Spring 2010

Weekly Climate, Water & Drought Assessment

Today's Agenda

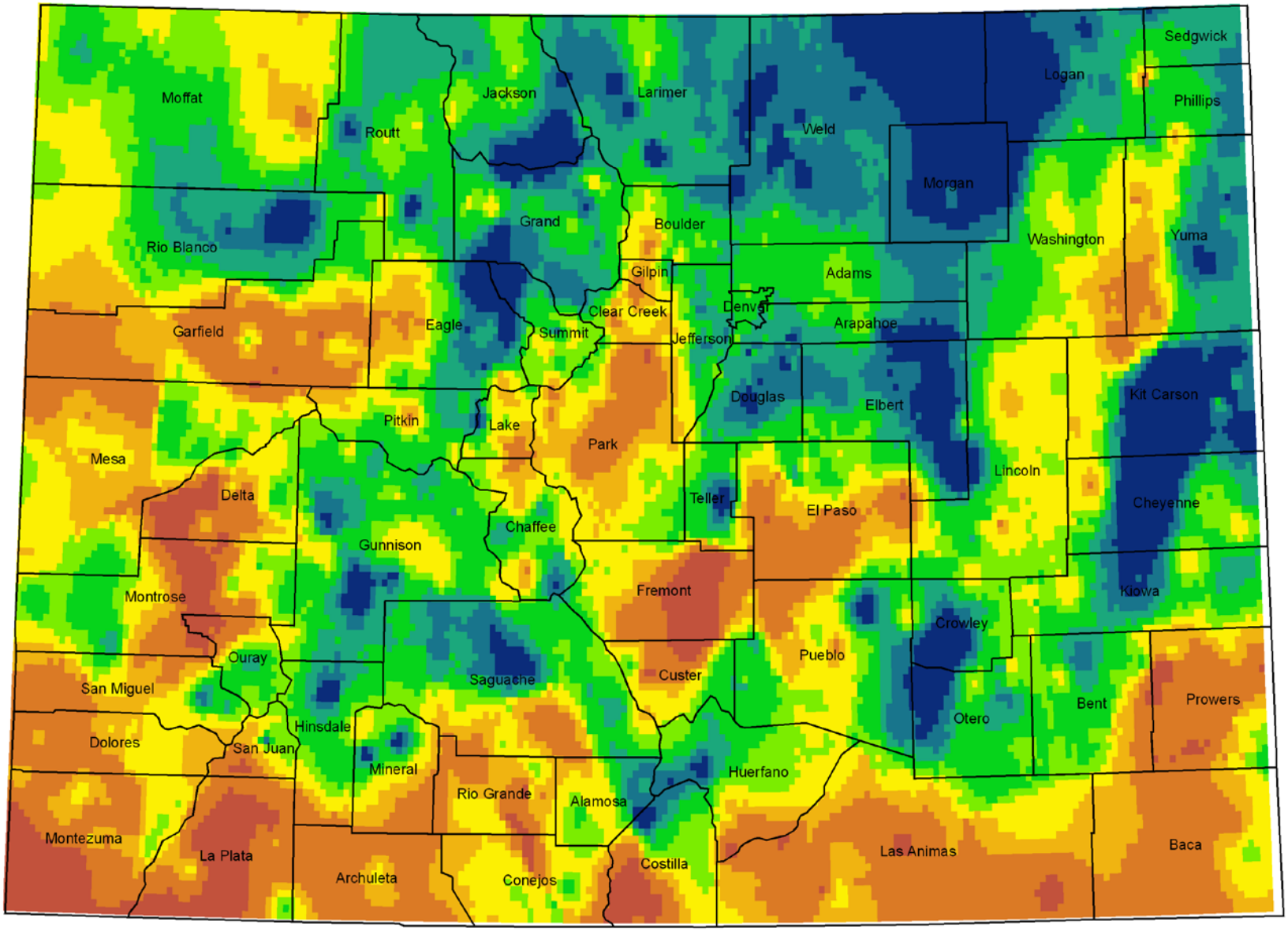
-Assessment of current water conditions

- Precipitation Forecast

- Recommendations for Drought Monitor

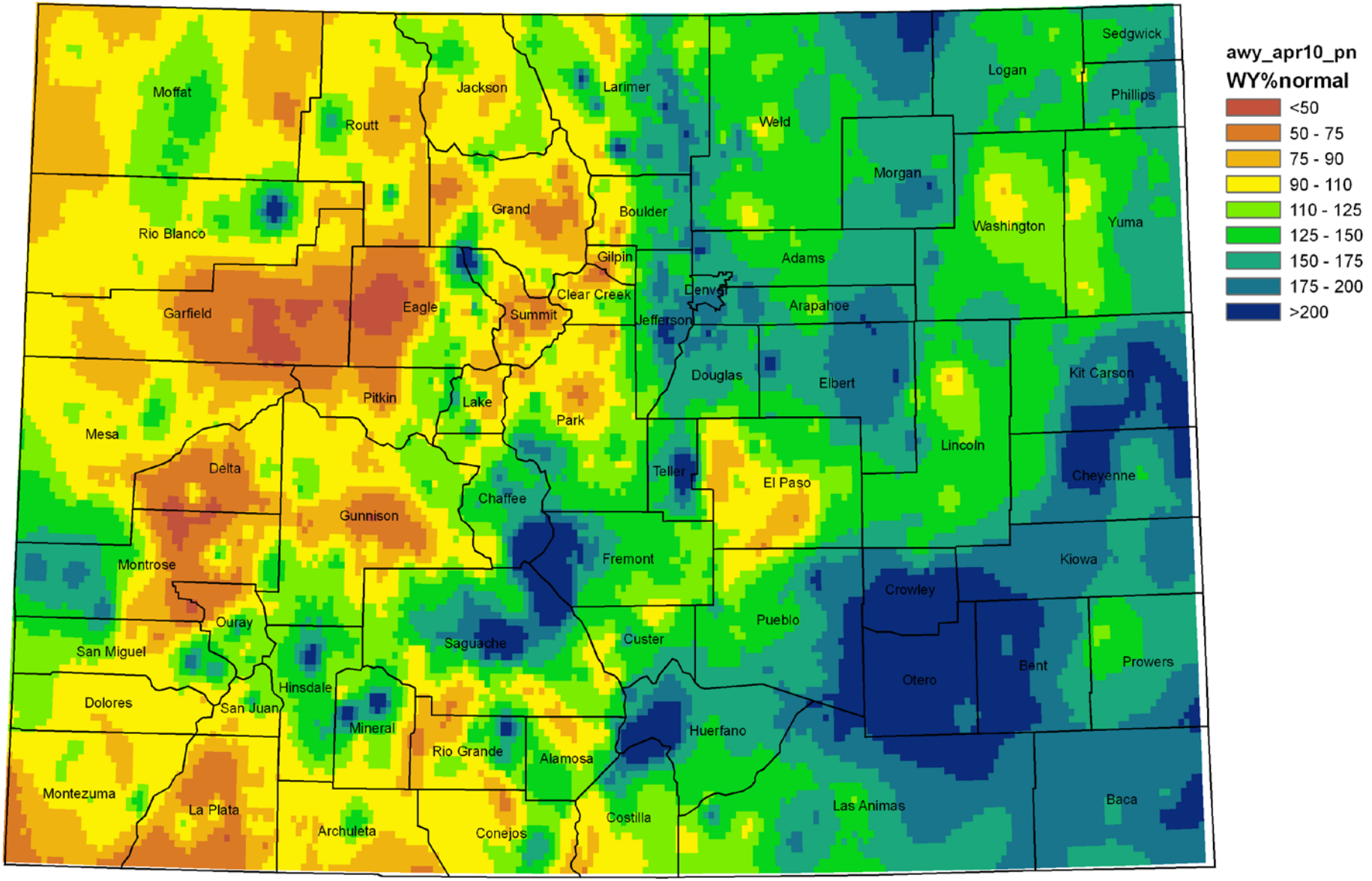
Precipitation/Snowpack Update

April 2010 Precipitation as Percent of Normal



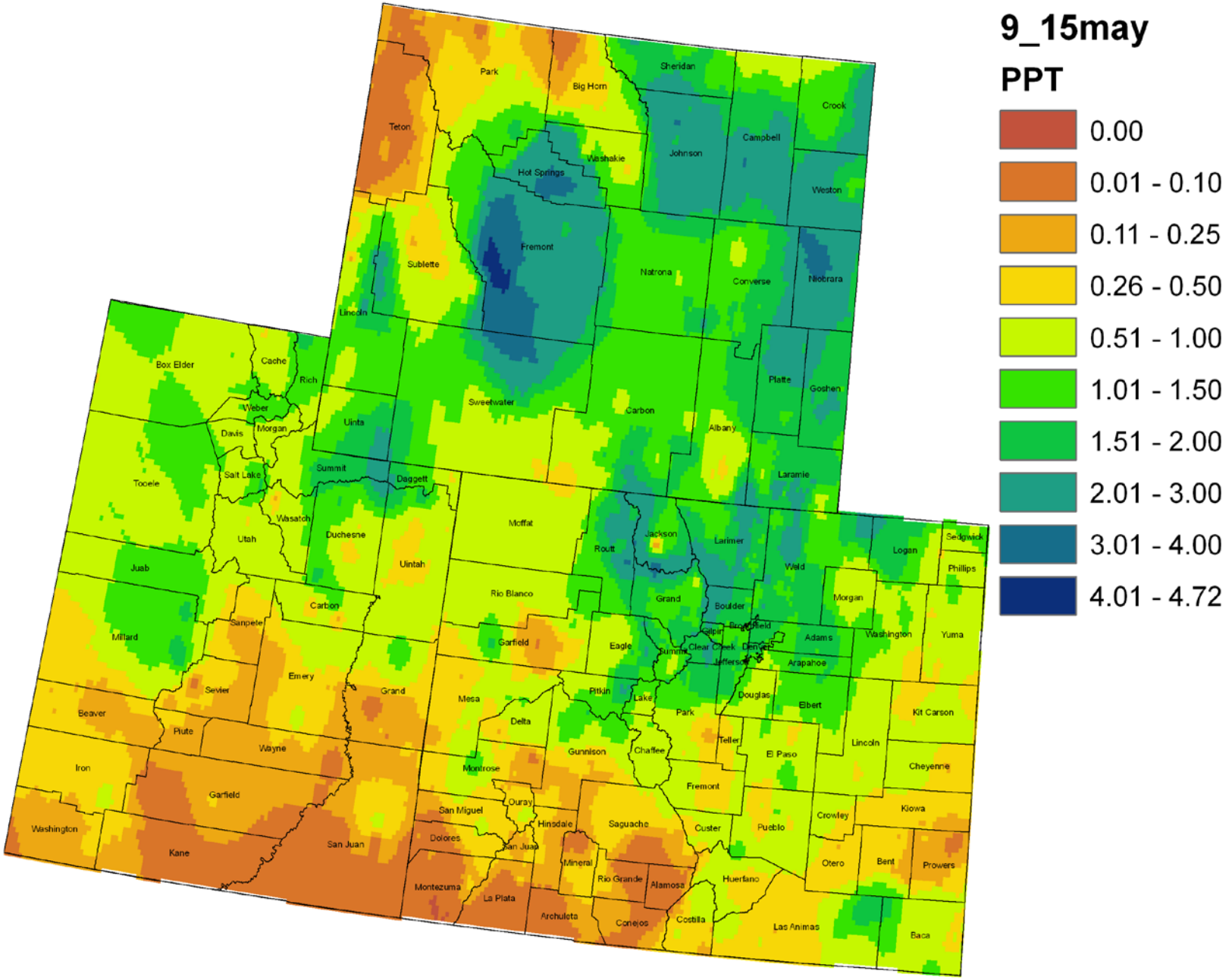
Produced by the Colorado Climate Center utilizing Snotel, NWS, CoCoRaHS and CoAgMet* Preliminary Precipitation Data
Analysis: Inverse Distance Weighting
*Summer only

Water Year 2010 Precipitation as Percent of Normal (Oct 09 - Apr 10)

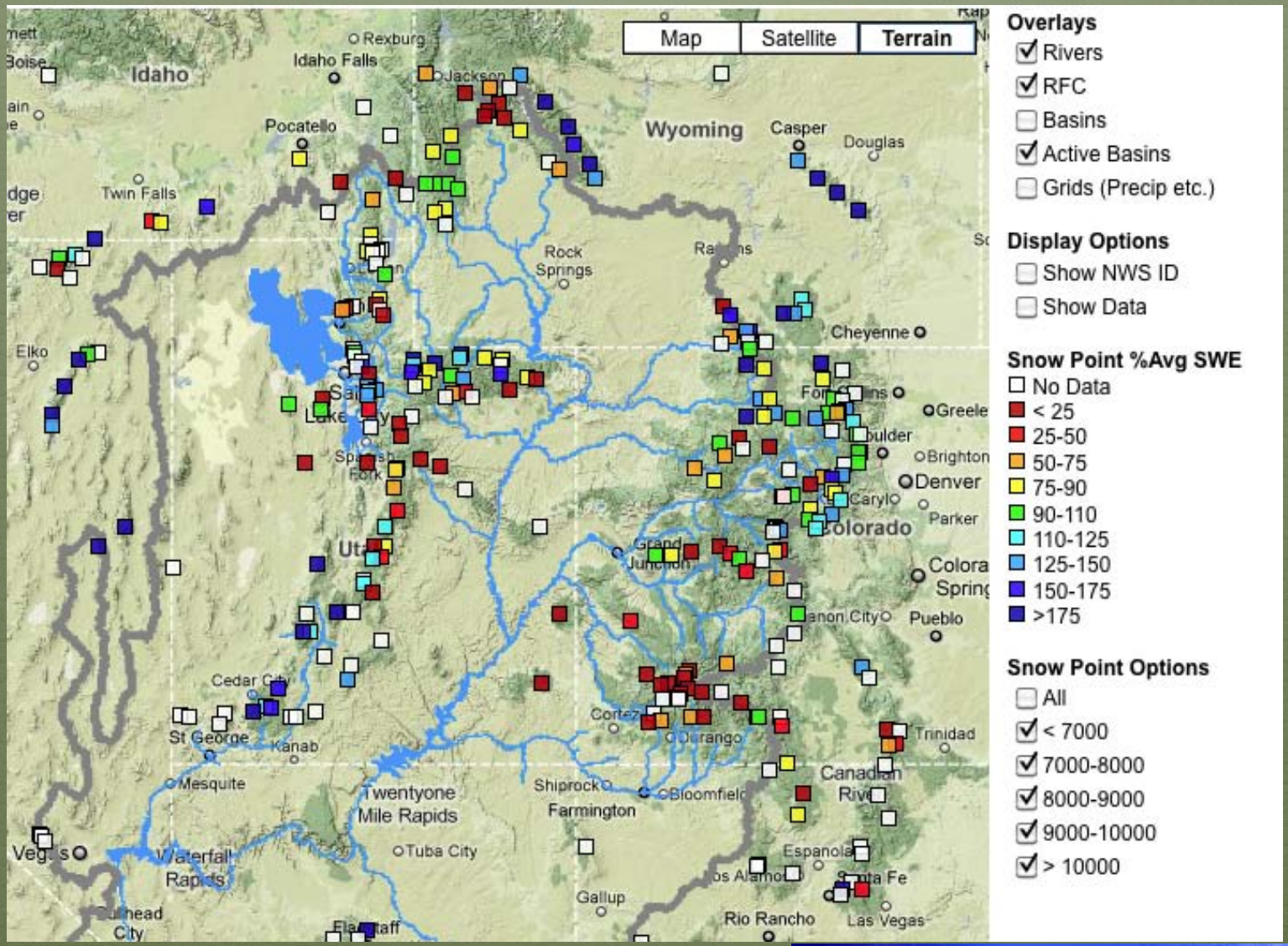


Produced by the Colorado Climate Center utilizing Snotel, NWS, CoCoRaHS and CoAgMet* Preliminary Precipitation Data
Analysis: Inverse Distance Weighting
*Summer only

