RECLAMATION

Managing Water in the West

Navajo Unit Operations
January 27, 2009
Coordination Meeting

U.S. Department of the Interior
Bureau of Reclamation

Agenda

- Welcome
- Review of Past Operations
- Operations for 2009
- Recommendations for San Juan River Administration and Operation
- Navajo Dam Maintenance Activities
- Fish & Wildlife Service/San Juan RIP Update
- Reports from other Agencies
- Questions from Audience
- How To Access Information
- Close

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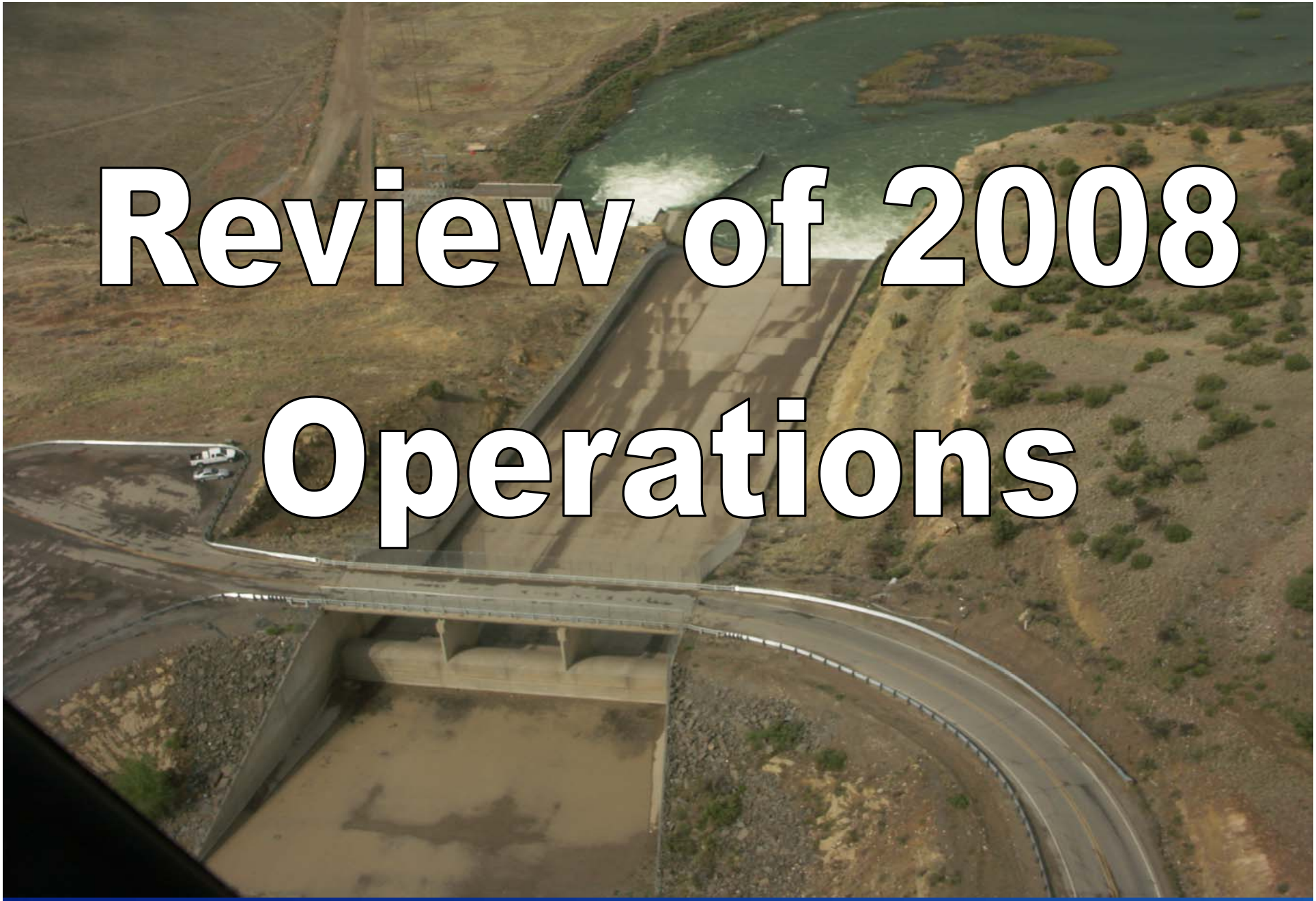

Review of 2008 Operations

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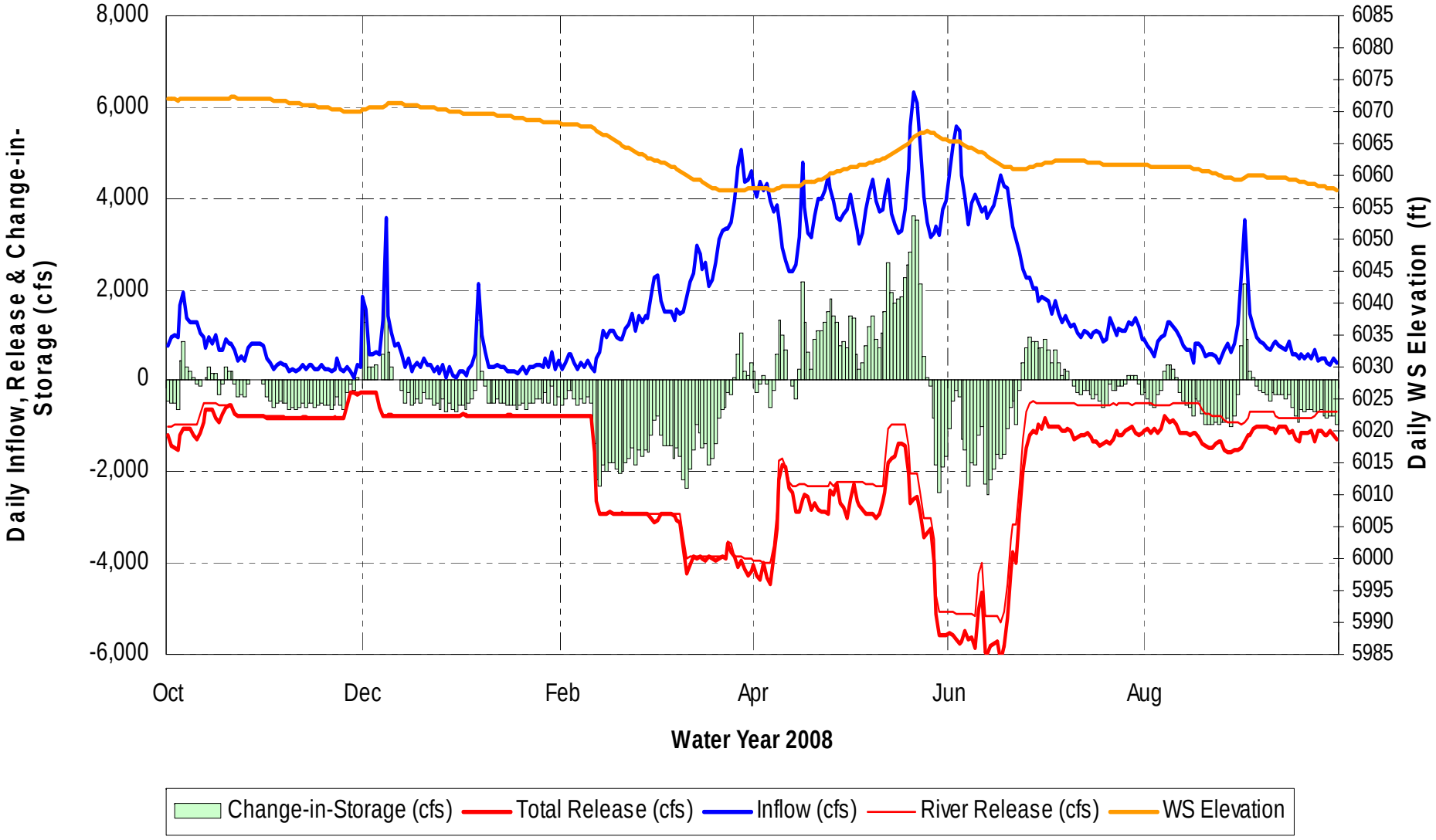

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Chasing the Target Base Flow

Dates	Reservoir Release
7/2 – 8/19	500 cfs Base
8/19 – 8/26	700 cfs
8/26 – 9/2	900 cfs
9/2 – 9/11	700 cfs
9/11 – 9/23	800 cfs
9/23 – 10/7	700 cfs
10/7 - Current	500 cfs Base

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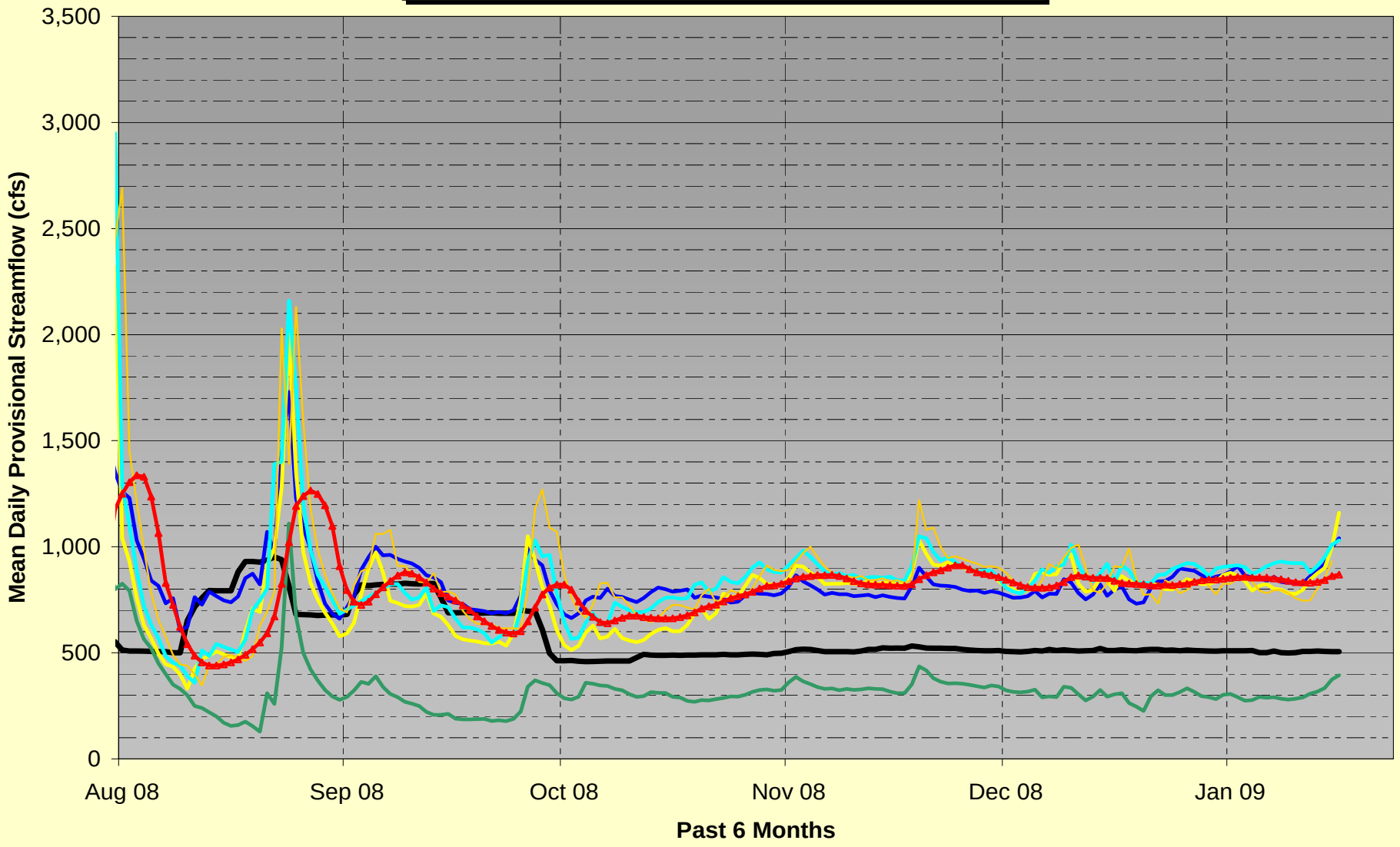
USGS PROVISIONAL MEAN DAILY STEAMFLOW
SAN JUAN RIVER STATIONS

