

RECLAMATION

Managing Water in the West



**Navajo Unit Operations
January 22, 2008
Coordination Meeting**



U.S. Department of the Interior
Bureau of Reclamation

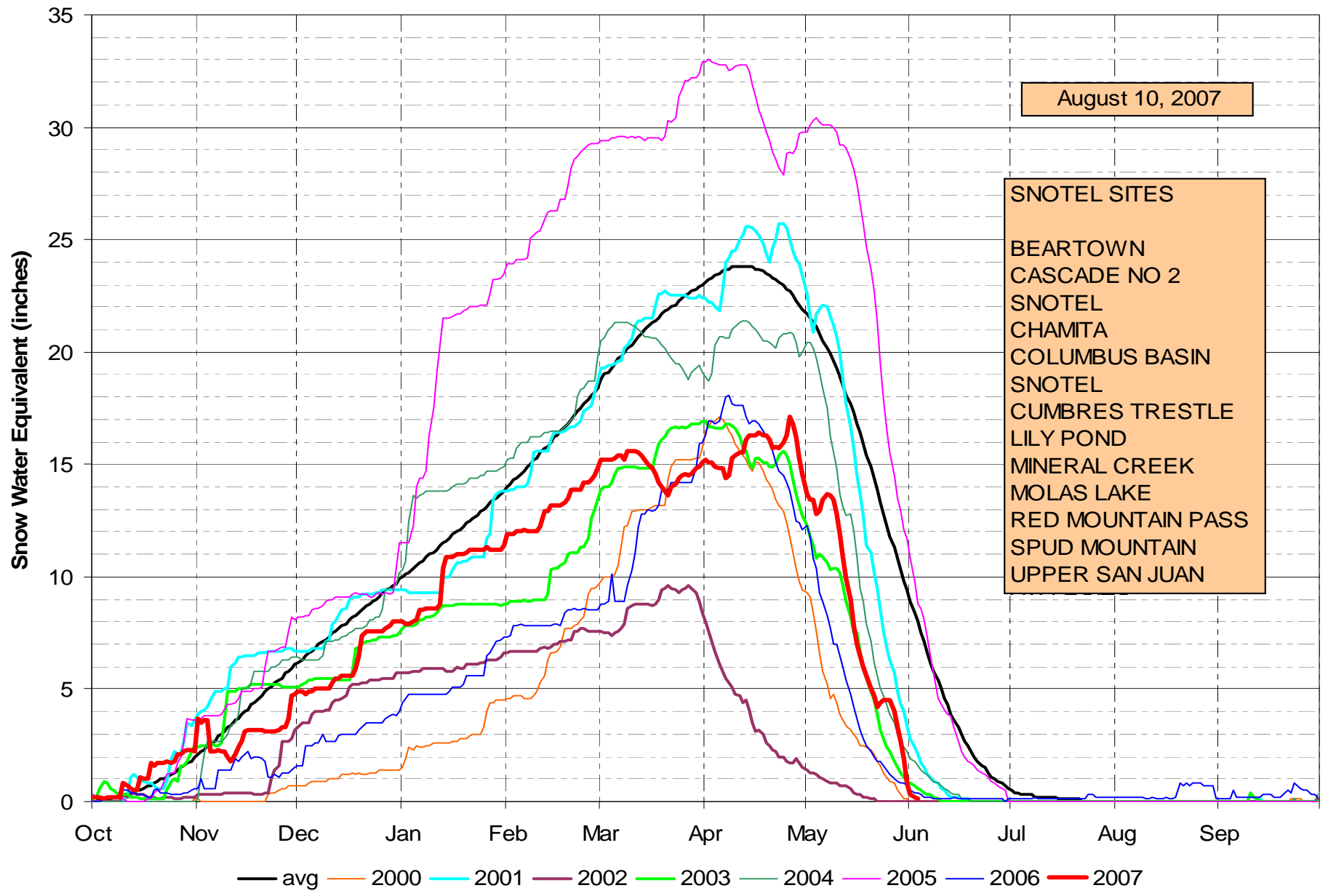
Agenda

- Welcome
- Review 2007 Operations
- Current Forecast and Proposed 2008 Operations
- 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

Review of
2007
Operations

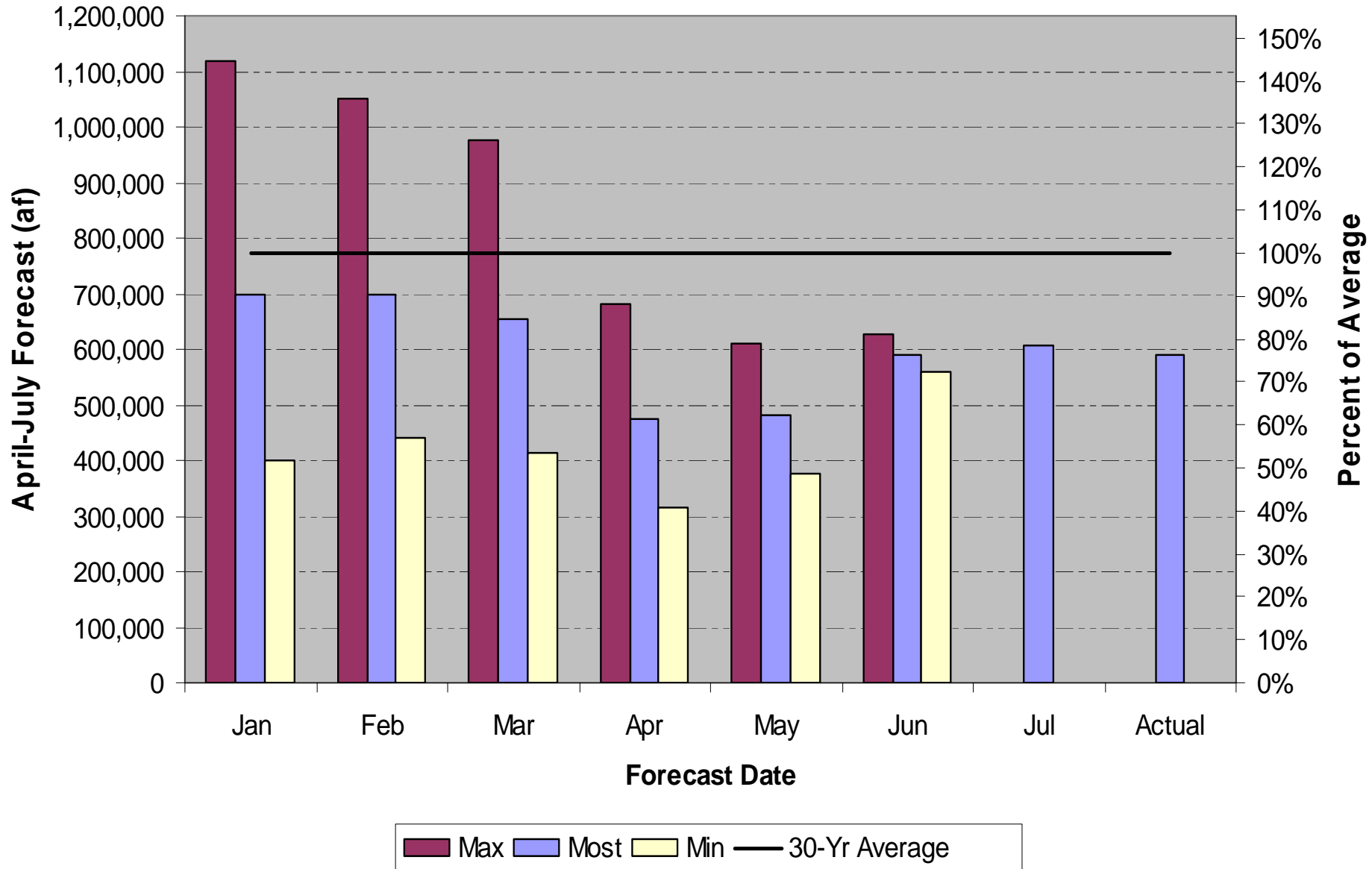
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San Juan Basin 1 Multiple Station Snotel Plot



