Peak Flow Forecast Briefing

March 10, 2017

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Colorado Basin River Forecast Center
National Weather Service
NOAA

Conference Phone #: 877-929-0660 Passcode #: 1706374

* Please mute your phone until you have a question-Thank You *

Today's Presentation

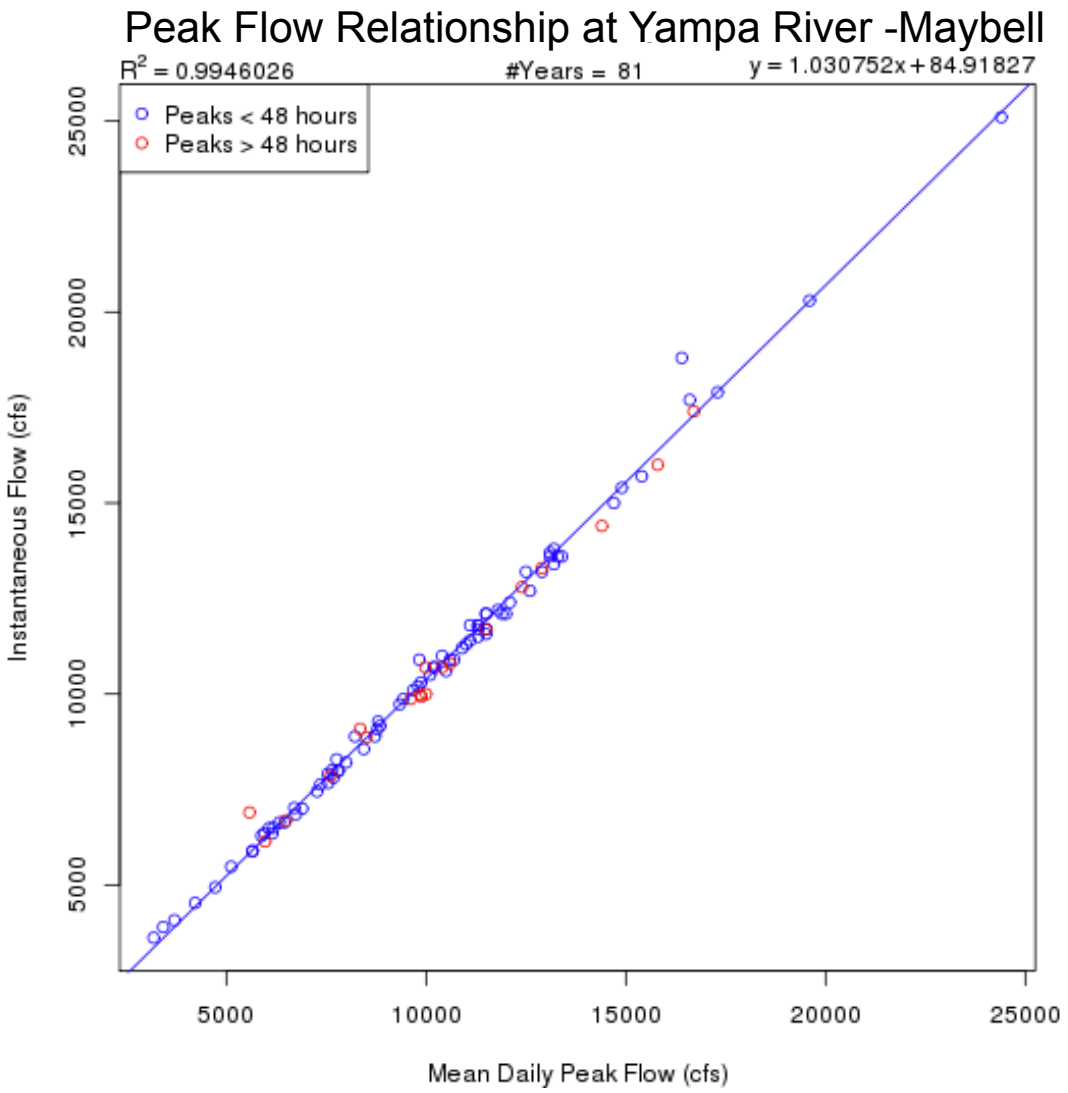
- Peak Flow Forecasts Described
  - Mean Daily Peaks
  - Instantaneous Peaks
- Peak Flow Map, Lists, & Graphics
- Current conditions driving the peak flow forecasts
- Specific peak flow forecast graphics
- Summary of flood concerns
- Spring Weather Impacts
- Upcoming Weather

What is a Peak Flow Forecast?

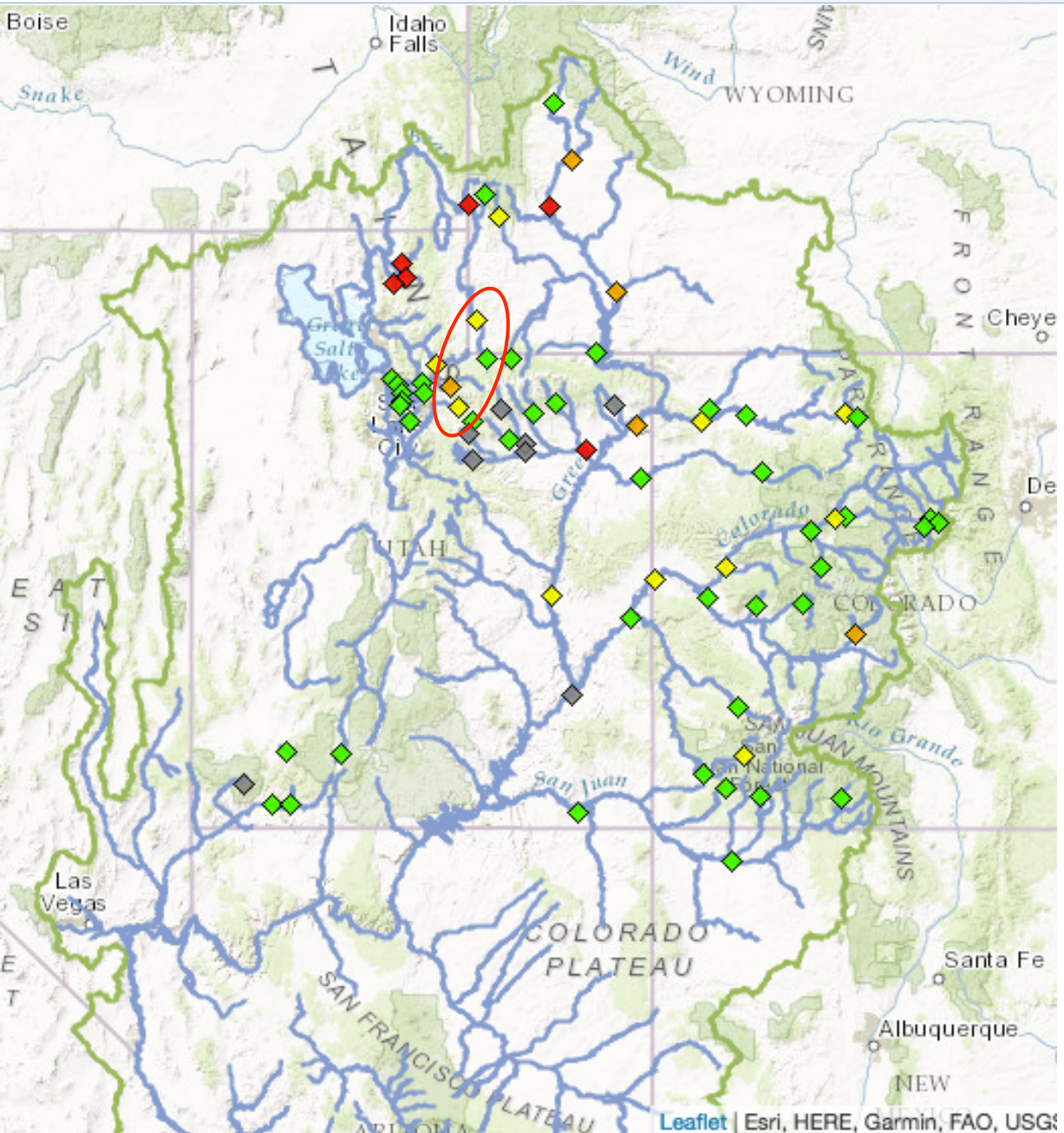
- Maximum Mean Daily Flow due to snowmelt
  - April-July period
- Probabilistic Forecasts
  - Exceedance Probabilities = 10%, 25%, 50%, 75%, 90%
- Regulated Flow (Downstream Points)
  - Accounts for reservoirs/diversions
  - Scheduled operations (if known), or assumptions based on past ops.
- Long range outlooks of peak magnitude for several locations
- Do not provide a specific date of the peak forecast
  - Typically only have a 5-10 day lead time for timing the peak
  - Prior to that we provide the average time period of the peak

Instantaneous Peak Flow Forecasts

- Relationship between max daily flow and instantaneous peak
- Only available for locations with good correlations & historical data
- Sites with frequent heavy rain have poor relationships



Peak Flow Map – A quick look at flood potential



Peak Flood Probablity

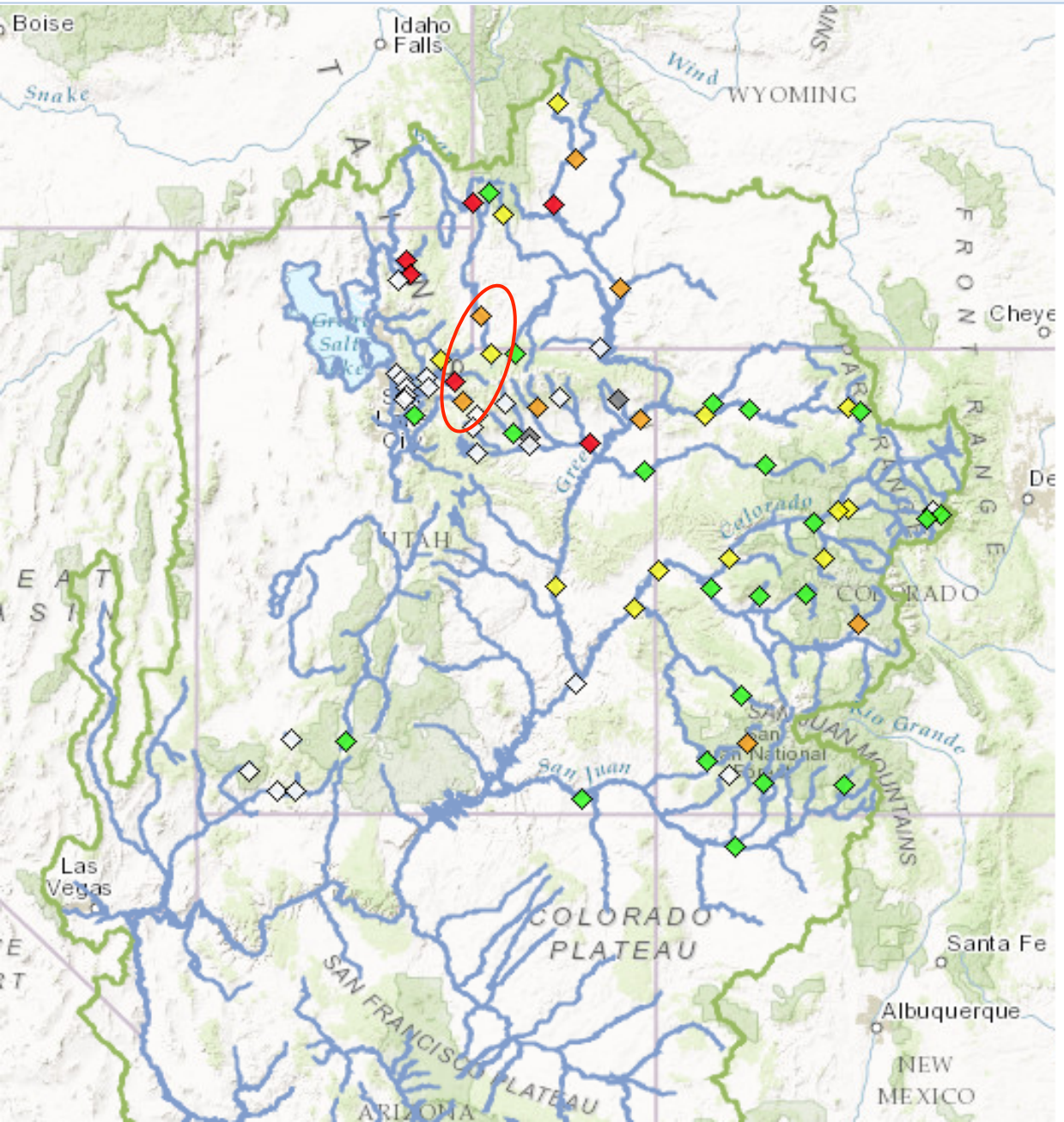
Forecast Date: 2017-03-01

Show Hide Other Types

Mean Daily
Instantaneous

No Forecast
No FLood Stage
<10%
>10-25%
>25-50%
>50%

Peak Flood Map – Instantaneous Peaks



Peak Flood Probablity

Forecast Date: 2017-03-01

☑ Show Hide Other Types

○ Mean Daily
◉ Instantaneous

◇ No Forecast
◆ No FLood Stage
◆ <10%
◆ >10-25%
◆ >25-50%
◆ >50%

Peak Flow List

Peak Flow Forecast List

Help | Download Data | Requery | Rebuild Plots

Peak Flood Probability Legend

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

Options (on/off): Mean Daily Forecasts Instantaneous Forecasts Plot

Select by Area: CBRFC Green Colorado San Juan Great Sevier Virgin Low Col

Columns (on/off): ID River Location Flood Flow PI Issue Date Observed Peak to Date Observed Date Historic Peak Hist Peak Date Average Peak Normal Earliest Date Normal Latest Date Last Year Peak Last Year Date Notes Area Sub Area DS

Click column heading to sort by that data. Click ID to view point info.

	ID	River	Location	Flood Flow	PI	Issue Date	Mean Daily 90	Mean Daily 75	Mean Daily 50	Mean Daily 25	Mean Daily 10	Inst 90	Inst 75	Inst 50	Inst 25	Inst 10	Average Peak	Normal Earliest Date	Normal Latest Date	Last Year Peak	Last Year Date
1	WBRW4	Green	Daniel	6100	◆	2017-03-01	3800	4300	**4700**	5300	6000	3900	4400	4800	5400	6200	2695	05-27	06-28	2750	2016-06-11
2	BPNW4	New Fork	Big Piney	8847	◆	2017-03-01	5800	6300	**7200**	9000	10500	6000	6500	7400	9200	11000	4730	05-26	06-23	5130	2016-06-10
3	LABW4	Green	La Barge	11448	◆	2017-03-01	12000	13500	**16000**	19000	21000	12000	14000	16000	19000	21000	8000	05-26	06-21	8560	2016-06-13
4	GRRW4	Green	Green River	11191	◆	2017-03-01	8000	9000	**10000**	12000	14000	8100	9200	10000	12000	14000	5790	05-05	07-08	6550	2016-06-19
5	HMFW4	Hams Fork	Frontier	1794	◆	2017-03-01	900	1100	**1300**	1600	1800	970	1200	1400	1700	2000	710	05-09	06-06	877	2016-05-10
6	BNRU1	Blacks Fork	Robertson	2580	◆	2017-03-01	950	1200	**1400**	1600	2100	1200	1500	1700	1900	2500	1380	05-23	06-17	1750	2016-06-10
7	HFMW4	Henrys Fork	Manila	2960	◆	2017-03-01	300	400	**500**	800	1000	NA	NA	NA	NA	NA	750	05-10	06-26	2220	2016-06-09
8	STMC2	Yampa	Steamboat Springs	5930	◆	2017-03-01	2000	2500	**3000**	3700	4800	2300	2800	3300	4100	5200	3070	05-19	06-10	3420	2016-06-07
9	ENMC2	Elk	Milner	5719	◆	2017-03-01	2800	3400	**4000**	4800	6000	3200	3800	4500	5400	6700	3865	05-17	06-03	4070	2016-06-11
10	MBLC2	Yampa	Maybell	21241	◆	2017-03-01	7500	9000	**10000**	12000	16000	7800	9400	10000	12000	17000	10300	05-12	06-05	10900	2016-05-18
11	LILC2	Little Snake	Lily	14871	◆	2017-03-01	3000	4000	**5000**	6000	8000	3400	4500	5600	6800	9000	4320	05-03	06-04	5570	2016-05-19
12	YDLC2	Yampa	Deerlodge Park	20685	◆	2017-03-01	10500	12500	**14000**	16500	23000	11000	13000	14000	17000	24000	13470	05-11	06-04	15600	2016-05-19
13	WRMC2	White	Meeker	8886	◆	2017-03-01	2000	2500	**2800**	3500	4300	2200	2700	3000	3800	4600	3040	05-17	06-09	2480	2016-06-07

Peak Flow List

Peak Flow Forecast List

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Peak Flood Probability Legend

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

Options (on/off): Mean Daily Forecasts Instantaneous Forecasts Plot

Select by Area: CBRFC Green Colorado San Juan Great Sevier Virgin Low Col

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2	LABW4	Green	La Barge	11448	◆	2017-03-01	12000	13500	16000	19000	21000	12000	14000	16000	19000	21000	8000	05-26	06-21	8560	2016-06-13
3	BRBW4	Bear	Border	3217	◆	2017-03-01	3200	3500	4100	4600	5500	3200	3500	4200	4700	5600	1840	05-08	06-29	1610	2016-06-18
4	LGNU1	Logan	Logan	1370	◆	2017-03-01	1500	1600	1850	2200	2500	1600	1700	1900	2300	2600	950	05-16	06-09	775	2016-05-22
5	HRMU1	Blacksmith Fork	Hyrum	904	◆	2017-03-01	850	950	1000	1100	1400	1000	1100	1200	1300	1700	445	04-16	05-17	307	2016-04-15
6	PRZU1	Little Bear	Paradise	1193	◆	2017-03-01	1050	1250	1350	1500	1750	NA	NA	NA	NA	NA	560	04-14	05-16	364	2016-04-25
7	JESU1	Green	Jensen	24730	◆	2017-03-01	18500	20500	22500	25000	31000	19000	21000	23000	26000	32000	16990	05-11	06-07	20500	2016-06-13
8	BPNW4	New Fork	Big Piney	6847	◆	2017-03-01	5800	6300							9200	11000	4730	05-26	06-23	5130	2016-06-10
9	GRRW4	Green	Green			2017-03-01	8000	9000	10000	12000	14000	8100	9200	10000	12000	14000	5790	05-05	07-08	6550	2016-06-19
10	OAWU1	Weber	Oakley	2230	◆	2017-03-01	1600	1900	2200	2700	3200	1900	2200	2600	3200	3800	1645	05-20	06-16	1530	2016-06-07
11	ALEC2	East	Almont	3180	◆	2017-03-01	2100	2300	2700	3200	3800	2300	2500	3000	3500	4200	2000	05-21	06-11	1880	2016-06-07
12	GRVU1	Green	Green River	36425	◆	2017-03-01	23000	26000	30000	35000	44000	23000	26000	31000	36000	45000	21700	05-16	06-11	24200	2016-06-15
13	HMFW4	Hams Fork	Frontier	1794	◆	2017-03-01	900	1100	1300	1600	1800	970	1200	1400	1700	2000	710	05-09	06-06	877	2016-05-10
14	ENMC2	Elk	Milner	5719	◆	2017-03-01	2800	3400	4000	4800	6000	3200	3800	4500	5400	6700	3865	05-17	06-03	4070	2016-06-11

