

Spring 2010

June 8th, 2010



NIDIS - UPPER COLORADO BASIN PILOT PROJECT

Weekly Climate, Water & Drought Assessment

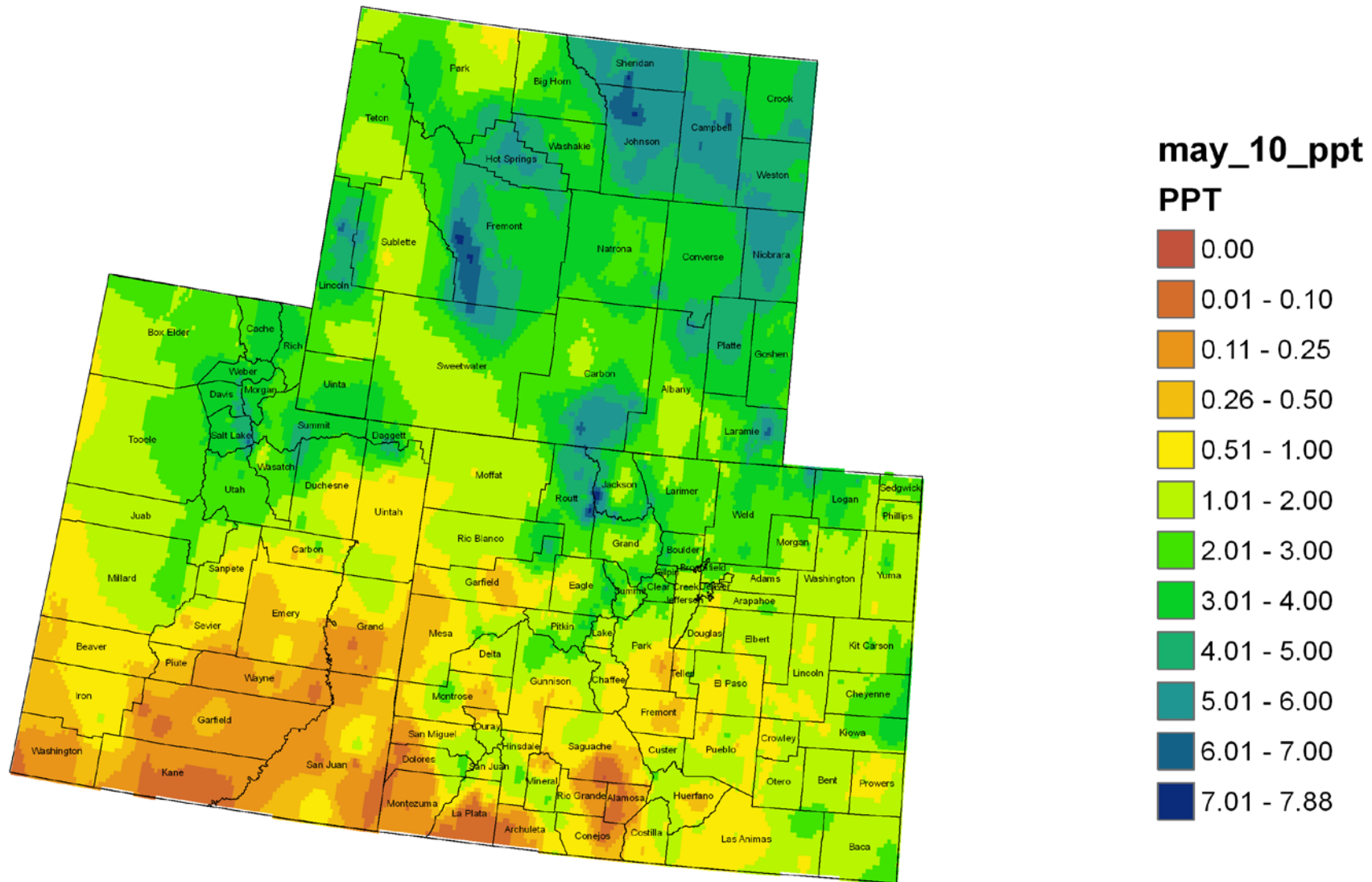
Today's Agenda

- Assessment of current water conditions
- Precipitation Forecast
- Recommendations for Drought Monitor

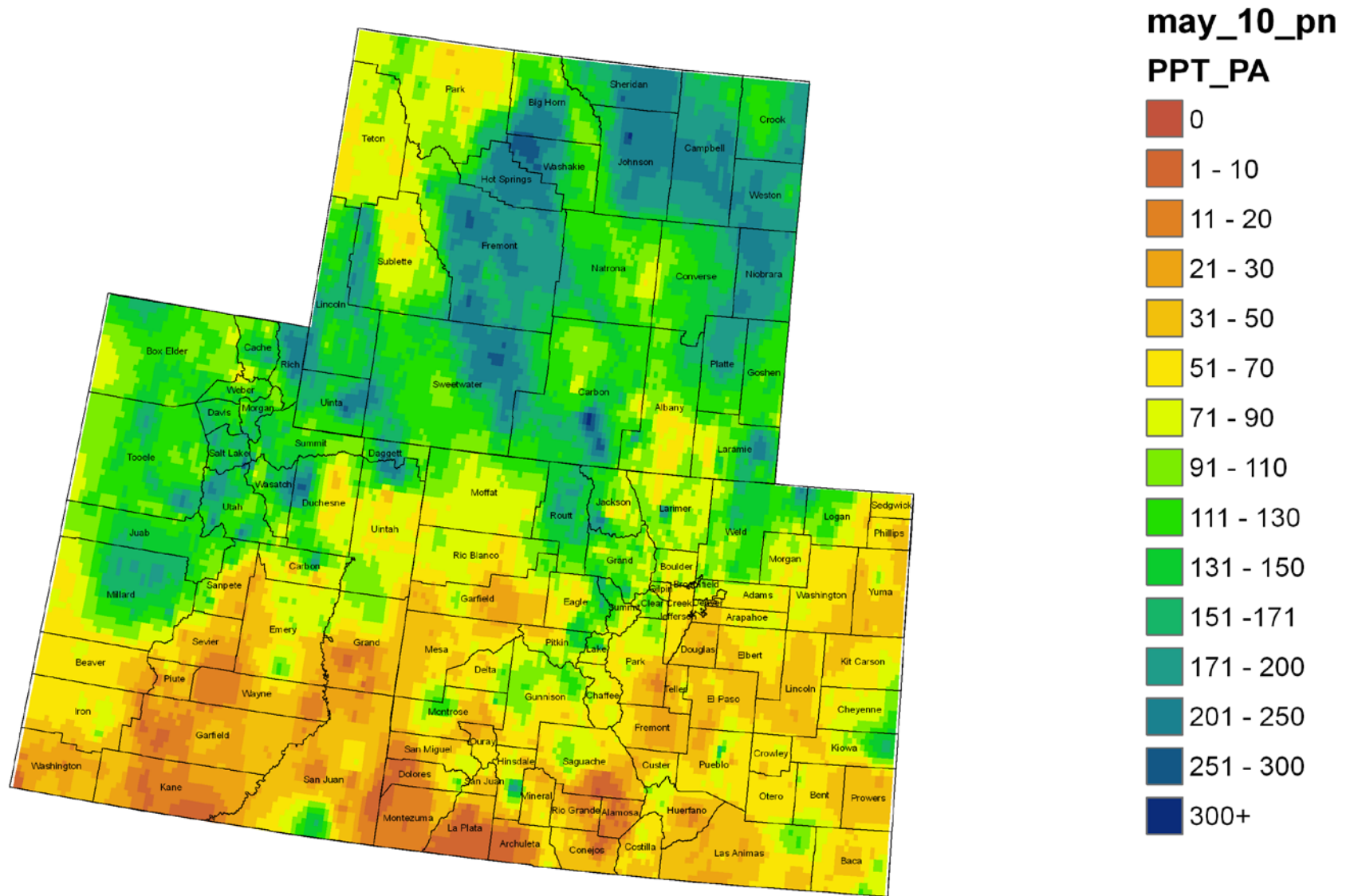
Precipitation/Snowpack Update



Colorado, Utah and Wyoming May Precipitation (in)



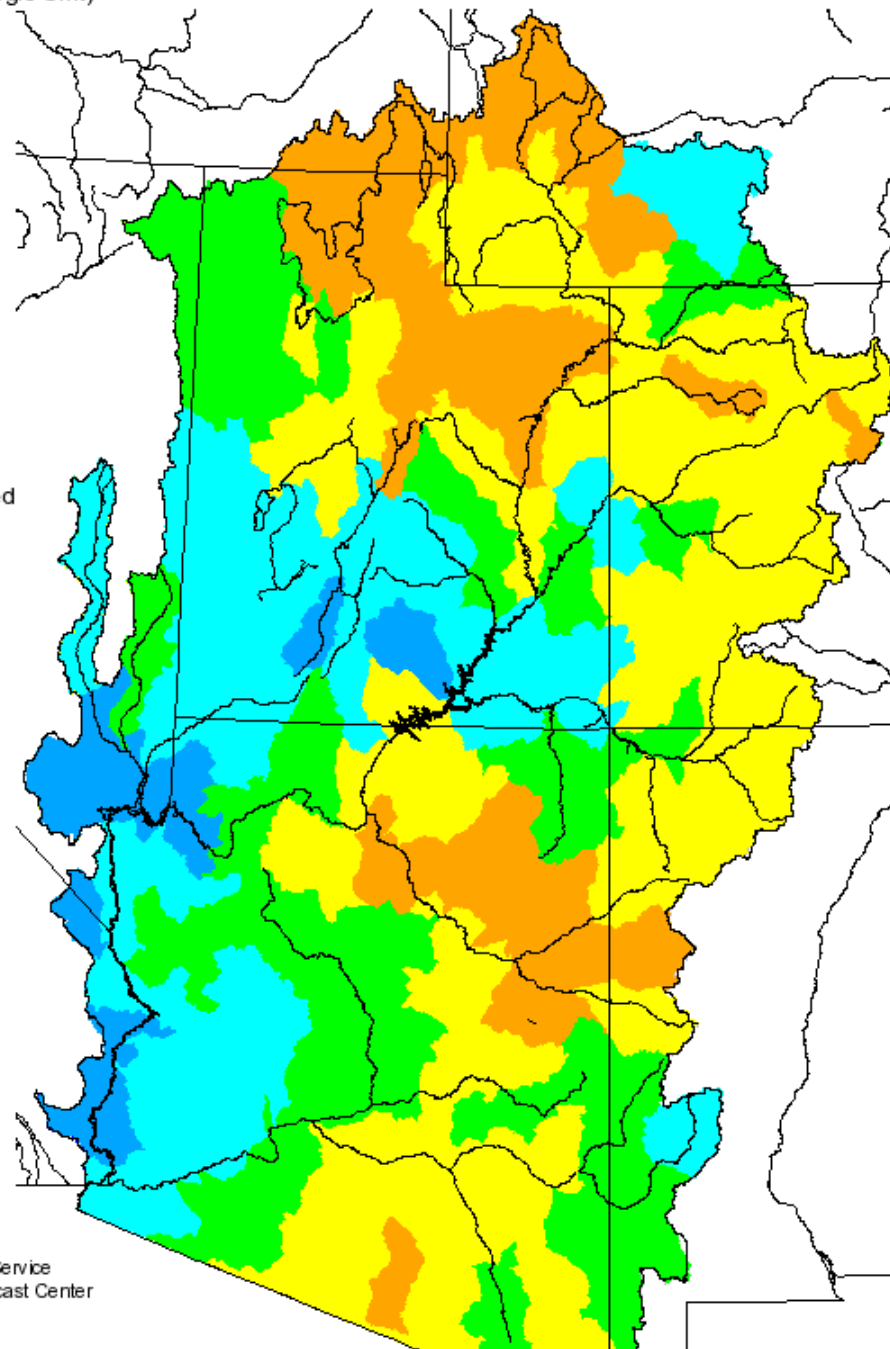
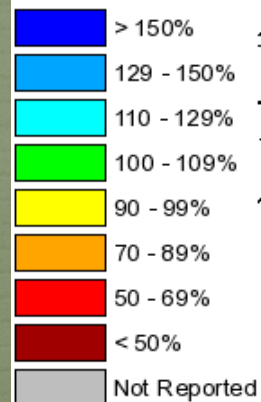
Colorado, Utah and Wyoming May Precipitation as Percent of Average



Seasonal Precipitation, October 2009 - May 2010

(Averaged by Hydrologic Unit)

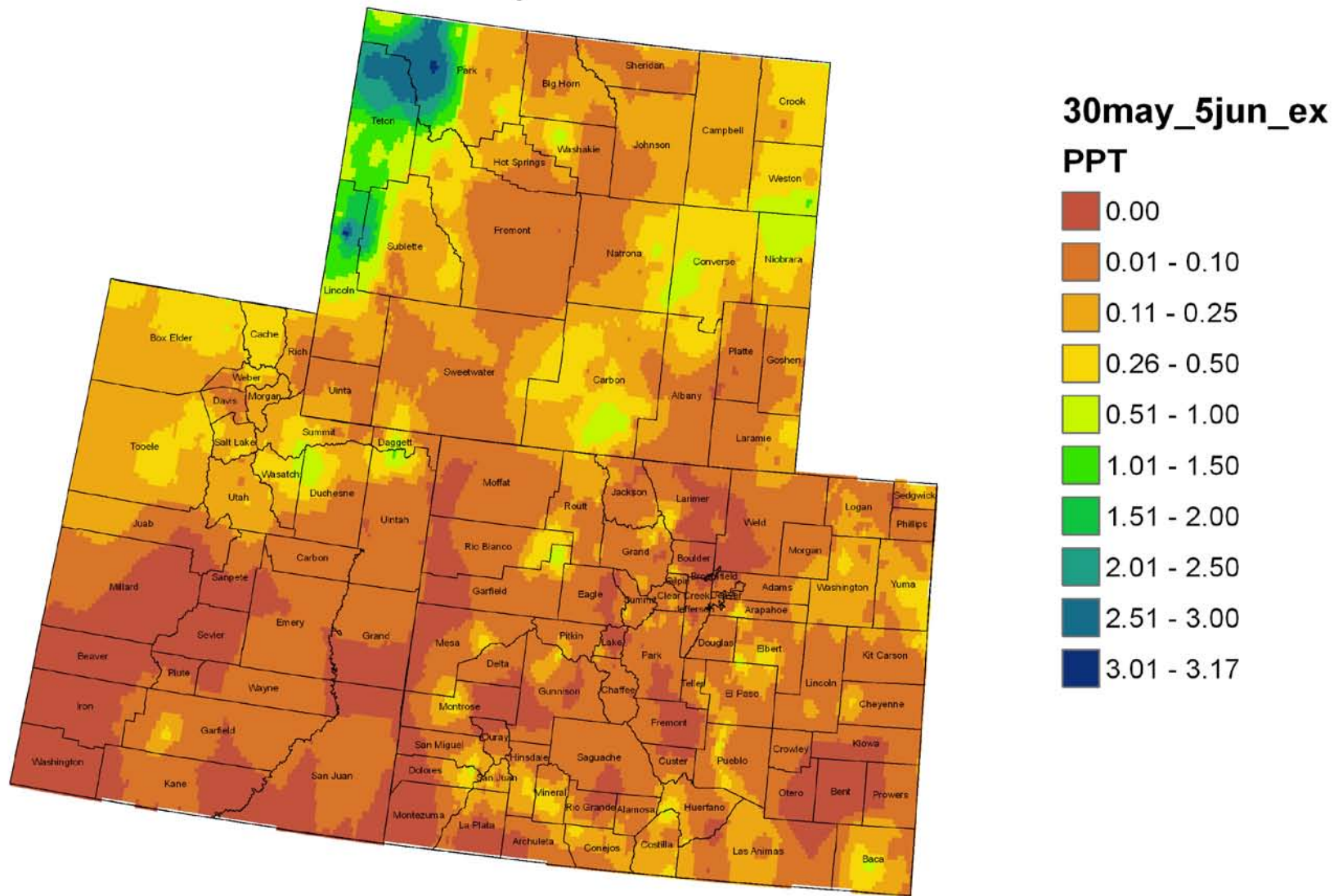
% Average



Prepared by
NOAA, National Weather Service
Colorado Basin River Forecast Center
Salt Lake City, Utah
www.cbrfc.noaa.gov

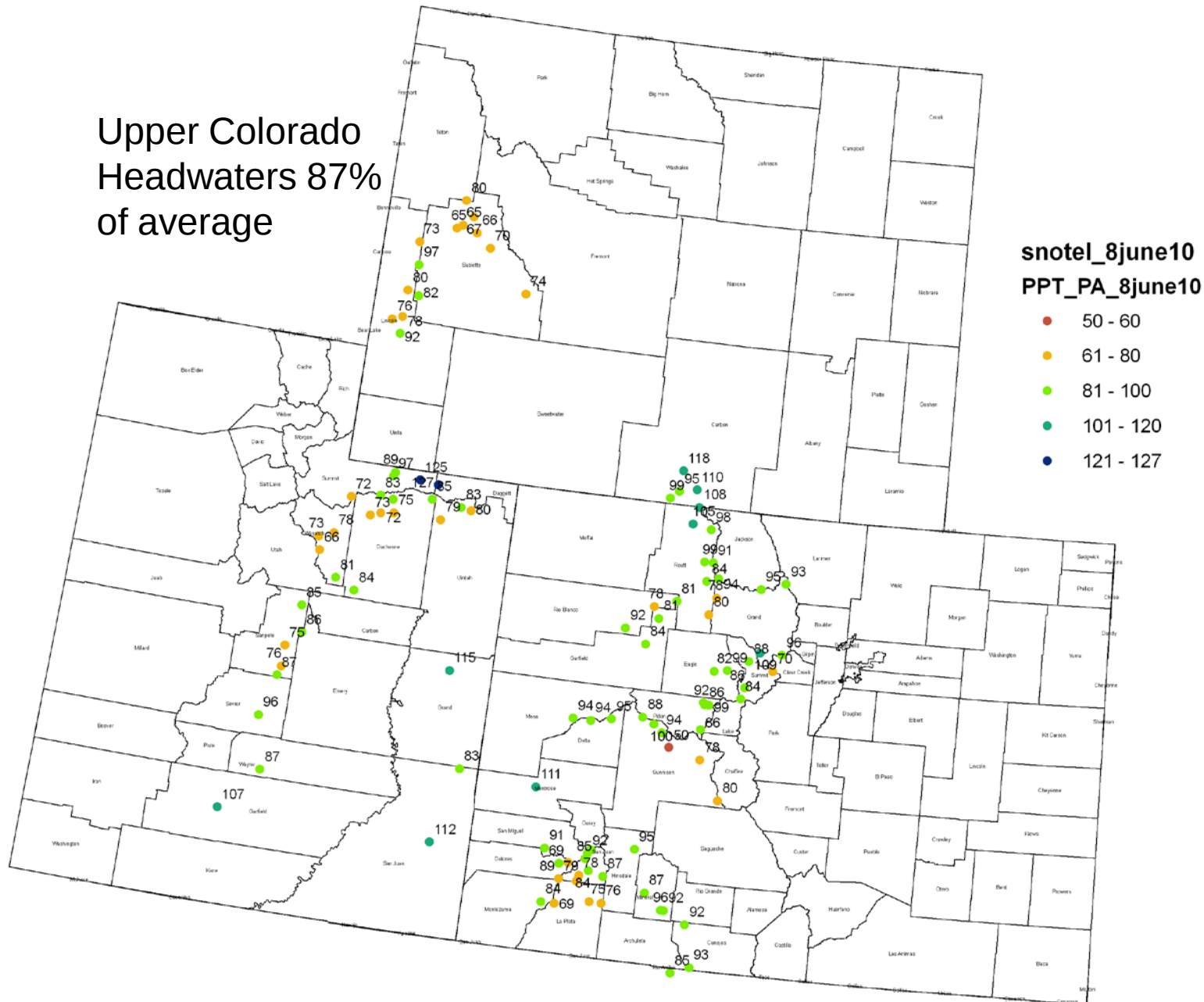
Colorado, Utah and Wyoming 7 Day Precipitation (in)

30 May - 5 June 2010

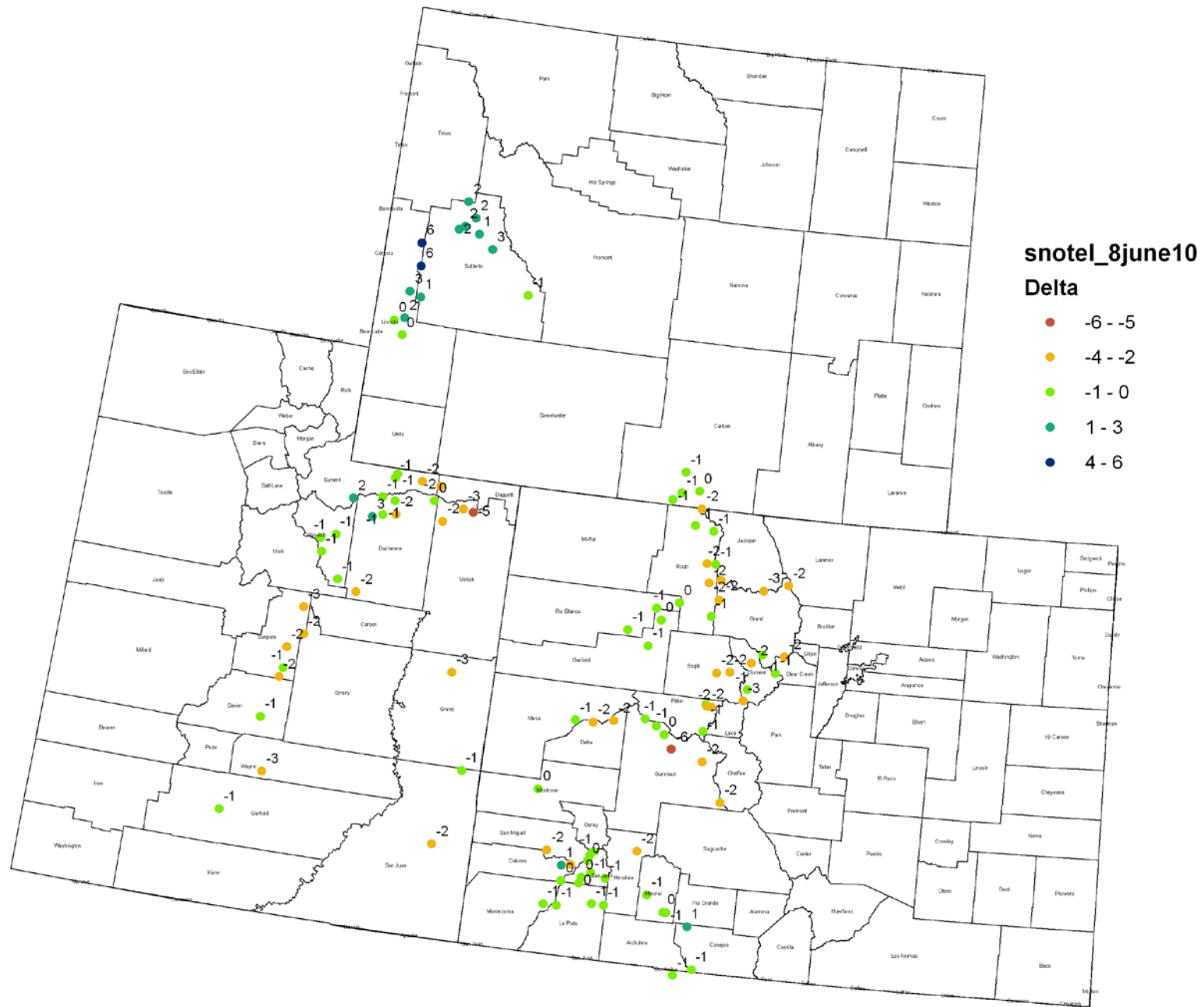


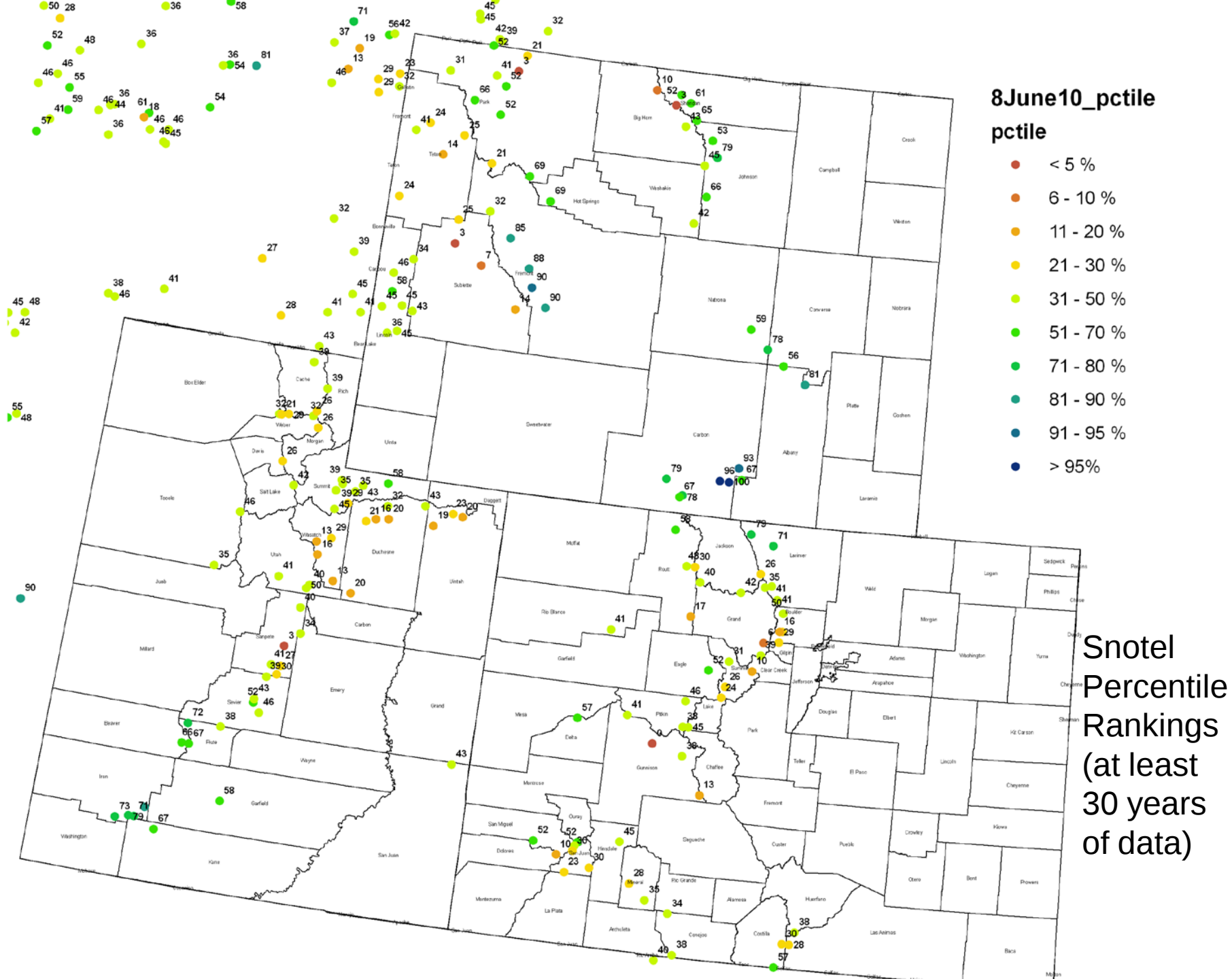
Snotel WYTD Precipitation as Percentage of Average

