Summer 2012

Weekly Climate, Water & Drought Assessment

Today's Agenda

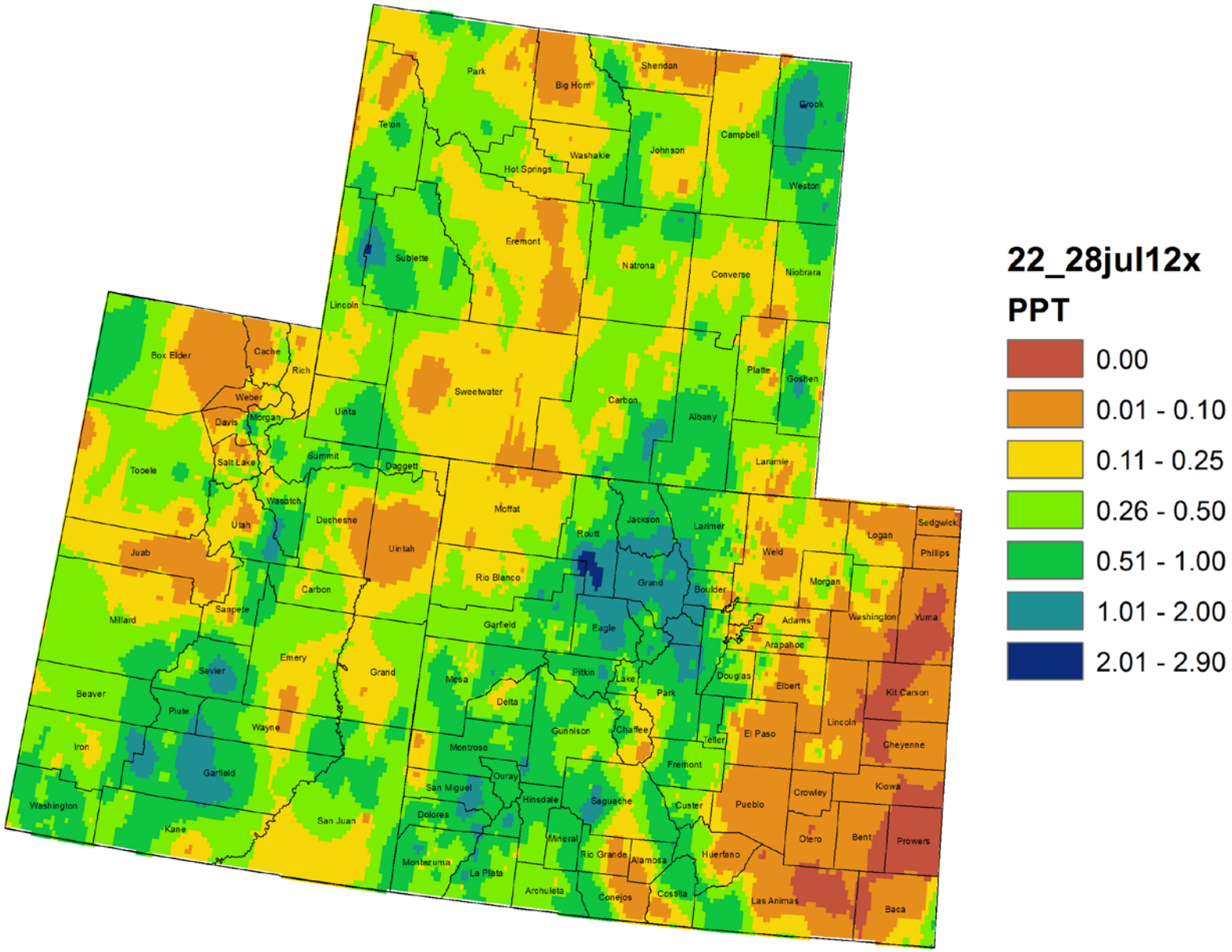
-Assessment of current water conditions

- Precipitation Forecast

- Recommendations for Drought Monitor

Precipitation/Snowpack Update

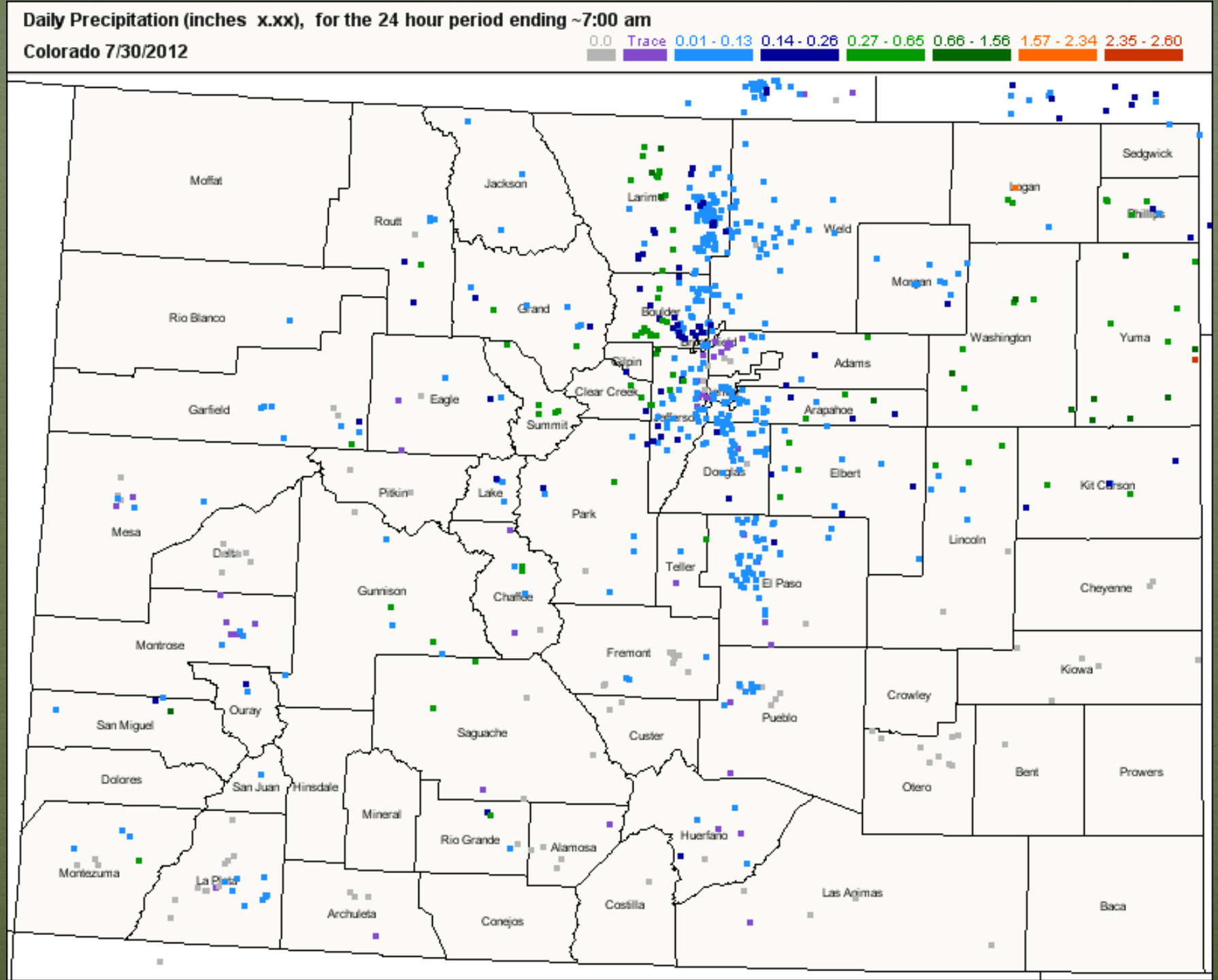
Colorado, Utah and Wyoming 7 Day Precipitation (in)
22 - 28 July 2012

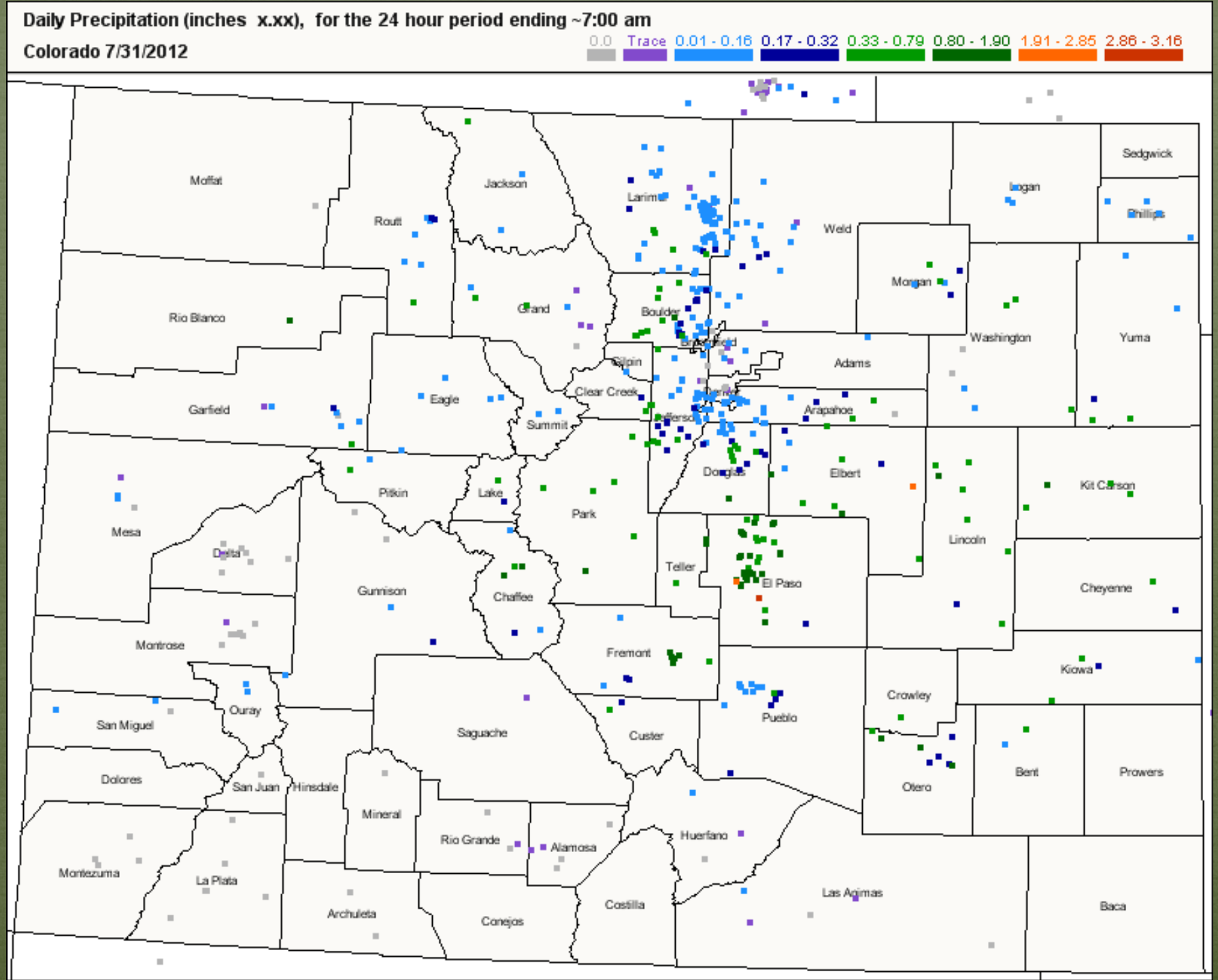


22_28jul12x

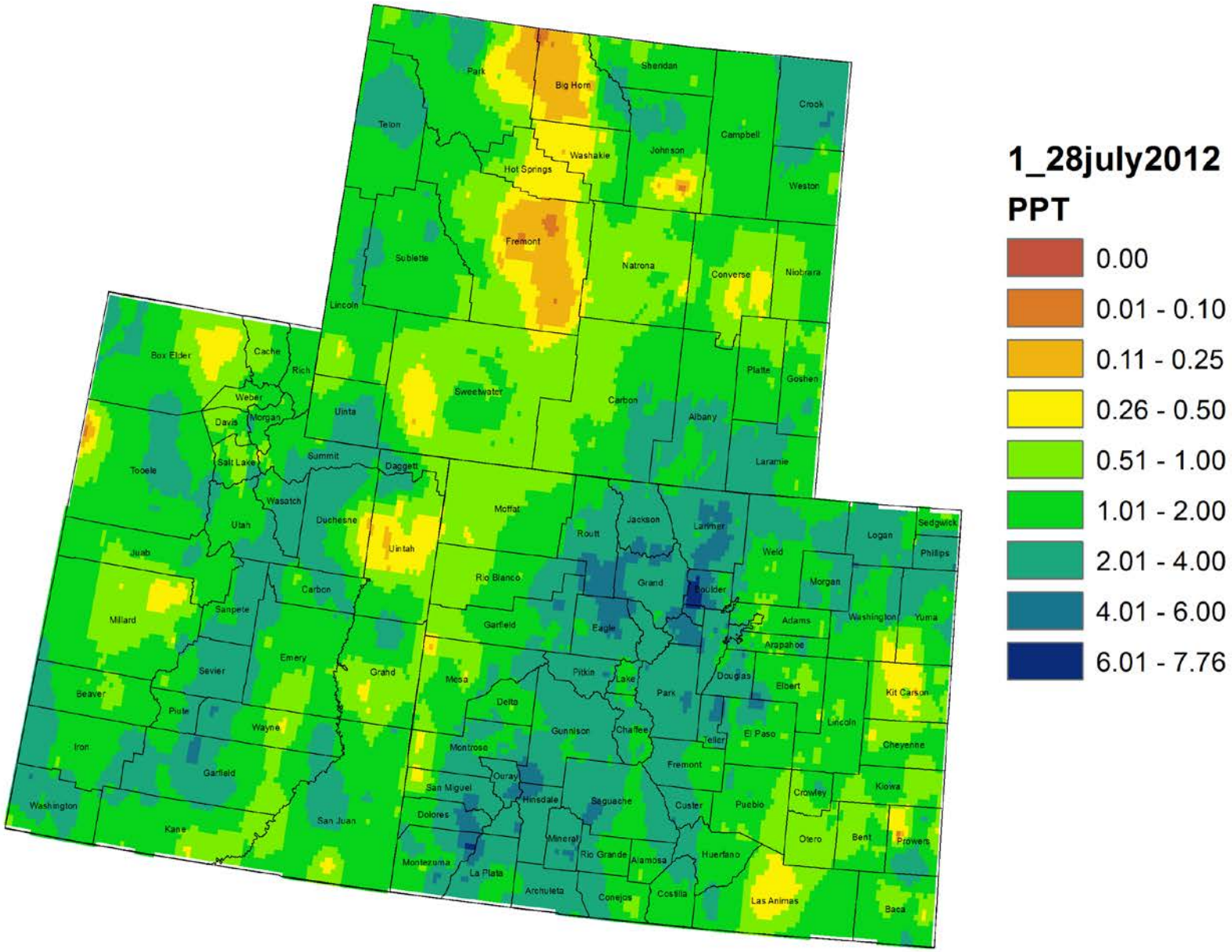
PPT

- 0.00
- 0.01 - 0.10
- 0.11 - 0.25
- 0.26 - 0.50
- 0.51 - 1.00
- 1.01 - 2.00
- 2.01 - 2.90

