

# RECLAMATION

*Managing Water in the West*



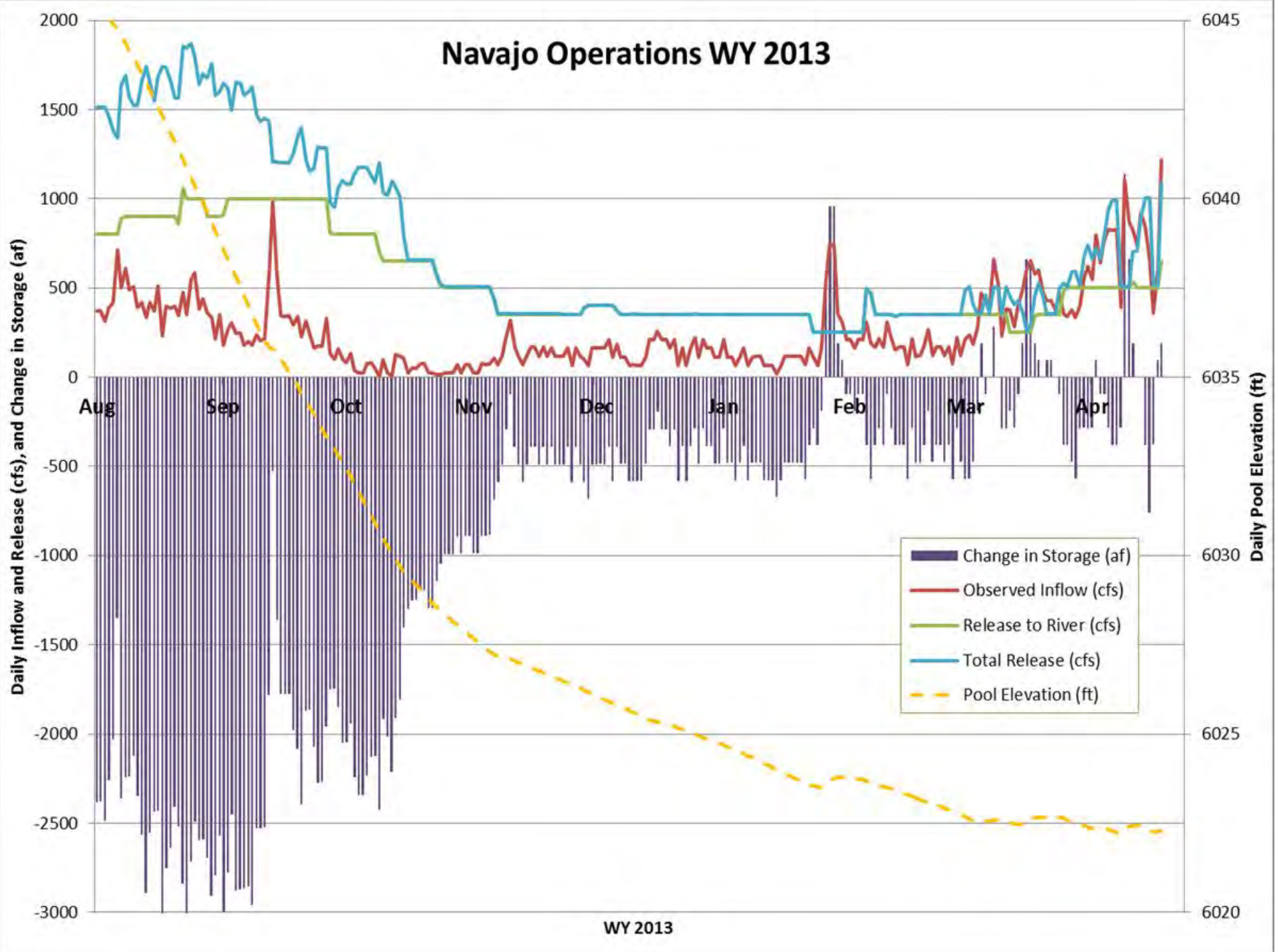
**Navajo Unit Operations**

**April 23, 2013**

**Coordination Meeting**

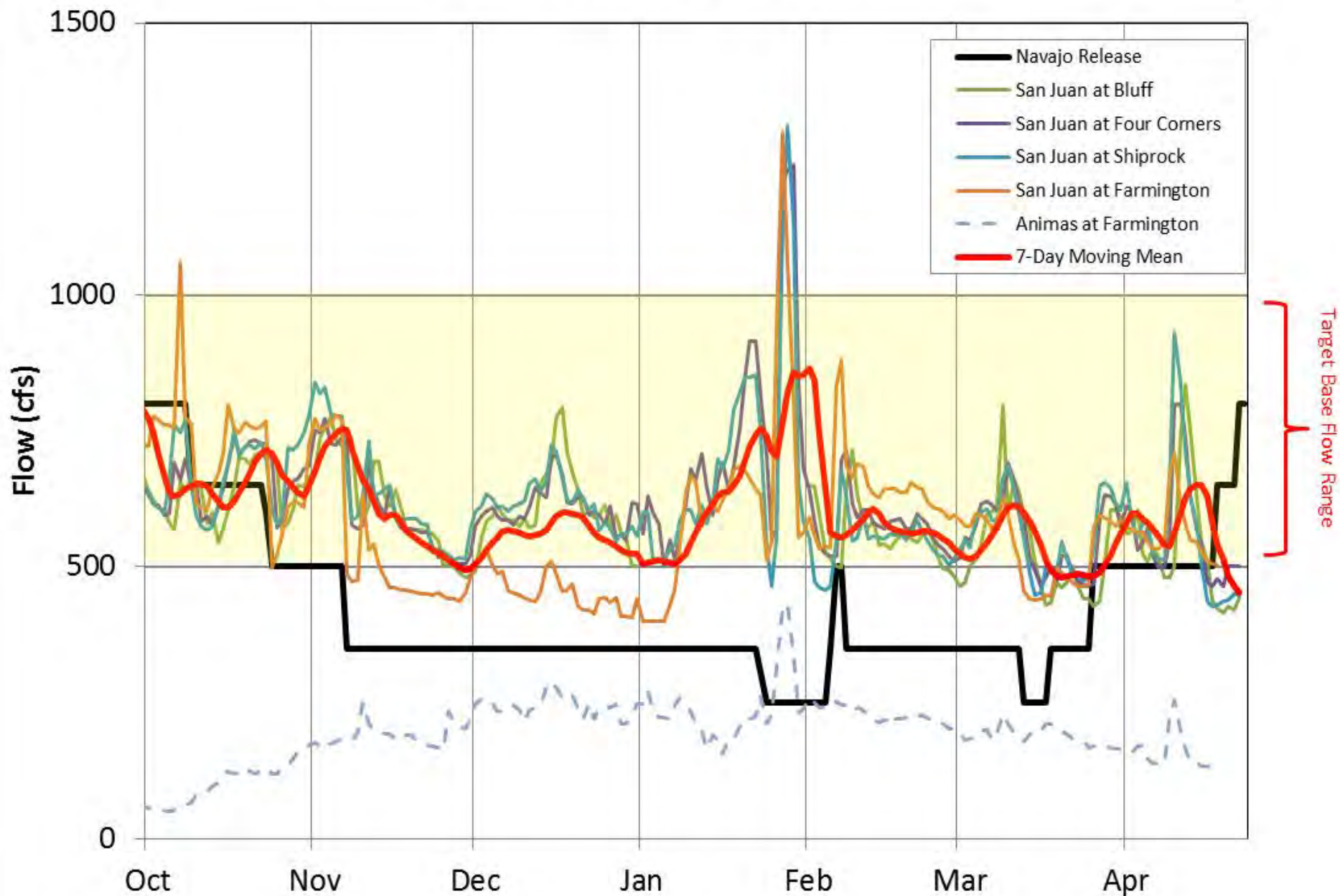
U.S. Department of the Interior  
Bureau of Reclamation

# Navajo Operations WY 2013





# Chasing the Target Baseflow



# Navajo Current Conditions

(as of 4/22/13)

Elevation = 6022 (74% of Average)

Storage = 929,228 af (55% Full)

Inflow = 699 cfs\*

Release = 800 cfs

NIIP = 618 cfs

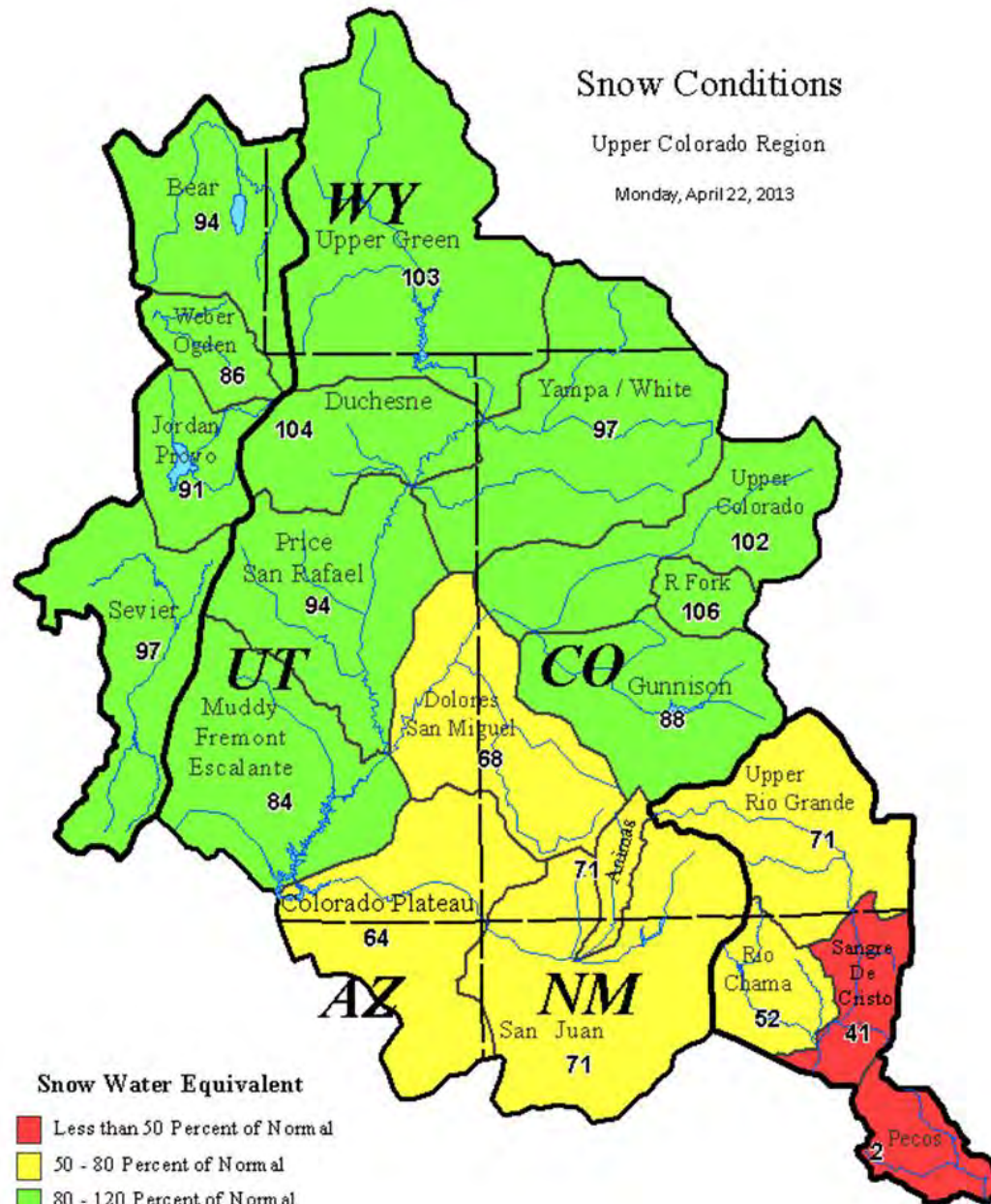
SJ-Chama Diversion = 195 cfs

*\*Average of the last 7 days*

# Snow Conditions

Upper Colorado Region

Monday, April 22, 2013



## Snow Water Equivalent

- Less than 50 Percent of Normal
- 50 - 80 Percent of Normal
- 80 - 120 Percent of Normal
- 120 - 150 Percent of Normal
- Greater than 150 Percent of Normal

