

RECLAMATION

Managing Water in the West



**Navajo Unit Operations
January 25, 2011
Coordination Meeting**



U.S. Department of the Interior
Bureau of Reclamation

Agenda

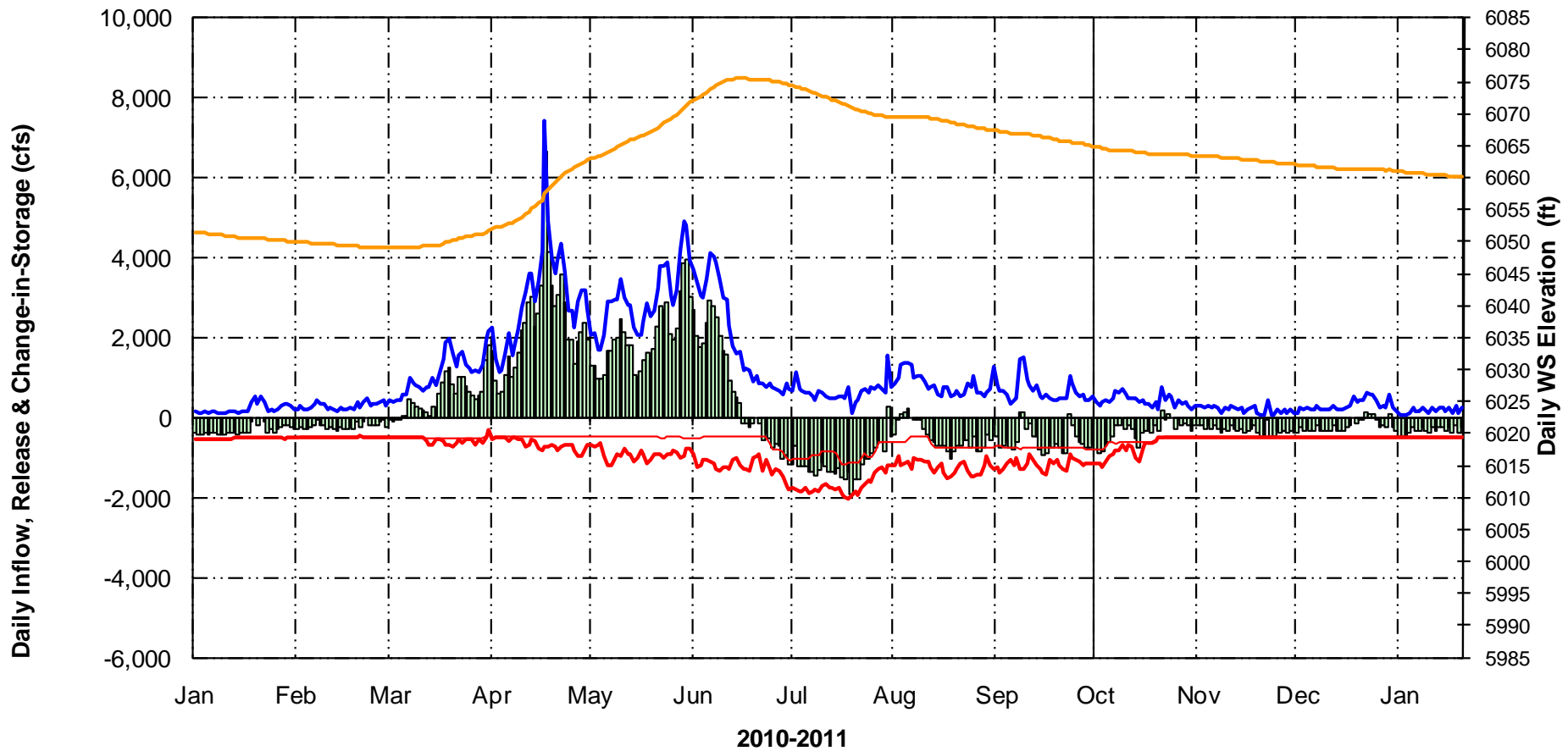
- Welcome
- Special Presentation – Colorado Basin River Forecast Ctr
- Review of Water Year 2010 Operations
- Water Year 2011 Current Conditions/Snowpack
- Water Year 2011 Forecasts & Proposed Operations
- Current Reservoir Status
- Navajo Dam Maintenance Activities
- Fish & Wildlife Service/San Juan RIP Update
- Reports from other Agencies
- Questions from Audience
- How To Access Information
- Close

An aerial photograph of a large concrete dam with a reservoir behind it. A road curves around the dam. The surrounding landscape is arid and hilly. The text "Review of 2010 Operations" is overlaid in large white letters with a black outline.

Review of 2010 Operations

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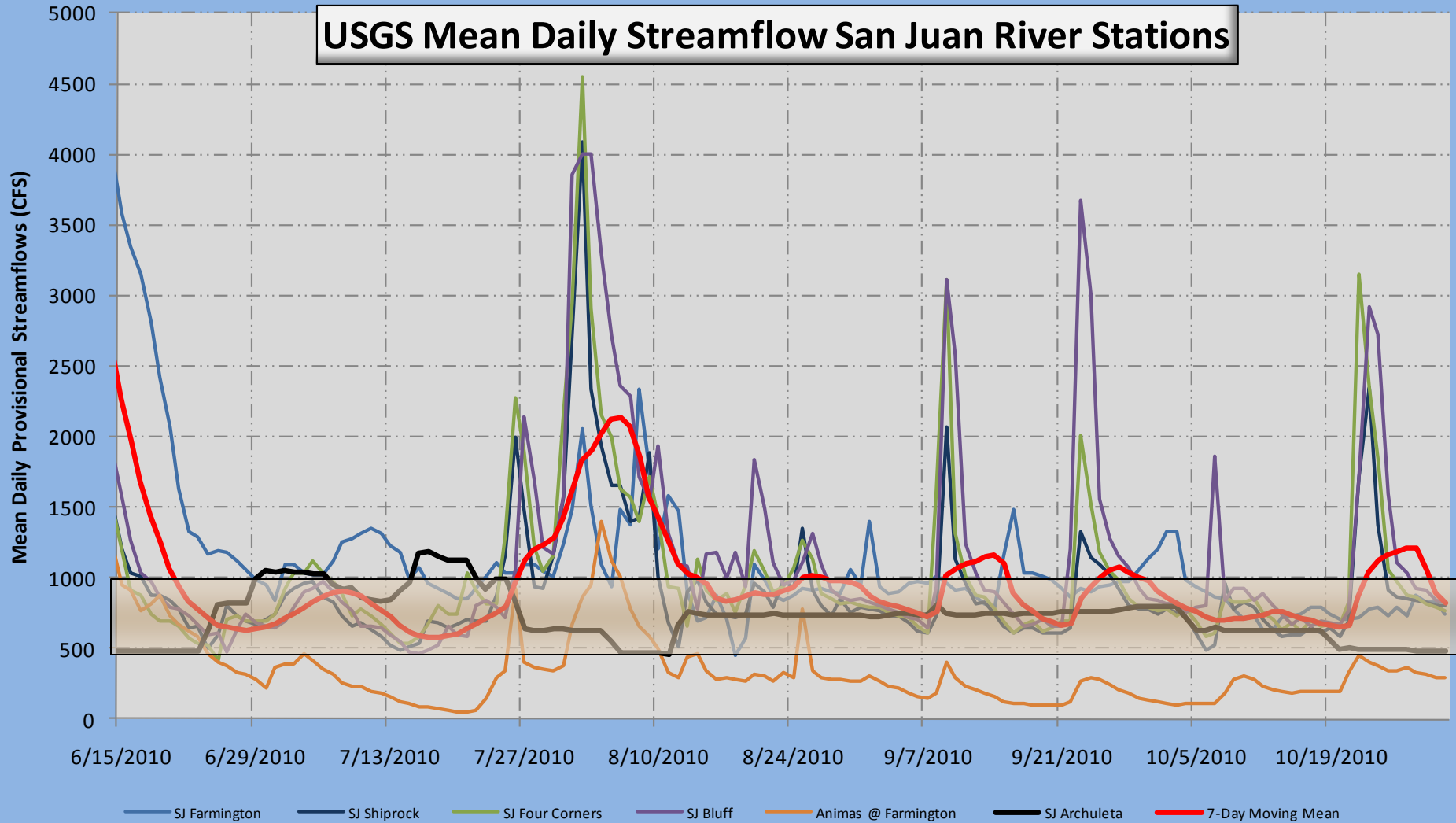
NAVAJO RESERVOIR OPERATIONS



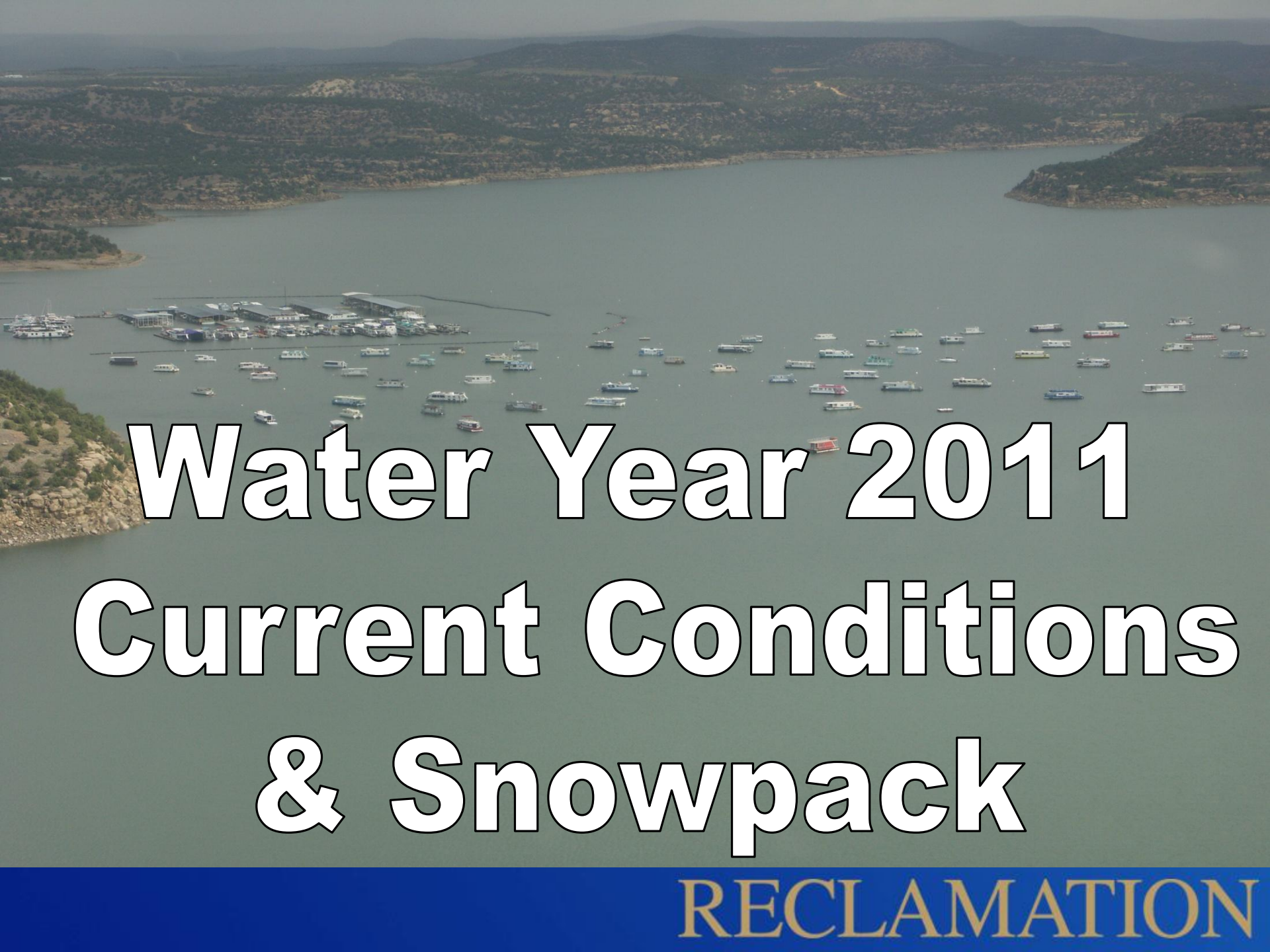
Observed April-July Inflow was 84% of Average

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Chasing the Target Base Flow (500-1000 CFS)