Colorado, Wyoming and Utah 7-Day Precipitation 9 - 15 May 2010

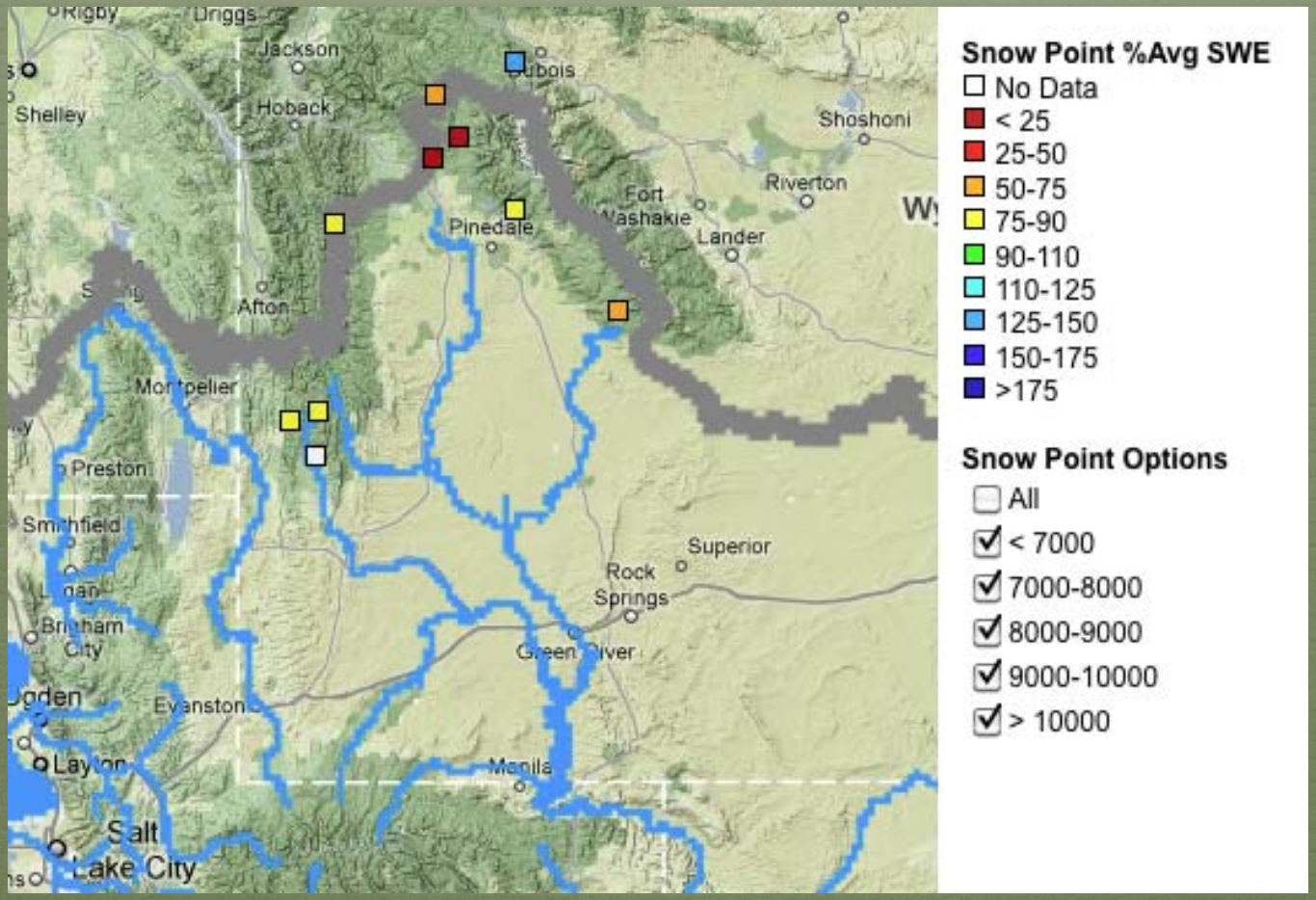


Upper Colorado River Basin

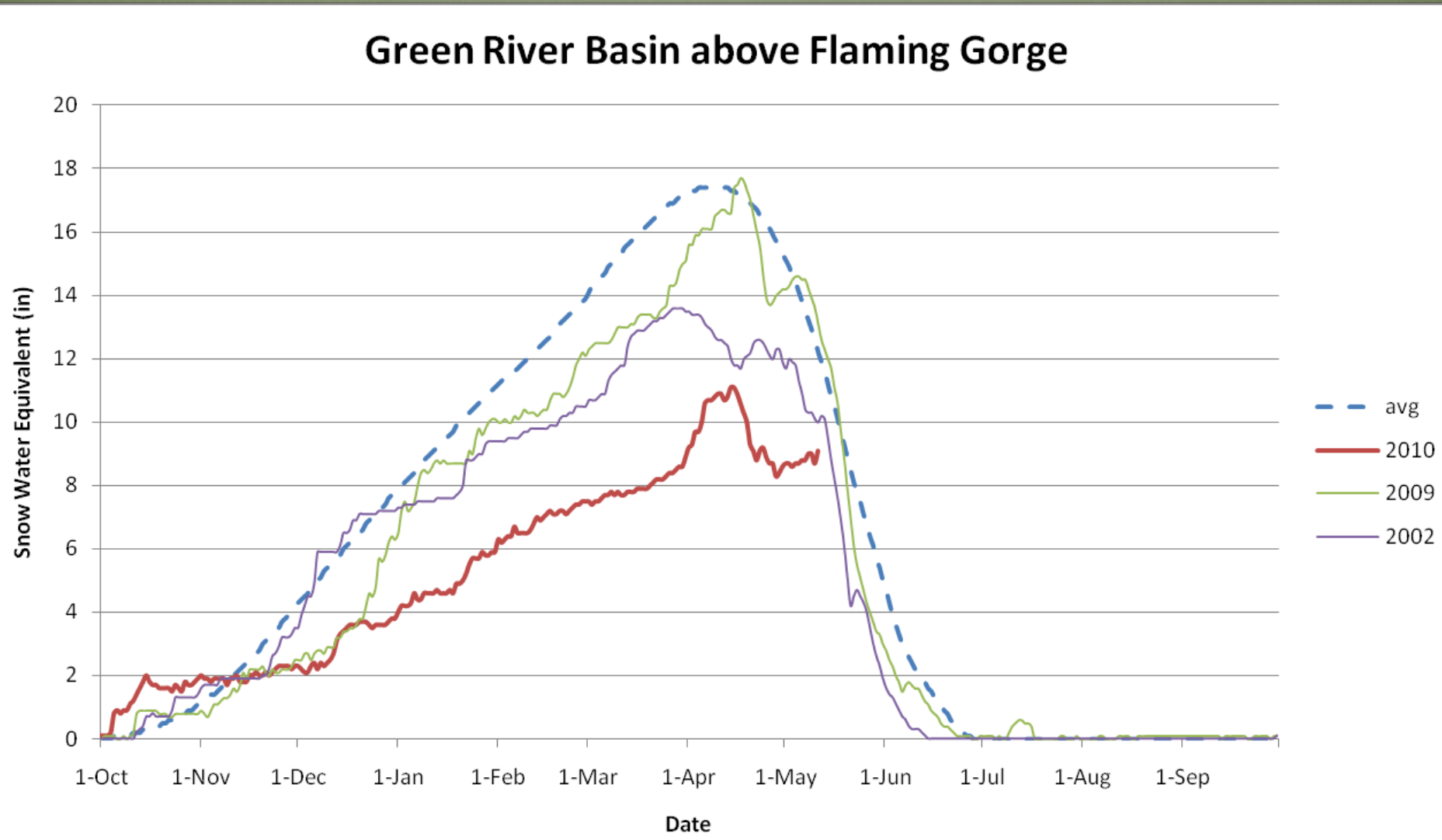


NATIONAL WEATHER SERVICE
Colorado Basin River Forecast Center

Green River Basin above Flaming Gorge



NATIONAL WEATHER SERVICE
Colorado Basin River Forecast Center

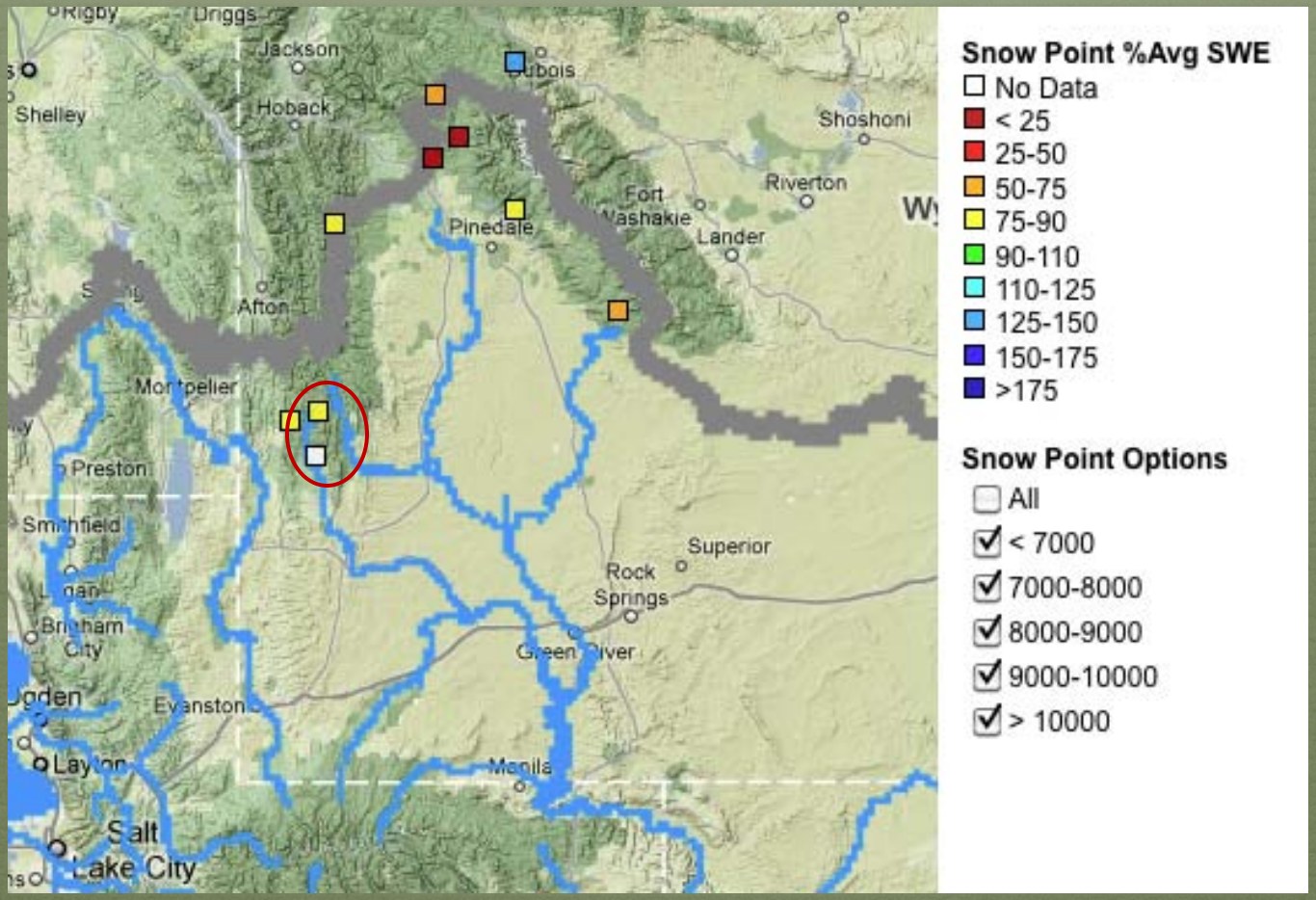


Basin Snowpack: 77%

Peak snowpack: 64% of average peak

WYTD Precipitation percent of average: 71%

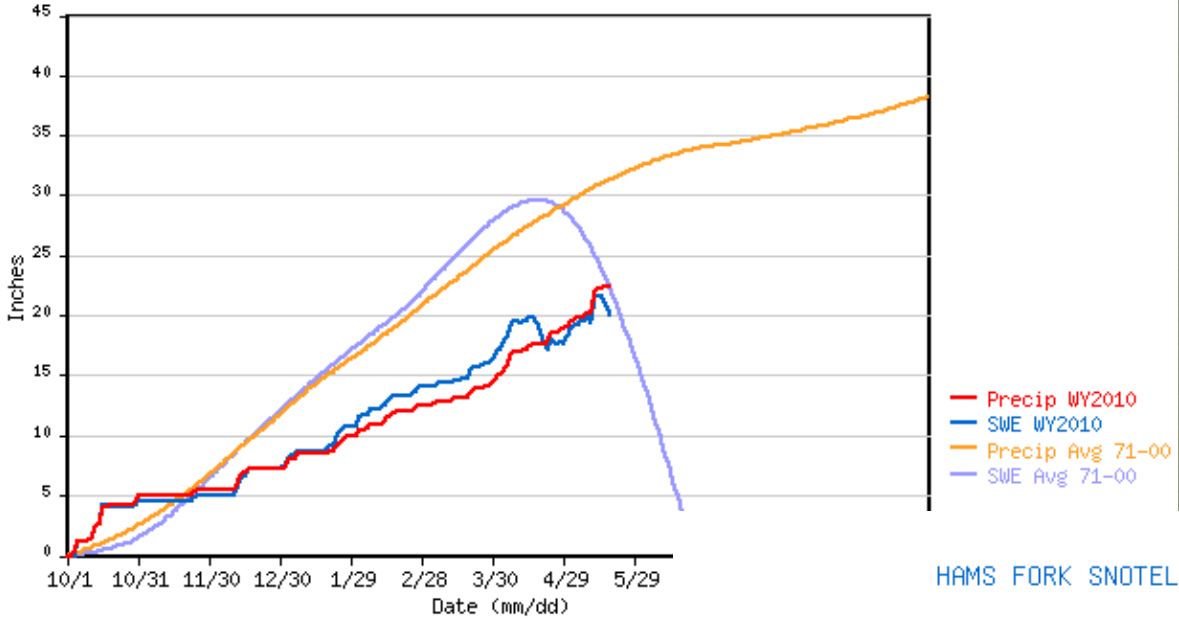
Indian Creek and Hams Fork



NATIONAL WEATHER SERVICE
Colorado Basin River Forecast Center

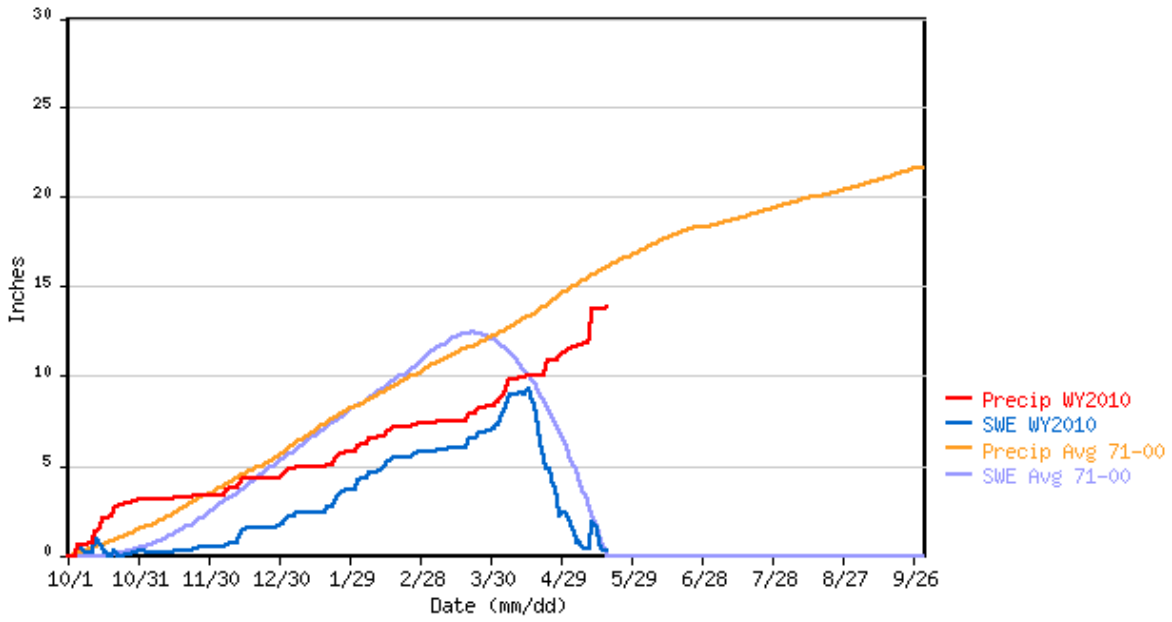
INDIAN CREEK SNOTEL for Water Year 2010

*** Provisional Data, Subject to Change ***

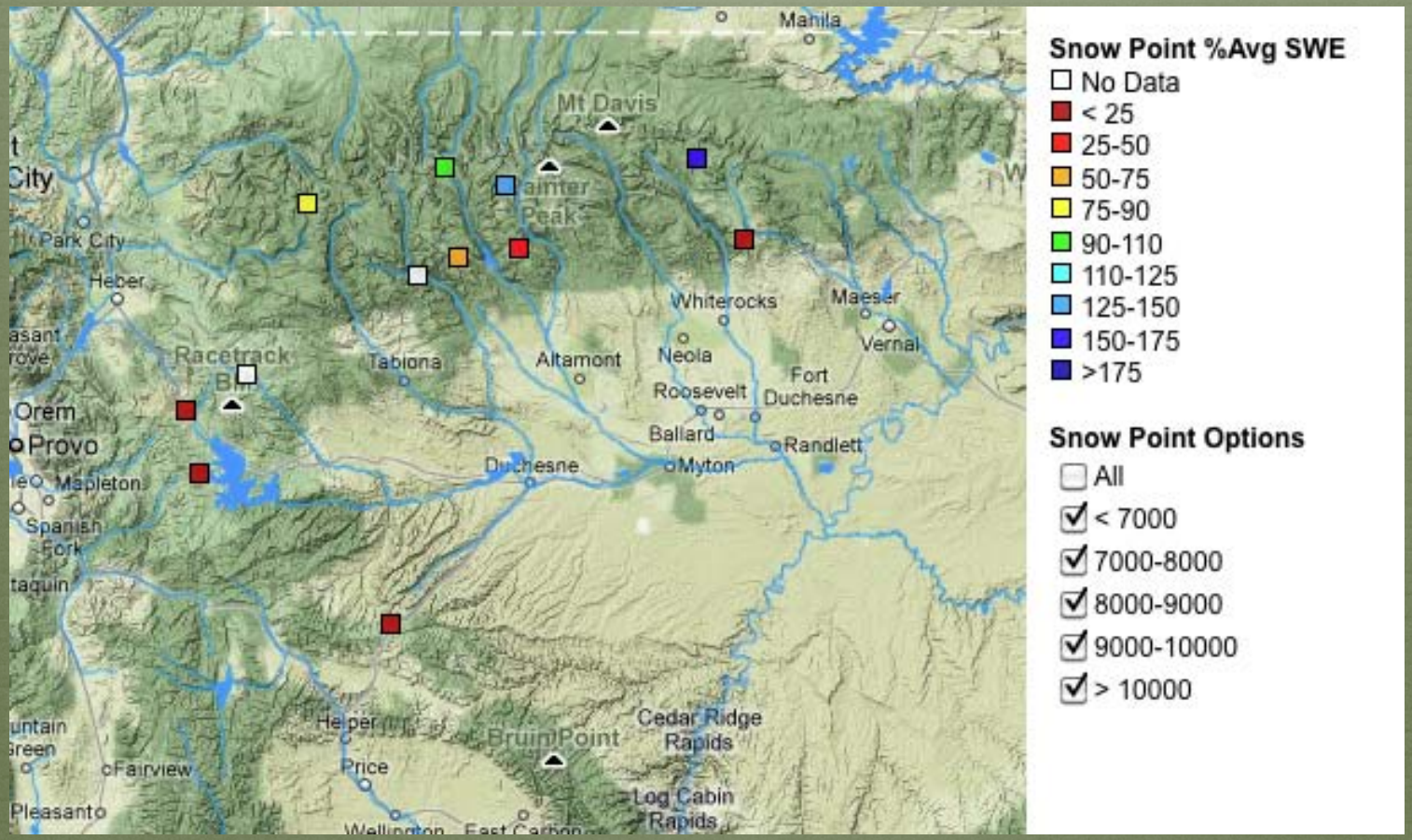


HAMS FORK SNOTEL for Water Year 2010

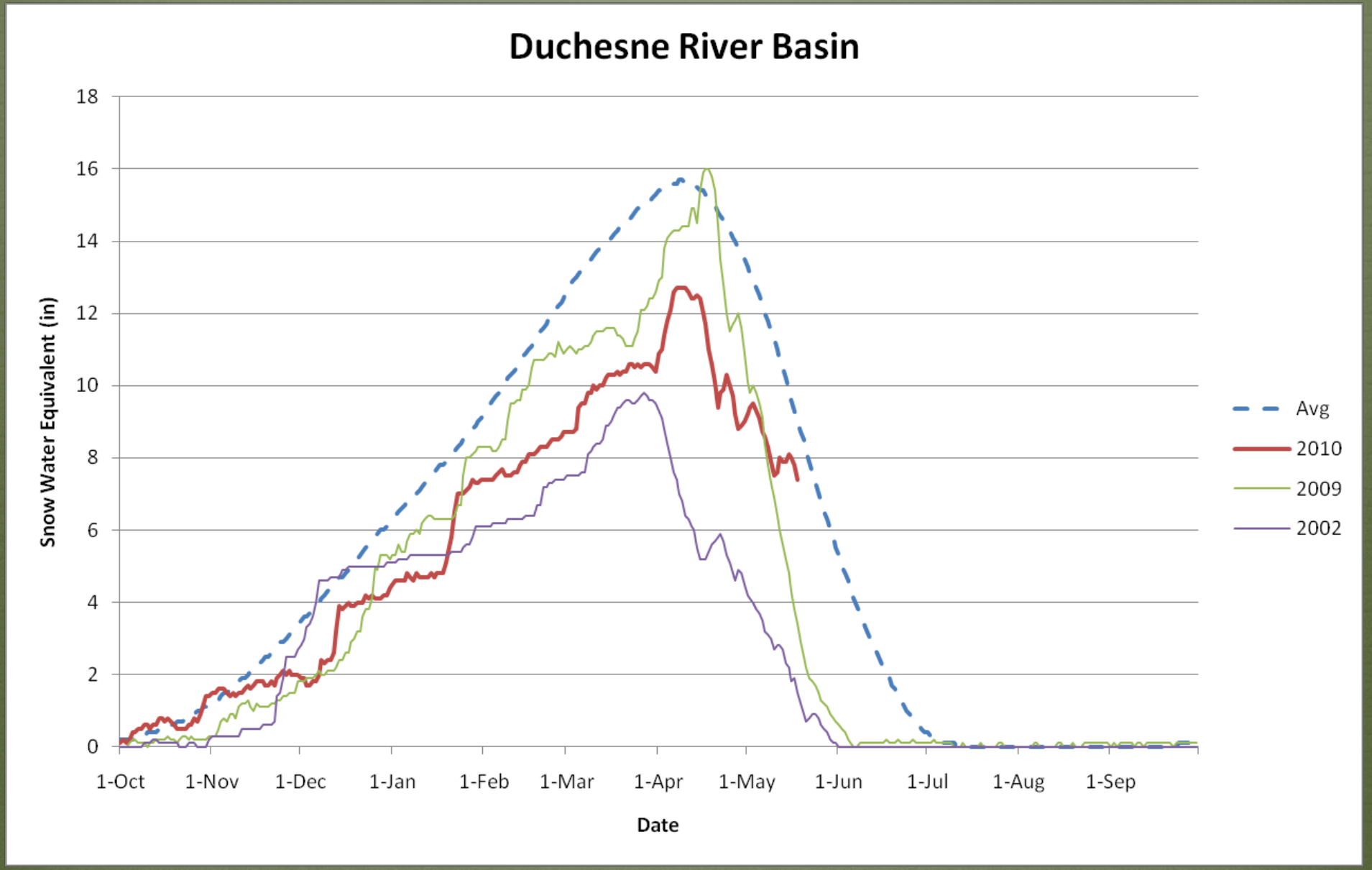
*** Provisional Data, Subject to Change ***



Duchesne River Basin



NATIONAL WEATHER SERVICE
Colorado Basin River Forecast Center

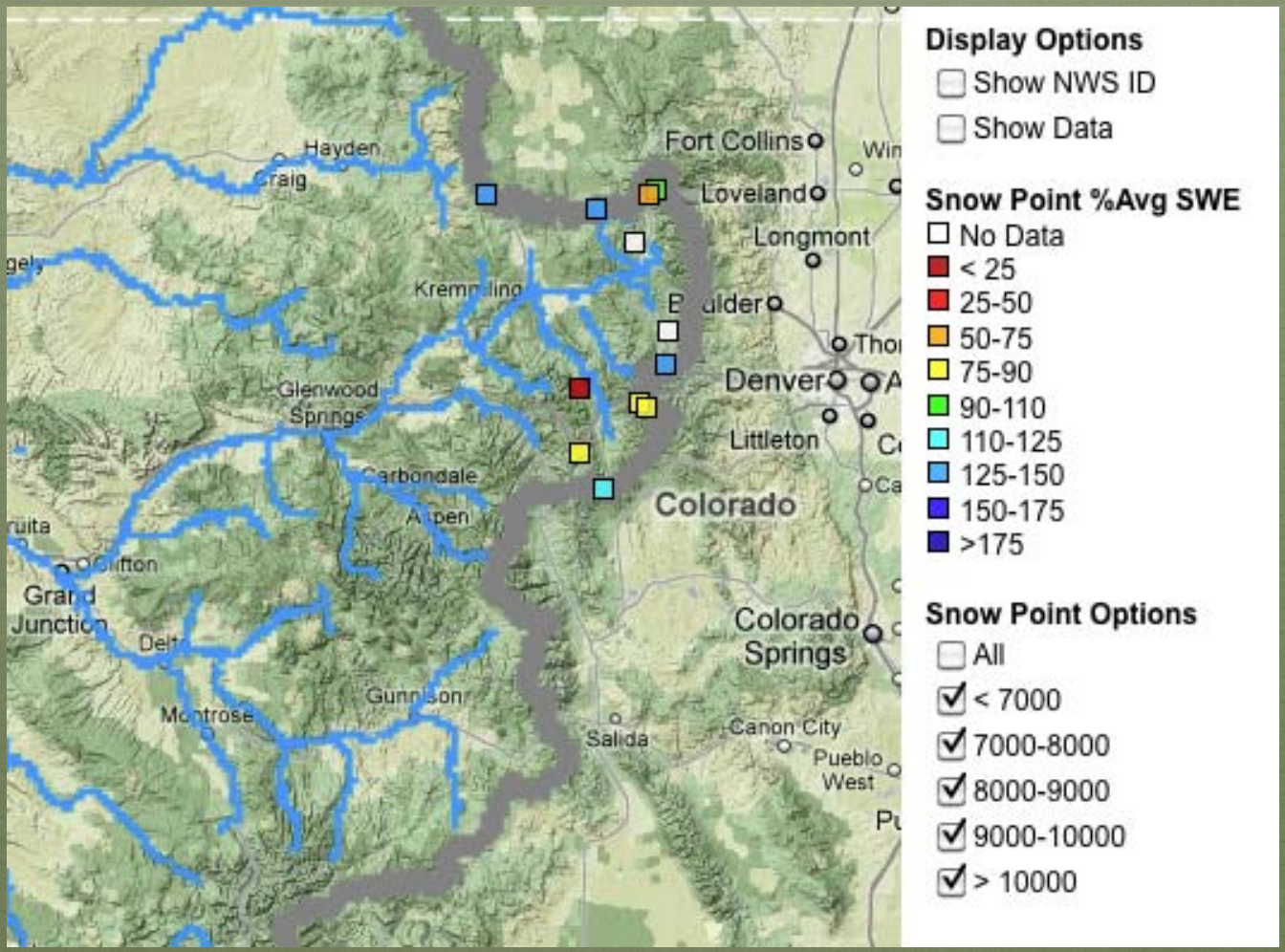


Basin snowpack: 82%

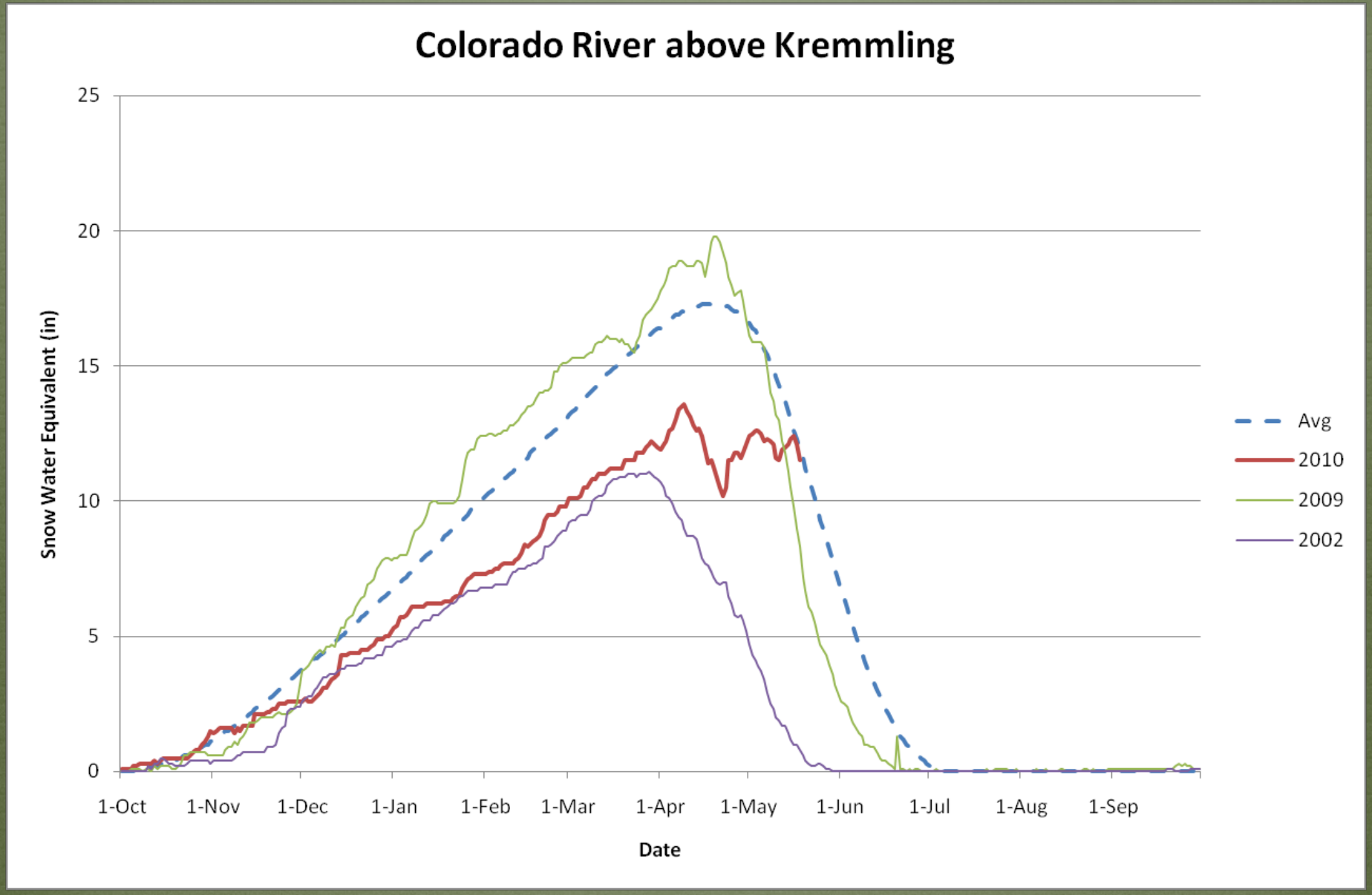
Peak snowpack: 81% of average peak

WYTD Precipitation percent of average: 78%

Upper Colorado above Kremmling



NATIONAL WEATHER SERVICE
Colorado Basin River Forecast Center

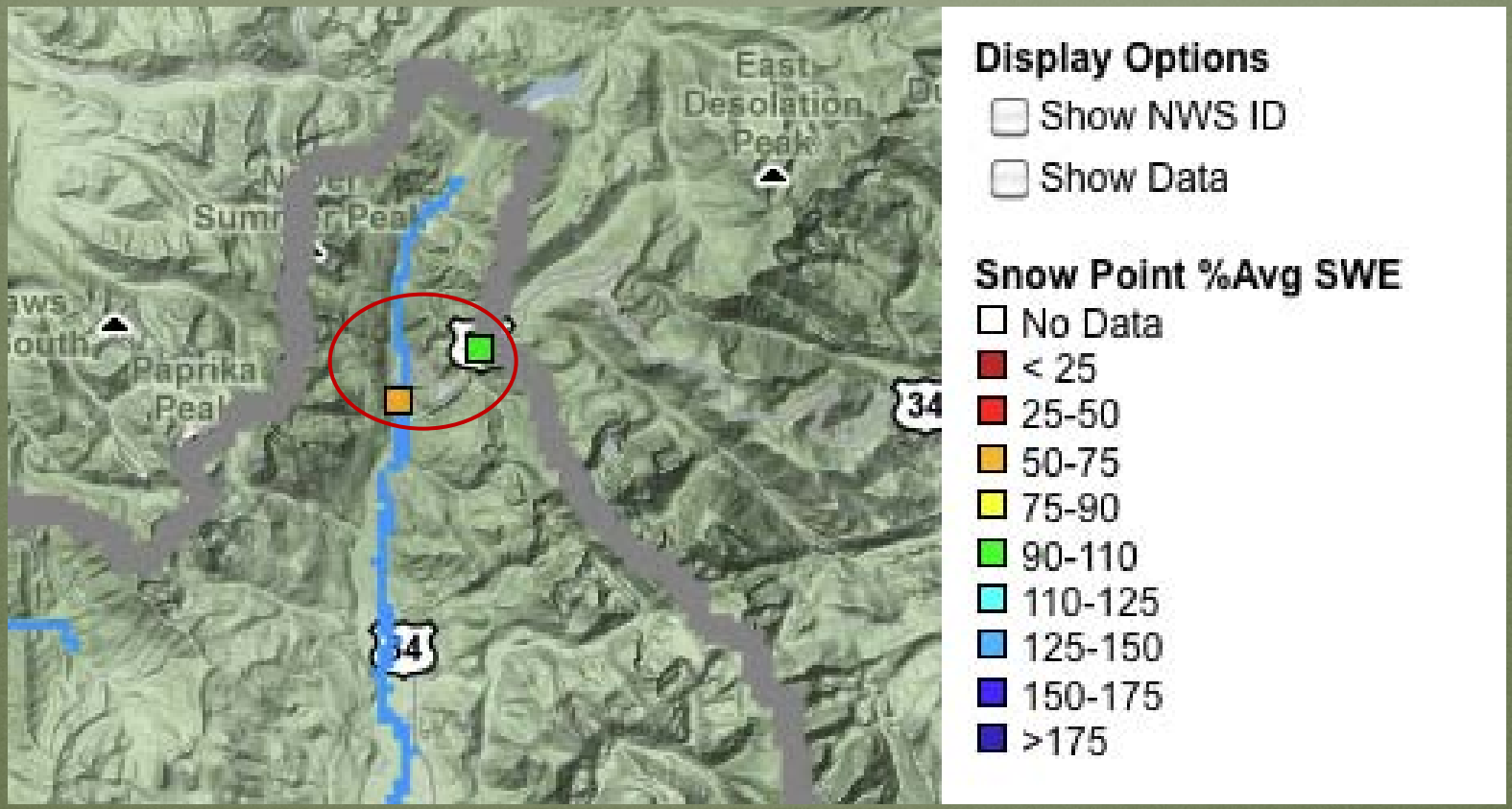


Basin Snowpack: 104%

Peak snowpack: 79% of average peak

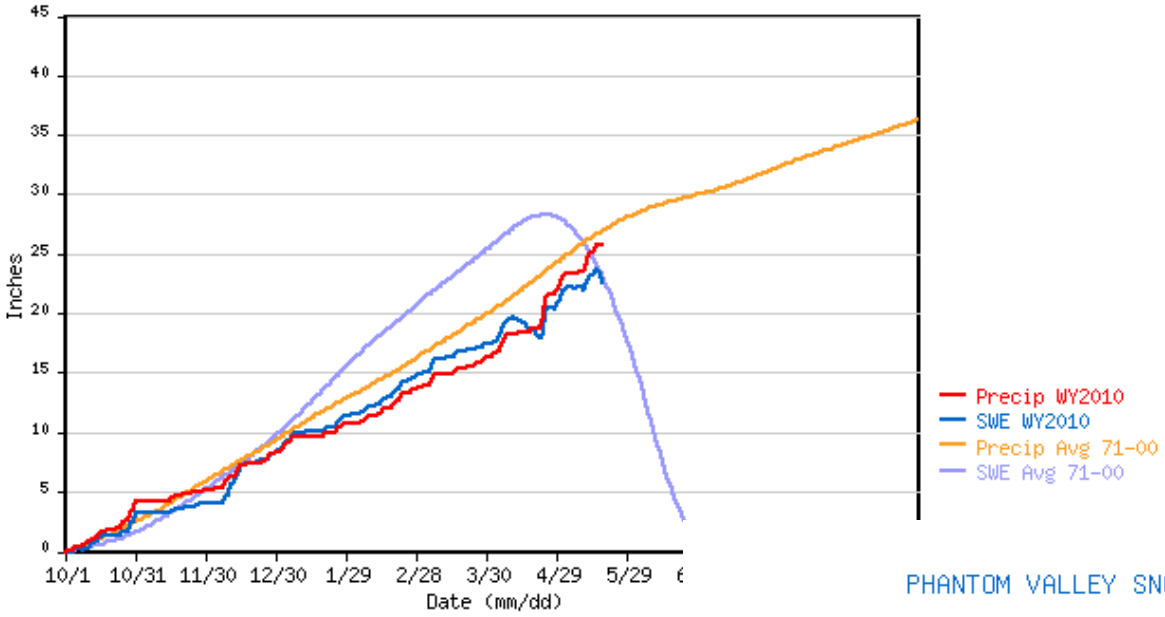
WYTD Precipitation percent of average: 92%

