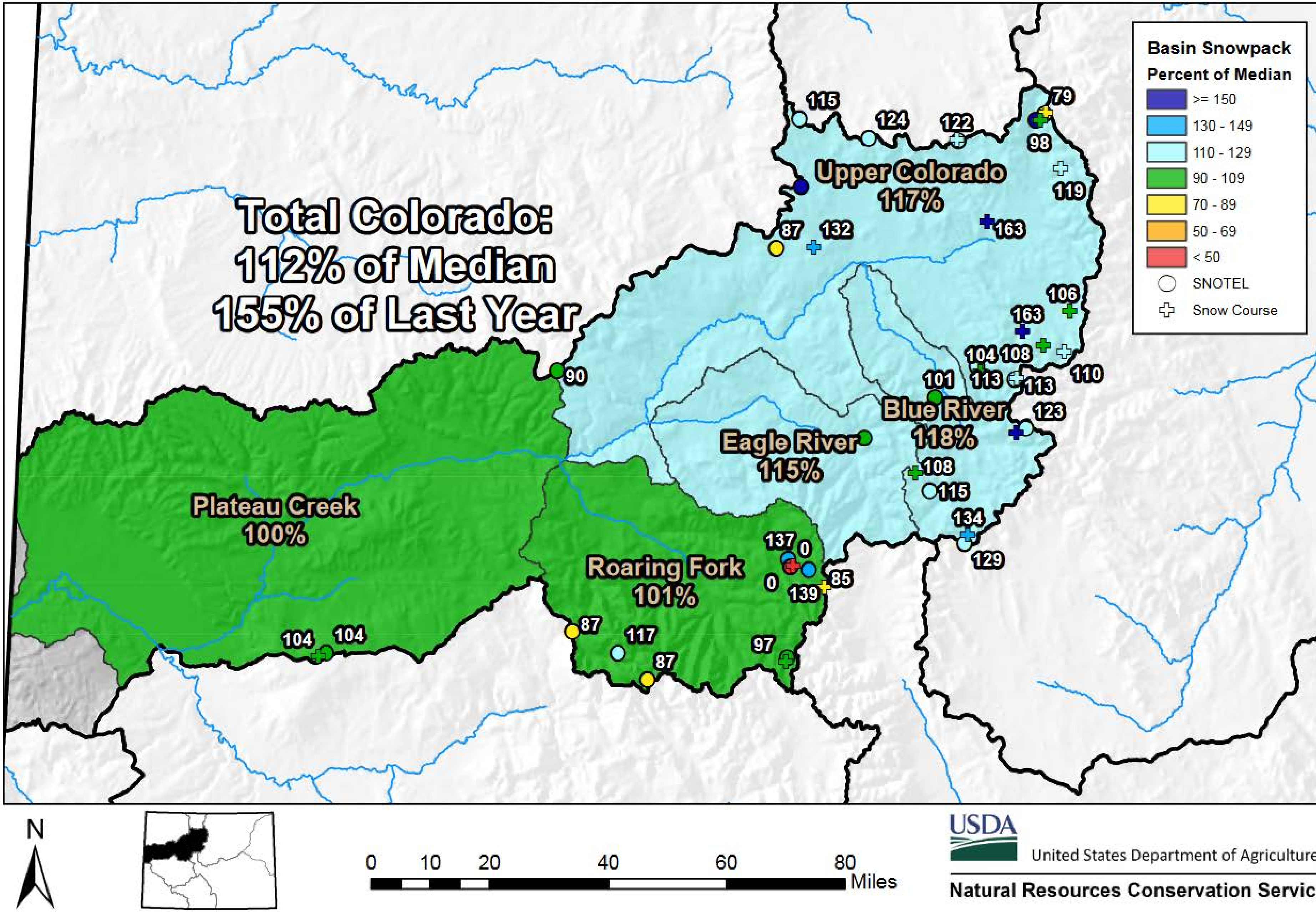

Fremont Pass Snow Course April 1 Snow Water Equivalent
Snow Water Equivalent (inches of water)
35
30
25
20
15
10
5
0
1936
1939
1942
1945
1948
1951
1954
1957
1960
1963
1966
1969
1972
1975
1978
1981
1984
1987
1990
1993
1996
1999
2002
2005
2008
2011
2014
2017
2020
Year


May 1 Total Colorado River Basin Snowpack
Percent of Median
Year
0
20
40
60
80
100
120
140
160
180
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
115
76
165
125
95
134
106
125
87
38
126
132
144
29
128
142
169
104
124
43
87
59
73
108
65
151
85
132
140
142
99
91
84
79
27
105
55
88
78
71
120
99
71
154
22
99
121
68
112