retrieved: 2009-01-26



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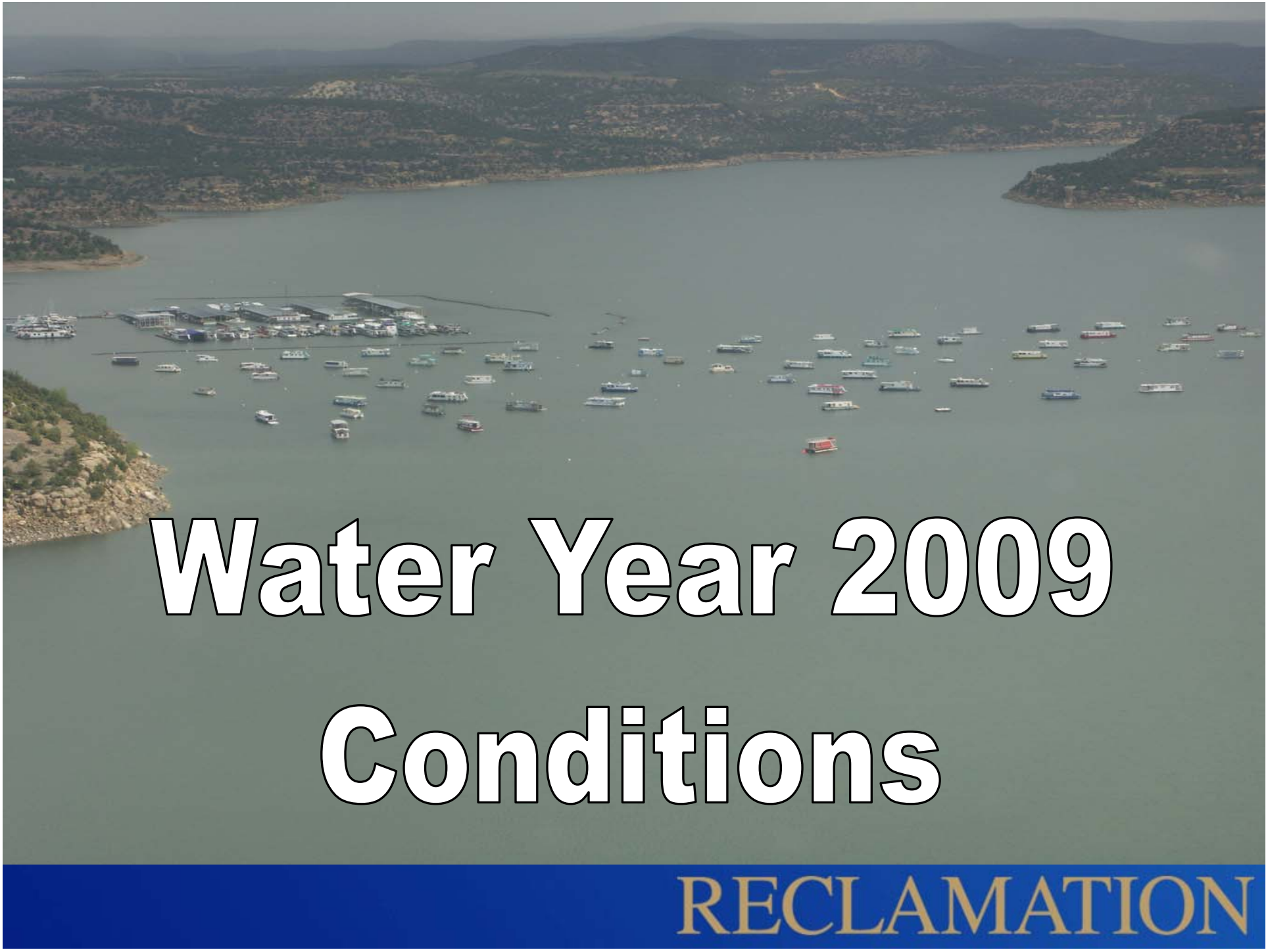

Water Year 2009 Conditions

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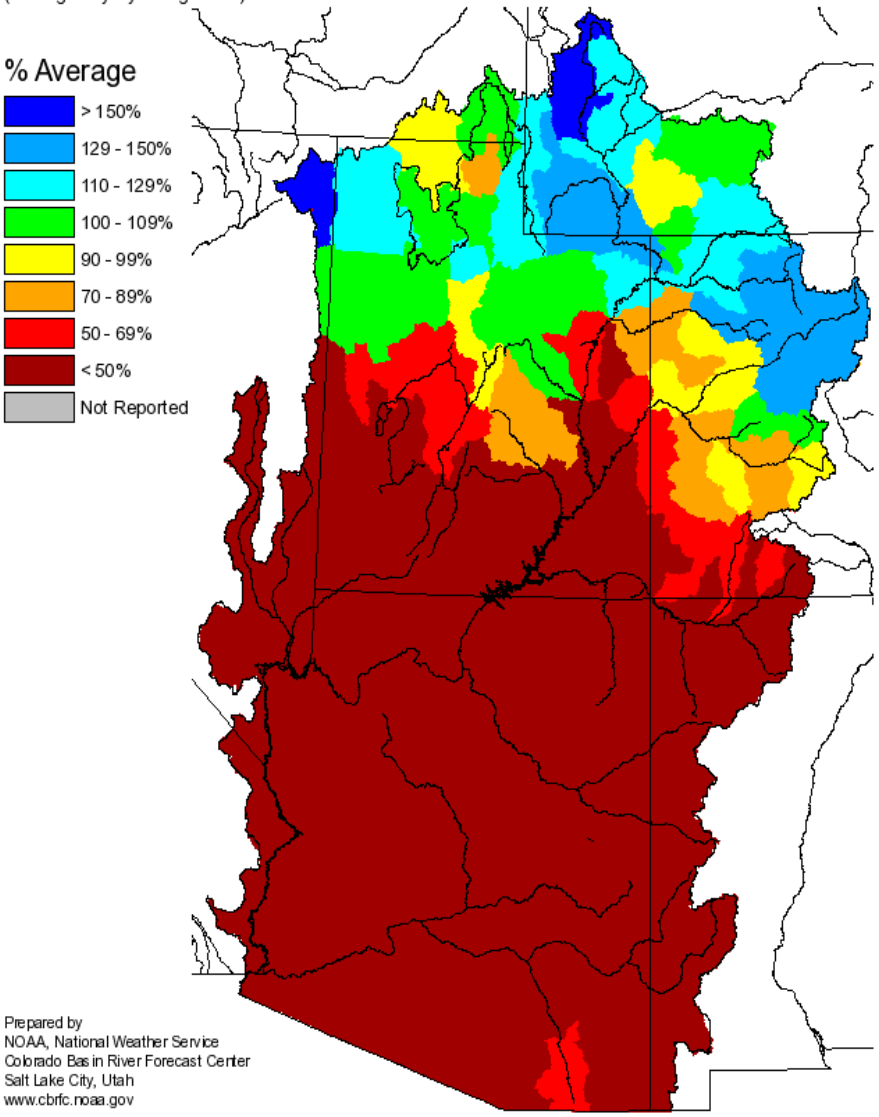
Monthly Precipitation for October 2007

(Averaged by Hydrologic Unit)



Prepared by
NOAA, National Weather Service
Colorado Basin River Forecast Center
Salt Lake City, Utah
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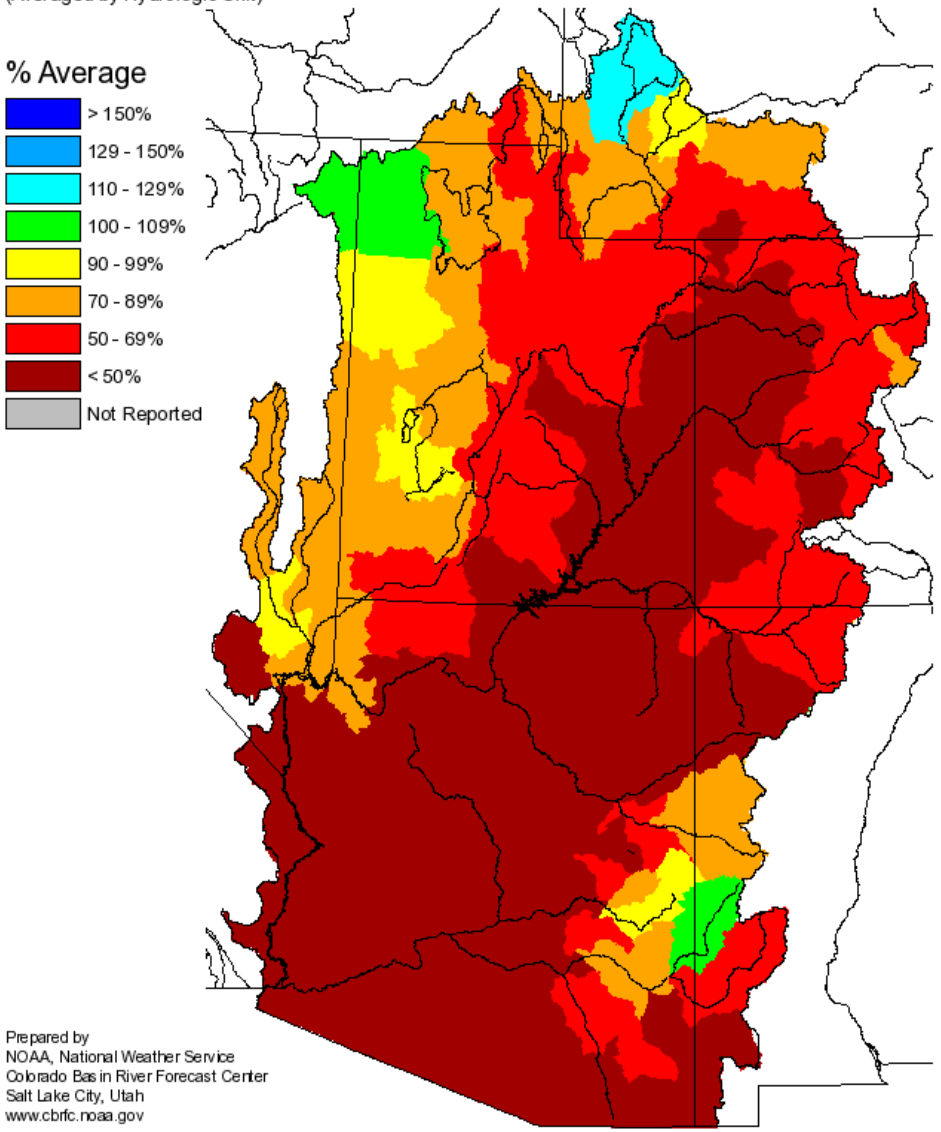