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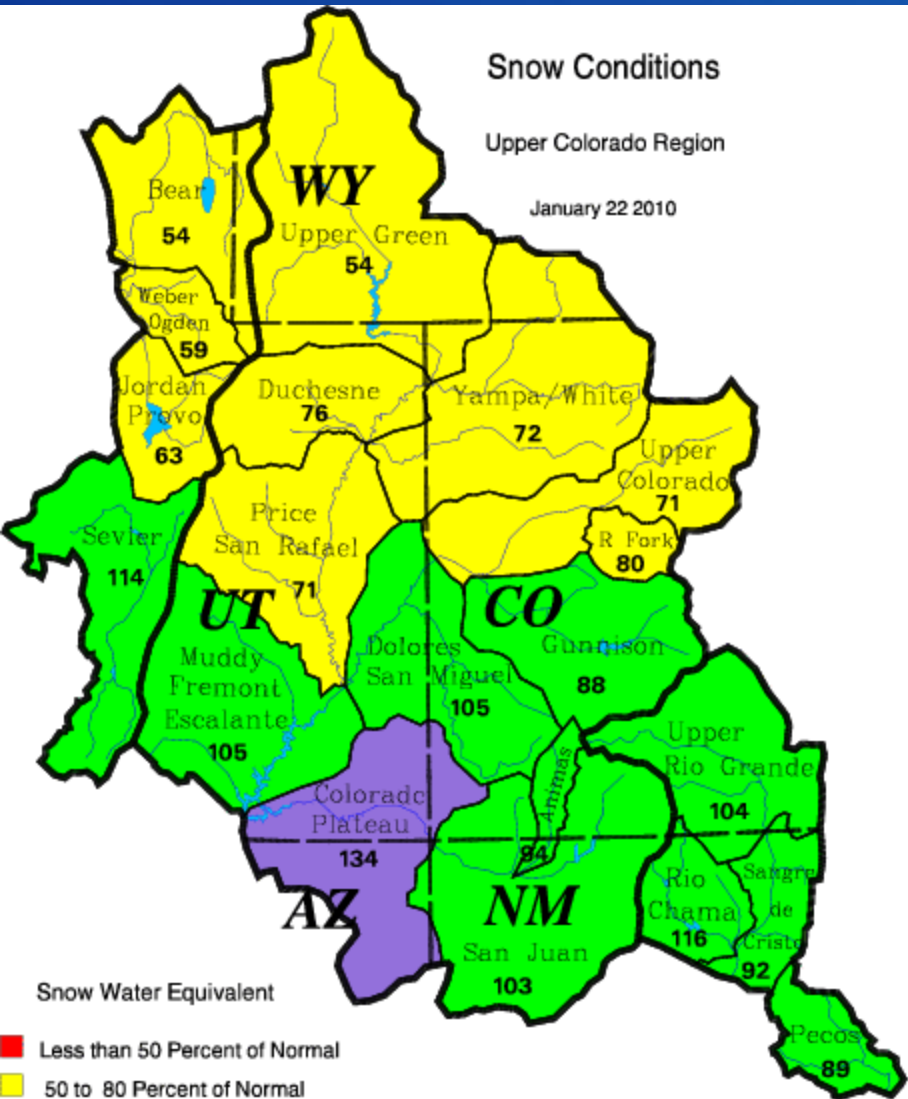
Water Year 2011 Current Conditions & Snowpack

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Snow Conditions

Upper Colorado Region

January 22 2010



Snow Water Equivalent

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

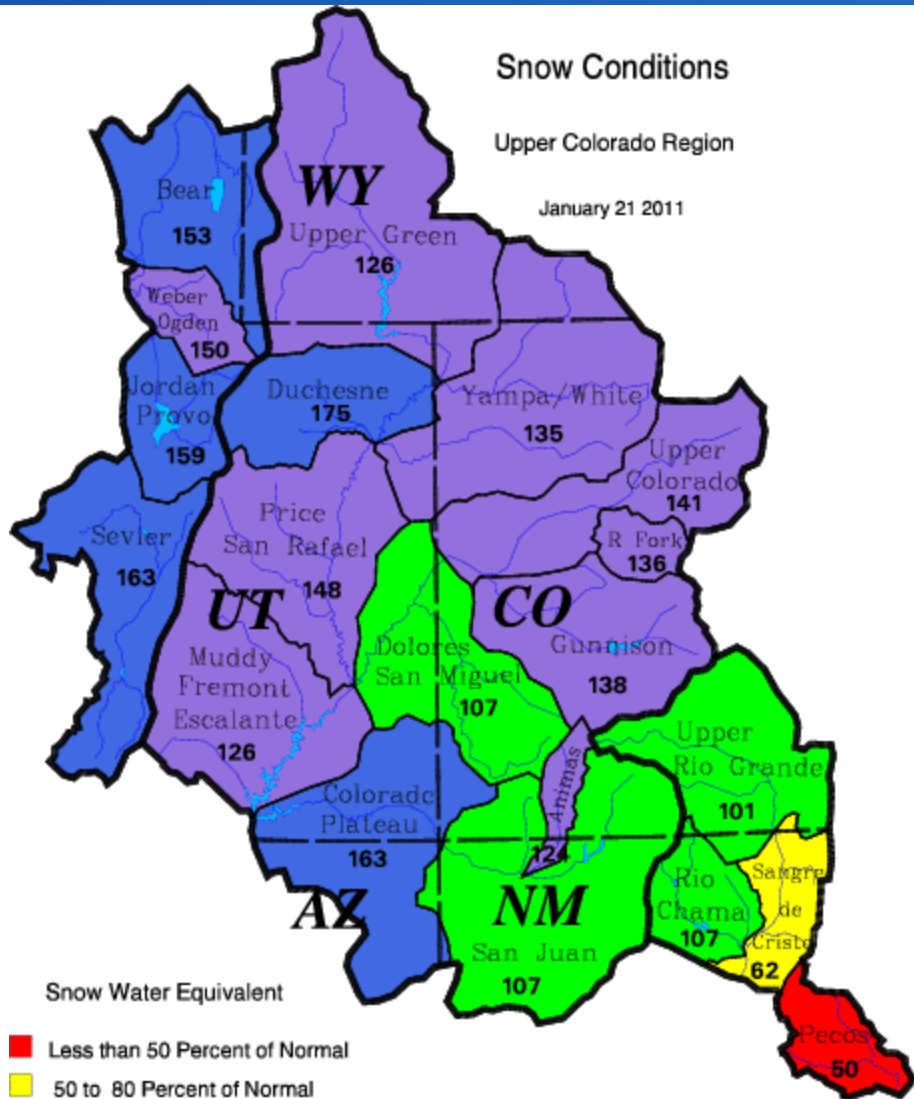
Upper Colorado
GIS
Region

Data Provided by the Natural Resource Conservation Service

Snow Conditions

Upper Colorado Region

January 21 2011



Snow Water Equivalent

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Upper Colorado
GIS
Region

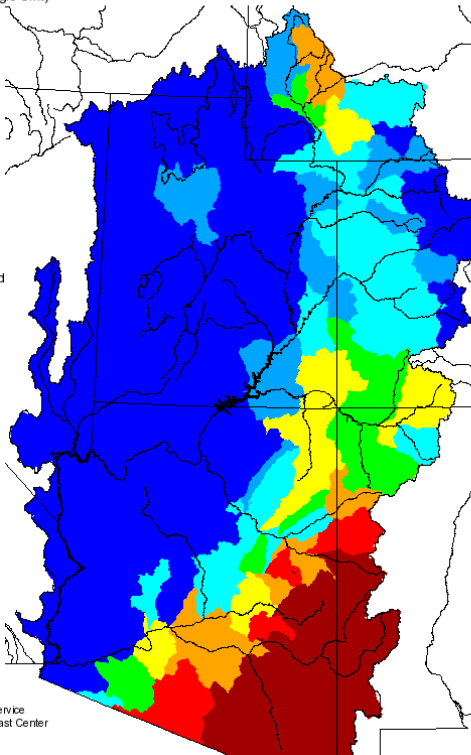
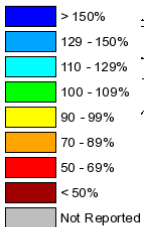
Data Provided by the Natural Resource Conservation Service

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Monthly Precipitation for October 2010

(Averaged by Hydrologic Unit)

% Average

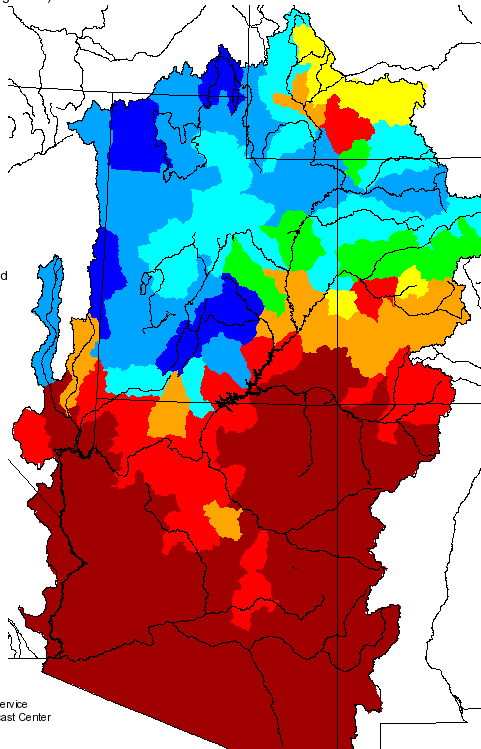
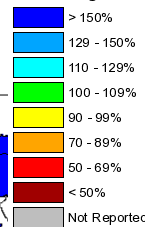


Prepared by
NOAA, National Weather Service
Colorado Basin River Forecast Center
Salt Lake City, Utah
www.cbafc.noaa.gov

Monthly Precipitation for November 2010

(Averaged by Hydrologic Unit)

% Average

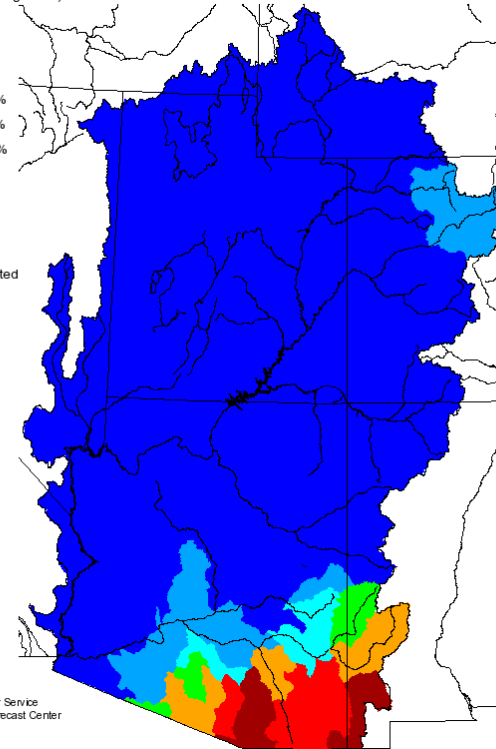
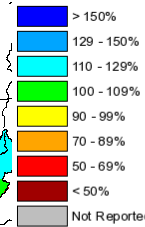


Prepared by
NOAA, National Weather Service
Colorado Basin River Forecast Center
Salt Lake City, Utah
www.cbafc.noaa.gov

Monthly Precipitation for December 2010

(Averaged by Hydrologic Unit)

% Average

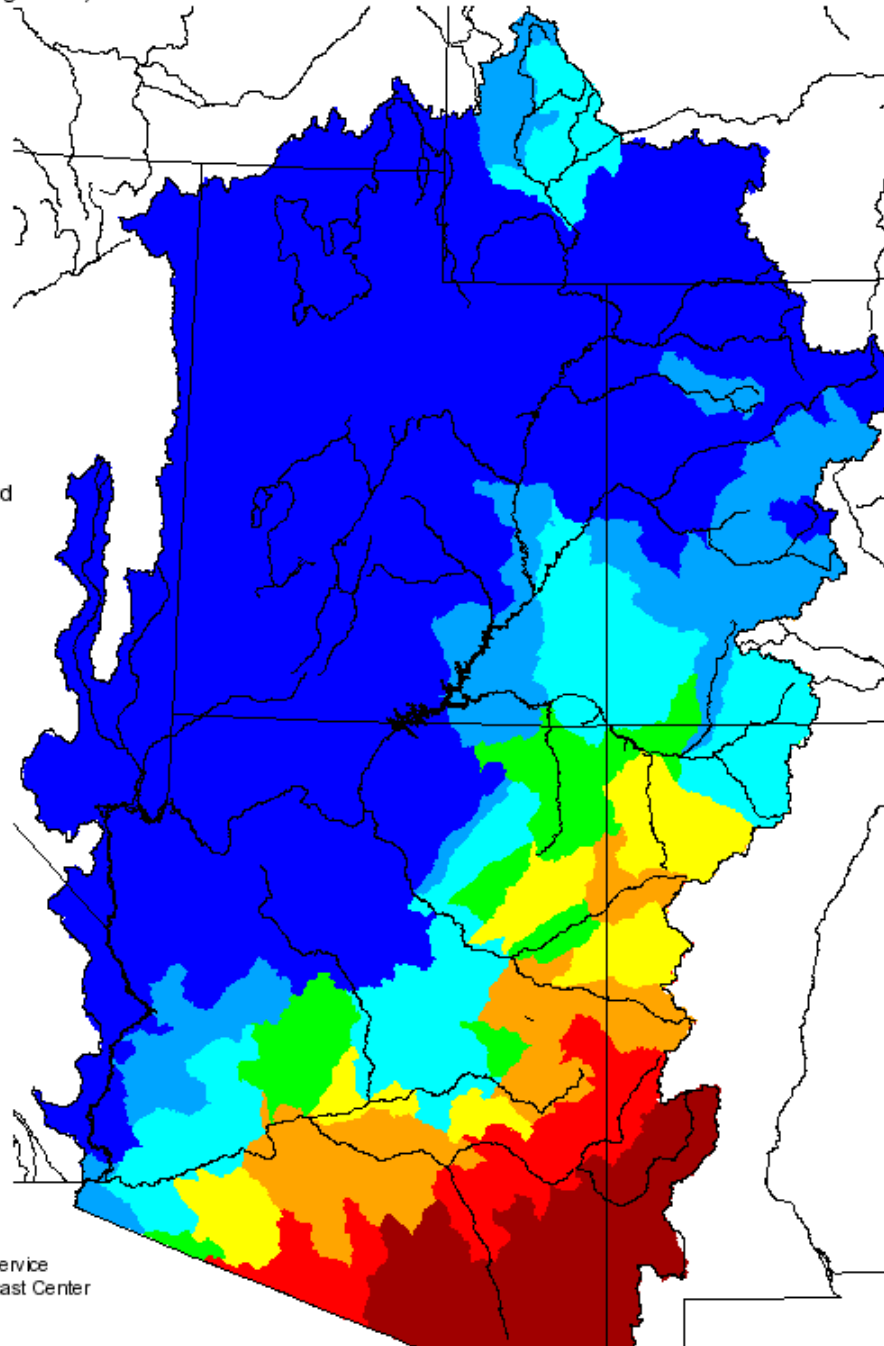
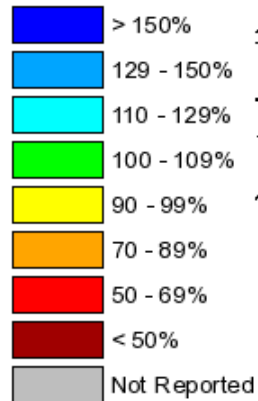