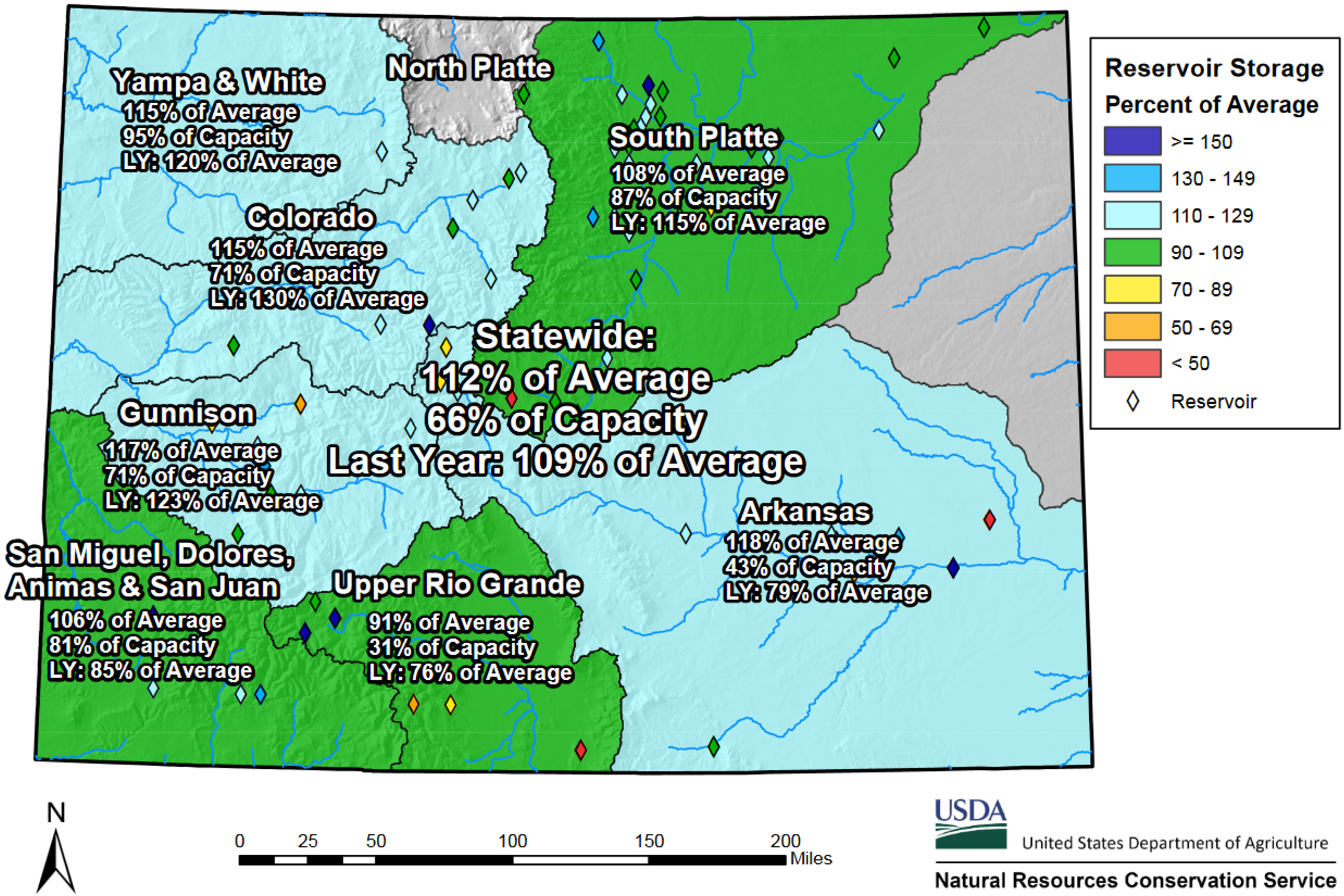
May 1 Upper Colorado River Basin Snowpack
Percent of Median
Year
0
20
40
60
80
100
120
140
160
180
200
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
119
73
170
141
99
132
136
121
76
35
128
136
143
25
128
143
175
97
122
42
93
58
74
104
71
149
83
122
151
143
91
92
91
84
29
117
51
77
85
81
115
103
71
156
22
101
131
72
117

Upper Colorado River Basin Monthly Snowpack Summary
May 1, 2016



Colorado Monthly Reservoir Storage Summary

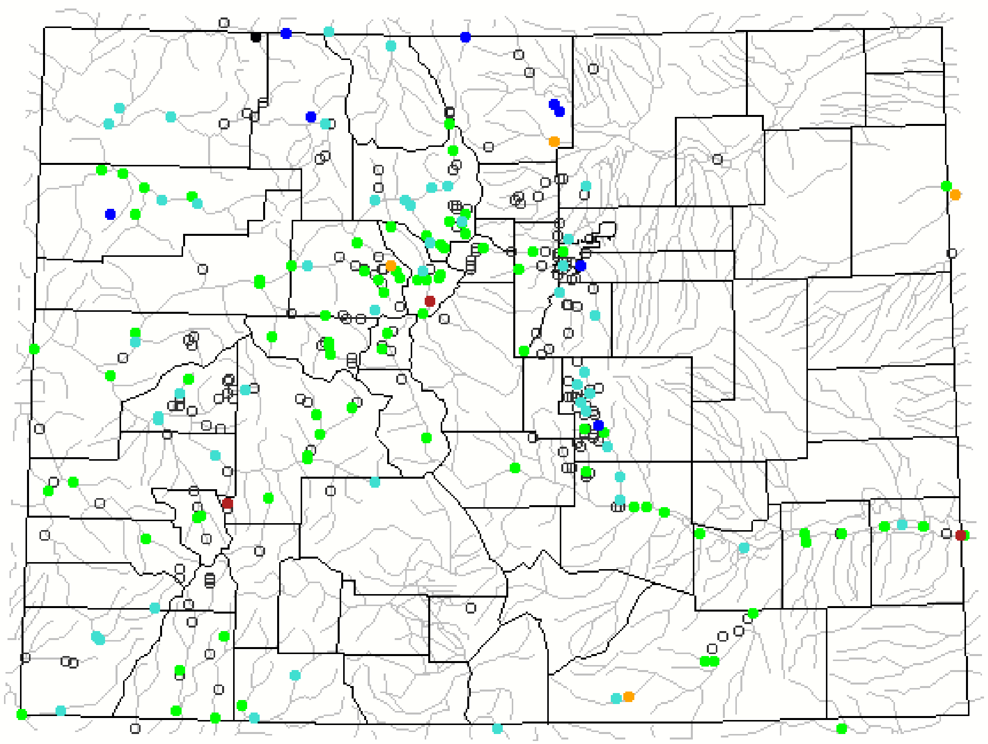
End of April 2016



USDA
United States Department of Agriculture
Natural Resources Conservation Service