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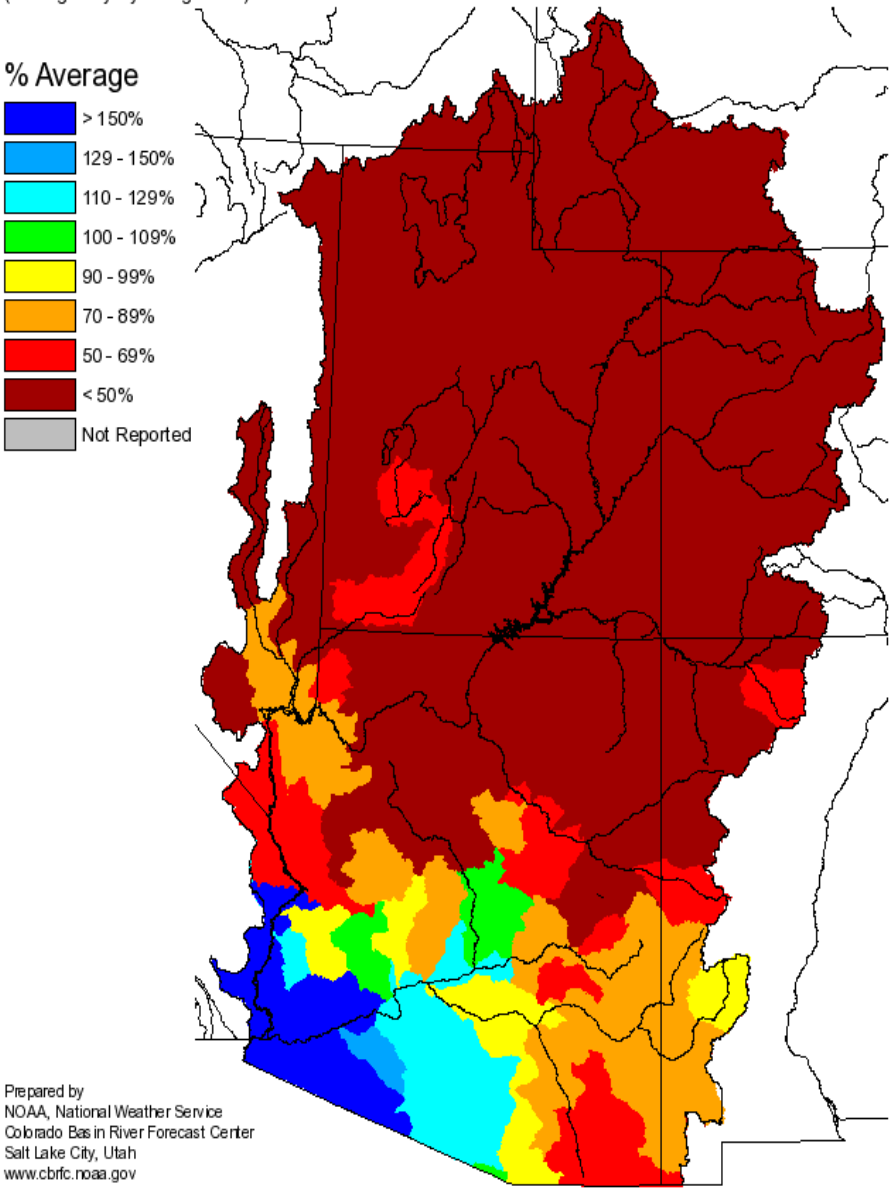

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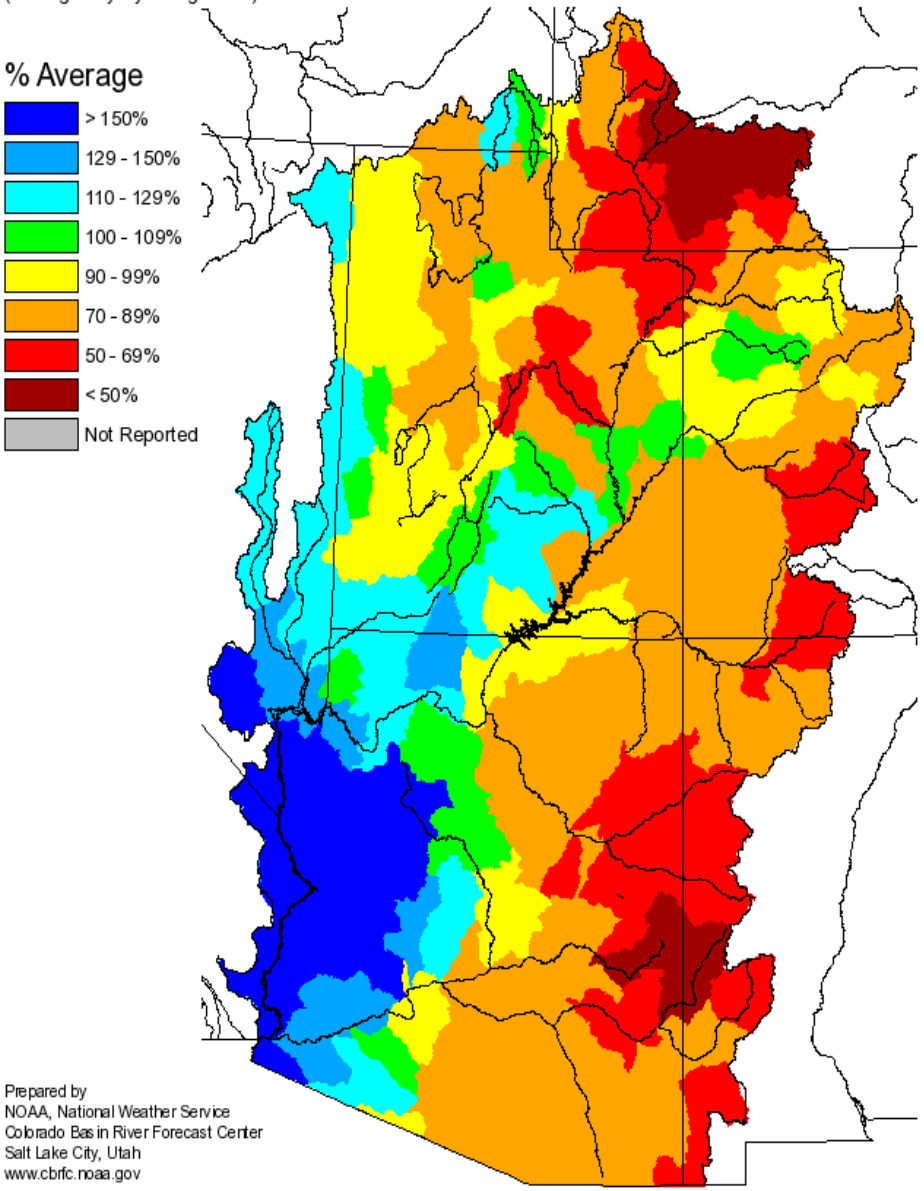

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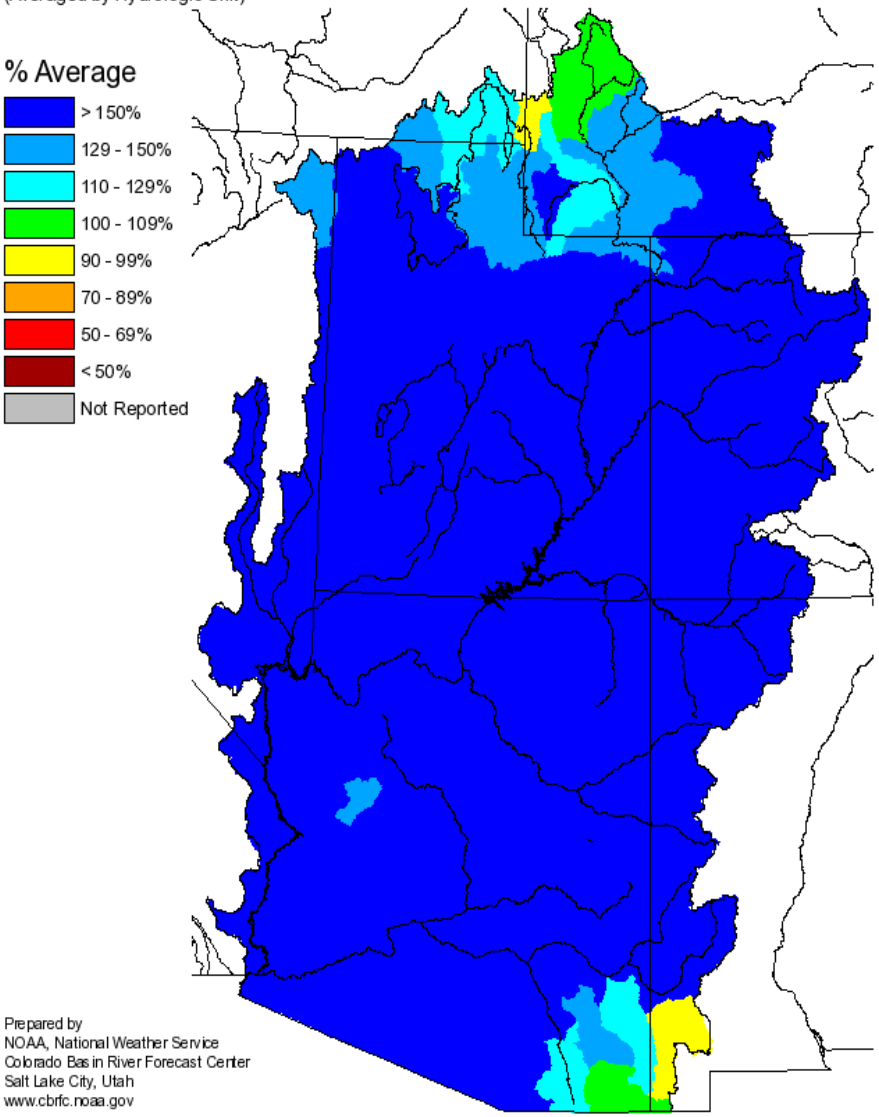

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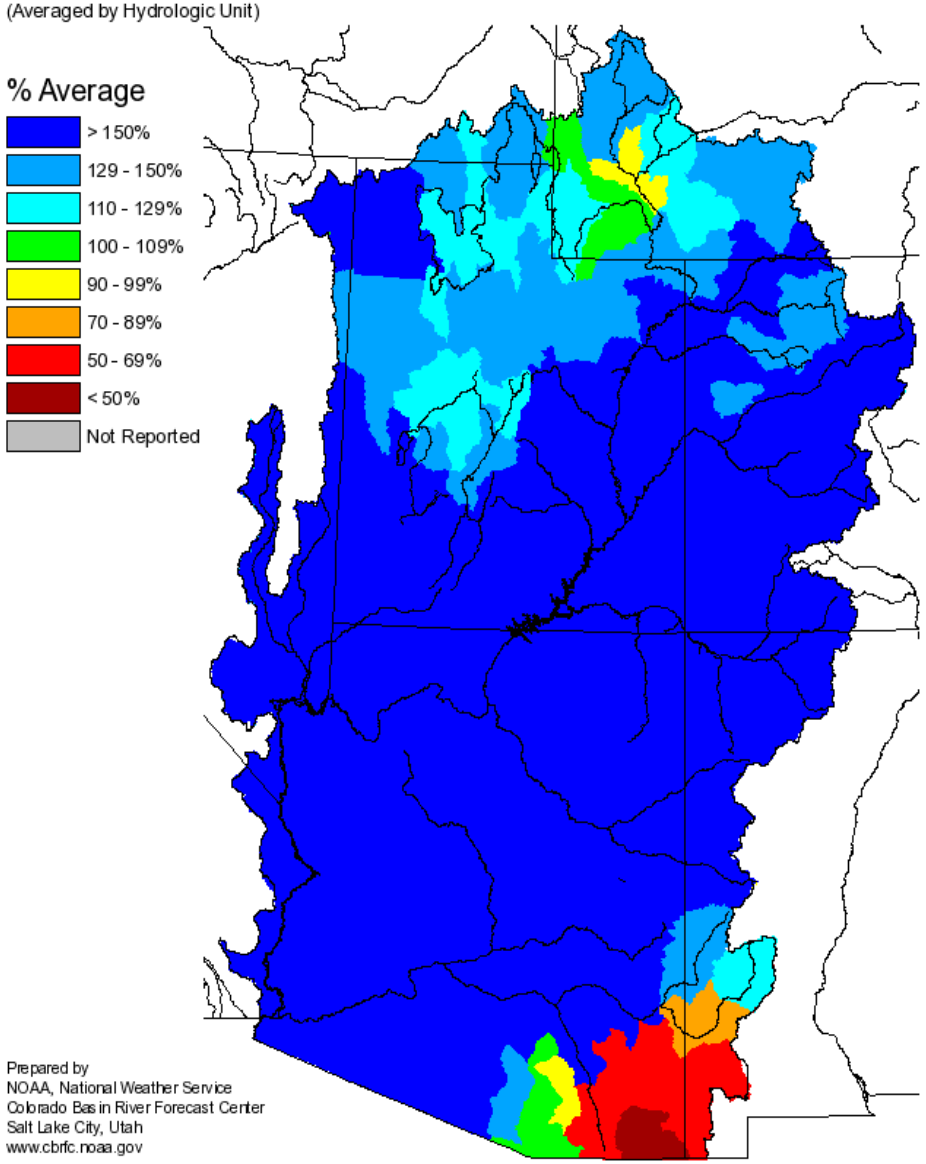