flood level

50% or greater mean daily forecast exceeds flood level

Peak Flow List

Peak Flow Forecast List Help | Download Data | Requery | Rebuild Plots

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2	LABW4	Green	La Barge	11448	◆	2017-03-01	12000	13500	**16000**	19000	21000	12000	14000	16000	19000	21000	8000	05-26	06-21	8560	2016-06-13
3	BRBW4			3217	◆	2017-03-01	3200	3500	**4100**	4[illegible]61	5488	3200	3500	4100					[illegible]-29	1610	2016-06-18
4	LGNU1	Logan	Logan	1372	◆	2017-03-01	1549	1839	**2051**	2[illegible]85	2667	1600	1700	2200					[illegible]-09	775	2016-05-22
5	HRMU1	Blacksmith Fork	Hyrum	903	◆	2017-03-01	829	939	**1009**	1[illegible]10	1403	980	1100	1200	1300	1700	445	04-16	05-17	307	2016-04-15
6	PRZU1	Little Bear	Paradise	[illegible]50	◆	2017-03-01	1073	1266	**1343**	1[illegible]04	1735	NA	NA	NA	NA	NA	560	04-14	05-16	364	2016-04-25
7	JESU1	Green	Jensen	24130	◆	2017-03-01	18500	20500	**22500**	25000	31000	19000	21000	23000	26000	32000	16990	05-11	06-07	20500	2016-06-13
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10	OAWU1	Weber	Oakley	2510	◆	2017-03-01	1621	1922	**2224**	2724	3152	1900	2200	2600	3200	3700	1645	05-20	06-16	1530	2016-06-07
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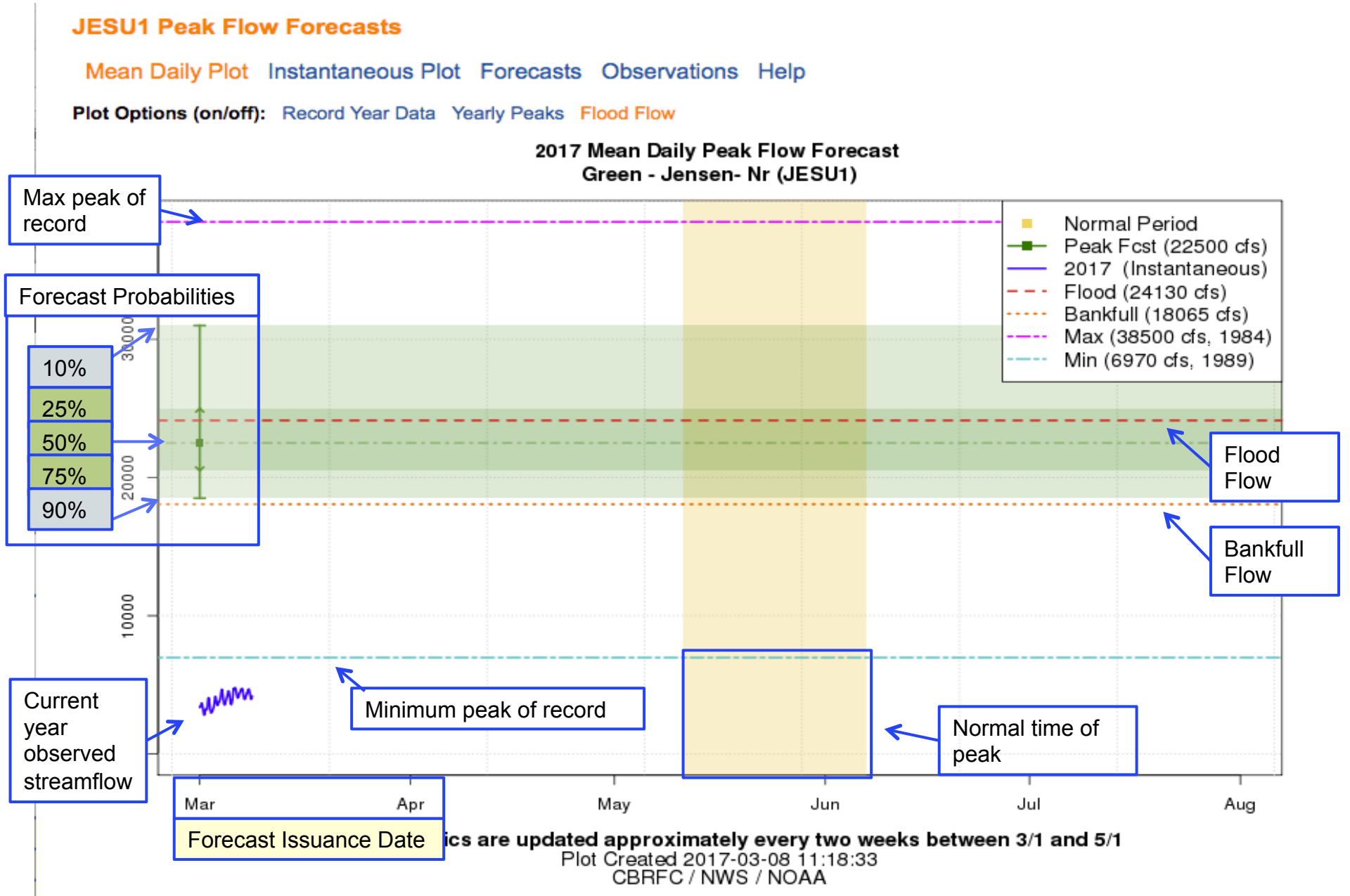
flood level

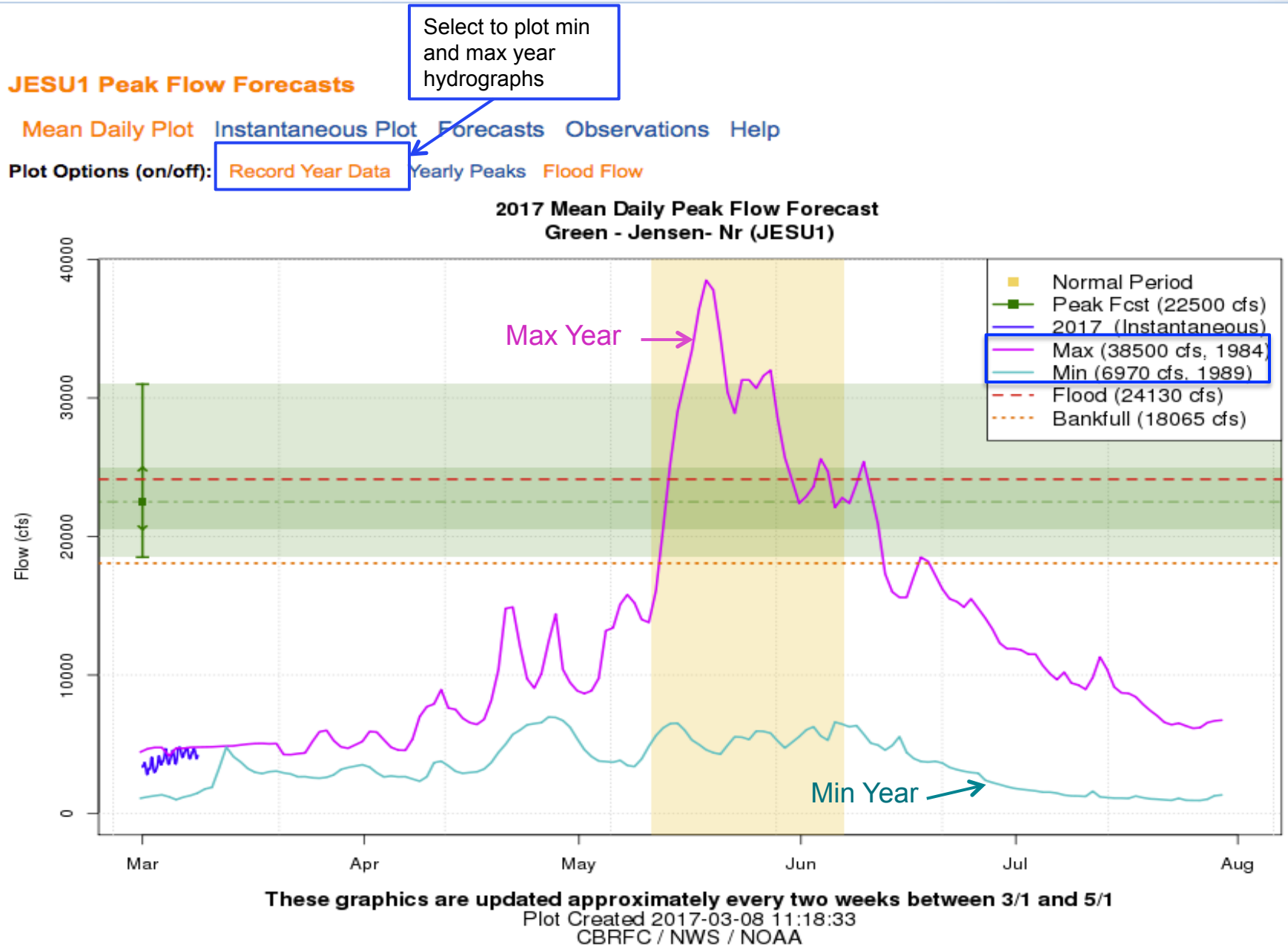
25-50% mean daily forecast exceeds flood level

Instantaneous peak relationship exceeds flood at 50% probability

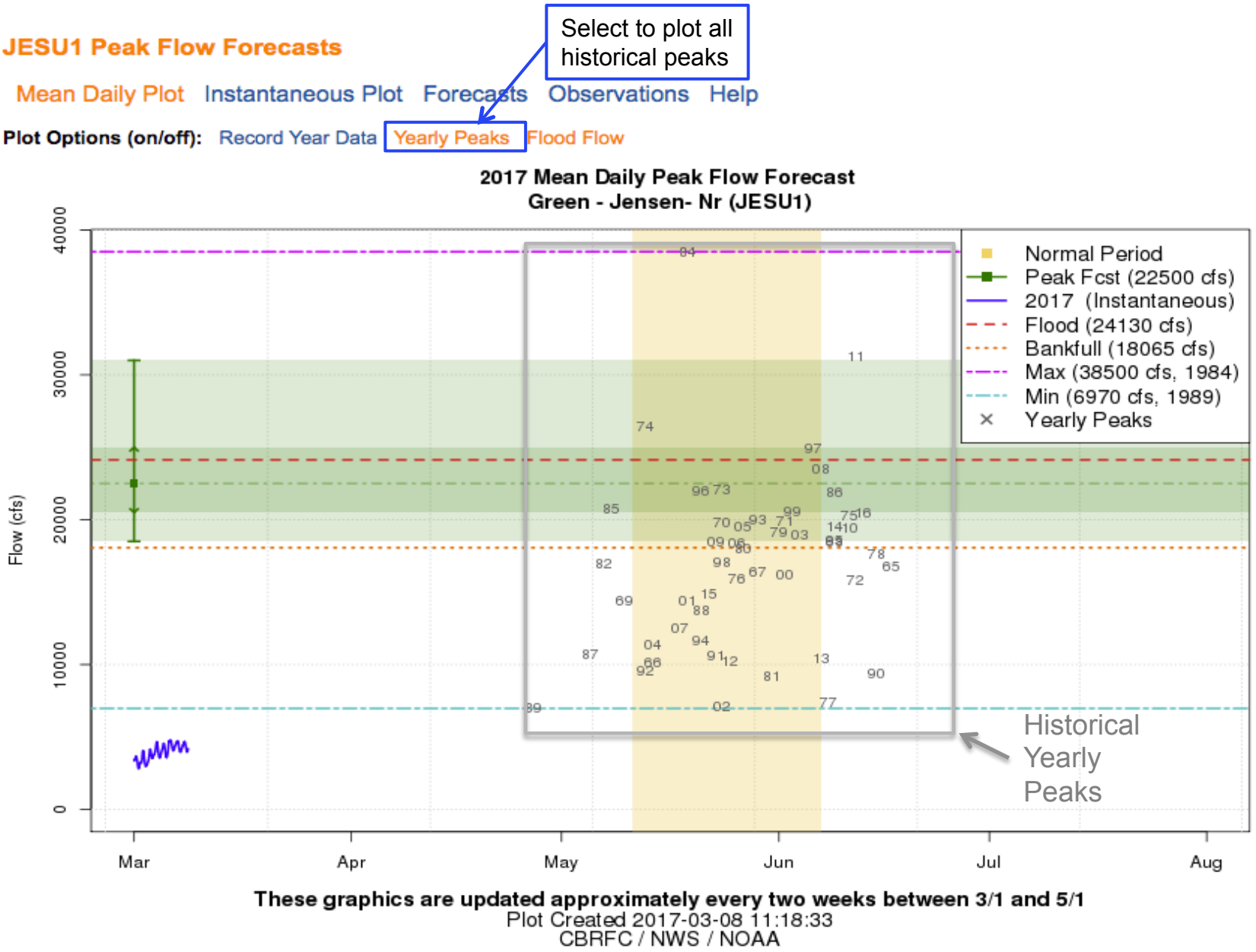
Peak Flow Graphic



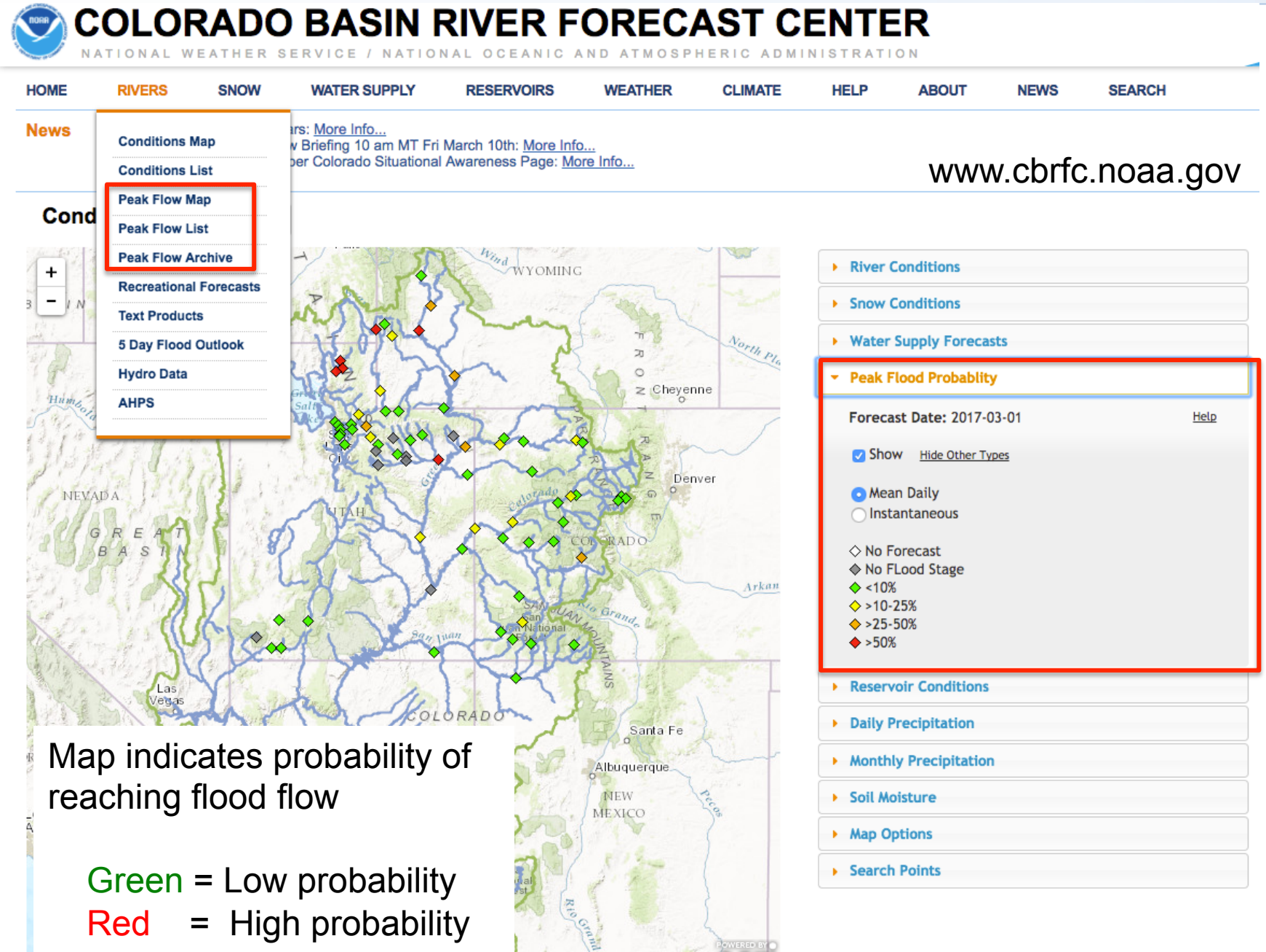
Peak Flow Graphic



Peak Flow Graphic



Where do I find peak flow forecasts?