Colorado Basin River Forecast Center (NWS)

Navajo Reservoir April-July Modified Unregulated Inflow Forecast (af)

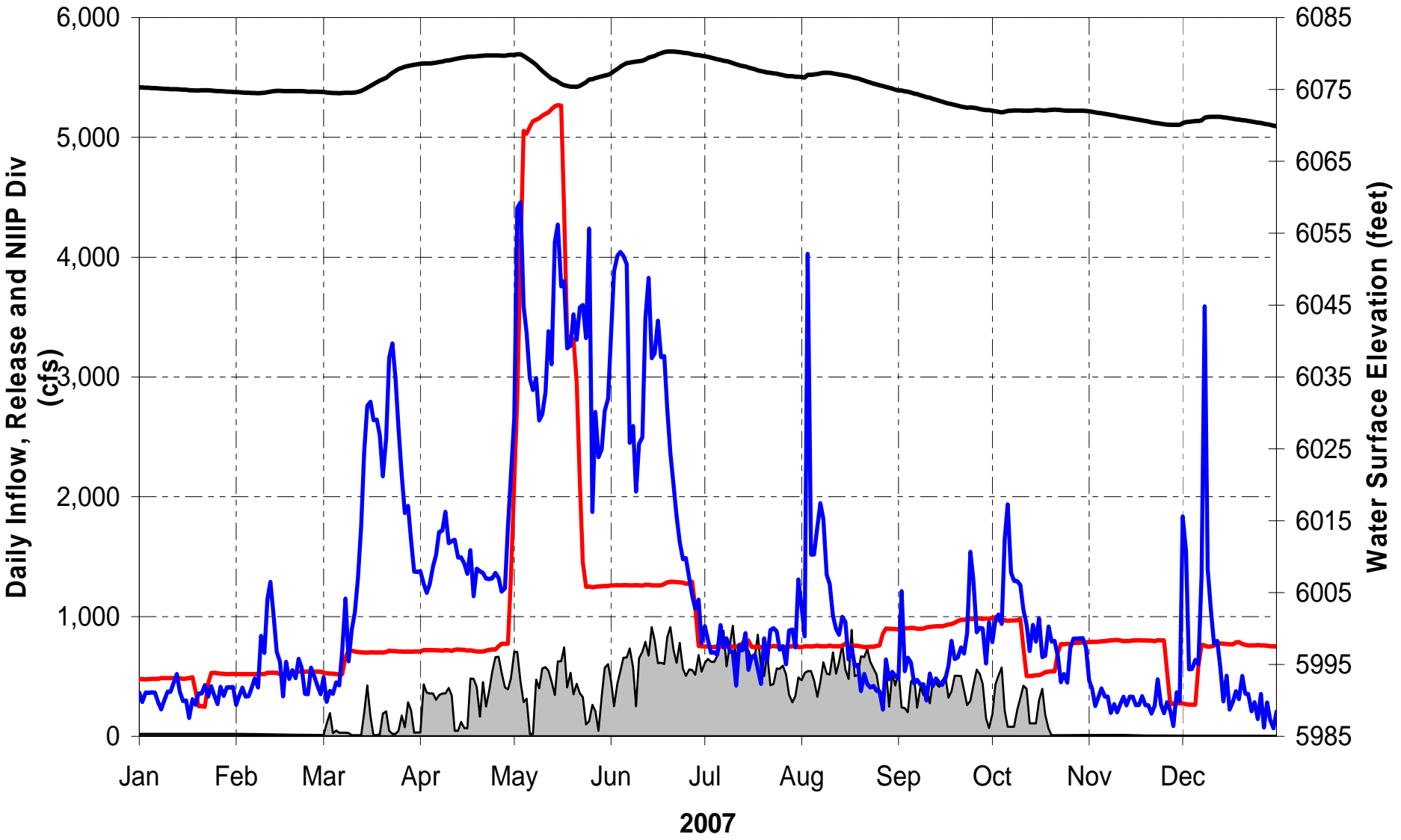


Year 2007 Navajo Res Inflows

Month	Inflow (af)	% of Average
January	21,441	105%
February	30,768	105%
March	104,384	121%
April	87,061	58%
May	200,171	90%
June	154,363	77%
July	46,398	58%
August	58,874	96%
September	40,552	77%
October	56,731	124%
November	17,230	55%
December	40,149	173%
Total	858,122	85%
Apr-Jul	487,993	75%
Aug-Dec	213,536	99%

