Spring 2012

Weekly Climate, Water & Drought Assessment

Today's Agenda

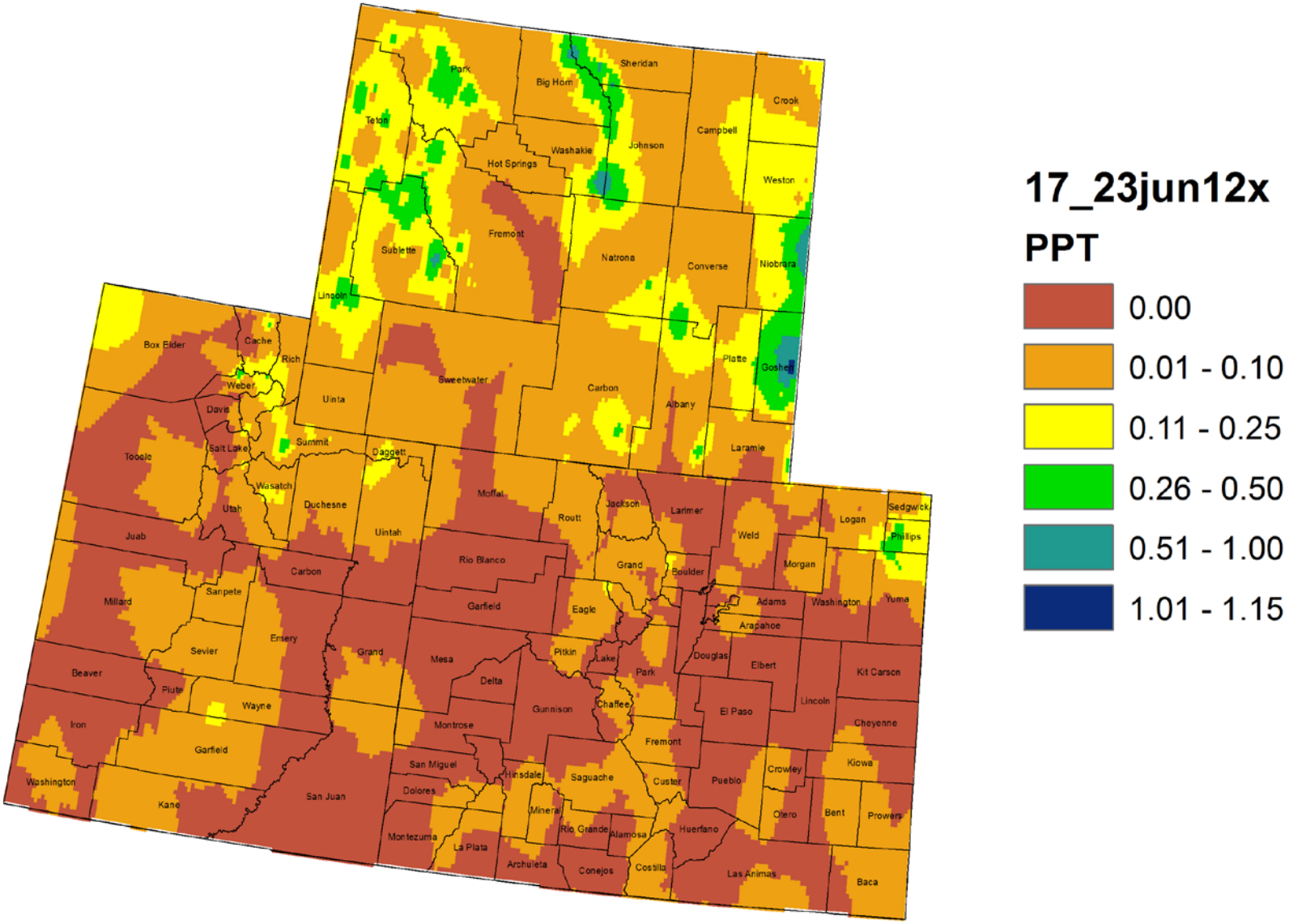
-Assessment of current water conditions

- Precipitation Forecast

- Recommendations for Drought Monitor

Precipitation/Snowpack Update

Colorado, Utah and Wyoming 7 Day Precipitation (inches)
17 - 23 June 2012

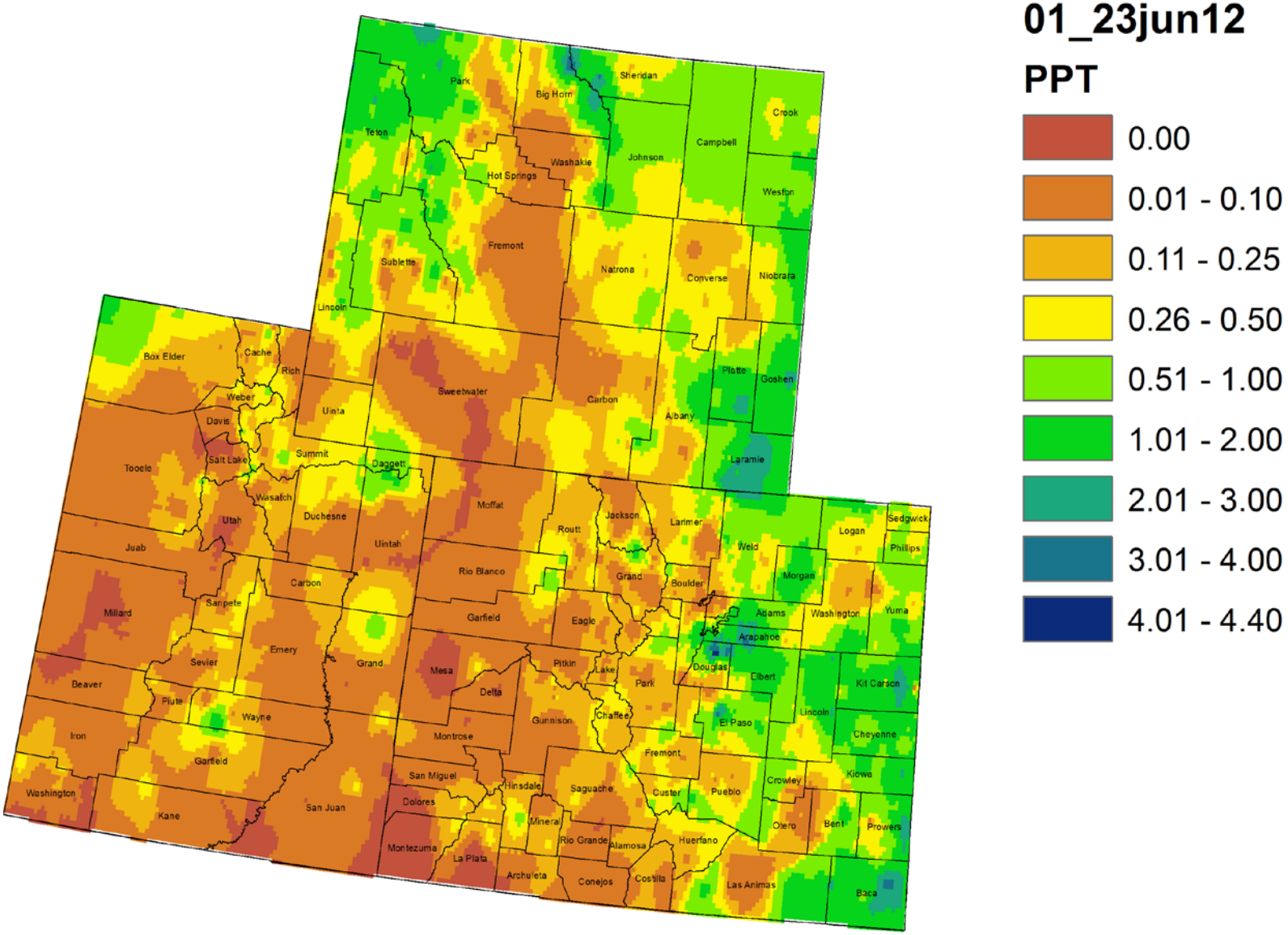


17_23jun12x

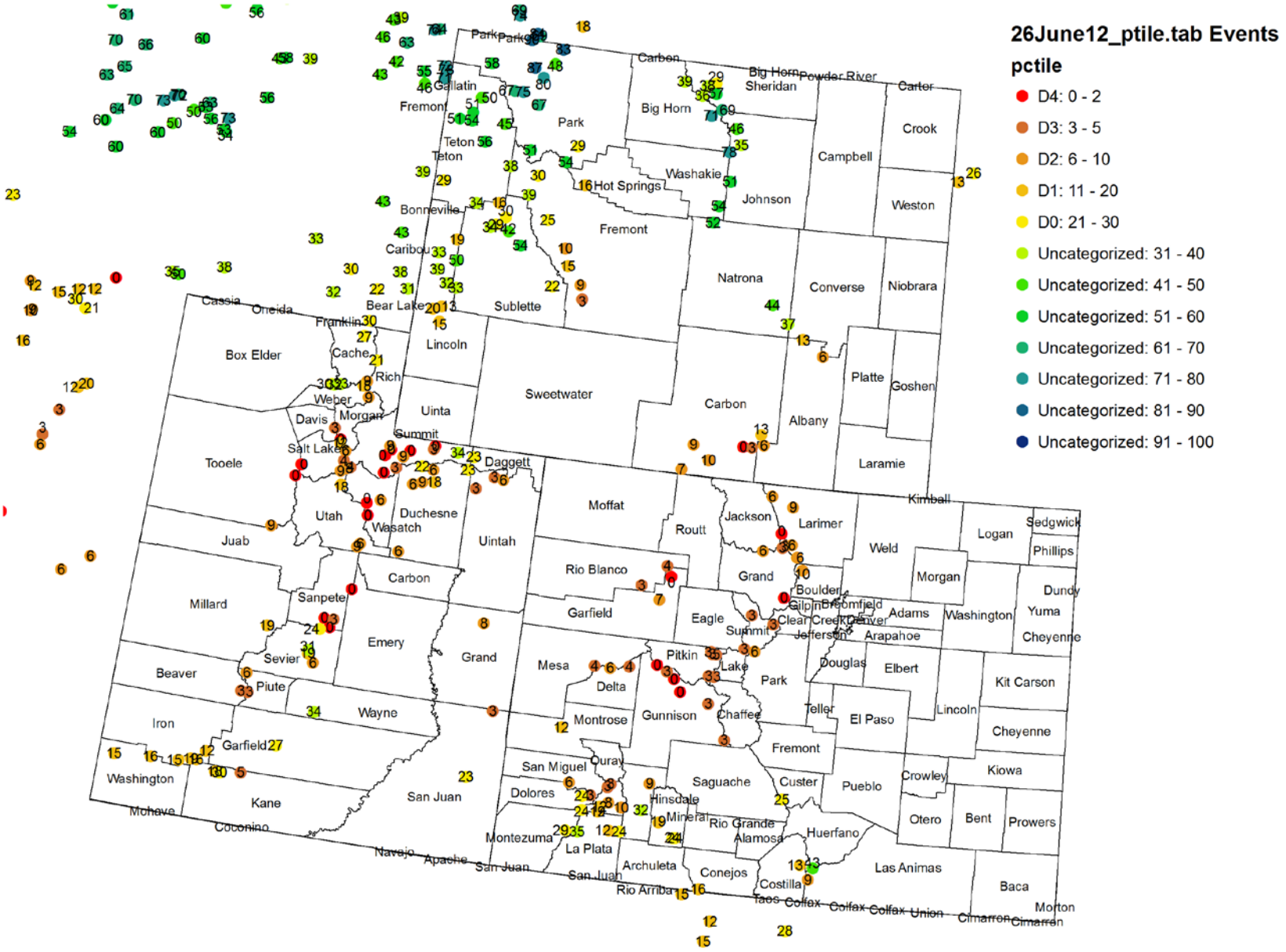
PPT

- 0.00
- 0.01 - 0.10
- 0.11 - 0.25
- 0.26 - 0.50
- 0.51 - 1.00
- 1.01 - 1.15

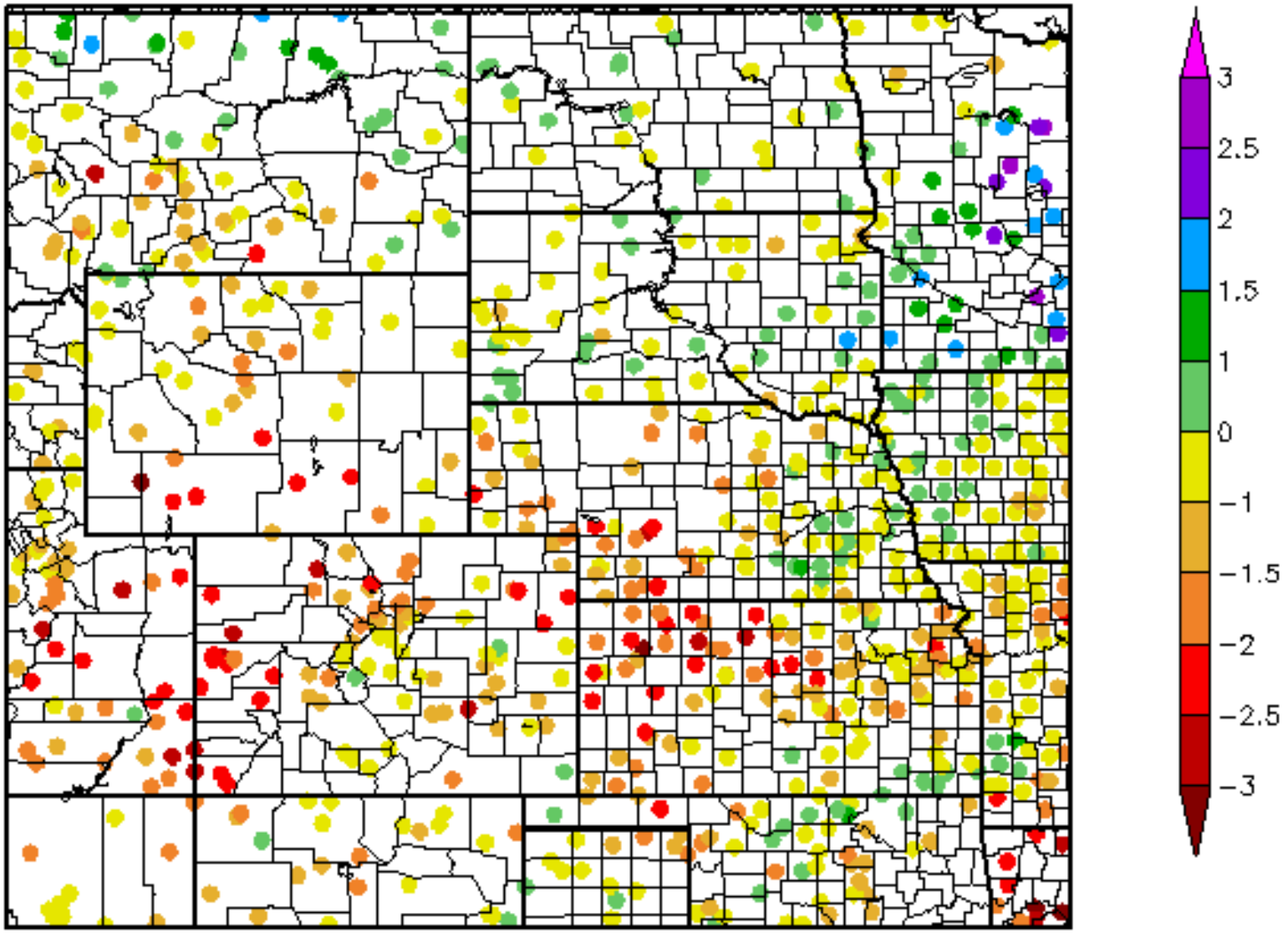
Colorado, Utah and Wyoming Month to Date Precipitation (inches)
1 - 23 June 2012



Snotel Water Year Precipitation Percentile Ranking for 26 June 2012 (Stations with 15+ years of data only)



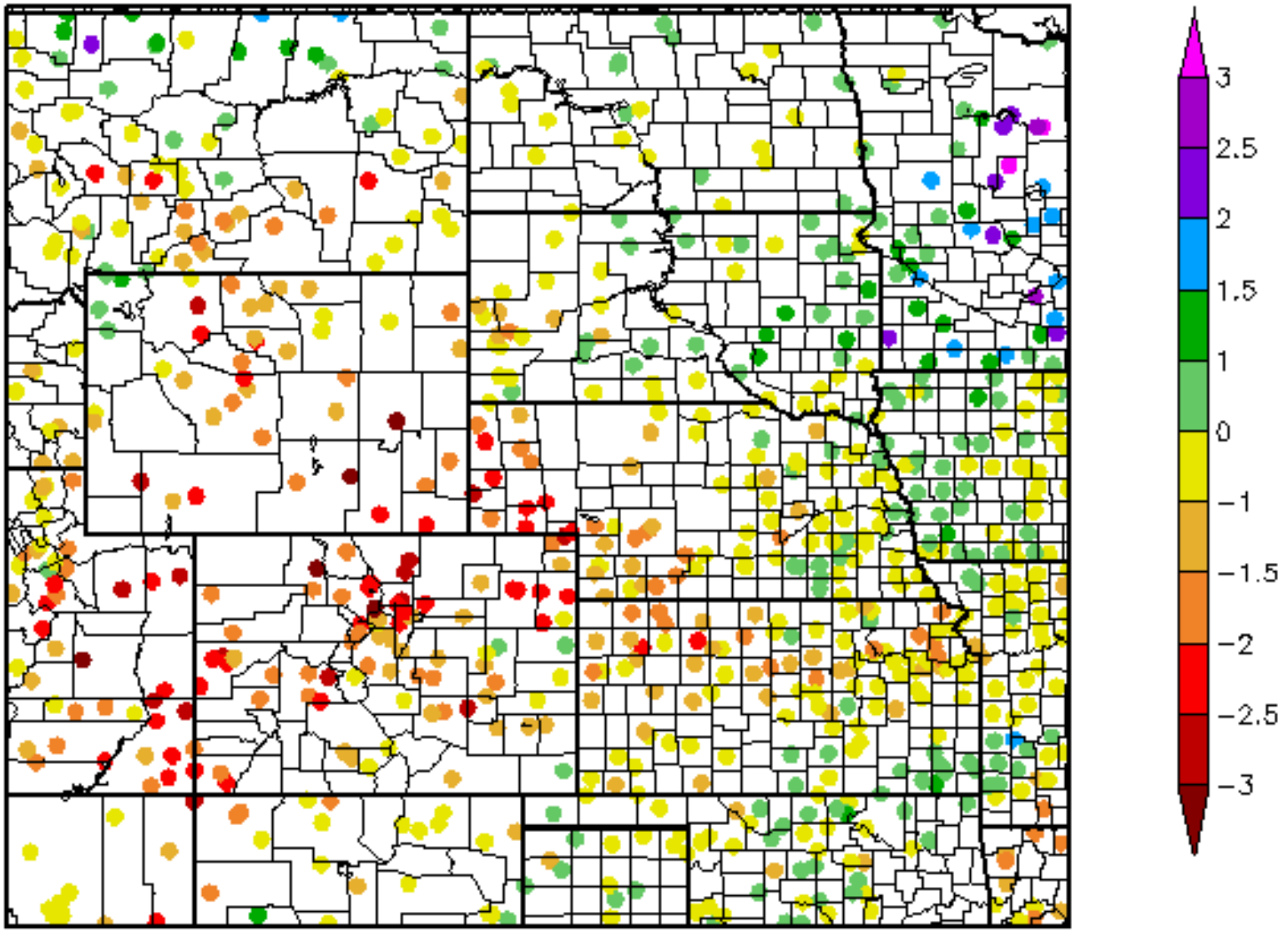
60 Day SPI
4/27/2012 – 6/25/2012



Generated 6/26/2012 at HPRCC using provisional data.