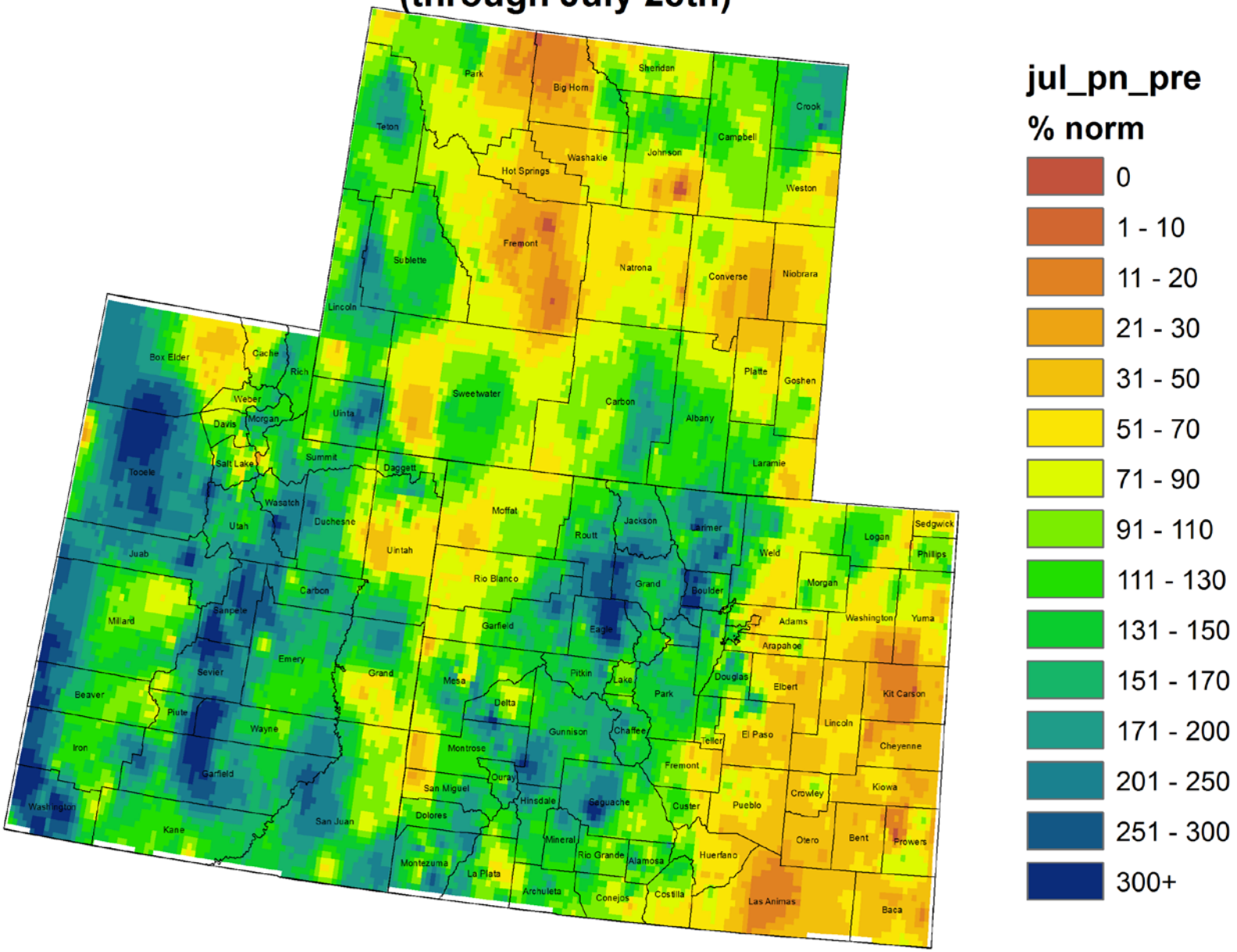

Daily Precipitation (inches x.xx), for the 24 hour period ending ~7:00 am
Colorado 7/30/2012
0.0
Trace
0.01 - 0.13
0.14 - 0.26
0.27 - 0.65
0.66 - 1.56
1.57 - 2.34
2.35 - 2.60
Moffat
Routt
Jackson
Larimer
Weld
Logan
Sedgwick
Phillips
Rio Blanco
Grand
Boulder
Morgan
Washington
Yuma
Garfield
Eagle
Summit
Clear Creek
Gilpin
Adams
Arapahoe
Jefferson
Douglas
Elbert
Kit Carson
Lincoln
Cheyenne
Pitkin
Lake
Park
Teller
El Paso
Mesa
Delta
Gunnison
Chaffee
Fremont
Montrose
Ouray
San Miguel
Saguache
Custer
Pueblo
Crowley
Kiowa
Otero
Bent
Prowers
Dolores
San Juan
Hinsdale
Mineral
Rio Grande
Alamosa
Huerfano
Las Animas
Baca
Montezuma
La Plata
Archuleta
Conejos
Costilla


Daily Precipitation (inches x.xx), for the 24 hour period ending ~7:00 am
Colorado 7/31/2012
0.0
Trace
0.01 - 0.16
0.17 - 0.32
0.33 - 0.79
0.80 - 1.90
1.91 - 2.85
2.86 - 3.16
Moffat
Routt
Jackson
Larimer
Weld
Logan
Sedgwick
Phillips
Rio Blanco
Grand
Boulder
Morgan
Washington
Yuma
Garfield
Eagle
Summit
Clear Creek
Gilpin
Adams
Arapahoe
Douglas
Elbert
Kit Carson
Lincoln
Cheyenne
Pitkin
Lake
Park
Mesa
Delta
Gunnison
Chaffee
Teller
El Paso
Montrose
Fremont
Kiowa
Crowley
Ouray
San Miguel
Saguache
Custer
Pueblo
Otero
Bent
Prowers
Dolores
San Juan
Hinsdale
Mineral
Rio Grande
Alamosa
Huerfano
Las Animas
Baca
Montezuma
La Plata
Archuleta
Conejos
Costilla

Colorado, Utah and Wyoming Month to Date Precipitation (in)
1 - 28 July 2012



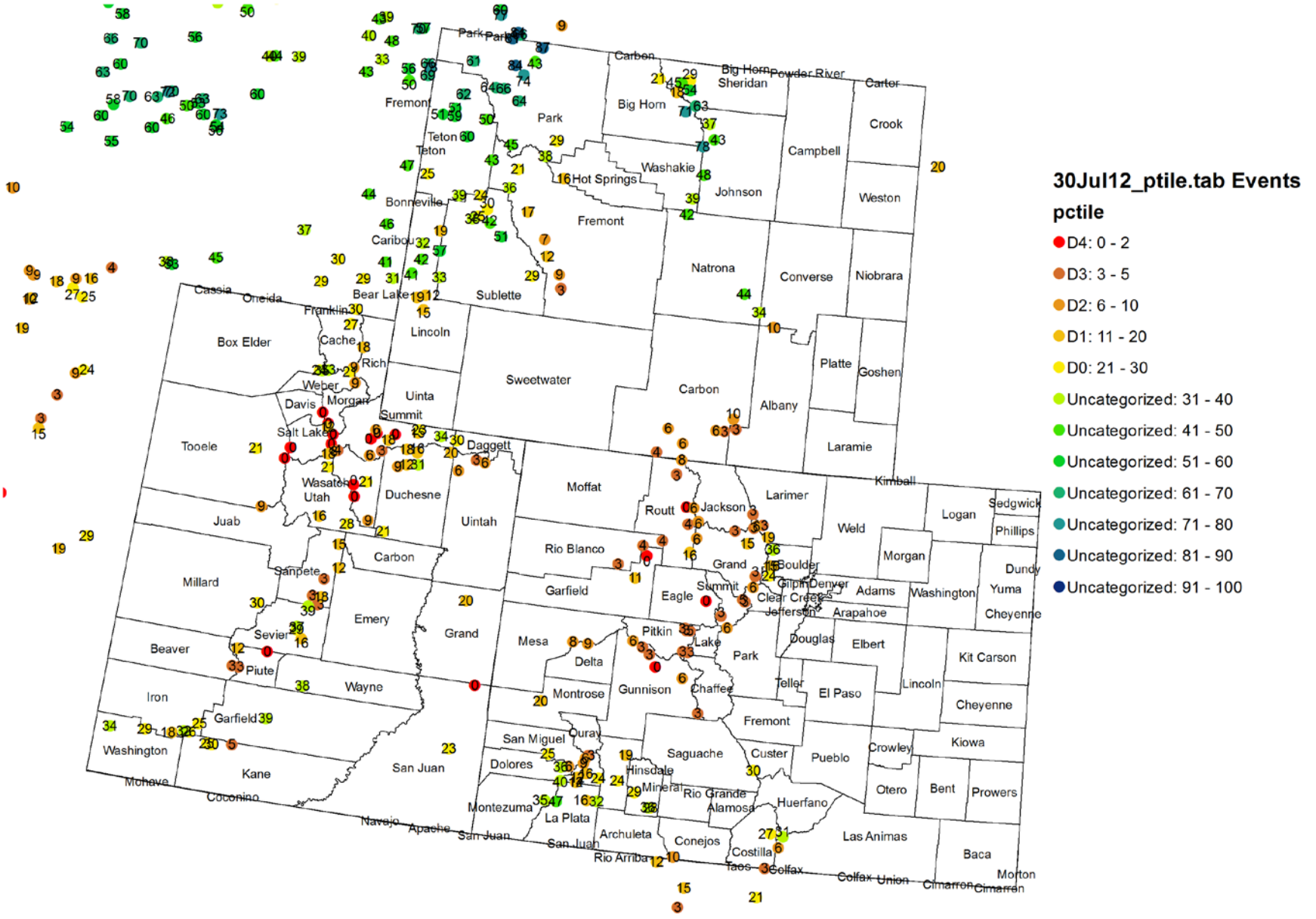
Colorado, Utah and Wyoming Preliminary July 2012 Precipitation as Percentage of Normal (through July 28th)



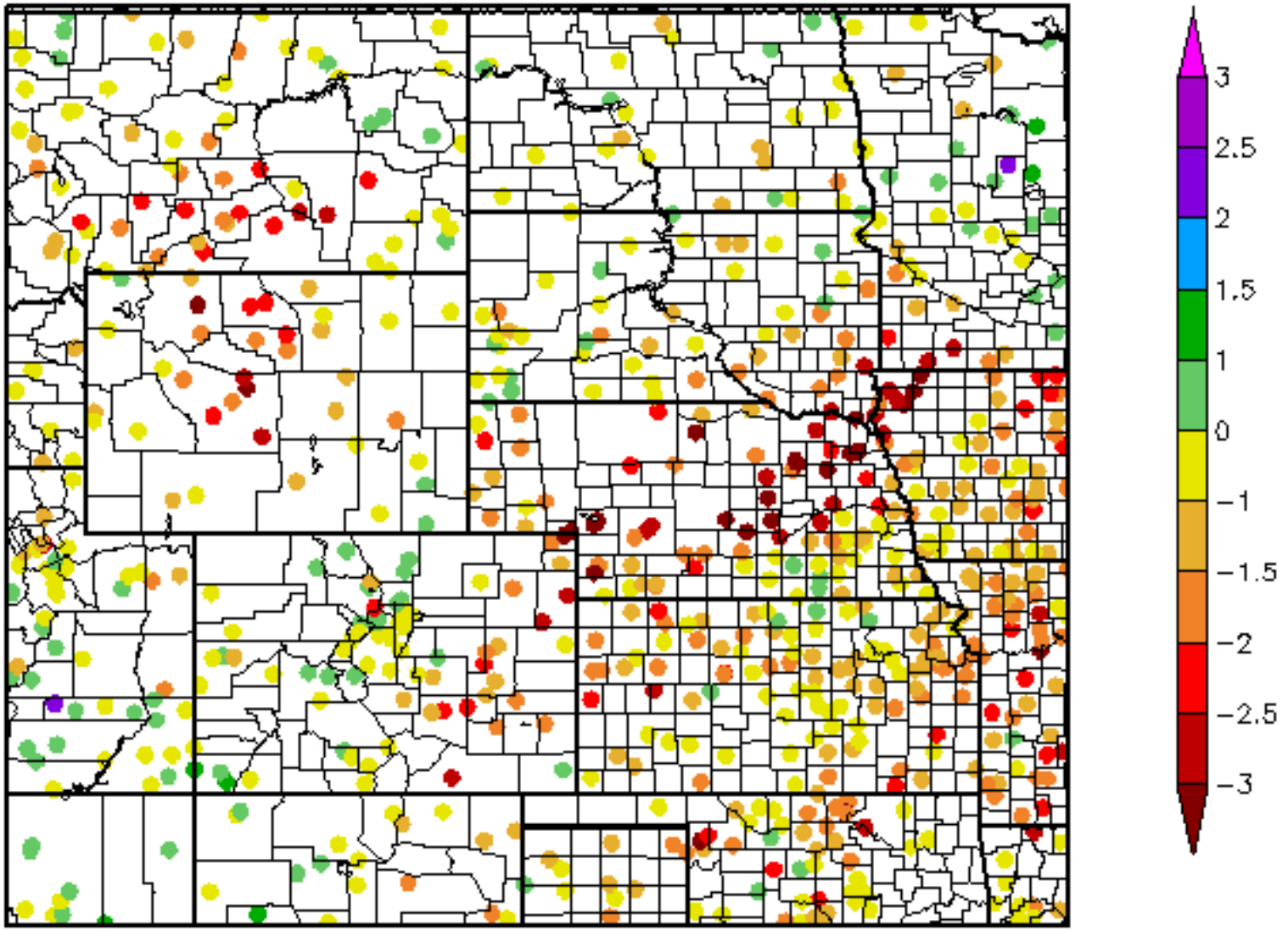
jul_pn_pre
% norm

- 0
- 1 - 10
- 11 - 20
- 21 - 30
- 31 - 50
- 51 - 70
- 71 - 90
- 91 - 110
- 111 - 130
- 131 - 150
- 151 - 170
- 171 - 200
- 201 - 250
- 251 - 300
- 300+

Snotel Water Year Precipitation Percentile Ranking for 30 July 2012 (Stations with 15+ years of data only)



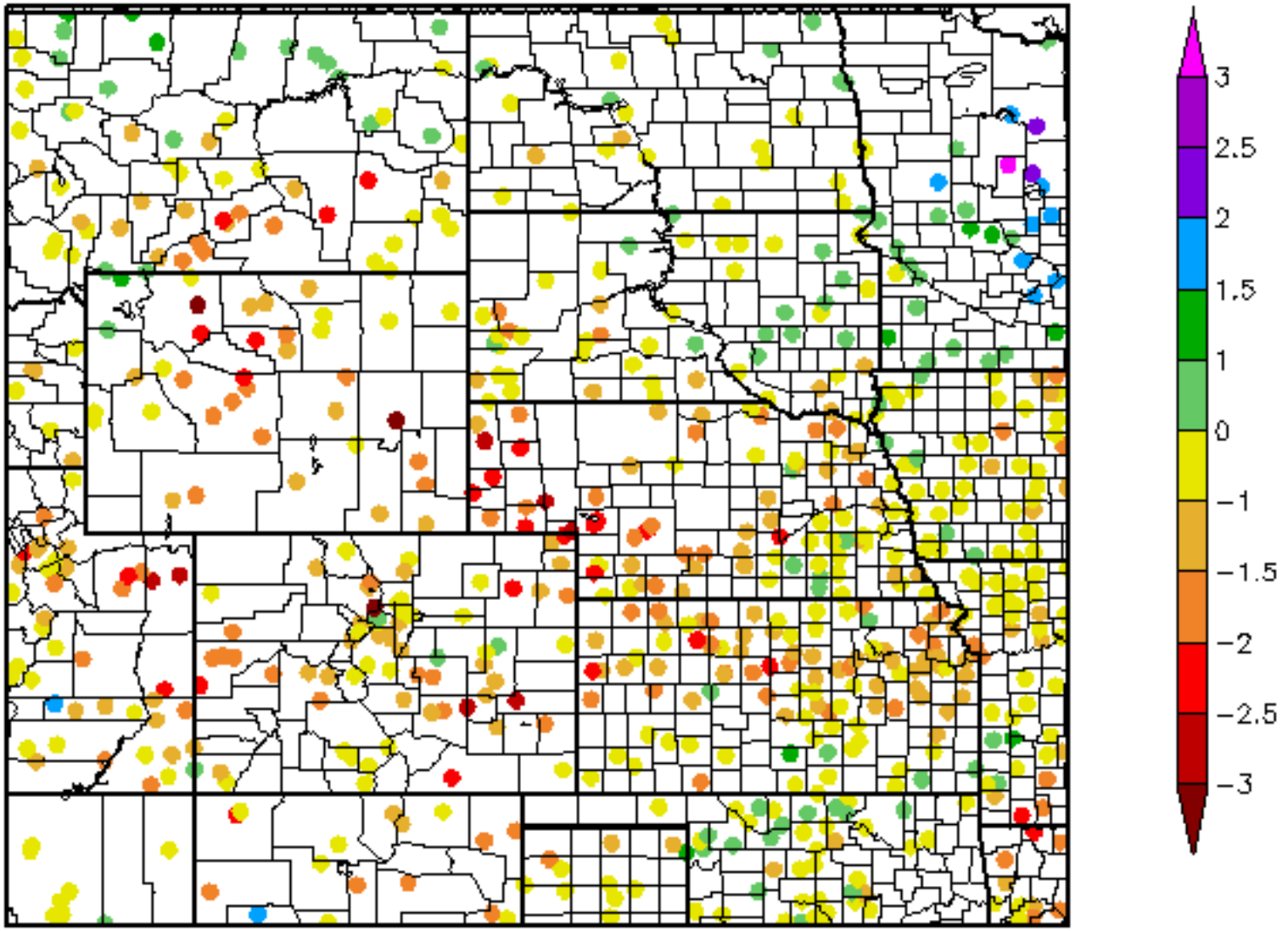
60 Day SPI
5/31/2012 – 7/29/2012



Generated 7/30/2012 at HPRCC using provisional data.

Regional Climate Centers

6 Month SPI
1/30/2012 – 7/29/2012

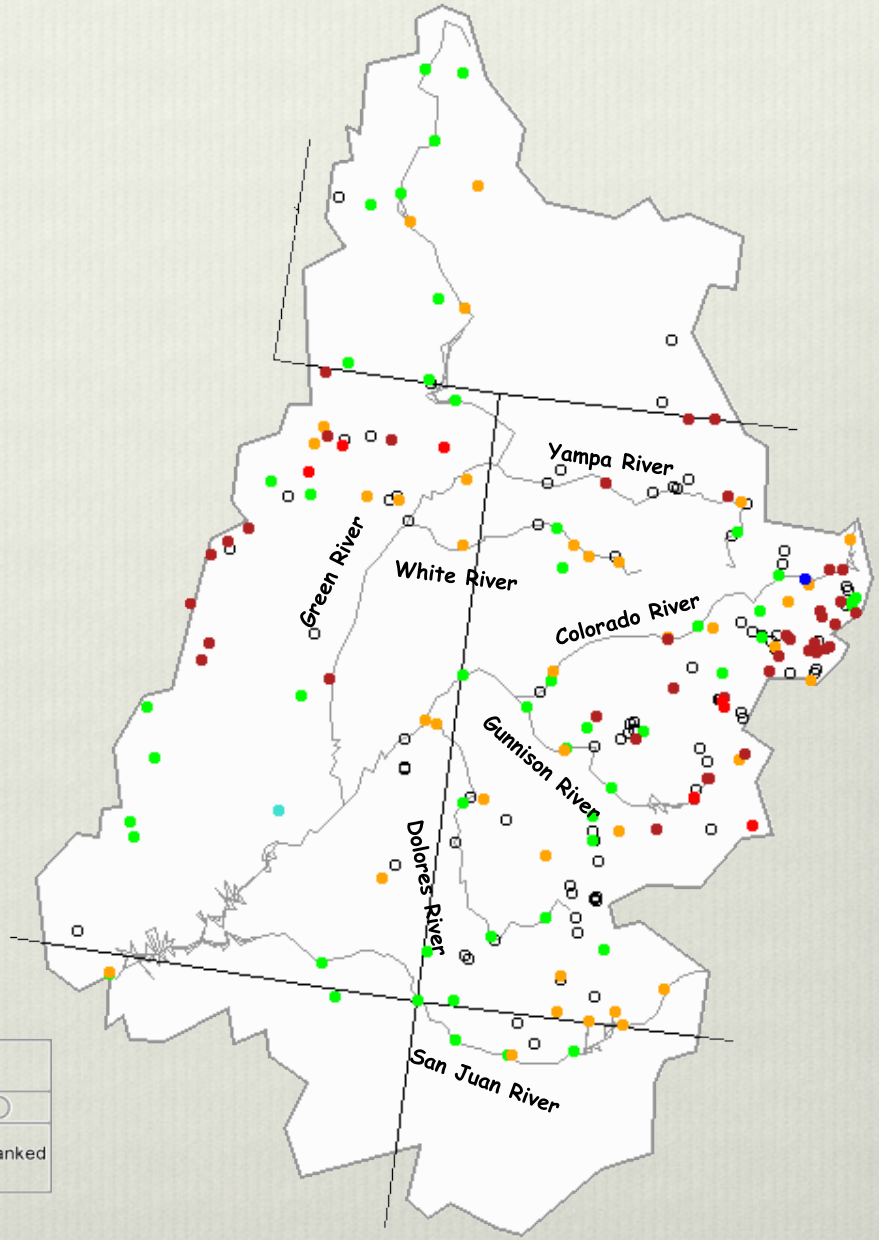


Generated 7/30/2012 at HPRCC using provisional data.