Prepared by
NOAA, National Weather Service
Colorado Basin River Forecast Center
Salt Lake City, Utah
www.cbafc.noaa.gov

Seasonal Precipitation, October 2010 - December 2010

(Averaged by Hydrologic Unit)

% Average



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Colorado Basin River Forecast Center
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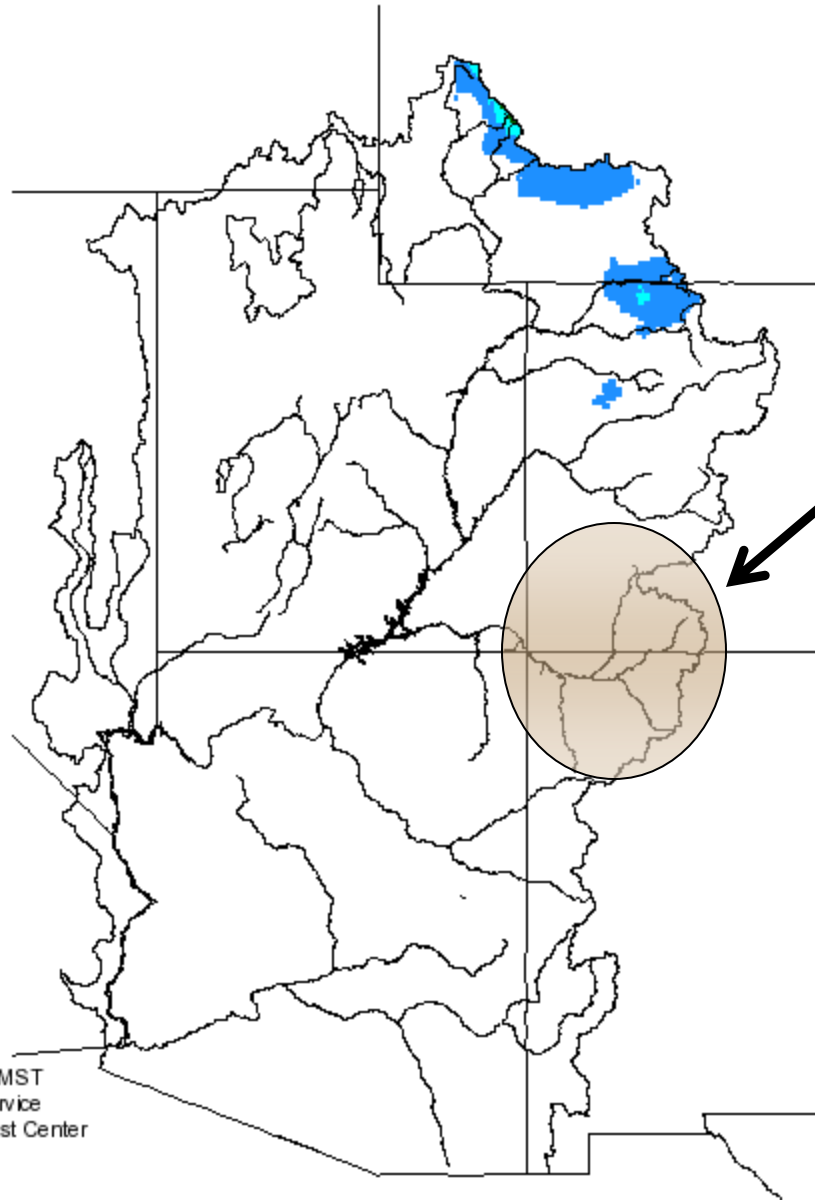
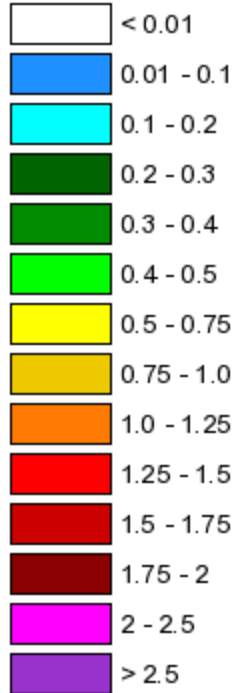
JANURARY Precipitation

Multisensor Precipitation Estimate (MPE)

Colorado Basin River Forecast Center

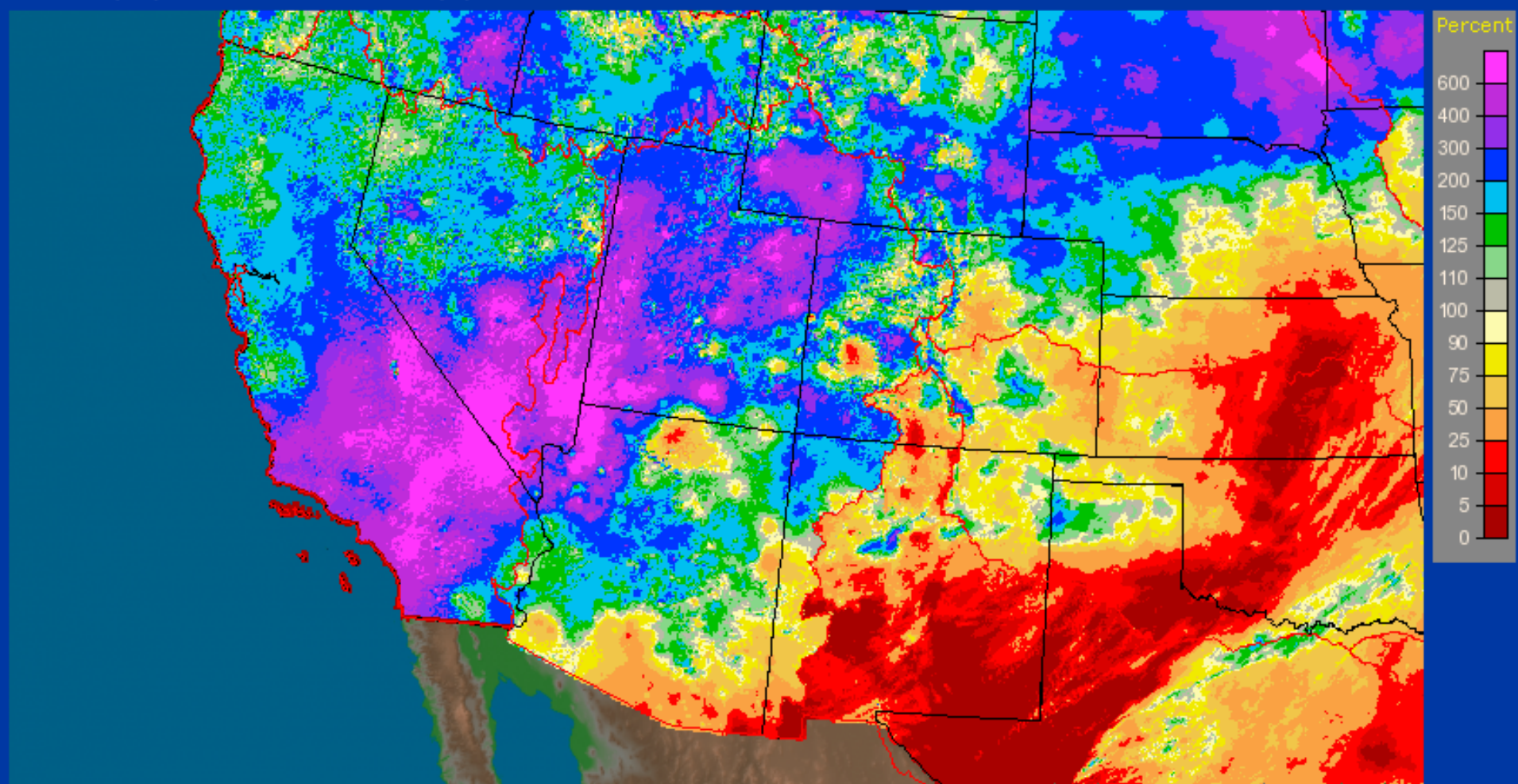
01/24/2011 GMT

Legend



San
Juan
River
Basin

Prepared 13:00 01/24/2011 MST
NOAA, National Weather Service
Colorado Basin River Forecast Center
Salt Lake City, Utah
www.cbfc.noaa.gov



- Topo
- Pcpn Amount
- Counties
- Rivers
- States
- Highway/City
- RFC Boundary

Water Year 2010

San Juan Basin Snowpack Summary

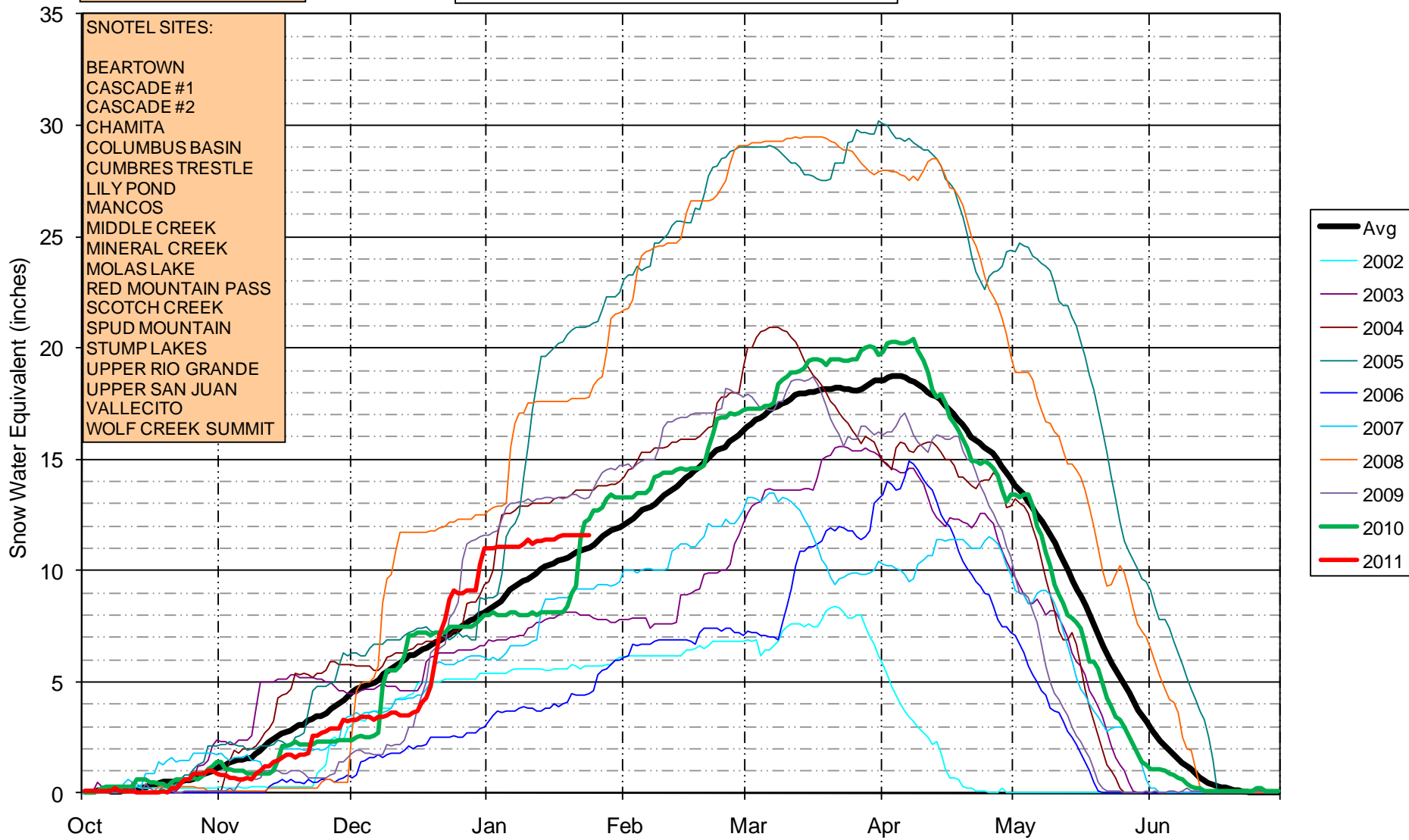
(as of 1/24/2011)

Locations	Average of Applicable SNOTEL Stations (SWE – inches)	% Average
San Juan (Bluff)	11.6	105%
Navajo Reservoir	11.8	109%
Vallecito Reservoir	11.7	111%
Animas @ Durango	11.1	107%

San Juan Basin Multiple Station Snotel Plot

January 24, 2011

Current Snowpack is (11.6/11) = 105% of Average



Water Year 2011 (as of 1/24/2010)

Navajo Inflows & San Juan Basin Snowpack

EOM	Inflow (af)	% Average	SJ SWE (in.)	% Average
October	26,548	52%	0.9	56%
November	12,096	37%	3.2	65%
December	18,785	76%	11.0	136%
January (Current)	8,075	50%	11.6	105%

An aerial photograph of a river valley. The river flows from the top center towards the bottom left. The left bank is lush with green trees and fields, while the right bank is a steep, arid hillside with sparse vegetation. The sky is not visible.