Regional Climate Centers

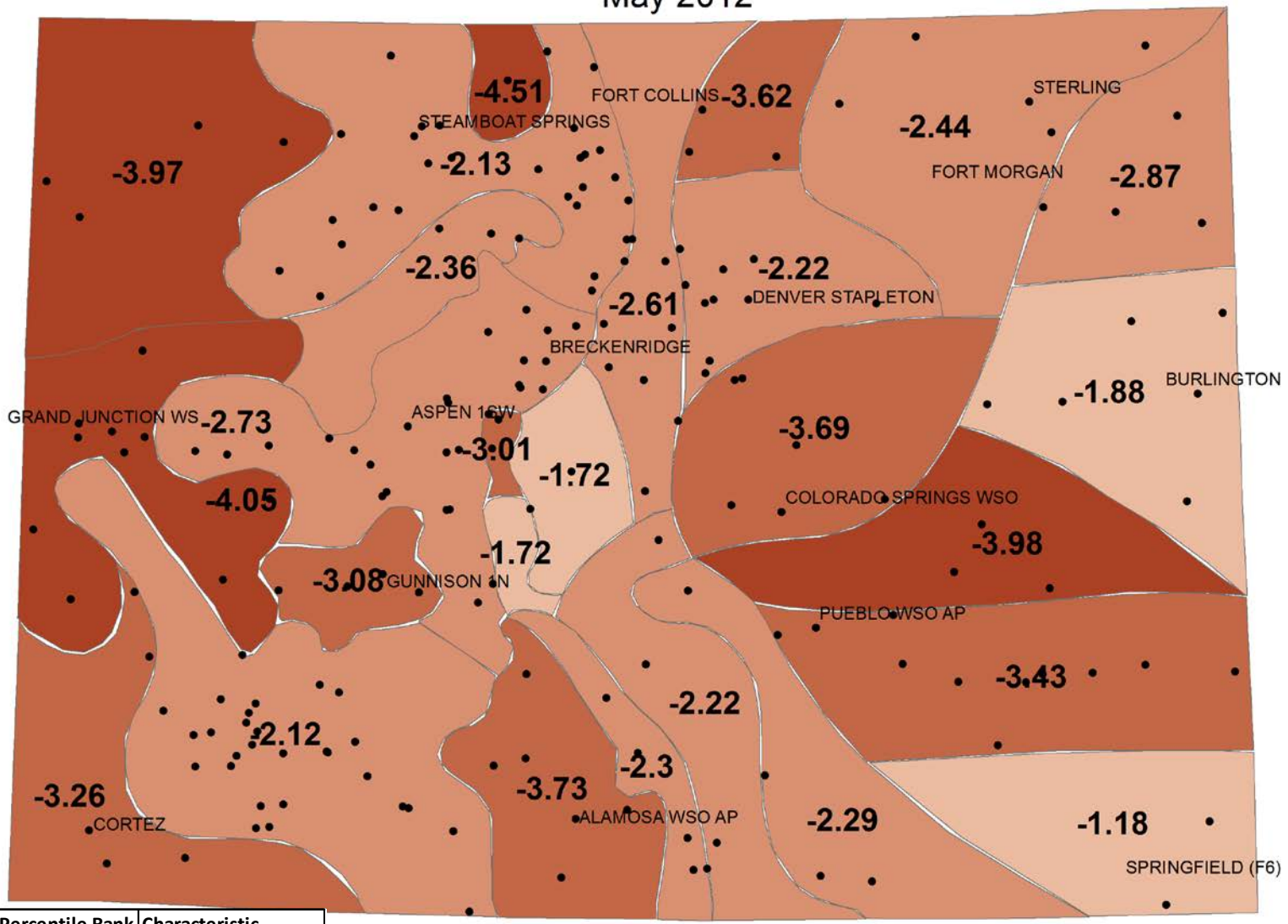
120 Day SPI
2/27/2012 – 6/25/2012



Generated 6/26/2012 at HPRCC using provisional data.

Regional Climate Centers

Modified Palmer Drought Severity Index for Colorado
May 2012

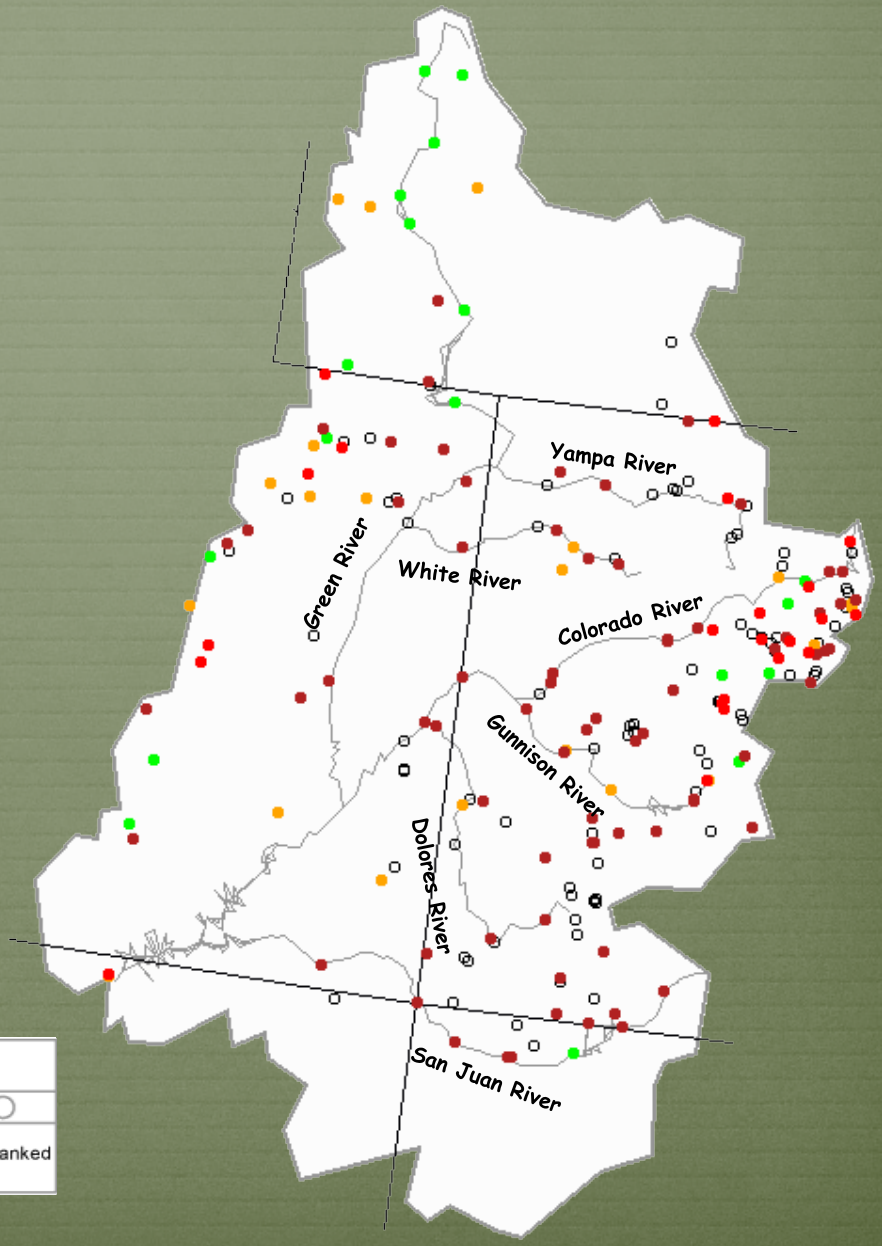


CMPDSI Value	Percentile Rank	Characteristic
-1.0 - -1.9	21-30	Abnormally Dry
-2.0 - -2.9	11-20	Moderate Drought
-3.0 - -3.9	6-10	Severe Drought
-4.0 - -4.9	3-5	Extreme Drought
≤ -5.0	0-2	Exceptional Drought

Streamflow Update

Monday, June 25, 2012

7-day average discharge compared to historical discharge for the day of the year (June 25)

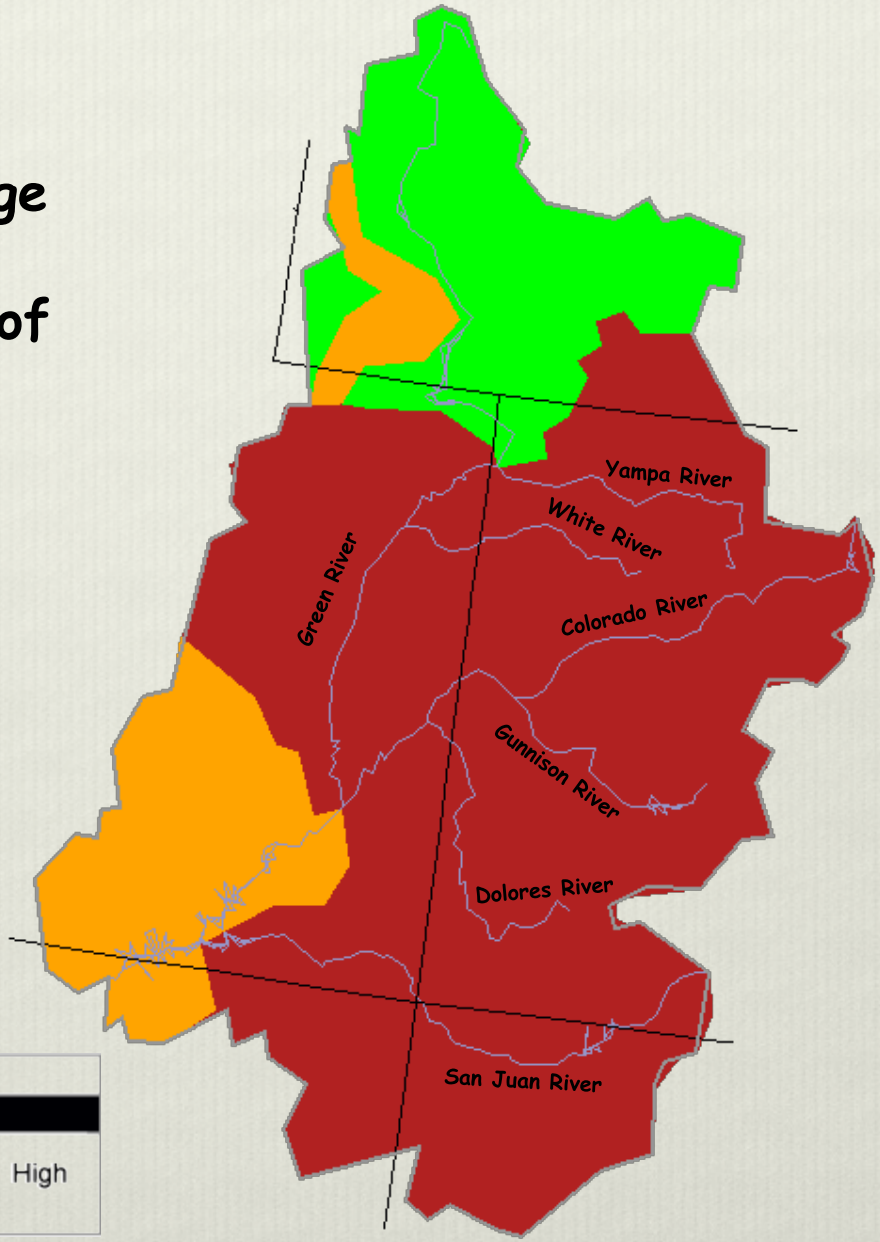


Explanation - Percentile classes							
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		

USGS

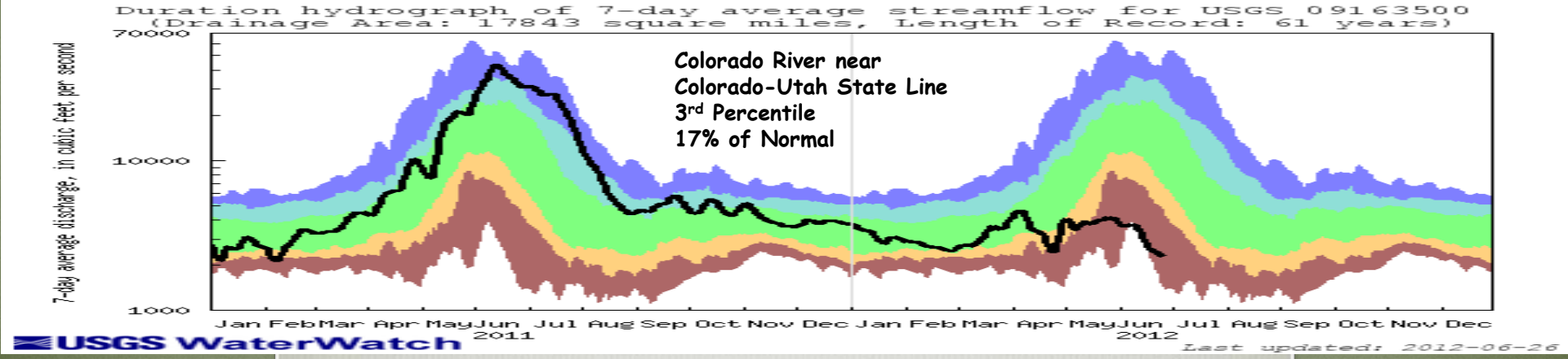
Monday, June 25, 2012

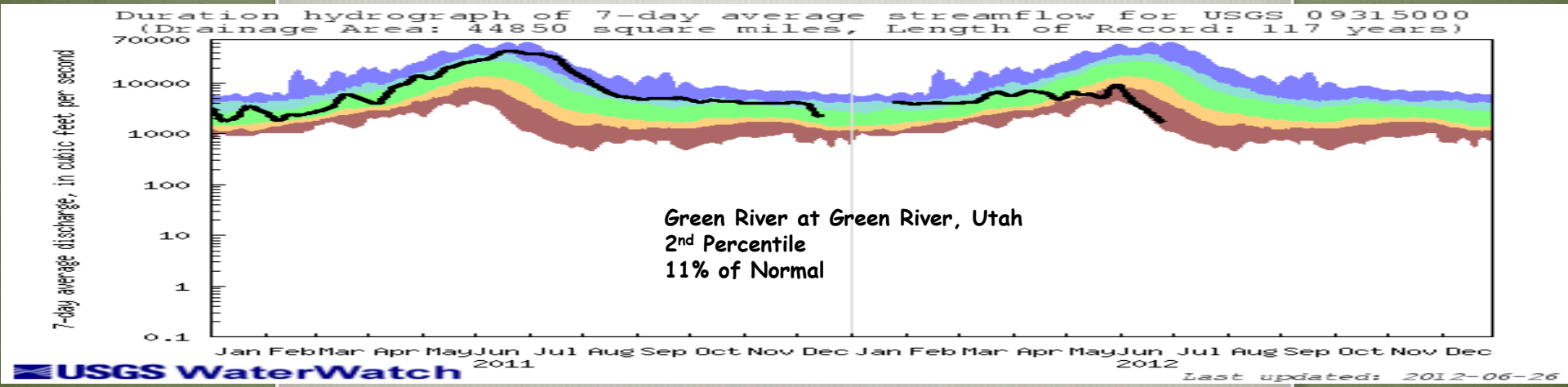
7-day average discharge compared to historical discharge for the day of the year (June 25)

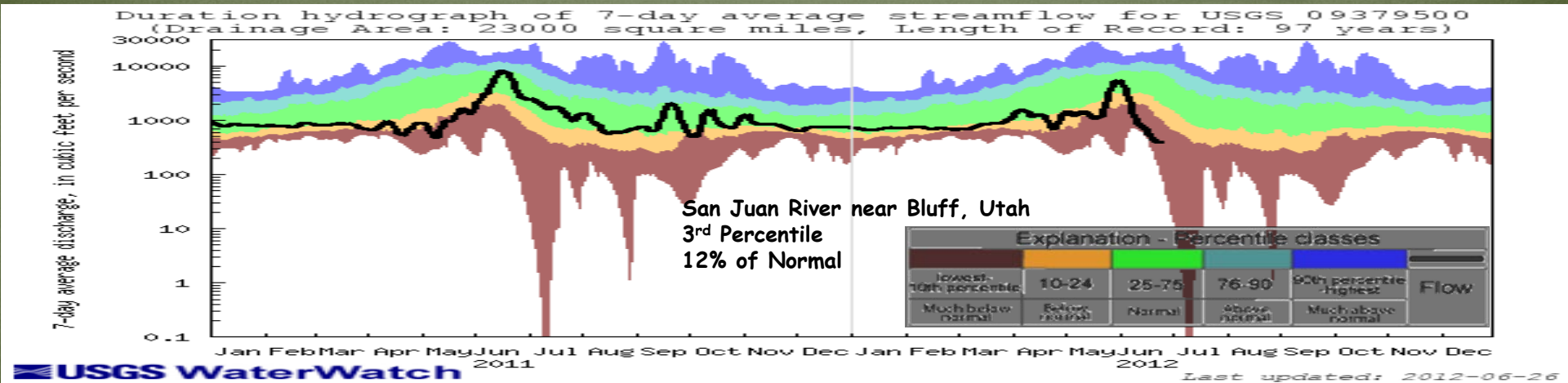


Explanation - Percentile classes						
Low	<10	10-24	25-75	76-90	>90	High
	Much below normal	Below normal	Normal	Above normal	Much above normal	