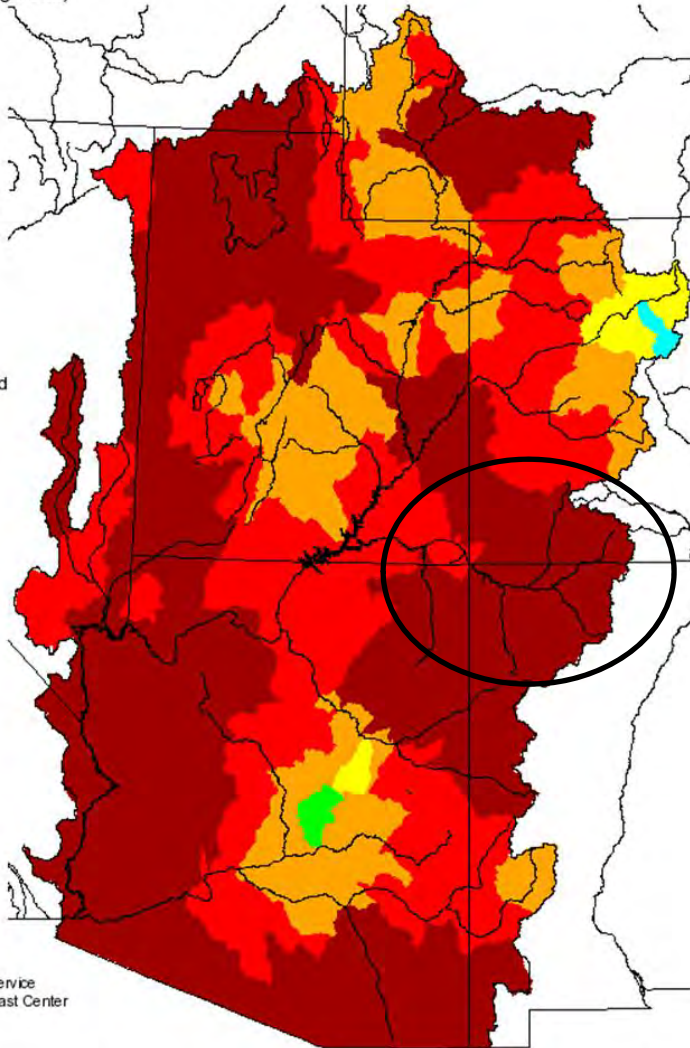
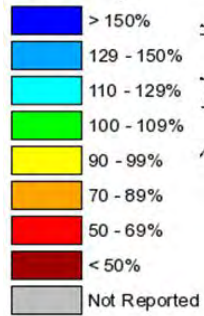
Upper Colorado  
**GIS**  
Region



## Monthly Precipitation for March 2013

(Averaged by Hydrologic Unit)

### % Average

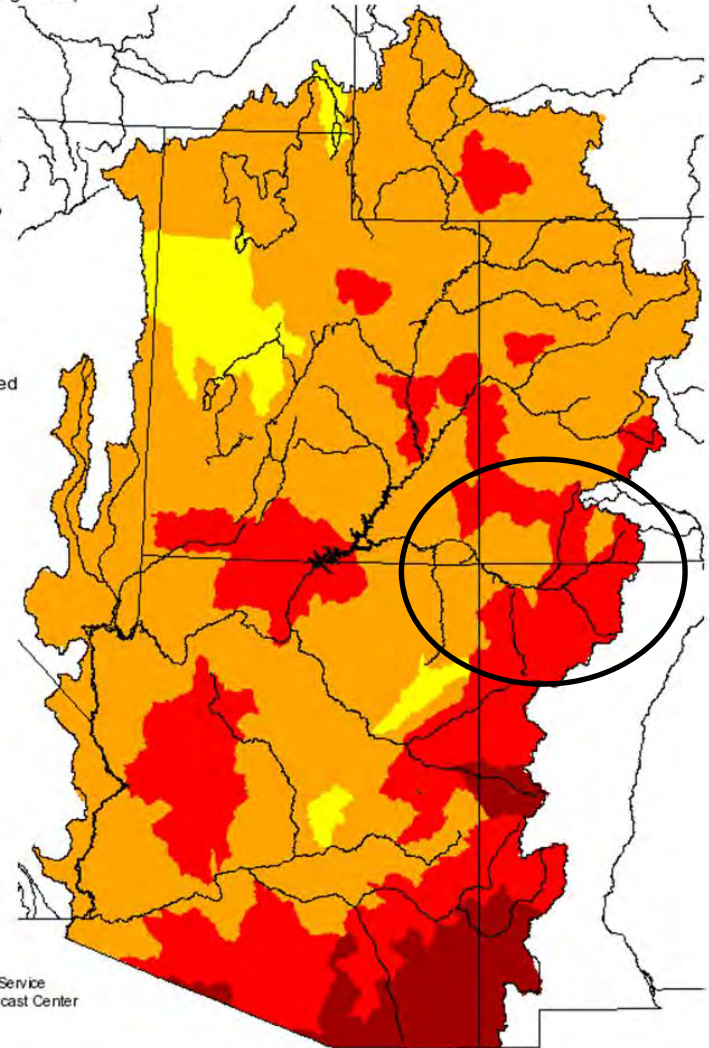
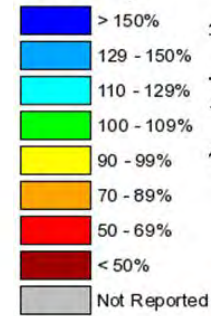


Prepared by  
NOAA, National Weather Service  
Colorado Basin River Forecast Center  
Salt Lake City, Utah  
[www.cbrfc.noaa.gov](http://www.cbrfc.noaa.gov)

## Seasonal Precipitation, October 2012 - March 2013

(Averaged by Hydrologic Unit)

### % Average

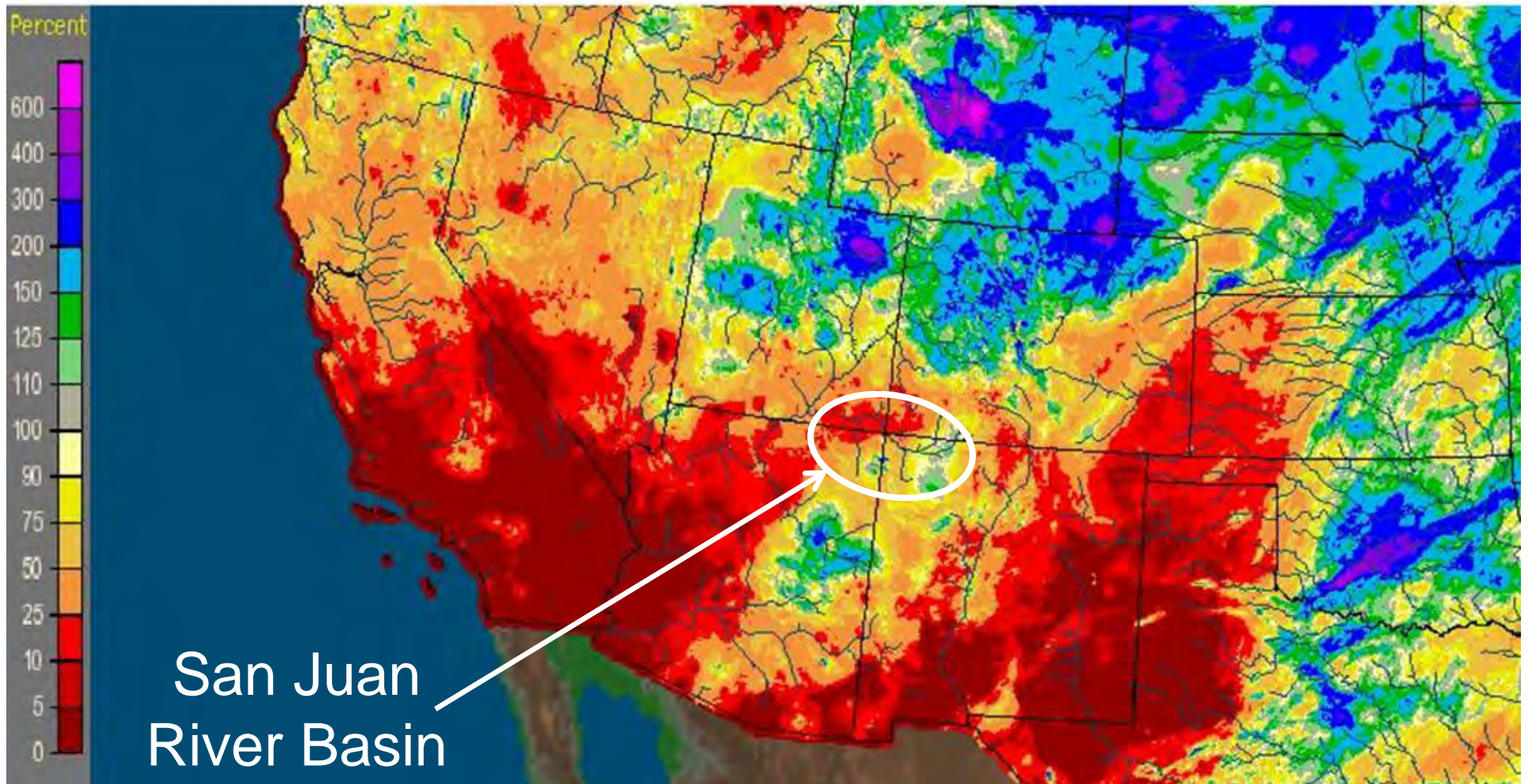


Prepared by  
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# % of Average Precipitation for April through 4/22