Water Year 2011 Forecasts

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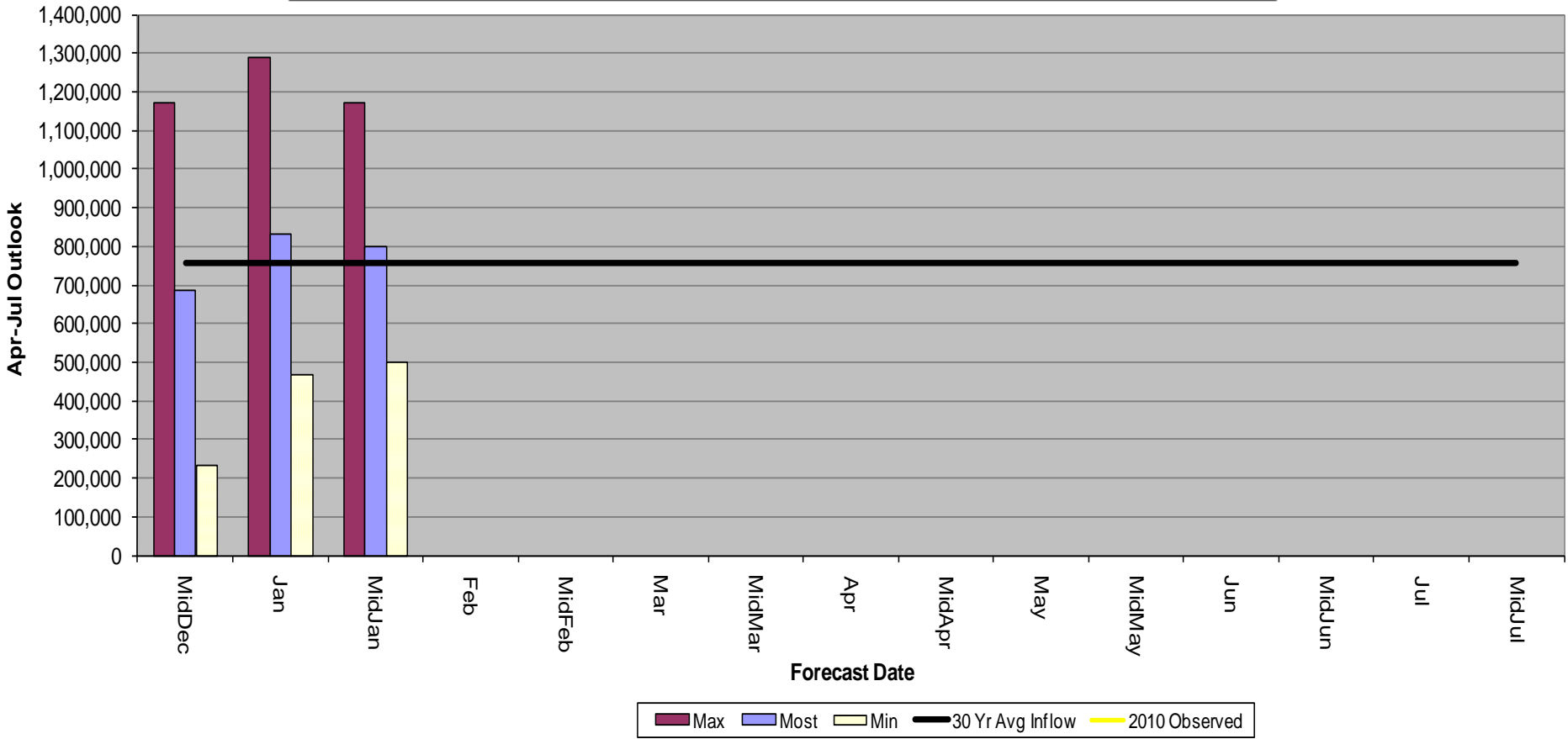
Mid-January 2011 Forecast
Navajo Reservoir
Modified Unregulated
April-July Inflow Volume

	Inflow (af)	% of Average	2010 Forecast
Most Probable	800,000	106%	700,000 (93%)
Minimum Probable	500,000	66%	400,000 (53%)
Maximum Probable	1,170,000	155%	1,120,000 (148%)

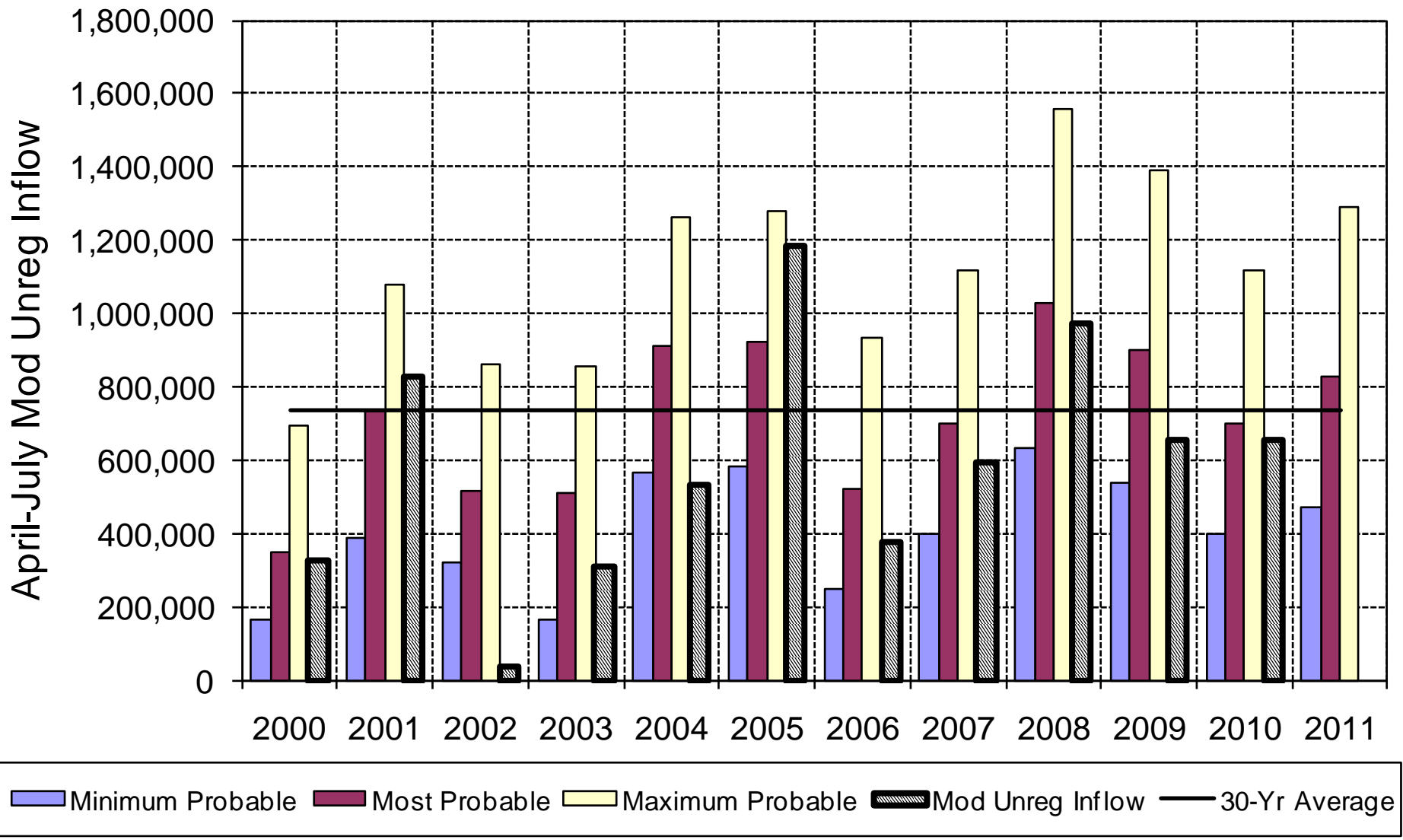
Last Year's SWE above Navajo = 12.8" (11.8" this year) on 1/24

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WY2011 CBRFC - Navajo Reservoir Most, Max and Min Inflow Forecasts (acre-feet)

