

# RECLAMATION

*Managing Water in the West*



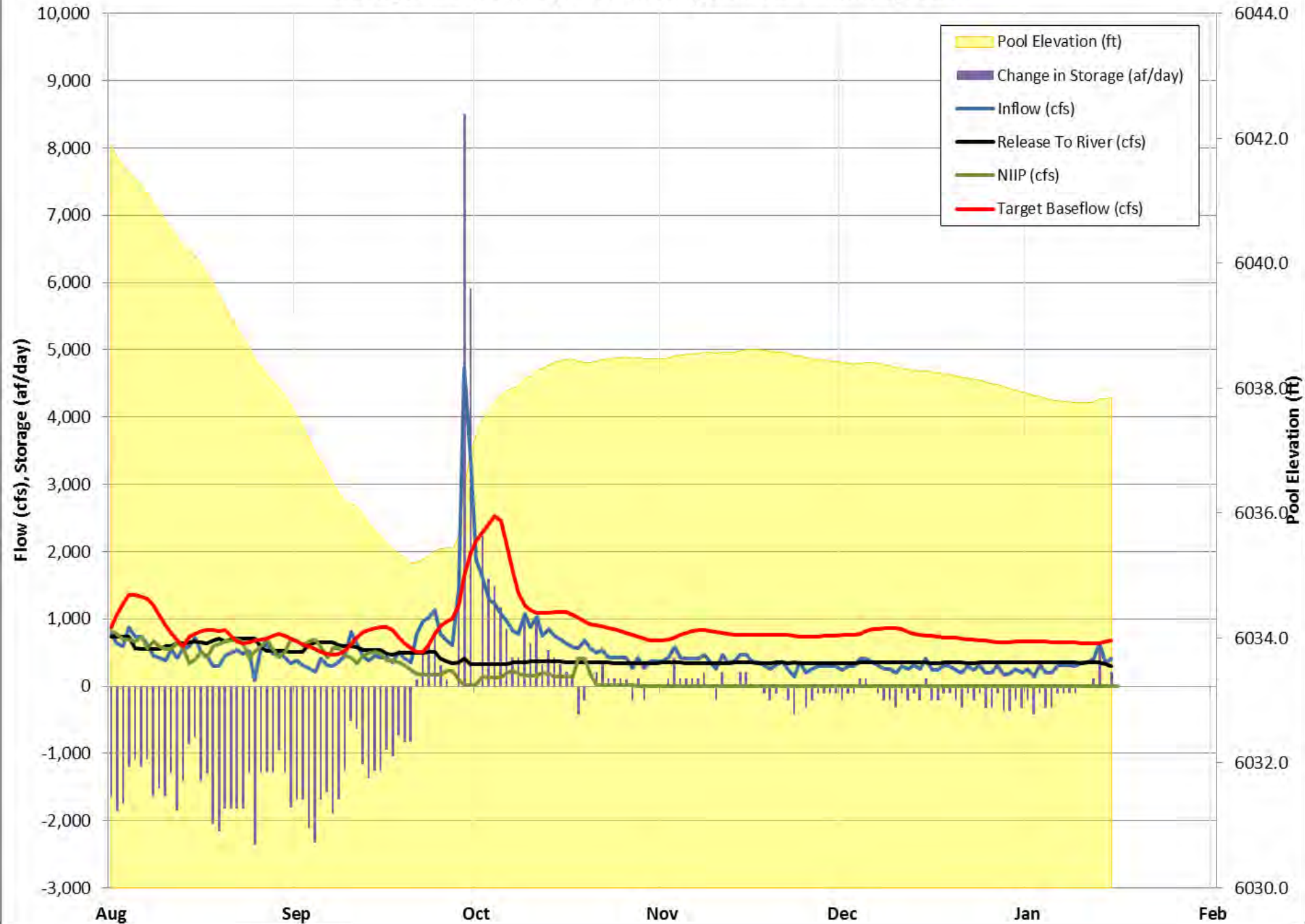
**Navajo Unit Operations  
January 20, 2015  
Coordination Meeting**

U.S. Department of the Interior  
Bureau of Reclamation

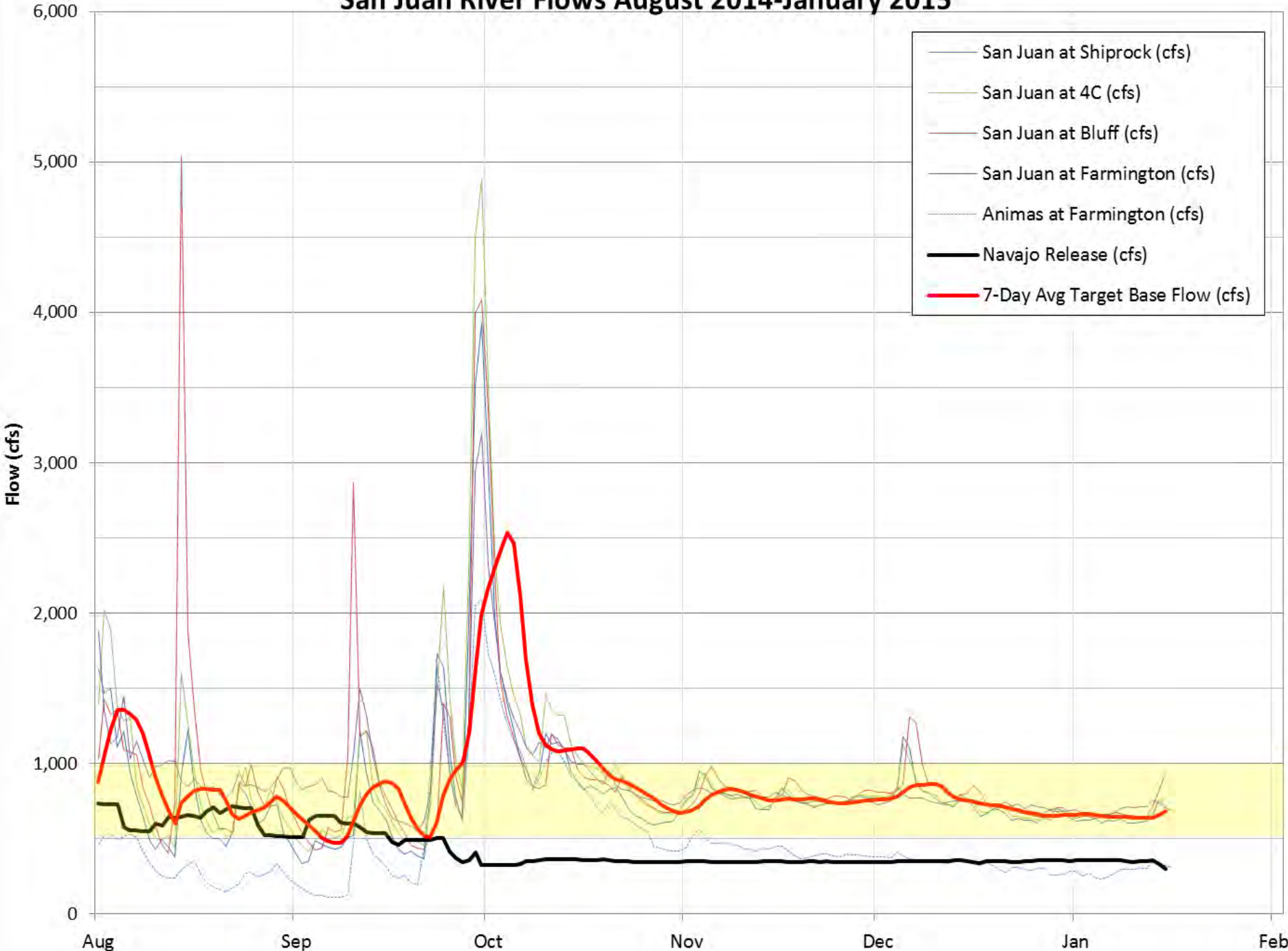
# AGENDA

- Review of operations since last meeting (Aug 2014)
- Current soil and snowpack conditions
- Current reservoir status
- Water Year 2015 Forecasts and Proposed Operations
- Navajo Dam Maintenance Activities
- Nearby Projects Update
- Reports from Other Agencies

# Navajo Reservoir Operations August 2014 - January 2015



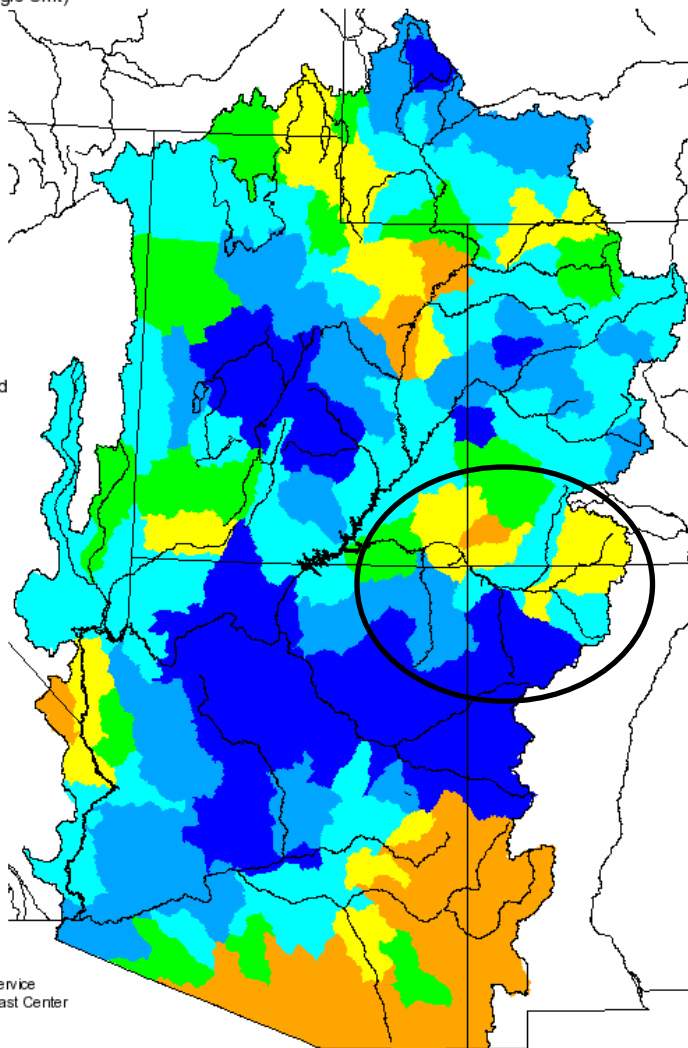
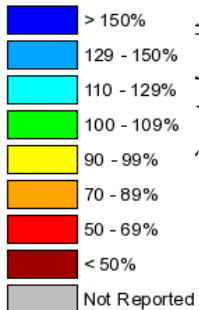
# San Juan River Flows August 2014-January 2015



# Monthly Precipitation for December 2014

(Averaged by Hydrologic Unit)

## % Average

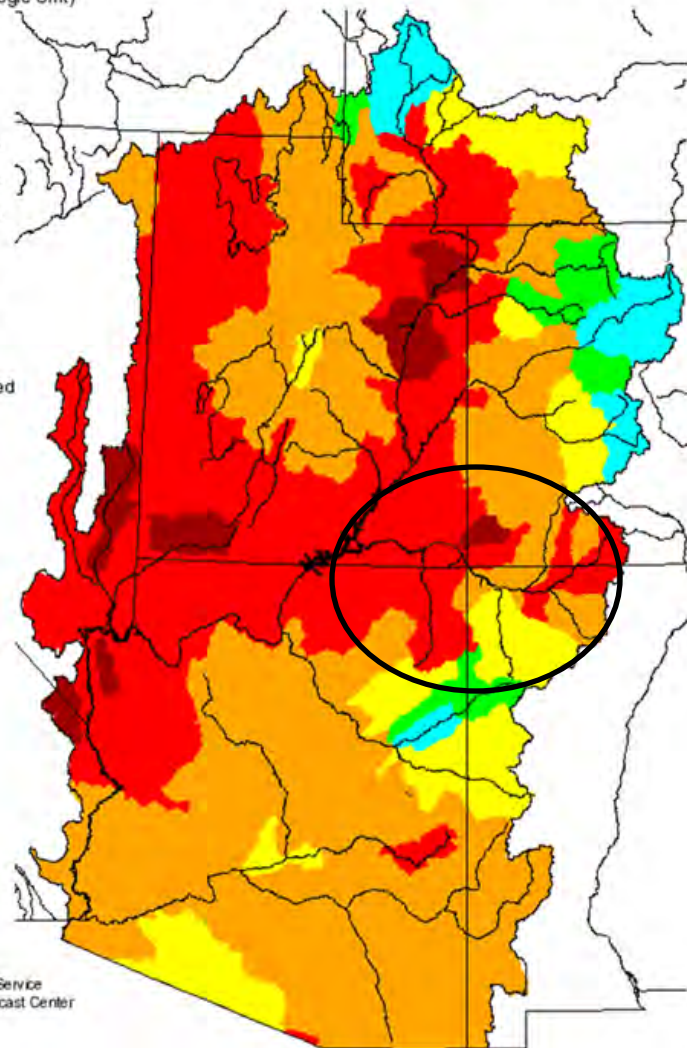
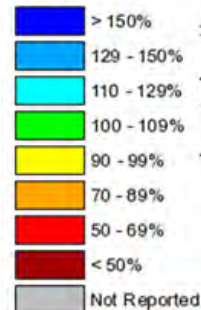