Lake Irene and Phantom Valley



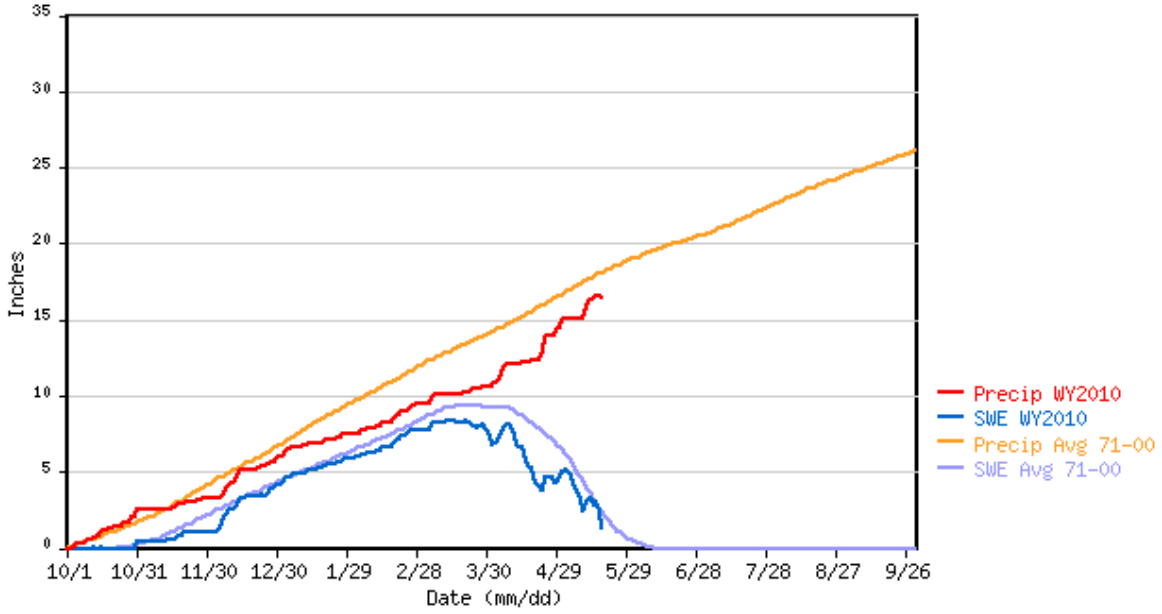
LAKE IRENE SNOTEL for Water Year 2010

*** Provisional Data, Subject to Change ***

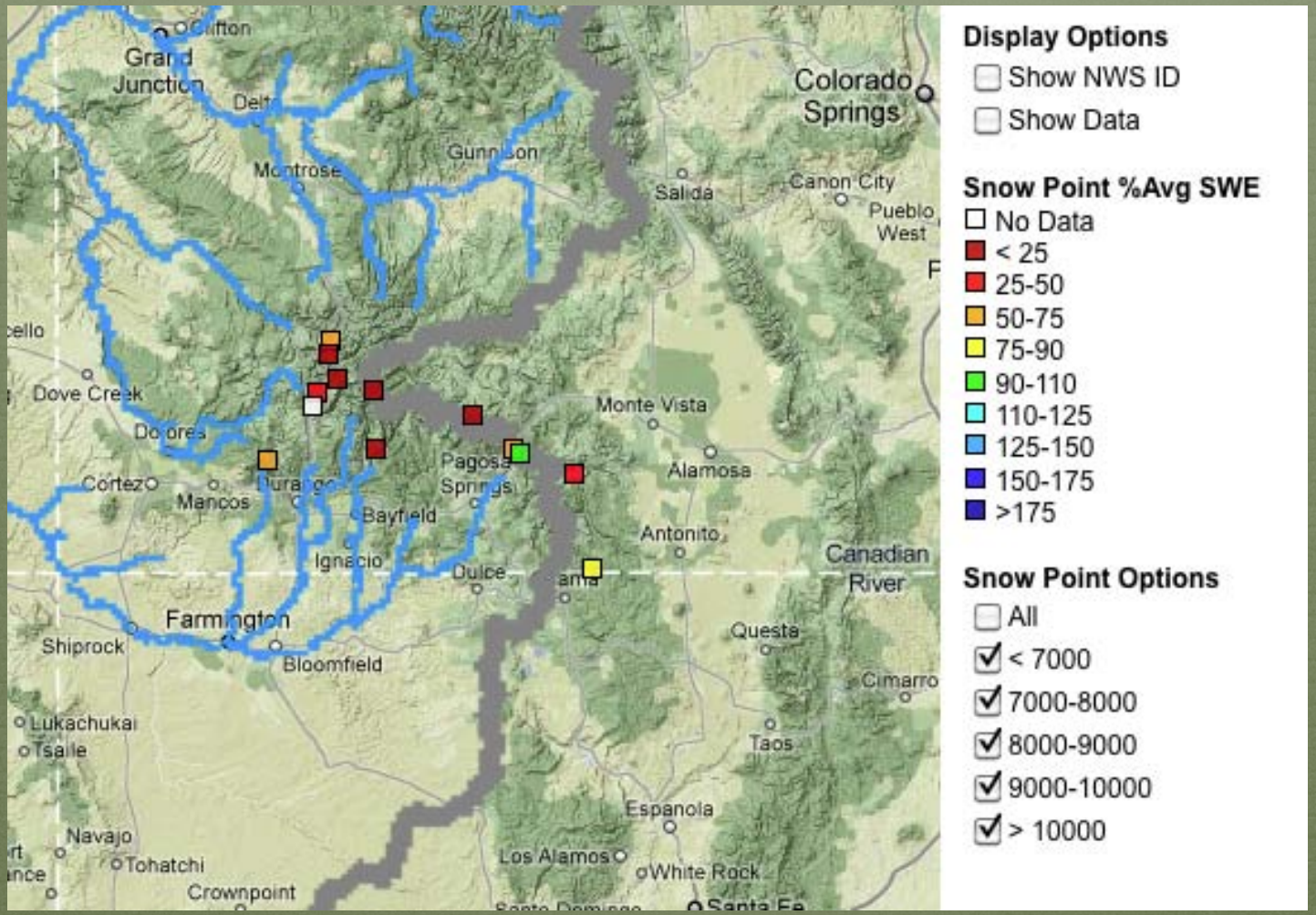


PHANTOM VALLEY SNOTEL for Water Year 2010

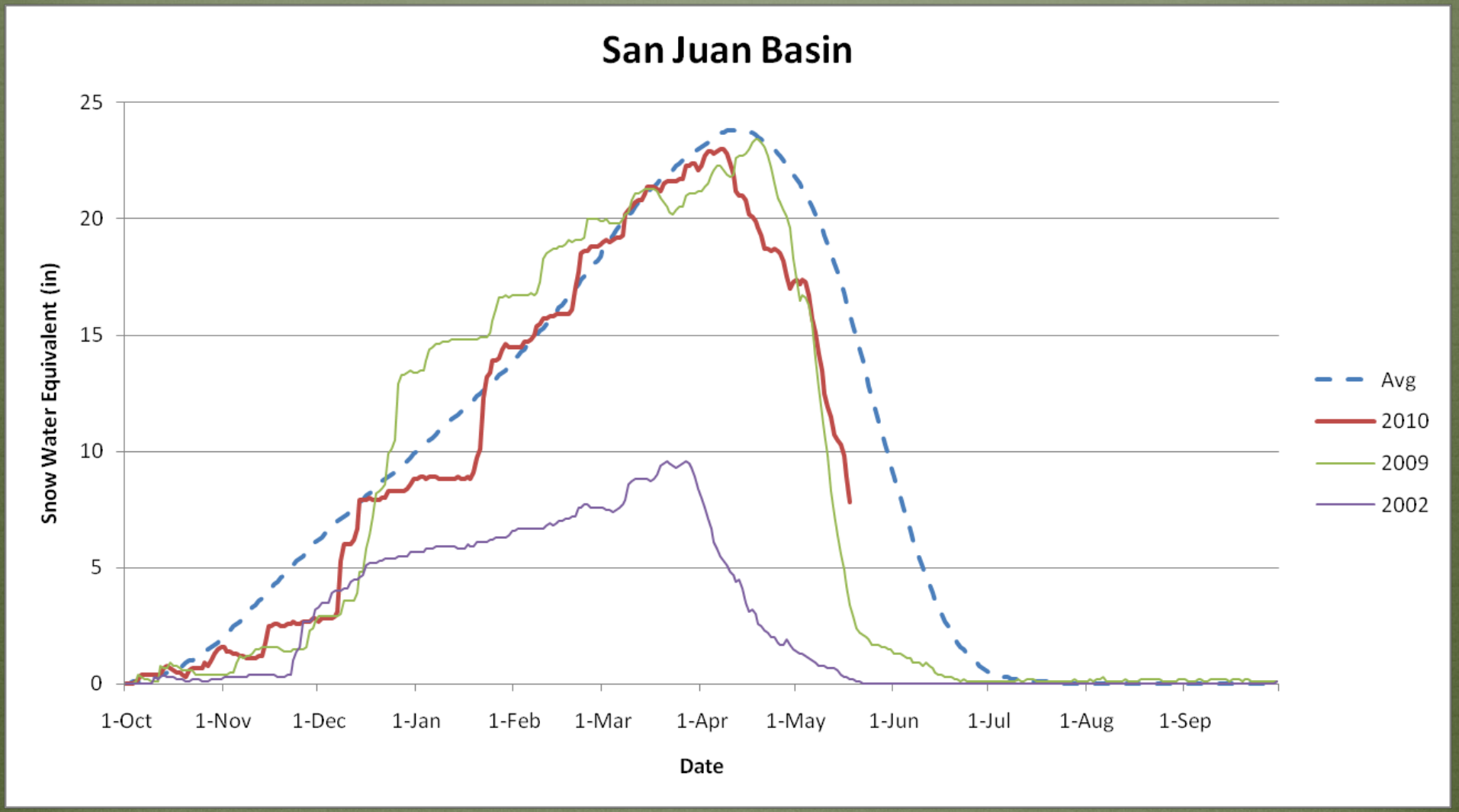
*** Provisional Data, Subject to Change ***



San Juan Basin



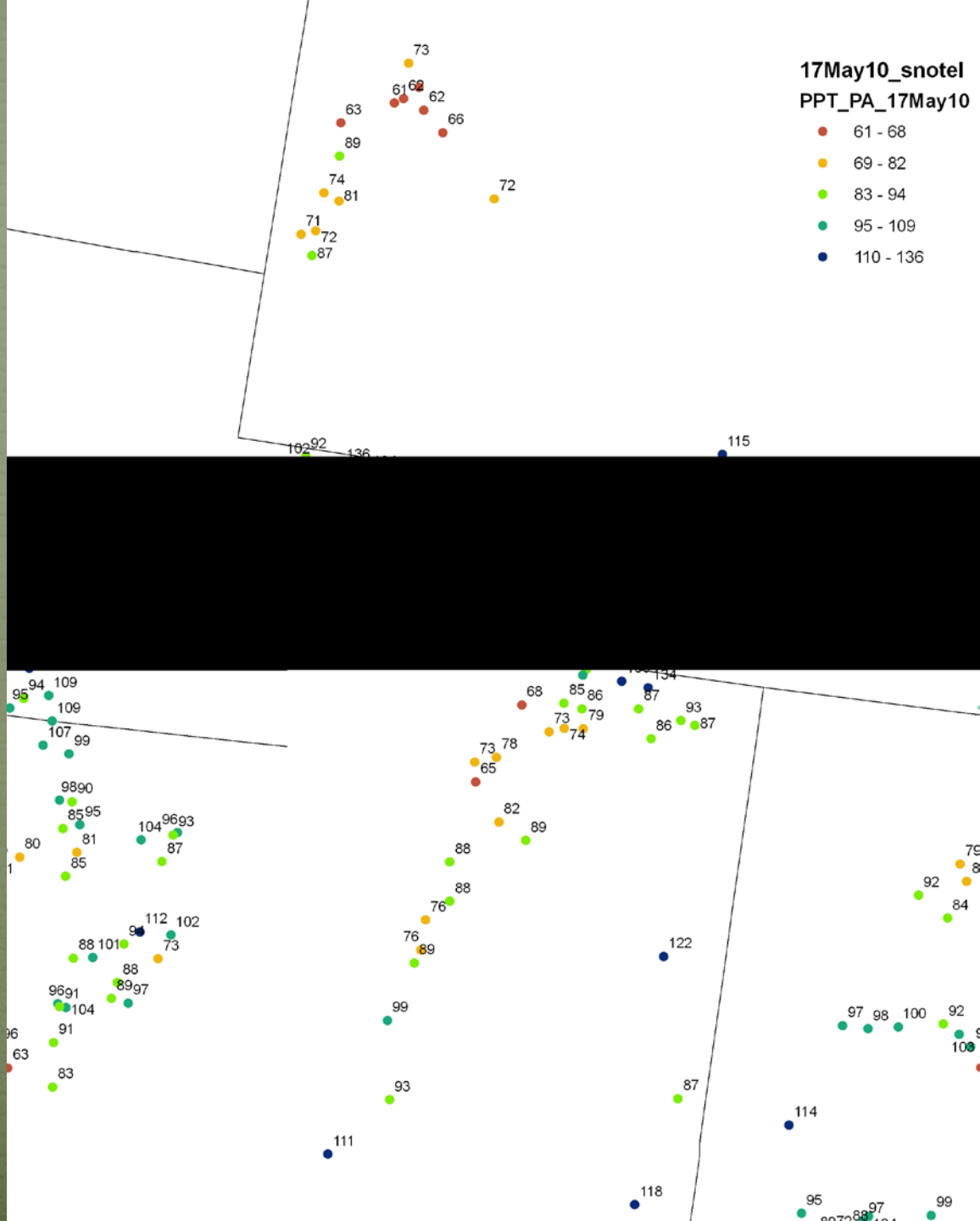
NATIONAL WEATHER SERVICE
Colorado Basin River Forecast Center



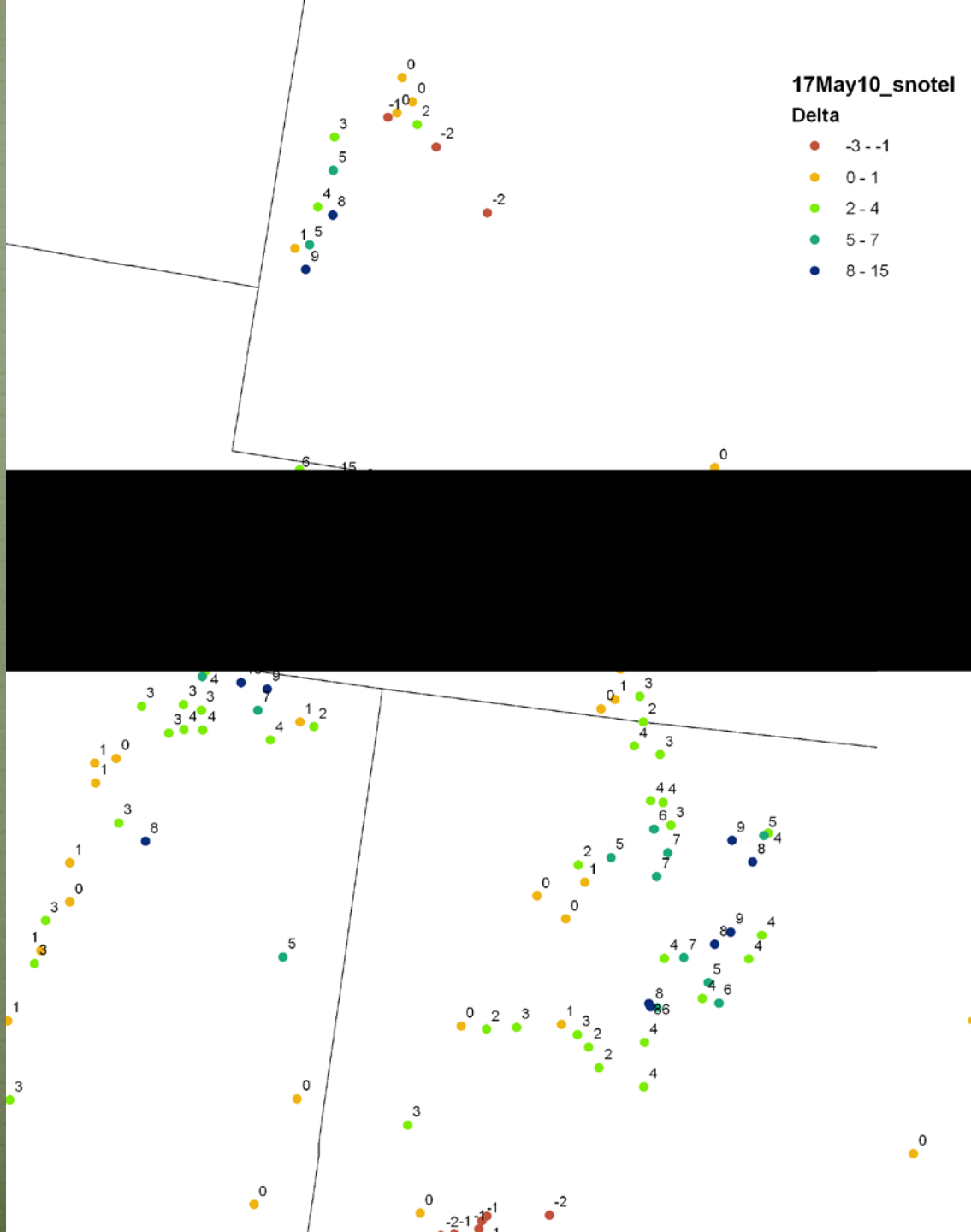
Basin Snowpack: 49%
Peak snowpack: 97% of average peak
WYTD Precipitation percent of average: 86%

Snotel WYTD Precipitation as Percentage of Average

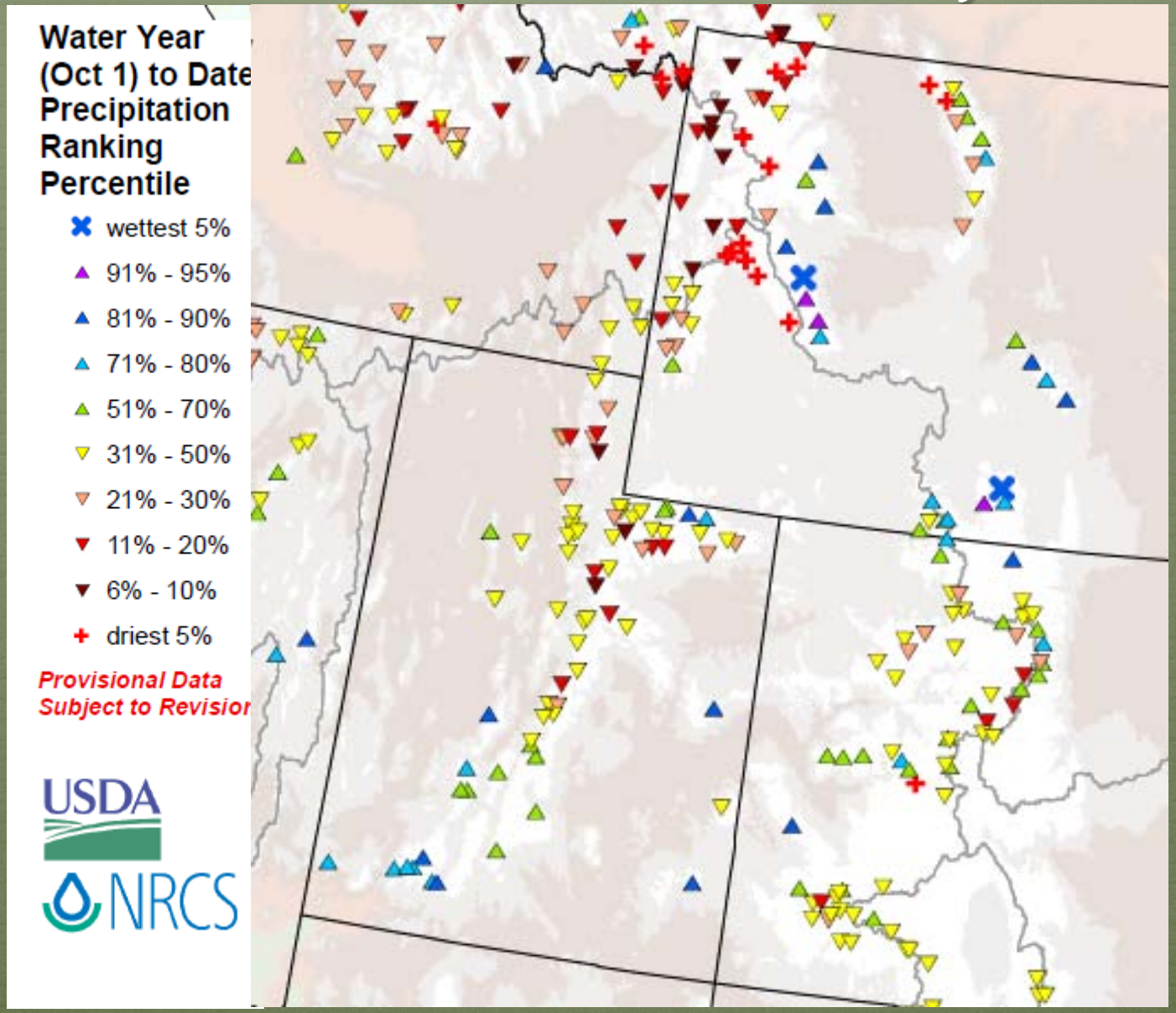
Upper Colorado 91% of Average Overall (5% increase from last week)



1 Week Change in Snotel WYTD Precipitation Percent of Average

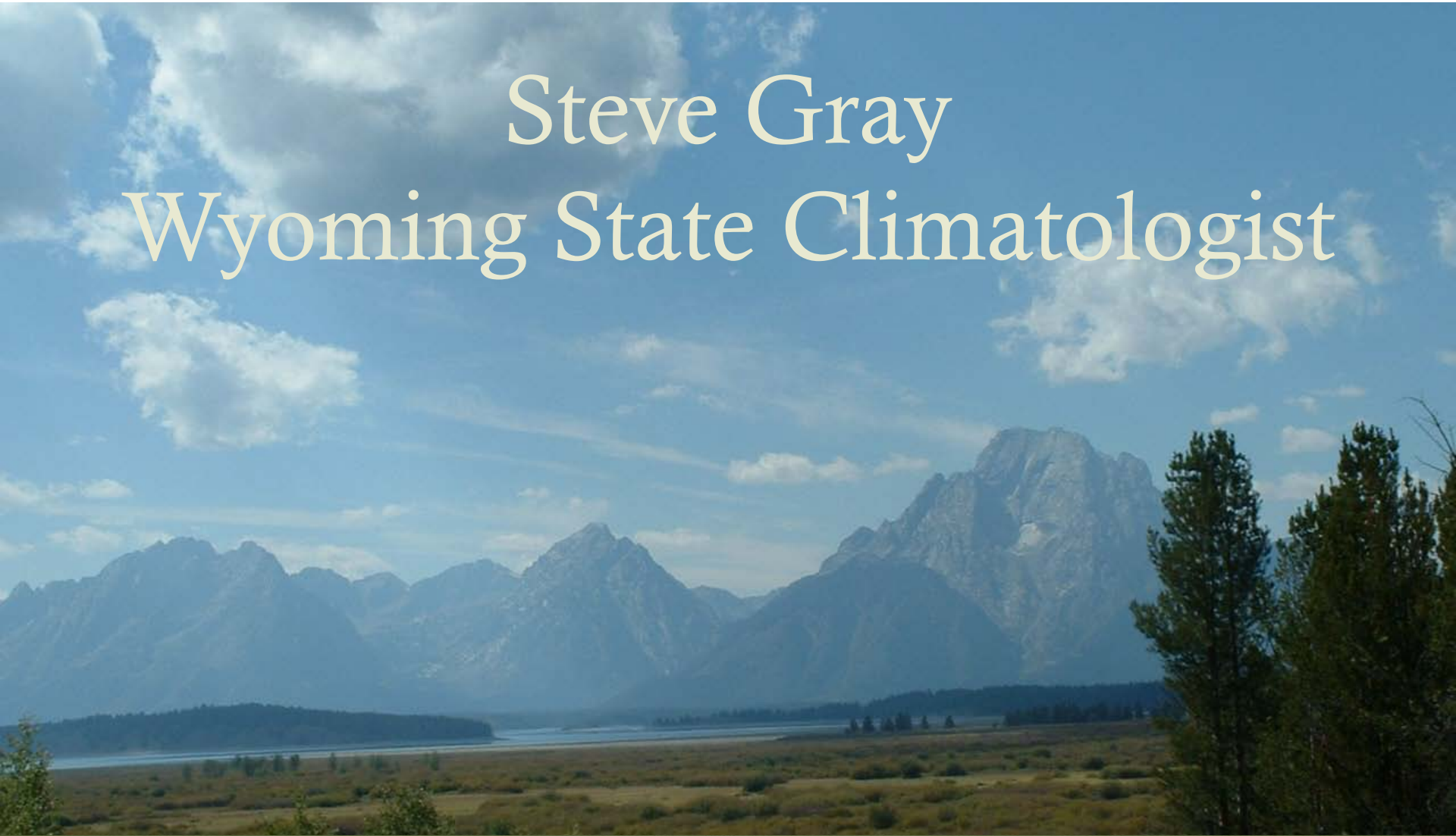


Western Snotel Percentiles 17 May 2010



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

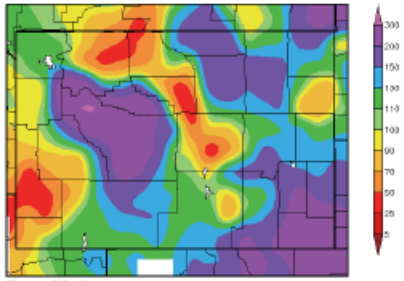
Wyoming Update



Steve Gray
Wyoming State Climatologist

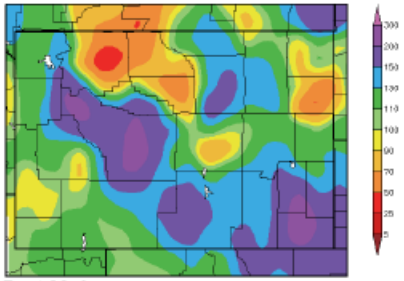
Wyoming Precipitation: Departures from Normal