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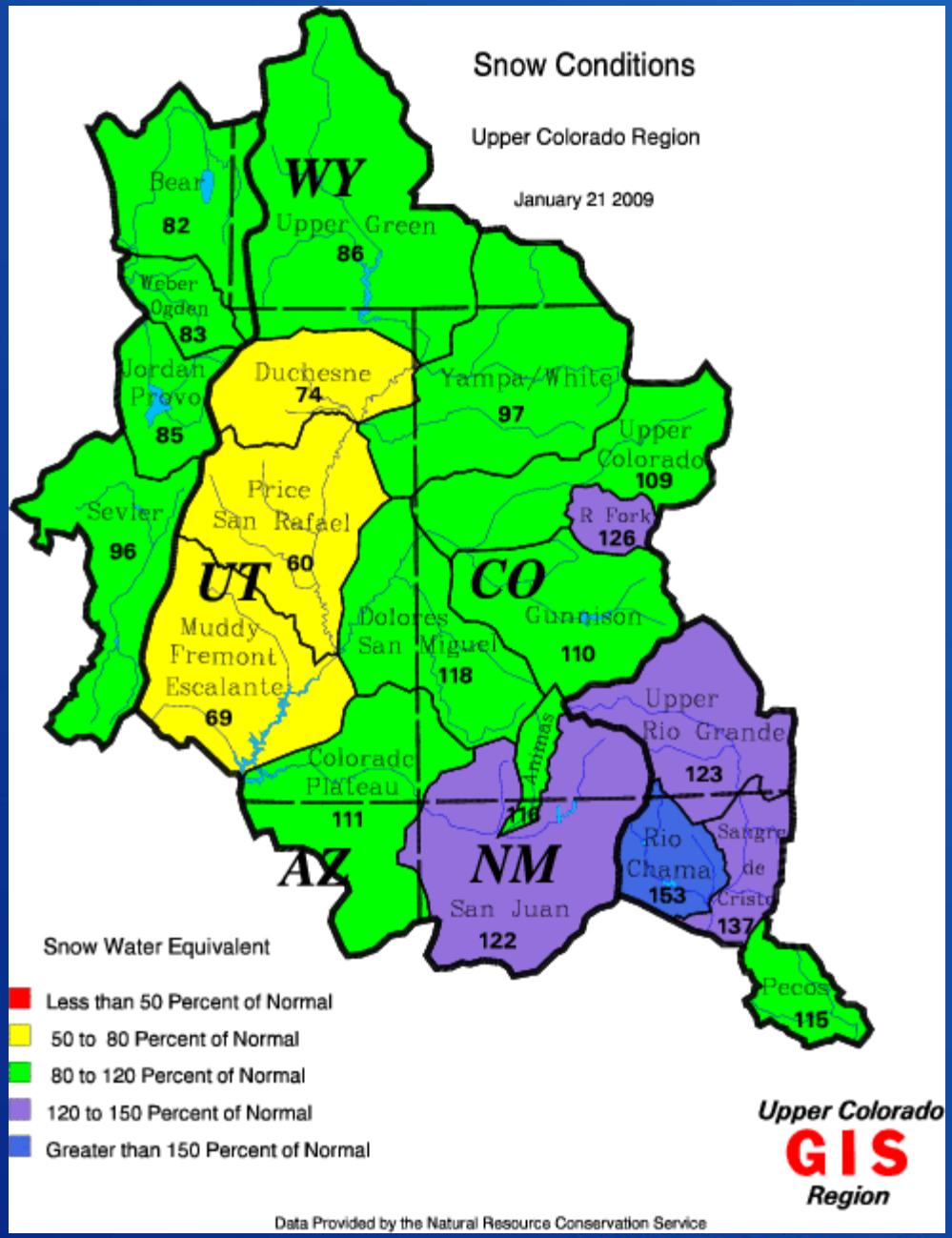

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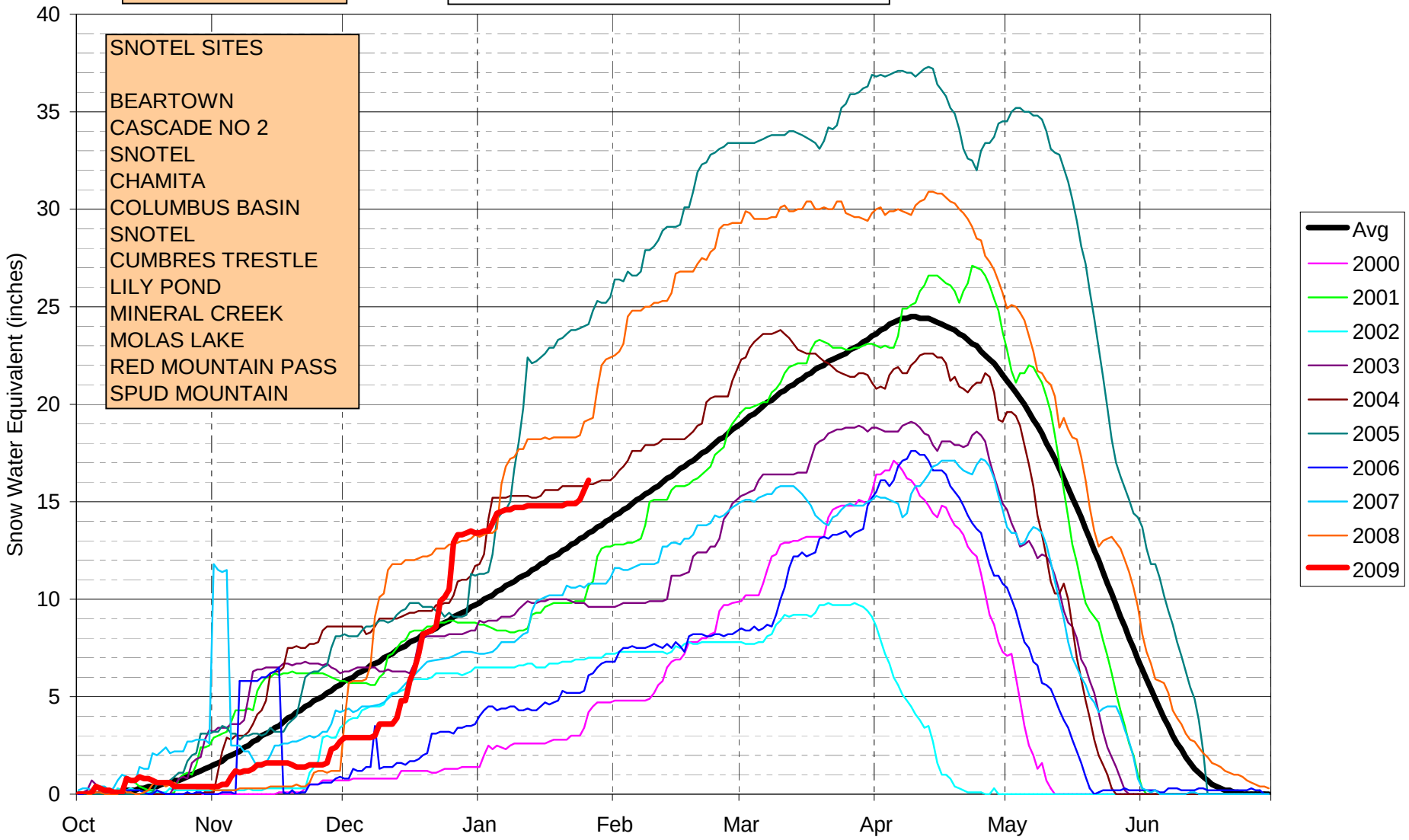
San Juan Basin Multiple Station Snotel Plot

January 26, 2009

Current Snowpack is (16.1/13.1) = 123% of Average



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Water Year 2009 (as of 1/26/2009)
Navajo Inflows & San Juan Basin Snowpack

EOM	Inflow (af)	% Average	SJ SWE (in.)	% Average
October	34,188	68%	0.4	20%
November	16,996	48%	2.7	44%
December	16,311	69%	13.4	135%
January (Current)	13,307	84%	16.1	123%


Water Year 2009
Forecasts
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Mid January 2009 Forecast
Navajo Reservoir Unregulated
April-July Inflow Volume

	Inflow (af)	% of Average	2008 Forecast
Most Probable	900,000	117%	1,030,000 (133%)
Minimum Probable	540,000	70%	635,000 (82%)
Maximum Probable	1,390,000	180%	1,560,000 (202%)