Upper Colorado
Headwaters 87%
of average

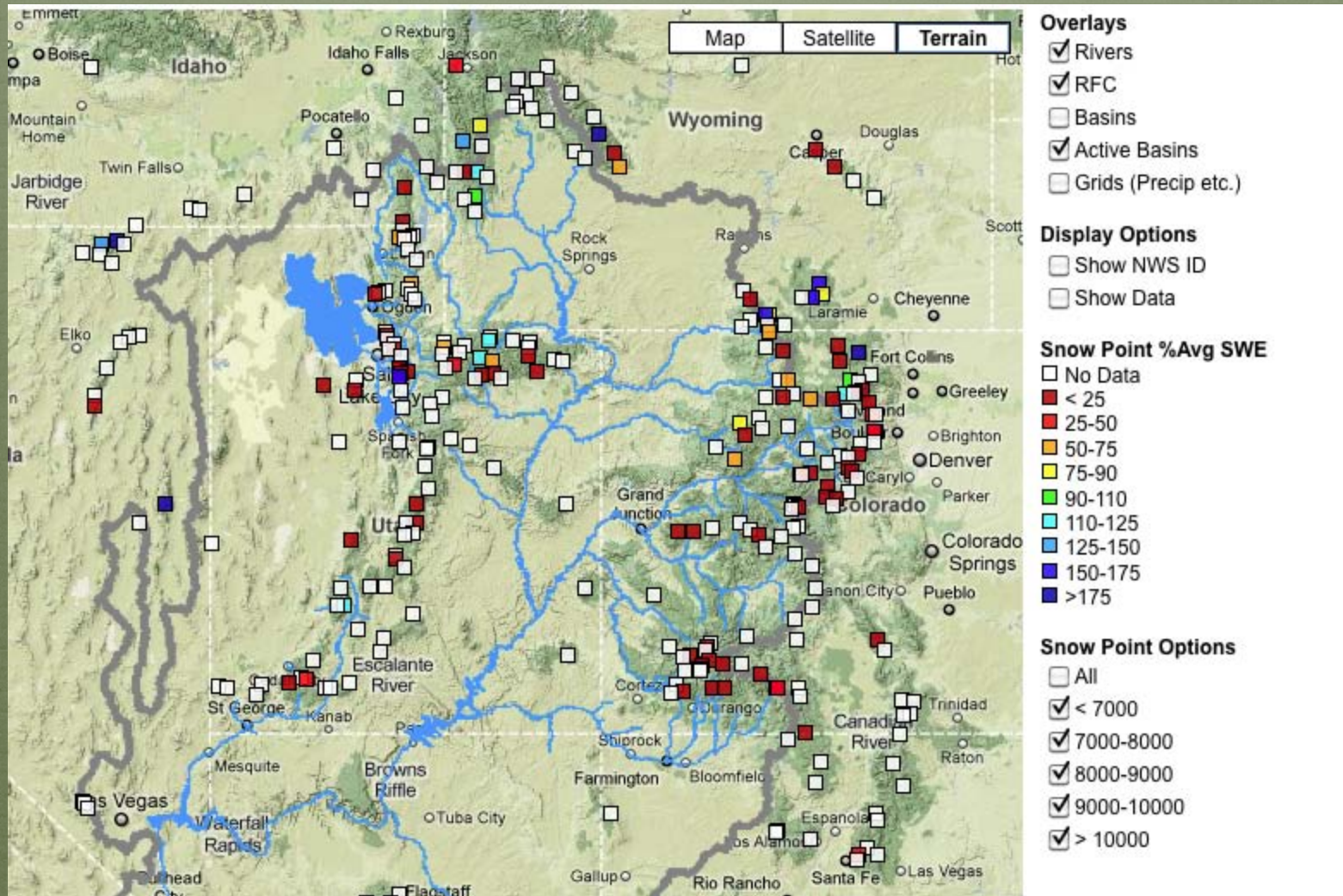


1 Week Change in Snotel WYTD Precipitation % Average

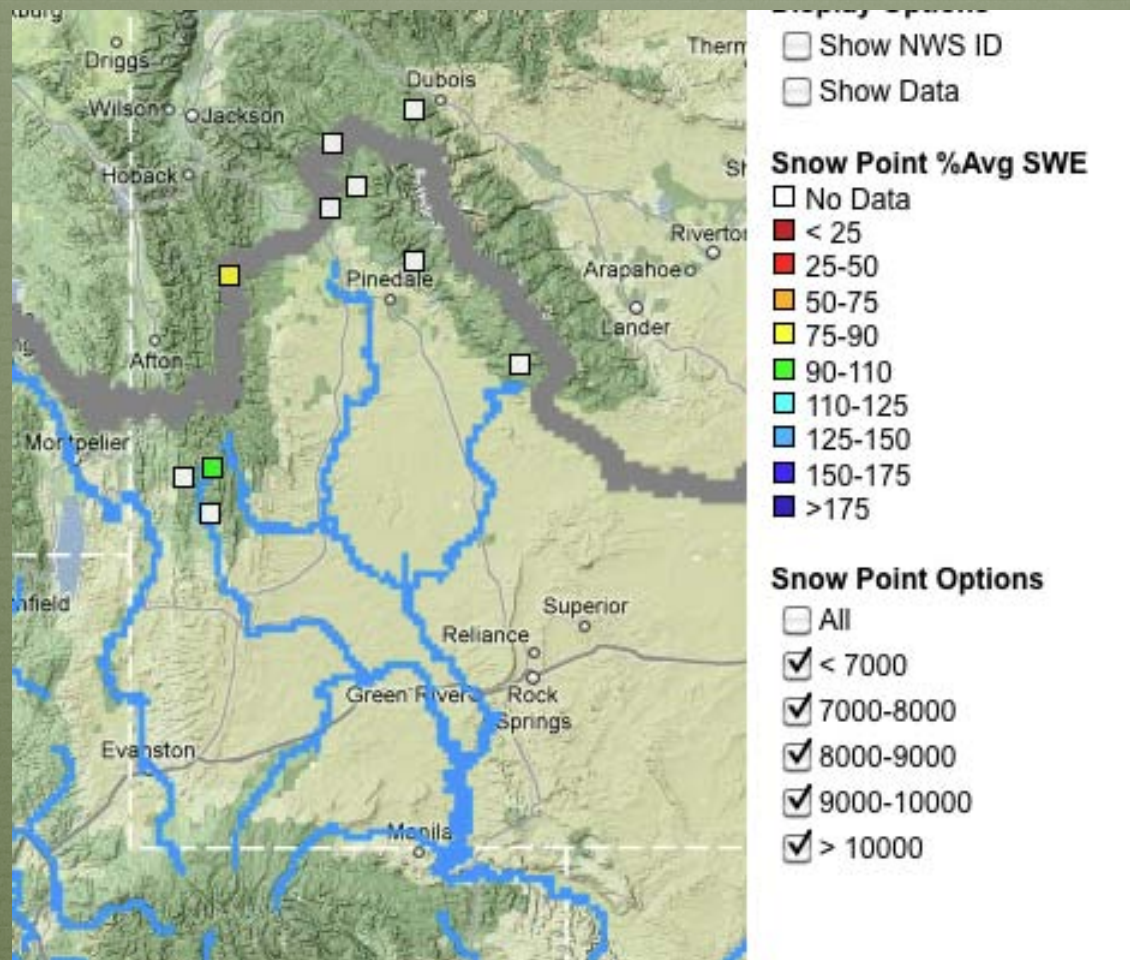




Upper Colorado River Basin

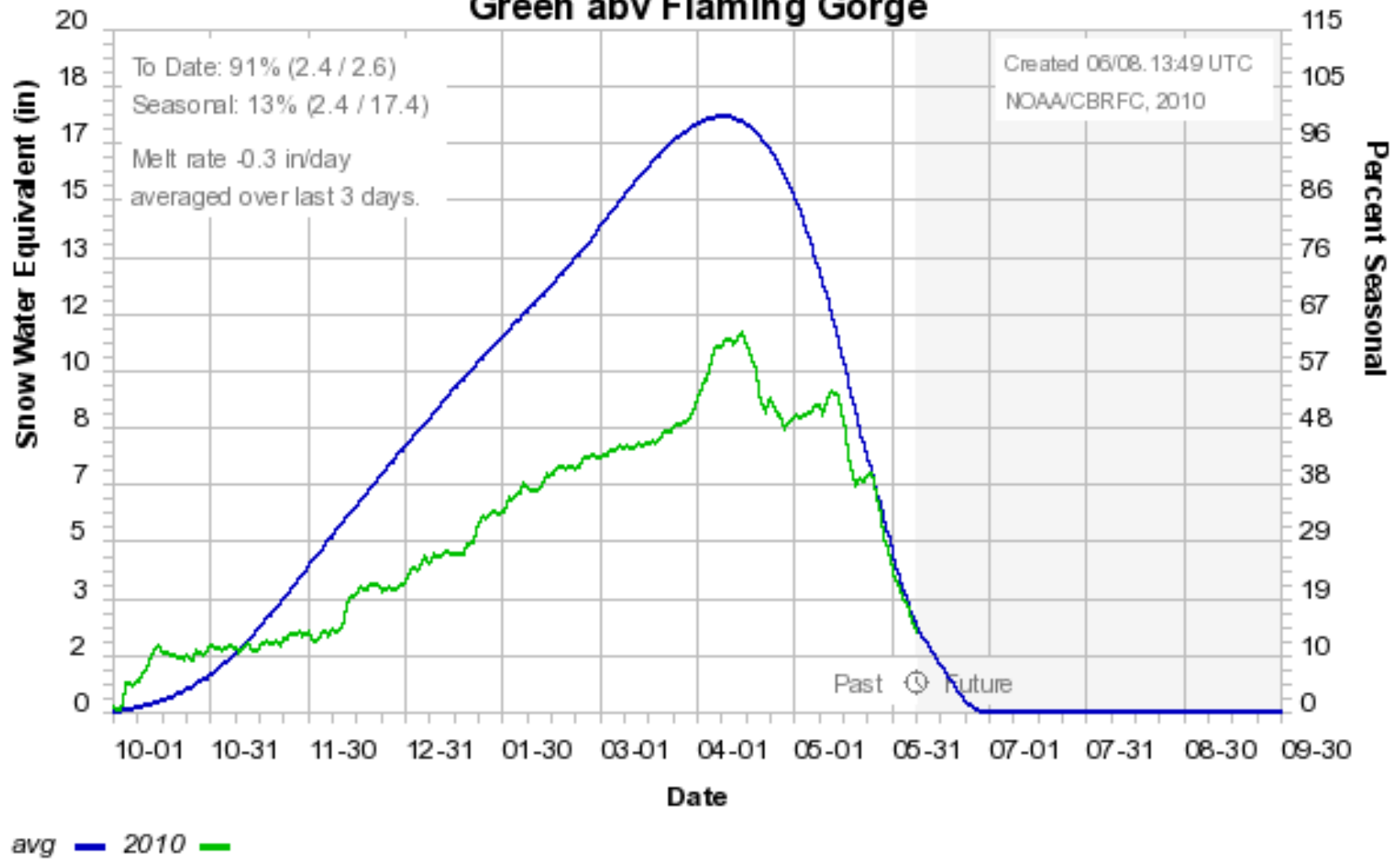


Green River Basin above Flaming Gorge



Colorado Basin River Forecast Center

Green abv Flaming Gorge

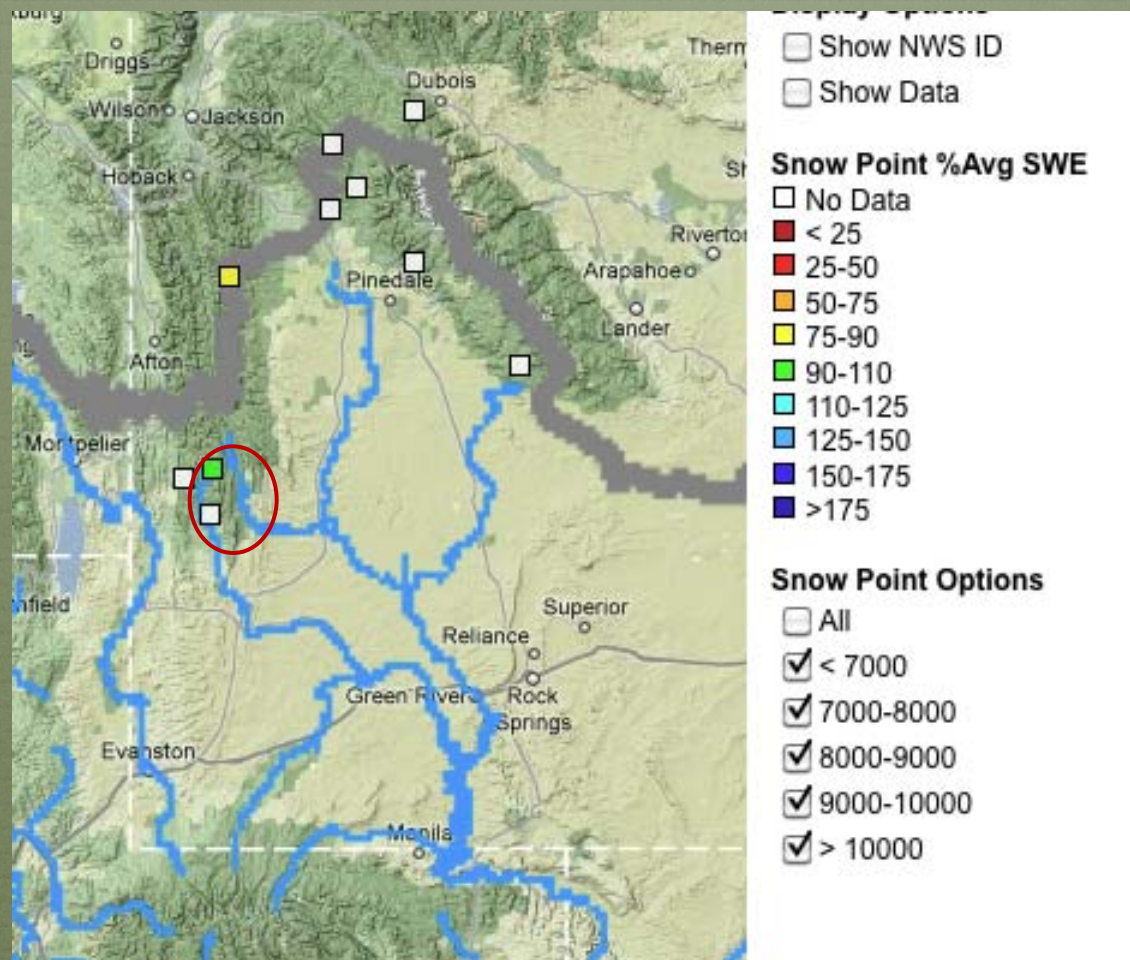


Basin Snowpack: 91%

Peak snowpack: 64% of average peak

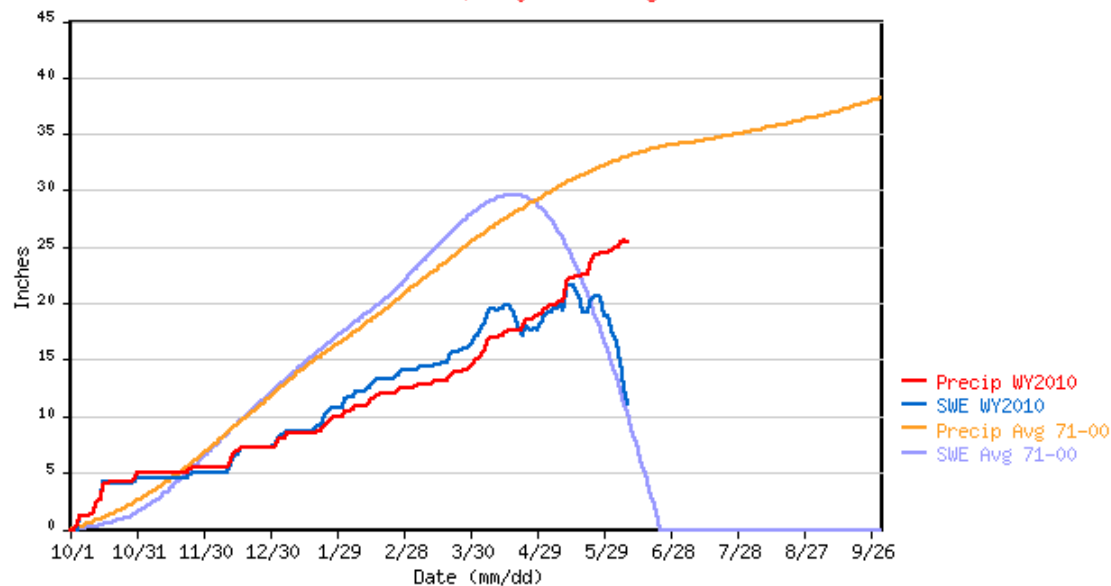
WYTD Precipitation percent of average: 82%