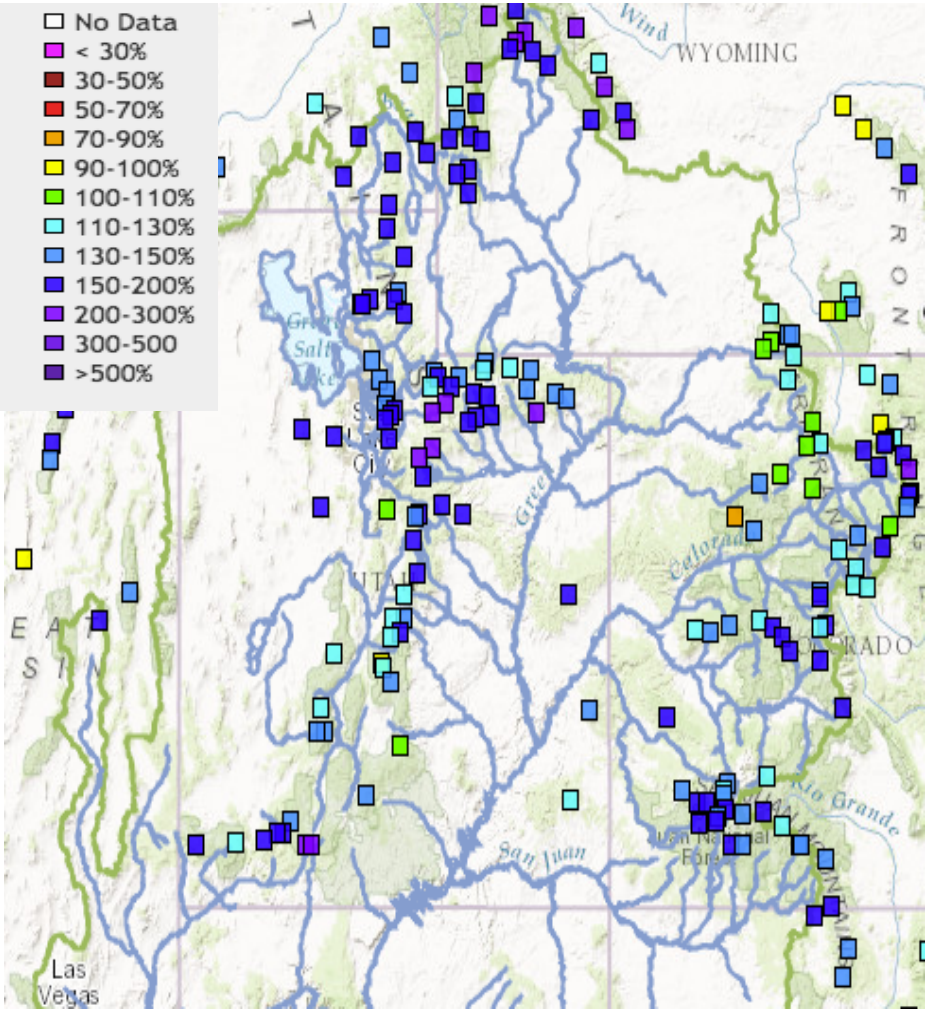


Map indicates probability of reaching flood flow

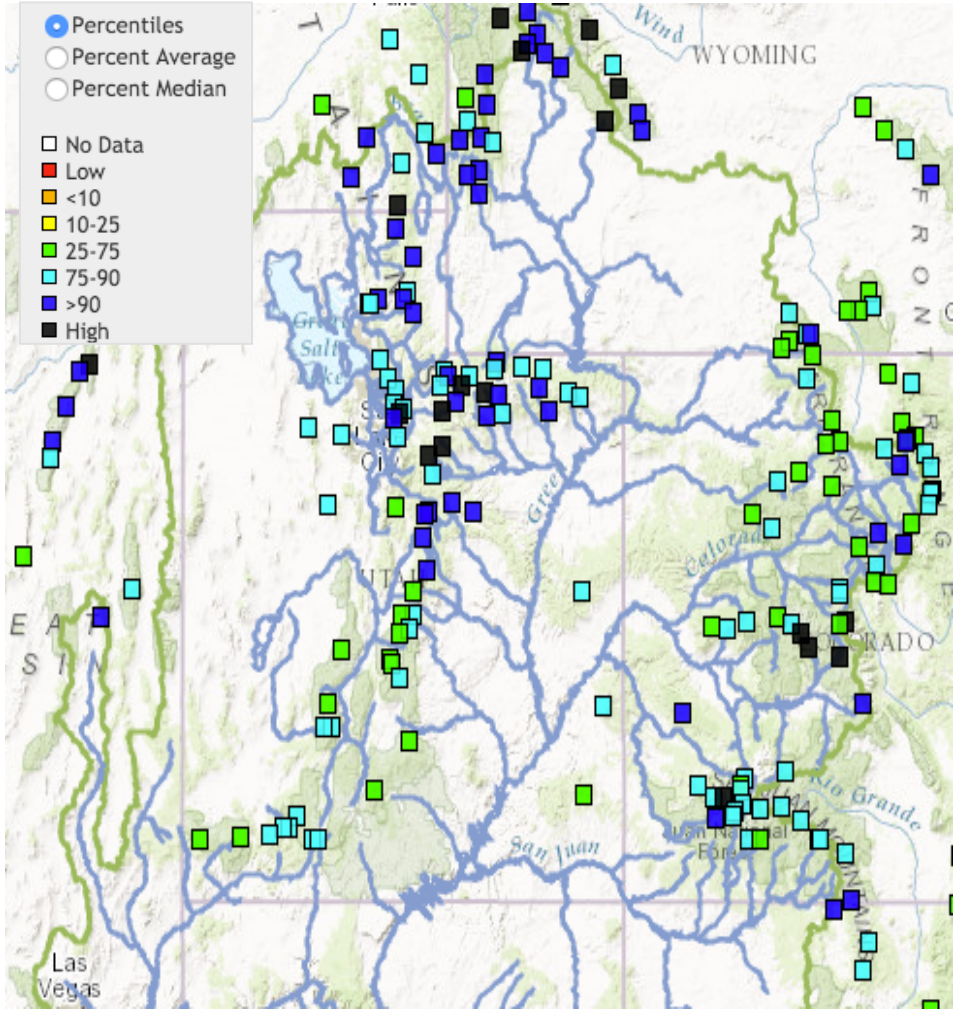
Green = Low probability

Red = High probability

Current conditions impacting peaks: SNOTEL Network

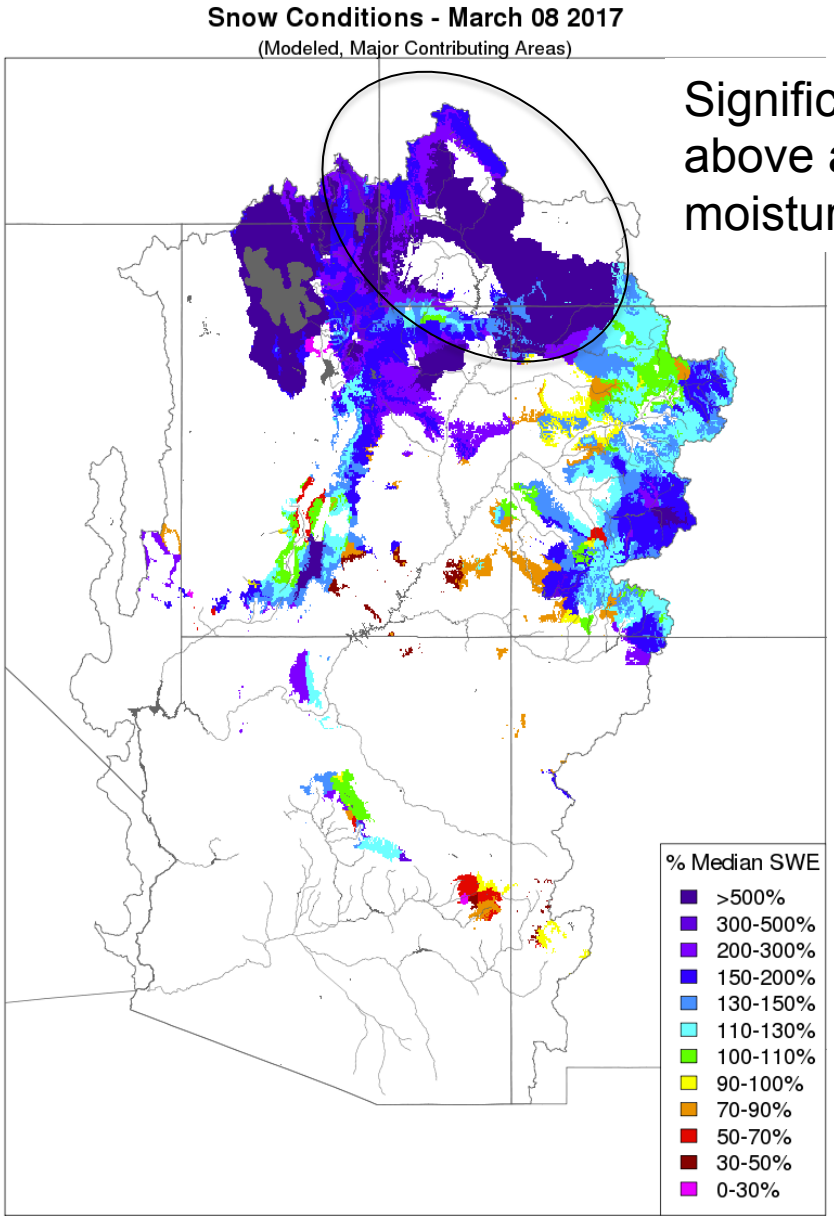


Snow (% median): March 8 2017

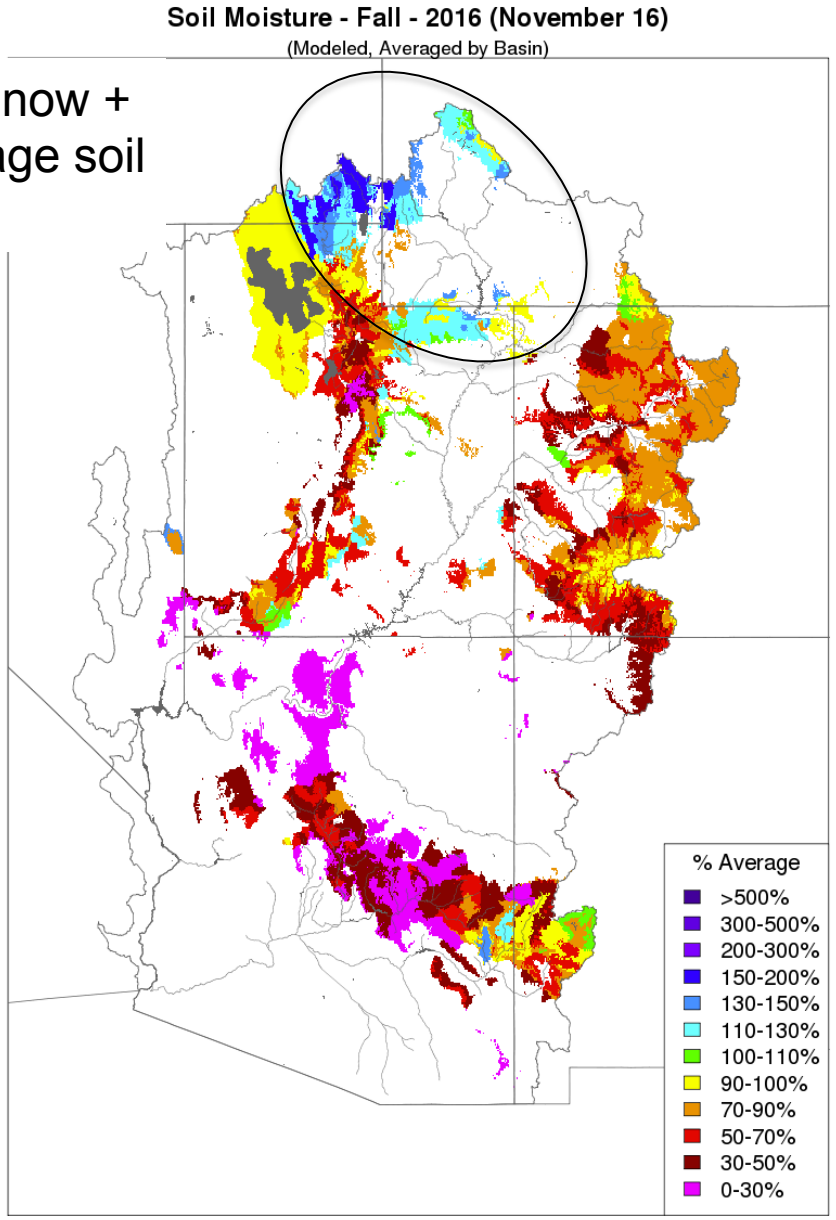


Snow (ranking): March 8 2017

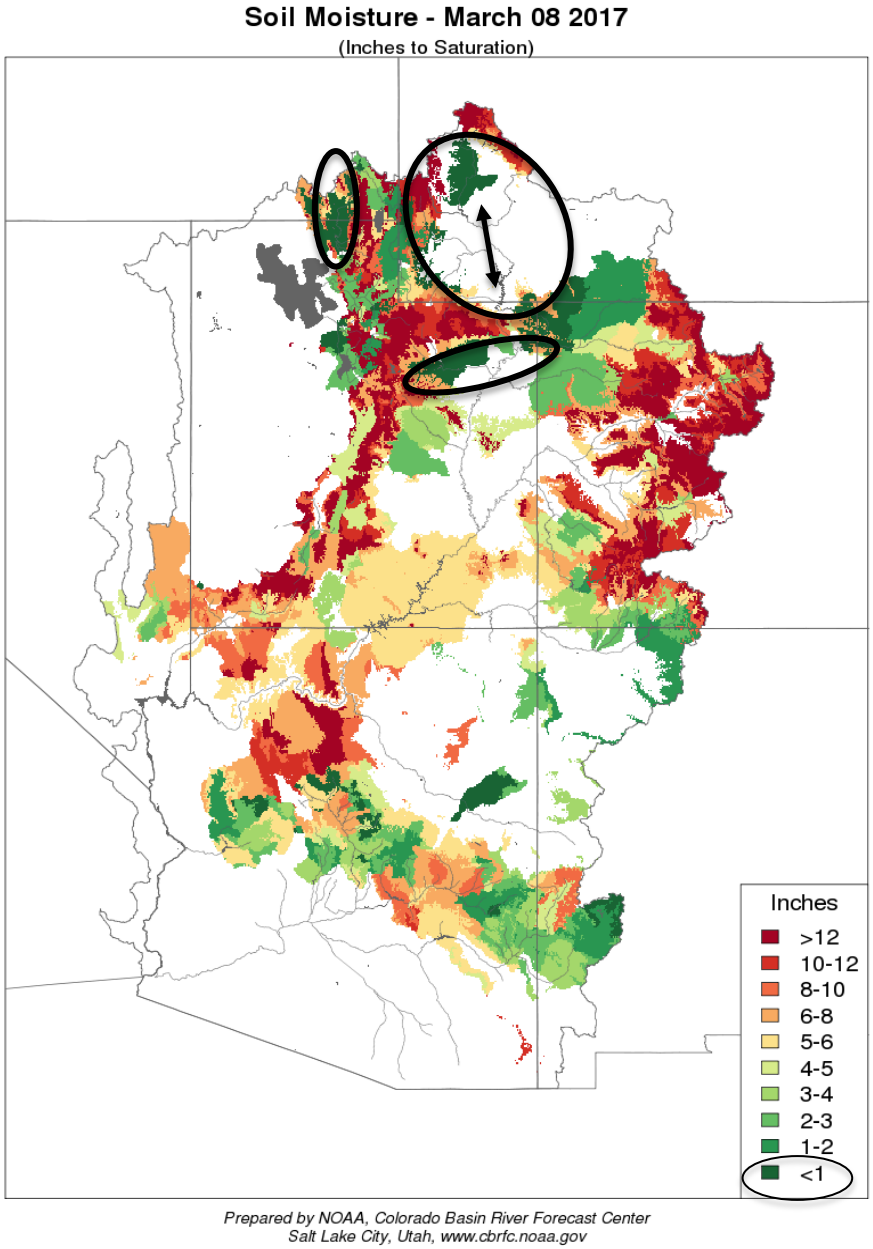
Current conditions impacting peaks: Snow & Soil Moisture



Significant snow + above average soil moisture



Current conditions impacting peaks: Saturated Areas

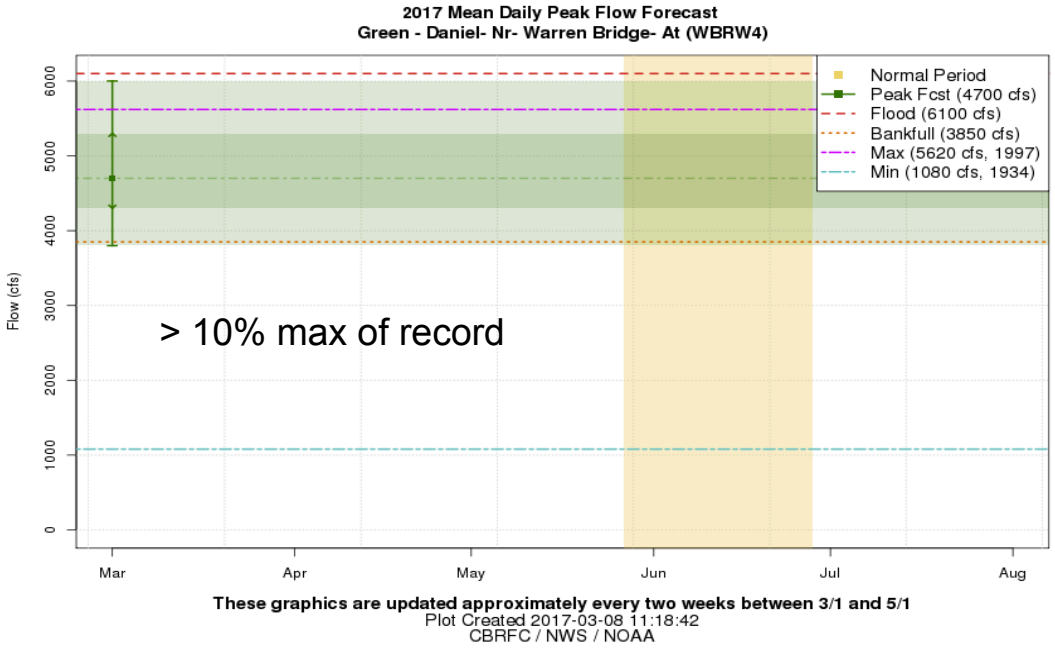


Model representation of where areas are becoming saturated
(dark green < 1 inch)

Saturated soils will result in enhanced runoff due to rain / snow melt:

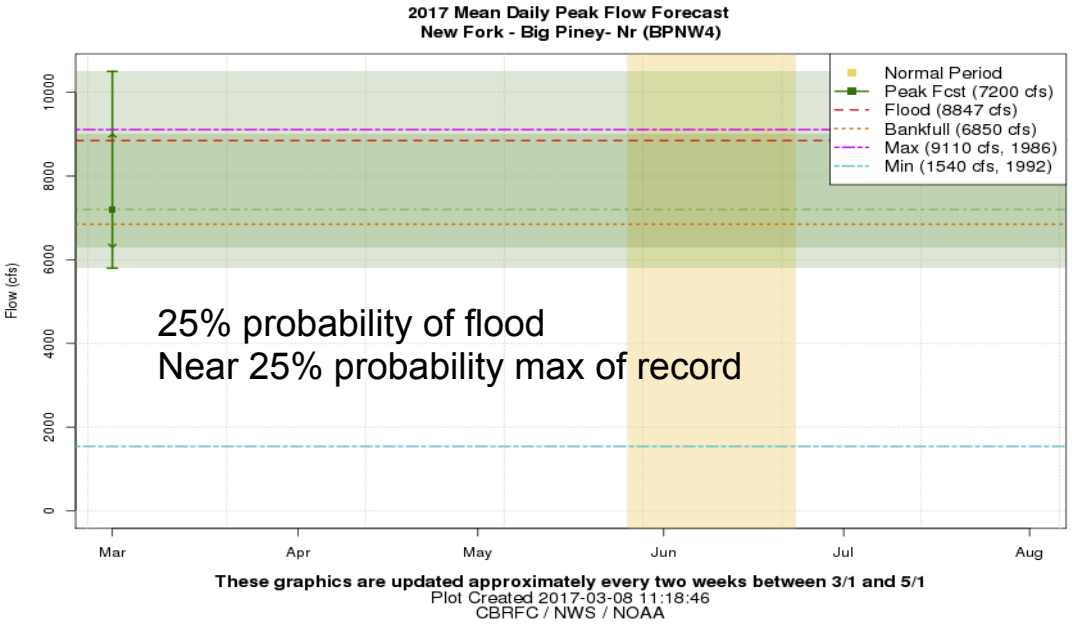
Lower Bear River Basin
Duchesne River Basin
Green River Basin in Wyoming

Green River Basin – Upper Green



Green River – Warren Bridge

Forecast:	**4700 CFS**
Average:	2700 CFS
Flood:	6100 CFS
Last Year:	2750 CFS
Max of Record:	5620 CFS

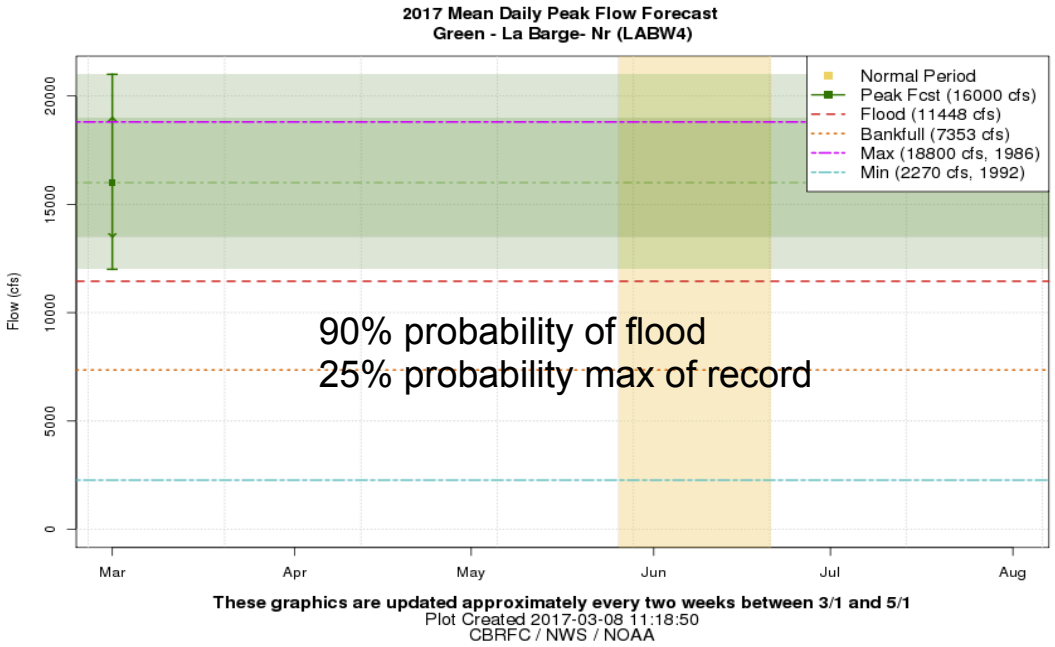


New Fork – Big Piney, WY

Forecast:	**7200 CFS**
Average:	4700 CFS
Flood:	8847 CFS
Last Year:	5130 CFS
Max of Record:	9110 CFS

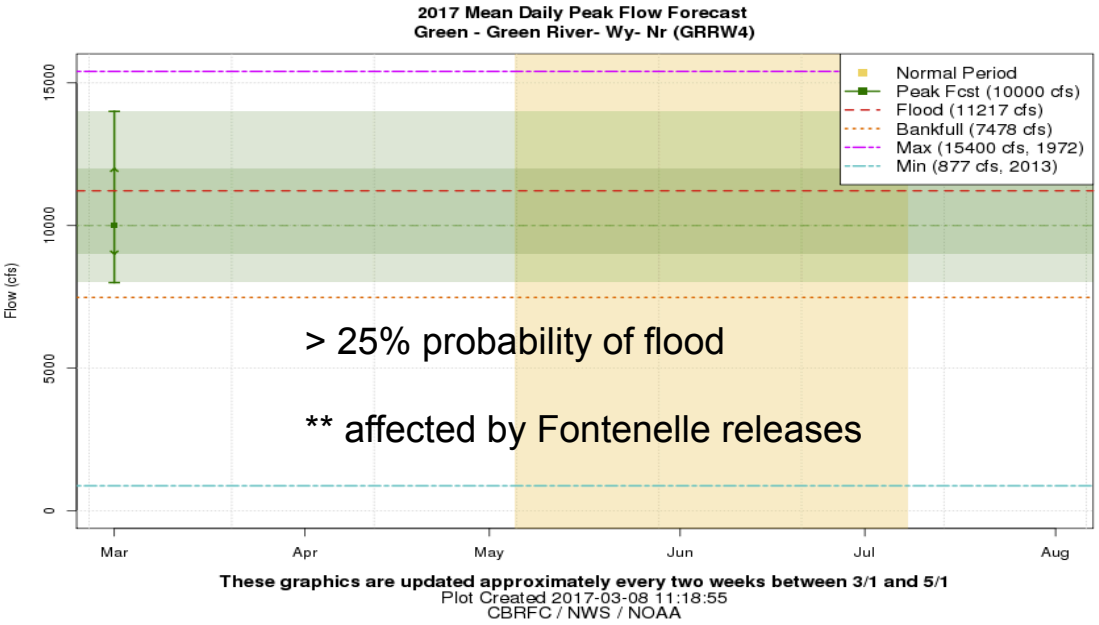
Forecasts are 50% Exceedance

Green River Basin – Upper Green



Green River – LaBarge

Forecast:	**16000 CFS**
Average:	8000 CFS
Flood:	**11500 CFS**
Last Year:	8560 CFS
Max of Record:	18800 CFS