7 day average streamflow – May 16, 2016

Monday, May 16, 2016 11:30ET

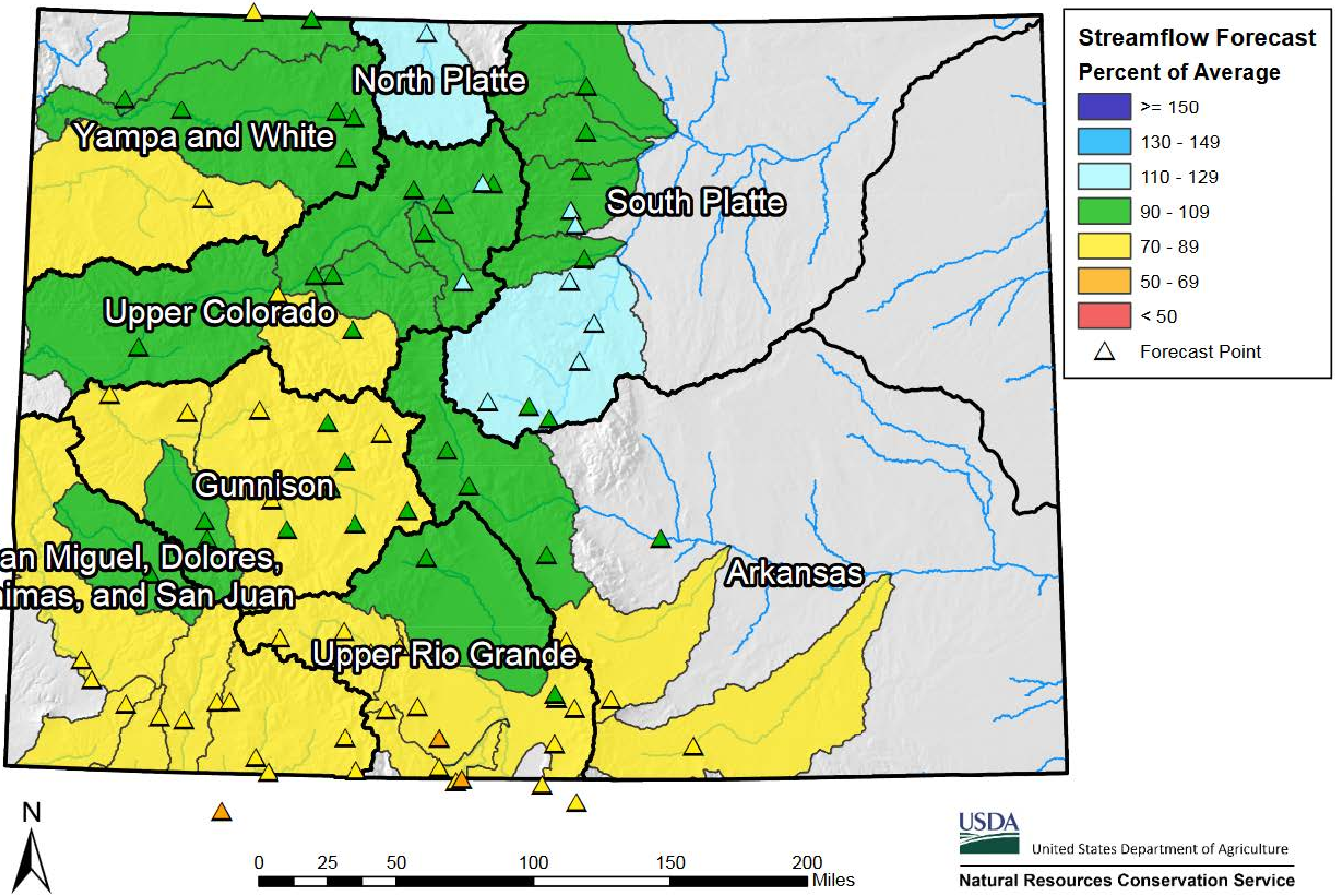


USGS

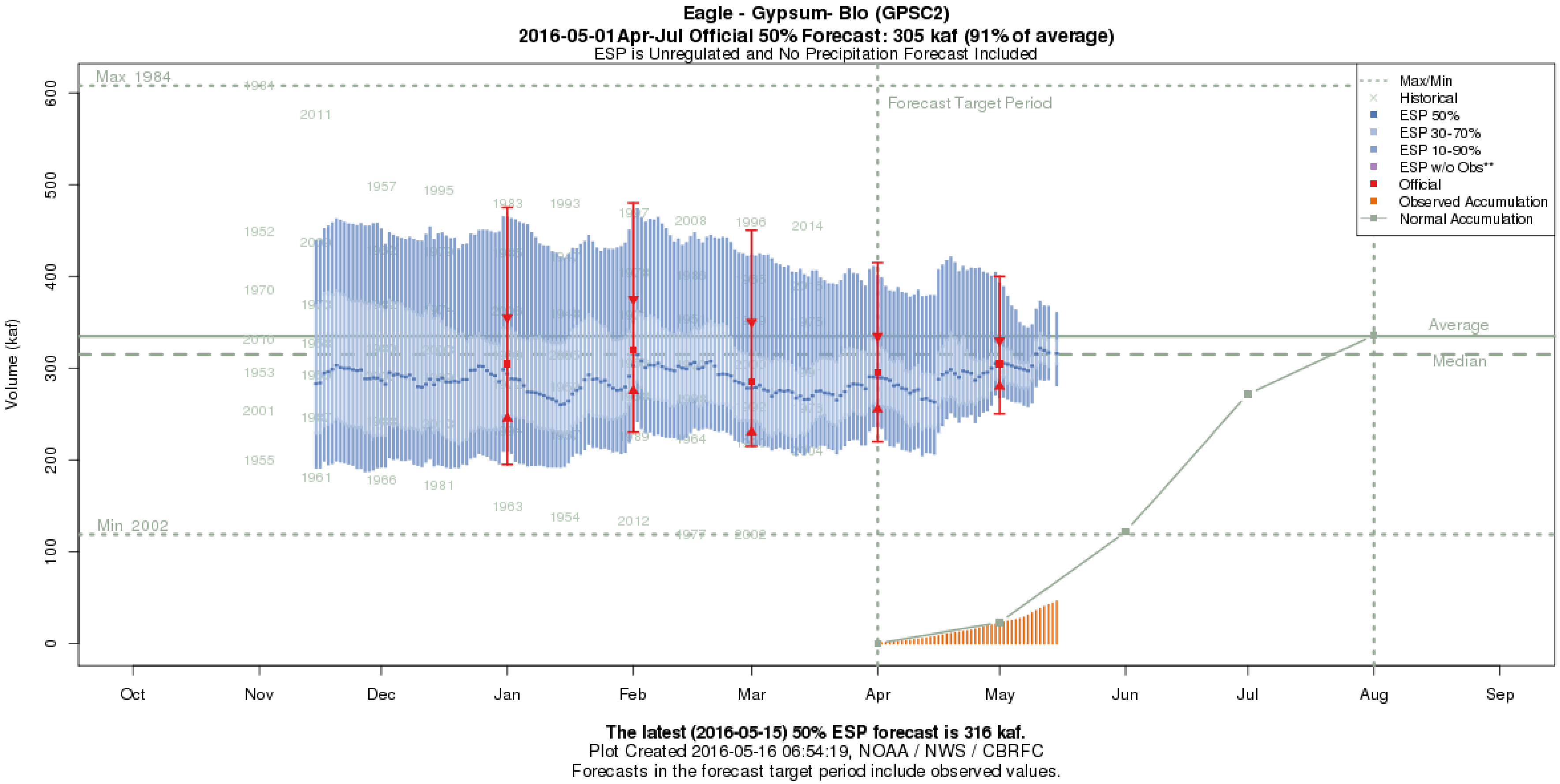
Click map to obtain more