Colorado River Storage Project
Flaming Gorge Working Group

2010 Water Supply Forecast Verification And Water Year Review

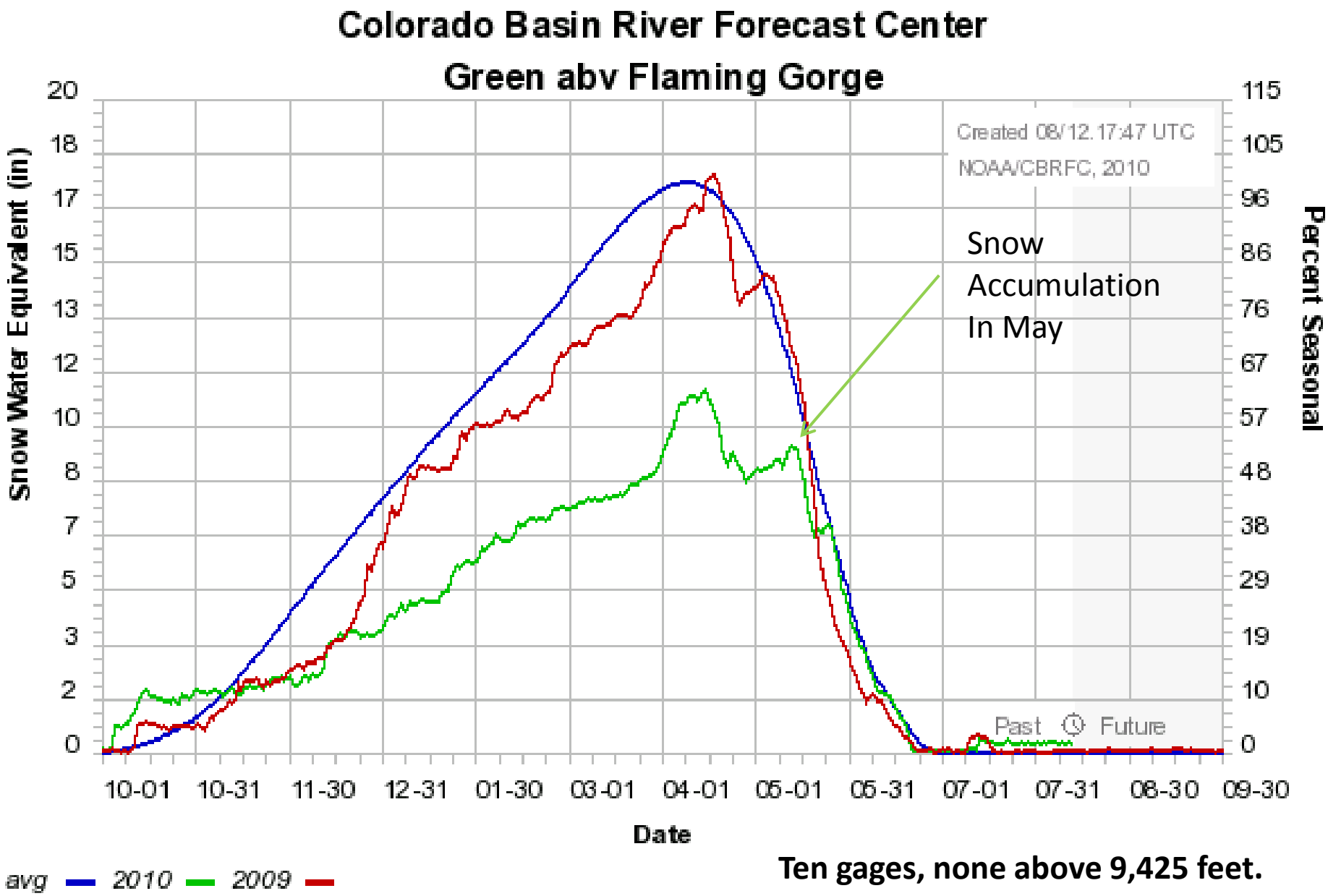
8/26/2010

William B. Reed
Colorado Basin River Forecast Center

CBRFC Slides for Flaming Gorge

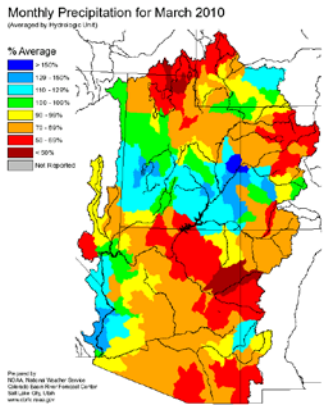
2010 Water Year Review and Verification

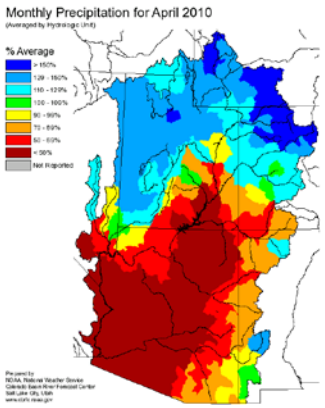
- SNOTEL Accumulation
- Seasonal and Monthly Precipitation
- Seasonal Forecasts + Verification
- Monthly Forecasts
- Daily Forecasts
- Peak Forecasts

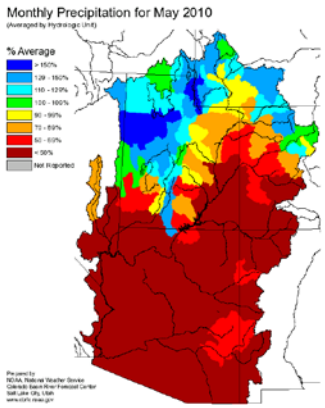


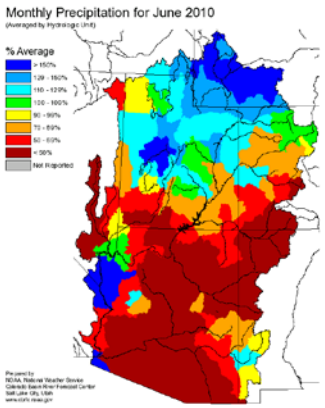
Ten gages, none above 9,425 feet.

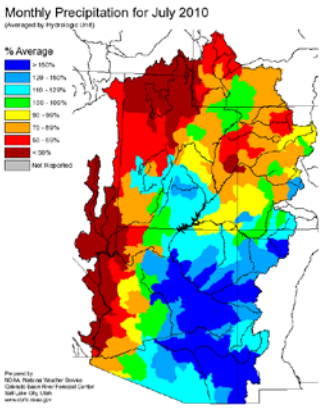
Monthly: Above Average Precipitation (April, May, and June) During The Runoff Season.