Prepared by  
NOAA, National Weather Service  
Colorado Basin River Forecast Center  
Salt Lake City, Utah  
[www.cbfc.noaa.gov](http://www.cbfc.noaa.gov)

# Seasonal Precipitation, October 2014 - December 2014

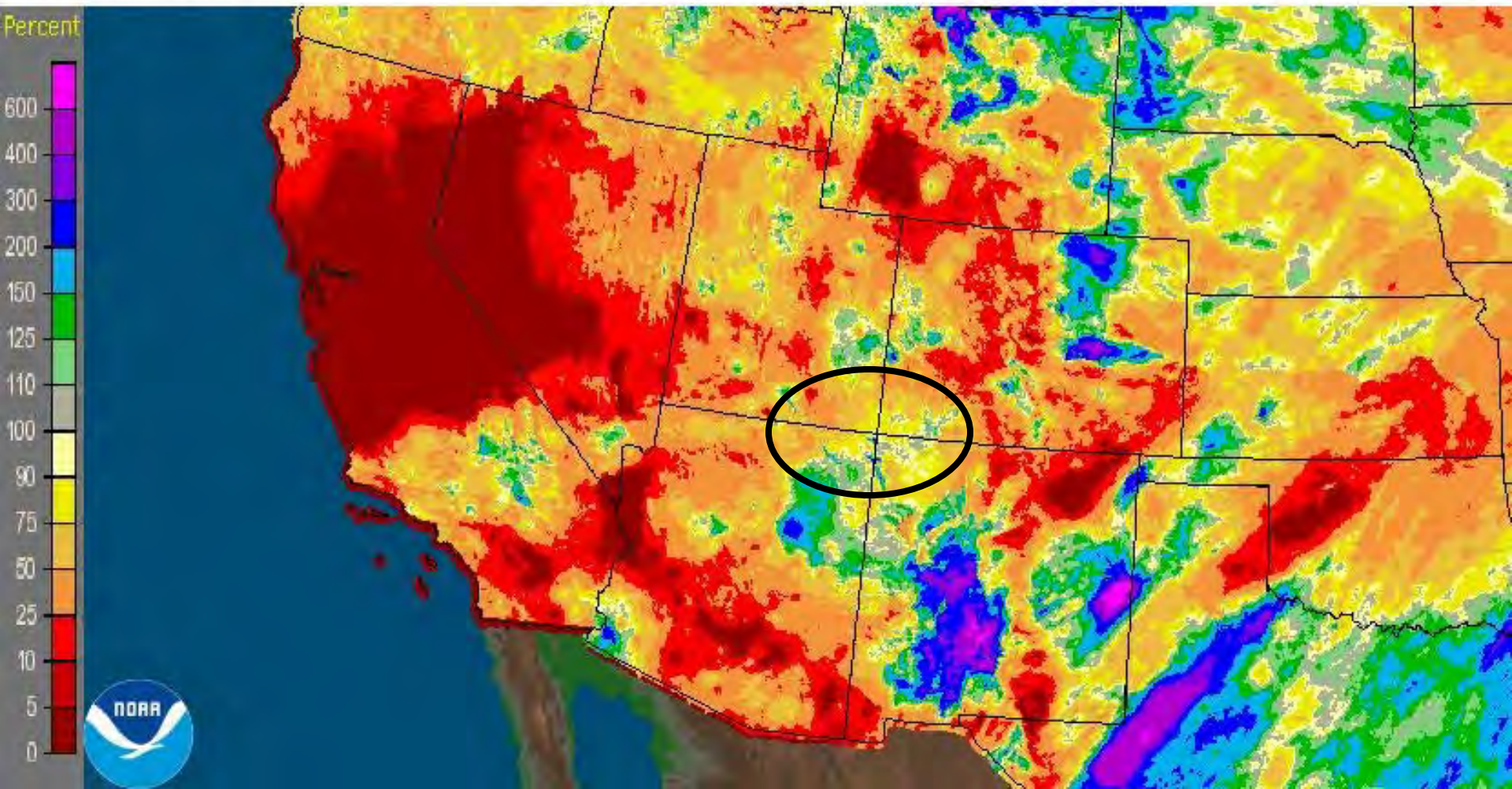
(Averaged by Hydrologic Unit)

## % Average



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

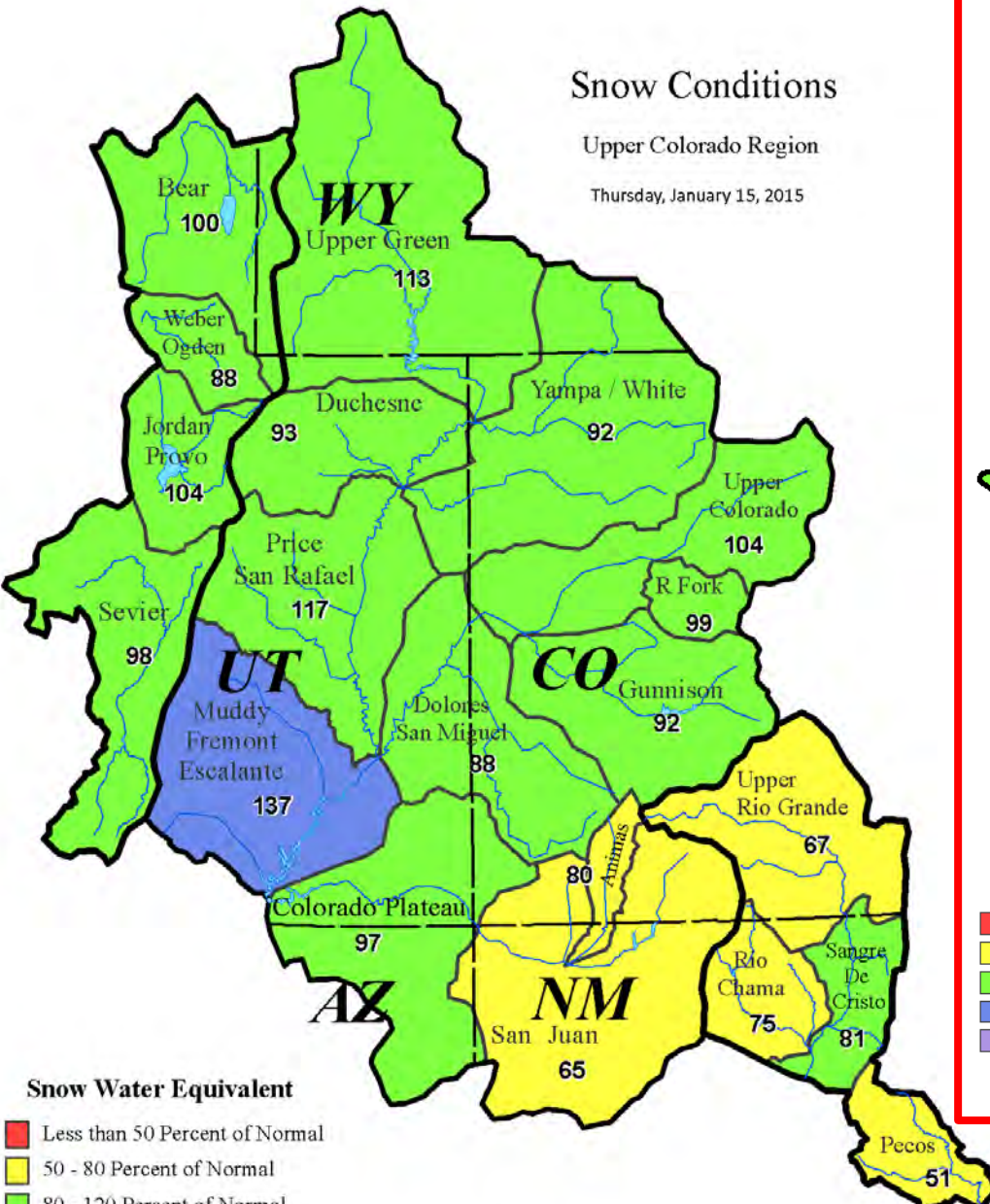
Colorado Basin RFC Salt Lake City, UT: Current Month to Date Percent of Normal Precipitation  
Valid at 1/19/2015 1200 UTC- Created 1/20/15 13:43 UTC



# Snow Conditions

Upper Colorado Region

Thursday, January 15, 2015



## 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

Data Provided by the Natural Resource Conservation Service

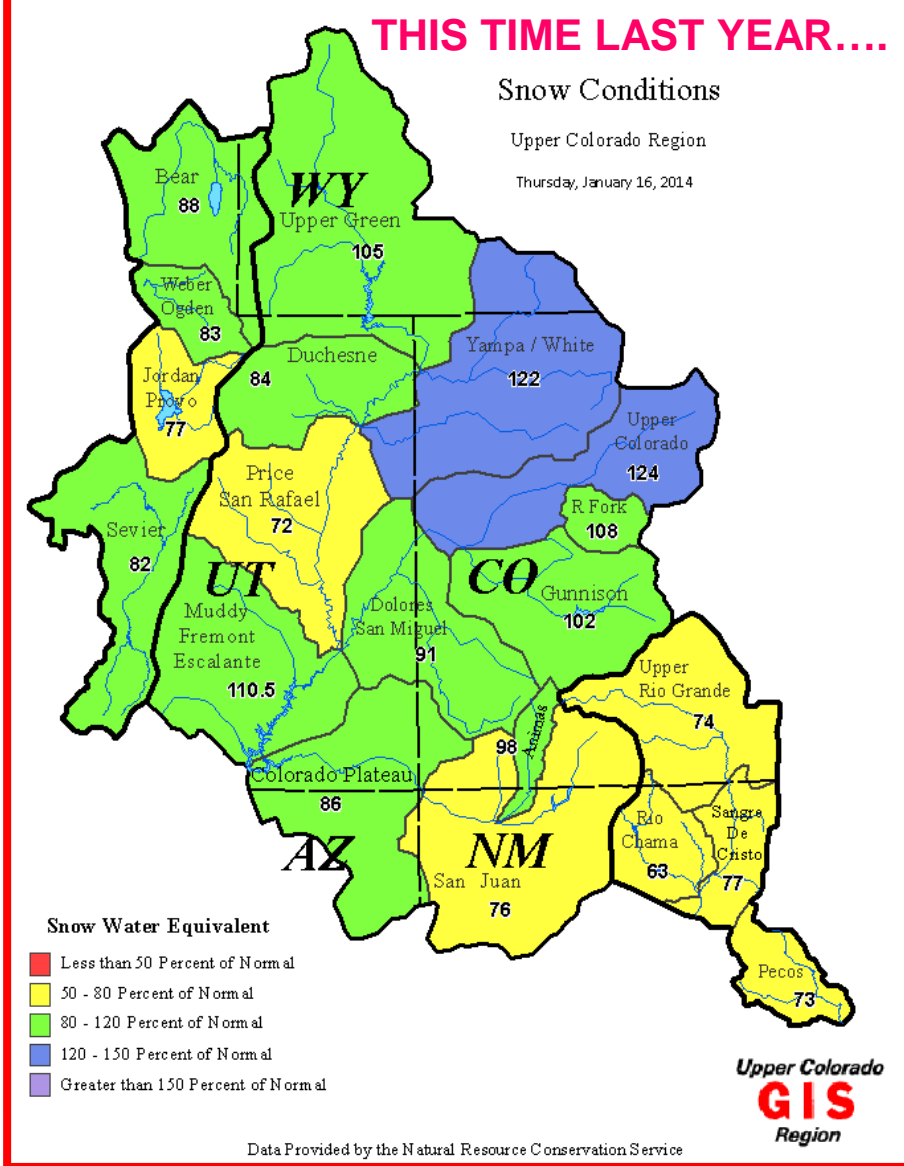
Upper Colorado  
**GIS**  
Region

# THIS TIME LAST YEAR....

## Snow Conditions

Upper Colorado Region

Thursday, January 16, 2014



## Snow Water Equivalent

- Less than 50 Percent of Normal
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Data Provided by the Natural Resource Conservation Service