detailed drought information for the state

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	

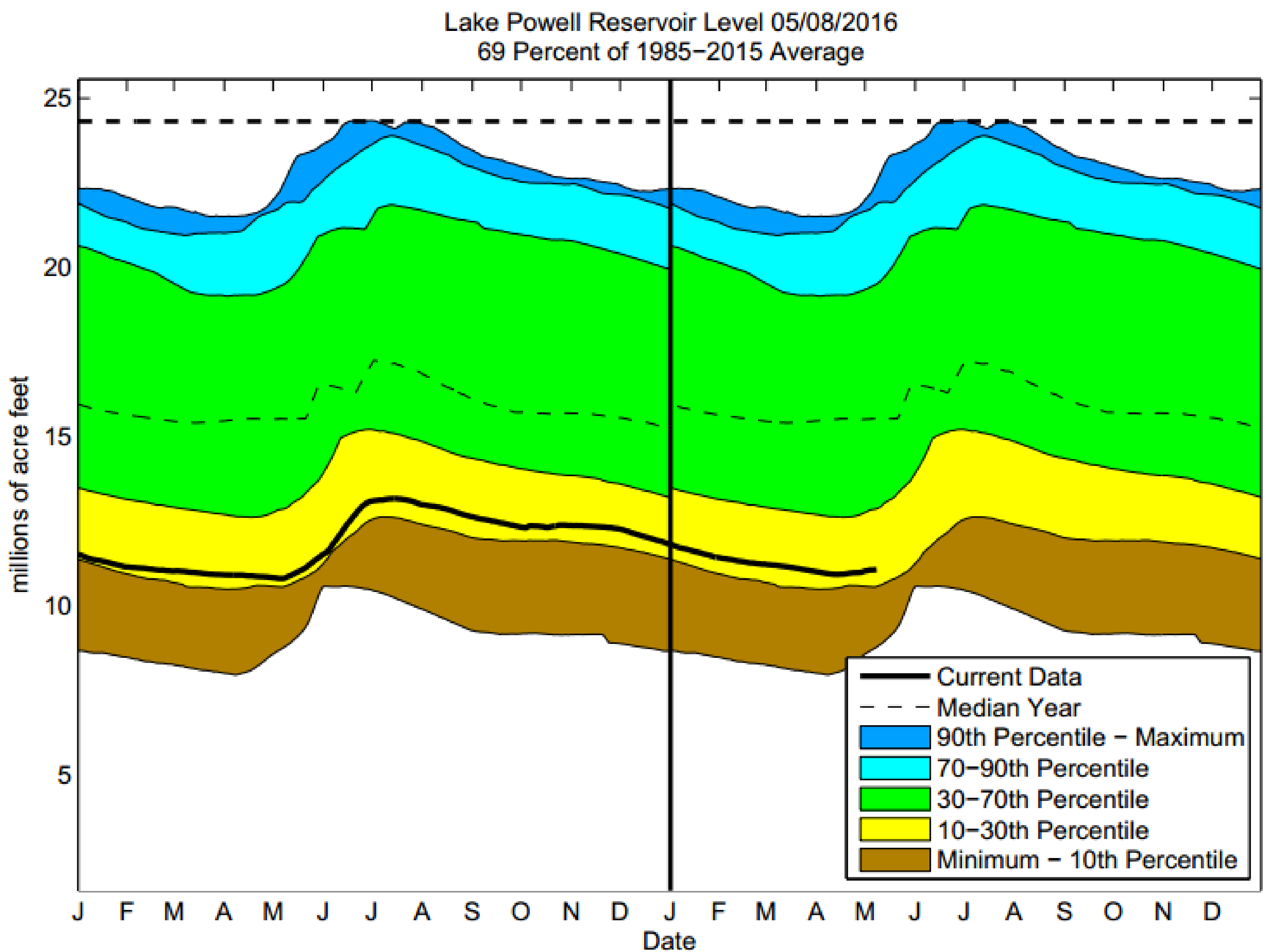
Colorado Streamflow Forecasts Summary
May 1, 2016