Regional Climate Centers

Streamflow Update

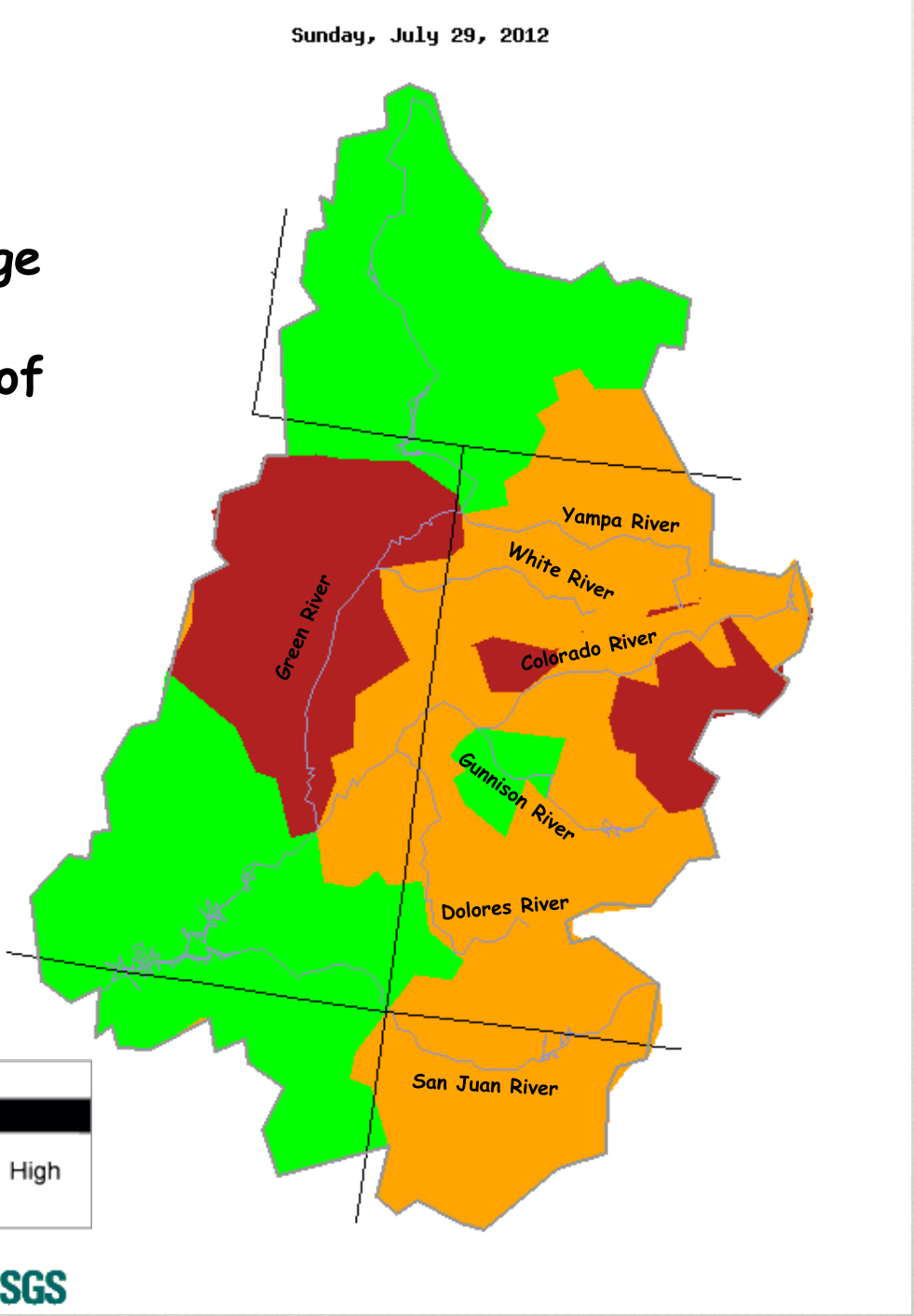
7-day average discharge compared to historical discharge for the day of the year (July 29)



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

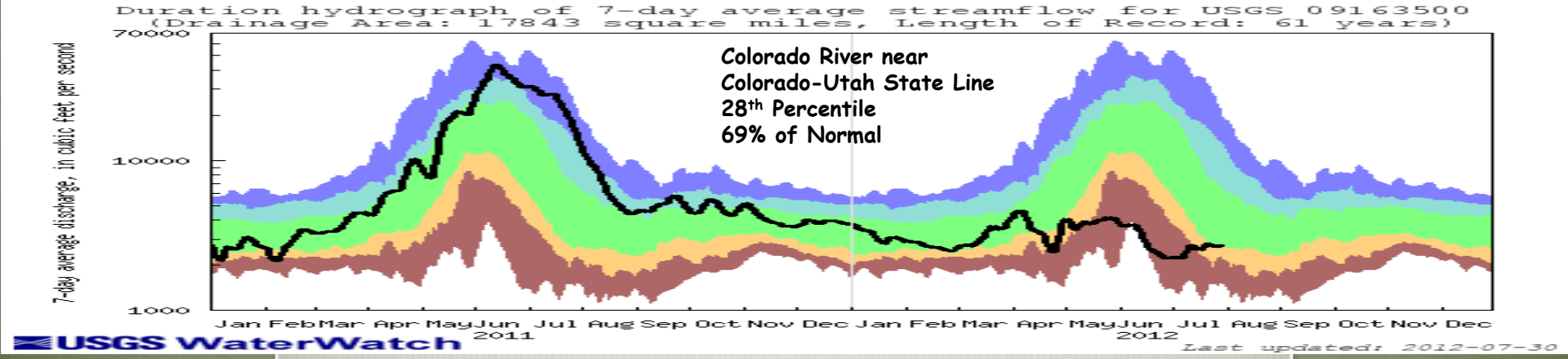
USGS

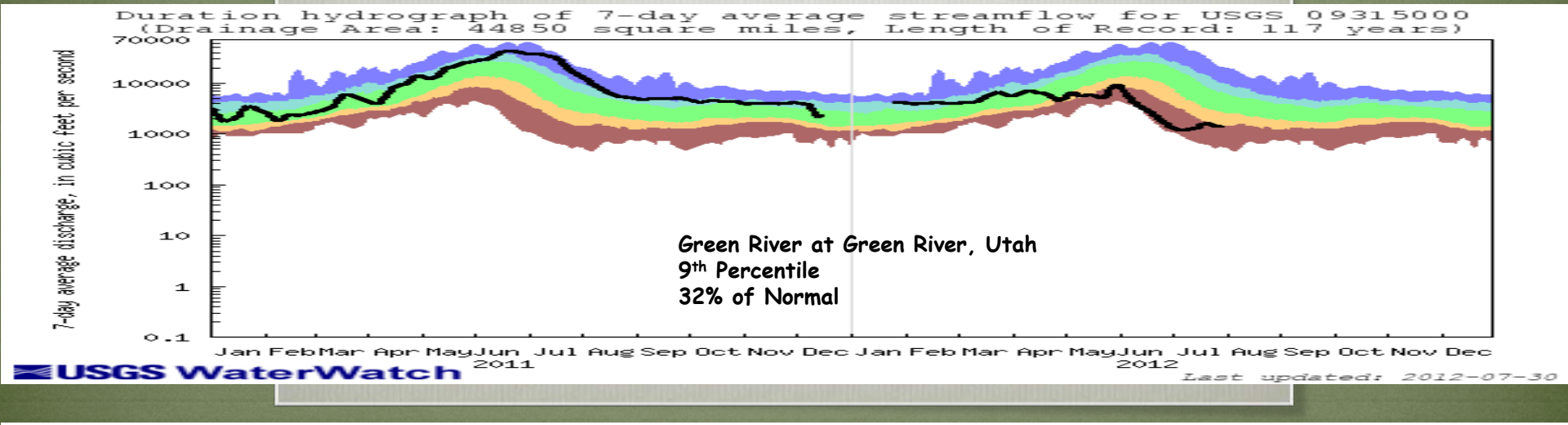
7-day average discharge compared to historical discharge for the day of the year (July 29)

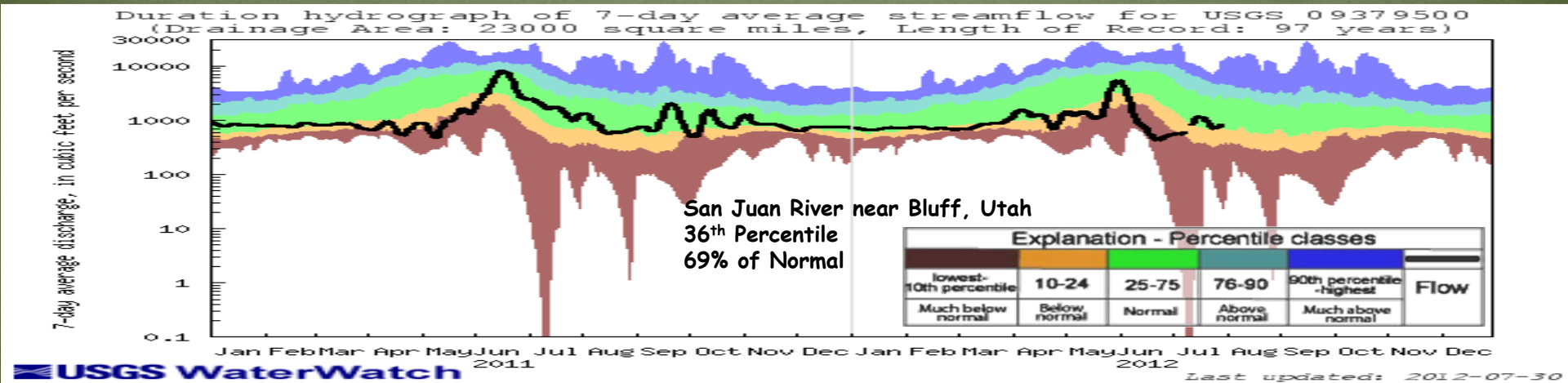


Explanation - Percentile classes						
Low	<10	10-24	25-75	76-90	>90	High
	Much below normal	Below normal	Normal	Above normal	Much above normal	

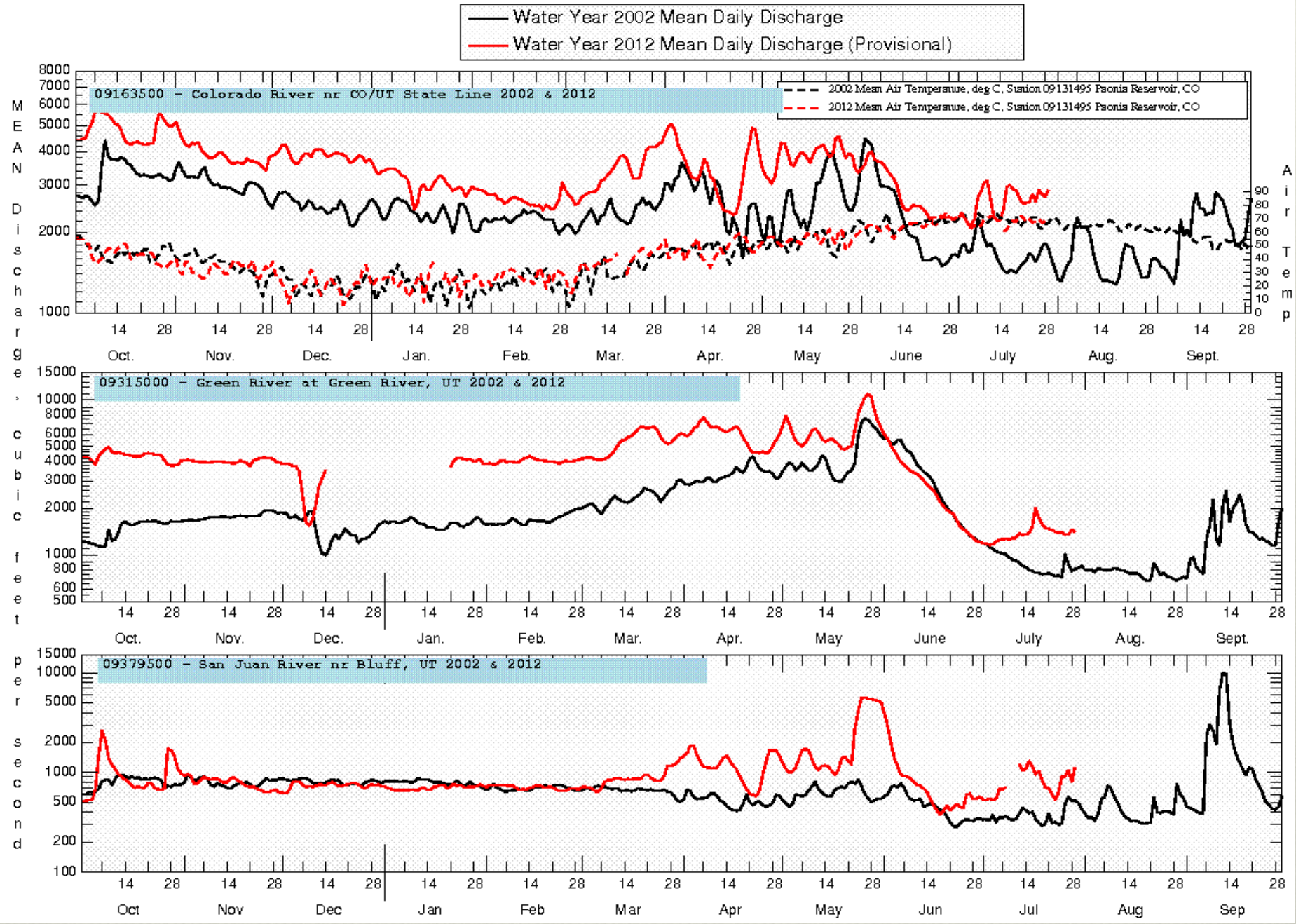
USGS


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
28th Percentile
69% 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: 2012-07-30


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
9th Percentile
32% 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: 2012-07-30


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
36th Percentile
69% 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: 2012-07-30

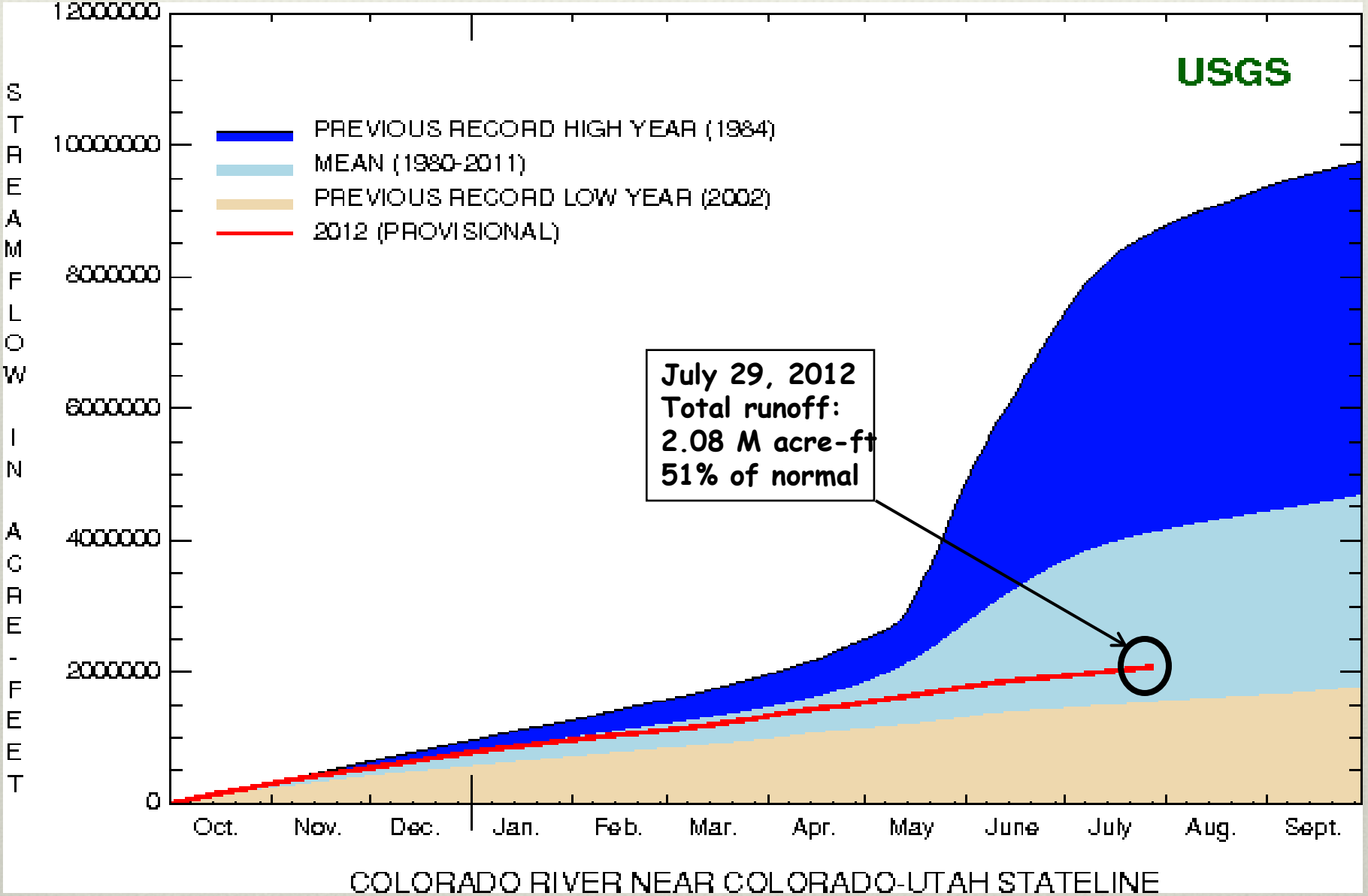
Colorado River Basin 2002 vs. 2012 Mean Daily Discharge Comparison at Select Stations