Upper Colorado  
**GIS**  
Region

# Colorado Basin River Forecast Center

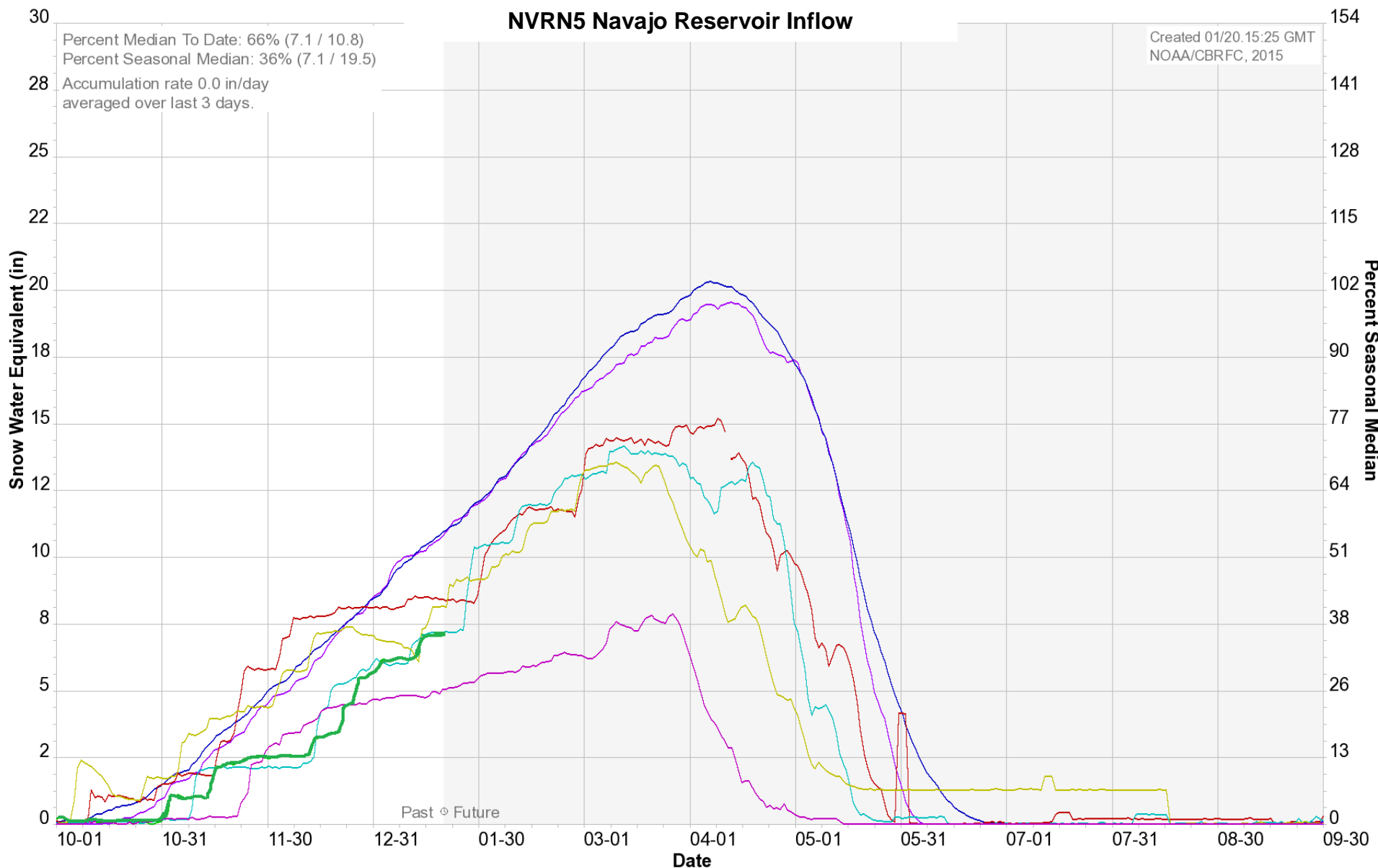
## NVRN5 Navajo Reservoir Inflow

Created 01/20 15:25 GMT  
NOAA/CBRFC, 2015

Percent Median To Date: 66% (7.1 / 10.8)  
Percent Seasonal Median: 36% (7.1 / 19.5)  
Accumulation rate 0.0 in/day  
averaged over last 3 days.

Snow Water Equivalent (in)

Percent Seasonal Median



Past ◉ Future

Median 1981-2010 — Average 1981-2010 — 2015 — 2014 — 2013 — 2012 — 2002 —





## Snow Percent Median

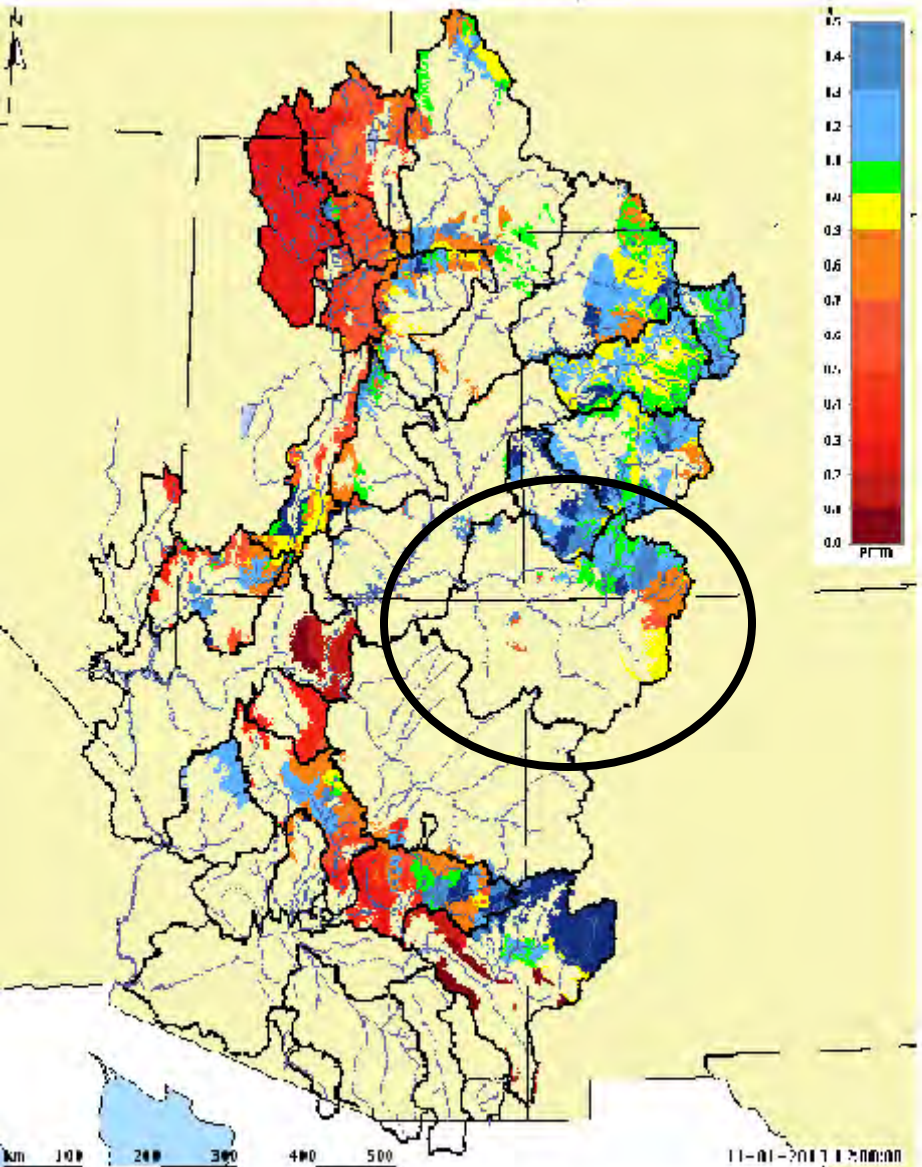
- No Data
- < 25%
- 25-50%
- 50-75%
- 75-90%
- 90-110%
- 110-125%
- 125-150%
- 150-175%
- >175%

fgrp= SANJUAN  
(29 Snow Points Found)

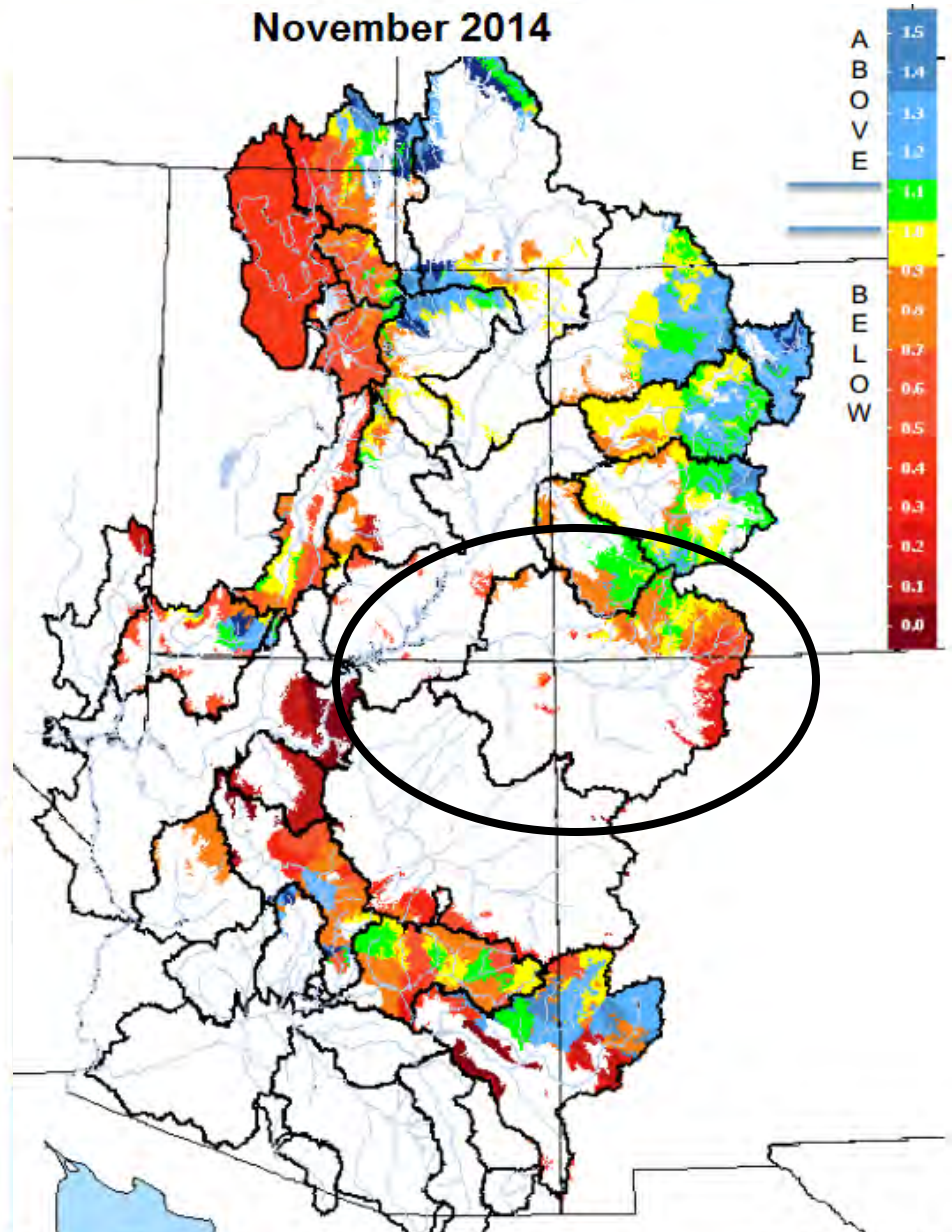
- [BRT: Beartown](#)
- [BUC: Buckboard Flat Snowcourse](#)
- [BVR: Beaver Spring](#)
- [CAD: Cascade #2](#)
- [CHA: Chamita](#)
- [CJS: Camp Jackson](#)
- [CSC: Cascade](#)
- [CUM: Cumbres Trestle](#)
- [EDS: El Diente Peak](#)
- [GYB: Grayback](#)
- [IDR: Idarado](#)
- [LIZ: Lizard Head Pass](#)
- [LPD: Lily Pond](#)
- [MDL: Middle Creek](#)
- [MIN: Mineral Creek](#)
- [MLS: Molas Lake](#)
- [MNC: Mancos](#)
- [RMP: Red Mountain Pass](#)