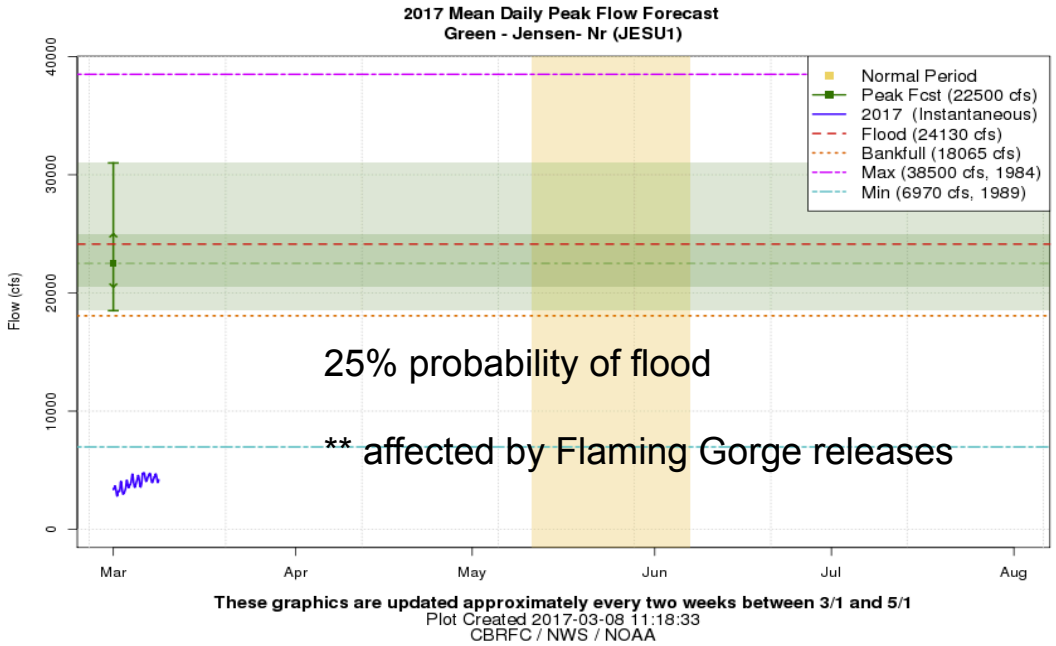


Green River – Green River, WY

Forecast:	**10000 CFS**
Average:	5790 CFS
Flood:	11200 CFS
Last Year:	6550 CFS

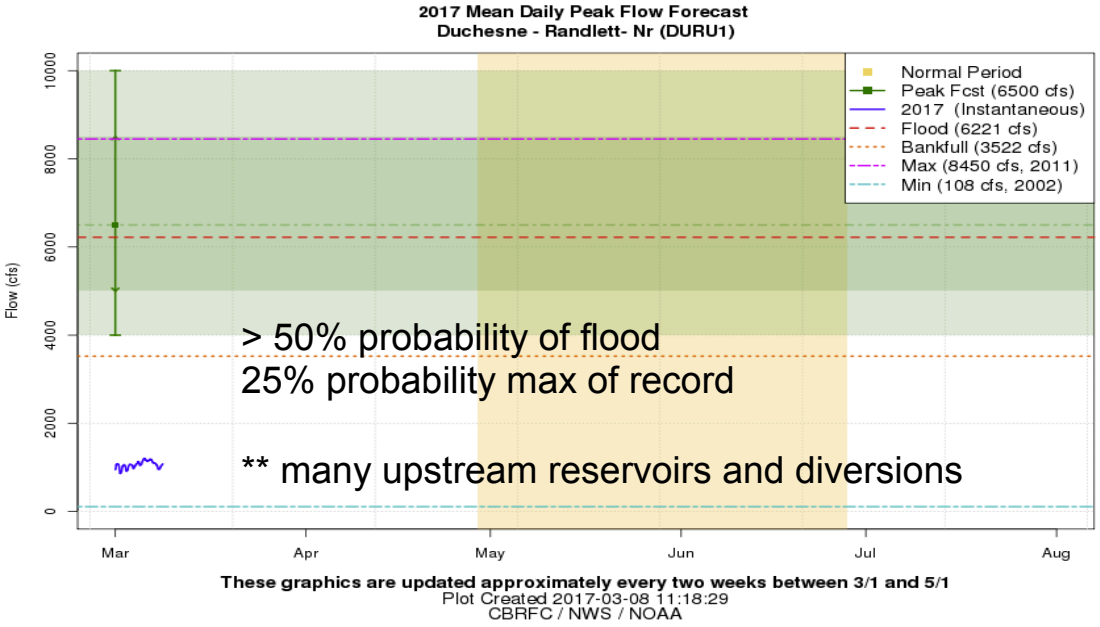
Forecasts are 50% Exceedance

Green River Basin



Green River – Jensen

Forecast:	**22500 CFS**
Average:	16990CFS
Flood:	24130 CFS
Last Year:	20500CFS

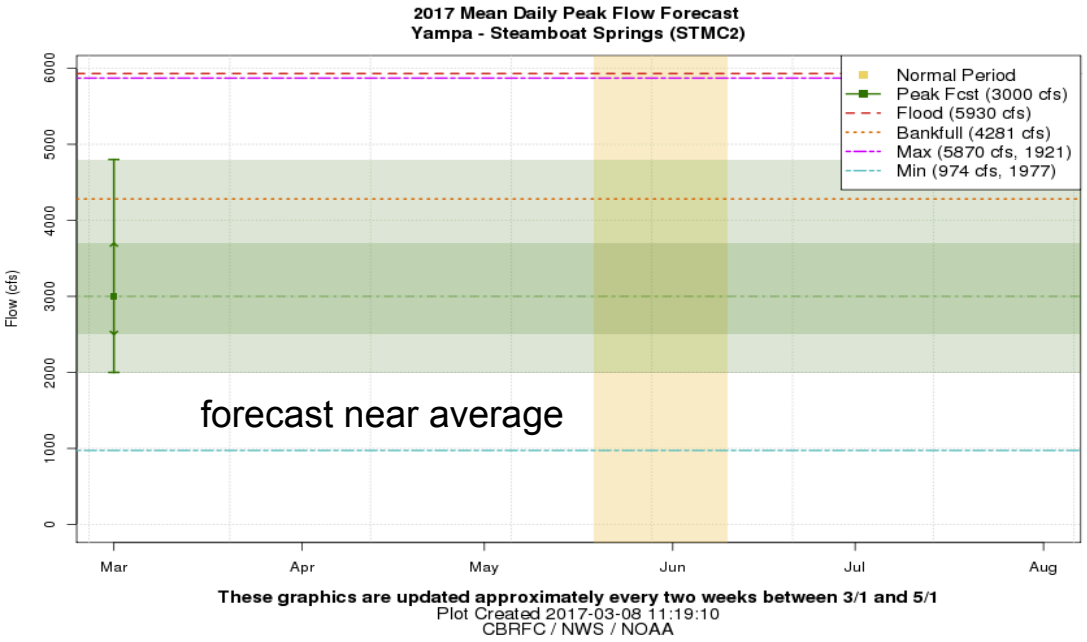


Duchesne– Randlett

Forecast:	**6500 CFS**
Average:	3070 CFS
Flood:	**6220 CFS**
Last Year:	2630 CFS
Max of Record:	8450 CFS