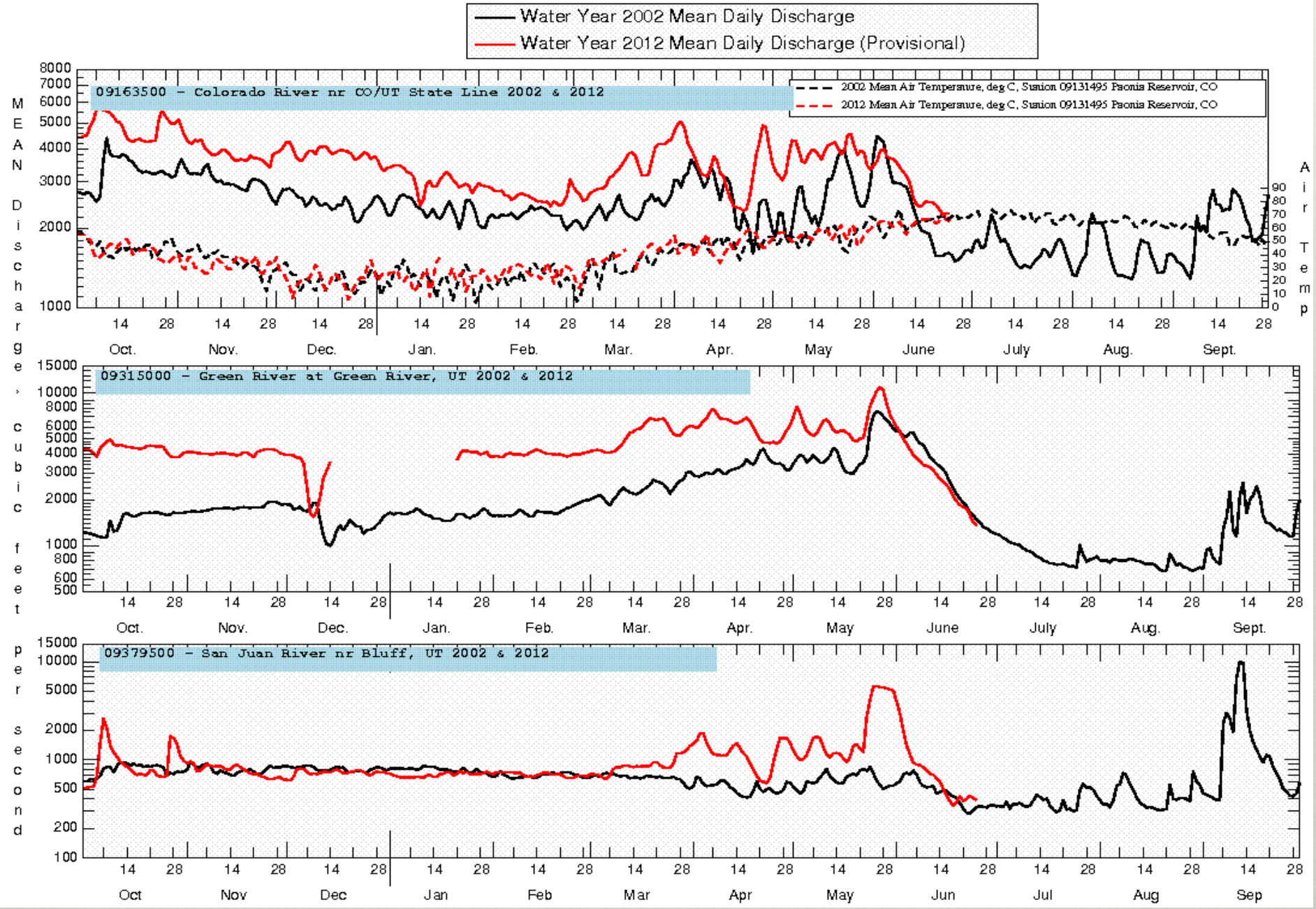
USGS


Duration hydrograph of 7-day average streamflow for USGS 09163500
(Drainage Area: 17843 square miles, Length of Record: 61 years)
7-day average discharge, in cubic feet per second
70000
10000
1000
Colorado River near
Colorado-Utah State Line
3rd Percentile
17% of Normal
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
2011
2012
USGS WaterWatch
Last updated: 2012-06-26

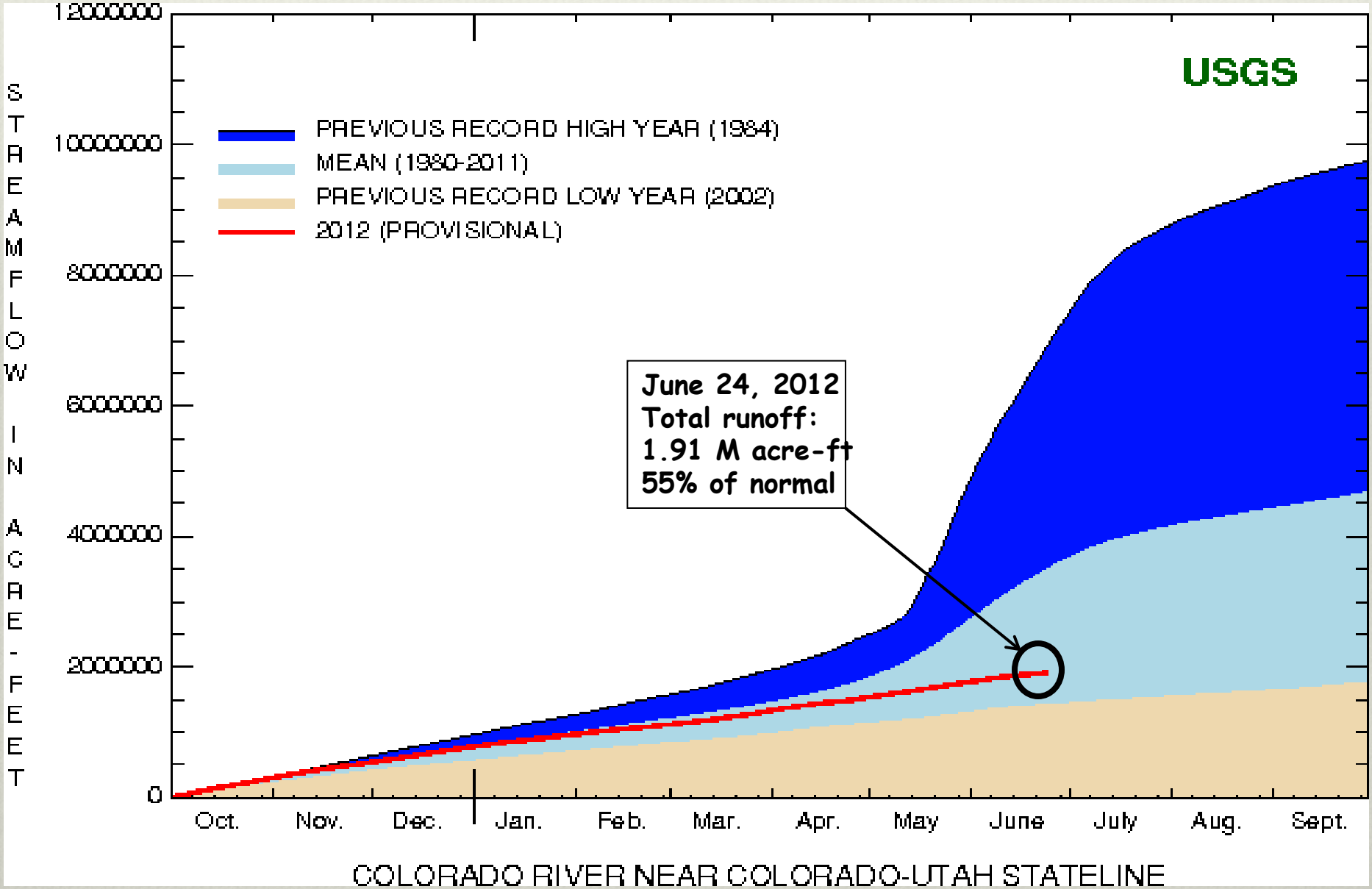

Duration hydrograph of 7-day average streamflow for USGS 09315000
(Drainage Area: 44850 square miles, Length of Record: 117 years)
7-day average discharge, in cubic feet per second
70000
10000
1000
100
10
1
0.1
Green River at Green River, Utah
2nd Percentile
11% of Normal
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
2011
2012
USGS WaterWatch
Last updated: 2012-06-26


Duration hydrograph of 7-day average streamflow for USGS 09379500
(Drainage Area: 23000 square miles, Length of Record: 97 years)
7-day average discharge, in cubic feet per second
30000
10000
1000
100
10
1
0.1
San Juan River near Bluff, Utah
3rd Percentile
12% of Normal
Explanation - Percentile classes
Lowest-10th percentile
10-24
25-75
76-90
90th percentile-Highest
Flow
Much below normal
Below normal
Normal
Above normal
Much above normal
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
2011
2012
USGS WaterWatch
Last updated: 2012-06-26

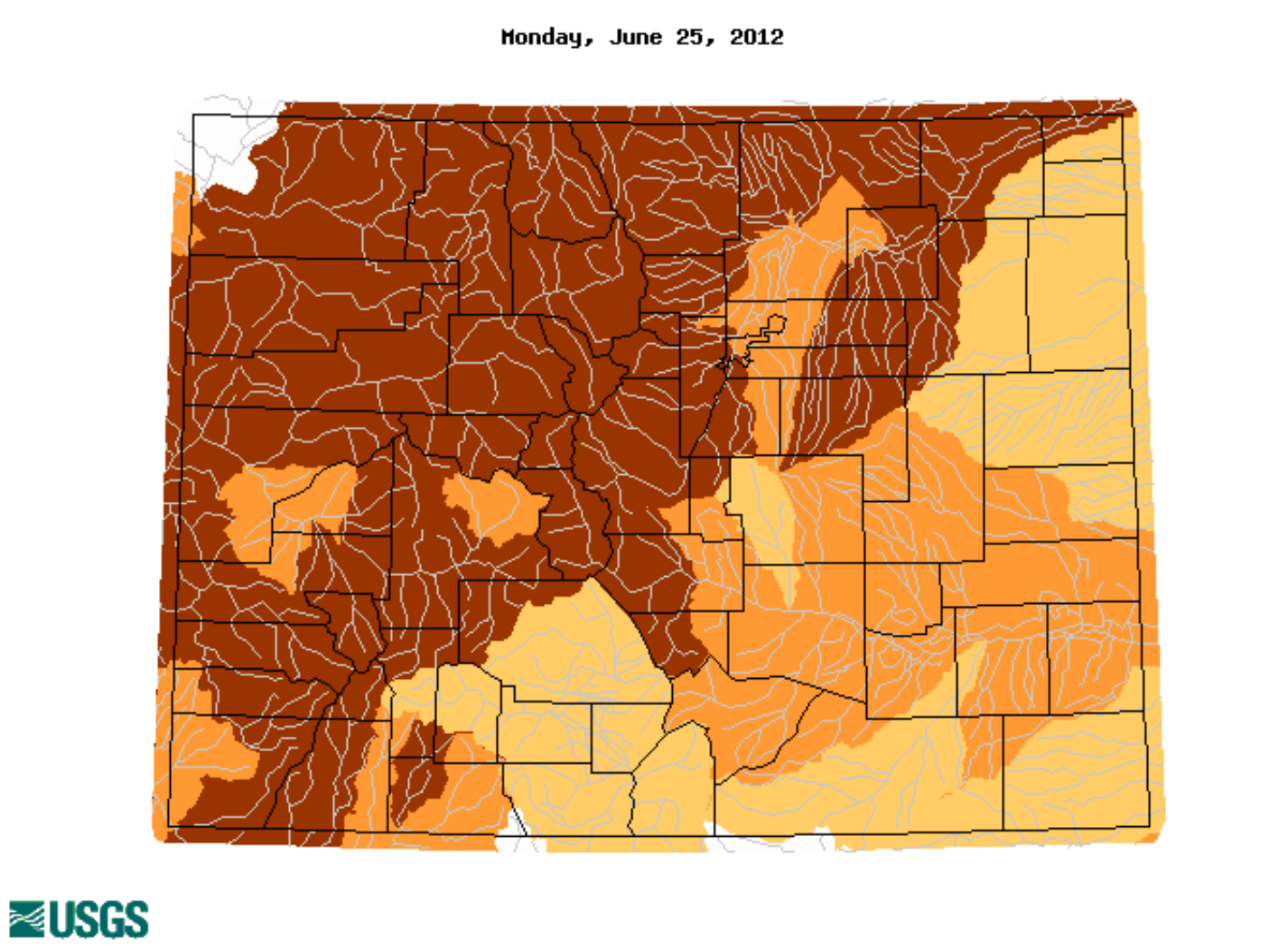
Colorado River Basin 2002 vs. 2012 Mean Daily Discharge Comparison at Select Stations



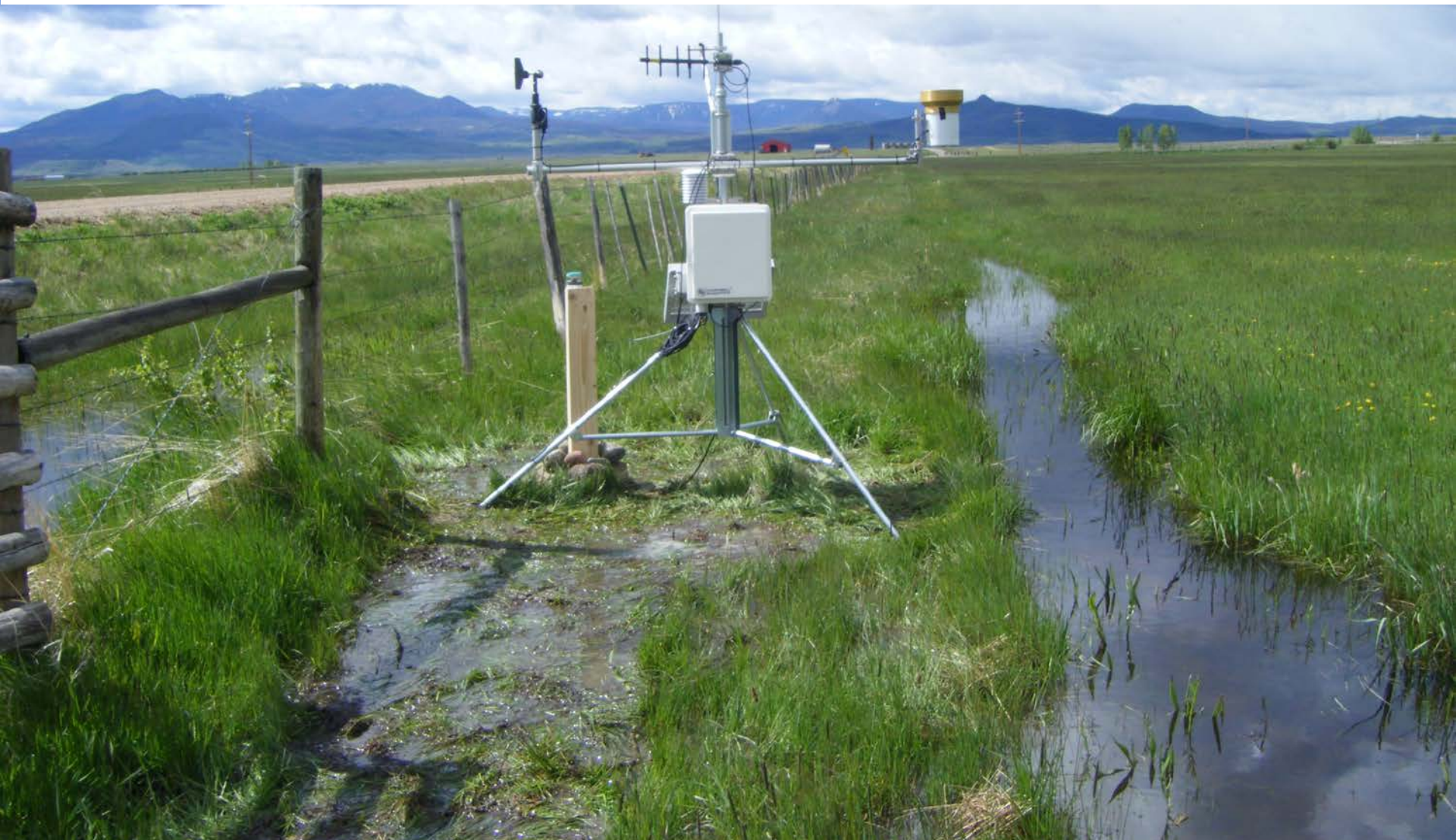
Total Streamflow Volume
Colorado River nr CO/UT State Line
Oct 1, 2011 to June 24, 2012