# Modeled Soil Moisture

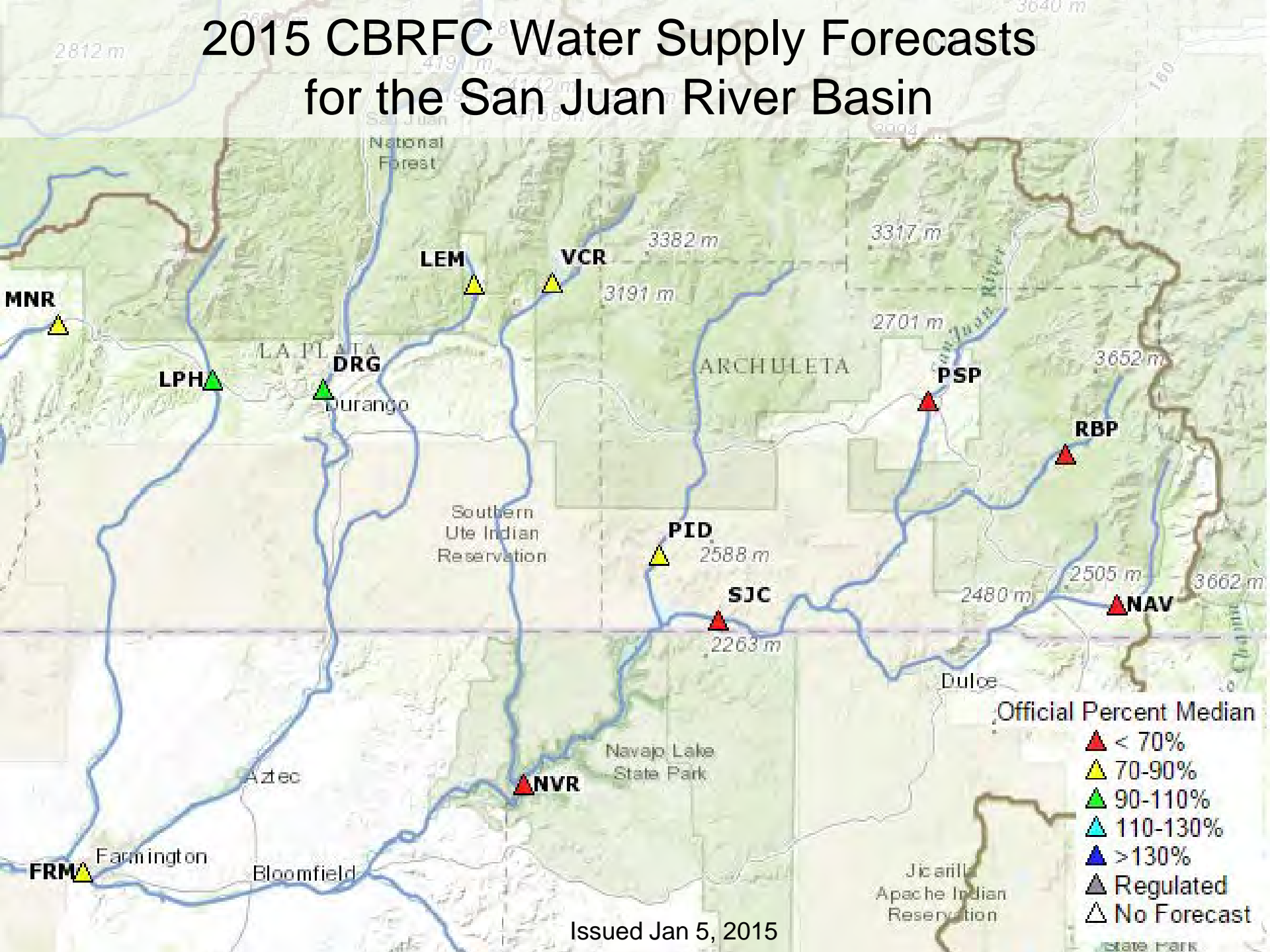
November 2013



November 2014



# 2015 CBRFC Water Supply Forecasts for the San Juan River Basin



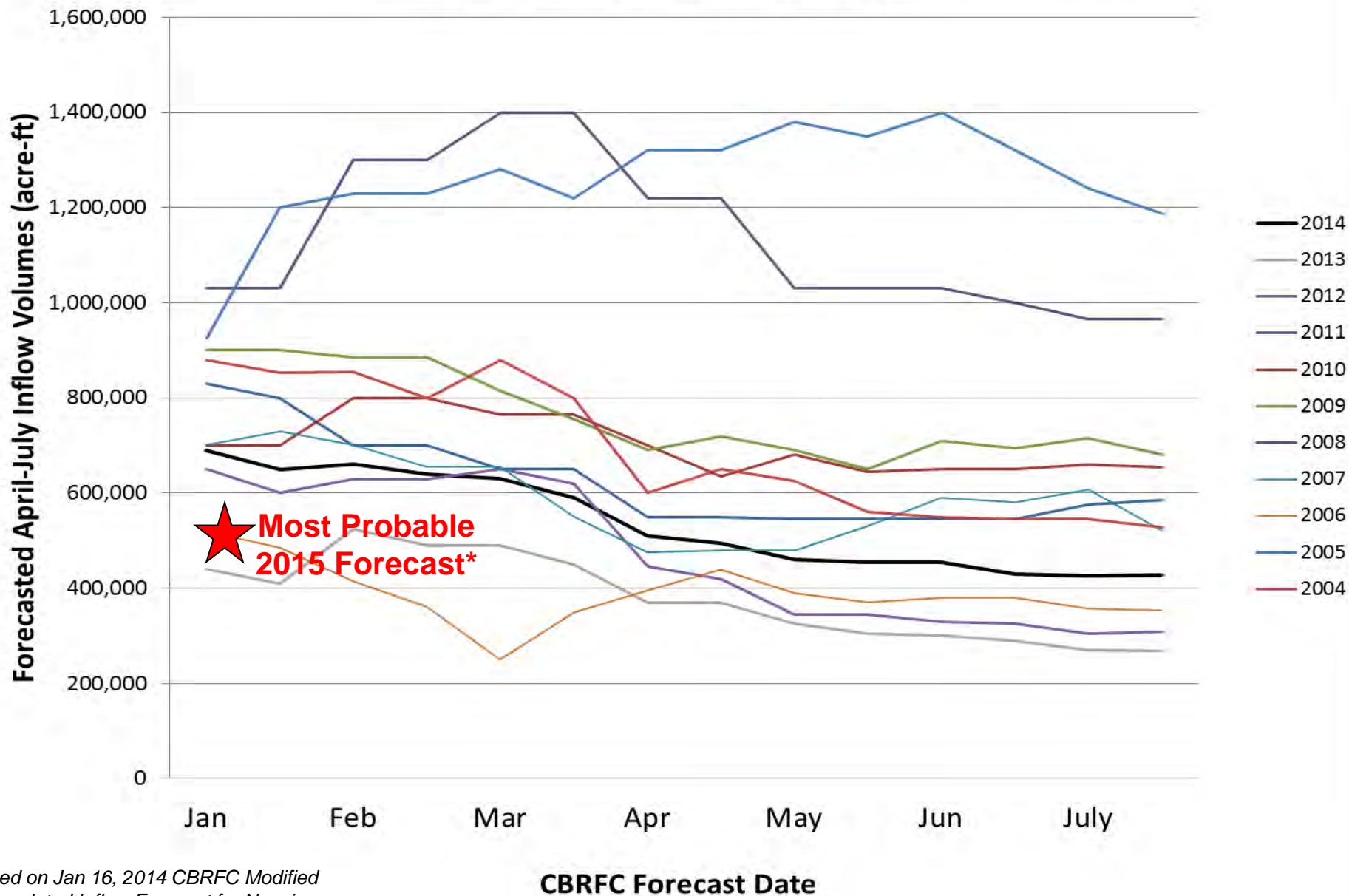
Issued Jan 5, 2015

# 2015 CBRFC Forecasts

Issued Jan 5, 2015

Forecast	Modified Unregulated Inflow Forecast (acre-ft) (% average)			
	January	February	March	April-July
<b>MIN</b>	15,000 68%	15,000 50%	30,000 32%	<b>250,000</b> 34%
<b>MOST</b>	17,000 78%	20,000 66%	50,000 54%	<b>450,000</b> 61%
<b>MAX</b>	22,000 100%	30,000 99%	80,000 87%	<b>750,000</b> 102%

# Historic April-July Modified Unregulated Inflow Forecast Trends Navajo Reservoir (2004-2014)



Based on Jan 16, 2014 CBRFC Modified Unregulated Inflow Forecast for Navajo

# El Niño/La Niña current status and forecast models

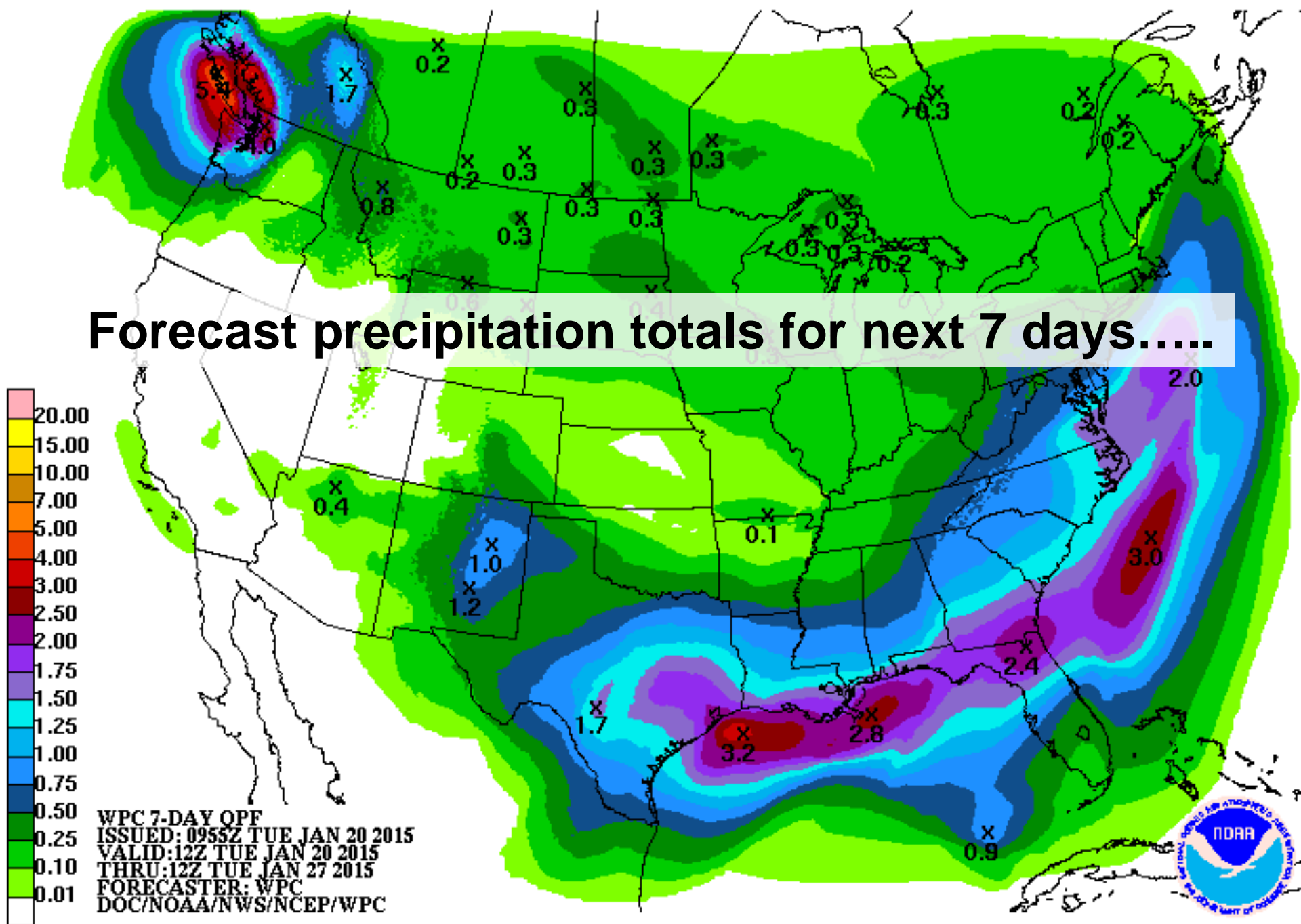
## EL NIÑO/SOUTHERN OSCILLATION (ENSO) DIAGNOSTIC DISCUSSION

issued by  
CLIMATE PREDICTION CENTER/NCEP/NWS  
and the International Research Institute for Climate and Society  
8 January 2015

**ENSO Alert System Status: [El Niño Watch](#)**

**Synopsis: There is an approximately 50-60% chance of El Niño conditions during the next two months, with ENSO-neutral favored thereafter.**