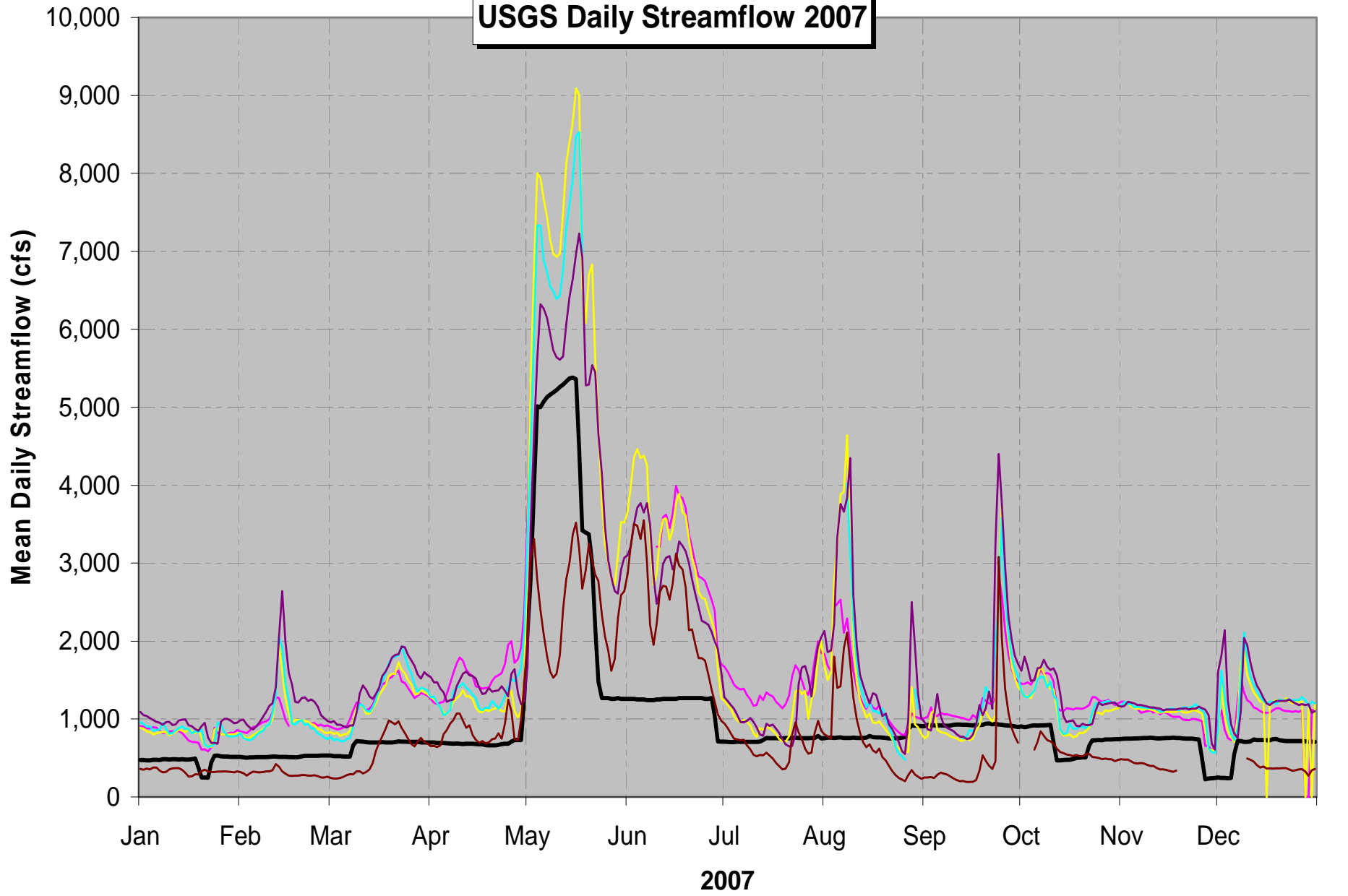
2007 NAVAJO RESERVOIR OPERATIONS

Inflow, Release, NIIP Div, WS Elev



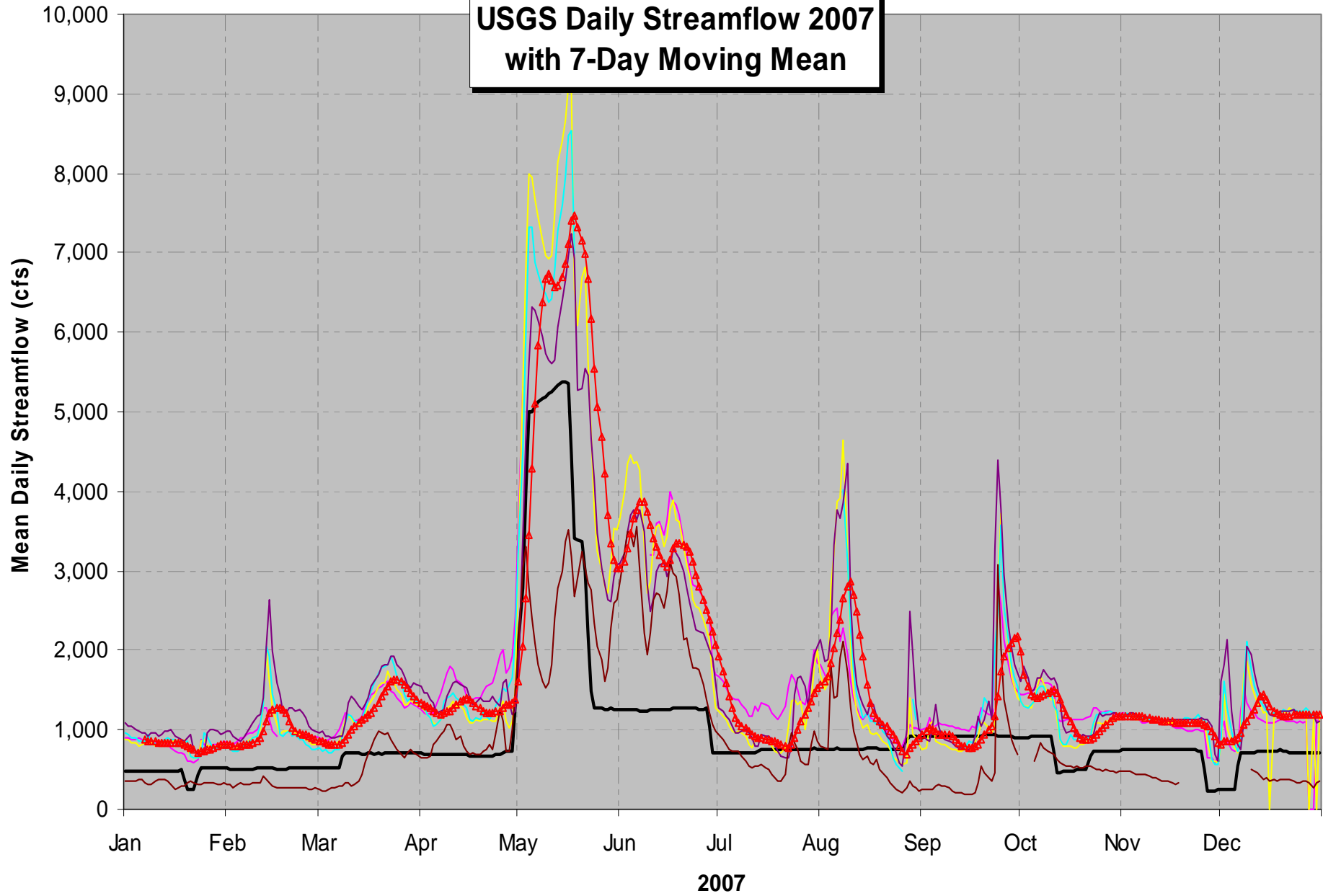
NIIP (cfs)
 Releases (cfs)
 Inflow (cfs)
 WS Elev

