Summer 2012

Weekly Climate, Water & Drought Assessment

Today's Agenda

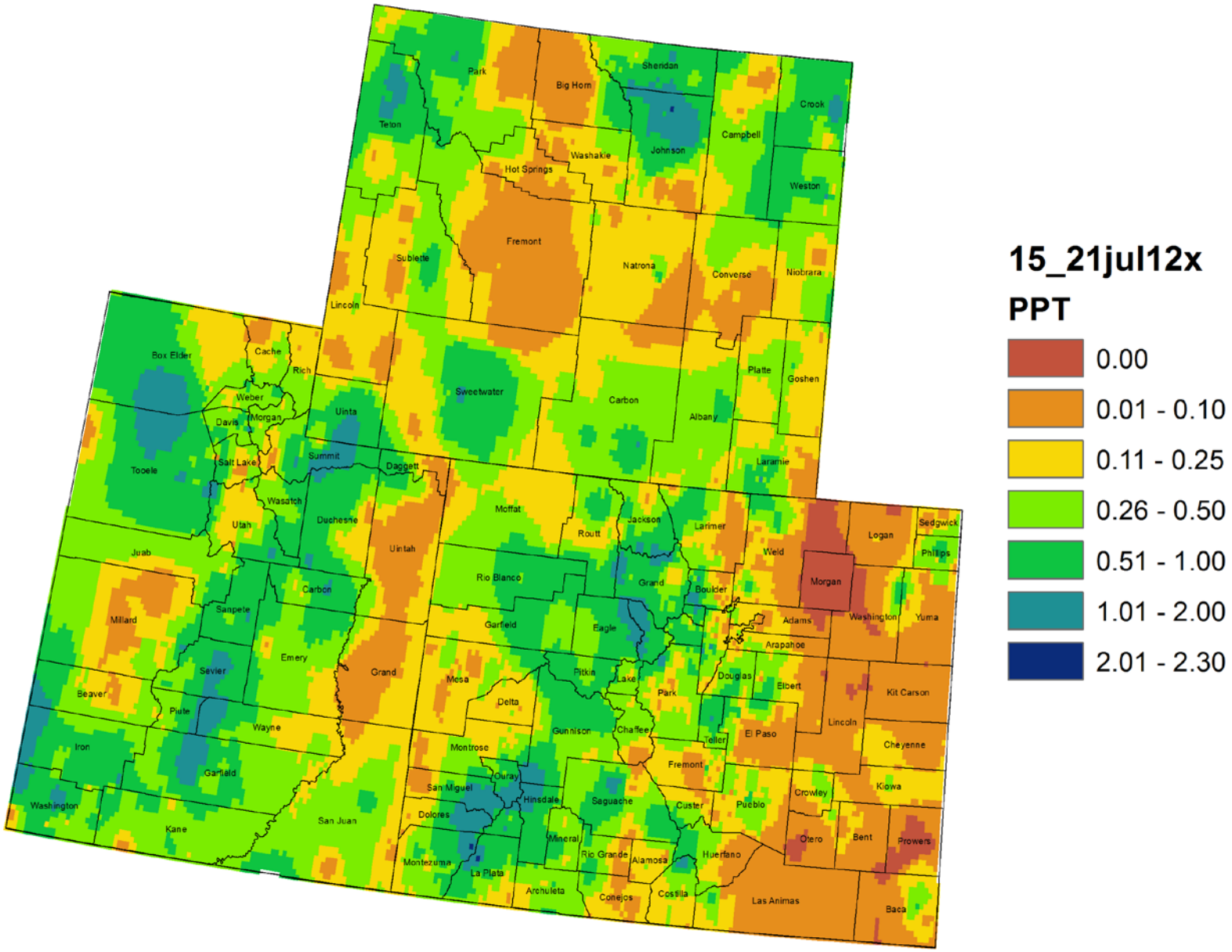
-Assessment of current water conditions

- Precipitation Forecast

- Recommendations for Drought Monitor

Precipitation/Snowpack Update

Colorado, Utah and Wyoming 7 Day Precipitation (in)
15 - 21 July 2012

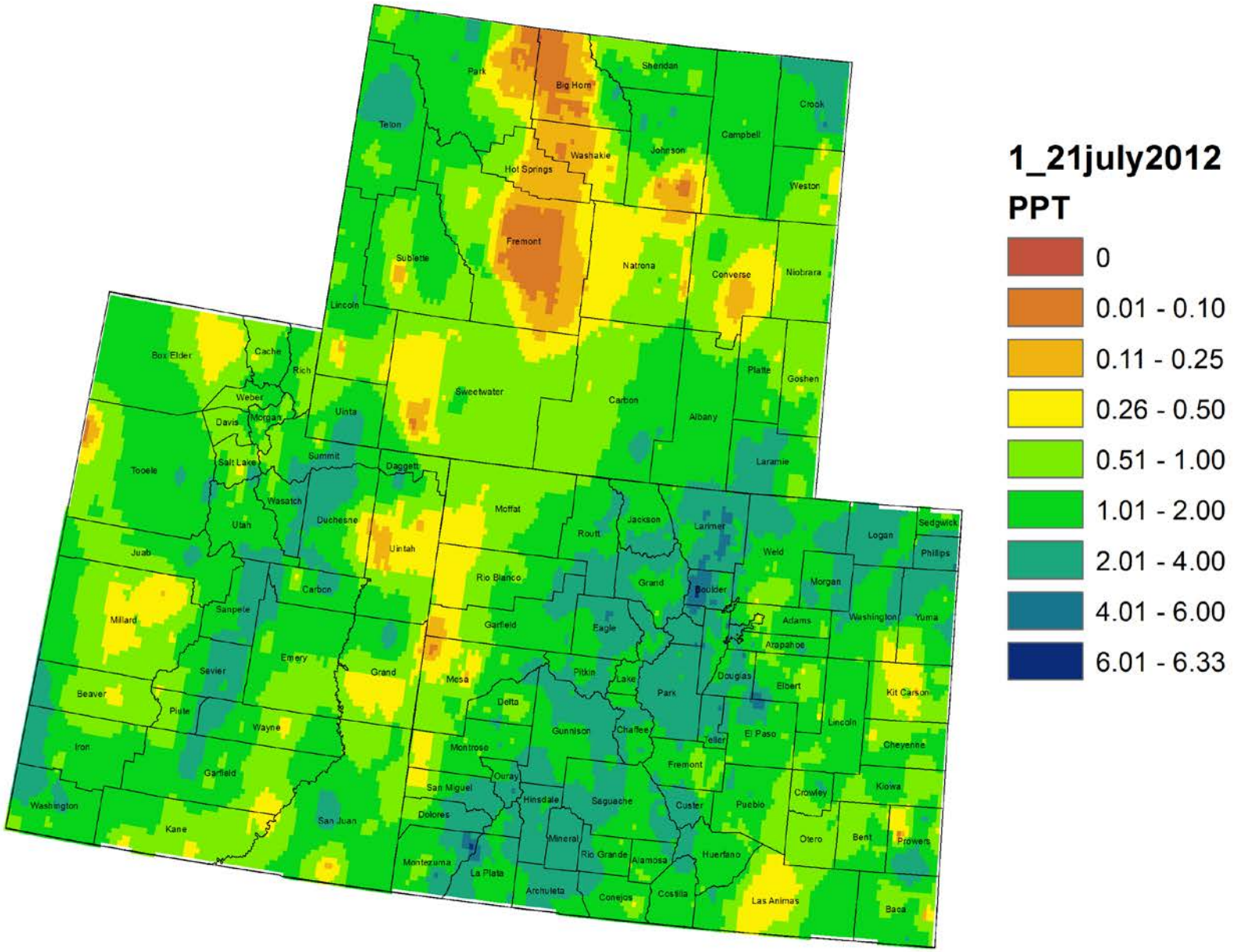


15_21jul12x

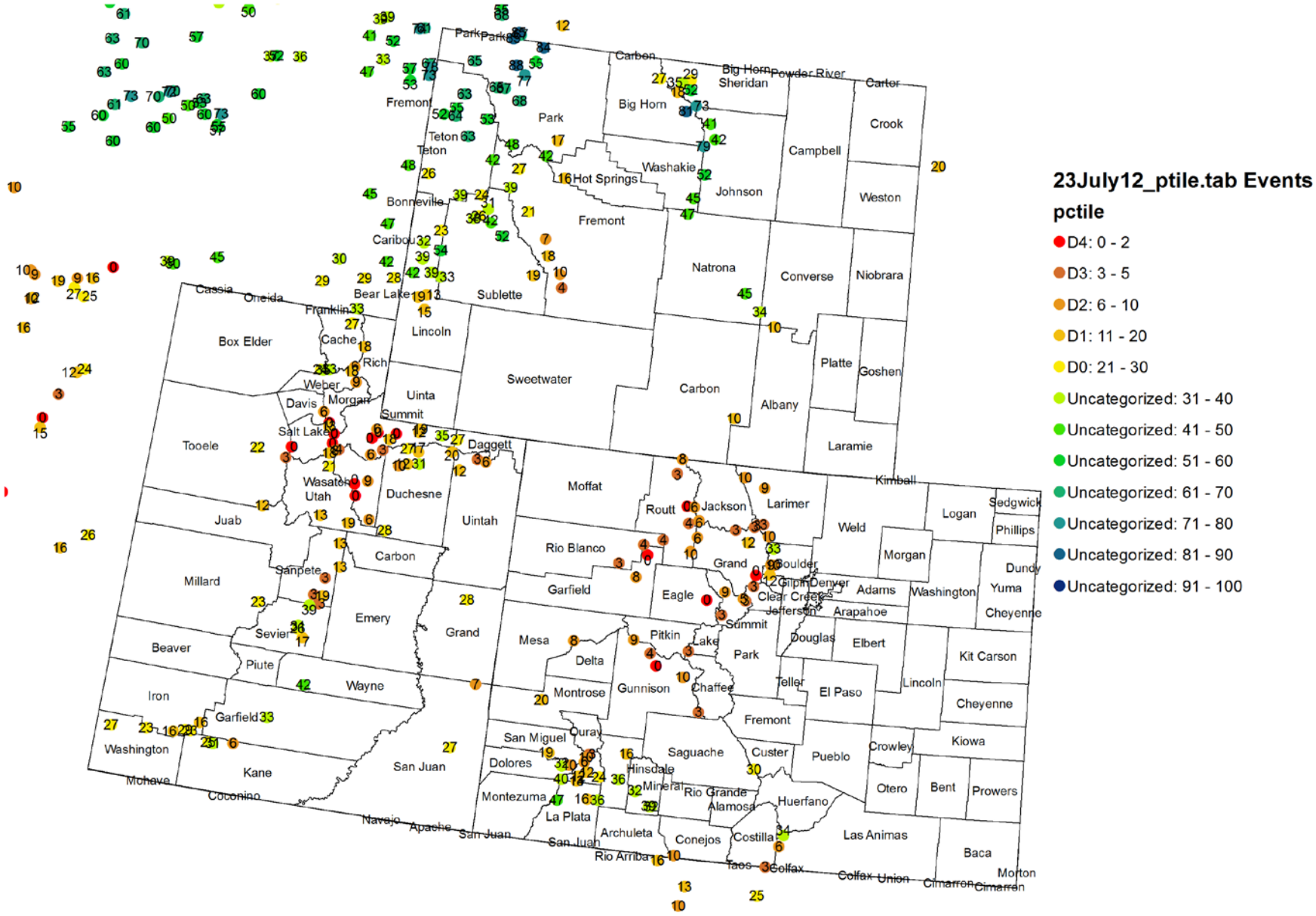
PPT

- 0.00
- 0.01 - 0.10
- 0.11 - 0.25
- 0.26 - 0.50
- 0.51 - 1.00
- 1.01 - 2.00
- 2.01 - 2.30

Colorado, Utah and Wyoming Month to Date Precipitation (in)
1 - 21 July 2012



Snotel Water Year Precipitation Percentile Ranking for 23 July 2012 (Stations with 15+ years of data only)

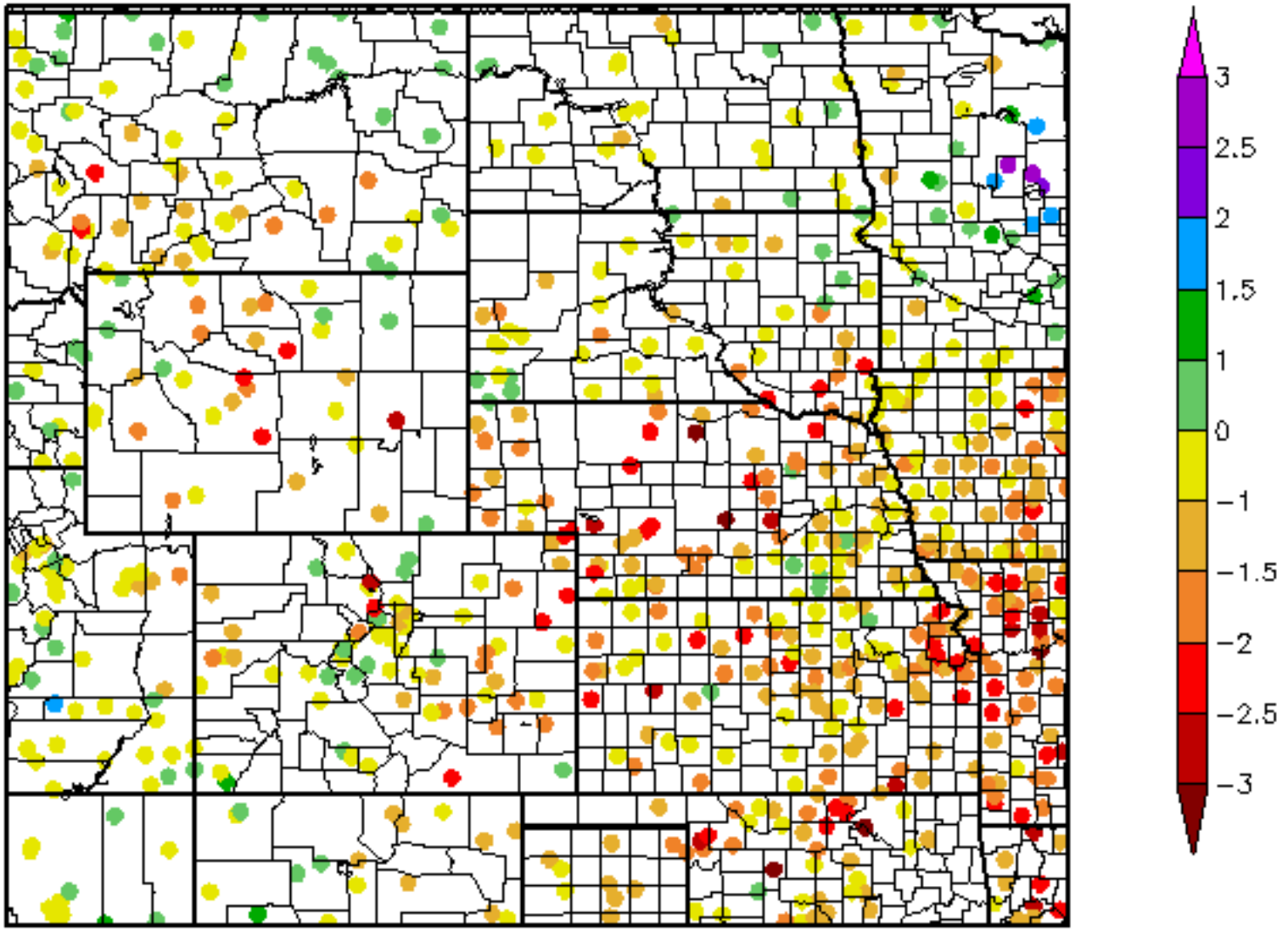


23July12_ptile.tab Events

pctile

- D4: 0 - 2
- D3: 3 - 5
- D2: 6 - 10
- D1: 11 - 20
- D0: 21 - 30
- Uncategorized: 31 - 40
- Uncategorized: 41 - 50
- Uncategorized: 51 - 60
- Uncategorized: 61 - 70
- Uncategorized: 71 - 80
- Uncategorized: 81 - 90
- Uncategorized: 91 - 100

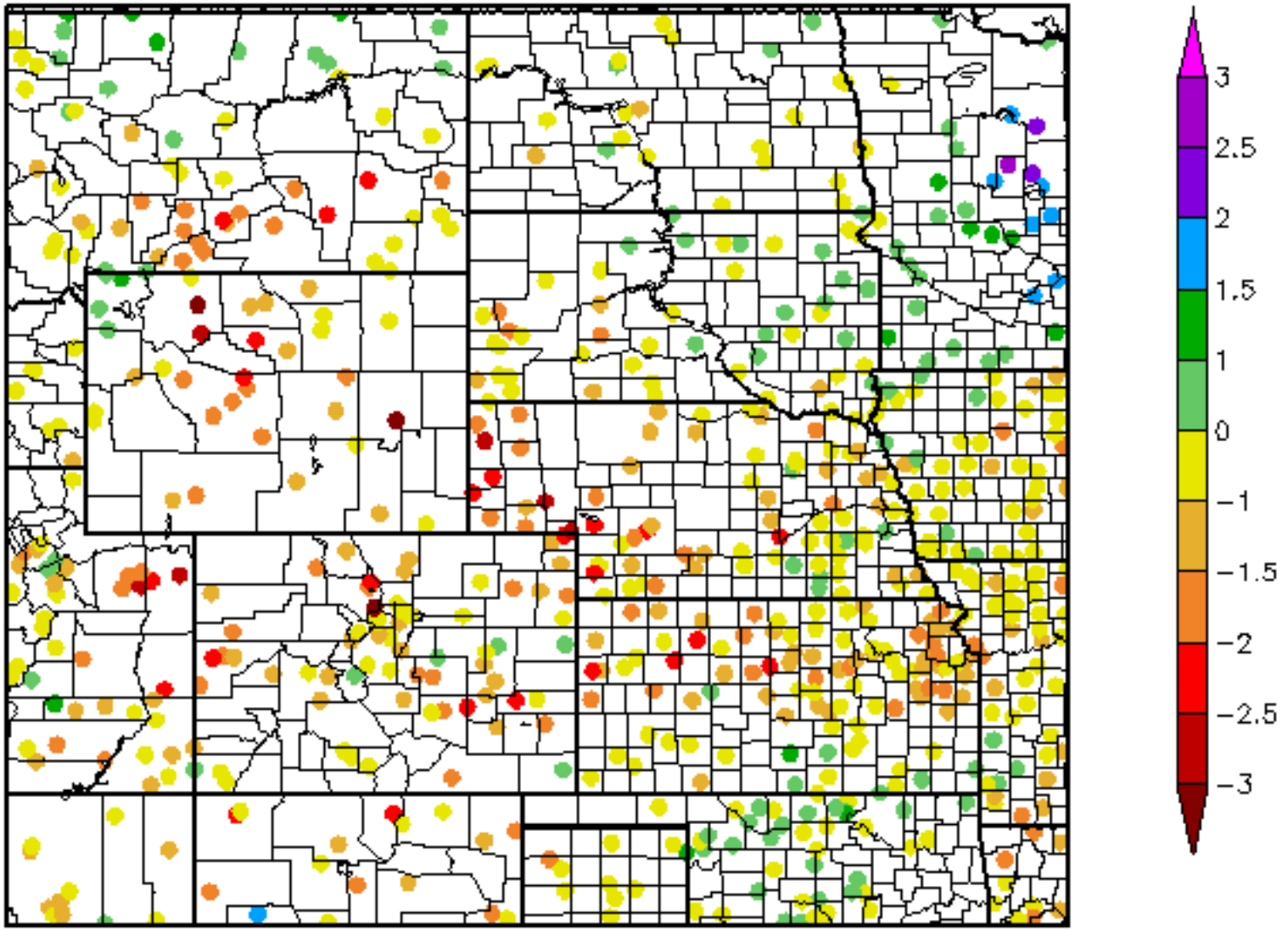
60 Day SPI
5/24/2012 – 7/22/2012



Generated 7/23/2012 at HPRCC using provisional data.