Indian Creek and Hams Fork



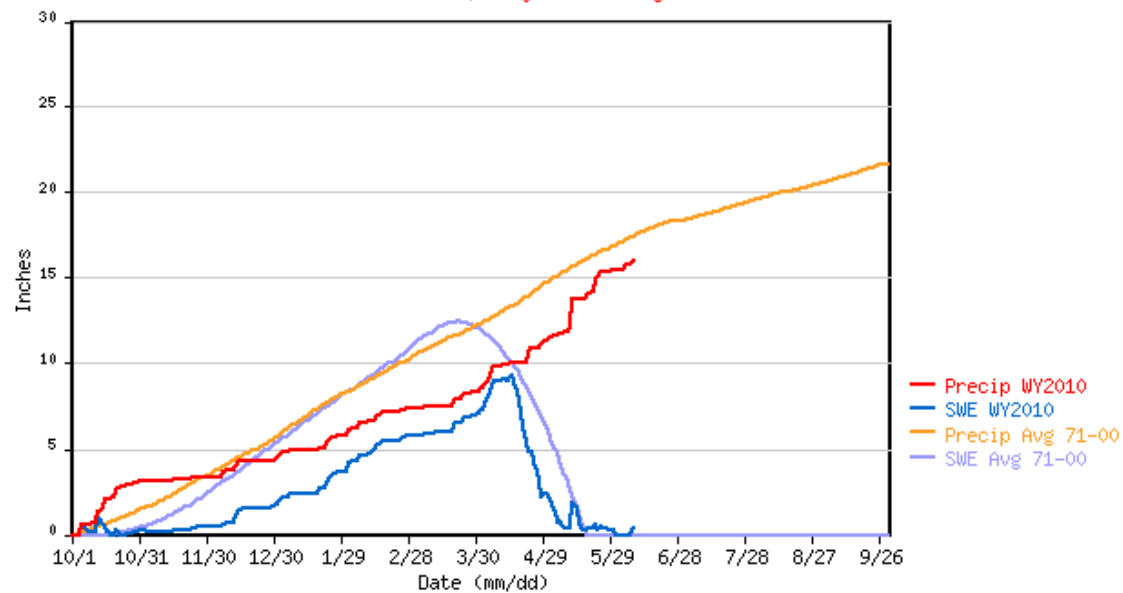
INDIAN CREEK SNOTEL for Water Year 2010

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

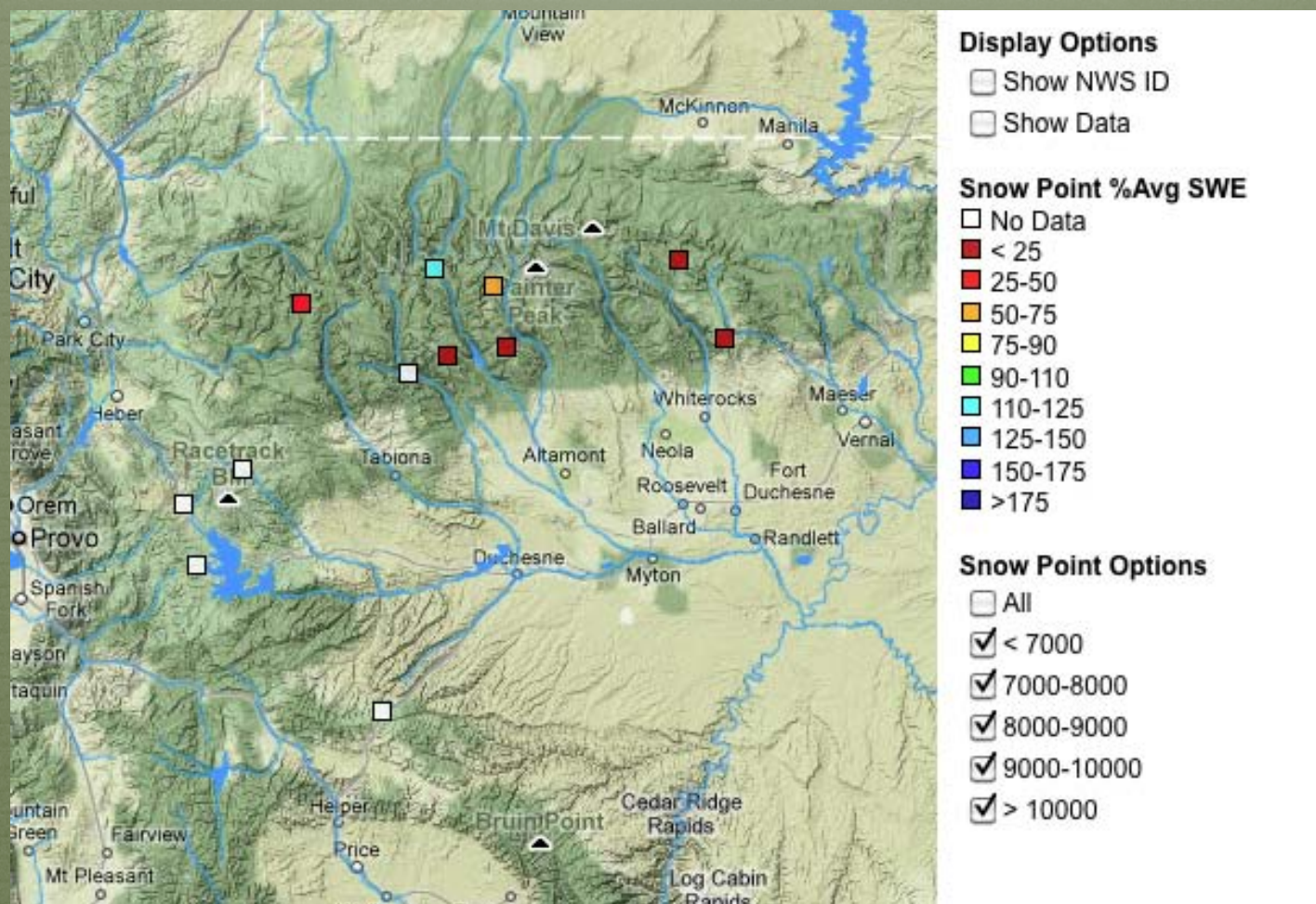


HAMS FORK SNOTEL for Water Year 2010

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



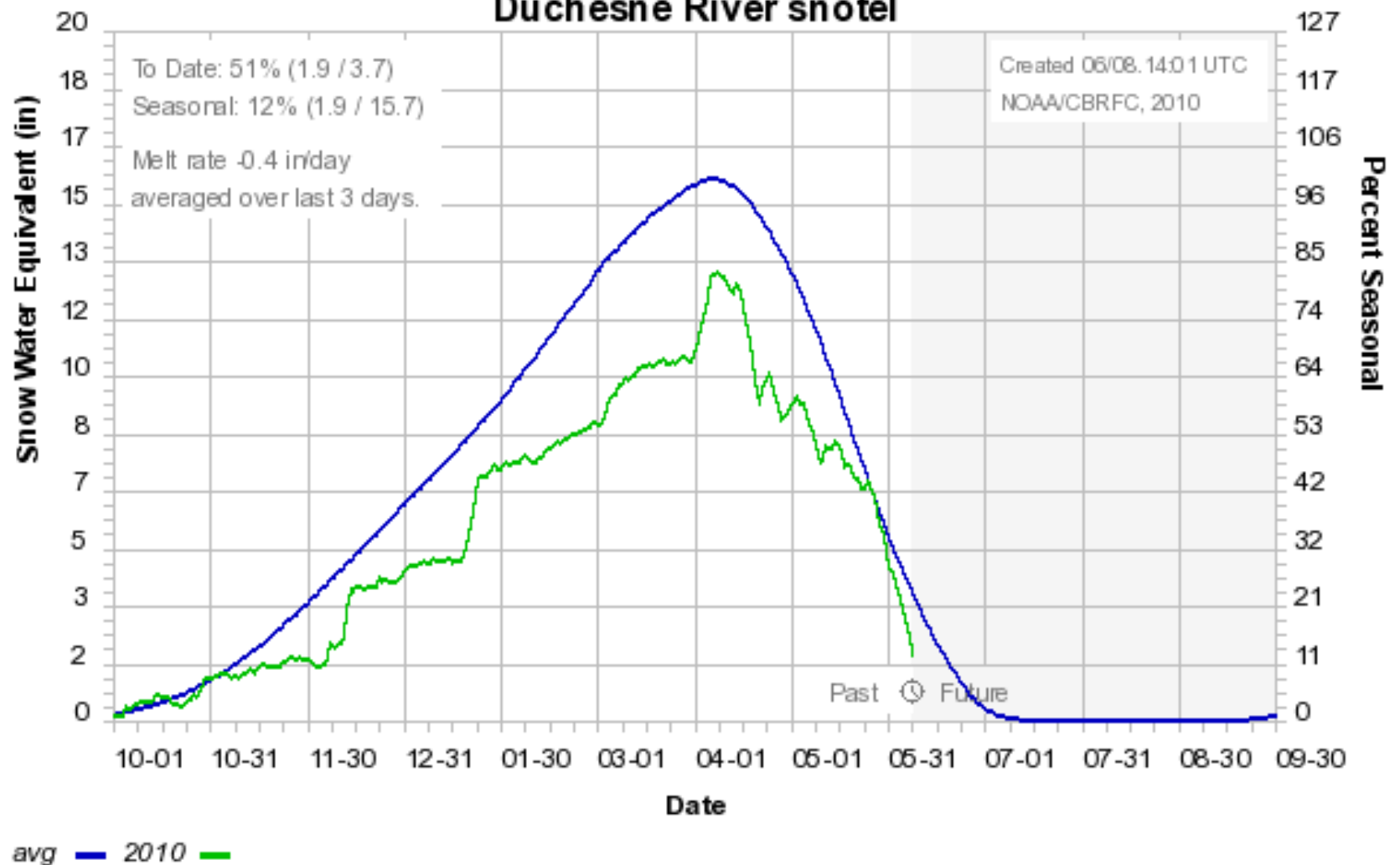
Duchesne River Basin



NATIONAL WEATHER SERVICE

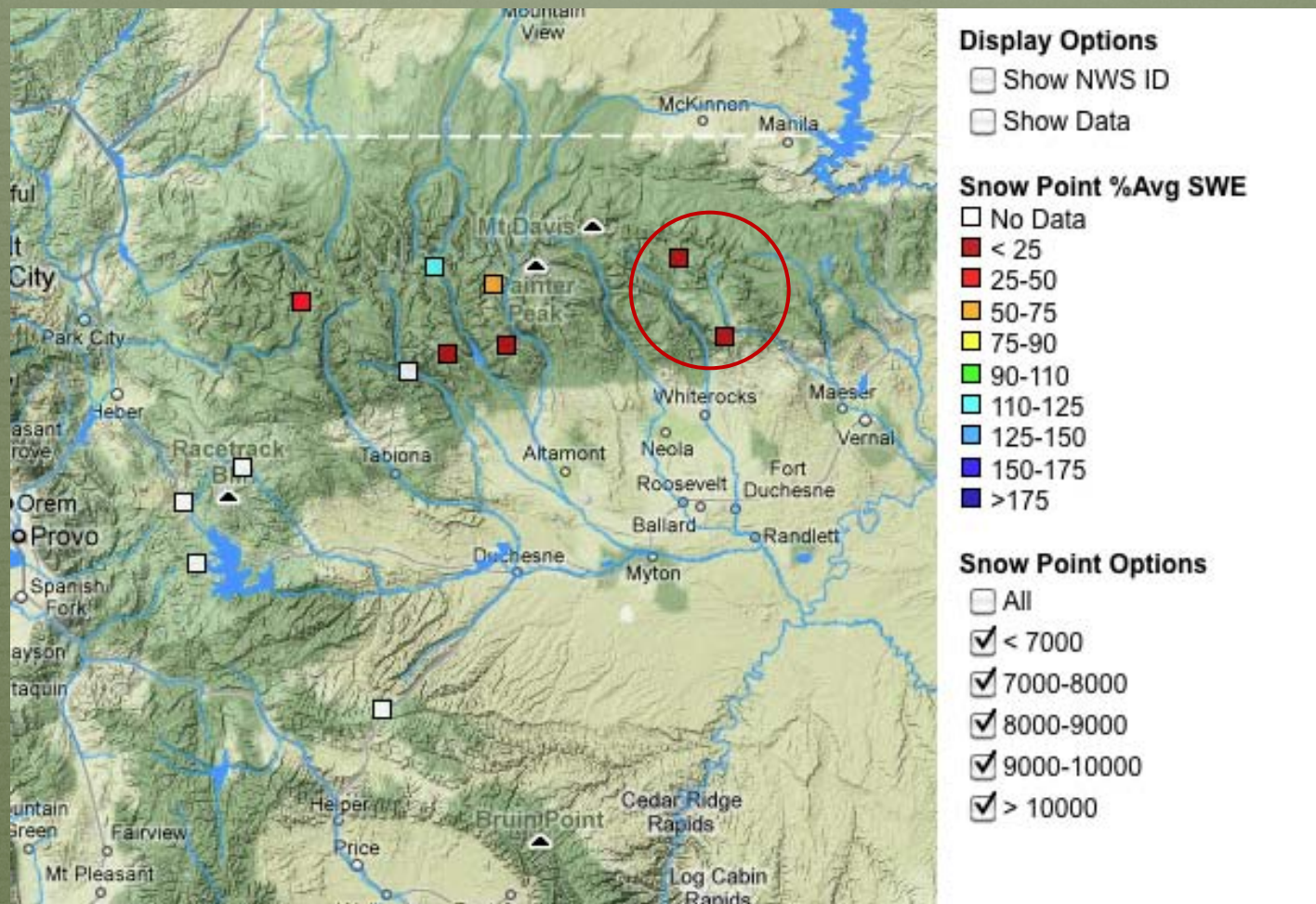
Colorado Basin River Forecast Center

Colorado Basin River Forecast Center Duchesne River snotel



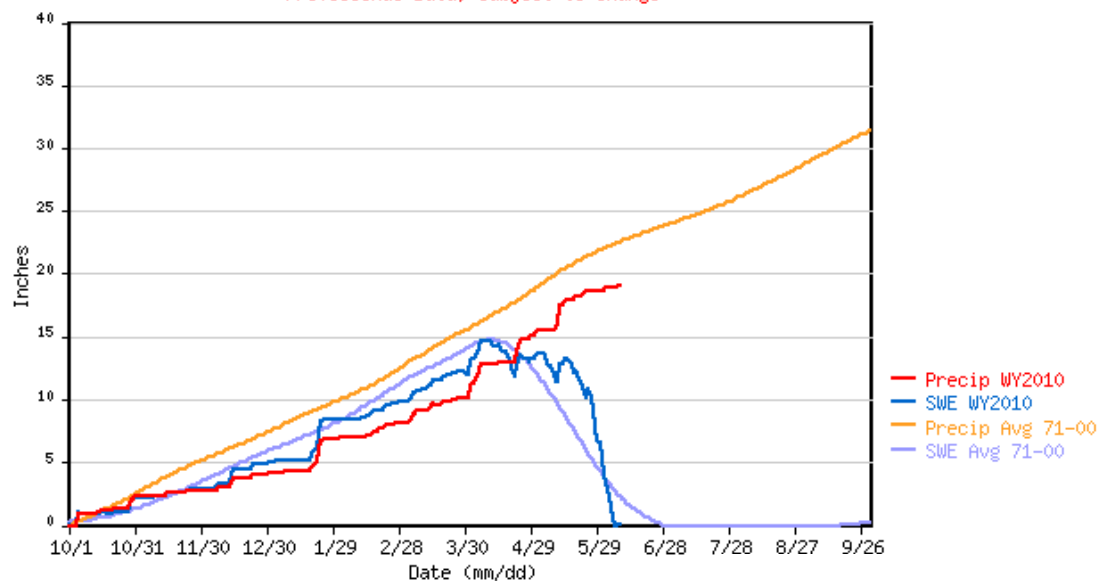
Basin snowpack: 51%
 Peak snowpack: 81% of average peak
 WYTD Precipitation percent of average: 77%

Chepeta and Mosby Mtn.



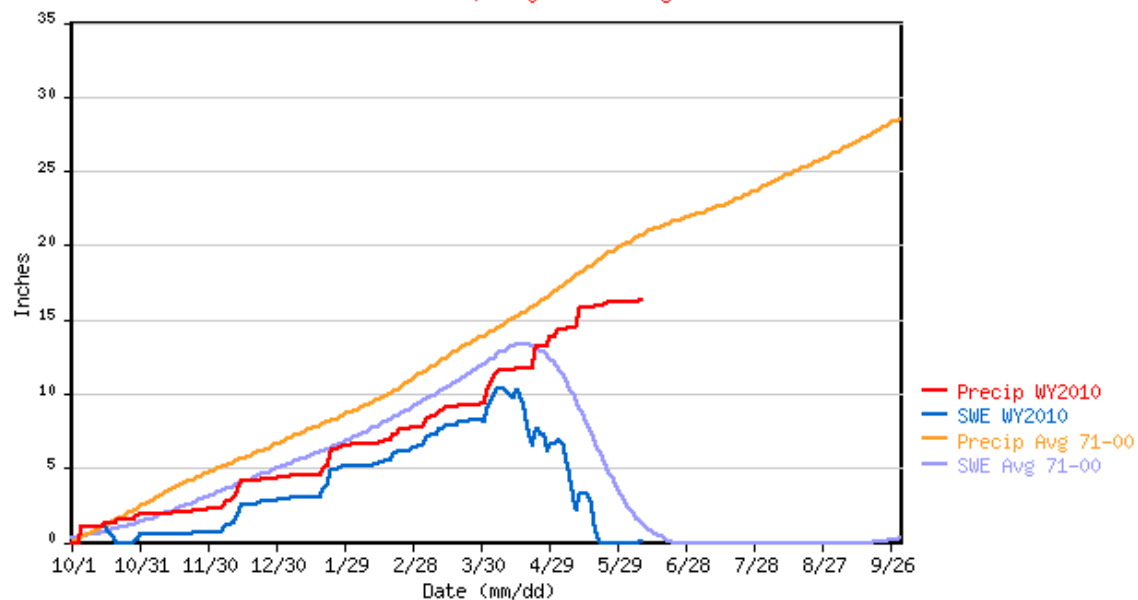
CHEPETA SNOTEL for Water Year 2010

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

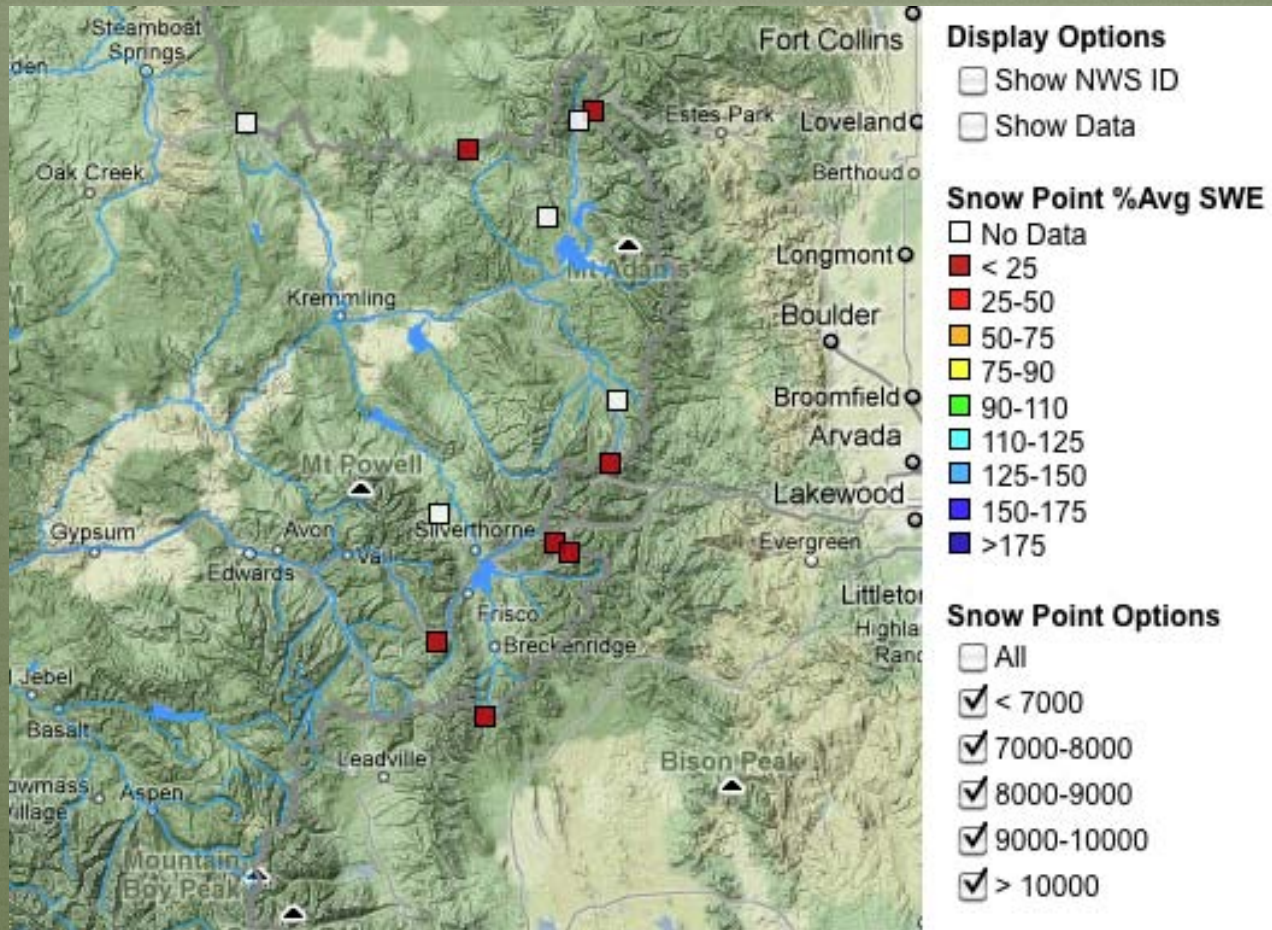


MOSBY MTN. SNOTEL for Water Year 2010

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

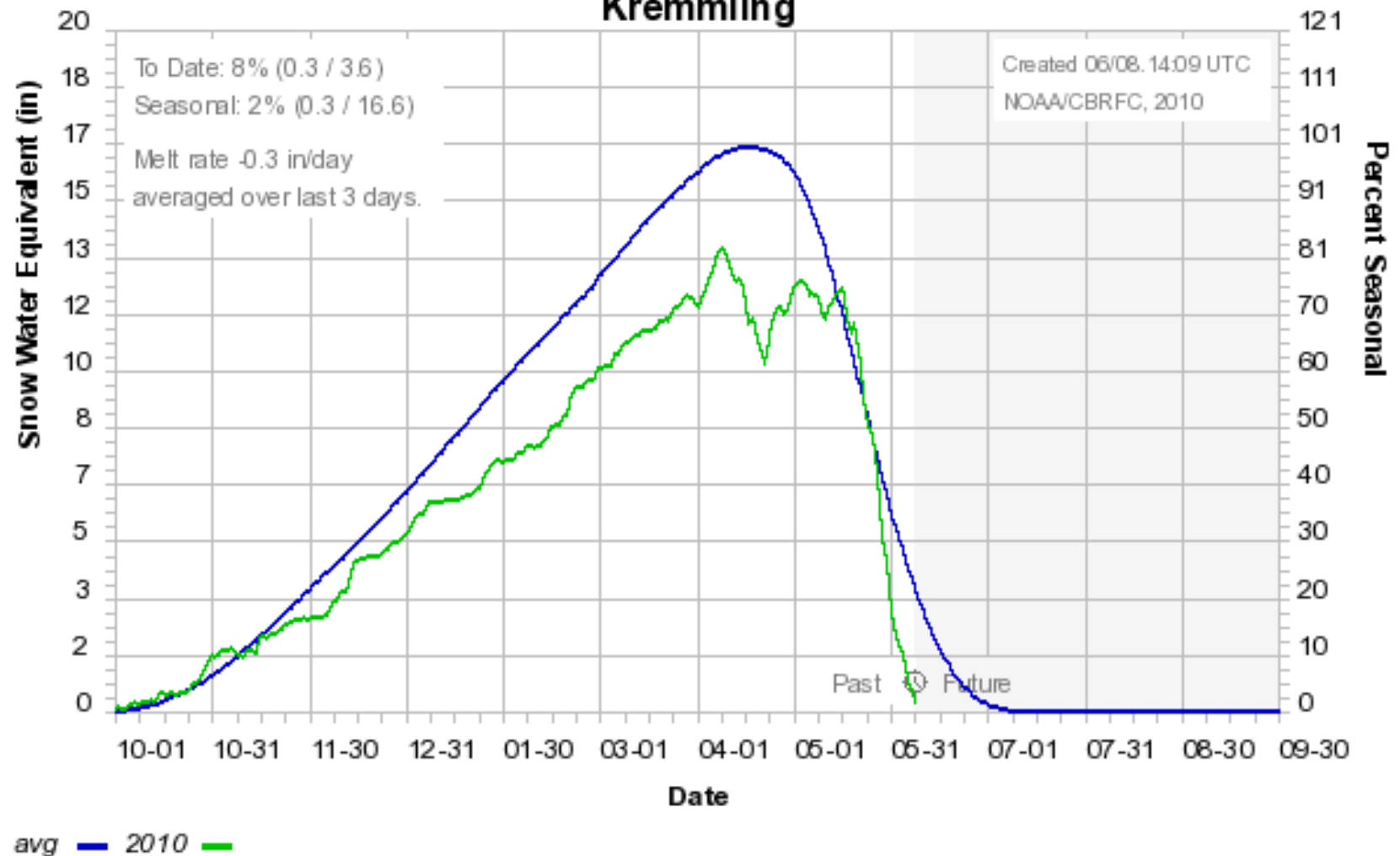


Upper Colorado above Kremmling



Colorado Basin River Forecast Center

Kremmling

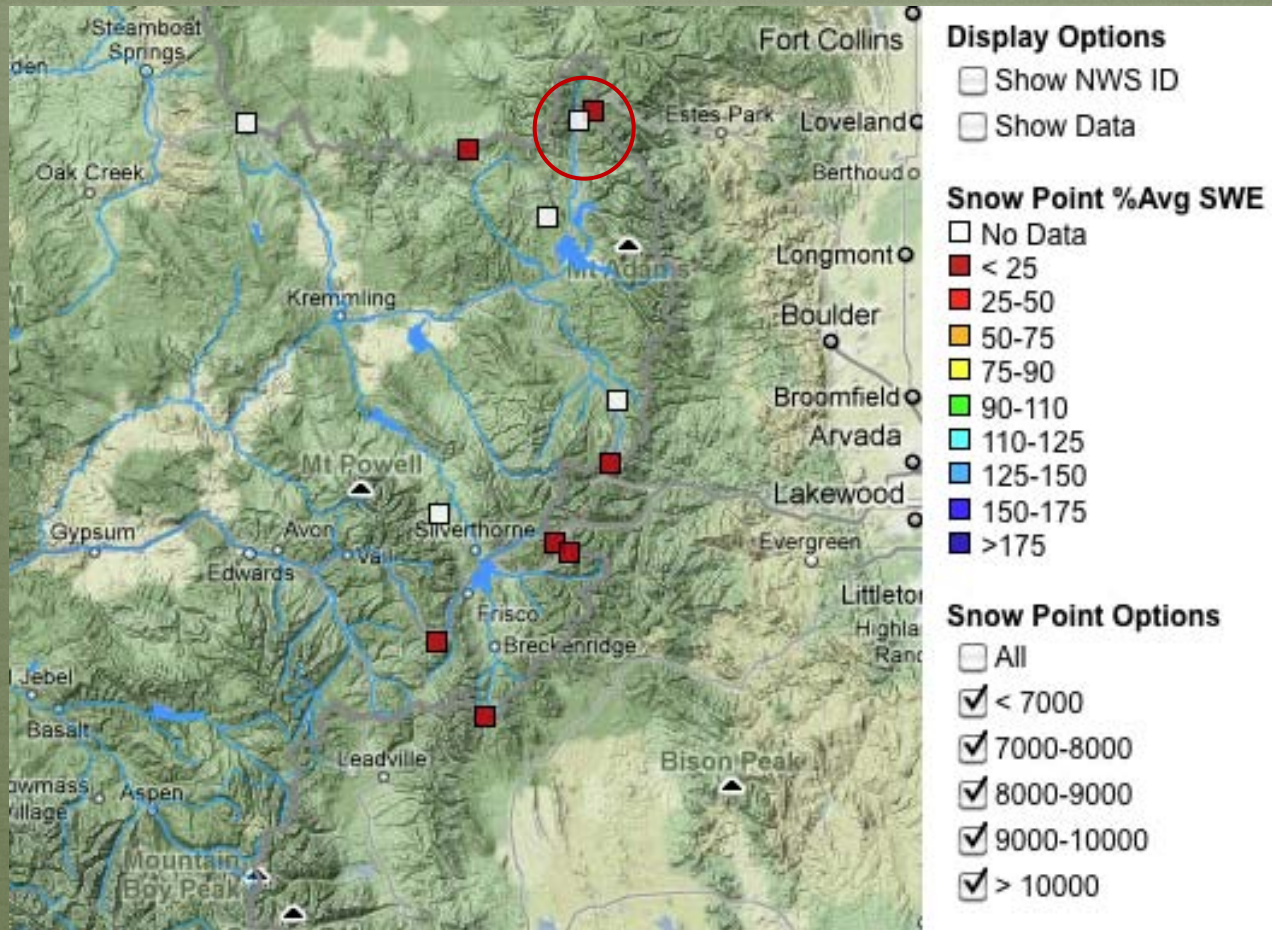


Basin Snowpack: 8%

Peak snowpack: 79% of average peak

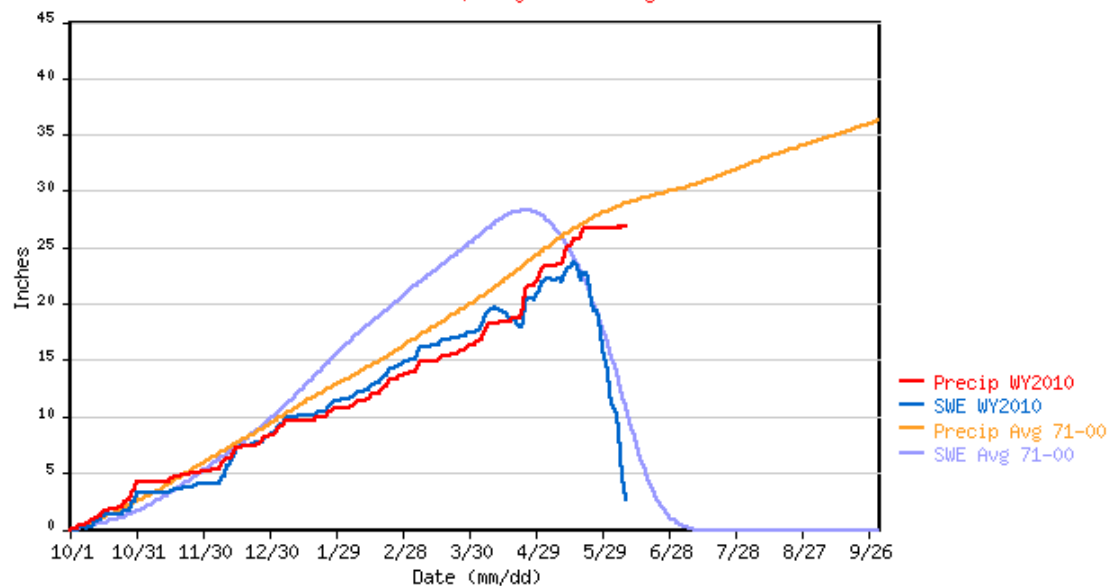
WYTD Precipitation percent of average: 87%