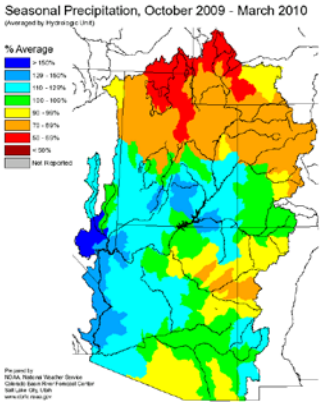


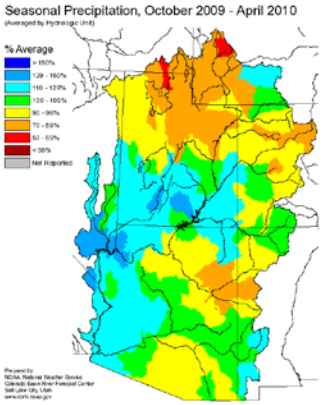


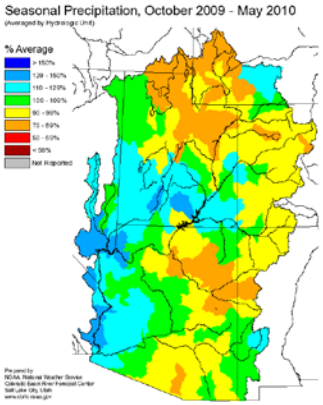


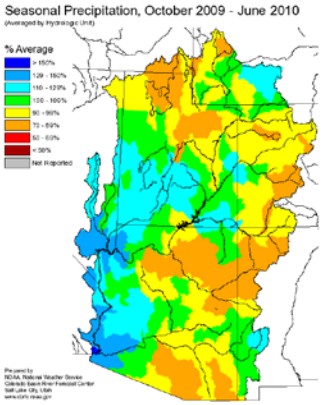


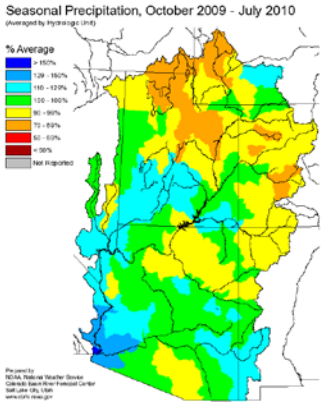
Seasonal: April 1st Dry











News: CBRFC Open House Aug 18

CBRFC Conditions Search Points

☑ River ☐ Snow ☐ Water Supply ☐ Peaks

small map

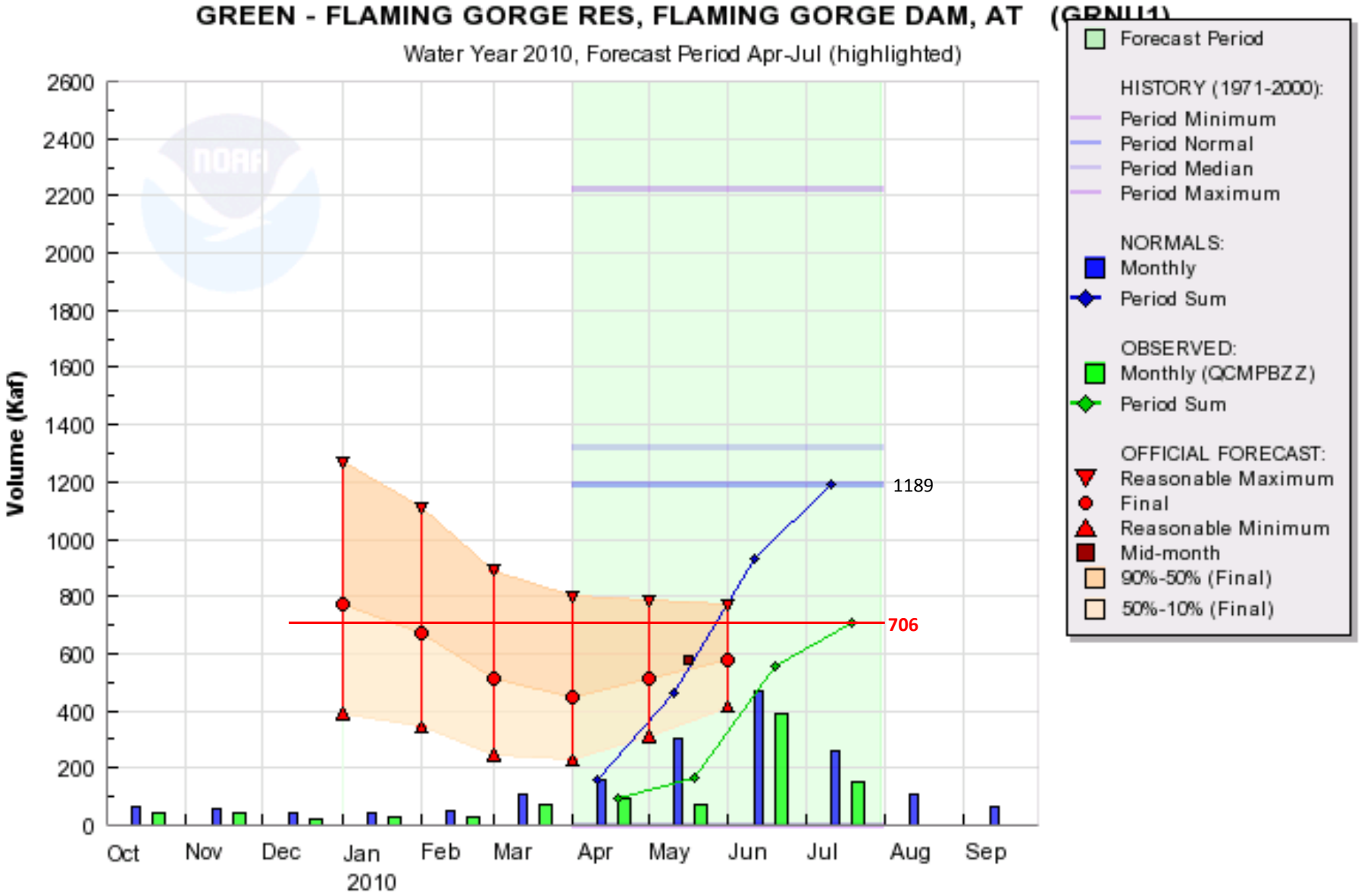
GRNU1 = GBRW4 + BIGW4 + LTAW4 + HFMW4

Overlays
- ☑ Rivers
- ☑ RFC
- ☐ Basins
- ☑ Active Basins
- ☐ Grids (Precip etc.)

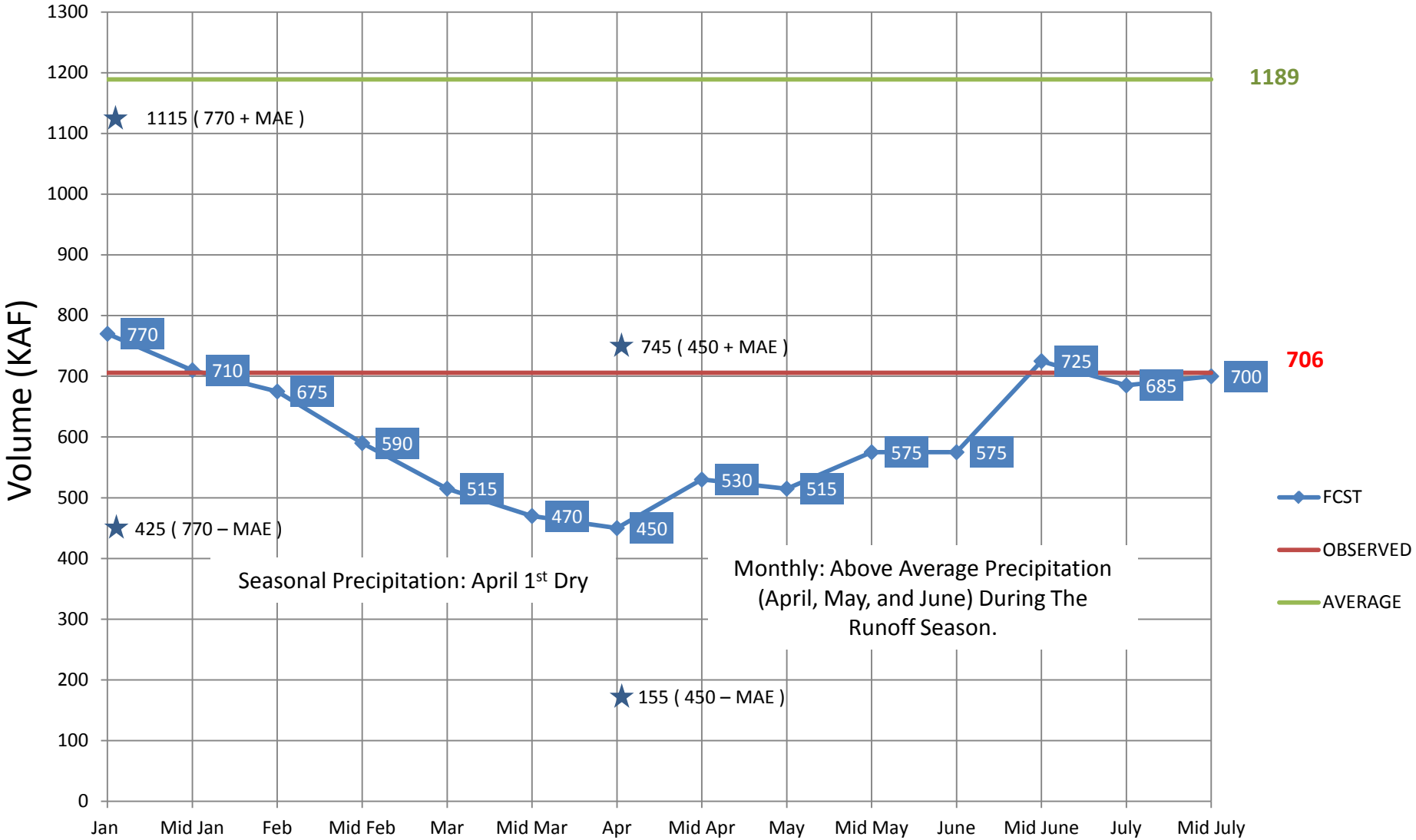
Display Options
- ☑ Show NWS ID
- ☐ Show Data

River Point Condition
- No Data
- Normal
- Significant Rise
- Near Bankfull
- Above Bankfull
- Above Flood Stage
- Outlook (> 3 days)

River Point Options
- ☐ All
- ☐ Data Points
- ☑ Forecast Points
- ☑ Reservoir Points
- ☑ Active Points