Regional Climate Centers

6 Month SPI
1/23/2012 – 7/22/2012



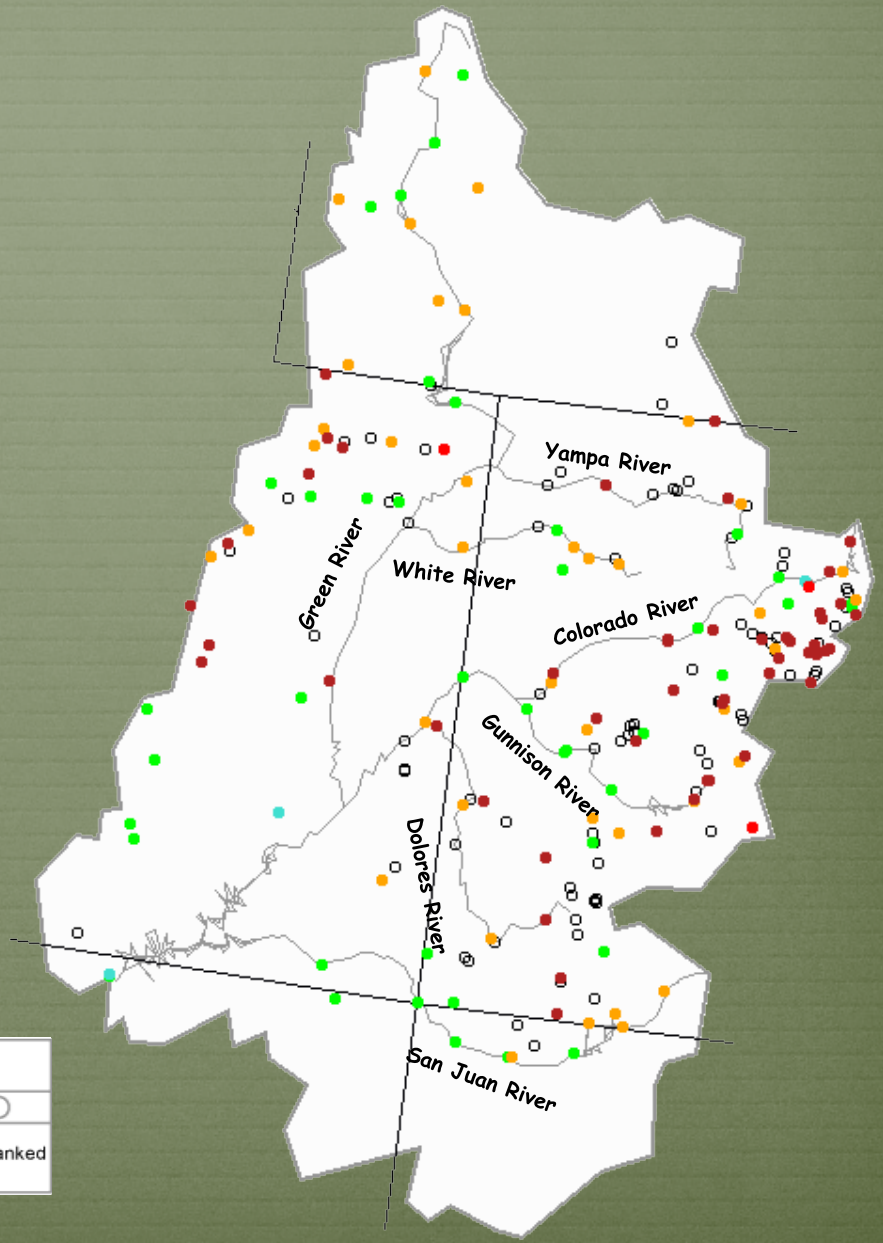
Generated 7/23/2012 at HPRCC using provisional data.

Regional Climate Centers

Streamflow Update

Sunday, July 22, 2012

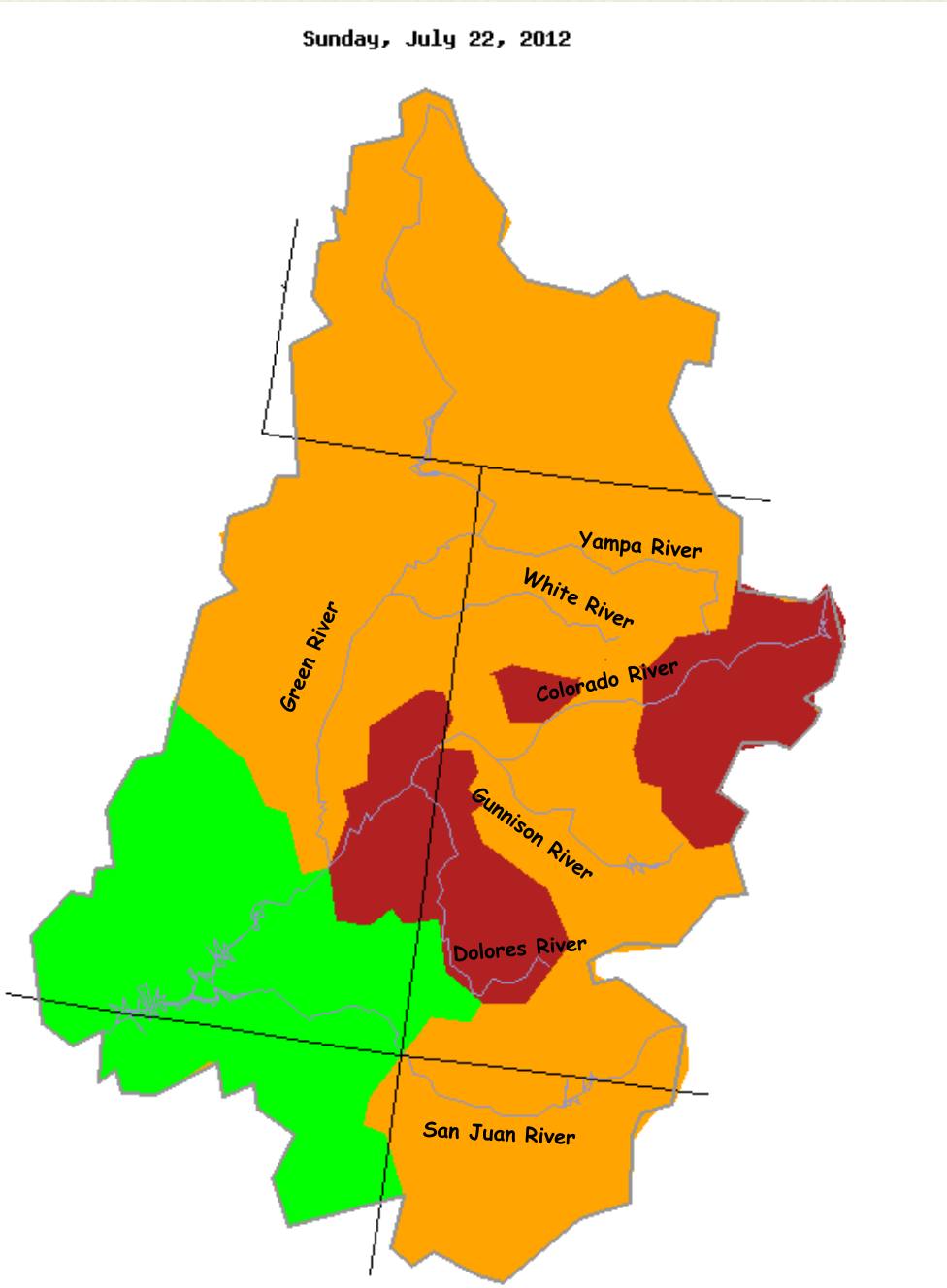
7-day average discharge compared to historical discharge for the day of the year (July 22nd)



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		

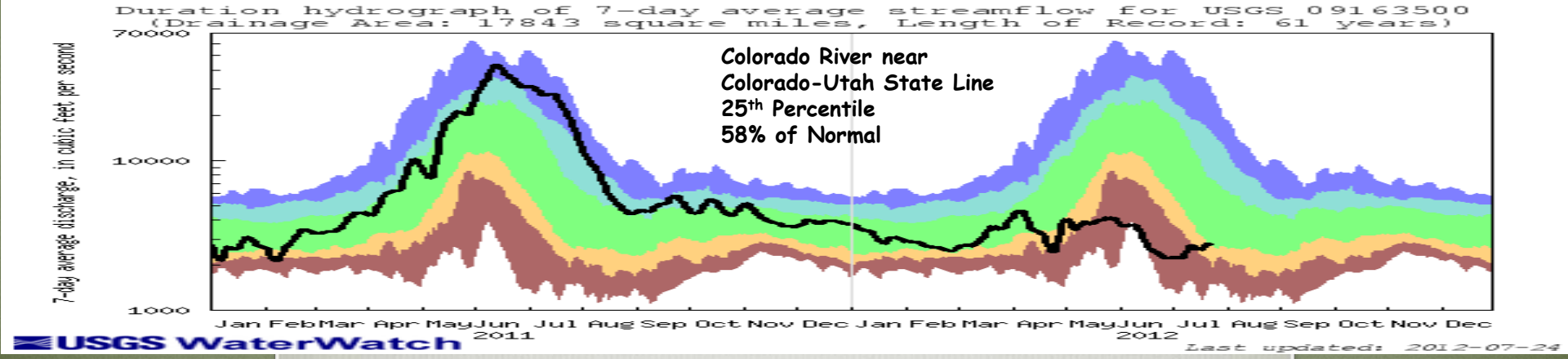
USGS

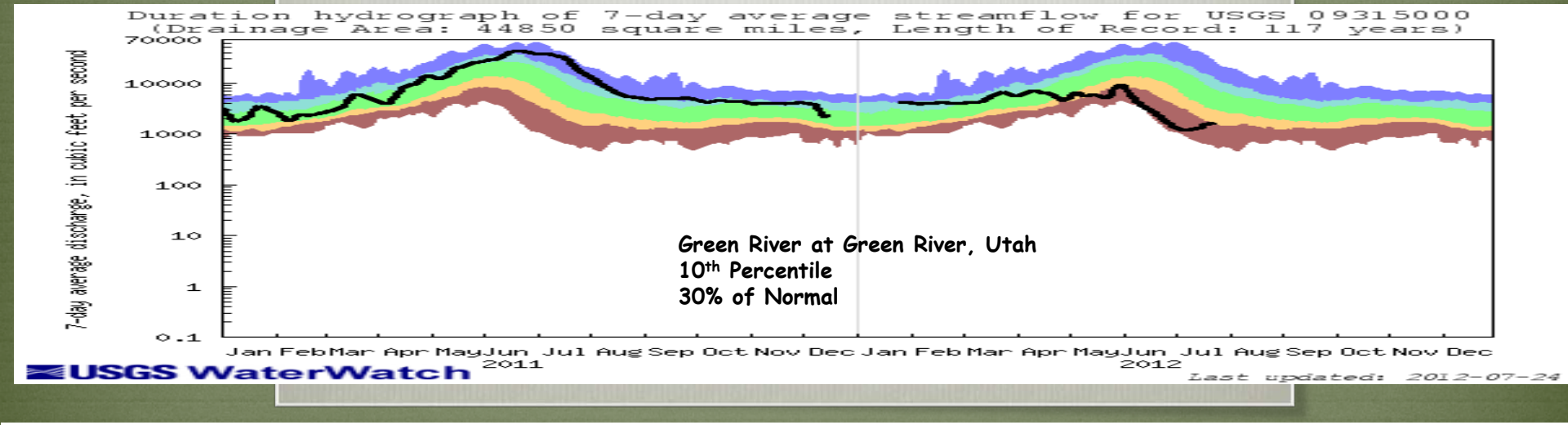
7-day average discharge compared to historical discharge for the day of the year (July 22)

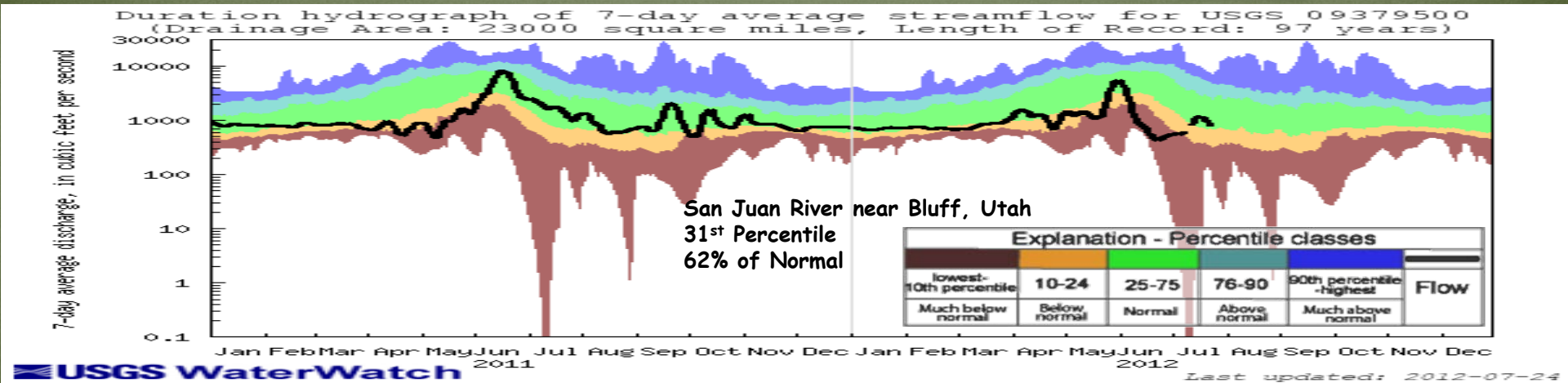


Explanation - Percentile classes						
Low	<10	10-24	25-75	76-90	>90	High
	Much below normal	Below normal	Normal	Above normal	Much above normal	

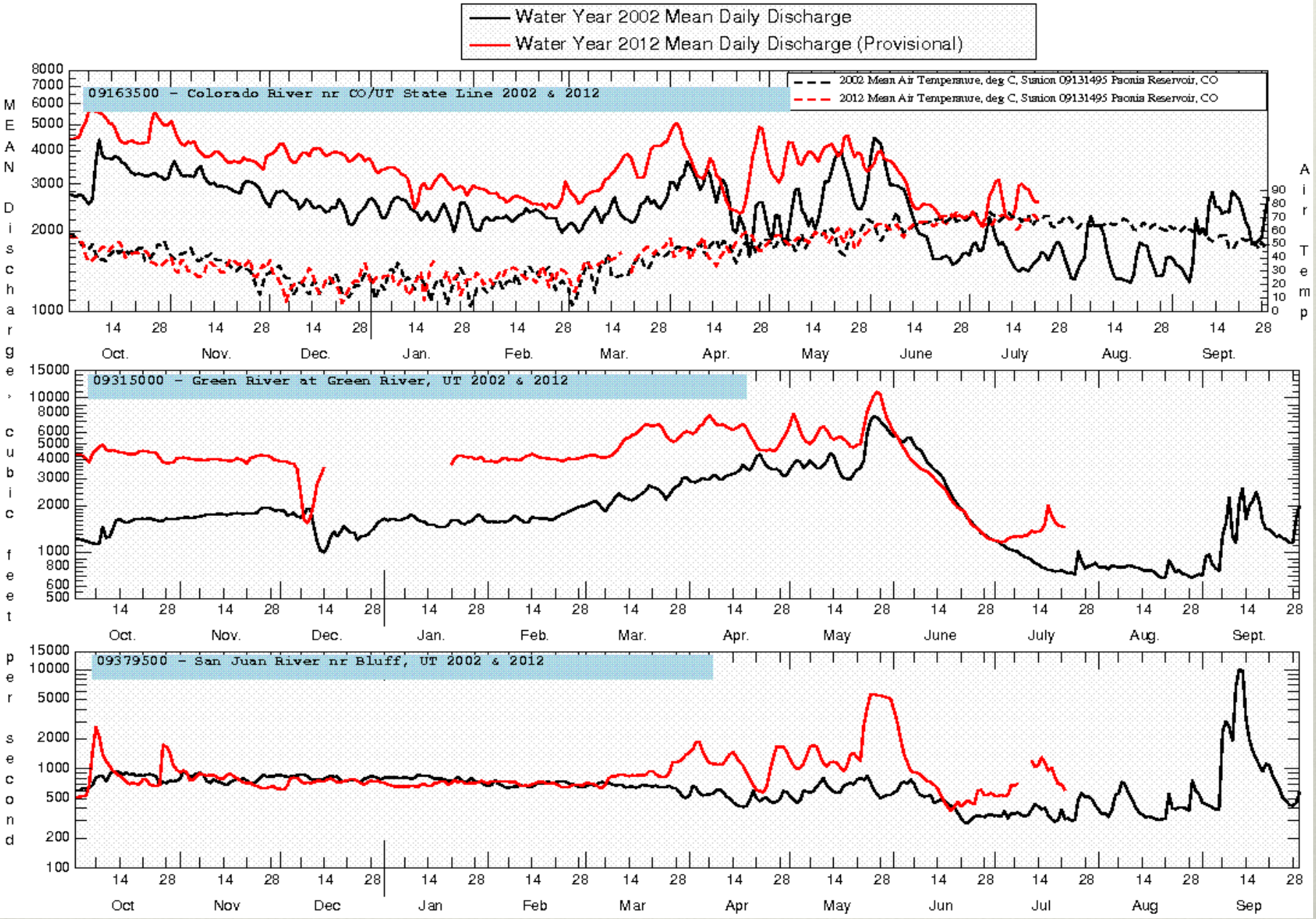
USGS


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
25th Percentile
58% 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: 2012-07-24

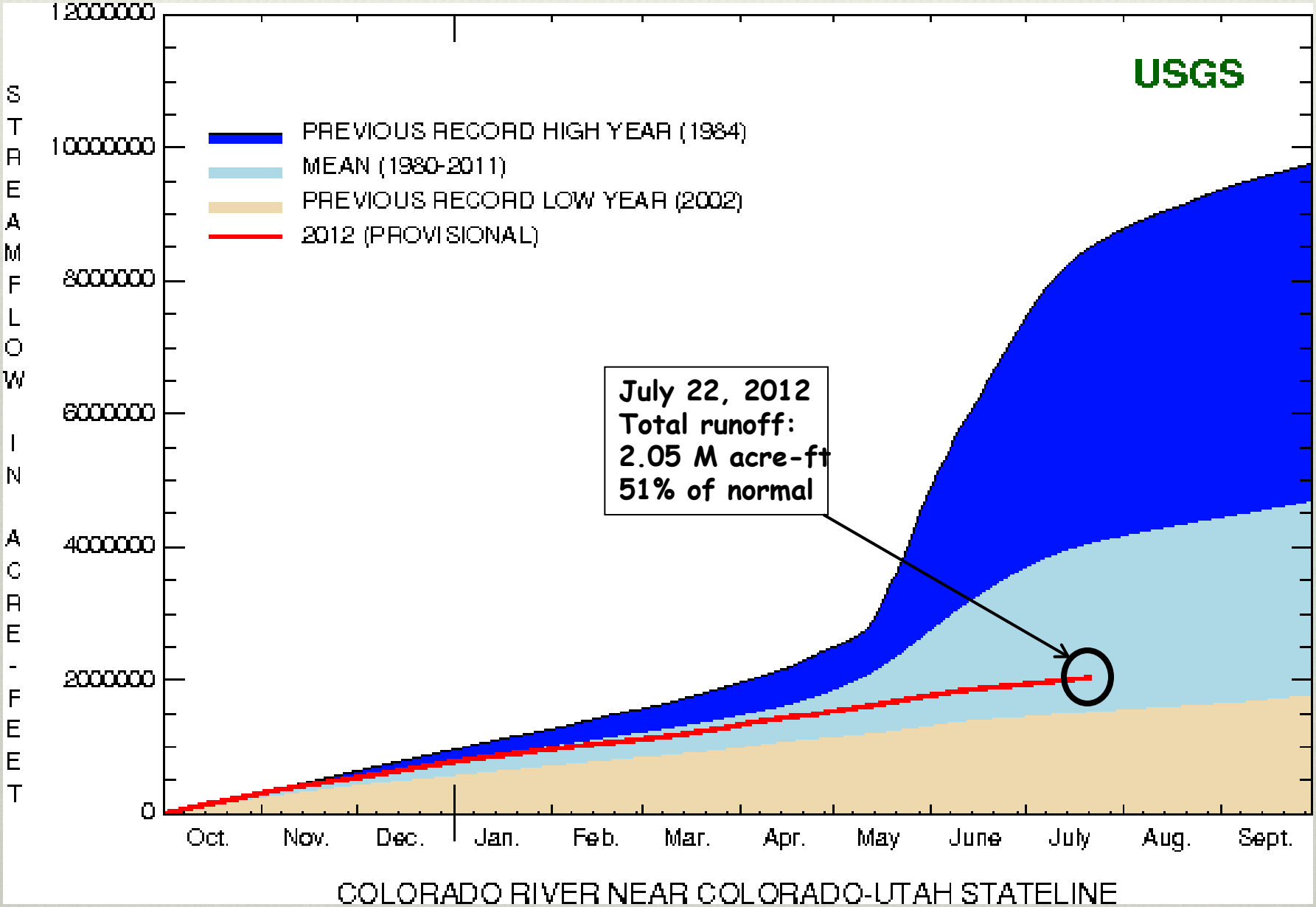

Duration hydrograph of 7-day average streamflow for USGS 09315000
(Drainage Area: 44850 square miles, Length of Record: 117 years)
7-day average discharge, in cubic feet per second
70000
10000
1000
100
10
1
0.1
Green River at Green River, Utah
10th Percentile
30% of Normal
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
2011
2012
USGS WaterWatch
Last updated: 2012-07-24


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
31st Percentile
62% 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: 2012-07-24

