

# CBRFC

## Peak Flow Forecast Webinar

**Presentation are available at:**

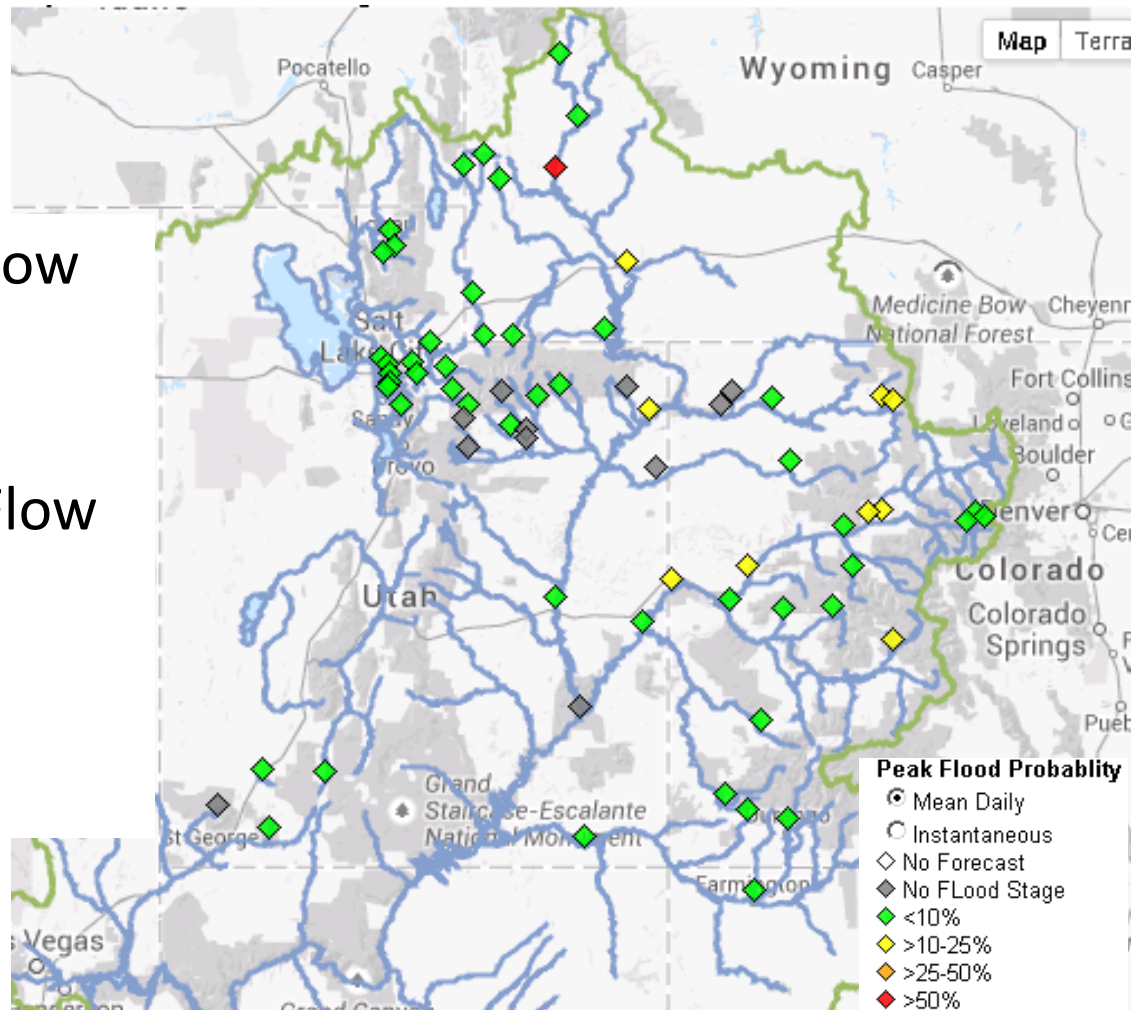
**[www.cbrfc.noaa.gov/present/present2014.cgi](http://www.cbrfc.noaa.gov/present/present2014.cgi)**

**April 9th, 2014**

**Greg Smith & Ashley Nielson**

# Today's Presentation

- What is a Peak Flow and How to Interpret the Graphics
- Current Soil and Snow Situation Impacting Peak Flow Forecasts
- Peak Flow Forecasts
- Spring Weather Impacts / Weather Forecast

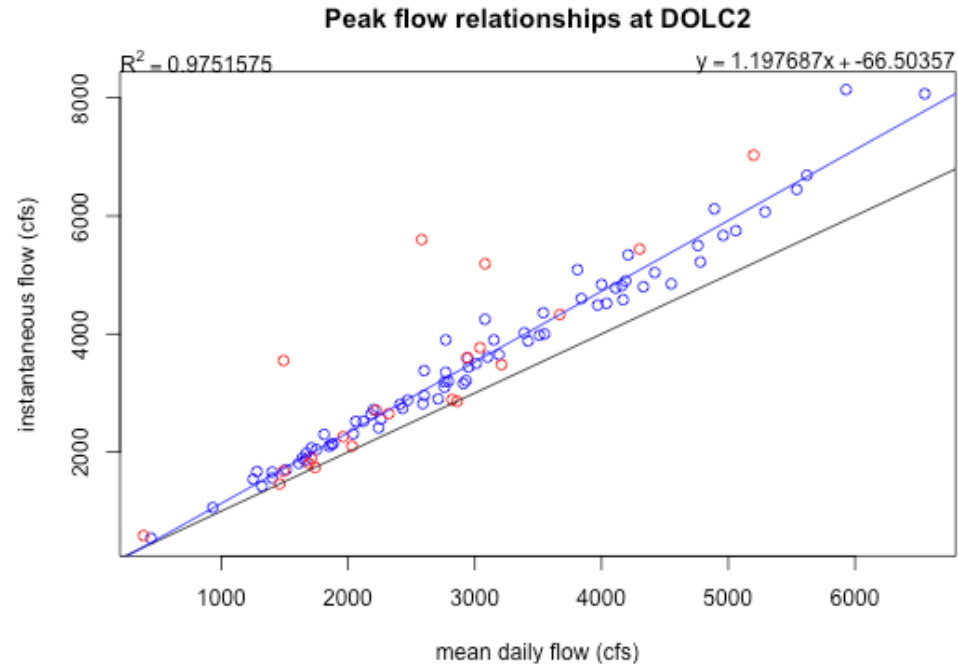


# What is a Peak Flow Forecast?

- Maximum Mean Daily Flow due to snowmelt
  - April-July Period
- Probabilistic Forecasts
  - Exceedence Probabilities -10%, 25%, 50%, 75%, 90%
- Regulated flow - accounting for reservoirs and diversions
  - Planned operations if known
  - Assumptions based on past operations
- Only forecast magnitude of peak not time of peak
- ~70 forecast points
- Will issue twice a month this year

# Instantaneous Peak Flow Forecasts

- Based on the observed relationship between maximum mean daily flow and maximum instantaneous flow.
- Only calculated for sites where there is a good correlation between the two.
  - Sites where heavy rains can cause sudden, large peaks generally do not have a good relationship.



Dolores River @ Dolores, CO

# Where to Find Peak Flow Forecasts

- Map:
  - <http://www.cbrfc.noaa.gov/gmap/gmapbeta.php?interface=peak>
- List:
  - <http://www.cbrfc.noaa.gov/rmap/peak/peaklist.php>



# COLORADO BASIN RIVER FORECAST CENTER

NATIONAL WEATHER SERVICE / NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

- HOME
- RIVERS**
- SNOW
- WATER SUPPLY
- RESERVOIRS
- WEATHER
- CLIMATE
- HELP
- OFFICE
- LINKS
- SEARCH

News Next CBRFC Webinar March 11 - Spring Peak Flows [Read More...](#)

## River Conditions

Data Queried: Mon, 10 Mar 2014 07:30:01 -0600

[Help](#), [Double Click Map to Zoom](#), Lat: 37.6 Lng: -110.5, Zoom: 6



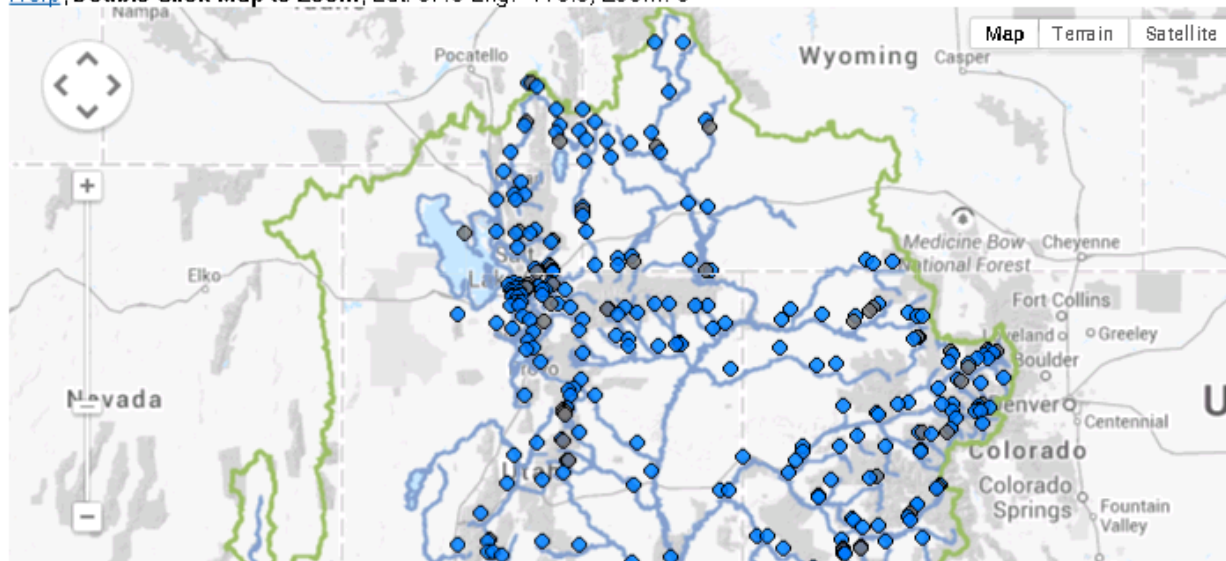
### Forecast Group

### Overlays

- Rivers
- RFC Boundary
- Forecast Groups
- Basins

### River Points

- All
- Data
- Forecast



### HOME

- CBRFC
- National Weather Service
- National Oceanic and Atmospheric Administration
- Department of Commerce

### RIVERS

- Conditions Map
- Conditions List
- Peak Flow Map**
- Peak Flow List
- Peak Flow Archive
- Recreational Forecasts
- Text Products
- 5 Day Flood Outlook
- Hydro Data
- AHPS

### SNOW

- Conditions Map
- Conditions List
- SnowGroups

### WATER SUPPLY

- Forecast Map
- Forecast List
- Discussion
- Publication
- Publication Archive
- Specific Site Archive
- Daily ESP
- Text Outlooks
- Documentation
- Precipitation
- Temperature
- Soil Moisture
- Internal Tools

### RESERVOIRS

- Conditions List
- Damcrit
- Webcat
- DamBreak

### WEATHER

- Forecast
- Observed
- Text Products
- Radar
- Satellite
- Legacy

### CLIMATE

- Hydroclimatology
- Climate Change
- Data and Indices
- Forecasts
- El Nino and MJO

### HELP

- General
- Water Supply Forecasts
- Peak Forecasts

### OFFICE

- News
- Email Updates
- Information
- Contact Us
- Papers and Presentations
- Podcasts
- Downloads

### LINKS

- NWS Offices
- Other Links
- Wiki
- Links
- Schedule
- Old SDM



# COLORADO BASIN RIVER FORECAST CENTER

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## News

Next CBRFC Webinar March 11 - Spring Peak Flows [Read More...](#)

### Peak Flow Forecasts Forecast Date: March 07 2014

[Help](#), [Double Click Map to Zoom](#), Lat: 37.6 Lng: -110.5, Zoom: 6

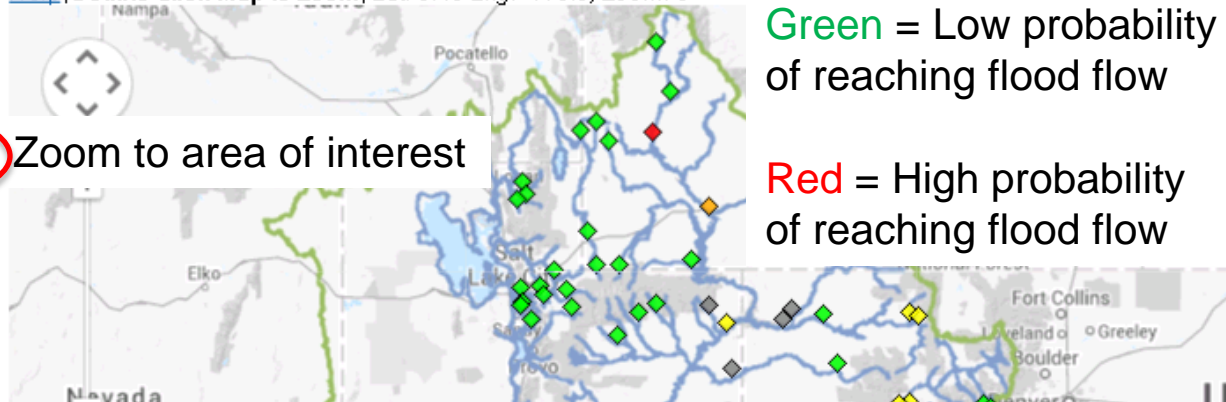

#### Forecast Group

#### Overlays

- Rivers
- RFC Boundary
- Forecast Groups
- Basins

#### Snow Sites

- All
- No Data
- No Average
- < 7000 ft
- 7000-8000 ft
- 8000-9000 ft
- 9000-10000 ft
- > 10000 ft



Zoom to area of interest

Hover over point to see name.  
Click on point to get graph.