# Forecast precipitation totals for next 7 days.....

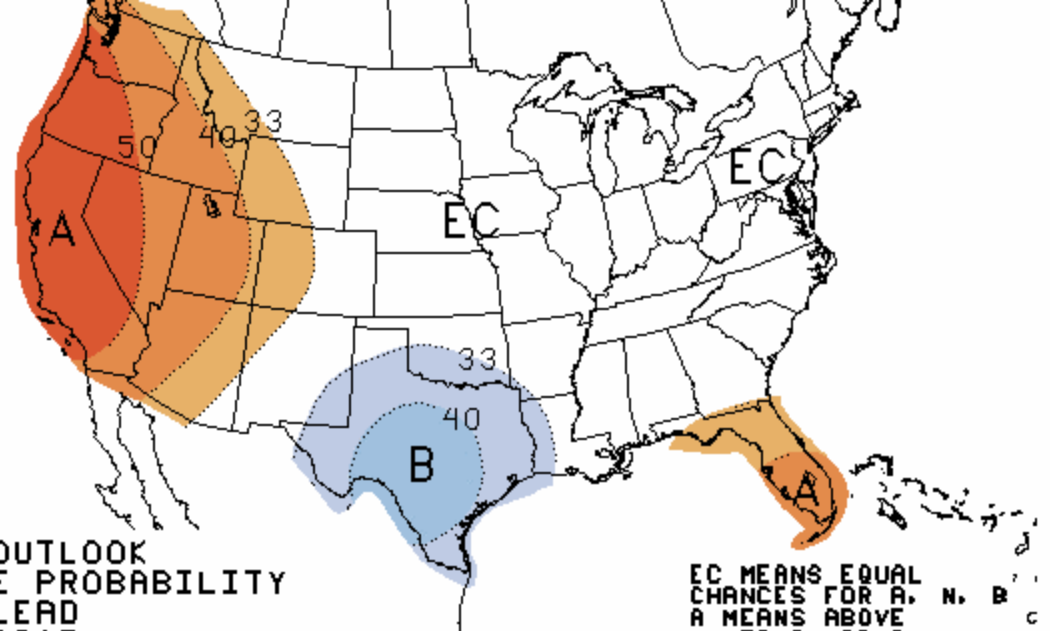


# CPC Outlook for February



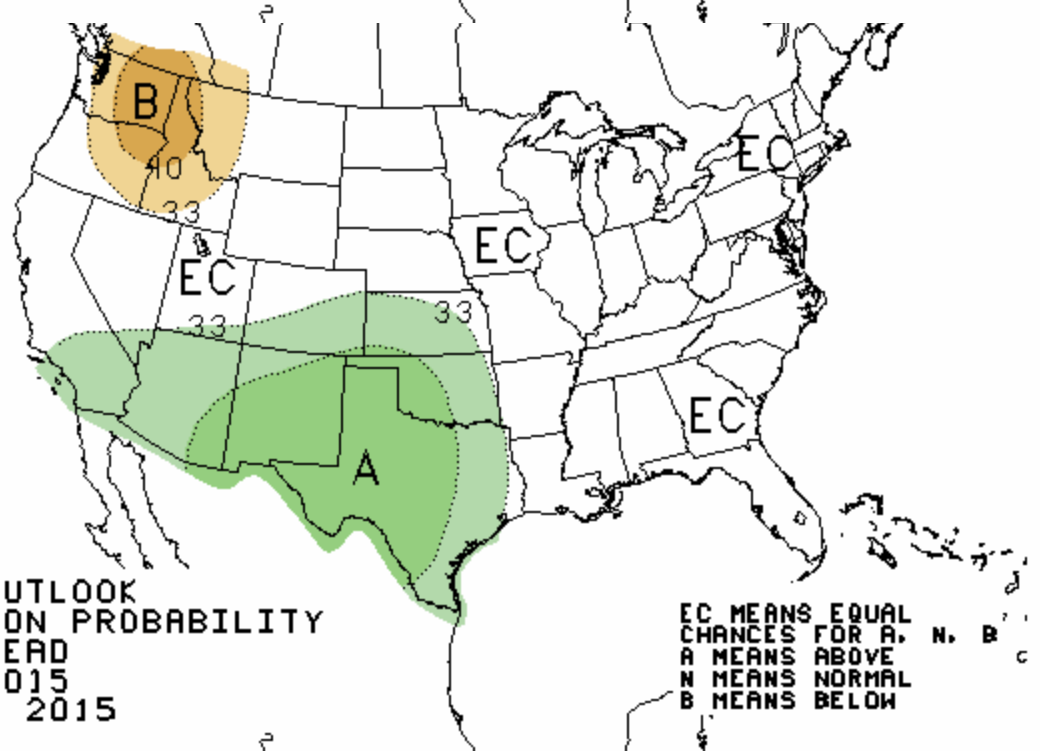
ONE-MONTH OUTLOOK  
TEMPERATURE PROBABILITY  
0.5 MONTH LEAD  
VALID FEB 2015  
MADE 15 JAN 2015

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



ONE-MONTH OUTLOOK  
PRECIPITATION PROBABILITY  
0.5 MONTH LEAD  
VALID FEB 2015  
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EC MEANS EQUAL  
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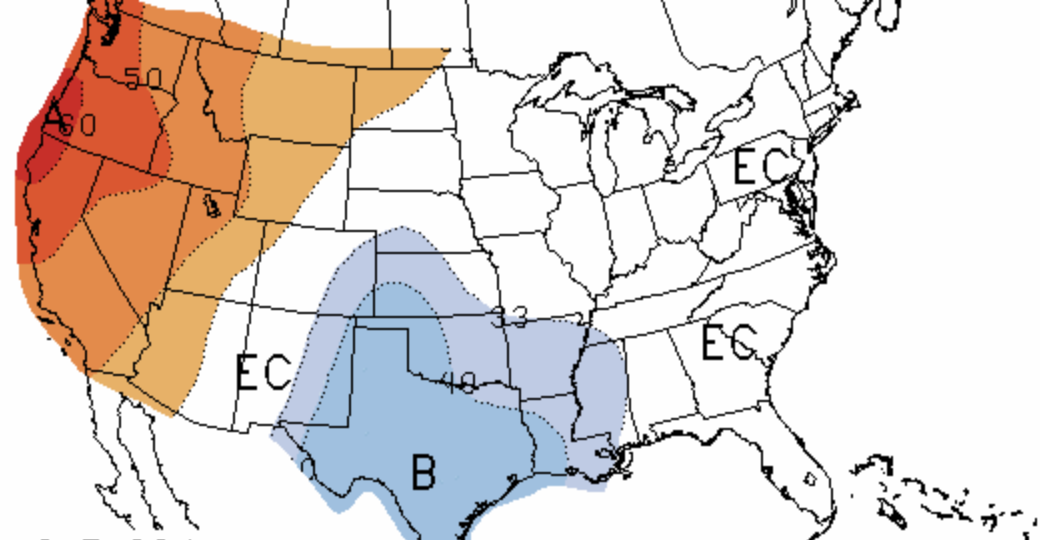


# CPC Outlook for Next 3 Months



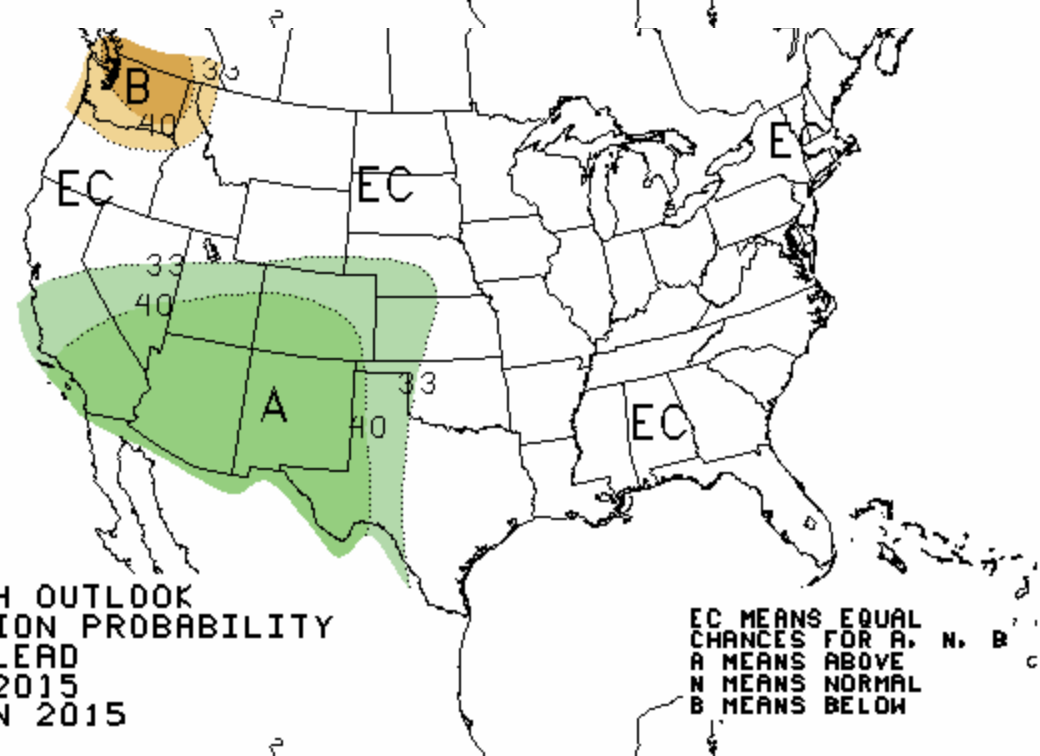
THREE-MONTH OUTLOOK  
TEMPERATURE PROBABILITY  
0.5 MONTH LEAD  
VALID FMA 2015  
MADE 15 JAN 2015

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

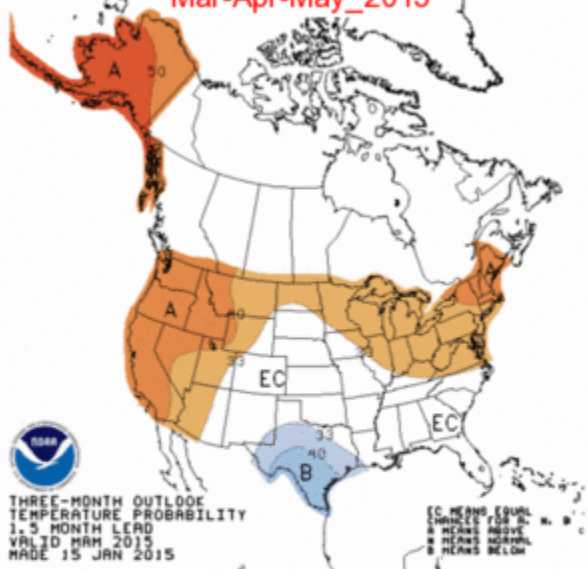


THREE-MONTH OUTLOOK  
PRECIPITATION PROBABILITY  
0.5 MONTH LEAD  
VALID FMA 2015  
MADE 15 JAN 2015

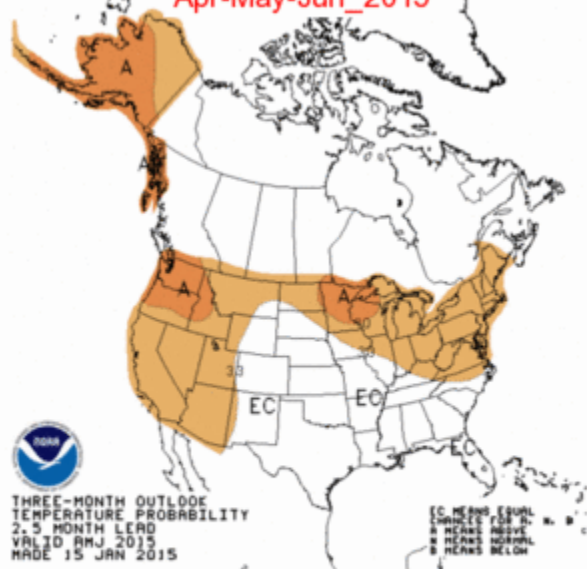
EC MEANS EQUAL  
CHANCES FOR A, N, B  
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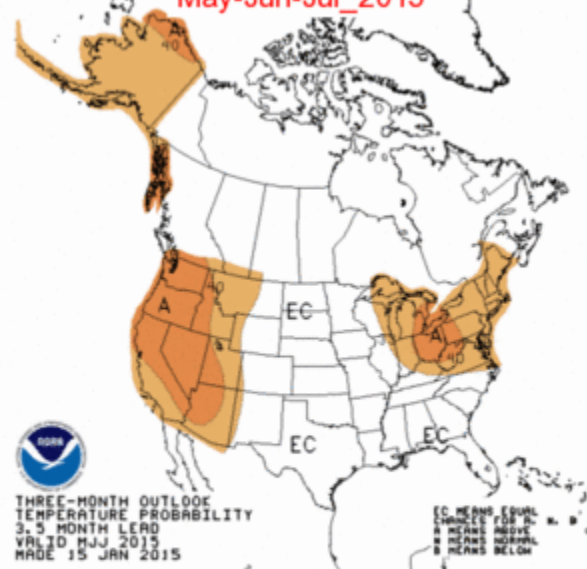
Mar-Apr-May\_2015