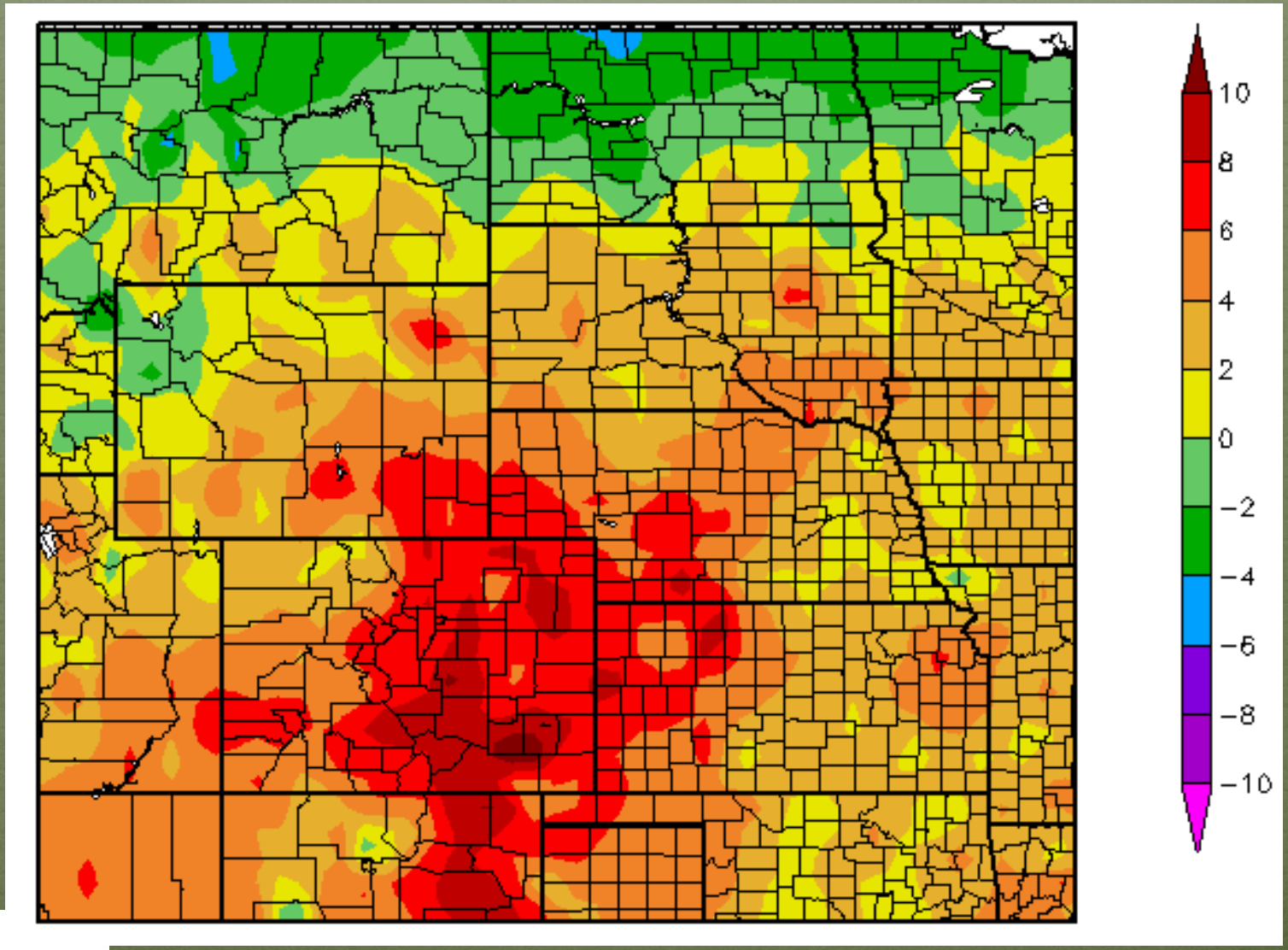
7-day average streamflow compared to historical streamflow