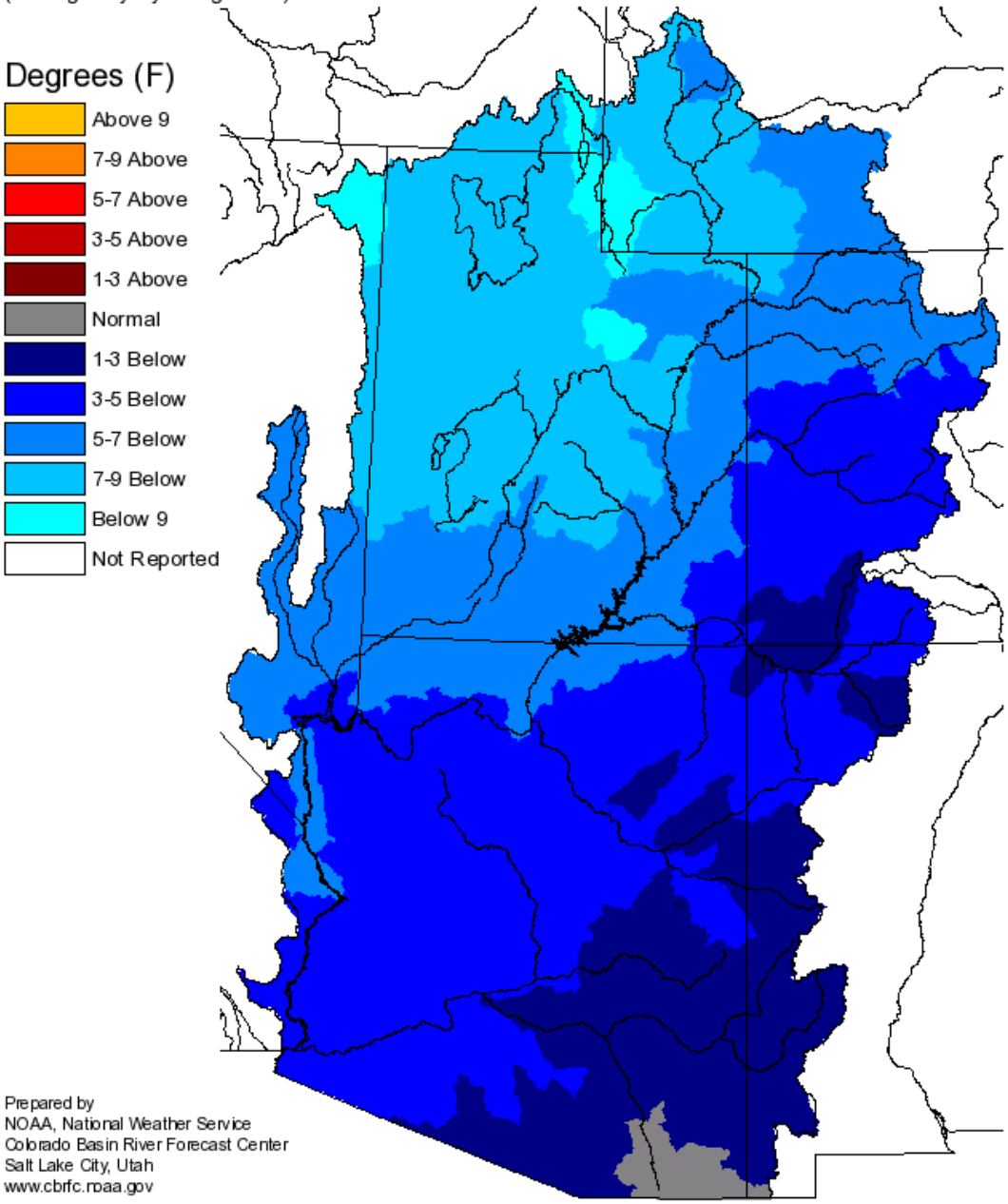
CBRFC/NWS/NOAA 08/12/10 17:55:45 UTC



Flaming Gorge 50% Values -2010

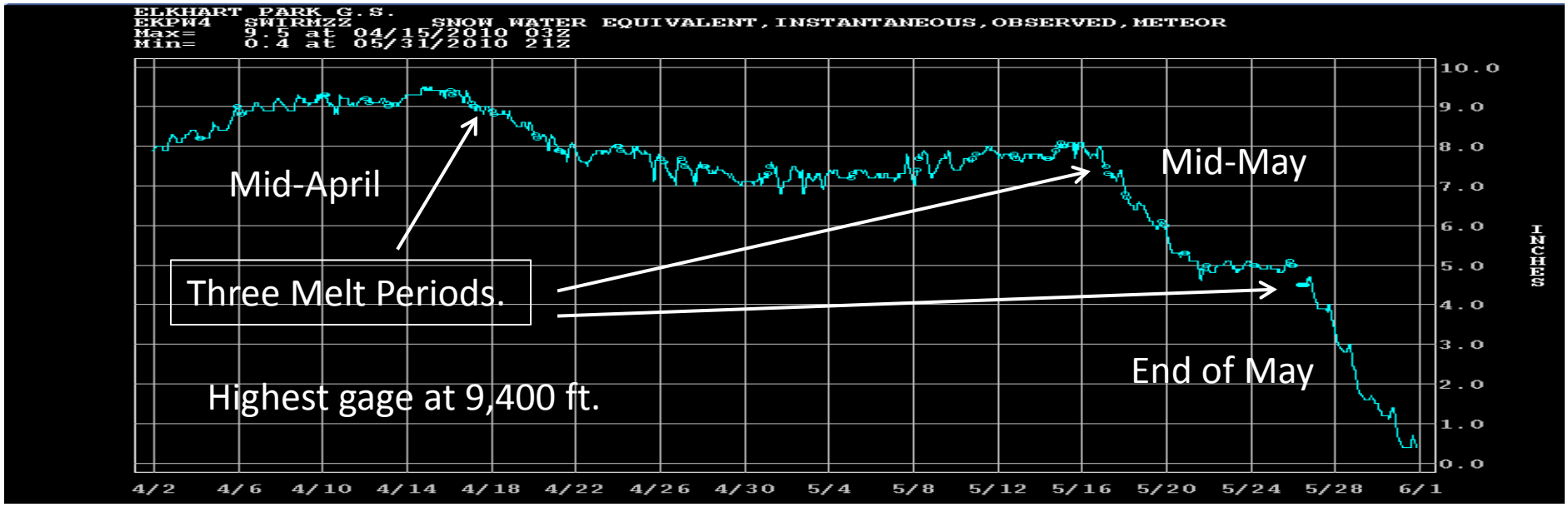
Monthly Max Temp Deviation for May 2010

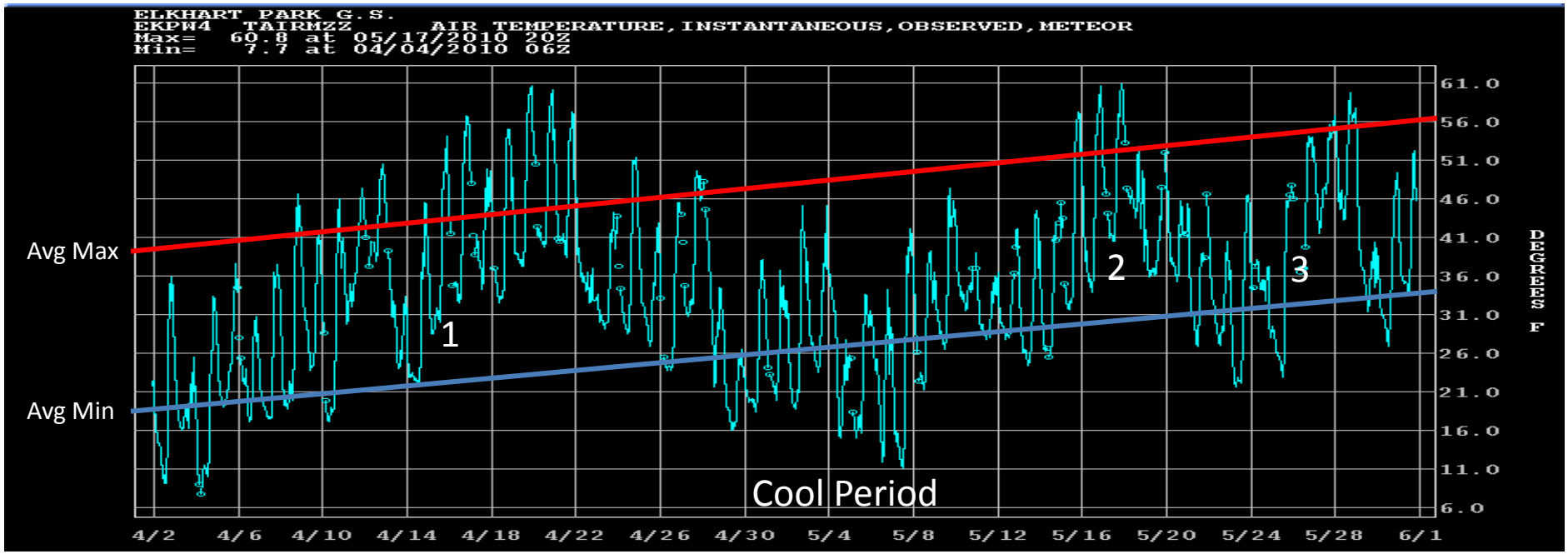
(Averaged by Hydrologic Unit)

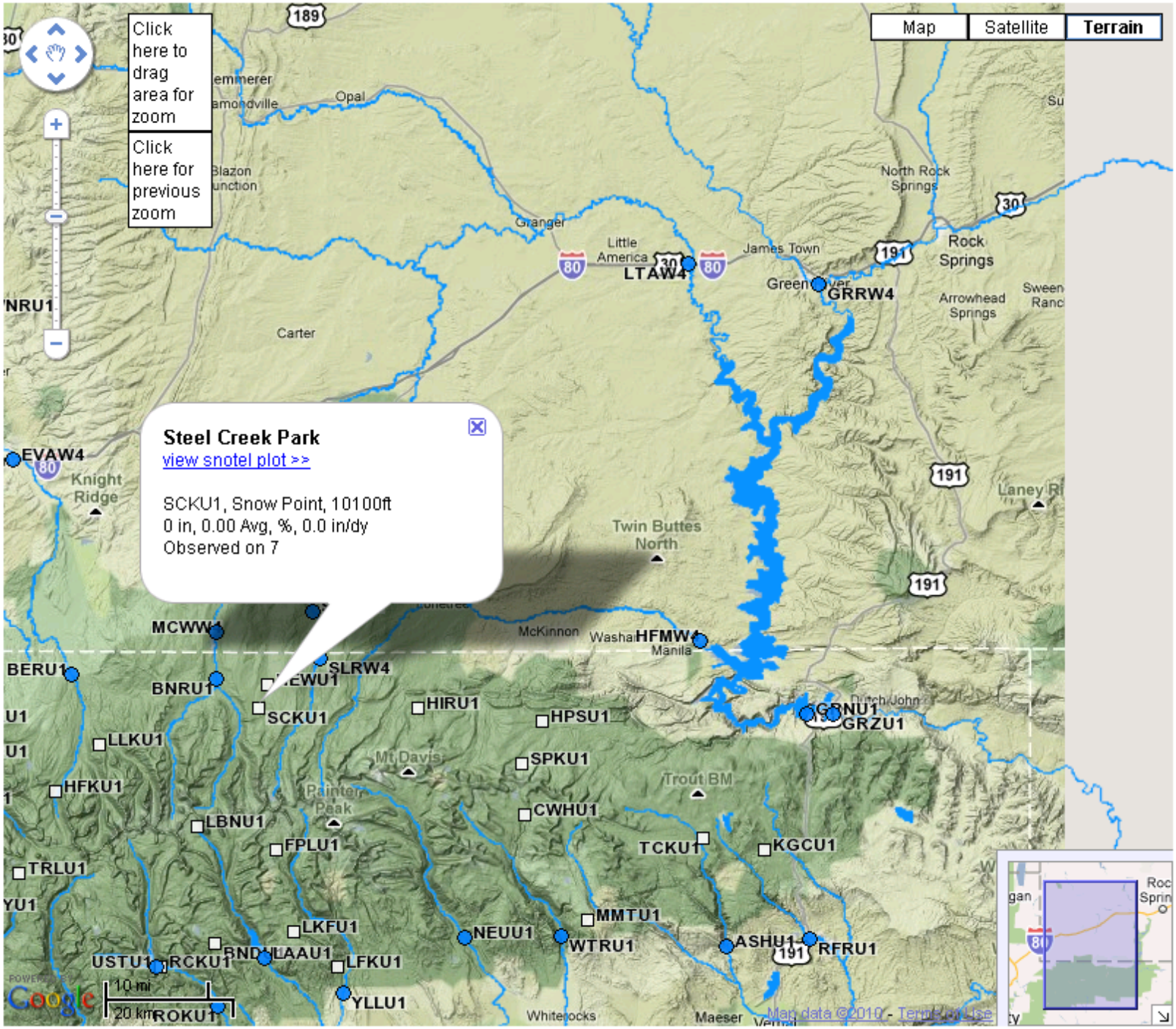


Prepared by
NOAA, National Weather Service
Colorado Basin River Forecast Center
Salt Lake City, Utah
www.cbrfc.noaa.gov

Above Fontenelle Reservoir







Overlays
- [x] Rivers
- [x] RFC
- [ ] Basins
- [x] Active Basins
- [ ] Grids (Precip etc.)

