

RECLAMATION

Managing Water in the West



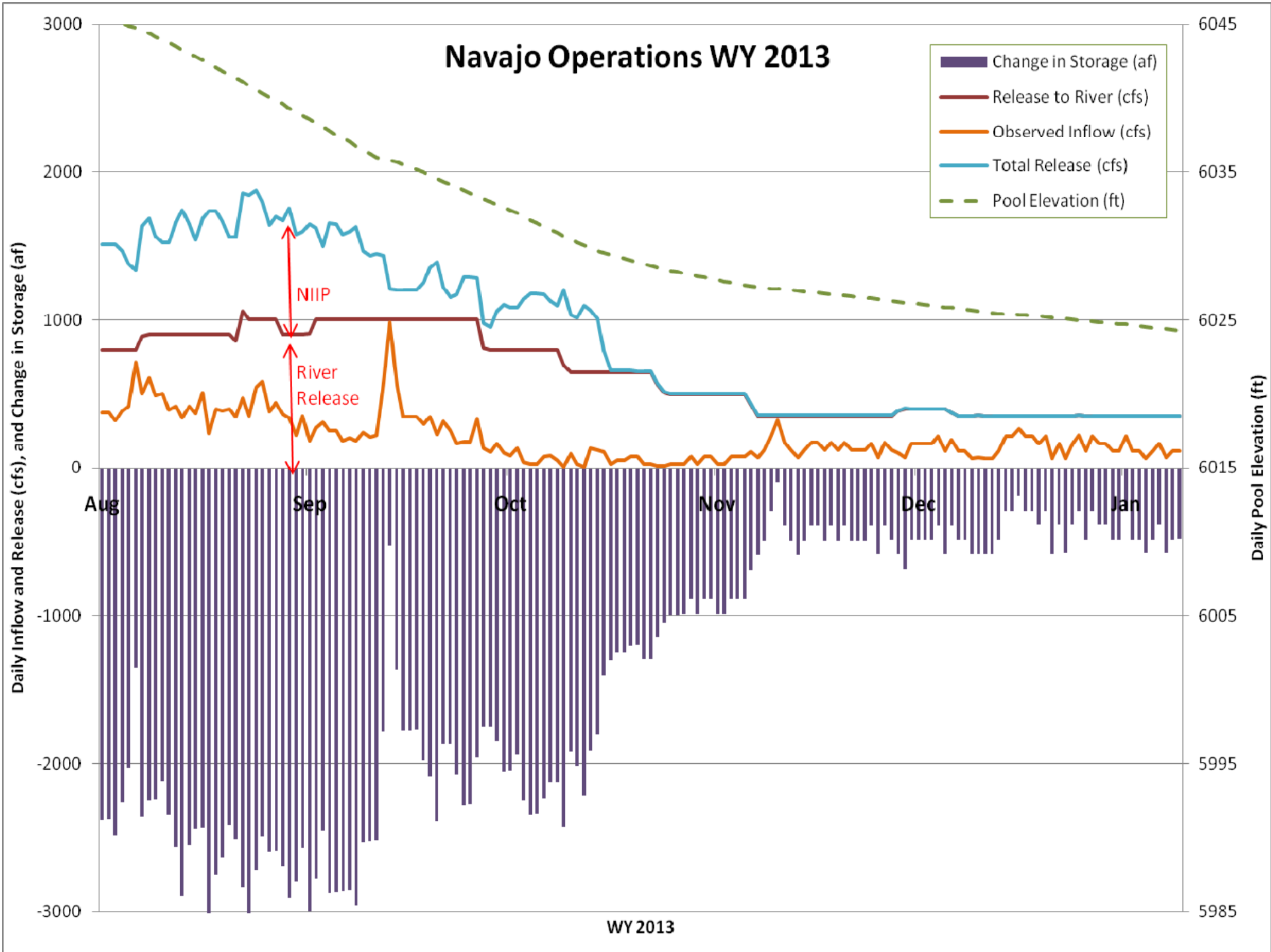
Navajo Unit Operations

January 15, 2013

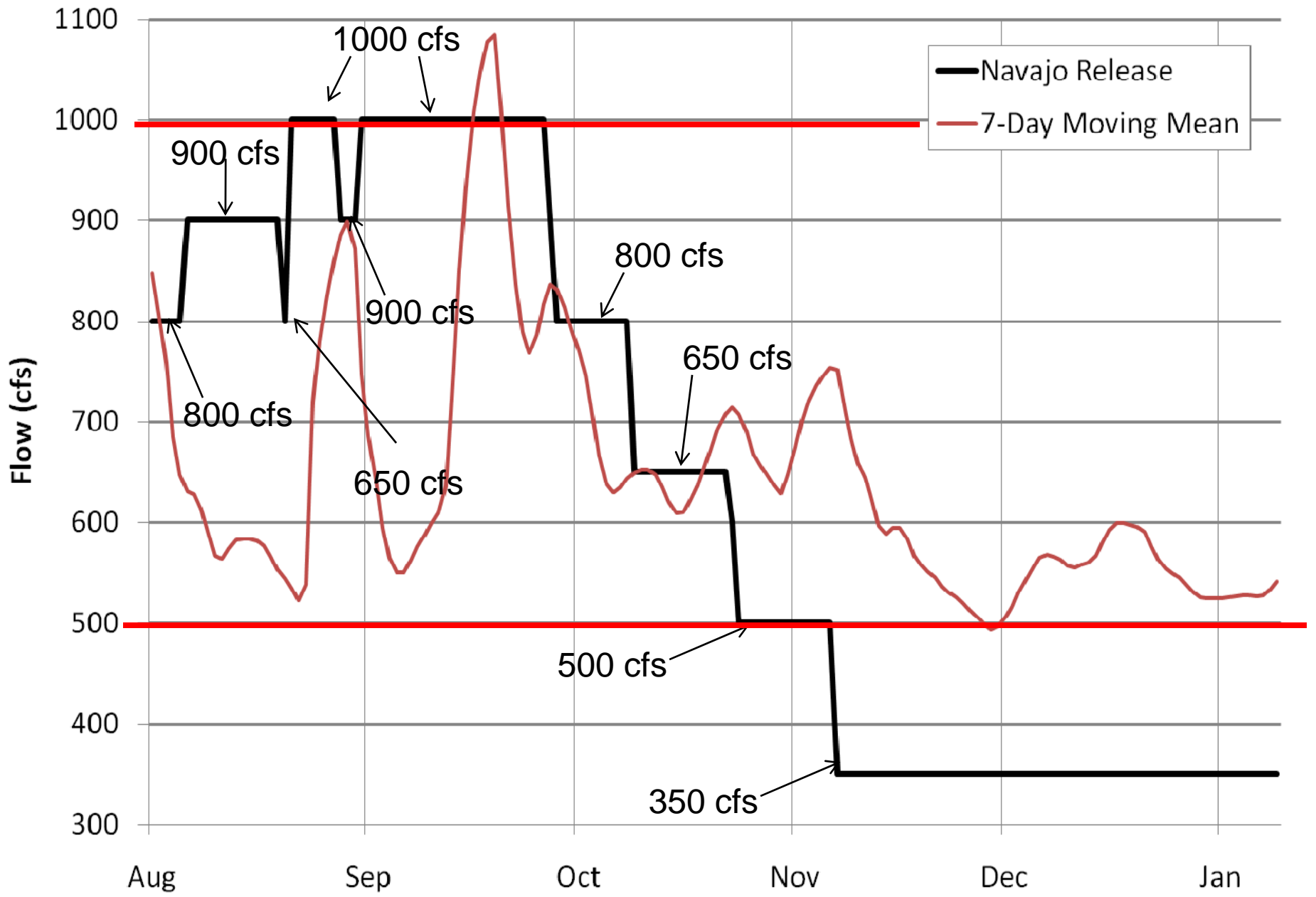
Coordination Meeting

U.S. Department of the Interior
Bureau of Reclamation

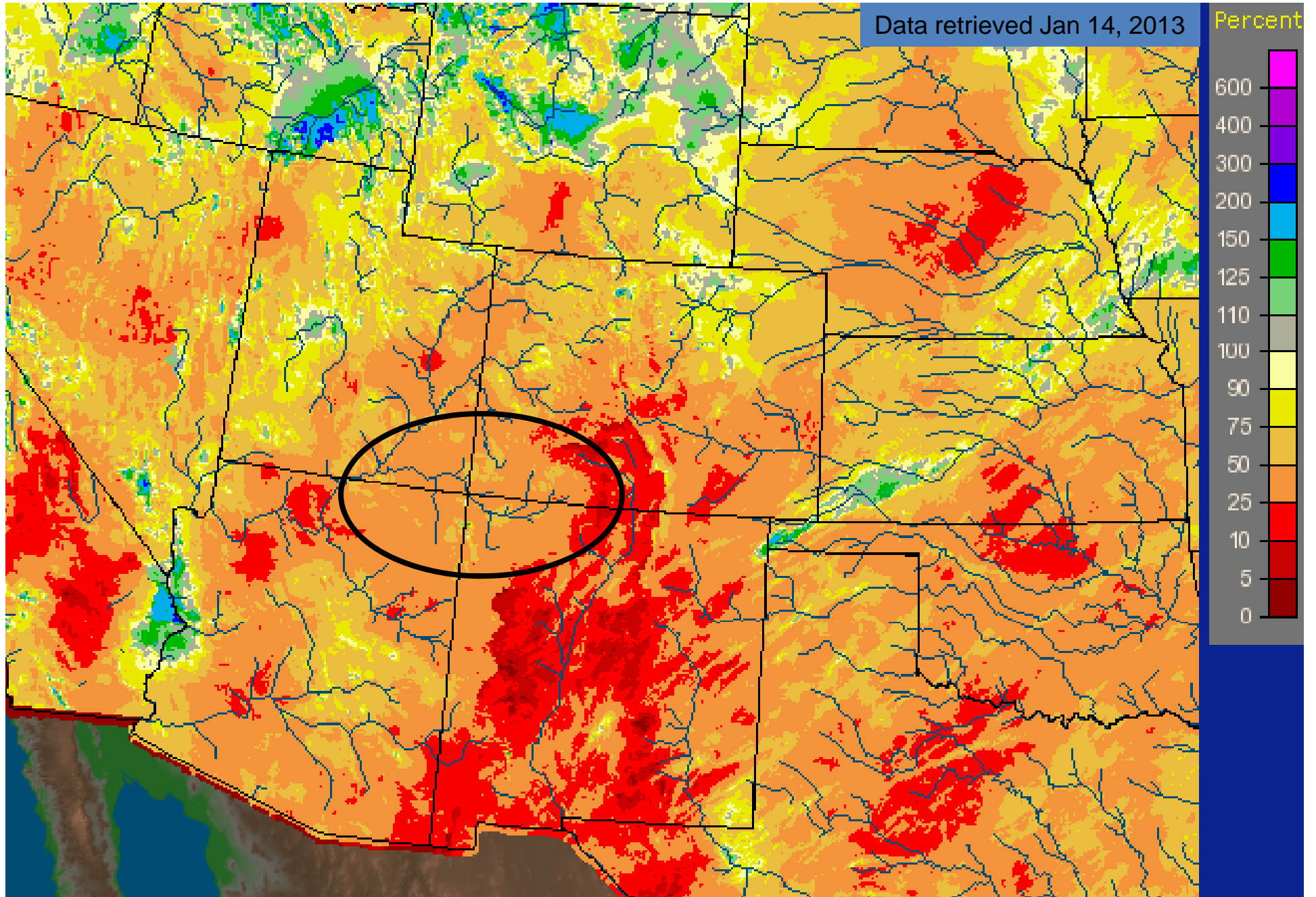
Navajo Operations WY 2013



Chasing the Target Baseflow



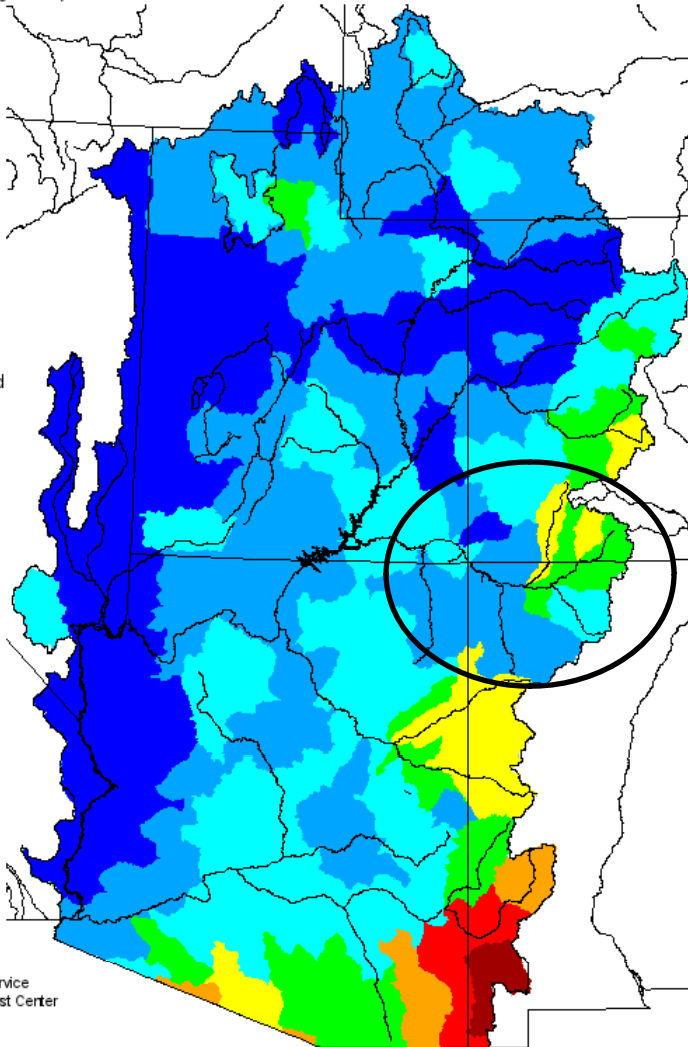
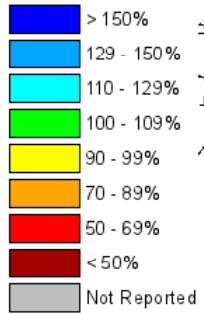
WY2013 to date % Normal Precipitation



Monthly Precipitation for December 2012

(Averaged by Hydrologic Unit)

% Average

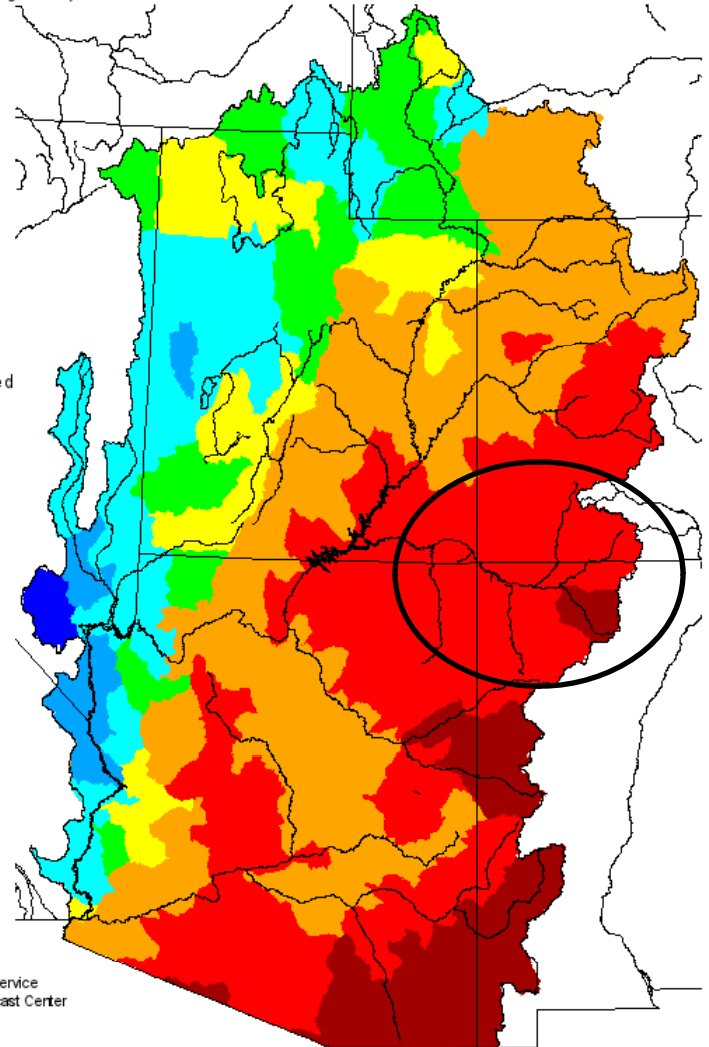
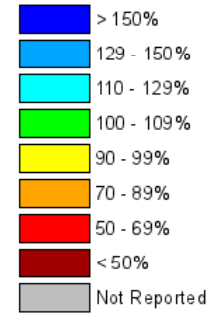