Water Demand

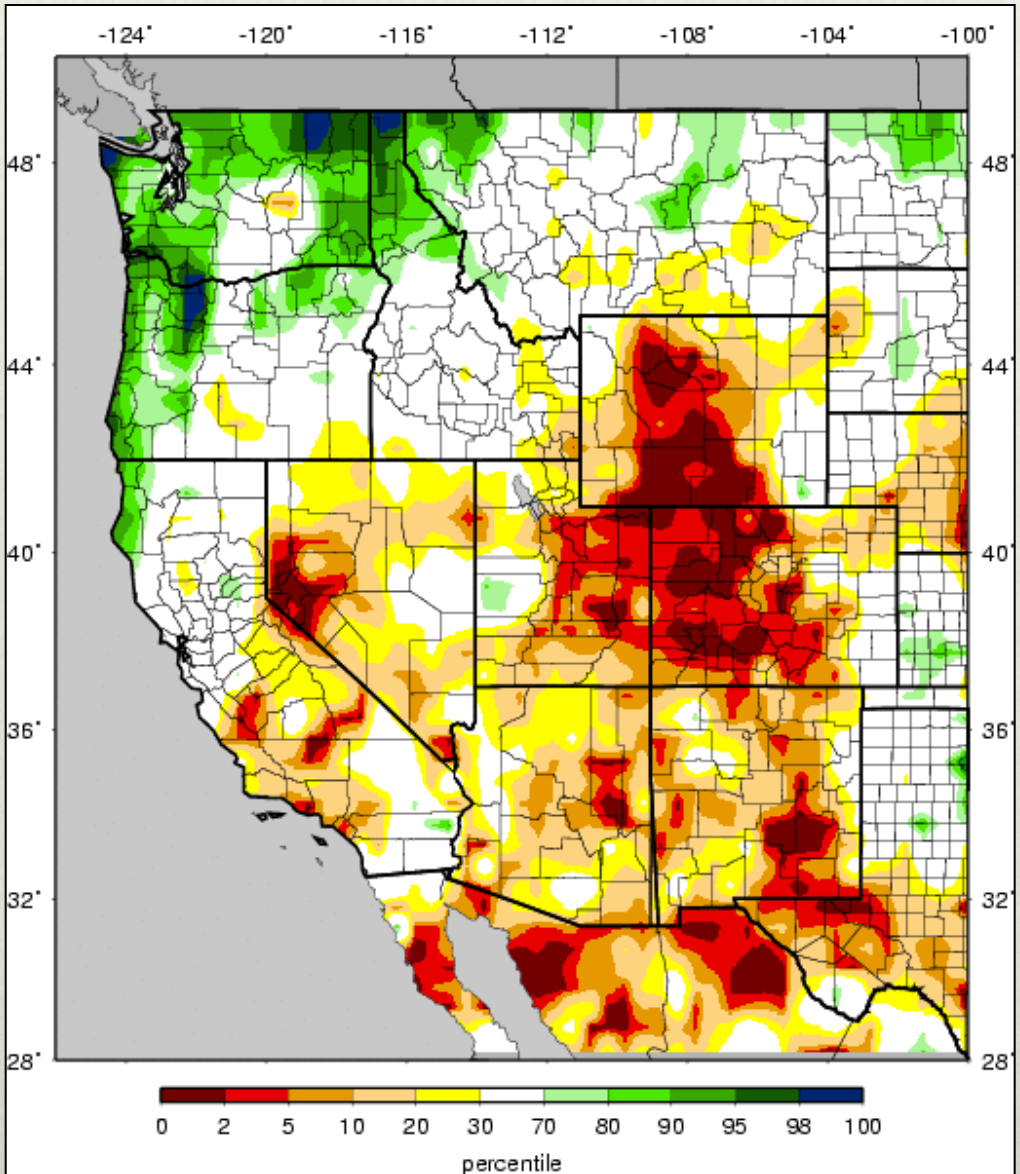


Temperature Departure from Normal
06/18/2012 – 06/24/2012

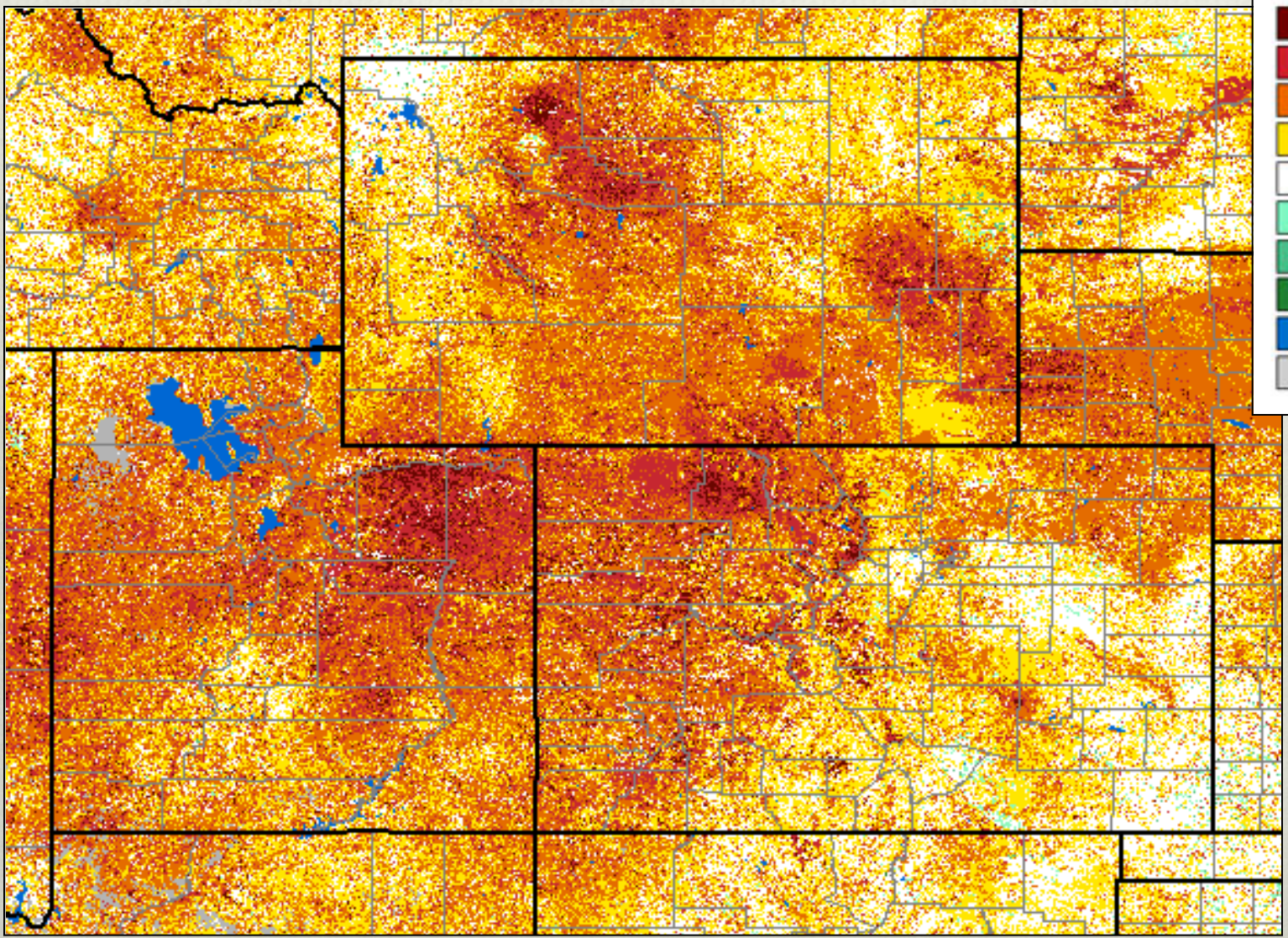


High Plains Regional Climate Center

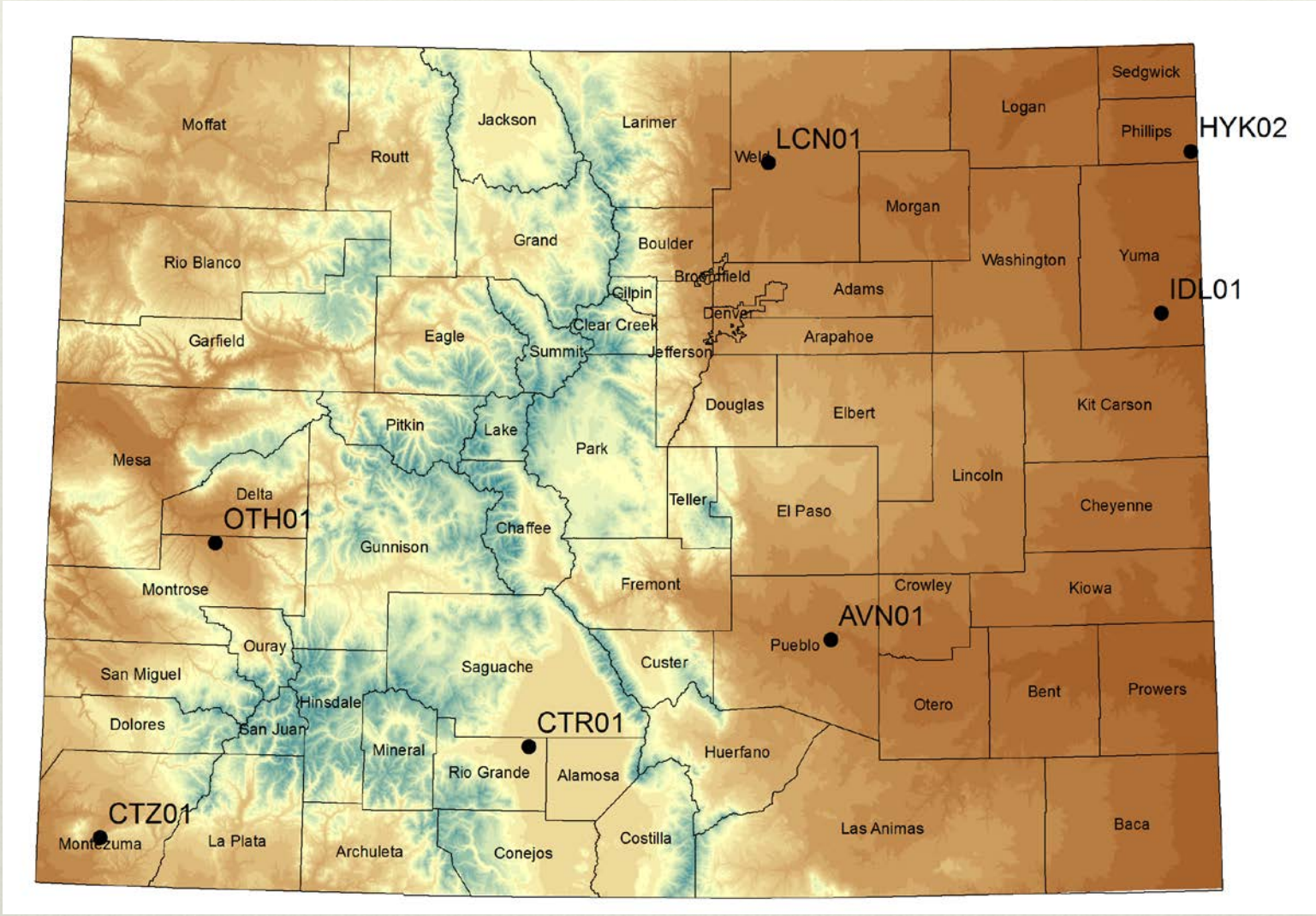
VIC Soil Moisture
24 June 2012

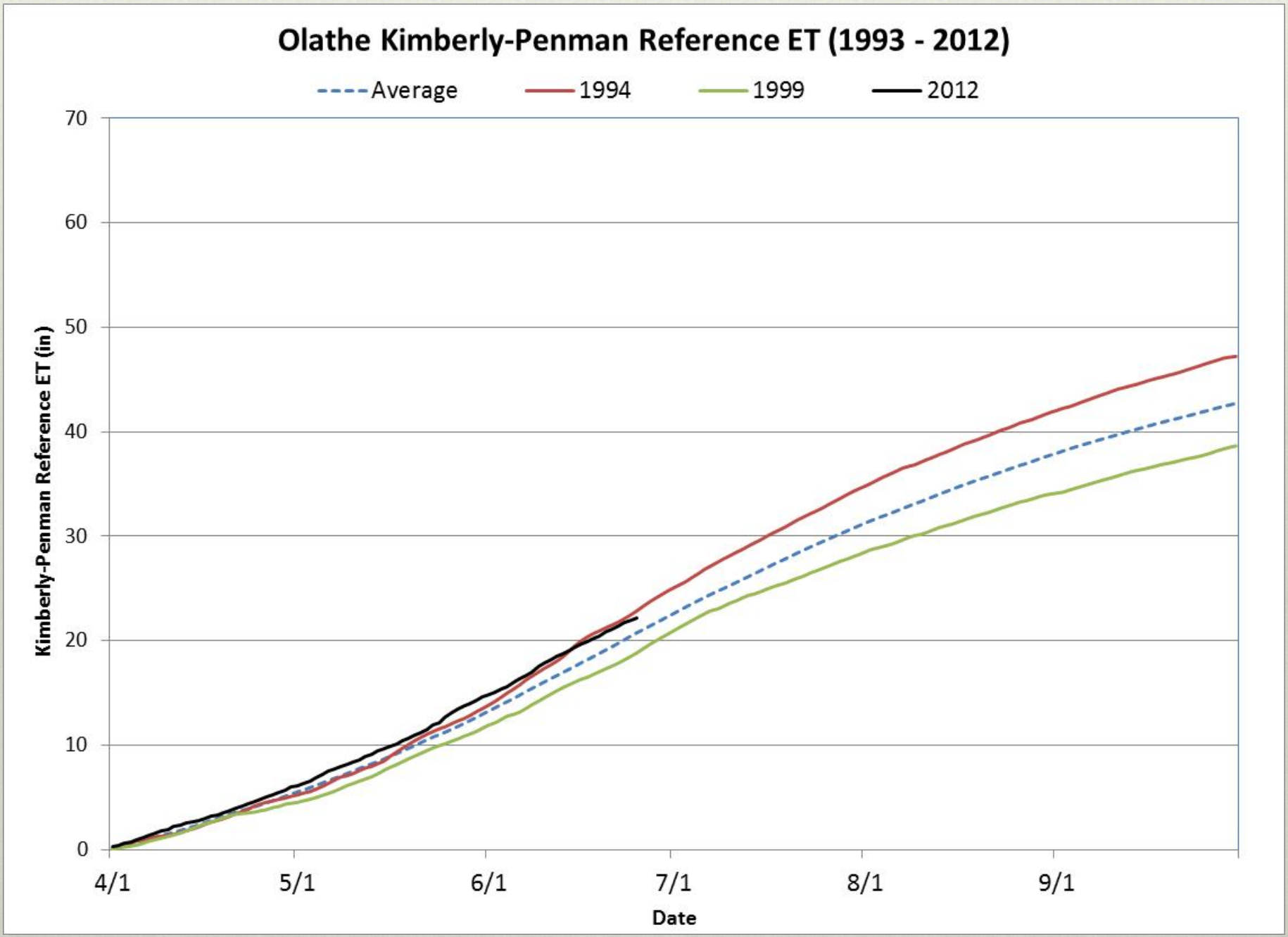


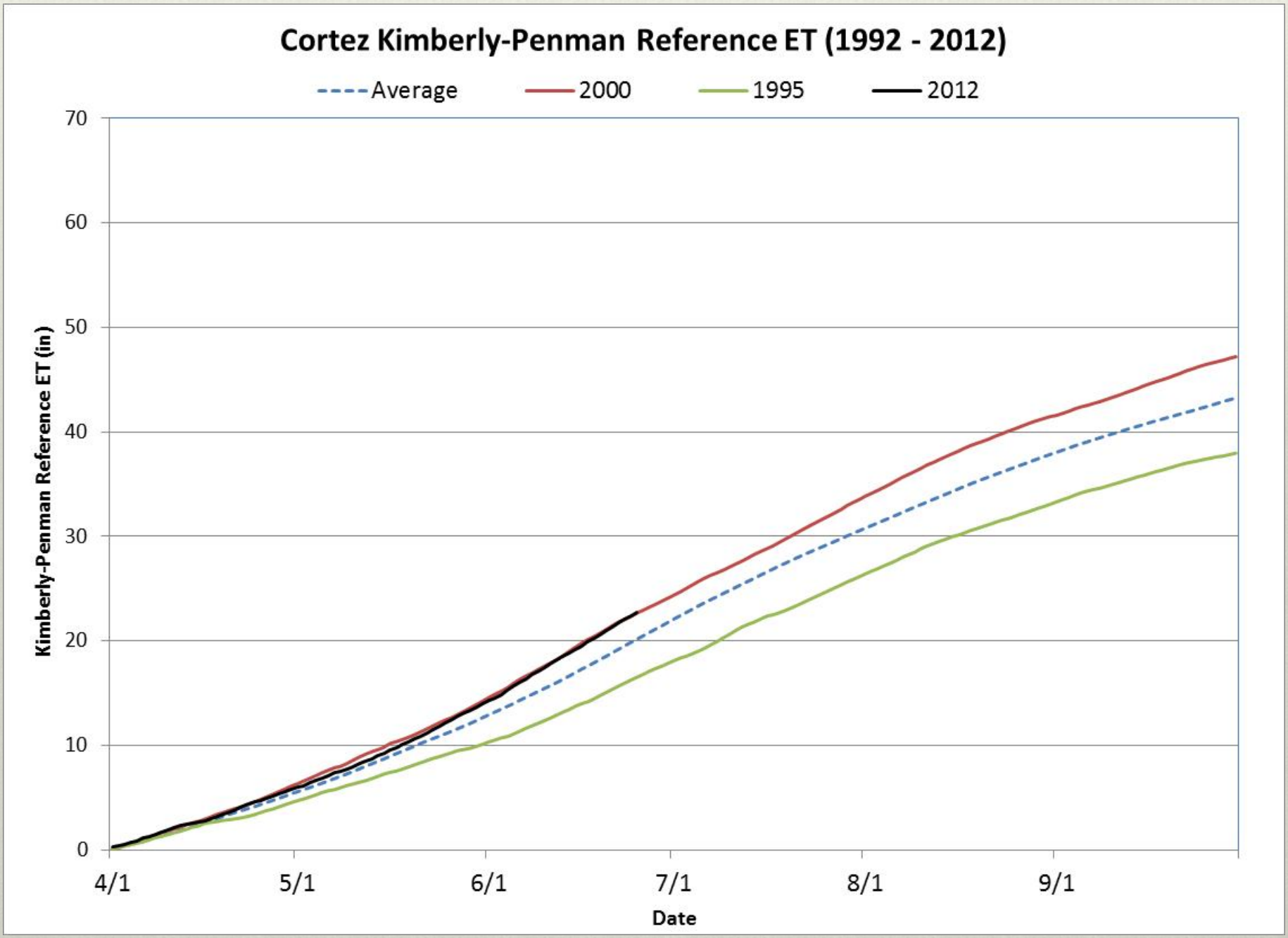
eMODIS VegDRI Vegetation
24 June 2012

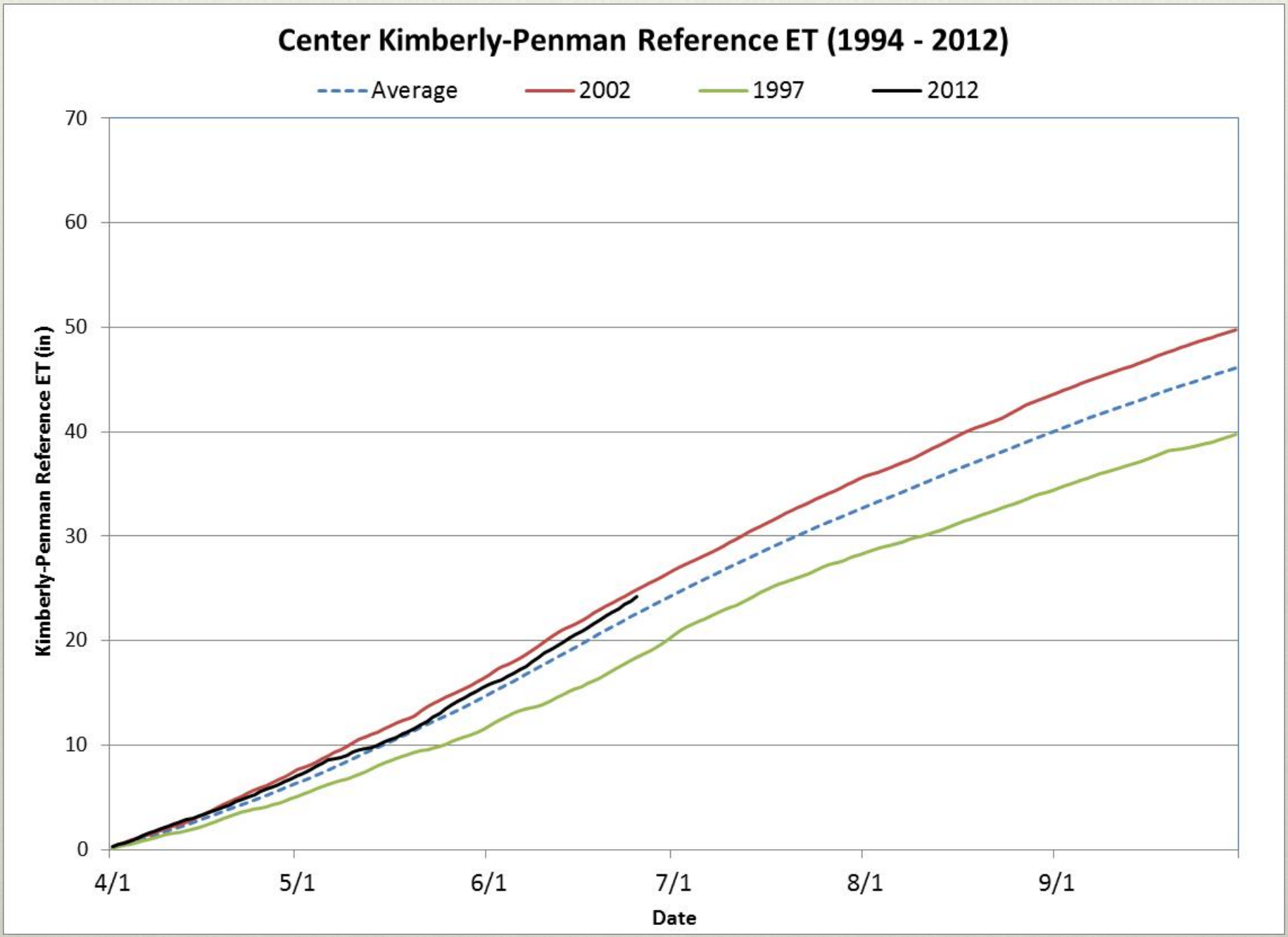


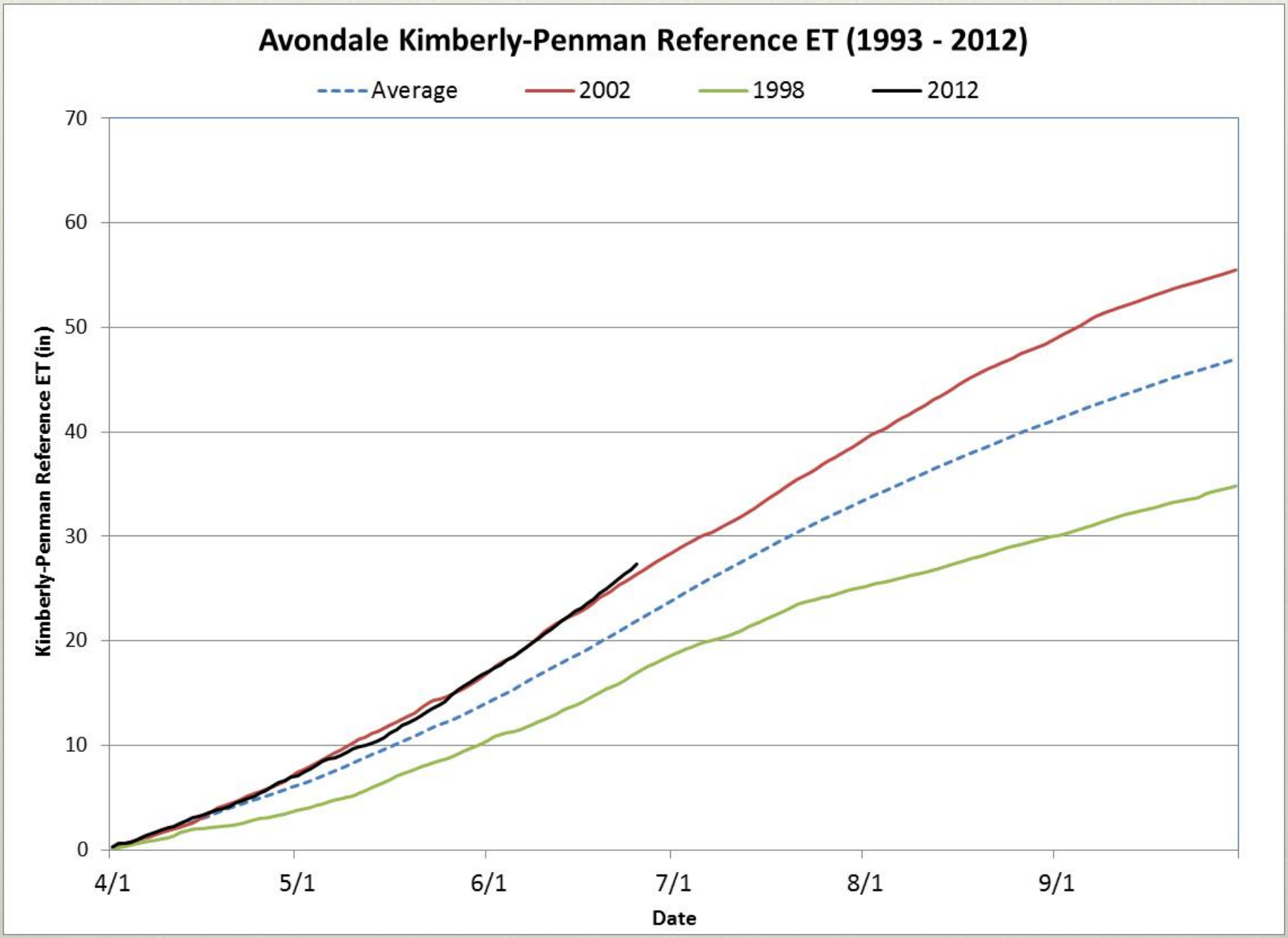
Reference Evapotranspiration Stations

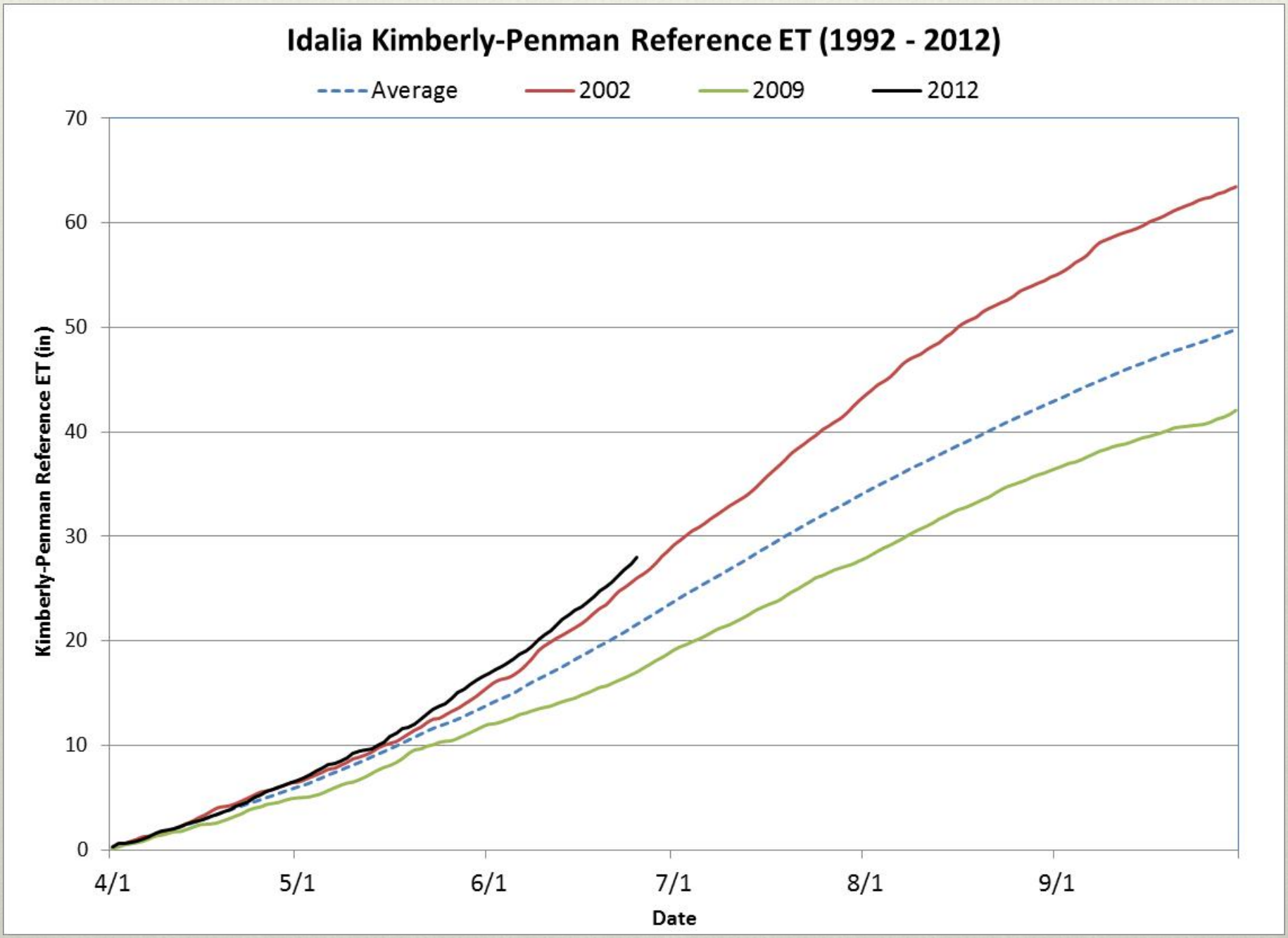


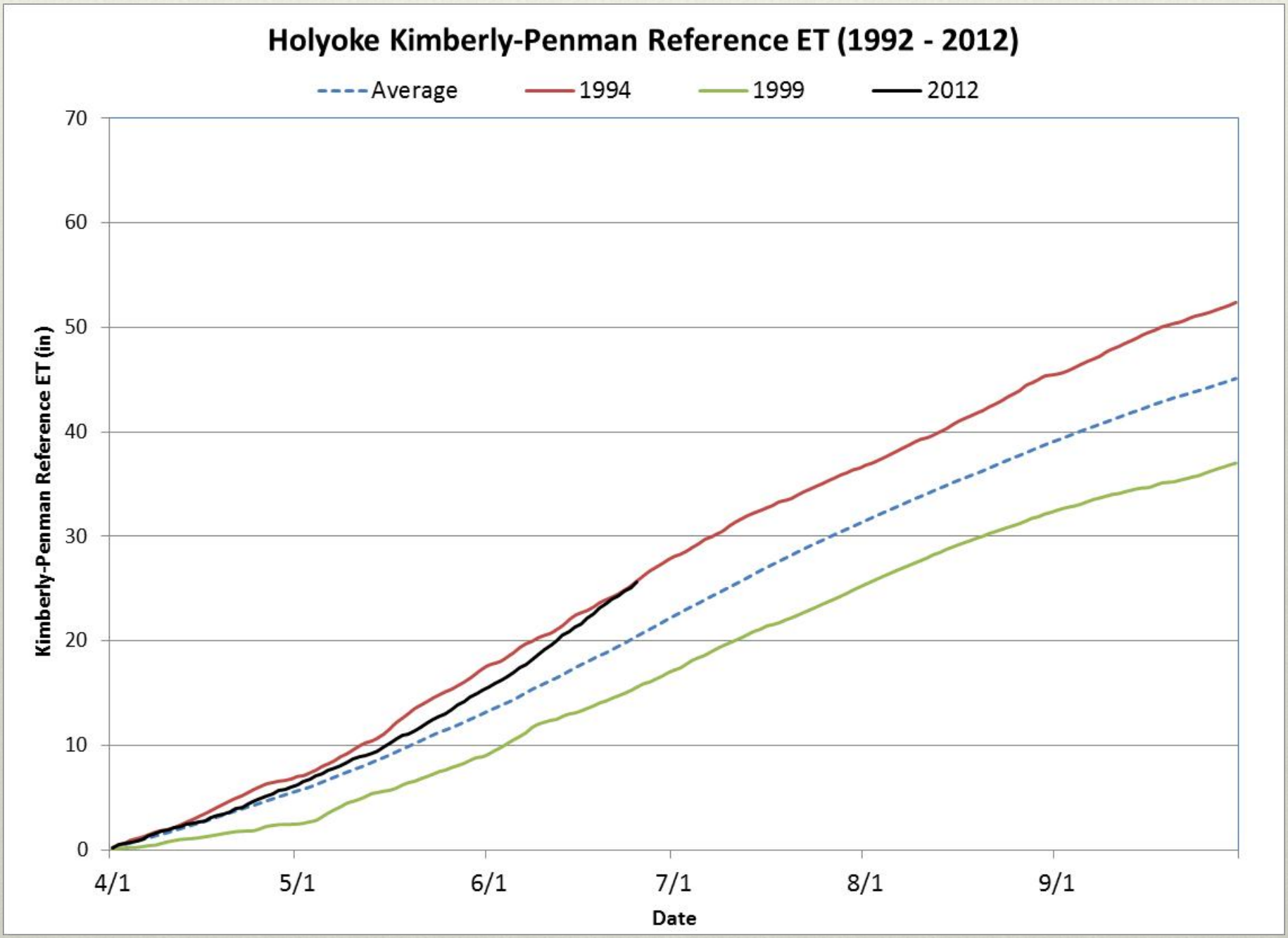

Olathe Kimberly-Penman Reference ET (1993 - 2012)
Average
1994
1999
2012
70
60
50
40
30
20
10
0
Kimberly-Penman Reference ET (in)
4/1
5/1
6/1
7/1
8/1
9/1
Date