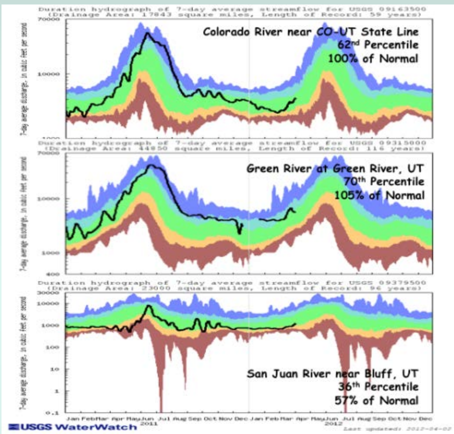
Eagle River at Gypsum 2016 Streamflow Volume Forecast

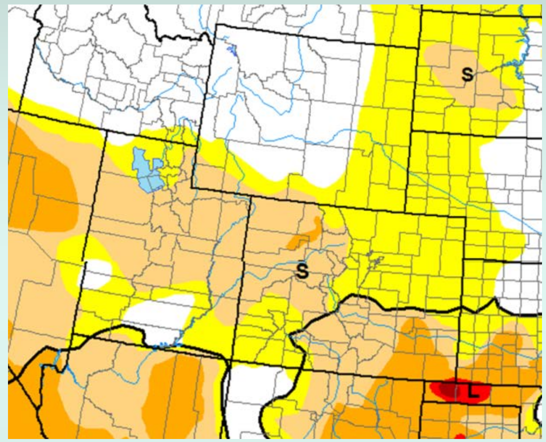


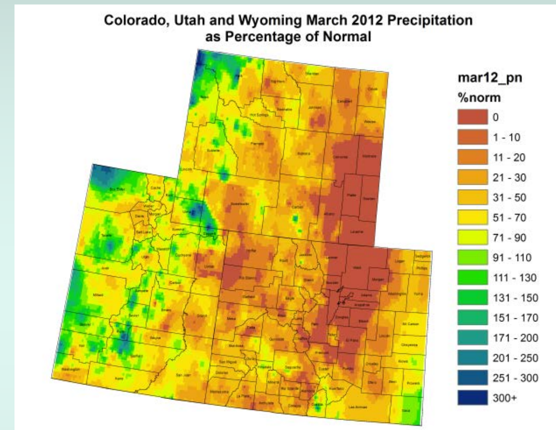
From Colorado River Basin Forecast Center

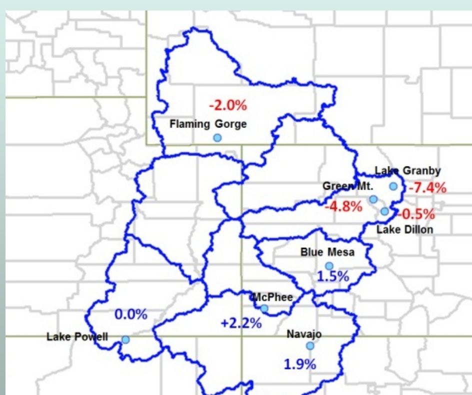

Lake Powell Reservoir Level 05/08/2016
69 Percent of 1985−2015 Average
millions of acre feet
25
20
15
10
5
J F M A M J J A S O N D J F M A M J J A S O N D
Date
Current Data
Median Year
90th Percentile − Maximum
70−90th Percentile
30−70th Percentile
10−30th Percentile
Minimum − 10th Percentile

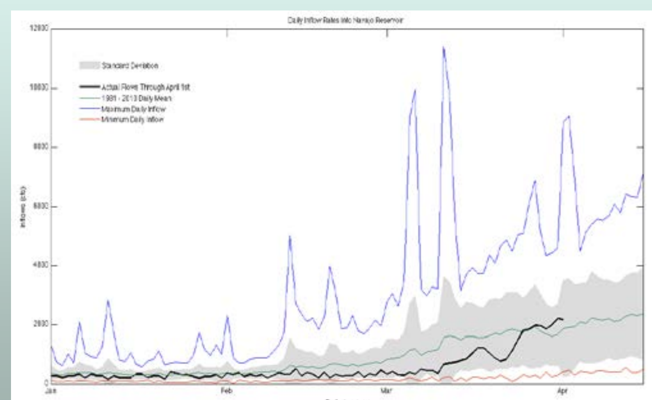
Weekly Climate Updates Available Upper Colorado Regional Drought Early Warning