Green = Low probability of reaching flood flow

Red = High probability of reaching flood flow

#### Peak Flood Probability

- Mean Daily
- Instantaneous
- No Forecast
- No Flood Stage
- <10%
- >10-25%
- >25-50%
- >50%

#### Snow

- Percentiles
- Percent Average
- Percent Median
- No Data
- < 25%
- 25-50%
- 50-75%
- 75-90%
- 90-110%
- 110-125%
- 125-150%
- 150-175%
- >175%



# Peak Flow Forecasts

Critical levels indicated in forecast distribution



|    | <i>ID</i>             | <i>River</i>       | <i>Flood Flow</i> | <i>PI</i> | <i>Mean Daily 90</i> | <i>Mean Daily 75</i> | <i>Mean Daily 50</i> | <i>Mean Daily 25</i> | <i>Mean Daily 10</i> | <i>Average Peak</i> | <i>Area</i>              |
|----|-----------------------|--------------------|-------------------|-----------|----------------------|----------------------|----------------------|----------------------|----------------------|---------------------|--------------------------|
| 1  | <a href="#">LABW4</a> | Green              | 11498             | ◆         | 9500                 | 11000                | <b>12500</b>         | 15000                | 16000                | 8000                | <a href="#">Green</a>    |
| 2  | <a href="#">JESU1</a> | Green              | 24138             | ◆         | 18000                | 19500                | <b>21000</b>         | 24000                | 27000                | 16990               | <a href="#">Green</a>    |
| 3  | <a href="#">GRRW4</a> | Green              | 11050             | ◆         | 8000                 | 9000                 | <b>10000</b>         | 11000                | 14000                | 5790                | <a href="#">Green</a>    |
| 4  | <a href="#">STMC2</a> | Yampa              | 5930              | ◆         | 3500                 | 4000                 | <b>4500</b>          | 5000                 | 6000                 | 3070                | <a href="#">Green</a>    |
| 5  | <a href="#">ENMC2</a> | Elk                | 5749              | ◆         | 3500                 | 4000                 | <b>5000</b>          | 5500                 | 6500                 | 3865                | <a href="#">Green</a>    |
| 6  | <a href="#">GPSC2</a> | Eagle              | 6530              | ◆         | 3200                 | 3600                 | <b>4400</b>          | 5200                 | 6800                 | 3600                | <a href="#">Colorado</a> |
| 7  | <a href="#">EGLC2</a> | Colorado           | 17000             | ◆         | 8900                 | 9500                 | <b>11500</b>         | 14500                | 20000                | 8700                | <a href="#">Colorado</a> |
| 8  | <a href="#">CAMC2</a> | Colorado           | 26000             | ◆         | 15000                | 17000                | <b>20000</b>         | 24000                | 33000                | 17000               | <a href="#">Colorado</a> |
| 9  | <a href="#">CCUC2</a> | Colorado           | 46200             | ◆         | 22000                | 25000                | <b>31000</b>         | 38000                | 50000                | 25500               | <a href="#">Colorado</a> |
| 10 | <a href="#">ALEC2</a> | East               | 3170              | ◆         | 1900                 | 2200                 | <b>2500</b>          | 2800                 | 3300                 | 2000                | <a href="#">Colorado</a> |
| 11 | <a href="#">WFDU1</a> | West Fork Duchesne | 721               | ◆         | 25                   | 50                   | <b>70</b>            | 90                   | 110                  | 185                 | <a href="#">Green</a>    |

## Peak Flood Probability Legend

◆ No Forecast   ◆ No Flood Stage   ◆ <10   ◆ >10   ◆ >25   ◆ >50

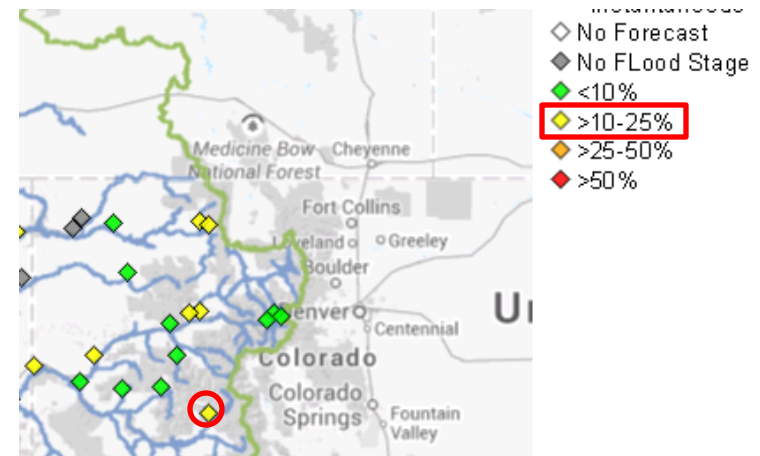


# Last month.....

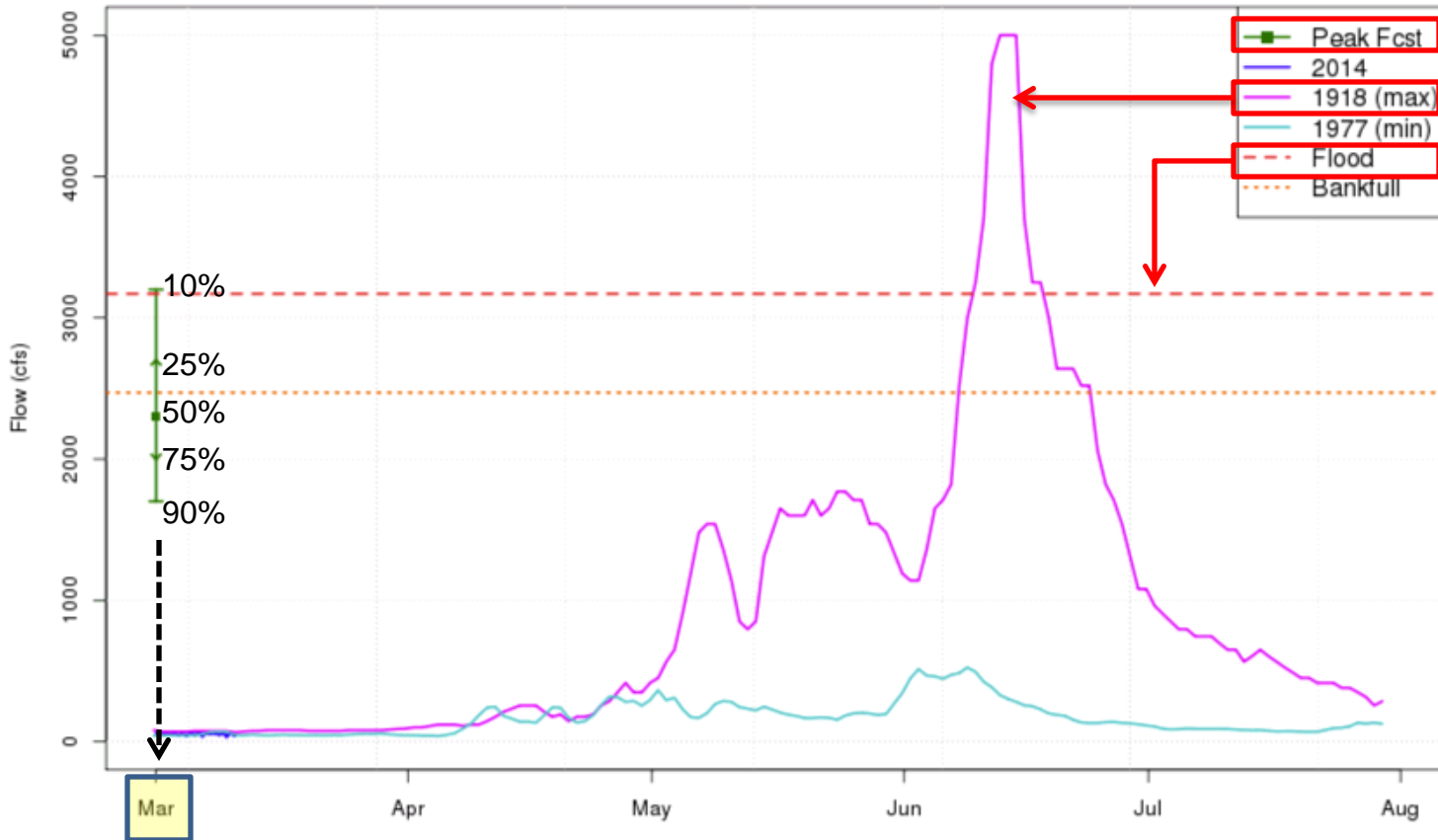
## ALEC2 Peak Flow Forecasts

Plot Forecasts Observations

Plot Options (on/off): Record Years Yearly Peaks Flood Flow



2014 Peak Flow Forecast  
East - Almont (ALEC2)



Issue Date

Plot Created 2014-03-10 13:17:49, CBRFC / NWS / NOAA  
Maximum peak of 5000 on 1918-06-13, Minimum peak of 524 on 1977-06-09  
Previous year data are Mean Daily (Daily).

# JESU1 Peak Flow Forecasts

Select to plot min and max year hydrographs

Plot Instantaneous Plot Forecasts  
Record Year Data Yearly Peaks

Select to plot all historical peaks

Max peak of record

Forecast Probabilities

- 10%
- 25%
- 50%
- 75%
- 90%

Minimum peak of record

Current year observed daily streamflow to date

Mar Apr  
Forecast Issuance Date

## 2014 Mean Daily Peak Flow Forecast Green - Jensen- Nr (JESU1)

- Normal Period
- Peak Fcst (19500 cfs)
- 2014
- Flood (24138 cfs)
- Bankfull (18078 cfs)
- Max (38500 cfs, 1984)
- Min (6970 cfs, 1989)

Flood Flow

Bankfull Flow

Normal time of peak



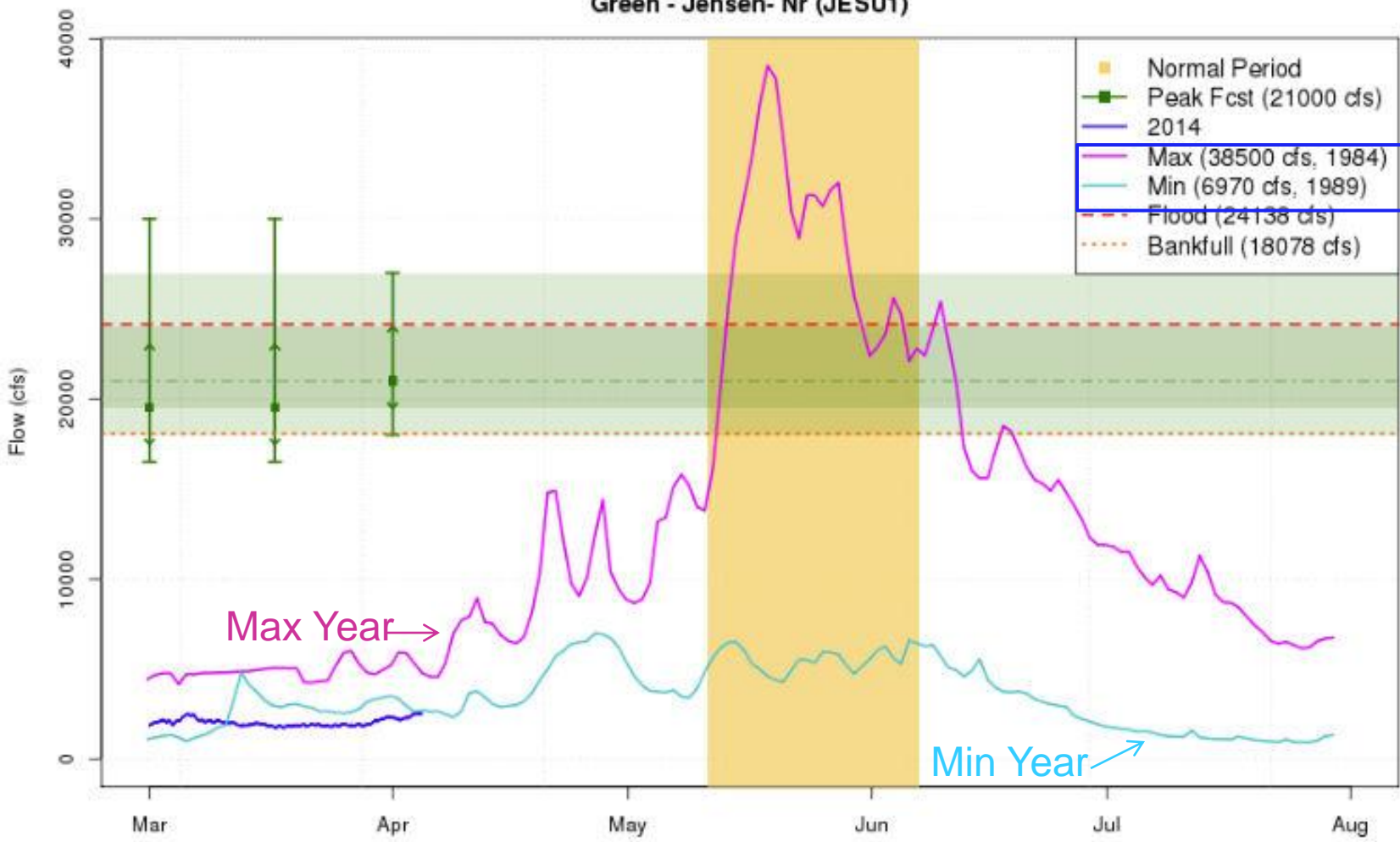
# JESU1 Peak Flow Forecasts

Select to plot min and max year hydrographs

Plot Instantaneous Plot Forecasts Observations

on/off Record Year Data Yearly Peaks Flood Flow

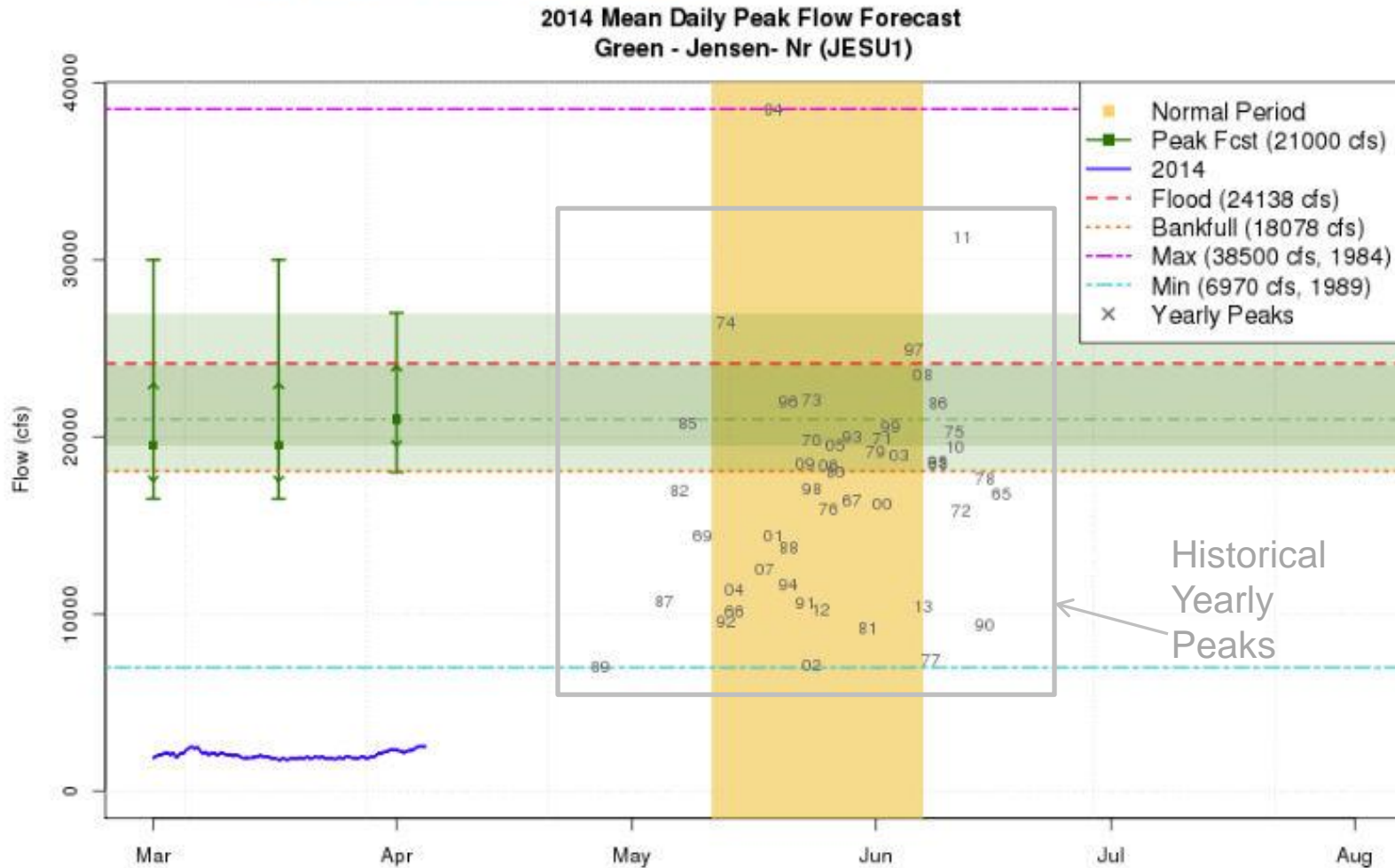
### 2014 Mean Daily Peak Flow Forecast Green - Jensen- Nr (JESU1)