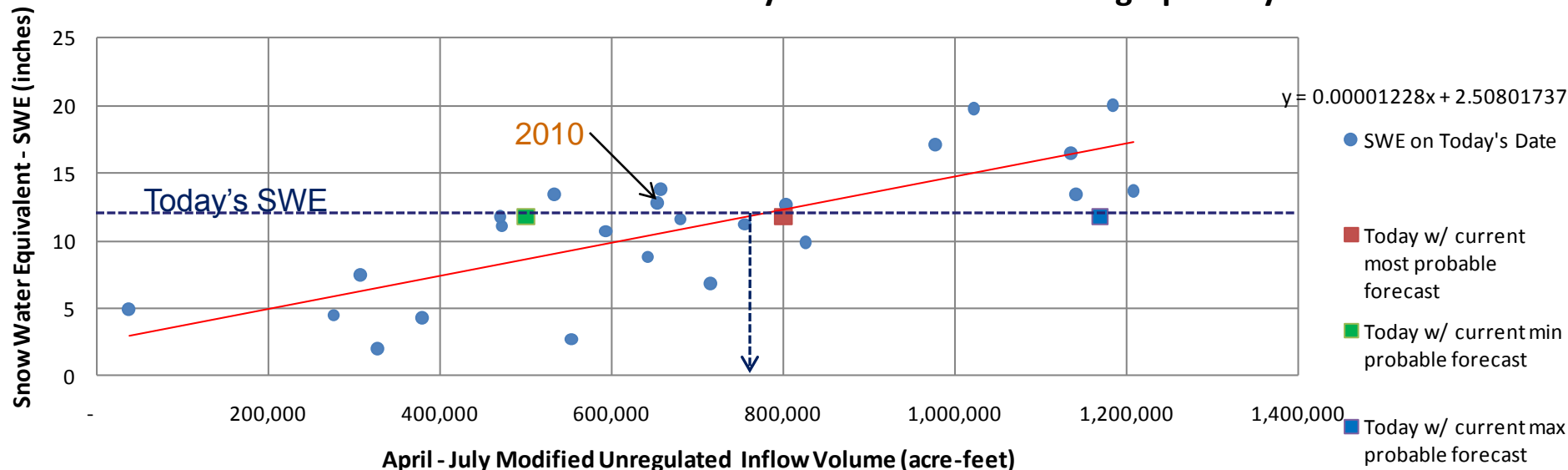


April-July Mod Unreg Forecast from January vs Actual Mod Unreg Inflow

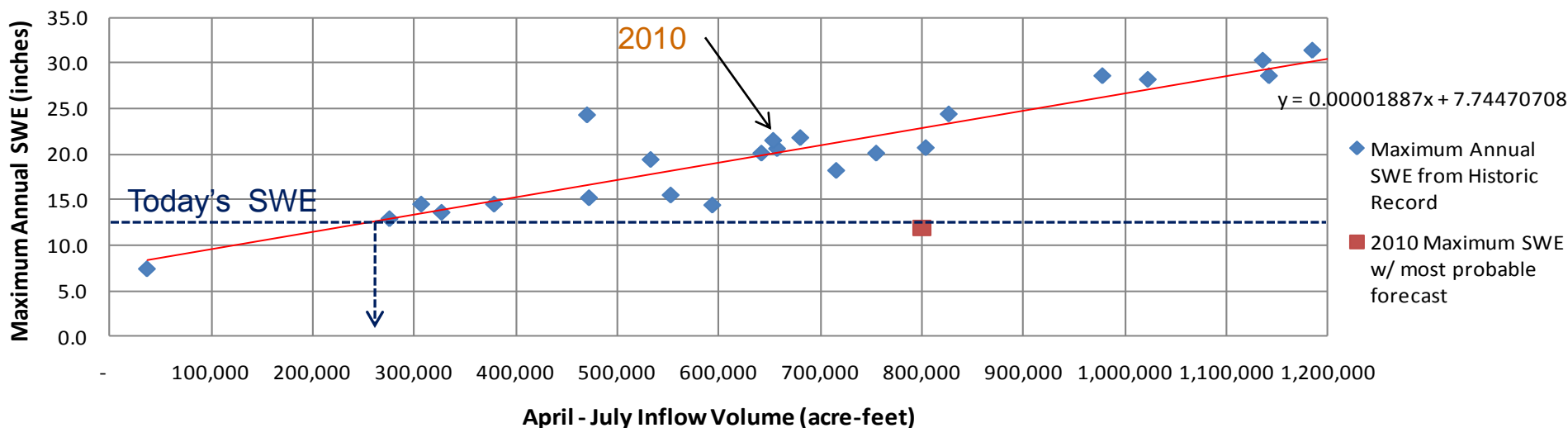


SNOTEL above Navajo vs. Inflow Forecast

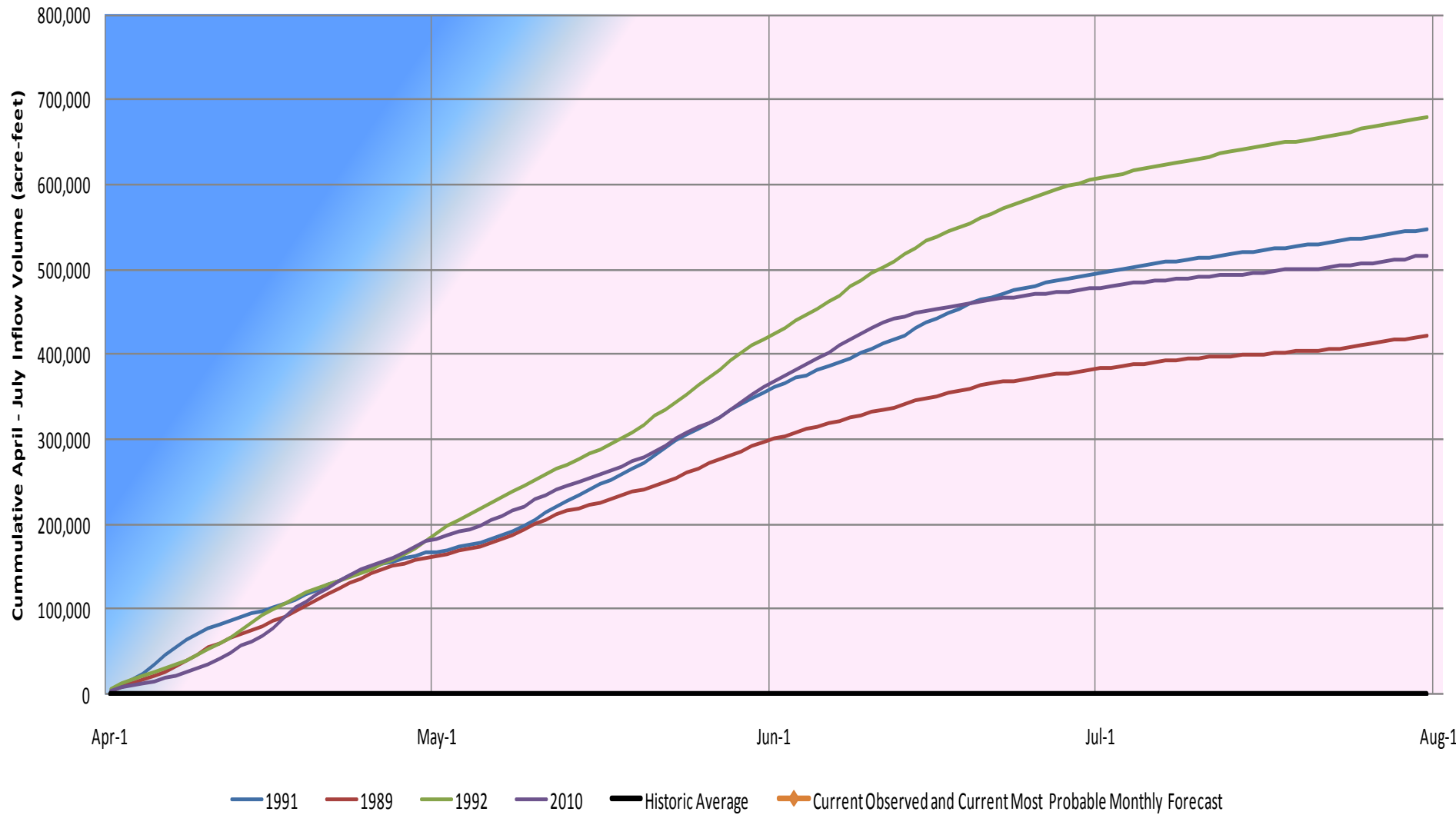
Correlation of Historical SWE from Today's Date and Mod Unreg April-July Inflow



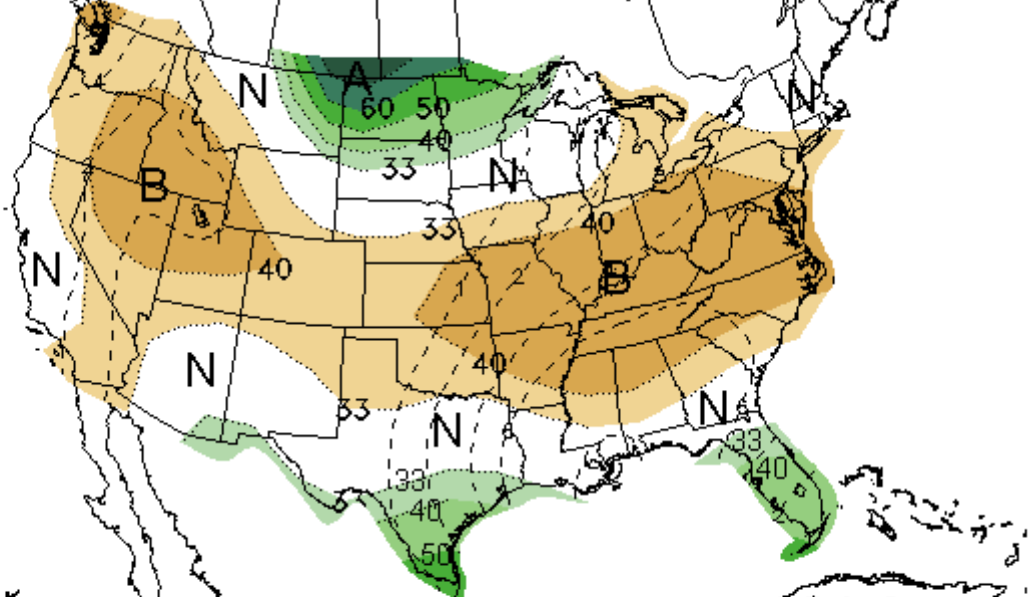
Historical April-July Inflows compared to Maximum Annual SWE



Cummulative April - July Observed Inflow of Representative SWE Years



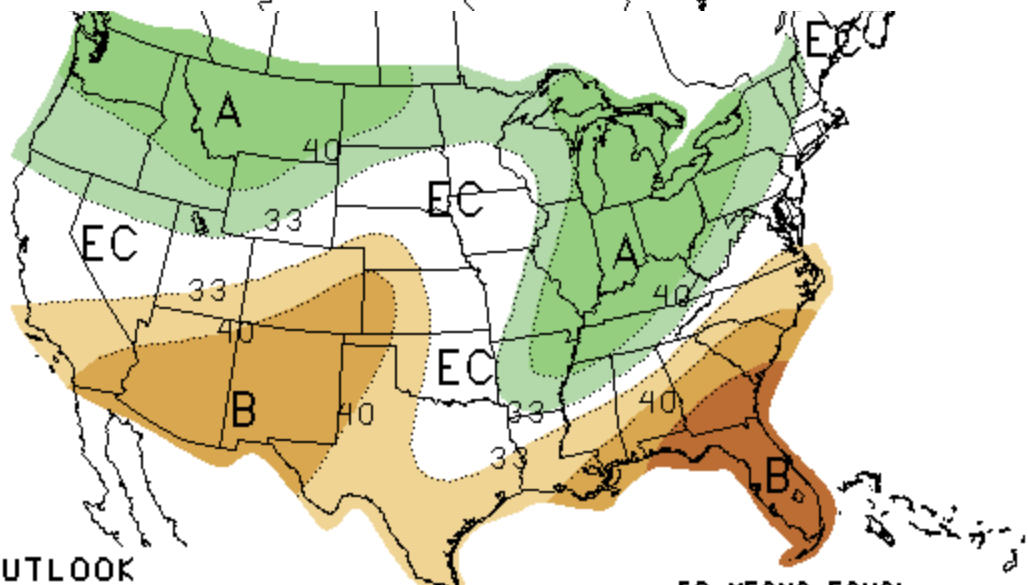
Climate Prediction Center Precip. Outlooks



8-14 DAY OUTLOOK
PRECIPITATION PROBABILITY
MADE 23 JAN 2011
VALID JAN 31 - FEB 06, 2011

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

8-14 Day →



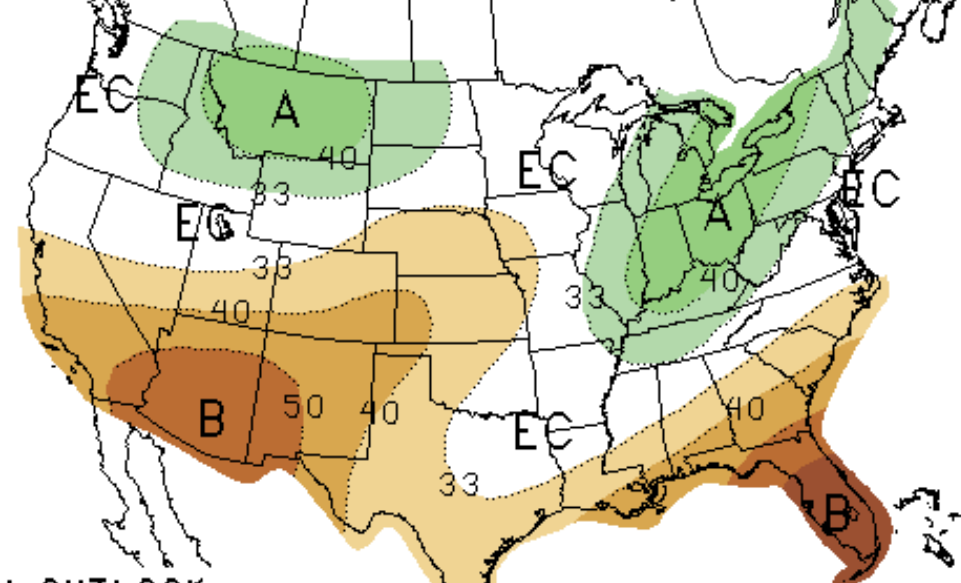
ONE-MONTH OUTLOOK
PRECIPITATION PROBABILITY
0.5 MONTH LEAD
VALID FEB 2011
MADE 20 JAN 2011