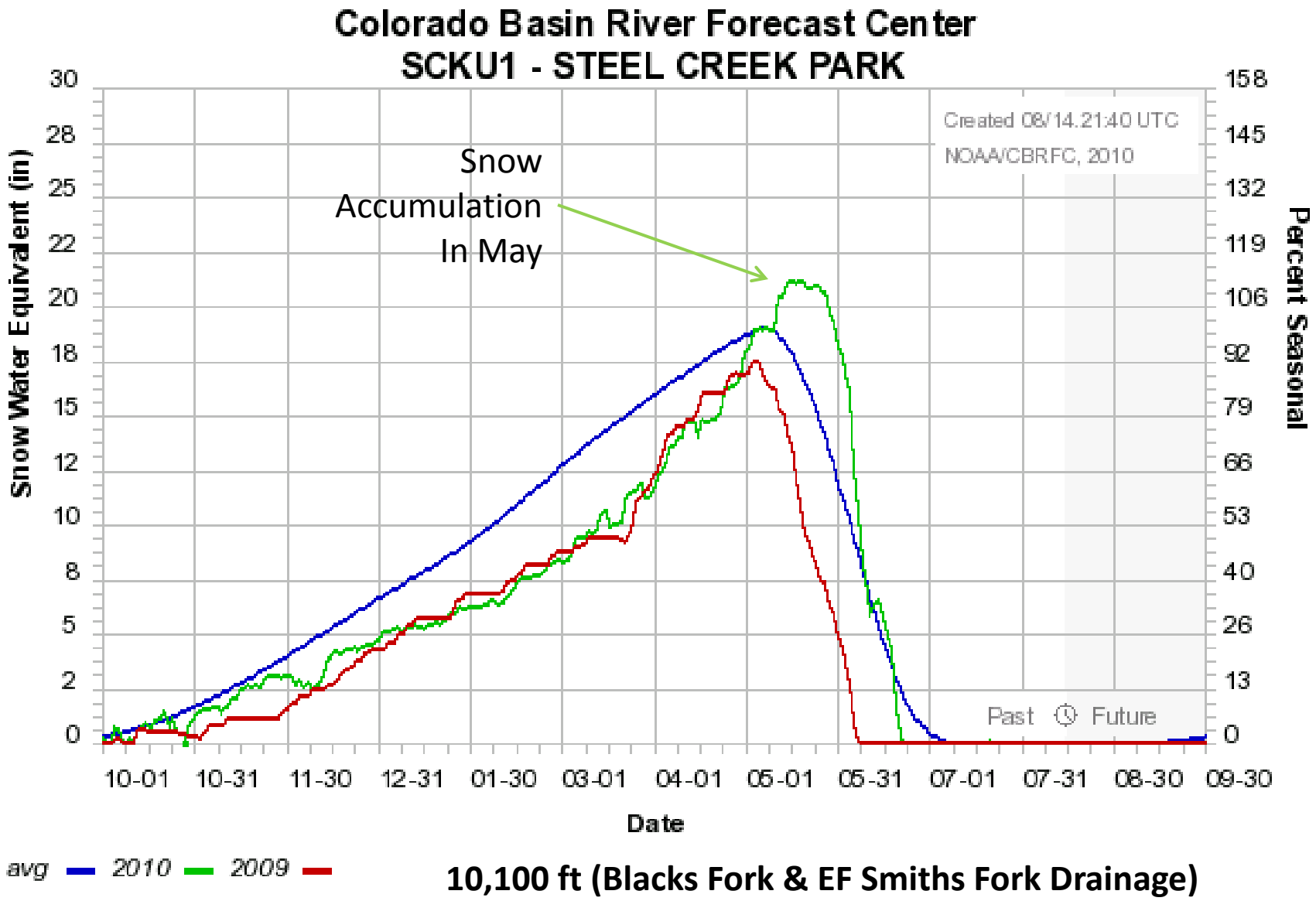
Display Options
- [x] Show NWS ID
- [ ] Show Data

River Point Condition
- No Data
- Normal
- Significant Rise
- Near Bankfull
- Above Bankfull
- Above Flood Stage
- Outlook (> 3 days)

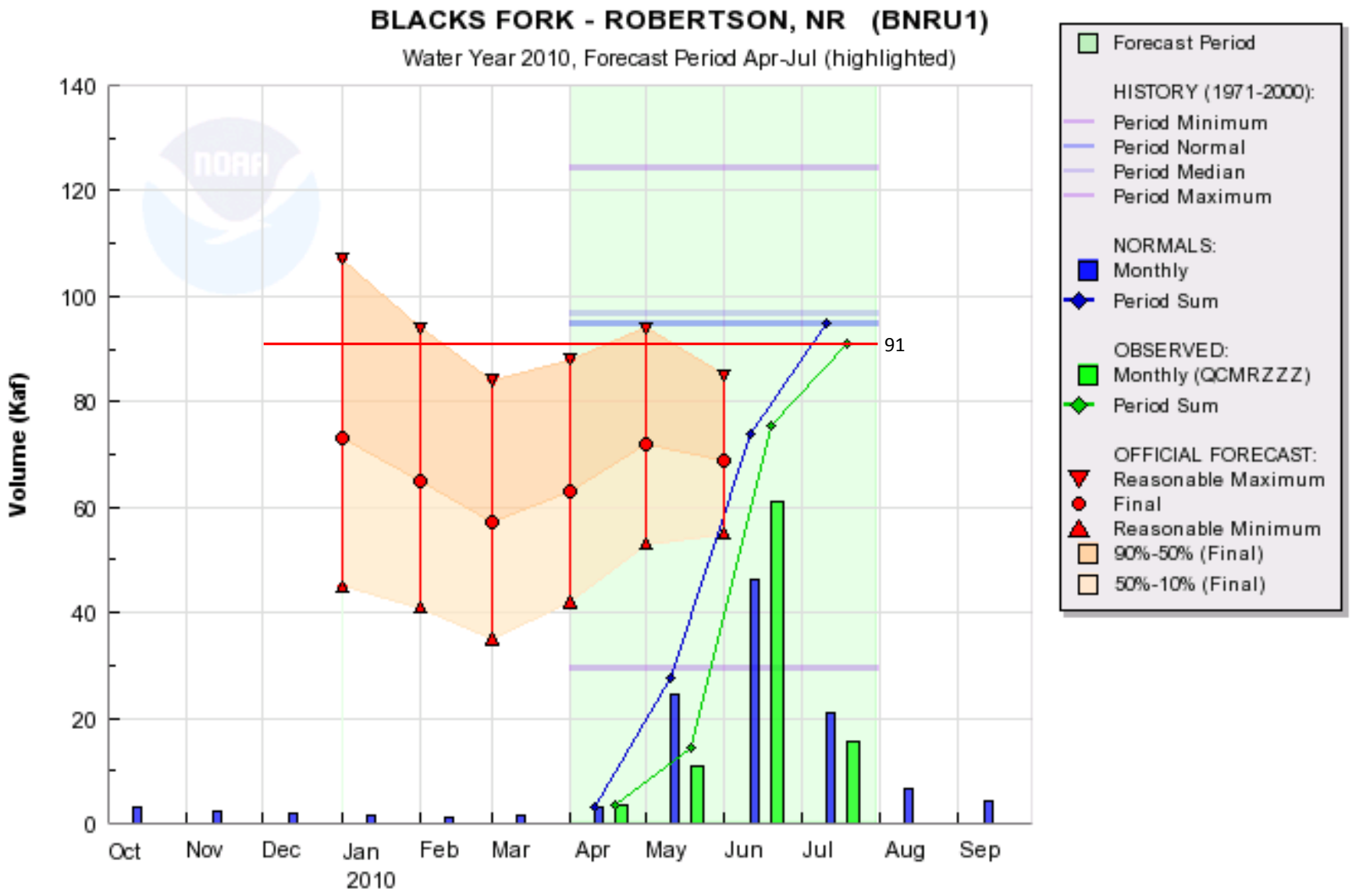
River Point Options
- [ ] All
- [ ] Data Points
- [x] Forecast Points
- [x] Reservoir Points
- [x] Active Points

Snow Point %Avg SWE
- No Data
- < 25
- 25-50
- 50-75
- 75-90
- 90-110
- 110-125
- 125-150
- 150-175
- >175

Snow Point Options
- [ ] All
- [x] < 7000
- [x] 7000-8000



10,100 ft (Blacks Fork & EF Smiths Fork Drainage)