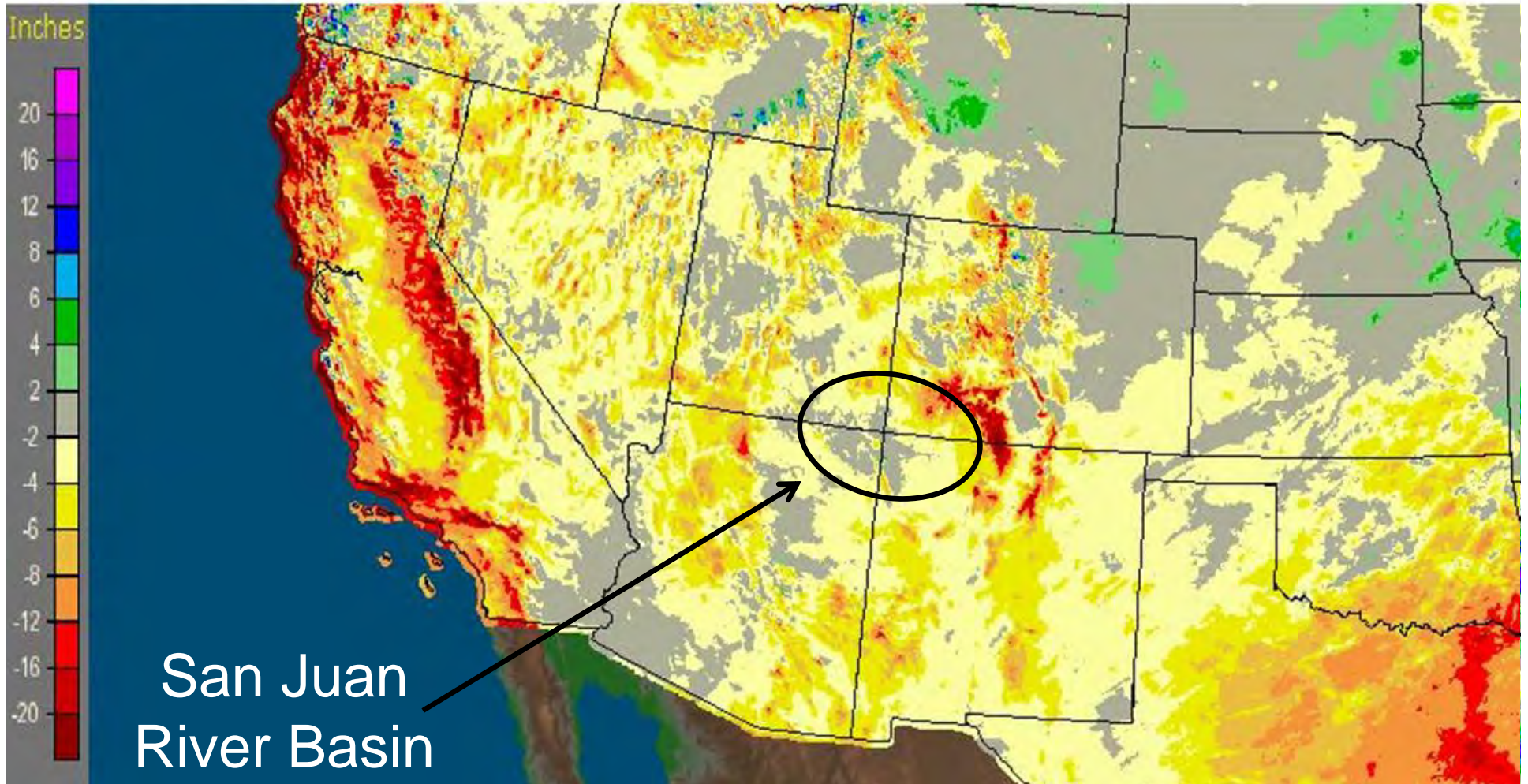
Colorado Basin RFC Salt Lake City, UT: Current Month to Date Percent of Normal Precipitation  
Valid at 4/22/2013 1200 UTC- Created 4/22/13 18:06 UTC





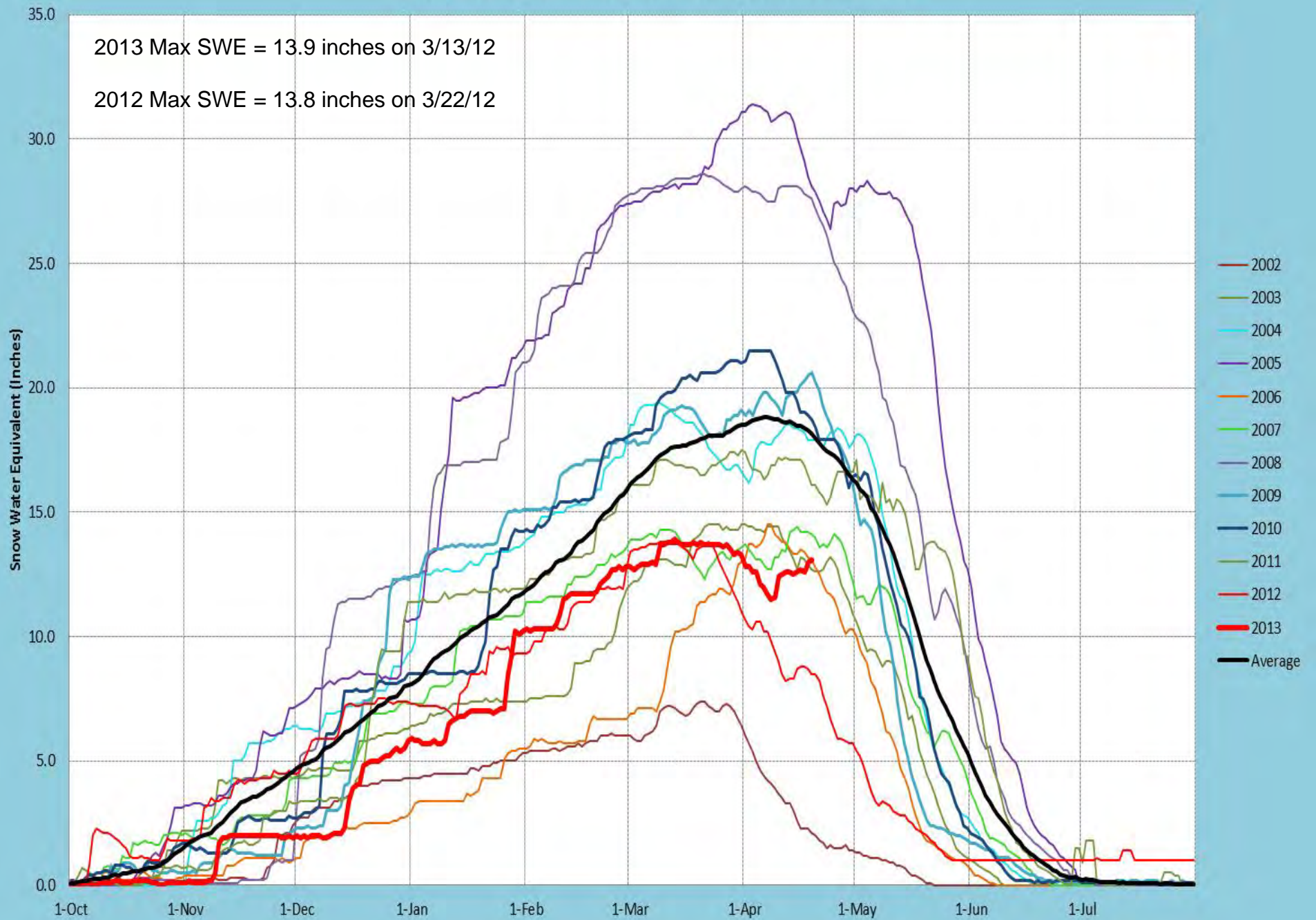
# WY 2013 Departure from Normal Precipitation

Colorado Basin RFC Salt Lake City, UT: Current Water-Year (Oct 1) Departure from Normal Prec  
Valid at 4/22/2013 1200 UTC- Created 4/22/13 18:29 UTC





# Navajo Reservoir SNOTEL SWE from 2002-2013



# Observed Navajo Inflow & Snowpack

End of Month	Observed Inflow (af)	% Average	SWE (in.)	% Average
October	3,262	7%	0.1	7%
November	7,283	22%	1.9	40%
December	3,039	48%	5.8	69%
January	3,344	62%	10.2	85%
February	9,917	35%	12.8	80%
March	4,186	61%	13.3	69%

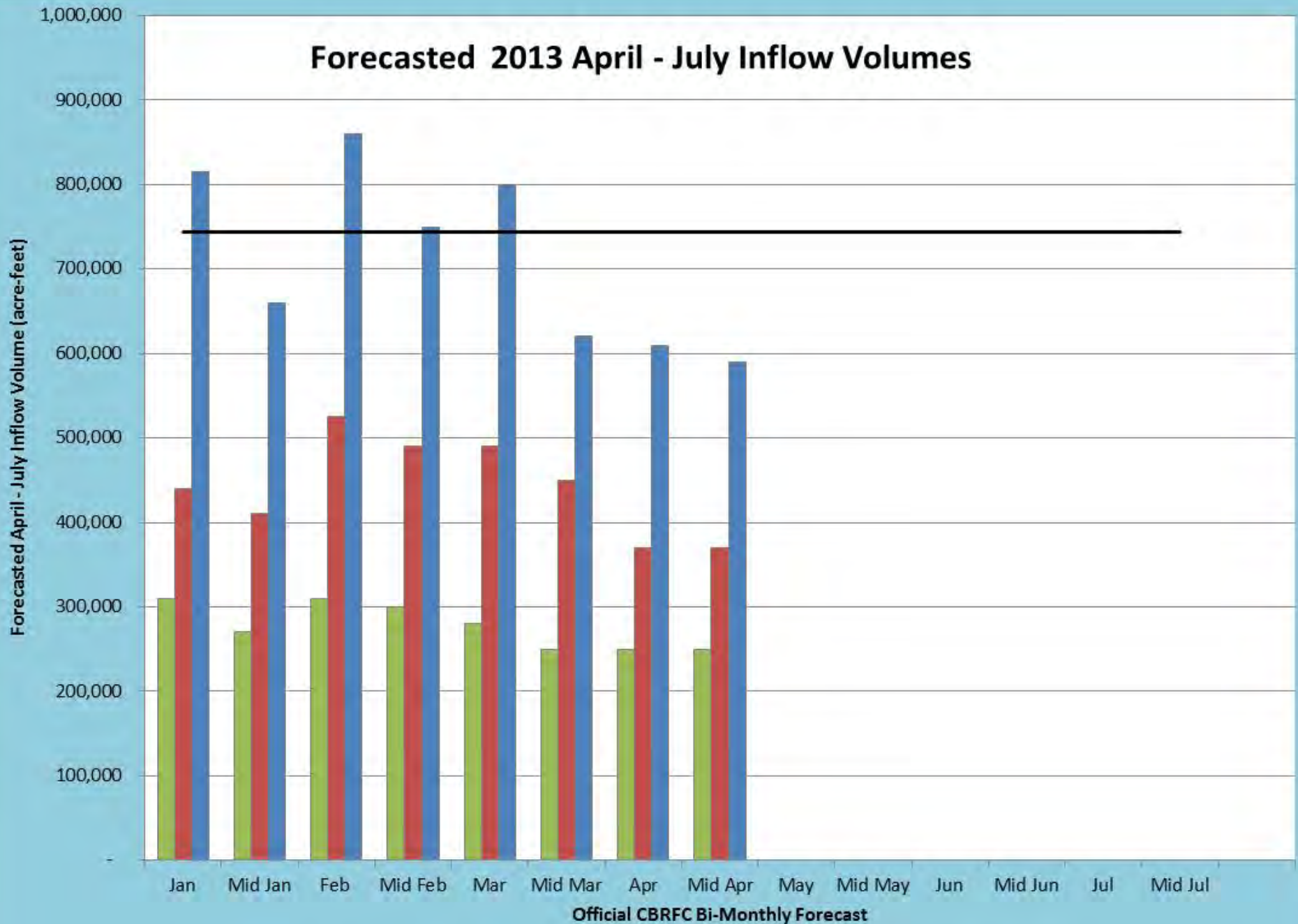


**Mid-April 2013 CBRFC Forecast**  
**Navajo Reservoir Mod Unregulated**  
**April-July Inflow Volume**

<b>Probability</b>	<b>Inflow (af)</b>	<b>% of Average</b>	<b><i>2012 Forecast</i></b>
<b>MOST</b>	370,000	50%	<i>420,000 (56%)</i>
<b>MIN</b>	250,000	34%	<i>244,000 (33%)</i>
<b>MAX</b>	590,000	79%	<i>600,000 (81%)</i>