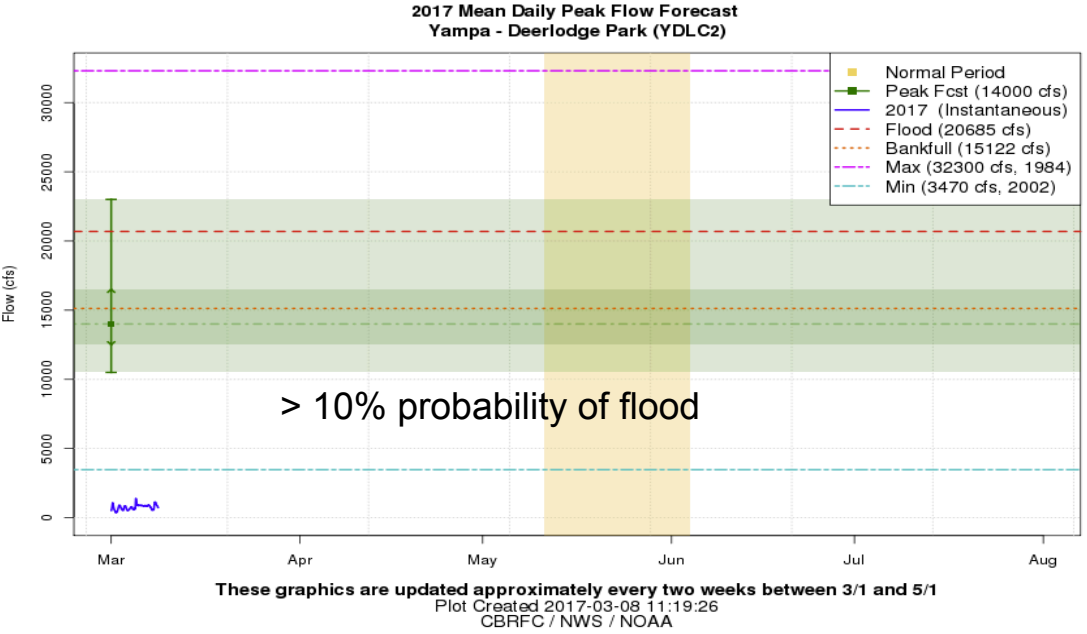
Forecasts are 50% Exceedance

Yampa River Basin



Yampa River-Steamboat Springs

Forecast:	**3000 CFS**
Average:	3070 CFS
Flood:	5930 CFS
Last Year:	3420 CFS

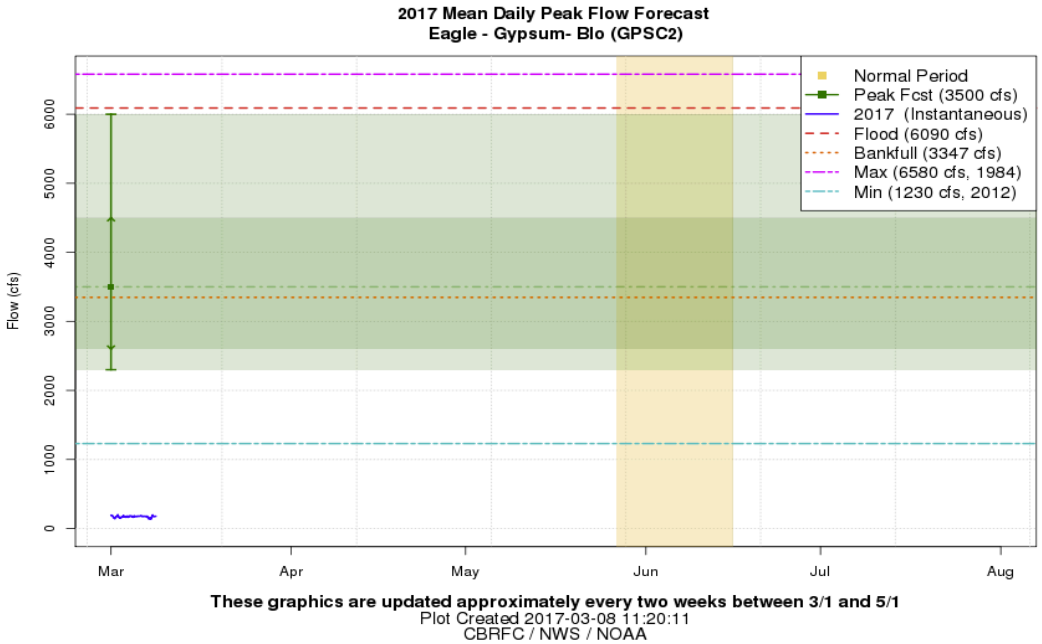


Yampa River - Deerlodge

Forecast:	**14000 CFS**
Average:	13500 CFS
Flood:	20700 CFS
Last Year:	15160 CFS

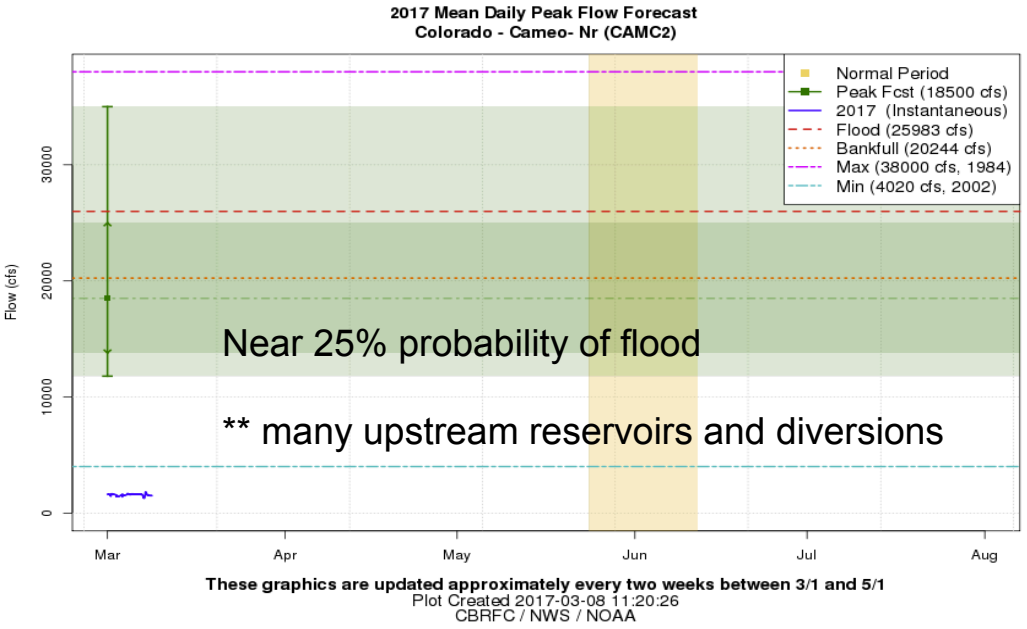
Forecasts are 50% Exceedance

Upper Colorado River Basin



Eagle River - Gypsum

Forecast:	**3500 CFS**
Average:	3600 CFS
Flood:	6100 CFS
Last Year:	4200 CFS

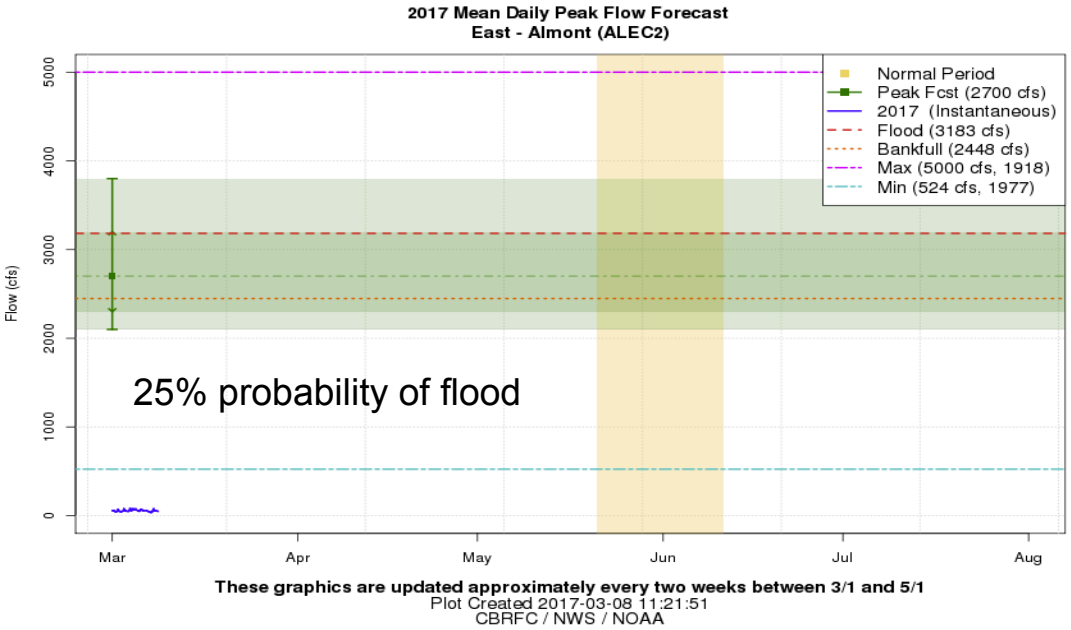


Colorado River - Cameo

Forecast:	**18500 CFS**
Average:	17000 CFS
Flood:	26000 CFS
Last Year:	19200 CFS

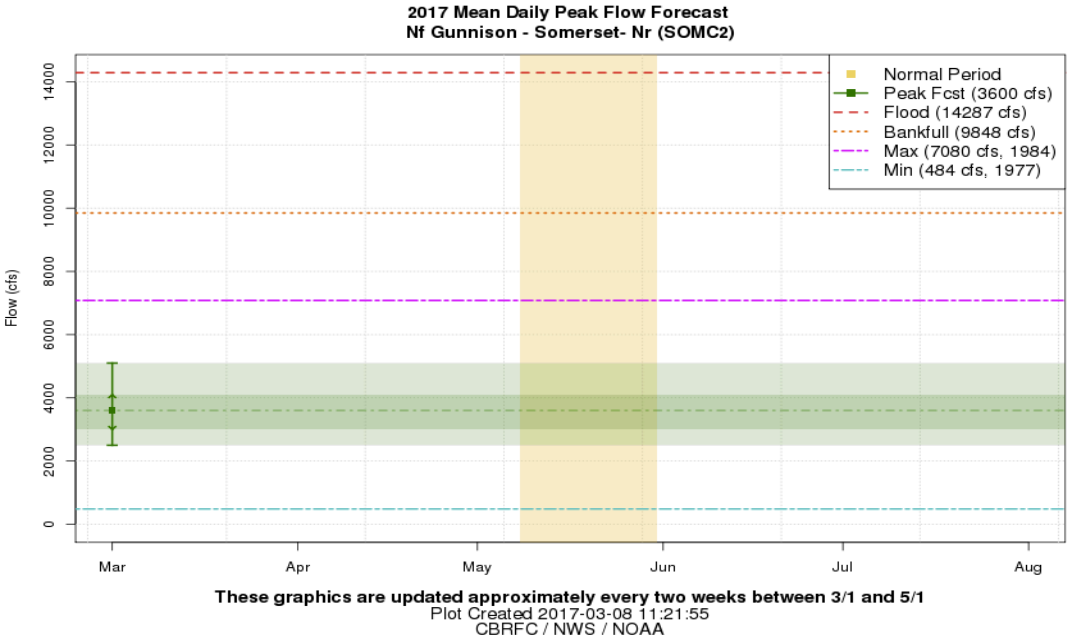
Forecasts are 50% Exceedance

Gunnison River Basin



East River - Almont

Forecast:	**2700 CFS**
Average:	2000 CFS
Flood:	3180 CFS
Last Year:	1880 CFS

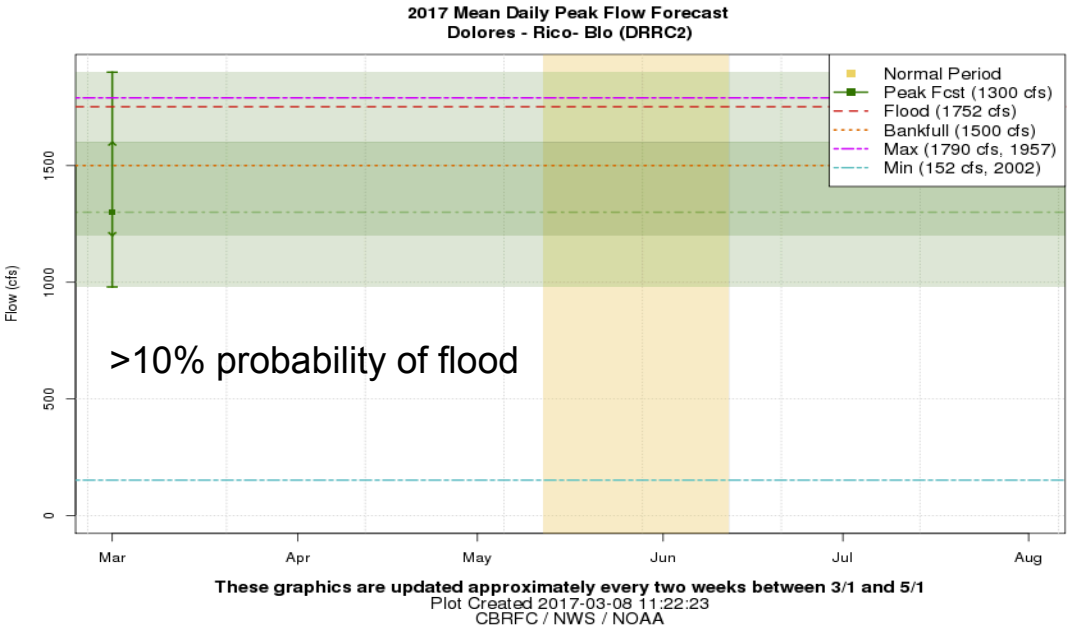


NF Gunnison - Somerset

Forecast:	**3600 CFS**
Average:	3120 CFS
Flood:	14280 CFS
Last Year:	2450 CFS

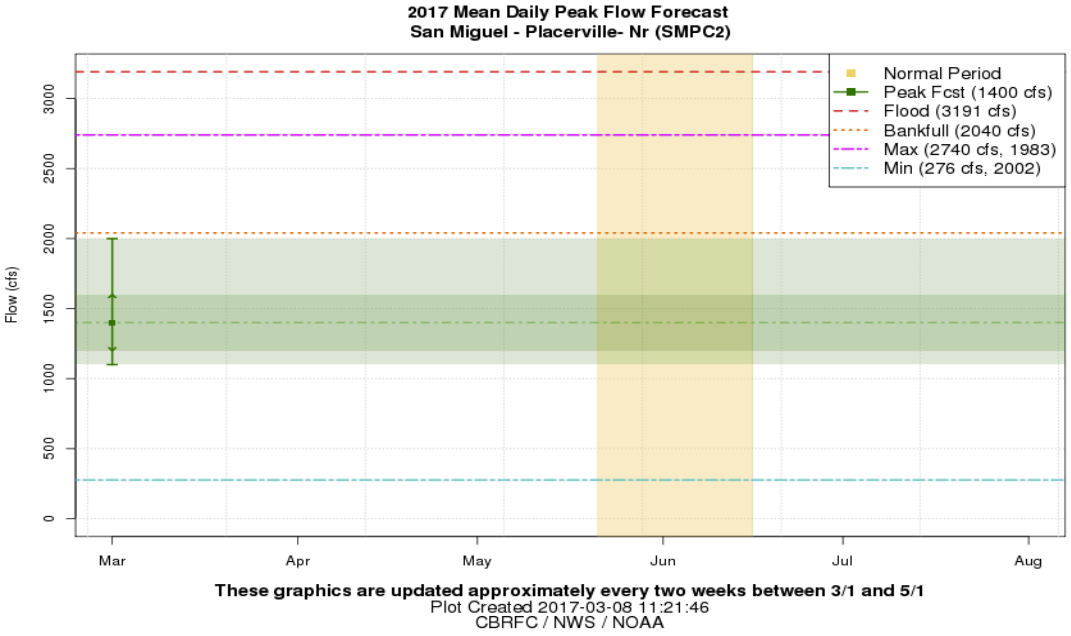
Forecasts are 50% Exceedance

Dolores River Basin



Dolores- Rico

Forecast:	**1300 CFS**
Average:	970 CFS
Flood:	1750 CFS
Last Year:	1100 CFS

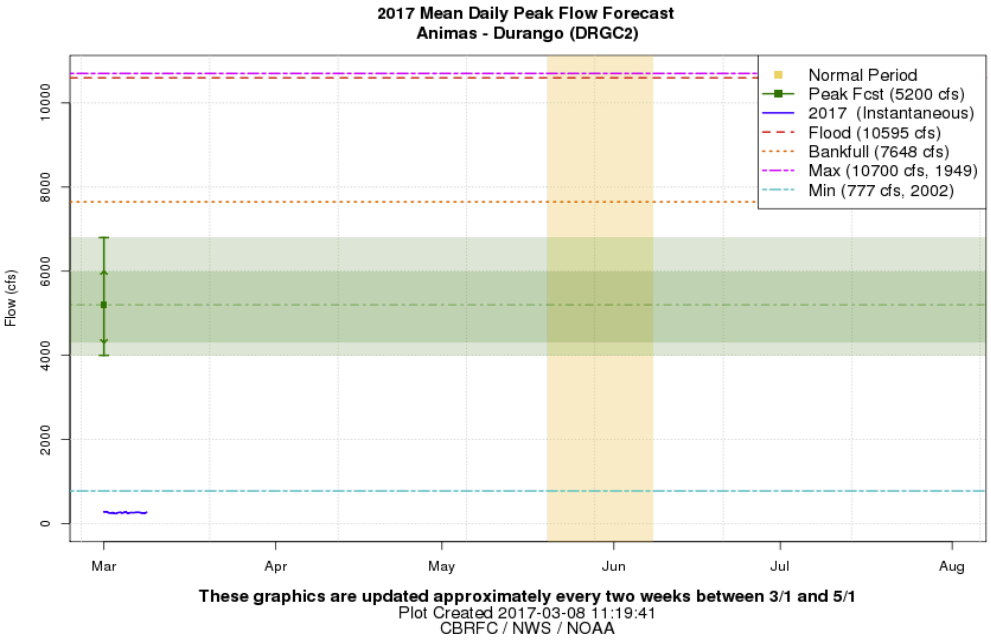


San Miguel- Placerville

Forecast:	**1400 CFS**
Average:	1260 CFS
Flood:	3190 CFS
Last Year:	1490 CFS

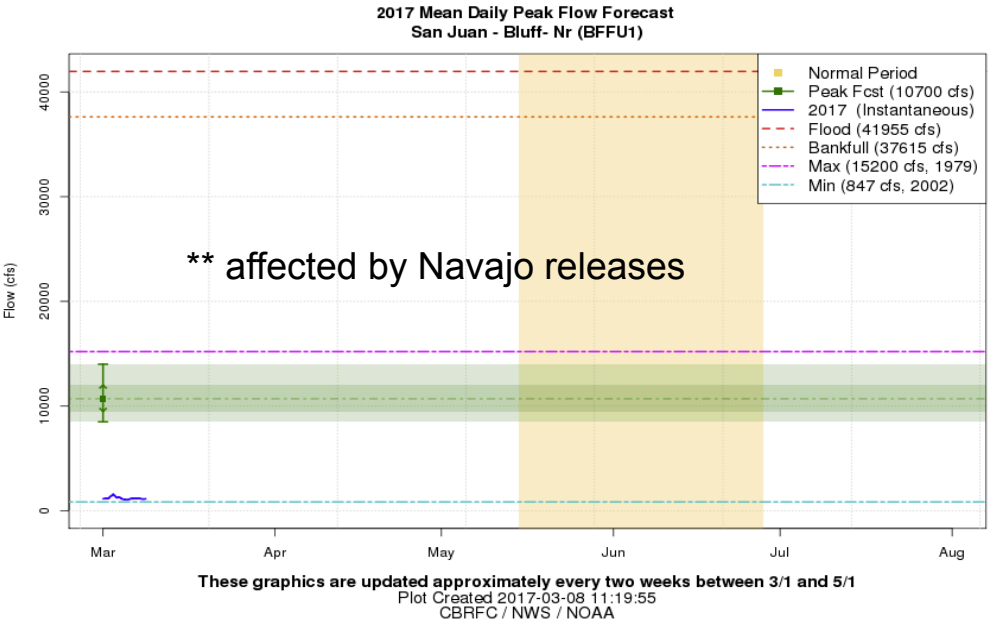
Forecasts are 50% Exceedance

San Juan River Basin



Animas River - Durango

Forecast:	**5200 CFS**
Average:	4600 CFS
Flood:	10500 CFS
Last Year:	5110 CFS

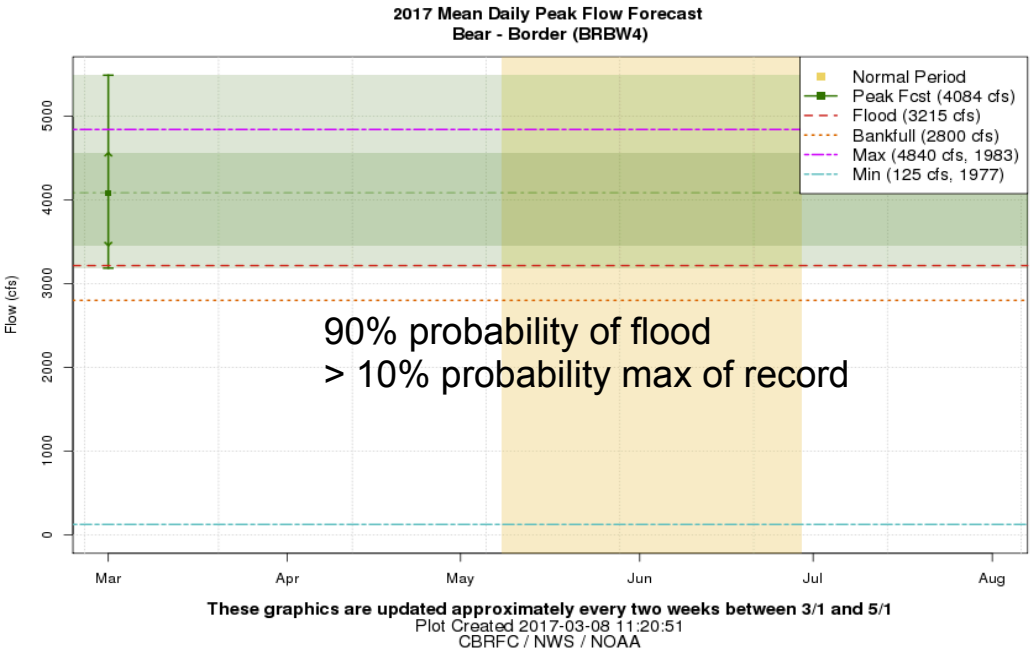


San Juan River - Bluff

Forecast:	**10700 CFS**
Average:	7340 CFS
Flood:	41900 CFS
Last Year:	7340 CFS

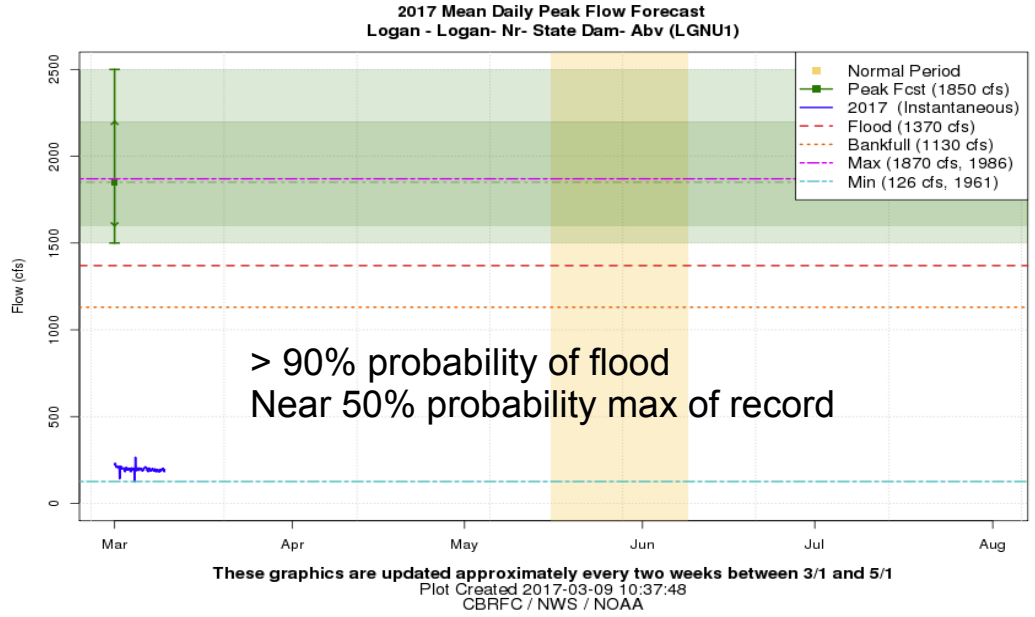
Forecasts are 50% Exceedance

Great Basin – Bear River Basin



Bear River – Border, WY

Forecast:	**4100 CFS**
Average:	1840 CFS
Flood:	**3200 CFS**
Last Year:	1610 CFS
Max of Record:	4840 CFS

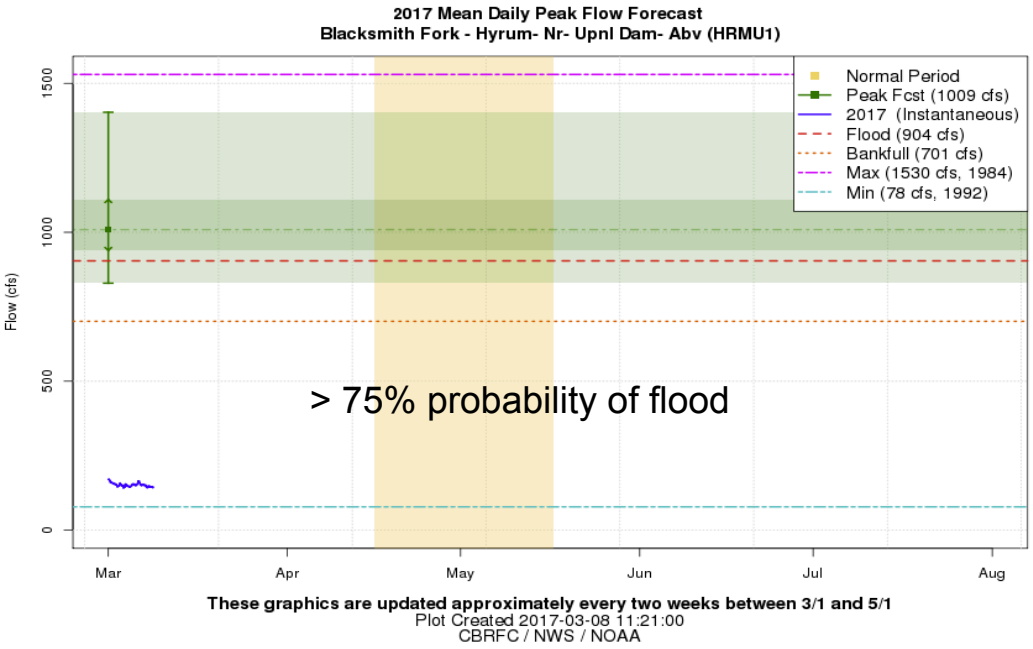


Logan River – Logan

Forecast:	**1850 CFS**
Average:	950 CFS
Flood:	**1370 CFS**
Last Year:	780 CFS
Max of Record:	**1870 CFS**