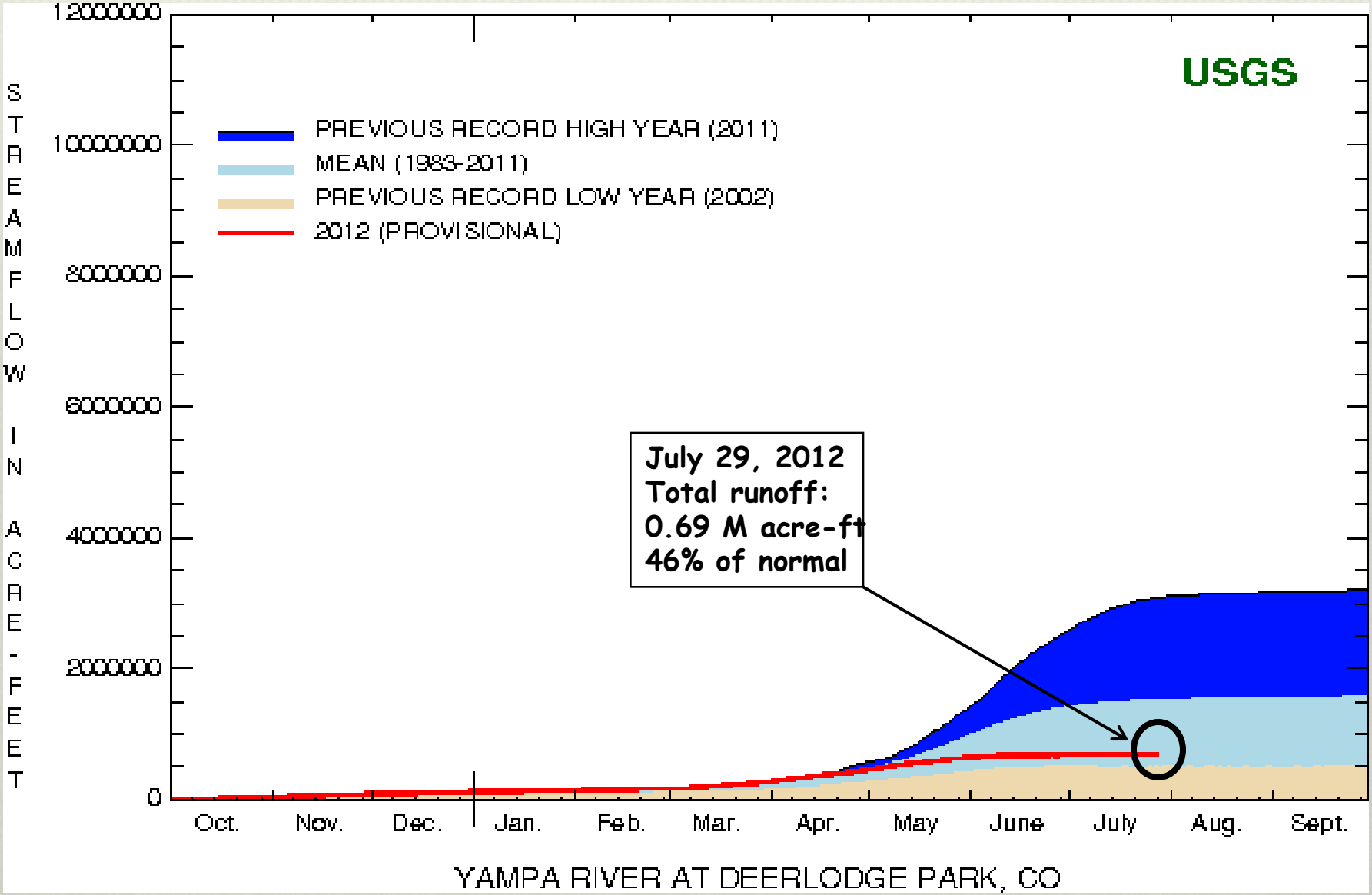
Total Streamflow Volume

Colorado River nr CO/UT State Line

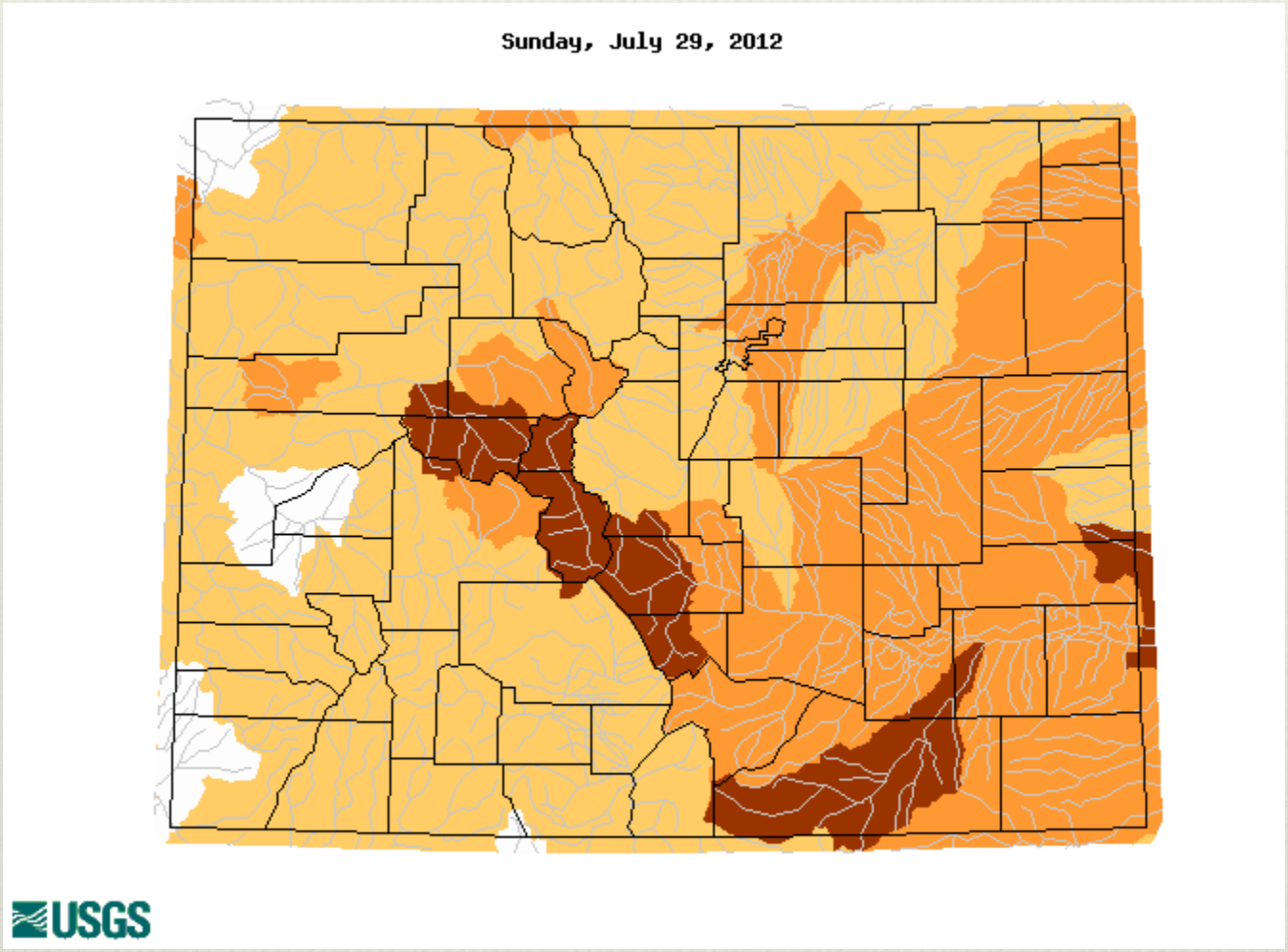
Oct 1, 2011 to July 29, 2012



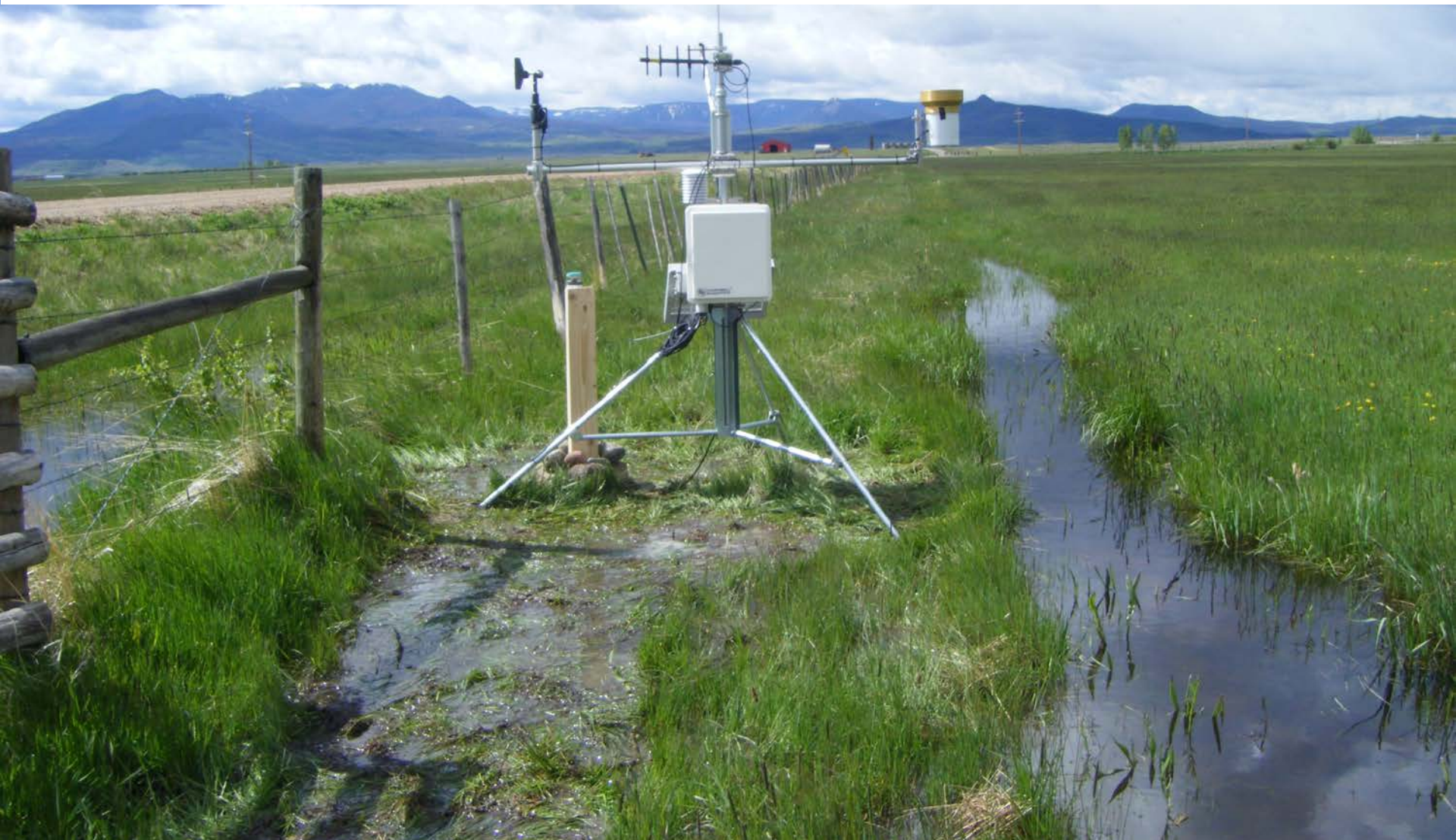
Total Streamflow Volume
Yampa River at Deerlodge Park, CO
Oct 1, 2011 to July 29, 2012



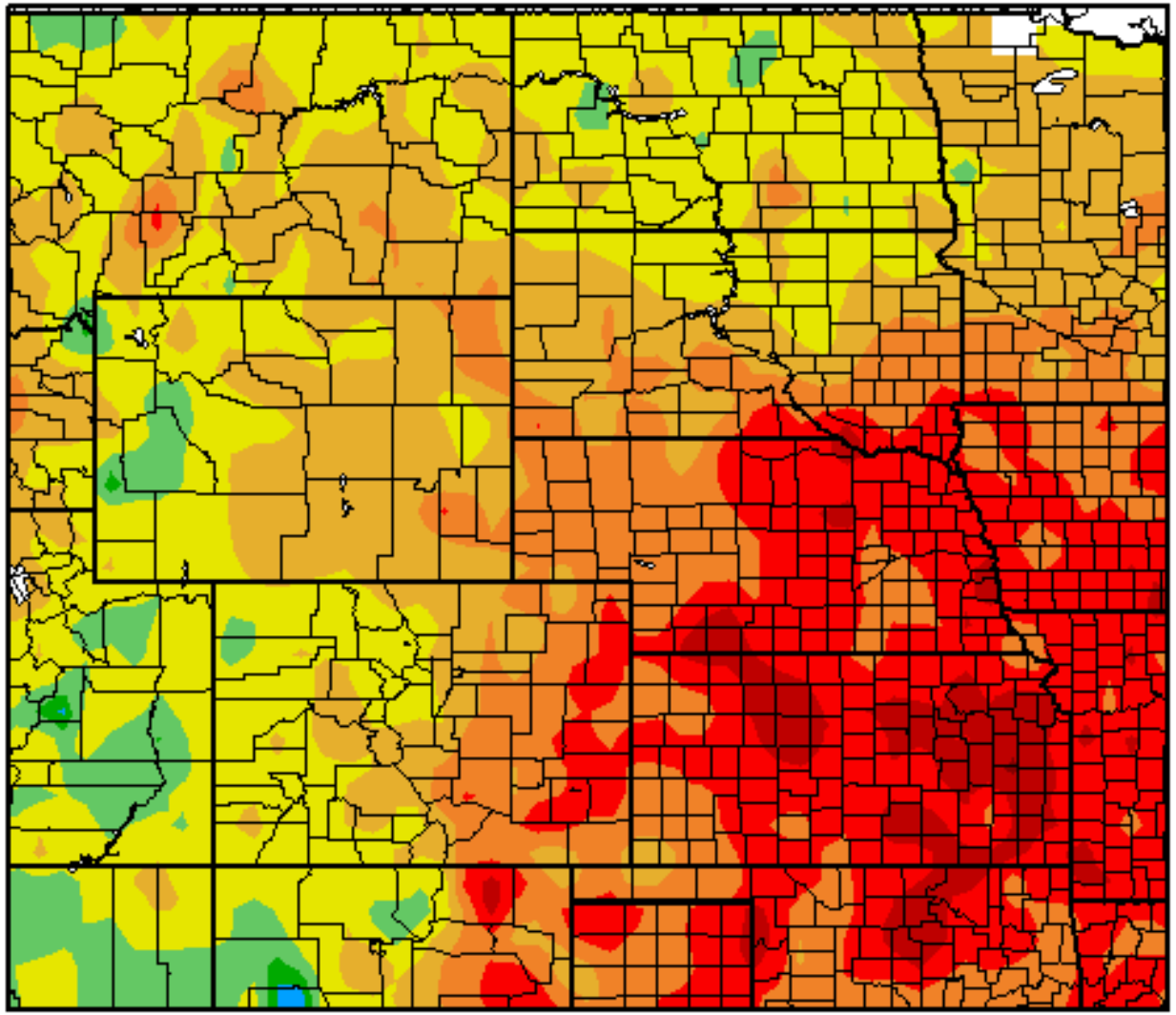
7-day average streamflow compared to historical streamflow