Prepared by
NOAA, National Weather Service
Colorado Basin River Forecast Center
Salt Lake City, Utah
www.cbrfc.noaa.gov

Seasonal Precipitation, October 2012 - December 2012

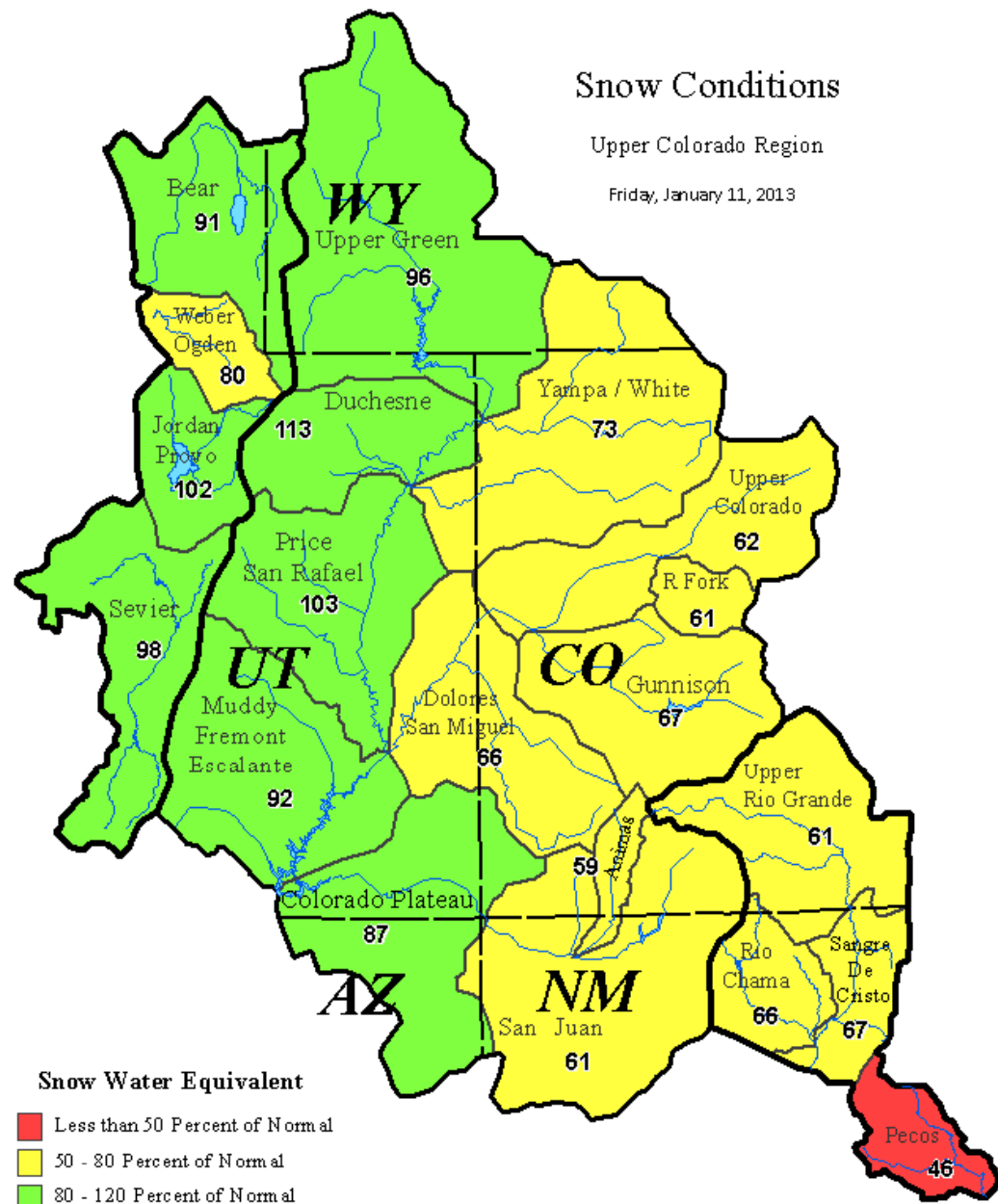
(Averaged by Hydrologic Unit)

% Average



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

Current
 San Juan Basin
 Snowpack
 59%
 (1/14/2013)

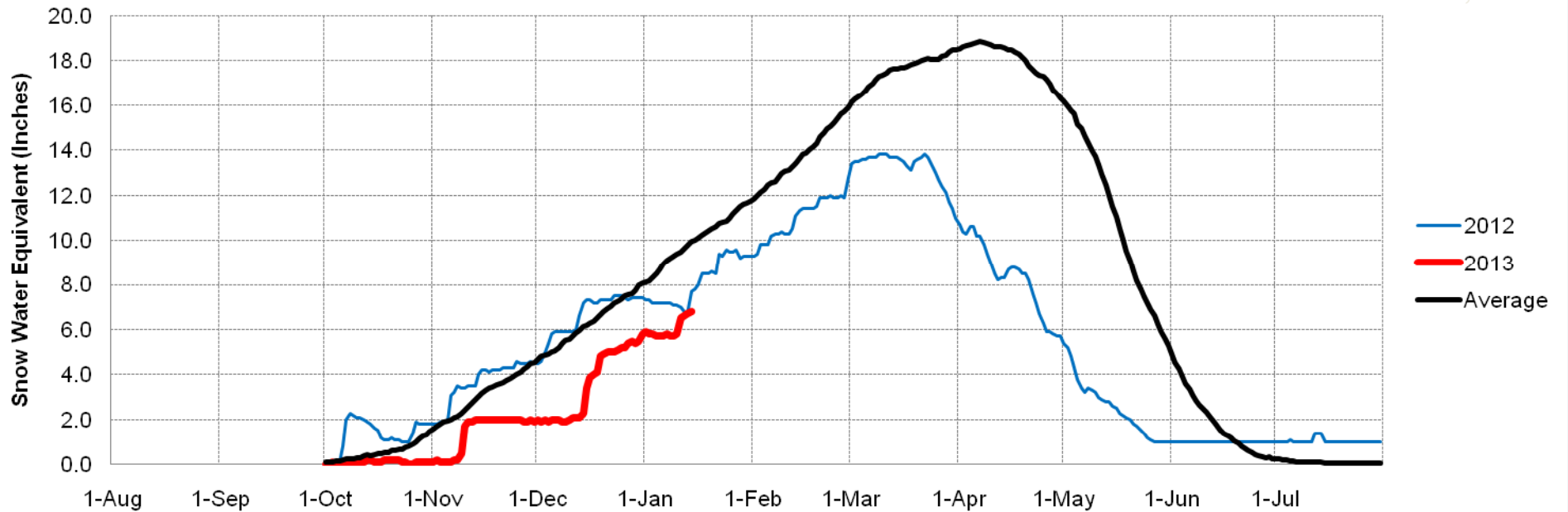


- Snow Water Equivalent**
- Less than 50 Percent of Normal
 - 50 - 80 Percent of Normal
 - 80 - 120 Percent of Normal
 - 120 - 150 Percent of Normal
 - Greater than 150 Percent of Normal