## JESU1 Peak Flow Forecasts

Mean Daily Plot Instantaneous Plot Forecasts Ob  
Plot Options (on/off): Record Year Data Yearly Peaks Flood

Select to plot all historical peaks



Plot Created 2014-04-04 12:02:13, CBRFC / NWS / NOAA

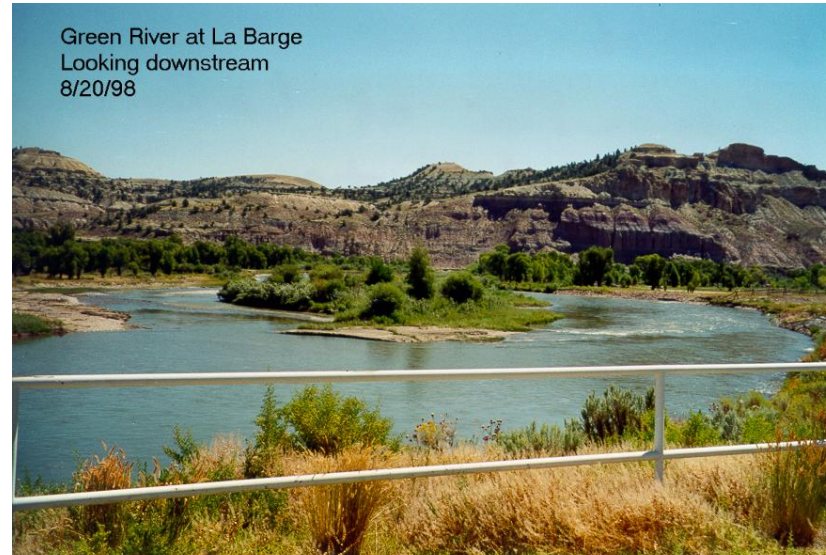
# Current Conditions



Green River at Warren Bridge near Daniel  
Looking downstream  
8/19/98

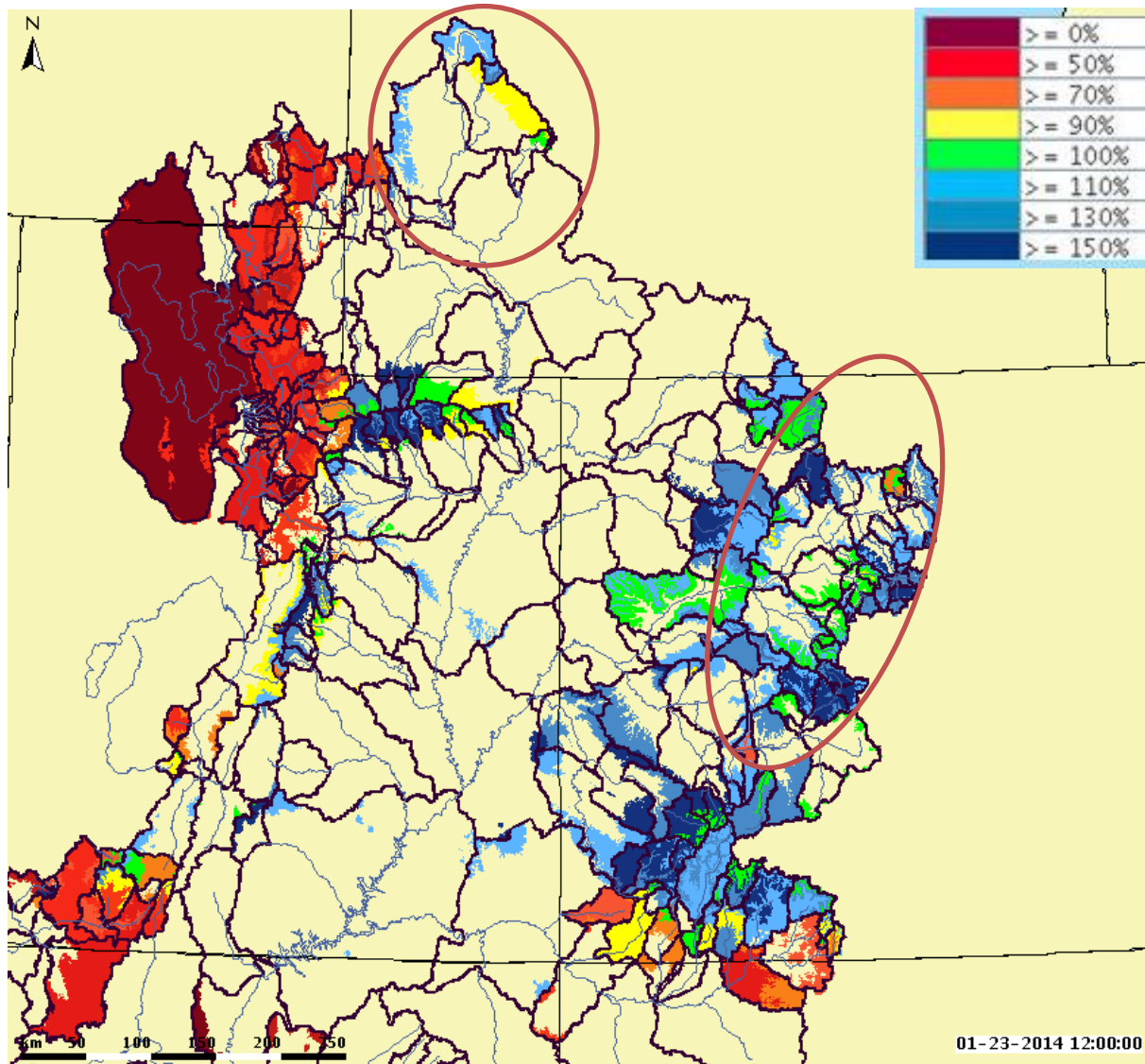


Green River at La Barge  
Looking downstream  
8/20/98

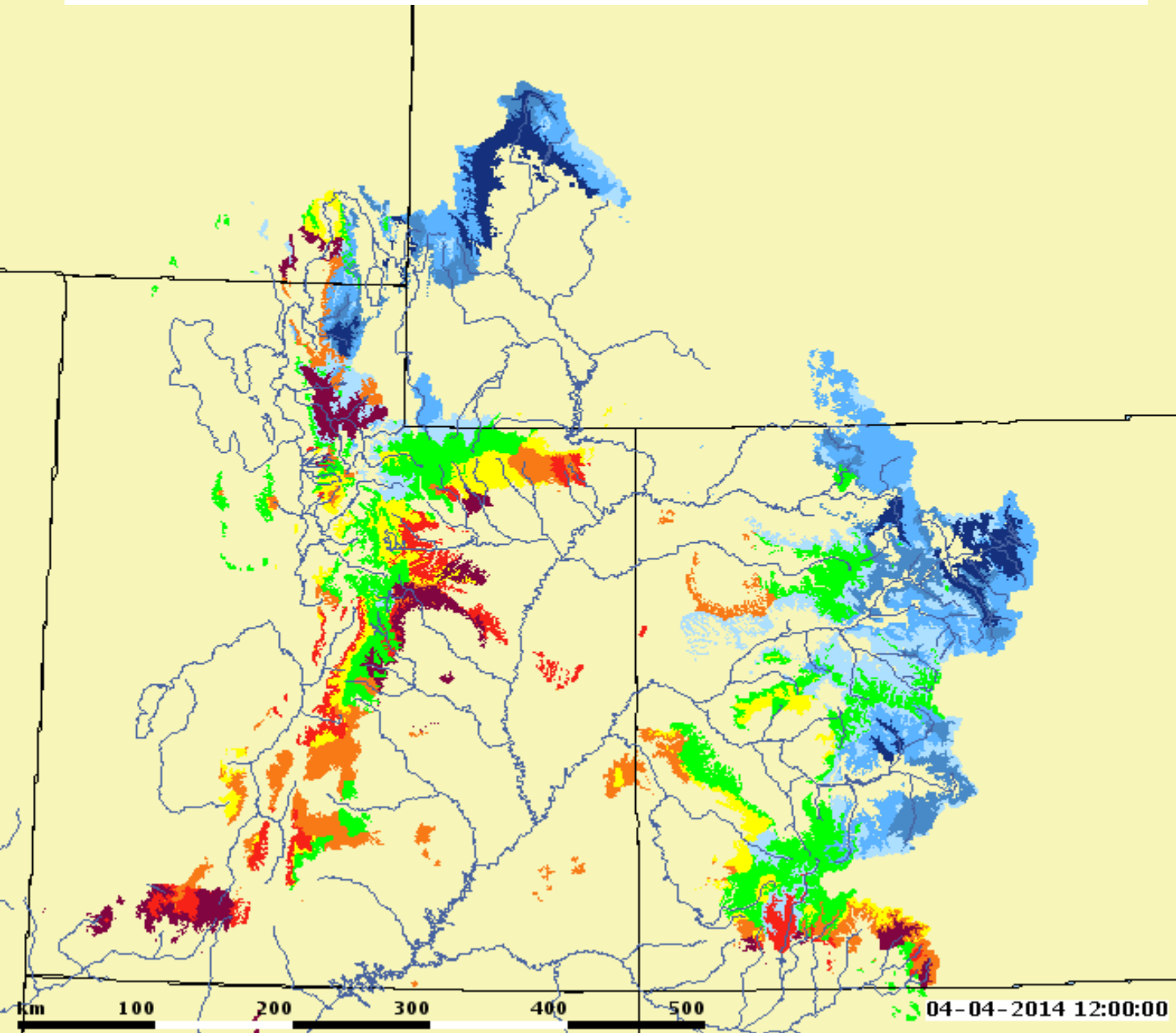


# Modeled Soil Moisture

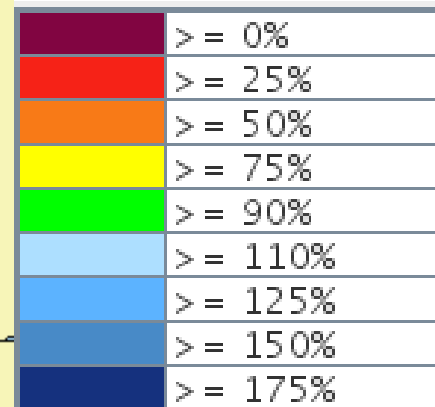
Well above Upper Colorado and well below Great Basin



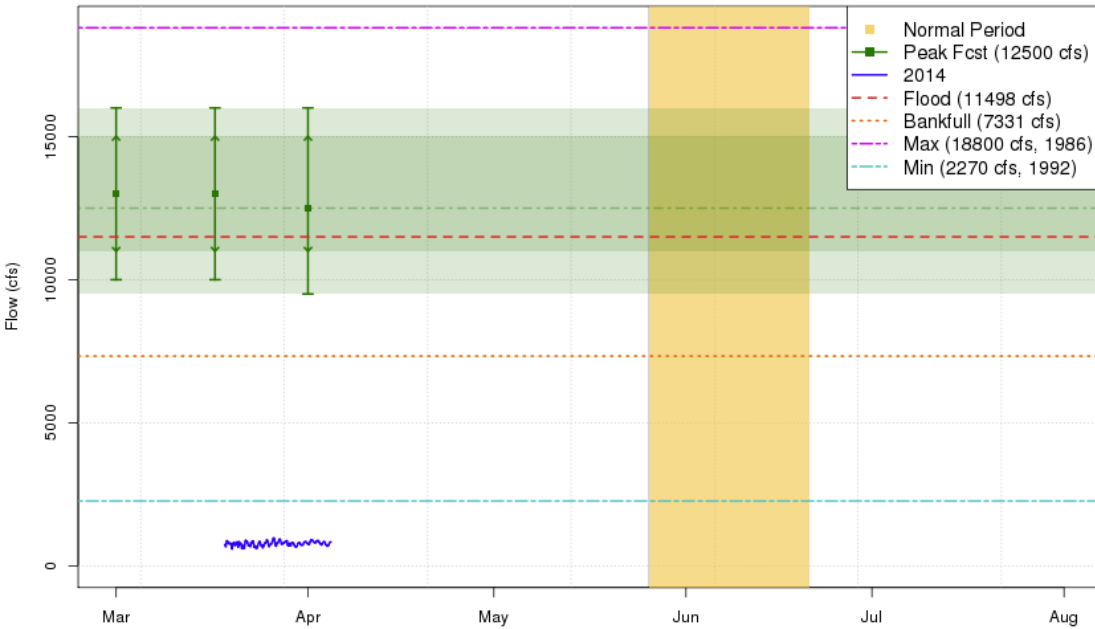
SNOW – As represented in the CBRFC hydrologic model on April 8<sup>th</sup> 2014



Percent of the 30  
year model  
calibration  
average as of this  
date



**2014 Mean Daily Peak Flow Forecast  
Green - La Barge- Nr (LABW4)**



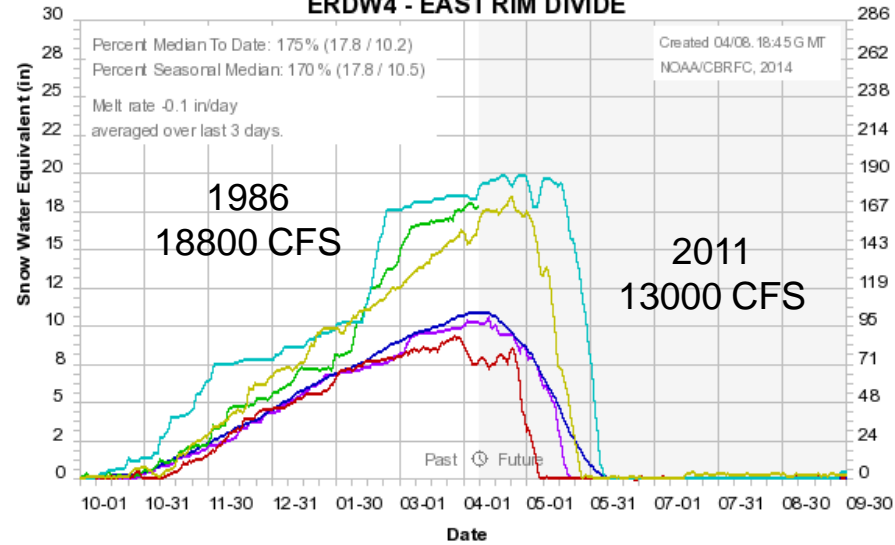
Plot Created 2014-04-04 12:02:31, CBRFC / NWS / NOAA