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

February Monthly →

Climate Prediction Center Seasonal Precipitation Outlooks

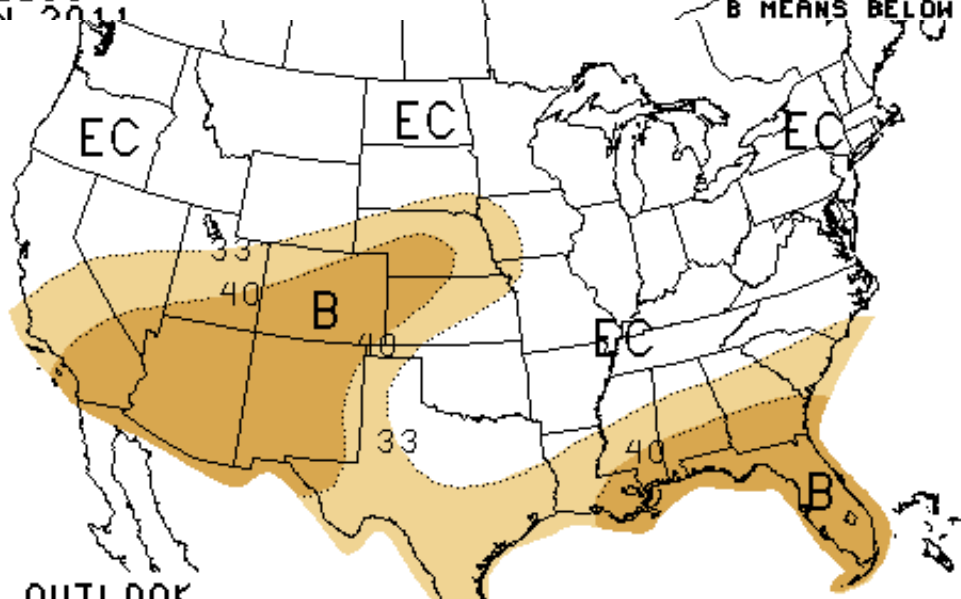
February-March-April



THREE-MONTH OUTLOOK
PRECIPITATION PROBABILITY
0.5 MONTH LEAD
VALID FMA 2011
MADE 20 JAN 2011


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

March-April-May



THREE-MONTH OUTLOOK
PRECIPITATION PROBABILITY
1.5 MONTH LEAD
VALID MAM 2011
MADE 20 JAN 2011

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



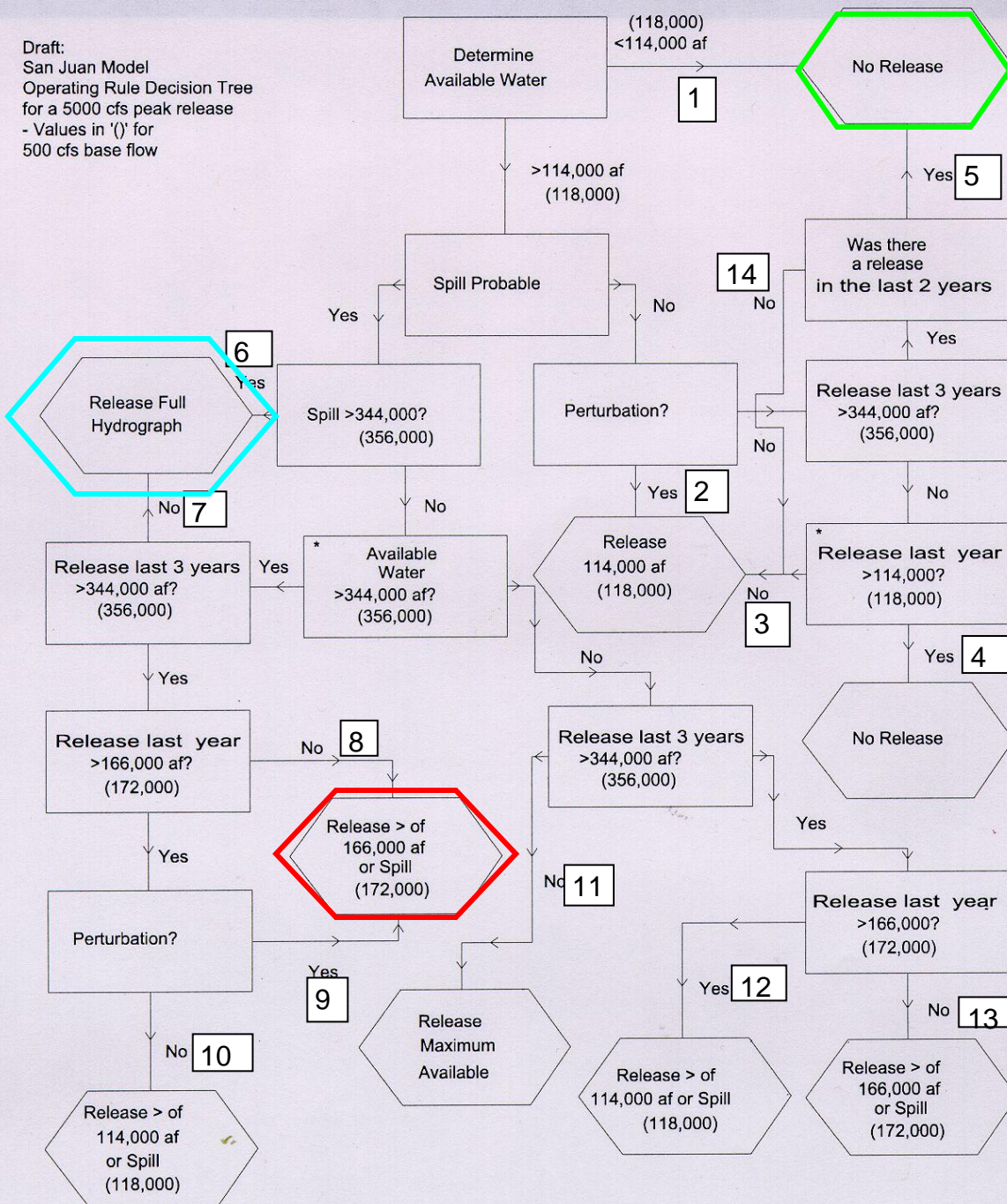
**Water Year 2011
Forecasts &
Proposed Operations**

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Water Year 2011 Proposed Operations

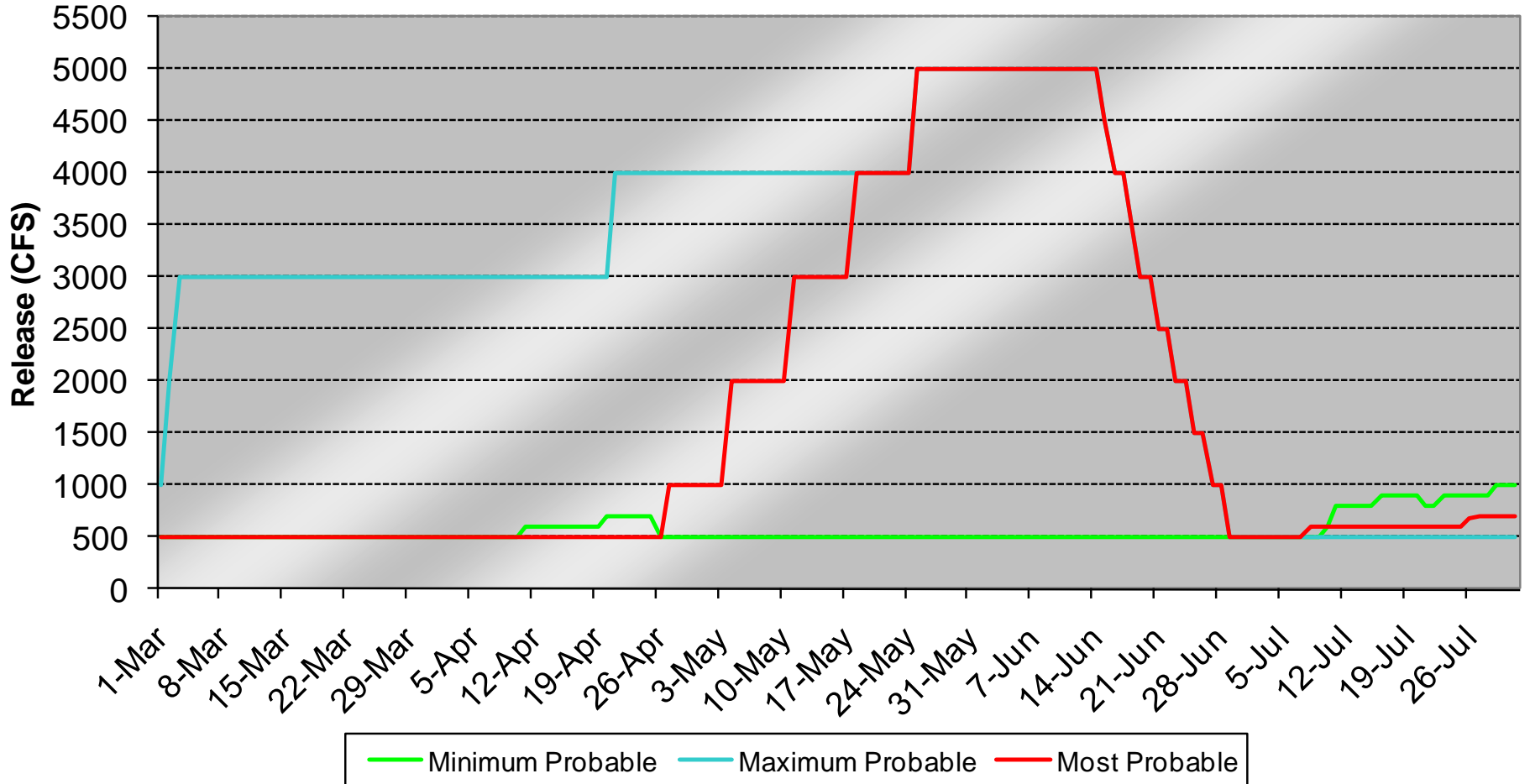
- Navajo Reservoir is at a manageable elevation
- 500 cfs base release until Spring Peak Release
- As of now, it is likely there will be a Spring Peak Release
- It is only January, and a lot can still change!

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

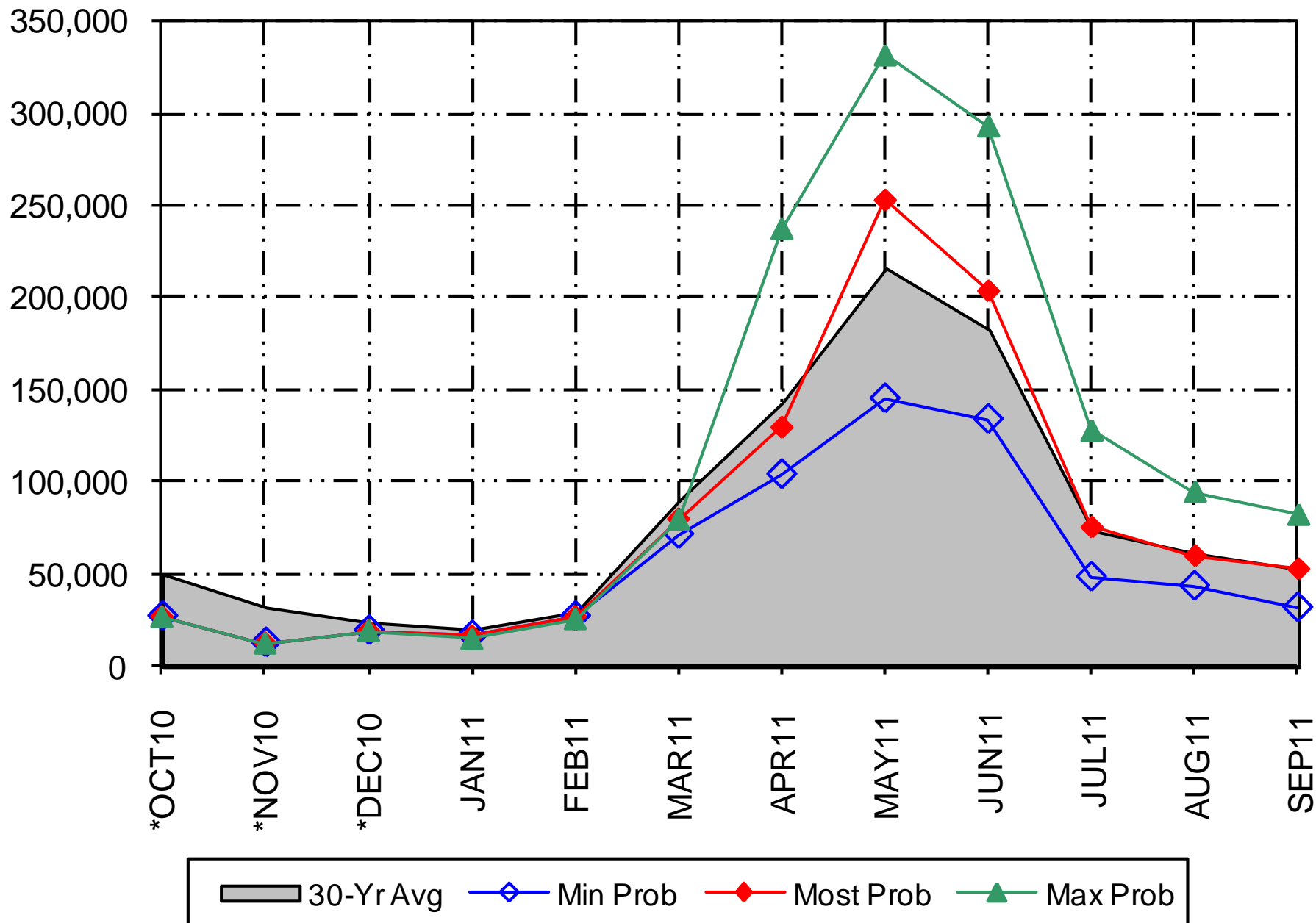


AVAILABLE WATER	PATH
Min Prob: 510,000 af	#5
Most Prob: 749,000 af	#8
Max Prob: 1,072,000 af	#6

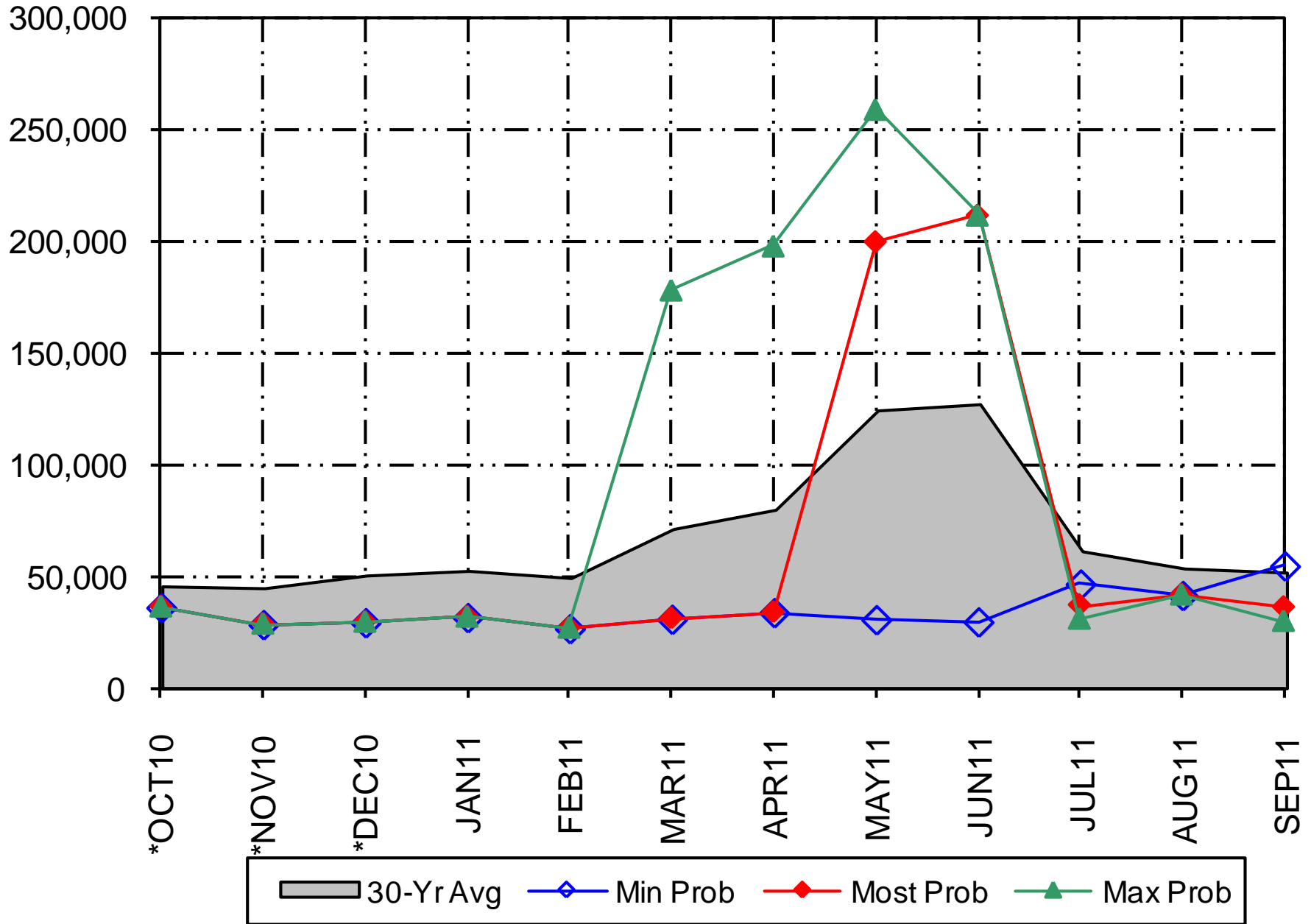
Spring Peak Hydrographs for WY2011 as of the Mid January Forecast