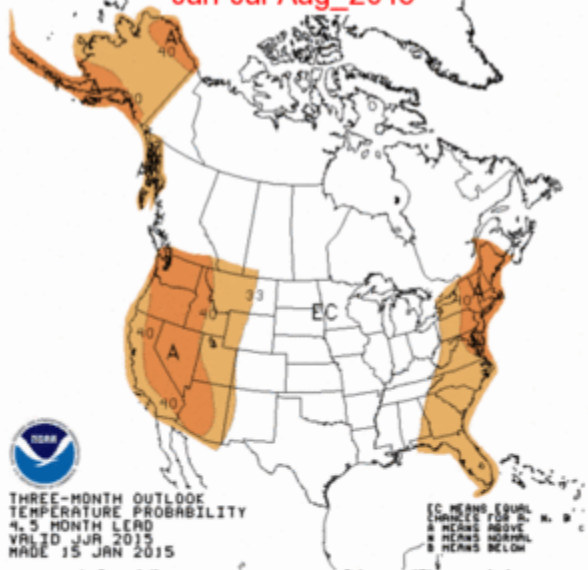
Apr-May-Jun\_2015



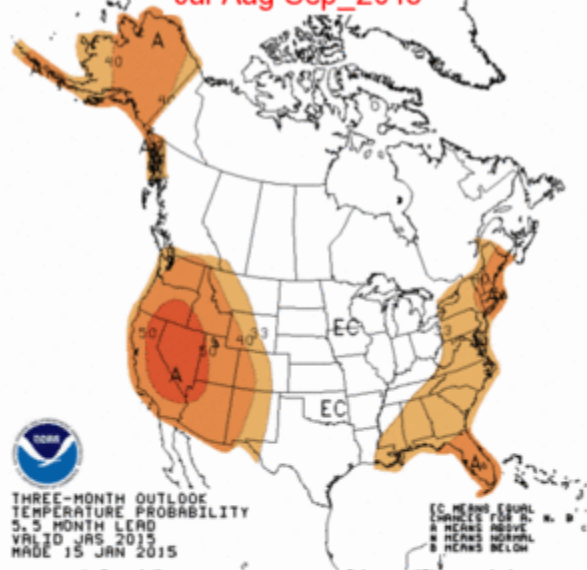
May-Jun-Jul\_2015



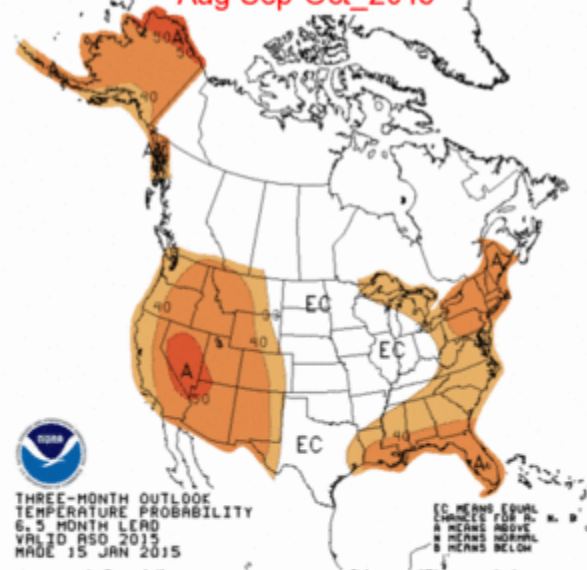
Jun-Jul-Aug\_2015



Jul-Aug-Sep\_2015



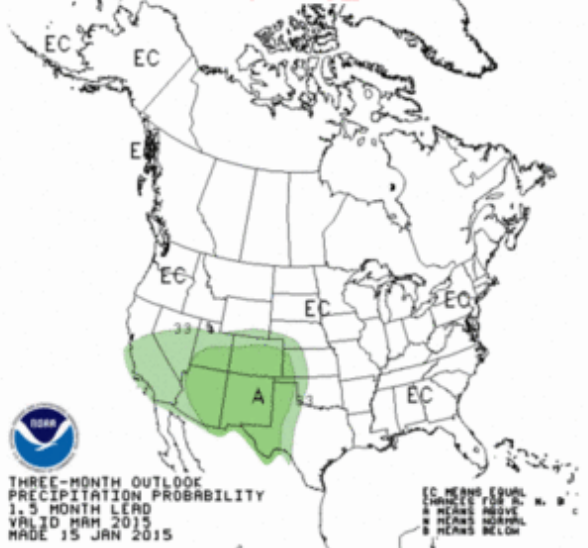
Aug-Sep-Oct\_2015



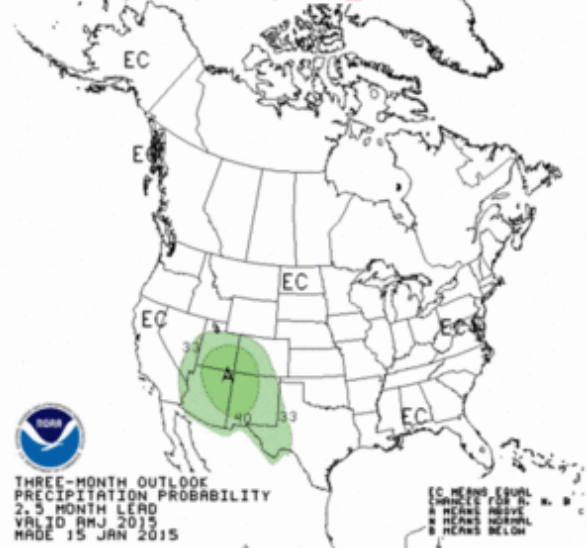
# CPC Temperature Outlook WY 2015

(as of Jan 15, 2015)

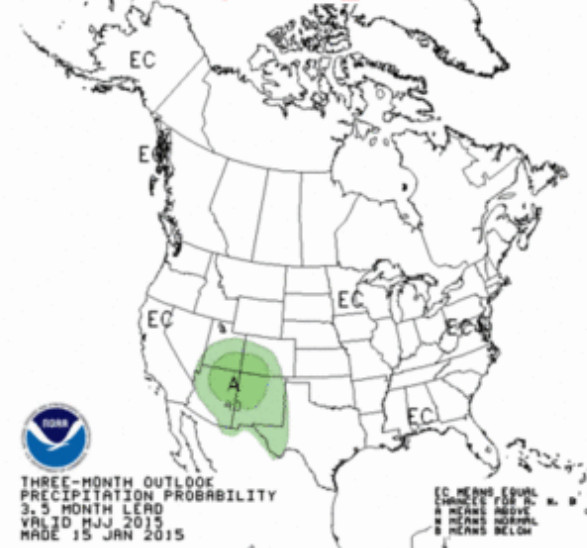
Mar-Apr-May\_2015



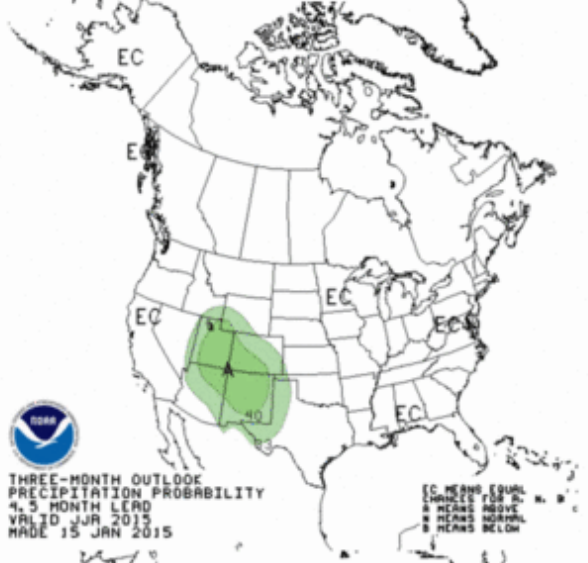
Apr-May-Jun\_2015



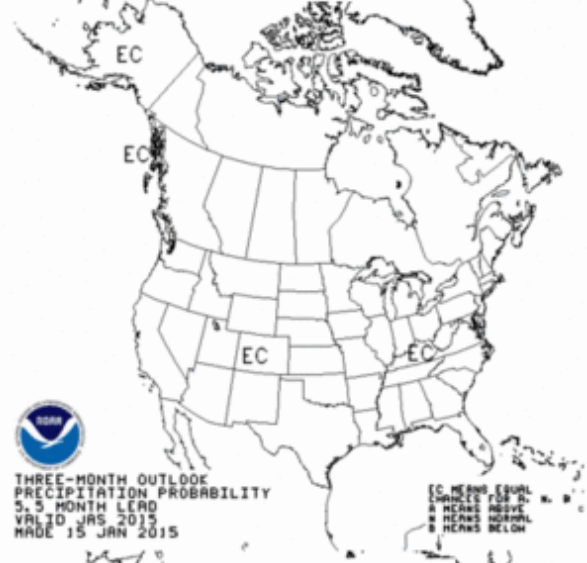
May-Jun-Jul\_2015



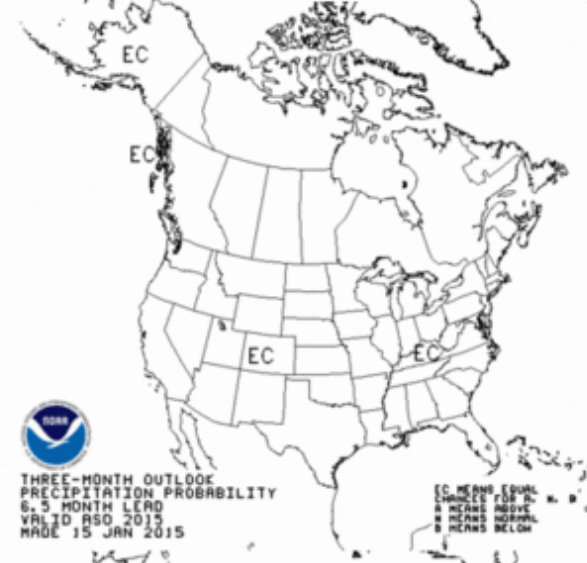
Jun-Jul-Aug\_2015



Jul-Aug-Sep\_2015



Aug-Sep-Oct\_2015



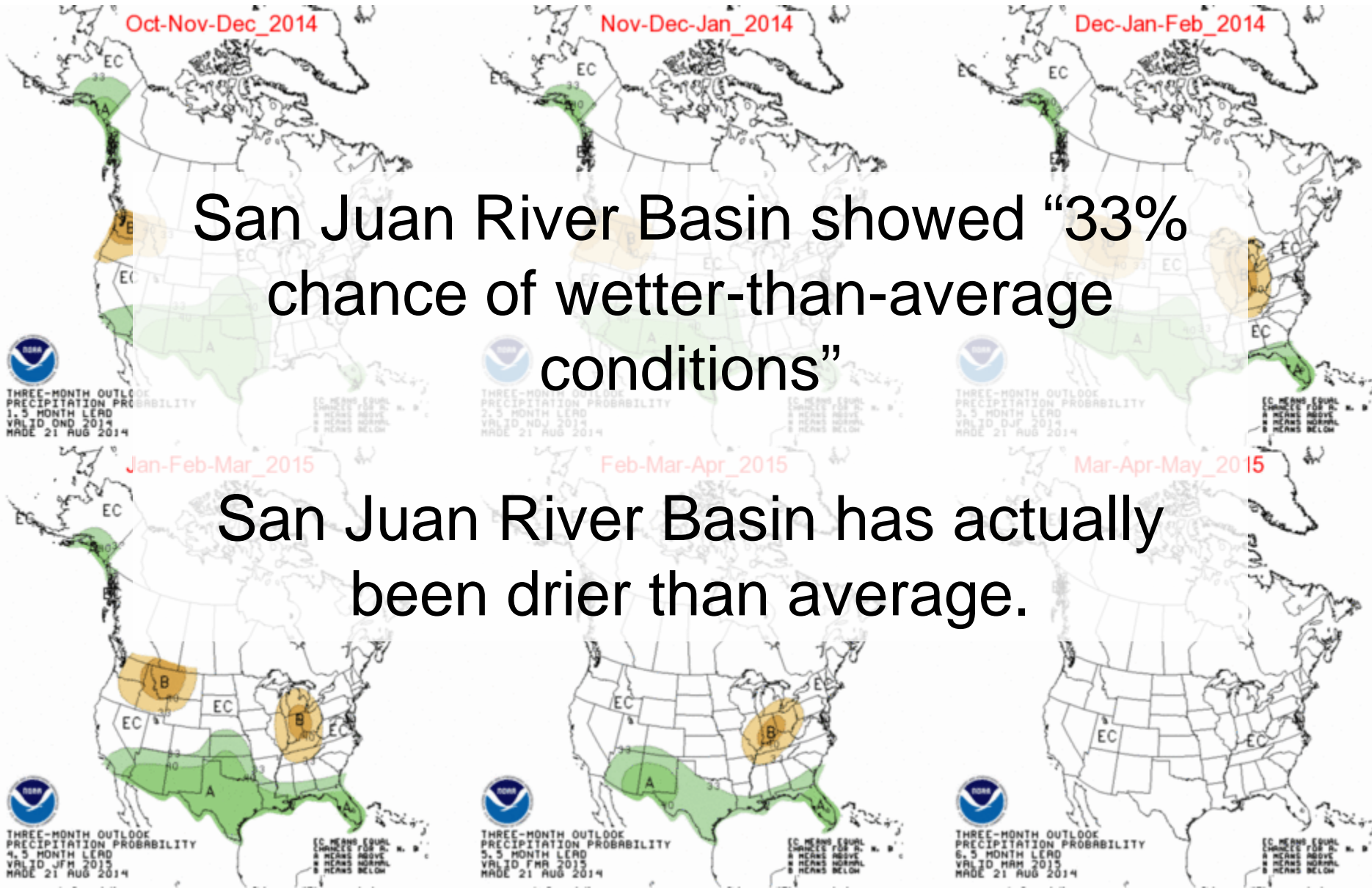
# CPC Precipitation Outlook WY 2015

(as of Jan 15, 2015)

# CPC Forecast from last August

San Juan River Basin showed “33% chance of wetter-than-average conditions”

San Juan River Basin has actually been drier than average.