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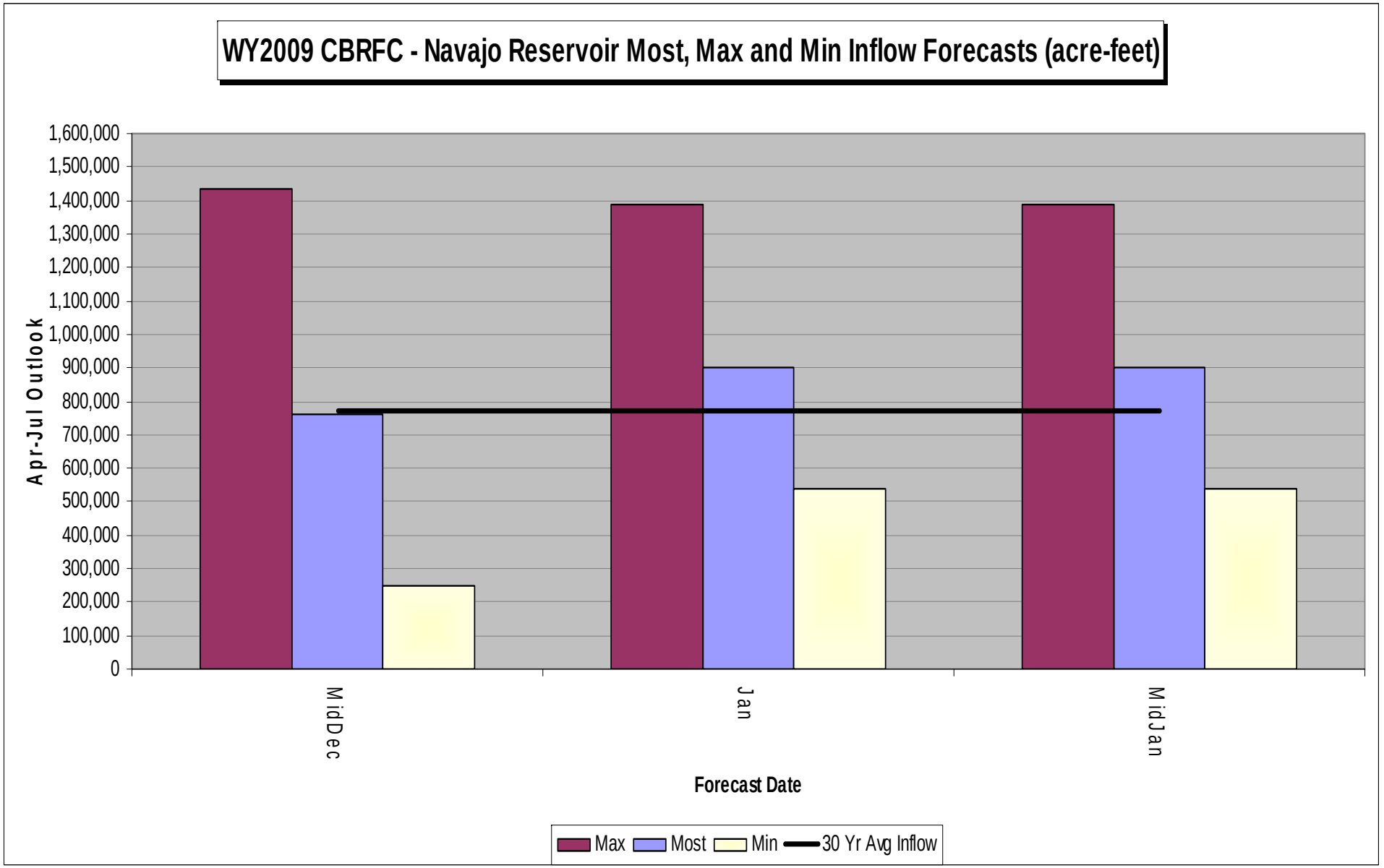
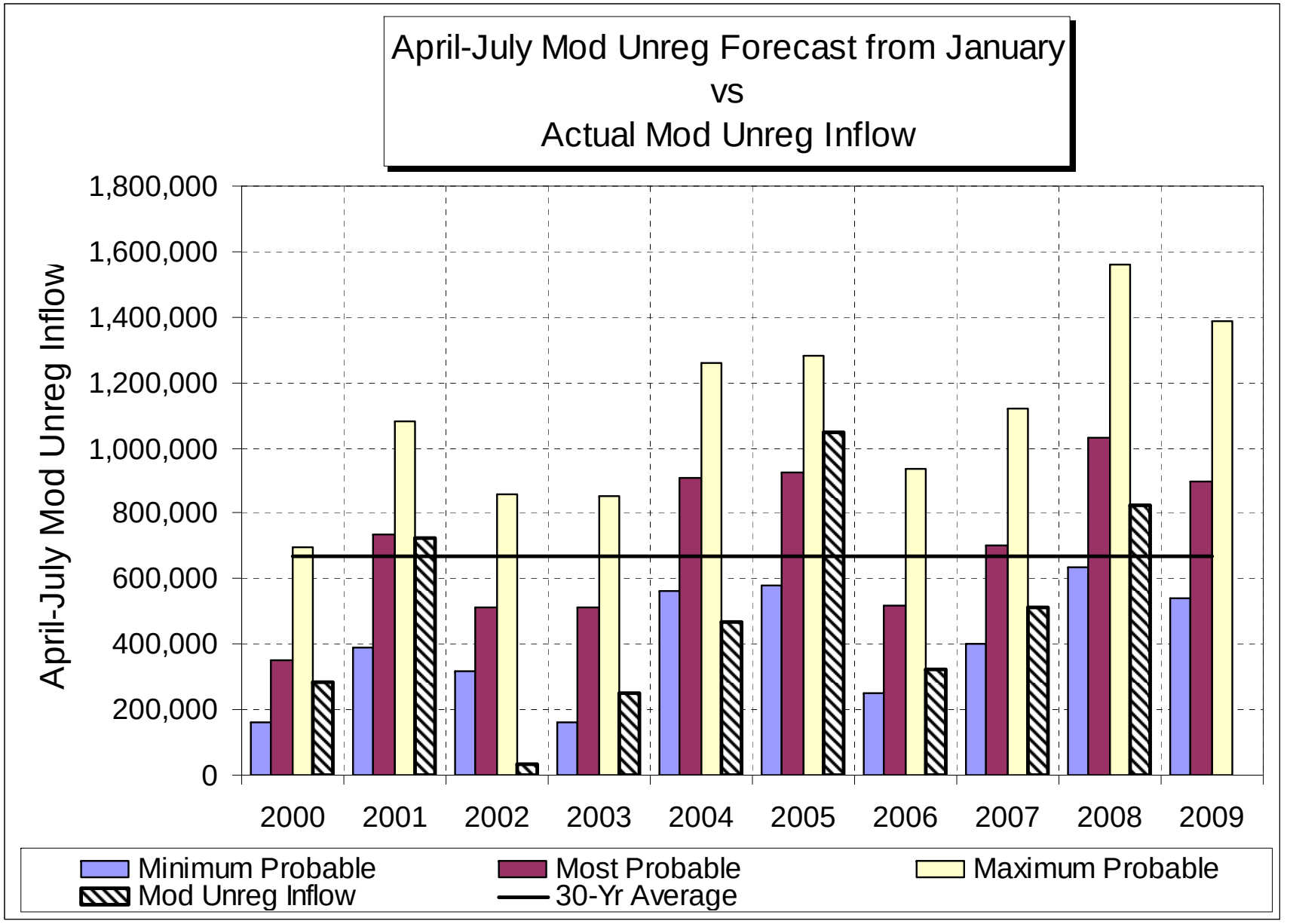

WY2009 CBRFC - Navajo Reservoir Most, Max and Min Inflow Forecasts (acre-feet)
1,600,000
1,500,000
1,400,000
1,300,000
1,200,000
1,100,000
1,000,000
900,000
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
Apr-Jul Outlook
MidDec
Jan
MidJan
Forecast Date
Max
Most
Min
30 Yr Avg Inflow


April-July Mod Unreg Forecast from January
vs
Actual Mod Unreg Inflow
April-July Mod Unreg Inflow
1,800,000
1,600,000
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
Minimum Probable
Most Probable
Maximum Probable
Mod Unreg Inflow
30-Yr Average

Water Year 2009 Operations

- For WY2009, the reservoir is at a more manageable elevation to handle variable conditions and large fluctuations in the forecast
- 500 cfs base release until Spring Peak Release
- Under the current Most Probable Forecast, the Maximum Hydrograph as defined by the Flow Recommendations will be released.
- It is only January, and a lot can still change!

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2009 Spring Release Decision Tree Values Based on the MidJan Forecast for the Most, Minimum and Maximum Probable Inflows

	Flow Chart Parameters	Most Probable	Minimum Probable	Maximum Probable
1	***Available Water** (acre-feet):	783,000	377,000	1,333,000
2	****Spill** (acre-feet):	82,000	(324,000)	631,000
3	**Fish Releases:**			
	2006 140,000 (acre-feet)			
	2007 233,000 (acre-feet)			
	2008 744,000 (acre-feet)			
4	**Was there a perturbation?** No			
5	**Spring Release Volume** (acre-feet) (above the base flow)	118,000	-	356,000

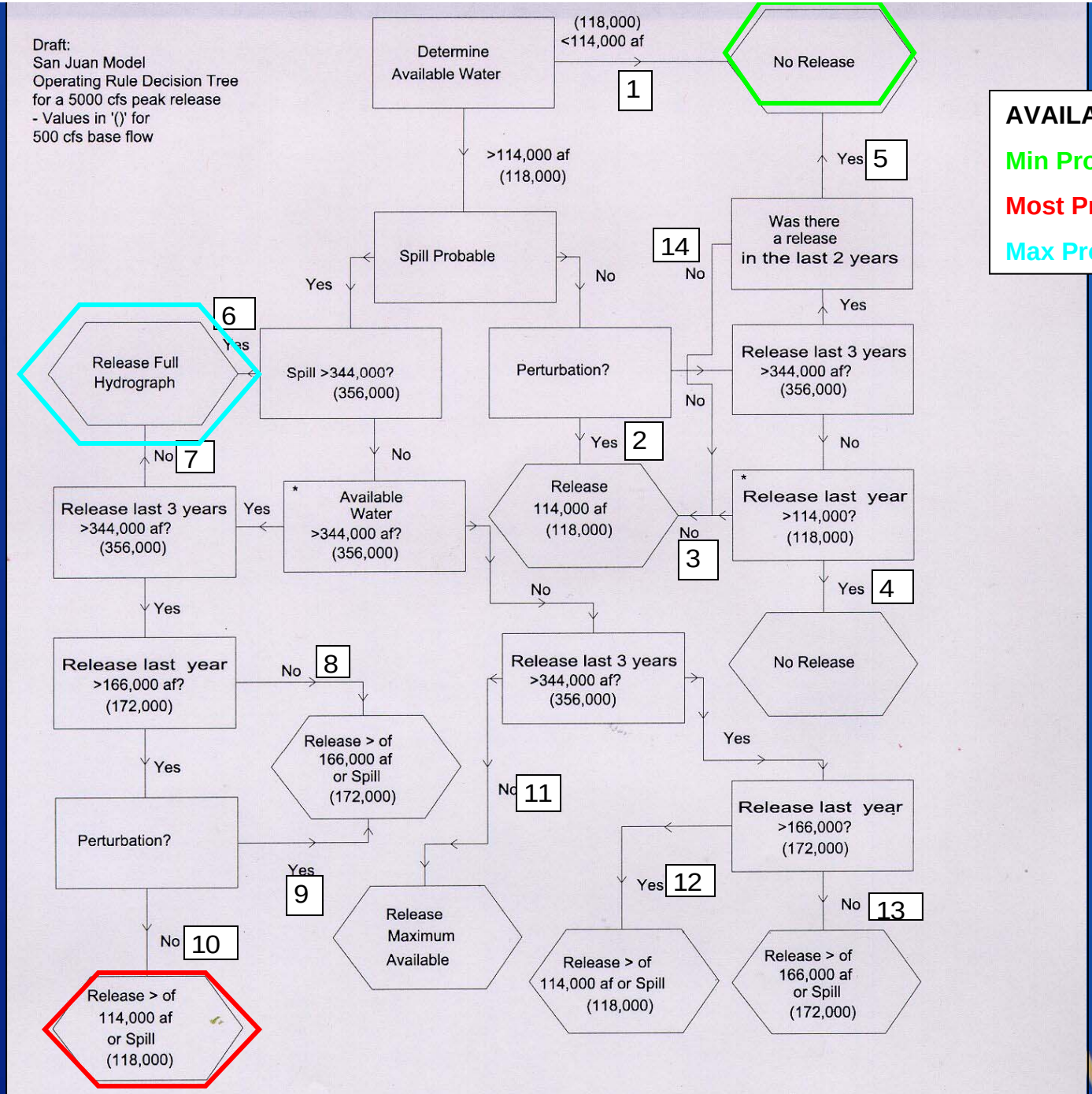
* Available Water = Predicted Inflow + Available Storage -NIIP Diversions - EVAP - Base Release

where: Available Storage = End of March Storage - Minimum Carryover Storage (1,000,000 af)

** Spill = Predicted inflow - NIIP Diversions - Base Release - EVAP - Remaining Storage

(Set to zero if computed value goes negative)

where: Remaining Storage = Maximum Content (Elev 6082) - End of March Content



AVAILABLE WATER		PATH
Min Prob:	377,000 af	#5
Most Prob:	783,000 af	#10
Max Prob:	1,333,000 af	#6