Water Demand

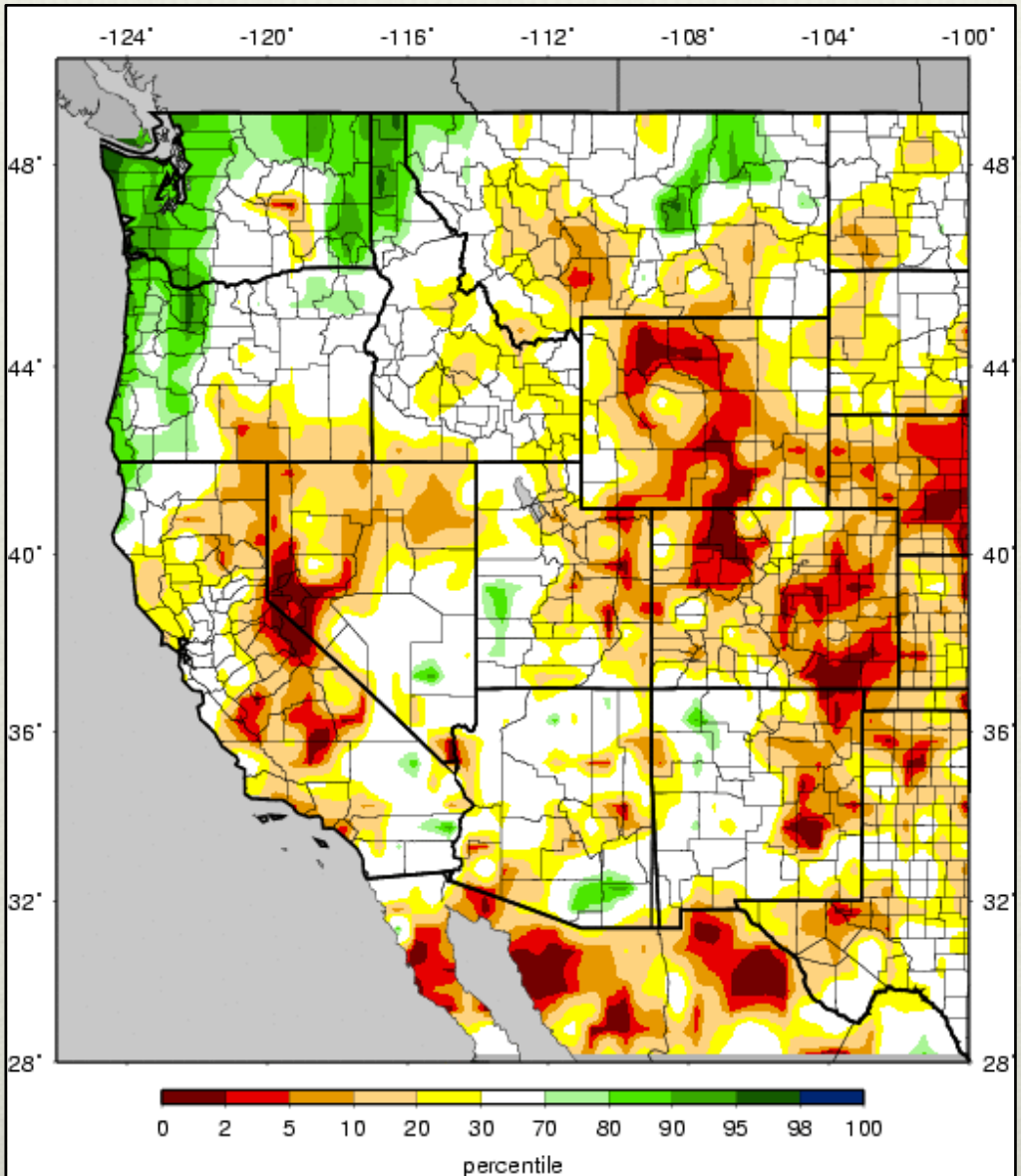


Temperature Departure from Normal
07/23/2012 – 07/29/2012

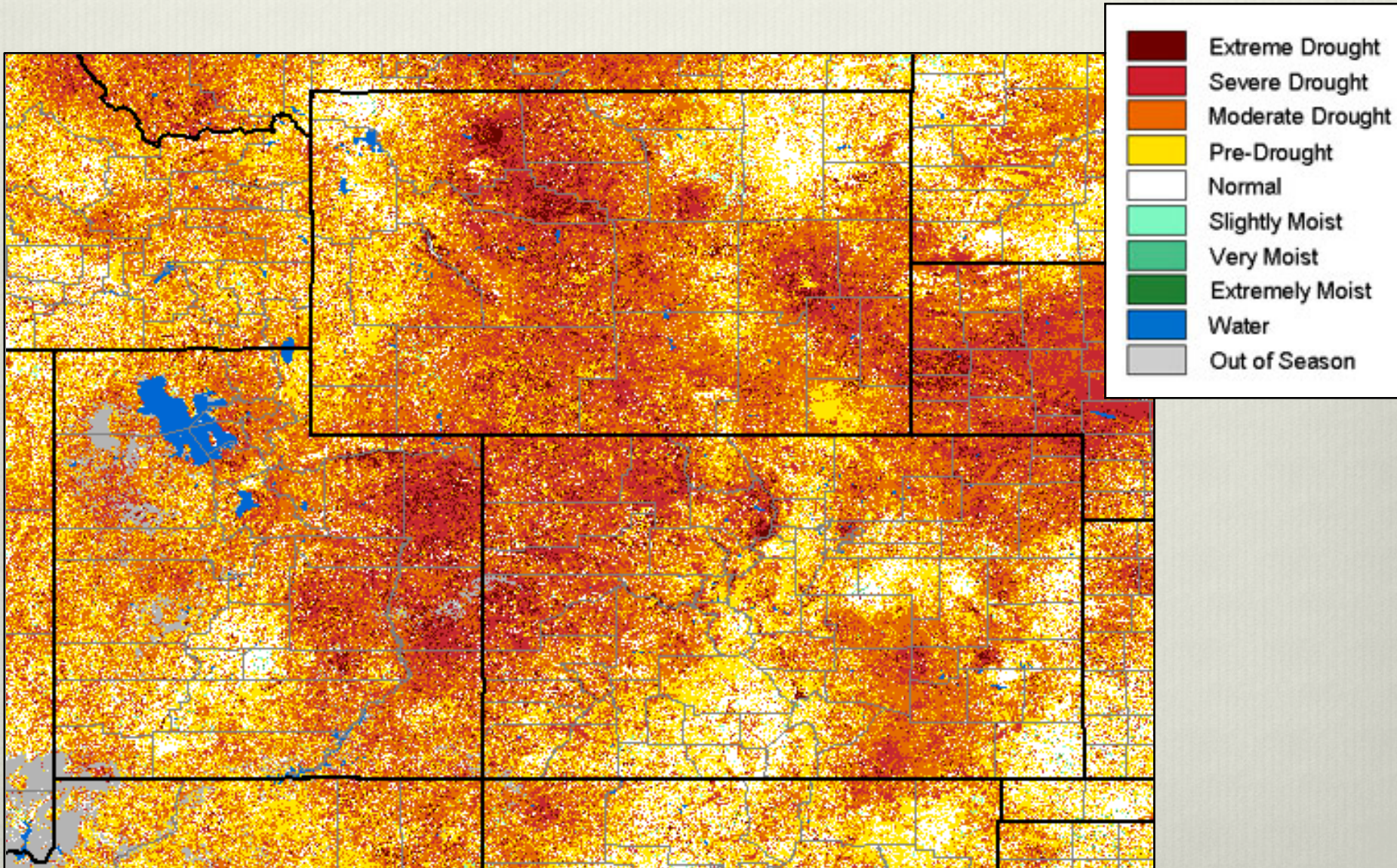


High Plains Regional Climate Center

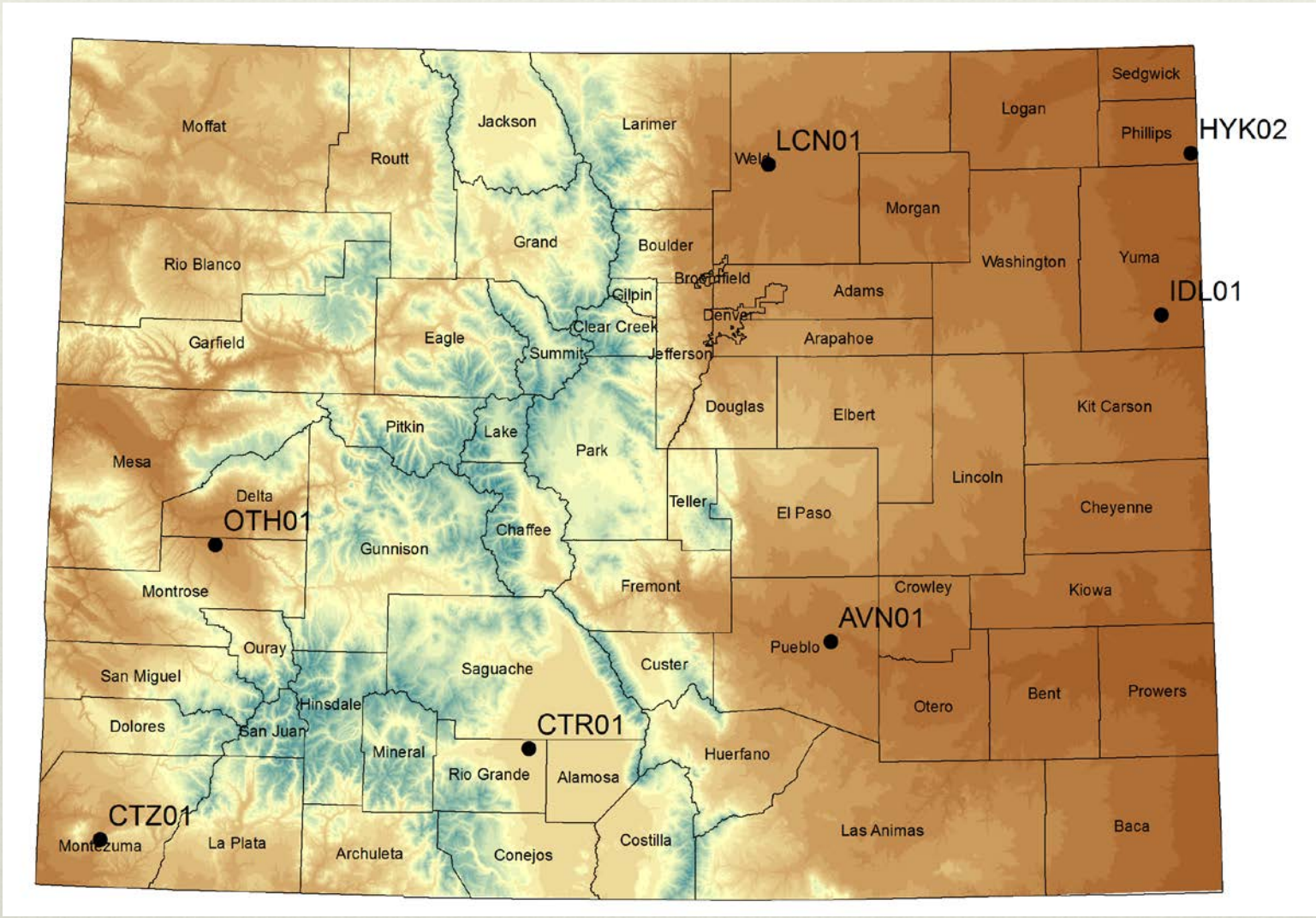
VIC Soil Moisture
28 July 2012

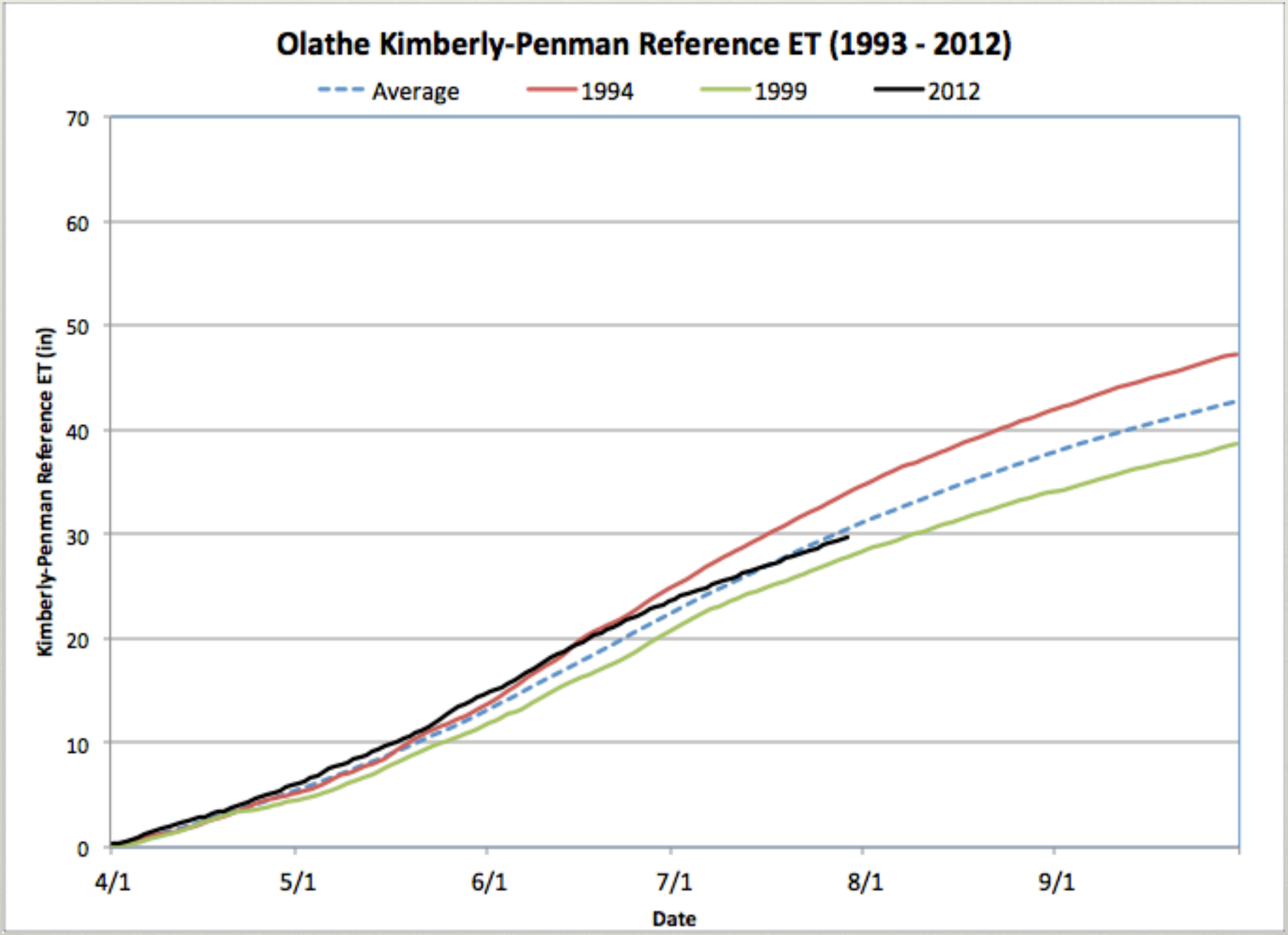


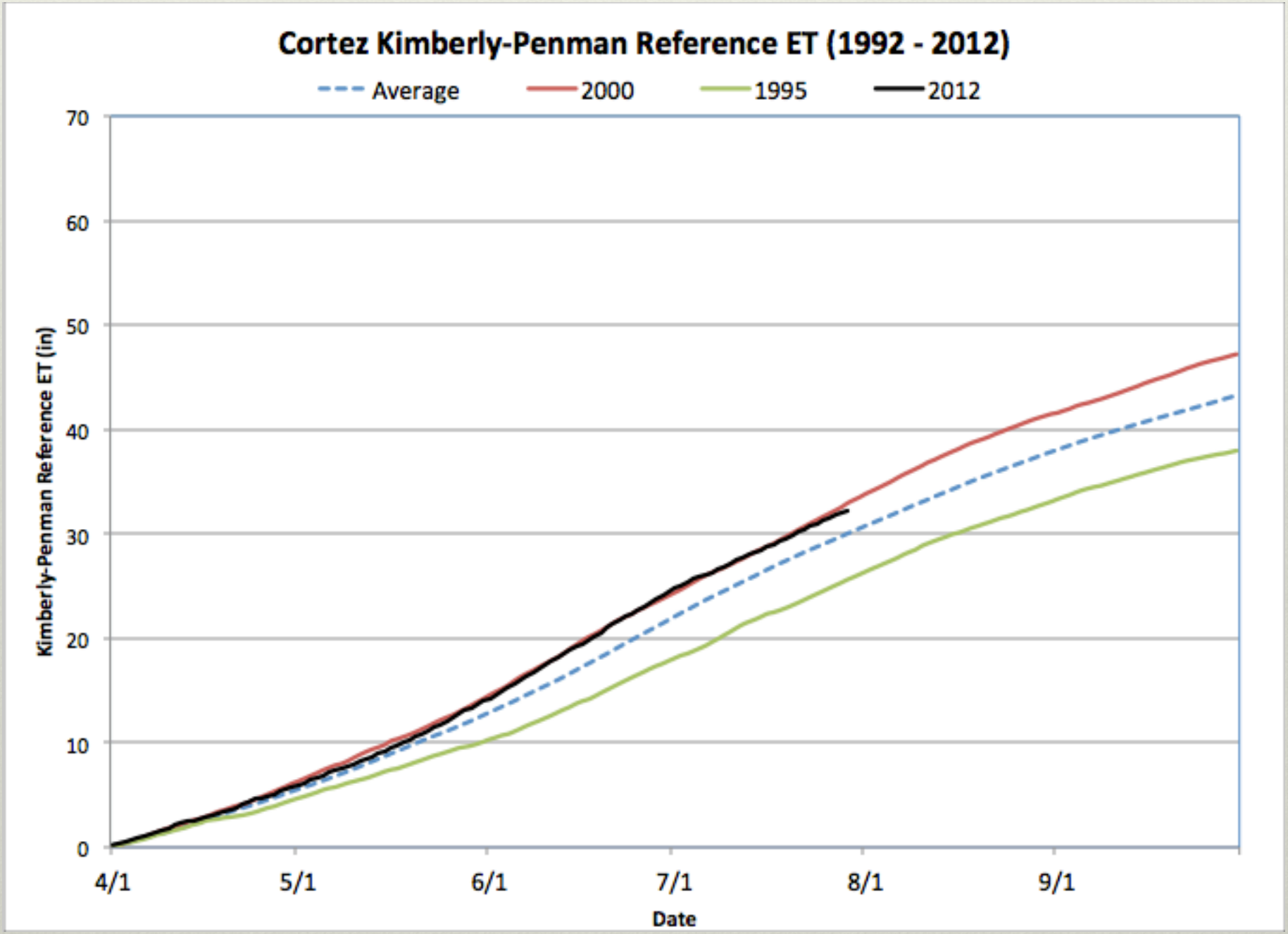
eMODIS VegDRI Vegetation