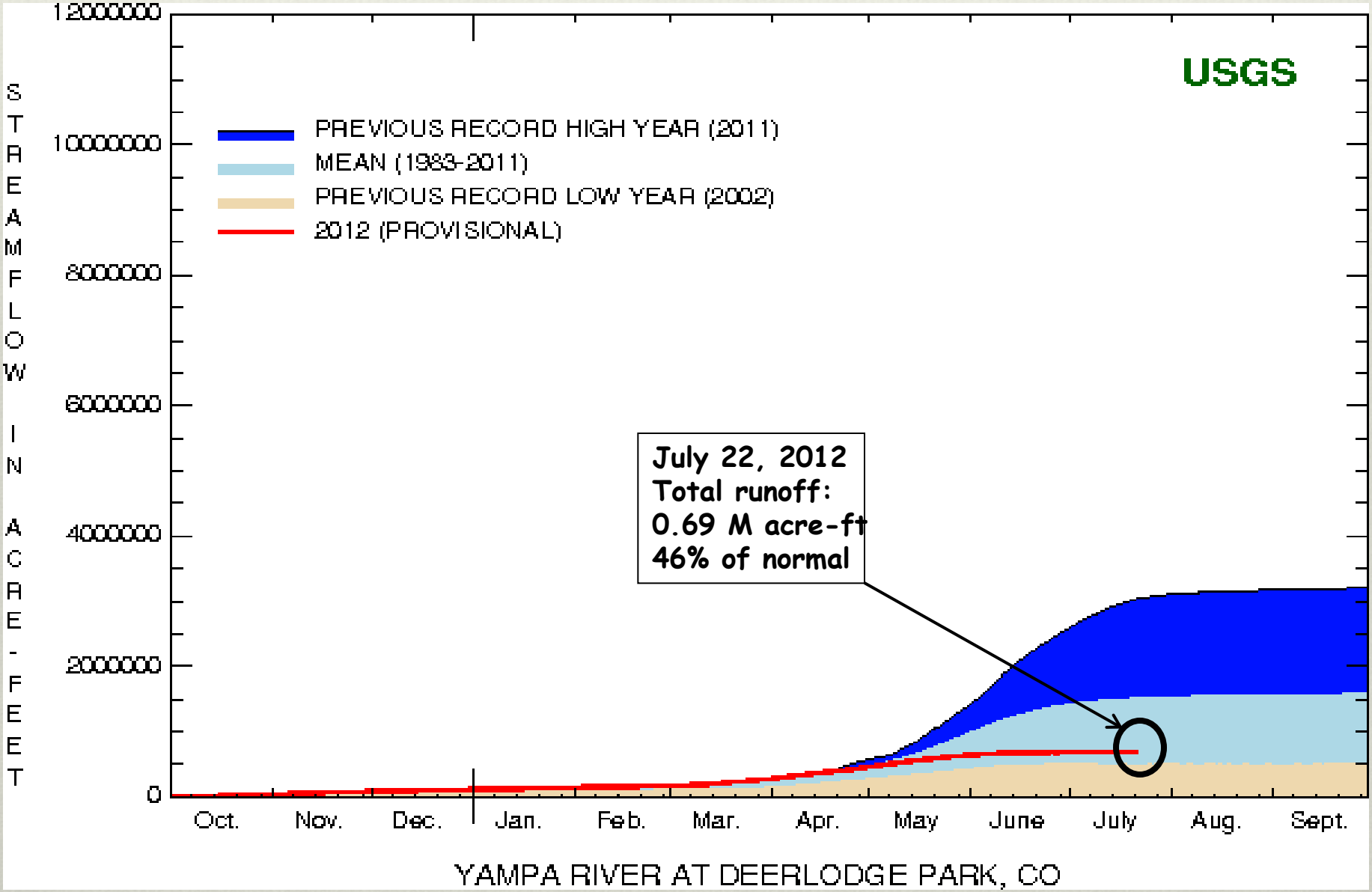
Colorado River Basin 2002 vs. 2012 Mean Daily Discharge Comparison at Select Stations



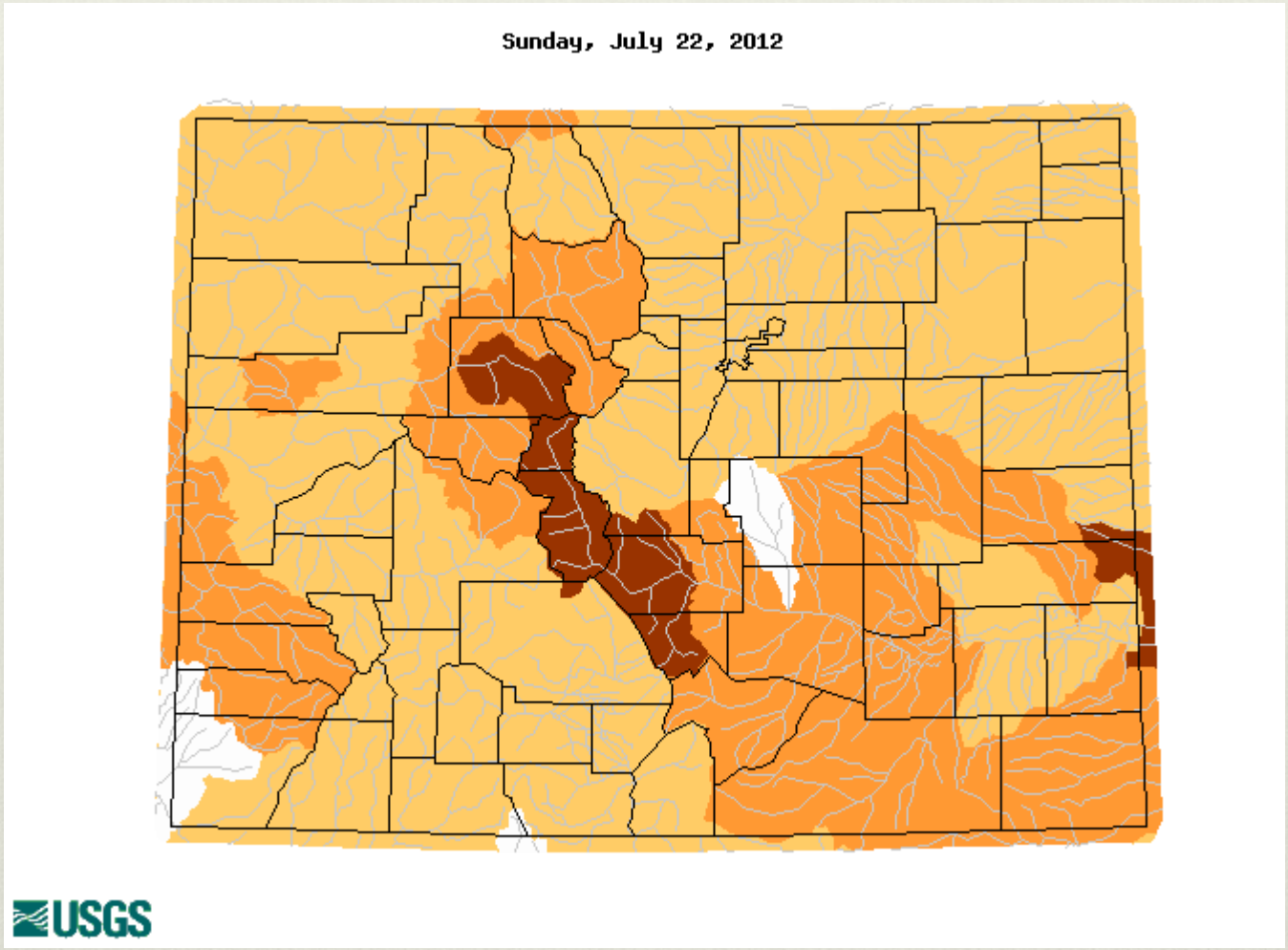
Total Streamflow Volume
Colorado River nr CO/UT State Line
Oct 1, 2011 to July 22, 2012



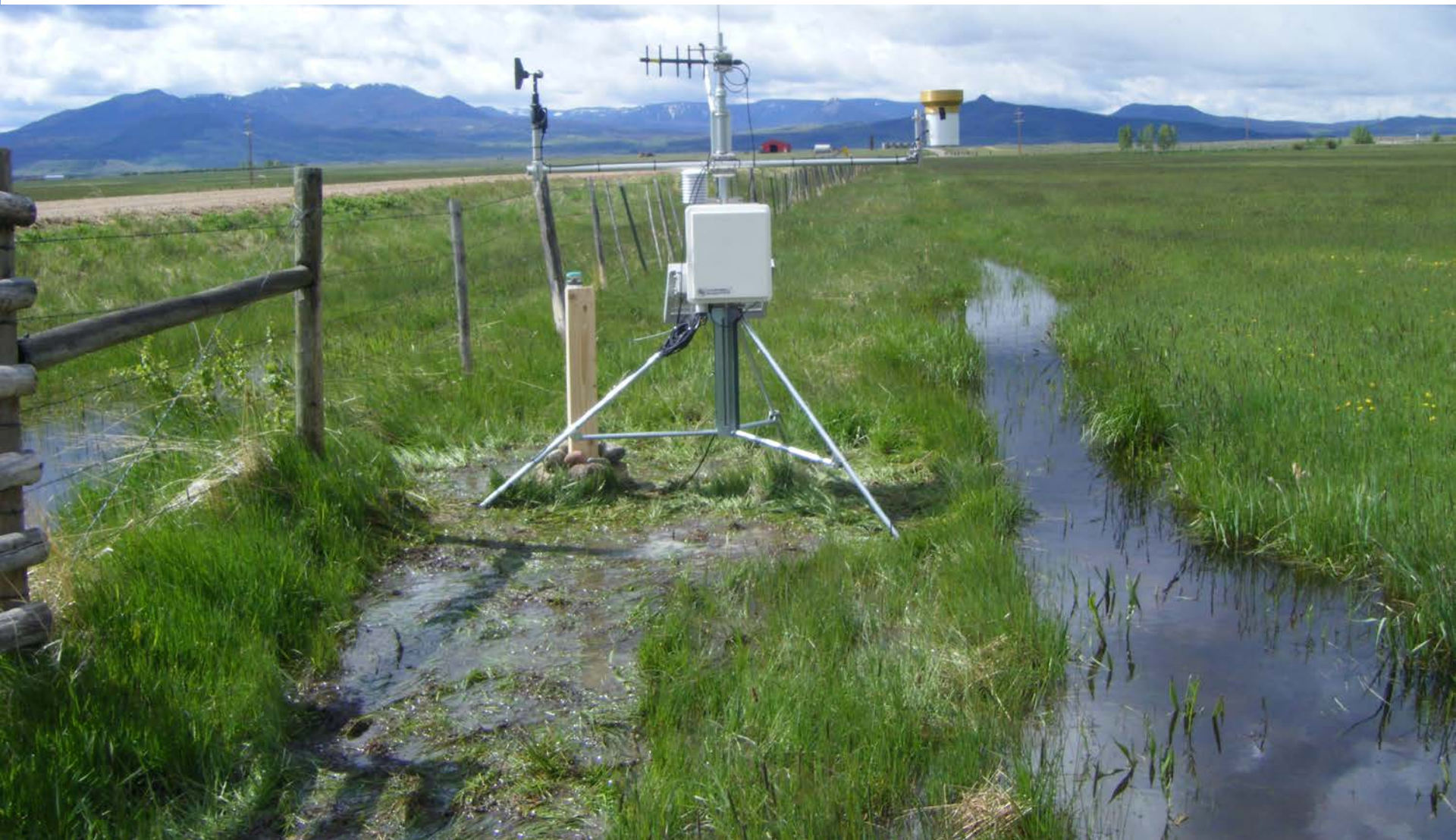
Total Streamflow Volume
Yampa River at Deerlodge Park, CO
Oct 1, 2011 to July 22, 2012



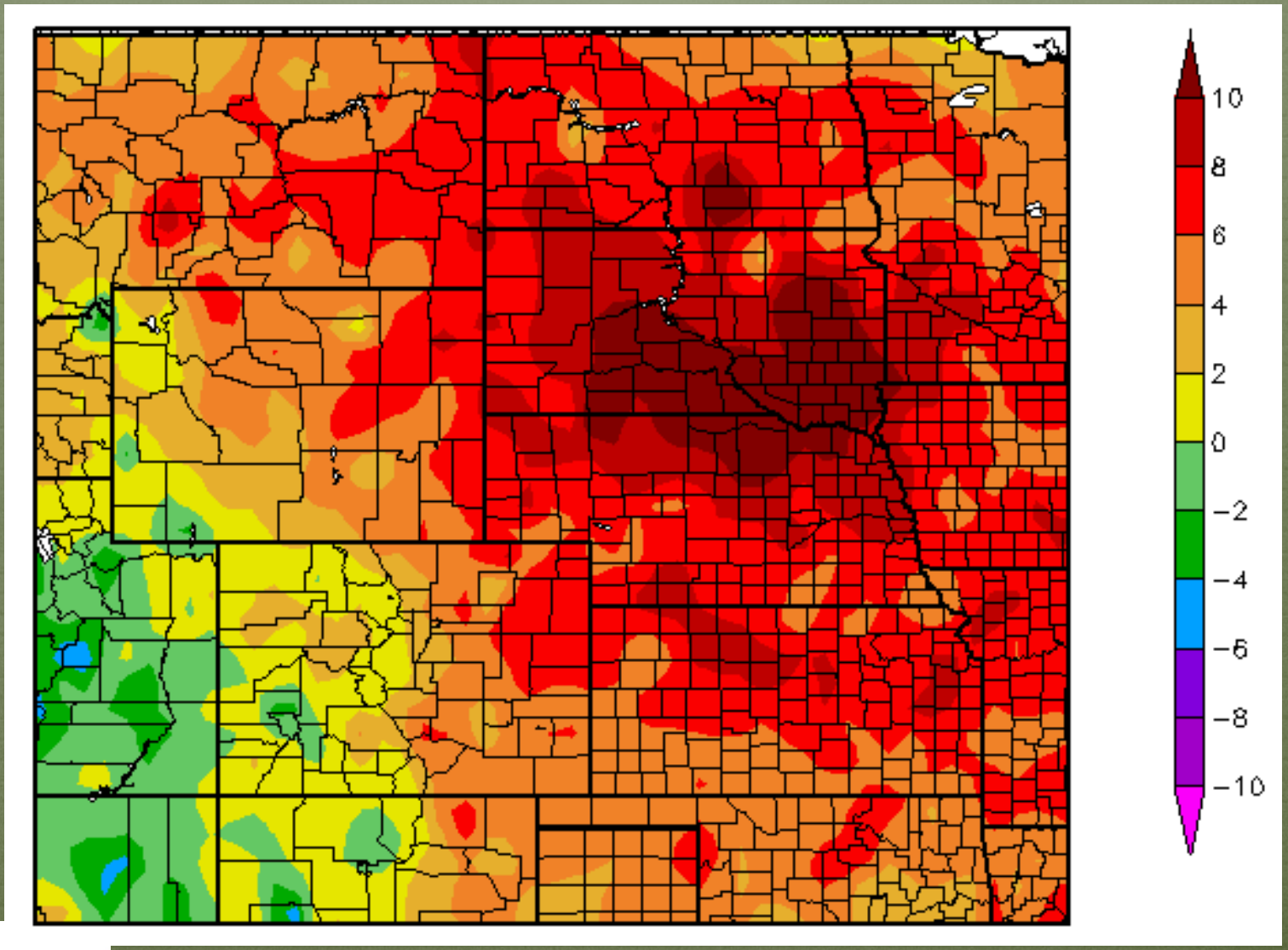
7-day average streamflow compared to historical streamflow