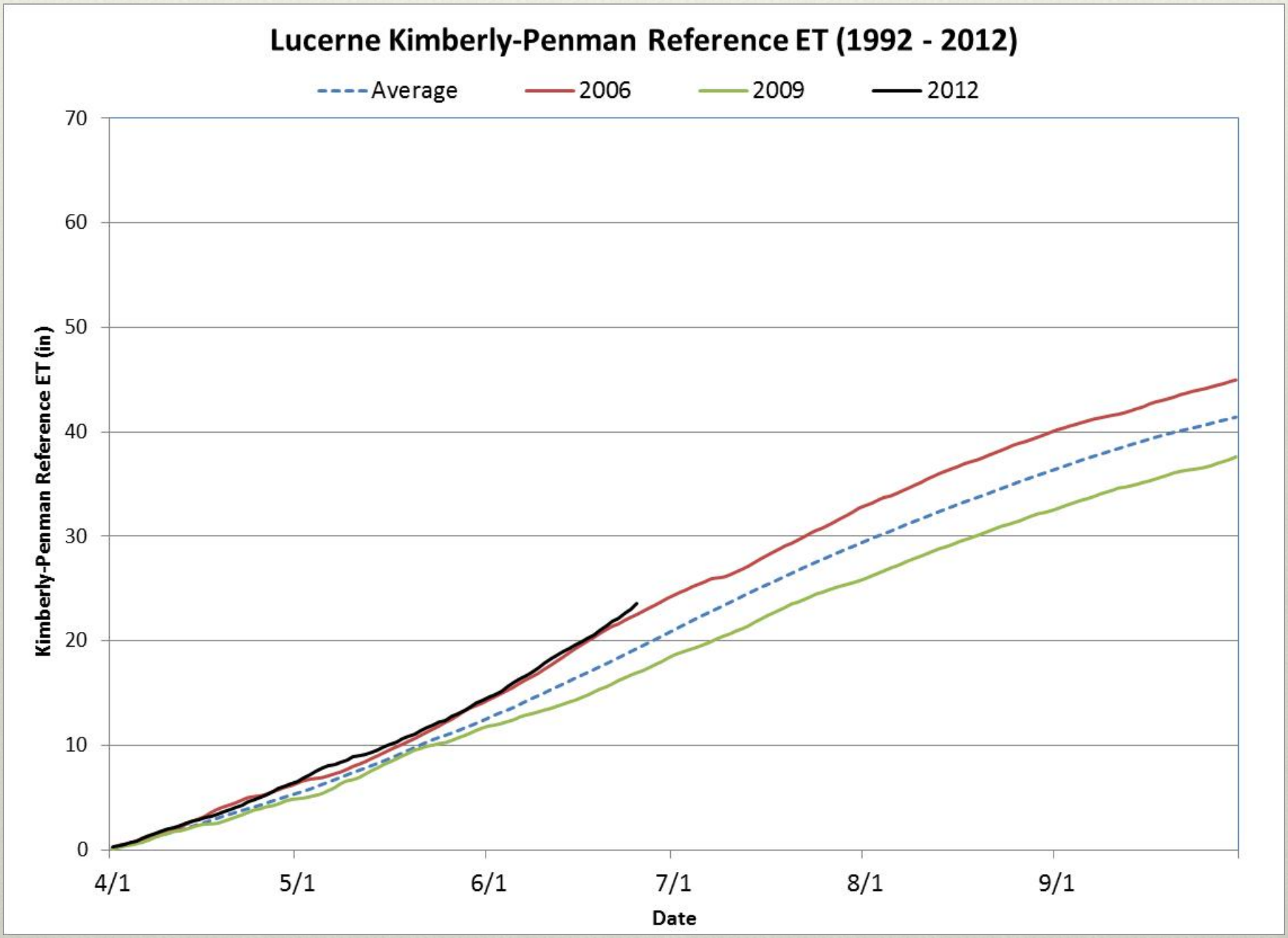

Cortez Kimberly-Penman Reference ET (1992 - 2012)
Average
2000
1995
2012
70
60
50
40
30
20
10
0
Kimberly-Penman Reference ET (in)
4/1
5/1
6/1
7/1
8/1
9/1
Date


Center Kimberly-Penman Reference ET (1994 - 2012)
Average
2002
1997
2012
70
60
50
40
30
20
10
0
Kimberly-Penman Reference ET (in)
4/1
5/1
6/1
7/1
8/1
9/1
Date


Avondale Kimberly-Penman Reference ET (1993 - 2012)
Average
2002
1998
2012
70
60
50
40
30
20
10
0
Kimberly-Penman Reference ET (in)
4/1
5/1
6/1
7/1
8/1
9/1
Date

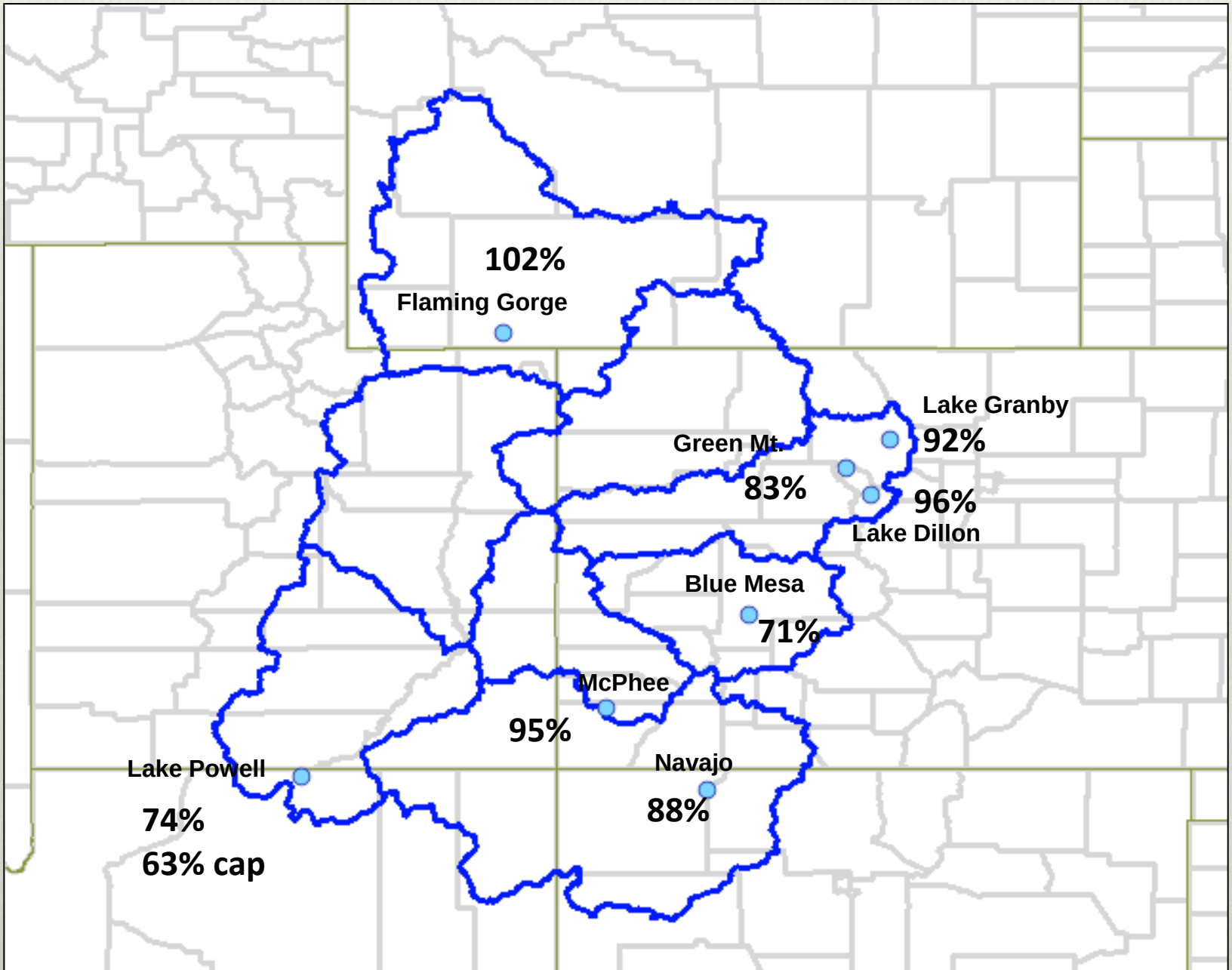

Idalia Kimberly-Penman Reference ET (1992 - 2012)
Average
2002
2009
2012
70
60
50
40
30
20
10
0
Kimberly-Penman Reference ET (in)
4/1
5/1
6/1
7/1
8/1
9/1
Date


Holyoke Kimberly-Penman Reference ET (1992 - 2012)
Average
1994
1999
2012
70
60
50
40
30
20
10
0
Kimberly-Penman Reference ET (in)
4/1
5/1
6/1
7/1
8/1
9/1
Date

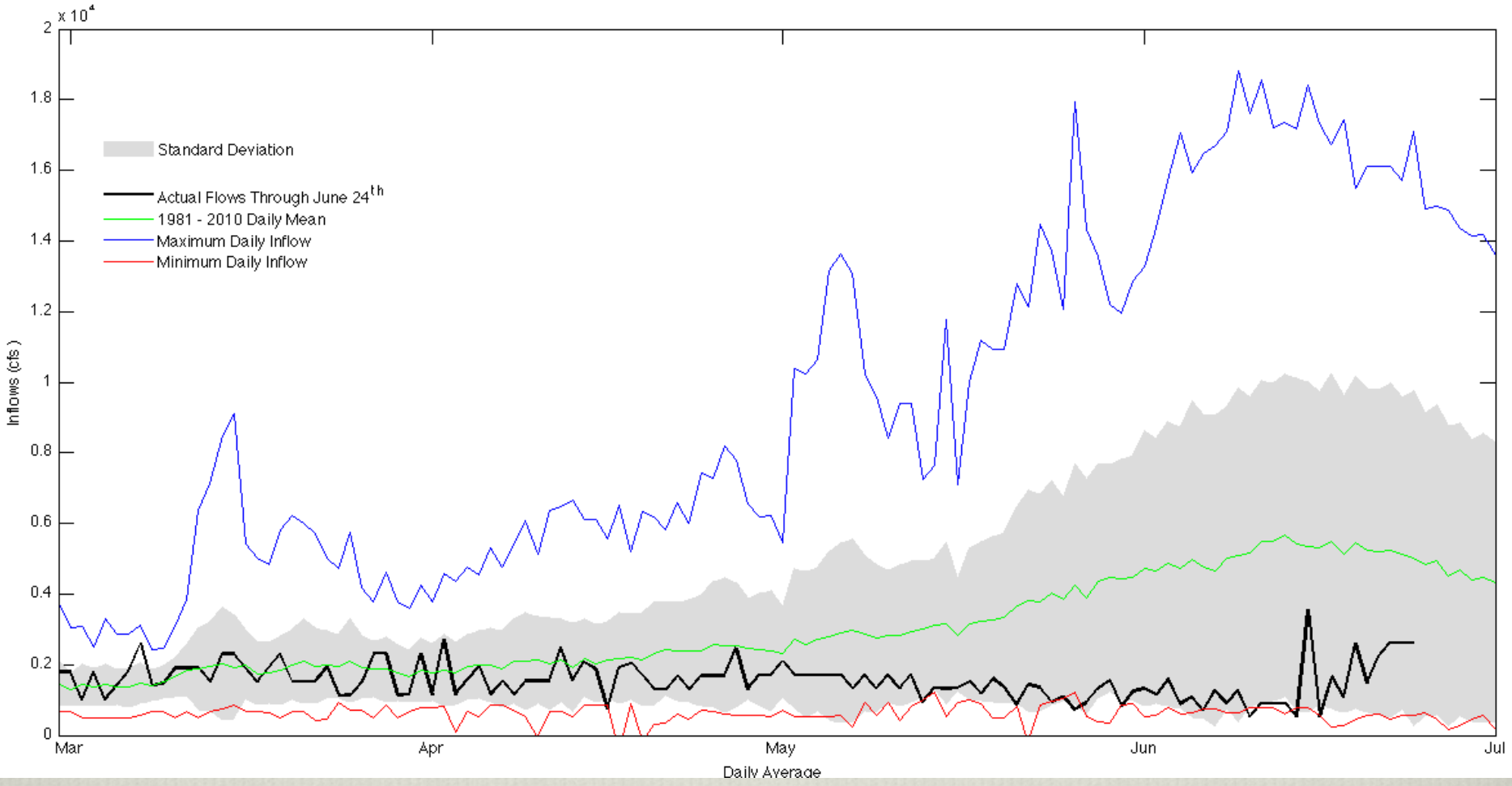

Lucerne Kimberly-Penman Reference ET (1992 - 2012)
Average
2006
2009
2012
70
60
50
40
30
20
10
0
Kimberly-Penman Reference ET (in)
4/1
5/1
6/1
7/1
8/1
9/1
Date