2012 Actual = 310,000 acre-feet

## Forecasted 2013 April - July Inflow Volumes



■ Minimum Probable   
 ■ Most Probable   
 ■ Maximum Probable   
 — 30-yr Average



## Historic April-July Forecast Trends (2002-2012)

Forecasted April-July Inflow Volumes (acre-ft)

1,400,000

1,200,000

1,000,000

800,000

600,000

400,000

200,000

0

Jan

Mid  
Jan

Feb

Mid  
Feb

Mar

Mid  
Mar

Apr

Mid  
Apr

May

Mid  
May

Jun

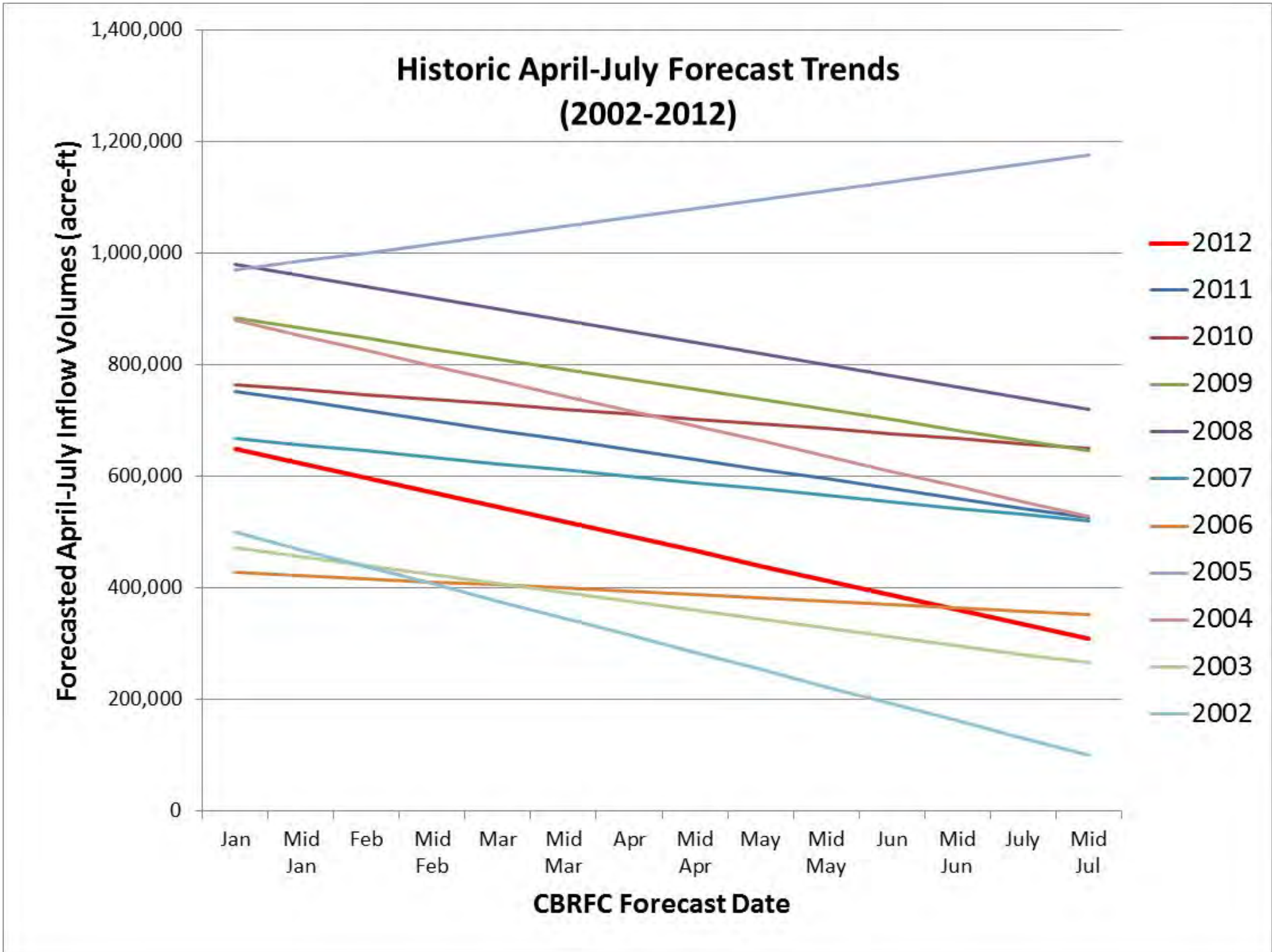
Mid  
Jun

July

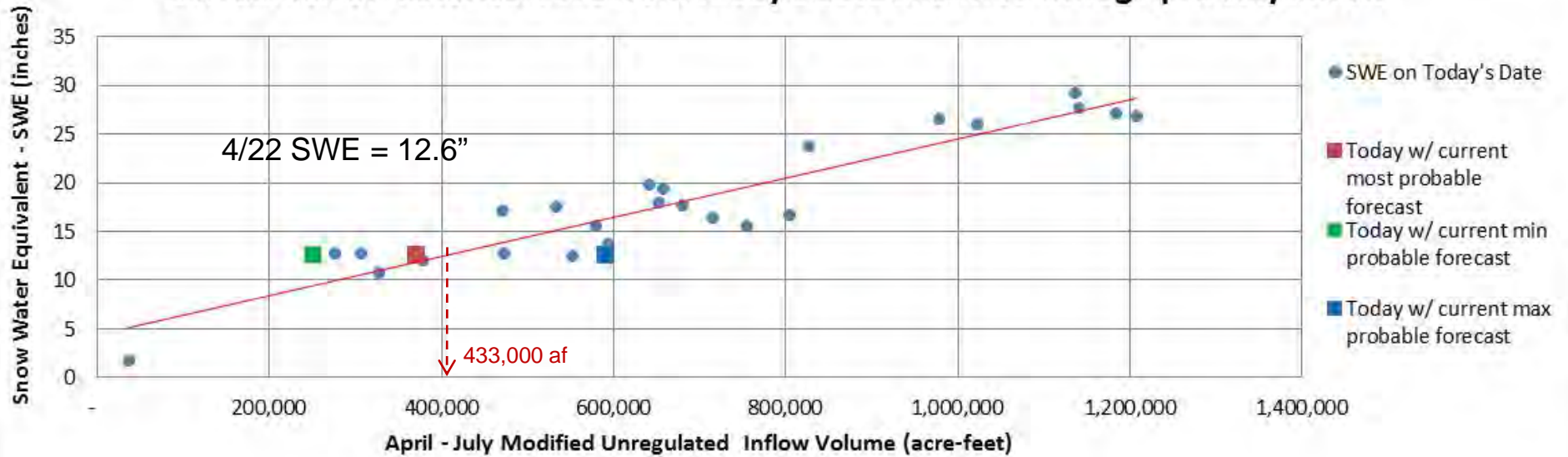
Mid  
Jul

CBRFC Forecast Date

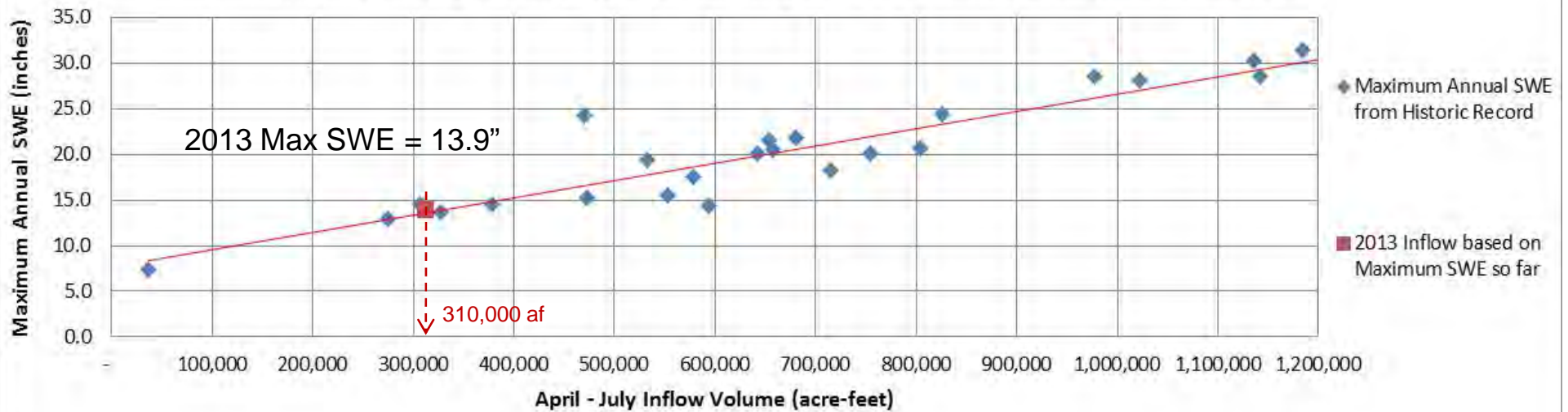
- 2012
- 2011
- 2010
- 2009
- 2008
- 2007
- 2006
- 2005
- 2004
- 2003
- 2002