# Navajo Current Conditions

(as of 1/19/15)

Elevation = 6037.83 ft

Storage = 1089541 af (*64% Full, 41% Active, 86% of Avg*)

Inflow = 287 cfs

Release = 350 cfs

NIIP = 0 cfs

San Juan-Chama Diversion = 0 cfs

# 2015 Spring Peak Release

(Based on current forecast and the SJRIP Flow Recommendations)

## **Most Probable**

Water Available = 245,000 af

Peak Release = 1-week release at 5,000 cfs

## **Minimum Probable**

Water Available = 42,000 af

Peak Release = No Release

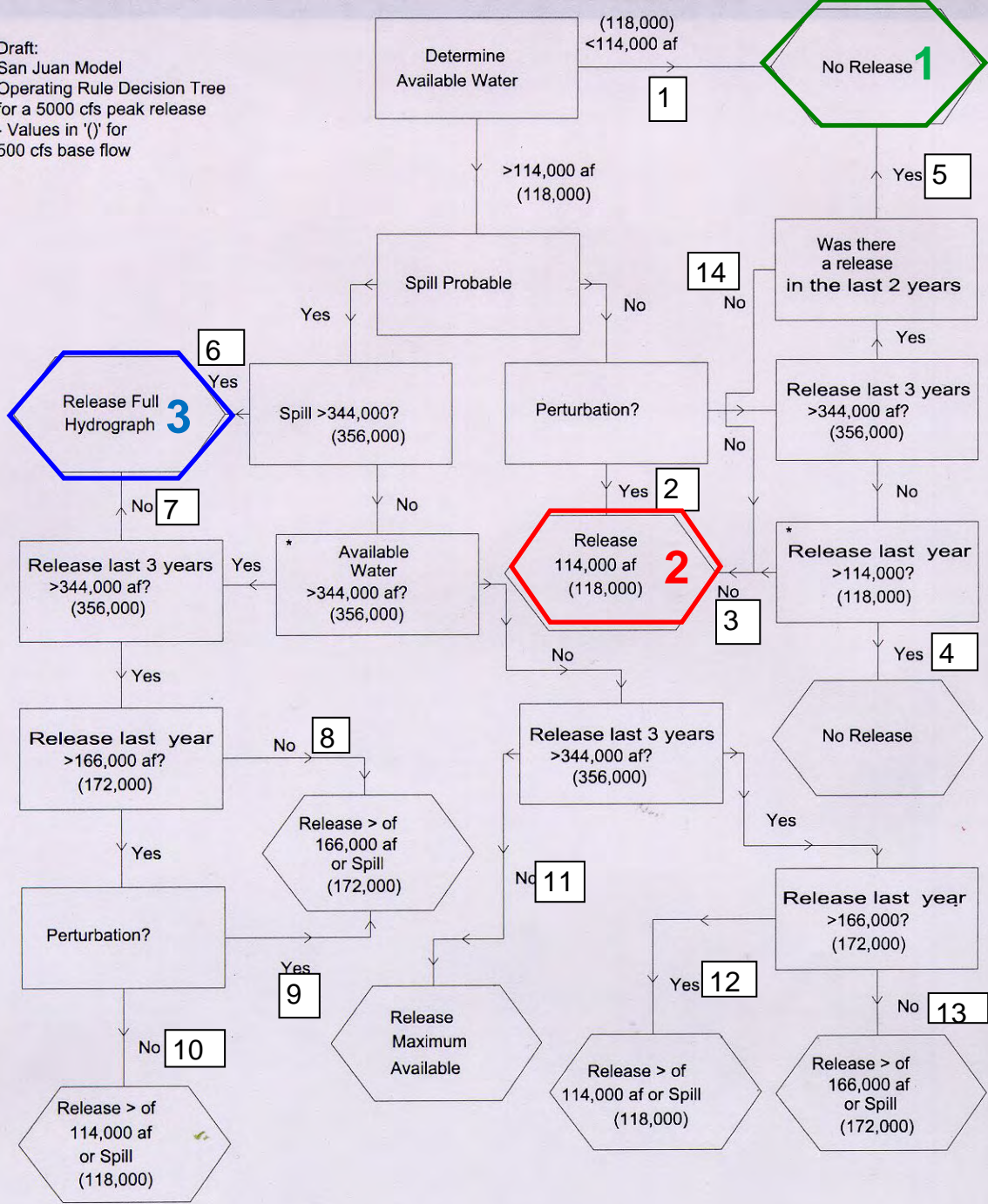
## **Maximum Probable**

Water Available = 521,000 af

Peak Release = Full hydrograph (3-weeks at 5,000 cfs)

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

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

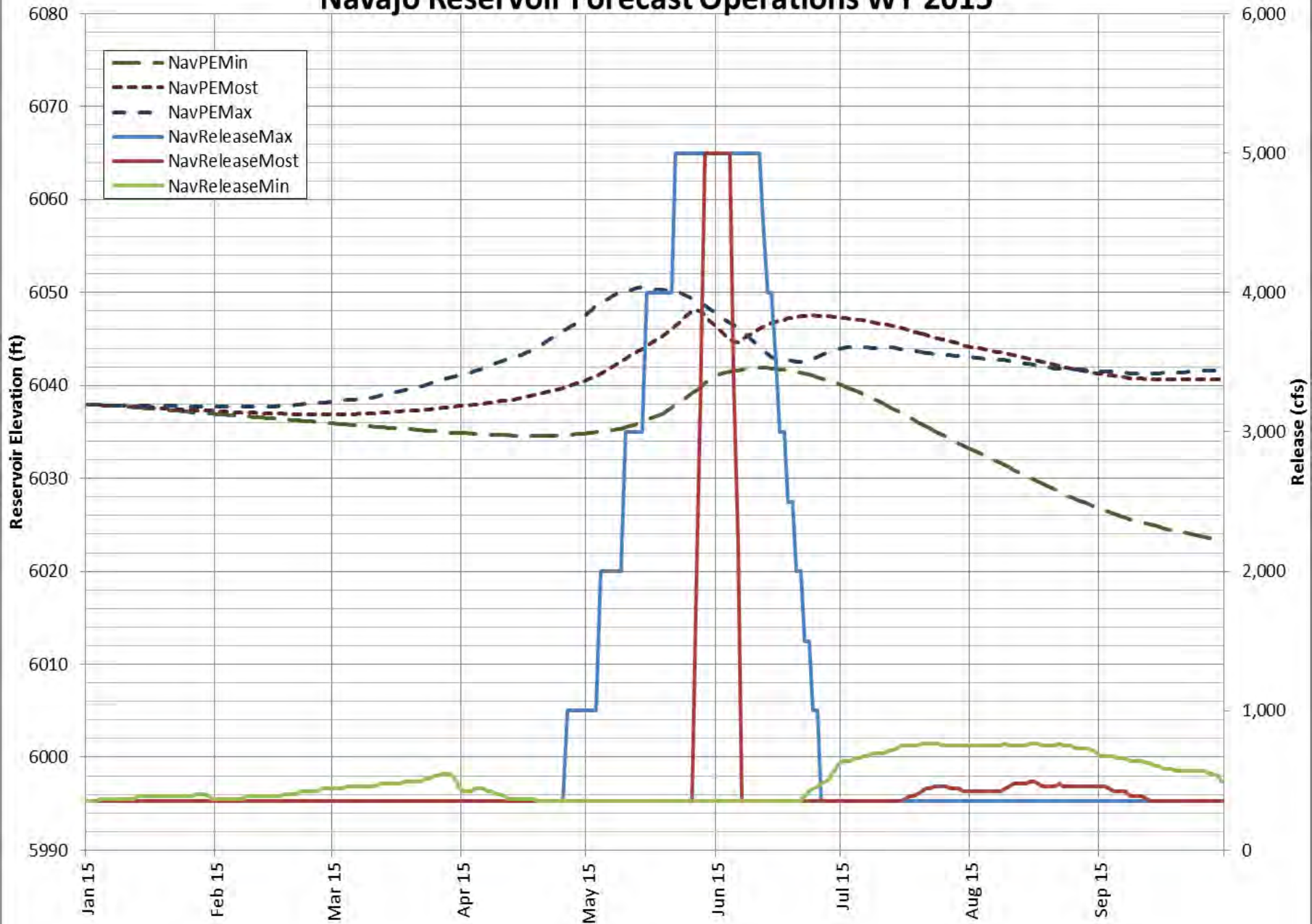


**MIN PROBABLE**  
42,000 af  
PATH #1

**MOST PROBABLE**  
245,000 af  
PATH #2

**MAX PROBABLE**  
521,000 af  
PATH #3

# Navajo Reservoir Forecast Operations WY 2015





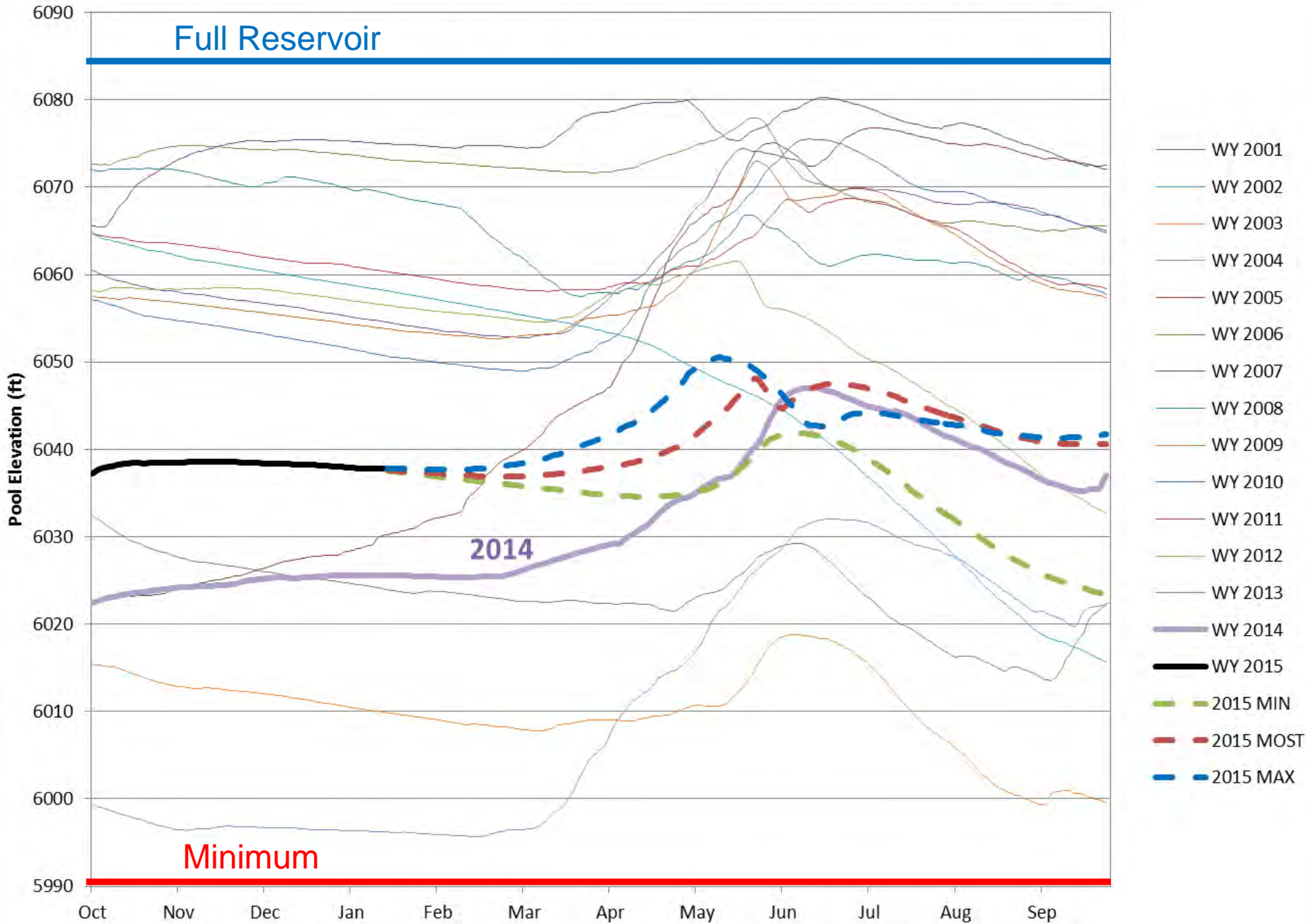
# WATER YEAR 2015 PROPOSED OPERATIONS SUMMARY

- Water Saving Mode after poor early winter
- Spring peak release is possible but unlikely.
- As per ROD, goal minimum release is 350 cfs. But....
- Prepare for a return to minimum release of 250 cfs unless snowpack improves