**50% Exceedance  
Forecast**

**Green River – LaBarge**

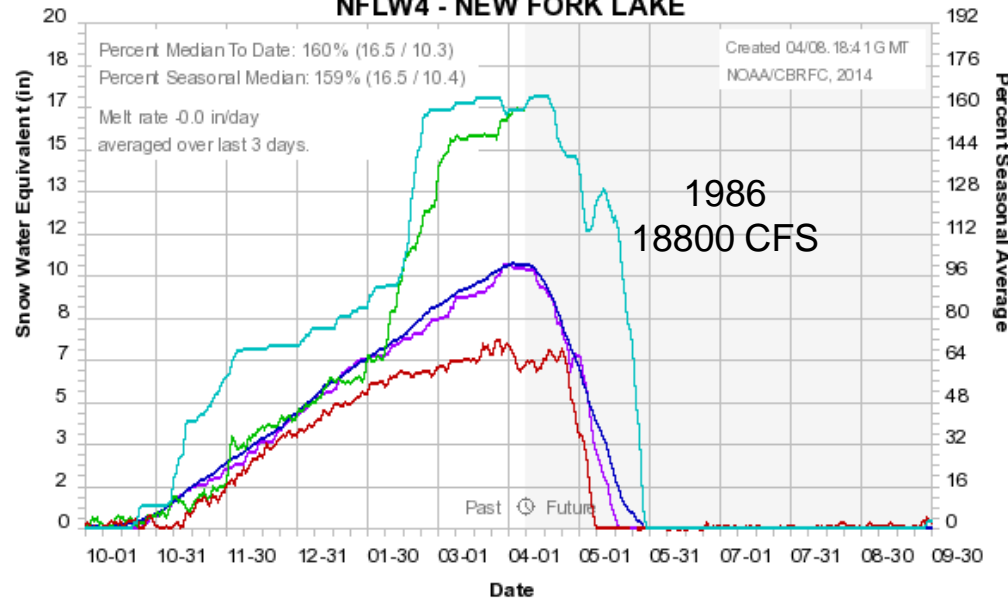
Forecast: **12500 CFS**  
 Average: **4730 CFS**  
 Flood: **11500 CFS**  
 Last Year: **3800 CFS**

**Colorado Basin River Forecast Center  
ERDW4 - EAST RIM DIVIDE**



Created 04/08, 18:45 GMT  
NOAA/CBRFC, 2014

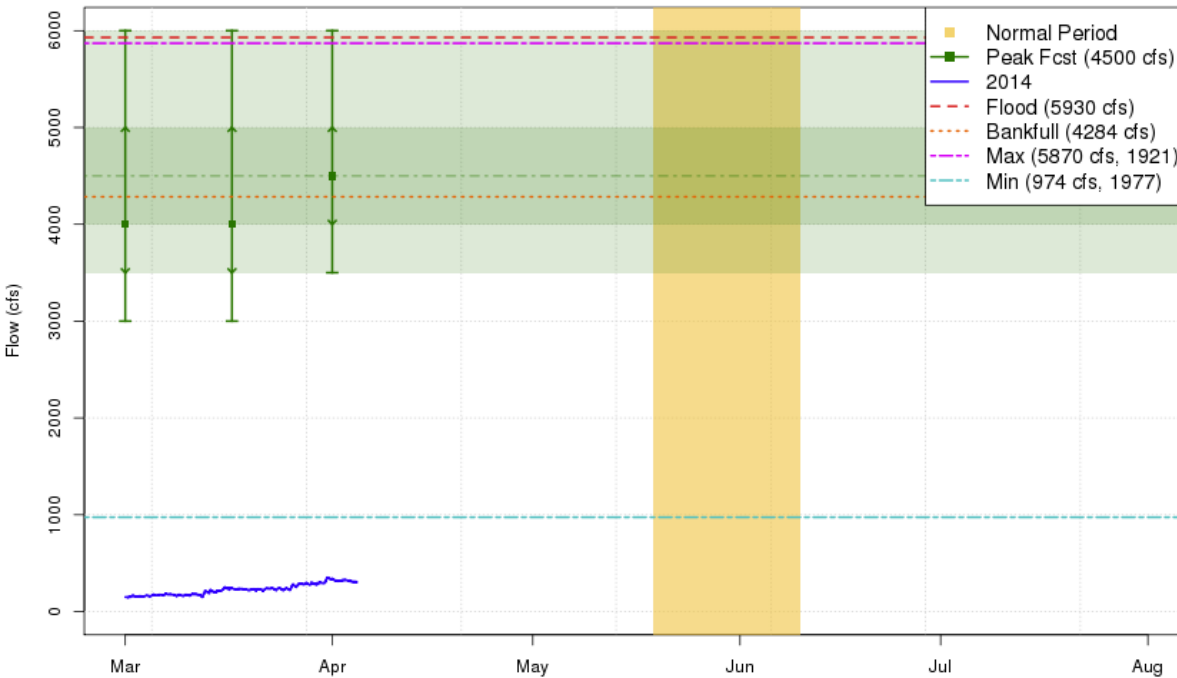
**Colorado Basin River Forecast Center  
NFLW4 - NEW FORK LAKE**



Created 04/08, 18:41 GMT  
NOAA/CBRFC, 2014



**2014 Mean Daily Peak Flow Forecast  
Yampa - Steamboat Springs (STMC2)**



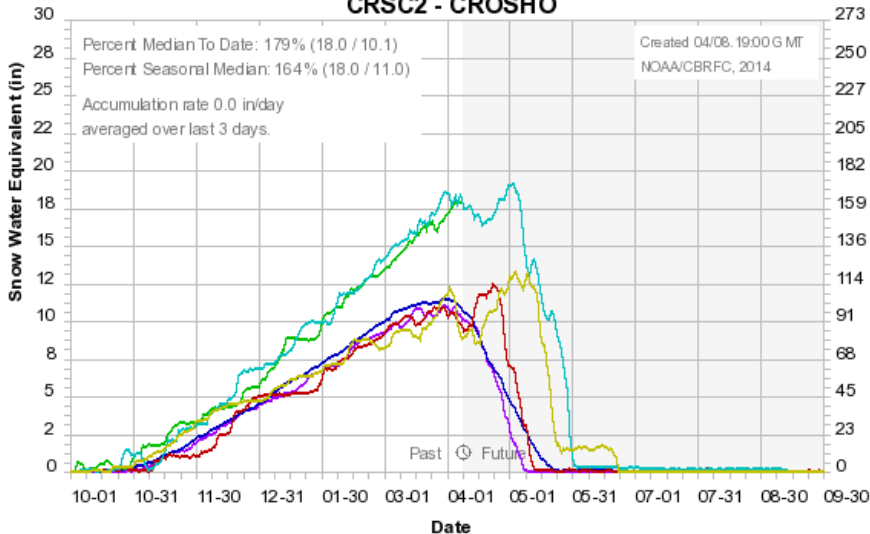
Plot Created 2014-04-04 12:02:51, CBRFC / NWS / NOAA

**50% Exceedance  
Forecast**

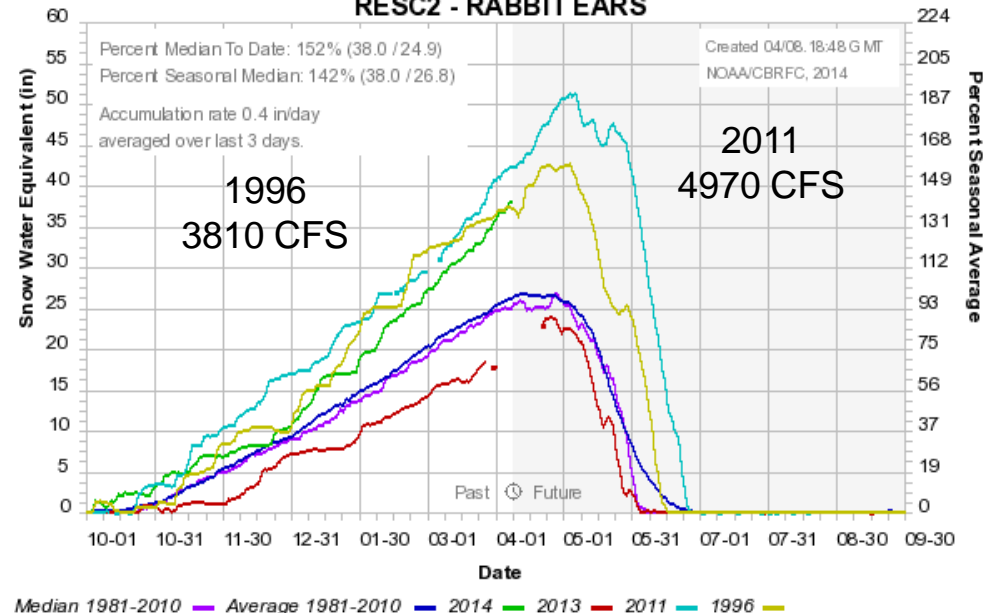
**Yampa – Steamboat Springs**

Forecast: **4500 CFS**  
 Average: **3070 CFS**  
 Flood: **5930 CFS**  
  
 Last Year: **2550 CFS**

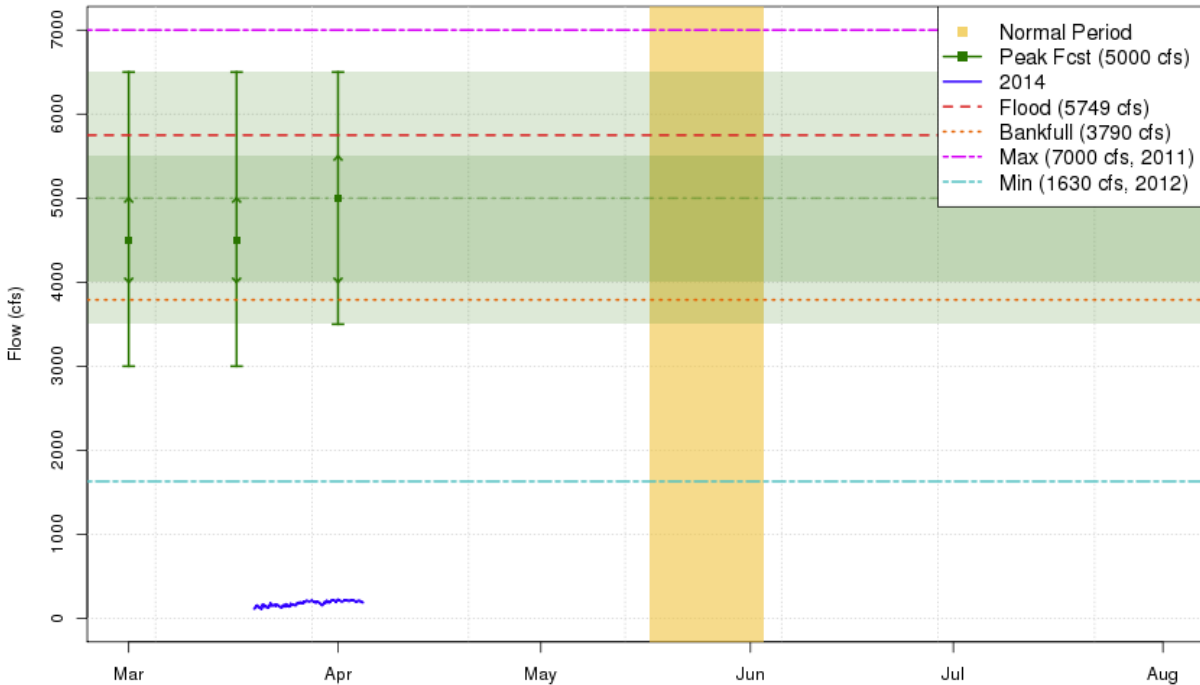
**Colorado Basin River Forecast Center  
CRSC2 - CROSHO**



**Colorado Basin River Forecast Center  
RESC2 - RABBIT EARS**



**2014 Mean Daily Peak Flow Forecast  
Elk - Milner- Nr (ENMC2)**



Plot Created 2014-04-04 12:02:55, CBRFC / NWS / NOAA

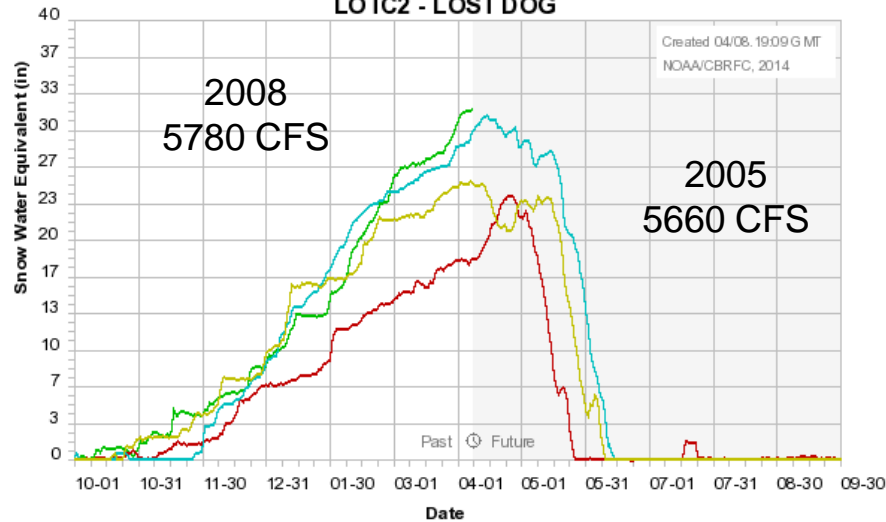
**50% Exceedance  
Forecast**

**Elk River - Milner**

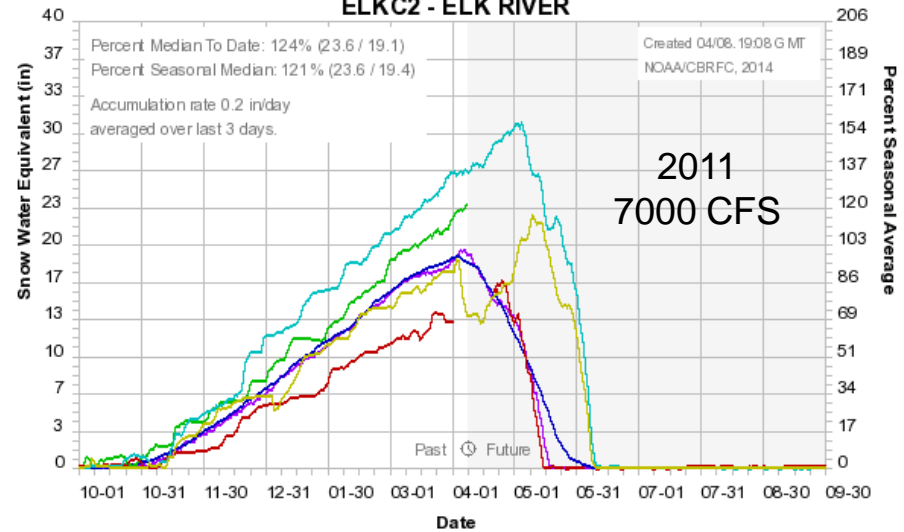
Forecast: **5000 CFS**  
 Average: **3865 CFS**  
 Flood: **5750 CFS**