Lake Irene and Phantom Valley



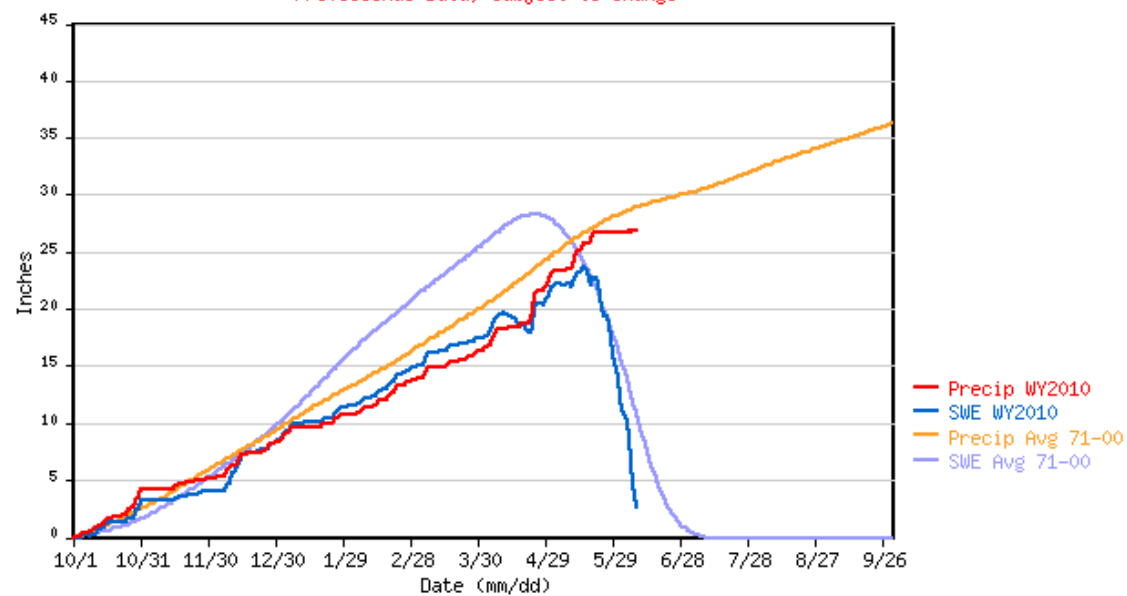
LAKE IRENE SNOTEL for Water Year 2010

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

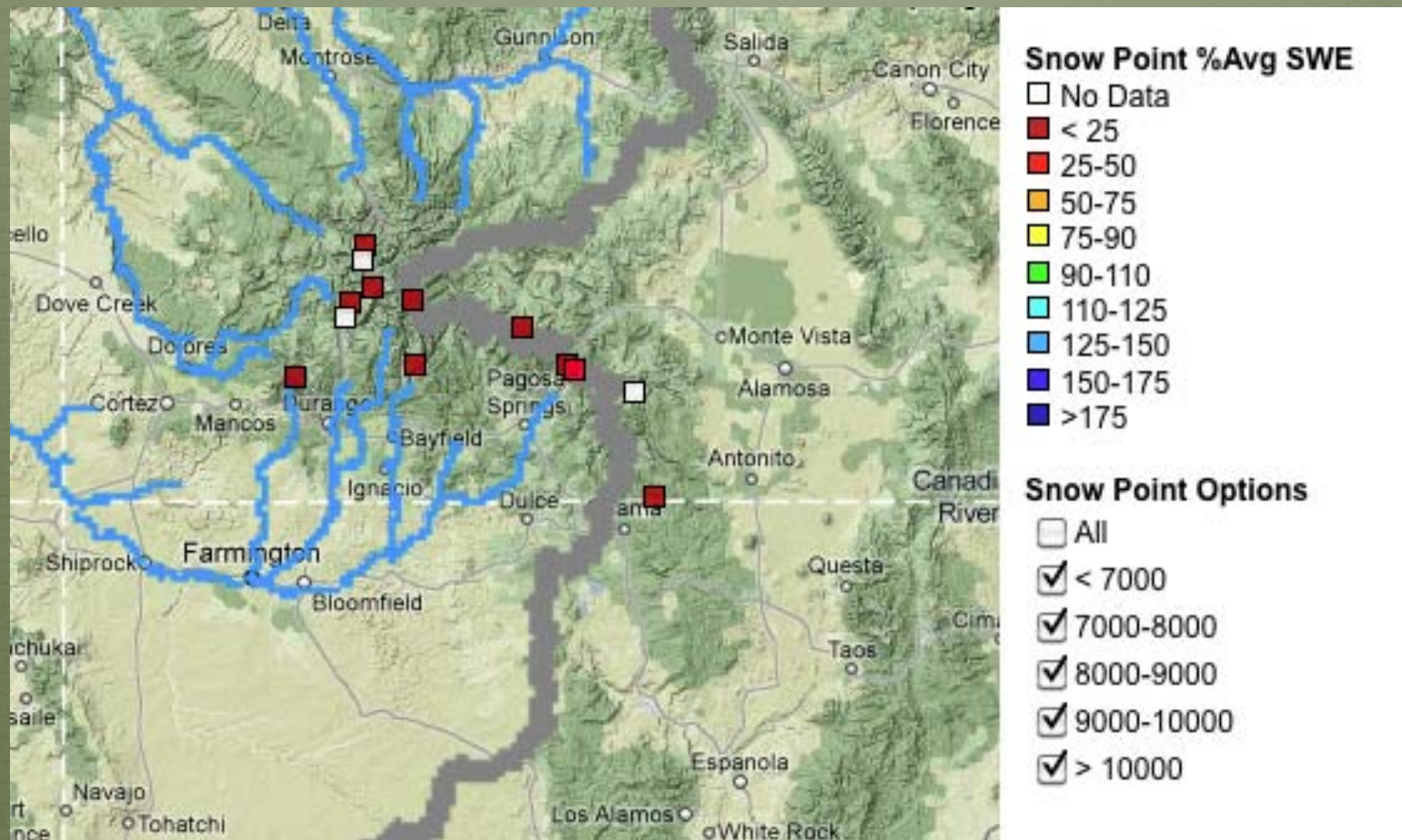


LAKE IRENE SNOTEL for Water Year 2010

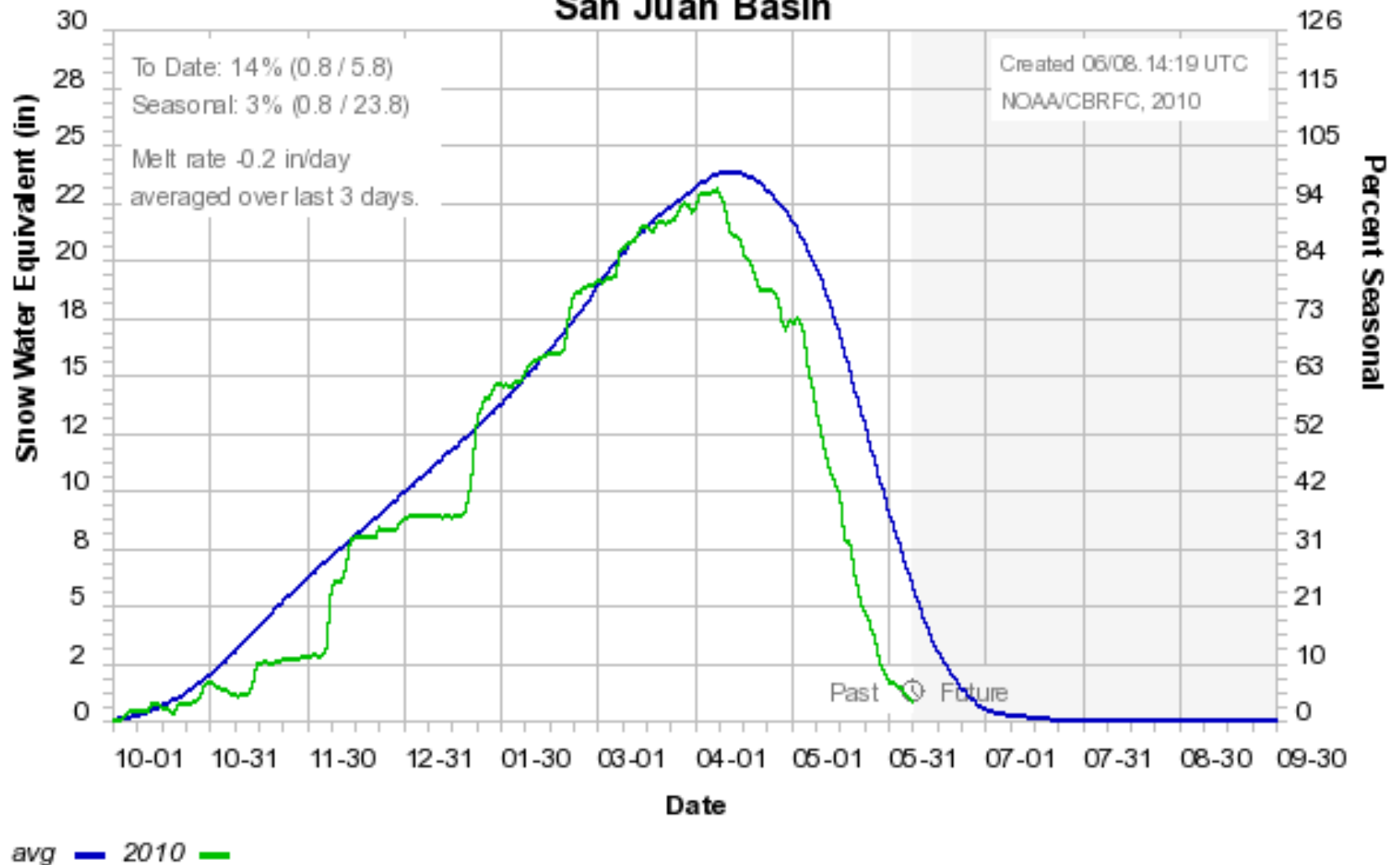
*** Provisional Data, Subject to Change ***



San Juan Basin

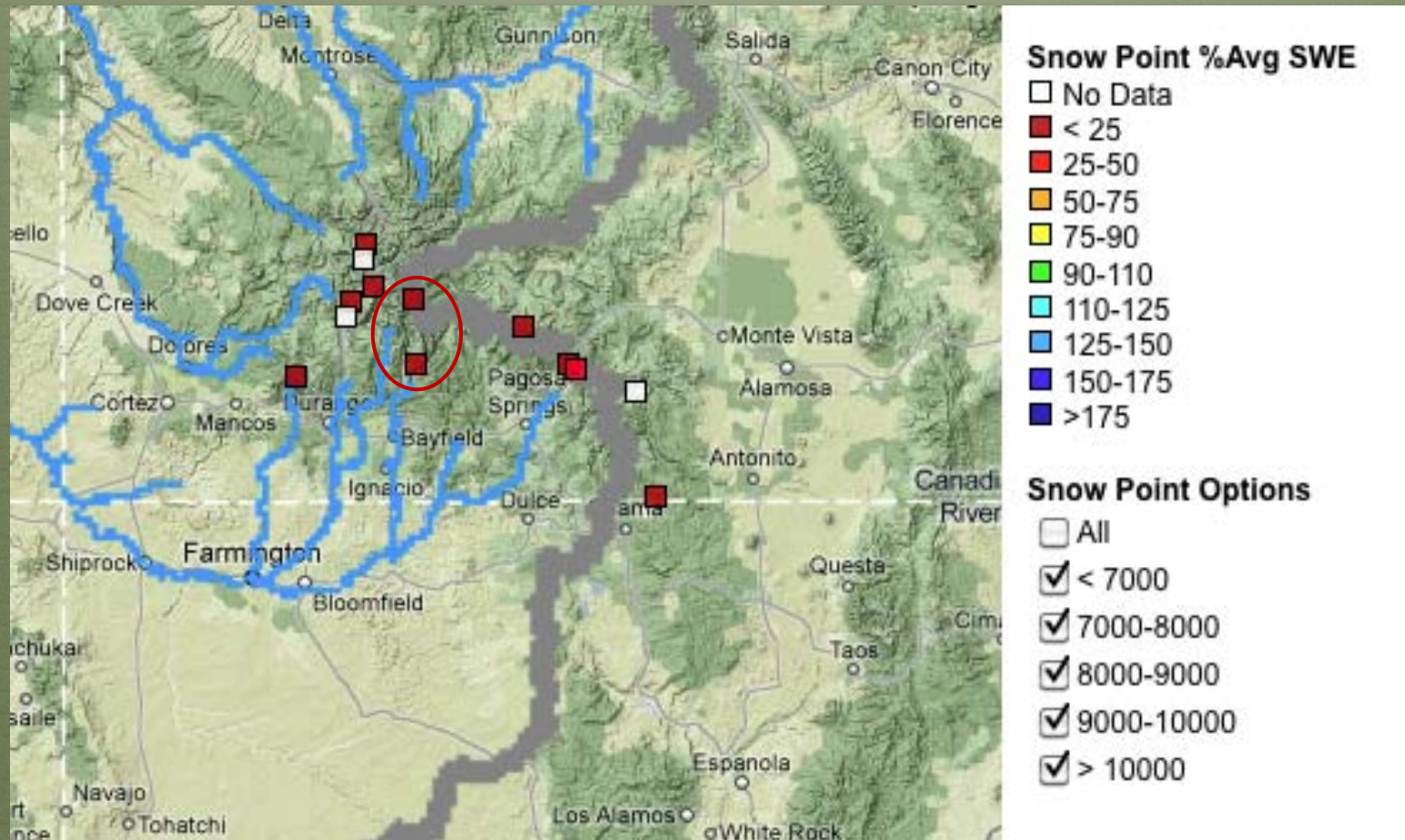


Colorado Basin River Forecast Center San Juan Basin



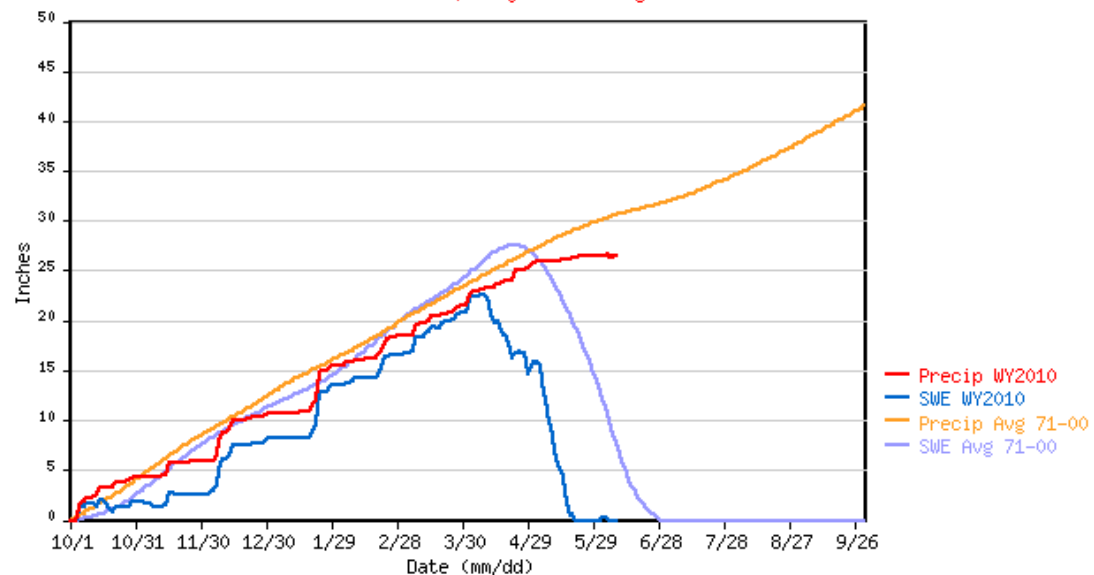
Basin Snowpack: 14%
Peak snowpack: 97% of average peak
WYTD Precipitation percent of average: 88%