29 July 2012

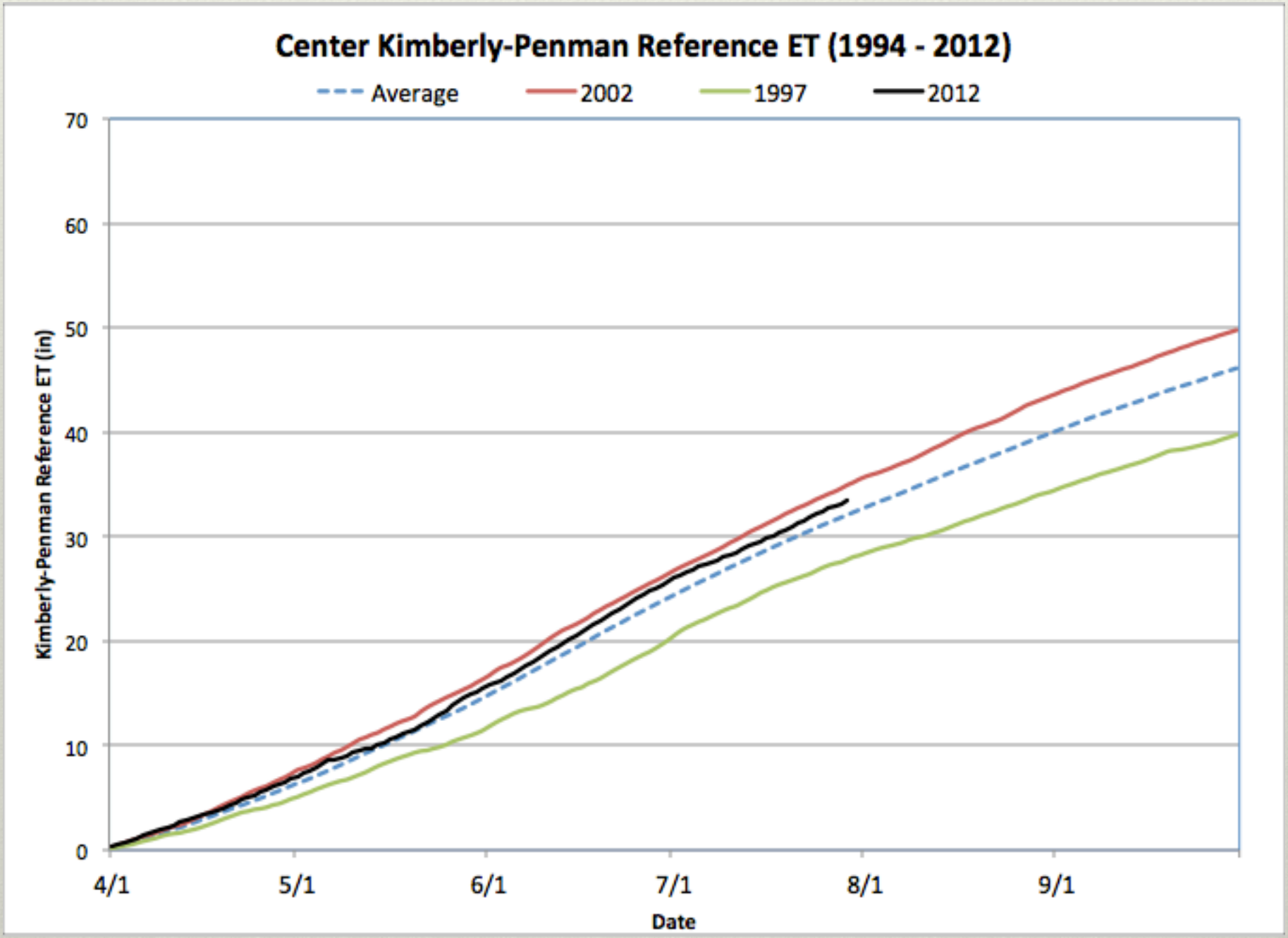


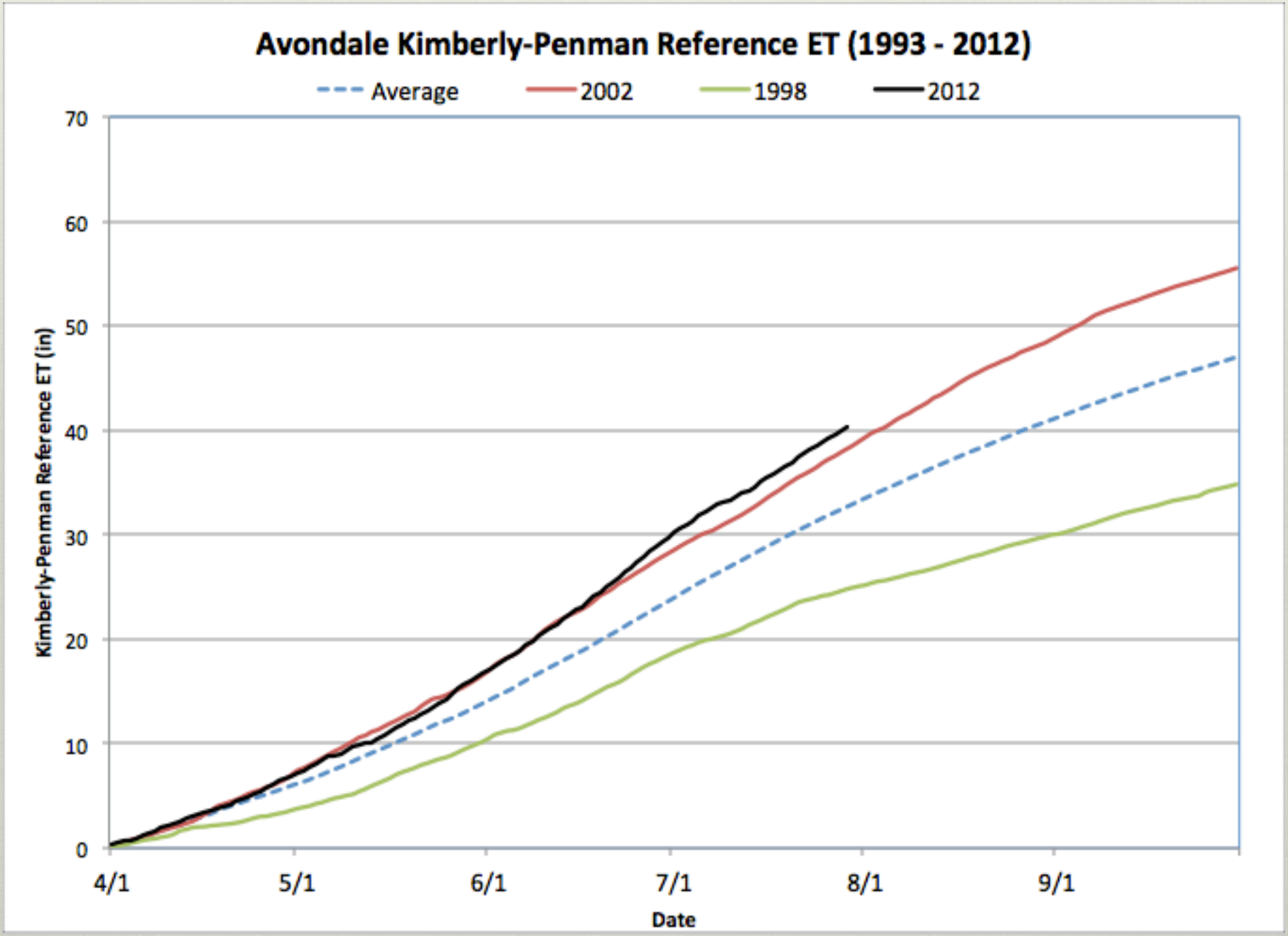
CoAgMet Reference Evapotranspiration Stations

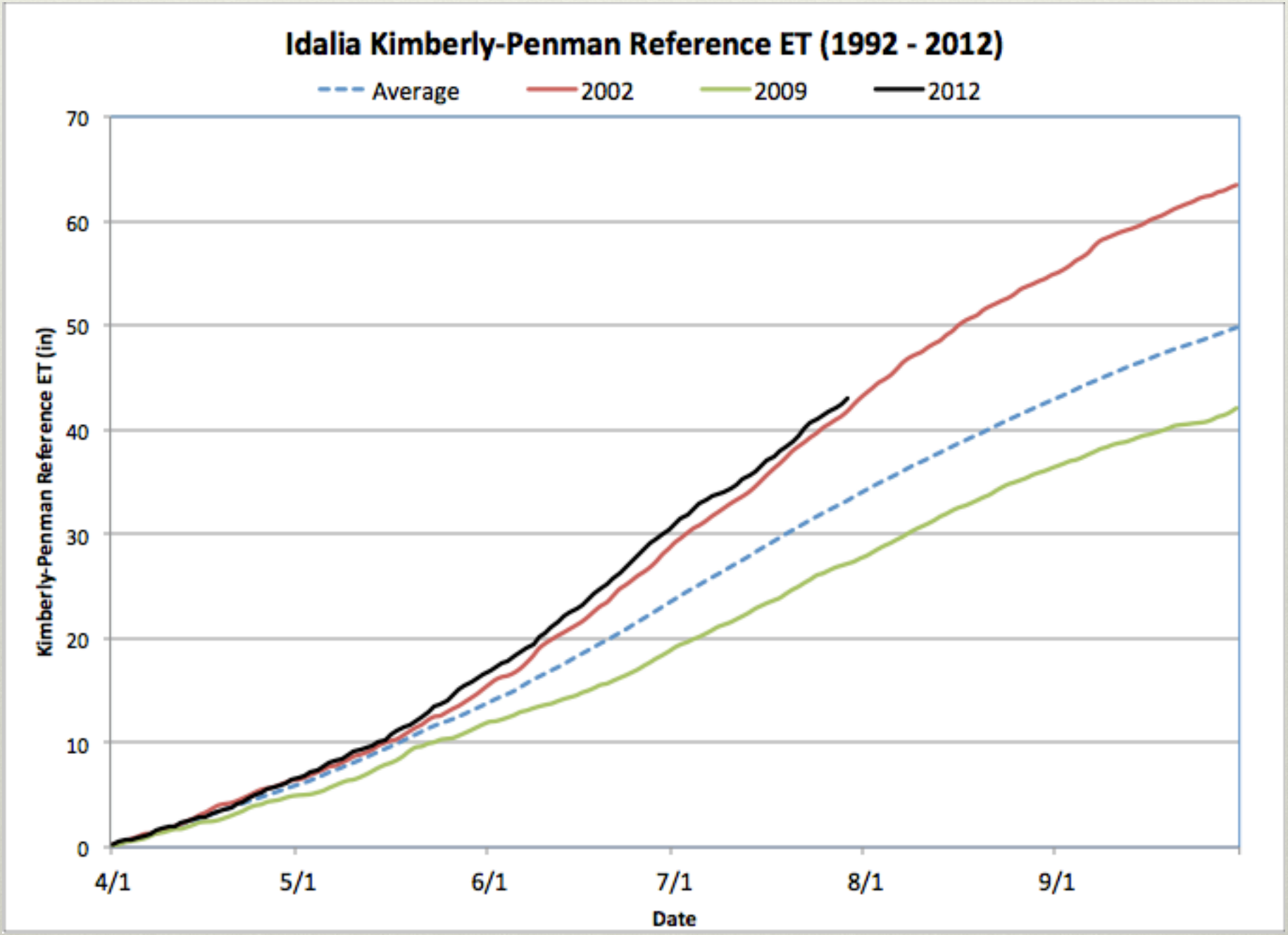


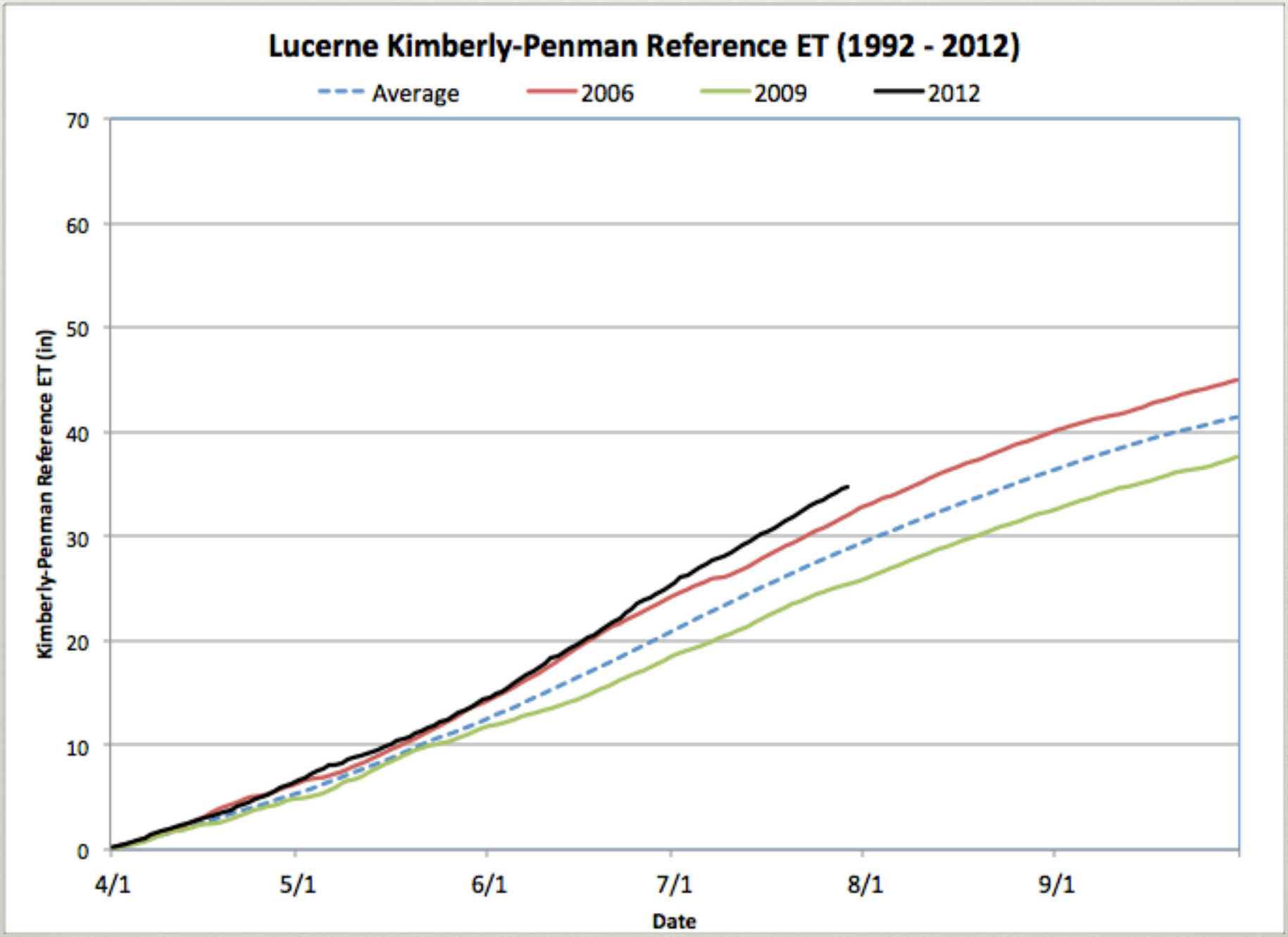

Olathe Kimberly-Penman Reference ET (1993 - 2012)
Average
1994
1999
2012
70
60
50
40
30
20
10
0
Kimberly-Penman Reference ET (in)
4/1
5/1
6/1
7/1
8/1
9/1
Date