Last Year: **3090 CFS**

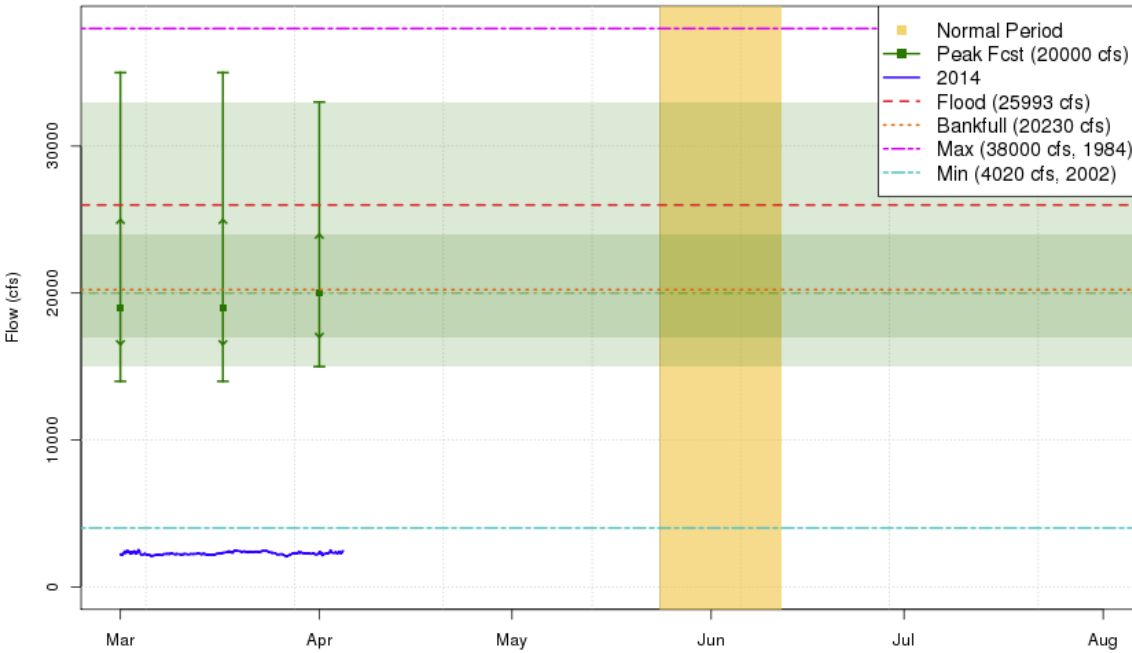
**Colorado Basin River Forecast Center  
LOT2 - LOST DOG**



**Colorado Basin River Forecast Center  
ELKC2 - ELK RIVER**



**2014 Mean Daily Peak Flow Forecast  
Colorado - Cameo- Nr (CAMC2)**



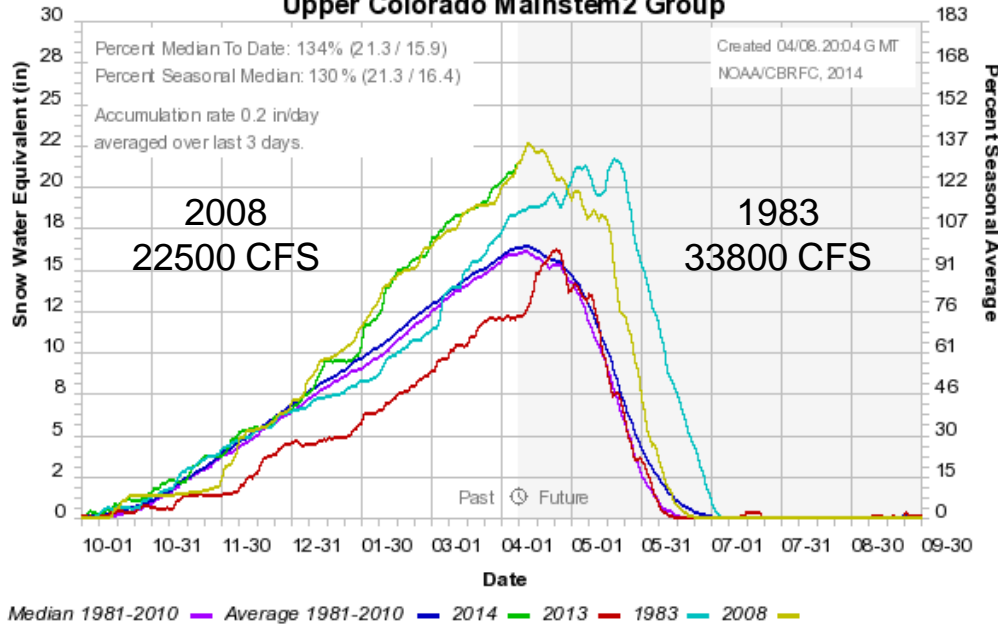
**50% Exceedance  
Forecast**

**Colorado - Cameo**

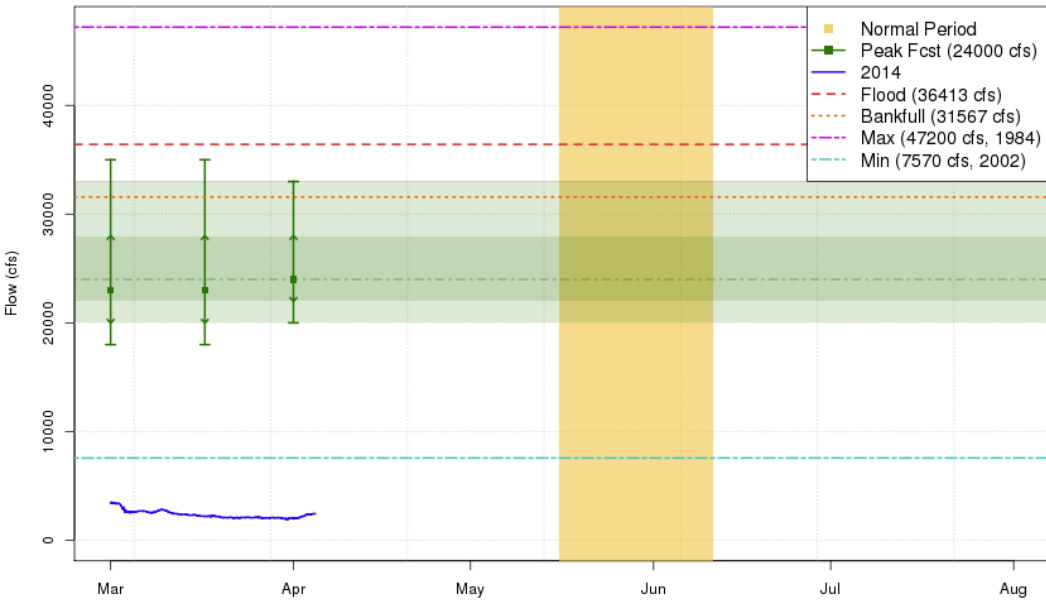
Forecast: **20000 CFS**  
 Average: **17000 CFS**  
 Flood: **26000 CFS**  
 Last Year: **9540 CFS**

F

**Colorado Basin River Forecast Center  
Upper Colorado Mainstem2 Group**



**2014 Mean Daily Peak Flow Forecast  
Green - Green River- Ut (GRVU1)**



Plot Created 2014-04-04 12:02:18, CBRFC / NWS / NOAA

**Green River – Green River, UT**

Forecast: **24000 CFS**  
 Average: 21700 CFS  
 Flood: 36400 CFS

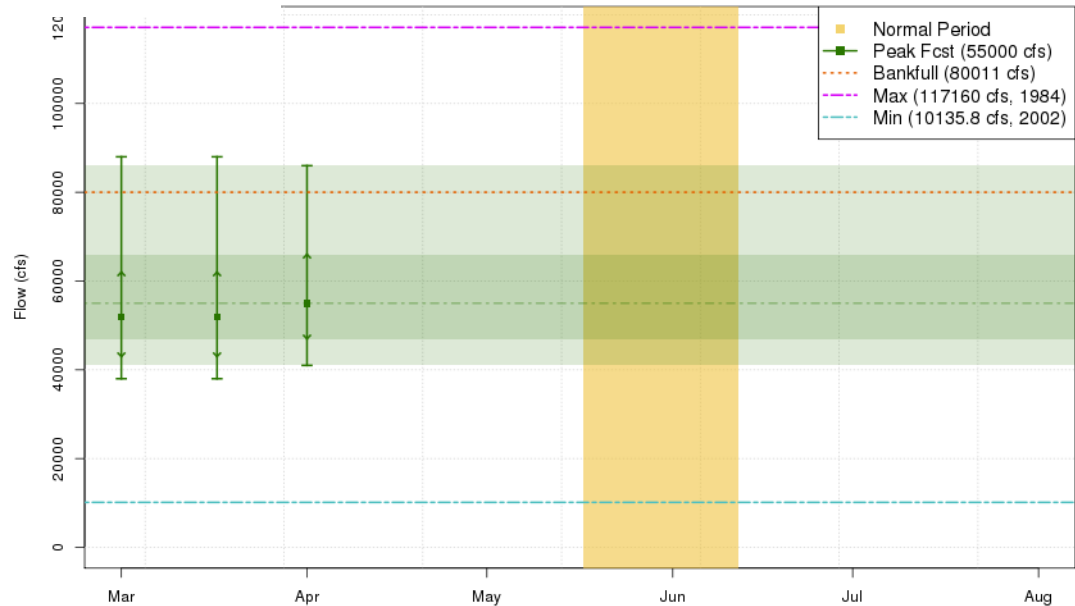
Last Year: 11500 CFS

**Colorado – Cataract Canyon**

Forecast: **55000 CFS**  
 Average: 48000 CFS  
 Flood: None

Last Year: 23000

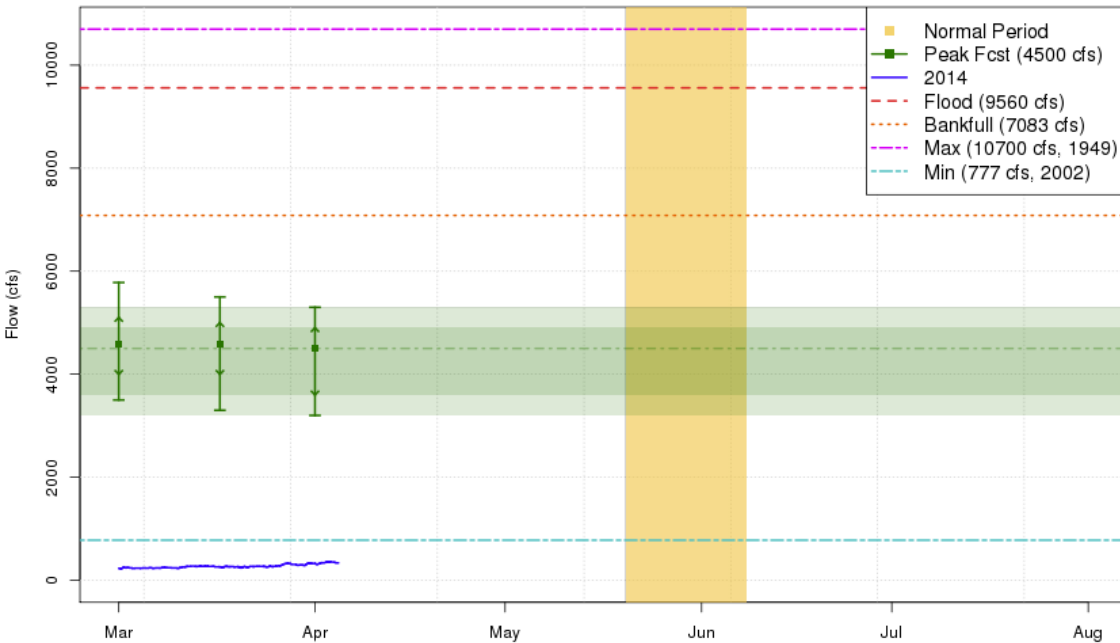
**2014 Mean Daily Peak Flow Forecast  
Colorado - Cataract Canyon (CTRU1)**



Plot Created 2014-04-04 12:04:28, CBRFC / NWS / NOAA

**Forecasts are 50% Exceedance Forecast**

**2014 Mean Daily Peak Flow Forecast  
Animas - Durango (DRGC2)**



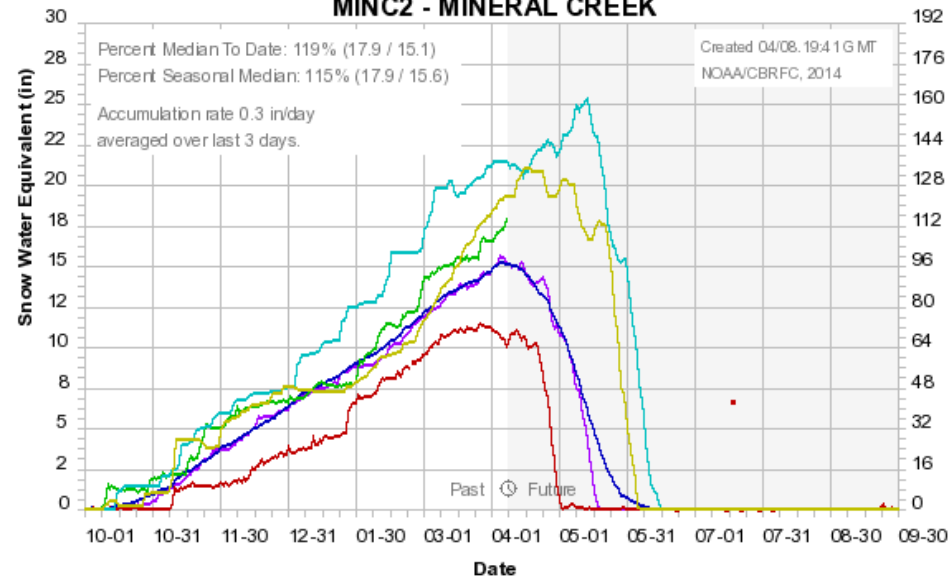
Plot Created 2014-04-04 12:03:24, CBRFC / NWS / NOAA