San Juan River USGS Daily Streamflow 2007



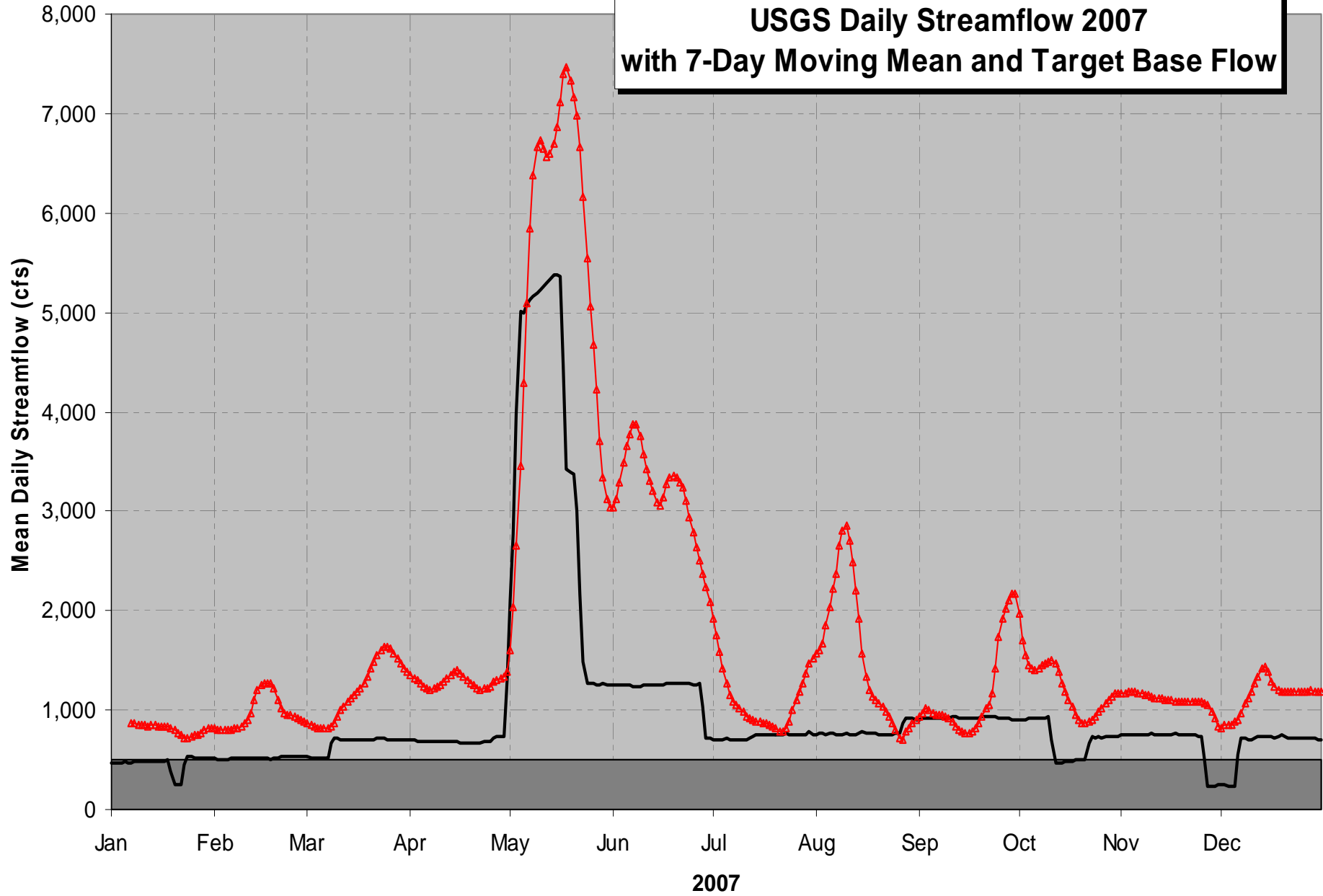
— Archuleta — Farmington — Shiprock — Four Corners — Bluff — Animas@Farmington

**San Juan River
USGS Daily Streamflow 2007
with 7-Day Moving Mean**



— Archuleta — Farmington — Shiprock — Four Corners — Bluff — Animas@Farmington —△ 7DMM