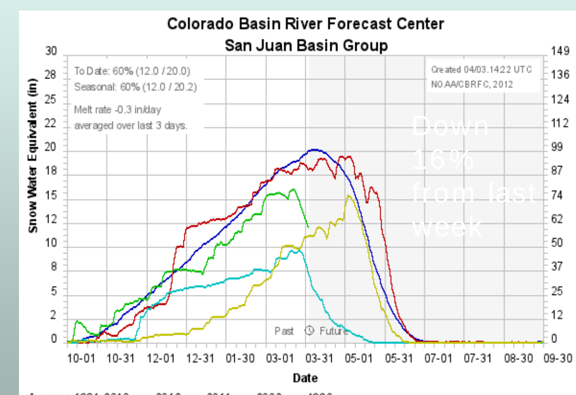












If you're tired of getting so few e-mails and would like one or two each week

Give me your business card today, and we can put you on our weekly update list

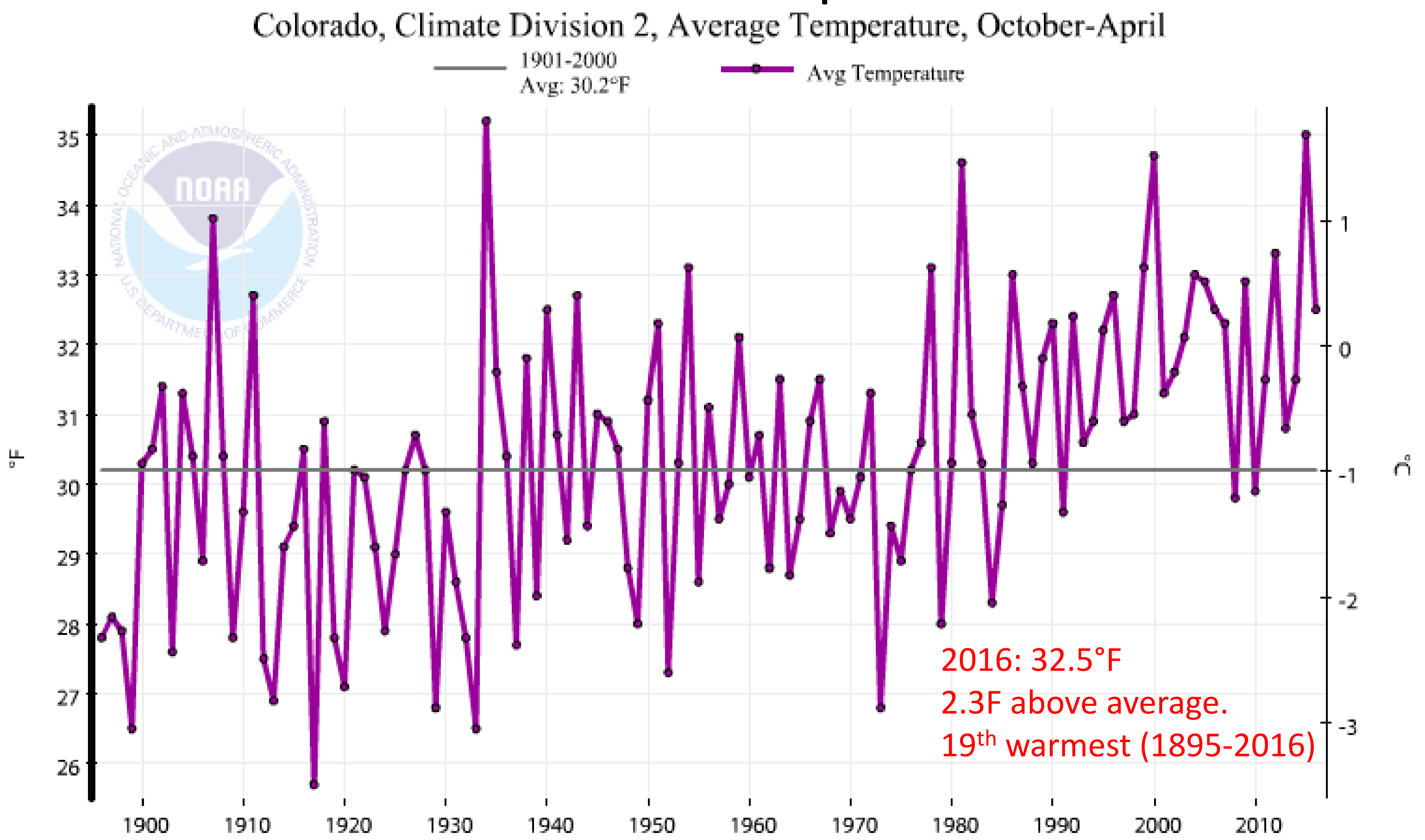
NIDIS
NATIONAL INTEGRATED DROUGHT INFORMATION SYSTEM