**50% Exceedance  
Forecast**

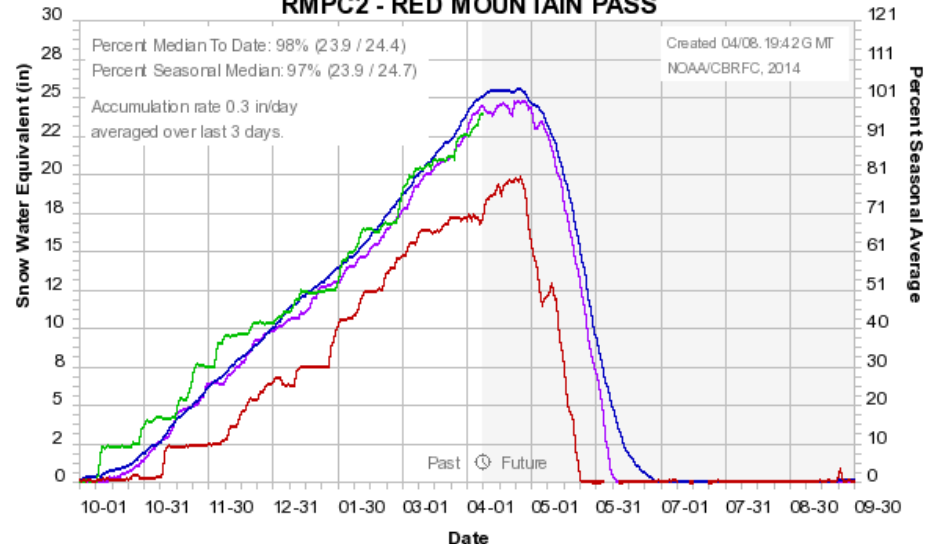
**Animas - Durango**

Forecast: **4500 CFS**  
 Average: **5780 CFS**  
 Flood: **9560 CFS**  
 Last Year: **2580 CFS**

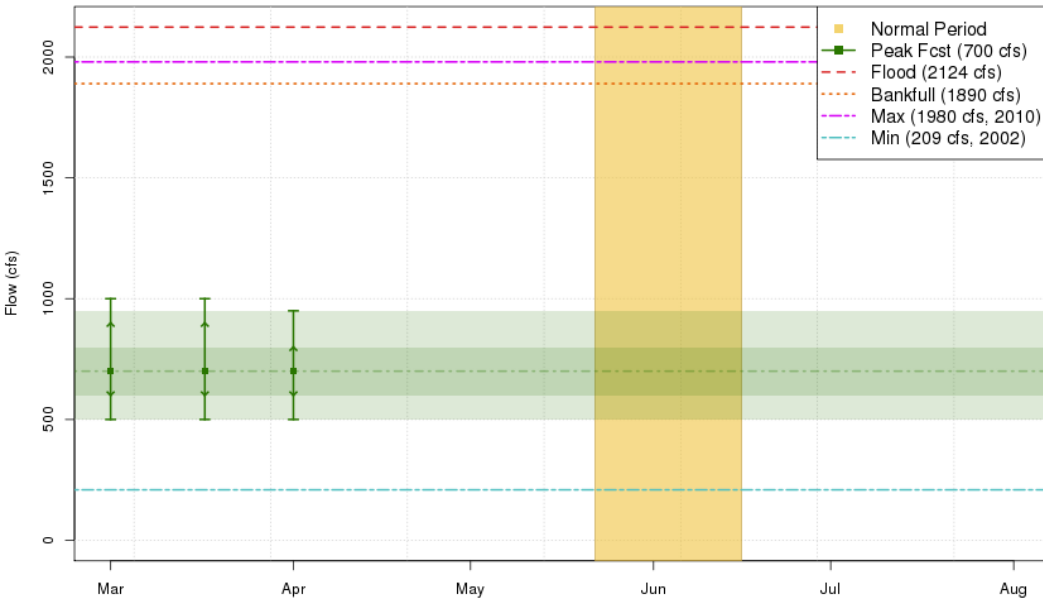
**Colorado Basin River Forecast Center  
MINC2 - MINERAL CREEK**



**Colorado Basin River Forecast Center  
RMPC2 - RED MOUNTAIN PASS**



**2014 Mean Daily Peak Flow Forecast  
Yellowstone - Altonah- Nr (YLLU1)**



Plot Created 2014-04-04 12:02:05, CBRFC / NWS / NOAA

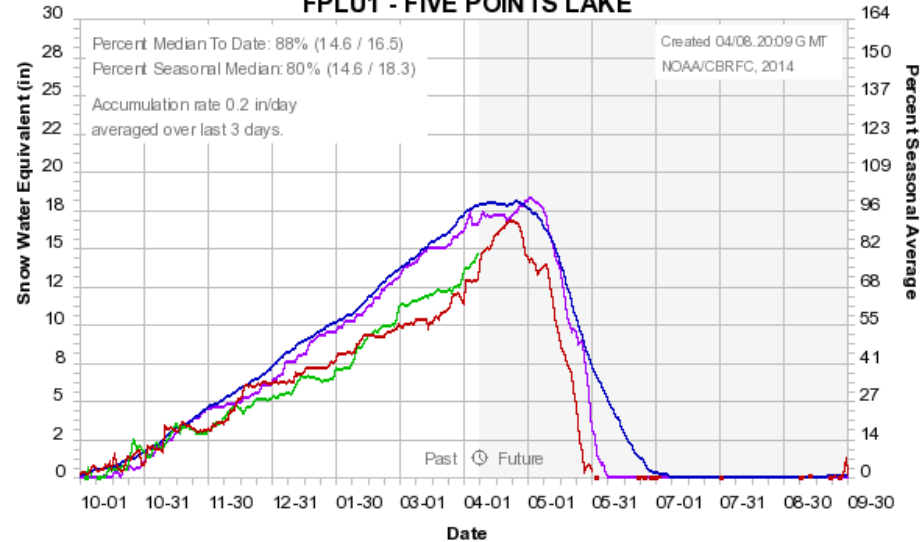
**50% Exceedance  
Forecast**

**Yellowstone - Altonah**

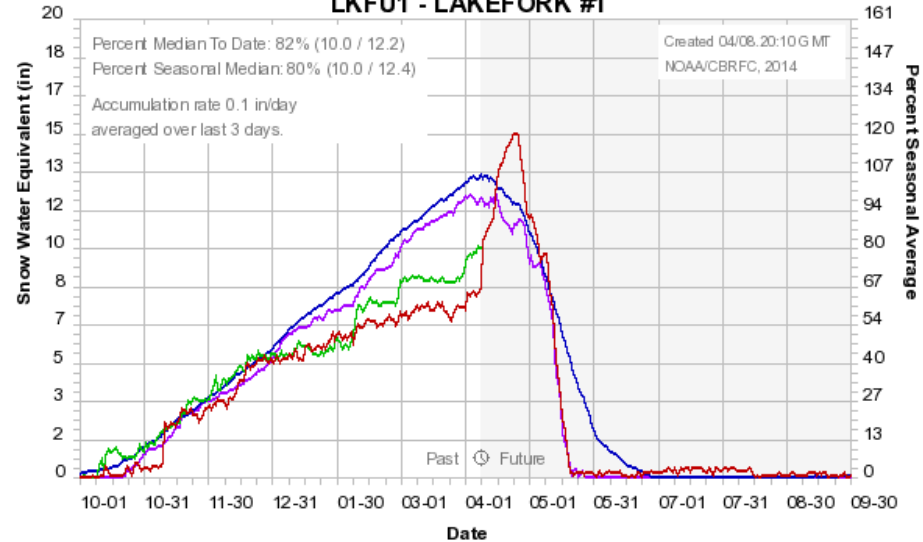
Forecast: **700 CFS**  
 Average: **950 CFS**  
 Flood: **2120 CFS**

Last Year: **440 CFS**

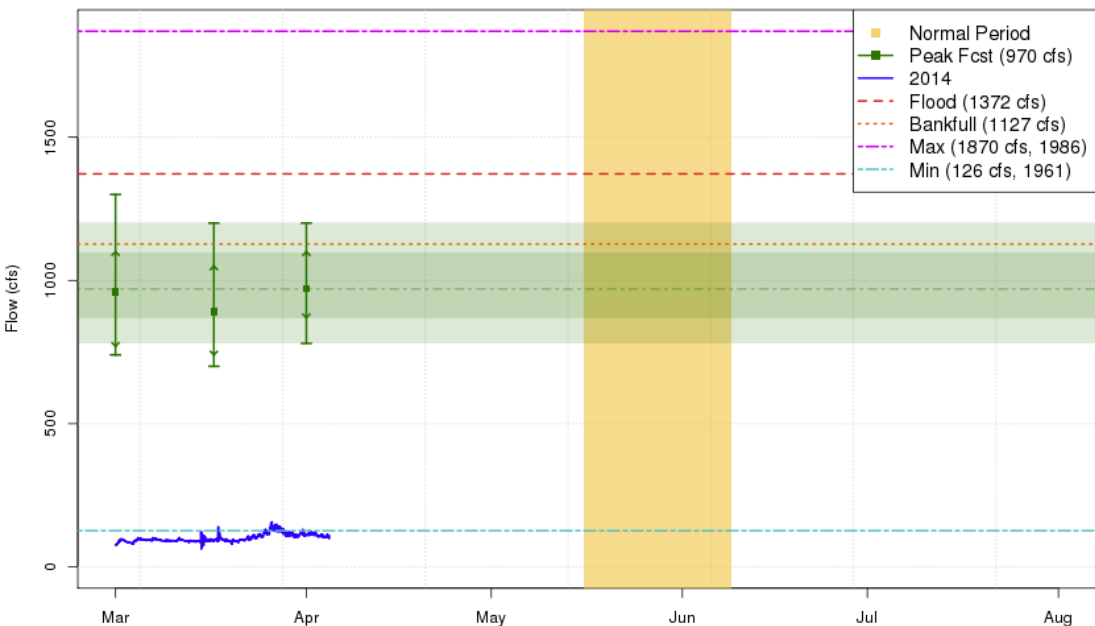
**Colorado Basin River Forecast Center  
FPLU1 - FIVE POINTS LAKE**



**Colorado Basin River Forecast Center  
LKFU1 - LAKEFORK #1**



**2014 Mean Daily Peak Flow Forecast  
Logan - Logan- Nr- State Dam- Abv (LGNU1)**



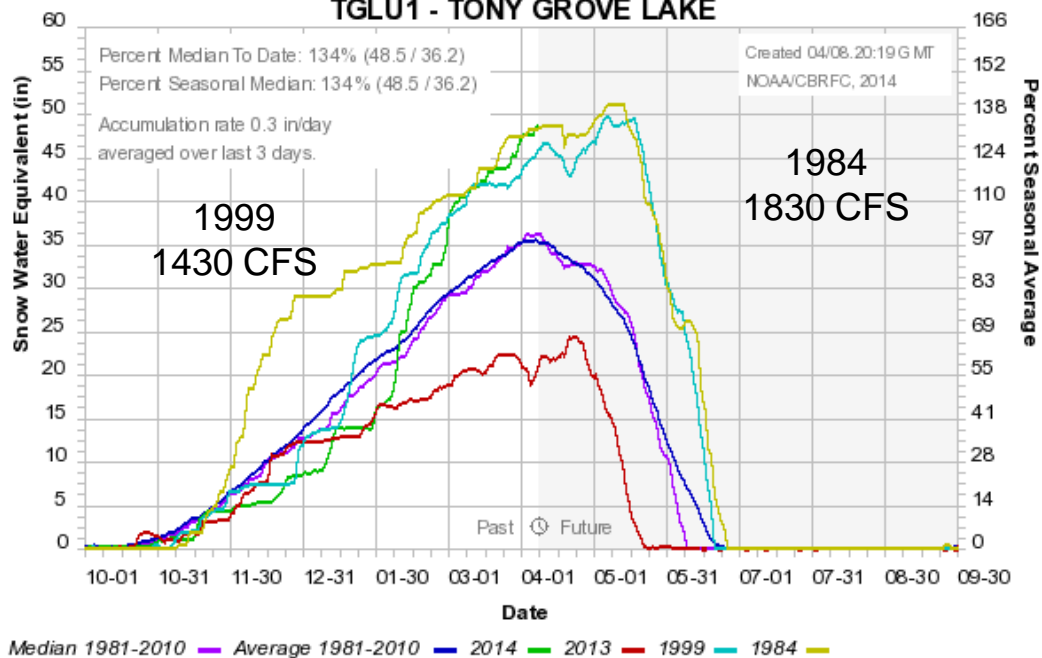
**50% Exceedance  
Forecast**

**Logan River - Logan**

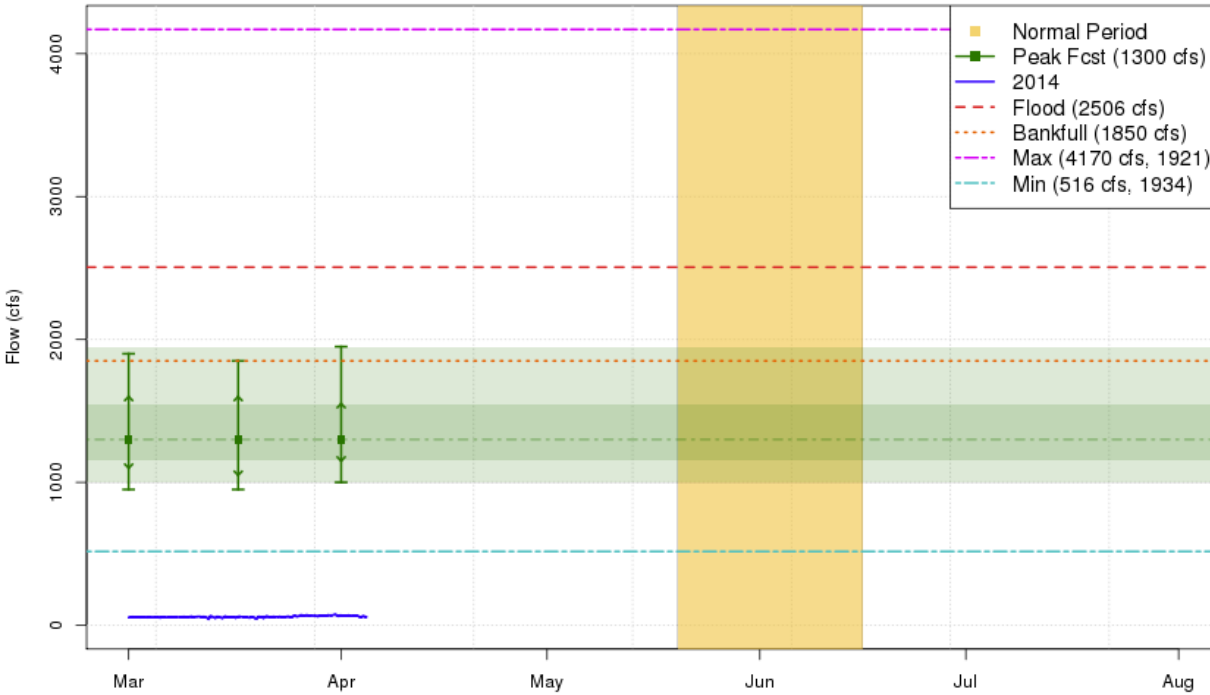
Forecast: **970 CFS**  
 Average: 950 CFS  
 Flood: 1370 CFS