Water Demand

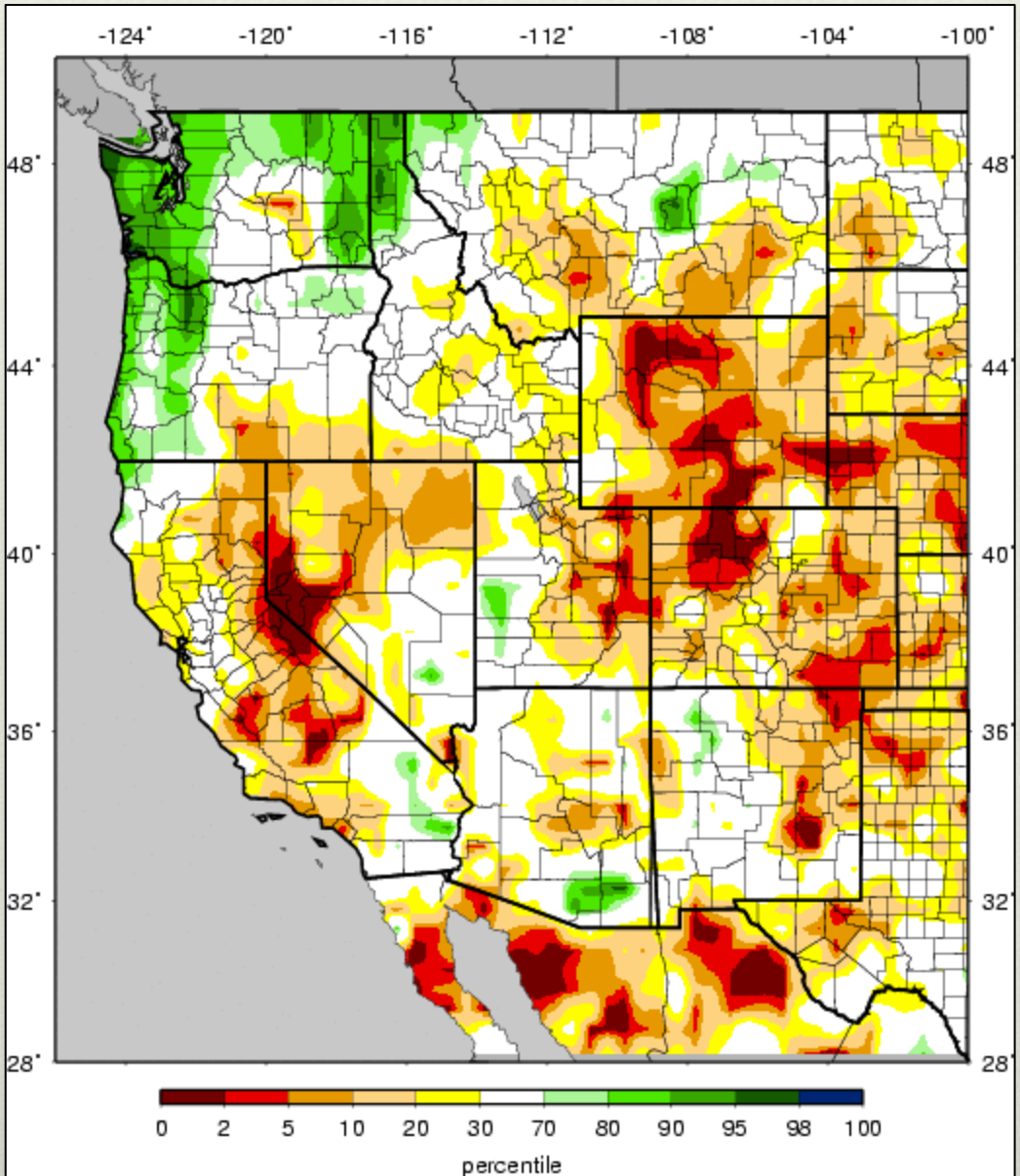


Temperature Departure from Normal
07/16/2012 – 07/22/2012

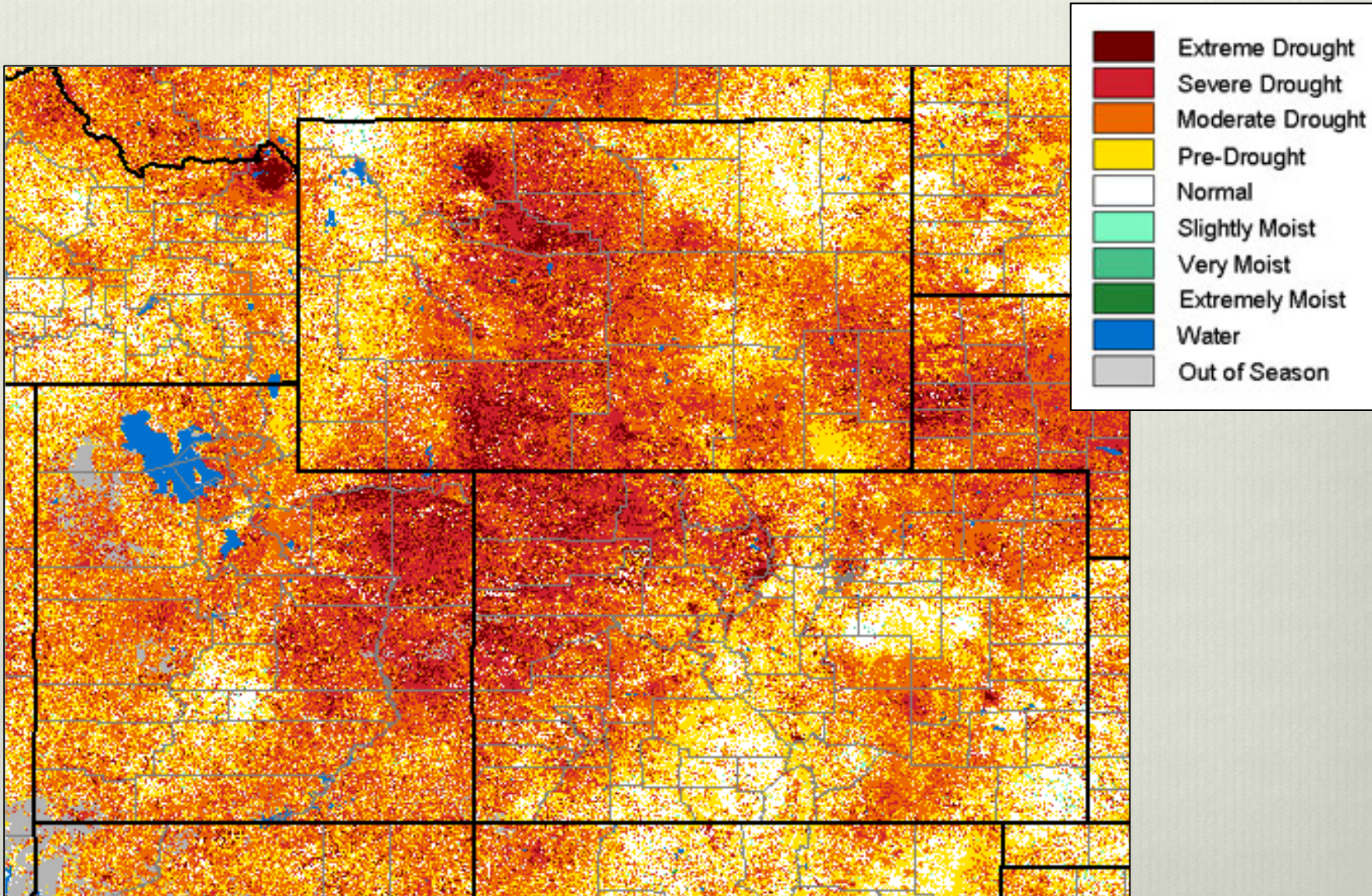


High Plains Regional Climate Center

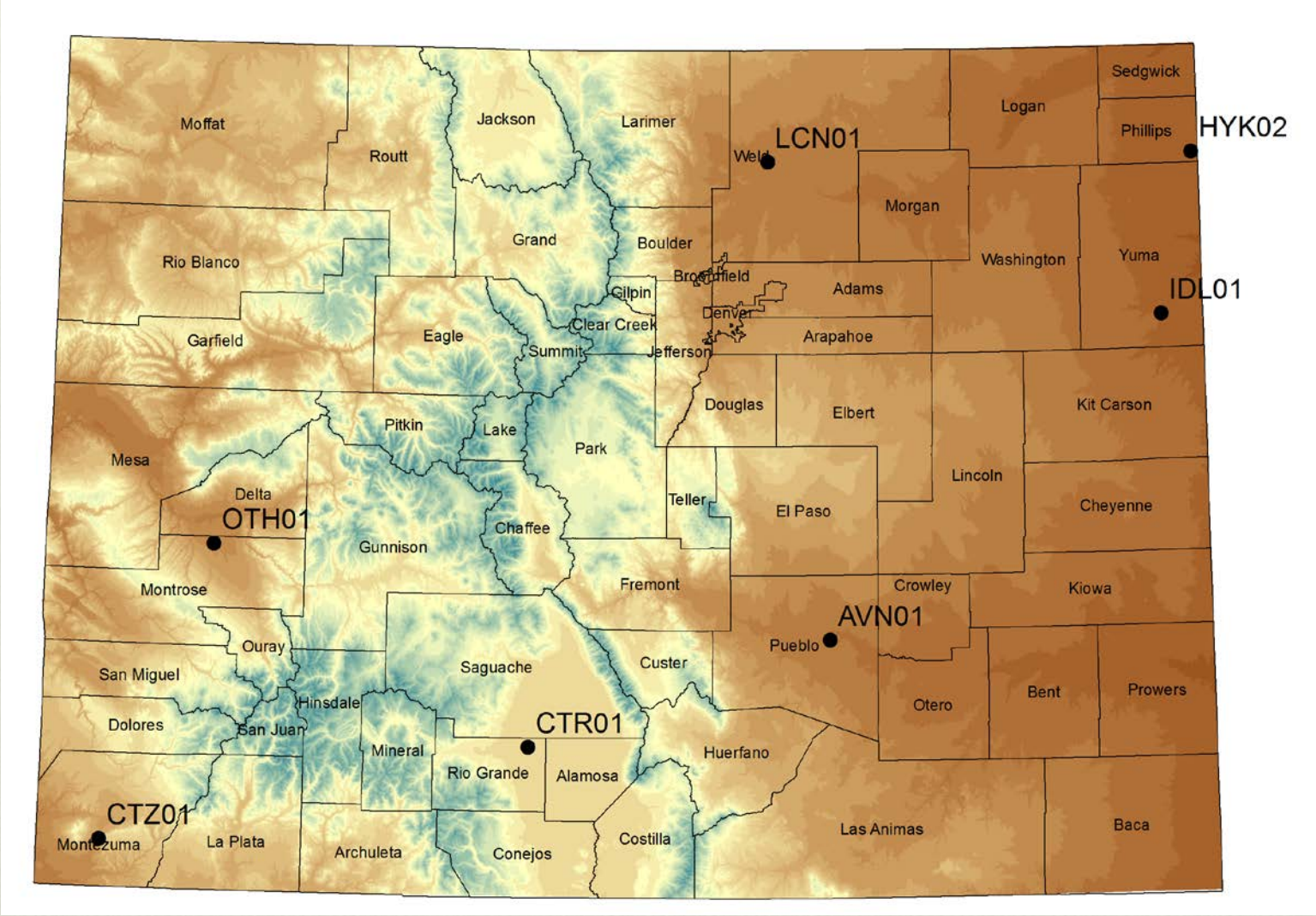
VIC Soil Moisture
22 July 2012

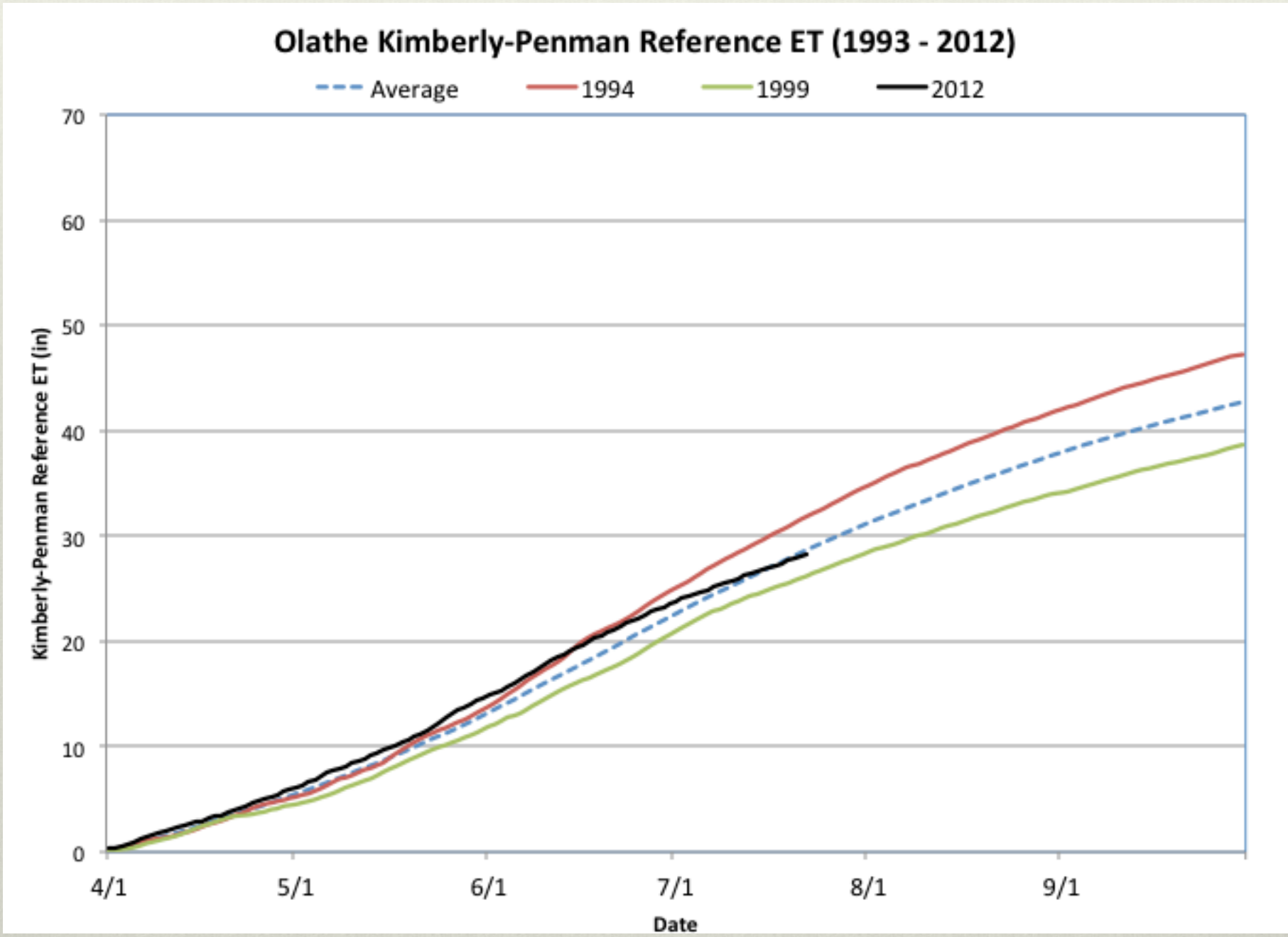


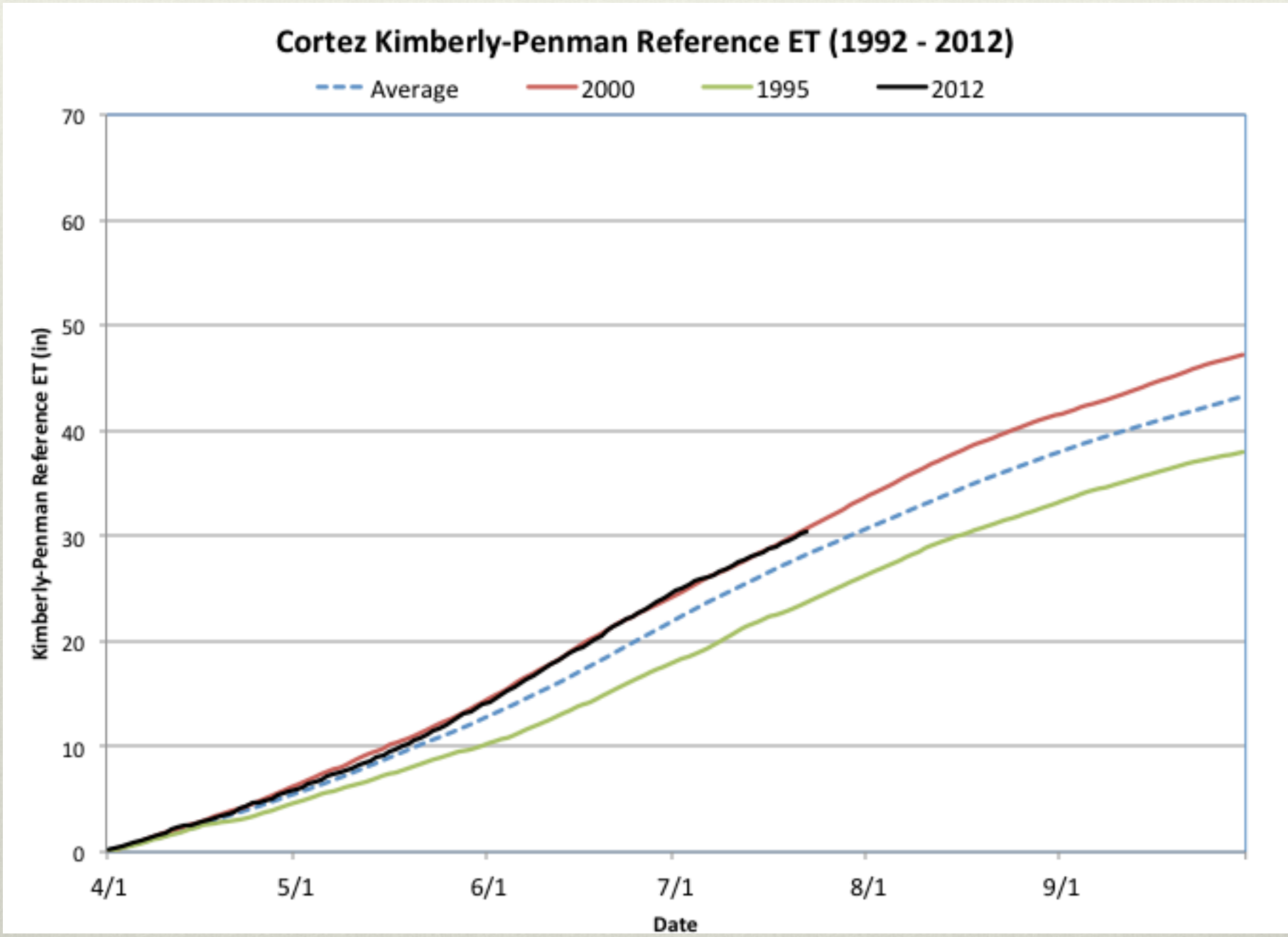
eMODIS VegDRI Vegetation
22 July 2012

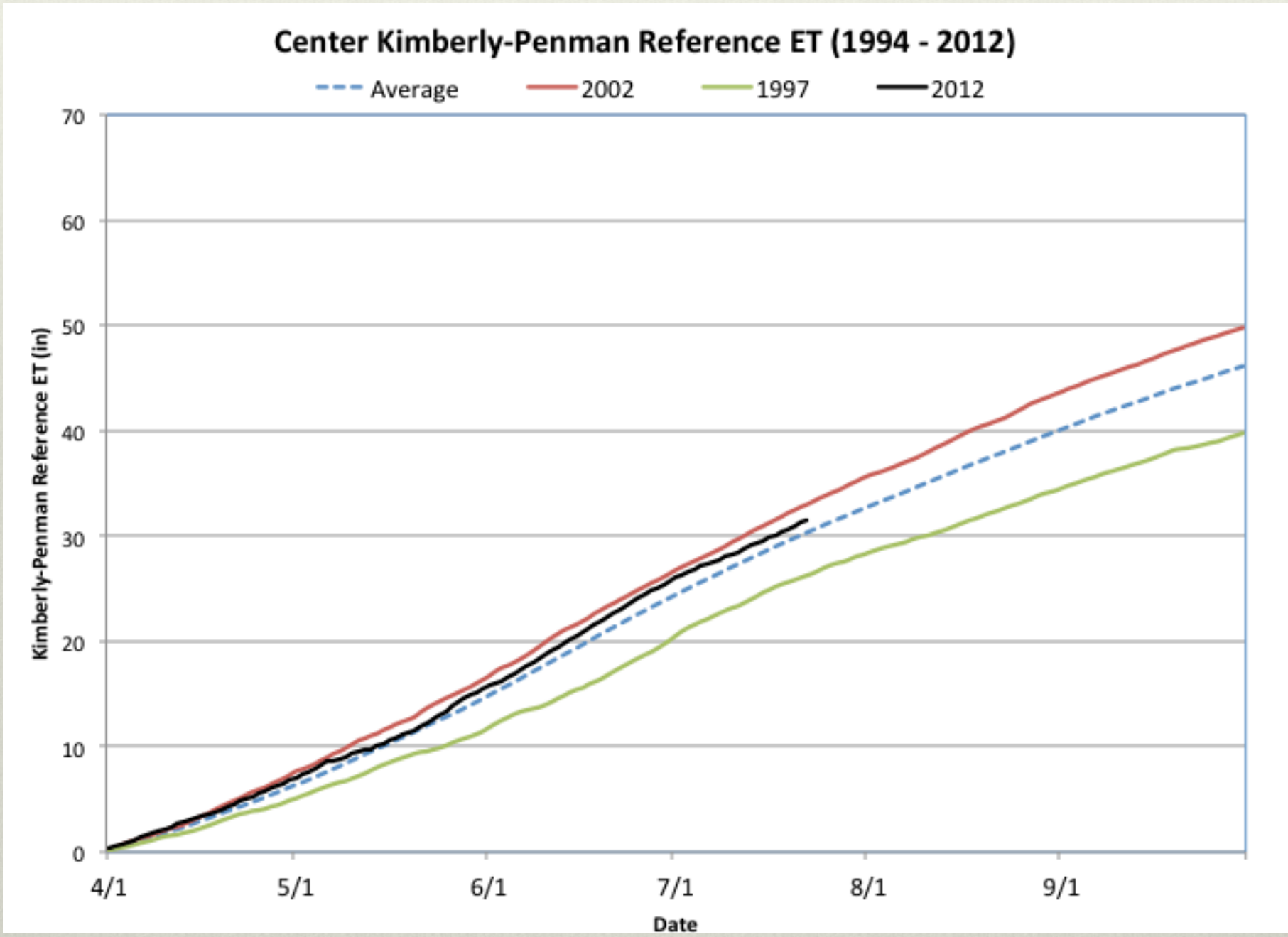


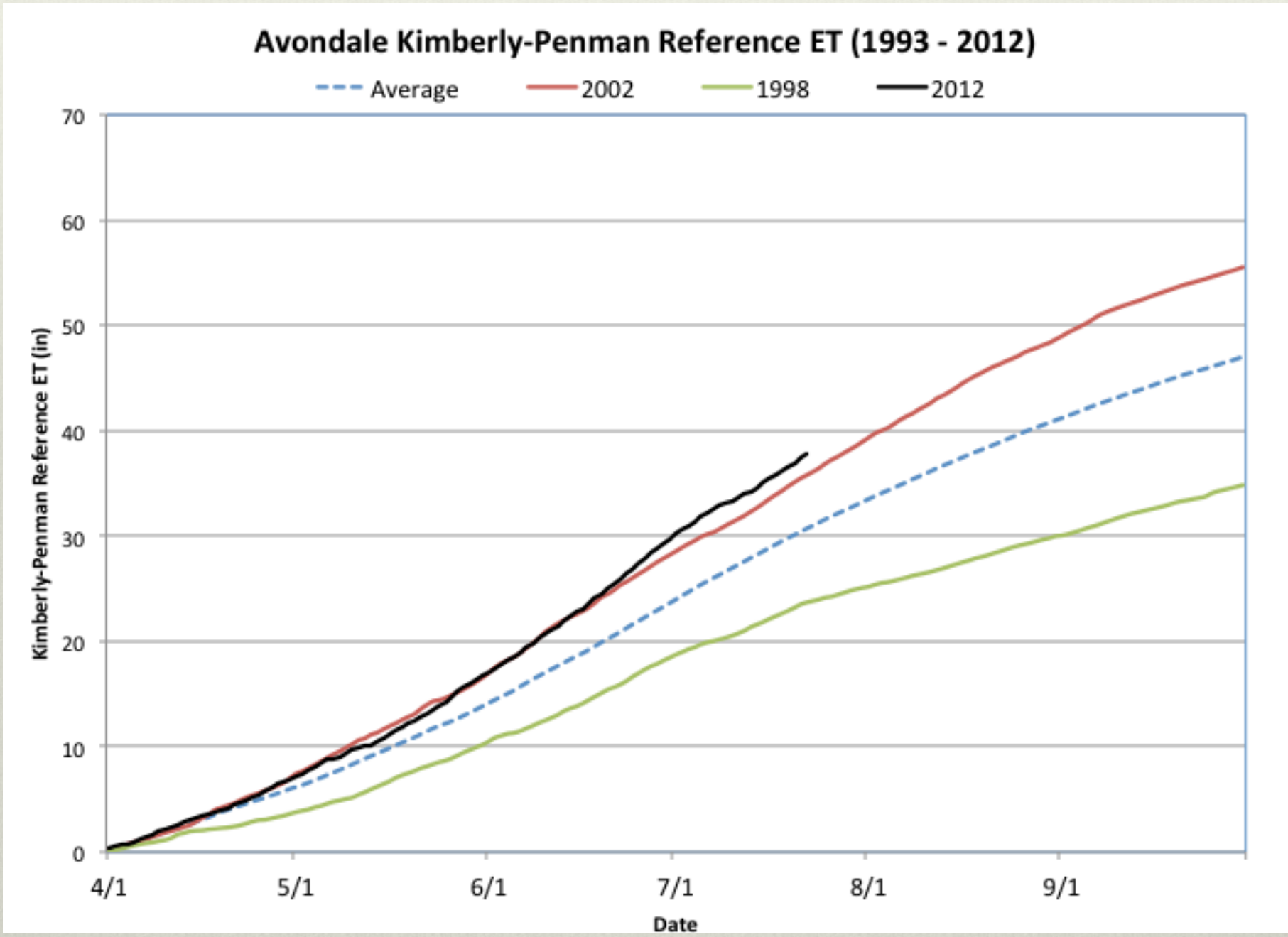
CoAgMet Reference Evapotranspiration Stations