COLORADO CLIMATE CENTER

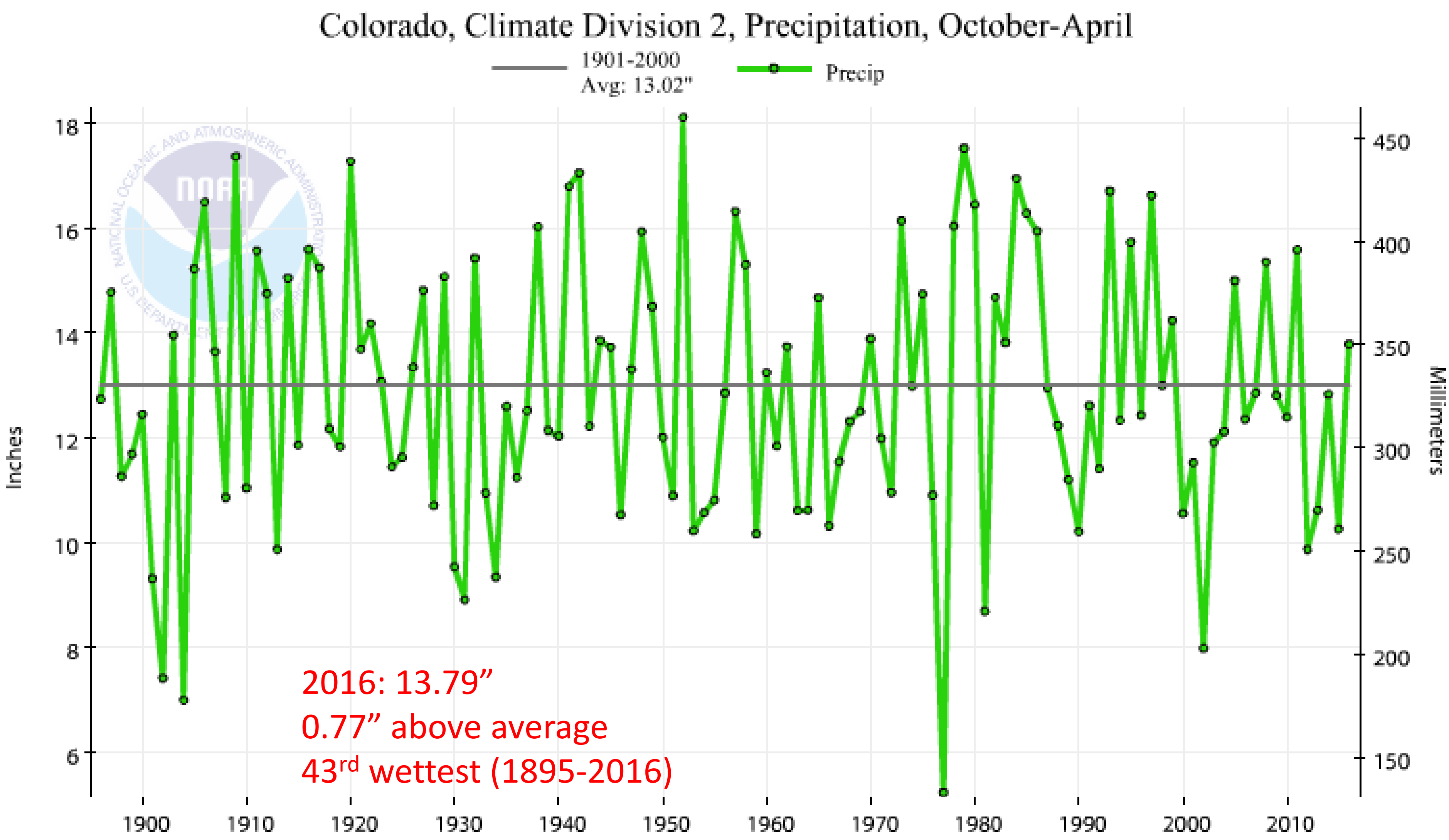
Colorado State University


Climate Update

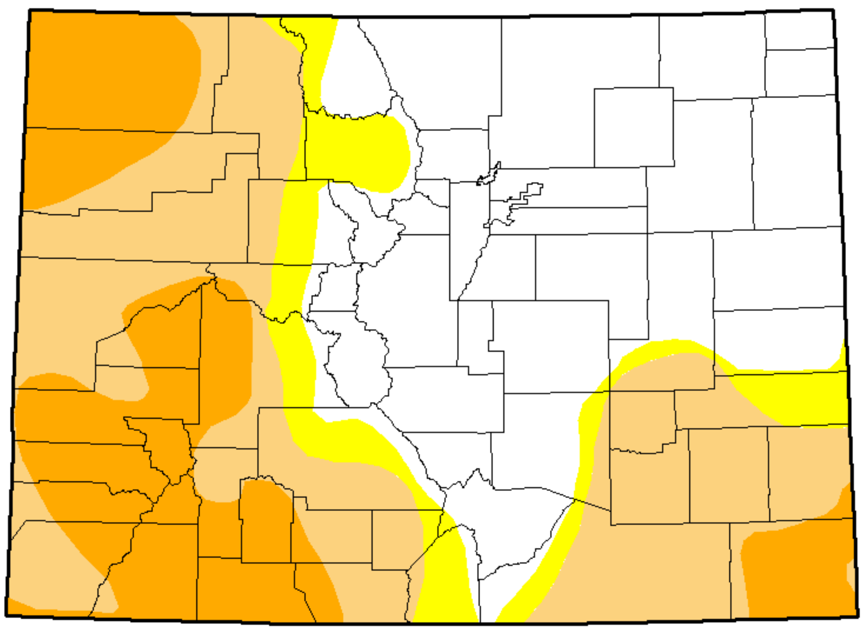
Colorado River Drainage Average Temperature October - April



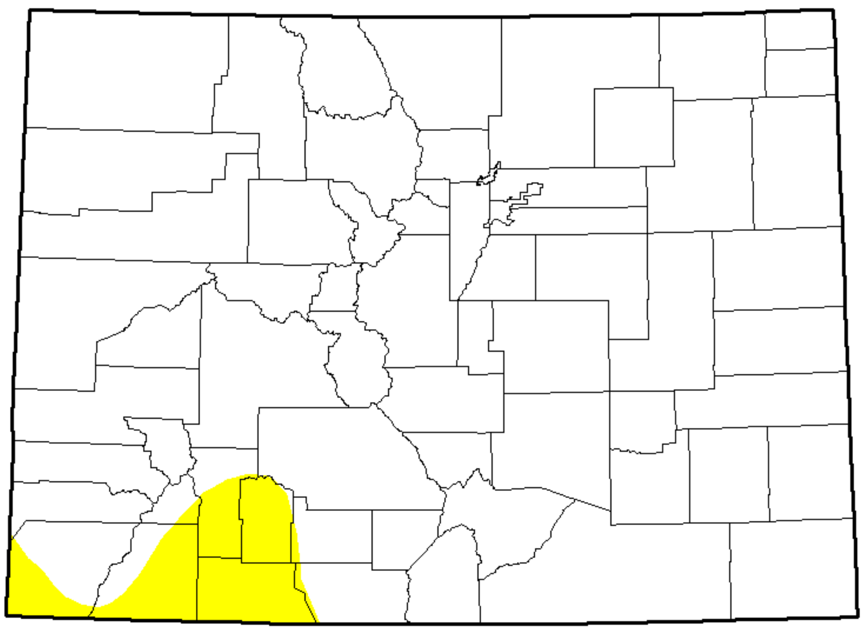
Colorado River Drainage Precipitation
October - April