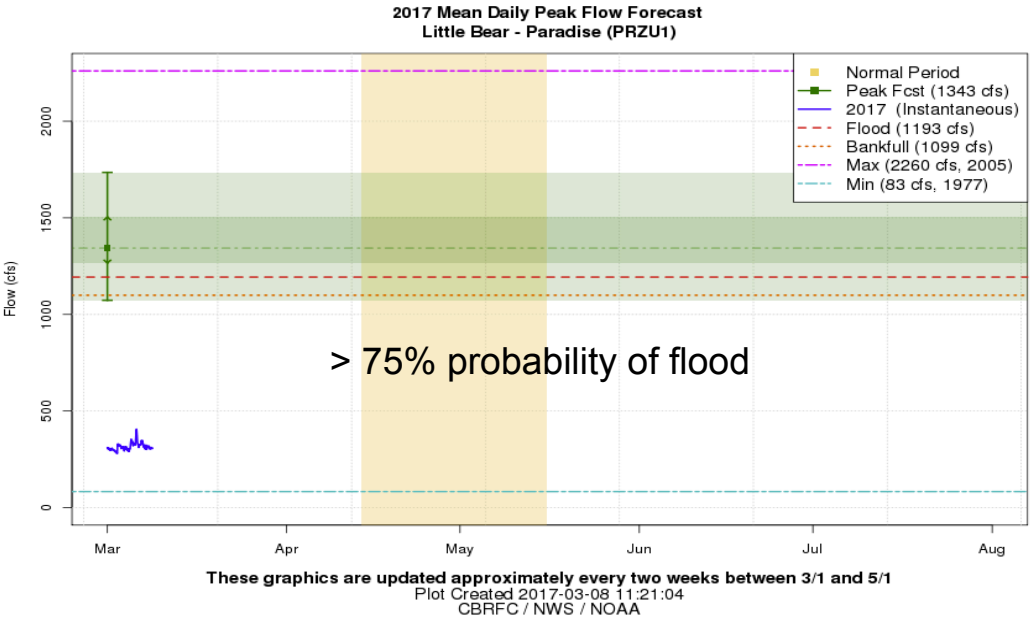
Forecasts are 50% Exceedance

Great Basin – Bear River Basin



Blacksmiths Fork – Hyrum

Forecast:	**1000 CFS**
Average:	450 CFS
Flood:	**900 CFS**
Last Year	300 CFS

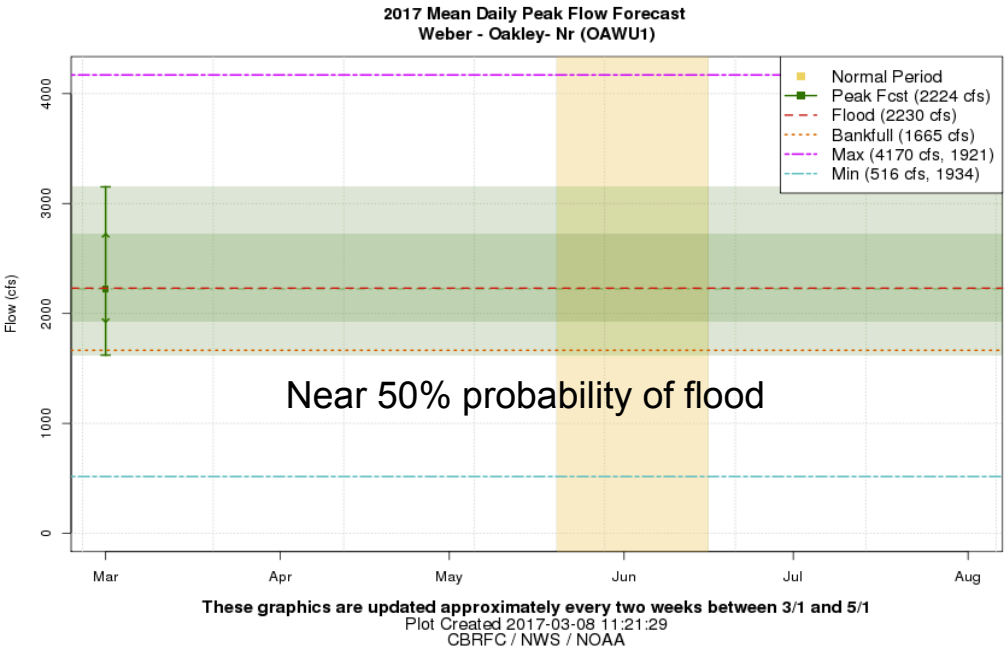


Little Bear River – Paradise

Forecast:	**1340 CFS**
Average:	560 CFS
Flood:	**1150 CFS**
Last Year:	360 CFS

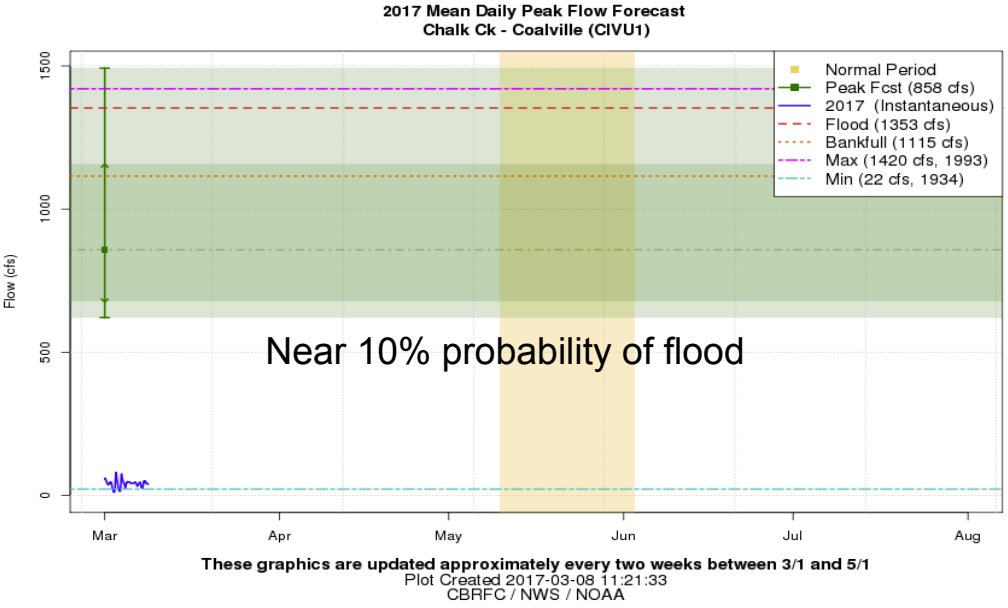
Forecasts are 50% Exceedance

Great Basin – Weber River Basin



Weber River - Oakley

Forecast:	**2200 CFS**
Average:	1640 CFS
Flood:	**2230 CFS**
Last Year:	1530 CFS

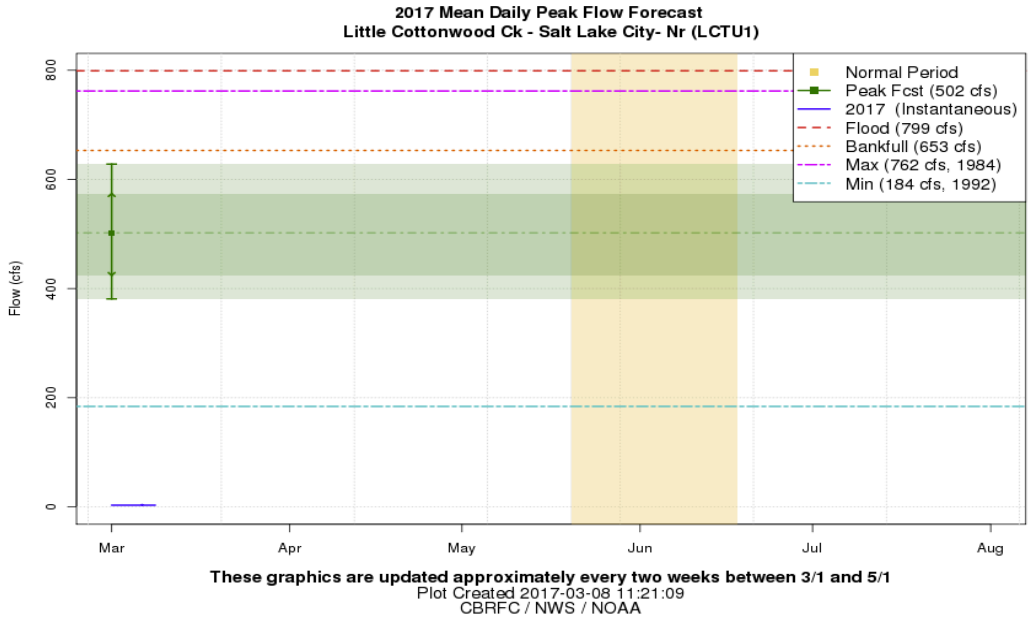


Chalk Creek – Coalville

Forecast:	**860 CFS**
Average:	560 CFS
Flood:	1340 CFS
Last Year:	380 CFS

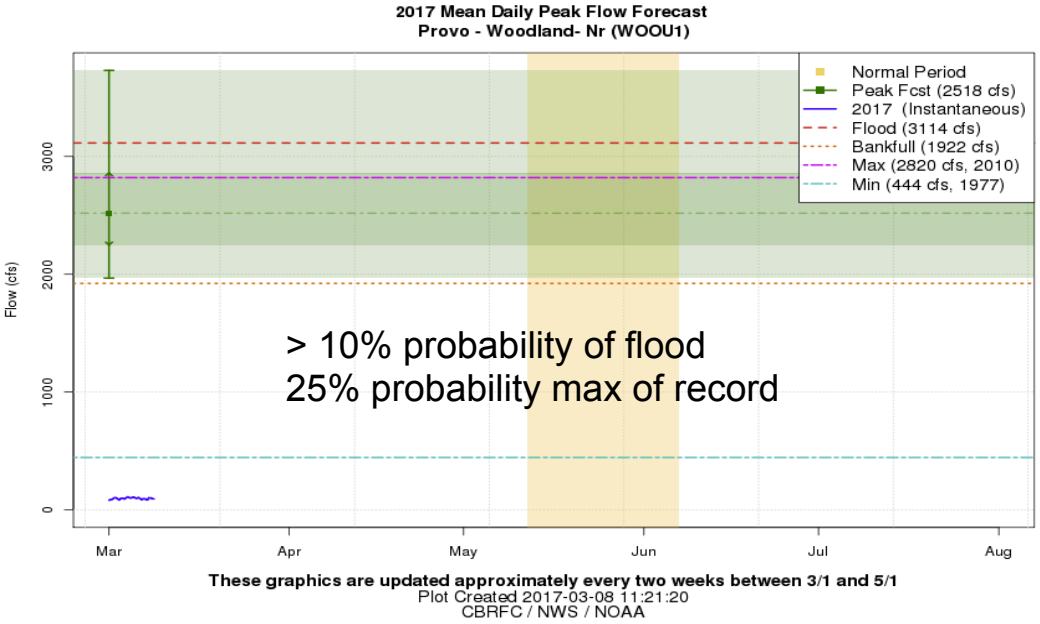
Forecasts are 50% Exceedance

Great Basin



Little Cottonwood - SLC

Forecast:	**500 CFS**
Average:	430 CFS
Flood:	800 CFS
Last Year:	230 CFS

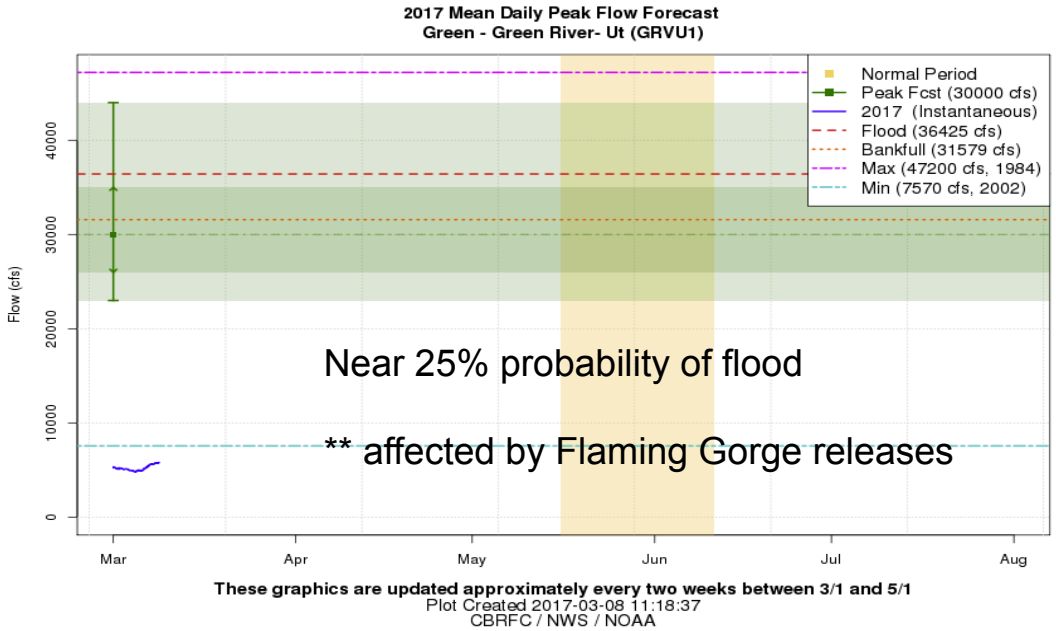


Provo River - Woodland

Forecast:	**2500 CFS**
Average:	1800 CFS
Flood:	3100 CFS
Last Year:	1710 CFS
Max of Record:	2820 CFS

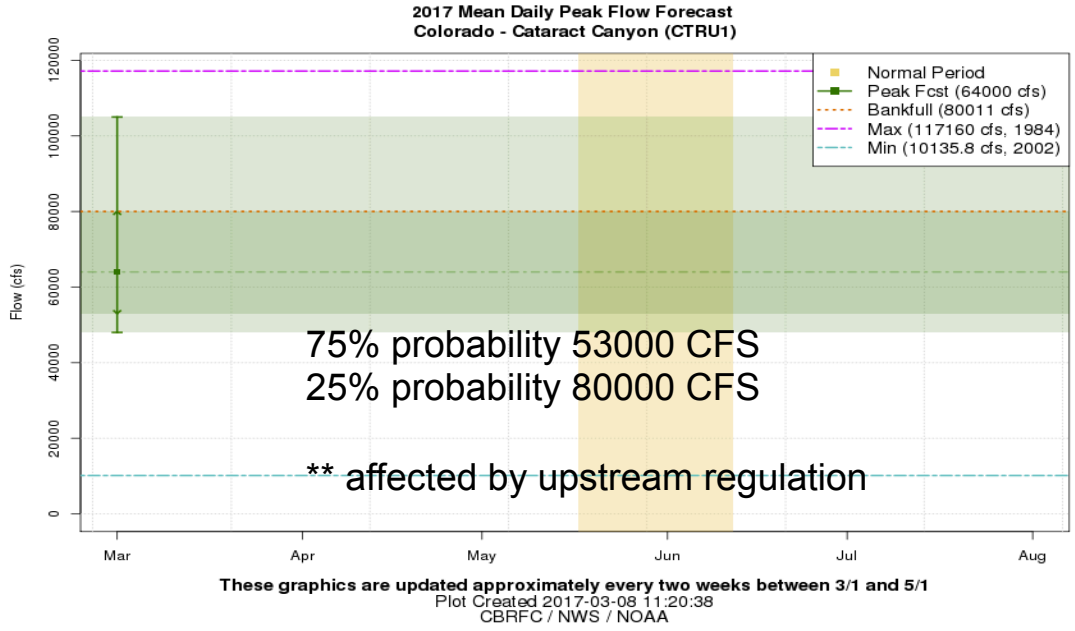
Forecasts are 50% Exceedance

Southeast Utah – Green & Colorado



Green River – Green River UT

Forecast:	**30000 CFS**
Average:	21700 CFS
Flood:	36400 CFS
Last Year:	24200 CFS



Colorado – Cataract Canyon

Forecast:	**64000 CFS**
Average:	48000 CFS
Last Year:	47200 CFS

Forecasts are 50% Exceedance

Peak Flow Forecast Summary

- Flood levels likely across parts of the northern Great Basin (Bear) and Green River Basin in southwest Wyoming

- Widespread bankfull conditions with flooding possible in parts of the Weber, Provo, Duchesne river basins and Gunnison river basin headwaters.

- Above average flows most areas with high flows possible for an extended period of time.

- Forecast procedures do not exist for all locations, areas with significant snowpack and a history of flood issues will be at greater risk this year.

- Situation is dynamic and will continue to evolve throughout the spring. Many scenarios are possible.

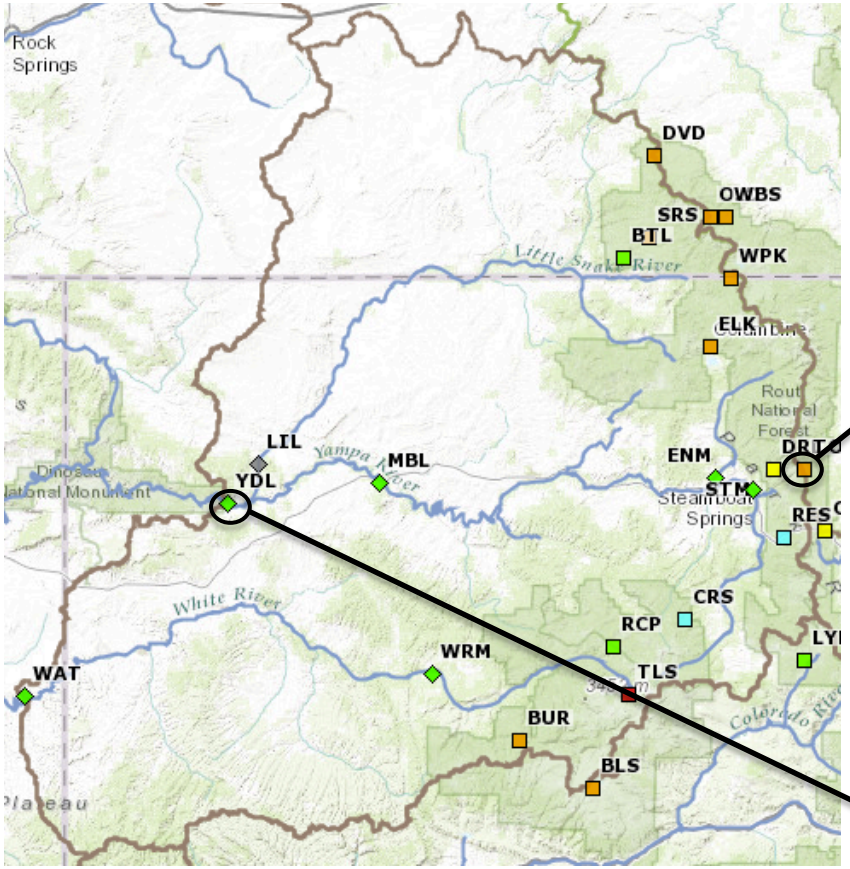
Peak Flow Forecast Summary

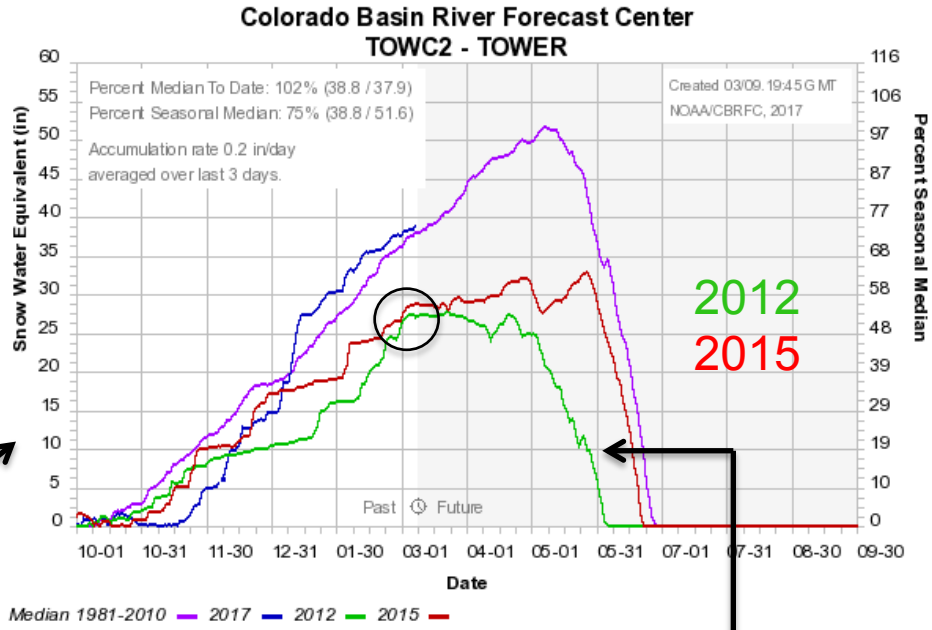
- Worst case scenarios for flood related Issues:
  - Heavy rain preceded by a significant warm period
  - Cool, wet spring and delayed melt into late spring

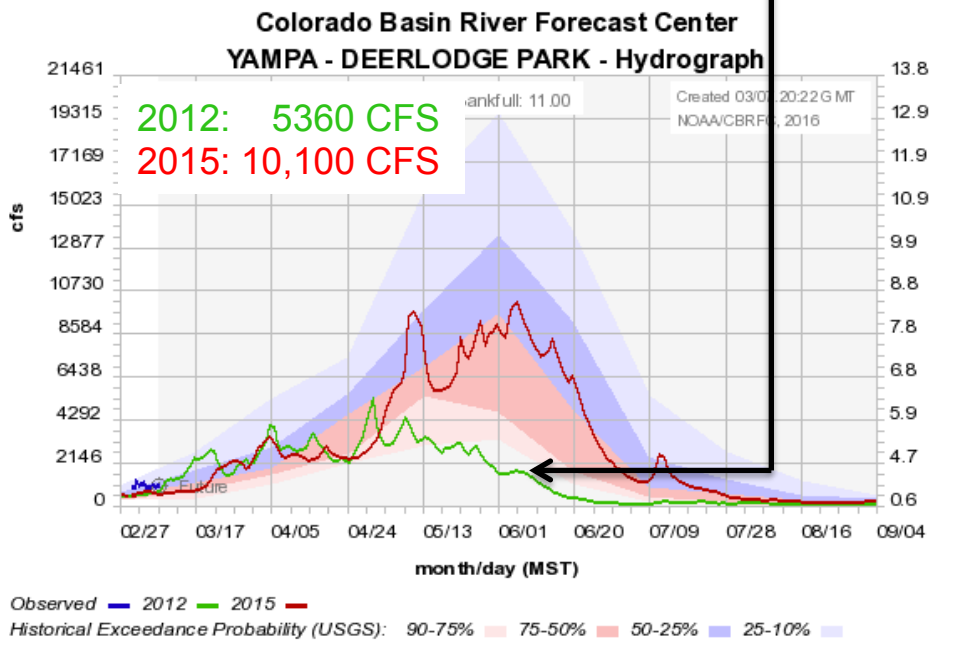
- Best case scenarios to reduce flood related issues:
  - Moderately warm early spring to bring off low/mid snow
  - Lack of heavy rain events during the runoff period

Impacts of Spring Weather

Yampa River Basin

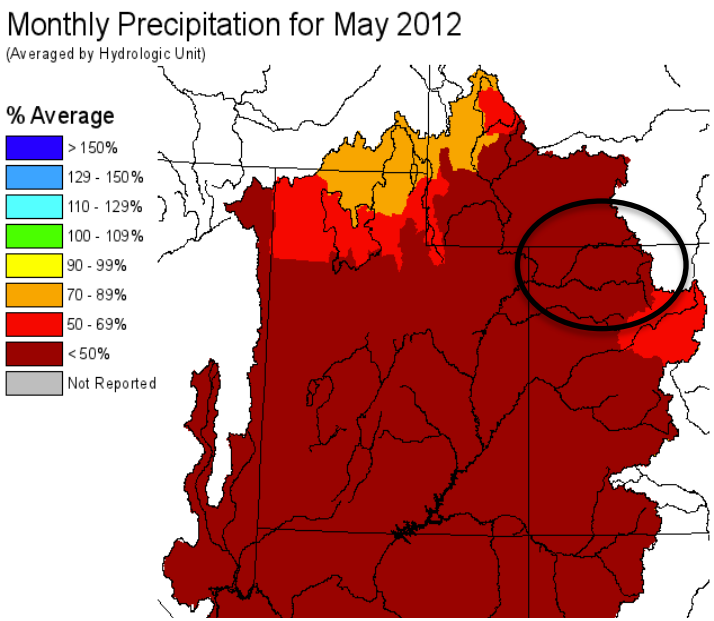


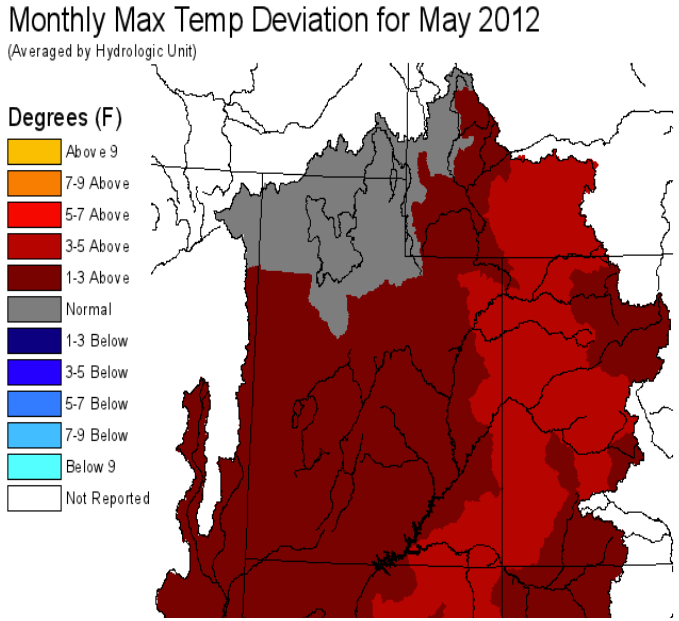




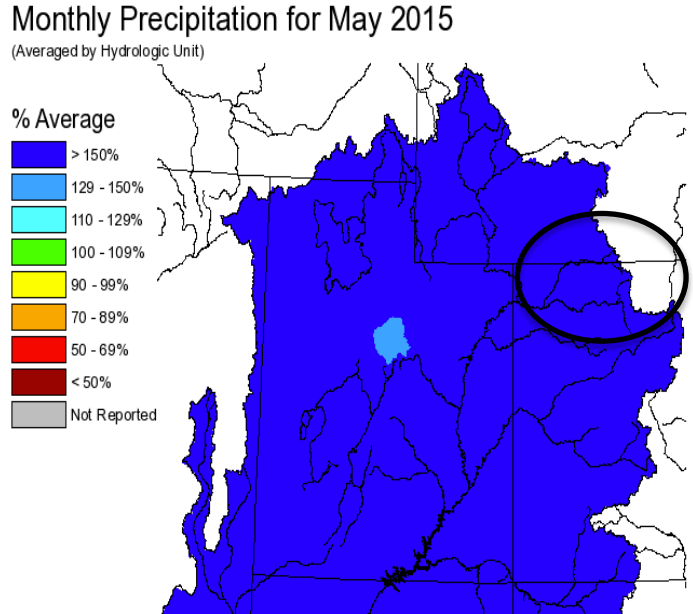
Impacts of Spring Weather

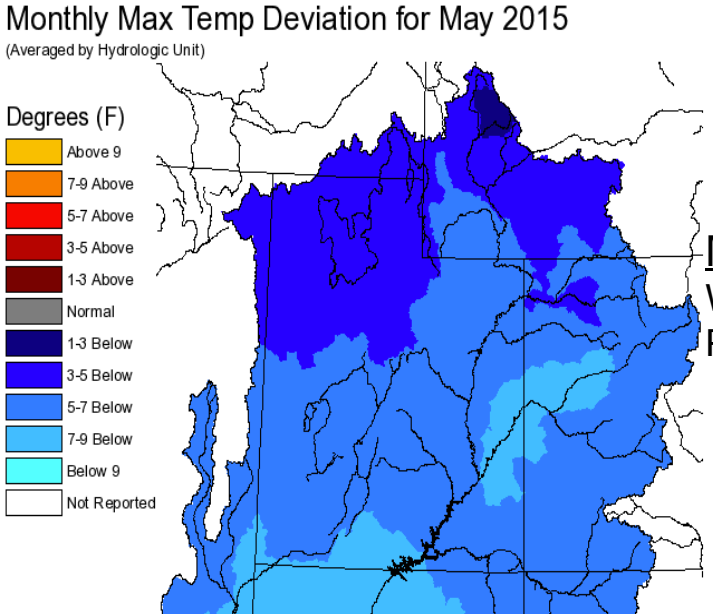
Yampa River Basin





May 2012
Dry and Warm
Peak Flow= 5360 CFS (40%)