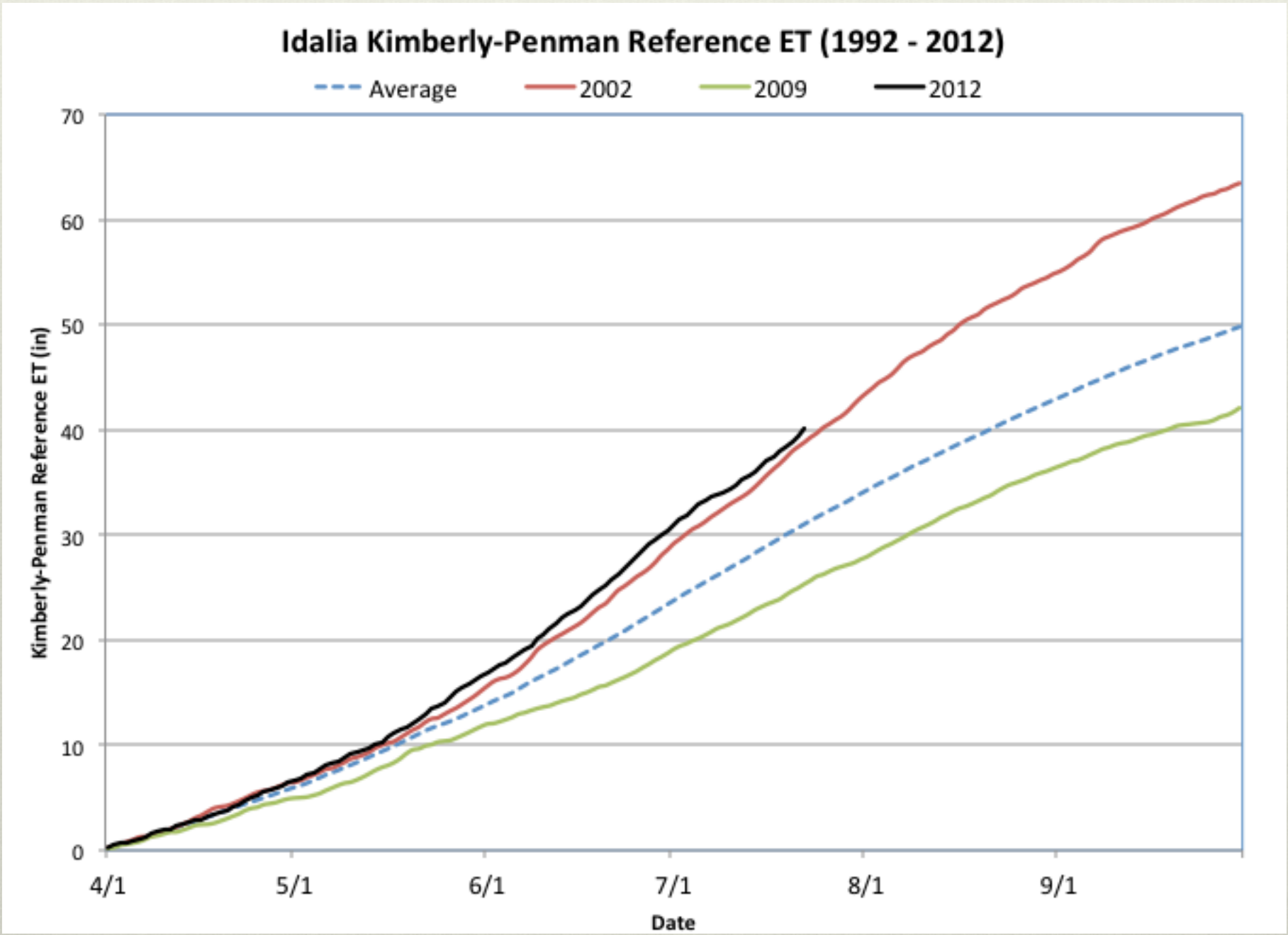


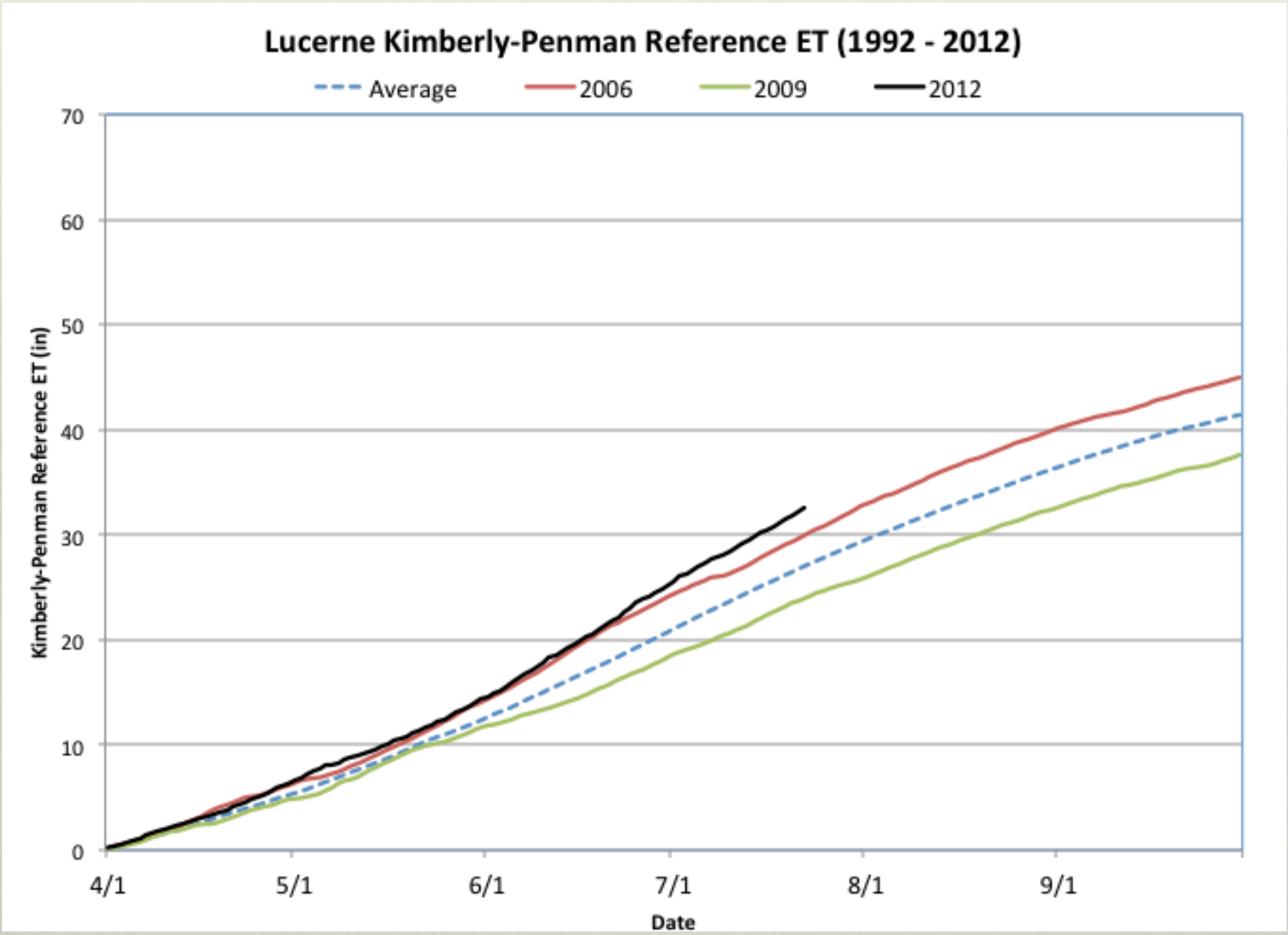

Olathe Kimberly-Penman Reference ET (1993 - 2012)
Average
1994
1999
2012
70
60
50
40
30
20
10
0
Kimberly-Penman Reference ET (in)
4/1
5/1
6/1
7/1
8/1
9/1
Date


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

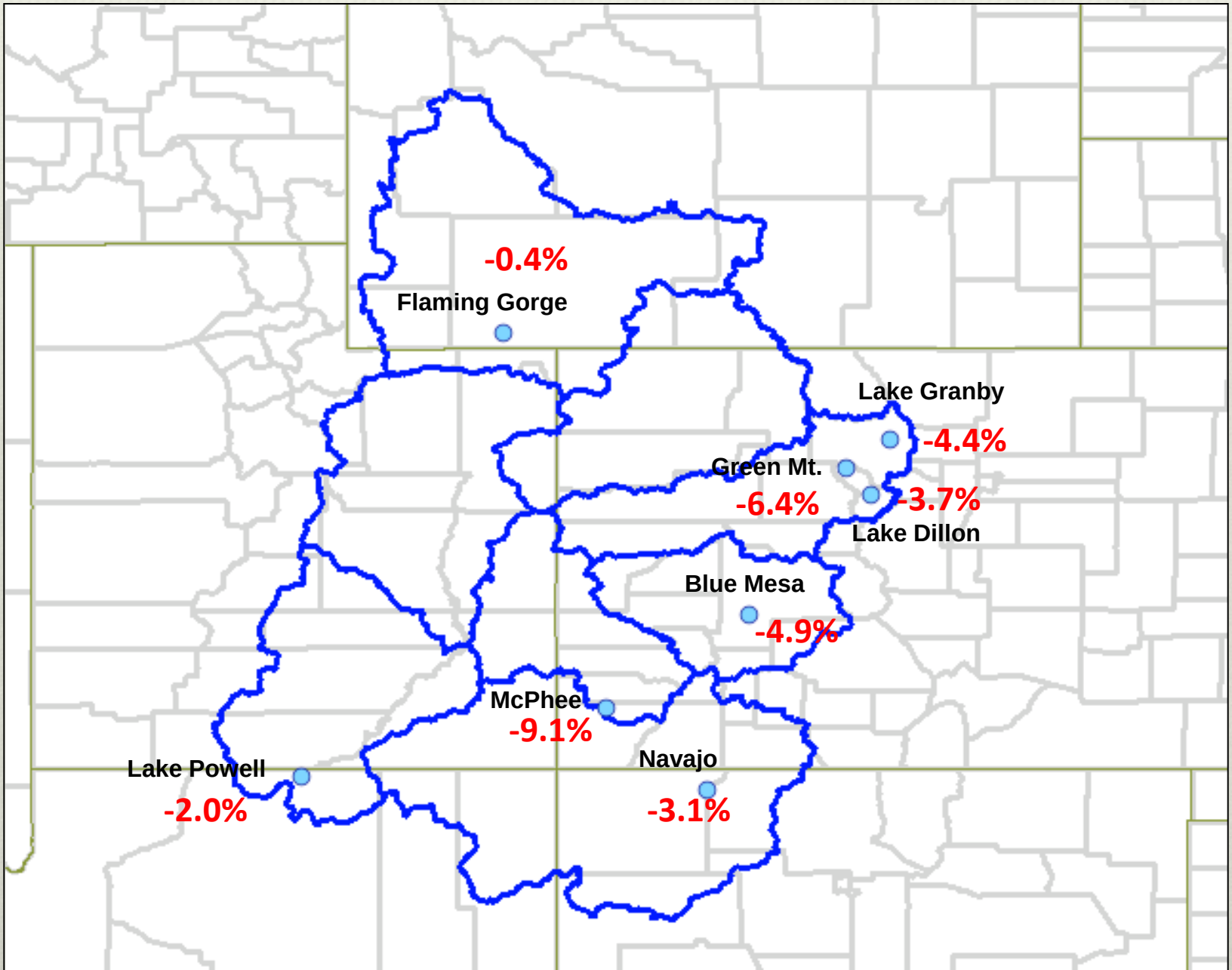

Avondale Kimberly-Penman Reference ET (1993 - 2012)
Average
2002
1998
2012
70
60
50
40
30
20
10
0
Kimberly-Penman Reference ET (in)
4/1
5/1
6/1
7/1
8/1
9/1
Date


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

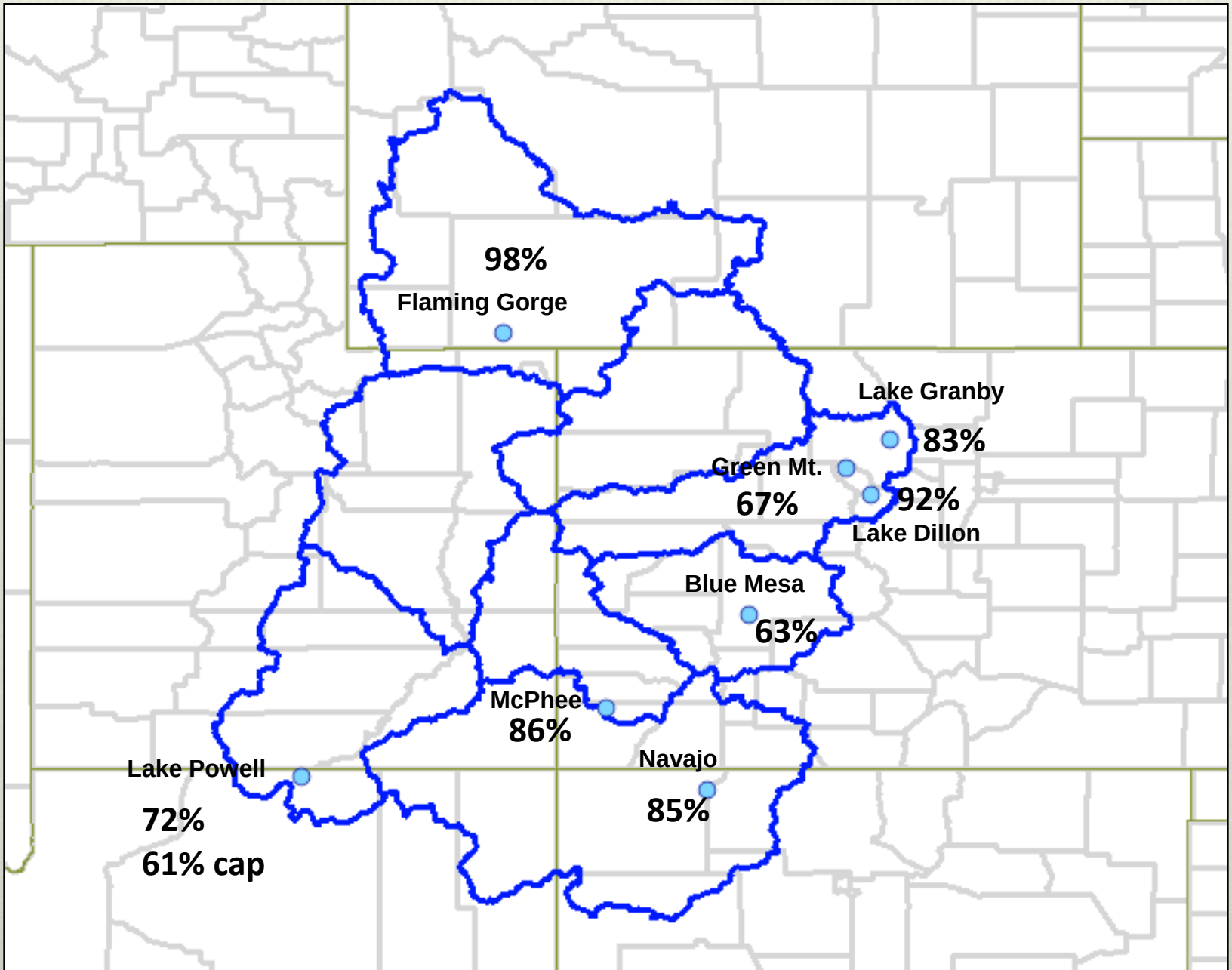

Lucerne Kimberly-Penman Reference ET (1992 - 2012)
Average
2006
2009
2012
70
60
50
40
30
20
10
0
Kimberly-Penman Reference ET (in)
4/1
5/1
6/1
7/1
8/1
9/1
Date