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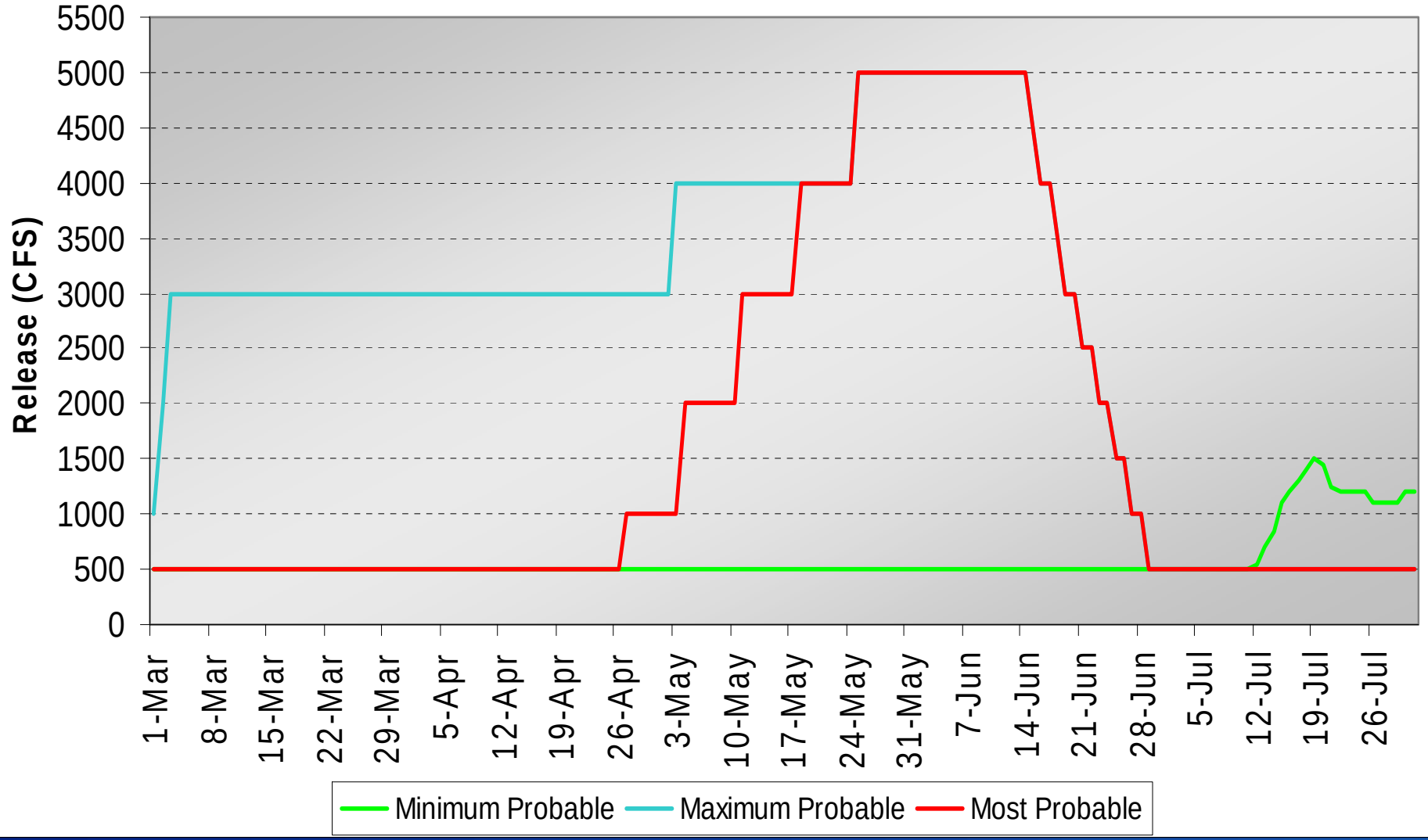
Spring Peak Hydrographs for WY2009 as of the January Mid Month Forecast



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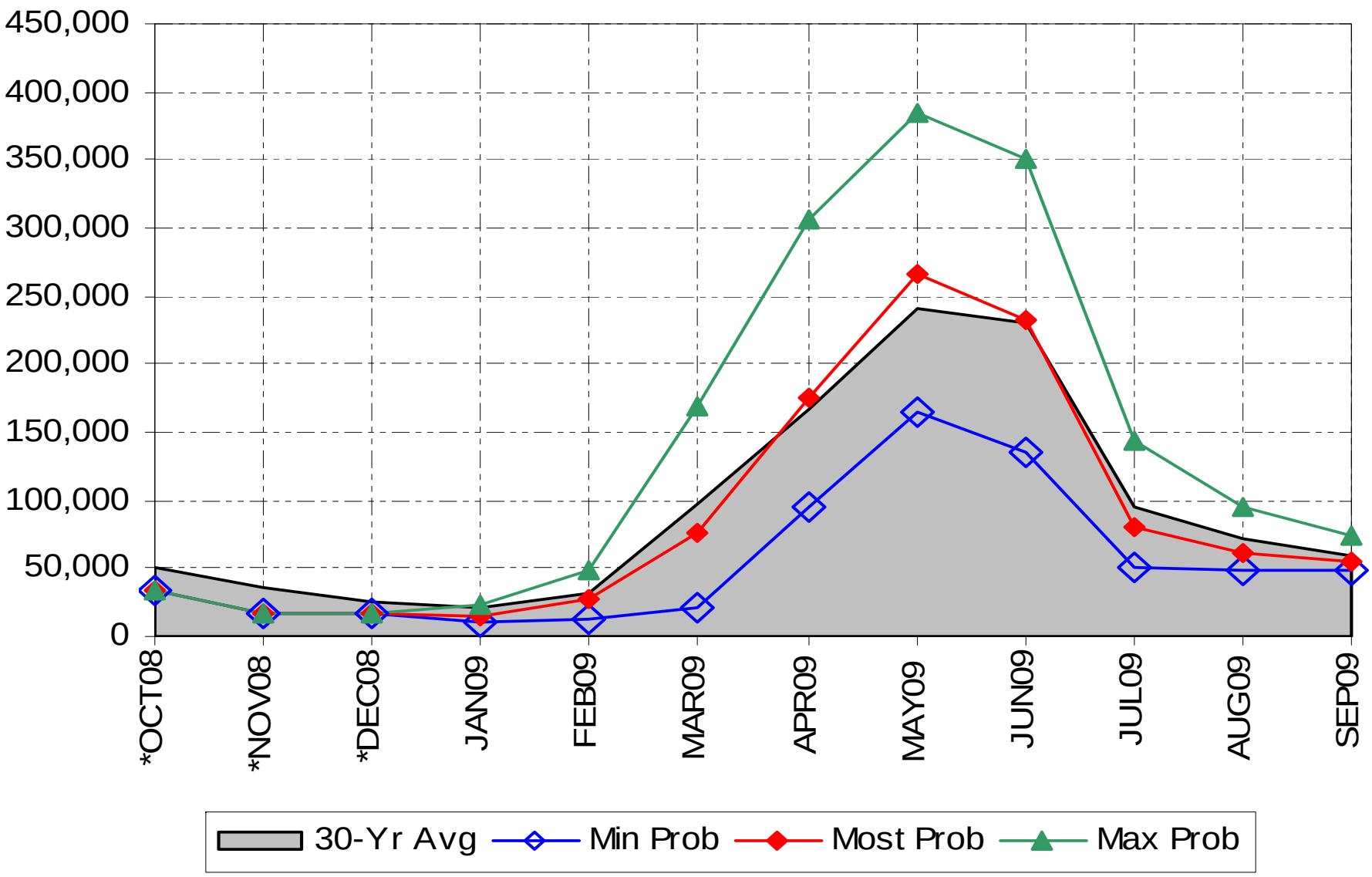
Inflow (af) as of January 2009 Mid Month Forecast



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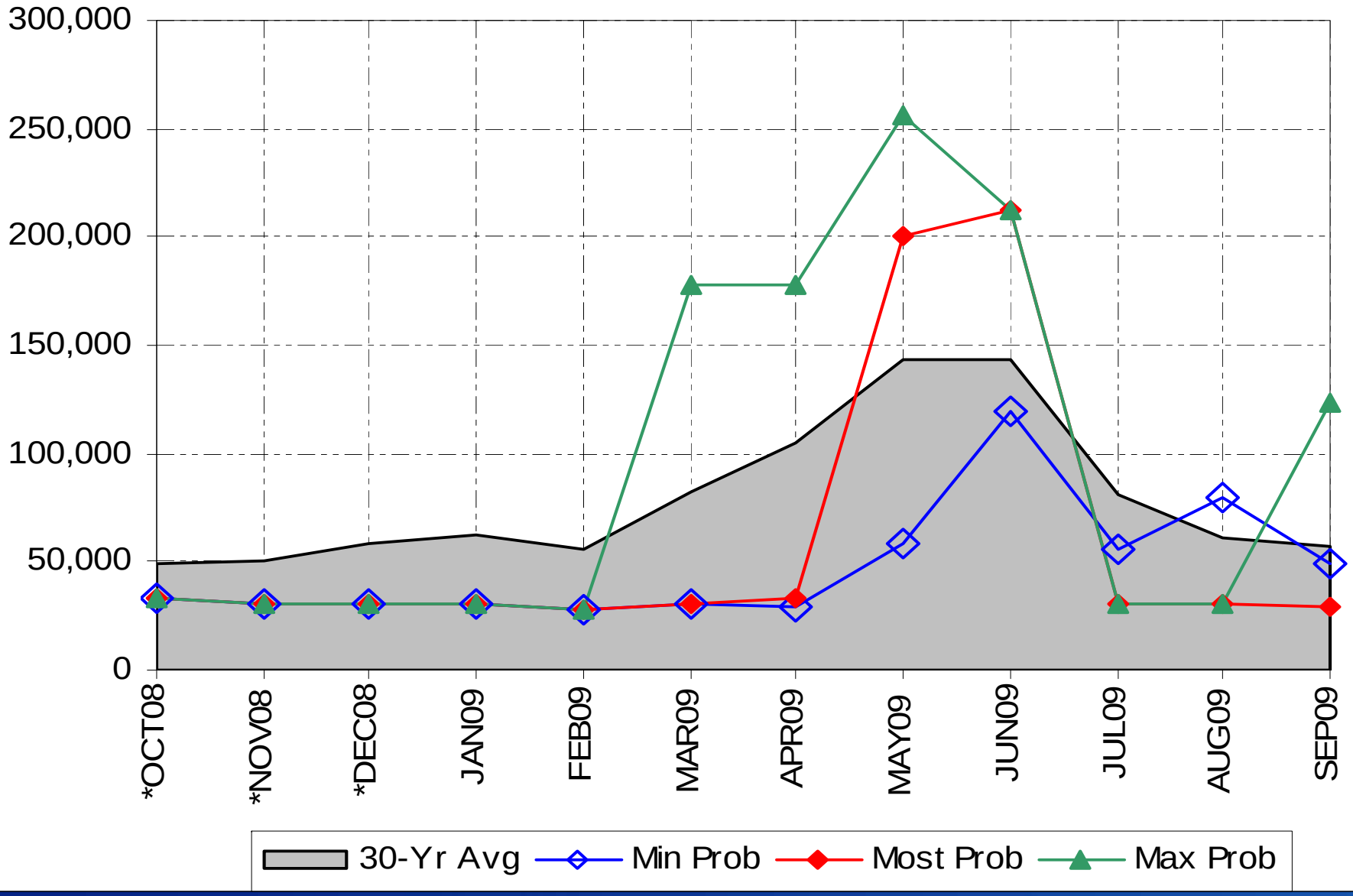
Release (af) as of January 2009 Mid Month Forecast