Reservoir Update

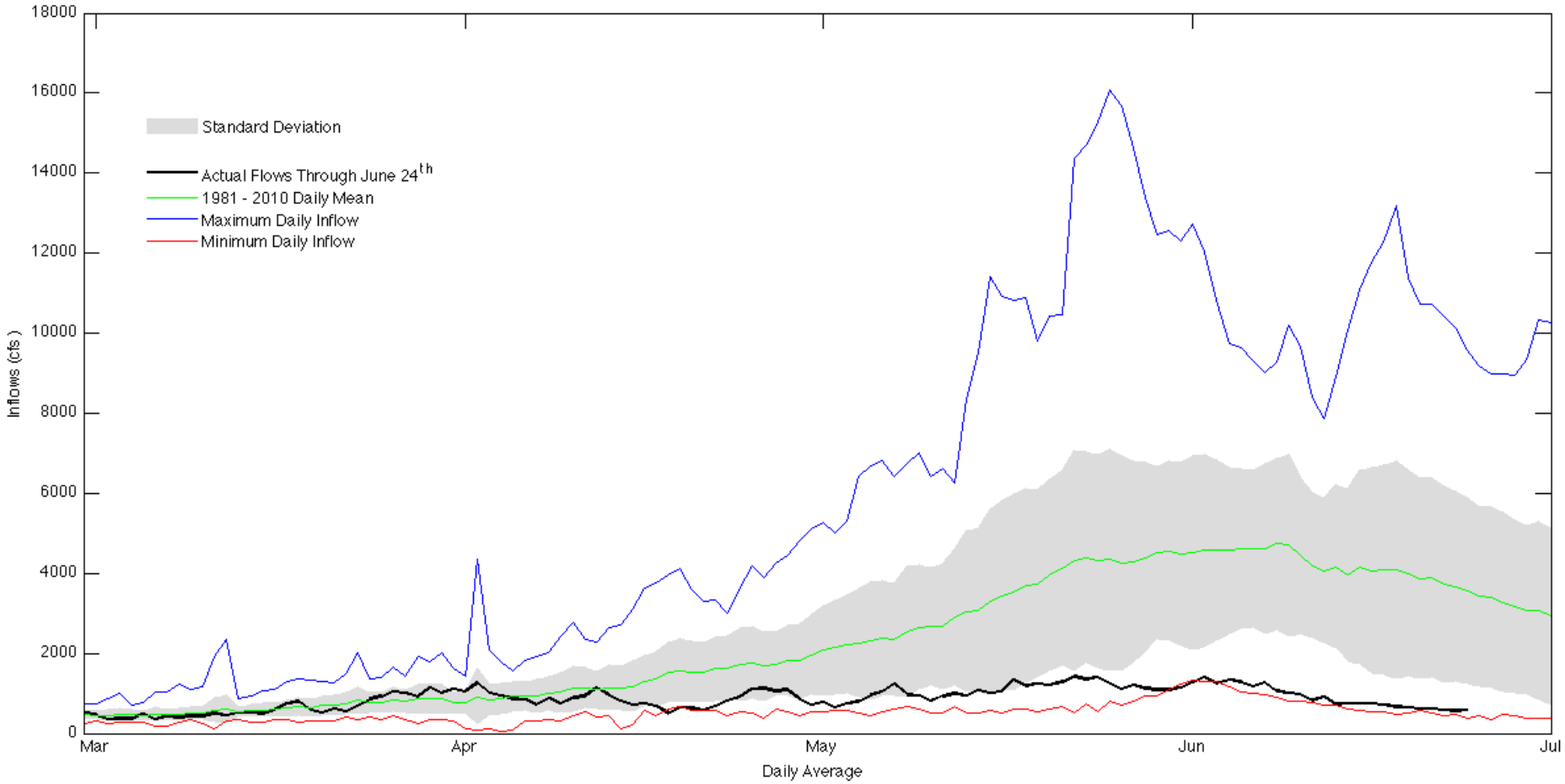
June Average Reservoir Storage Volume



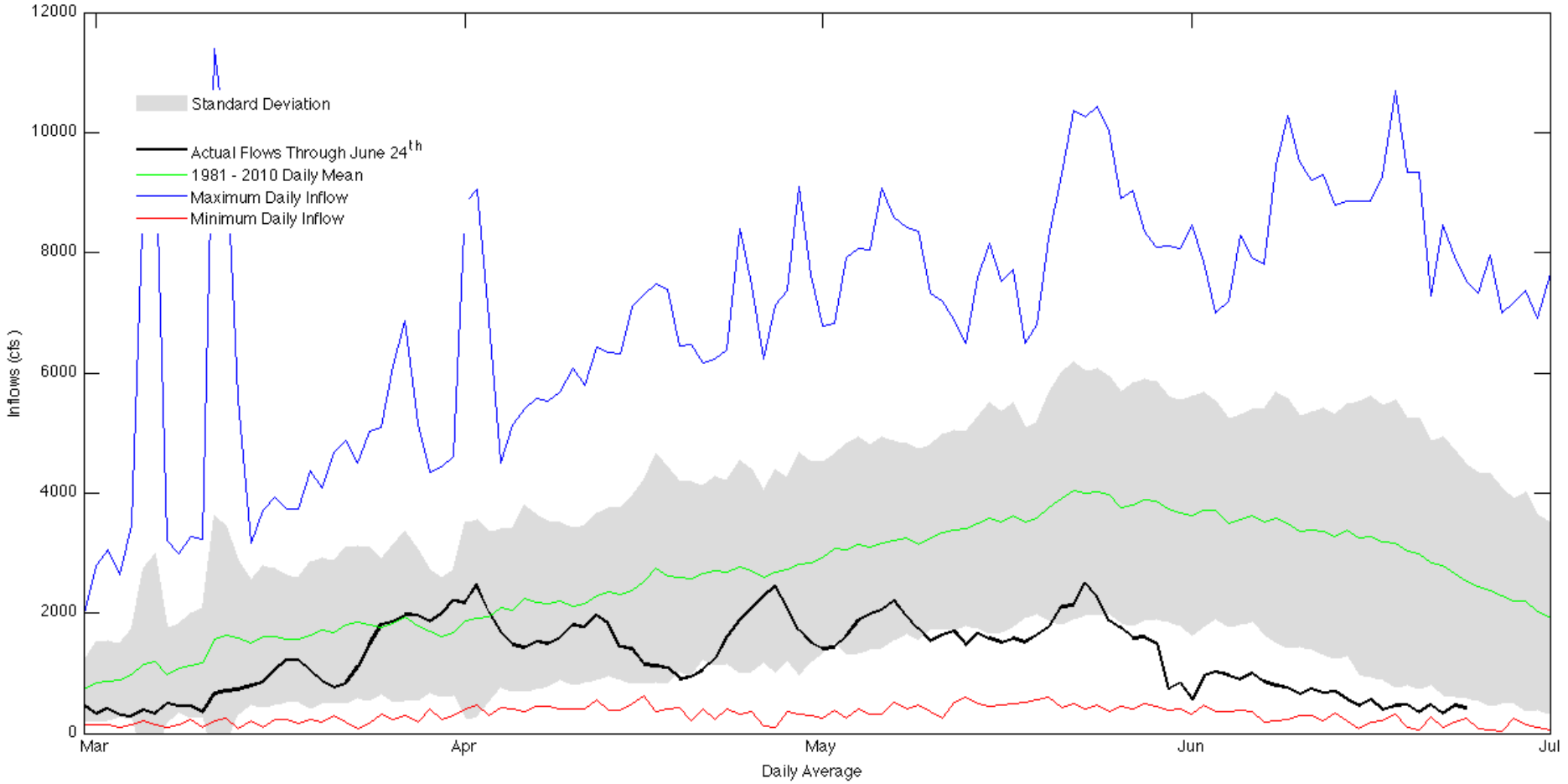
Daily Inflows into Flaming Gorge



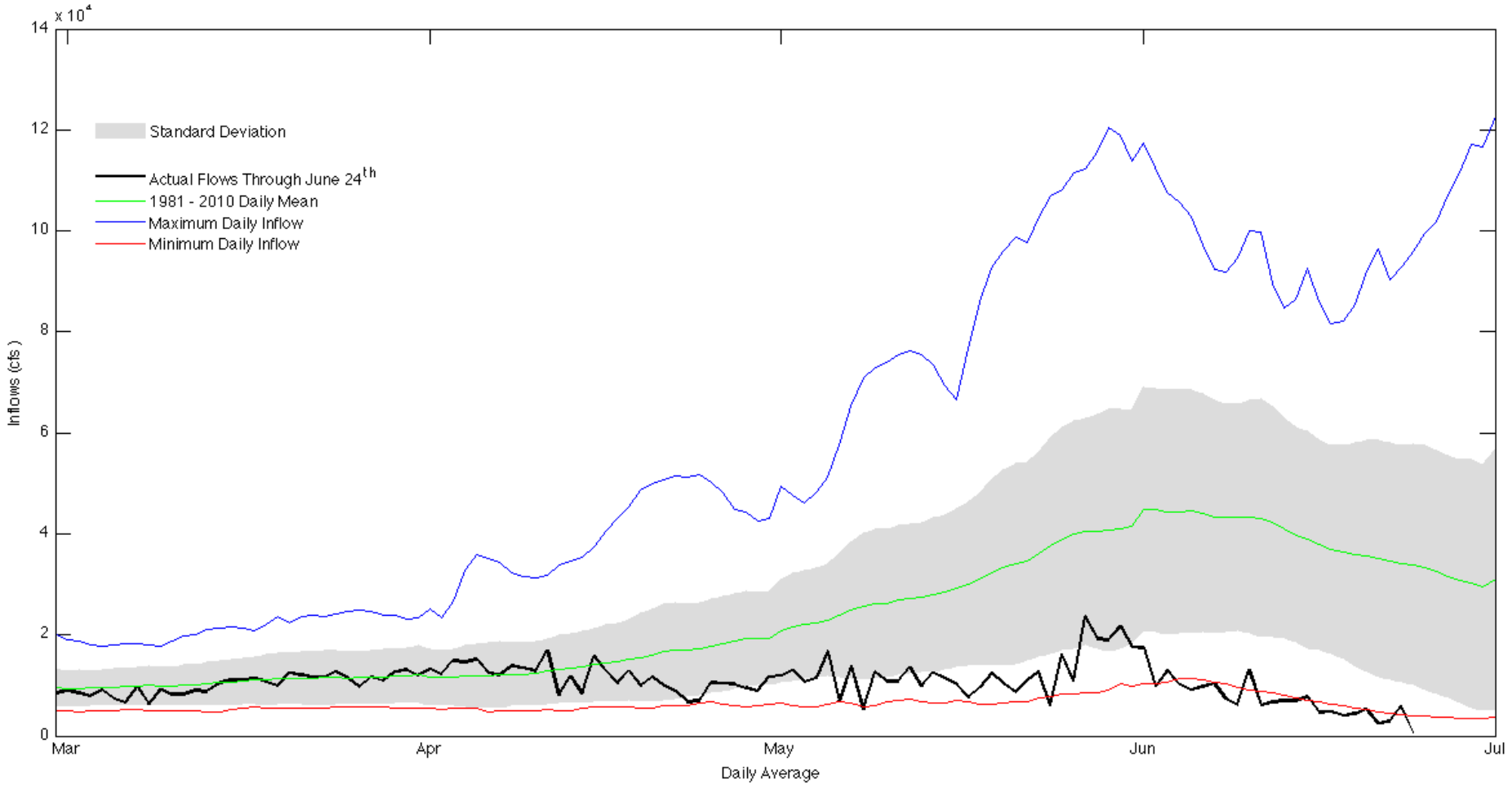
Daily Inflows into Blue Mesa



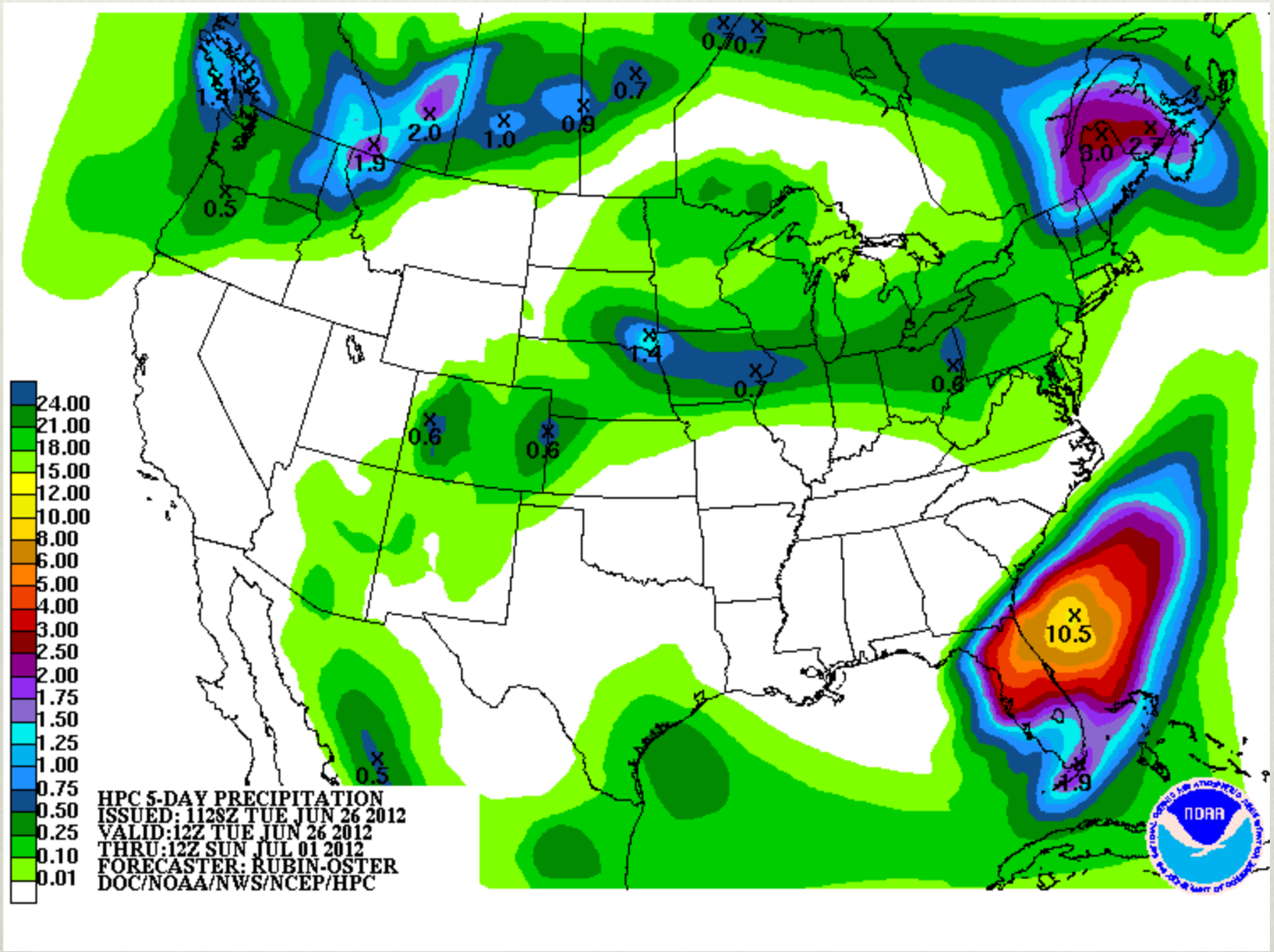
Daily Inflows into Navajo



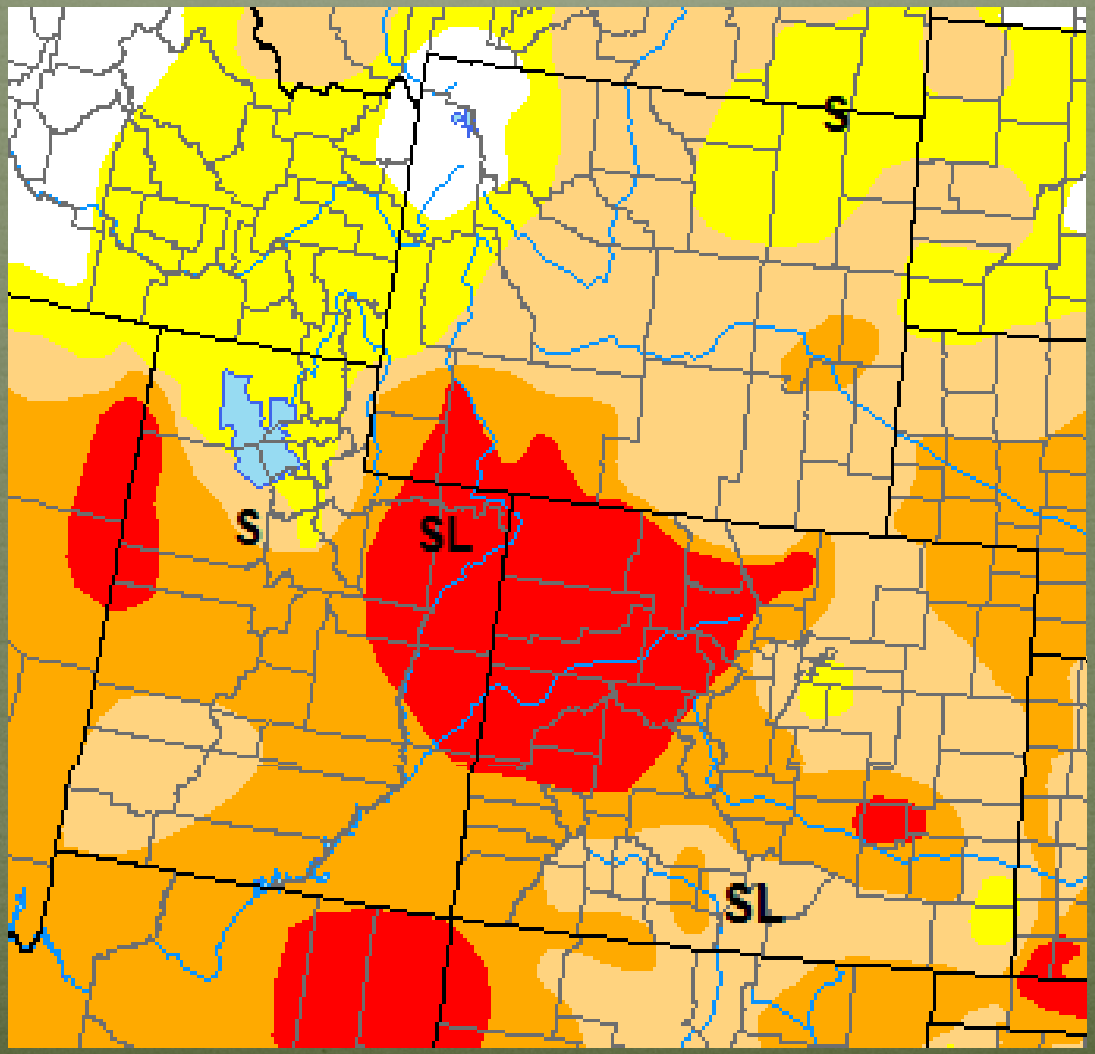
Daily Inflows into Lake Powell



Precipitation Forecast


24.00
21.00
18.00
15.00
12.00
10.00
8.00
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 5-DAY PRECIPITATION
ISSUED: 1128Z TUE JUN 26 2012
VALID:12Z TUE JUN 26 2012
THRU:12Z SUN JUL 01 2012
FORECASTER: RUBIN-OSTER
DOC/NOAA/NWS/NCEP/HPC
NOAA

Recommendations



INFO

For more information

NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

June 26, 2012

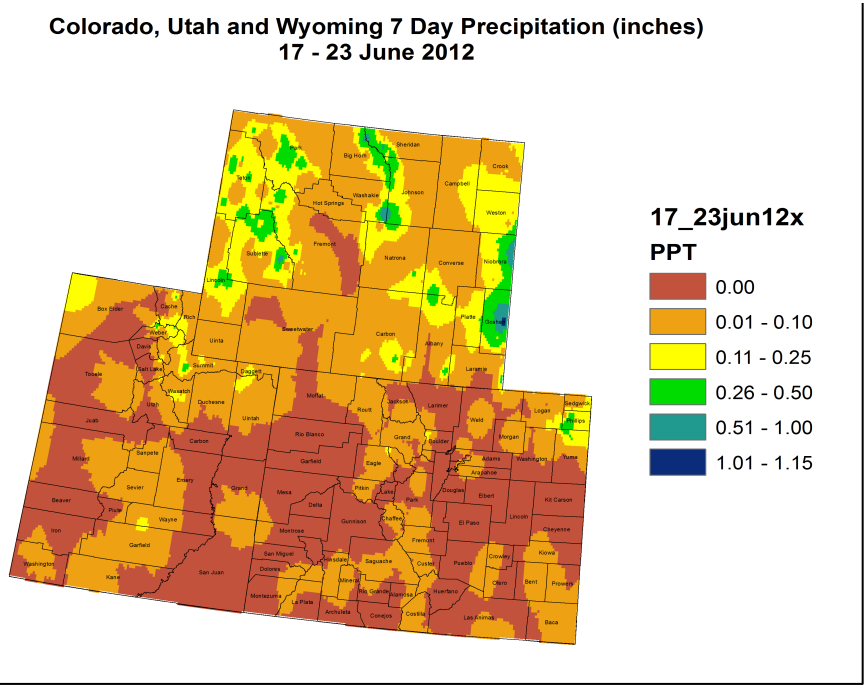


Fig. 1: June 17 – 23 precipitation in inches.