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

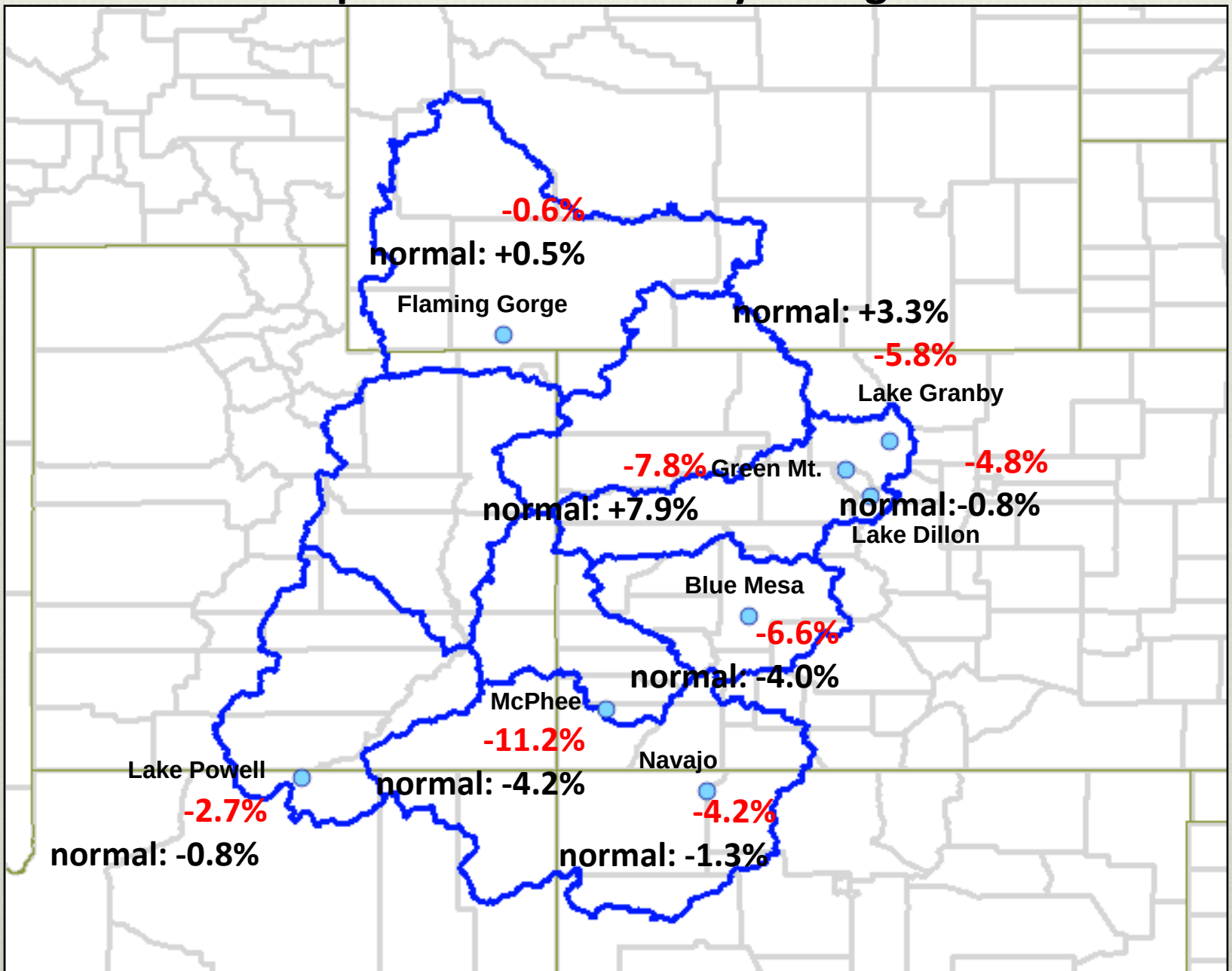

Avondale Kimberly-Penman Reference ET (1993 - 2012)
Average
2002
1998
2012
70
60
50
40
30
20
10
0
Kimberly-Penman Reference ET (in)
4/1
5/1
6/1
7/1
8/1
9/1
Date


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

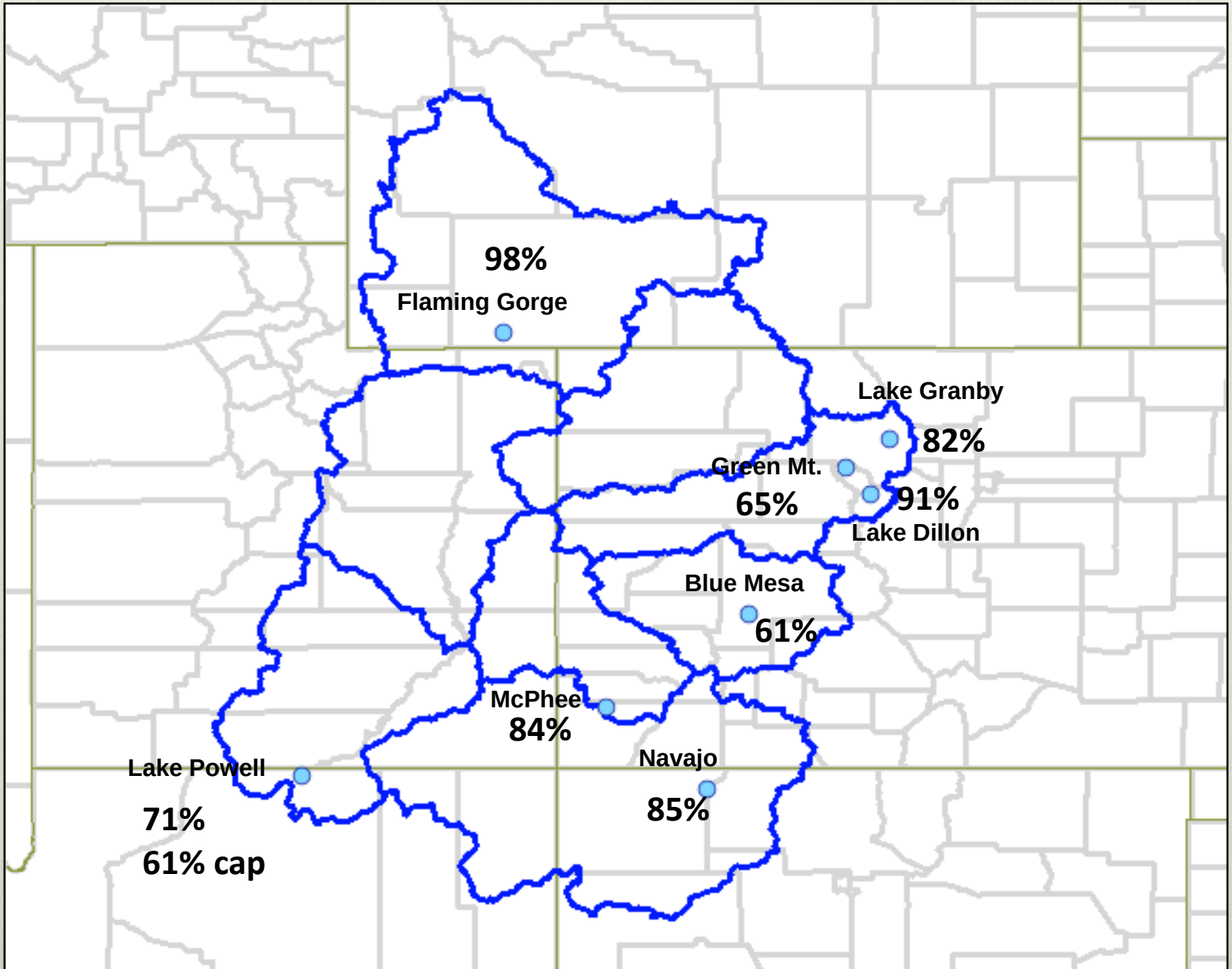

Lucerne Kimberly-Penman Reference ET (1992 - 2012)
Average
2006
2009
2012
70
60
50
40
30
20
10
0
Kimberly-Penman Reference ET (in)
4/1
5/1
6/1
7/1
8/1
9/1
Date

Reservoir Update

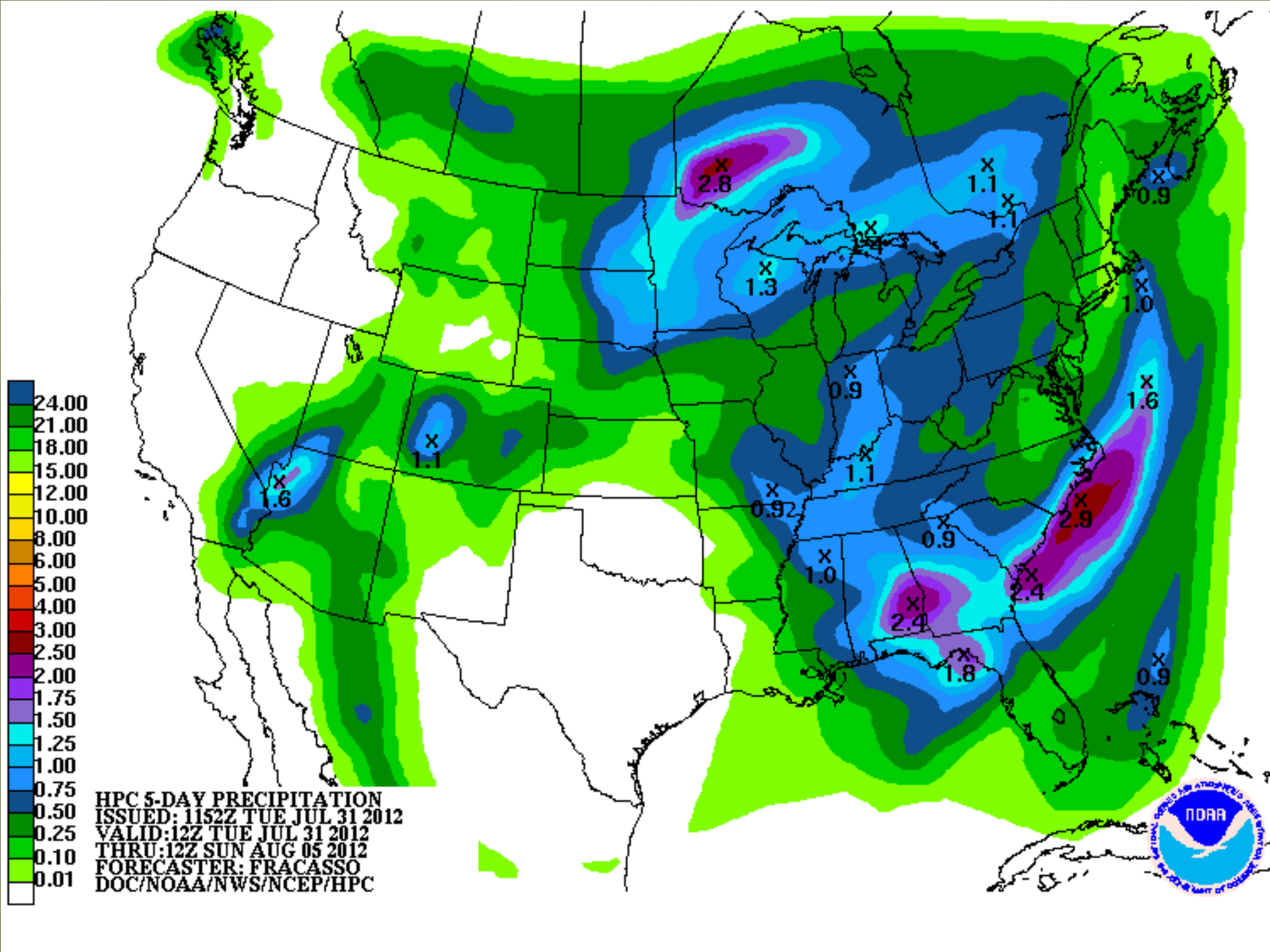
July Reservoir Storage Volume Changes
Compared to Normal July Changes



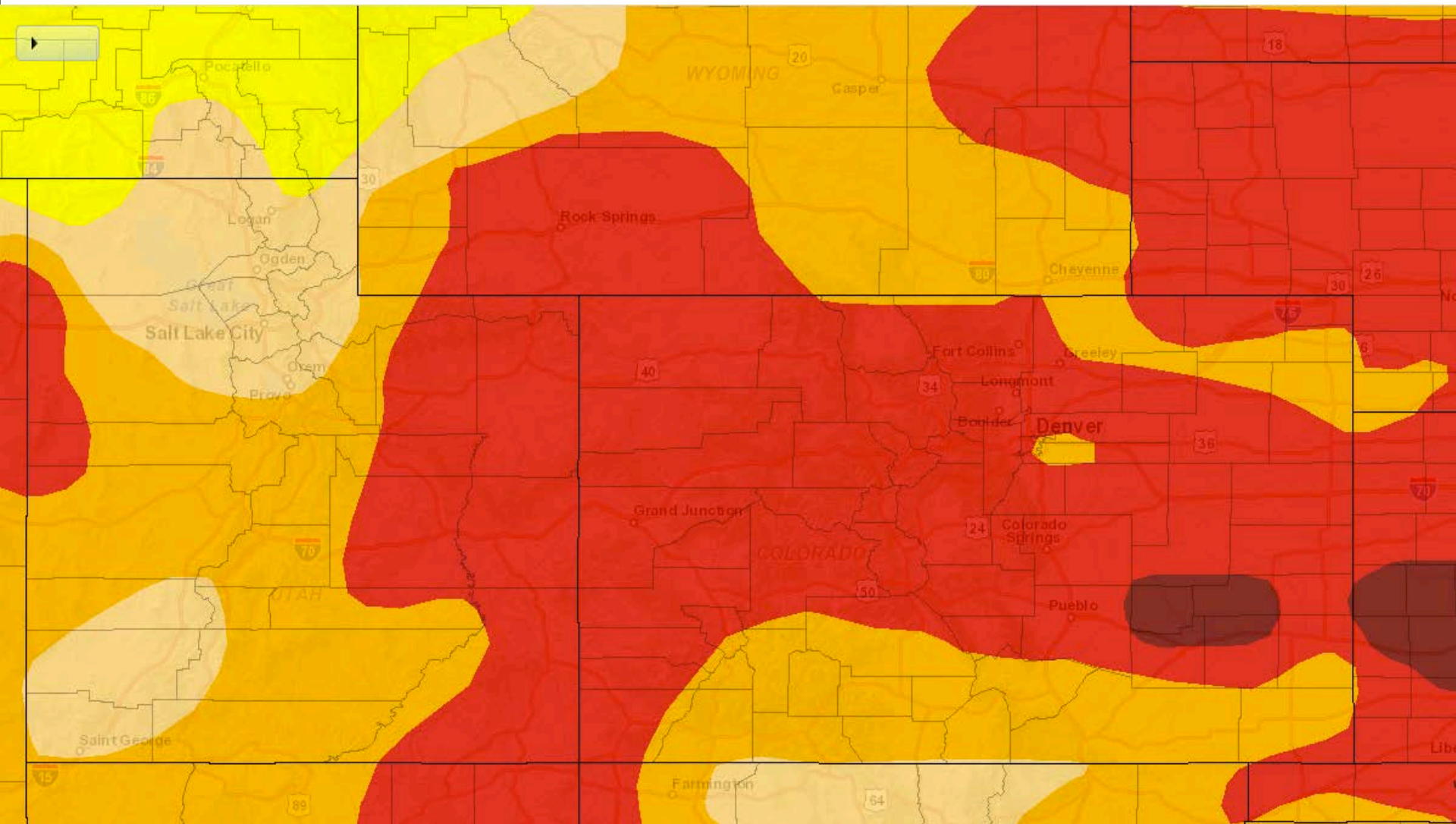
July Average Reservoir Storage Volume



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: 1152Z TUE JUL 31 2012
VALID:12Z TUE JUL 31 2012
THRU:12Z SUN AUG 05 2012
FORECASTER: FRACASSO
DOC/NOAA/NWS/NCEP/HPC
2.8
1.1
1.1
0.9
1.3
1.0
0.9
1.6
1.1
1.6
0.9
1.1
2.9
0.9
1.0
2.4
2.4
1.8
0.9
NOAA

Recommendations



INFO

For more information

NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

July 31, 2012

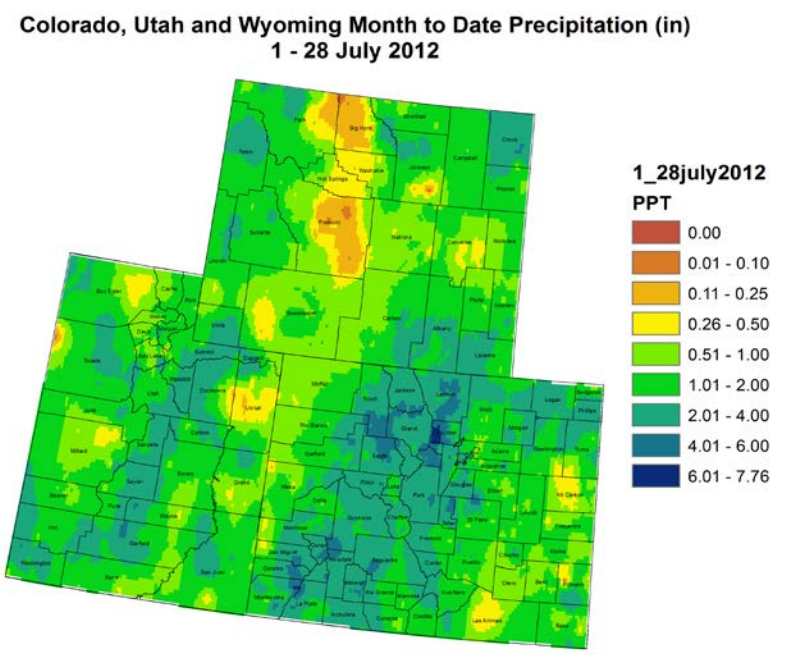


Fig. 1: July month-to-date precipitation in inches.