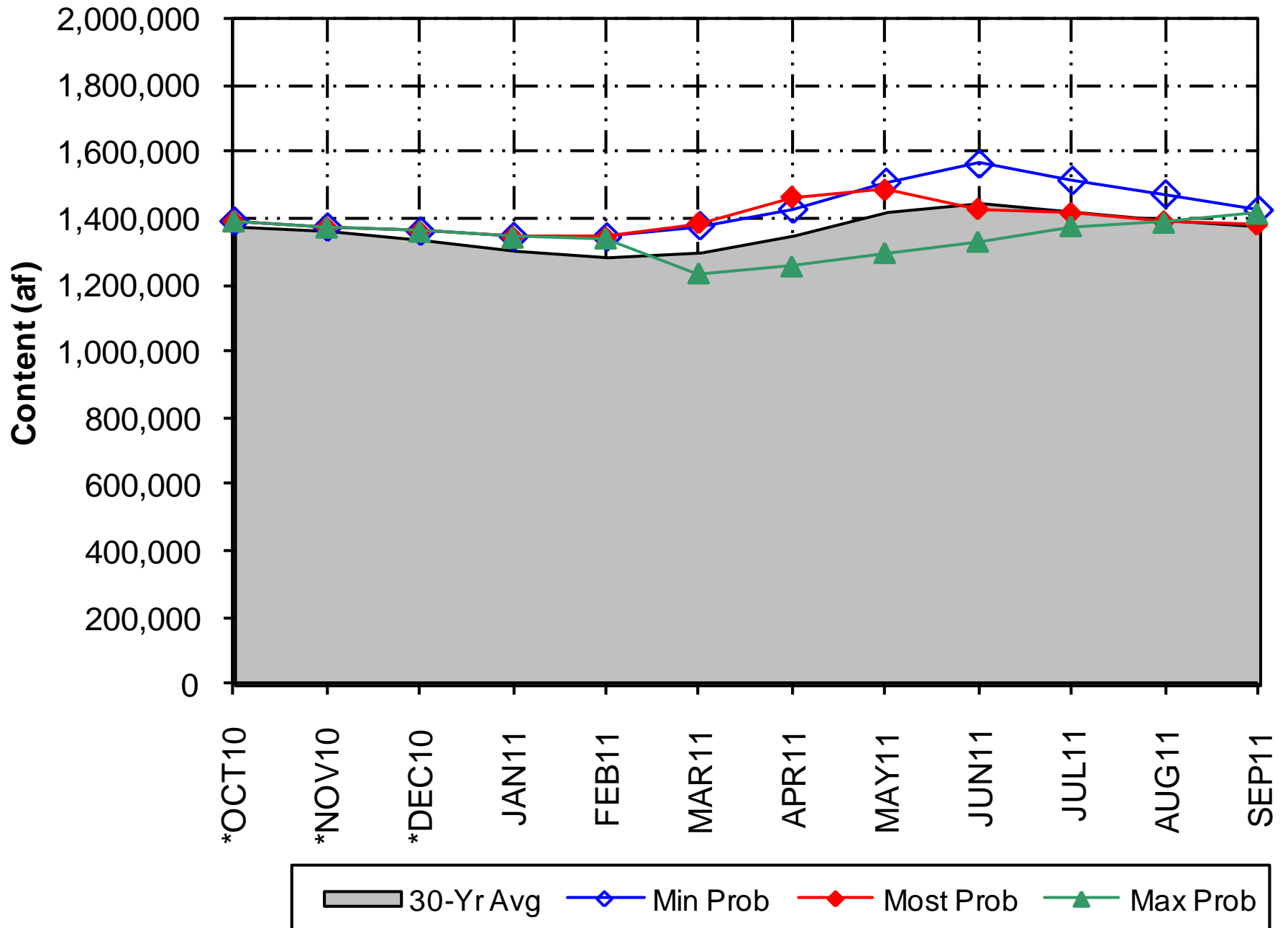
Inflow (af) as of January 2011 Mid Month Forecast



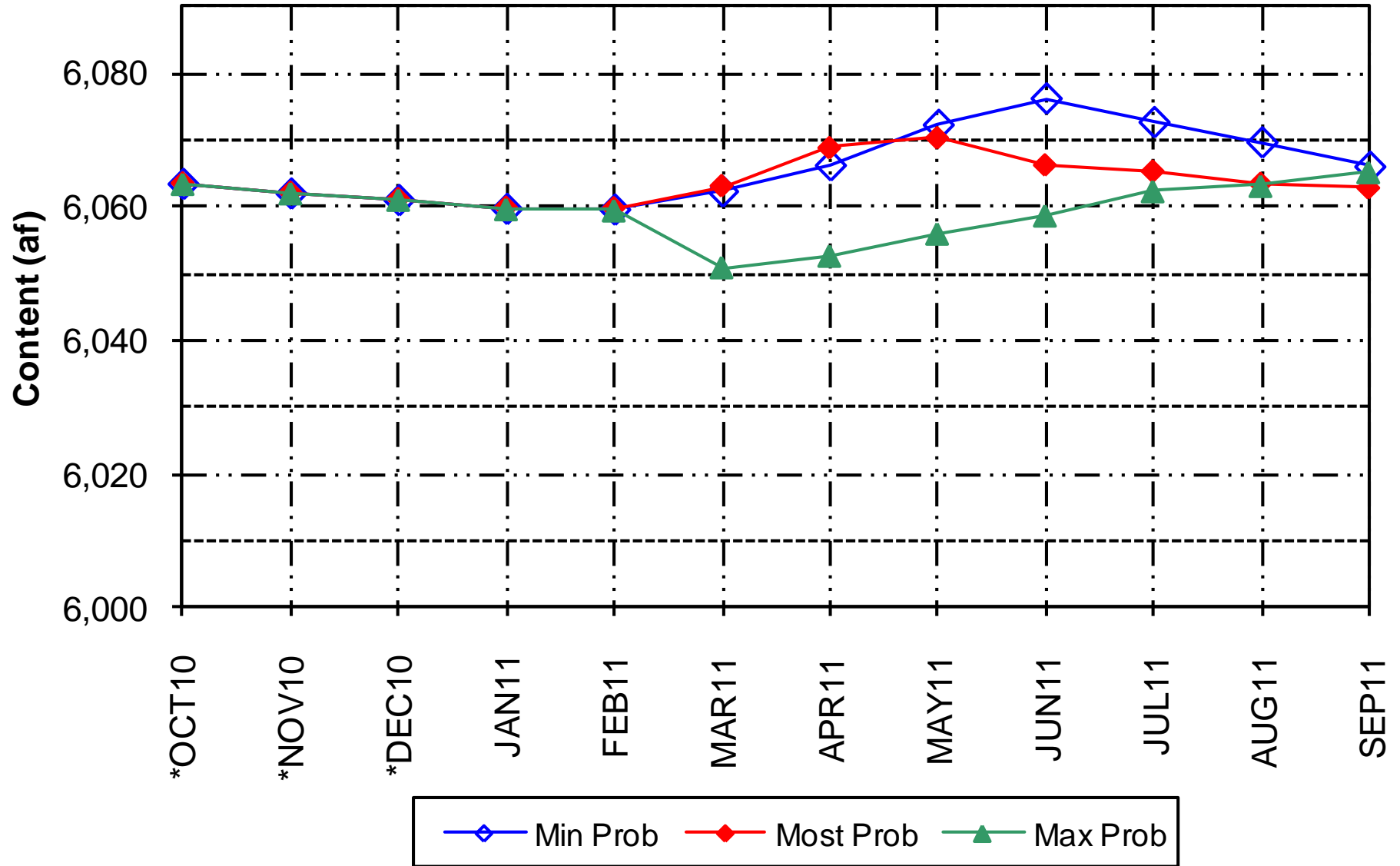
Release (af) as of January 2011 Mid Month Forecast