Reservoir Update

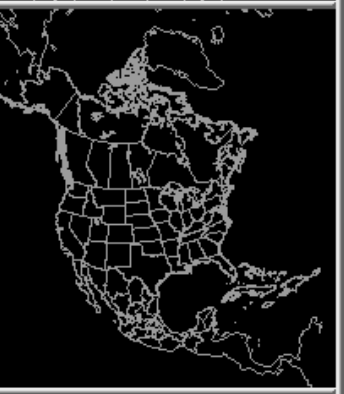
July Reservoir Storage Volume Changes

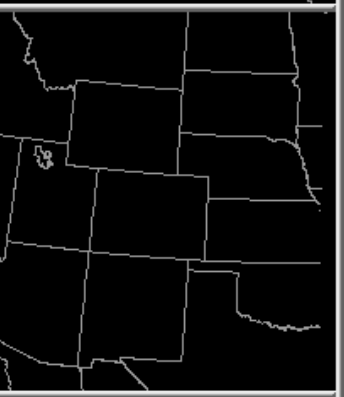


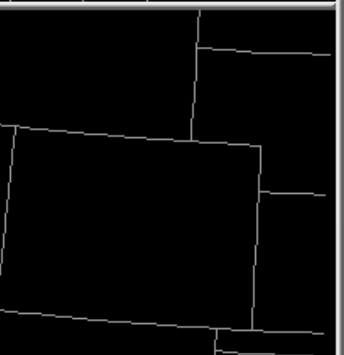
July Average Reservoir Storage Volume

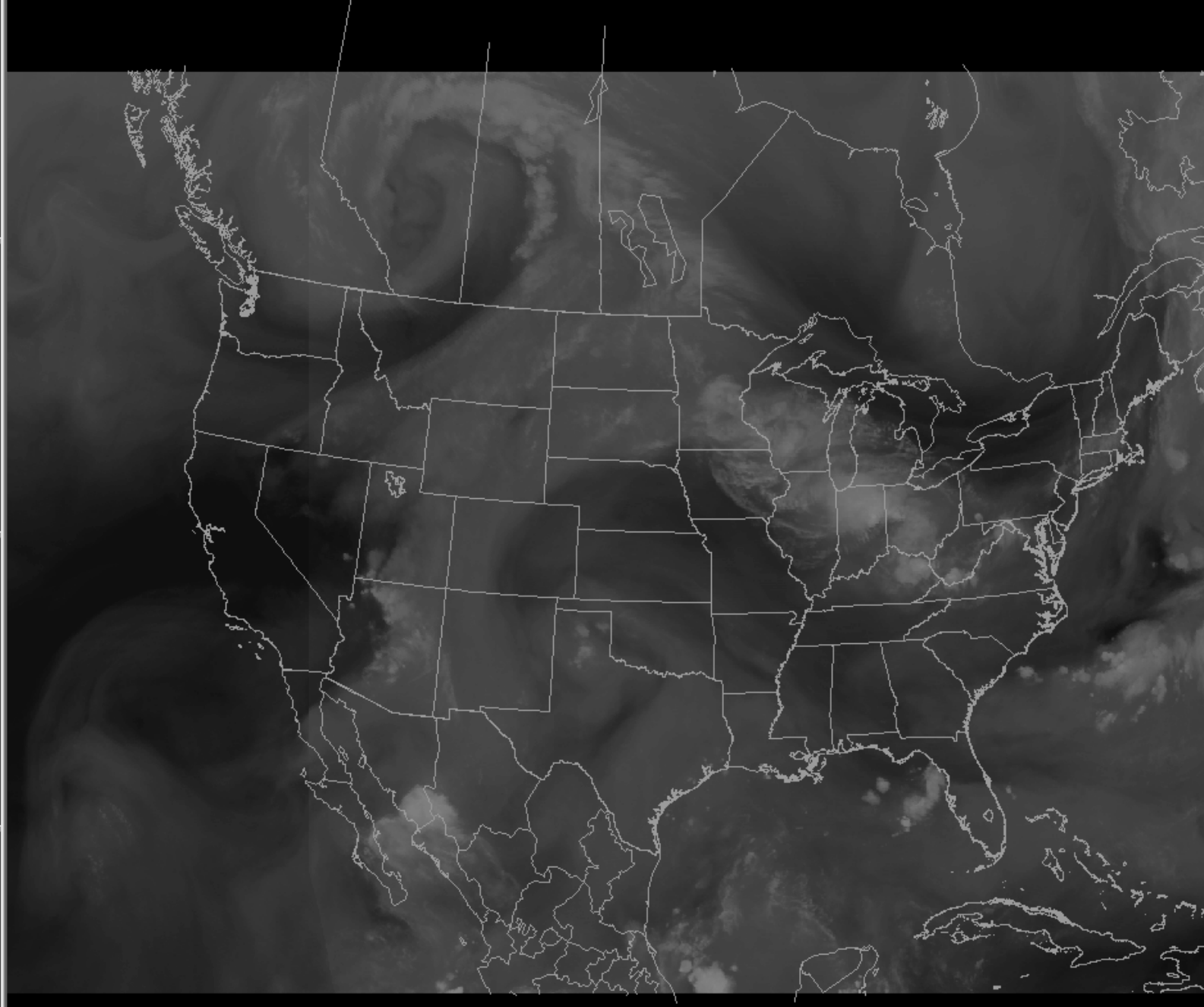


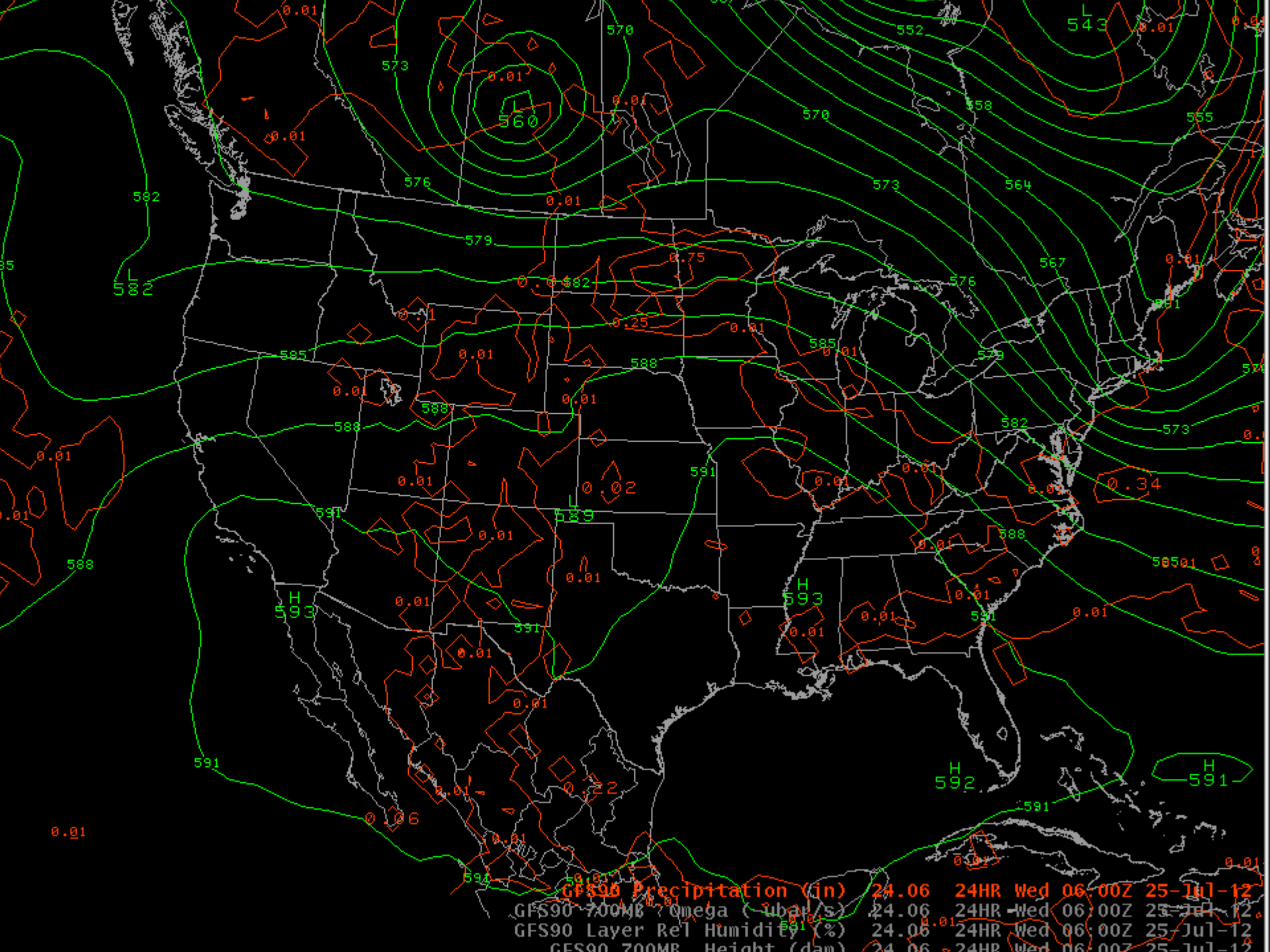
Precipitation Forecast

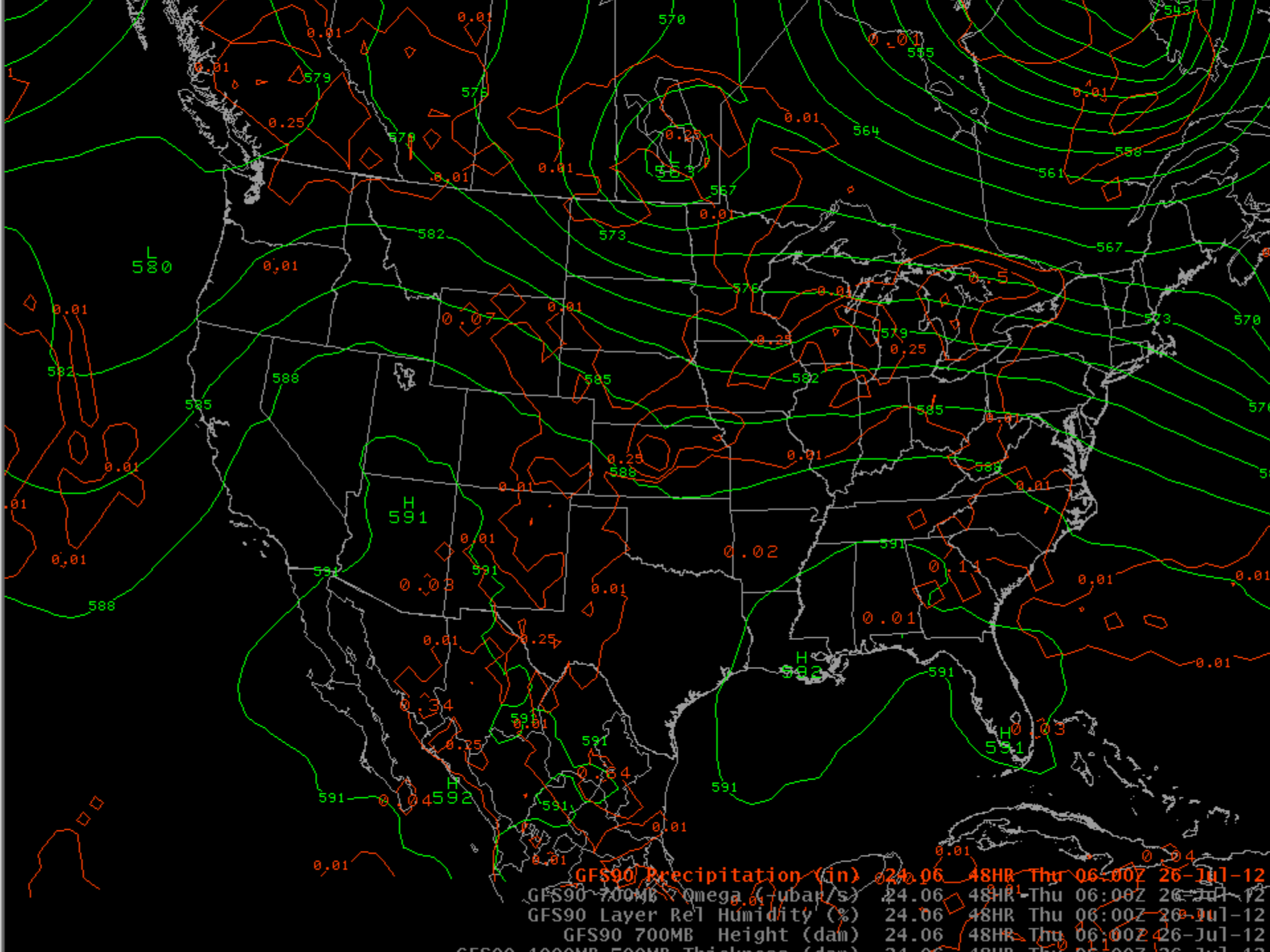


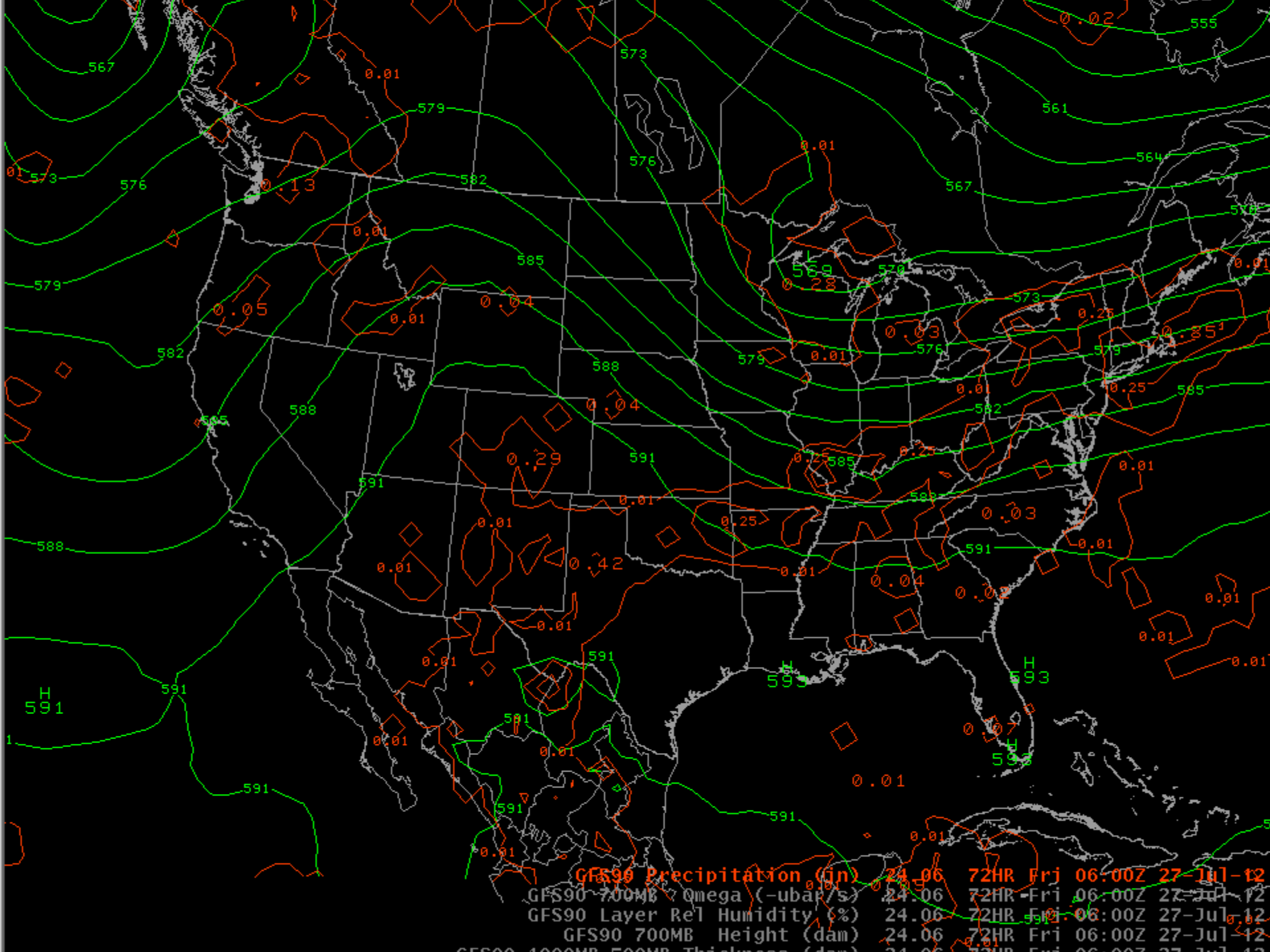


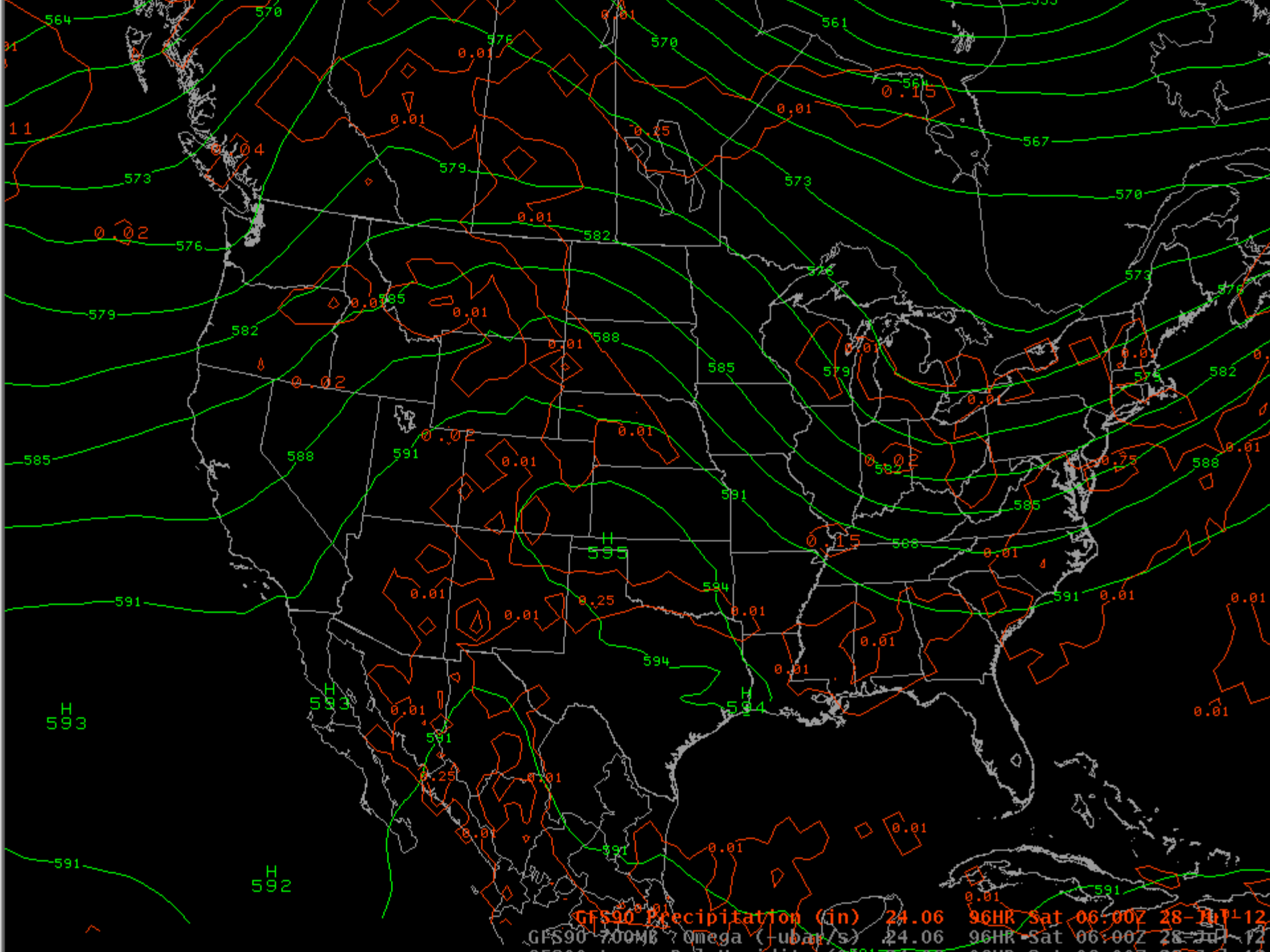


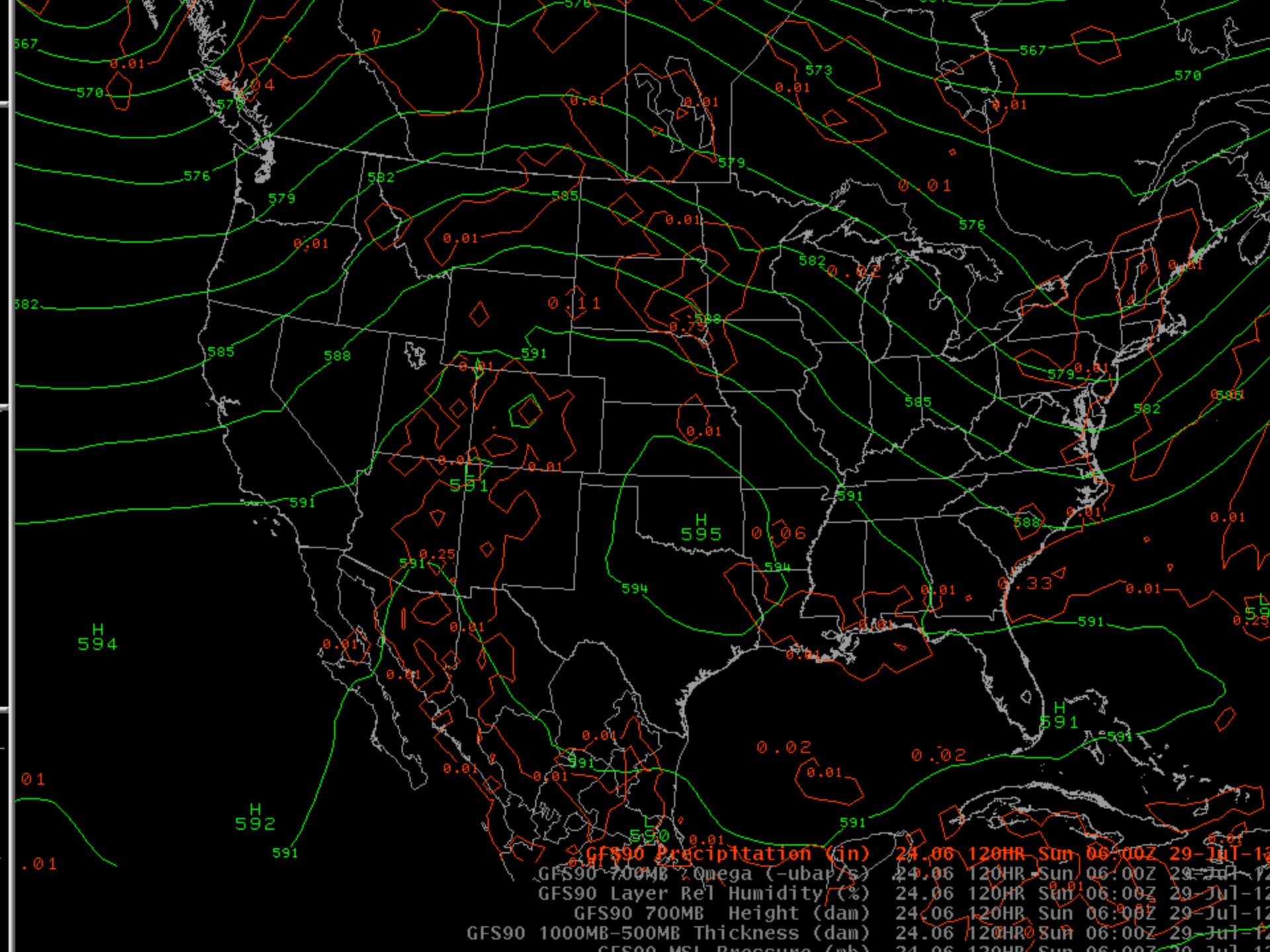


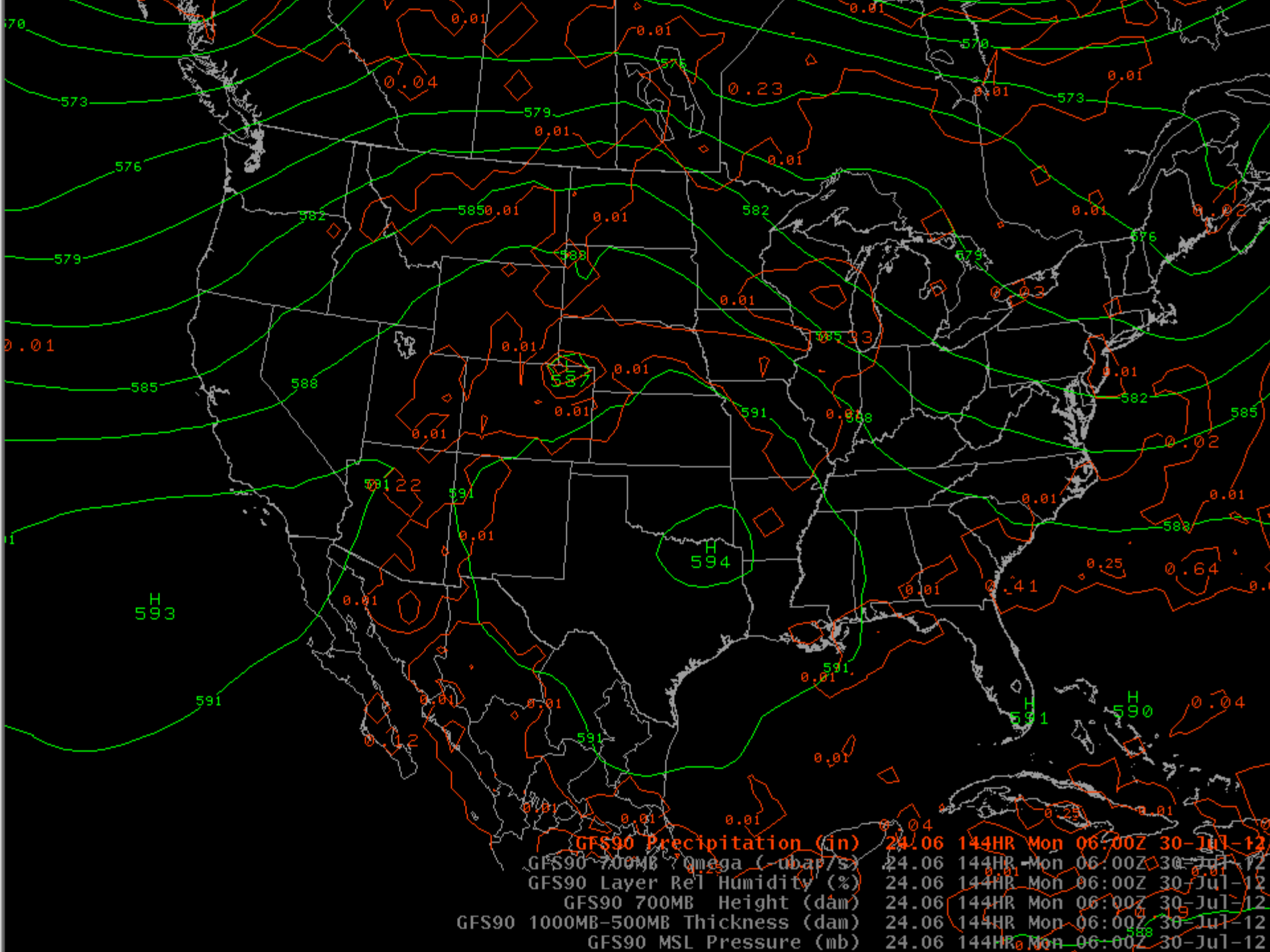

GFS90 Precipitation (in) 24.06 24HR Wed 06:00Z 25-Jul-12
GFS90 700MB Omega (ubar/s) 24.06 24HR Wed 06:00Z 25-Jul-12
GFS90 Layer Rel Humidity (%) 24.06 24HR Wed 06:00Z 25-Jul-12
GFS90 700MB Height (dam) 24.06 24HR Wed 06:00Z 25-Jul-12