### Correlation of Historical SWE from Today's Date and Mod Unreg April-July Inflow

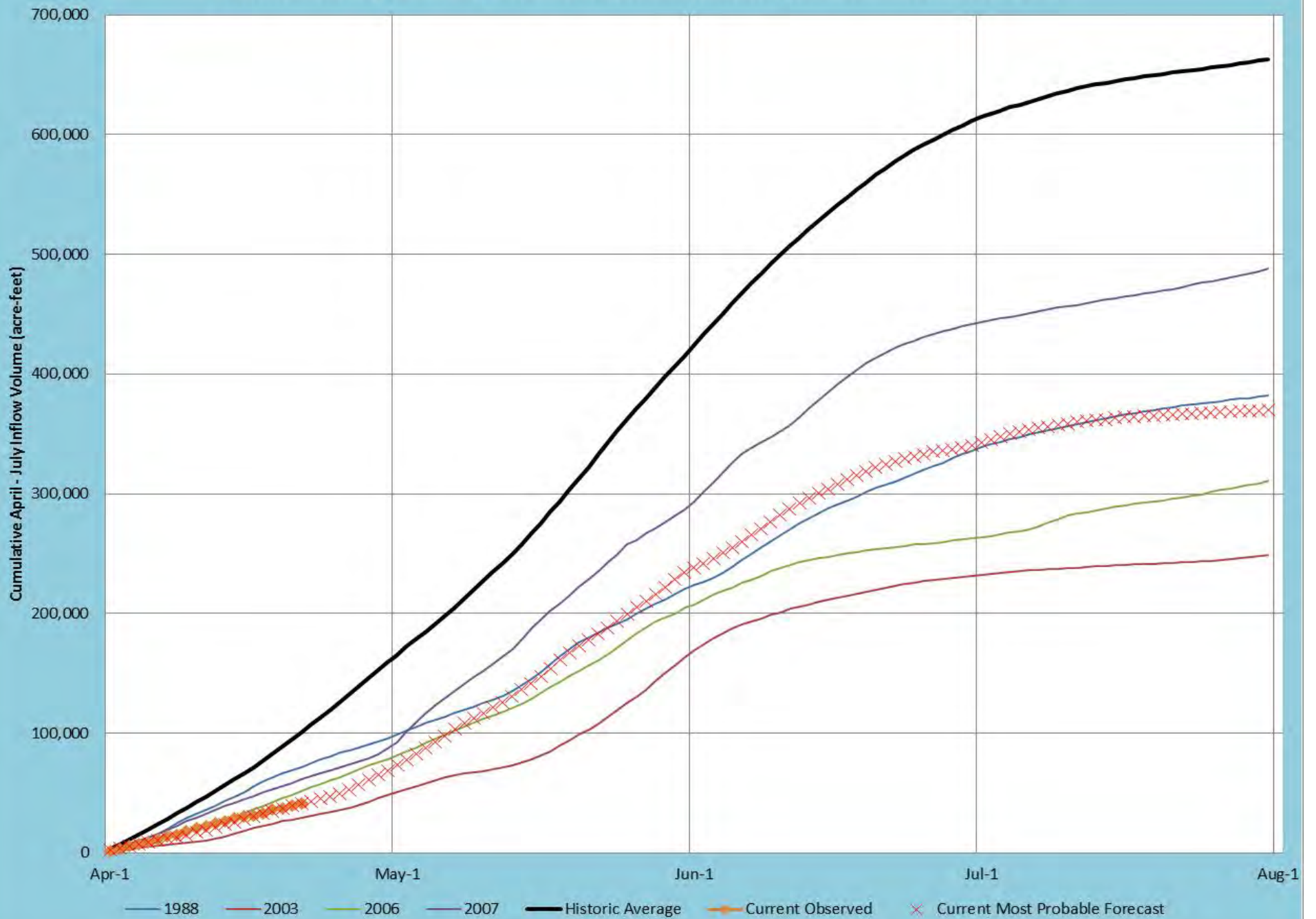


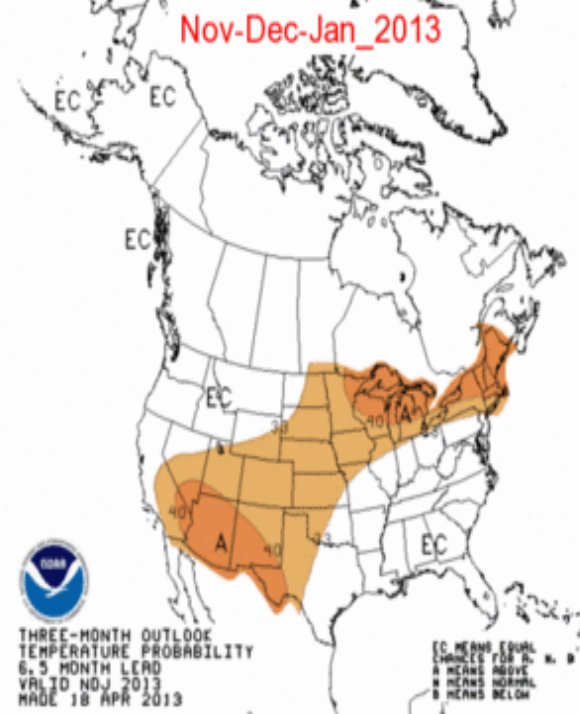
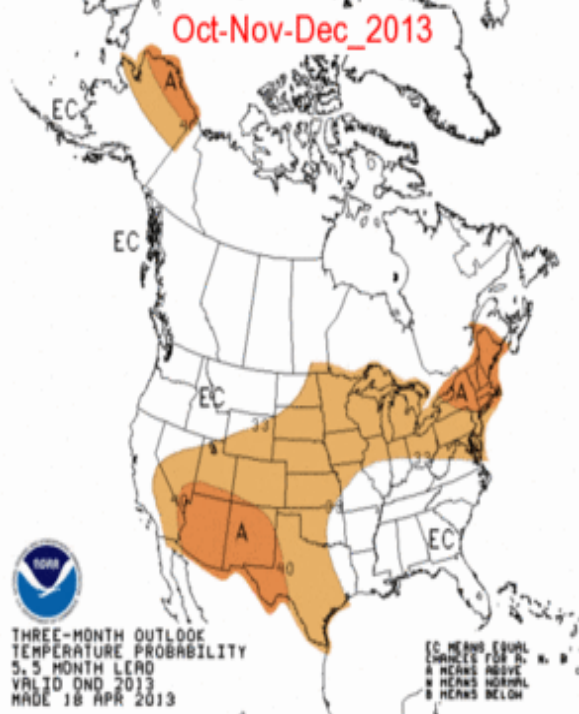
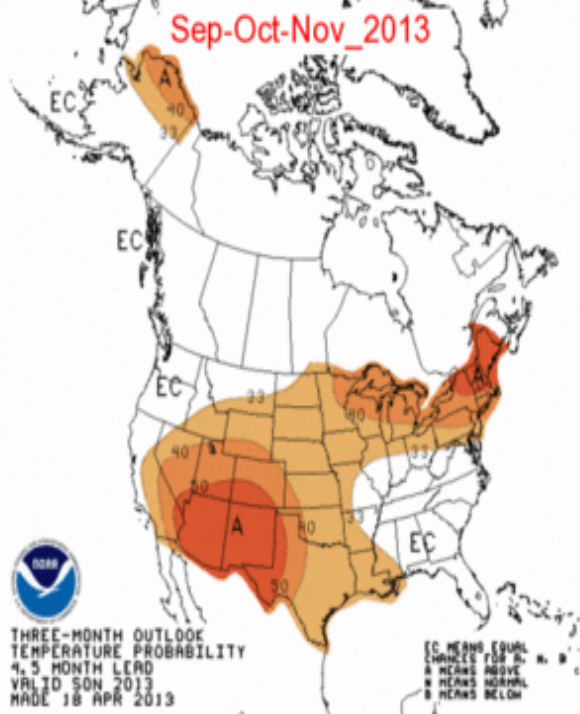
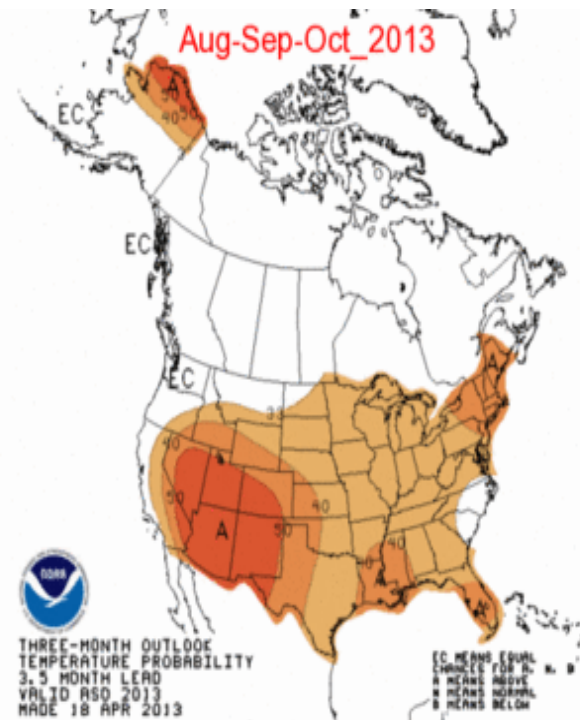
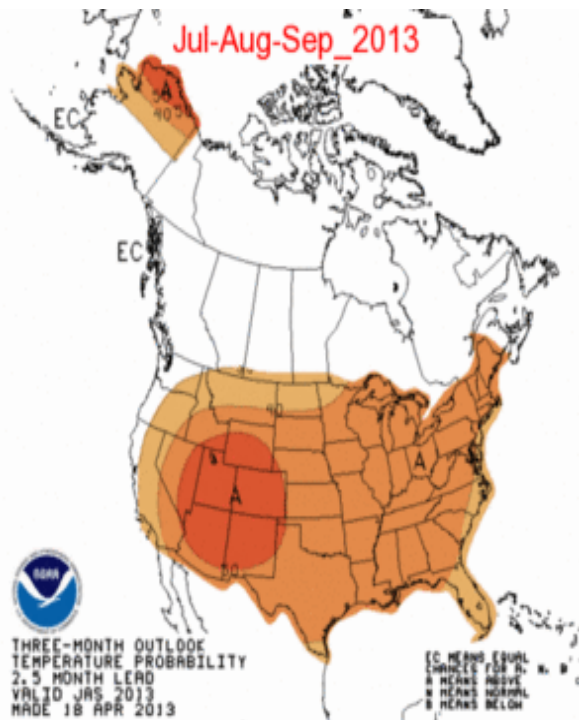
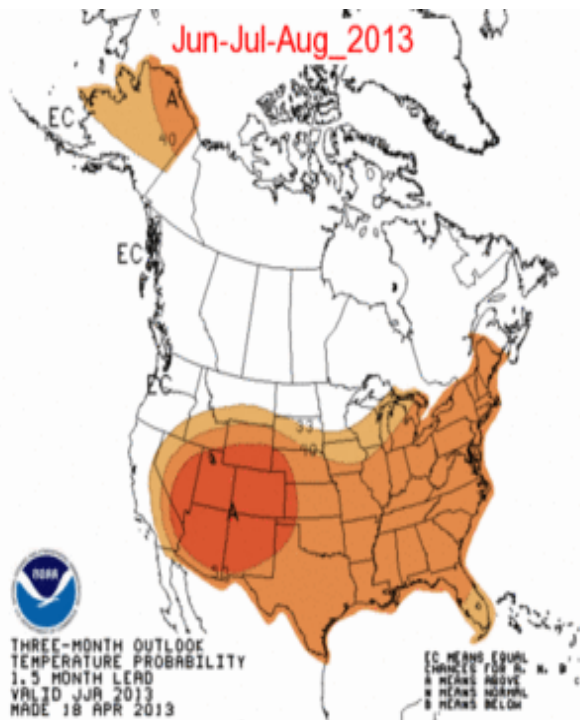
### Historical April-July Inflows compared to Maximum Annual SWE