Content (af) as of January 2011 Mid Month Forecast

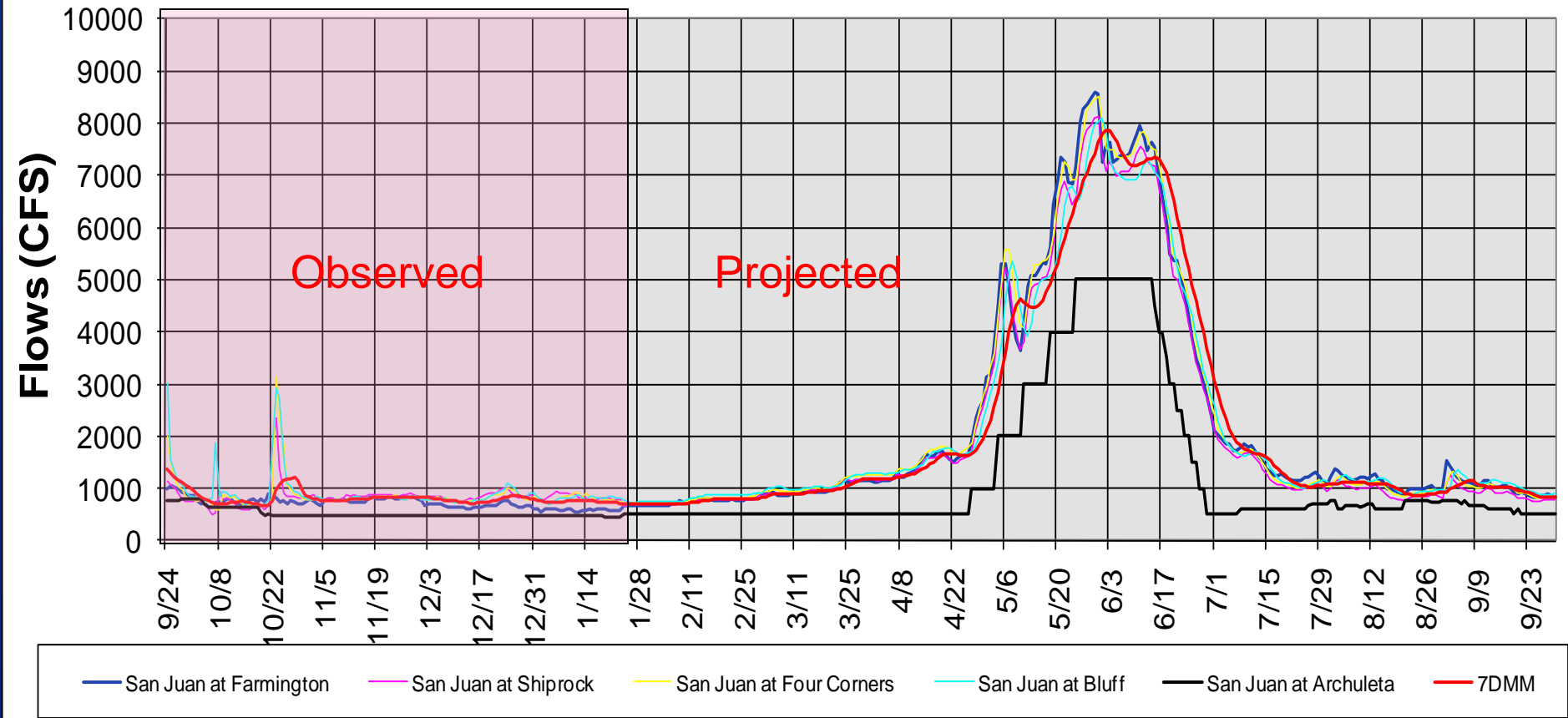


Elevation as of January 2011 Mid Month Forecast



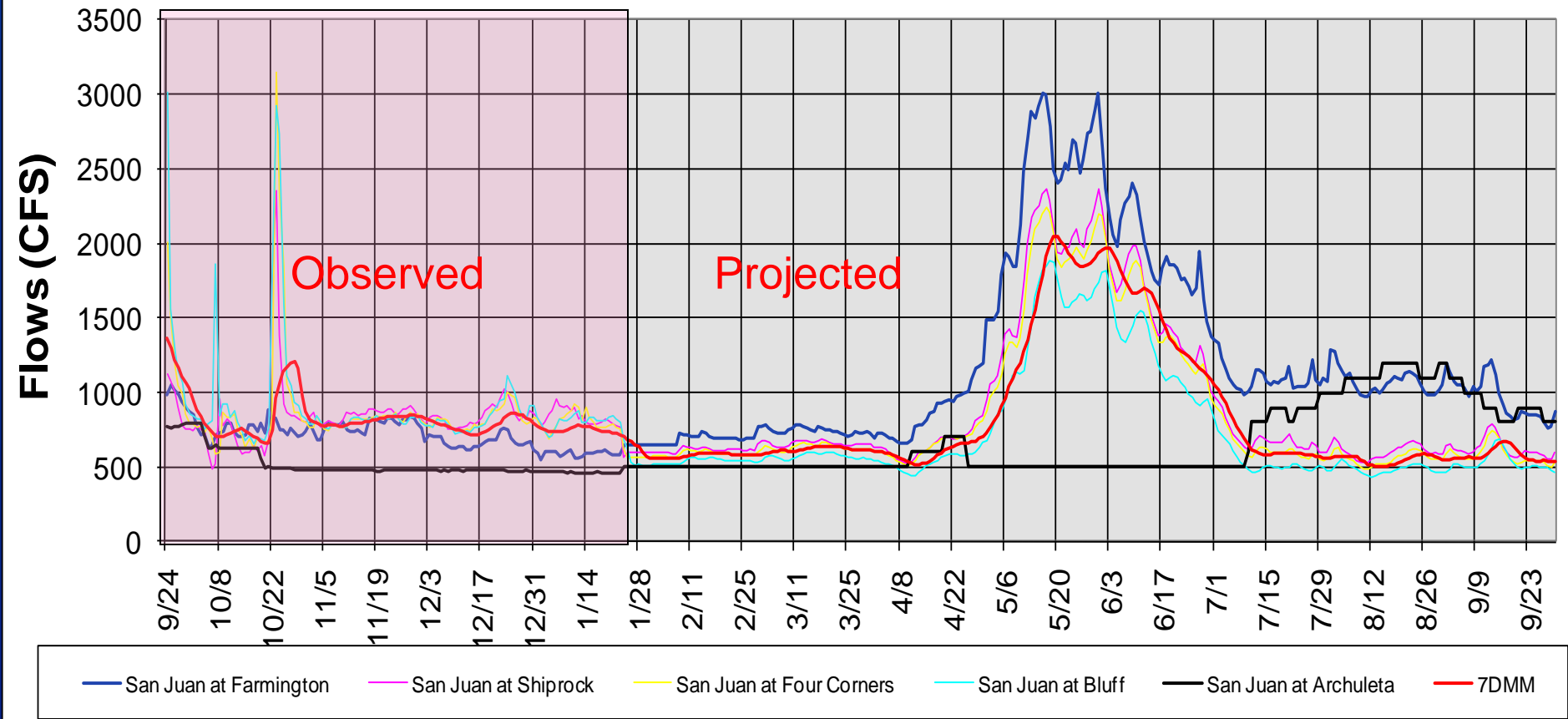
San Juan River Downstream Flows based on Most Probable Forecast and Median Losses

San Juan Flows based on Most Probable Forecasts for Navajo and the Animas River & Corresponding Navajo Operations based on that forecast



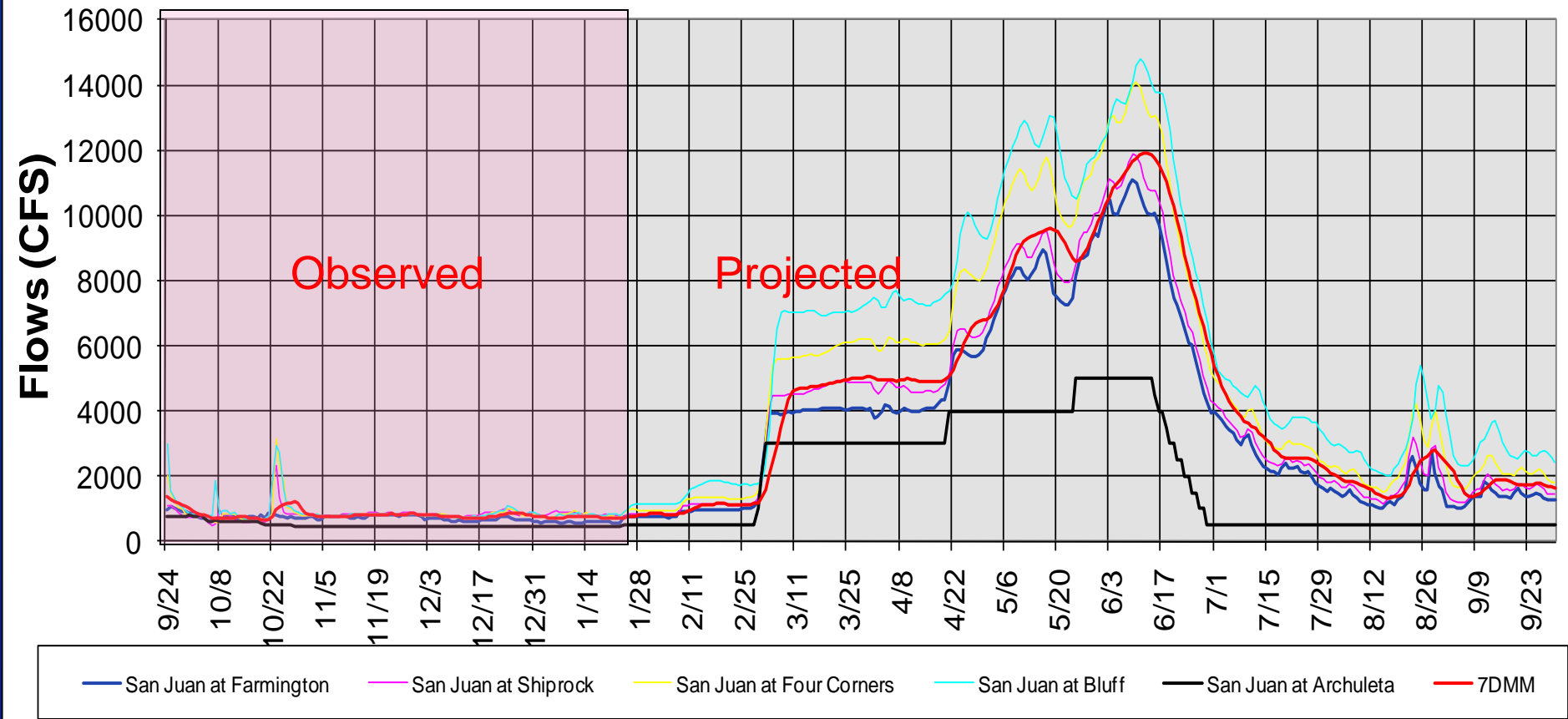
San Juan River Downstream Flows based on Min Probable Forecast and 90% Ex. Losses

San Juan Flows based on Minimum Probable Forecasts for Navajo and the Animas River & Corresponding Navajo Operations based on that forecast



San Juan River Downstream Flows based on Max Probable Forecast and 10% Ex. Losses

San Juan Flows based on Maximum Probable Forecasts for Navajo and the Animas River & Corresponding Navajo Operations based on that forecast



An aerial photograph of a reservoir with a winding path of water. The water is a light greenish-blue color. The surrounding landscape is a mix of dry, brownish hills and green vegetation. A road is visible at the top of the image. The text "Current Reservoir Status" is overlaid in the center in a large, white, bold font with a black outline.

Current Reservoir Status

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Navajo Current Conditions

(as of 1/23/11)

Elevation = 6060.0 (103% of Average)

Storage = 1,347,419 af (79% Full)

Inflow = 170 cfs (January Average)

Release = 500 cfs

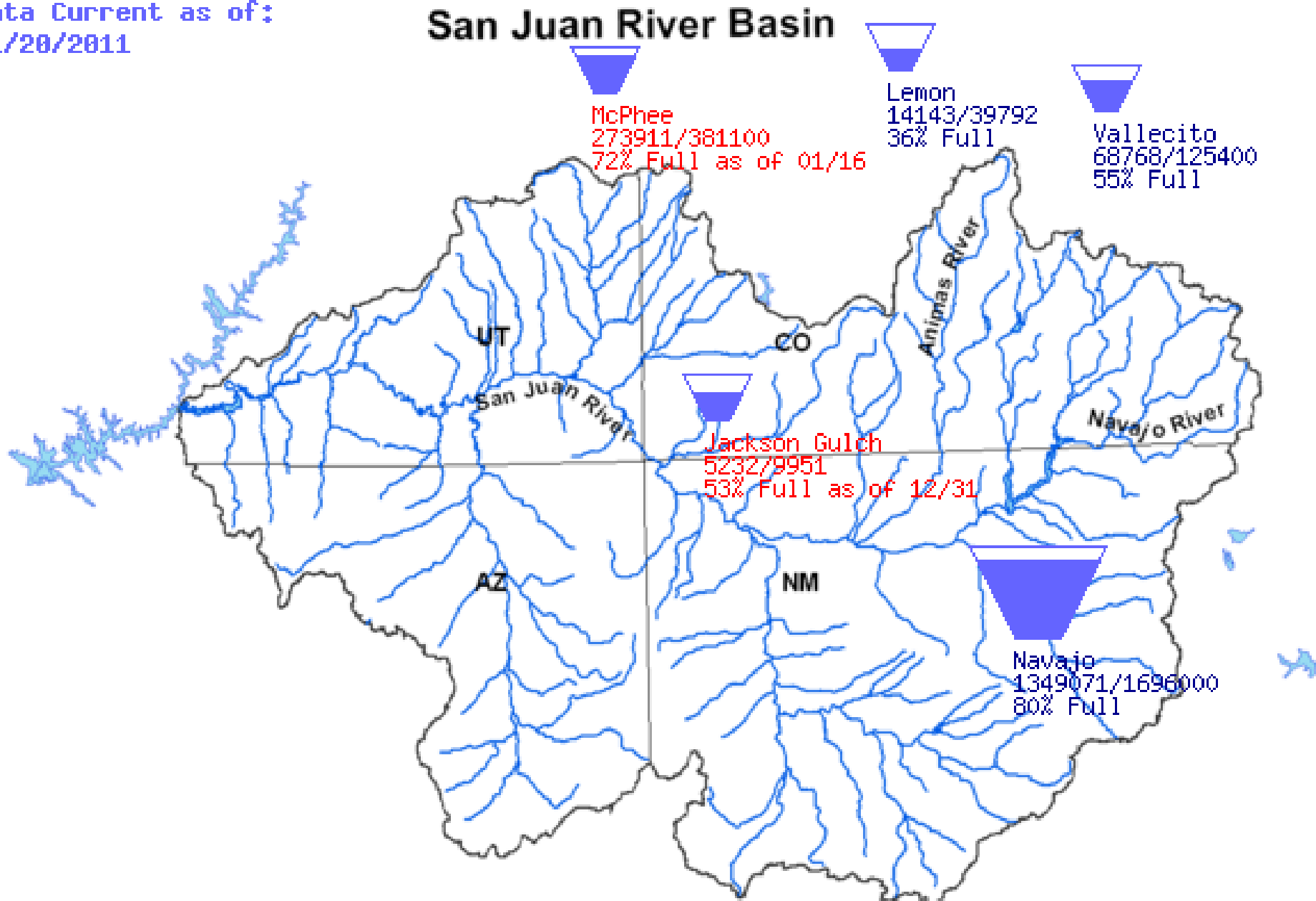
NIIP = Not currently diverting water

San Juan-Chama Diversion = None

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Nearby Reservoirs

Data Current as of:
01/20/2011



Nearby Reservoirs

(1/23/2011)

Vallecito

- Elevation = 7642.2 (55% Full, 109% of average)
- Storage = 69,030 af
- Release = 30 cfs
- Inflow = 79 cfs (January Average)

Lemon

- Elevation = 8095.5 (36% Full, 67% of average)
- Storage = 14,146 af
- Release = 11 cfs
- Inflow = 12 cfs (January Average)

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Animas-La Plata Project

- No pumping in January, first half of February
- Reservoir is 2/3 Full (79,500 af stored)
- Reservoir expected to fill this summer
- Navajo Nation Municipal Pipeline is currently under construction



Navajo Dam Maintenance Activities

Future Navajo Dam Maintenance Activities:

1. Muck-out Stilling Basin
2. 6x13 Emergency Gate Bonnet
Maintenance

- Will occur after Stilling Basin muck-out (Fall 2011)
- Flow will be diverted through auxiliary gate for 1 month to 6 weeks

Stilling Basin Update

- Contract has been awarded to DLM (ABQ)
- Waiting for submittals from contractor
- Notice to proceed has not been given
- Start date is still uncertain
- Estimate is 2-3 weeks to complete
- Release will remain at 500 cfs during work
- Cofferdam (aquadam) approach will provide minimum disturbance
- NM Game & Fish will remove any remaining fish in stilling basin prior to dewatering
- Anticipate no impacts to fishery

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Fish & Wildlife Service
San Juan RIP Update

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Reports from other Agencies

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The background consists of several overlapping, slightly crumpled white papers scattered across a light gray surface. Large, bold, black question marks are printed on the papers, some partially obscured by the folds and other papers. The overall composition is centered around the theme of questions and inquiry.

Questions from
the Audience

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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Ruth Swickard

970-385-6523, rswickard@usbr.gov

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Summary

- Several storms in December brought the snowpack to as high as 136% of average, current snowpack is just above average.
- Fall and early winter inflows have been below normal
- Most Probable April – July Inflow Forecast is 106% of average
- Historic snowpack and climate outlooks suggest less inflow
- Based on the most probable forecast, a full hydrograph of 21 days at 5000 cfs with weeklong ramp-ups is scheduled
- If the inflow forecast decreases, the spring peak will be less
- Downstream river flows are expected to be near normal
- Likely Minimum (Base) Release = 500 cfs before and after the spring peak release
- Target Baseflow is 500 -1000 cfs in Critical Habitat

- Next Operations Meeting: April ?, 2011



Thanks For Coming!

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