Beartown and Vallecito



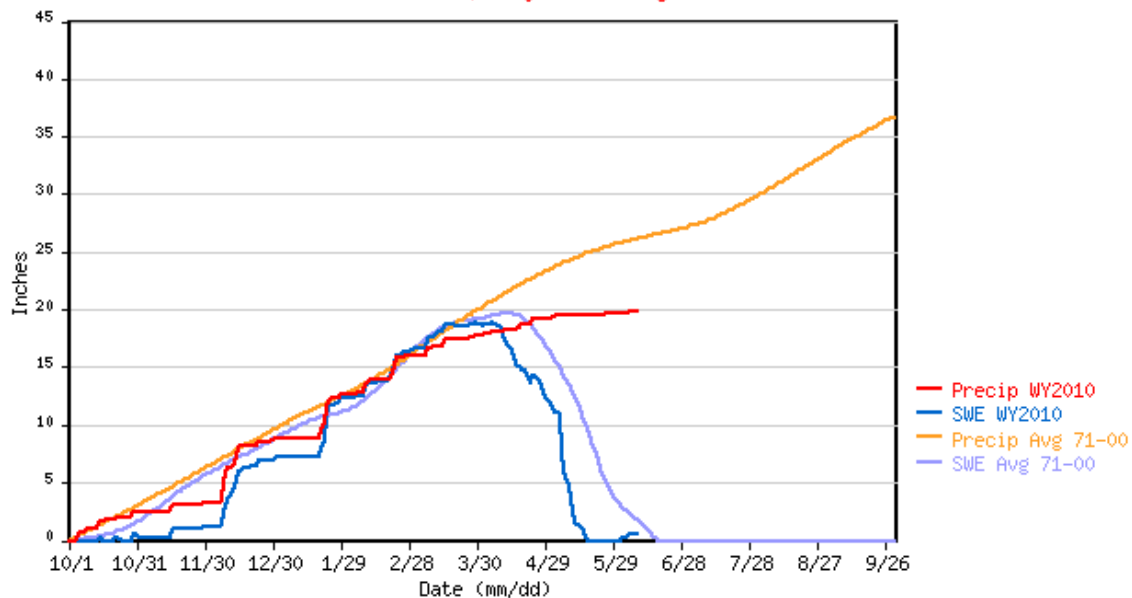
BEARTOWN SNOTEL for Water Year 2010

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



VALLECITO SNOTEL for Water Year 2010

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



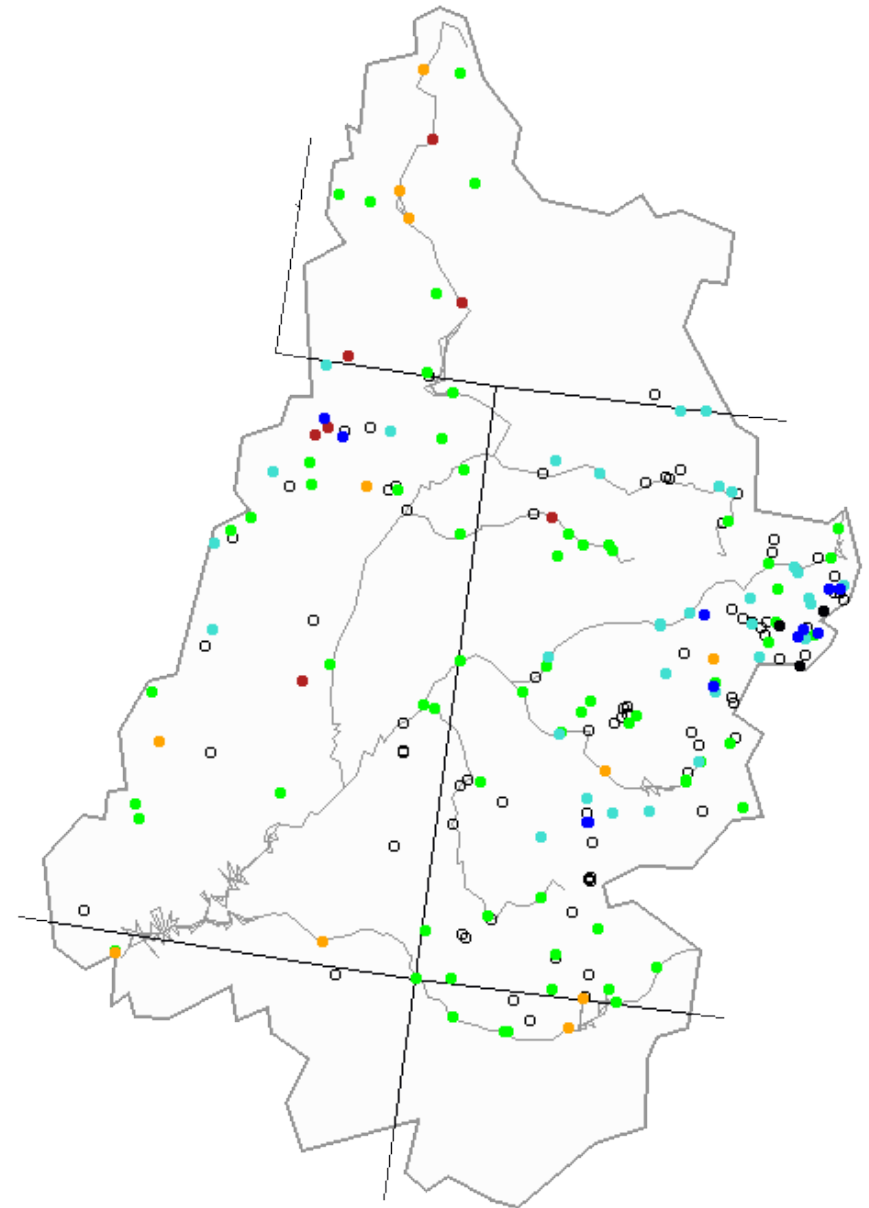
Streamflow Update

Michael Lewis USGS

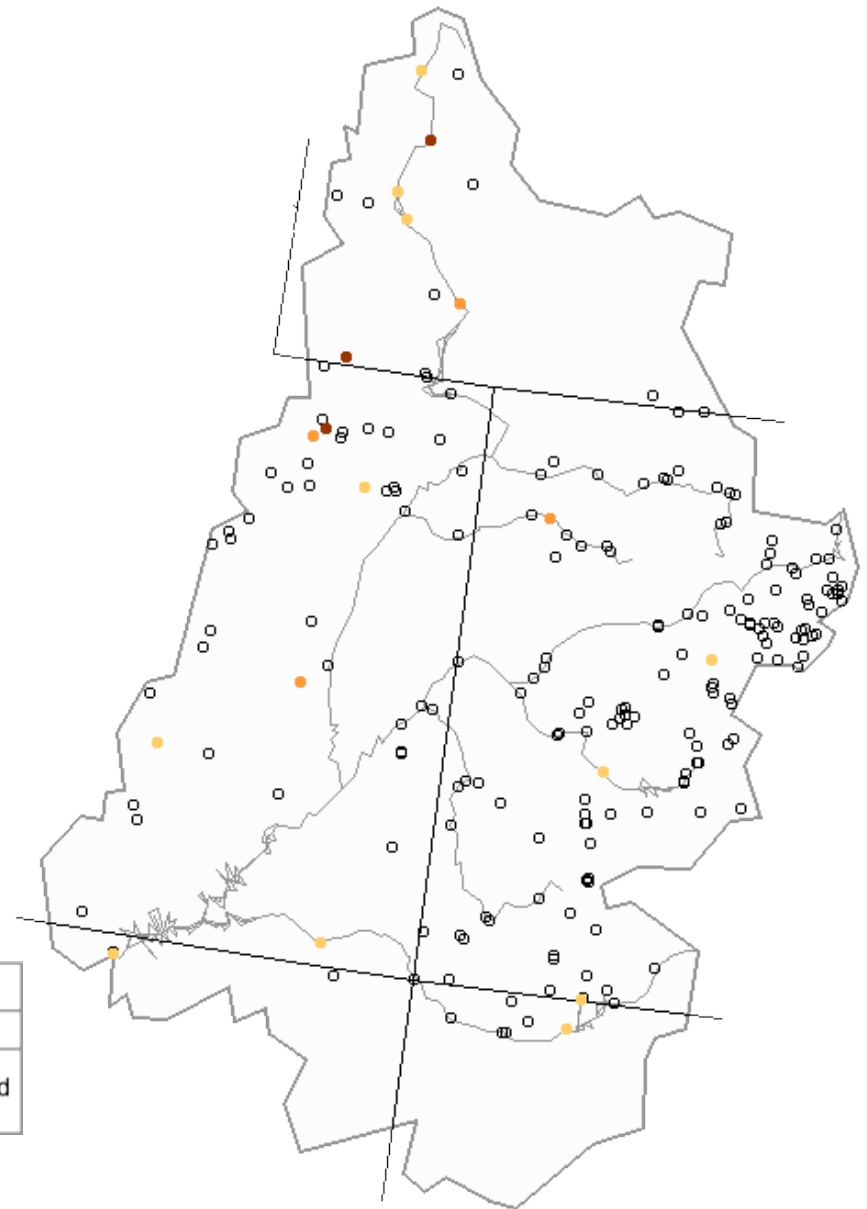


7-day average streamflow compared to historical streamflow for the day of the year (Upper Colorado)

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		

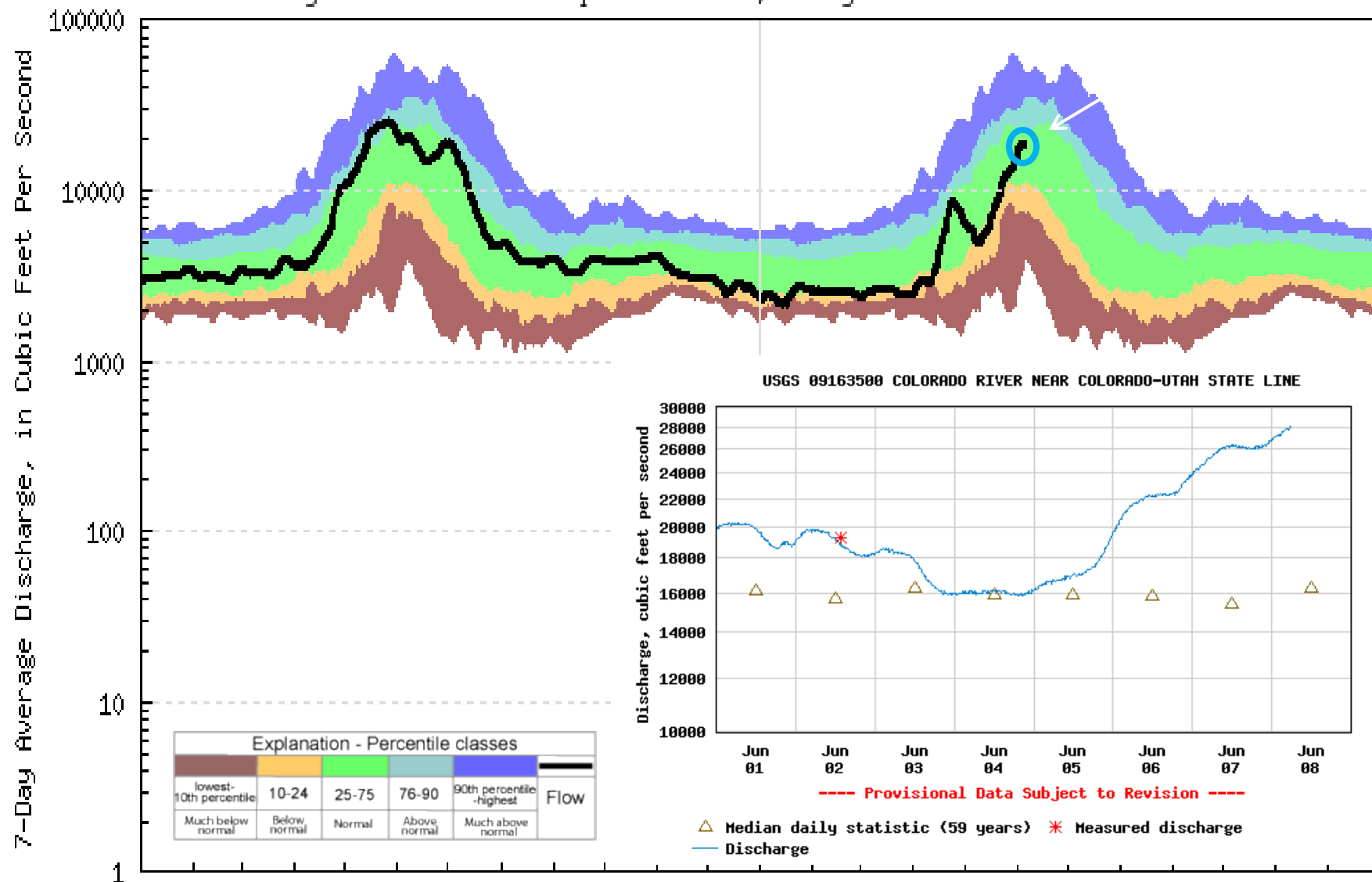


Below normal 7-day average streamflow compared to historical streamflow for the day of the year (Upper Colorado)



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

USGS 09163500 COLORADO RIVER NEAR COLORADO-UTAH STATE LINE
 Drainage Area: 17843 Square Miles, Length of Record: 58 Years



Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec 2009 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec 2010

STREAM FLOW IN ACRES- FEET

USGS

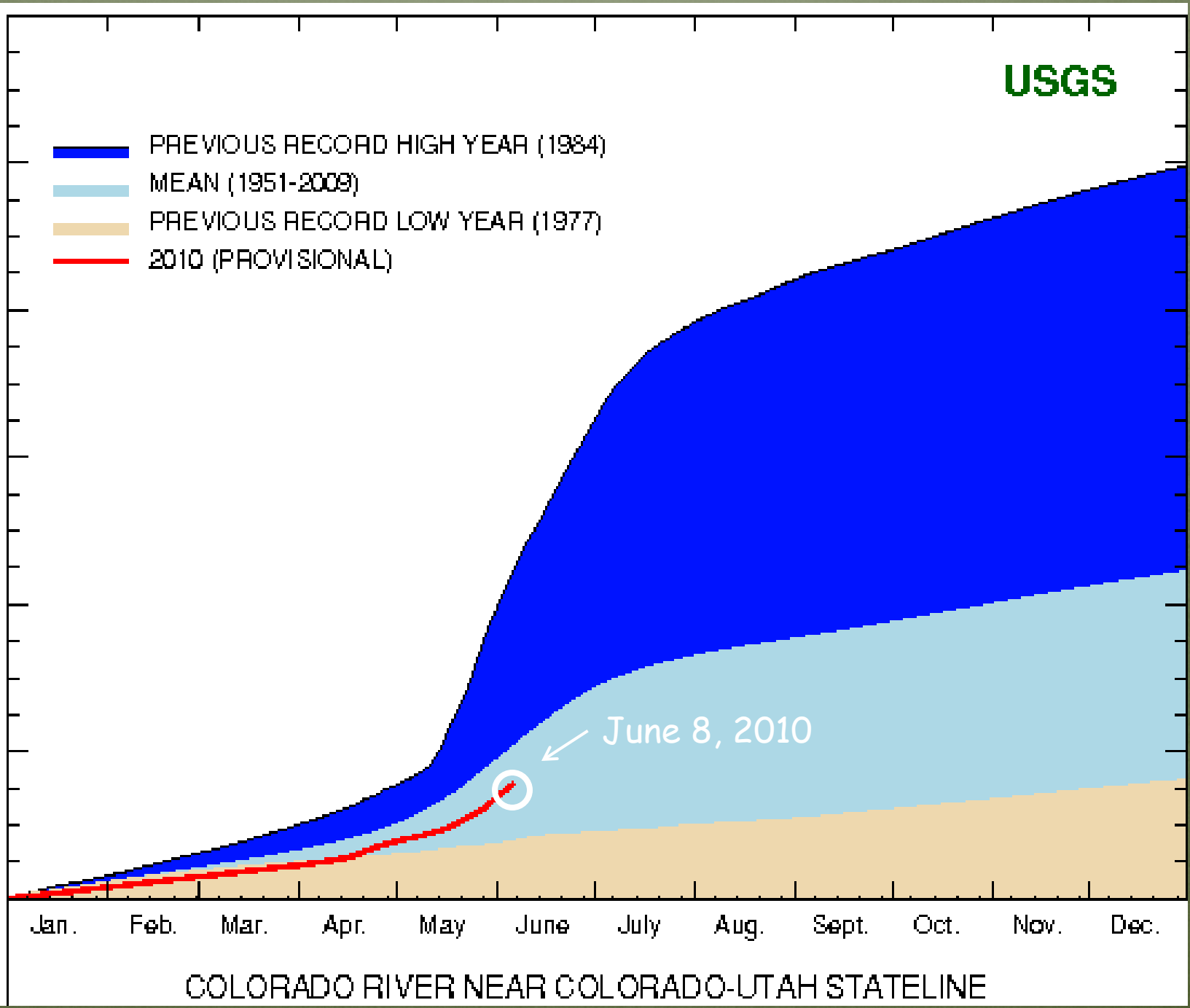
- PREVIOUS RECORD HIGH YEAR (1984)
- MEAN (1951-2009)
- PREVIOUS RECORD LOW YEAR (1977)
- 2010 (PROVISIONAL)

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

June 8, 2010



USGS 09163500 COLORADO RIVER NEAR COLORADO-UTAH STATE LINE
Drainage Area: 17843 Square Miles, Length of Record: 58 Years

7-Day Average Discharge, in Cubic Feet Per Second

Colorado River near Colorado-Utah State Line

Explanation - Percentile classes					Flow
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	
Much below normal	Below normal	Normal	Above normal	Much above normal	

USGS 09315000 GREEN RIVER AT GREEN RIVER, UT
Drainage Area: 44850 Square Miles, Length of Record: 109 Years

7-Day Average Discharge, in Cubic Feet Per Second

Green River at Green River, Utah

USGS 09379500 SAN JUAN RIVER NEAR BLUFF, UT
Drainage Area: 23000 Square Miles, Length of Record: 84 Years

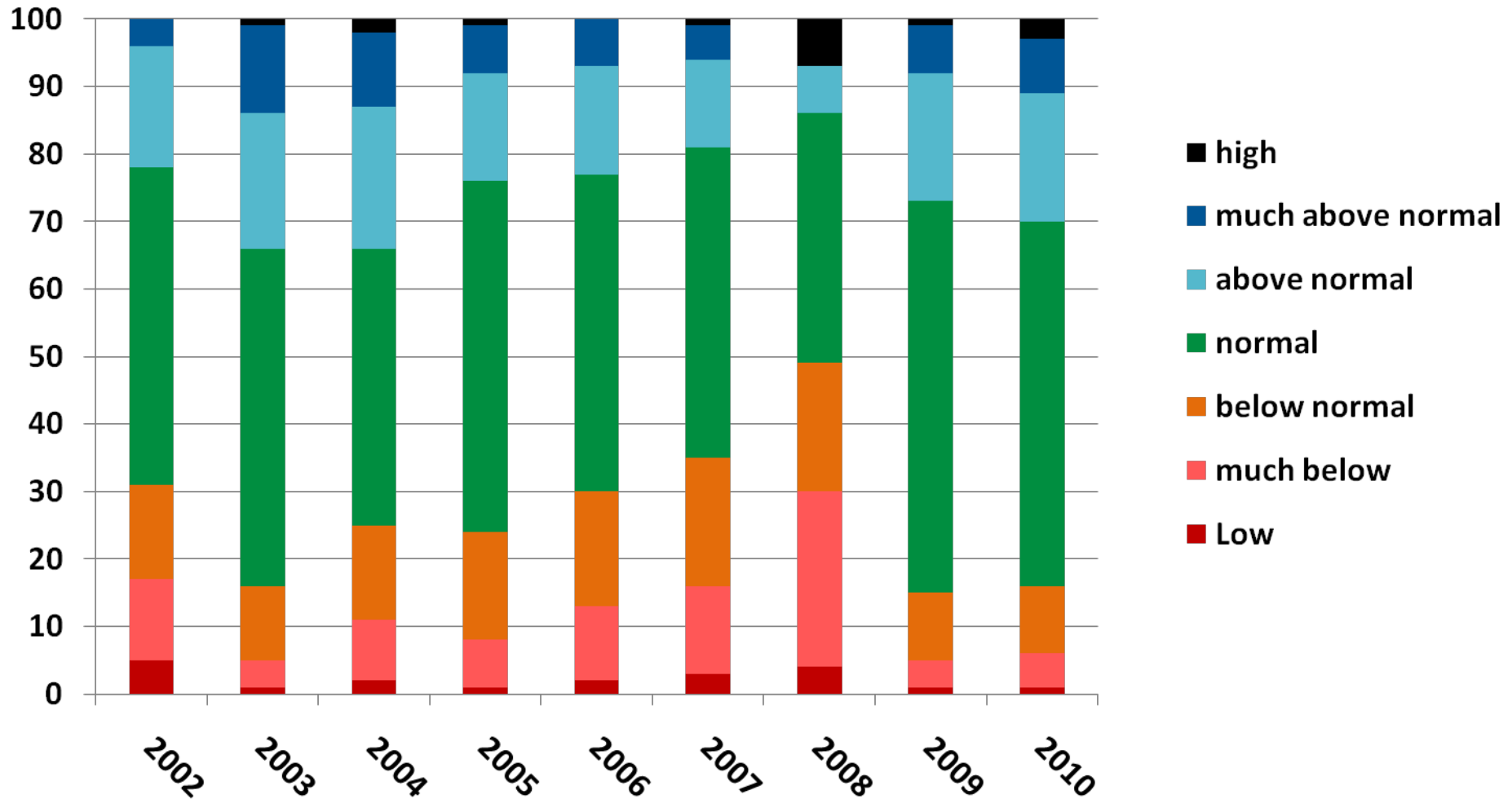
7-Day Average Discharge, in Cubic Feet Per Second

San Juan River near Bluff, Utah

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec 2009 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec 2010

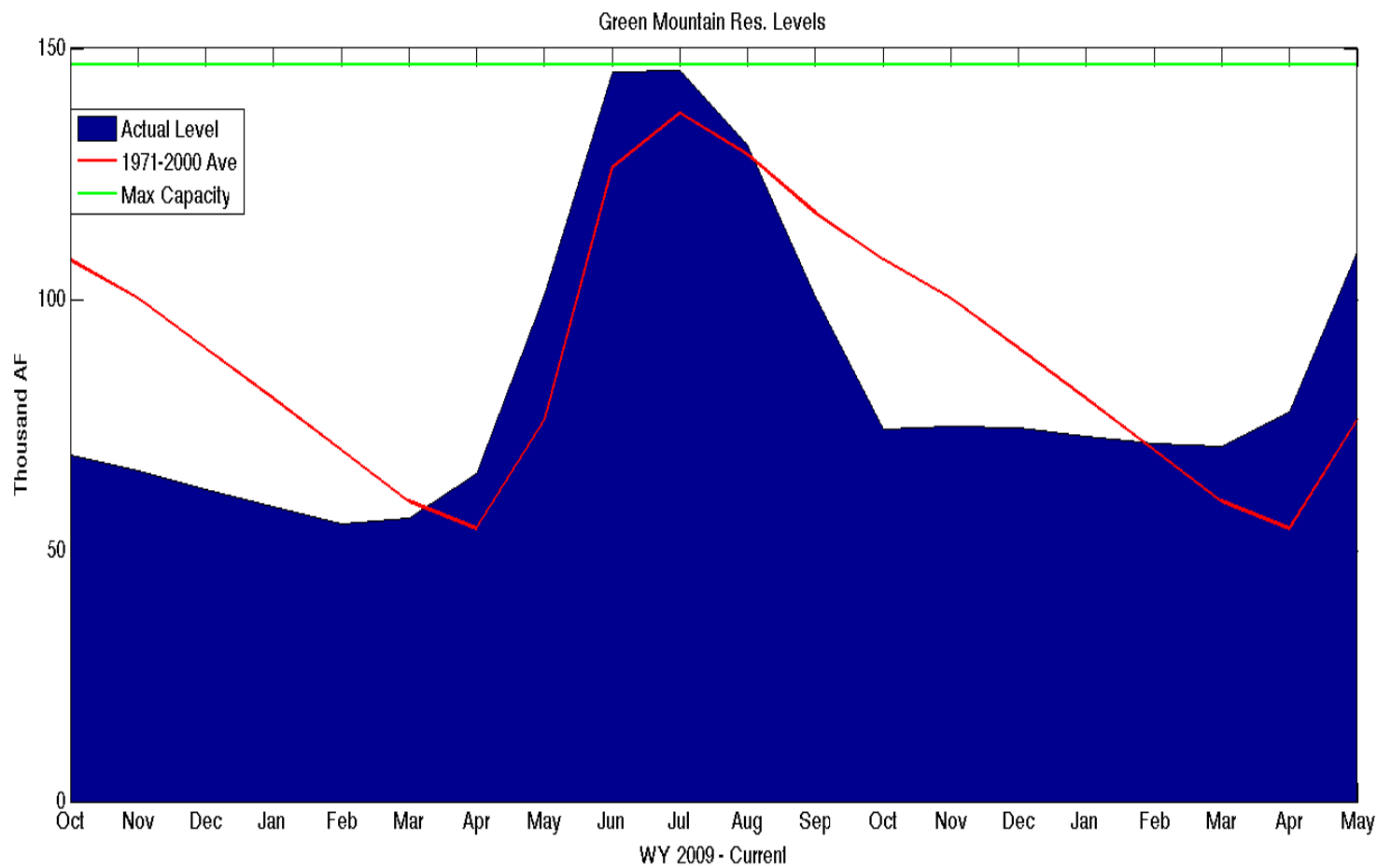
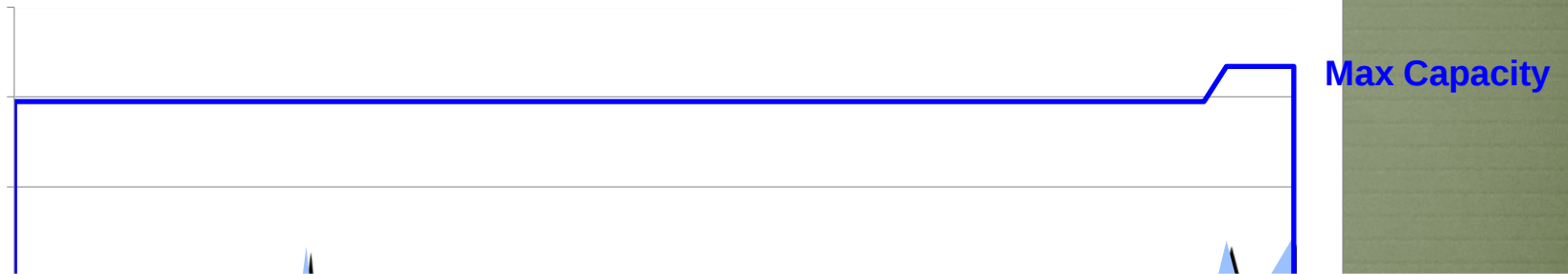
June 6