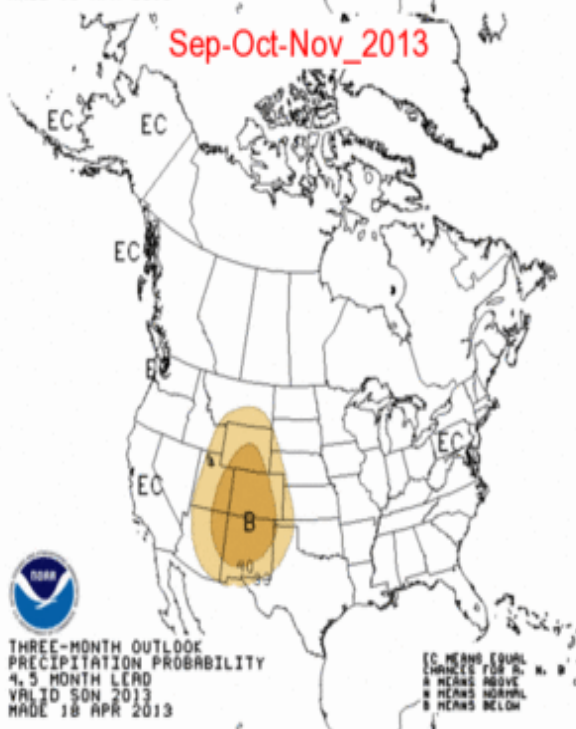
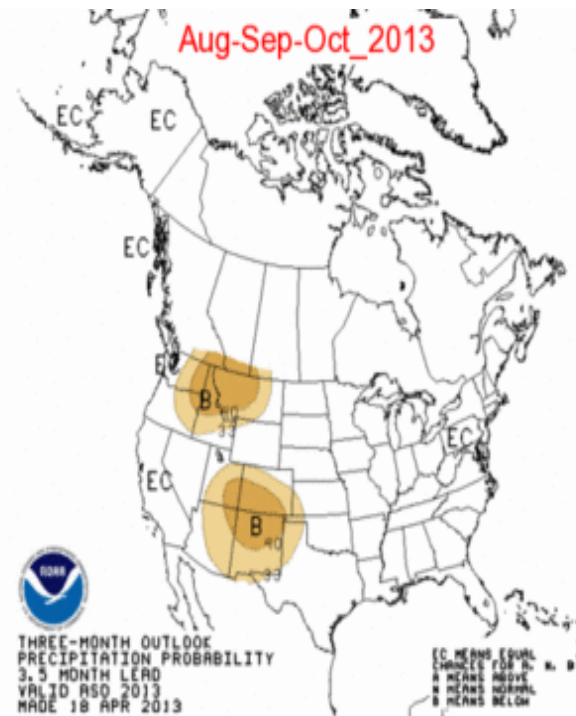
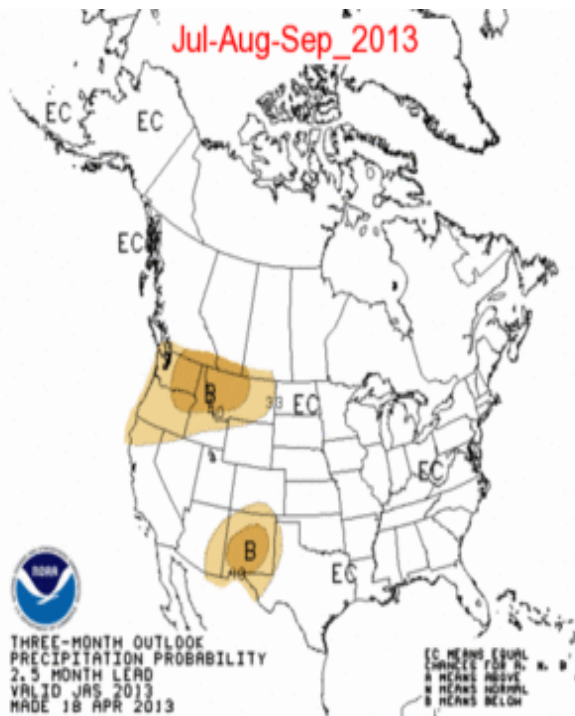
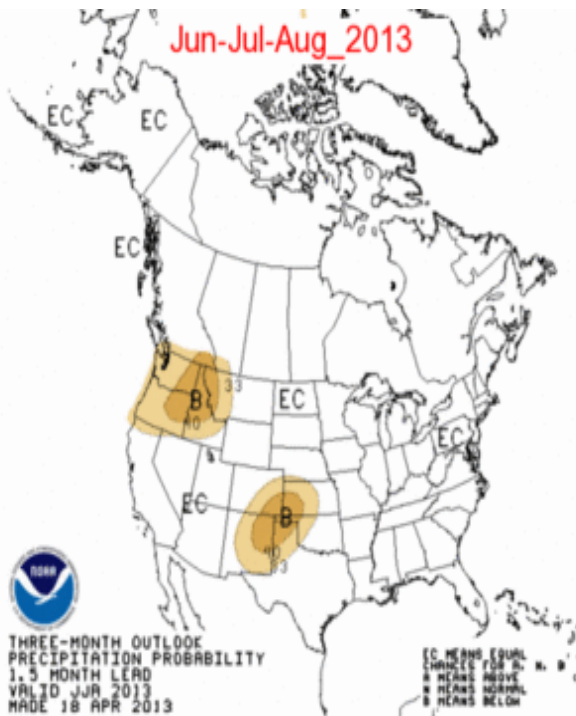


### Cumulative April - July Observed Inflow of Representative SWE Years









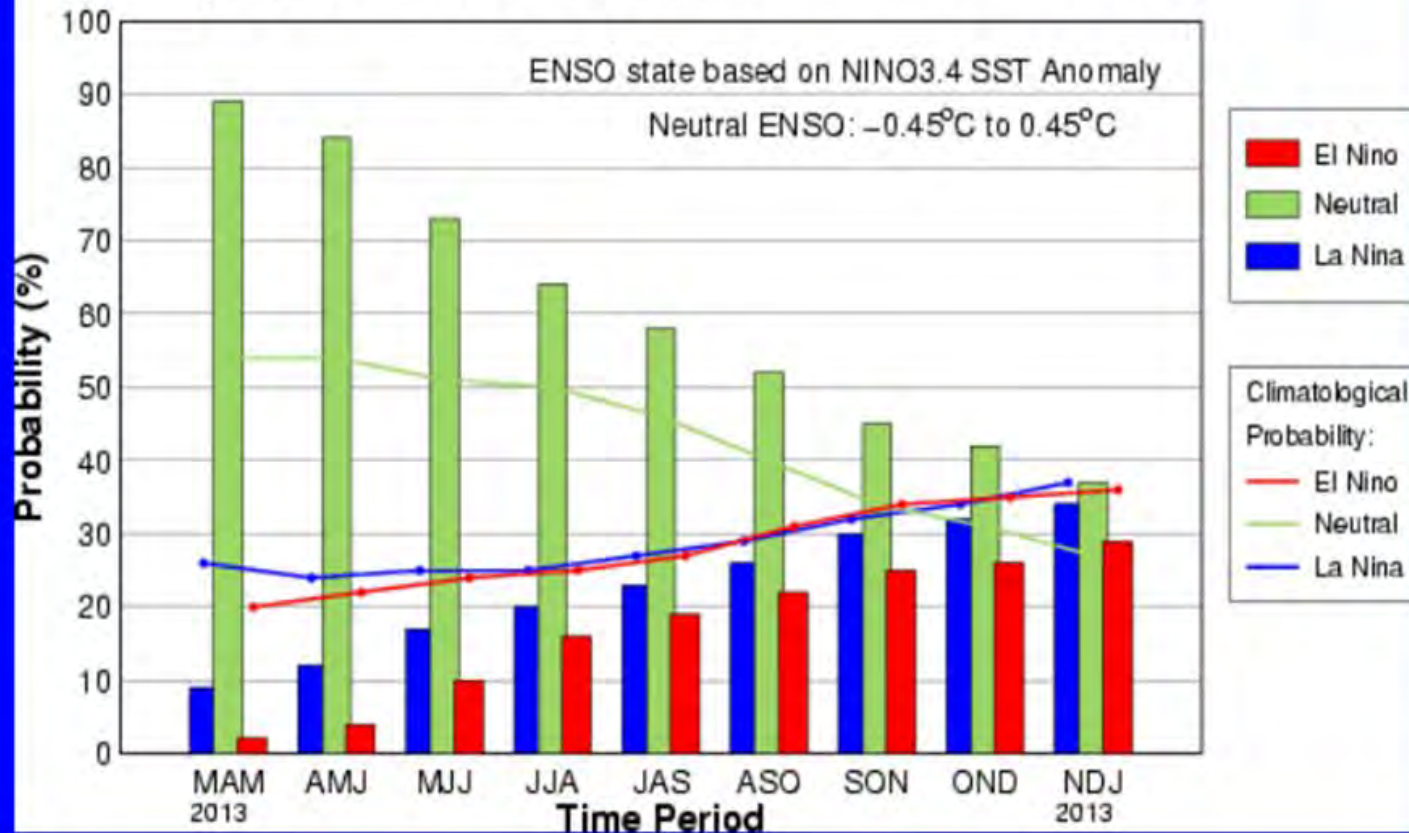


# CPC/IRI Probabilistic ENSO Outlook

(updated 4 April 2013)

**ENSO-neutral is favored into the Northern Hemisphere fall 2013.**

Early-Apr CPC/IRI Consensus Probabilistic ENSO Forecast



# 2013 Spring Peak Release

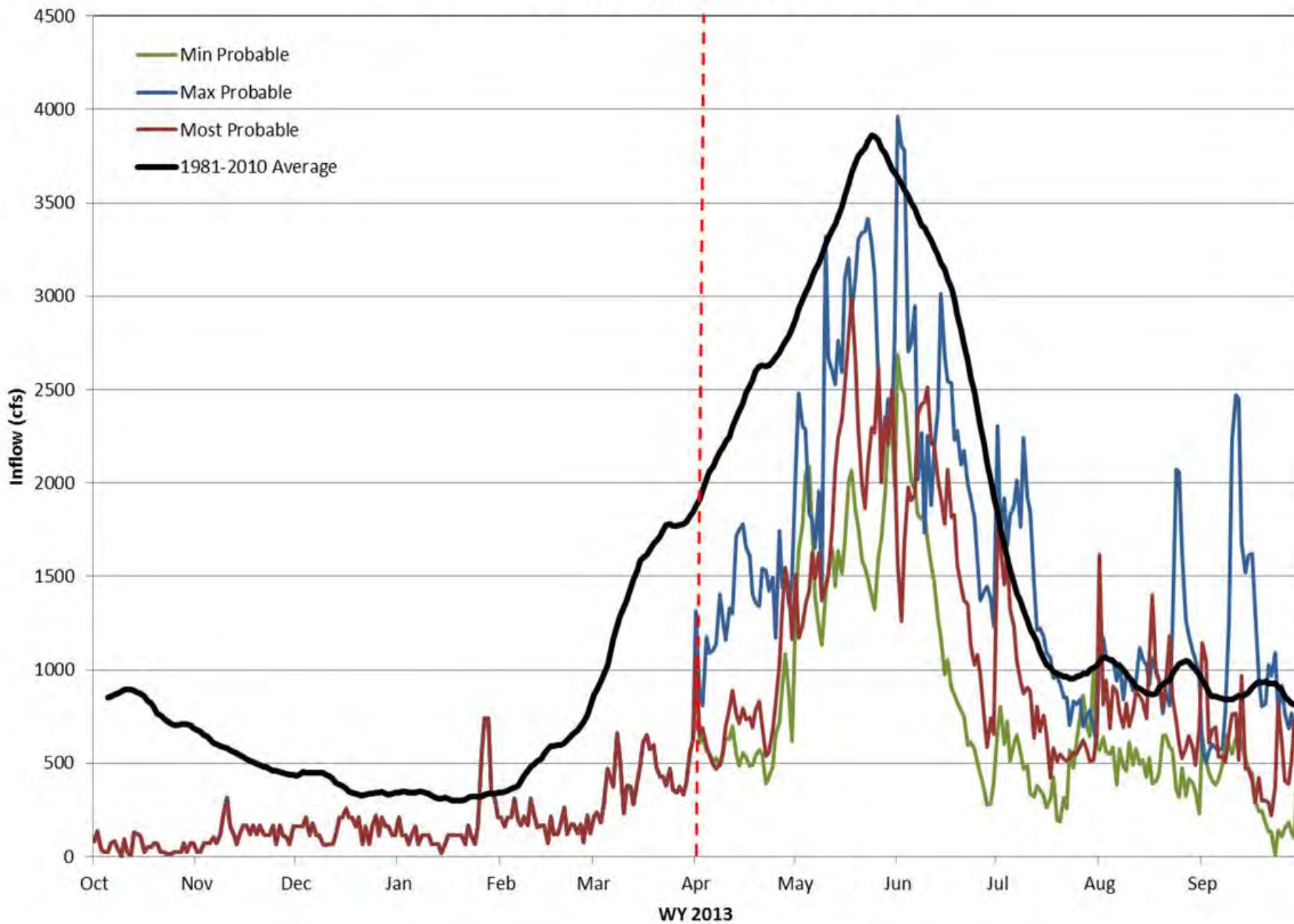
<b>Probability</b>	<b>Available Water</b>	<b>Release</b>
Min	(102,000) af	none
Most	(13,000) af	none
Max	150,000 af	1 week at 5,000 cfs

The Most Probable forecast would need to increase by 90,000 acre-ft to be considered for a spring peak release.