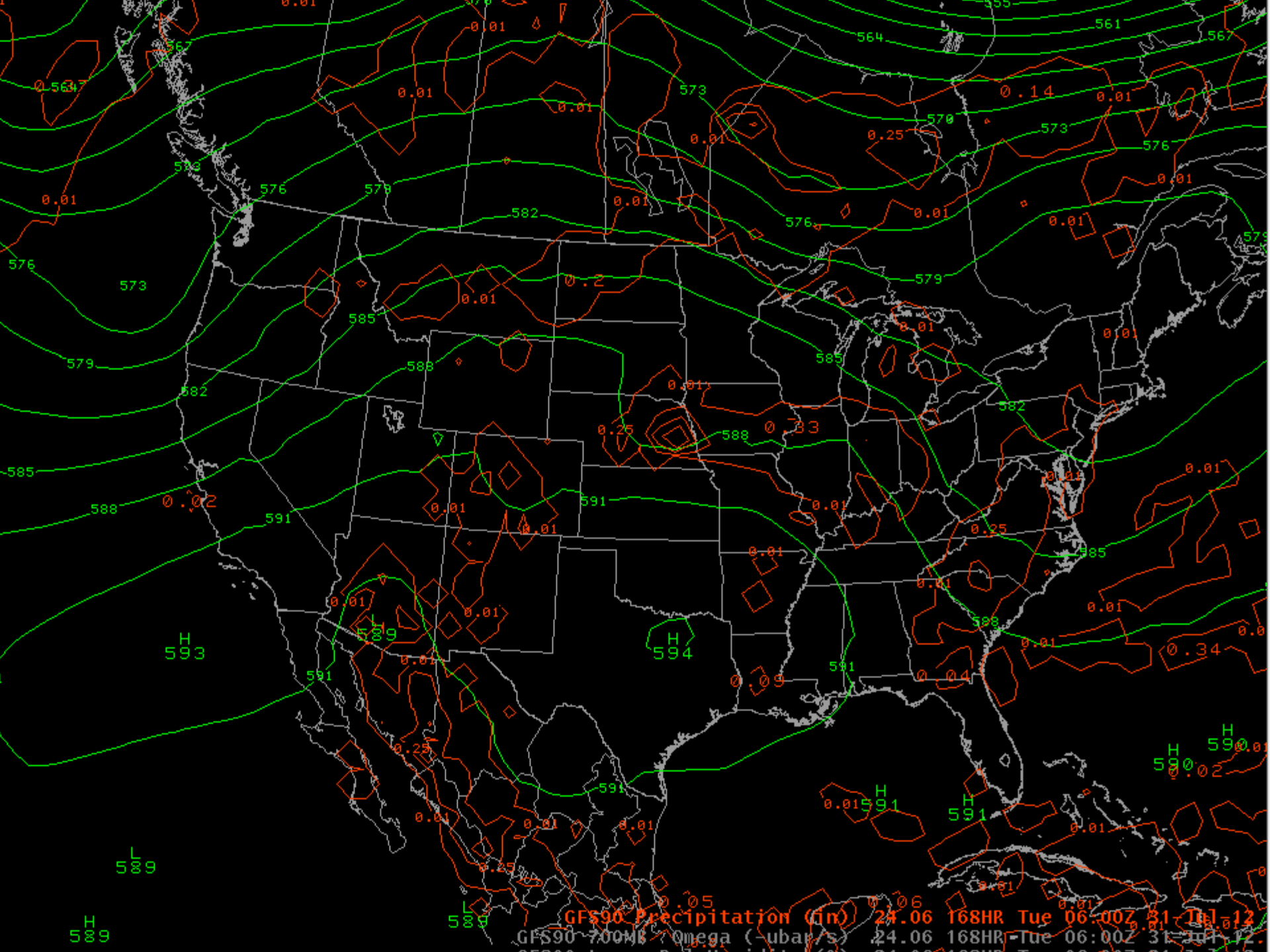

GFS90 Precipitation (in) 24.06 48HR Thu 06:00Z 26-Jul-12
GFS90 700MB Omega (-ubar/s) 24.06 48HR Thu 06:00Z 26-Jul-12
GFS90 Layer Rel Humidity (%) 24.06 48HR Thu 06:00Z 26-Jul-12
GFS90 700MB Height (dam) 24.06 48HR Thu 06:00Z 26-Jul-12

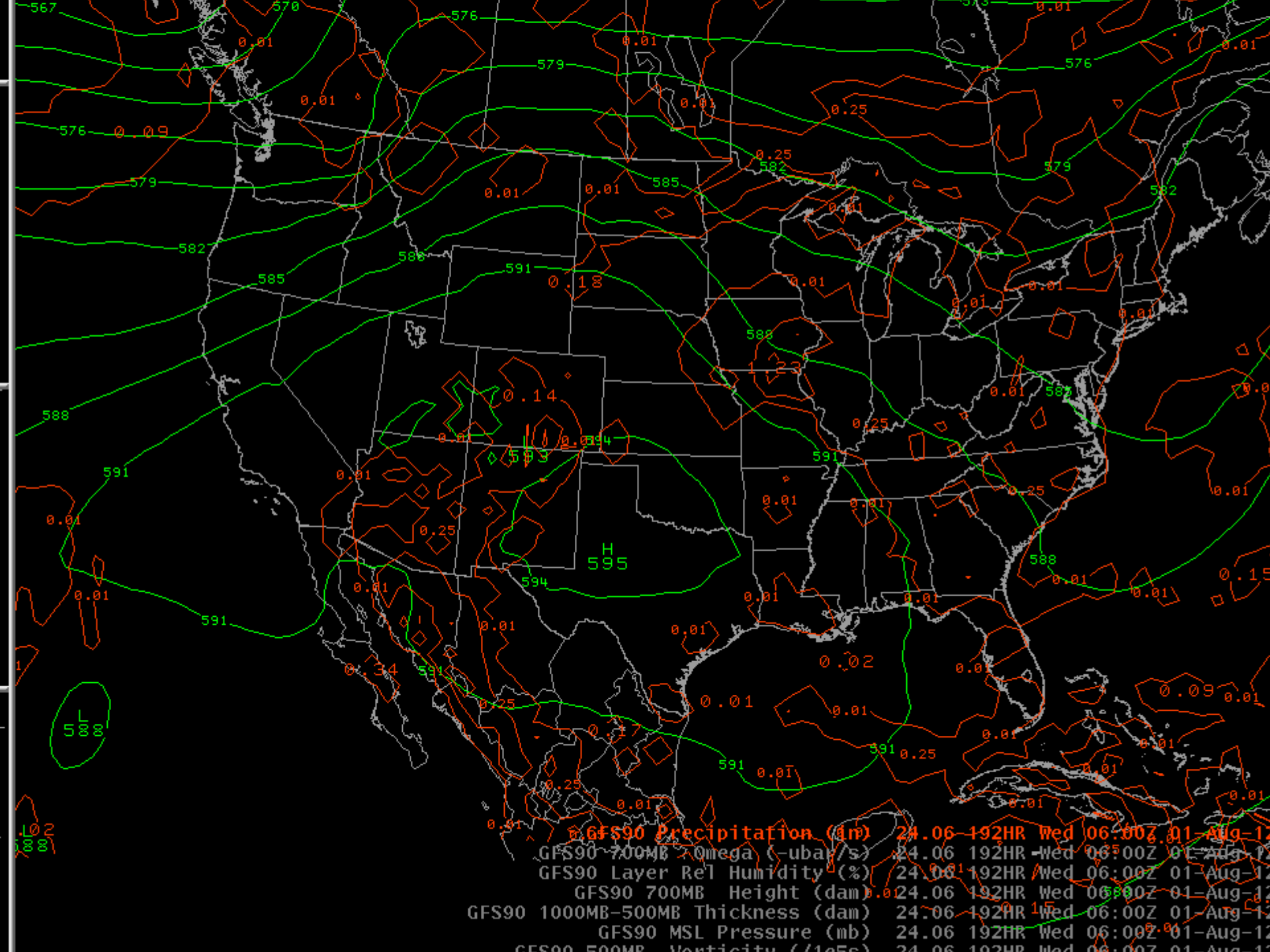

GFS90 Precipitation (in) 24.06 72HR Fri 06:00Z 27-Jul-12
GFS90 700MB Omega (-ubar/s) 24.06 72HR Fri 06:00Z 27-Jul-12
GFS90 Layer Rel Humidity (%) 24.06 72HR Fri 06:00Z 27-Jul-12
GFS90 700MB Height (dam) 24.06 72HR Fri 06:00Z 27-Jul-12

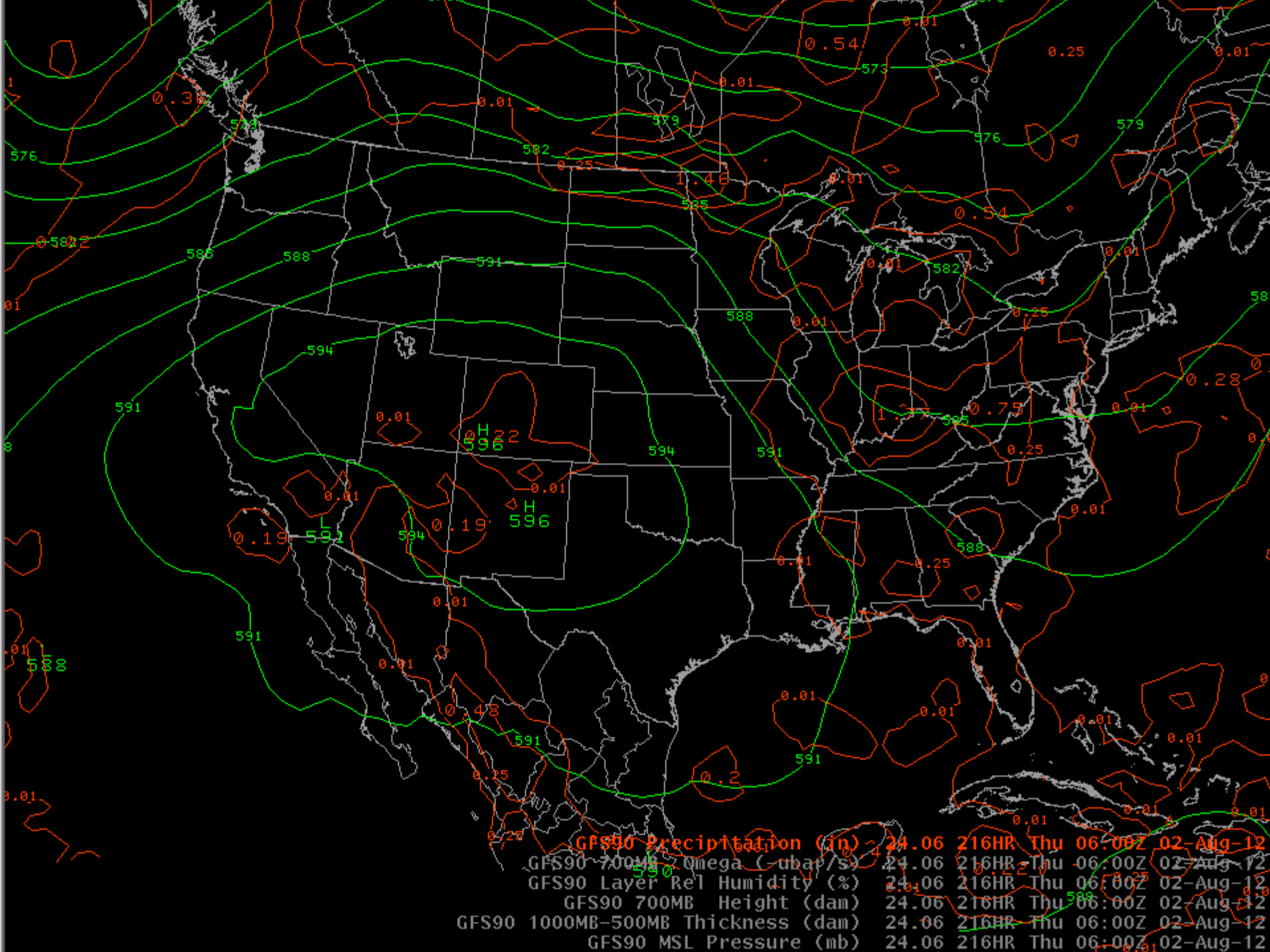

GFS90 Precipitation (in) 24.06 96HR Sat 06:00Z 28-Jul-12
GFS90 700MB Omega (-ubar/s) 24.06 96HR Sat 06:00Z 28-Jul-12


GFS90 Precipitation (in) 24.06 120HR Sun 06:00Z 29-Jul-1
GFS90 700MB Omega (-ubar/s) 24.06 120HR Sun 06:00Z 29-Jul-1
GFS90 Layer Rel Humidity (%) 24.06 120HR Sun 06:00Z 29-Jul-1
GFS90 700MB Height (dam) 24.06 120HR Sun 06:00Z 29-Jul-1
GFS90 1000MB-500MB Thickness (dam) 24.06 120HR Sun 06:00Z 29-Jul-1


GFS90 Precipitation (in) 24.06 144HR Mon 06:00Z 30-Jul-12
GFS90 700MB Omega (-ubar/s) 24.06 144HR Mon 06:00Z 30-Jul-12
GFS90 Layer Rel Humidity (%) 24.06 144HR Mon 06:00Z 30-Jul-12
GFS90 700MB Height (dam) 24.06 144HR Mon 06:00Z 30-Jul-12
GFS90 1000MB-500MB Thickness (dam) 24.06 144HR Mon 06:00Z 30-Jul-12
GFS90 MSL Pressure (mb) 24.06 144HR Mon 06:00Z 30-Jul-12


GFS90 Precipitation (in) 24.06 168HR Tue 06:00Z 31 Jul 12
GFS90 700MB Omega (-ubar/s) 24.06 168HR Tue 06:00Z 31 Jul 12


GFS90 Precipitation (in) 24.06 192HR Wed 06:00Z 01-Aug-12
GFS90 700MB Omega (-ubar/s) 24.06 192HR Wed 06:00Z 01-Aug-12
GFS90 Layer Rel Humidity (%) 24.06 192HR Wed 06:00Z 01-Aug-12
GFS90 700MB Height (dam) 24.06 192HR Wed 06:00Z 01-Aug-12
GFS90 1000MB-500MB Thickness (dam) 24.06 192HR Wed 06:00Z 01-Aug-12
GFS90 MSL Pressure (mb) 24.06 192HR Wed 06:00Z 01-Aug-12
H 595
L 588


GFS90 Precipitation (in) 24.06 216HR Thu 06:00Z 02-Aug-12
GFS90 700MB Omega (-ubar/s) 24.06 216HR Thu 06:00Z 02-Aug-12
GFS90 Layer Rel Humidity (%) 24.06 216HR Thu 06:00Z 02-Aug-12
GFS90 700MB Height (dam) 24.06 216HR Thu 06:00Z 02-Aug-12
GFS90 1000MB-500MB Thickness (dam) 24.06 216HR Thu 06:00Z 02-Aug-12
GFS90 MSL Pressure (mb) 24.06 216HR Thu 06:00Z 02-Aug-12

NOAA Graphical Forecast for Central Rockies - Windows Internet Explorer

http://graphical.weather.gov/sectors/centrockiesWeek.php#tabs

McAfee

Favorites | Suggested Sites (2) | Suggested Sites | Suggested Sites (3)

NOAA Graphical Forecast for Central Rockies

Warnings & Forecasts | Graphical Forecasts | National Maps | Radar | Water | Air Quality | Satellite | Climate

Graphical Forecasts - Central Rockies

Public | Fire Weather | Tropical | Hazardous

Zoom Out

Daily View | Weekly View | Loops

Image List | Page Help | Metric Units | Key

Expand More

Element Period	High / Low Temperature	Probability of Precip.	Weather
Today	High	PoP12	8am 11am 2pm 5pm
Tonight	Low	PoP12	8pm 11pm 2am 5am
Wednesday	High	PoP12	8am 11am 2pm 5pm
Wednesday Night	Low	PoP12	8pm 11pm 2am 5am
Thursday	High	PoP12	8am 11am 2pm 5pm
Thursday Night	Low	PoP12	8pm 2am
Friday	High	PoP12	8am 2pm
Friday Night	Low	PoP12	8pm 2am
Saturday	High	PoP12	8am 2pm
Saturday Night	Low	PoP12	8pm 2am
Sunday	High	PoP12	8am 2pm
Sunday Night	Low	PoP12	8pm 2am
Monday	High	PoP12	8am 2pm

More

Table MouseOver Effect On

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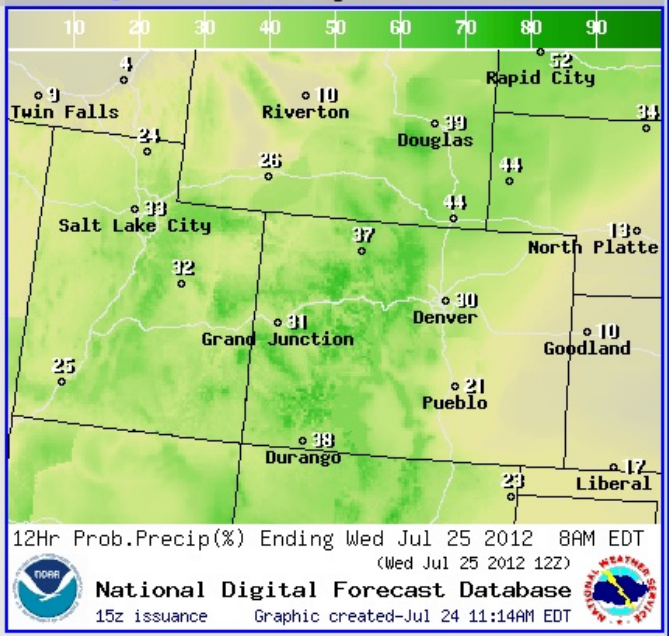

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Sunday	High	PoP12	8am 2pm
Sunday Night	Low	PoP12	8pm 2am
Monday	High	PoP12	8am 2pm

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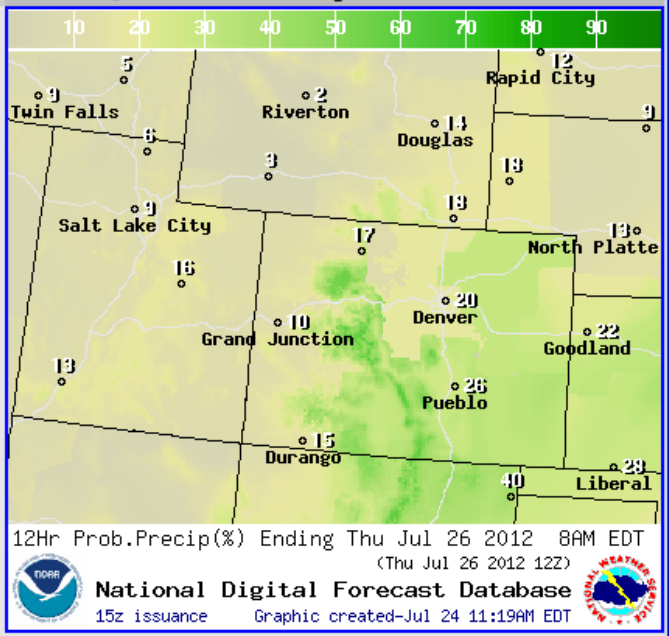

NOAA Graphical Forecast for Central Rockies - Windows Internet Explorer

NOAA Graphical Forecast for Central Rockies - Windows Internet Explorer

http://graphical.weather.gov/sectors/centrockiesWeek.php#tabs

McAfee

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Sunday Night	Low	PoP12	8pm 2am
Monday	High	PoP12	8am

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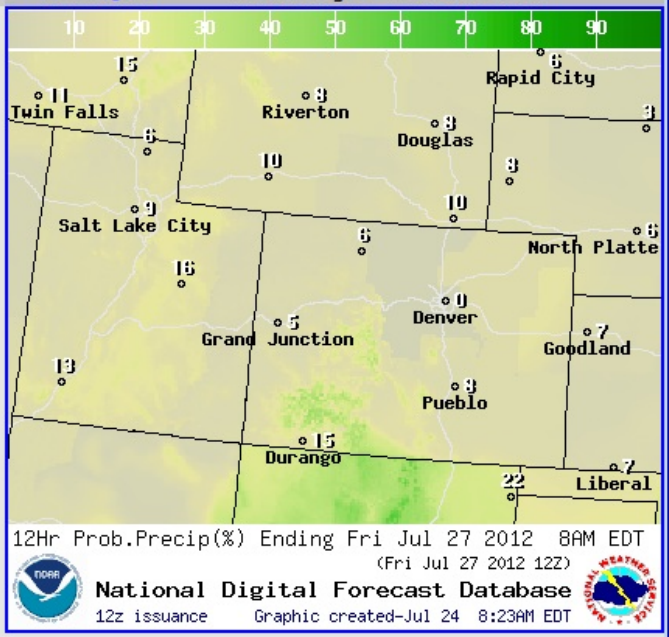
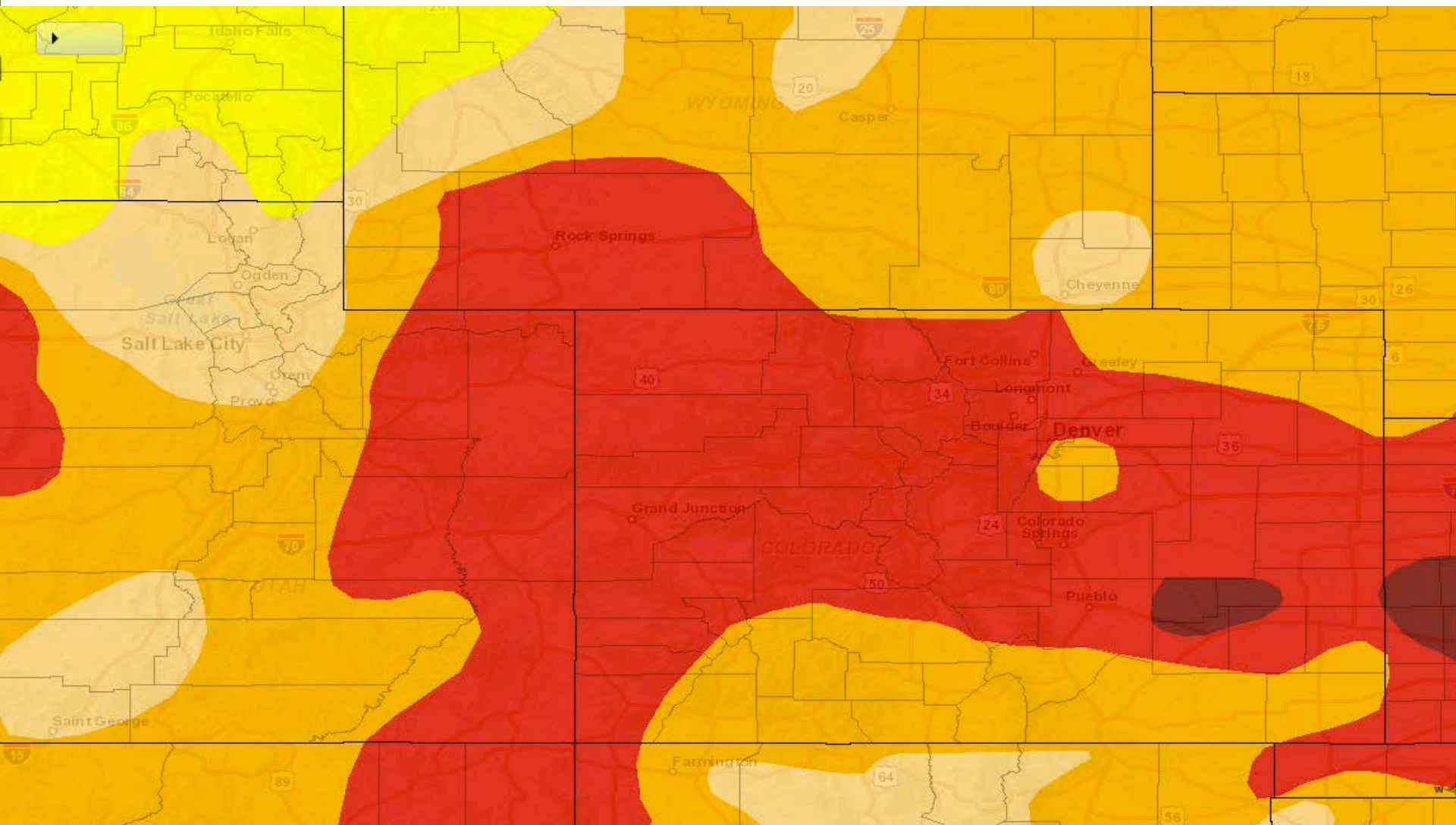