No data before 2009-10-01

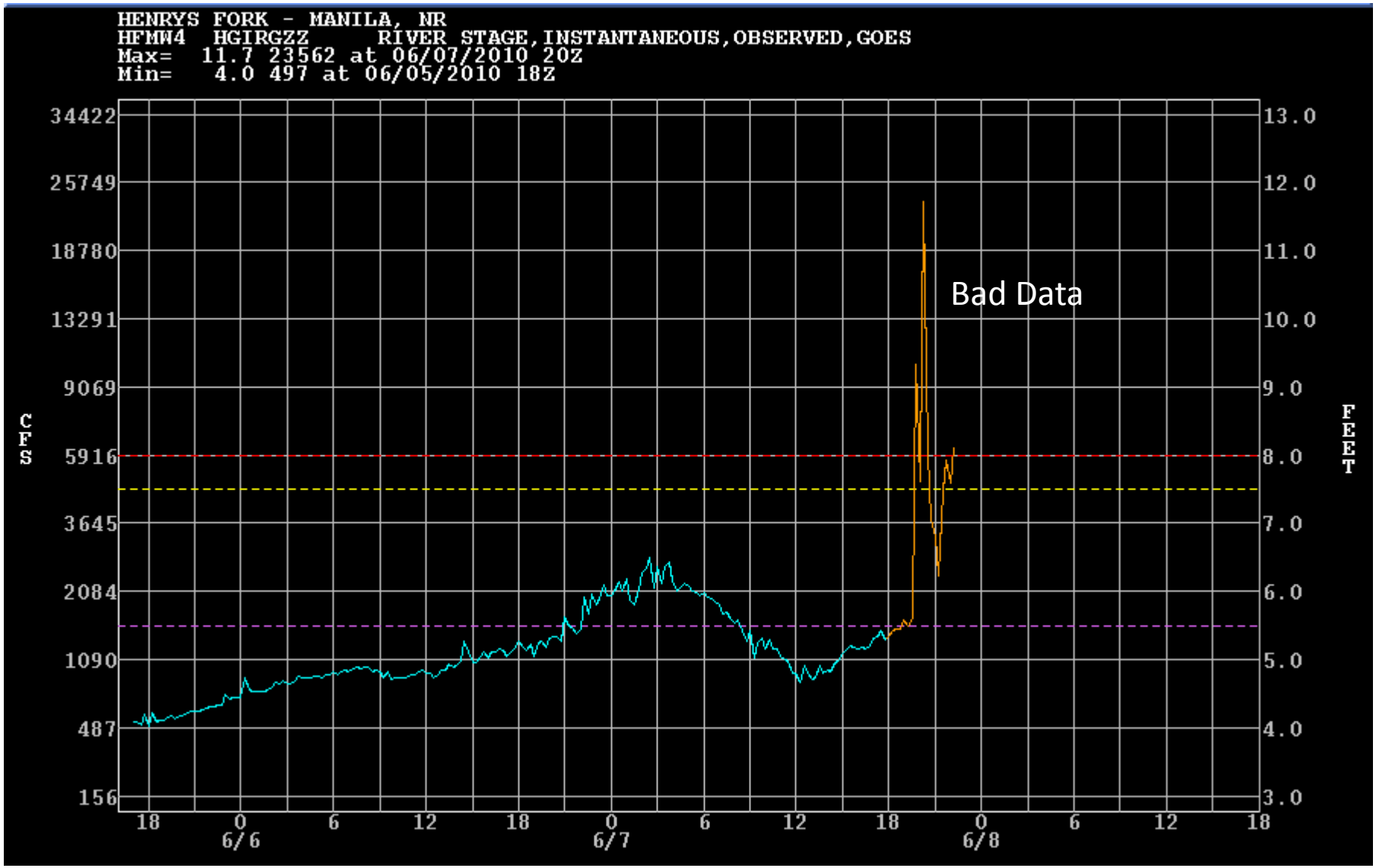
CBRFC/NWS/NOAA 08/15/10 19:28:18 UTC

River gage/rain gage site along Henrys Fork <u>before</u> the flood waters swallowed up the site.

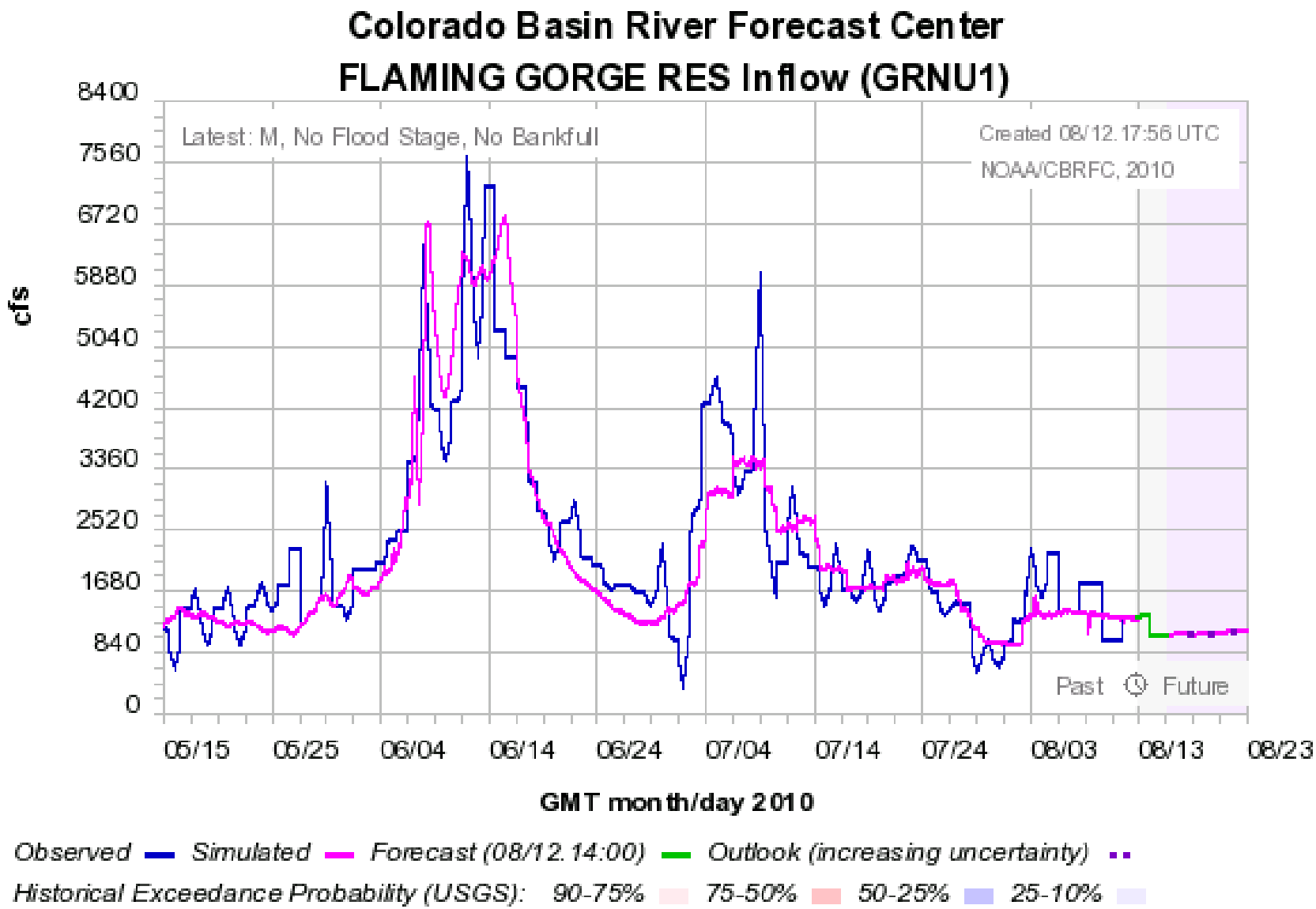
Jim Fahey
Wyoming NOAA hydrologist
Riverton, Wy
857-3898 ext 493

River gage/rain gage site along the Henrys Fork <u>after</u> flood waters swallowed up the site--Gone!!!

Jim Fahey
Wyoming NOAA hydrologist
Riverton, Wy
857-3898 ext 493


HENRYS FORK - MANILA, NR
HFMW4 HGIRGZZ RIVER STAGE,INSTANTANEOUS,OBSERVED,GOES
Max= 11.7 23562 at 06/07/2010 20Z
Min= 4.0 497 at 06/05/2010 18Z
Bad Data
CFS
34422
25749
18780
13291
9069
5916
3645
2084
1090
487
156
FEET
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
18
0
6/6
6
12
18
0
6/7
6
12
18
0
6/8
6
12
18

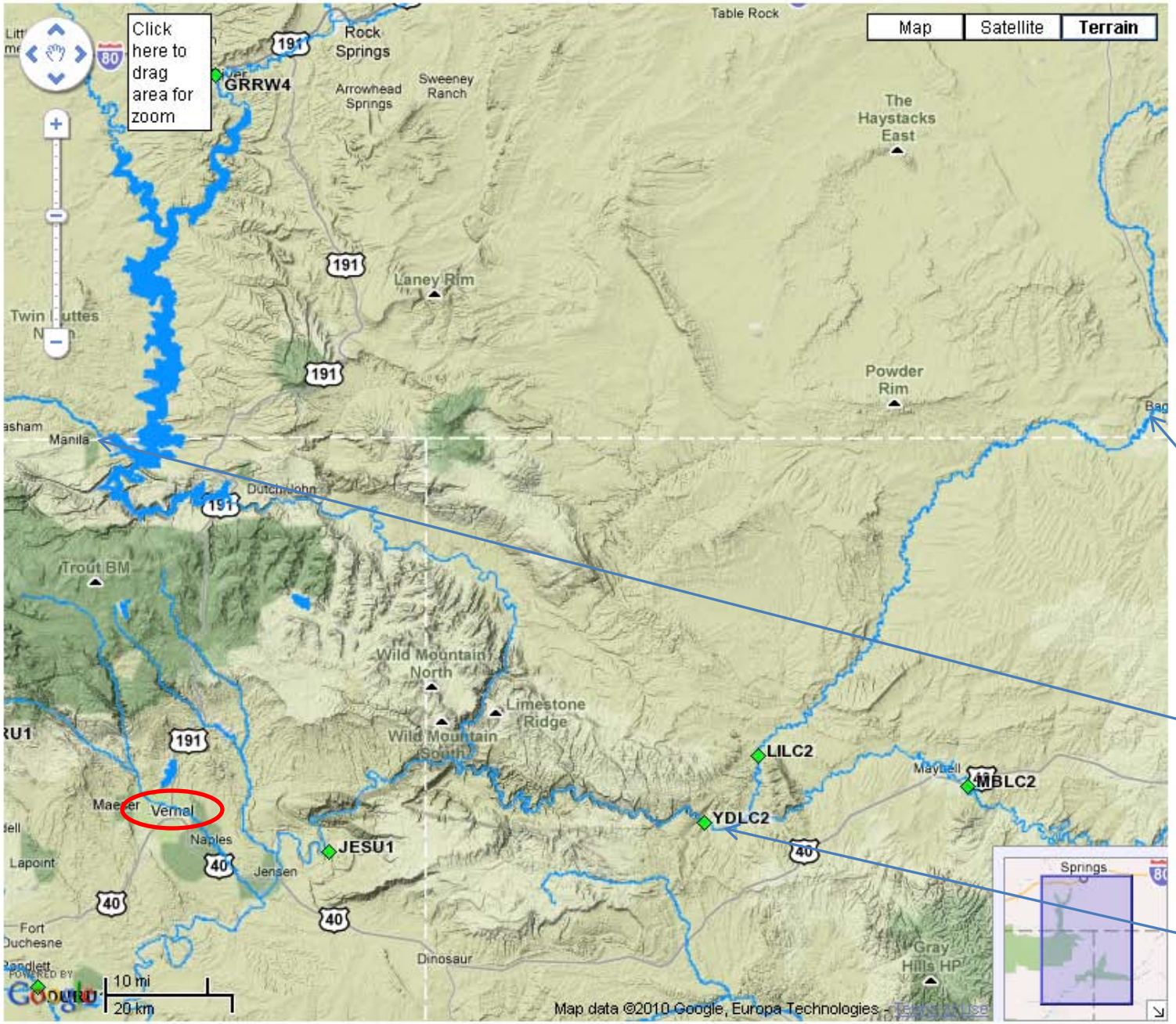
Flaming Gorge Daily Forecasts Verification



CBRFC Conditions Search Points

☐ River ☐ Snow ☐ Water Supply ☑ Peaks

small map



Overlays
- ☑ Rivers
- ☑ RFC
- ☐ Basins
- ☑ Active Basins
- ☐ Grids (Precip etc.)