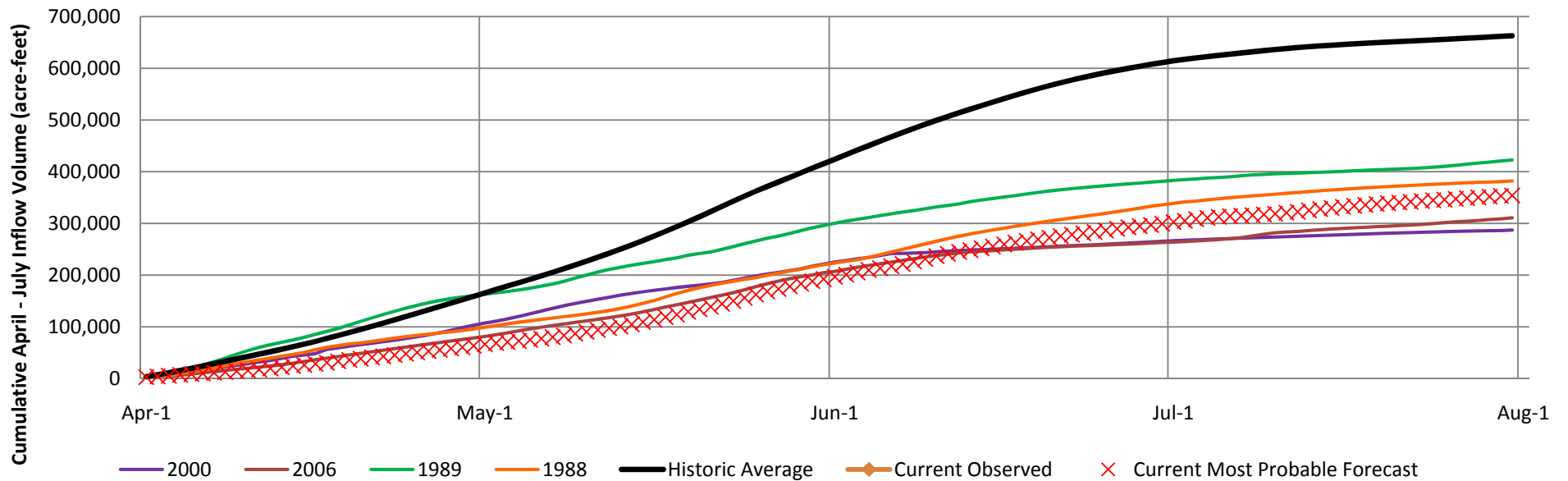


Navajo Reservoir SNOTEL SWE

Data retrieved
Jan 14, 2013



Cumulative April - July Observed Inflow of Representative SWE Years

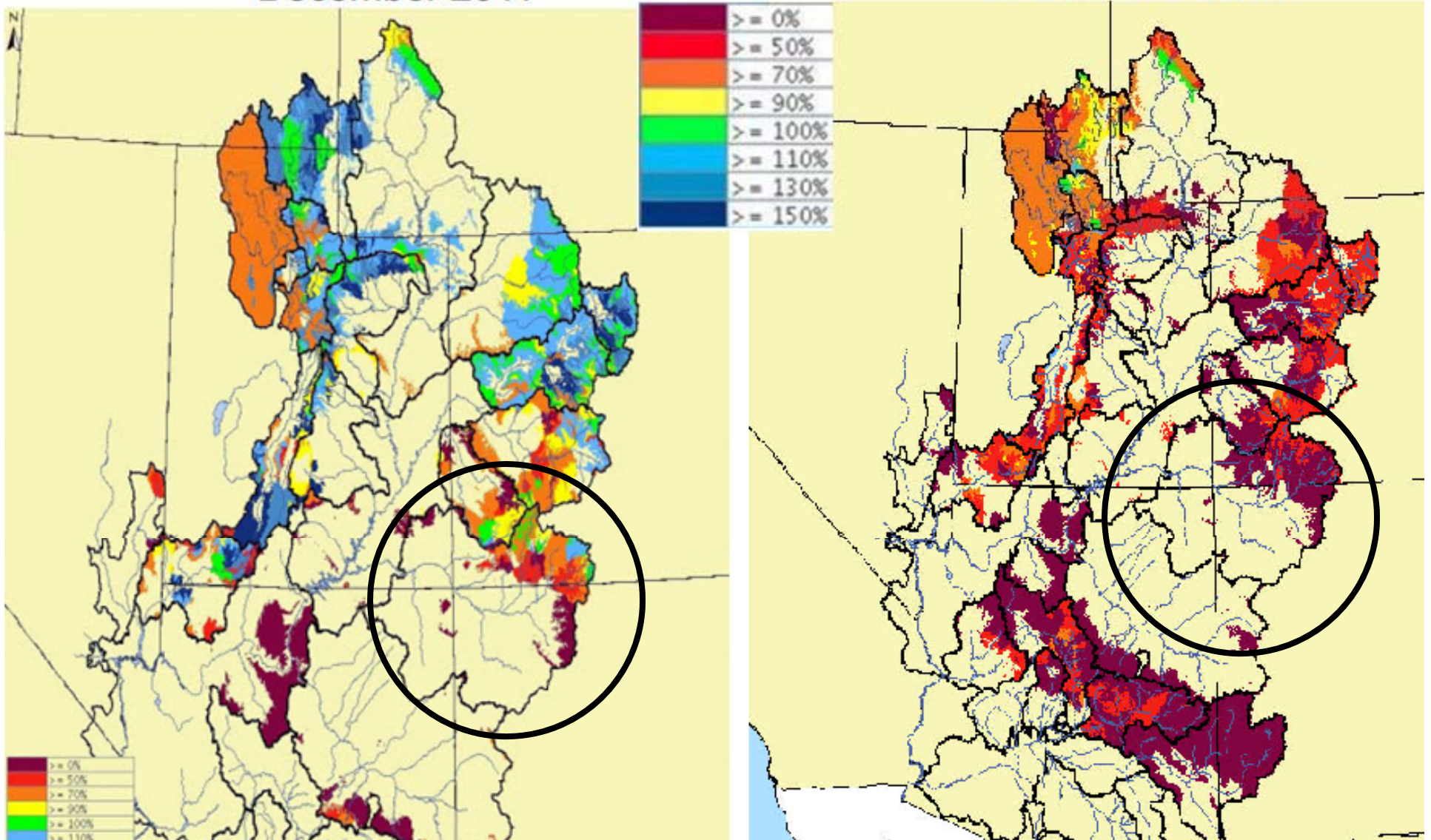


CBRFC

Modeled Soil Moisture

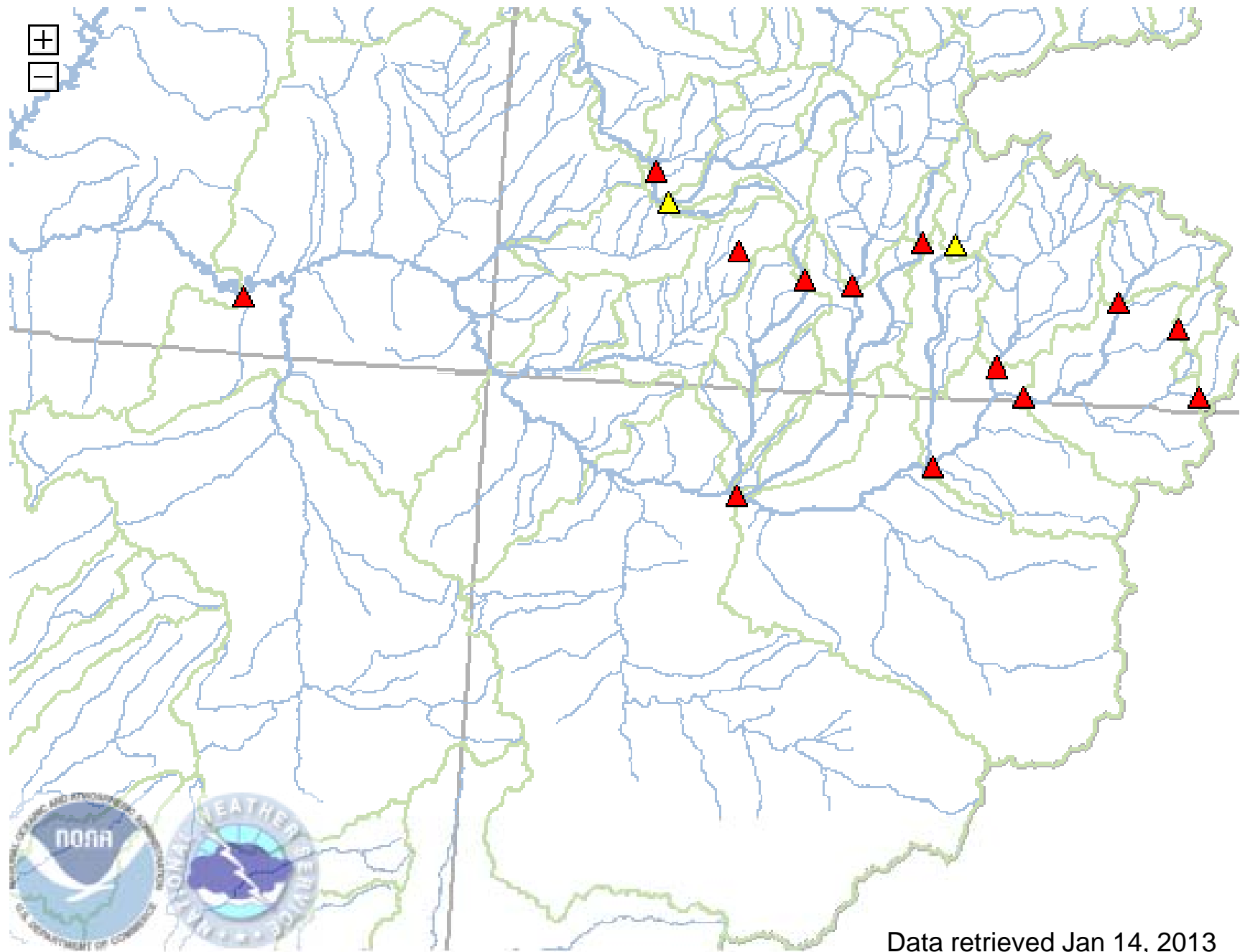
December 2011

December 2012



Water Supply Point %Avg/Median

▲ < 70 ▲ 70-90 ▲ 90-110 ▲ 110-130 ▲ >130 ▲ Regulated



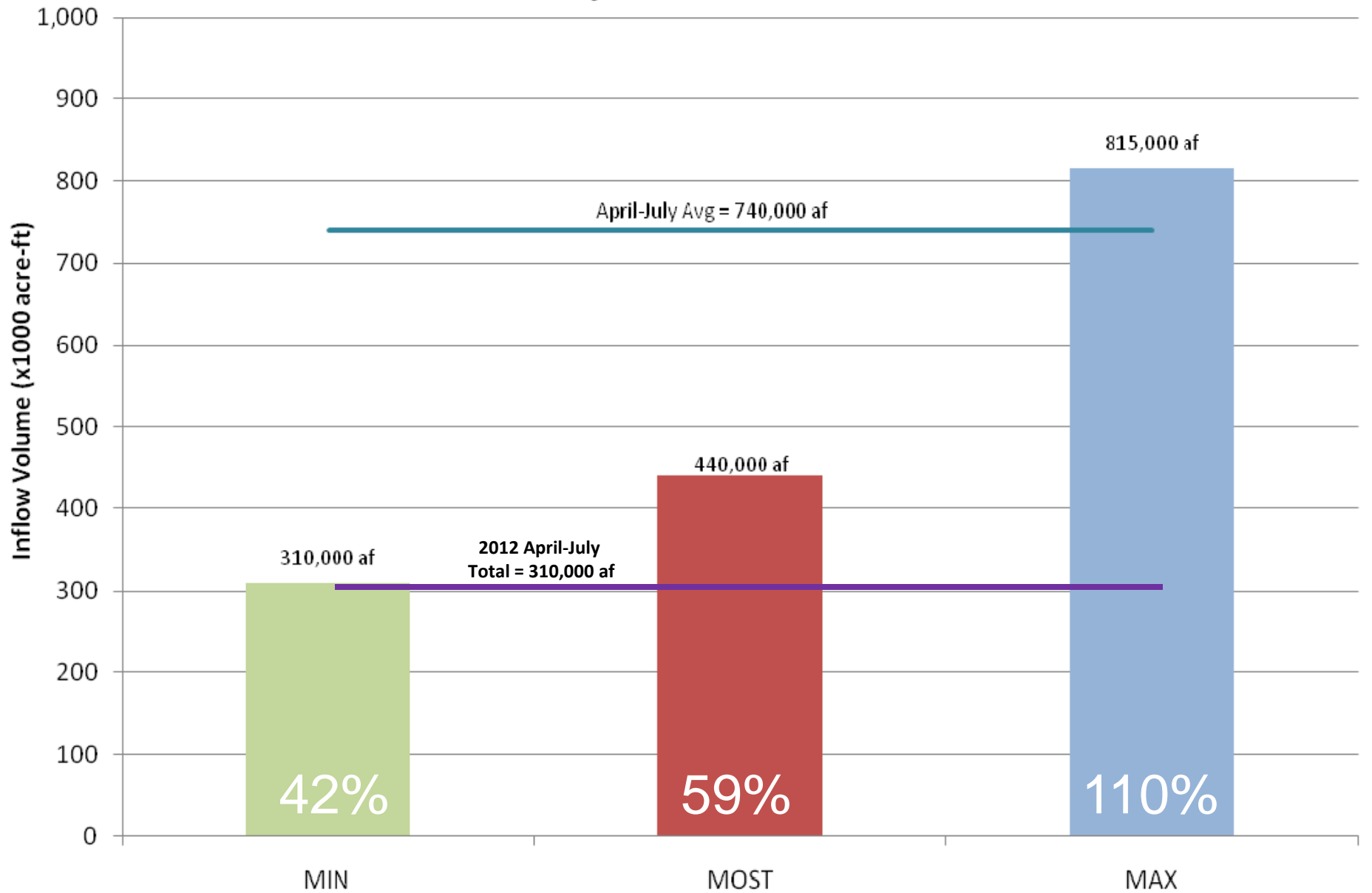
Data retrieved Jan 14, 2013

2013 CBRFC Forecasts

Issued Jan 3, 2013

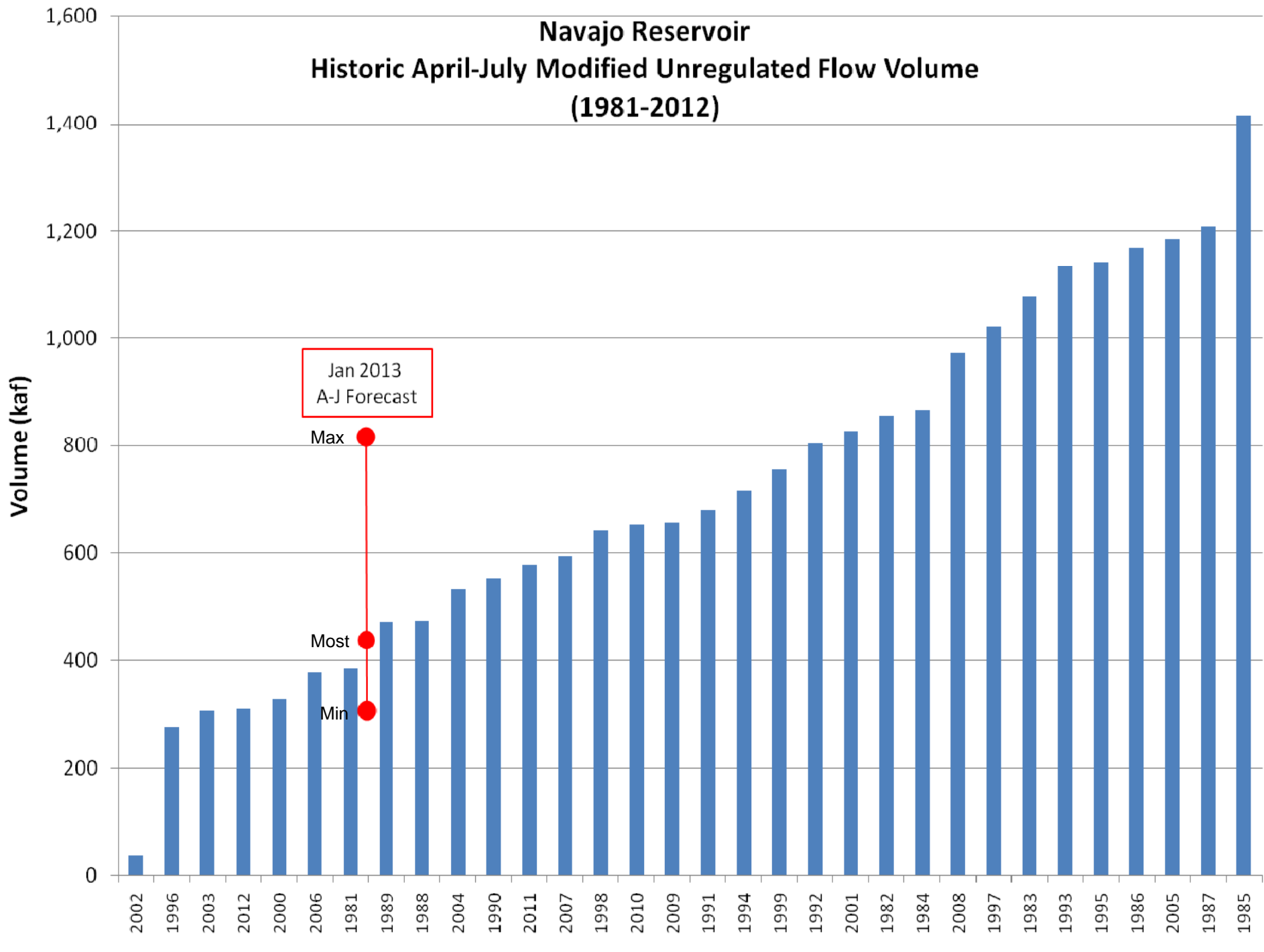