Percent of Normal Precipitation (%)
4/17/2010 – 5/16/2010



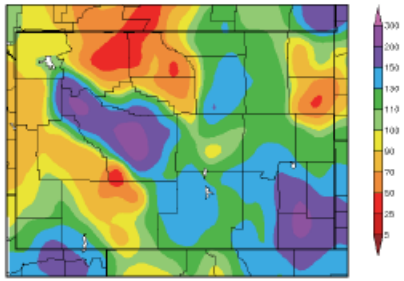
Past 30 days

Percent of Normal Precipitation (%)
3/18/2010 – 5/16/2010



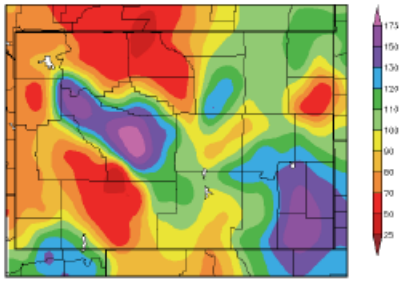
Past 60 days

Percent of Normal Precipitation (%)
2/16/2010 – 5/16/2010



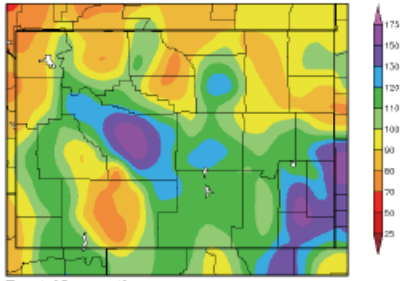
Past 90 days

Percent of Normal Precipitation (%)
11/17/2009 – 5/16/2010



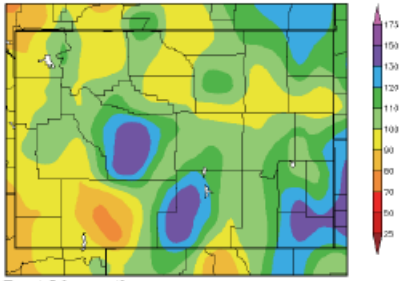
Past 6 months

Percent of Normal Precipitation (%)
5/17/2009 – 5/16/2010



Past 12 months

Percent of Normal Precipitation (%)
5/17/2008 – 5/16/2010

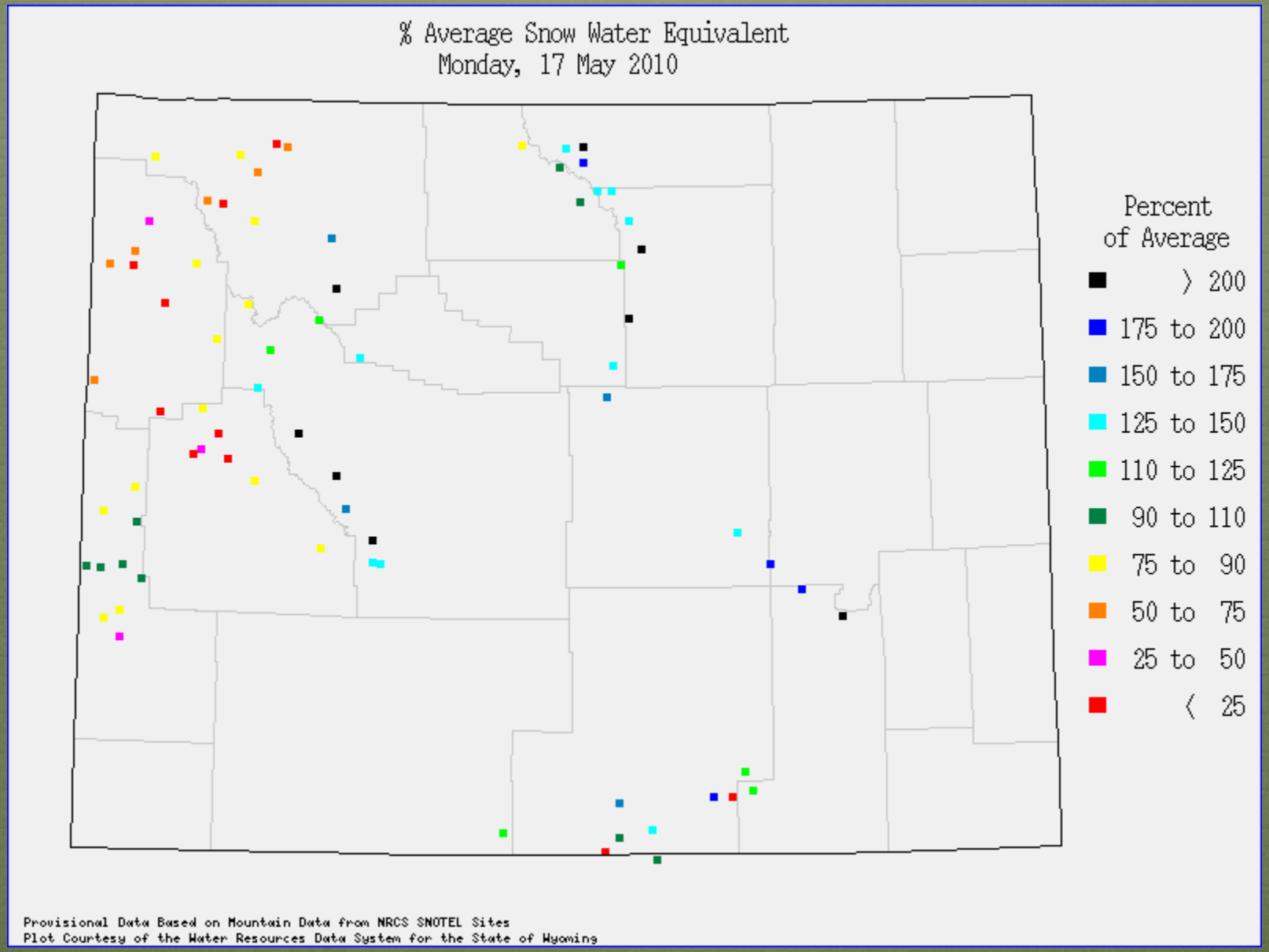


Past 24 months

Product of the Wyoming Water Resources Data System
http://www.wrds.uwyo.edu/
Data Courtesy: High Plains Regional Climate Center
http://www.hprcc.unl.edu/

SWE Change: May 2010

DRAINAGE BASIN	5/17/2010	5/10/2010	5/3/2010
SNAKE RIVER	*71*	*71*	*62*
UPPER YELLOWSTONE	*71*	*73*	*65*
WIND RIVER	*139*	*105*	*92*
BIGHORN BASIN	*93*	*77*	*67*
SHOSHONE	*80*	*70*	*60*
POWDER - TONGUE	*140*	*102*	*82*
BELLE FOURCHE	*433** *NA*	*86*	*32*
UPPER NORTH PLATTE	*117*	*104*	*96*
LOWER N PLATTE, SWT	*140*	*113*	*105*
LITTLE SNAKE RIVER	**122**	**107**	**98**
UPPER GREEN RIVER	**73**	**62**	**53**
LOWER GREEN RIVER	**105**	**79**	**76**
UPPER BEAR RIVER	*94*	*77*	*70*
Weighted State Average	**104**	**90**	**77**

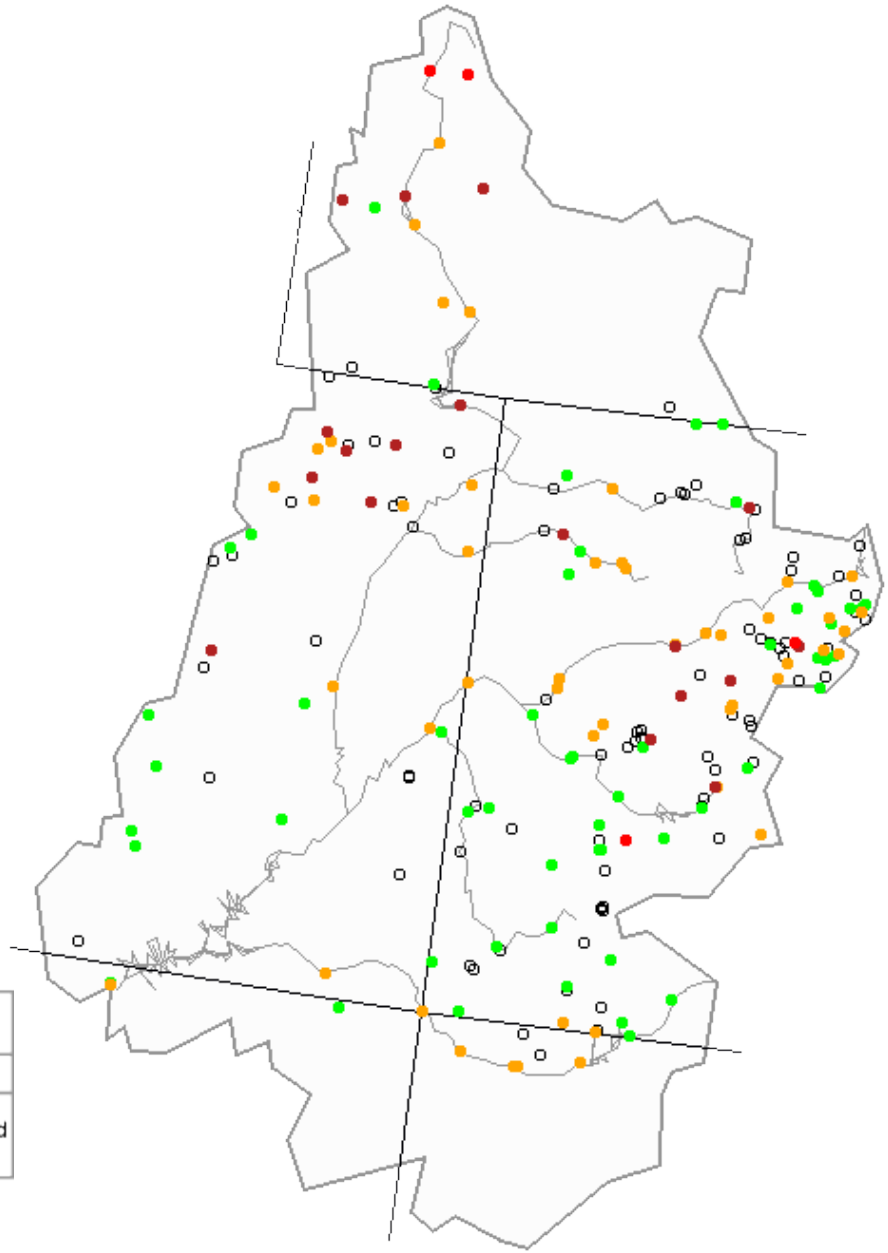

% Average Snow Water Equivalent
Monday, 17 May 2010
Percent of Average
〉 200
175 to 200
150 to 175
125 to 150
110 to 125
90 to 110
75 to 90
50 to 75
25 to 50
〈 25
Provisional Data Based on Mountain Data from NRCS SNOTEL Sites
Plot Courtesy of the Water Resources Data System for the State of Wyoming

Streamflow Update

Michael E. Lewis – USGS

CBRFC

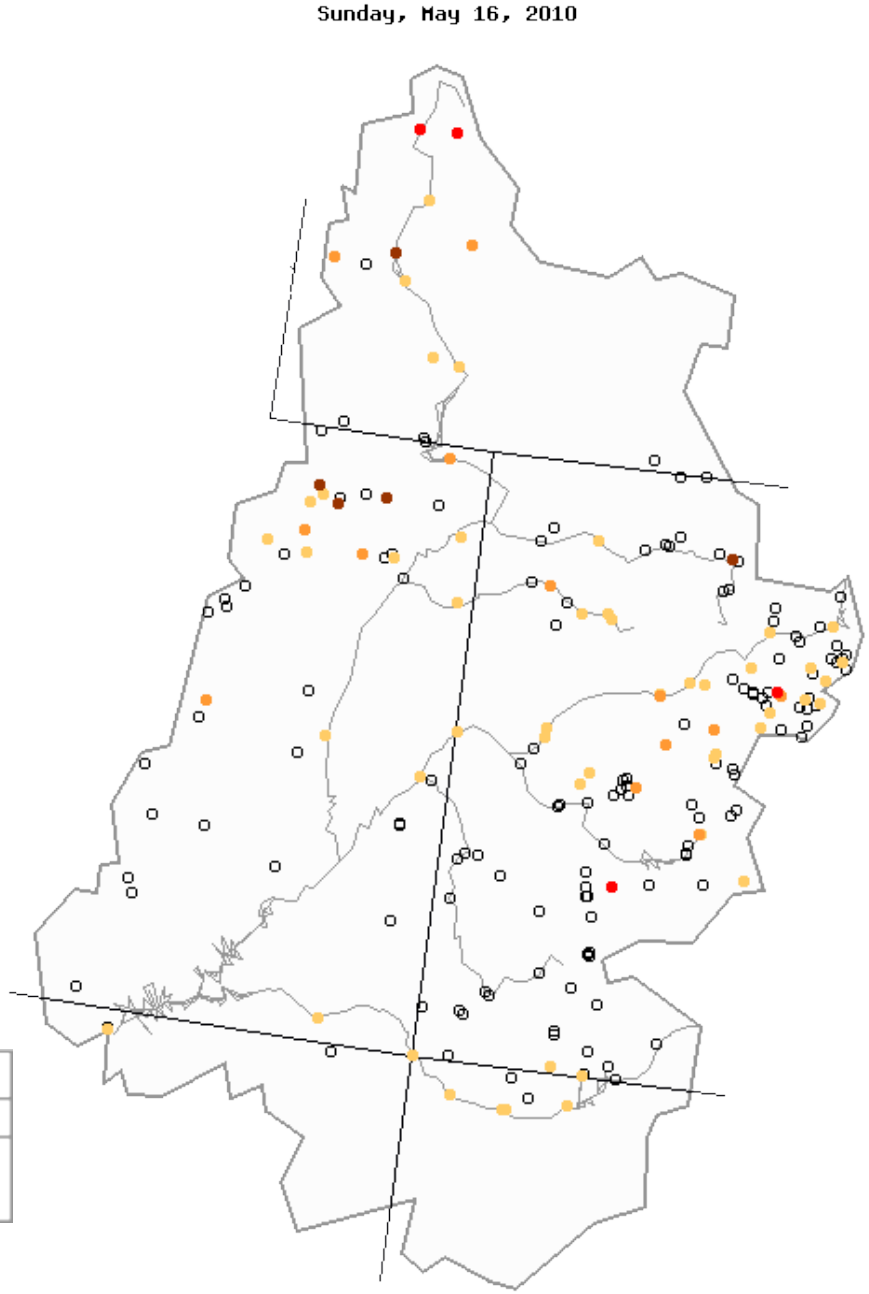
7-day average streamflow compared to historical streamflow for the day of the year (Upper Colorado)



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		

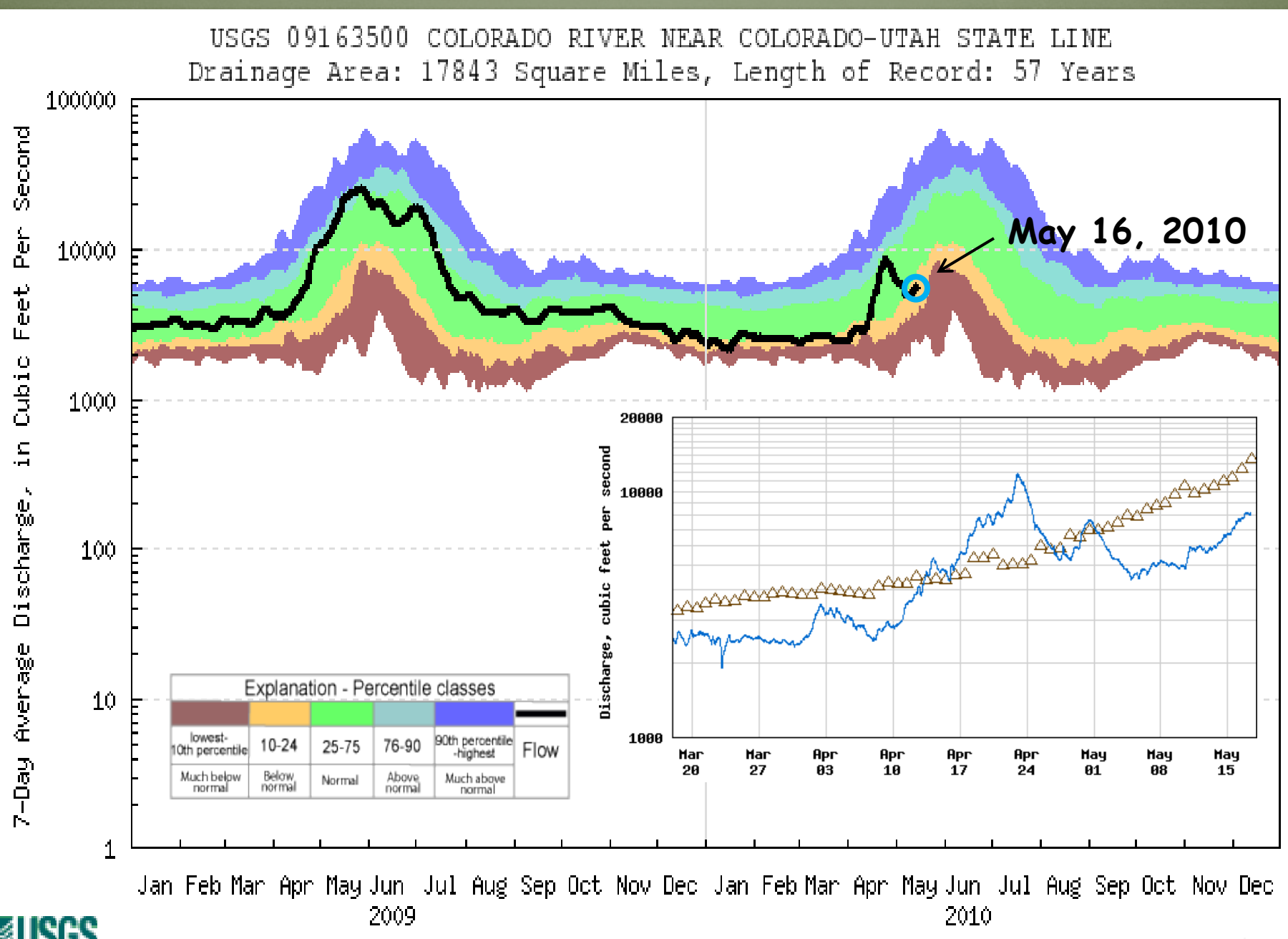
USGS

Below normal 7-day average streamflow compared to historical streamflow for the day of the year (Upper Colorado)



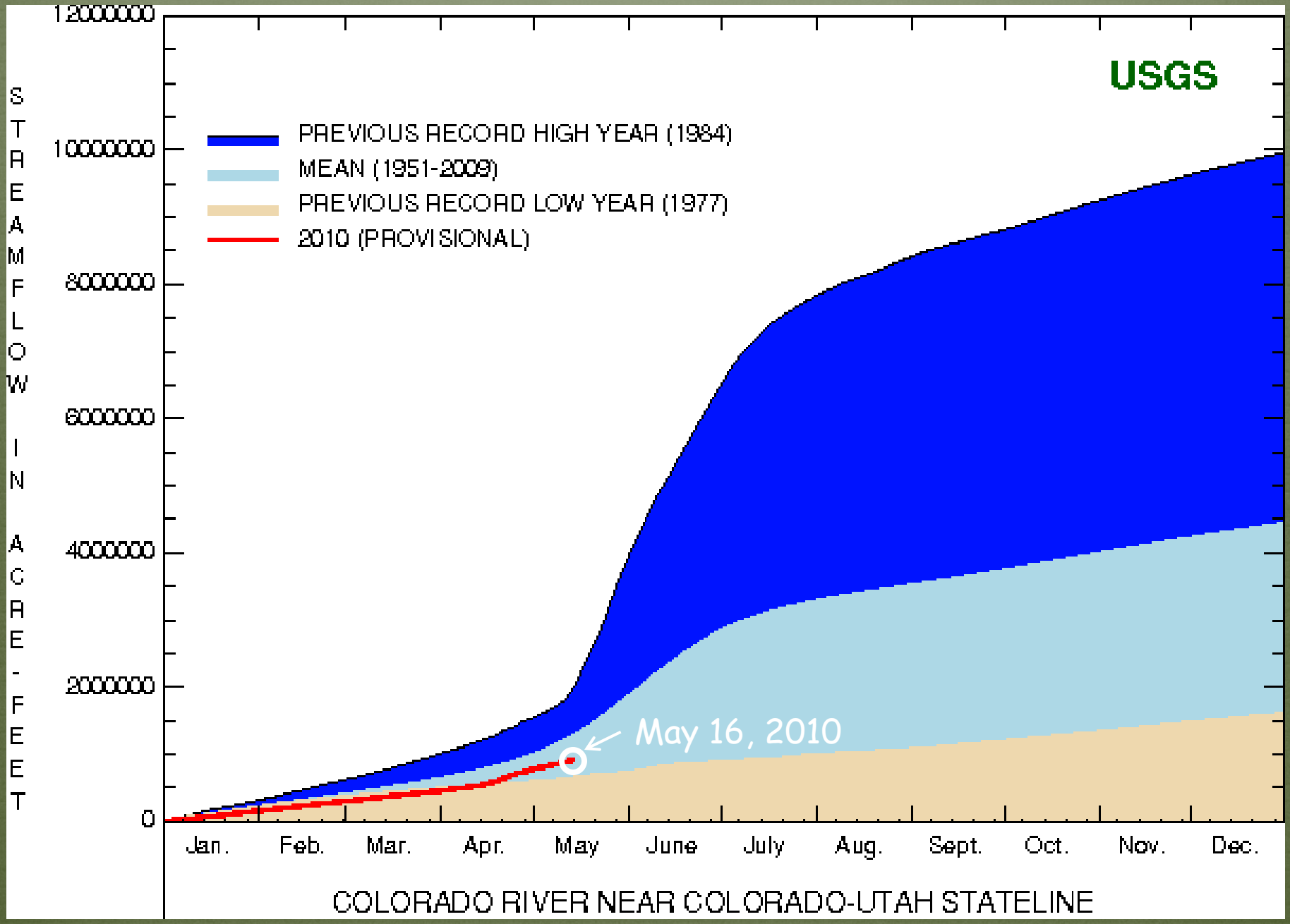
Explanation - Percentile classes				
New low	<=5	6-9	10-24	Not ranked
Extreme hydrologic drought	Severe hydrologic drought	Moderate hydrologic drought	Below normal	