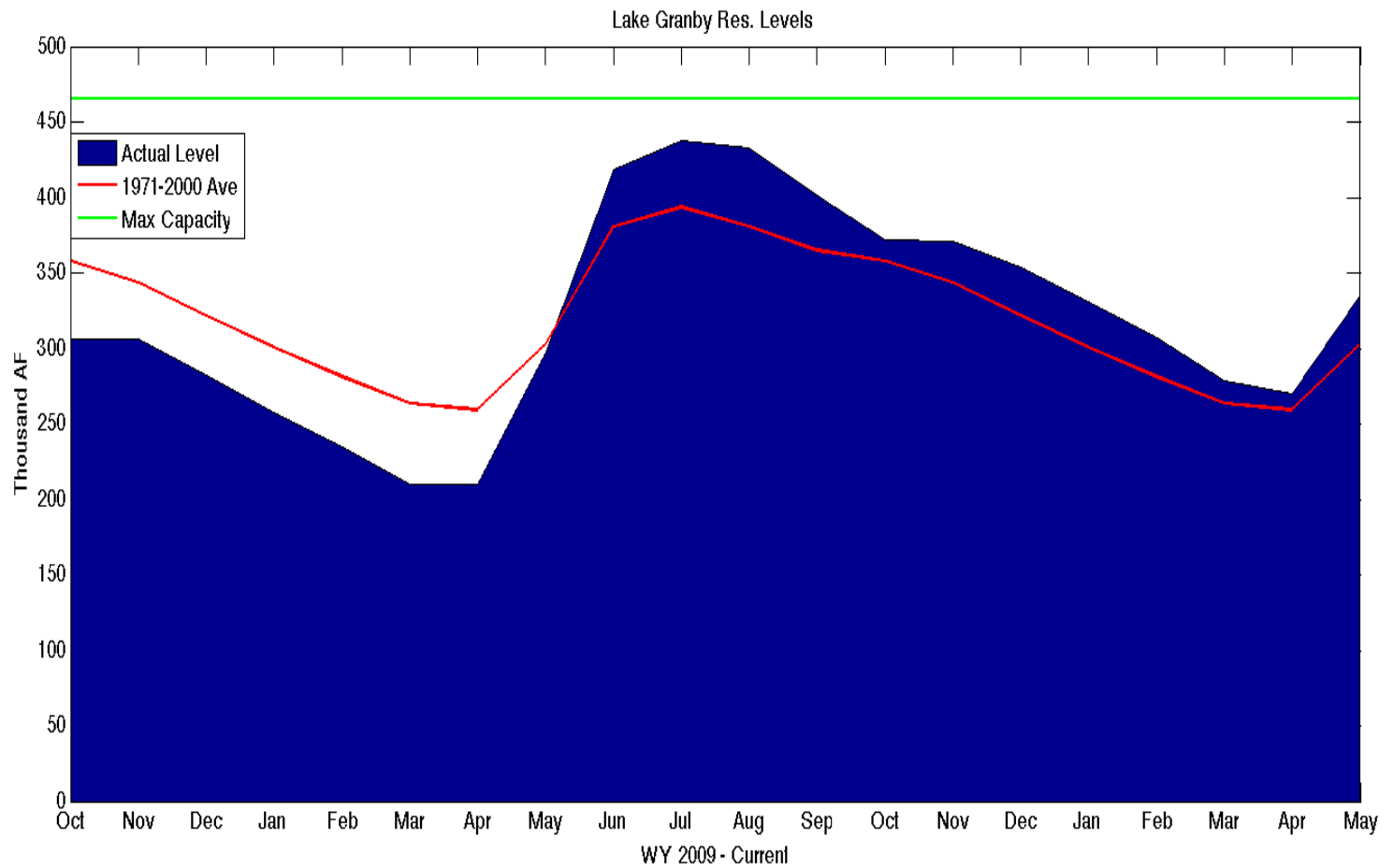
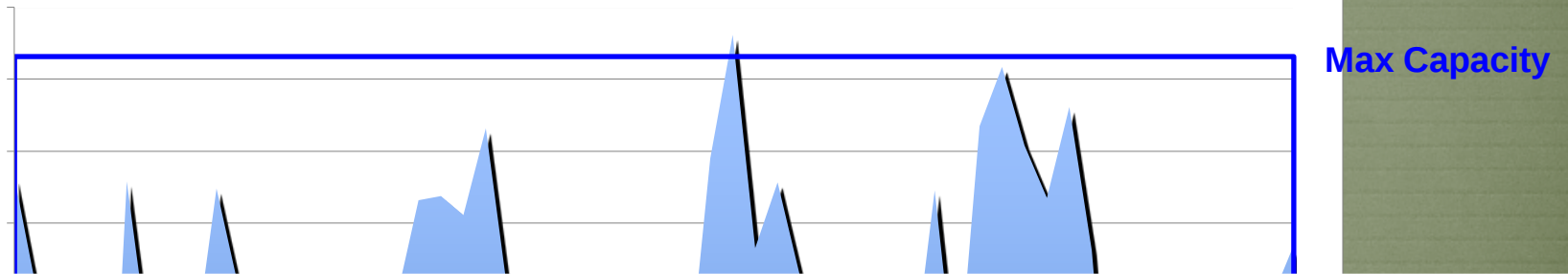
Percentage of Streamgages per Percentile Class 7-day Average Streamflow

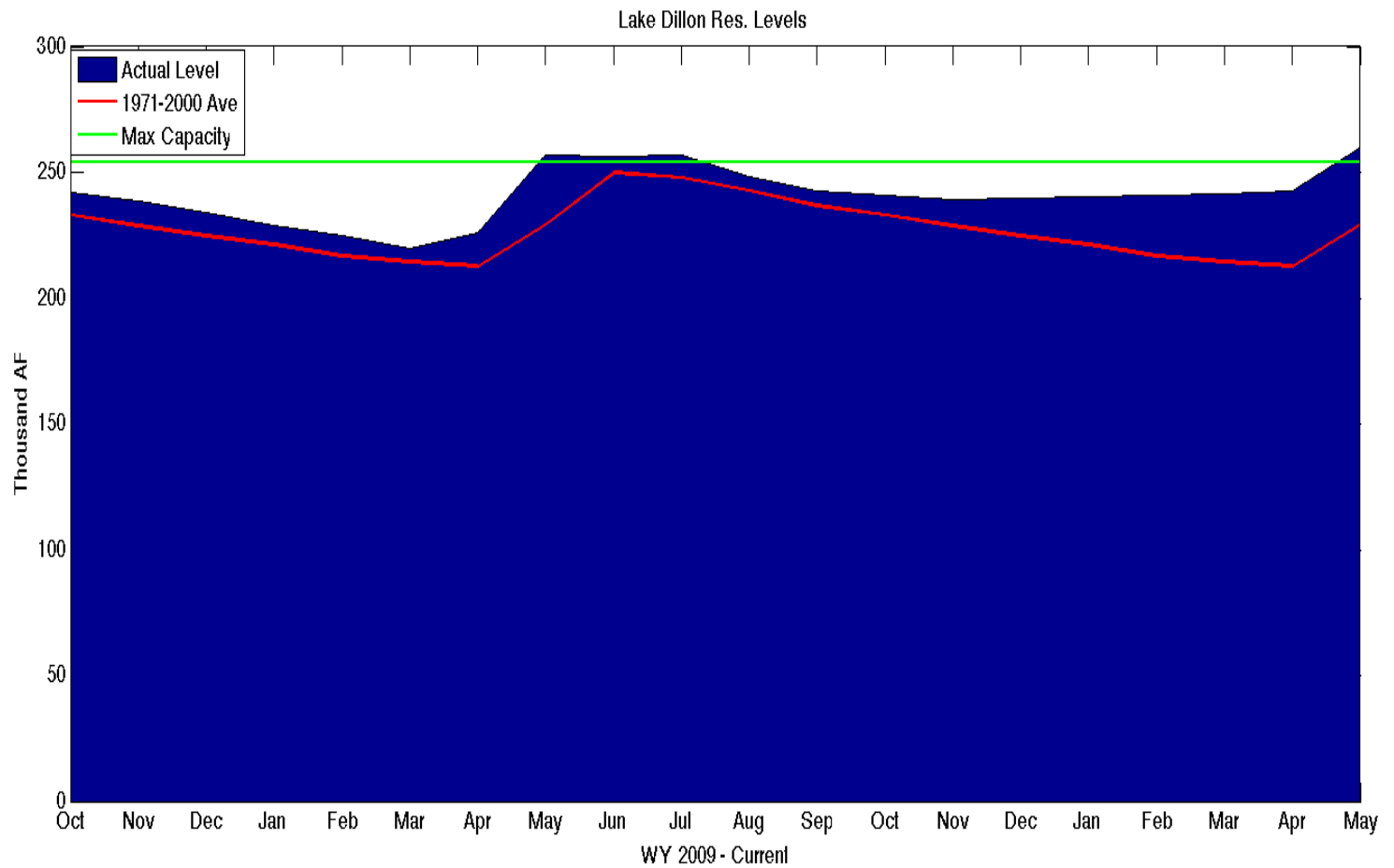
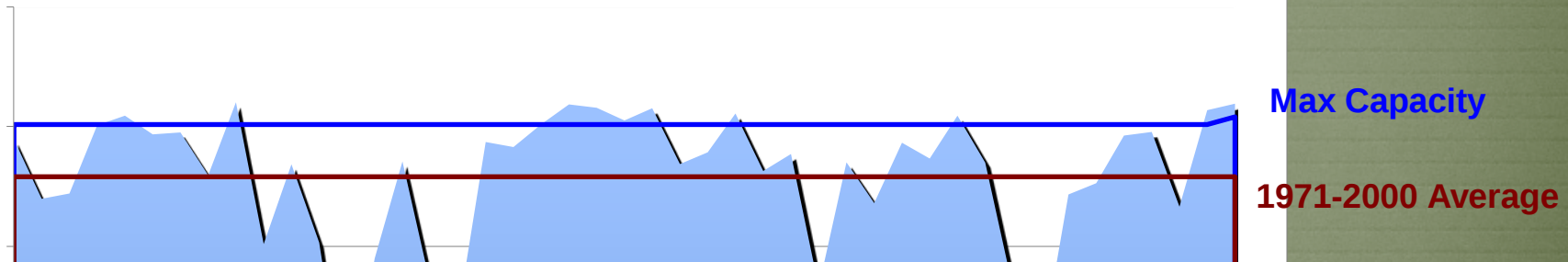


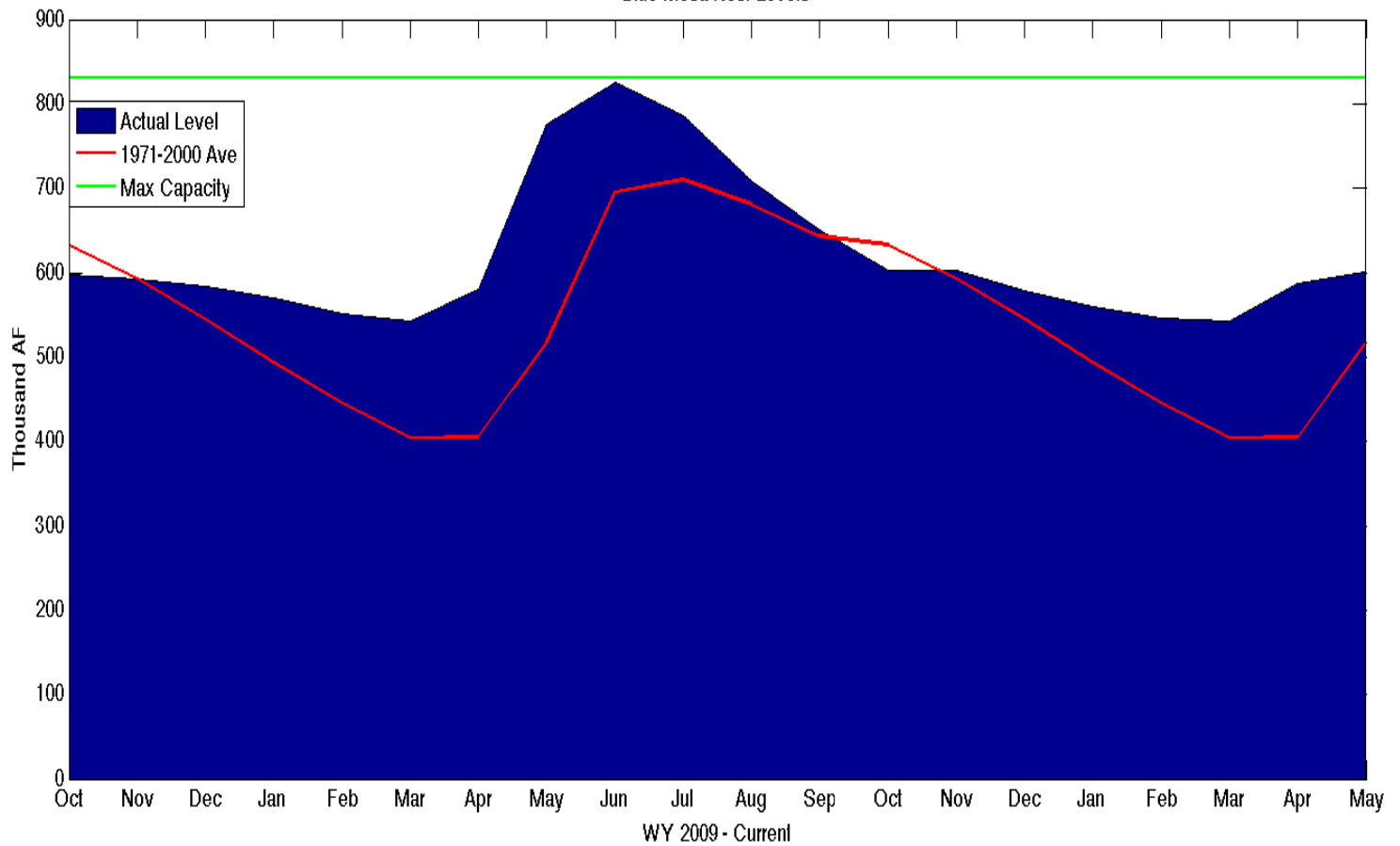
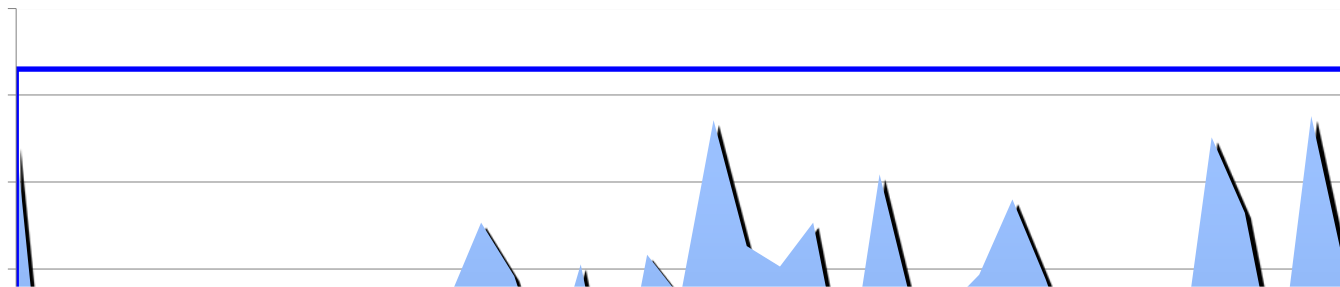
Reservoir Update

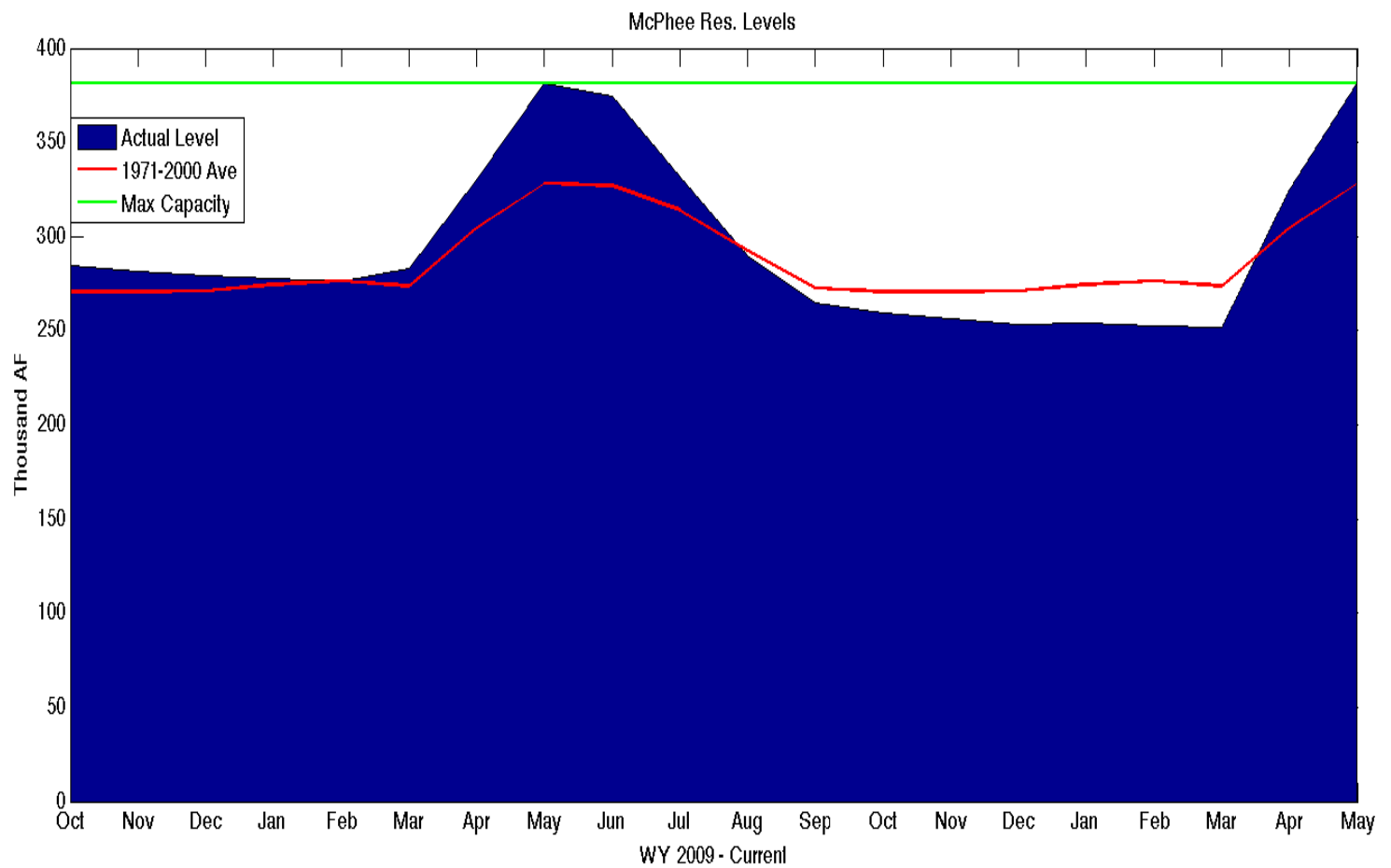
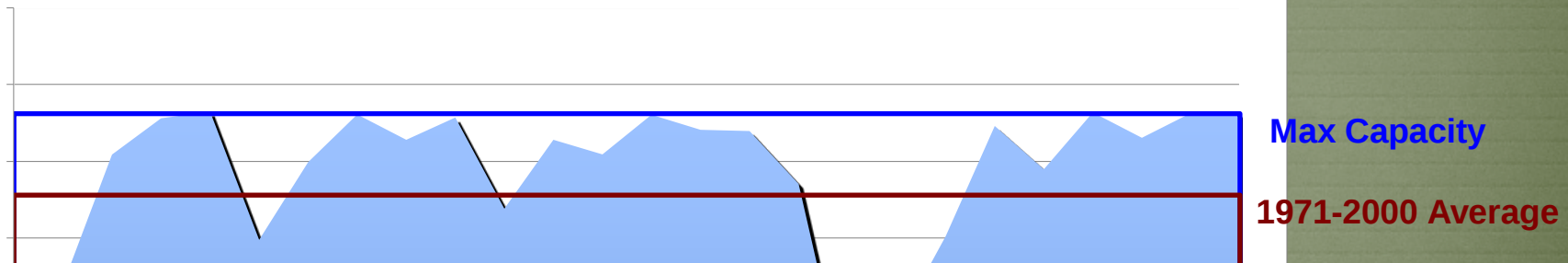


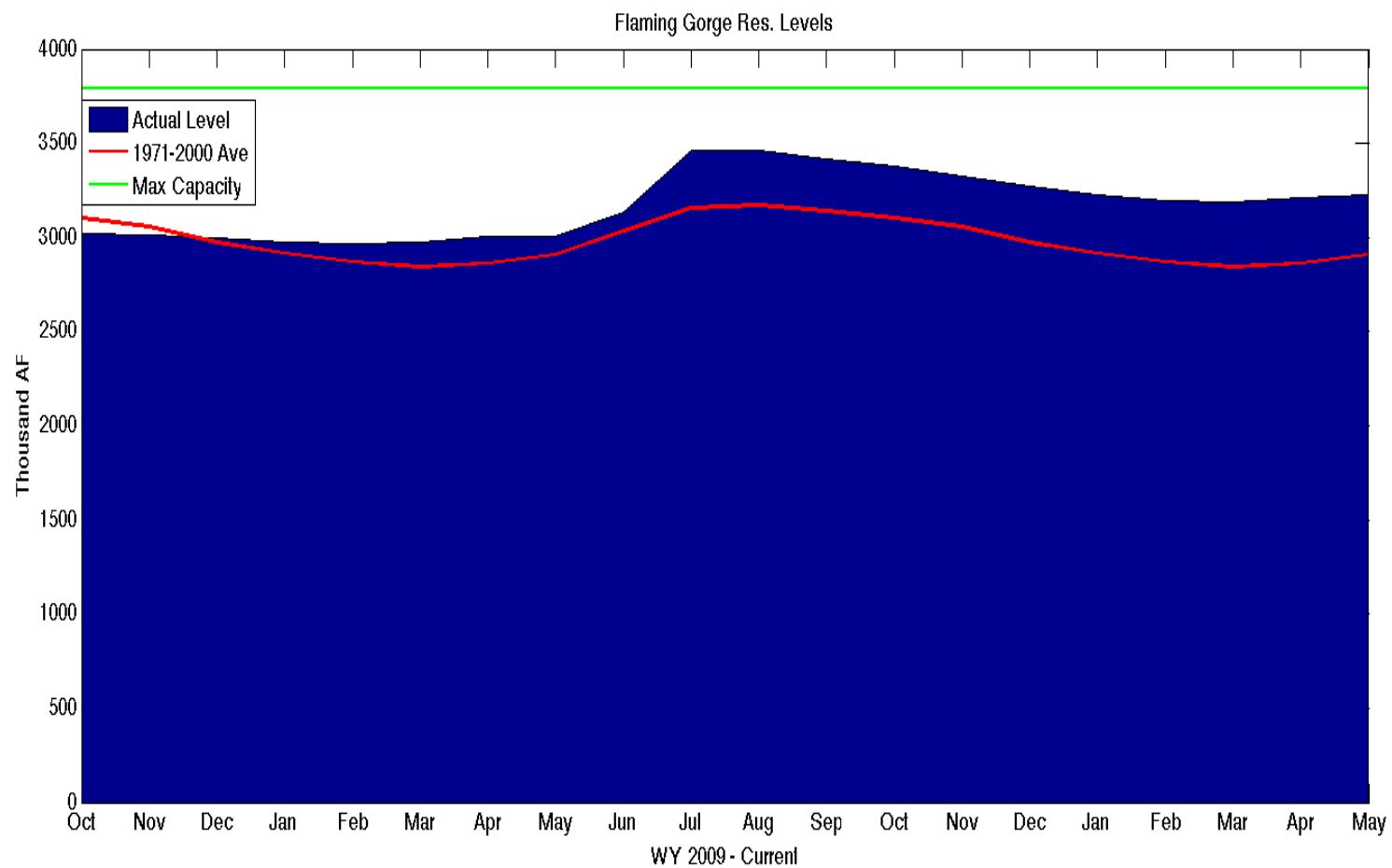
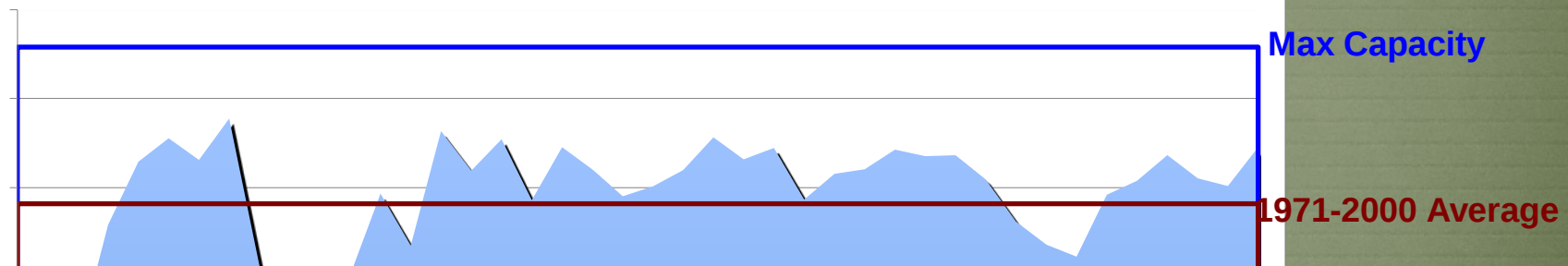