NAVAJO	Inflow Forecast (acre-ft) (percent of average)			
	Jan	Feb	Mar	Apr-Jul
Min	9,500 (48%)	11,000 (38%)	26,000 (29%)	310,000 (42%)
Most	12,000 (60%)	15,000 (52%)	41,000 (46%)	440,000 (59%)
Max	18,000 (90%)	24,000 (83%)	84,000 (94%)	815,000 (110%)

April-July 2013 Navajo Inflow Forecast



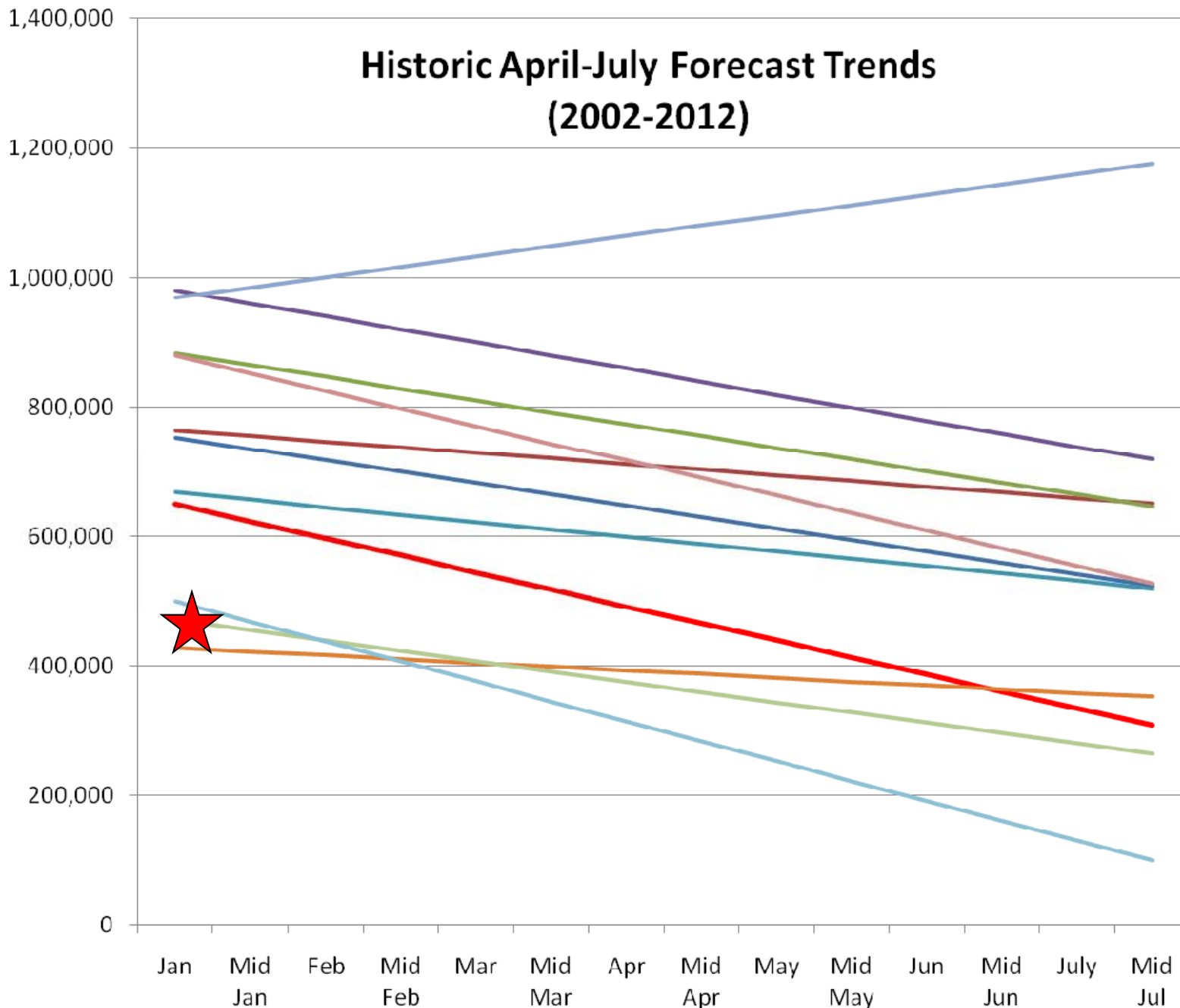
Navajo Reservoir

Historic April-July Modified Unregulated Flow Volume (1981-2012)



Historic April-July Forecast Trends (2002-2012)

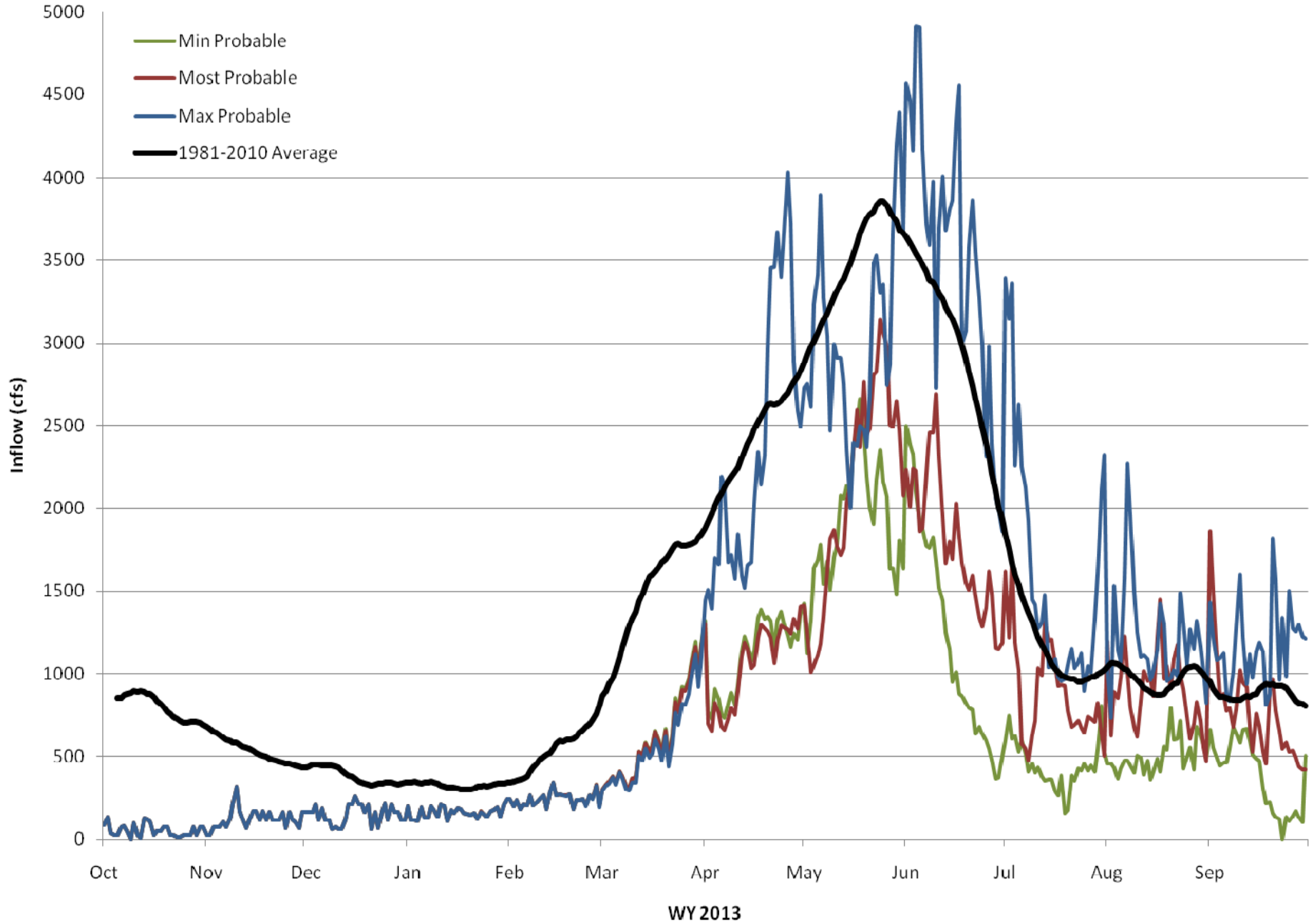
Forecasted April-July Inflow Volumes (acre-ft)