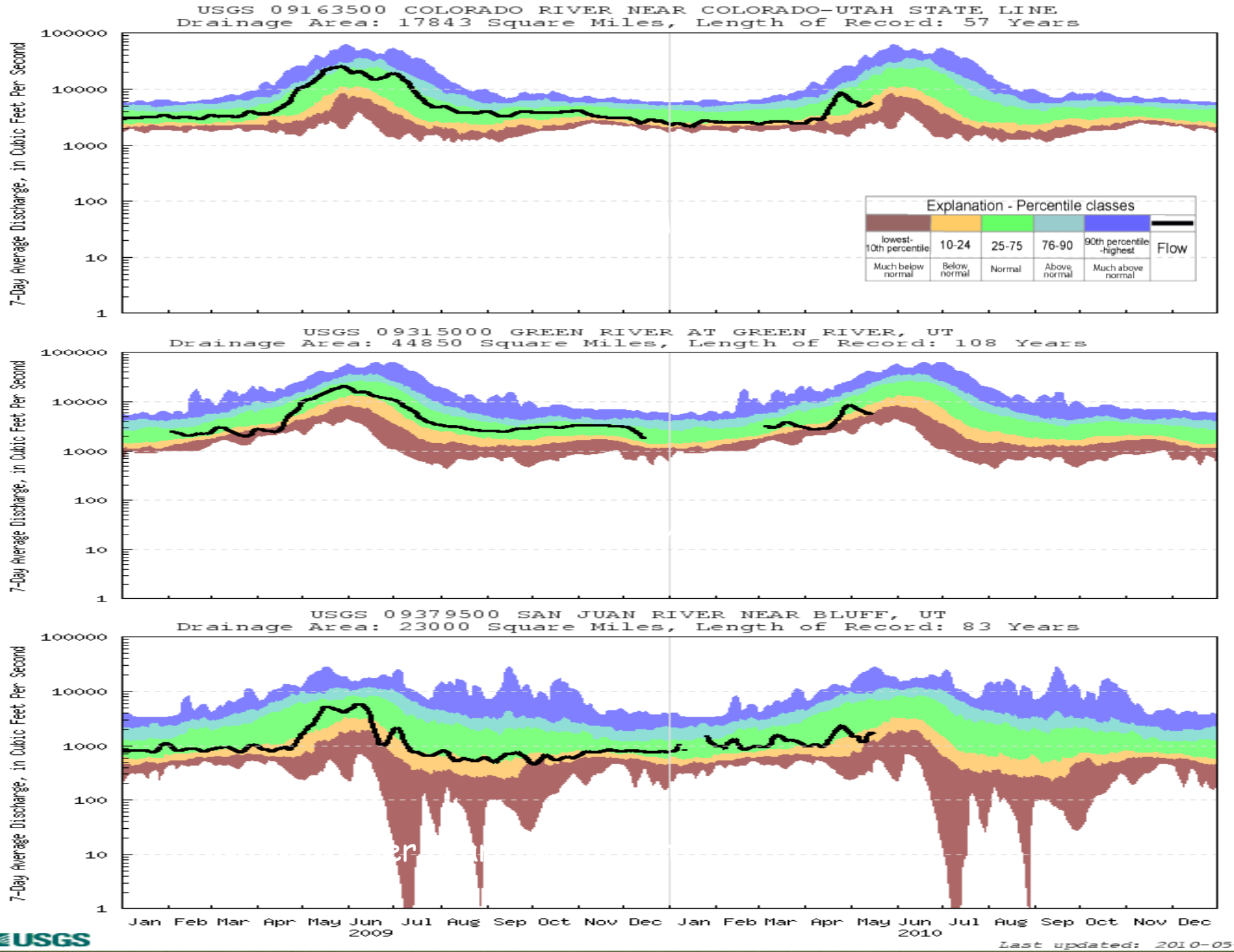
USGS



USGS

Last updated: 2010-05-17

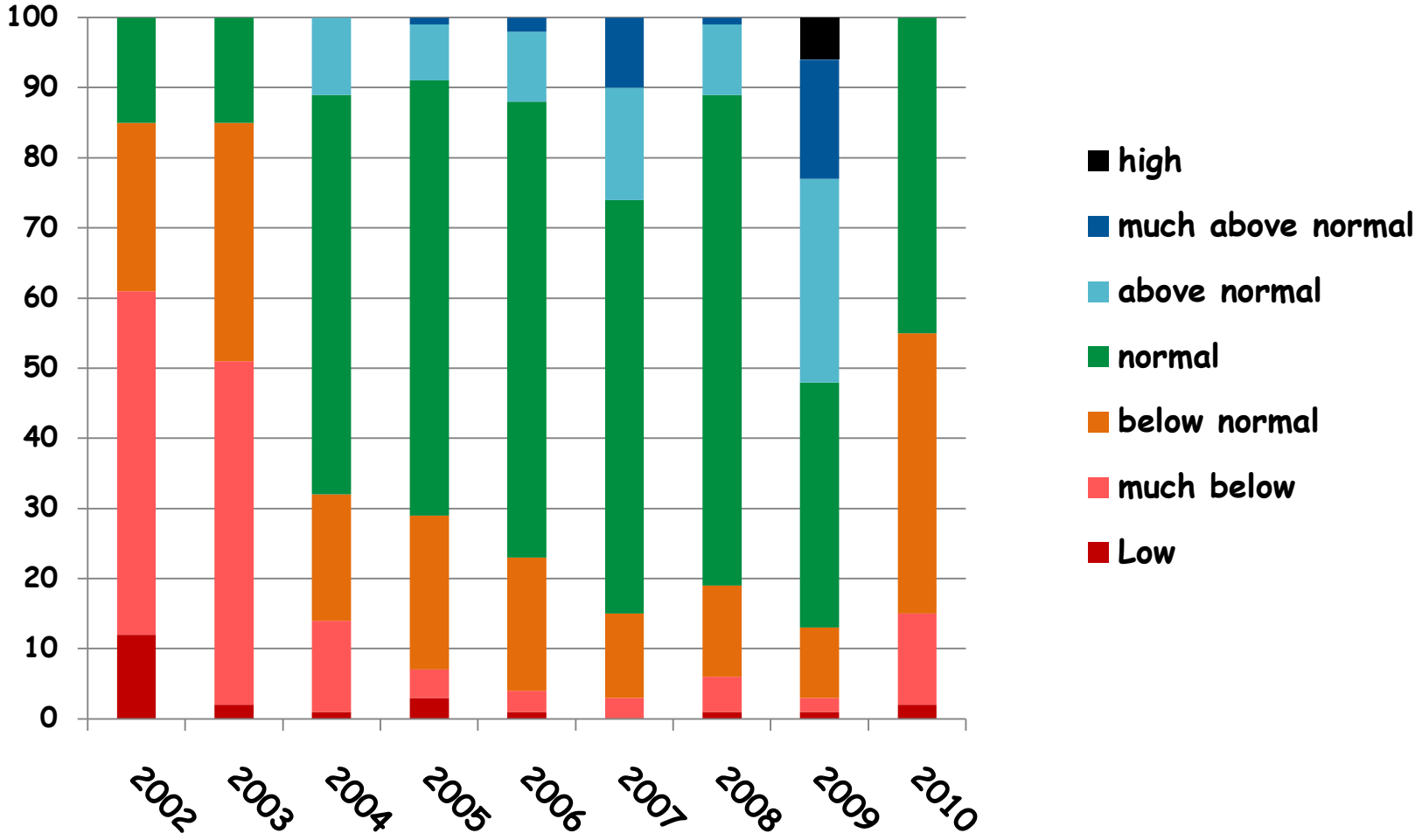

USGS
PREVIOUS RECORD HIGH YEAR (1984)
MEAN (1951-2009)
PREVIOUS RECORD LOW YEAR (1977)
2010 (PROVISIONAL)
May 16, 2010
STREAMFLOW IN ACRE-FEET
12000000
10000000
8000000
6000000
4000000
2000000
0
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.
COLORADO RIVER NEAR COLORADO-UTAH STATELINE



USGS

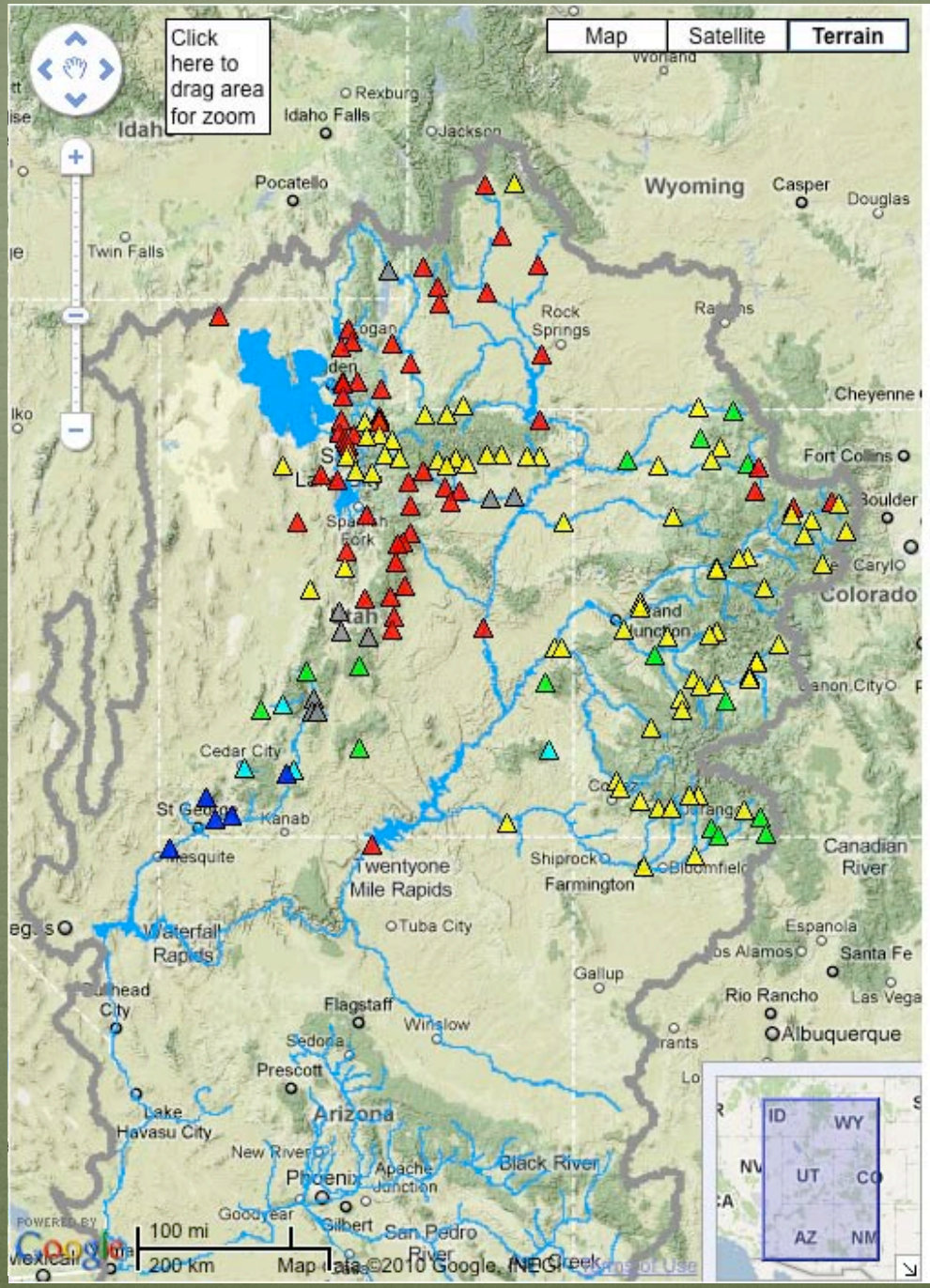
Last updated: 2010-05-17

May 15
Percentage of Streamgages per Percentile Class
7-day Average Streamflow

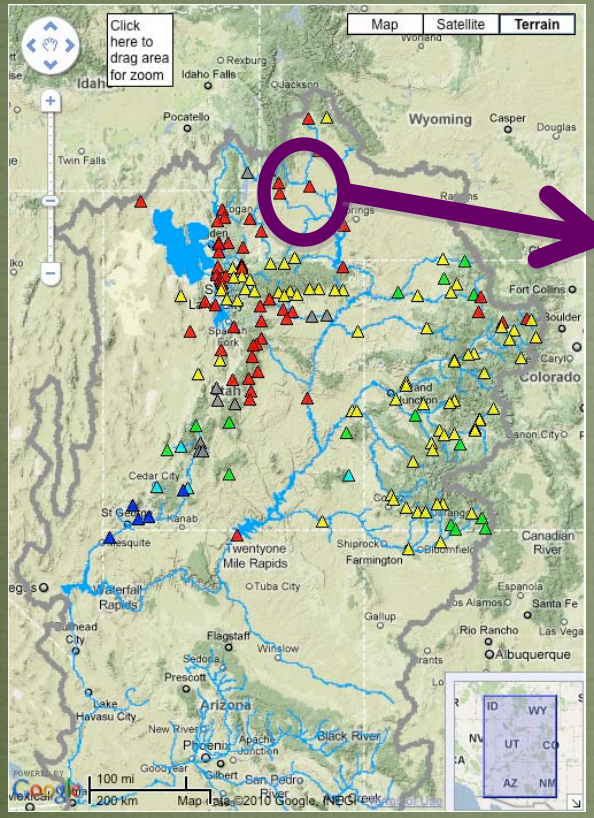


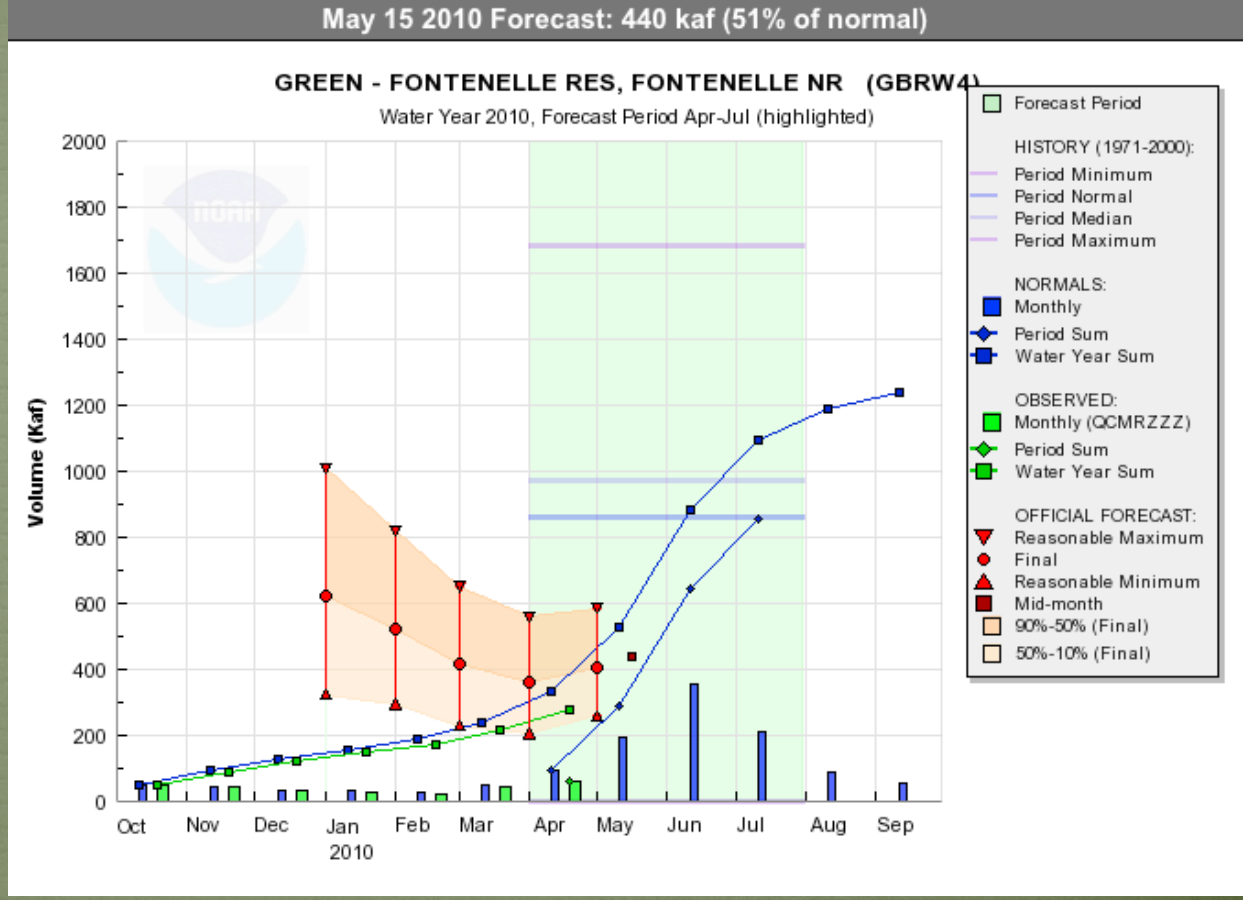
May 15, 2010
Water Supply
Forecasts

Highlights:
- Small changes to May 1 forecasts
- Slight increases in the Green River basin
- Slight decreases in the Gunnison and San Juan basins

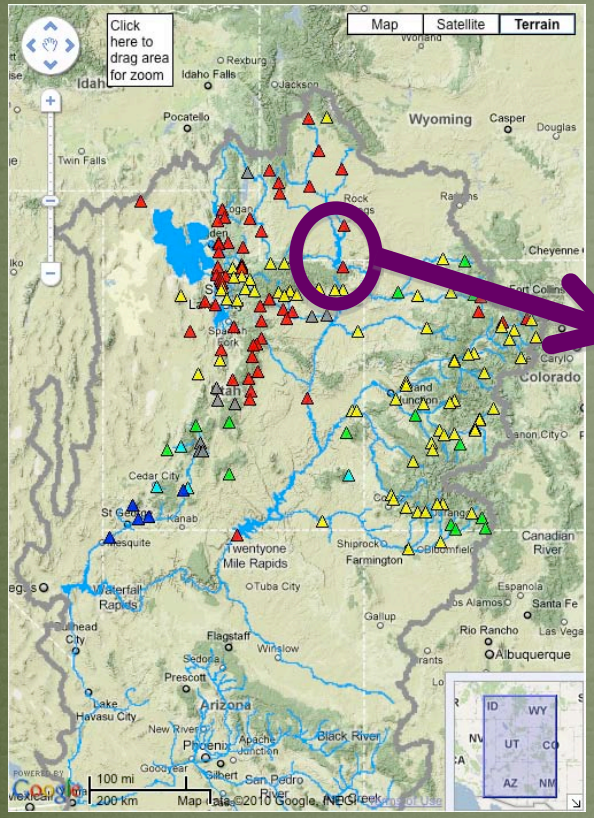


Web Reference: www.cbrfc.noaa.gov/gmap/gmapm.php?wcon=checked

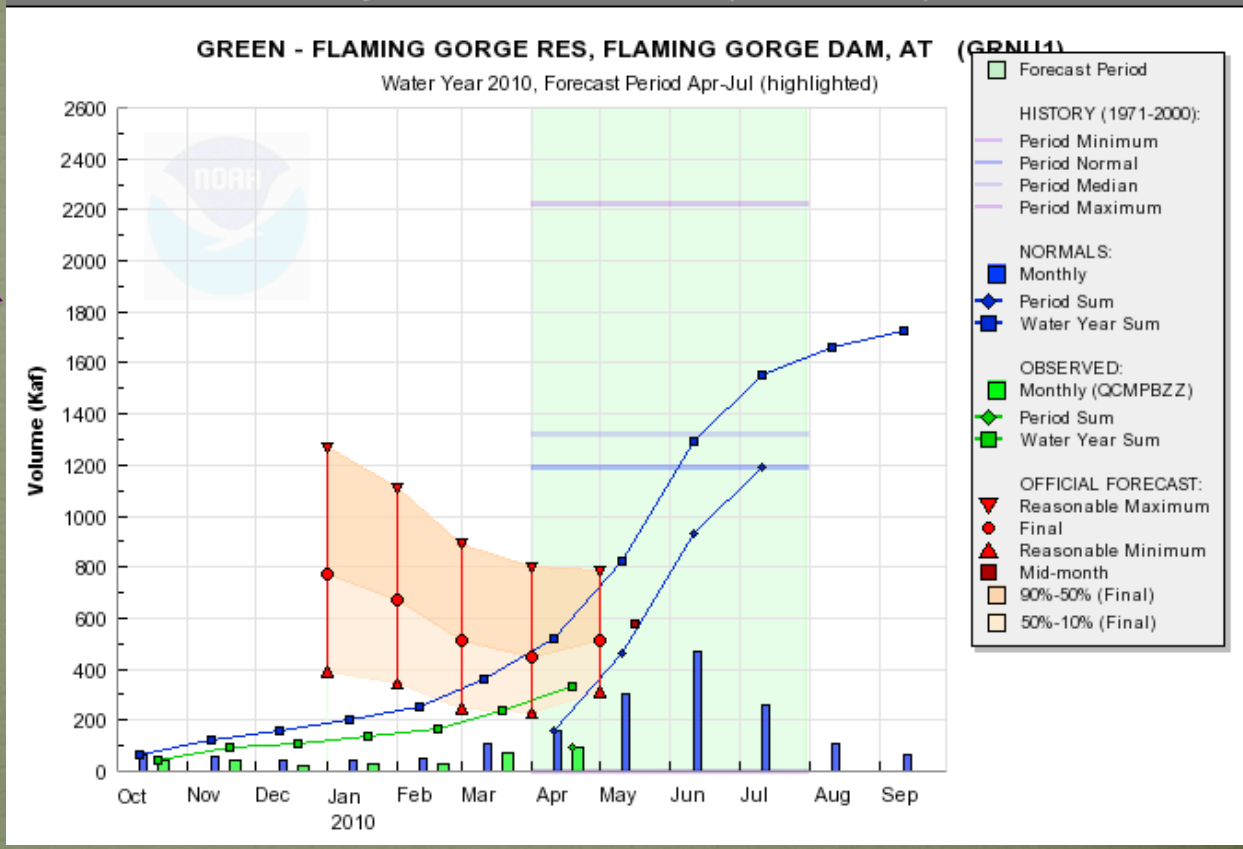




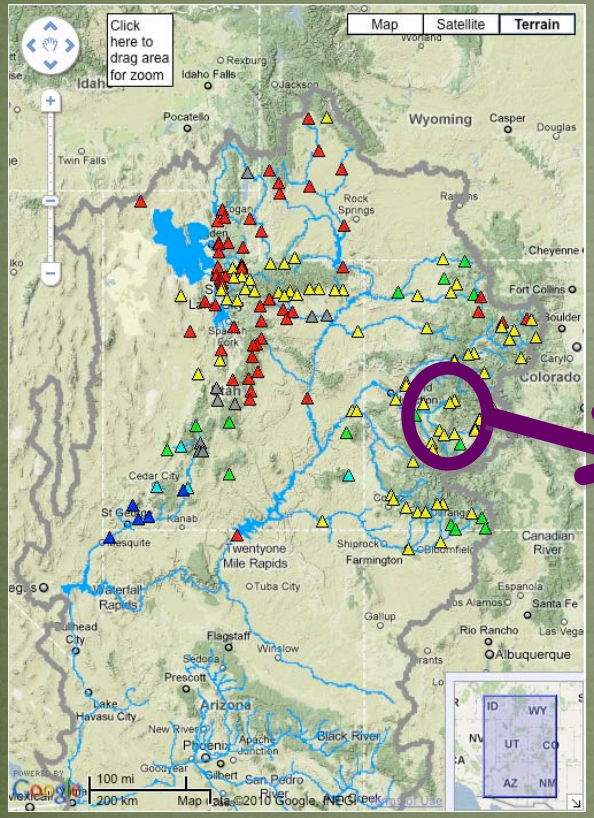
Web Reference: www.cbrfc.noaa.gov/gmap/gmapm.php?wcon=checked and waterwatch.usgs.gov

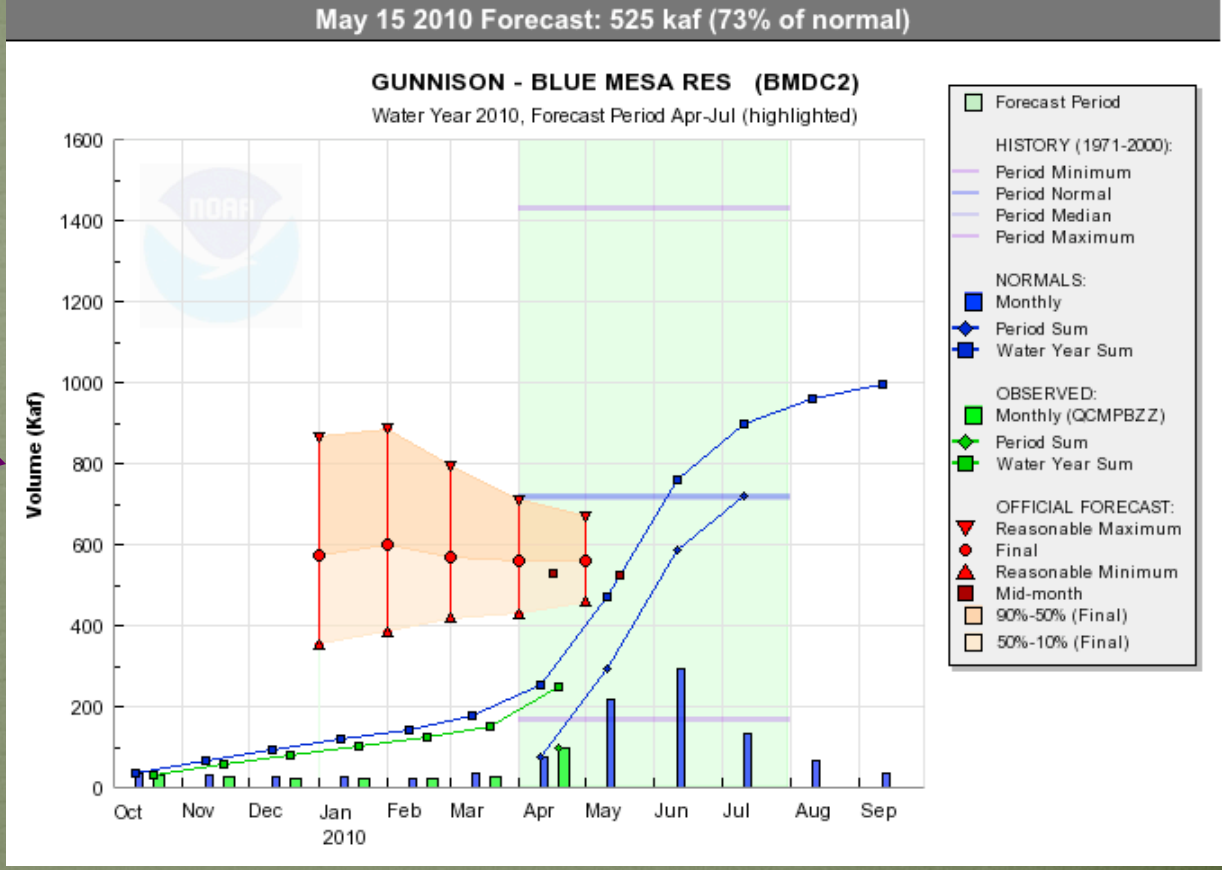


May 15 2010 Forecast: 575 kaf (48% of normal)