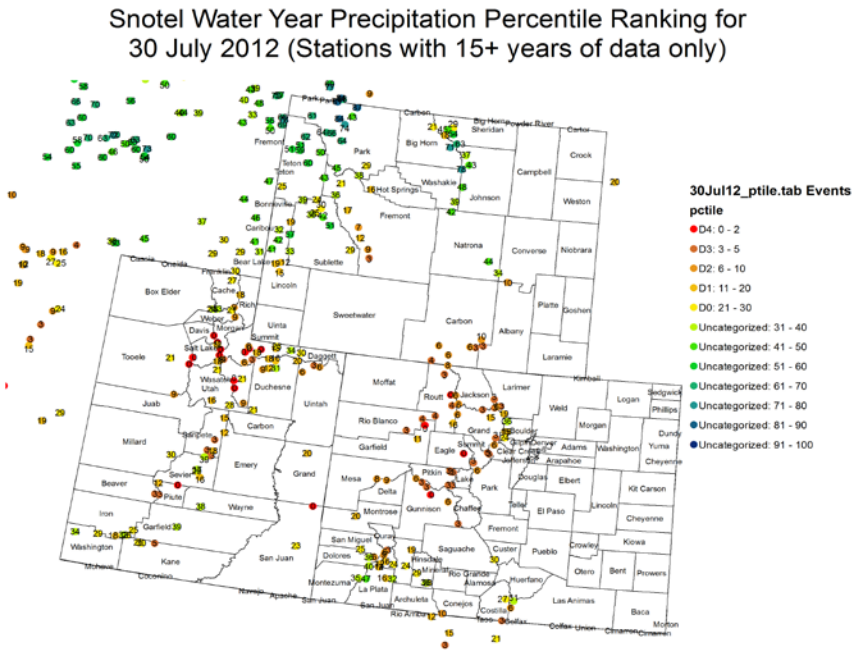


Fig. 2: SNOTEL WYTD precipitation percentiles (50% is median, 21 – 30% is Drought Monitor D0 category).

Precipitation

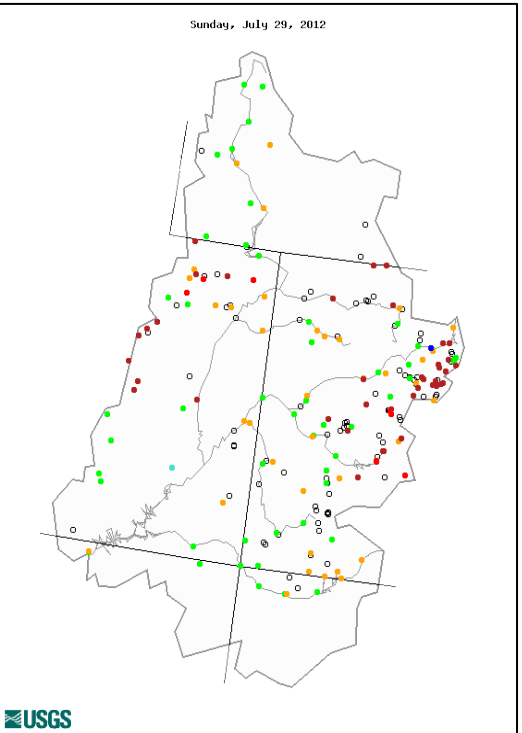
For the month of July so far, widespread precipitation has fallen over most of the Upper Colorado River Basin (UCRB, Fig. 1). Most areas have received between a .5 to 2 inches for the month. With monsoonal flow through the central Rockies, over 1 inch fell in southern Routt, Eagle, Grand and southern Jackson counties. July totals are now in the 2 to 4 inch for the eastern part of the USRB. Parts of eastern UT, the western slope of Colorado and southwest Wyoming have been a bit drier, receiving less than an inch of precipitation, month-to-date. East of the basin, most of CO has received between an inch to over two inches of precipitation. The Front Range of CO has seen more than 2 inches in July, with western Boulder County above 6 inches. Isolated areas in southeast CO and far eastern CO have seen less precipitation, receiving less than an inch month-to-date.

Water-year-to-date (WYTD), SNOTEL precipitation percentiles have increased for much of the UCRB, however the Yampa and Gunnison basins in CO, and the Wasatch range in UT remain in the lowest 10th percentile or below (Fig. 2). The northern mountains of CO are still reporting precipitation percentiles in the teens and single digits

Streamflow

As of July 29th, about 38% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) or above normal 7-day average streamflows (Fig. 3). There are two gages in the UCRB recording above normal flows, while about 30% percent of the gages in the basin are recording much below normal or low (i.e. lowest on record) streamflows (improved from 50% two weeks ago). Much below normal flows are concentrated in the middle Green River basin and around the Colorado River headwaters region. Near normal flows are concentrated around the Upper Green River and the Colorado River just above Lake Powell. The remainder of the basin is mostly in the below normal flows range.

There were only minor changes in flows at three key gages in the UCRB last week (Fig. 4). Flows on the Colorado River near the CO-UT state line are in the near normal range at the 28th percentile. Flows on the Green River at Green River, UT are still in the much below normal range at the 9th percentile. Flows on the San Juan River near Bluff, UT are near normal at the 36th percentile.



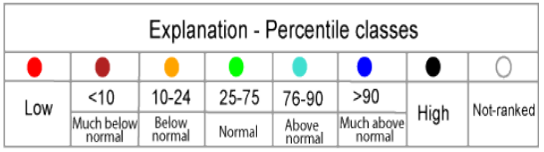


Fig. 3: 7-day average discharge compared to historical discharge for July 29th.

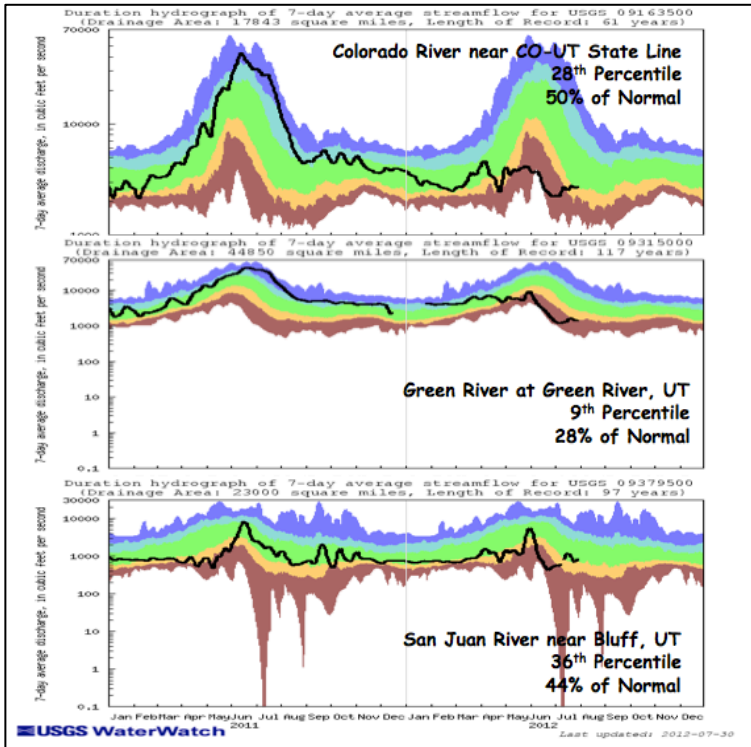


Fig. 4: USGS 7-day average discharge over time at the CO-UT stateline (top), Green River, UT (middle) and Bluff, UT (bottom).

Water Supply and Demand

Last week, temperatures across the UCRB were near average to slightly above average. East of the basin, the rest of CO experienced temperatures 4 to 8 degrees above average for the week. Satellite vegetation conditions show the driest vegetation over northwest CO and northeast UT, with dry conditions extending into southern WY and into the Four Corners region (Fig. 5). Very dry vegetation is also showing up over northeast CO and along the Arkansas valley in southeast CO. Reference ET rates throughout the basin have stabilized over the past couple weeks, with daily rates less than .25 inches. East of the basin, reference ET rates are very high (with daily rates as high as .50 inches), with some of the highest seasonal accumulations observed at many sites (Fig. 6).

For the month of July so far, all of the reservoirs have seen volume decreases with McPhee, Blue Mesa and Green Mountain seeing the largest decreases. Volume decreases are normal for this time of year, though all reservoirs are seeing larger decreases than what is normal for this time of year. All of the major reservoirs are below their July storage averages, with Blue Mesa at 61% of average, Green Mountain at 65% of average, and Lake Powell currently at 71% of average.

Precipitation Forecast

The monsoonal pattern will remain in place through the middle of the week as a large high pressure system located to the east of Colorado continues to pump moist sub-tropical air over much of the UCRB. This will lead to daily rounds of afternoon showers and thunderstorms with some storms capable of producing heavy rain. Expect the heaviest precipitation to occur in the southern and central mountains of CO where upwards of an inch of liquid accumulation is possible by Friday morning. Amounts will generally remain below 0.5 inches to the north and west in areas further away from the center of the monsoonal plume. By Friday a trough of low pressure moving across the US/Canadian border will begin to push much of the monsoonal moisture to the south and lead to a reduction in storm coverage. This drying trend is expected to continue through the weekend as the high pressure center redevelops immediately over CO and effectively cuts off the transport of sub-tropical moisture from the south. Precipitation chances will remain low through the weekend with some hints at a return of monsoonal moisture by early next week.

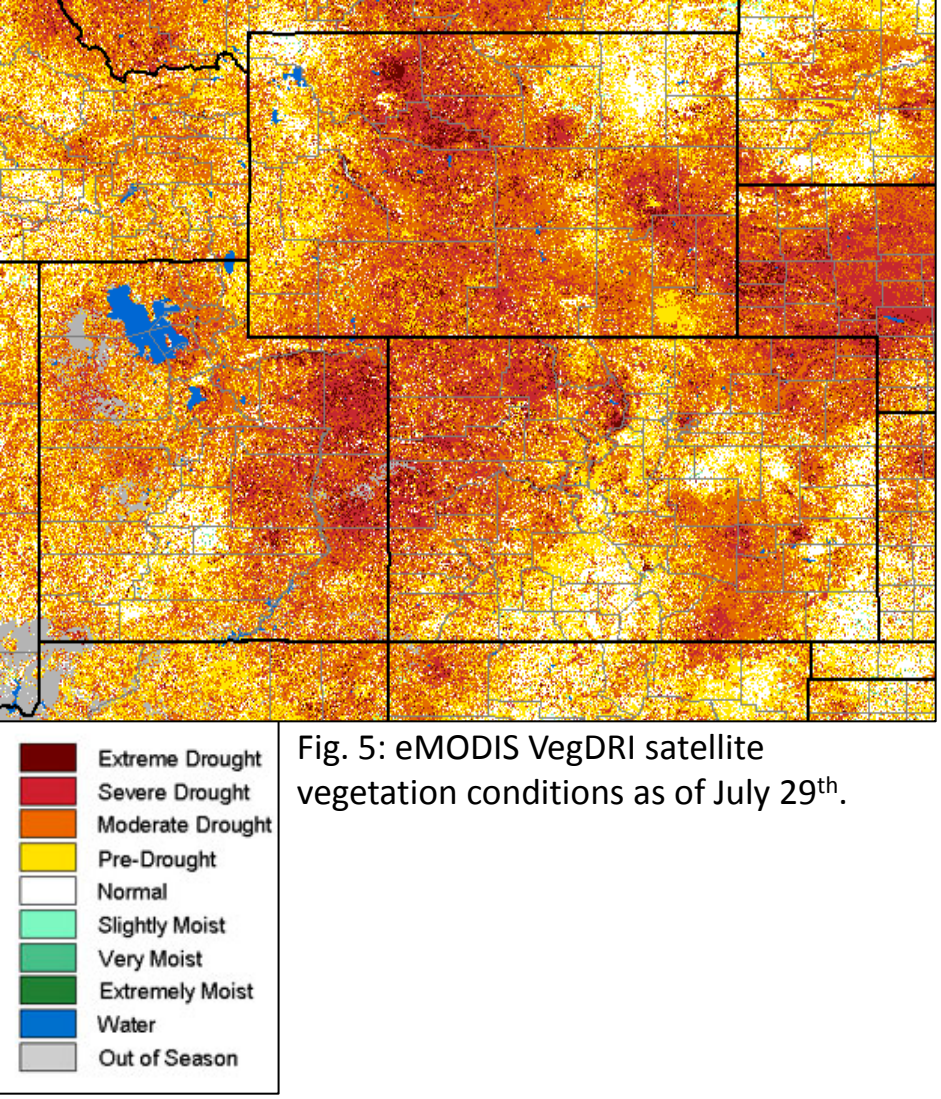


Fig. 5: eMODIS VegDRI satellite vegetation conditions as of July 29th.

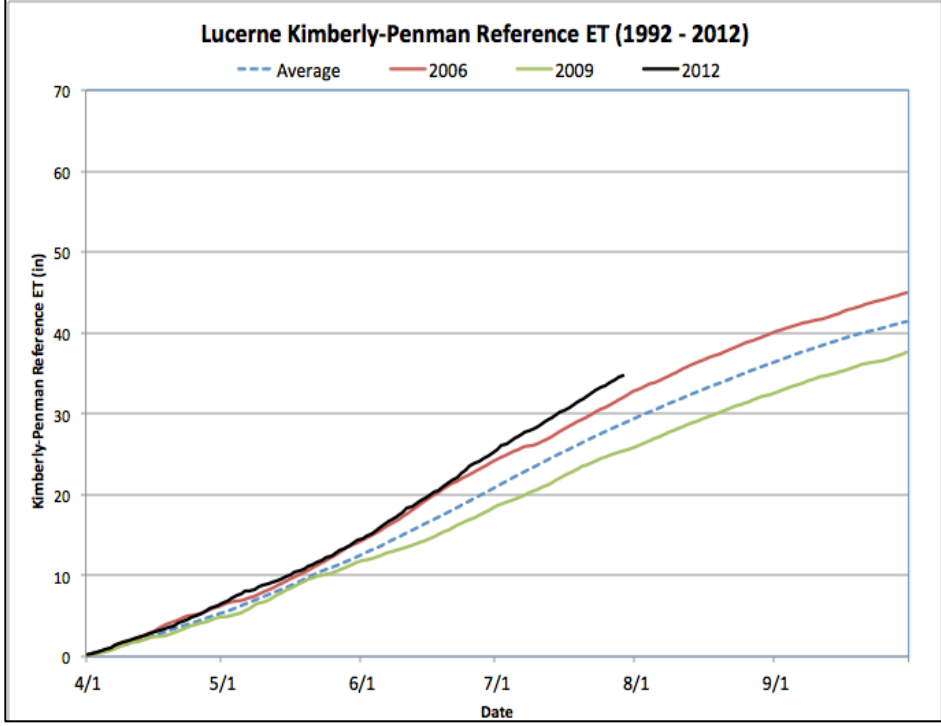


Fig. 6: Accumulated reference ET (black line) at Lucerne, CO in the northeast region, compared to the max year (red), min year (green), and average (dashed line).

Drought and Water Discussion

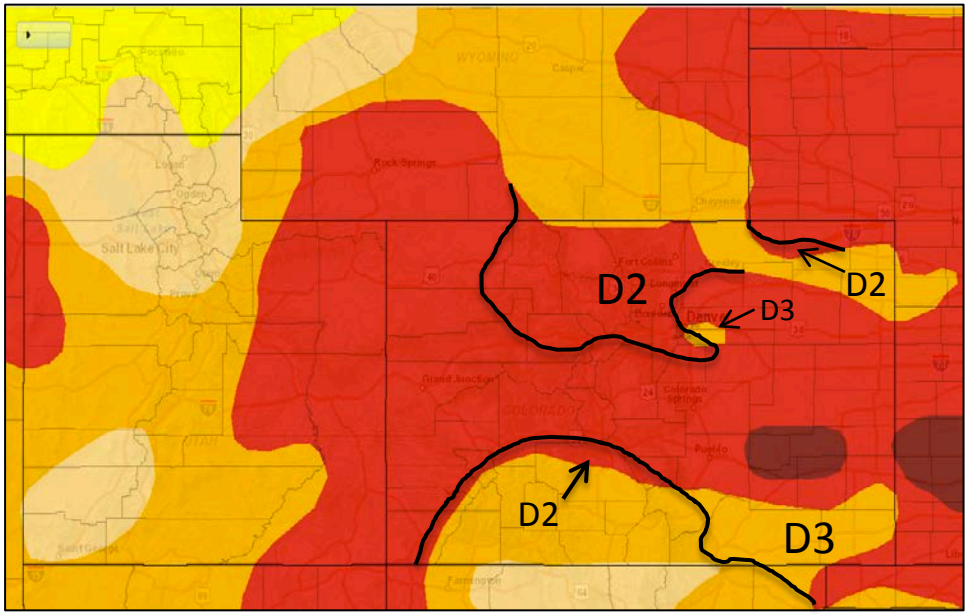
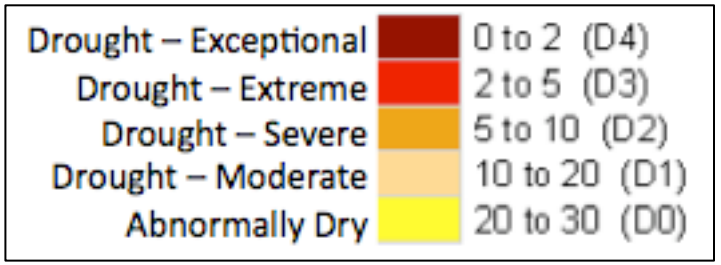


Fig. 7: July 24th release of U.S. Drought Monitor for the UCRB with recommendations.



Drought categories and their associated percentiles

UCRB: Beneficial rains have fallen in the basin through July prompting improvements from D3 to D2 (See Fig.7) in the north-central Colorado Rockies, extending to the northern Front Range of Colorado. The D2 in southwest CO has also been pushed northward thanks to the monsoonal plume. It has also been mentioned in past weeks the D3 extends too far west into Utah, again we leave this up to the USDM author.

Eastern CO: With the improvements in the UCRB, D3 should also be removed from the much of the northern Front Range (Fig. 7). There is also proposed trimming of the D3 in northeastern Weld and southern Logan counties. D3 should cover central Arapahoe and southwestern Adams counties. With much below normal July rain, D3 will be added in southeastern CO to fill in the notch of D2, extending into much of Las Animas County and eastern Huerfano County. There was discussion about connecting the D4 in southern CO and Kansas, however that will be held off for this week and re-evaluated next week.