**San Juan River
USGS Daily Streamflow 2007
with 7-Day Moving Mean and Target Base Flow**



■ Target Base Flow — Archuleta —△— 7DMM

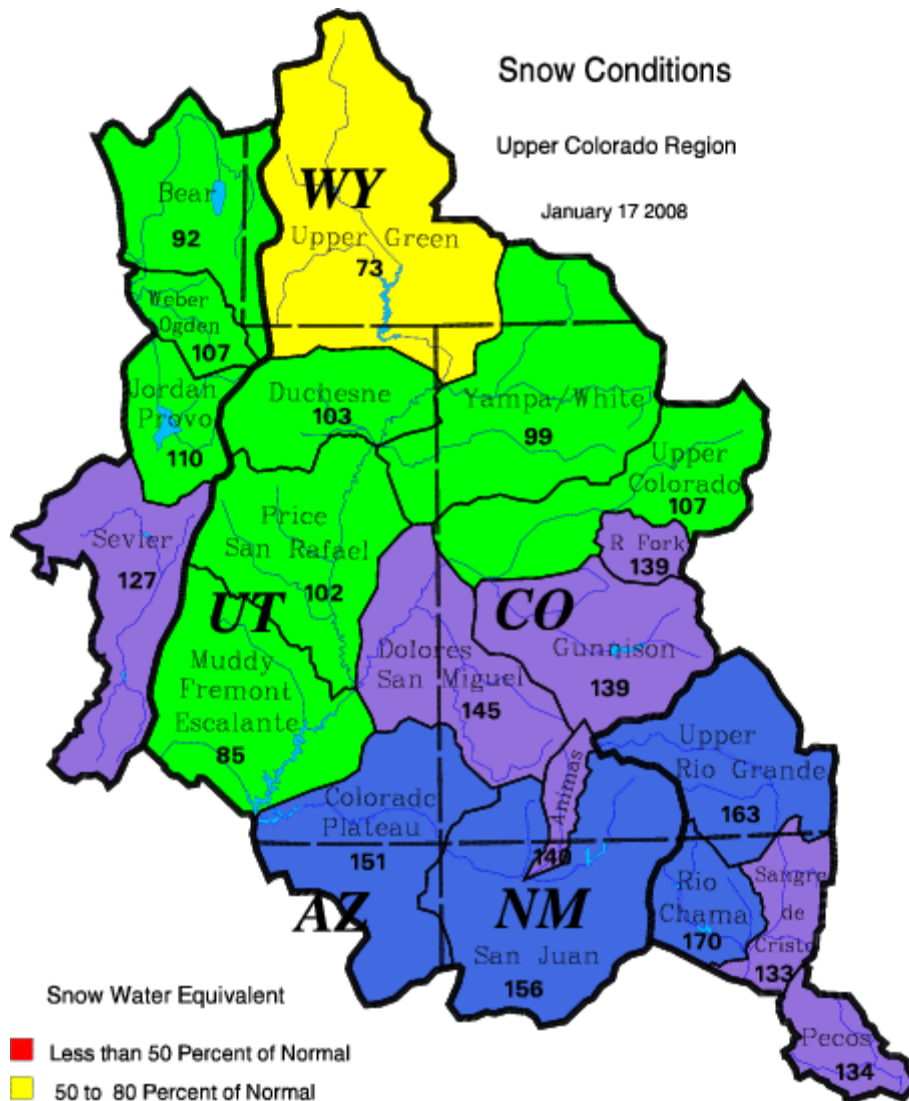
Current Forecast
and
Proposed Operations
for 2008

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Snow Conditions

Upper Colorado Region

January 17 2008



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

Colorado River Basin SNOTEL Snow/Precipitation Update Report

Based on Mountain Data from NRCS SNOTEL Sites

Provisional data, subject to revision

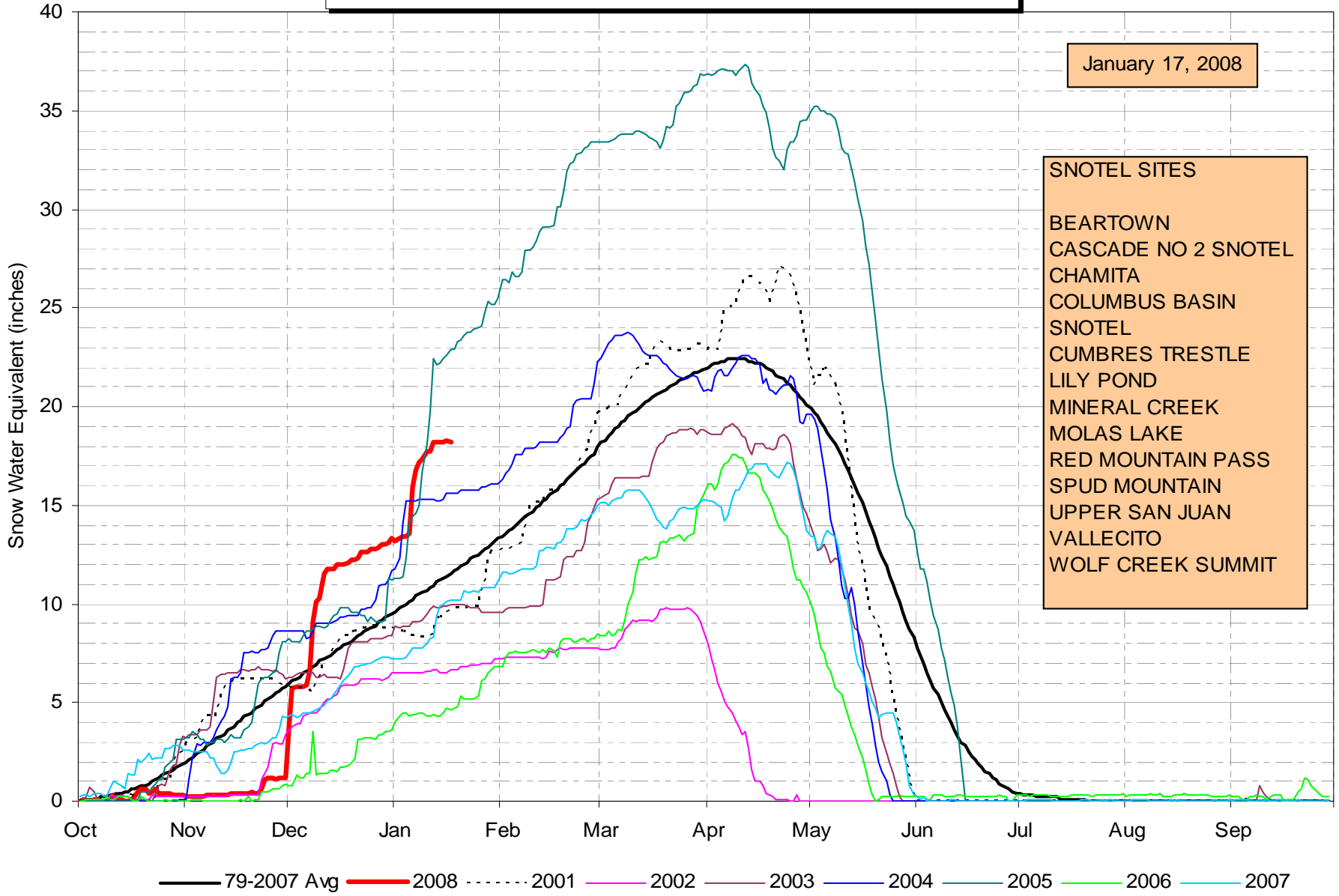
Data based on the first reading of the day (typically 00:00) for Thursday, January 17, 2008