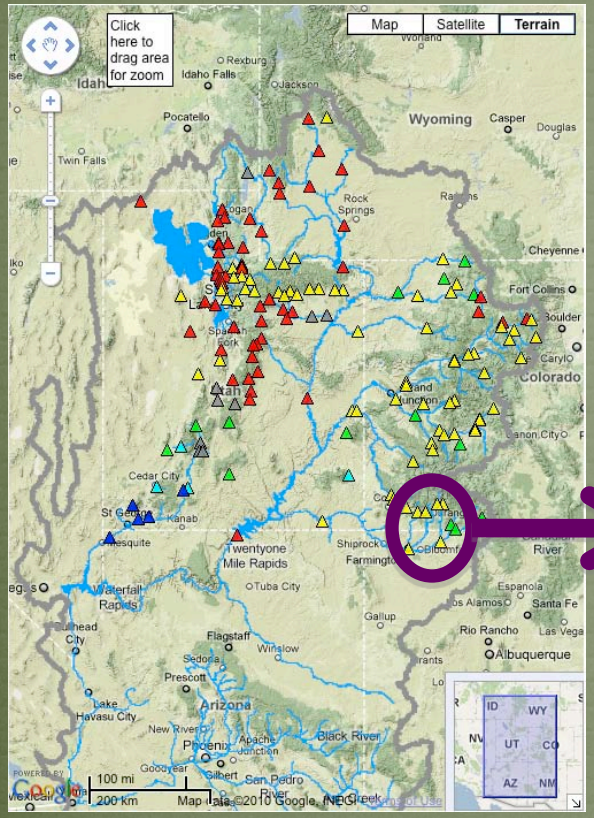


Web Reference: www.cbrfc.noaa.gov/gmap/gmapm.php?wcon=checked

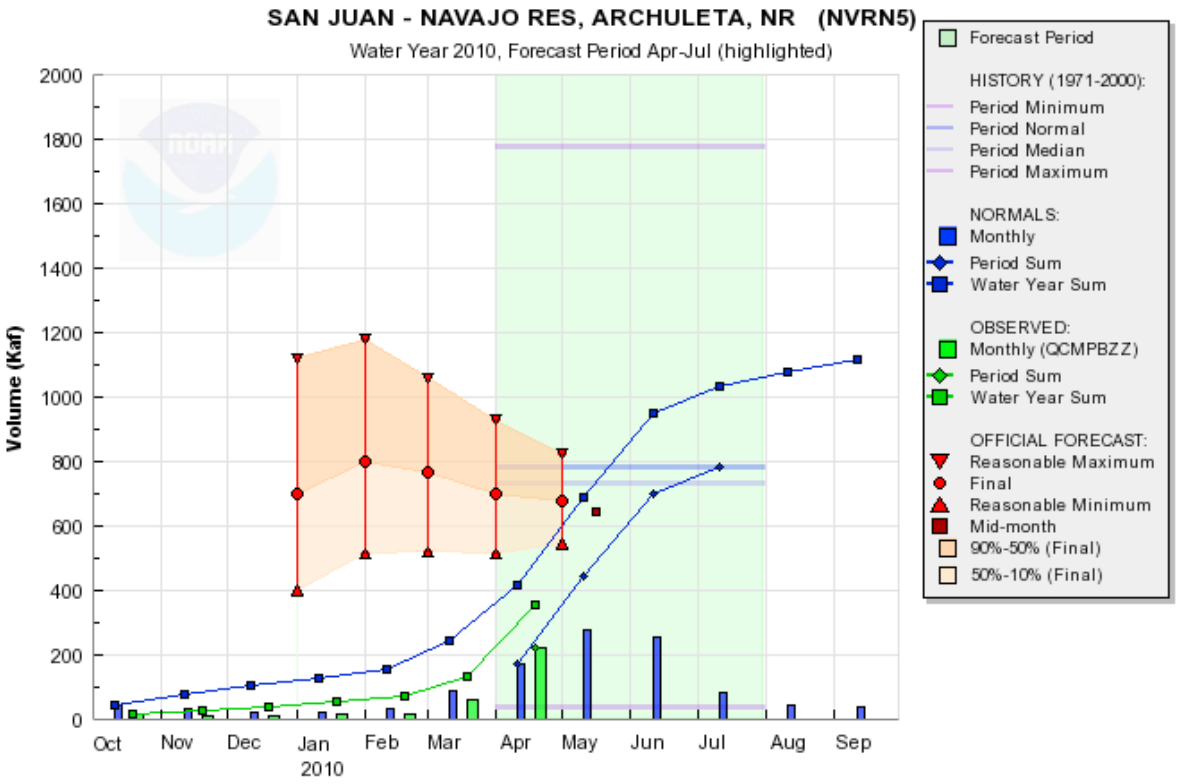




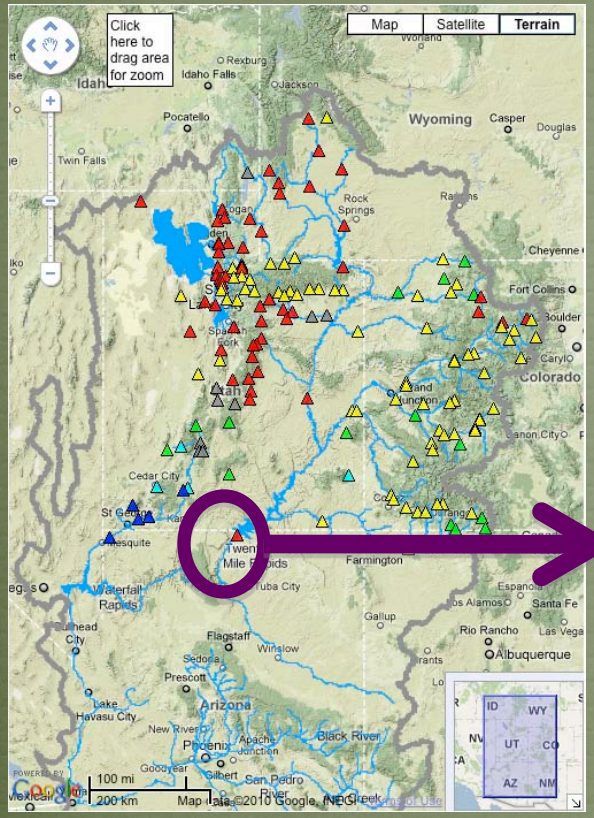
Web Reference: www.cbrfc.noaa.gov/gmap/gmapm.php?wcon=checked and Waterwatch.usgs.gov



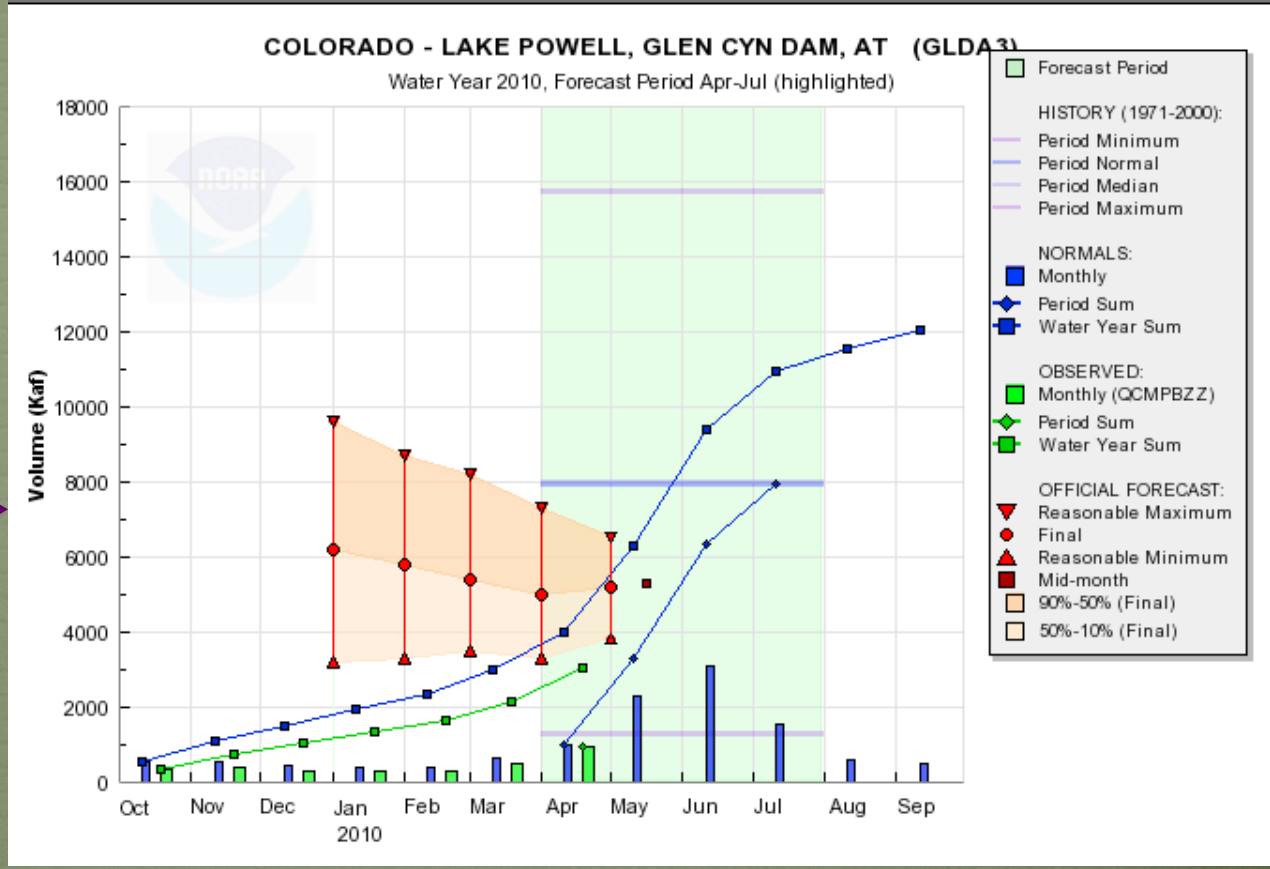
May 15 2010 Forecast: 645 kaf (82% of normal)



Web Reference: www.cbrfc.noaa.gov/gmap/gmapm.php?wcon=checked



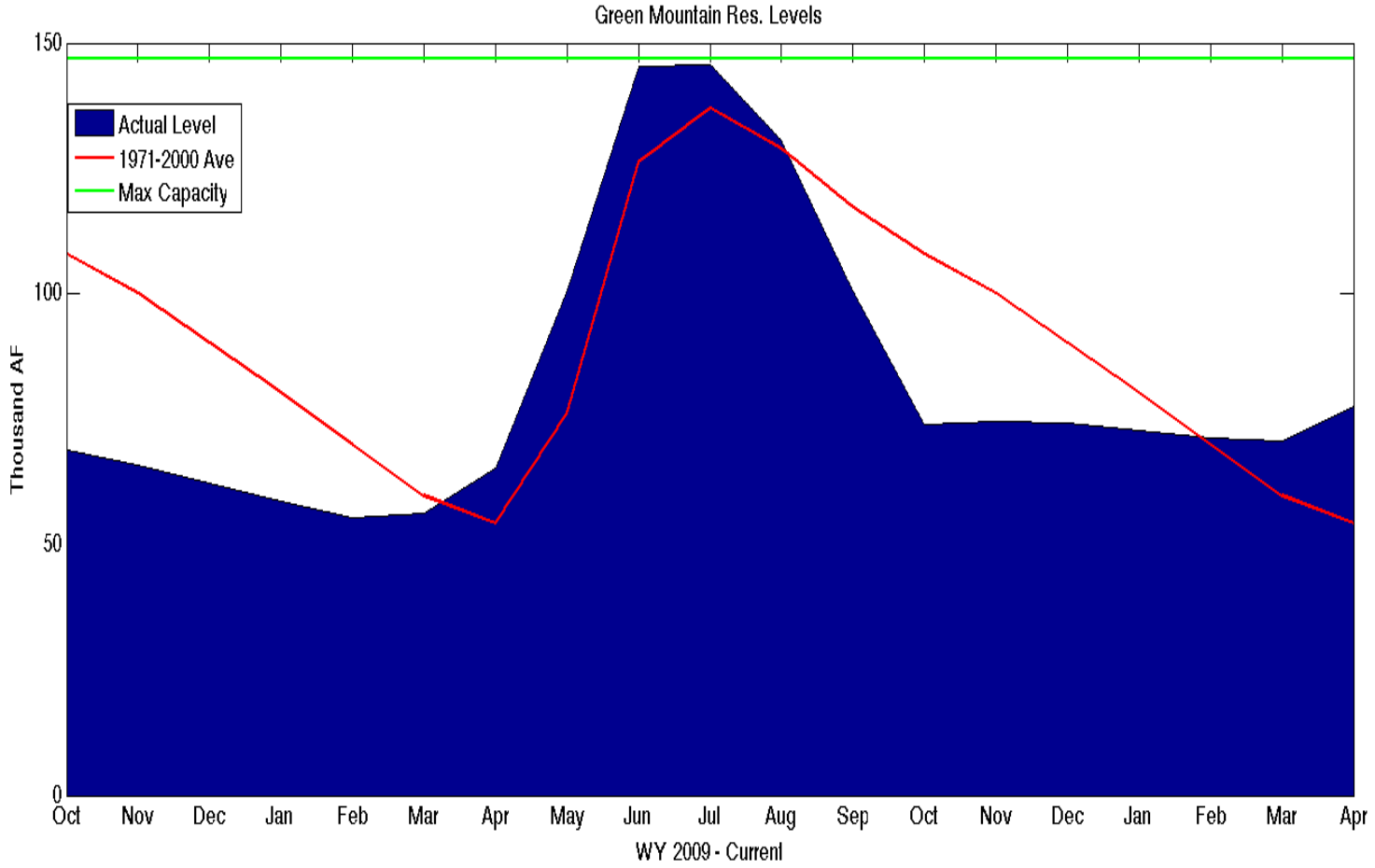
May 15 2010 Forecast: 5300 kaf (67% of normal)