# WY 2013 Navajo Inflow Forecast

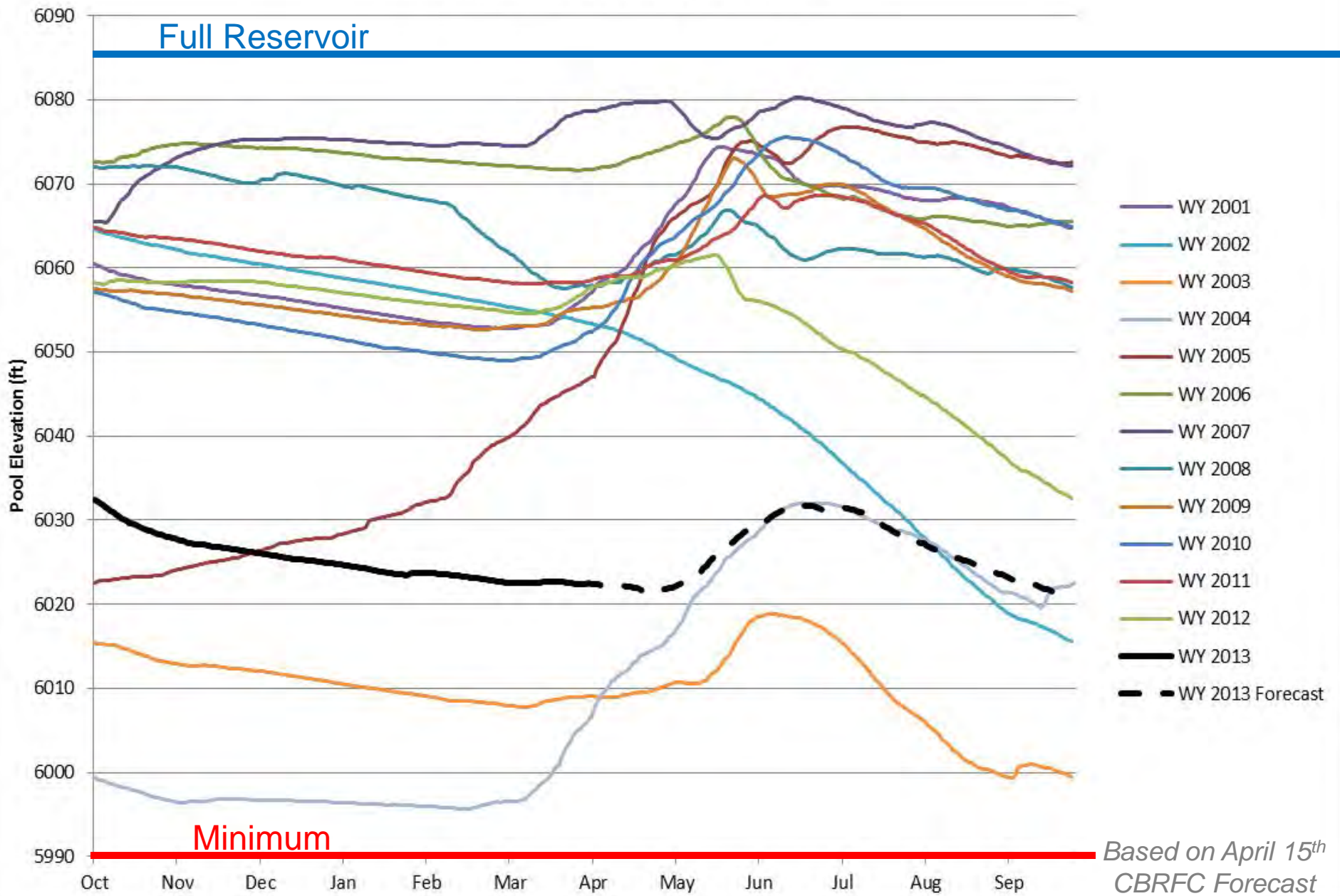
Based on April 15<sup>th</sup>  
CBRFC Forecast







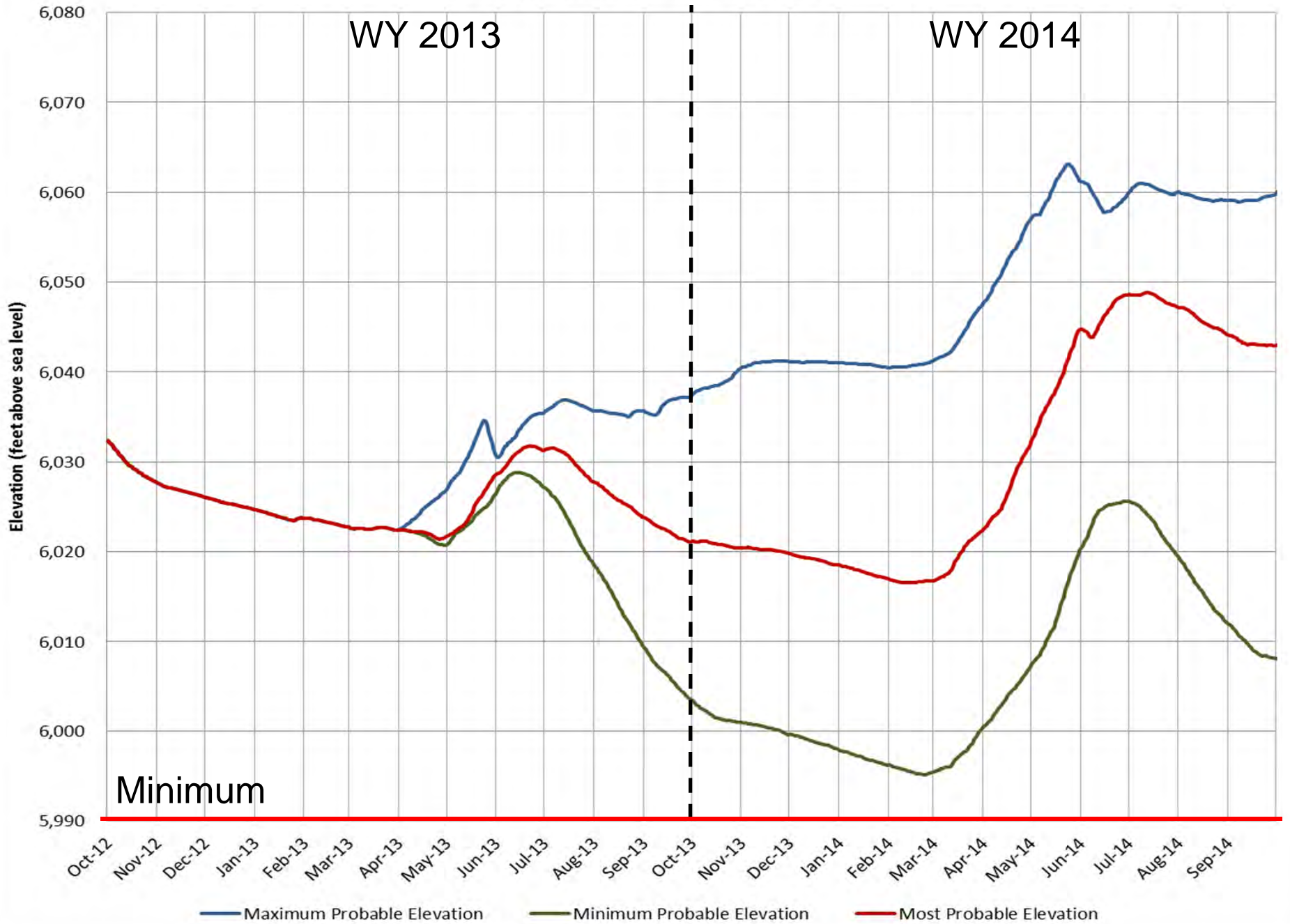
# Historic Navajo Pool Elevations and Forecast Elevation based on current Most Probable Operation Plan



Based on April 15<sup>th</sup> CBRFC Forecast



# Navajo Reservoir Elevation



# WHAT IS A SHORTAGE?

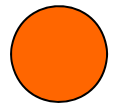
A “Shortage” is declared when under Minimum Probable Conditions, the pool elevation at Navajo is forecasted to drop below 5990 ft at any time during the year. This is the elevation required to maintain NIIP diversions.



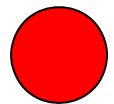
1. Use minimum release of 350 cfs



2. Use minimum release of 250 cfs



3. SJRIP voluntary reduction in Target Base Flow



4. Shortage Sharing Begins



# CBRFC PEAK FLOW FORECASTS

San Juan - Bluff- Nr  
BFFU1

## Mean Daily Forecast

90%: 1800 cfs  
75%: 2000 cfs  
50%: 2400 cfs  
25%: 3000 cfs  
10%: 3800 cfs

## Instantaneous Forecast

90%: 2700 cfs  
75%: 2900 cfs  
50%: 3300 cfs  
25%: 3900 cfs  
10%: 4700 cfs

Flood: 33838 cfs

Hist Peak: 15200 cfs

Issue Date: 2013-04-16

Animas - Durango  
DRGC2

## Mean Daily Forecast

90%: 1500 cfs  
75%: 1700 cfs  
50%: 2100 cfs  
25%: 2500 cfs  
10%: 3100 cfs

## Instantaneous Forecast

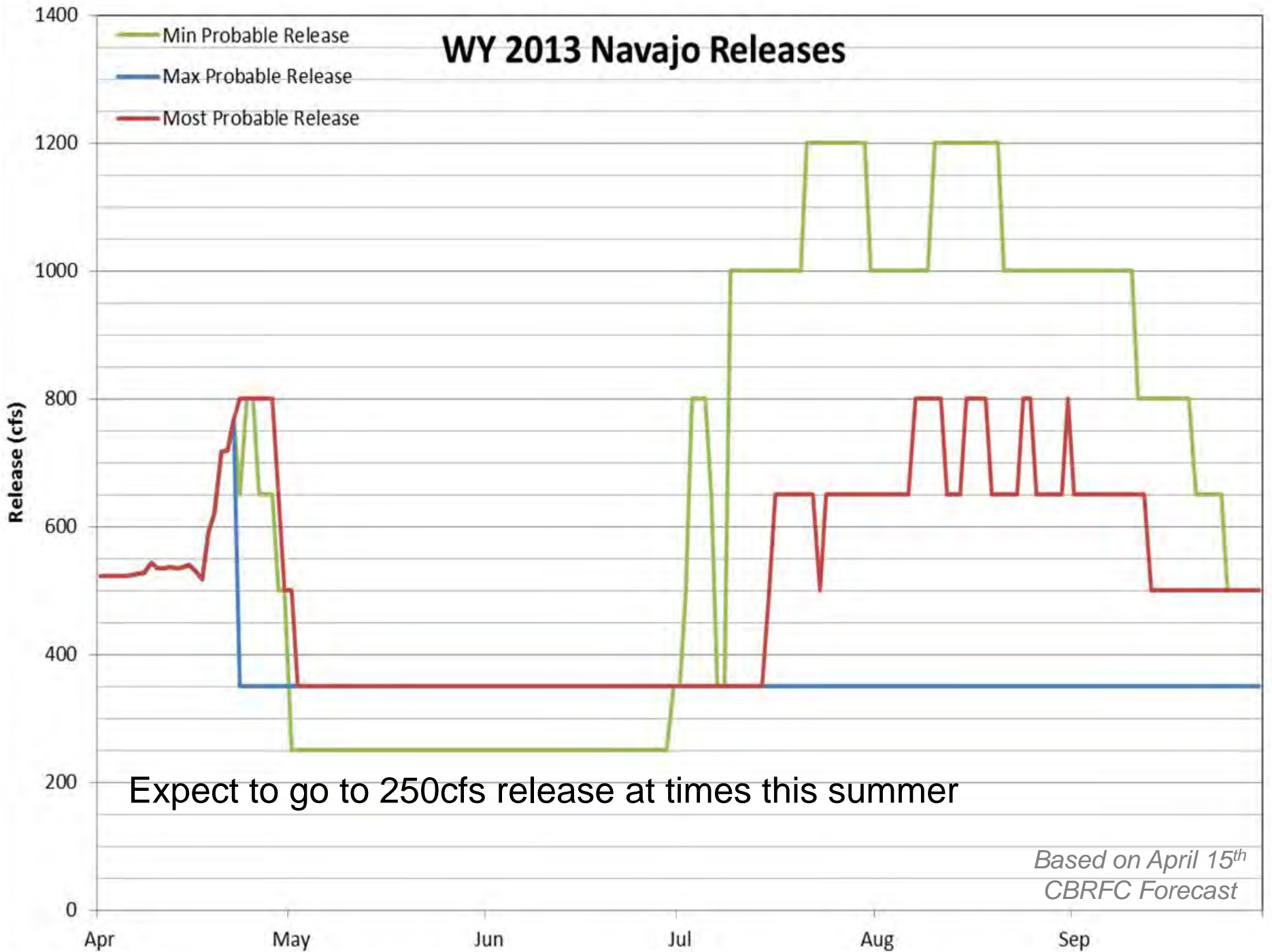
90%: 1700 cfs  
75%: 1900 cfs  
50%: 2300 cfs  
25%: 2800 cfs  
10%: 3400 cfs