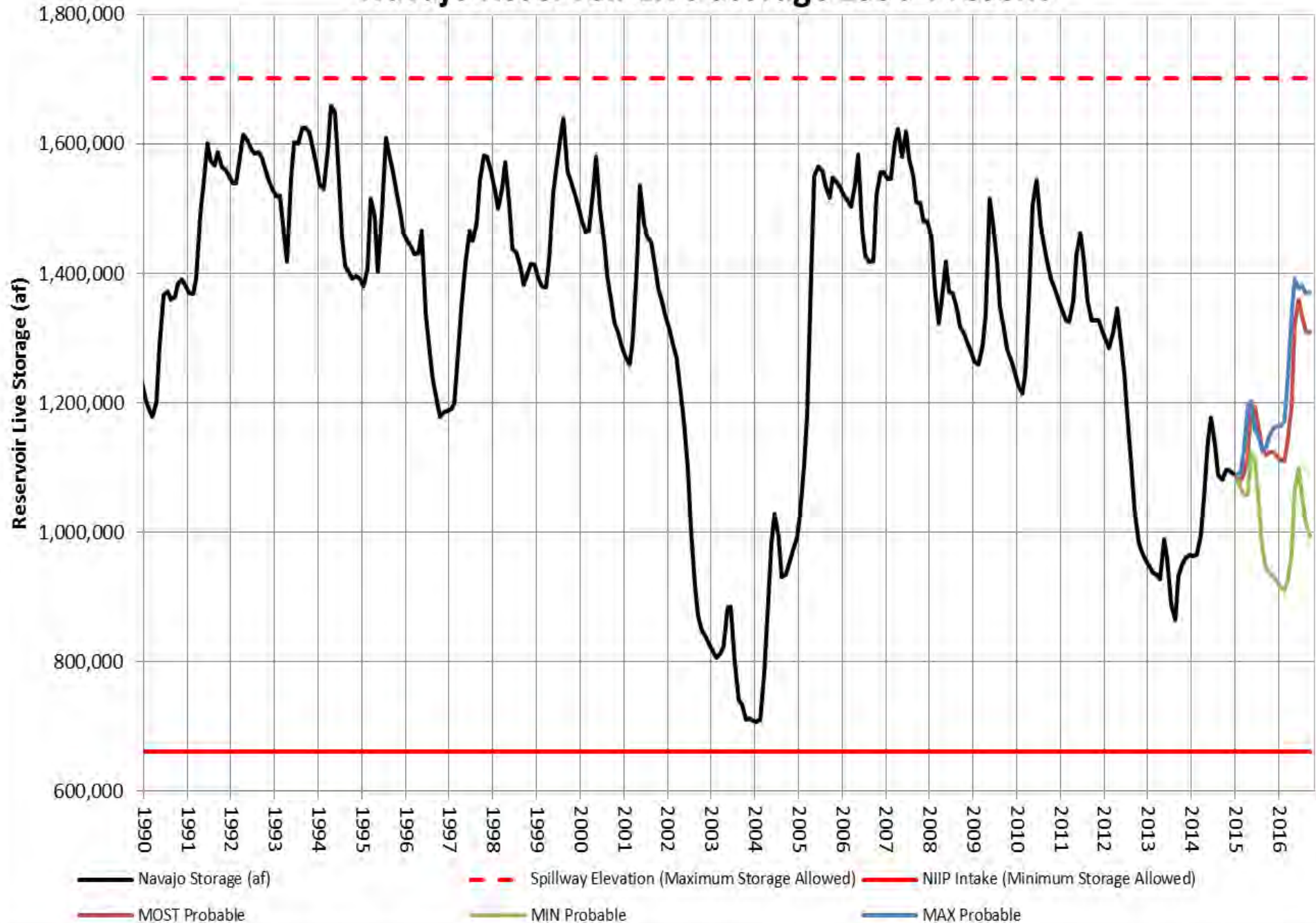
# Historic Navajo Pool Elevations and Forecast Elevation

Full Reservoir

Minimum



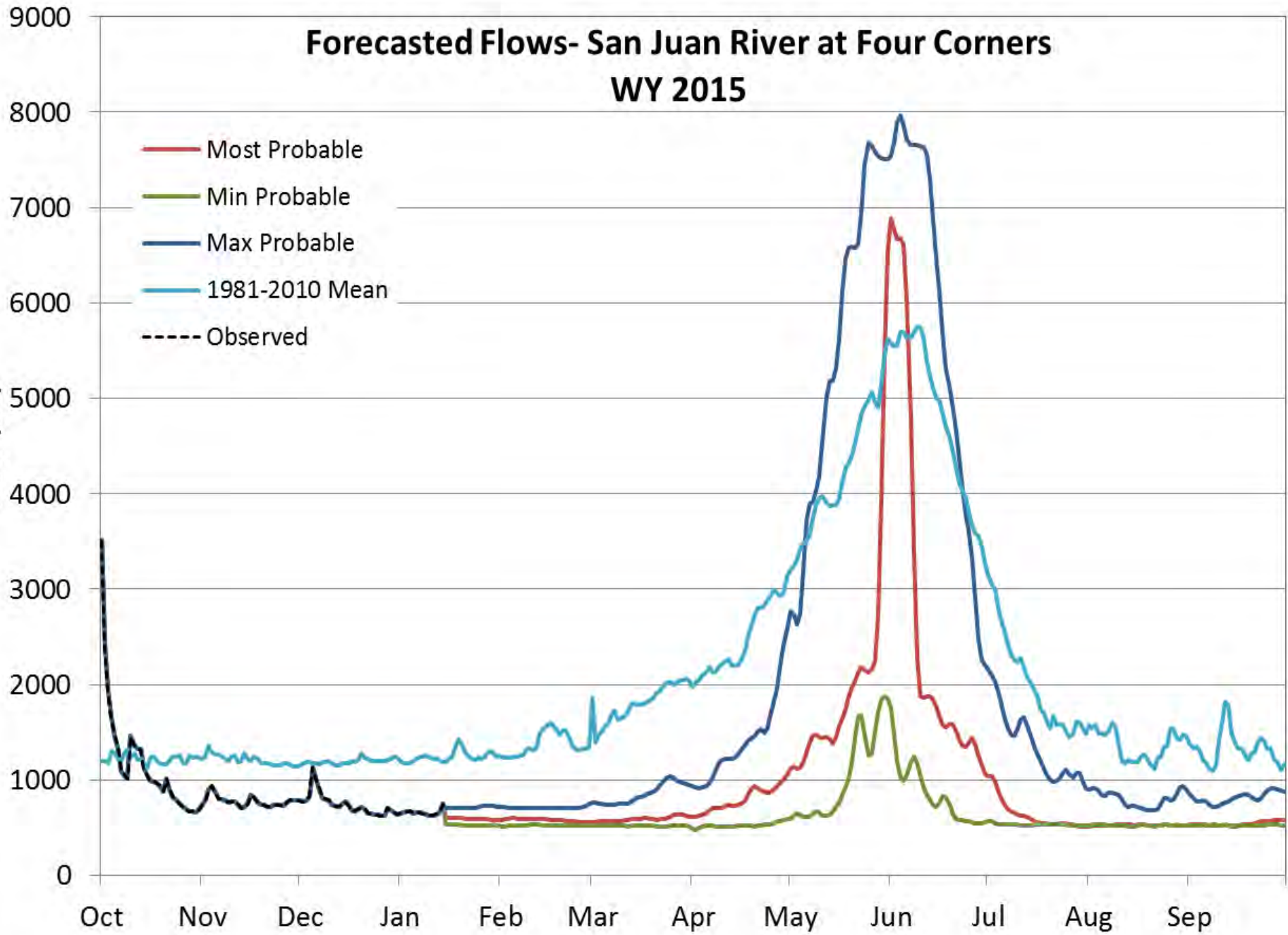
# Navajo Reservoir Live Storage 1990-Present



# Forecasted Flows- San Juan River at Four Corners WY 2015

- Most Probable
- Min Probable
- Max Probable
- 1981-2010 Mean
- Observed

Flow (cfs)



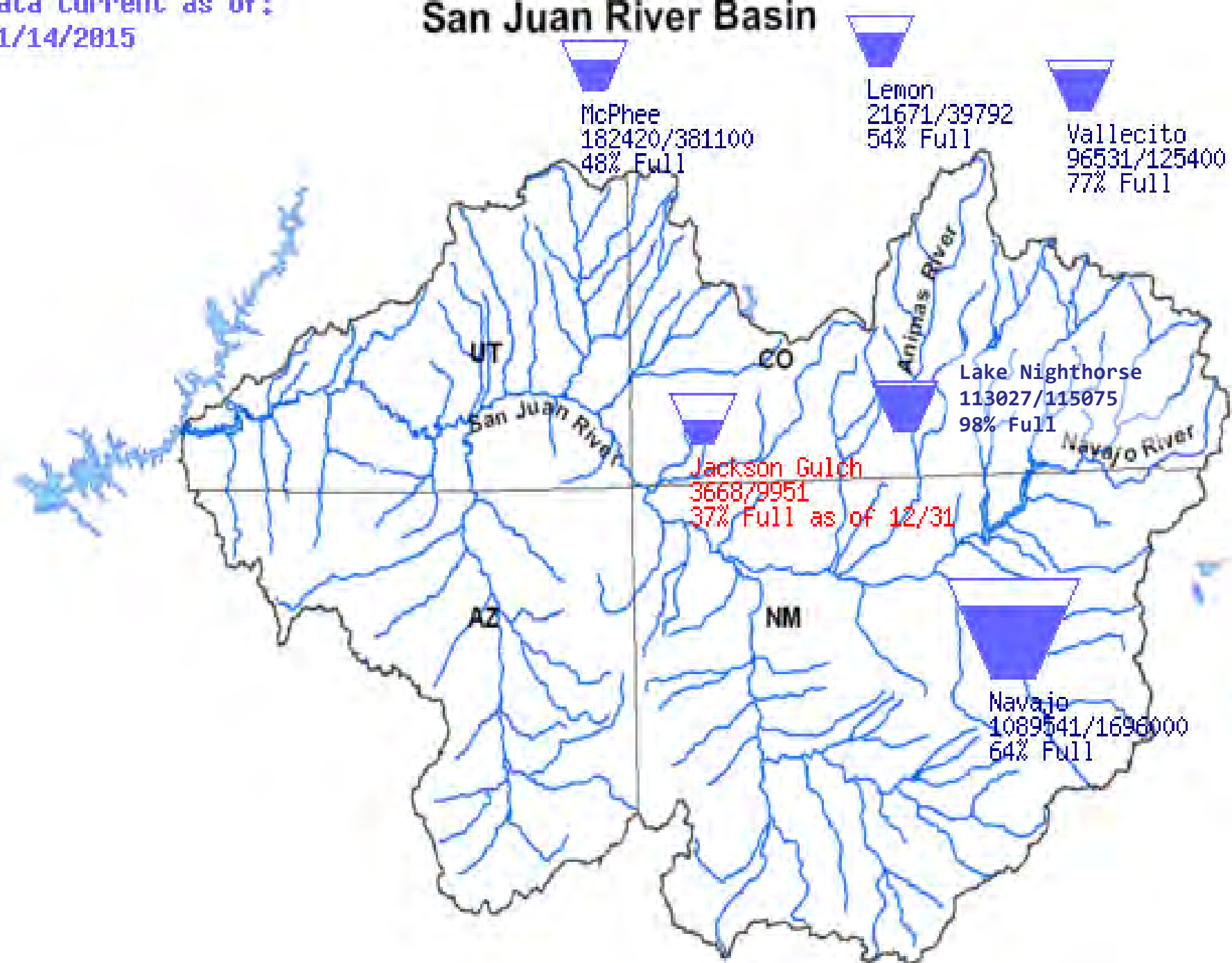
# Comparison to Conditions this time last year

- Reservoir Elevation is 12-ft higher
- Snowpack is lower
- Soil Moisture is lower
- Inflow Forecasts are lower

(partially due to lack of snow, partially due to forecaster's awareness of San Juan Basin overforecasting)

Data Current as of:  
01/14/2015

# San Juan River Basin



## Nighthorse

- Elevation = 6880.62
- Storage = 113,027 af (98% full)
- Release = 0 cfs
- Pumping = 0 cfs

Lake Nighthorse is scheduled to be topped off May-June of this year

## Vallecito

- Elevation = 7653.98 ft
- Storage = 96,706 af (77% full, 154% avg)
- Release = 78 cfs
- Inflow = 92 cfs

Vallecito's new ice-preventing bubbler system is allowing higher storage levels than in previous winters.

## Lemon

- Elevation = 8114.64 ft
- Storage = 21,702 af (55% full, 105% avg)
- Release = 11 cfs
- Inflow = 13 cfs

# Navajo Maintenance Activities

- Completed: Rock fall mitigation and concrete repairs to spillway
- Completed: Security fence along frontage road
- Completed: Right groin rehabilitation work



# 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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**Susan Novak Behery**

**970-385-6560    sbehery@usbr.gov**

**Ruth Swickard**

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

# Summary

- The current snowpack above Navajo is 66% of average.
- Modeled soil moisture is below average.
- CPC is forecasting above average moisture, but CPC has been crying wolf for several months now.
- Current Most Probable April – July Inflow Forecast is 61% of average.
- Based on the most probable forecast, a 1-week spring peak release is possible.
- Downstream river flows are anticipated to be at or below average.
- Under Minimum Probable Forecast, the minimum reservoir elevation is forecast to reach 6020 ft over next winter (using water conservation measures).
- A shortage is not currently forecasted, but conservation measures may be implemented to avoid a shortage.
  
- Next Operations Meeting: Tuesday, April 21<sup>st</sup> 2015