Basin Site Name	Elev (ft)	Snow Water Equivalent			Year-to-Date Precipitation		
		Current (in)	Average (in)	Pct of Avg	Current (in)	Average (in)	Pct of Avg
SAN JUAN RIVER HEADWATERS							
BEARTOWN	11600	16.2	13.1	124	17.7	14.7	120
MIDDLE CREEK	11250	15.6	10.6	147	20.6	13.7	150
STUMP LAKES	11200	14.2	10.9	130	13.8	12.2	113
LILY POND	11000	12.9	8.1	159	16.5	11.7	141
WOLF CREEK SUMMIT	11000	27.4	17.2	159	29.3	18.5	158
VALLECITO	10880	14.7	10.5	140	14	11.4	123
UPPER SAN JUAN	10200	28.6	15.9	180	28.4	18.5	154
CUMBRES TRESTLE	10040	24.4	13.3	183	23.7	13.8	172
CHAMITA	8400	9.5	5.2	183	12.6	8.5	148
Basin-wide percent of average		156			144		
ANIMAS RIVER BASIN							
BEARTOWN	11600	16.2	13.1	124	17.7	14.7	120
RED MOUNTAIN PASS	11200	17.6	12.4	142	19.5	14.3	136
STUMP LAKES	11200	14.2	10.9	130	13.8	12.2	113
COLUMBUS BASIN	10785	18.4	12.8	144	20.1	18.2	110
SPUD MOUNTAIN	10660	21	15.6	135	23.1	17	136
MOLAS LAKE	10500	15.7	11.1	141	15.8	11.8	134
MINERAL CREEK	10040	11.1	8.2	135	14.3	10	143
CASCADE #2	8920	11.3	7.7	147	15.9	11.8	135
CASCADE	8880	13.3	7.2	185	16.3	11.6	141
Basin-wide percent of average		140			129		

NWS Colorado Basin River Forecast Center
 San Juan Basin Multiple Station Snotel Plot
 Current Snowpack is (18.2/12) = 152% of Average

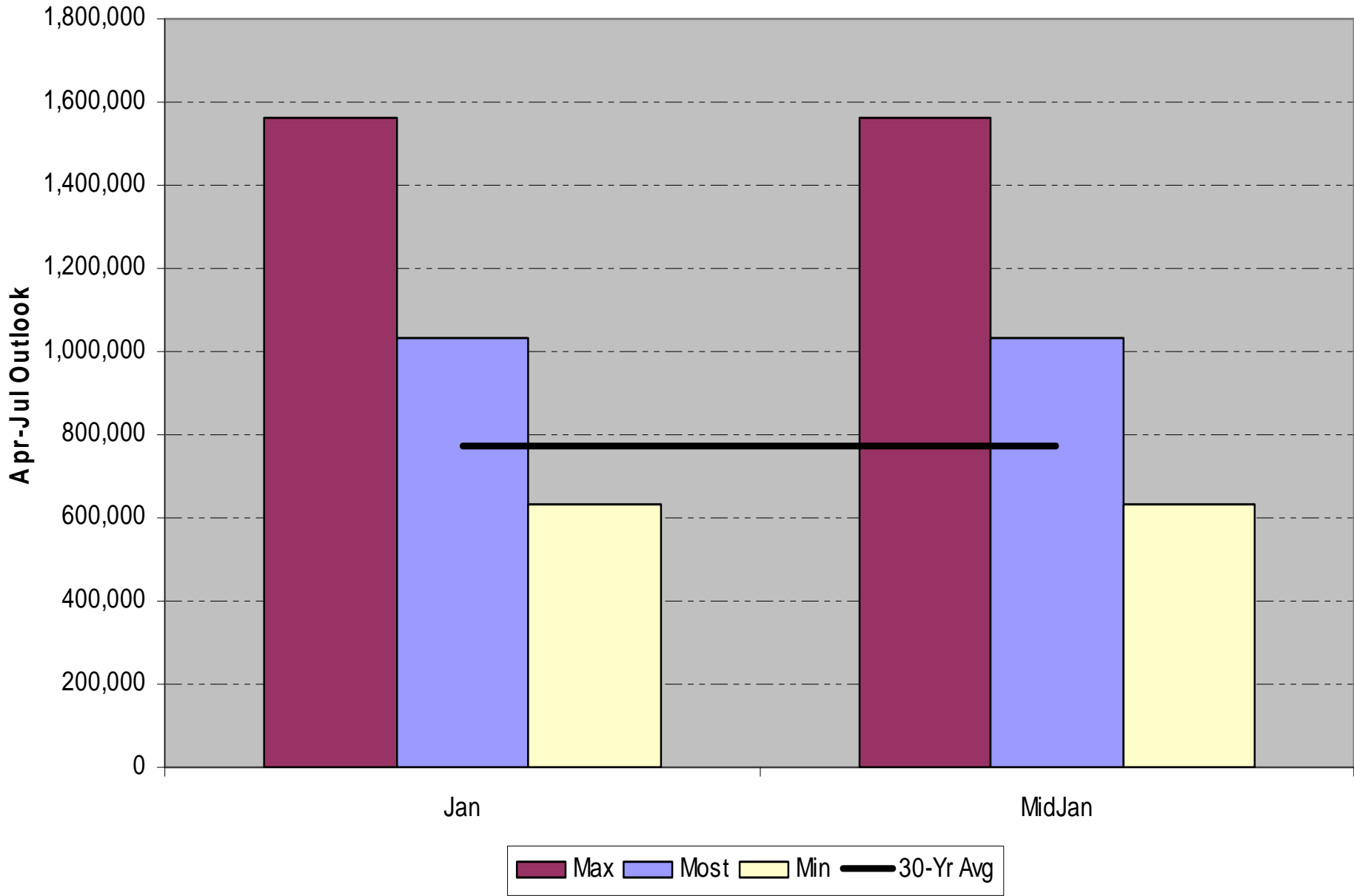
January 17, 2008

- SNOTEL SITES
- BEARTOWN
 - CASCADE NO 2 SNOTEL
 - CHAMITA
 - COLUMBUS BASIN SNOTEL
 - CUMBRES TRESTLE
 - LILY POND
 - MINERAL CREEK
 - MOLAS LAKE
 - RED MOUNTAIN PASS
 - SPUD MOUNTAIN
 - UPPER SAN JUAN
 - VALLECITO
 - WOLF CREEK SUMMIT



— 79-2007 Avg — 2008 - - - - 2001 — 2002 — 2003 — 2004 — 2005 — 2006 — 2007

CBRFC - Navajo Reservoir Most, Maximum and Minimum Modified Unregulated Inflow Forecasts (ac-ft)