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

CBRFC Forecast Date

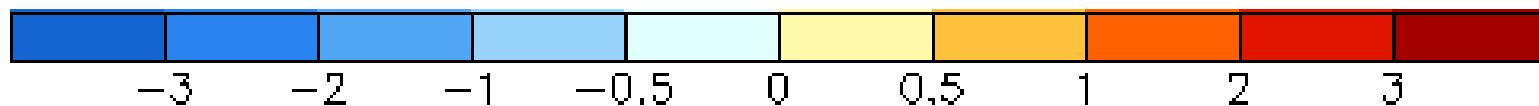
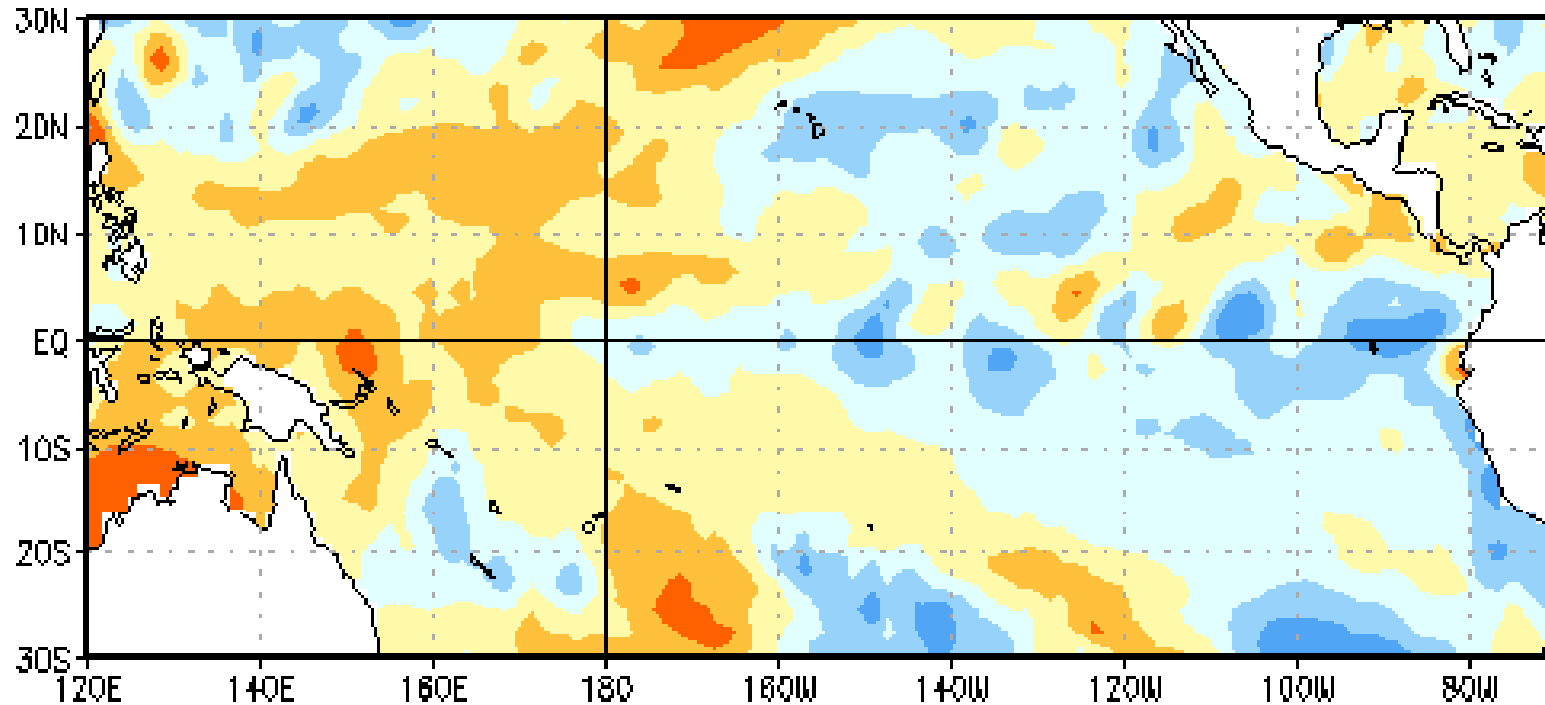
WY 2013 Navajo Inflow Forecast



El Niño/La Niña current status and forecast models

SST Anomalies (°C)

02 JAN 2013





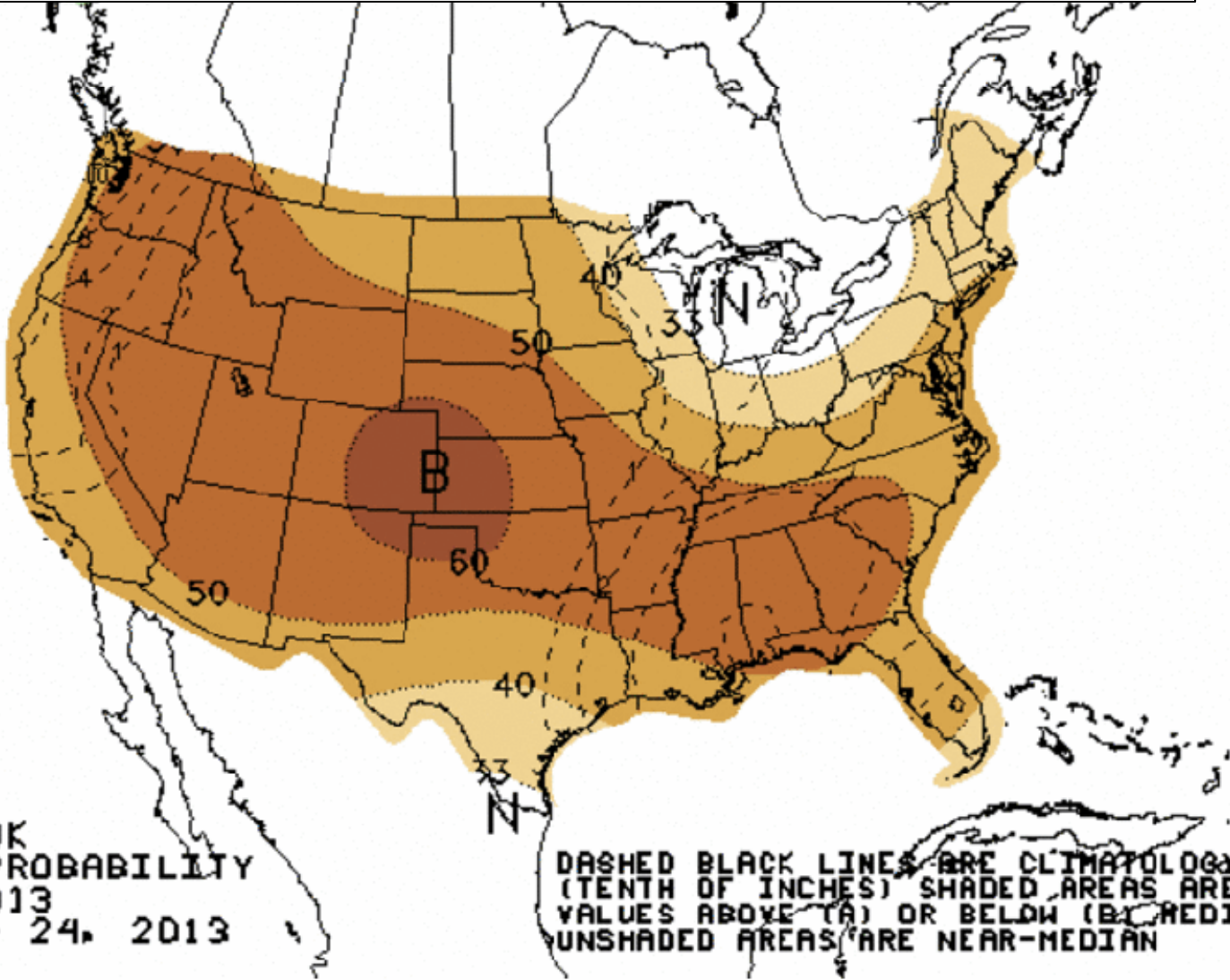
Summary

ENSO Alert System Status: Not Active

- **ENSO-neutral conditions continue.***
- **Equatorial sea surface temperatures (SST) are near average across most of the Pacific Ocean.**
- **The atmospheric circulation over the tropical Pacific is near average.**
- **ENSO-neutral is favored for Northern Hemisphere winter 2012-13 and into spring 2013.***

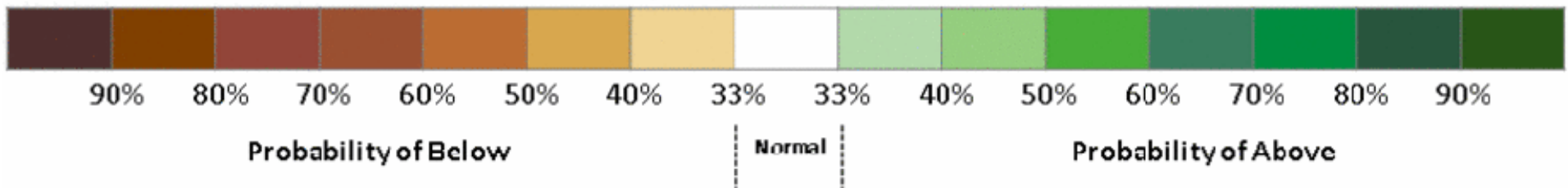
* Note: These statements are updated once a month in association with the ENSO Diagnostics Discussion:
http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory