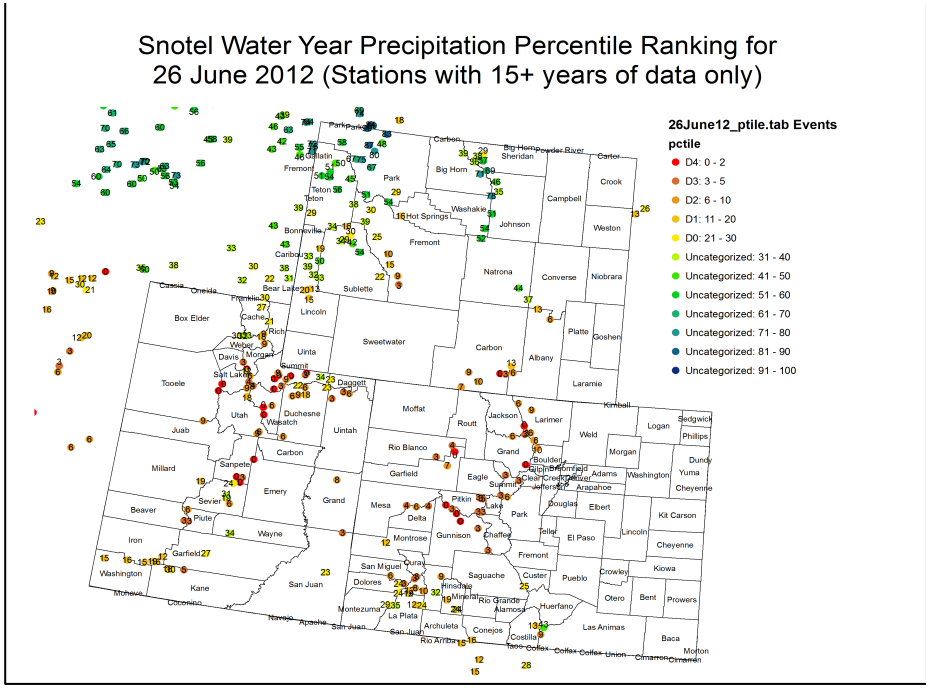


Fig. 2: SNOTEL WYTD precipitation percentiles (50% is median, 21 – 30% is Drought Monitor D0 category).

Precipitation

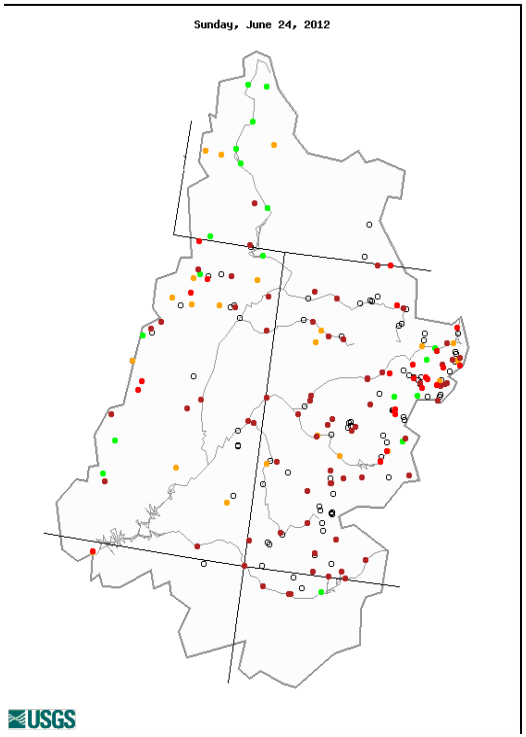
Last week, most of the Upper Colorado River Basin (UCRB) received less than .10 inches of moisture, with many areas receiving no precipitation (Fig. 1). East of the basin, only a few spotty areas received precipitation while most of the Front Range and eastern plains of Colorado received little to no precipitation. For the month of June so far, most of the UCRB has received less than .25 inches, while some of the Front Range and eastern plains received between half an inch to an inch with a some local areas receiving over two inches for the month.

Water-year-to-date (WYTD), SNOTEL precipitation percentiles are low for the Yampa and Gunnison basins in CO, and the Wasatch range in UT, with many sites reporting in the lowest 5th percentile or below (Fig. 2). The northern mountains of CO are also dry, with most all sites reporting below the 10th percentile for precipitation. SNOTEL percentiles in the Upper Green basin in WY are around the 30th percentile, and percentiles in the San Juan basin are in the teens and 20s.

Streamflow

As of June 24th, 13% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) 7-day average streamflows (Fig. 3). There are no gages in the UCRB recording above normal flows, while about 69% percent of the gages in the basin are recording much below normal or low streamflows. The gages on the Upper Green River are showing near normal and below normal flows. Most gages on the Yampa, Colorado, Gunnison, Dolores and San Juan rivers are currently recording flows below the 10th percentile. Low flows are mainly concentrated in headwater regions on the east side of the basin.

Flows on all three key gages in the UCRB saw large decreases last week (Fig. 4). Flows on the Colorado River at the CO-UT state line, the Green River at Green River, UT and the San Juan River near Bluff, UT reported at the 3rd, 2nd, and 3rd percentiles, respectively. Though the San Juan River saw a larger seasonal peak, this was mainly due to releases from upstream Navajo Reservoir. Flows at all three key gages are much below normal for this time of year.



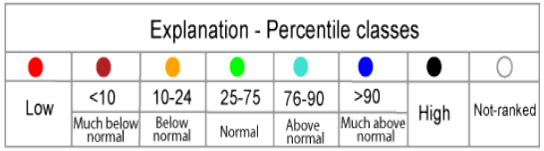


Fig. 3: 7-day average discharge compared to historical discharge for June 24th.

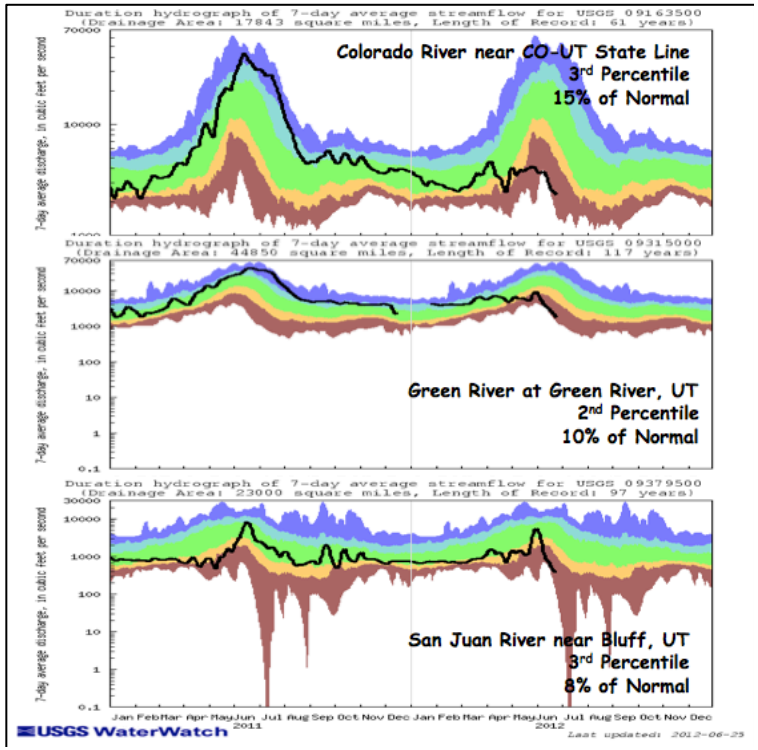


Fig. 4: USGS 7-day average discharge over time at the CO-UT stateline (top), Green River, UT (middle) and Bluff, UT (bottom).

Water Supply and Demand

Much of the UCRB experienced above average temperatures for the week, with the Four Corners region experiencing temperatures 4 to 8 degrees above average. The rest of CO saw temperatures between 6 and 10 degrees warmer than average last week. Satellite vegetation conditions show the driest vegetation over western CO and eastern UT, extending down to the Four Corners region (Fig. 5). Very dry vegetation is also showing up over southern WY and northeast CO. Reference ET rates throughout the basin are very high, with CoAgMet stations in western CO reporting some of their highest ET rates on record (Fig. 6). Daily reference ET rates are ranging from between .30 to .50 inches, meaning that smaller amounts of precipitation will provide only minimal relief to crops and soils, and the majority of precipitation can quickly evaporate back into the atmosphere.

Blue Mesa, Flaming Gorge, Lake Powell, McPhee, Navajo, and Dillon have all seen volume decreases since the beginning of the month. Flaming Gorge is currently above its June average volume, while the rest of the reservoirs are slightly below their June averages. Lake Powell is currently at 74% of average and 63% of capacity. Daily inflows into the major reservoirs in the basin are much below average for this time of year.

Precipitation Forecast

The UCRB will remain on the western edge of a large high pressure ridge through the middle of the week. Southerly flow aloft will allow a narrow ribbon of sub-tropical moisture to move over the eastern half of the basin, and provide fuel for afternoon thunderstorms as daytime heating de-stabilizes the atmosphere. Expect these storms to be high based in nature, producing more wind than rain. The best storm coverage will stretch from the San Juan mountains northeastward into the northern CO mountains, with most areas picking up less than 0.25 inches of liquid through the end of the week. By Friday the moisture plume thins out and is shifted further to the southeast, leaving most of the UCRB underneath dry westerly flow aloft. Expect storm chances to decrease through the weekend while temperatures again climb well above normal. Towards the beginning of next week forecast models are hinting at a return of sub-tropical moisture to the extreme southern portions of the basin, which may lead to an increased chance of isolated thunderstorms over the San Juan and Four Corners regions by Monday depending on the depth and position of the developing moisture plume.

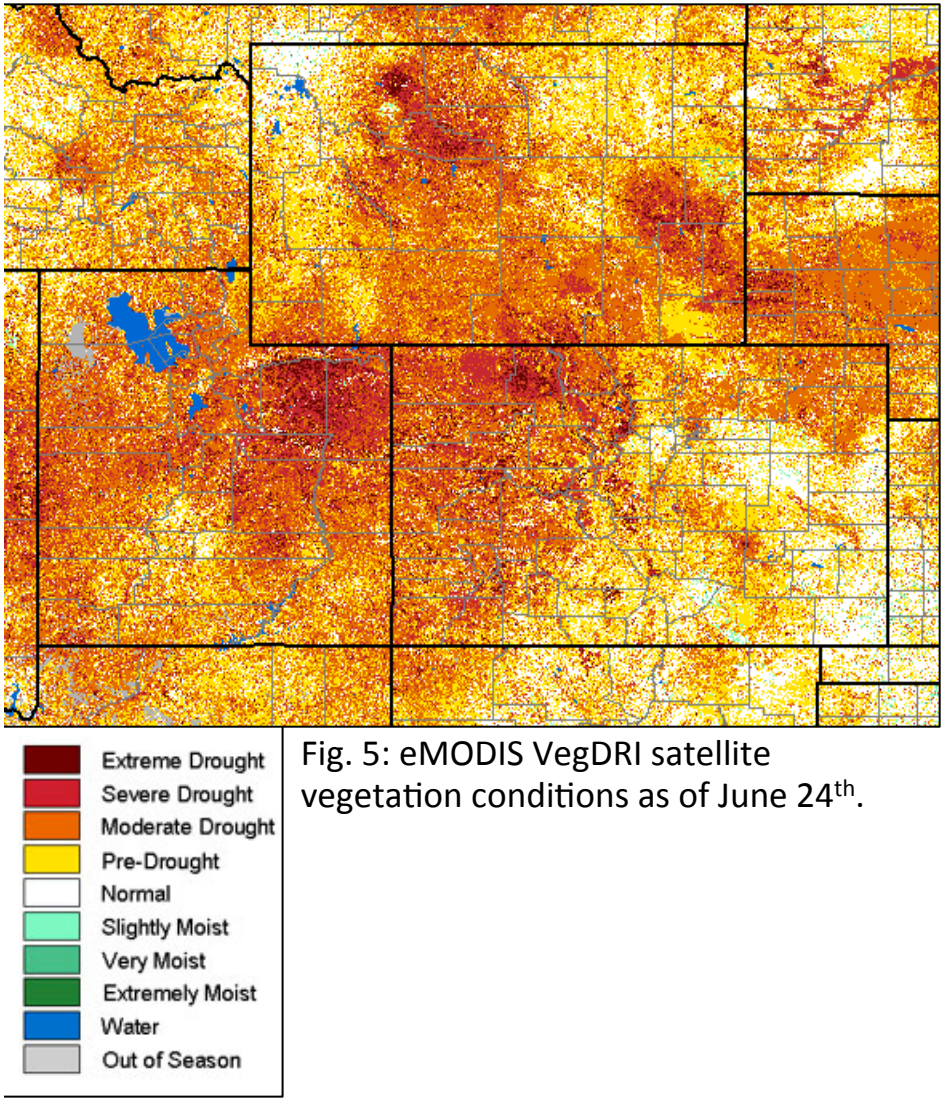


Fig. 5: eMODIS VegDRI satellite vegetation conditions as of June 24th.

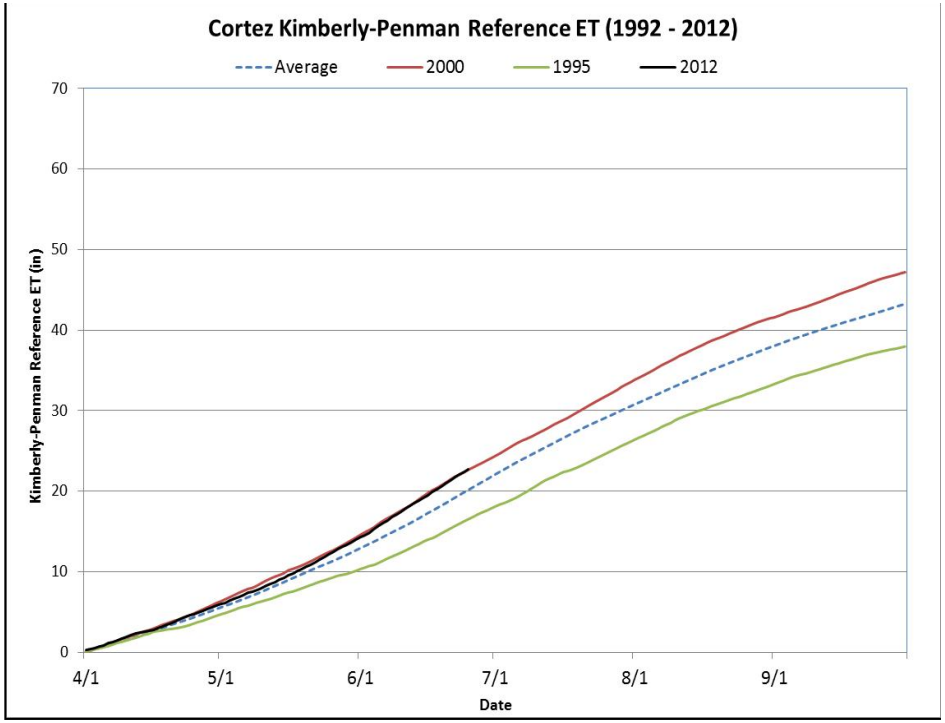
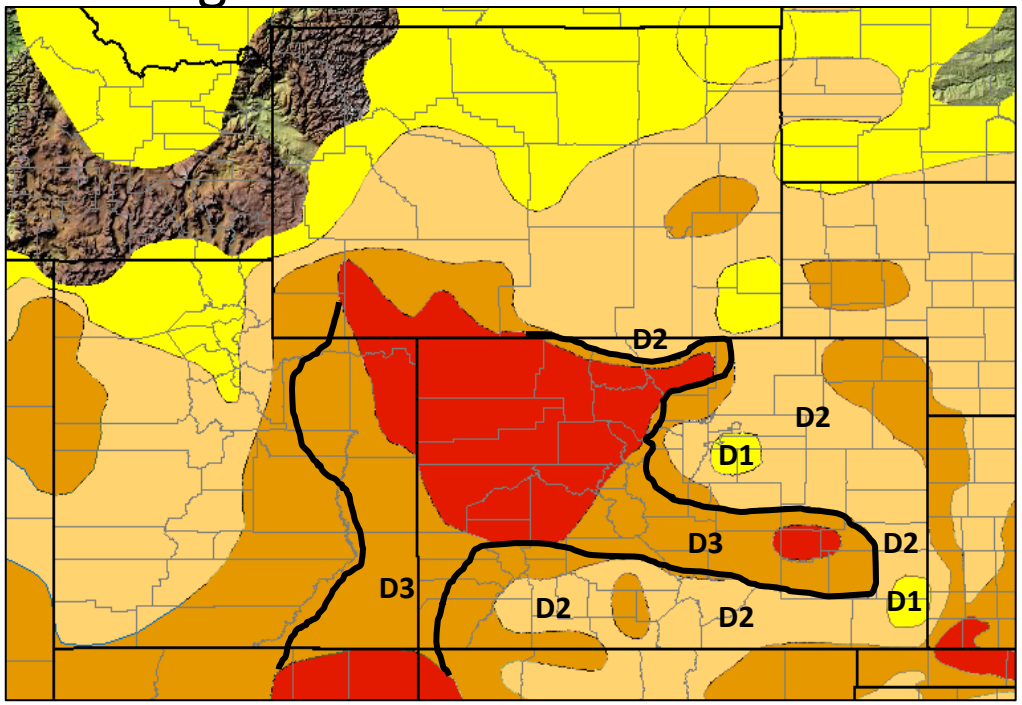
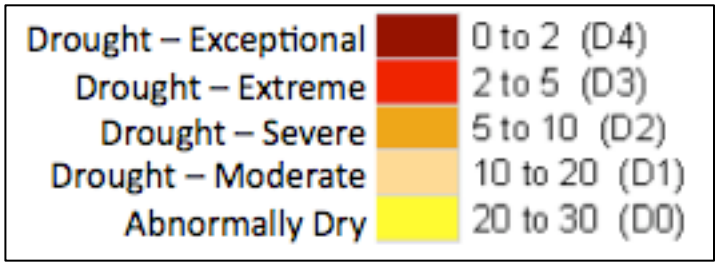


Fig. 6: Accumulated reference ET (black line) at Cortez, CO near the Four Corners, compared to the max year (red), min year (green), and average (dashed line).

Drought and Water Discussion





Drought categories and
their associated percentiles

Fig. 7: June 19th release of U.S. Drought Monitor for the UCRB.

UCRB and the rest of Colorado:

Widespread one category deteriorations for all of Colorado and the UCRB around the Four Corners region are recommended based on very dry vegetation conditions, streamflows below the 10th percentile, 120-day standardized precipitation indices below -1.5 in many areas, very hot temperatures, and impacts ranging from large crop losses to easily starting and quickly spreading wildfires.

D1—The remaining D0 pockets in Colorado (around the southeast Denver metro area and in southeast CO) should now become D1. All of Colorado will now be D1 or worse (no D0).

D2 – All of the D1 currently in Colorado should now become D2.

D3 – It is recommended that the two separate D3s in the UCRB be connected and cover more of the Four Corners region (Fig. 7, black line). The D3 should also be expanded to cover most of the Arkansas River valley where there was D2 last week (Fig. 7, black line).

D4 – no D4 this week, though northwest CO will be closely monitored for possible future degradations.