Recommendations



INFO

For more information

NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

July 24, 2012

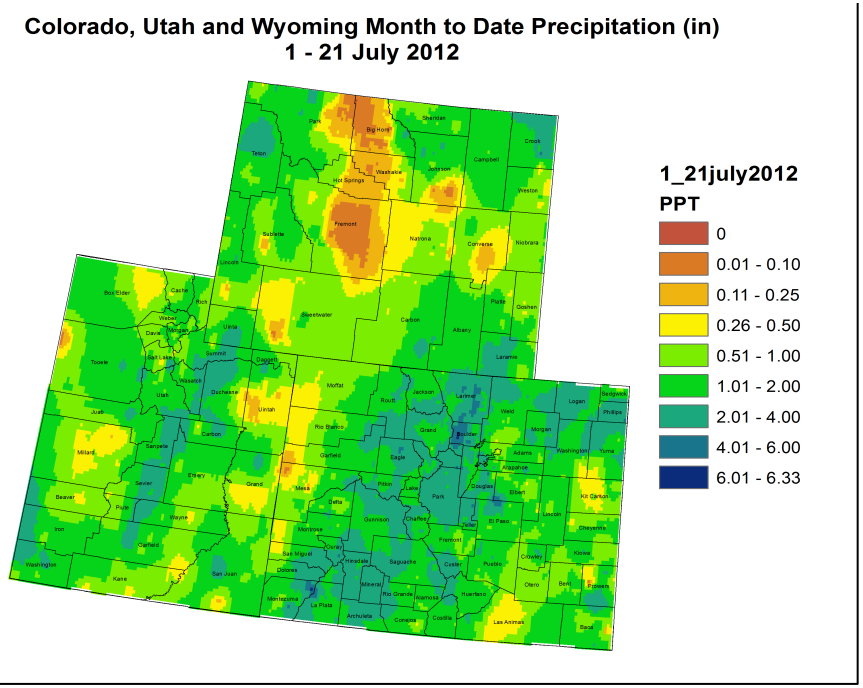


Fig. 1: July month-to-date precipitation in inches.

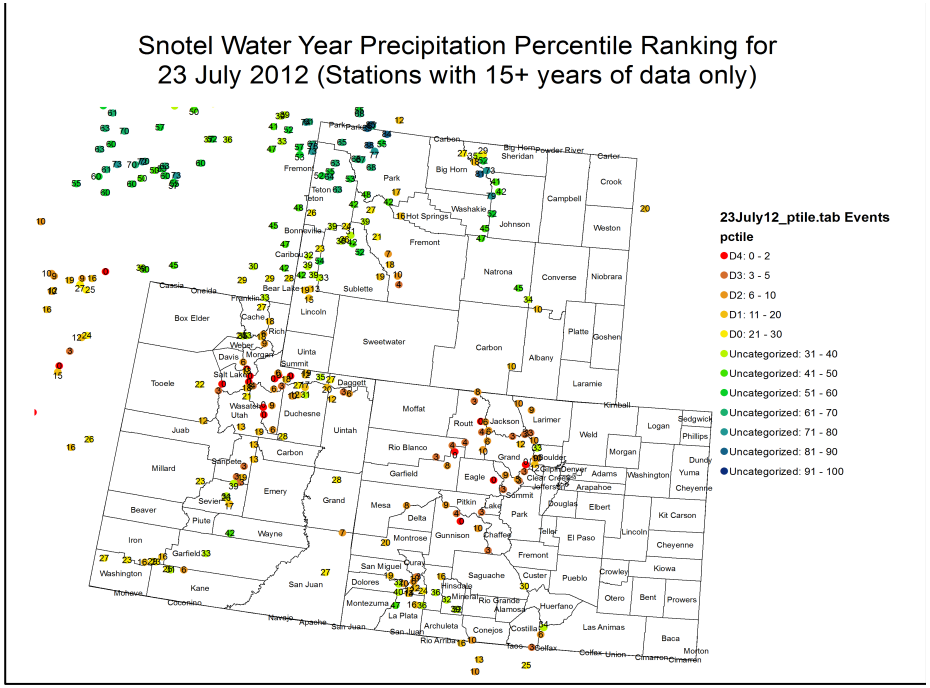


Fig. 2: SNOTEL WYTD precipitation percentiles (50% is median, 21 – 30% is Drought Monitor D0 category).

Precipitation

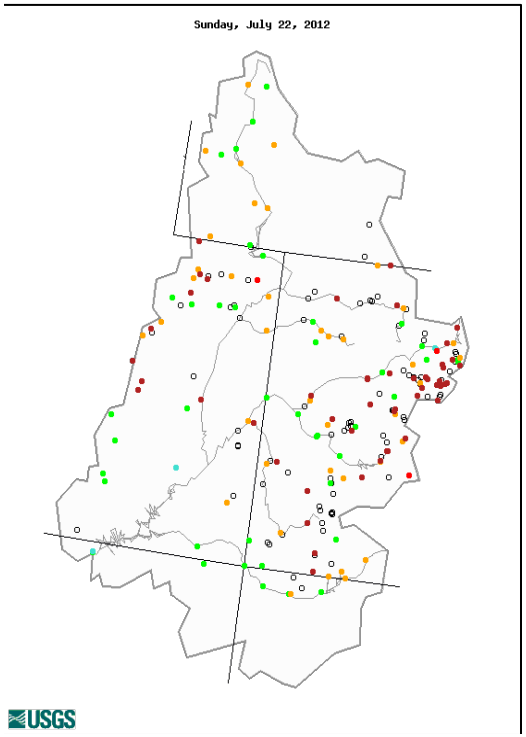
For the month of July so far, widespread precipitation has fallen over most of the Upper Colorado River Basin (UCRB, Fig. 1). Most areas have received between a .5 to 2 inches for the month. Two to 4 inches have fallen in the San Juans and in central Utah. Parts of eastern UT, the western slope of Colorado and southwest Wyoming have been a bit drier, receiving less than half 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. Som 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 are low for the Yampa and Gunnison basins in CO, and the Wasatch range in UT, with many sites reporting in the lowest 10th percentile or below (Fig. 2). The northern mountains of CO are also dry, with most sites reporting precipitation percentiles in the teens and single digits. 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 July 22nd, about 32% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) or above normal 7-day average streamflows (Fig. 3). There are 3 gages in the UCRB recording above normal flows, while about 38% percent of the gages in the basin are recording much below normal or low (i.e. lowest on record) streamflows (improved from 50% last week). The Yampa, White, and Green river basins have all seen improvement from the much below normal category last week to the below normal category this week. The San Juan, Dolores, and Gunnison basins to the south have degraded slightly since last week.

Flows on two of the three key gages in the basin saw increases last week (Fig. 4). Flows on the Colorado River near the CO-UT state line increased to the near normal range at the 26th percentile. Flows on the Green River at Green River, UT increased to the 10th percentile from the 4th percentile last week. Flows on the San Juan River near Bluff, UT are near normal at the 33rd percentile, down from the 39th percentile last week.



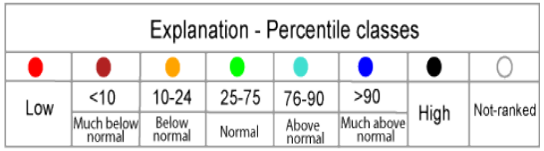


Fig. 3: 7-day average discharge compared to historical discharge for July 22nd.

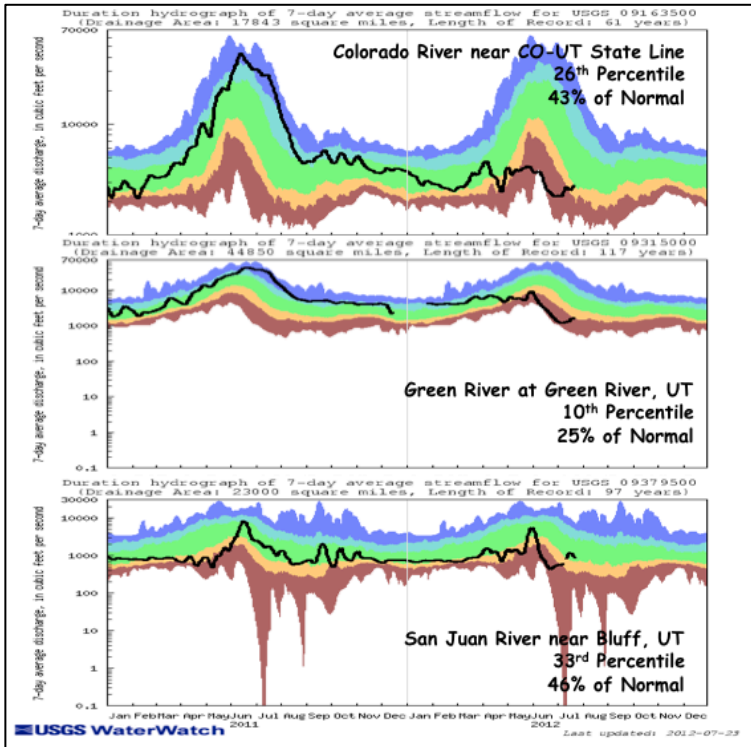


Fig. 4: USGS 7-day average discharge over time at the CO-UT stateline (top), Green River, UT (middle) and Bluff, UT (bottom).

Water Supply and Demand

Last week, temperatures on the west side of the UCRB were slightly cooler than average while temperatures on the east side of the UCRB were slightly warmer than average. The Front Range and eastern CO experienced temperatures 2 to 8 degrees warmer than 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 around .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, due to the high demand for irrigation. All of the major reservoirs are below their July storage averages, with Blue Mesa at 63% of average, Green Mountain at 67% of average, and Lake Powell currently at 72% of average.

Precipitation Forecast

The monsoonal moisture plume that has hovered over the Four Corners region will shift to the east over the next couple of days as a Canadian trough moves east. This will shift the pattern to more northwesterly flow over the basin and bring increased chances of precipitation and slightly cooler temperatures to eastern CO, while the UCRB is expected to dry out. As the ridge amplifies over the northern Rockies later this week, there will be an increased chance for precipitation in the central and southern mountains of CO. Another trough settles over the Pacific Northwest into the weekend and a high will settle over the southern plains. This will push the moisture plume back to the west and will improve chances for precipitation over the southern part of the basin, extending into the northern and central Rockies, with only slight chances of isolated showers over eastern CO.

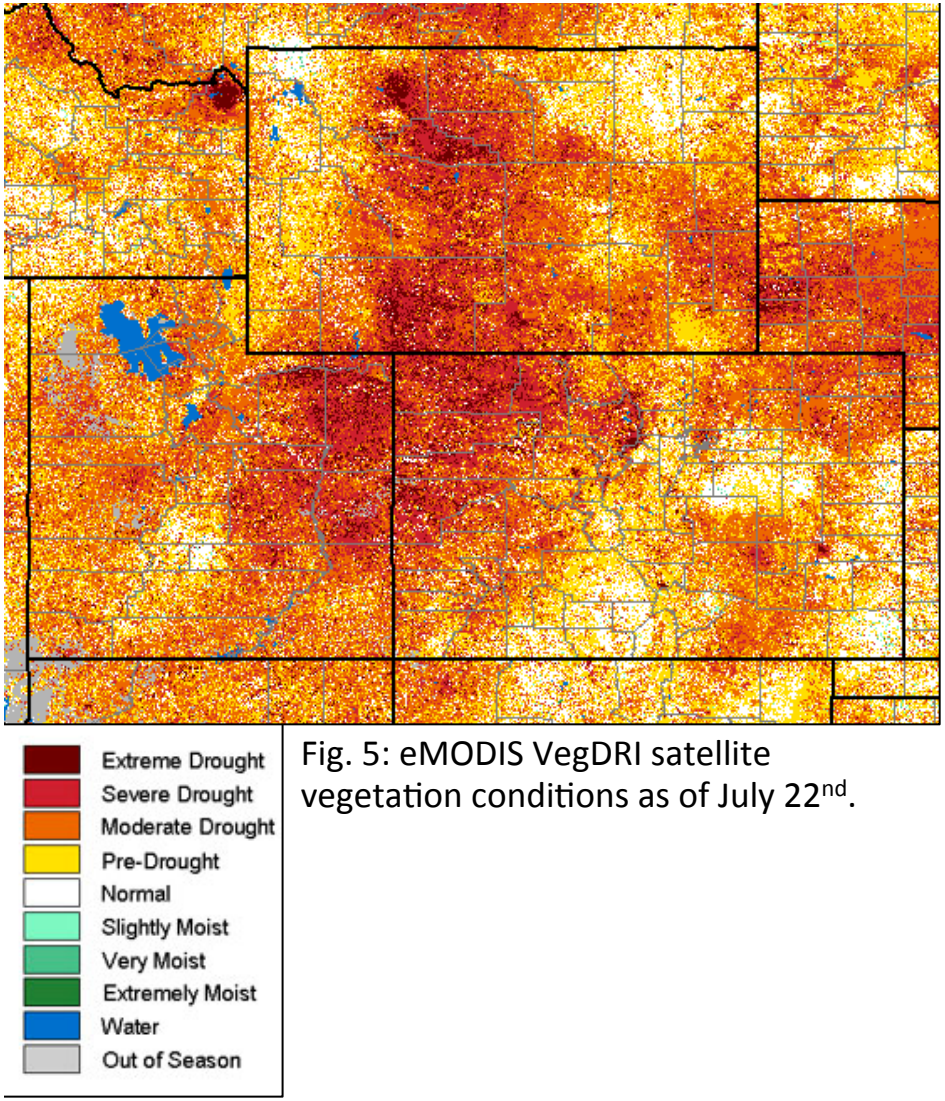


Fig. 5: eMODIS VegDRI satellite vegetation conditions as of July 22nd.

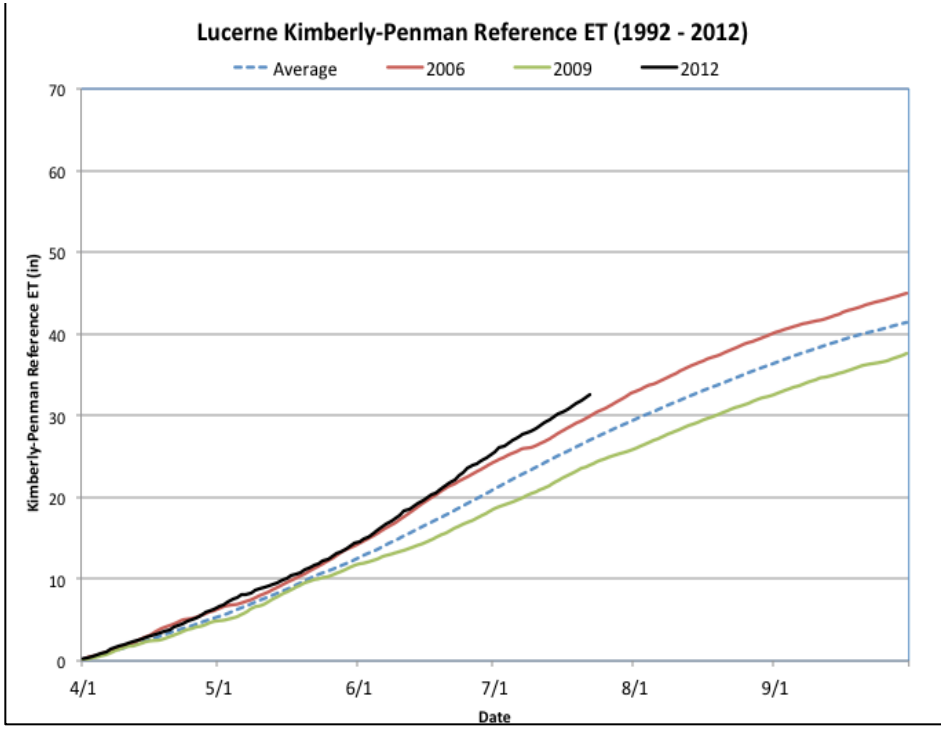


Fig. 6: Accumulated reference ET (black line) at Lucerne, CO in the northeast region, compared to the max year (red), min year (green), and average (dashed line).

Drought and Water Discussion

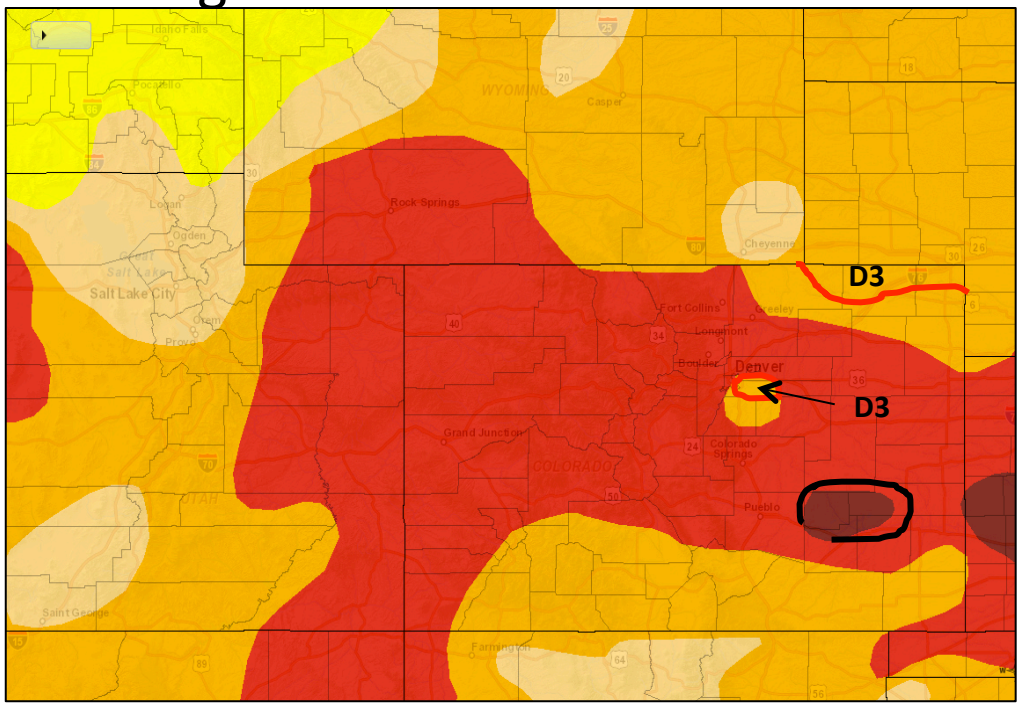
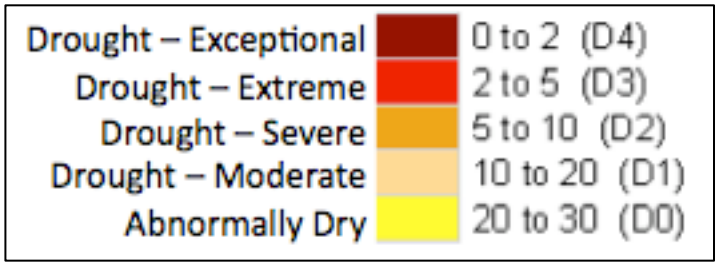


Fig. 7: July 17th release of U.S. Drought Monitor for the UCRB.



Drought categories and
their associated percentiles

UCRB: Status quo is recommended for the basin in the current depiction of the U.S. Drought Monitor (USDM) map (Fig. 7). Beneficial rains have fallen though heavier amounts have been more localized. Vegetation has still quickly dried out after storms and thunderstorms have ignited wildfires. If the monsoon plume continues to bring rains to the region, some improvements may be possible in the near future.

Eastern CO:

D3: An expansion of D3 is recommended for Sedgwick, Logan and eastern Weld counties to match across state lines with Nebraska (Fig. 7, red line). Reports from these counties are that pastures continue to degrade, dryland corn is extremely stressed, and the South Platte is running very low. High temperatures and winds are being recorded daily, and reference ET rates are extremely high. D3 should also cover the remainder of Arapahoe County, where reports are that conditions on the west side are just as bad as the east side.

D4: A further expansion of D4 is recommended in southeast CO to cover more of the heavily impacted regions (Fig. 7, black line).