NWS Climate Prediction Center Outlooks

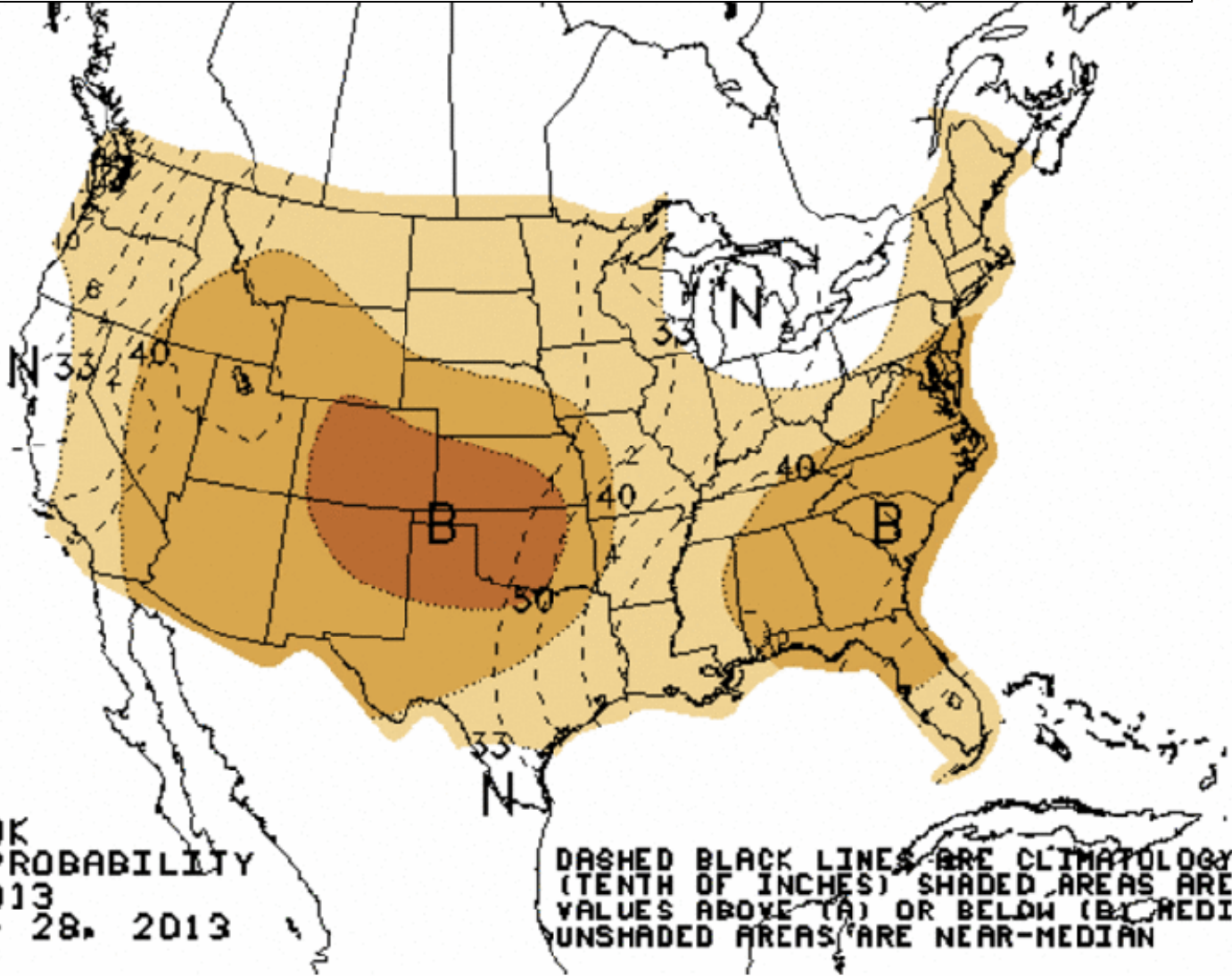


6-10 DAY OUTLOOK
 PRECIPITATION PROBABILITY
 MADE 14 JAN 2013
 VALID JAN 20 - 24, 2013

DASHED BLACK LINES ARE CLIMATOLOGY (TENTH OF INCHES) SHADED AREAS ARE FCS' VALUES ABOVE (A) OR BELOW (B) MEDIAN UNSHADED AREAS ARE NEAR-MEDIAN

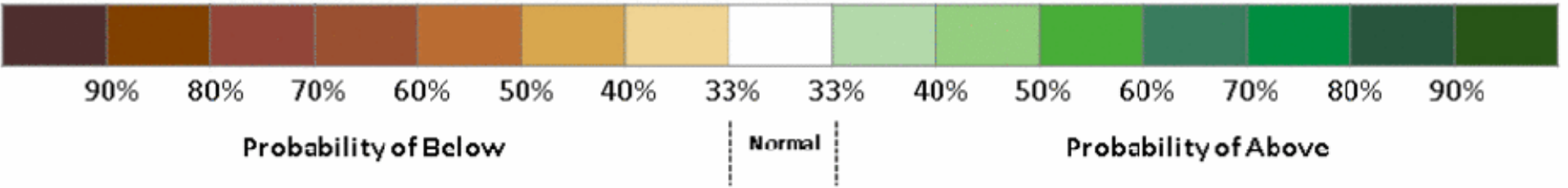


NWS Climate Prediction Center Outlooks

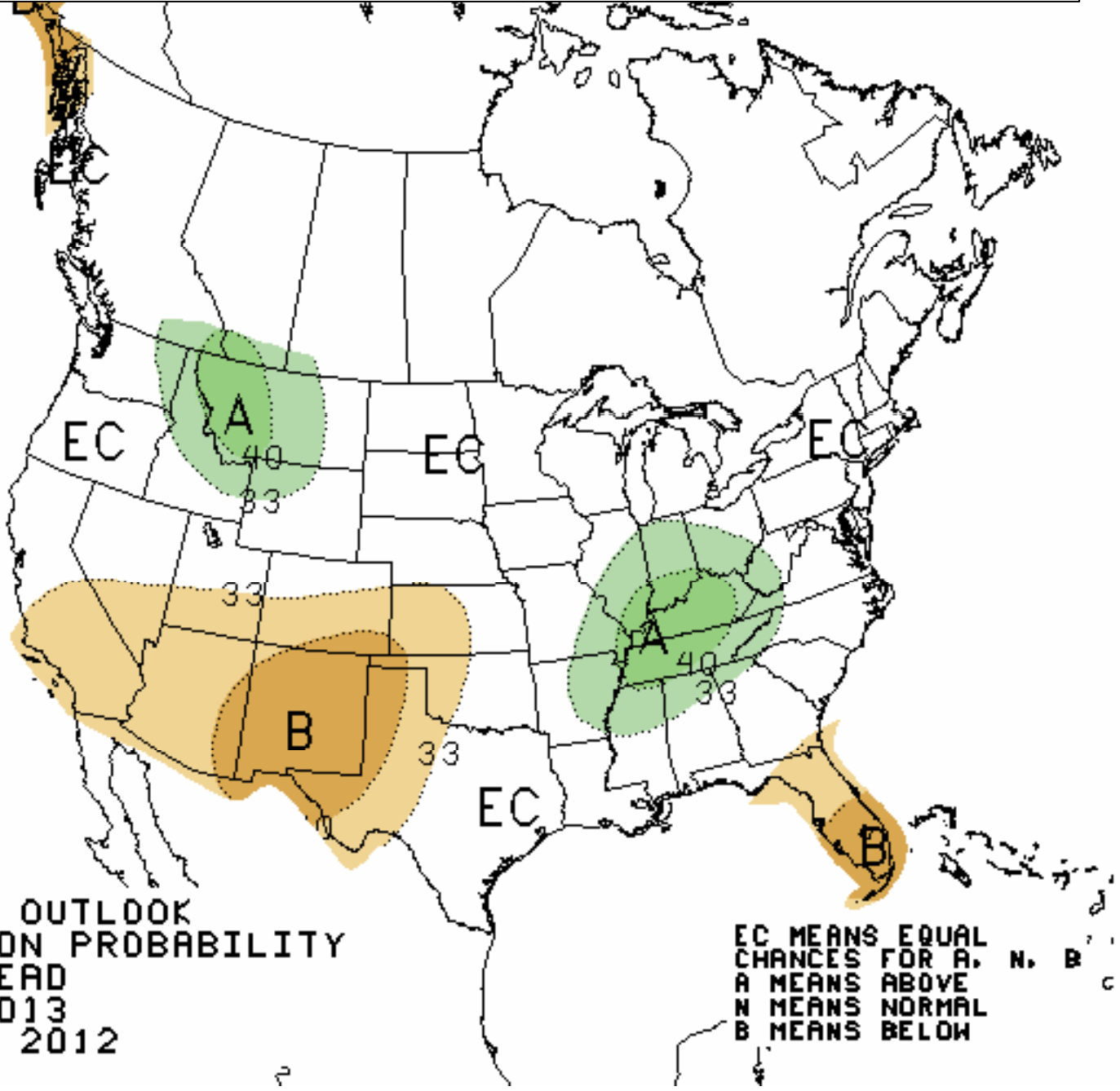


8-14 DAY OUTLOOK
 PRECIPITATION PROBABILITY
 MADE 14 JAN 2013
 VALID JAN 22 - 28, 2013

DASHED BLACK LINES ARE CLIMATOLOGY (TENTH OF INCHES) SHADED AREAS ARE FCS' VALUES ABOVE (A) OR BELOW (B) MEDIAN UNSHADED AREAS ARE NEAR-MEDIAN



NWS Climate Prediction Center Outlooks



THREE-MONTH OUTLOOK
PRECIPITATION PROBABILITY
0.5 MONTH LEAD
VALID JFM 2013
MADE 20 DEC 2012

EC MEANS EQUAL CHANCES FOR A, N, B
A MEANS ABOVE
N MEANS NORMAL
B MEANS BELOW

Navajo Current Conditions

(as of 1/13/13)

Elevation = 6024 ft

Storage = 950,176 af (56% Full, 75% of Avg)

Inflow = 87 cfs*

Release = 350 cfs

NIIP = 0 cfs*

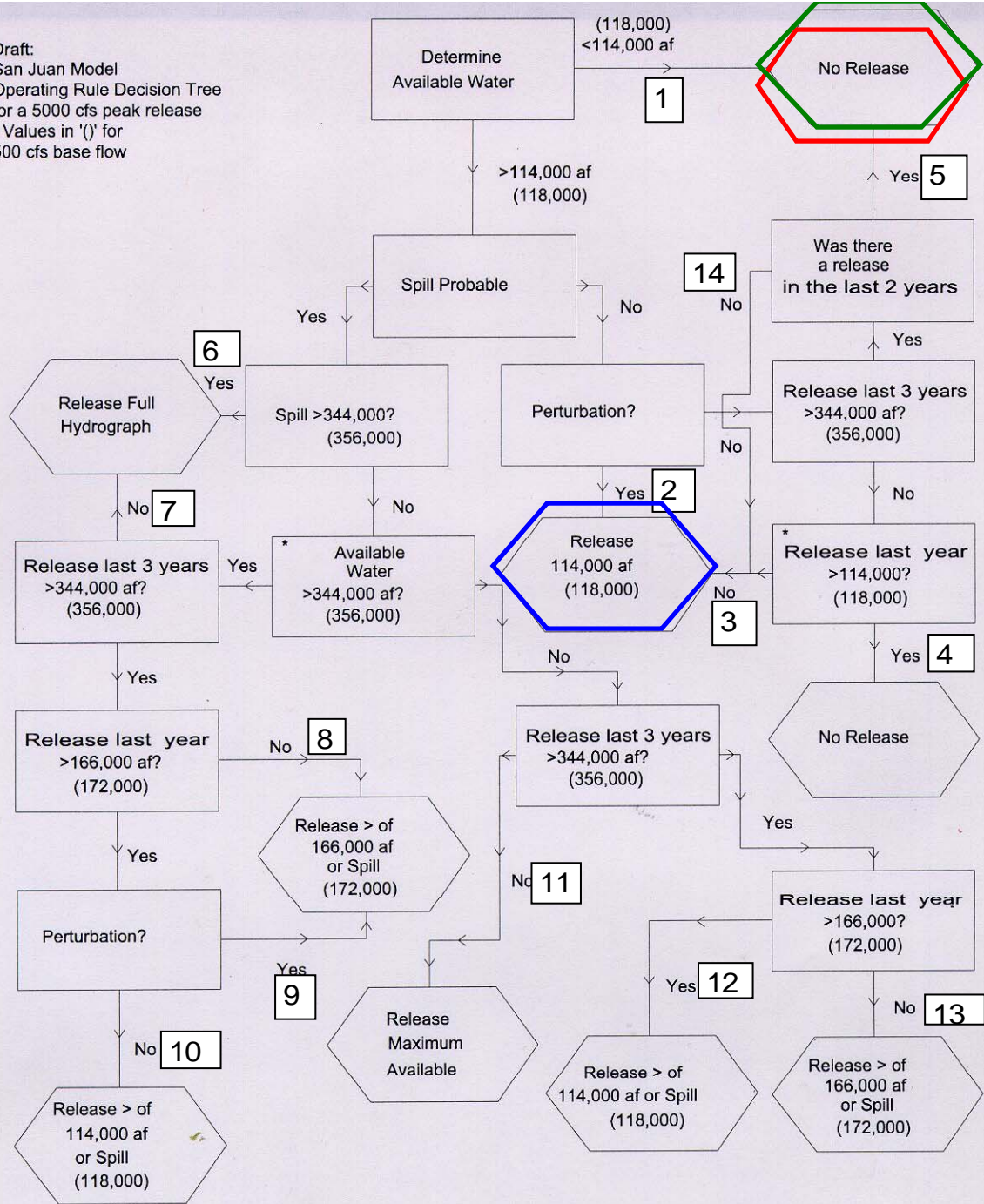
San Juan-Chama Diversion = 0 cfs*

* Average of the last 7 days

WATER YEAR 2013 PROPOSED OPERATIONS SUMMARY

- WATER SAVING MODE
- Spring peak release is unlikely.
- 250-500 cfs base release (will discuss in later slide)

Draft:
San Juan Model
Operating Rule Decision Tree
for a 5000 cfs peak release
- Values in '()' for
500 cfs base flow