Last Year: 480 CFS

**Colorado Basin River Forecast Center  
TGLU1 - TONY GROVE LAKE**



**2014 Mean Daily Peak Flow Forecast  
Weber - Oakley- Nr (OAWU1)**



Plot

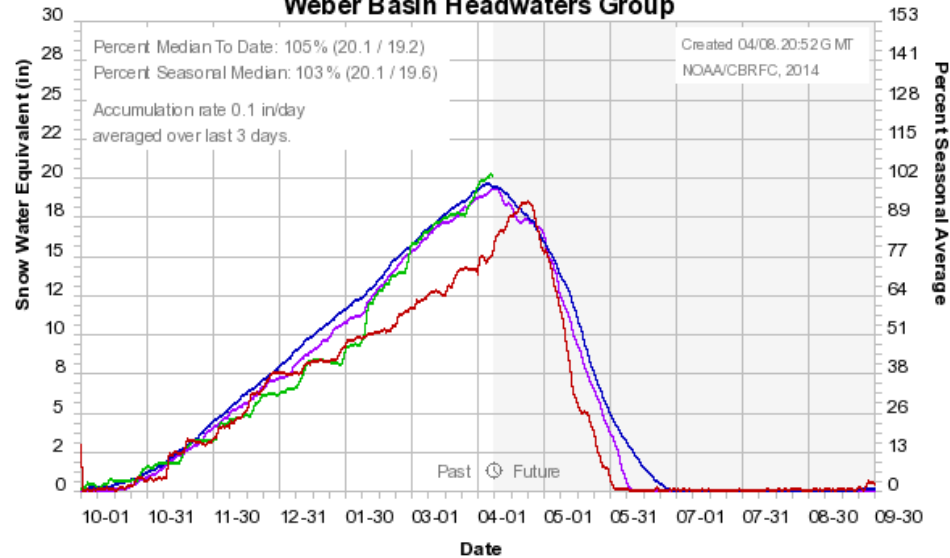
**50% Exceedance  
Forecast**

**Weber River - Oakley**

Forecast: **1300 CFS**  
 Average: **1650 CFS**  
 Flood: **2500 CFS**

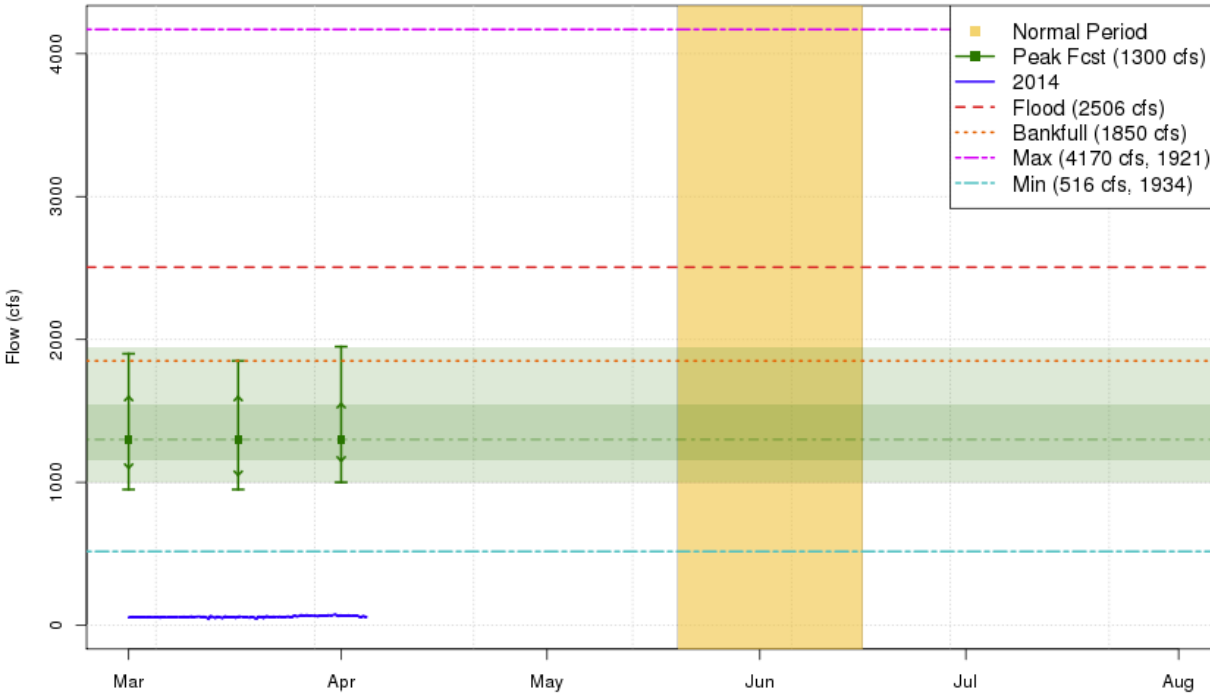
Last Year: **770 CFS**

**Colorado Basin River Forecast Center  
Weber Basin Headwaters Group**





**2014 Mean Daily Peak Flow Forecast  
Weber - Oakley- Nr (OAWU1)**



Plot

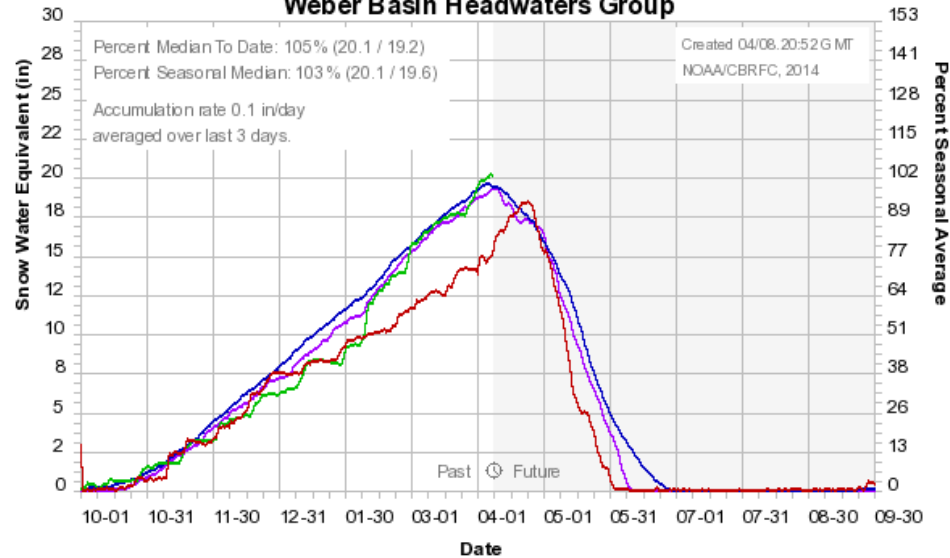
**50% Exceedance  
Forecast**

**Weber River - Oakley**

Forecast: **1300 CFS**  
 Average: **1650 CFS**  
 Flood: **2500 CFS**

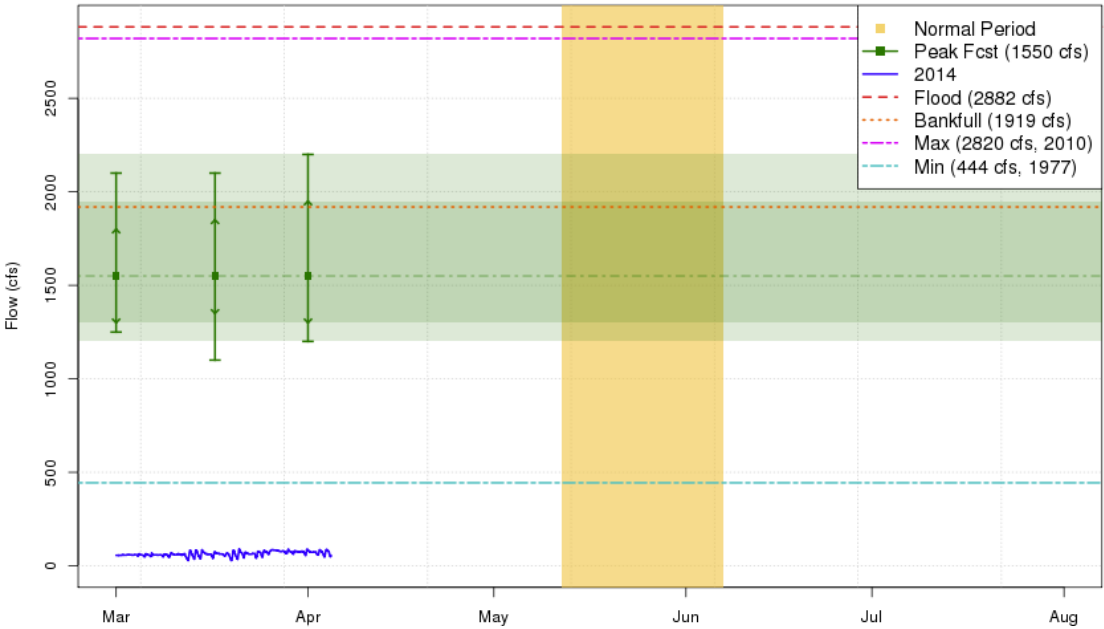
Last Year: **770 CFS**

**Colorado Basin River Forecast Center  
Weber Basin Headwaters Group**



Median 1981-2010 Average 1981-2010 2014 2013

**2014 Mean Daily Peak Flow Forecast  
Provo - Woodland- Nr (WOUU1)**



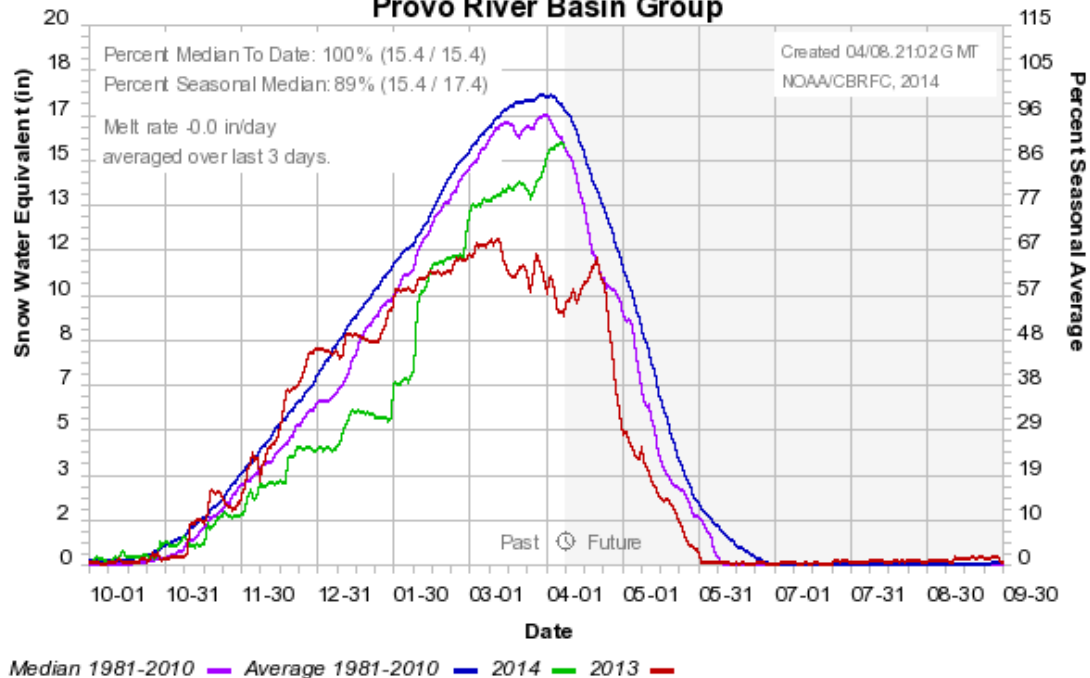
**50% Exceedance  
Forecast**

**Provo River - Woodland**

Forecast: **1550 CFS**  
 Average: 1790 CFS  
 Flood: 2880 CFS  
 Last Year: 1150 CFS

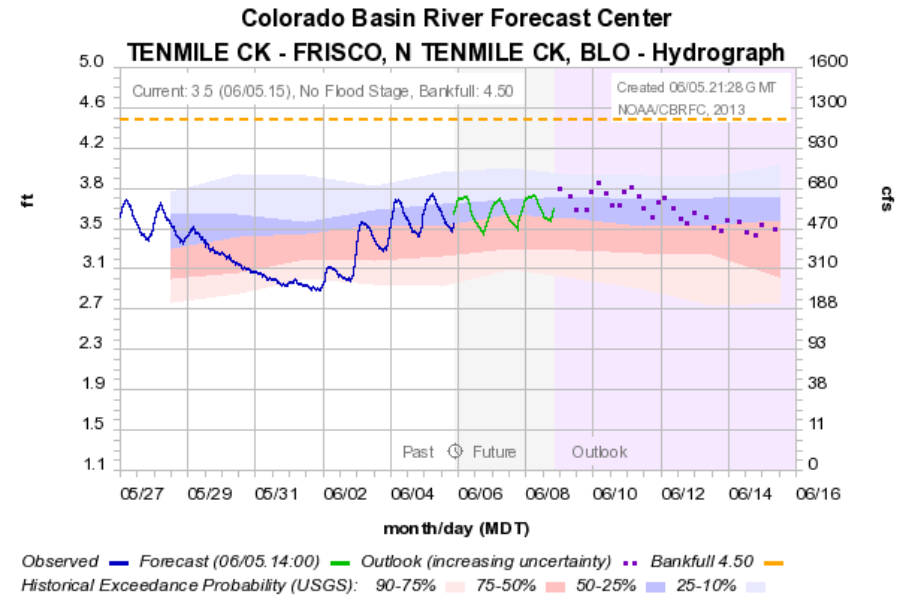
P

**Colorado Basin River Forecast Center  
Provo River Basin Group**



# Time of Peak

- Peak forecasts are meant to be long range outlooks and do not forecast the time of peak.
- As the peak nears, or as flows near critical levels, the **daily forecast hydrographs** are the place to get up-to-date information.
  - Peak flow list may indicate “Peaking Soon” or “Peak has Already Occurred”



# Peak Forecast Summary

Forecast distribution touches the flood level at:

- Upper Green River in Wyoming (\* exceeded at 50% forecast)
- Yampa River headwaters (Elk River, Steamboat Springs)
- Colorado River Headwaters (@ Stateline, above Cameo, Eagle River)
- Gunnison River above Blue Mesa (East River)