Display Options
- ☑ Show NWS ID
- ☐ Show Data

Peak Point Flood Probability
- <10
- >10
- >25
- >50

Peak Point Options
- ☐ All
- ☑ <10
- ☑ >10
- ☑ >25
- ☑ >50

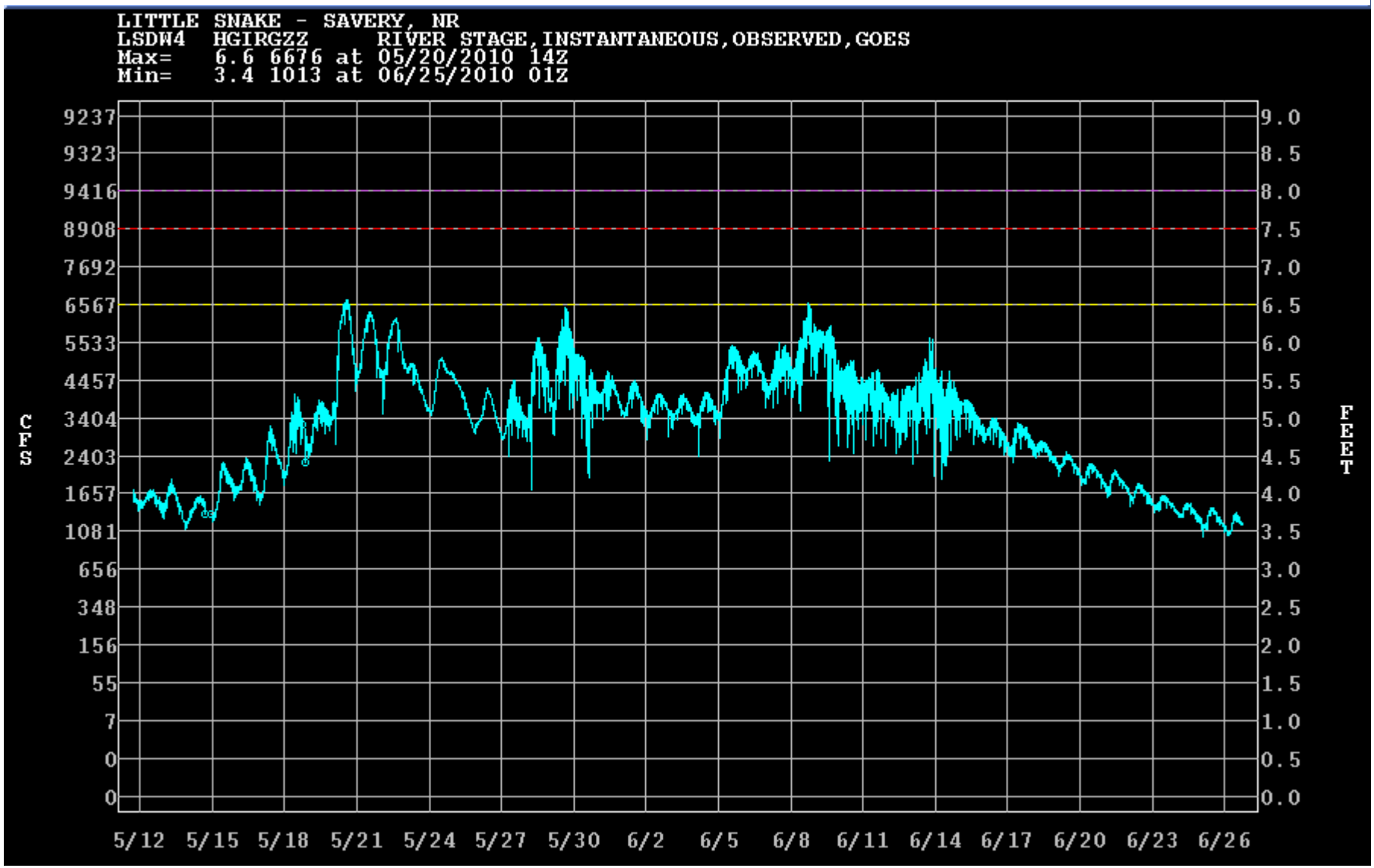
Baggs

Manila

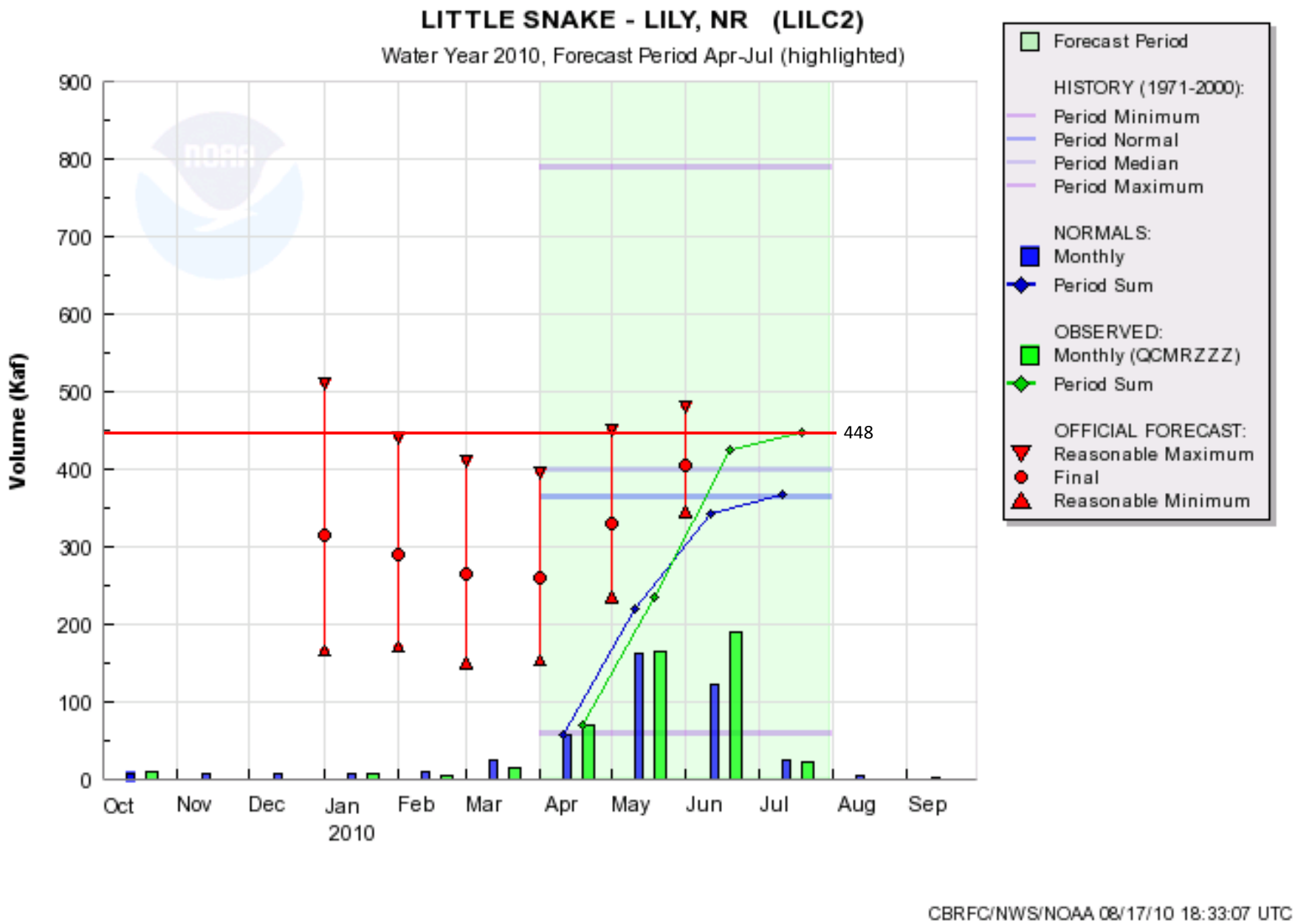
Deerlodge Park (Peak Flow)

Looking upstream along left bank --Little Snake River at Baggs (WYDOT Hwy Bridge) – out of bank flow occurred on 05/20/2010.

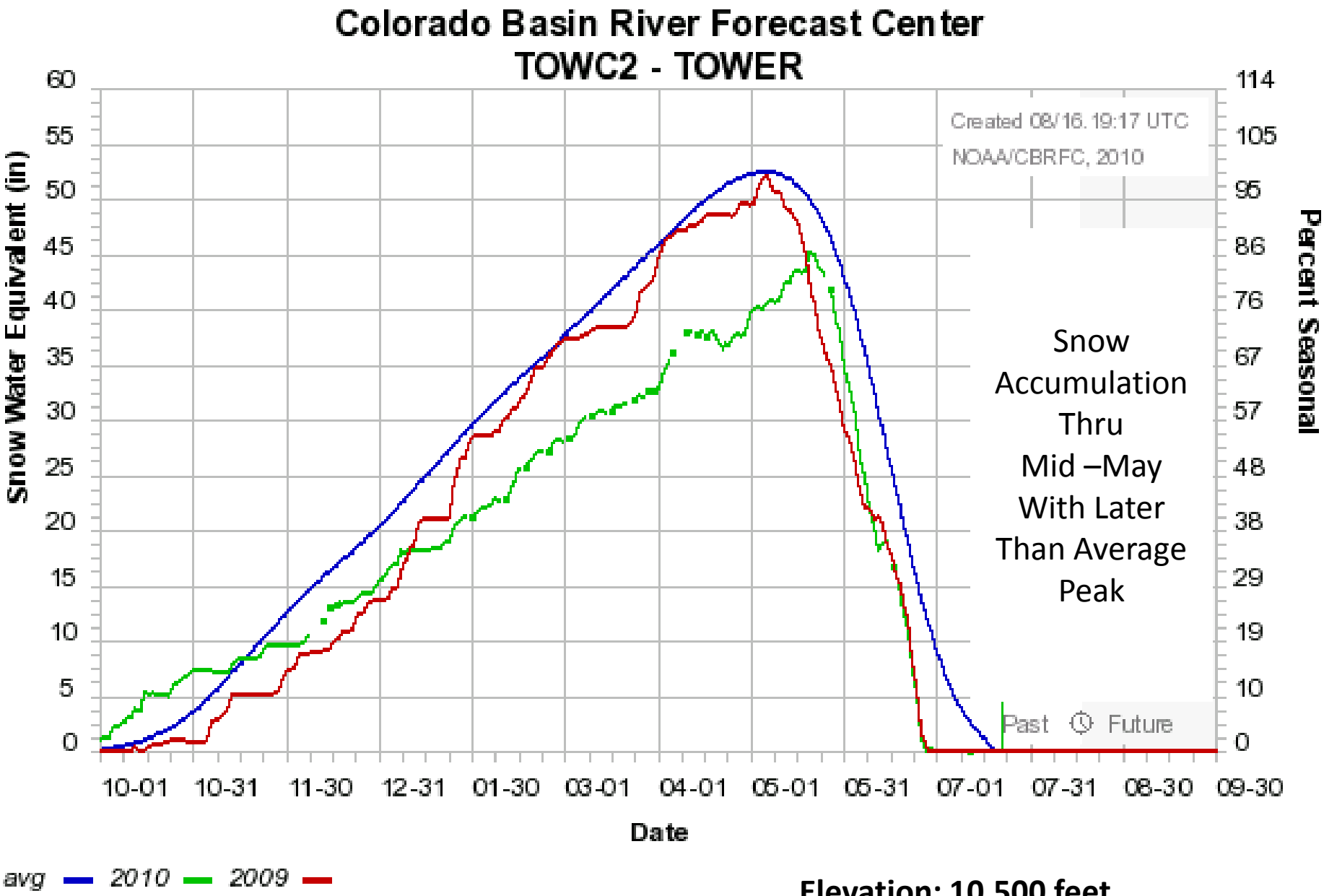
Jim Fahey
Wyoming NOAA hydrologist
Riverton, Wy
857-3898 ext 493