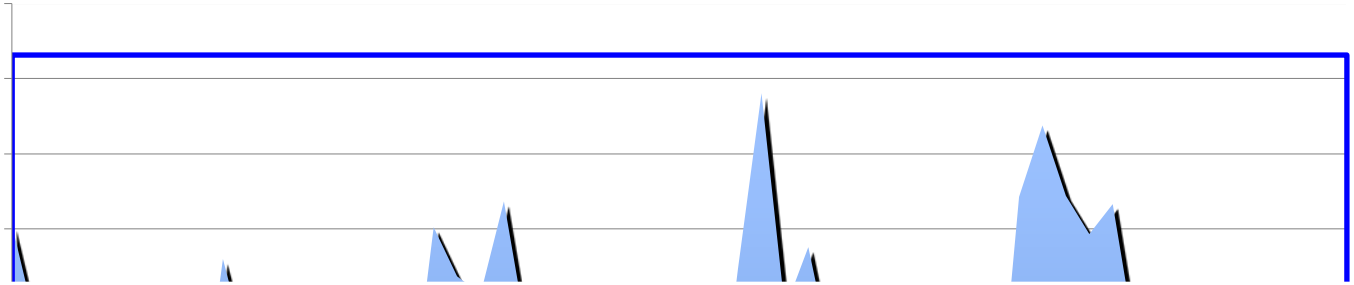


Web Reference: www.cbrfc.noaa.gov/gmap/gmapm.php?wcon=checked

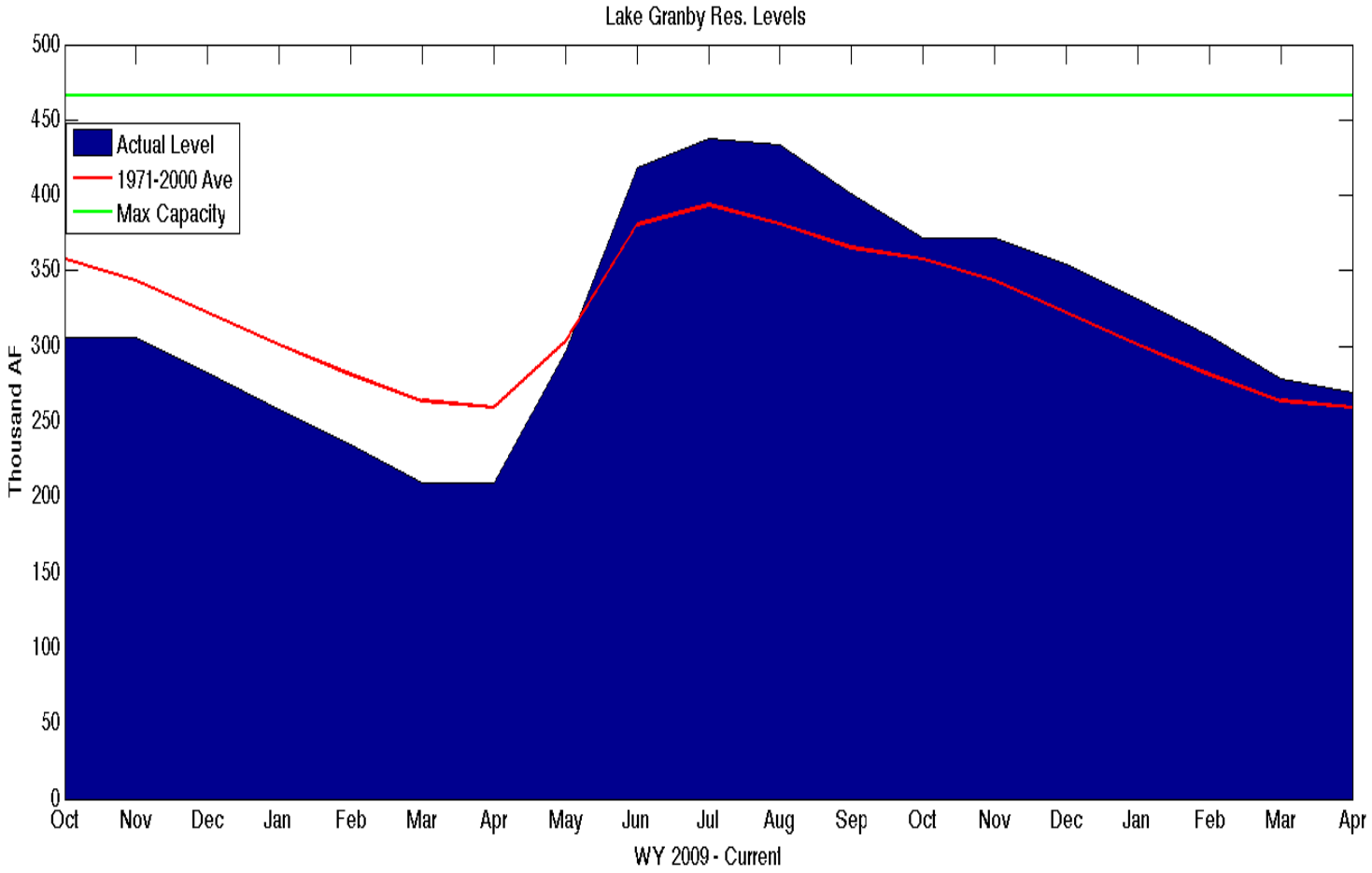
Reservoir Update

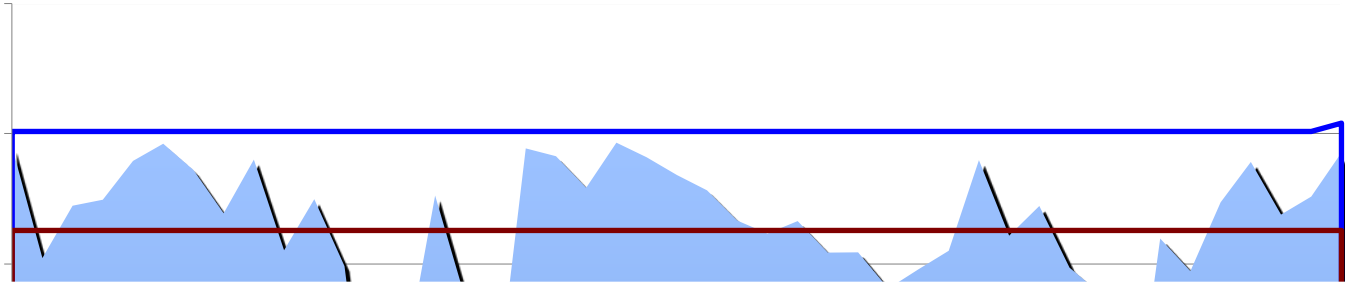
Max Capacity





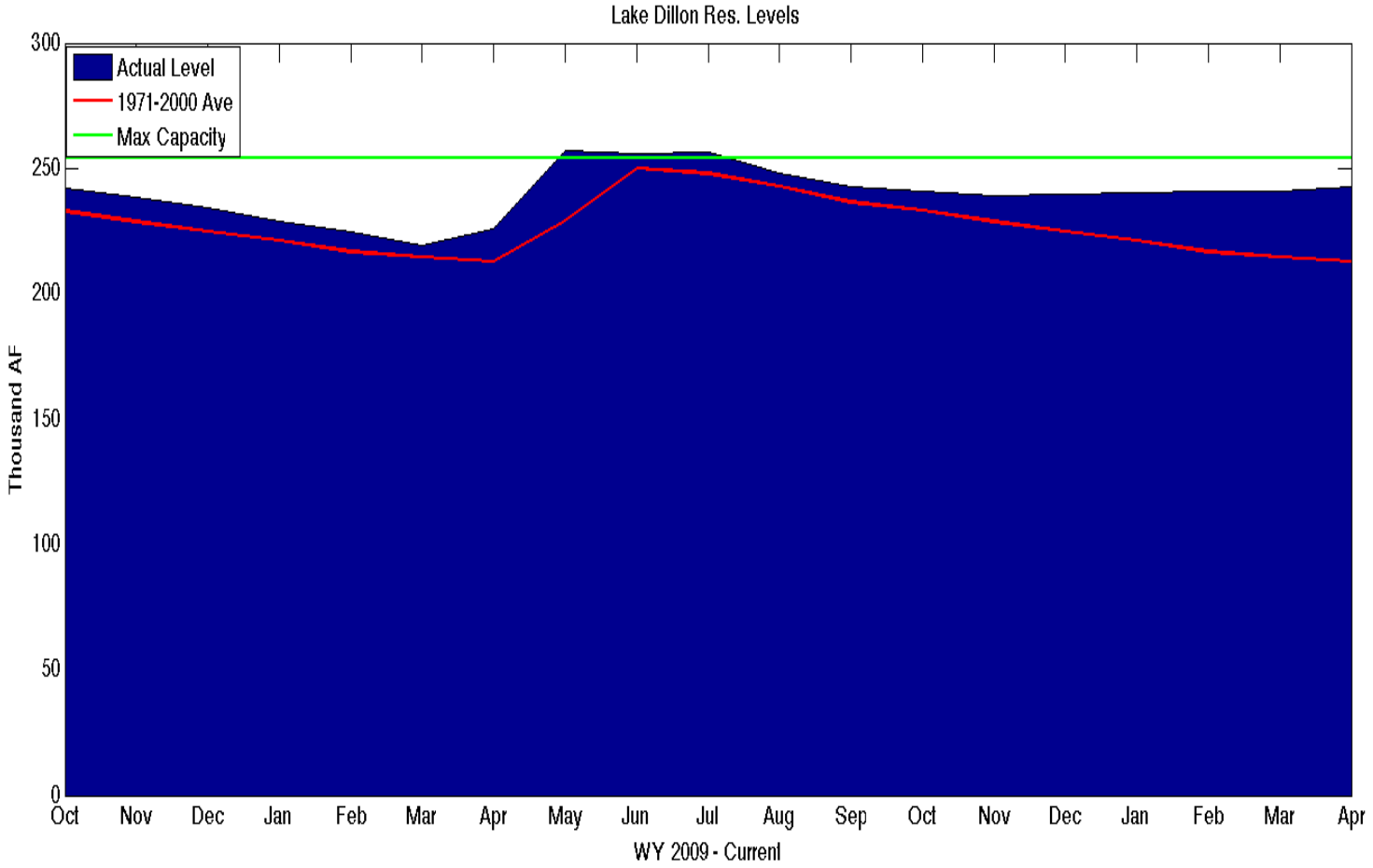
Max Capacity

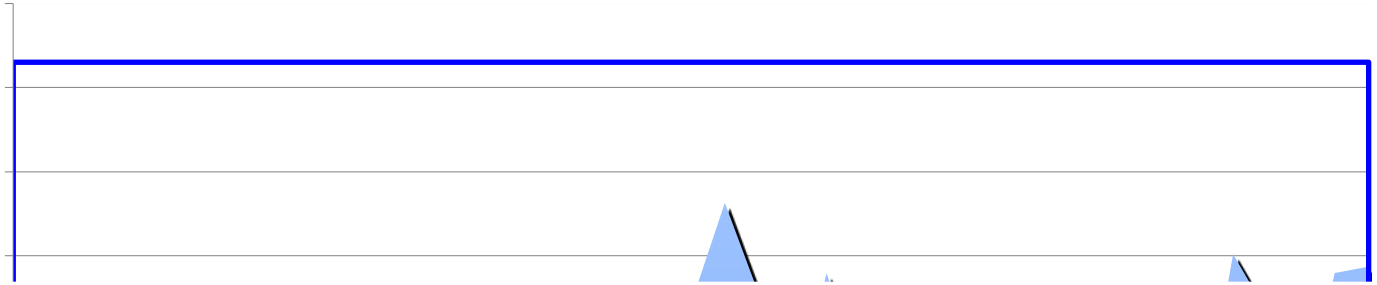




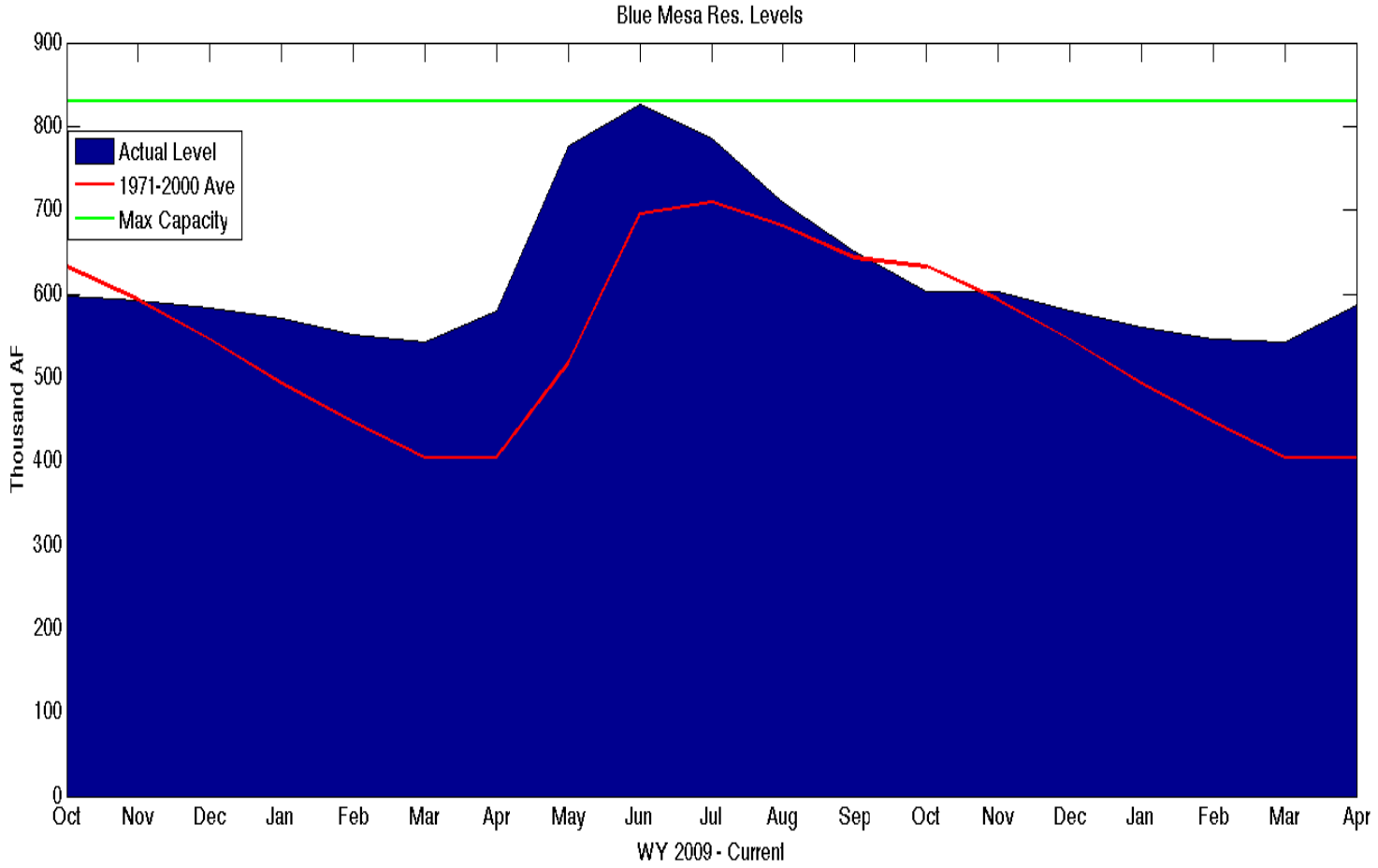
Max Capacity

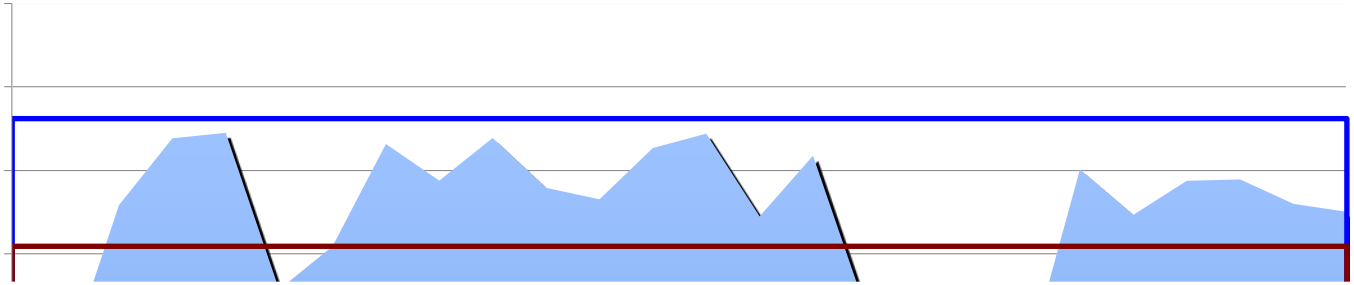
1971-2000 Average

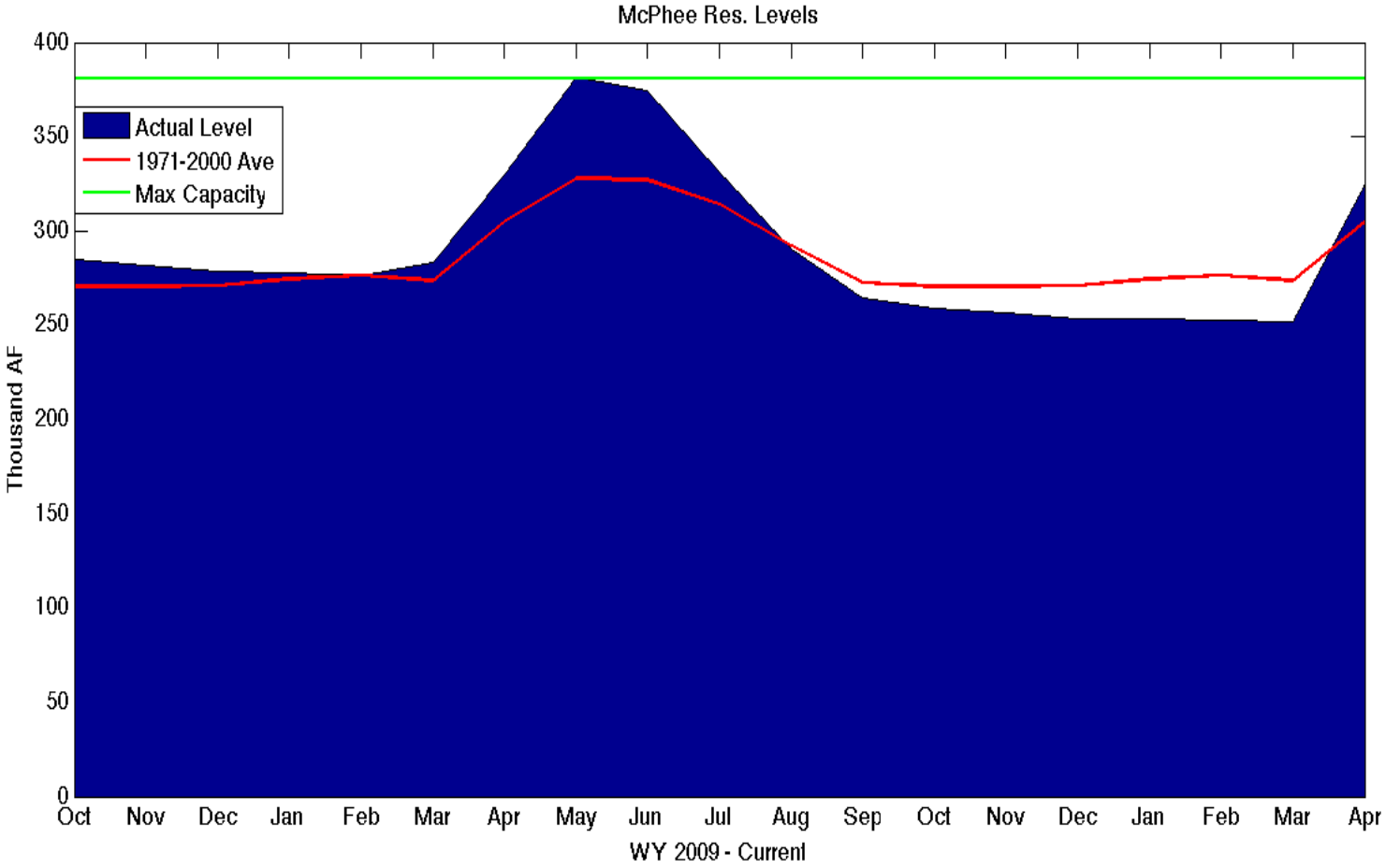


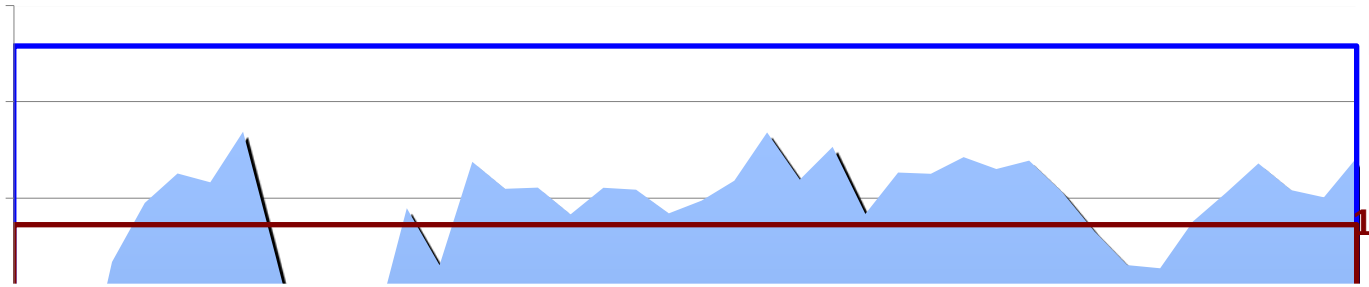

Max Capacity

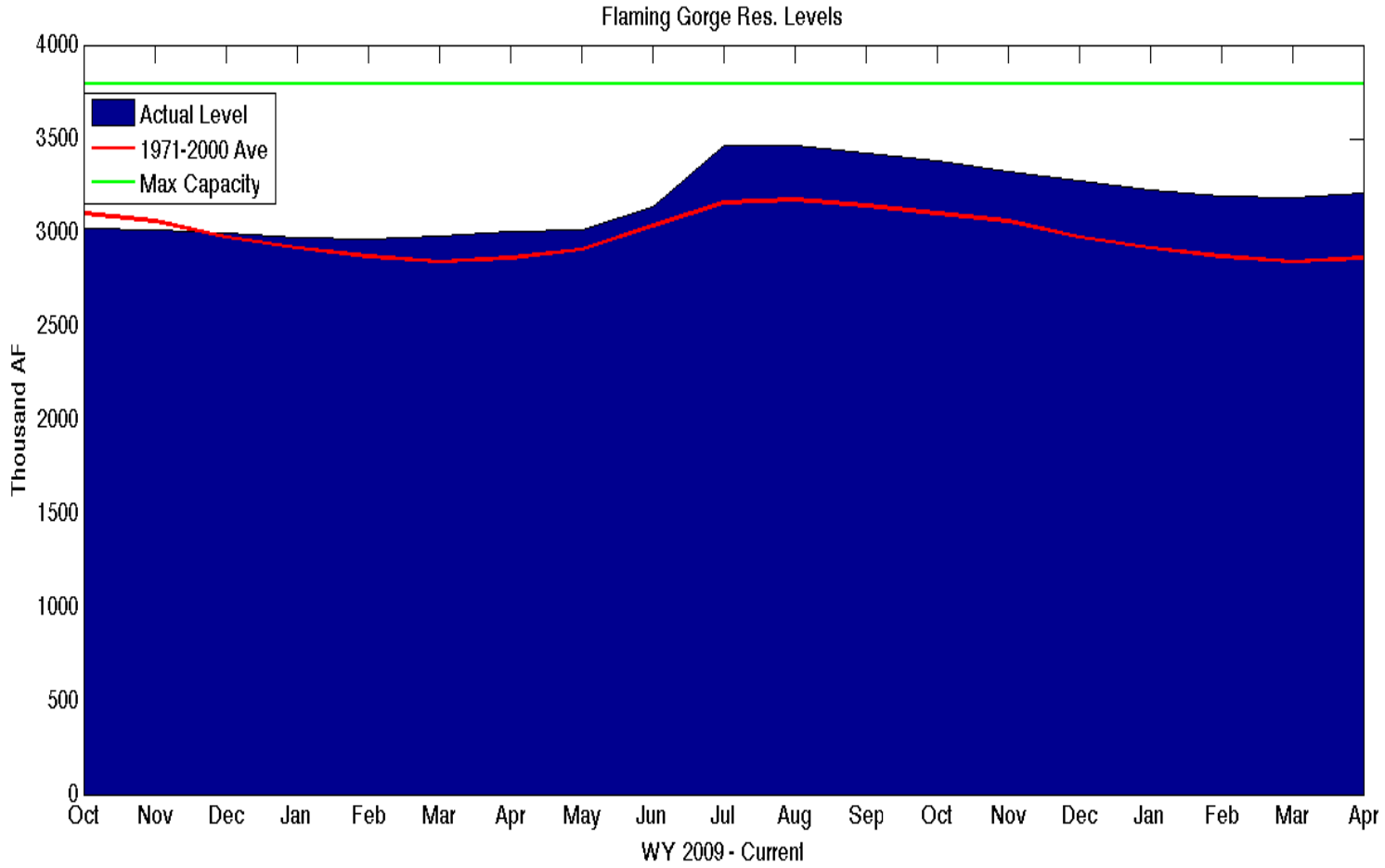
Thousand AF


Blue Mesa Res. Levels
Actual Level
1971-2000 Ave
Max Capacity
Thousand AF
900
800
700
600
500
400
300
200
100
0
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
WY 2009 - Current

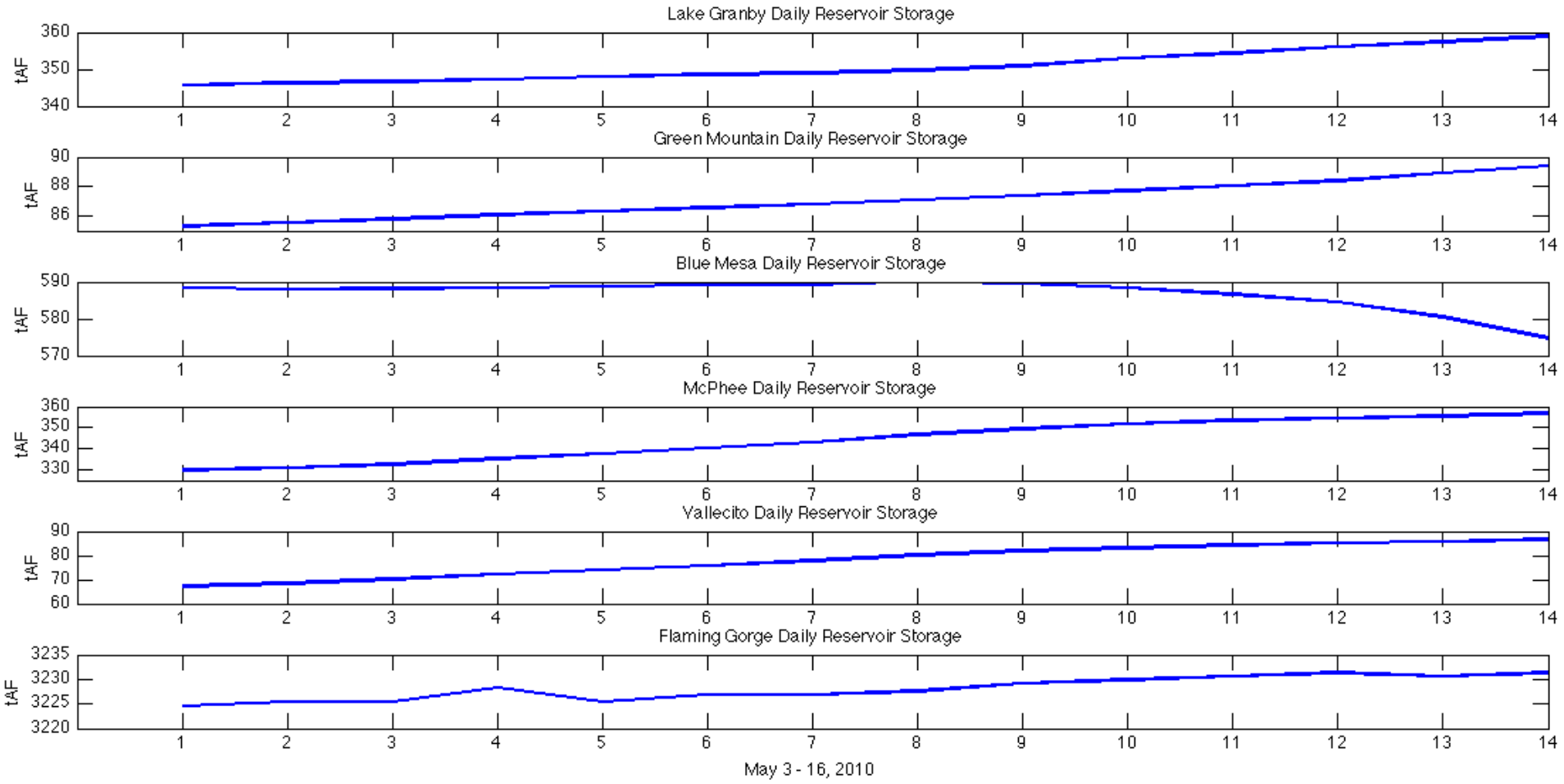

Max Capacity
1971-2000 Average


McPhee Res. Levels
Actual Level
1971-2000 Ave
Max Capacity
Thousand AF
400
350
300
250
200
150
100
50
0
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
WY 2009 - Current

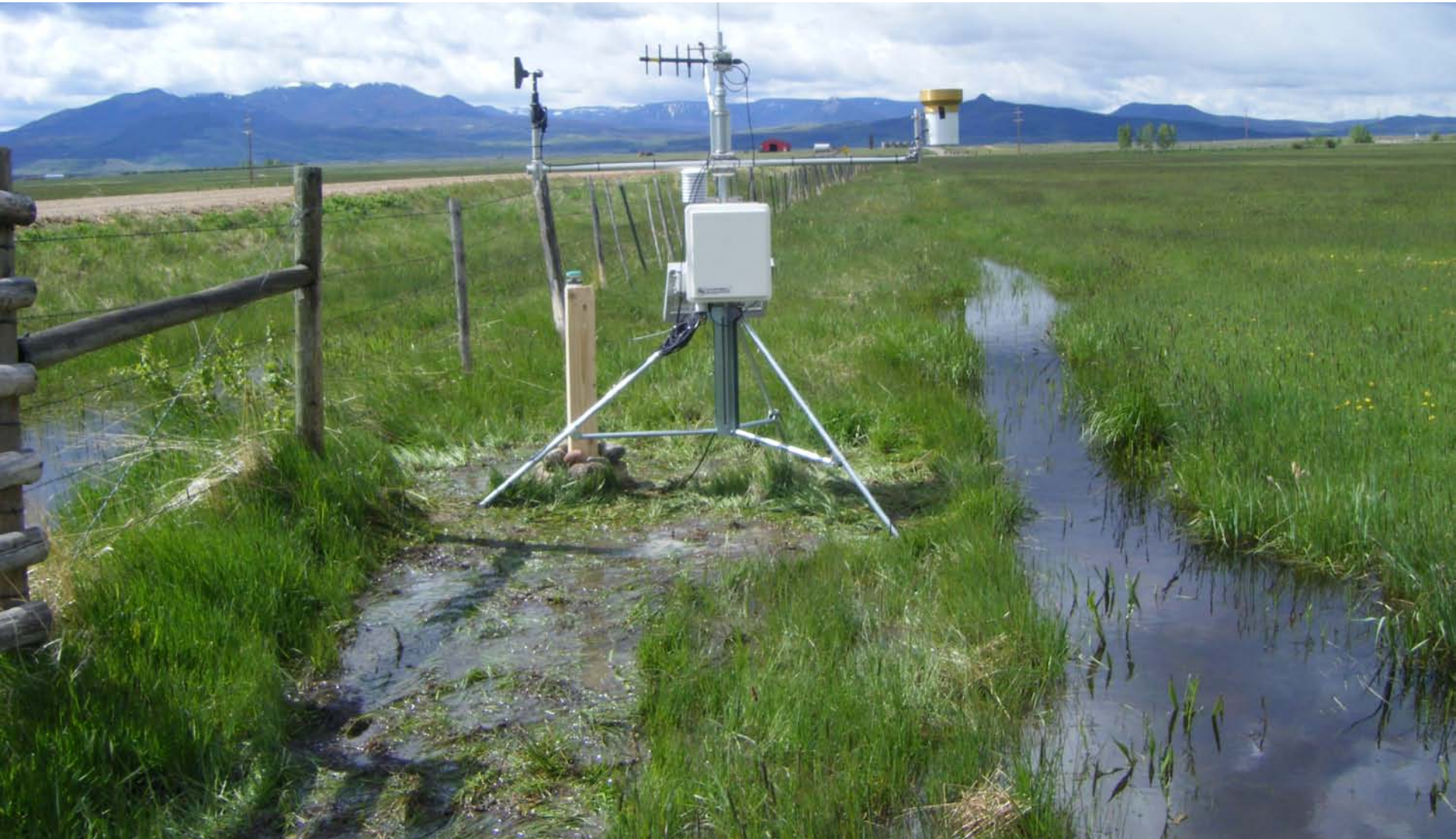

Max Capacity
1971-2000 Average


Flaming Gorge Res. Levels
Actual Level
1971-2000 Ave
Max Capacity
Thousand AF
4000
3500
3000
2500
2000
1500
1000
500
0
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
WY 2009 - Current

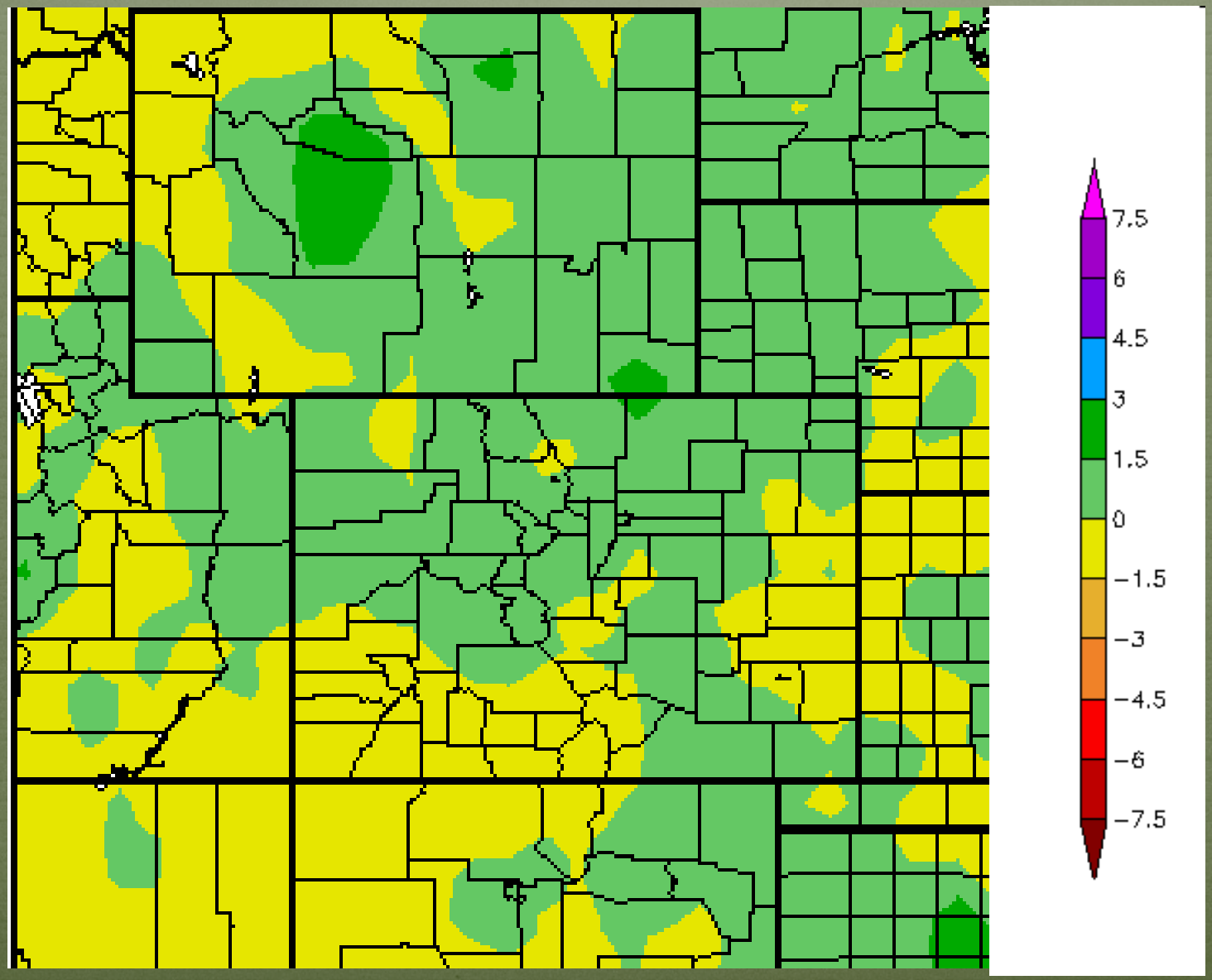
Daily Reservoir Level Time Series for Two Weeks