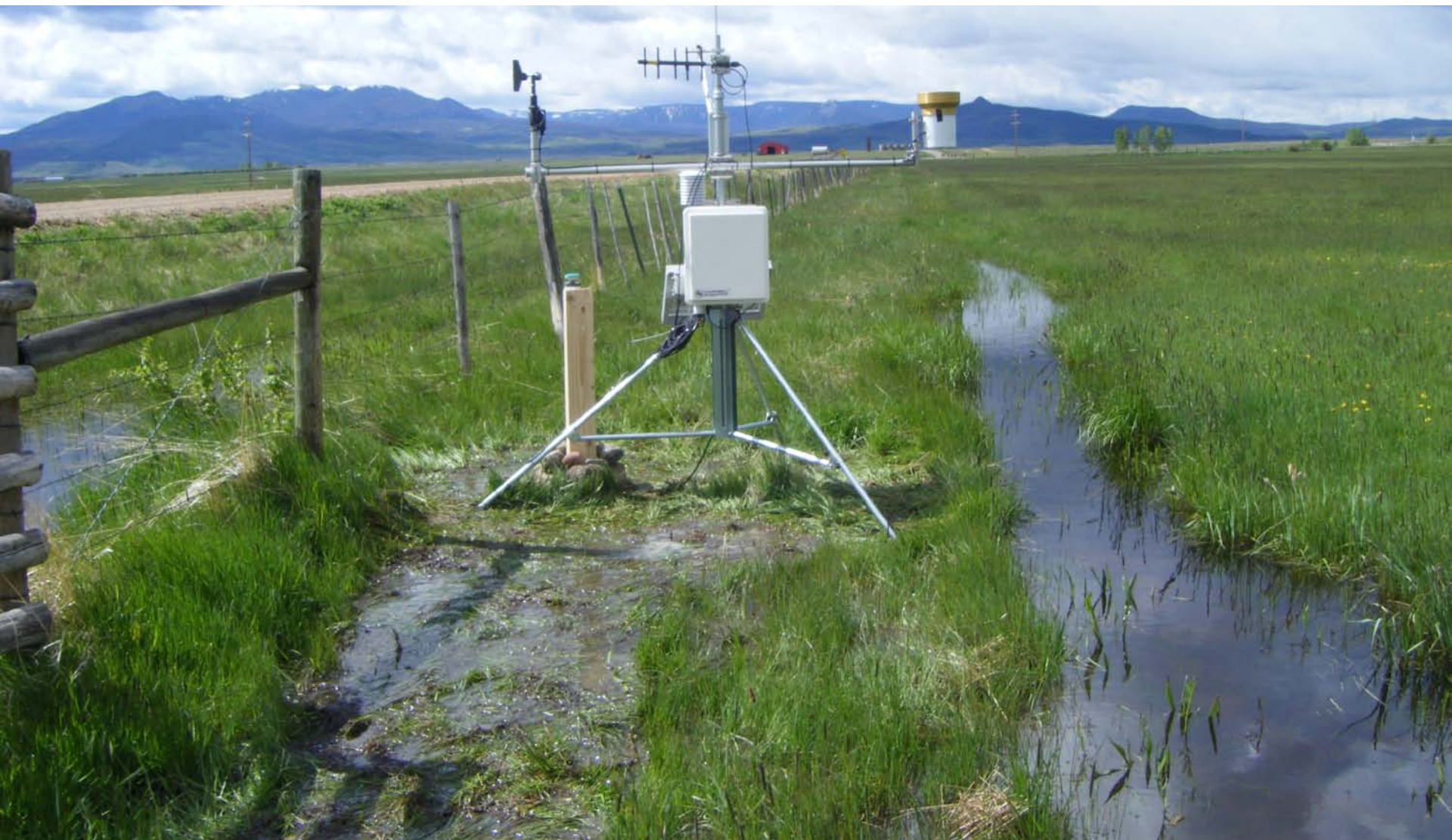




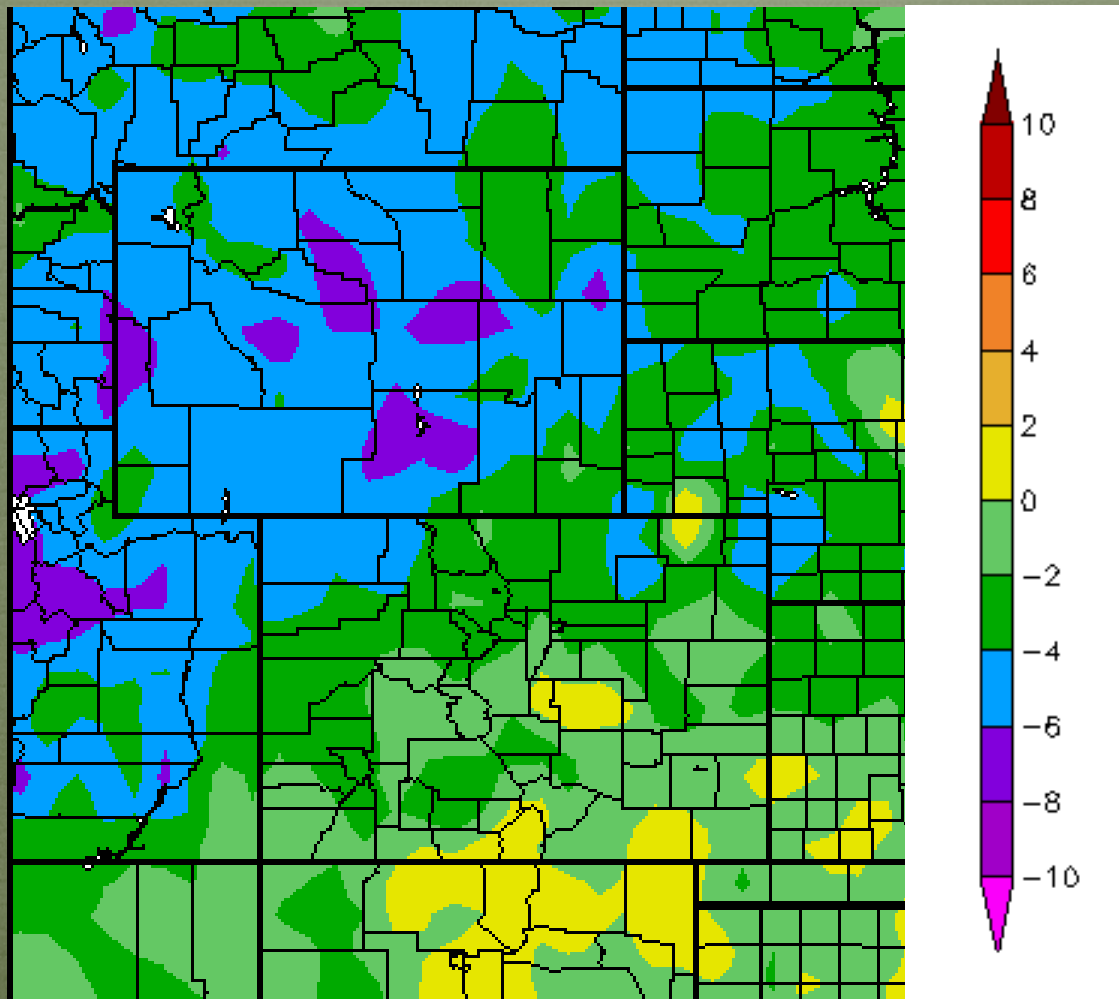




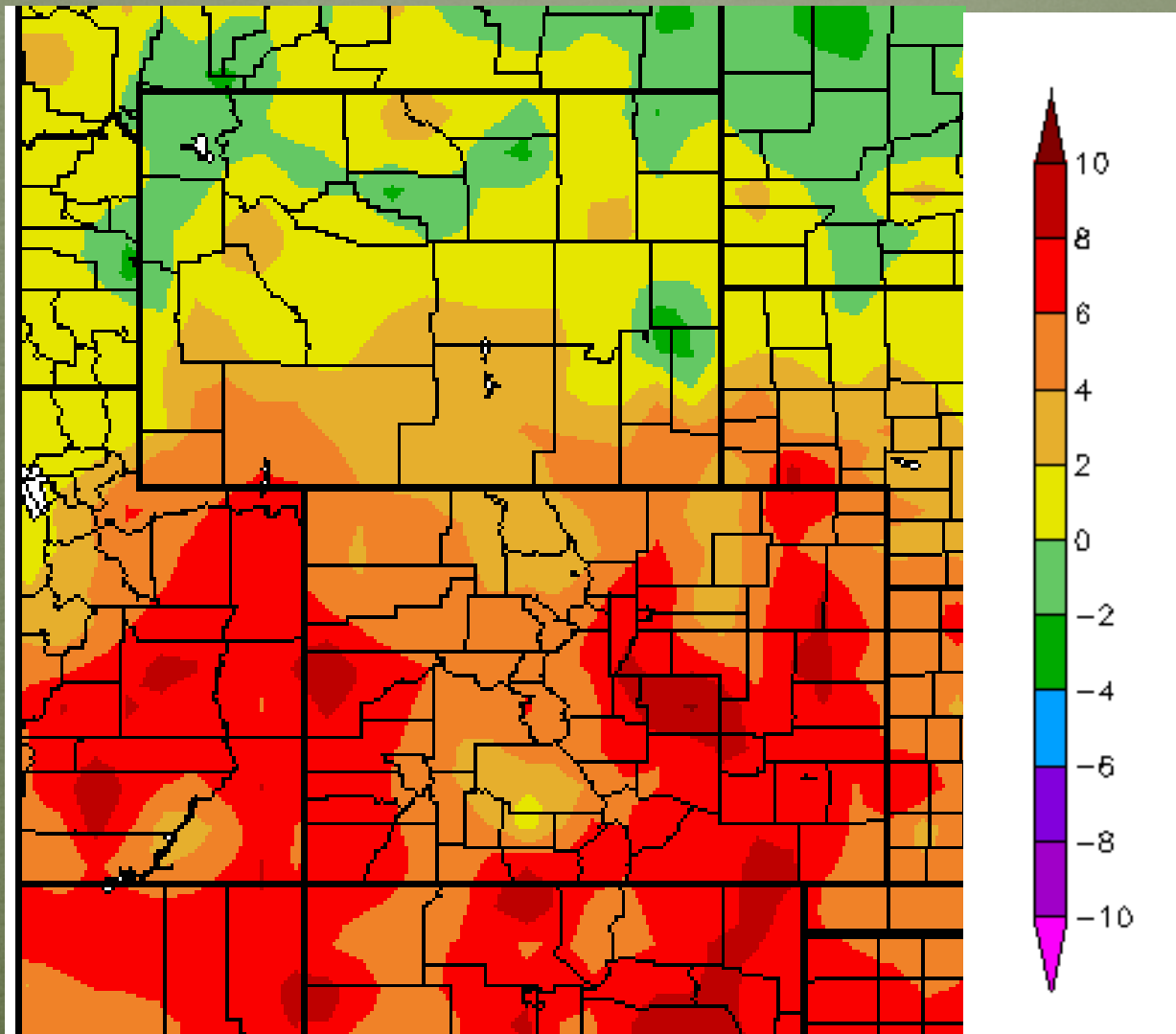
Water Demand



May Temperature Departure from Normal 5/1/2010 – 5/31/2010

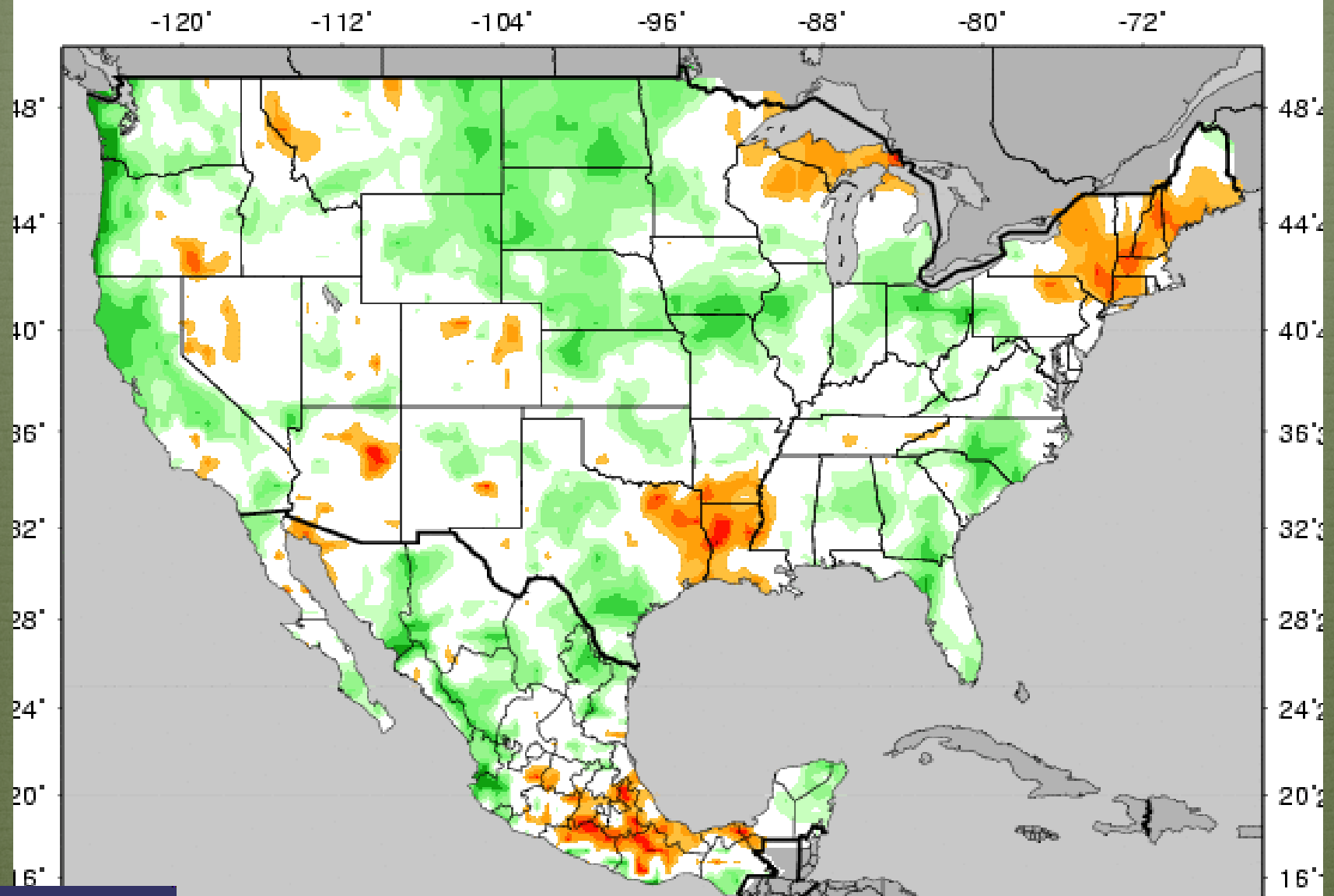


Temperature Departure from Normal 6/1/2010 – 6/7/2010



VIC Total Moisture Storage Percentiles (wrt/ 1916-2004)