Gage upstream of Baggs.



May Near Average Flow and June Above Average Flow .



Elevation: 10,500 feet

Colorado Basin River Forecast Center (CBRFC) - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.cbrfc.noaa.gov/

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Colorado Basin River Forecast Center

weather.gov

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AHPS

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Webcat
DamBreak

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Snow
Snow Groups
Precipitation
Temperature
Freezing Level
Soil Moisture
Radar
Satellite

Water Supply
Map
Current Publication
Weekly ESP
Weekly ESP Sandbox
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Documentation
Westwide
Precipitation
Temperature
Soil Moisture
Verification
Western Water Supply
Maps

News: CBRFC Open House Aug 18

CBRFC Conditions

Search Points

☐ River ☐ Snow ☐ Water Supply ☑ Peaks

05/07/2010 (14000/11100/8900)

big map

Show: Point Groups
Find: All Points
Find points in state: AZ, CO, ID, NV, NM, UT, WY

All Points

60 Peak Points Found:
Data from Fri, 07 May 2010 15:19:50 -0600

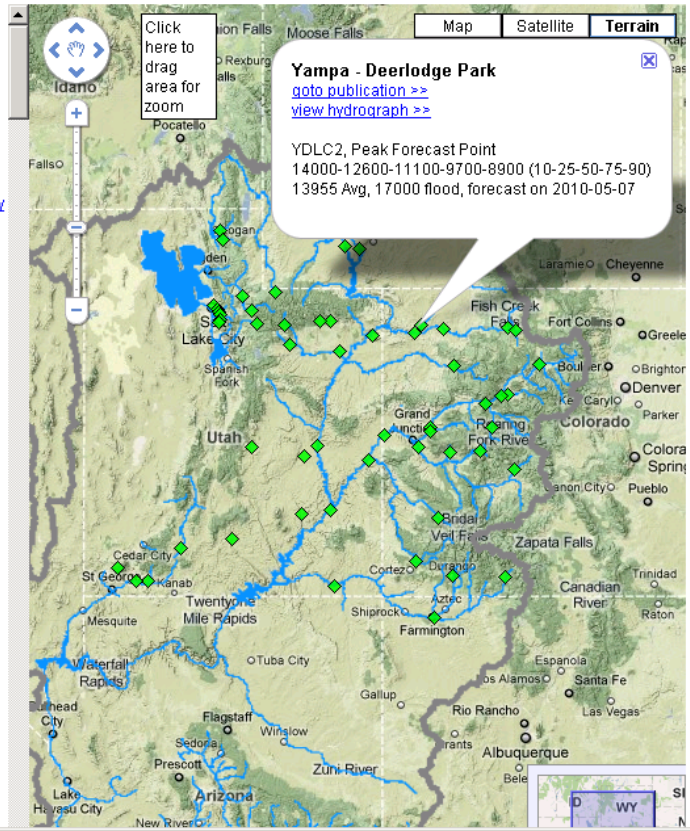
◆ **Animas - Durango** - zoom to point - find nearby points - goto publication >> - view hydrograph >>
DRGC2, Peak Forecast Point
4300-3900-3500-3100-2800 (10-25-50-75-90)
4675 Avg, 9560 flood, forecast on 2010-05-07

◆ **Animas - Farmington** - zoom to point - find nearby points - goto publication >> - view hydrograph >>
ARFN5, Peak Forecast Point
4500-4000-3600-3100-2700 (10-25-50-75-90)
4900 Avg, 8810 flood, forecast on 2010-05-07

◆ **Bear - Utah-wyoming State Line Nr** - zoom to point - find nearby points - goto publication >> - view hydrograph >>
BERU1, Peak Forecast Point
1700-1500-1300-1150-1050 (10-25-50-75-90)
1610 Avg, 4390 flood, forecast on 2010-05-06

◆ **Big Cottonwood Ck - Salt Lake City Nr** - zoom to point - find nearby points - goto publication >> - view hydrograph >>
BCTU1, Peak Forecast Point
310-280-250-230-210 (10-25-50-75-90)
430 Avg, 800 flood, forecast on 2010-05-06

◆ **Big Sandy - Farson Nr** - zoom to point - find nearby points - goto publication >> - view hydrograph >>
BSRW4, Peak Forecast Point
0-0-0-0-0 (10-25-50-75-90)



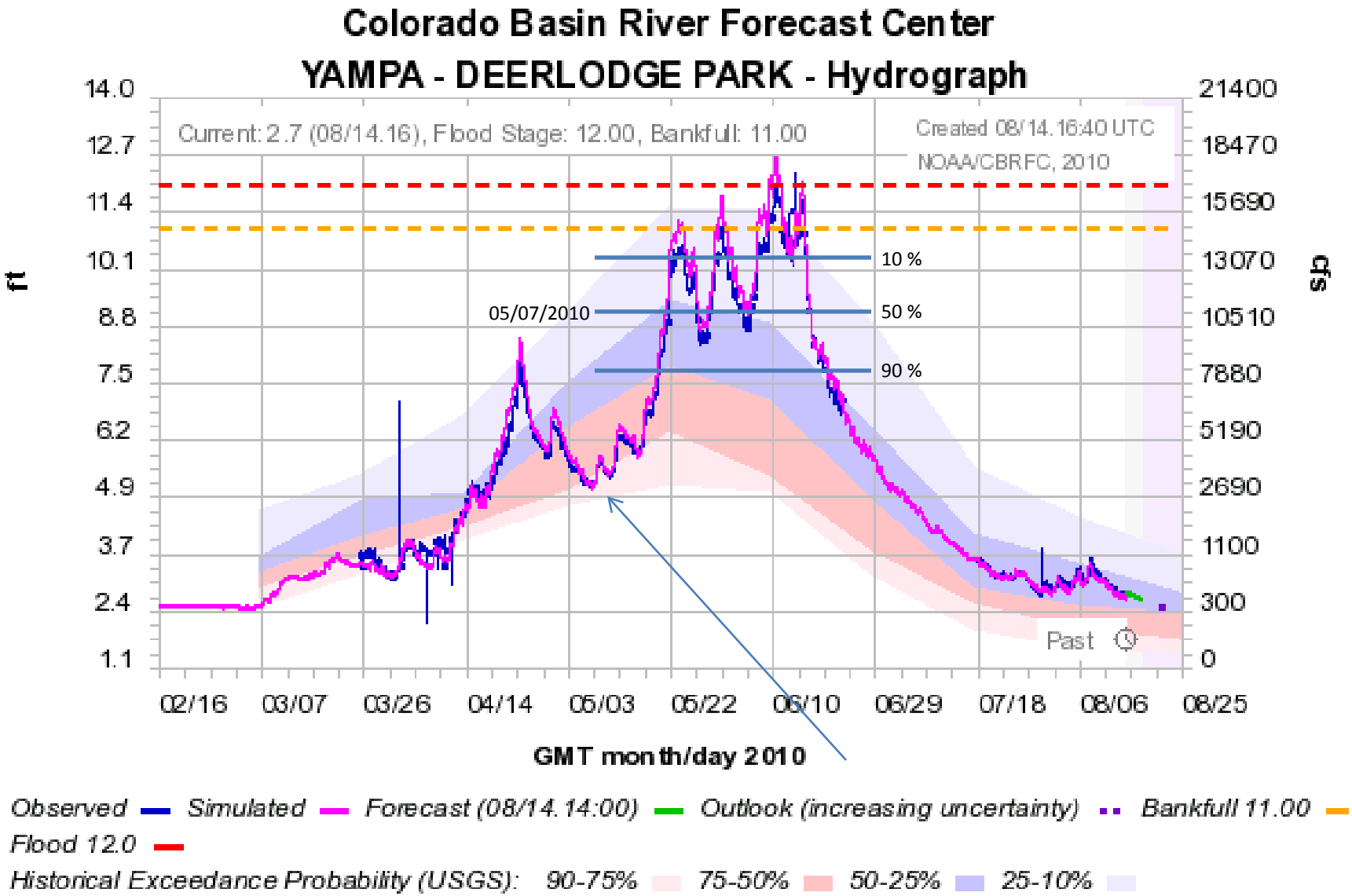
Overlays
☑ Rivers
☑ RFC
☐ Basins
☑ Active Basins
☐ Grids (Precip etc.)