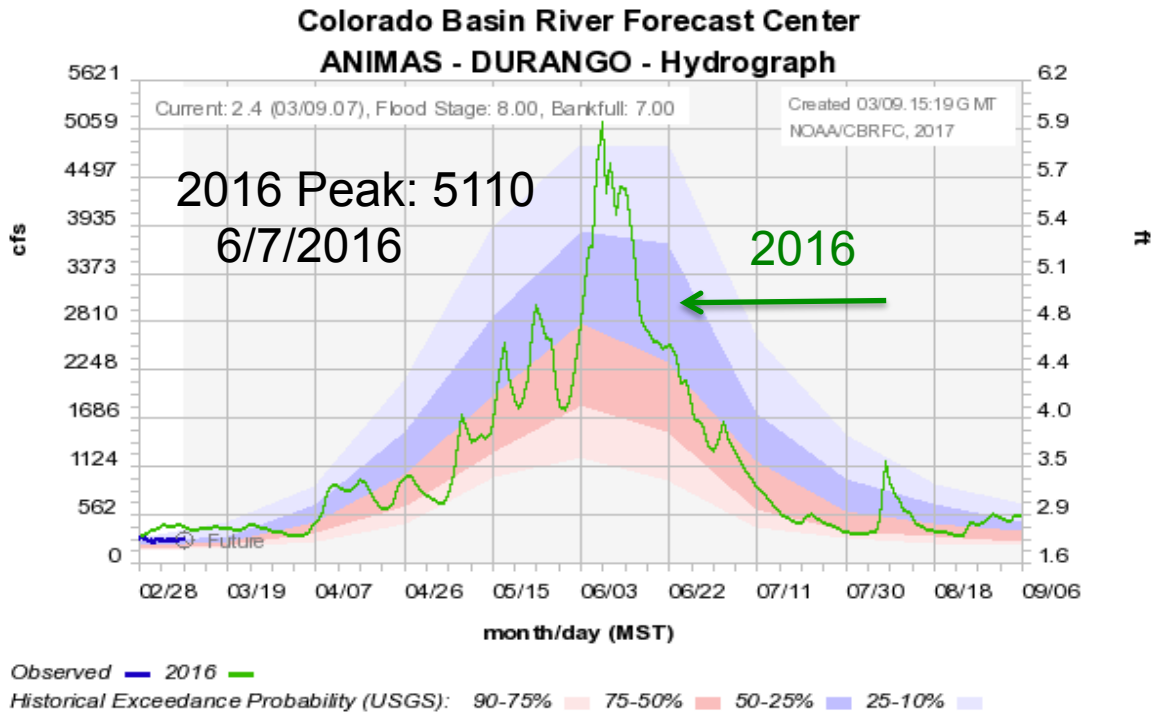
May 2015
Wet and Cold
Peak Flow: 10100 CFS(100%)

Impacts of Spring Weather (temperatures)

Animas – Durango March 1 2016 Forecast

90%	75%	50%	25%	10%
2800	3100	3600	4300	4700

Normal Peak Period 5/20 – 6/8



Durango Temperatures: 2-6 degrees below normal final 10 days of May

10 degrees above normal by June 5th

Transition to using daily model for guidance

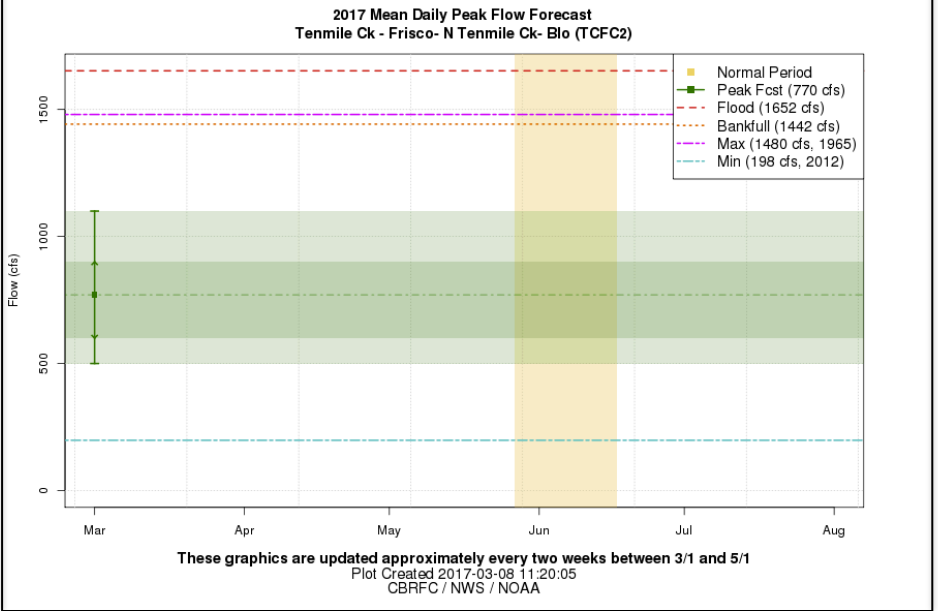
As the time of the peak nears – transition from using probabilistic guidance to output from the daily deterministic hydrologic model. Daily model forecasts are for 10 days into the future.

The daily model uses 5 days of precipitation forecasts and 10 days of temperature forecasts from meteorological models instead of climatology.

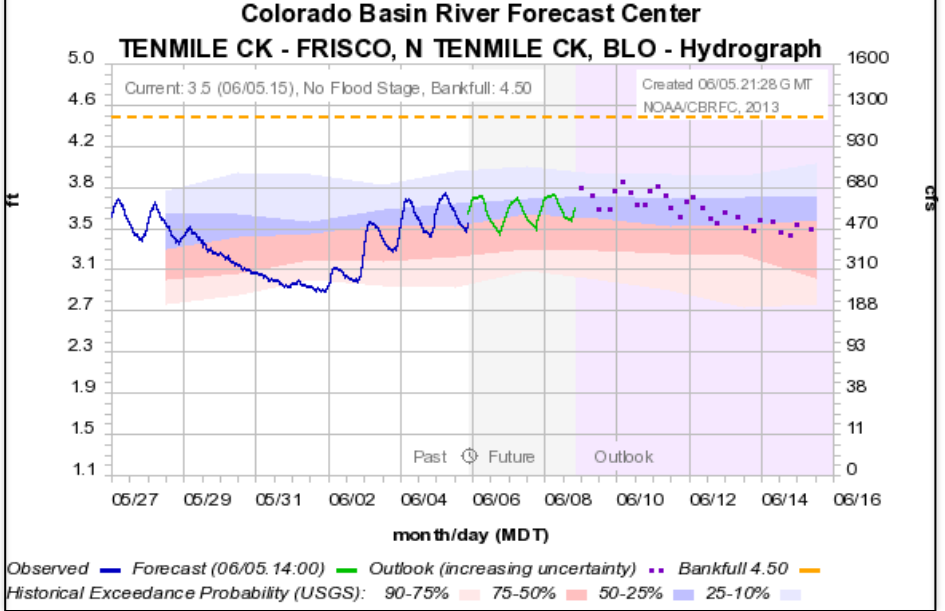
The daily model will also have observed reservoir releases (& planned if known) that are routed to points downstream.

The probabilistic graphics are discontinued at that time (usually early May) and the forecast lists indicates “peaking soon” or “peak has already occurred”.

Probabilistic forecast graphic



Output from deterministic model



CBRFC Main Web Page

Daily deterministic / Daily operational model output is available from the CBRFC main web page: www.cbrfc.noaa.gov

COLORADO BASIN RIVER FORECAST CENTER

NATIONAL WEATHER SERVICE / NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

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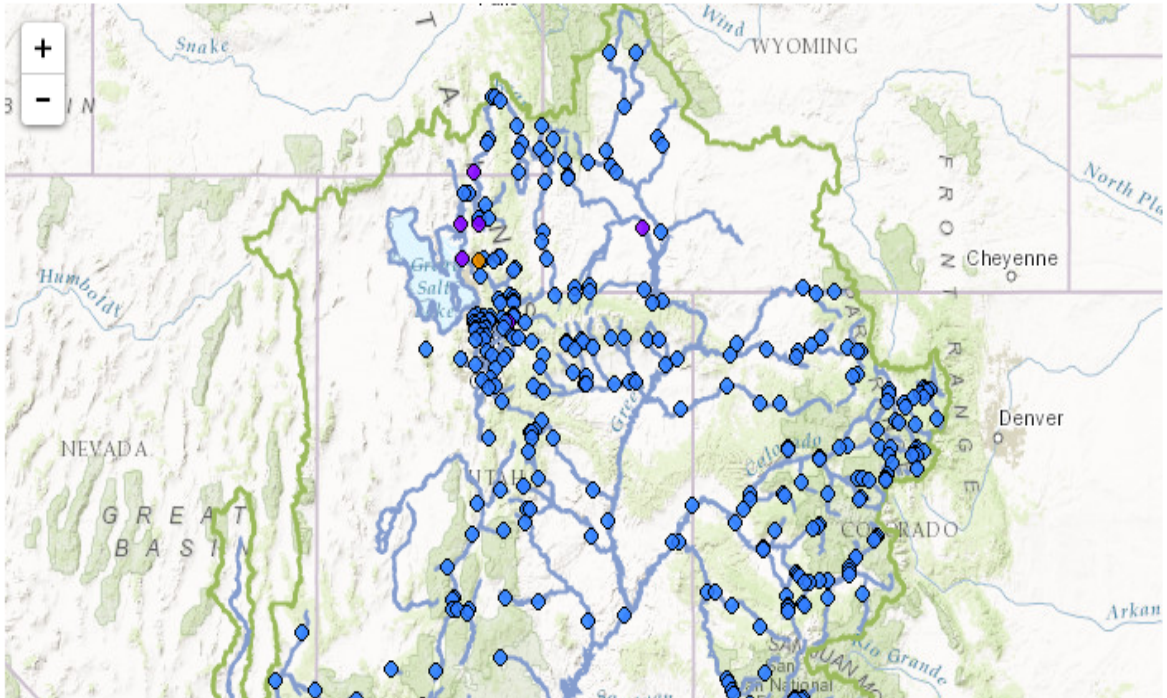
News

Upcoming Webinars: More Info...
CBRFC Peak Flow Briefing 10 am MT Fri March 10th: More Info...
Check out the Upper Colorado Situational Awareness Page: More Info...

Conditions Map Help



River Conditions

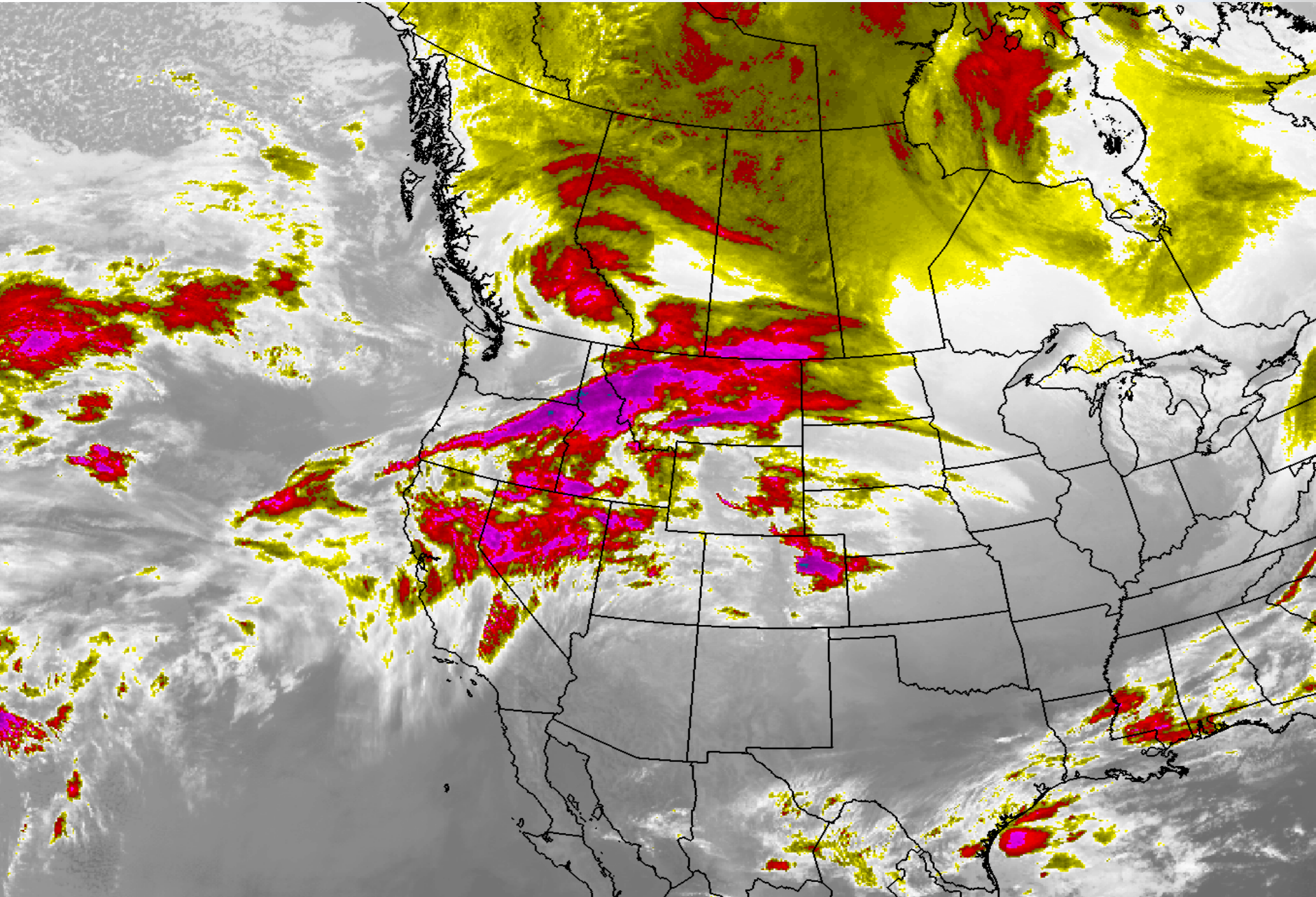
Data Updated: 03/09/16Z Help

- Show Hide Other Types
  - Data
  - Forecast
  - Reservoir Inflow
  - Reservoir Outflow
  - Official Flood
  - Active

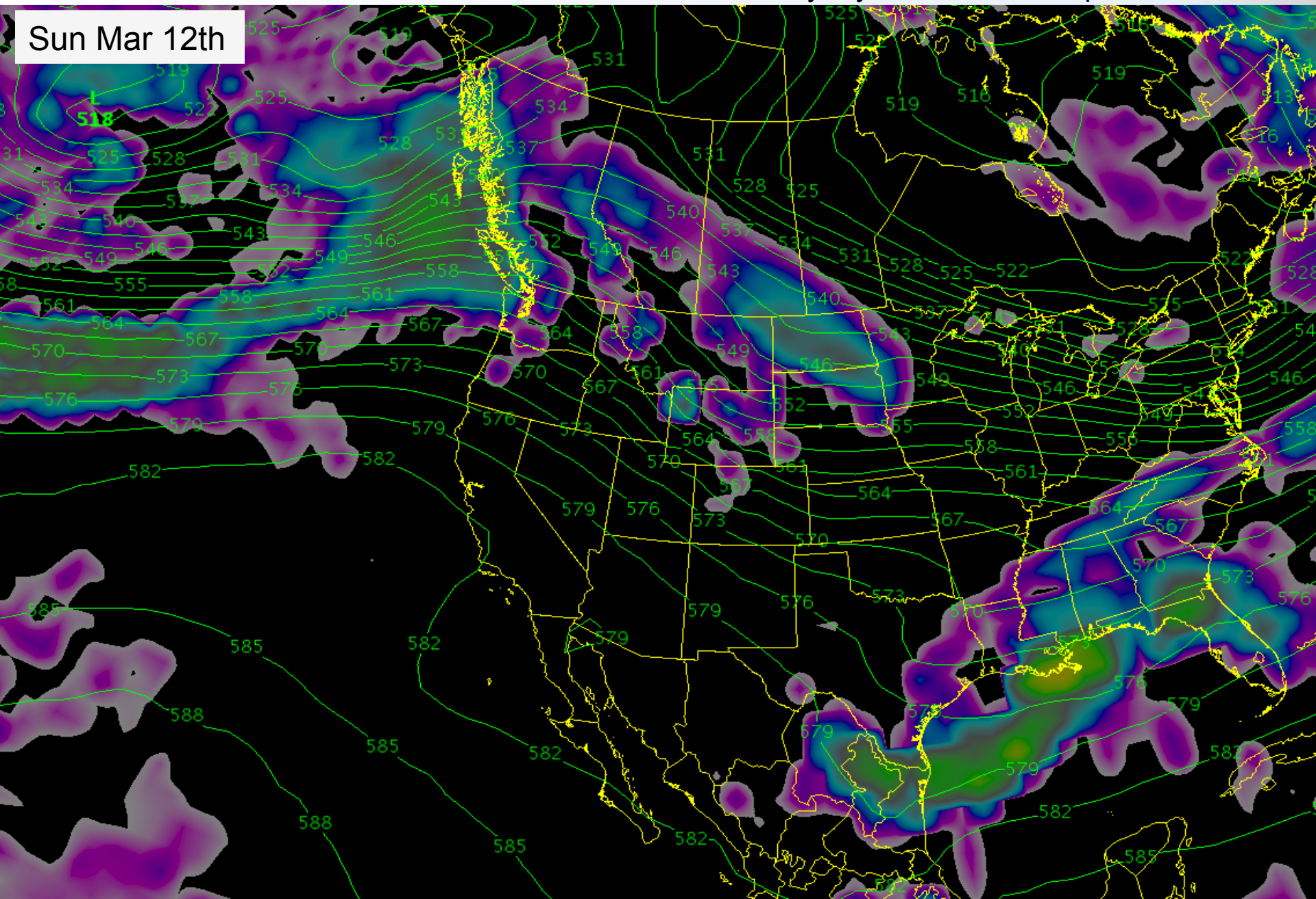
- Not Available
- Normal
- Significant Rise
- Near Bankfull
- Above Bankfull
- Above Flood Stage
- Outlook (> 3 days)