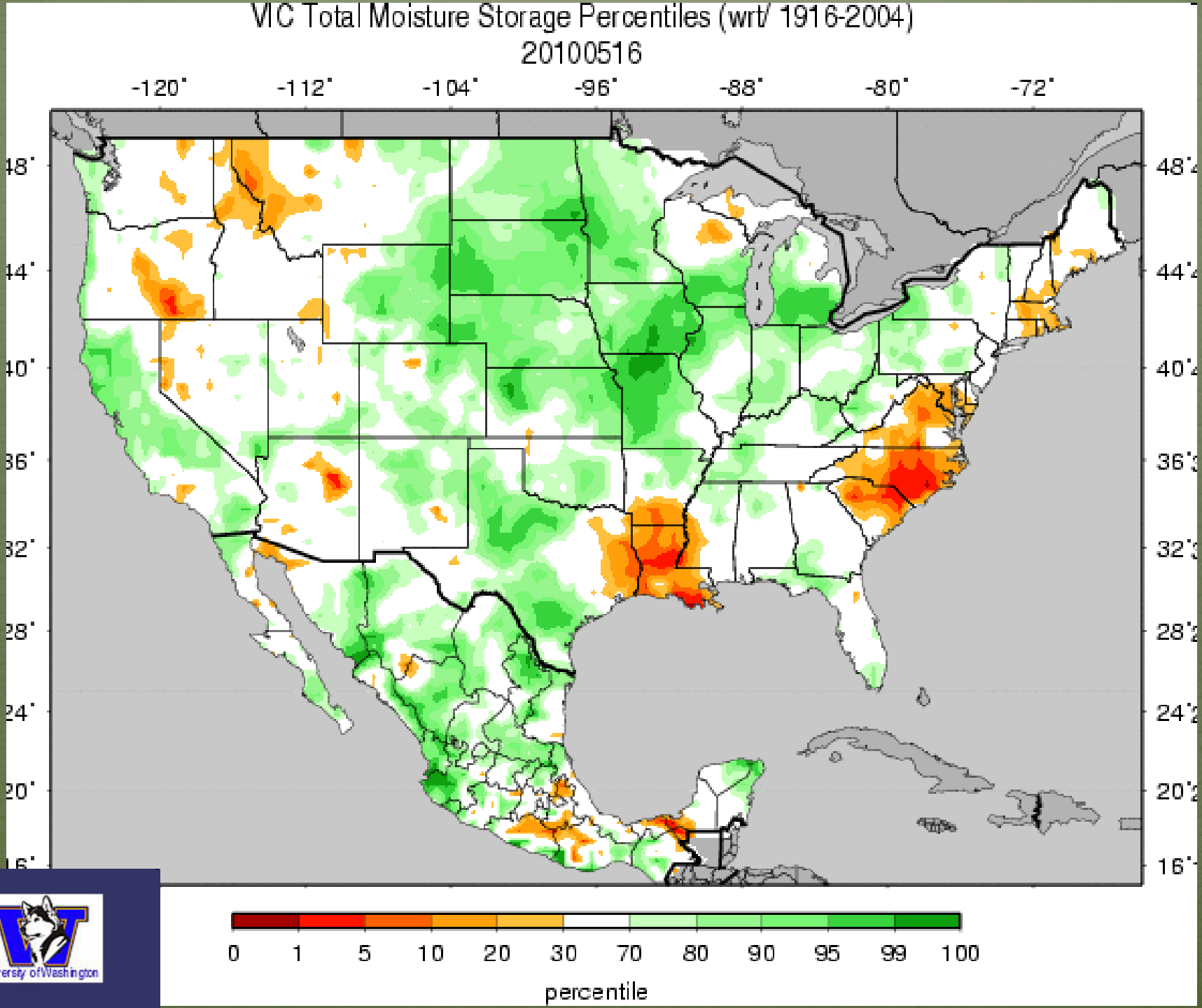


Water Demand



Temperature Departure from Normal
5/11/2010 – 5/17/2010

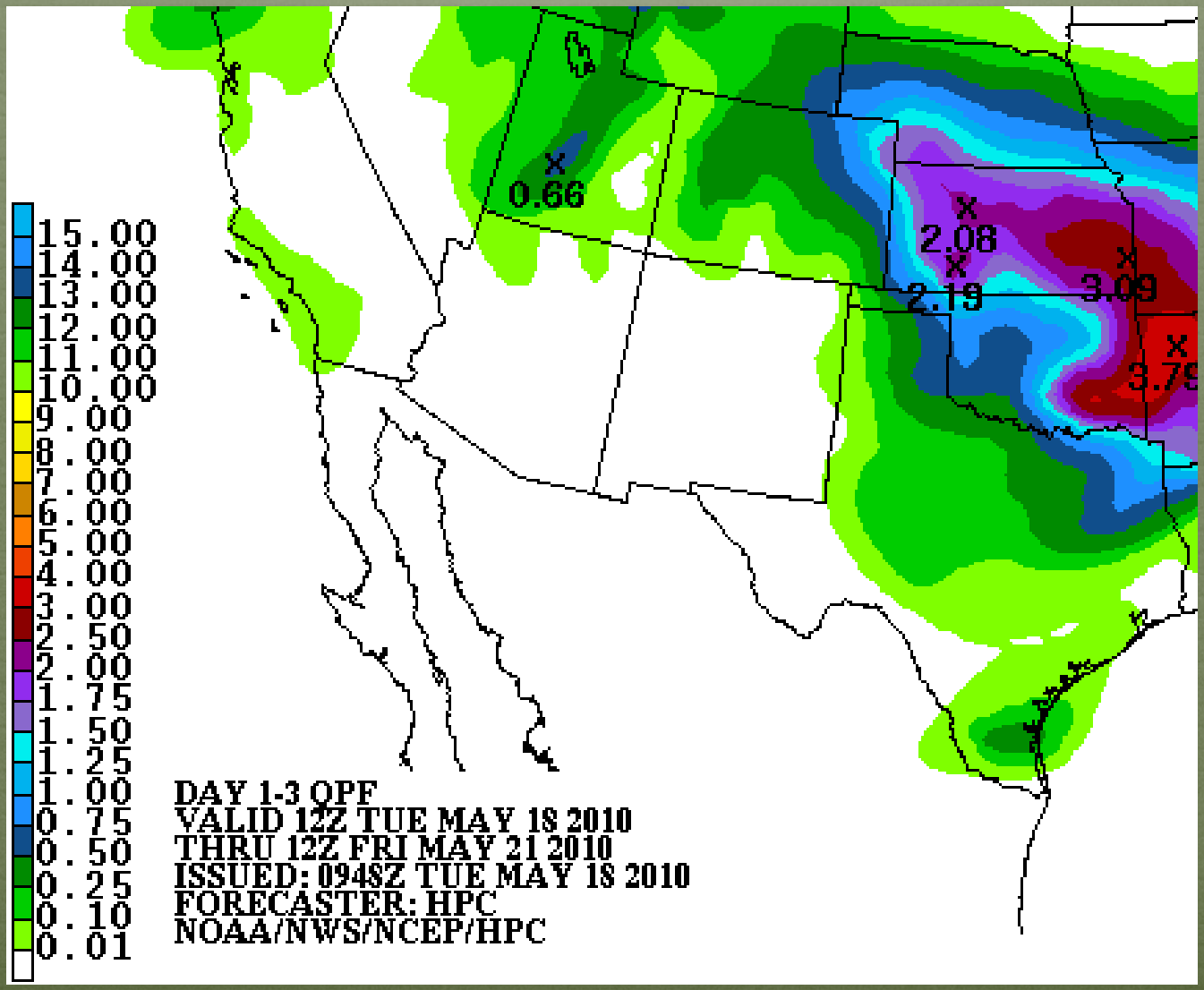




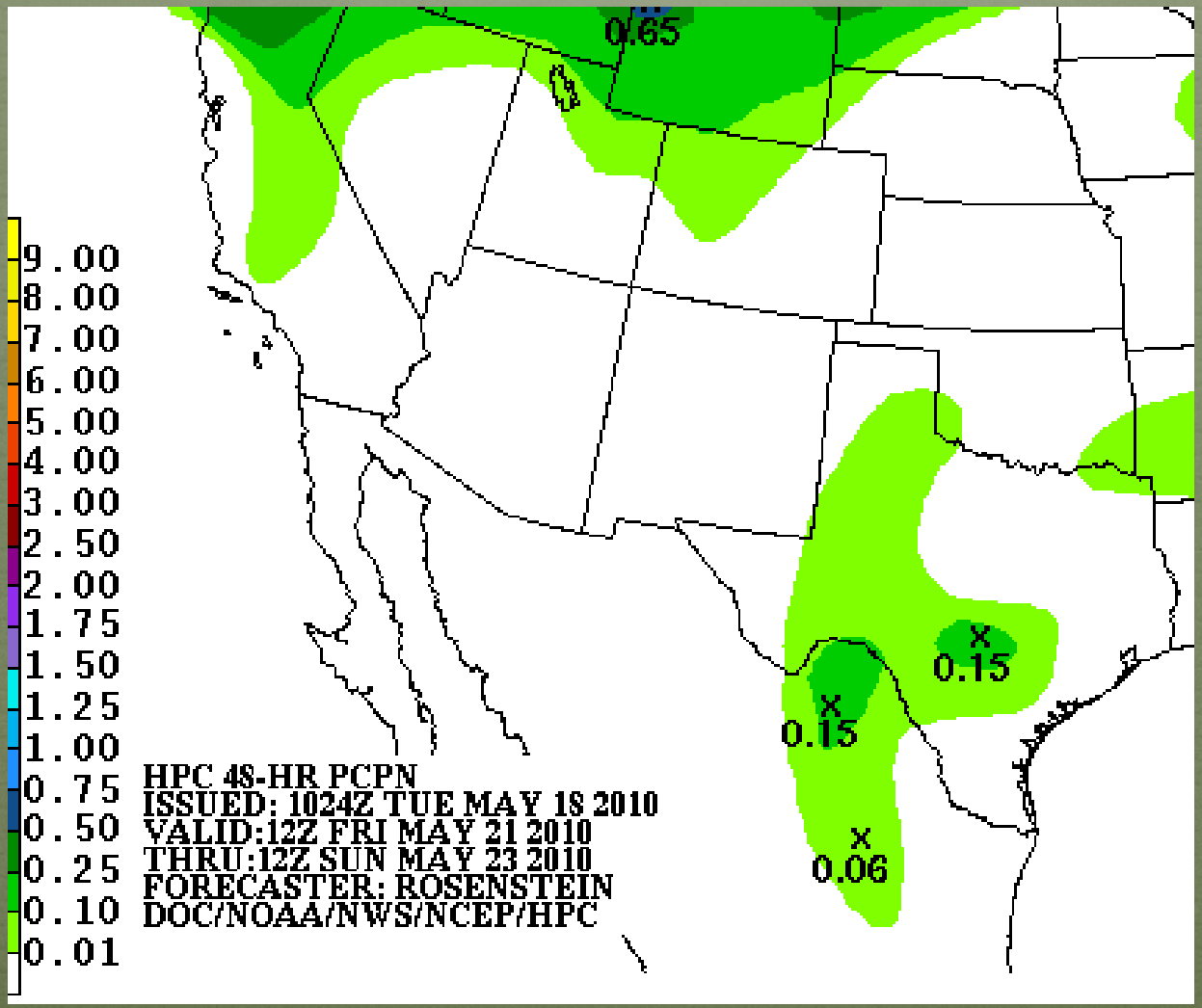
University of Washington

Precipitation Forecast

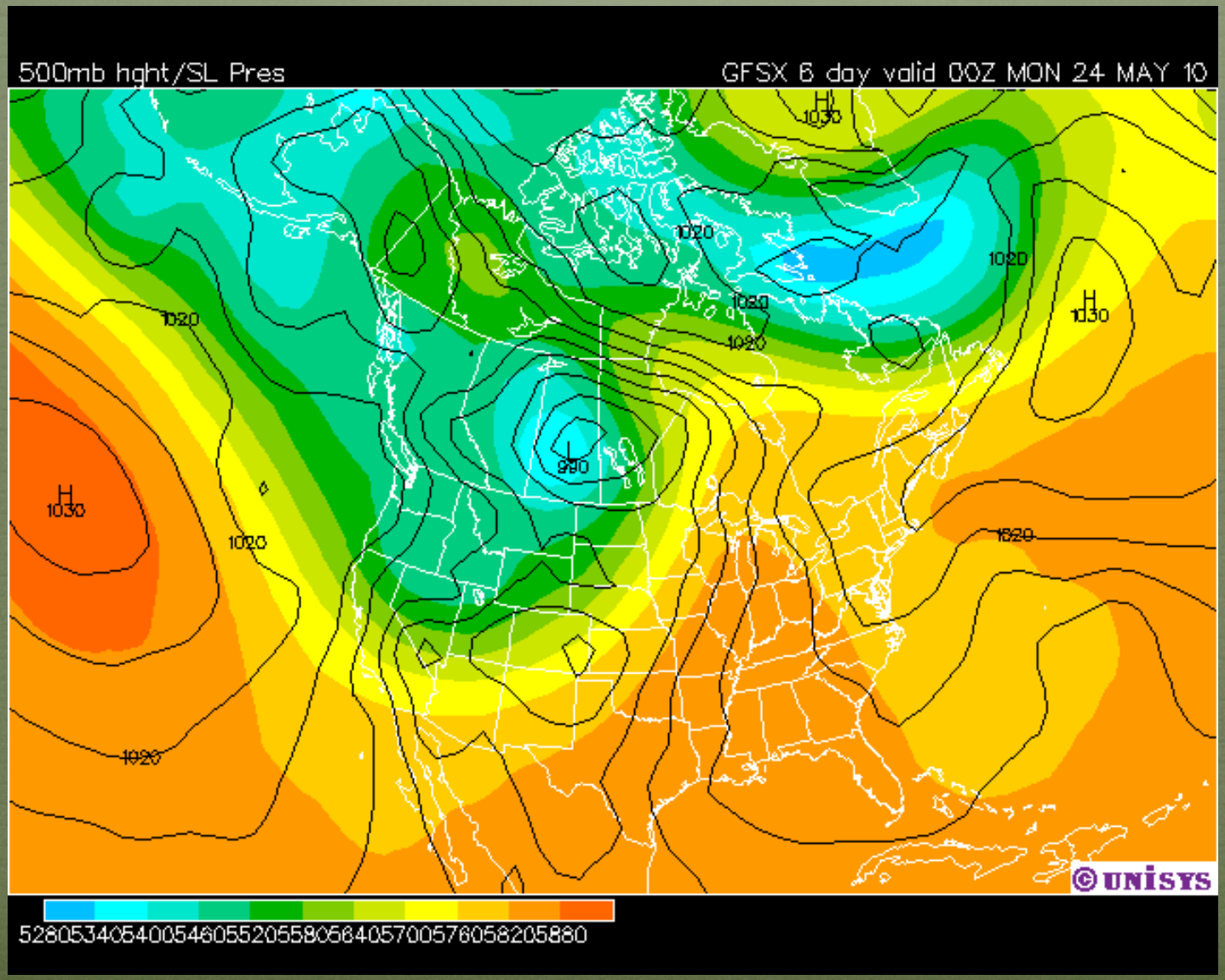
1-3 Day QPF


15.00
14.00
13.00
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.50
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.10
0.01
0.66
2.08
2.19
3.09
DAY 1-3 QPF
VALID 12Z TUE MAY 18 2010
THRU 12Z FRI MAY 21 2010
ISSUED: 0948Z TUE MAY 18 2010
FORECASTER: HPC
NOAA/NWS/NCEP/HPC

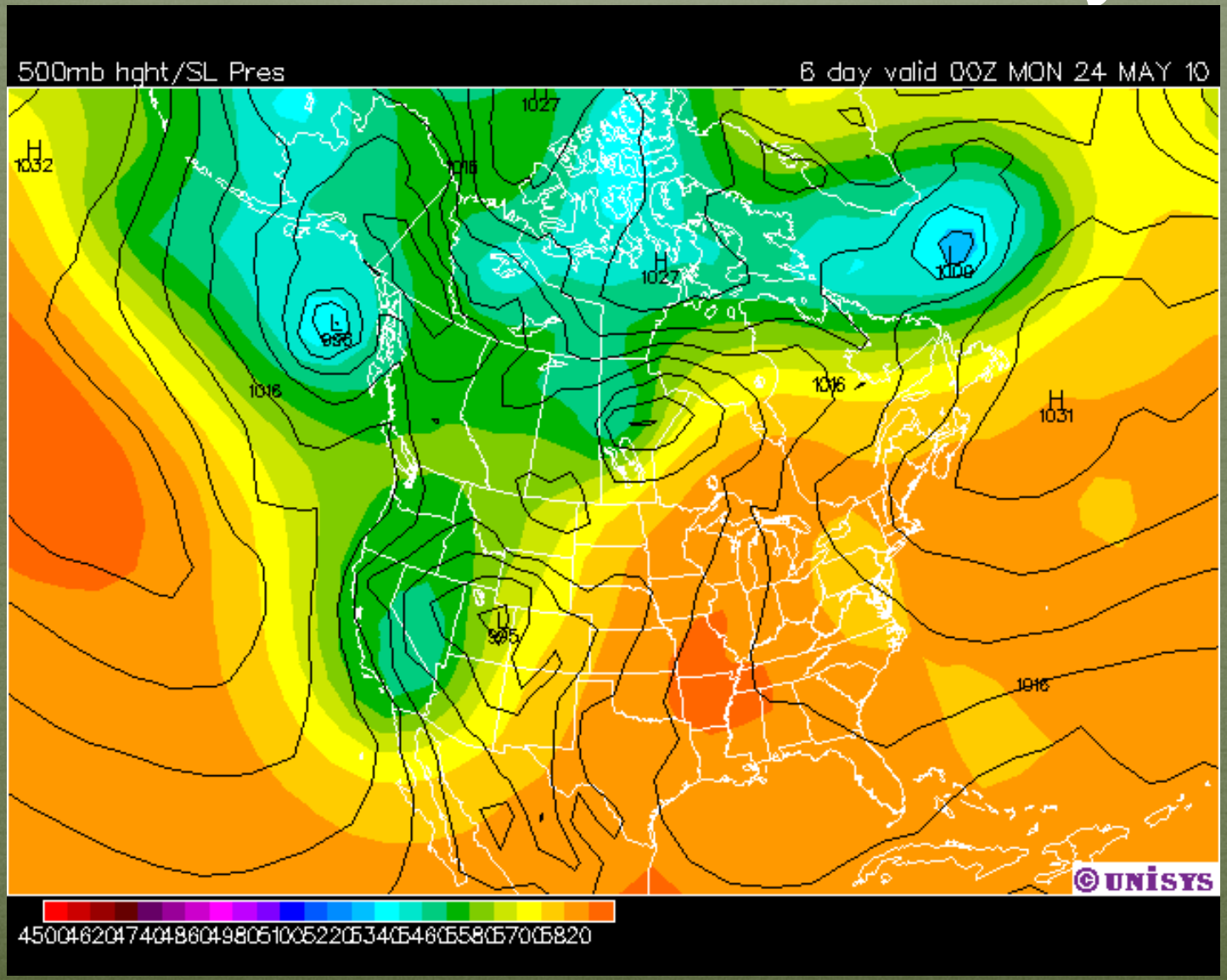
4-5 Day QPF


0.65
0.15
0.15
0.06
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.50
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.10
0.01
HPC 48-HR PCPN
ISSUED: 1024Z TUE MAY 18 2010
VALID:12Z FRI MAY 21 2010
THRU:12Z SUN MAY 23 2010
FORECASTER: ROSENSTEIN
DOC/NOAA/NWS/NCEP/HPC

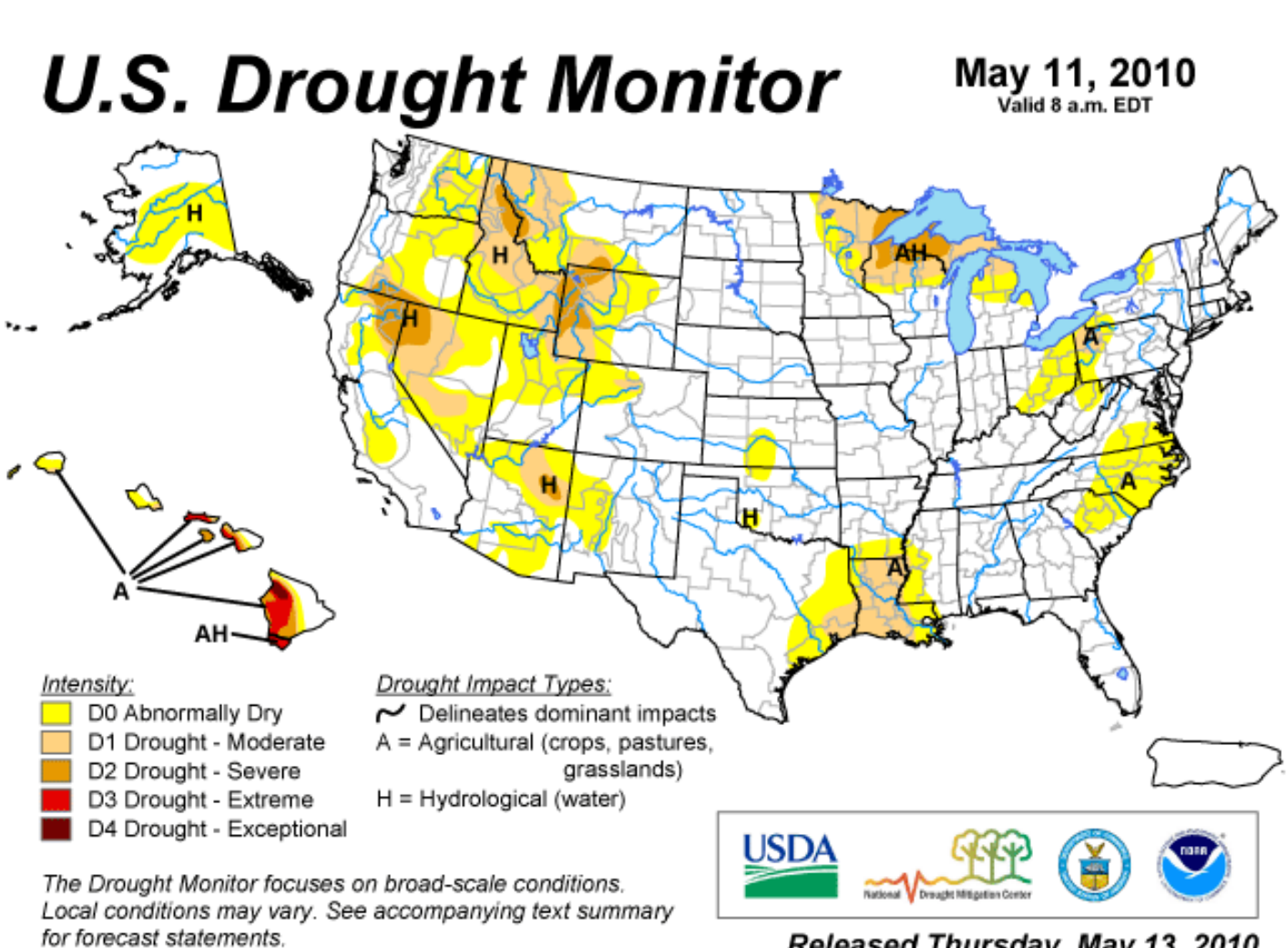
GFS 500 mb Day 6

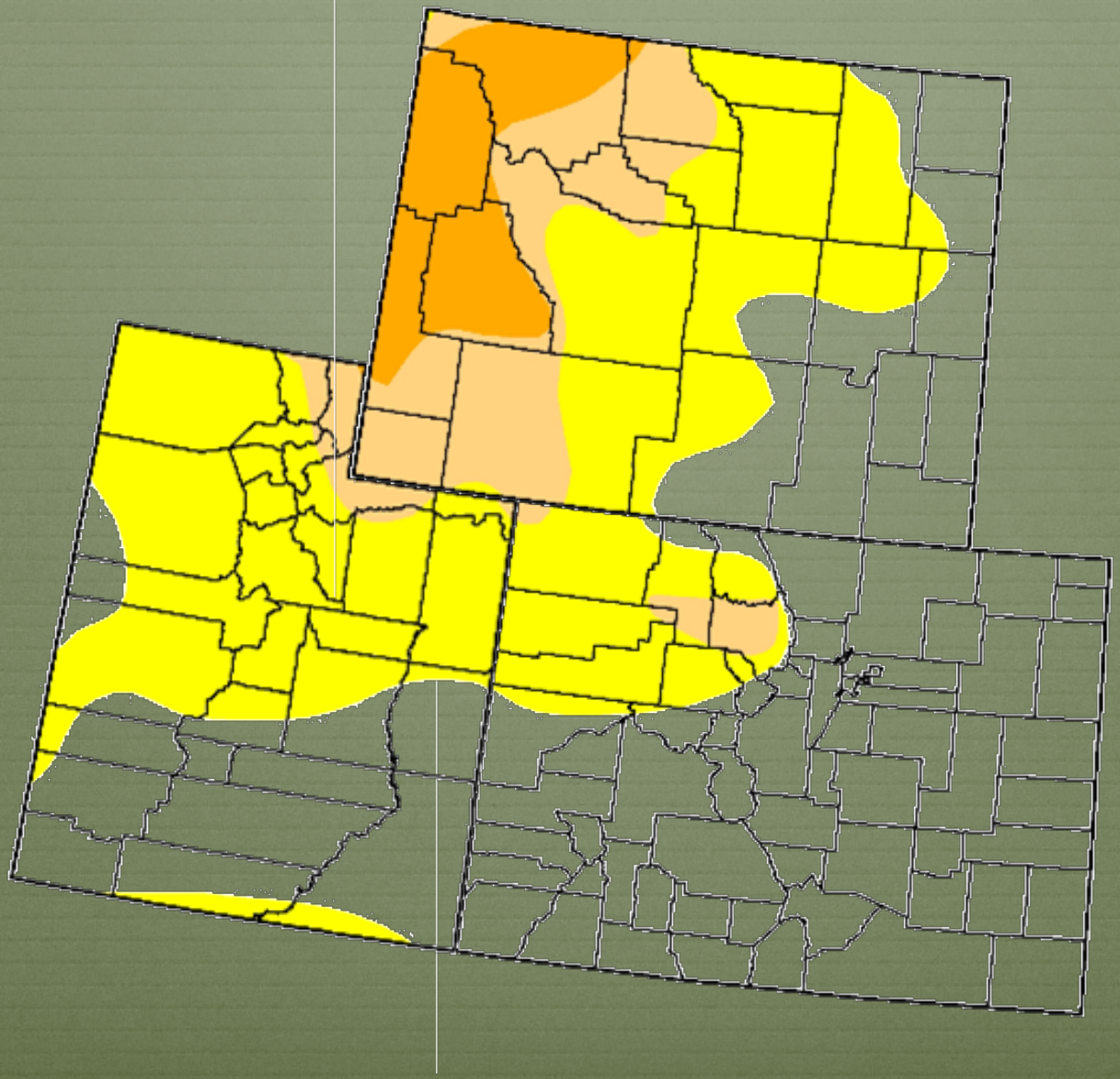


ECMWF 500 mb day 6



Recommendations





INFO

For more information

Summary

Storms last week brought ample amounts of moisture to the tri-state area and also helped keep temperatures near average. The majority of the snotels in the Upper Colorado saw increases in their water-year-to-date precipitation percent of averages from last week, and very little snow melt occurred. There was very little change in the streamflows from last week. 19 of the 69 gages reporting below normal flows were in the moderate to severe drought categories--these stations were mainly located in Utah and Wyoming. Compared to this time in previous years, more stations are reporting below normal flows than the last couple of years, but are in much better condition than the 2002-2003 drought years. Mid-month water supply forecasts from the CBRFC show improvements for the Green, Yampa-White and Colorado River basins, with decreases for the Gunnison and San Juan basins. Soil moisture conditions continue to improve over the drought affected regions, and reservoir levels across the tri-state area remain in good condition.

The upcoming storm looks to be primarily convectively driven and will focus most of its moisture east of the mountains. This is a warm system, which will mainly bring rain throughout the region, though later this evening, elevations above 9000 feet will see some snow accumulation. The area will dry out and warm up after the passage of this storm (with scattered showers through early Thursday), with the next possibility of wet weather coming late in the weekend and early next week. Models are in good agreement about the passage of a trough early next week, though there is disagreement about the location and intensity of the storm, with the ECMWF bringing in a stronger trough and wetter conditions.

A Wyoming representative on the call has recommended status quo for the Green River basin, as they have been seeing improvements, but not enough to warrant any drought category improvements. No recommendations were made for the Utah portion of the Upper Colorado basin. Opinions were pretty evenly split amongst the callers on whether or not to remove the D1 from Grand, Routt, and Jackson counties in Colorado. With good water supplies and recent heavy storms, some feel that there is not a lot of evidence to support keeping the D1. Others feel that the low streamflows and poor snowpack seasonal peaks in the area warrant keeping the D1. Because no settlement could be reached, we defer to the Drought Monitor author to choose what he thinks is best for the area. Also of concern is the San Juan basin which continues to dry out quickly after a wet winter. Our recommendation is status quo for the region (with no introductions of D0), and the situation will be closely monitored over the next few weeks.