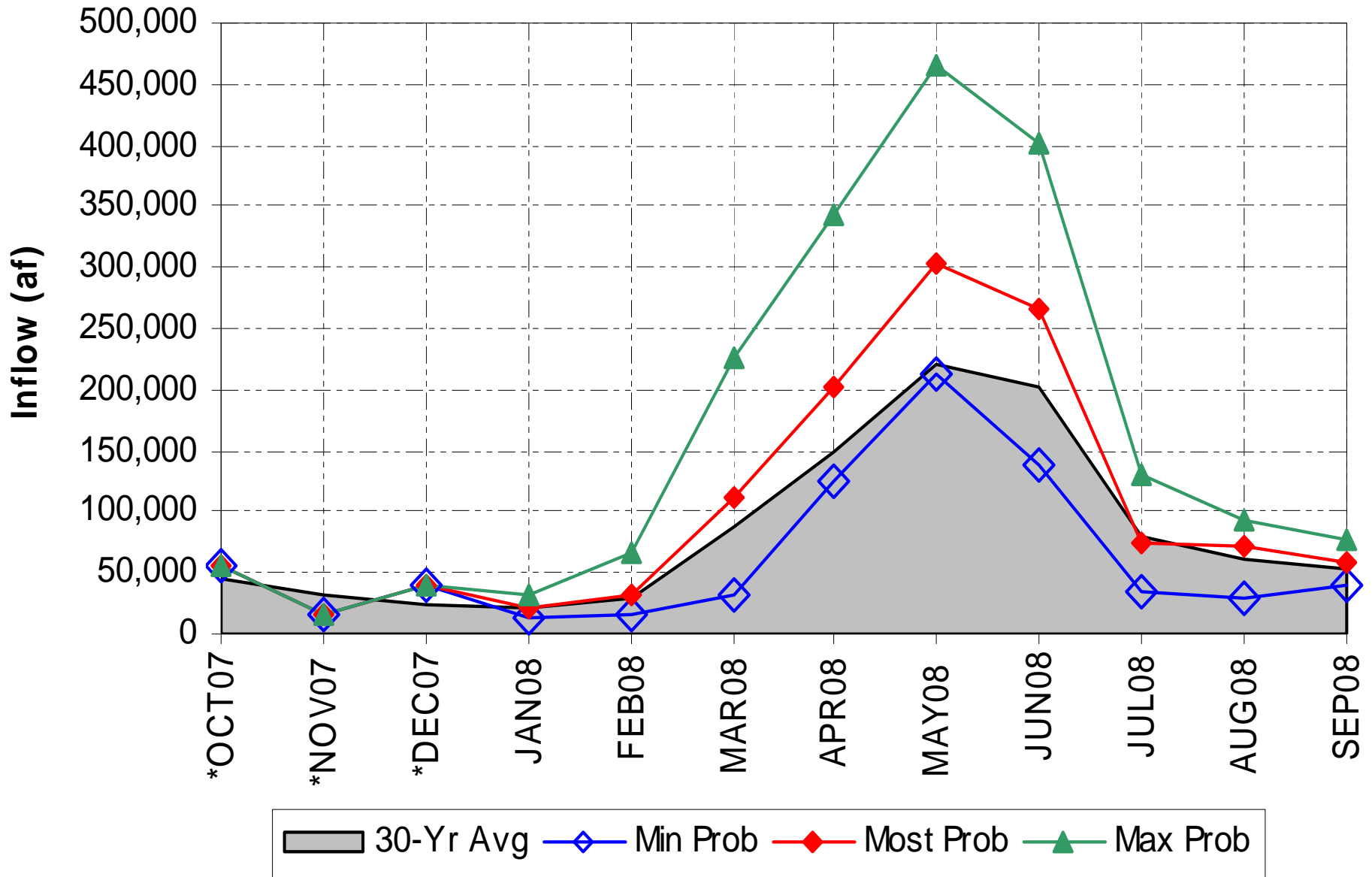


January 15th 2008

Navajo Reservoir Unregulated April-
July Inflow Forecast

	Inflow (af)	% of Average
Most Probable	1,030,000	133%
Minimum Probable	635,000	82%
Maximum Probable	1,560,000	202%

Navajo Reservoir Most, Maximum and Minimum Probable Inflows based on the January Mid Month Forecast



2008 Spring Release Decision Tree Values Based on the January Mid Month Forecast for the Most, Minimum and Maximum Probable Inflows

Flow Chart Parameters	Most Probable	Minimum Probable	Maximum Probable
1 *Available Water (acre-feet):	1,049,000	608,000	1,464,000
2 **Spill (acre-feet):	348,000	(93,000)	763,000
3 Fish Releases: 2005 344,000 (acre-feet) 2006 140,000 (acre-feet) 2007 233,000 (acre-feet)			
4 Was there a perturbation? Yes			
5 Spring Release Volume (acre-feet) (above the base flow)	340,000	112,000	340,000