Keep an eye on:

- Logan River near Logan
- Procedures don't exist everywhere \*

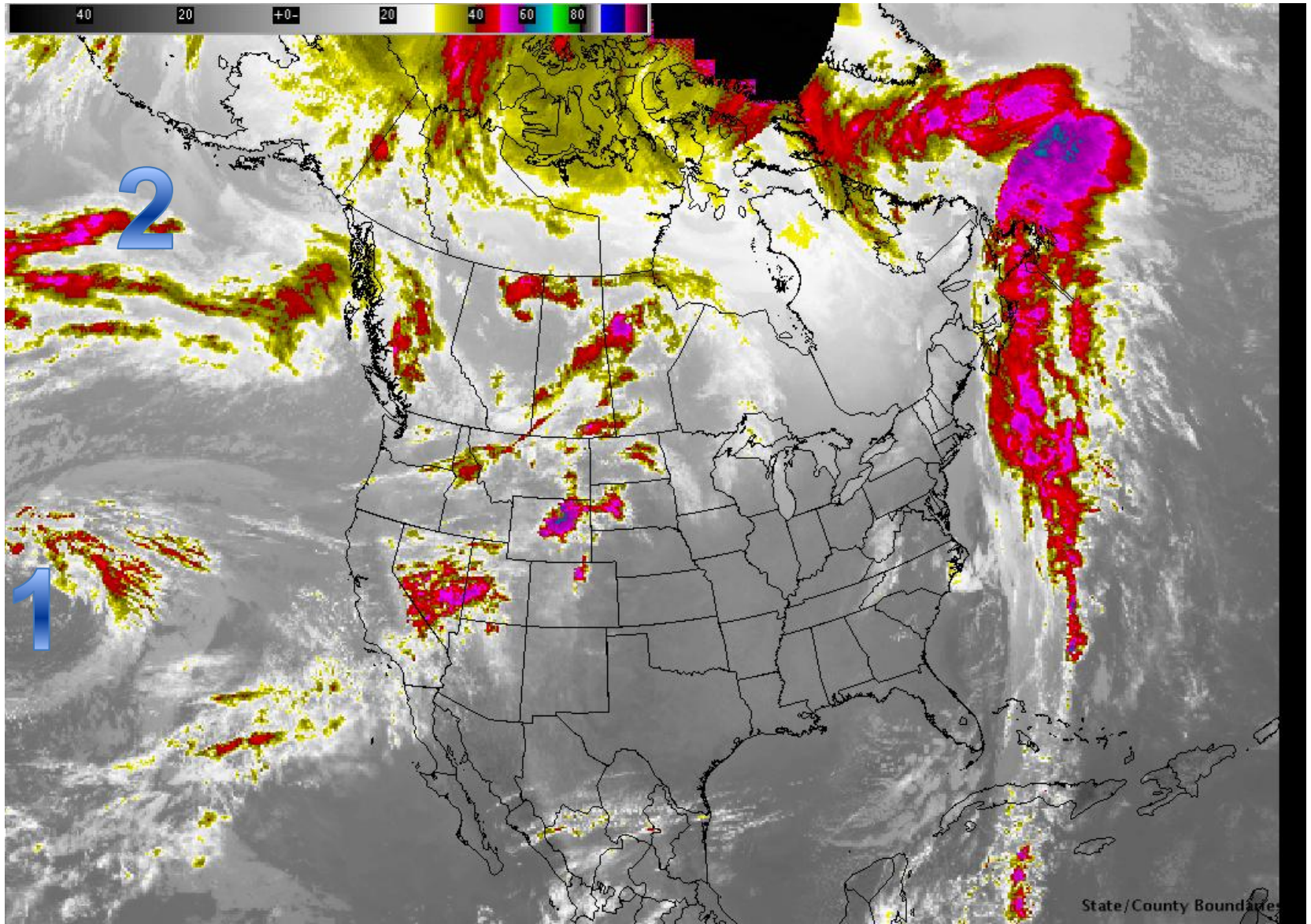
Small tributaries in heavy snowpack areas likely to see bankfull or greater conditions

# Impact of spring weather

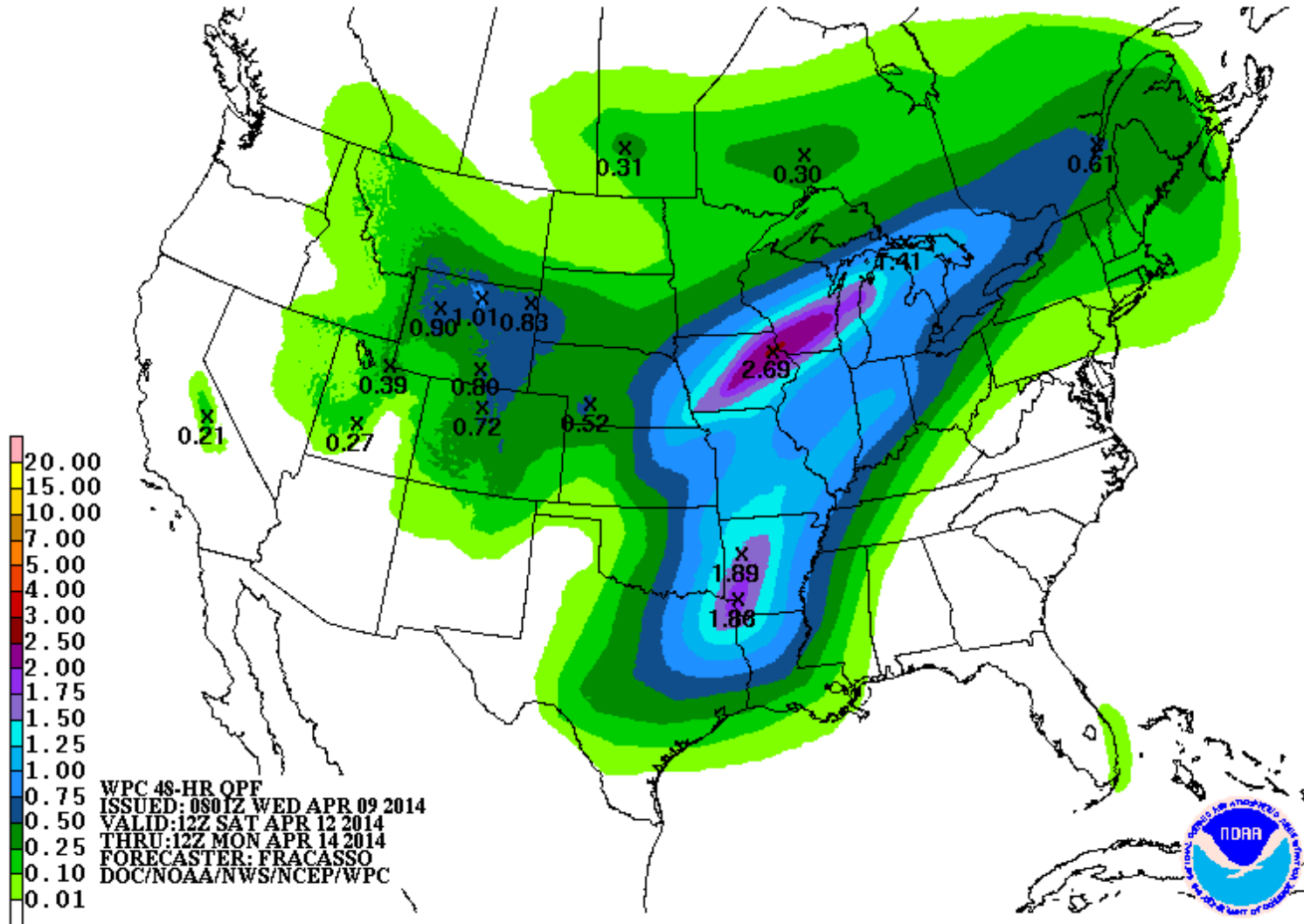
- **Runoff characteristics are largely determined by the day-to-day spring weather.**
  - While large snow pack years increase chances for flooding, it is not an inevitability (dodged a bullet at many sites in 2011)
  - Small snow pack years can flood with the right sequence of spring temperatures and with flows enhanced by precipitation.
  - Rain events may play a larger role in the magnitude of the peak flow during very low snow years.
  - Keep an eye on our web page / daily forecasts

# Upcoming Weather – Ridge begins to flatten – increased chances for precipitation

- 1 – Weak system moves across the southwest over the weekend
  - 2 – System sags southward into the area late in the weekend
- Additional chances for precipitation next week

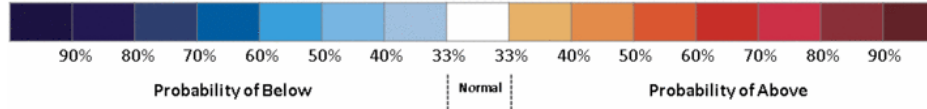
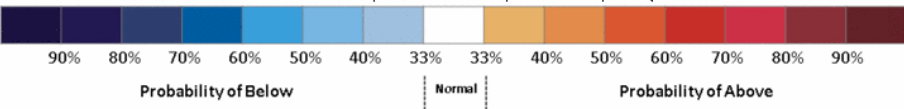
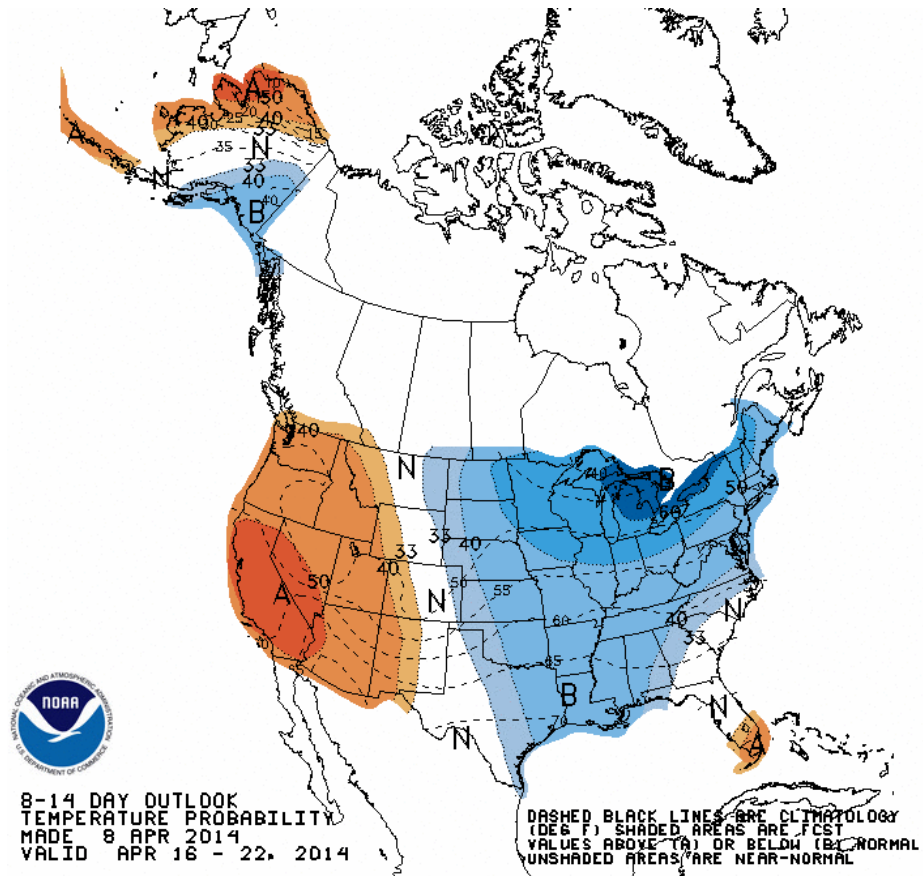
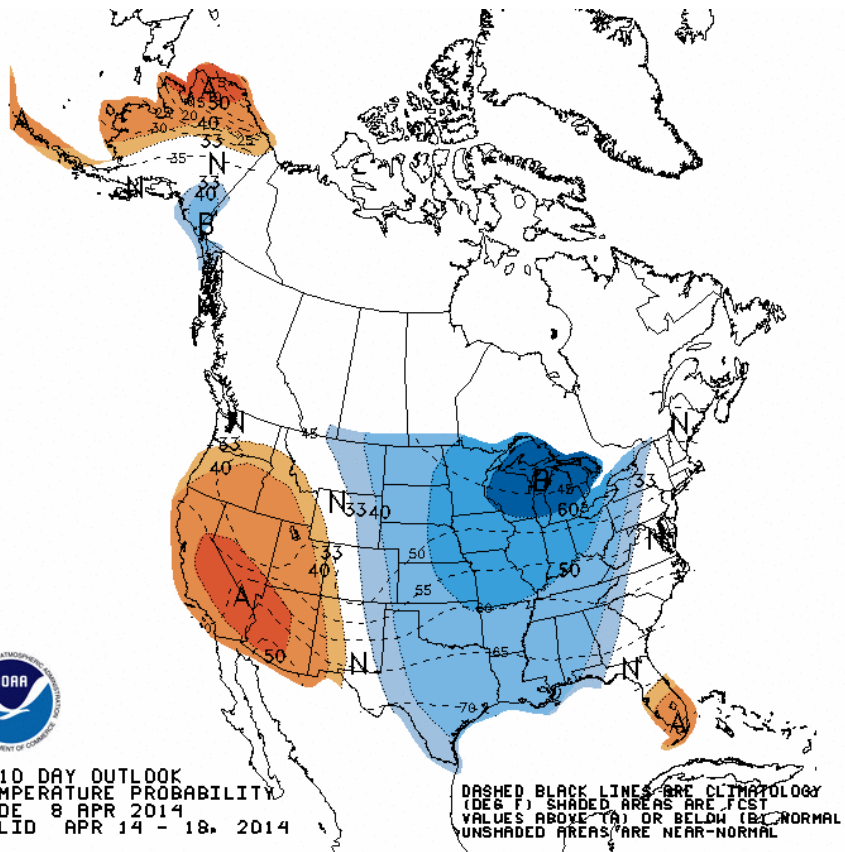


# Forecast Precipitation for this Weekend



Saturday 4/12 – Monday 4/14

# Temperature Outlook



April 14<sup>th</sup> – April 18<sup>th</sup>

April 16<sup>th</sup> – April 22<sup>nd</sup>





# Peak Flow Forecast Schedule

- Forecast updates planned for:
  - Twice Monthly (1<sup>st</sup> week & mid month) through early June.
- Upcoming Webinars:
  - Water Supply, May 6<sup>th</sup>, June 5<sup>th</sup> – all at 1 pm MDT
  - Peak Flow ~ Early May or as needed

# CBRFC Contacts

- Basin Focal Points for Peak Flow (Available to discuss forecasts: 801.524.5130)

- Upper Colorado: Brenda Alcorn
- Green: Ashley Nielson
- San Juan / Gunnison: Greg Smith
- Great Basin: Paul Miller
- Virgin / Sevier: Tracy Cox