Flood: 9560 cfs

Hist Peak: 10700 cfs

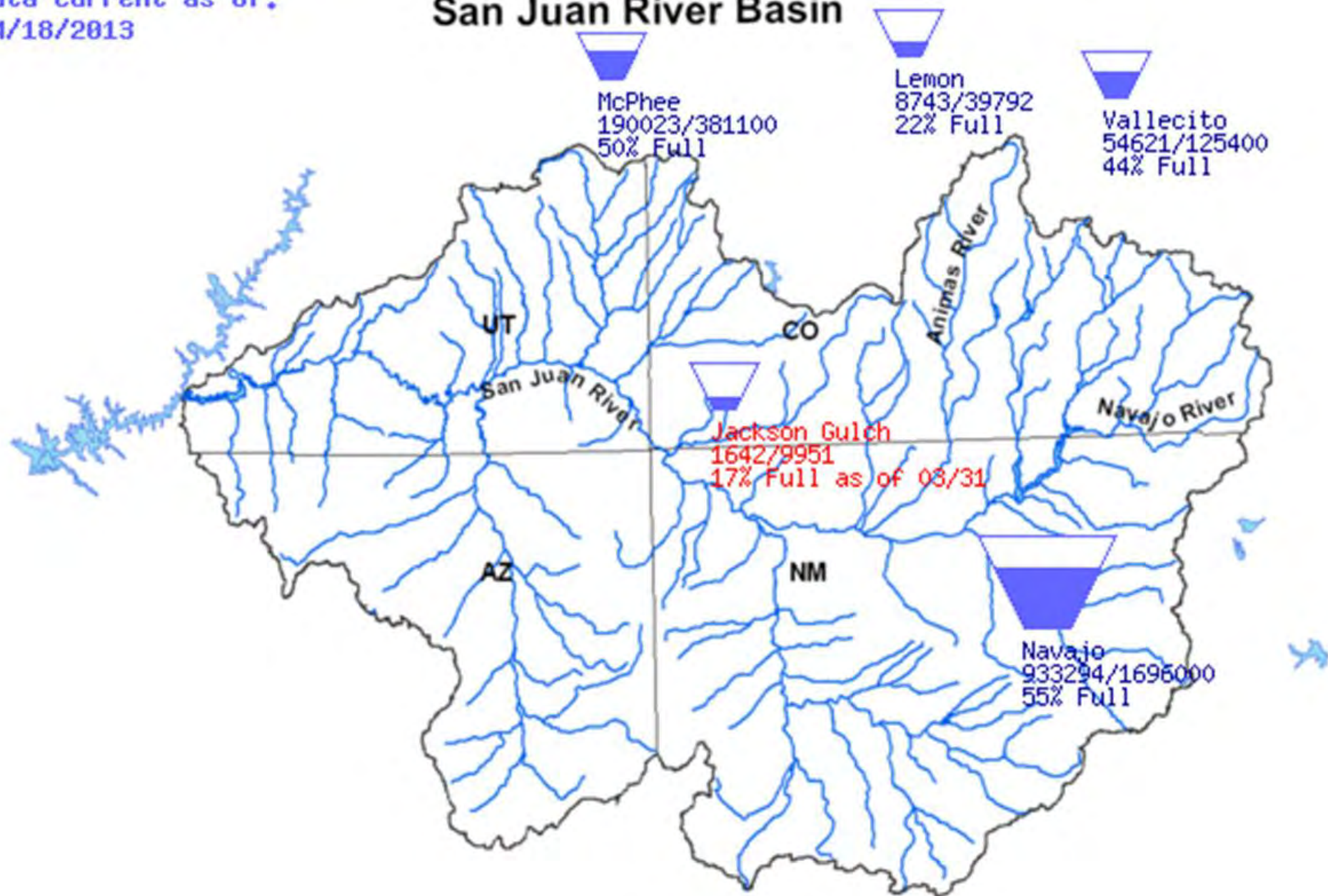
Issue Date: 2013-04-16

# WY 2013 Navajo Releases



Data Current as of:  
04/18/2013

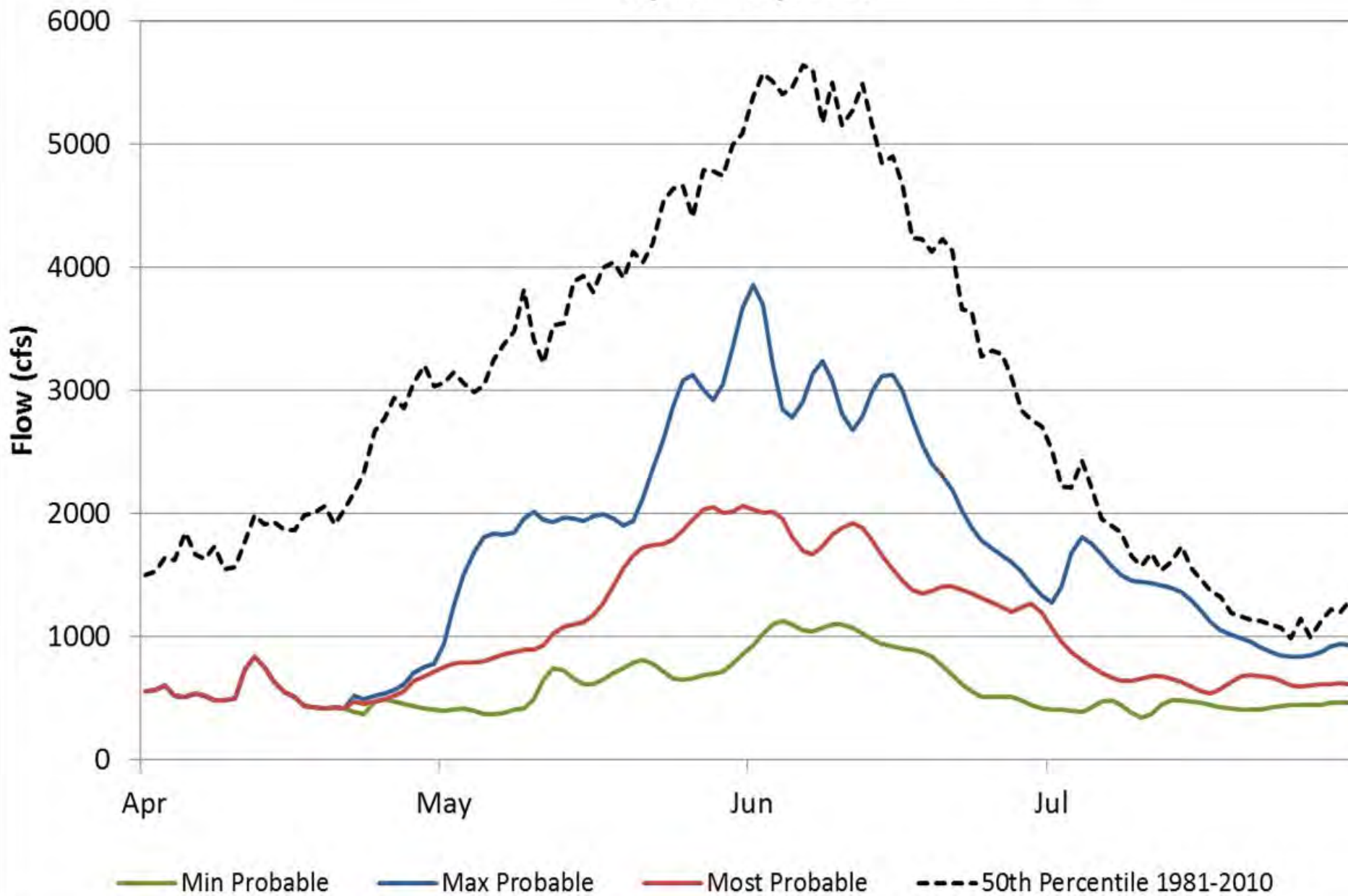
## San Juan River Basin





# Forecasted Flows- San Juan River at Bluff April - July 2013

Based on April 15<sup>th</sup>  
CBRFC Forecast



# Major San Juan River Basin Reservoirs

(4/22/2013)

## Nighthorse

- Elevation = 6877 (94% Full)
- Storage = 107,745 af
- Release = 0 cfs
- Pumping = 0 cfs

## Vallecito

- Elevation = 7636 (44% Full, 94% of average)
- Storage = 55,171 af
- Release = 9 cfs
- Inflow = 162 cfs
- April-July Most Prob Inflow Forecast = 110,000 AF (56% avg)

## Lemon

- Elevation = 8077 (22% Full, 41% of average)
- Storage = 8,855 af
- Release = 6 cfs
- Inflow = 29 cfs
- April-July Most Prob Inflow Forecast = 32,000 AF (59% avg)

# Maintenance Activities

- Work on Navajo unit buildings, parking lot
- Toe drain repair on right groin this fall



# Upcoming Meetings of Importance

- SJRIP Biology Committee Meeting 5/7 at Public Lands Building Durango
- SJRIP Annual Meeting (public) 5/8 at Fort Lewis College
- SJRIP Coordination Committee Meeting 5/9 at the Doubletree Durango

# How You Can Access Information

**Bureau of Reclamation**  
[www.usbr.gov/uc](http://www.usbr.gov/uc)

**USGS**  
<http://water.usgs.gov/nwis>

**Colorado Basin River Forecast Center**  
[www.cbrfc.noaa.gov](http://www.cbrfc.noaa.gov)



# **Reclamation Contacts:**

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**Ruth Swickard**

**970-385-6523    rswickard@usbr.gov**



# Summary

- Precipitation has been well below average for most of the winter and into spring in the San Juan River Basin. Cooler temperatures have prevented the early runoff we saw last year.
- Most Probable April–July Inflow Forecast is 50% of average.
- There will likely be no Spring Peak Release.
- Minimum Base release will be 250 cfs
- Shortage is not currently forecasted but preventative measures are being taken.
- Downstream flows in the San Juan River are likely to be below average.
- Increased releases may be necessary to meet Target Base Flows.
- Similar snowpack and inflow conditions to last year at this time of year, but with drier soil conditions and low reservoirs.
- Next Operations Meeting August 27, 2013