**MIN
PROBABLE**
(63,000) af
PATH #1

**MOST
PROBABLE**
53,000 af
PATH #1

**MAX
PROBABLE**
315,000 af
PATH #3

2013 Spring Peak Release

(Based on current forecast)

Most Probable

Water Available = 53,000 af

Peak Release = No Release

Minimum Probable

Water Available = (63,000) af

Peak Release = No Release

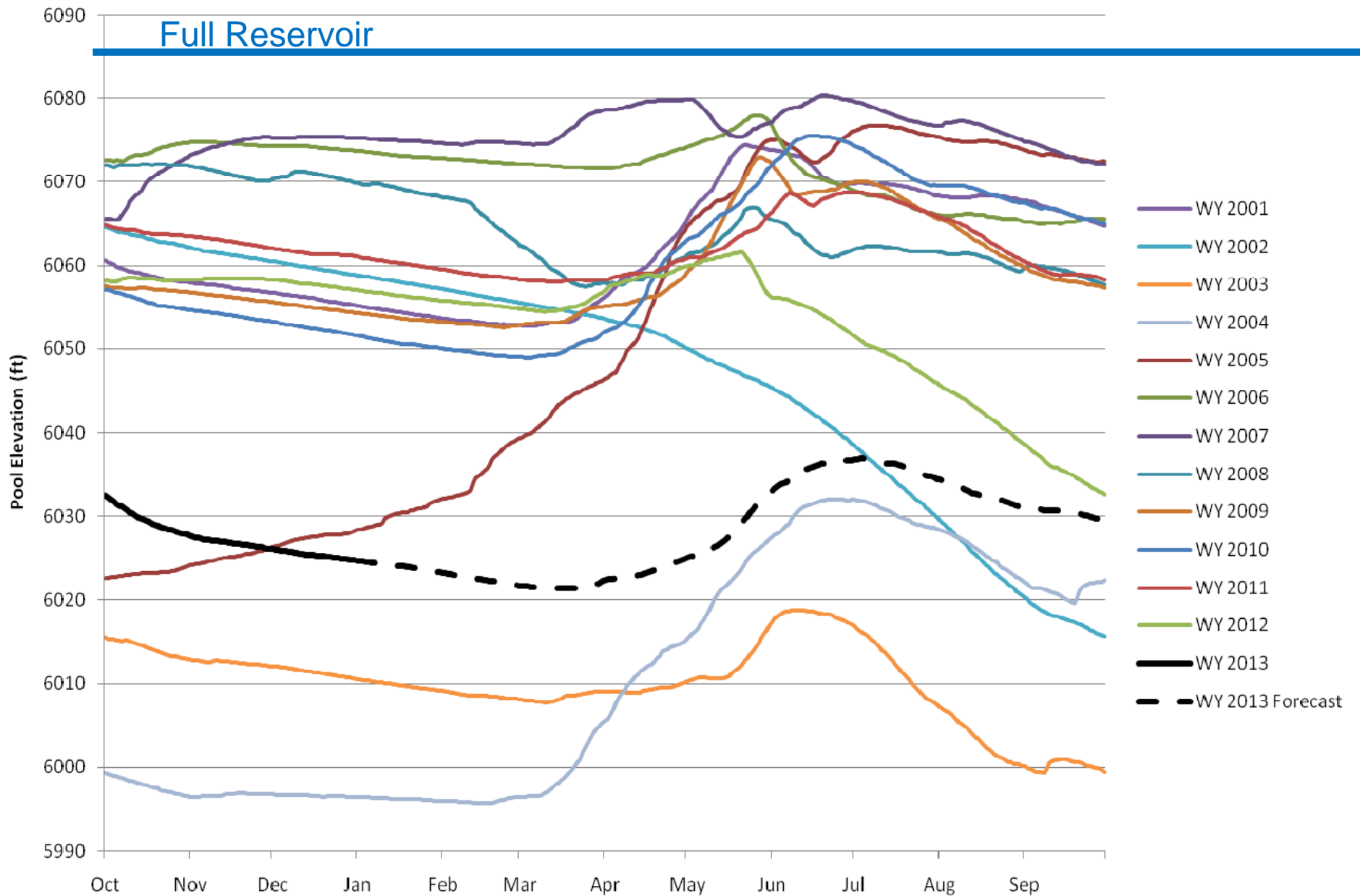
Maximum Probable

Water Available = 315,000 af

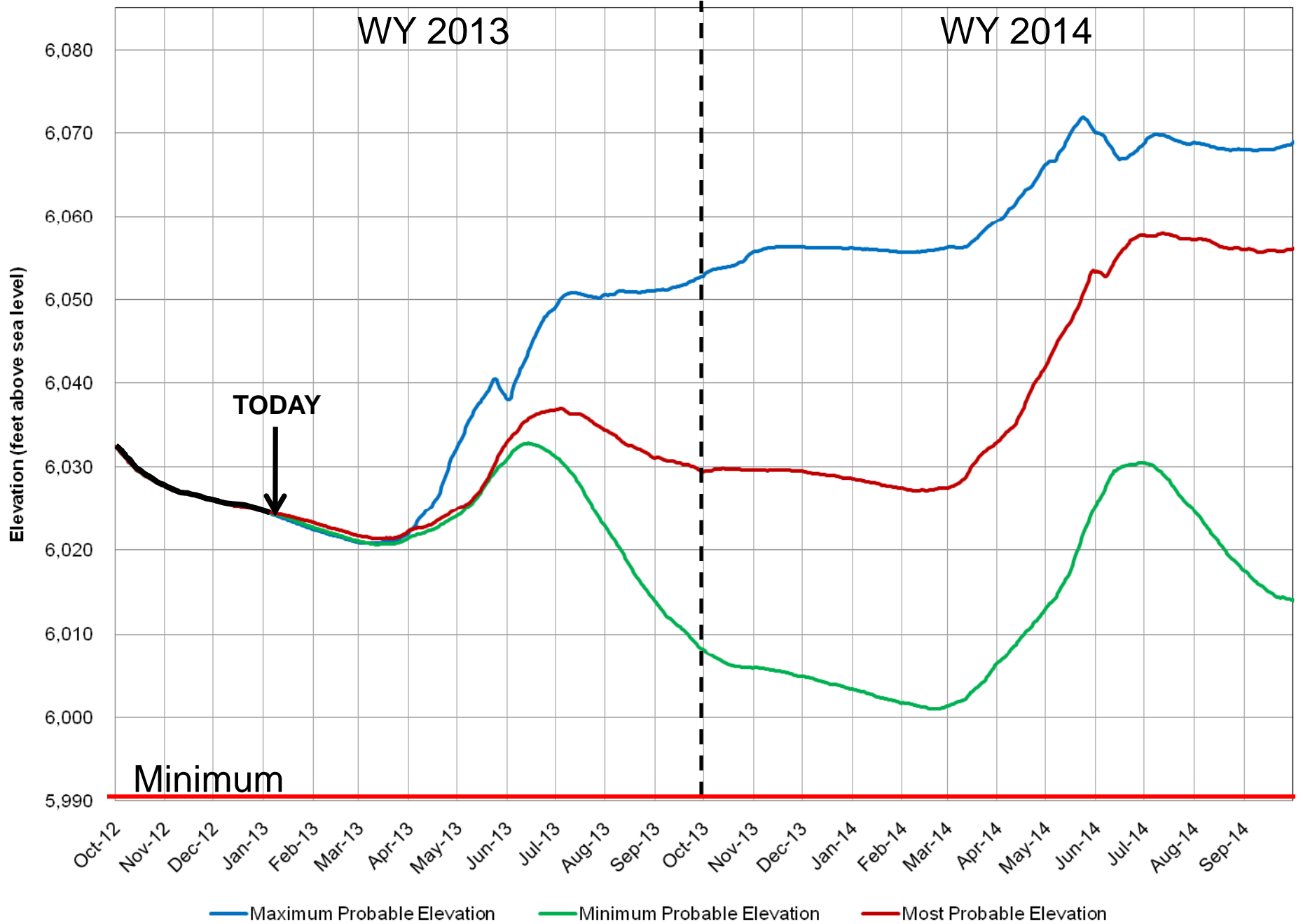
Peak Release = 1-week release, 80,000 acre-ft total

Base release of 250 - 500 cfs for remainder of water year

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



Navajo Reservoir Elevation



WHAT IS A SHORTAGE?


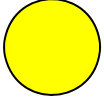
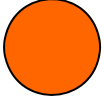
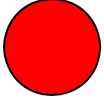
A “Shortage” is declared when under Minimum Probable Conditions, the pool elevation at Navajo is forecasted to drop below 5990 ft at any time during the year. This is the elevation required to maintain NIIP diversions.

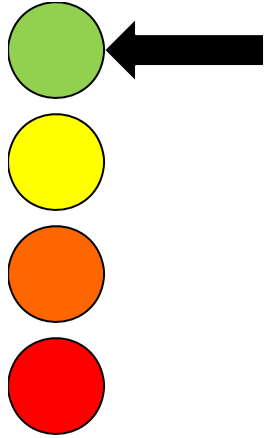
To prevent a shortage, several preventative water saving measures may take place.

FLOW DEFINITIONS

Base Release = Release directly from Navajo Reservoir. Measured at USGS San Juan at Archuleta gage

Target Base Flow = Range of flows recommended by the SJRIP in the critical habitat reach. Calculated as weekly average of the minimum three of the four gages on the San Juan River between Farmington and Lake Powell.

-  1. Use minimum base flow of 350 cfs
-  2. Use minimum base flow of 250 cfs
-  3. SJRIP voluntary reduction in Target Base Flow
-  4. Shortage Sharing applied

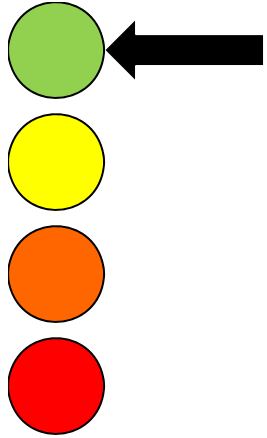


350 CFS BASE RELEASE

Record of Decision

“Currently, some flexibility in reservoir releases exists because water committed under present water rights and/or future development is not fully used. This may be a significant amount of water in some, but not all, years.”

*Record of Decision for the Navajo Reservoir Operations, Navajo Unit – San Juan River, New Mexico, Colorado, Utah Final Environmental Impact Statement, US Department of the Interior, Bureau of Reclamation, July 2006

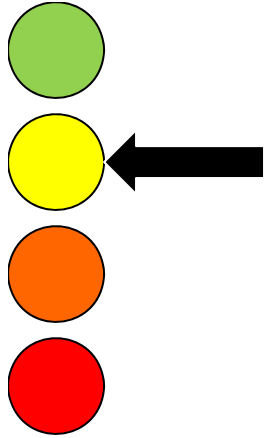


350 CFS BASE RELEASE

Record of Decision

“...The release of this water will be incorporated into operations to augment the minimum 250 cfs release ...with a goal of minimum releases of 350 cfs. The release of this additional water will help alleviate adverse effects on the trout fishery, river recreation, hydropower, the irrigators’ ability to divert, and water quality.”

*Record of Decision for the Navajo Reservoir Operations, Navajo Unit – San Juan River, New Mexico, Colorado, Utah Final Environmental Impact Statement, US Department of the Interior, Bureau of Reclamation, July 2006

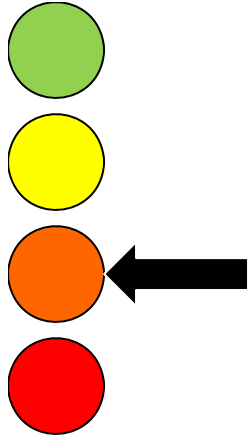


250 CFS BASE RELEASE

Record of Decision

“...The release of this water will be incorporated into operations to augment the minimum 250 cfs release ...with a goal of minimum releases of 350 cfs. The release of this additional water will help alleviate adverse effects on the trout fishery, river recreation, hydropower, the irrigators’ ability to divert, and water quality.”