U.S. Drought Monitor

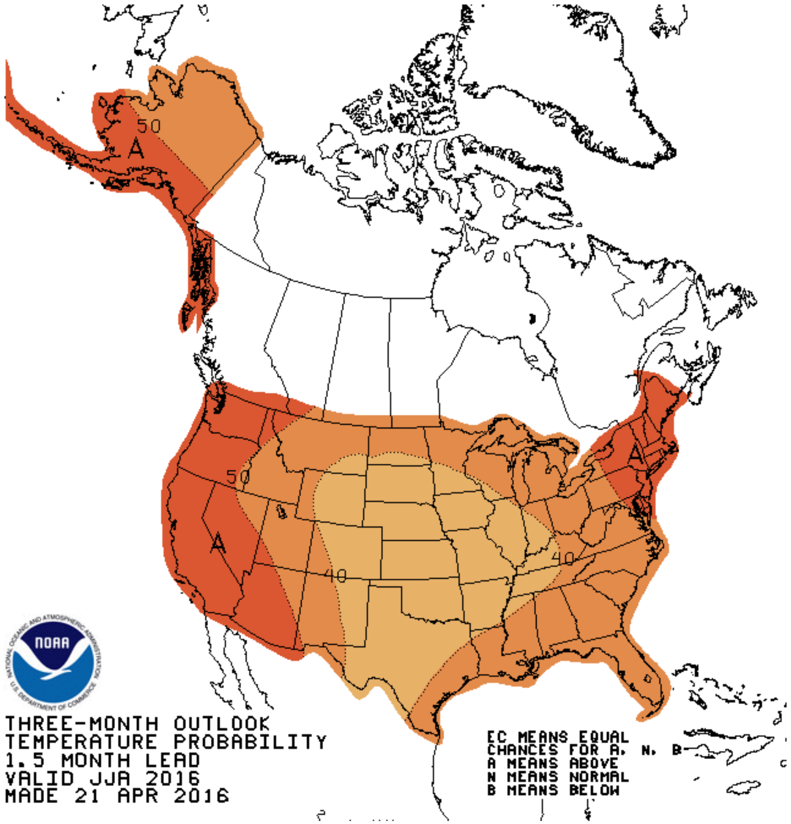


May 12, 2015

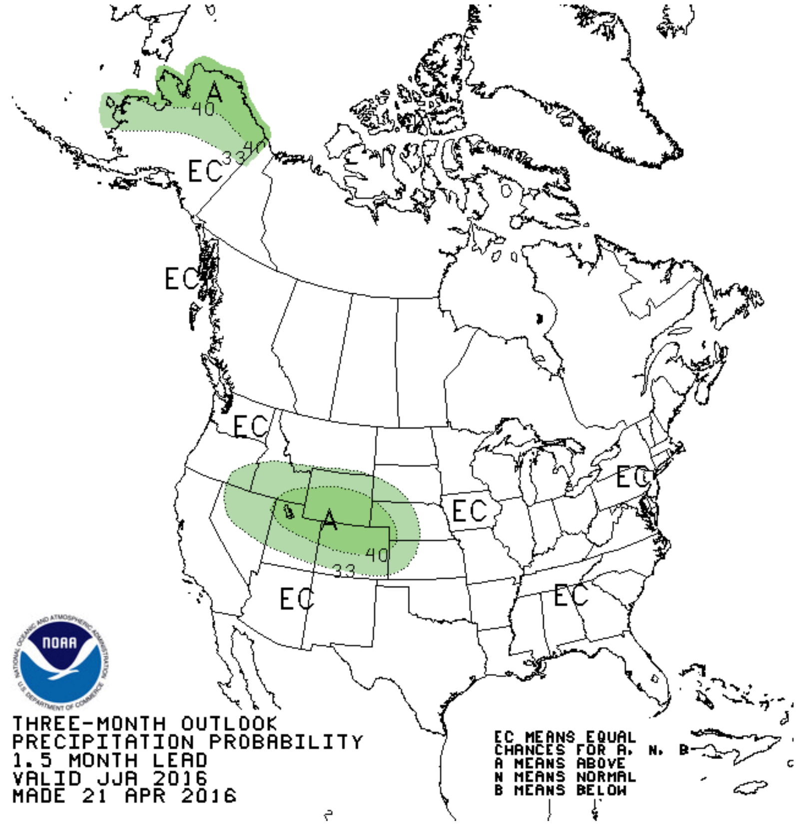


May 10, 2016

What to Expect this Summer



JJA Temperature



JJA Precipitation

When in doubt, measure!

If you are interested in weather and the variations in precipitation, please join the Community Collaborative Rain, Hail and Snow Network

http://www.cocorahs.org

or see me today

For information and to volunteer, visit the CoCoRaHS Web Site

http://www.cocorahs.org

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NSF Informal Science Education Program,
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and
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