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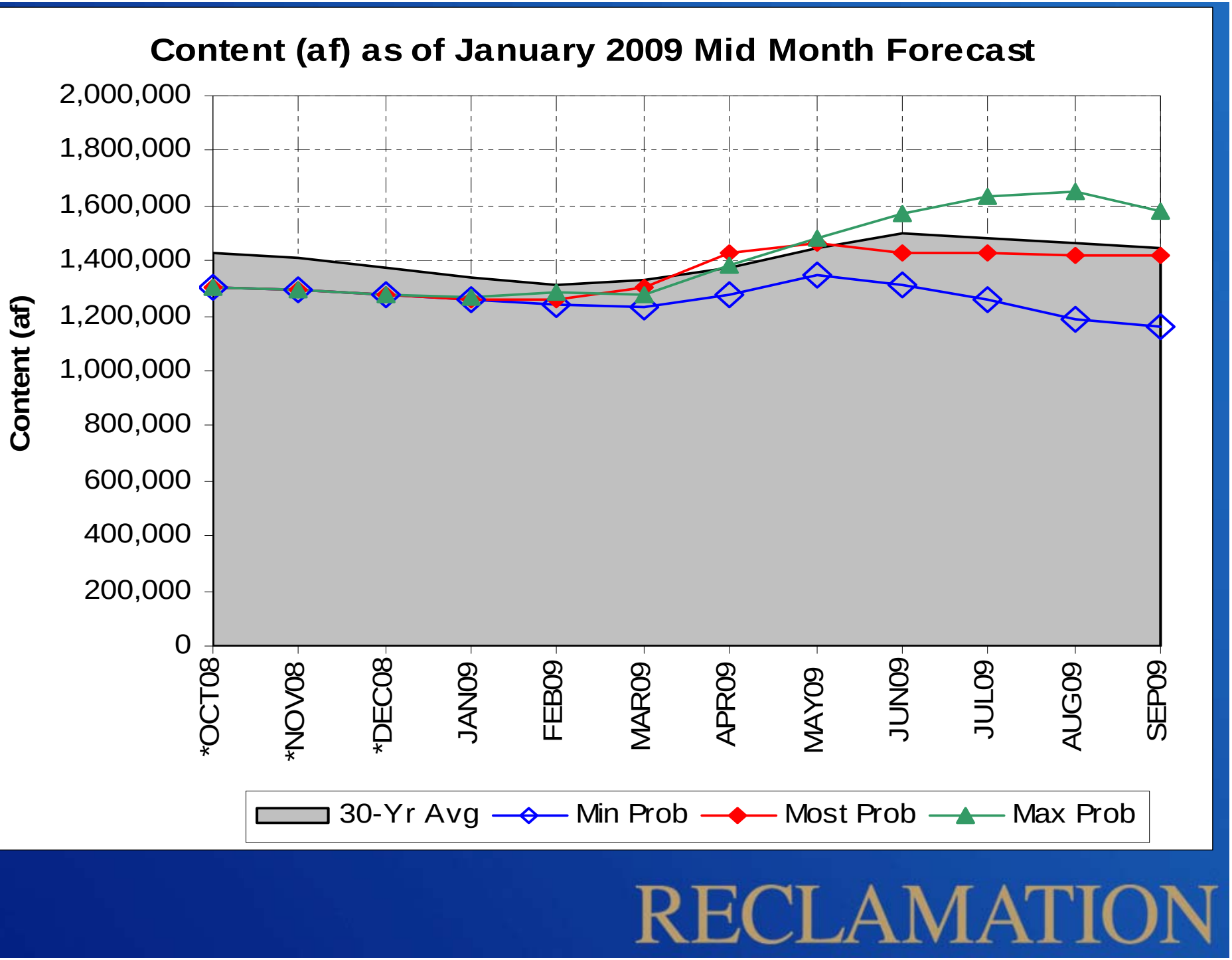

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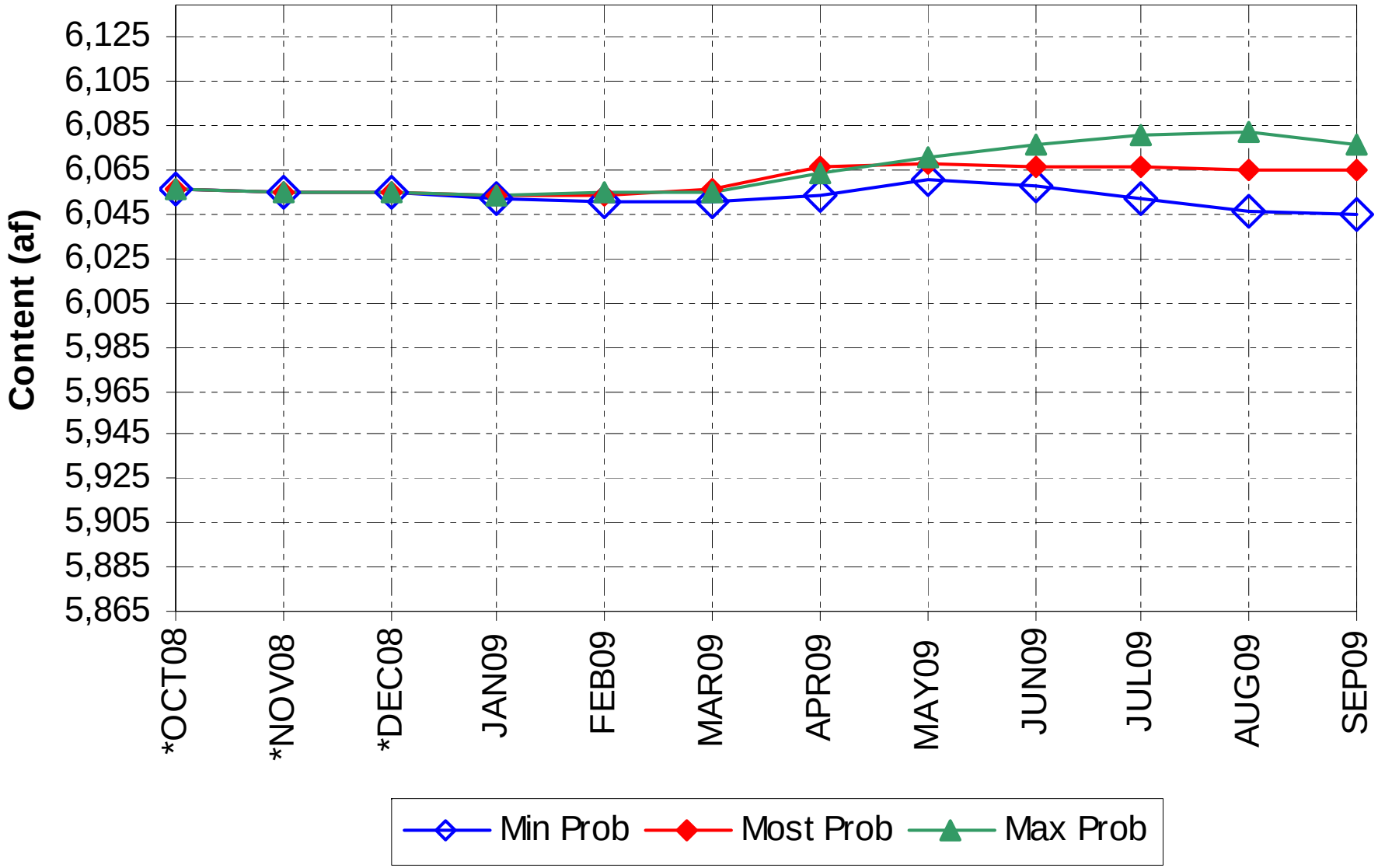
Elevation as of January 2009 Mid Month Forecast



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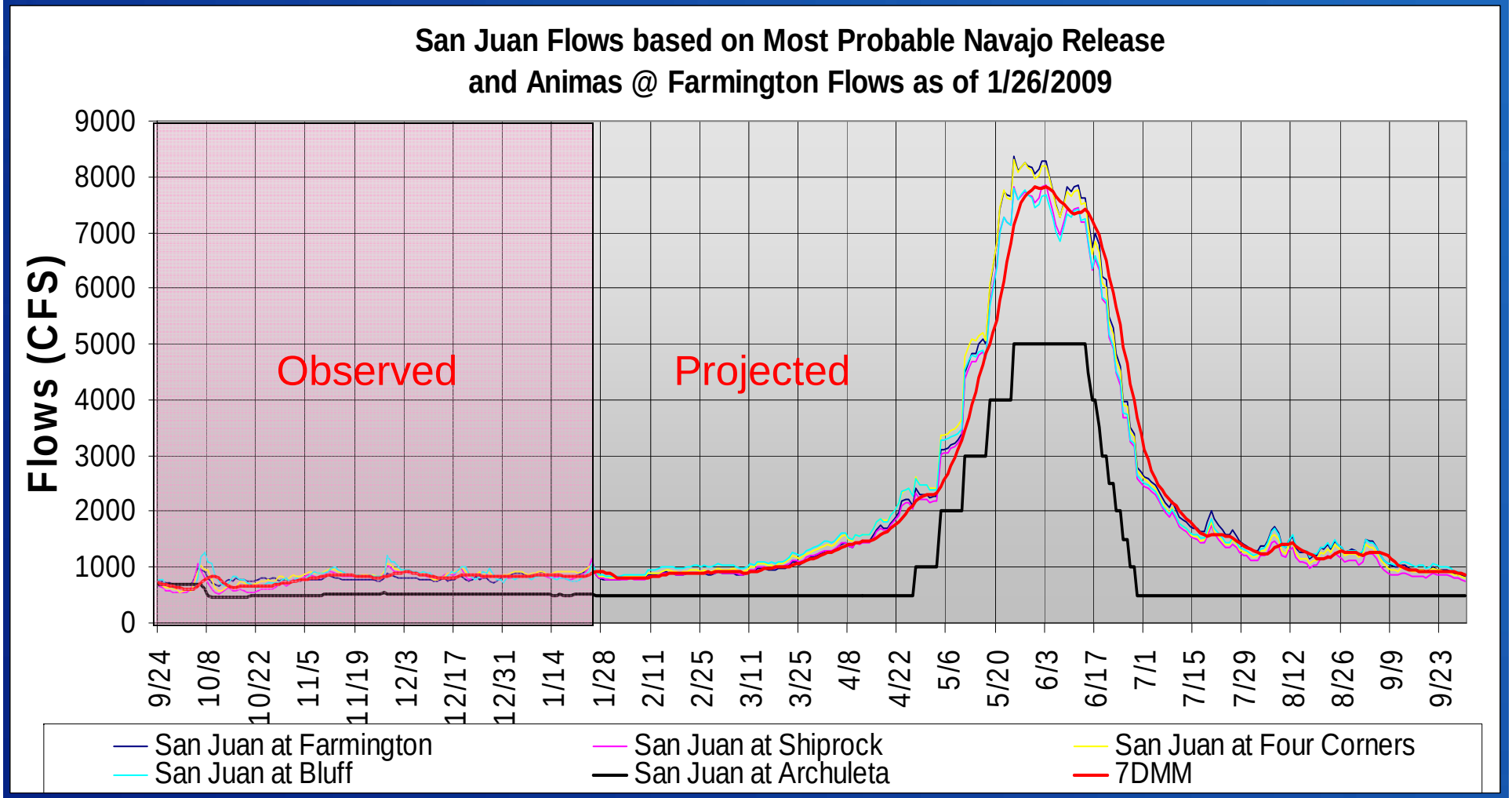
San Juan River Downstream Flows



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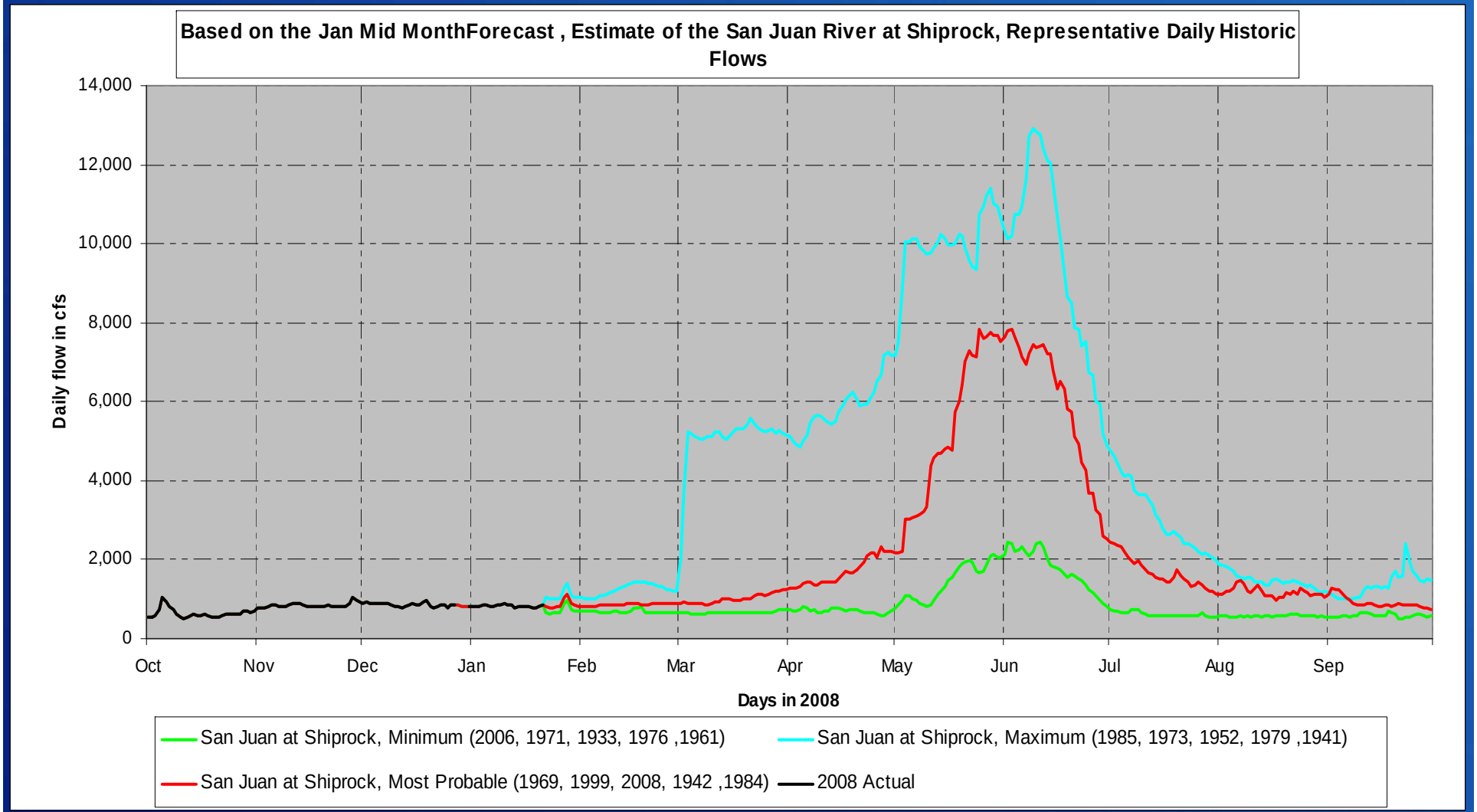
San Juan River at Shiprock