Indicators of active stream flow conditions

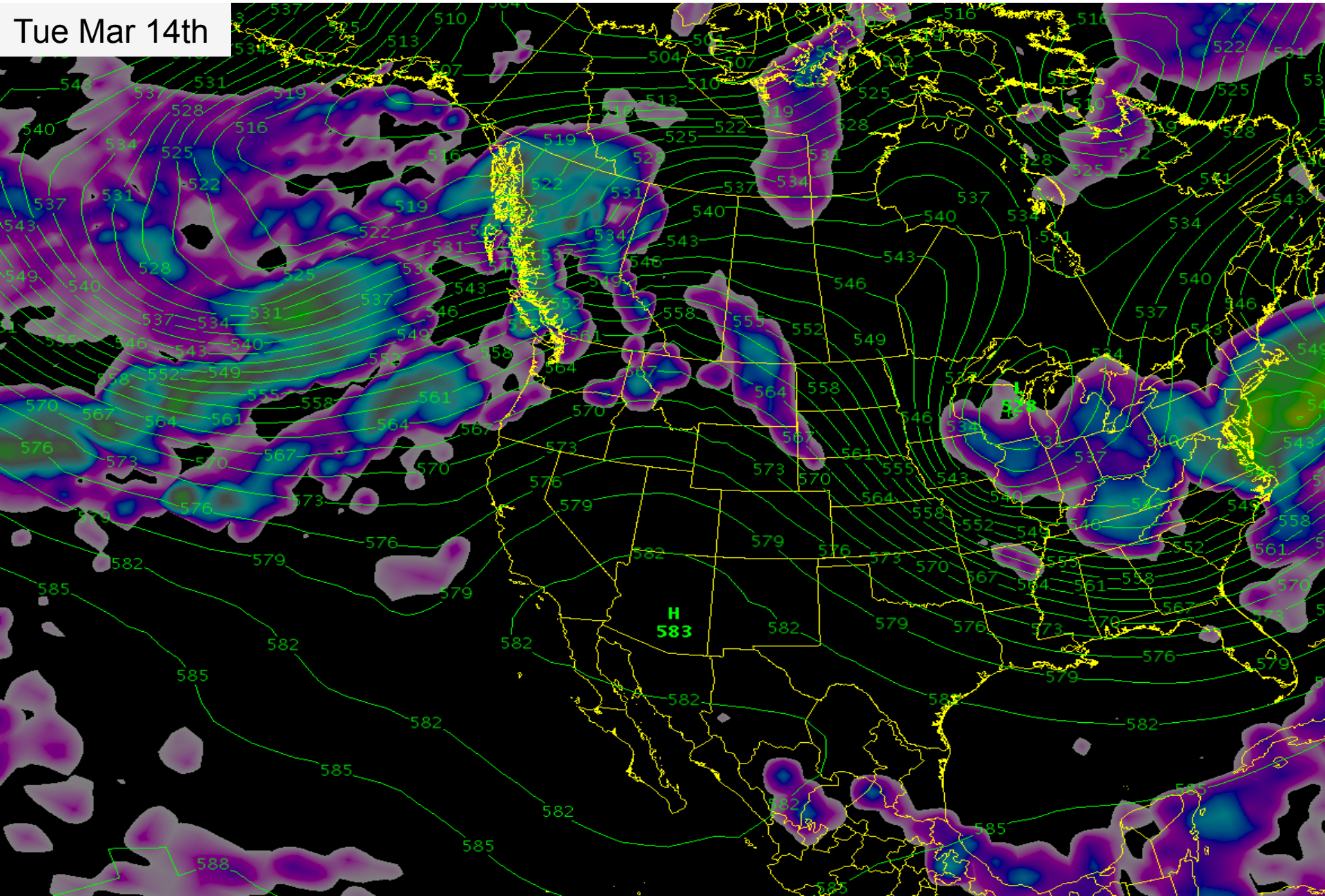
Upcoming Weather – Dry and mild westerly flow with storm pattern to the north



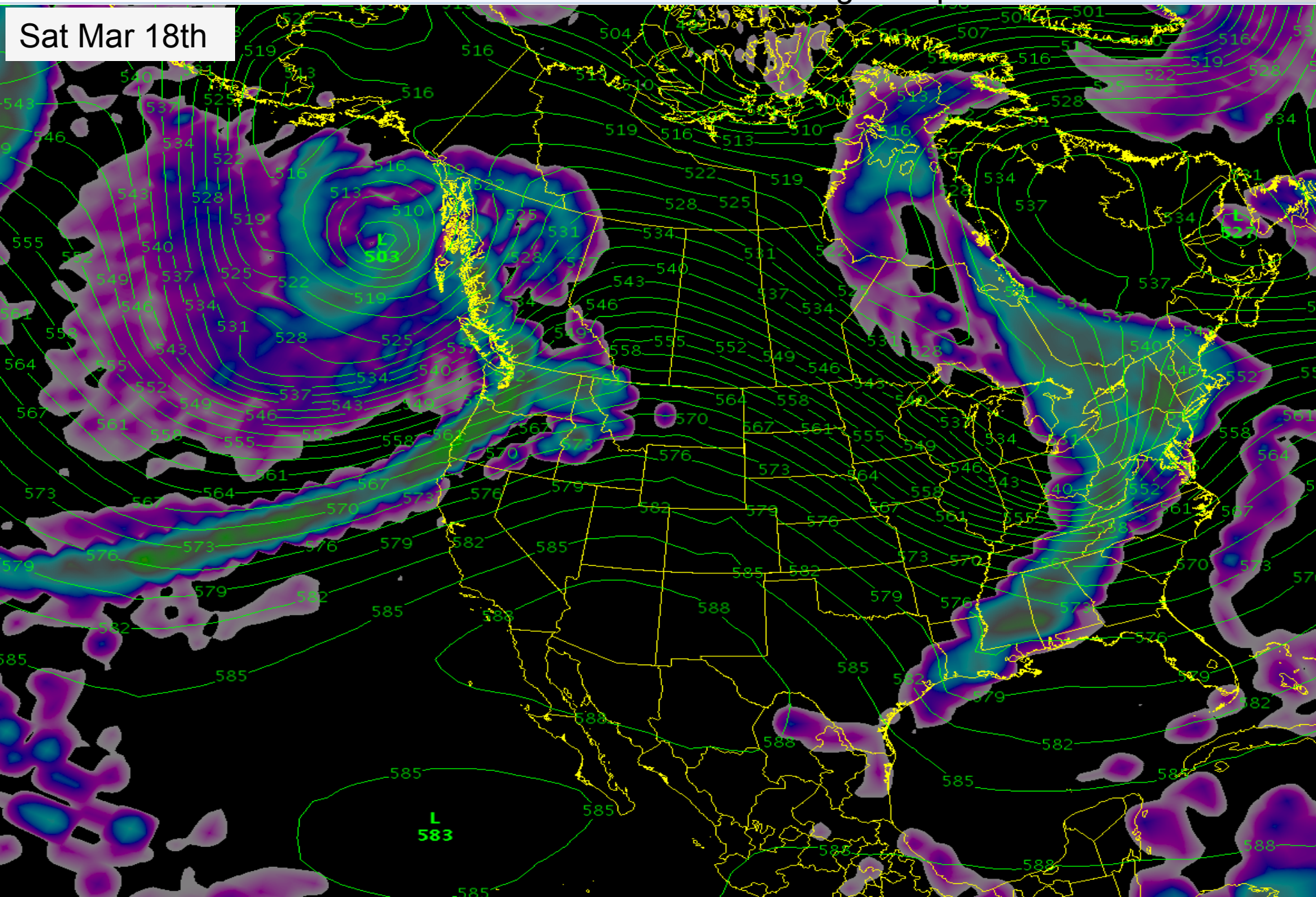
Upcoming Weather – Storm track just north of our area. Light precipitation possible higher elevation northern areas. Generally dry south . Mild temperatures.



Upcoming Weather – High Pressure / Temperatures 10-20 degrees above normal

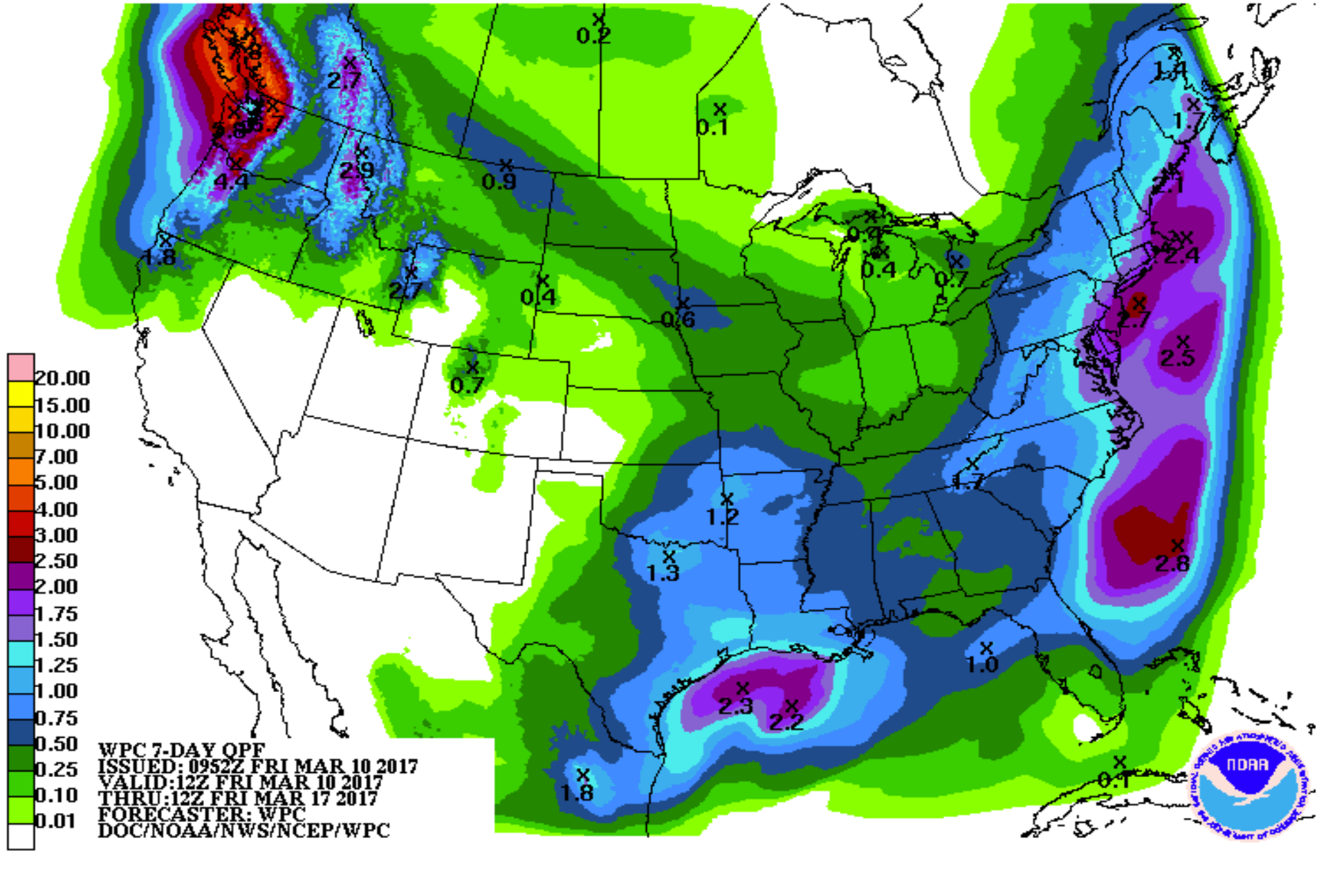


Upcoming Weather – Cool down Thurs / Fri of next week. Ridge rebounds by the next weekend with above average temperatures.



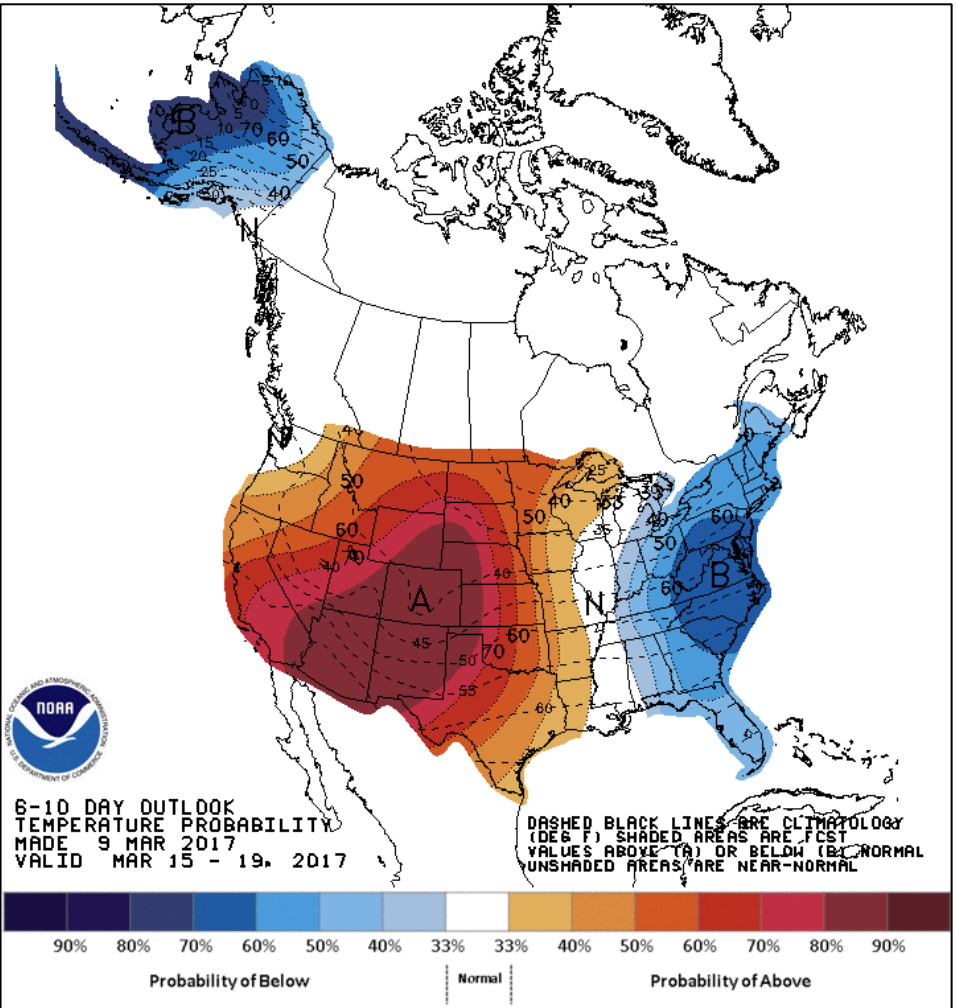
Upcoming Weather

Precipitation Forecast
March 10 - March 17 2017

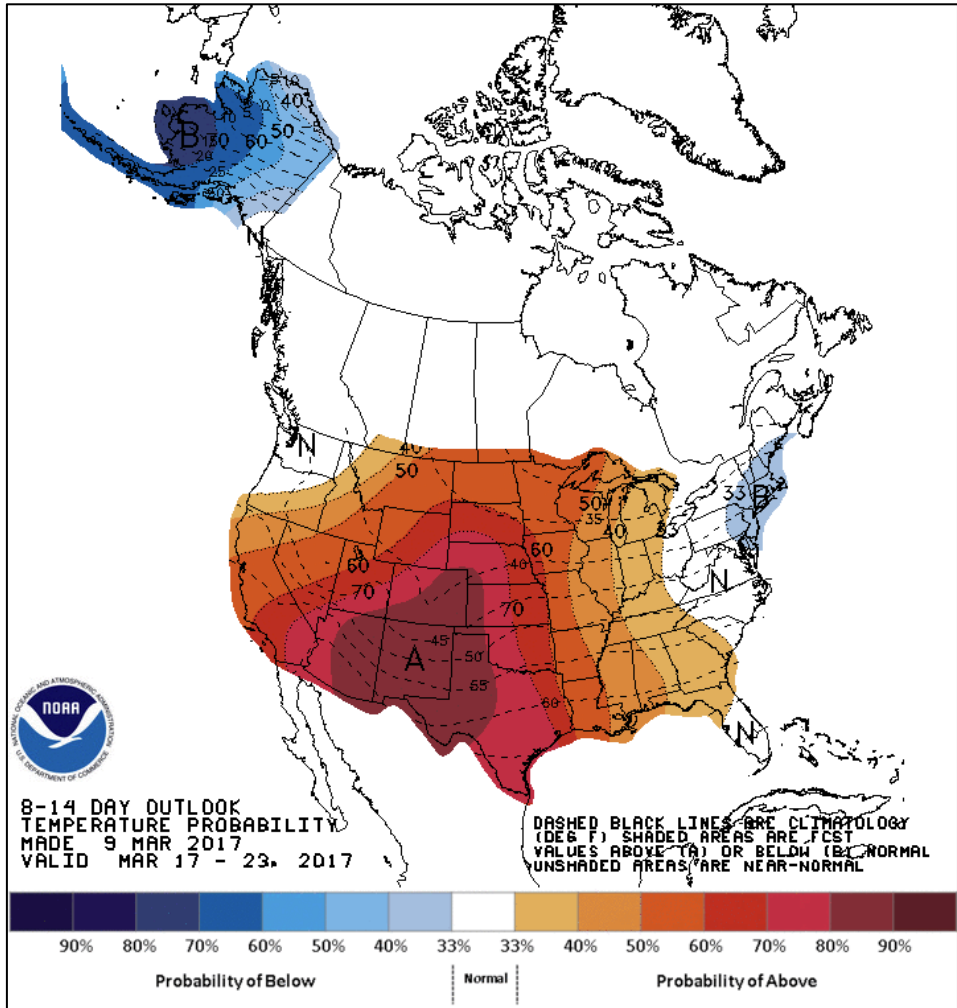


Upcoming Weather – Temperature Outlook

6-10 day temperature probabilities
March 15 - March 19 2017

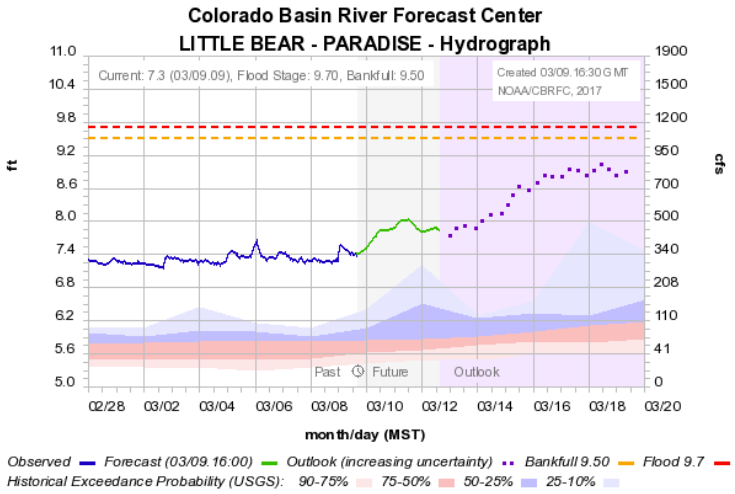


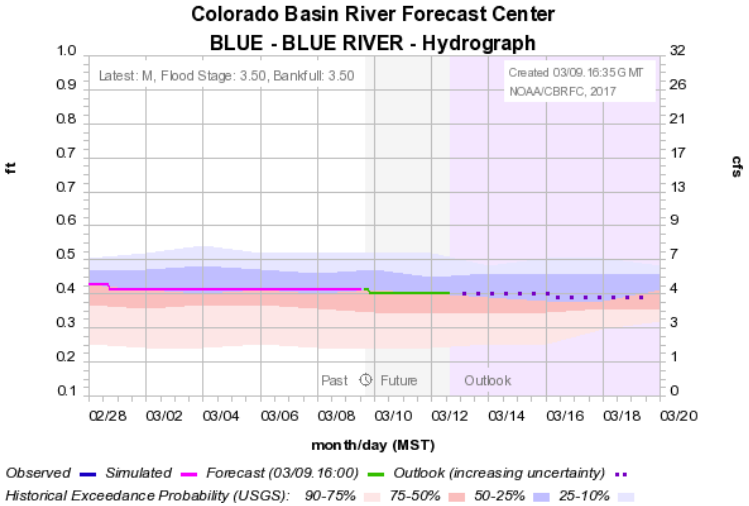
8-14 day temperature probabilities
March 17 - March 23 2017



Upcoming weather impacts

- Mid & lower elevation streamflow increases due to above normal temperatures





- Should effectively reduce some of the lower elevation snowpack of concern
- Probably not a significant impact to peak flows associated with higher elevation snow unless all of March is abnormally dry and warm.

Up Next

- Peak Flow updates twice a month (Week of Mar 20th)
- Another peak flow webinar will be schedule for April
- April - Colorado River Basin water supply briefing
  - April 6th at 11 am MDT (www.cbrfc.noaa.gov)
- April - Great Basin water supply briefing
  - April 6th at 1:30 pm MDT (www.cbrfc.noaa.gov)

These slides are available at: www.cbrfc.noaa.gov/present/present2017.cgi

CBRFC Water Supply Contacts

Please contact us with any questions

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Ashley Nielson – Green River Basin Focal Point
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Tracy Cox – Lower Colorado Basin, Virgin, Sevier Focal Point
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Brent Bernard – Great Basin Focal Point
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