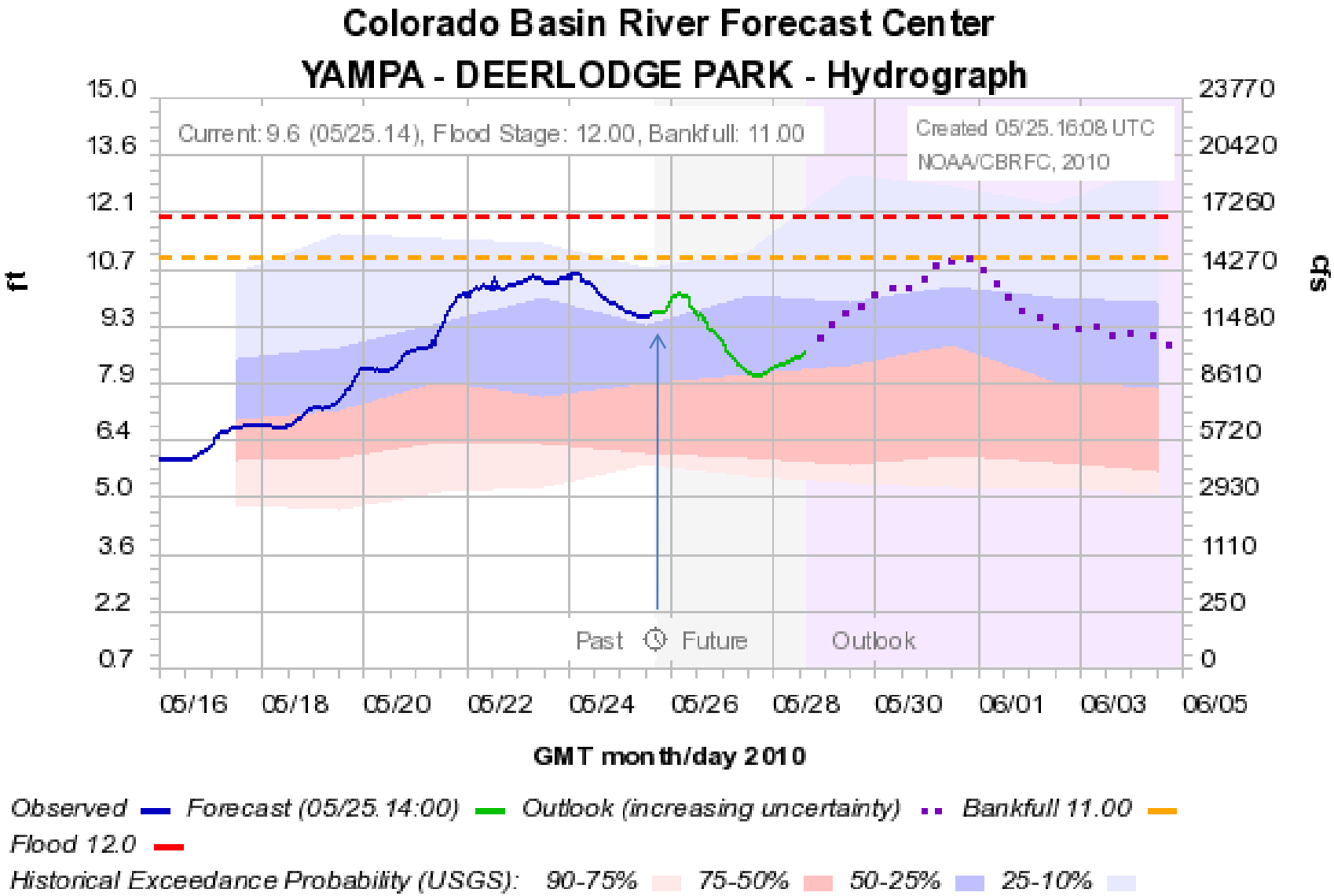
Display Options
☐ Show NWS ID
☐ Show Data

Peak Point Flood Probablity
◆ <10
◆ >10
◆ >25
◆ >50

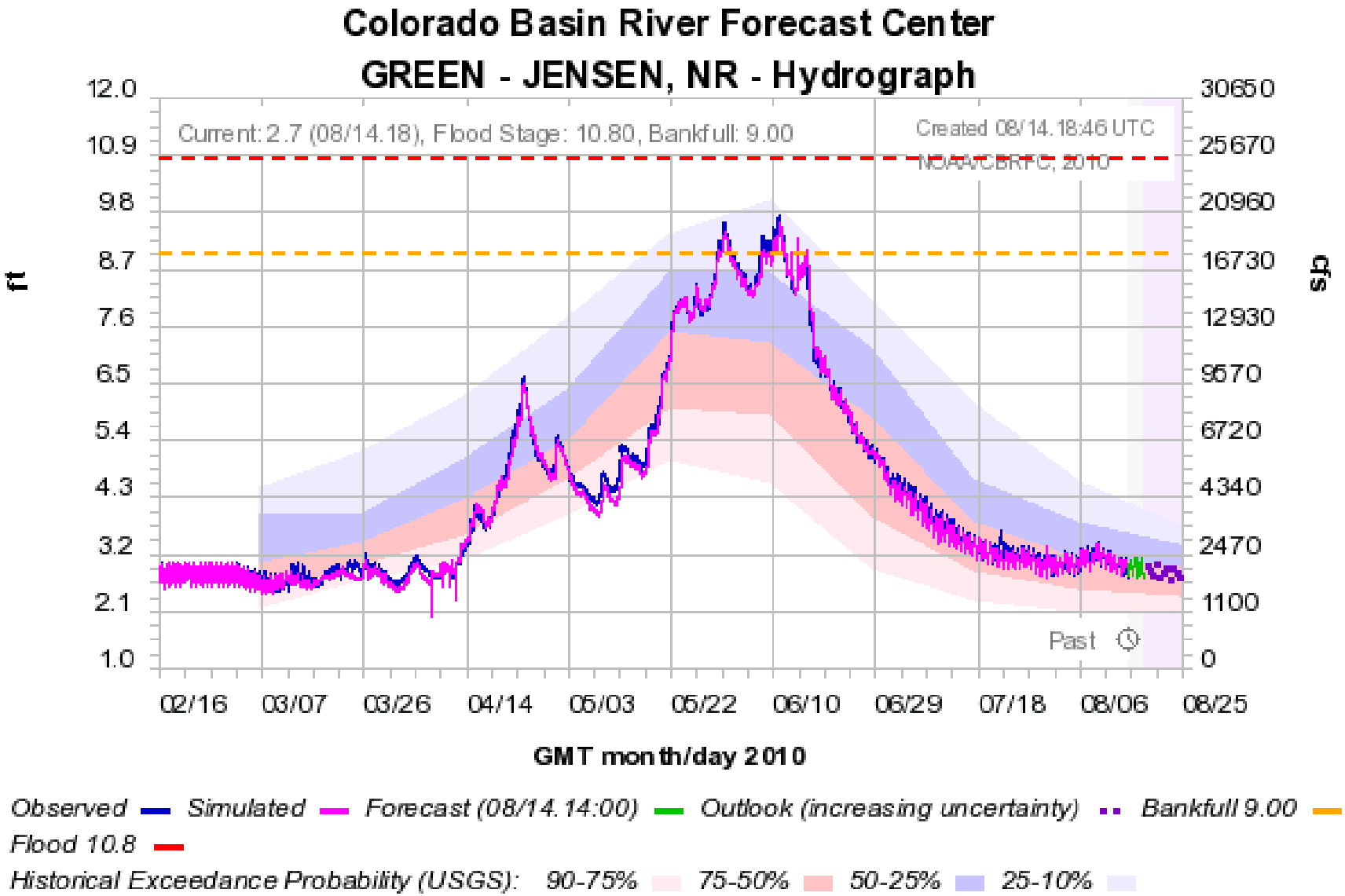
Peak Point Options
☐ All
☑ <10
☑ >10
☑ >25
☑ >50

Done


Colorado Basin River Forecast Center
YAMPA - DEERLODGE PARK - Hydrograph
Current: 2.7 (08/14.16), Flood Stage: 12.00, Bankfull: 11.00
Created 08/14.16:40 UTC
NOAA/CBRFC, 2010
ft
cfs
14.0
12.7
11.4
10.1
8.8
7.5
6.2
4.9
3.7
2.4
1.1
21400
18470
15690
13070
10510
7880
5190
2690
1100
300
0
10 %
50 %
90 %
05/07/2010
Past
02/16
03/07
03/26
04/14
05/03
05/22
06/10
06/29
07/18
08/06
08/25
GMT month/day 2010
Observed
Simulated
Forecast (08/14.14:00)
Outlook (increasing uncertainty)
Bankfull 11.00
Flood 12.0
Historical Exceedance Probability (USGS):
90-75%
75-50%
50-25%
25-10%



On 05/25/2010 had already had one peak and was forecasting a second.


Colorado Basin River Forecast Center
GREEN - JENSEN, NR - Hydrograph
Current: 2.7 (08/14.18), Flood Stage: 10.80, Bankfull: 9.00
Created 08/14.18:46 UTC
NOAA/CBRFC, 2010
ft
cfs
12.0
10.9
9.8
8.7
7.6
6.5
5.4
4.3
3.2
2.1
1.0
30650
25670
20960
16730
12930
9570
6720
4340
2470
1100
0
Past
02/16
03/07
03/26
04/14
05/03
05/22
06/10
06/29
07/18
08/06
08/25
GMT month/day 2010
Observed
Simulated
Forecast (08/14.14:00)
Outlook (increasing uncertainty)
Bankfull 9.00
Flood 10.8
Historical Exceedance Probability (USGS): 90-75% 75-50% 50-25% 25-10%

2010 Water Supply Forecast Summary

- It was a much below average SWE year (seasonal peak 62% of average)
- With cooler temperatures from end of April thru mid-May
- And above average precipitation (April, May, and June) during the runoff period. And local precipitation near average in July
- Henrys Fork Gage destroyed in early June
- Measured snow gone by June 25th below 10,000 feet
- Forecasts began on January 1st at 9% above observed (observed within MAE of January forecast)
- Forecasts fell to 36% below observed on April 1st (observed within MAE of April forecast) at that time seasonal conditions were dry
- Forecasts then rose during runoff period as above average precipitation occurred during runoff period
- 2010 April-July runoff volume (706 kaf) was 59% of average
- 2010 April-July Flaming Gorge unregulated (100%) = Fontenelle (70%) + Local (30%) -- includes Big Sandy & Blacks Fork & Henrys Fork
- High daily runoff from Uintas, however, overall it was still a dry year.

Bill Reed

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www.cbrfc.noaa.gov