20100606



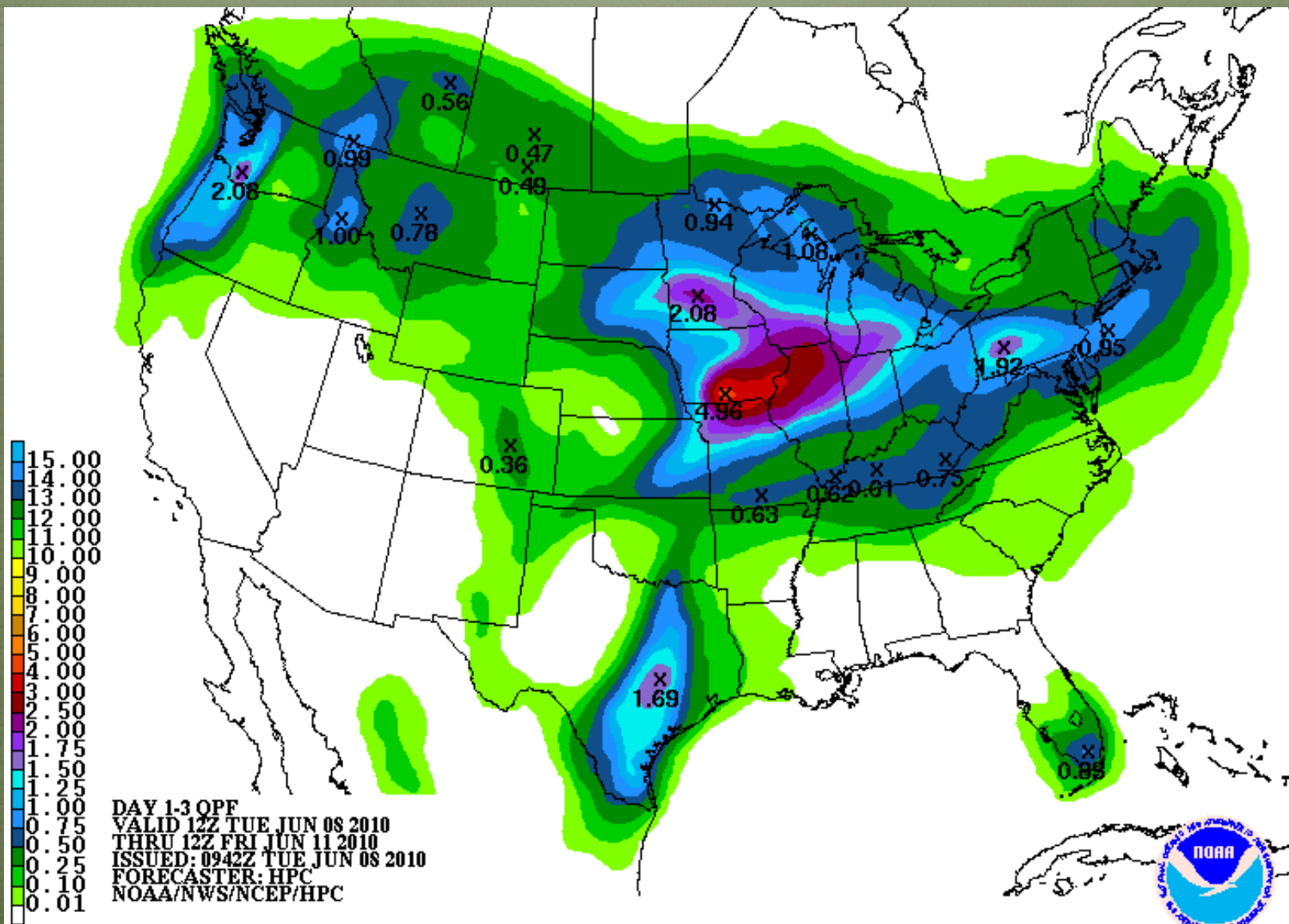
percentile



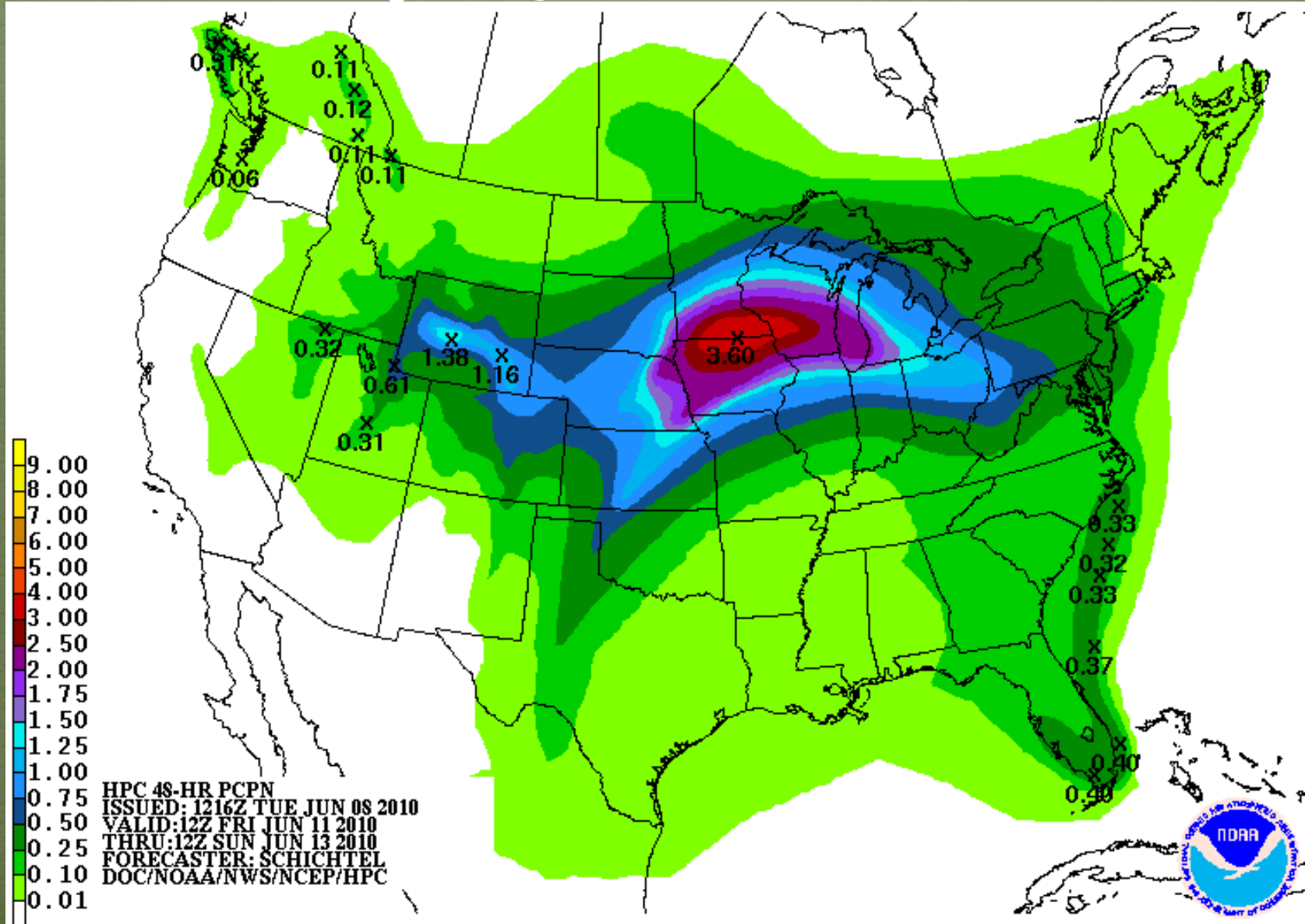
Precipitation Forecast



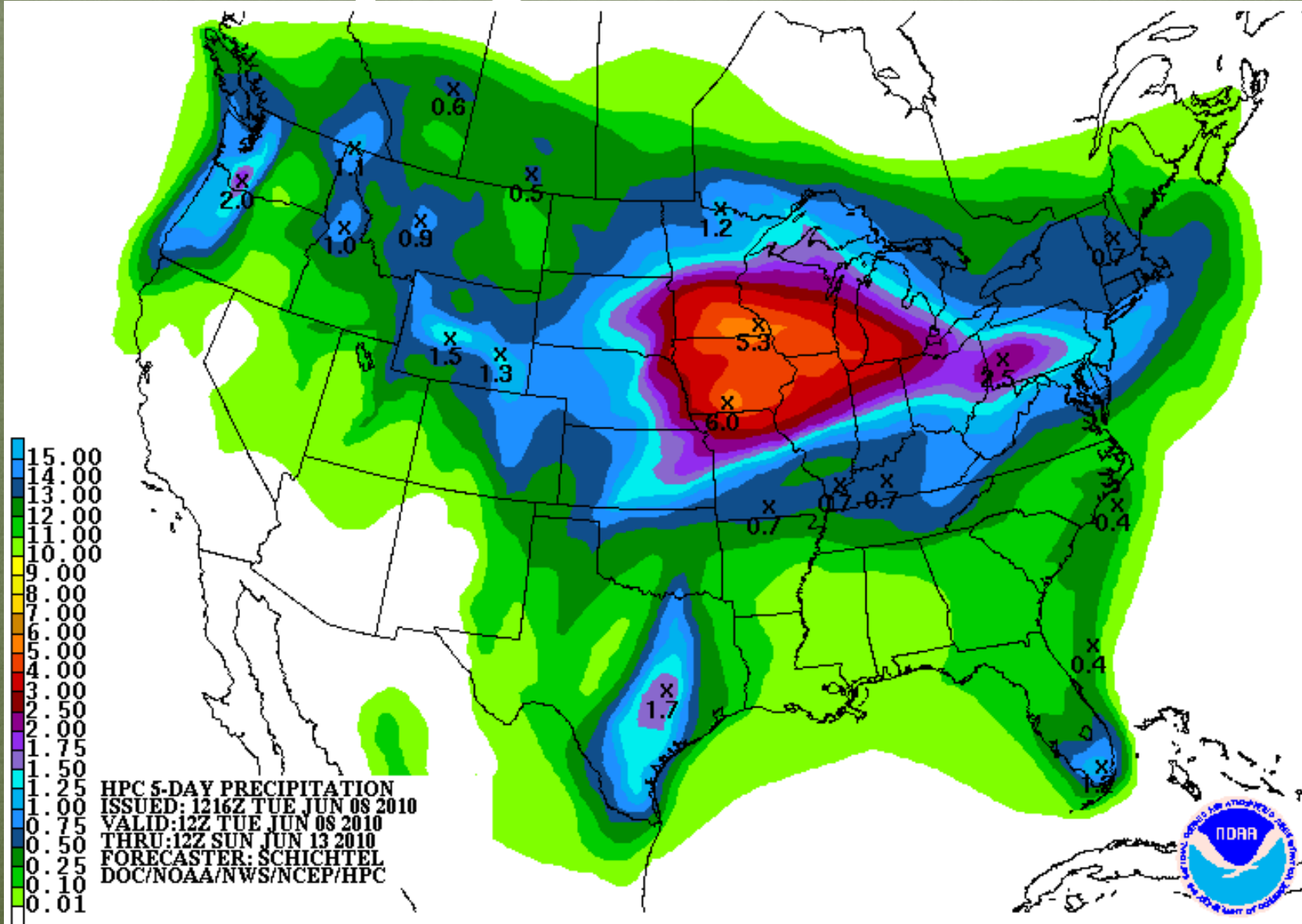
1-3 Day QPF 9-11 June



4-5 Day QPF 12-13 June



5 Day QPF 9-13 June



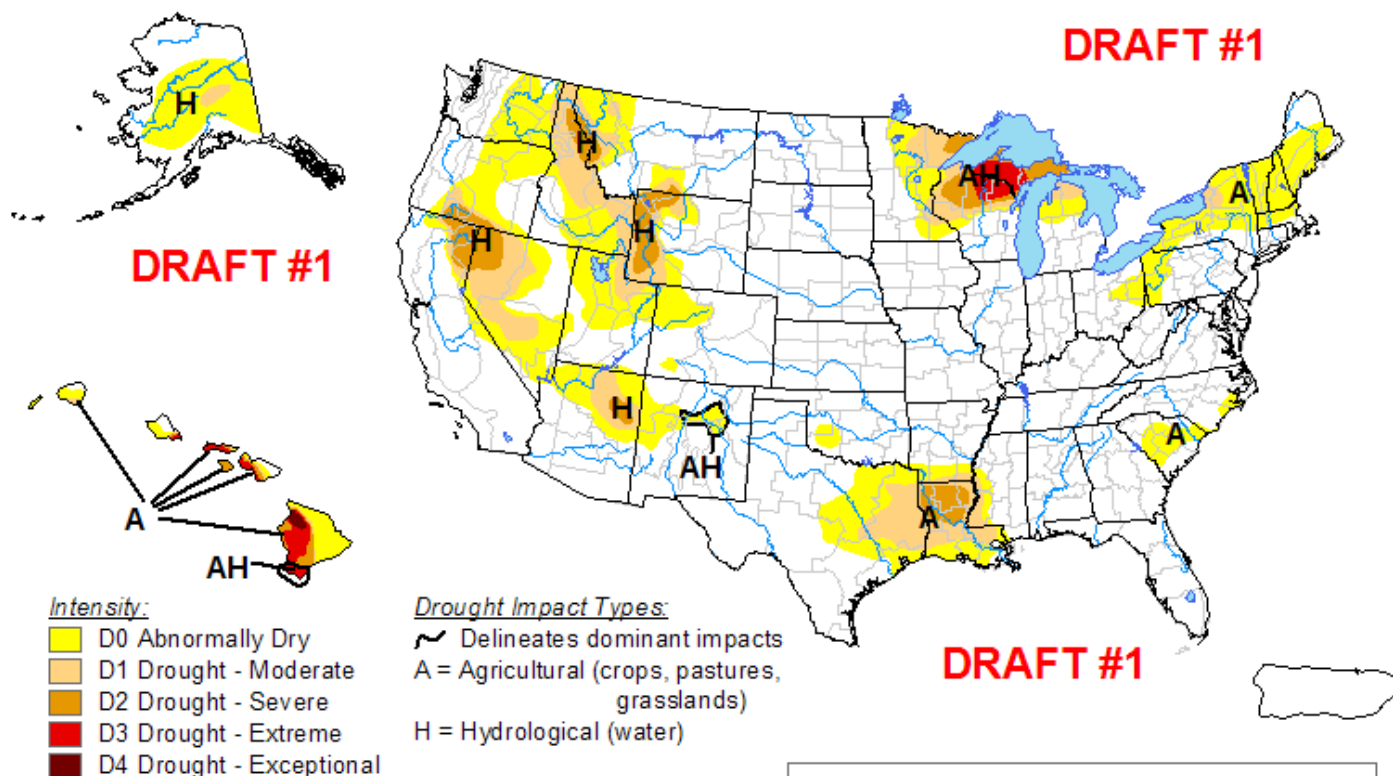
Recommendations

U.S. Drought Monitor

June 8, 2010

Valid 7 a.m. EDT

DRAFT #1



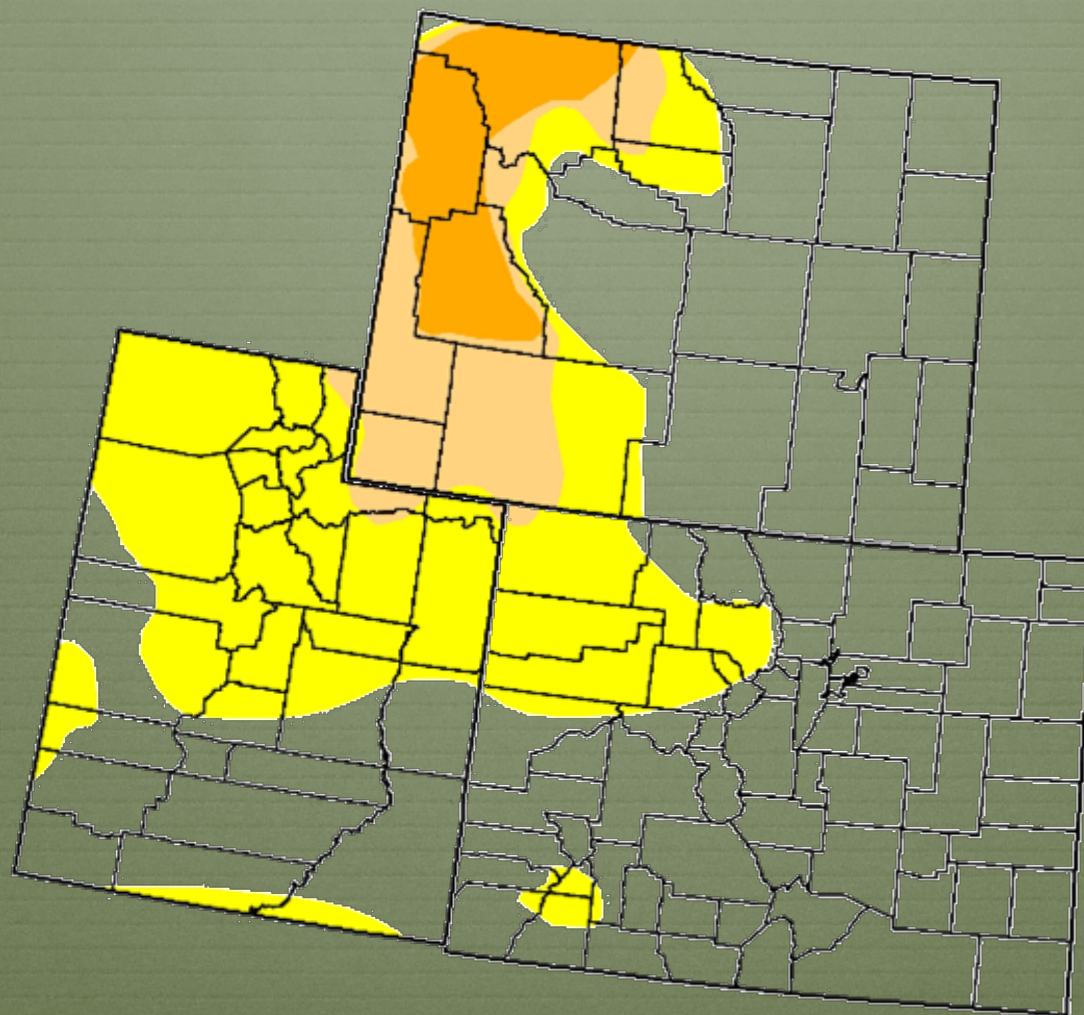
The Drought Monitor focuses on broad-scale conditions.
Local conditions may vary. See accompanying text summary
for forecast statements.



Released Thursday, June 10, 2010

<http://drought.unl.edu/dm>

Author: Mark Svoboda, National Drought Mitigation Center



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NIDIS - UPPER COLORADO BASIN PILOT PROJECT

For more information

NIDIS Weekly Climate, Water and Drought Assessment Upper Colorado River Basin

Precipitation and Snowpack

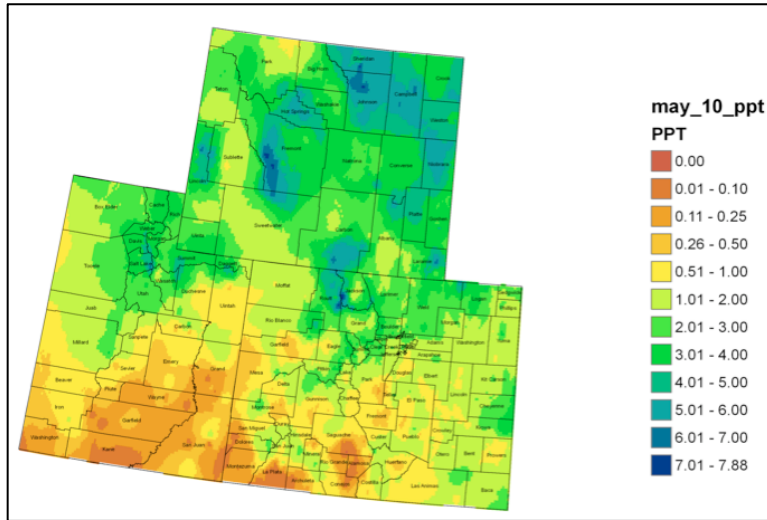


Fig. 1: May precipitation in inches

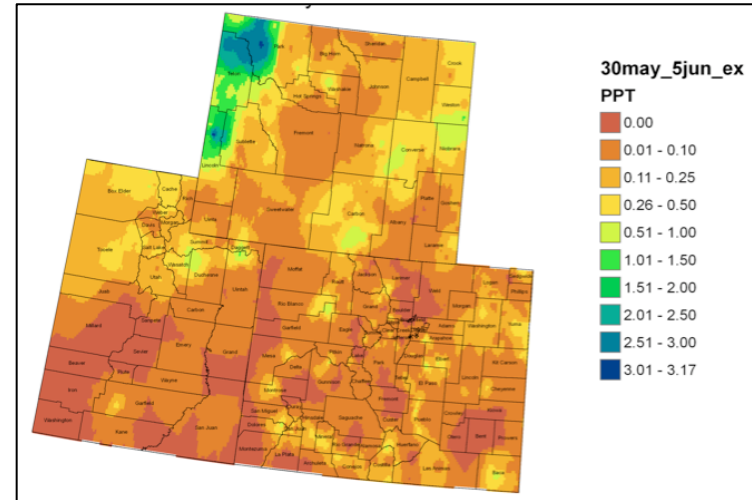


Fig. 2: May 30 - June 5 precipitation in inches

Northern Utah, northern Colorado, and most of Wyoming received good amounts of moisture for the month of May (Fig. 1), while the southern region of the tri-state area has quickly dried out after an earlier wet winter. For the first week of June (Fig. 2), the UCRB was dry, with very little precipitation falling aside from localized convective thunderstorms.

Snotel Water-Year-to-Date (WYTD) precipitation percent of averages show the driest areas in western WY, northeastern UT, and southwestern CO (Fig. 3), with the Upper Colorado River headwaters region currently at 87% of average for the water year. Much of the region saw 1-2% decreases in their percent of averages from last week, while Sublette county in Wyoming showed increases.

The majority of the basins in the region did not reach 80% of their peak snowpack for the season. The snowpack at most of the lower elevation stations throughout the region has completely melted. Many of the higher elevation stations retained much of their snow through most of May, thanks to cooler than average temperatures. The recent and rapid warm-up in the region has led to very quick melt-off at these stations in the past week.

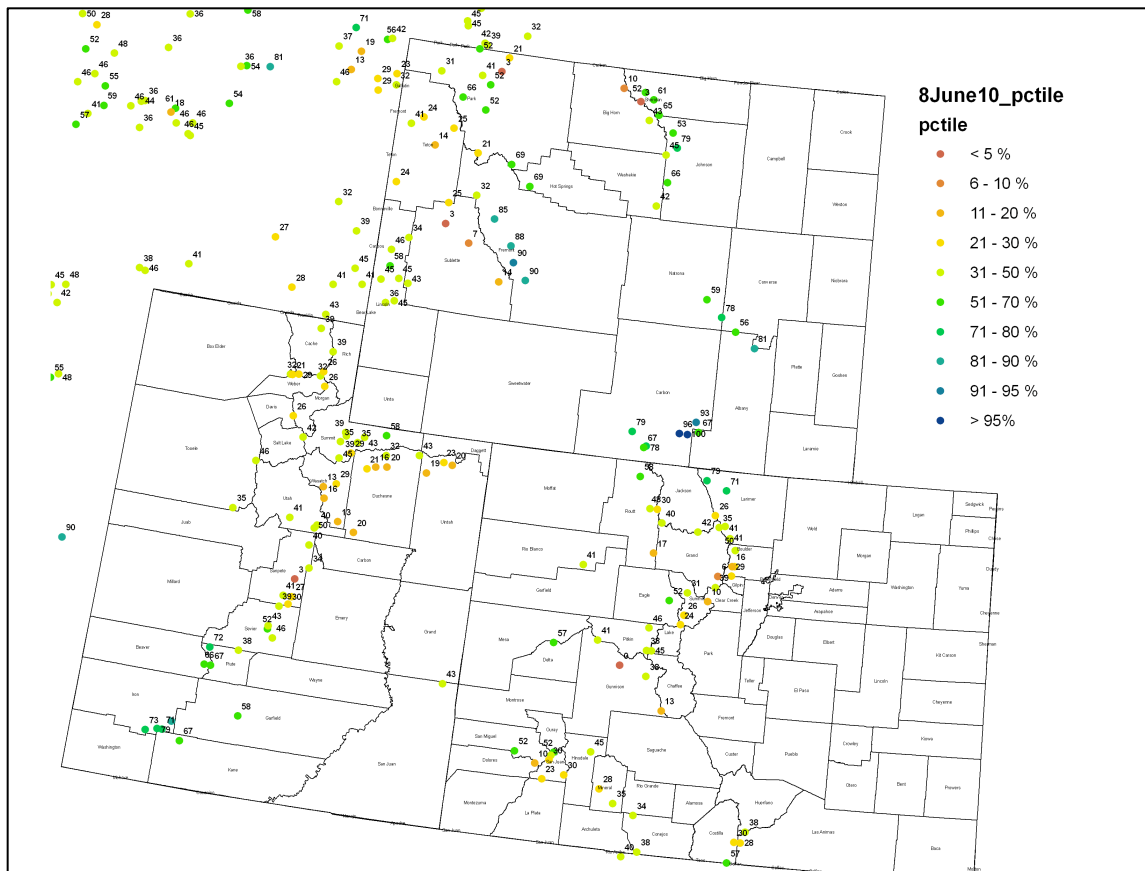


Fig. 3: Snotel WYTD precipitation percentiles (50% is median, 21-30% is Drought Monitor's D0 category).

Streamflow

Many stream gages in the region have recently reached their peak flows (with a few sites in Colorado recording near record levels), or will reach their peaks in the next day or two. 54% of the gages in the UCRB are recording normal 7-day average flows (in the 25-75% range), with the majority of the below normal sites located in Wyoming. Peak flows are occurring within the normal time of year (Fig. 4). The high flows are mostly due to the rapid melt-off, so conditions could quickly return to below normal once the runoff begins to slow.

The CBRFC released their latest streamflow forecasts (<http://www.cbrfc.noaa.gov/gmap/gmapm.php?wcon=checked>), which show decreases in the volume forecasts for the Duchesne and San Juan basins, and slight improvement for the Green River basin. Most basins in the region, with the exception of the Yampa-White, are forecast to experience much below normal runoff for April – July.

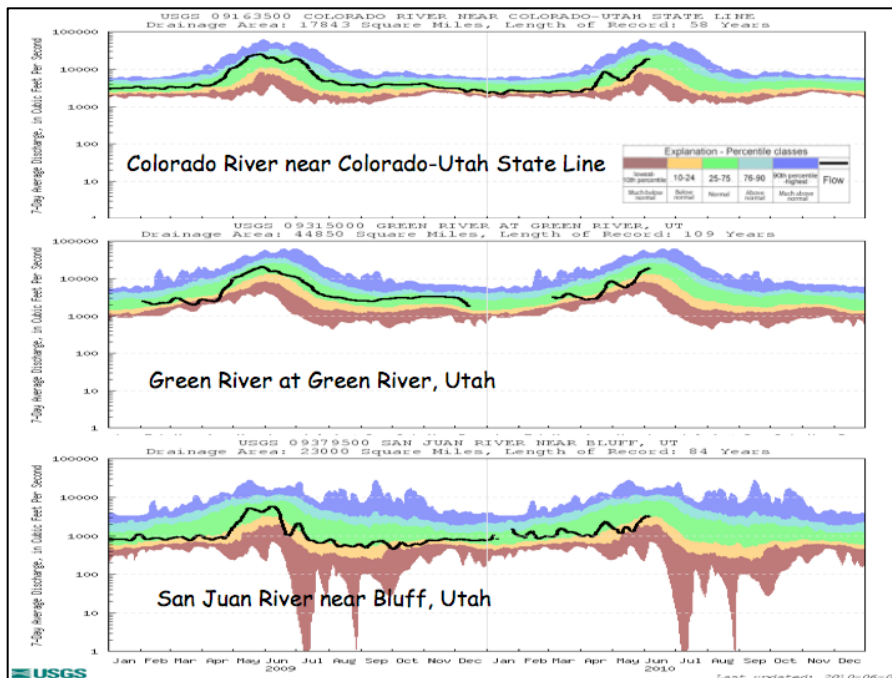


Fig. 4: streamflow timeseries in black relative to normal conditions (green) for three sites: Colorado River at CO-UT border, Green River in eastern UT, and the San Juan River in southeast UT.

Water Supply and Demand

As of the end of May, the major reservoirs in the UCRB are at or above their average levels for this time of year (Fig. 5). Many are filling rapidly and some, such as Dillon are at capacity. This is normal for this time of year when many of the reservoirs experience their maximum increases due to snowmelt and increased runoff. Over the past week, Flaming Gorge (in Wyoming) has seen a rapid decrease in its levels, timing its releases to match the peak flow from the Yampa River.

With the recent above average temperatures, and very dry conditions in the past week, soils along the eastern plains have dried (and have also dried near the headwaters of the Colorado River), and the demand for water (for farmland irrigation and watering of lawns) will likely increase.

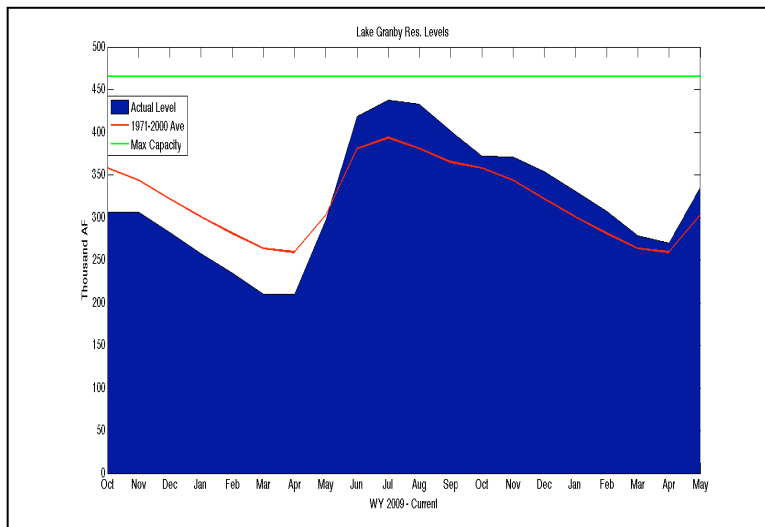


Fig. 5: Lake Granby reservoir levels in Grand County are at its highest levels 10 years.

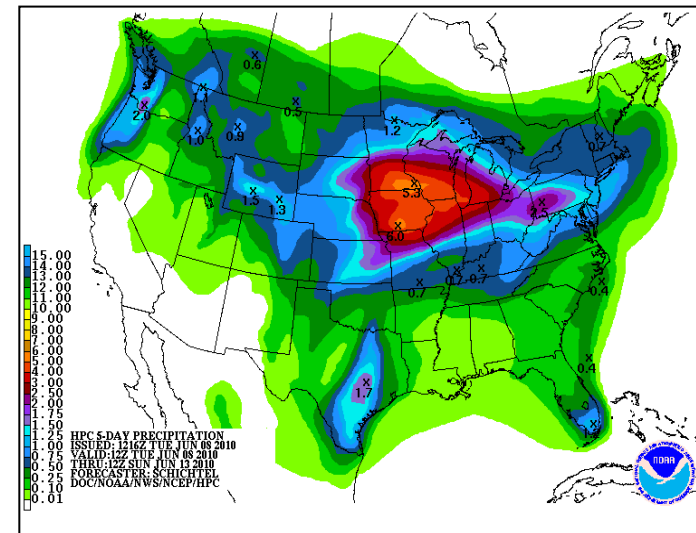


Fig. 6: HPC 5-day total precipitation forecast

Precipitation Forecast

This time of year, the most likely form of precipitation the region will receive will be the result of localized convective storms. In the next 1-3 days, conditions will be more favorable east of the divide. In the 4-5 day outlook, a larger system moving from

the Pacific northwest will bring moisture to the region, with better chances in the northern and central mountains, and less chance in the southwest (Fig. 6).

Drought and Water Discussion

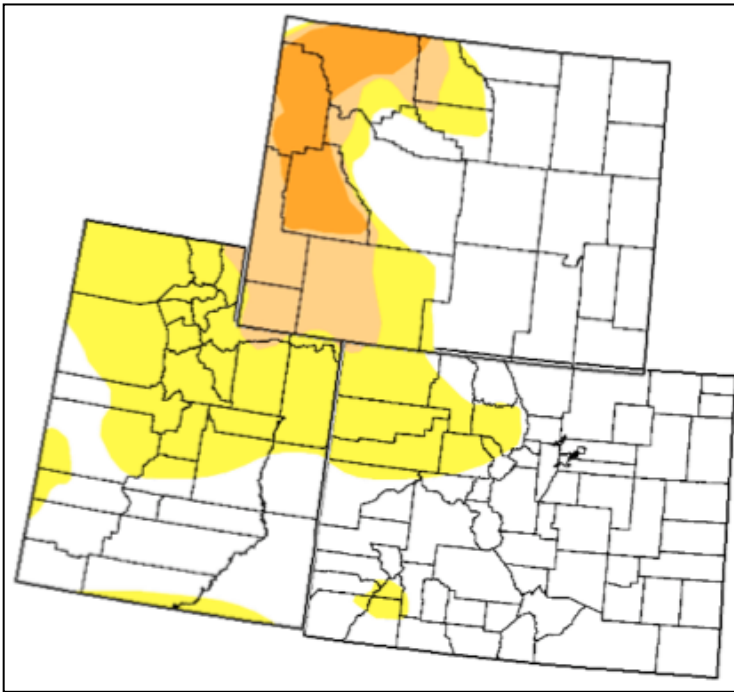


Fig. 7: June 3 release of U.S. Drought Monitor

Due to below normal streamflows and low Snotel precipitation percentiles in the Duchesne basin, there was consideration of adjusting the D1 line in Utah. There will also be consideration of a northward shift of the D0 line in Utah, as the region has good water supplies and the last month has been fairly moist. Any changes to Wyoming and Utah will be coordinated with their state experts. In Colorado, the discussion centered around expanding the D0 in the Colorado River basin to cover most of Eagle and Summit counties and to possibly include some of Lake county. The D0 in southwest Colorado could be expanded eastward to Mineral county.