*Record of Decision for the Navajo Reservoir Operations, Navajo Unit – San Juan River, New Mexico, Colorado, Utah
Final Environmental Impact Statement, US Department of the Interior, Bureau of Reclamation, July 2006

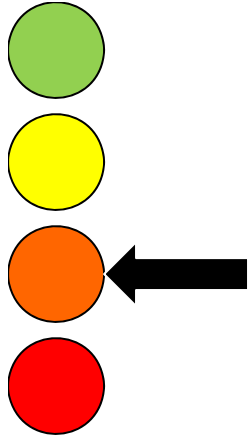


VOLUNTARY DECREASE TARGET BASE FLOW

Shortage Sharing Documentation*

“Reclamation, in consultation with the US Fish and Wildlife Service, shall operate the reservoir...to maintain a target minimum base flow rate of 500 cfs in the San Juan River from its confluence with the Animas River downstream to Lake Powell....”

* “Recommendations for San Juan River Operations and Administration for 2013 through 2016” Endorsed 2012

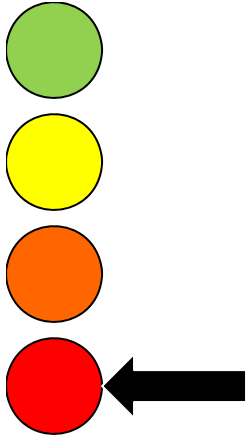


VOLUNTARY DECREASE TARGET BASE FLOW

Shortage Sharing Documentation*

“... unless the Minimum Probable Inflow Forecast projects the July 31, Navajo Reservoir content to be below 1,000,000 acre-ft. In that event, the target base flow rate through October of that year shall be 400 cfs; provided that Reclamation’s operations studies for Navajo Reservoir do not result in the calculation of a water supply shortage.”

* Recommendations for San Juan River Operations and Administration for 2013 through 2016, Endorsed 2012



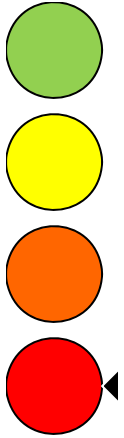
SHORTAGE SHARING IN EFFECT

Shortage Sharing Documentation*

The calculated amount of shortage will be distributed equitably as agreed upon by the endorsing parties:

- NIIP
- Hammond Irrigation Project
- San Juan Generation Station
- Four Corners Power Plant
- Jicarilla Subcontracts
- City of Farmington
- Citizens Ditch
- Farmers Mutual Ditch
- Fruitland Irrigation Project
- Jewett Valley Ditch
- Hogback Irrigation Project

* Recommendations for San Juan River Operations and Administration for 2013 through 2016, Endorsed 2012

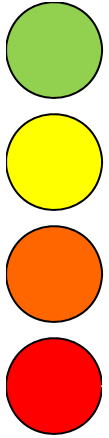


SHORTAGE SHARING IN EFFECT

Shortage Sharing Documentation*

“If Reclamation calculates a shortage...then target minimum base flow demand for the period April 1 through October 31, shall be reduced by the same percentage as the percentage shortage calculated by Reclamation...”

* “Recommendations for San Juan River Operations and Administration for 2013 through 2016” Endorsed 2012



SHORTAGE SHARING IN EFFECT

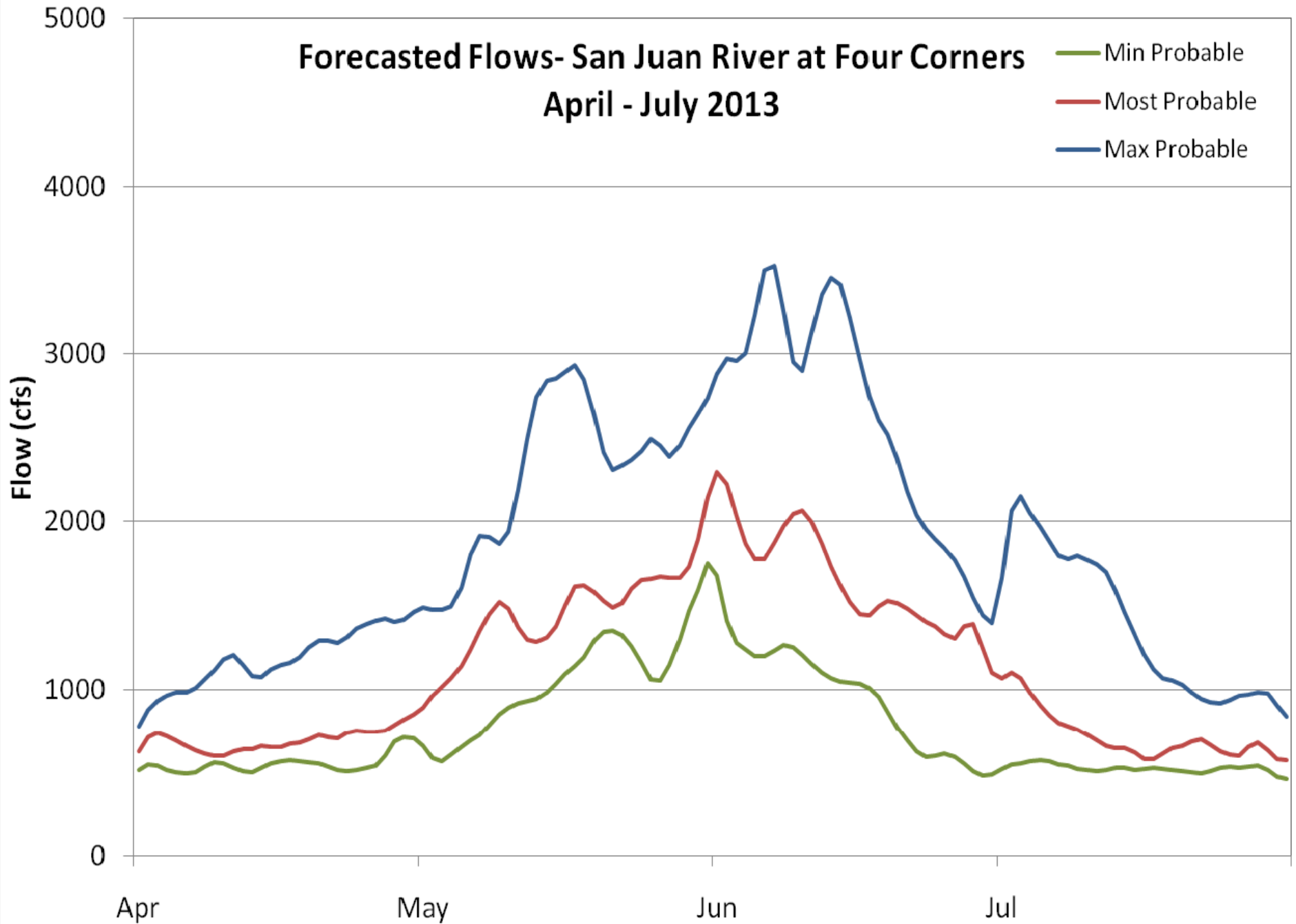
Shortage Sharing Documentation*

“...provided that the target minimum base flow rate shall not be less than 350 cfs for more than 50 days of which no more than 40 days may be below 350 cfs with a minimum flow of 250 cfs.”

* Recommendations for San Juan River Operations and Administration for 2013 through 2016, Endorsed 2012

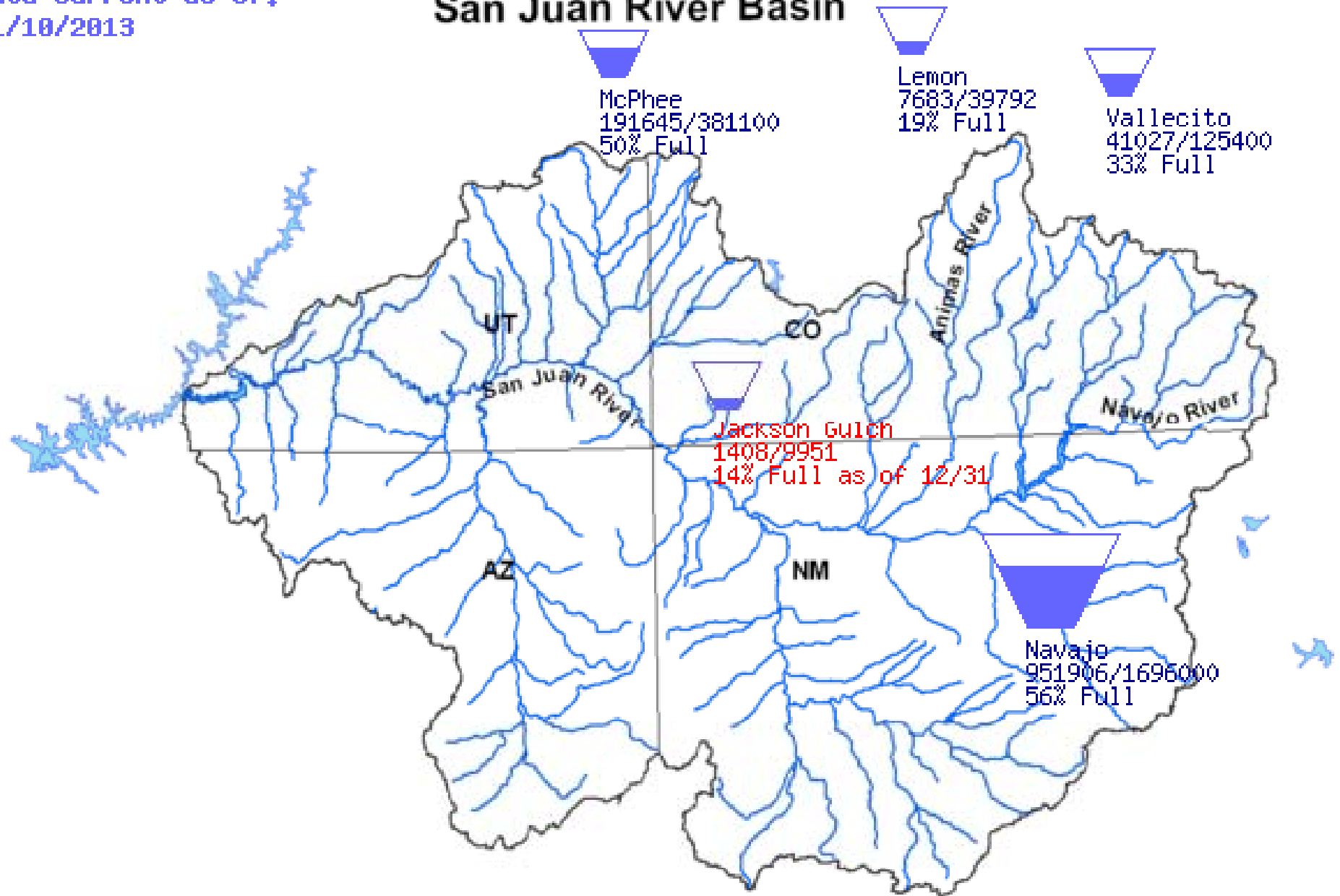
Forecasted Flows- San Juan River at Four Corners April - July 2013

- Min Probable
- Most Probable
- Max Probable



Data Current as of:
01/10/2013

San Juan River Basin



Major San Juan River Basin Reservoirs

(1/13/2013)

Nighthorse

- Elevation = 6877
- Storage = 107,688 af (94% full)
- Release = 0 cfs
- Pumping = 0 cfs

Vallecito

- Elevation = 7628 ft
- Storage = 41,281 af (33% full, 78% of average)
- Release = 3 cfs
- Inflow = 49 cfs

Lemon

- Elevation = 8072 ft
- Storage = 7,683 af (19% full, 39% of average)
- Release = 6 cfs
- Inflow = 6 cfs

Temporary Flow Reduction Requested

- SJRIP has requested a temporary reduction to 250 cfs from Navajo for instream work Feb 11-15 at PNM fish ladder and for four days in late March or early April in Mexican Hat.
- Release from Navajo will be reduced during this period of time.
- Target base flow requirement in the habitat reach may be suspended temporarily during each project.

How You Can Access Information

Bureau of Reclamation
www.usbr.gov/uc

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

Colorado Basin River Forecast Center
www.cbrfc.noaa.gov



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Summary

- The current snowpack is below average.
- CPC outlook indicates greater chance of below average precipitation.
- Most Probable April – July Inflow Forecast is 59% of average.
- Based on the most probable forecast, no spring peak release is expected.
- Downstream river flows are anticipated to be lower than normal.
- Base releases may be reduced to the minimum 250 cfs to conserve water.
- Shortage sharing is not currently forecasted, but conservation measures may be implemented to avoid a shortage.

- Next Operations Meeting: Tuesday, April 23rd 2013