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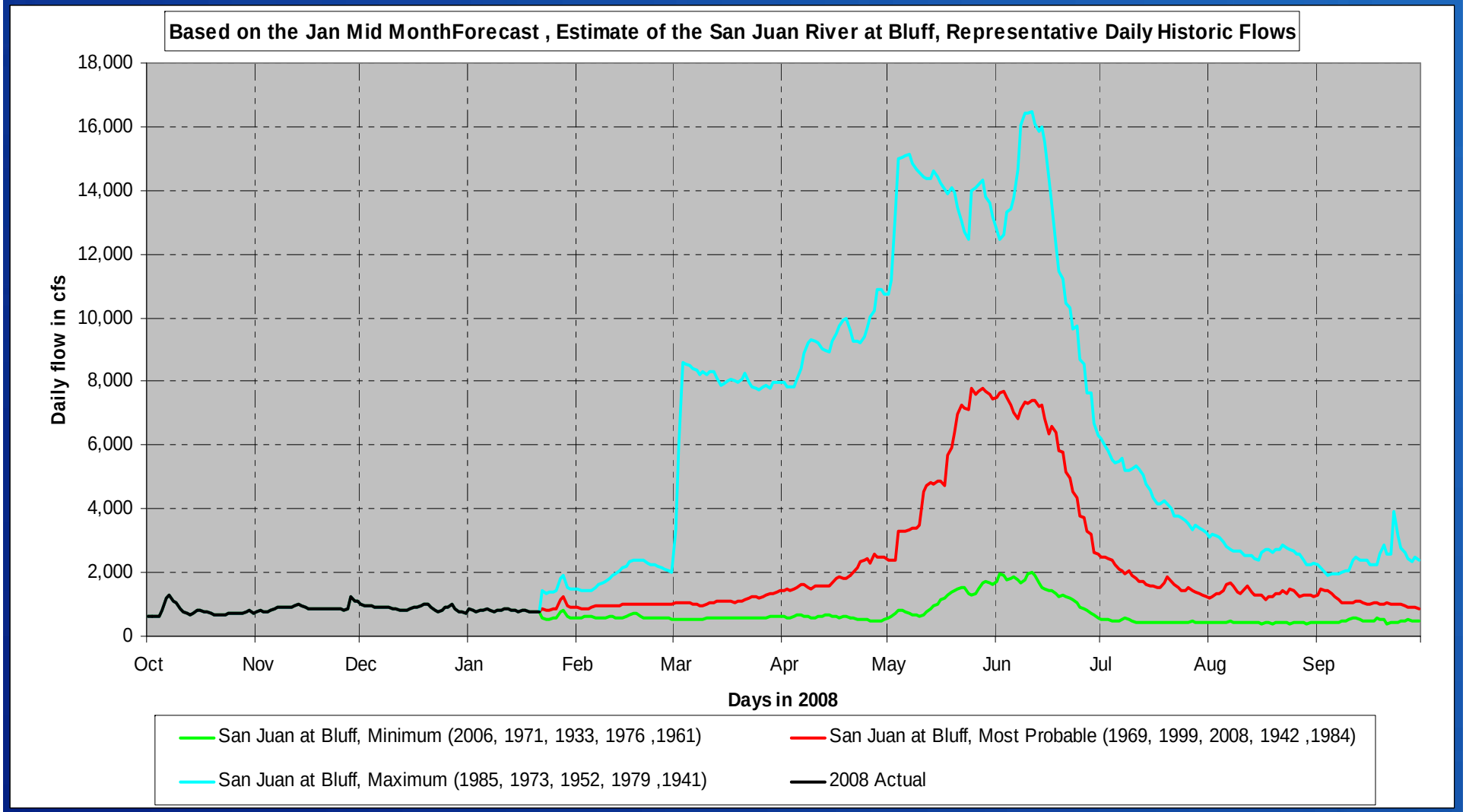
San Juan River at Bluff



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Navajo Reservoir
Current Conditions

(as of 1/26/09)

Elevation = 6053.46 (94% of Average)

Storage = 1,266,774 af (74% Full)

Inflow = 524 cfs

Release = 500 cfs

NIIP = Not currently diverting water

San Juan-Chama Diversion = 1.2 cfs

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Nearby Reservoirs

(1/26/2009)

Vallecito

- Elevation = 7644.2 (59% Full, 118% of average)
- Storage = 73,400 af
- Release = 40 cfs
- Inflow = 96 cfs

Lemon

- Elevation = 8106.2 (46% Full, 86% of average)
- Storage = 18,107 af
- Release = 11 cfs
- Inflow = 15 cfs

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Animas-La Plata Project

- The project is 66% complete
- Testing of pumps to begin soon
- First Fill is scheduled to begin March 1st, 2009
- Navajo Nation Municipal Pipeline is currently under construction

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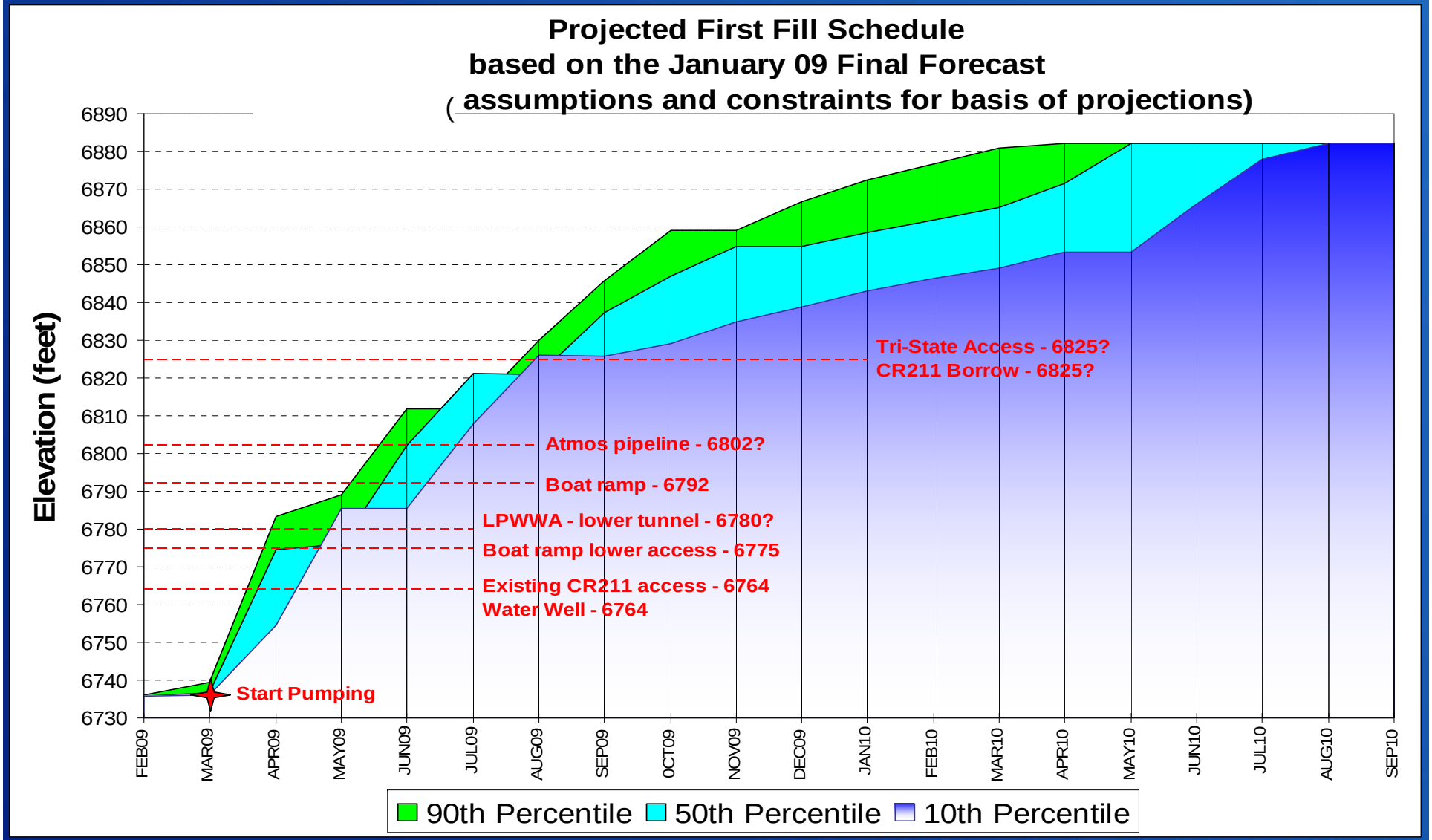
Animas-La Plata Project



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Recommendations
for the San Juan River
Operation and Administration
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Navajo Dam
Maintenance Activities

Routine Maintenance

- Hydraulic system valve work
- Left abutment drainage
- Instrumentation system
- Tunnel cleaning
- Spillway cleaning
- Vegetation removal
- Shop maintenance
- Road maintenance
- Tunnel lighting

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Navajo Outlet Works Inspections

- Required with releases > 3400 cfs
- Auxiliary outlet works – every 15 days
  (max release cut to 3400 cfs)
- Main outlet works – every 30 days
  (max release cut to 1600 cfs)
- Duration between inspections may be slightly less to avoid weekends, holidays

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Future Navajo Dam Maintenance Activities

- Muck-out Stilling Basin (late 2009/10)
- Replace Bolts on Penstocks (2010)

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Fish & Wildlife Service
San Juan RIP Update

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Reports from other Agencies

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Questions from the Audience ???

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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

Summary

- WY2008 had highly variable conditions (dry/wet/dry)
- For WY2009, the reservoir is at a more manageable elevation to handle variable conditions and large fluctuations in the forecast
- Forecasts are very preliminary!
- Most Probable April – July Inflow Forecast is 116% of average
- A Maximum Fish Spring Hydrograph is anticipated to be released under the Most Probable Forecast (21 days @ 5000 cfs)
- Required Gate Inspections will continue at releases >3000 cfs
- Likely Minimum (Base) Release = 500 cfs
- Target Baseflow is 500 -1000 cfs in Critical Habitat

- Next Operations Meeting: April ?, 2009

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Thanks For Coming!
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