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

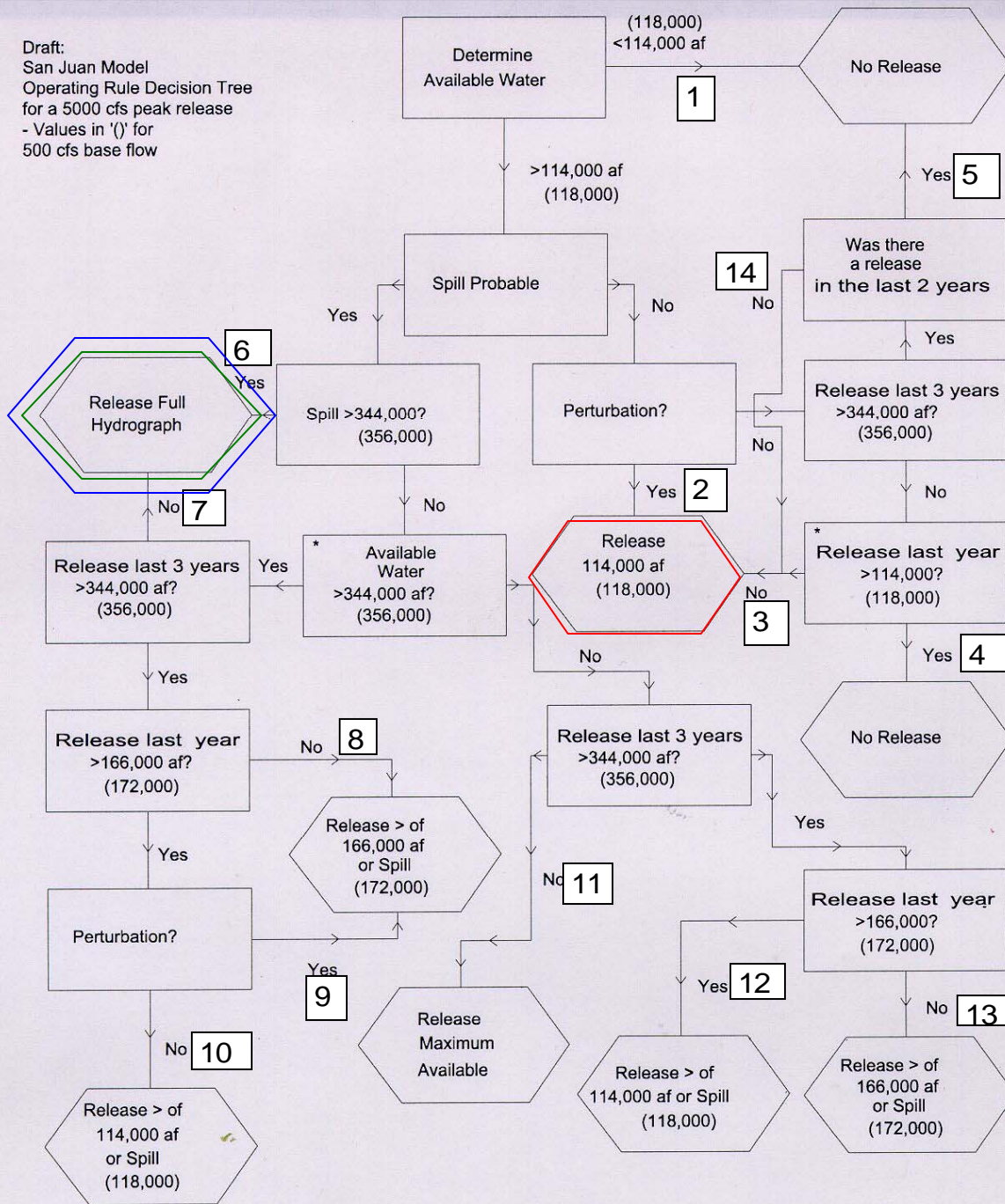
where: Available Storage = End of March Storage - Minimum Carryover Storage (1,000,000 af)

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

(Set to zero if computed value goes negative)

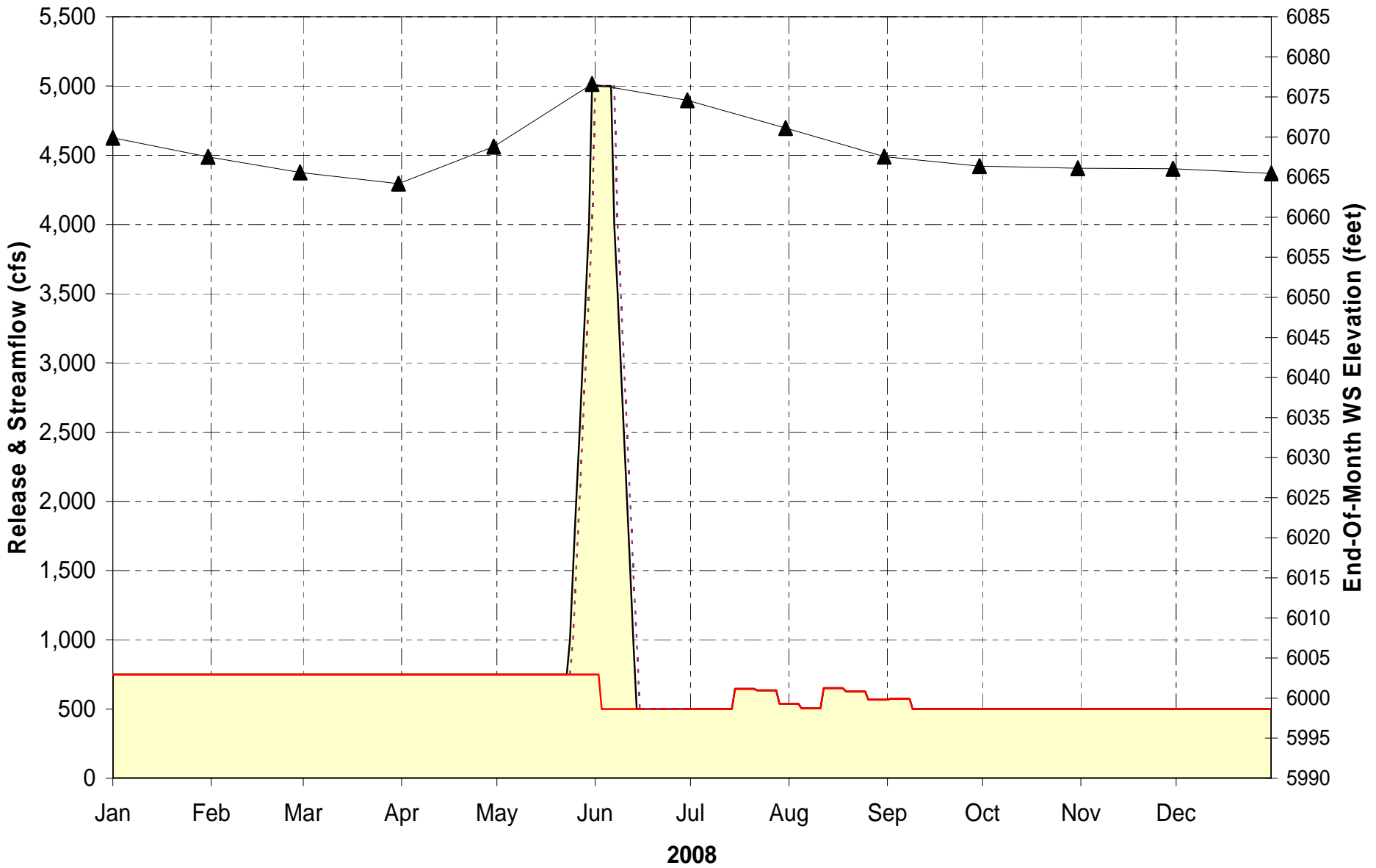
where: Remaining Storage = Maximum Content (Elev 6082) - End of March Content

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



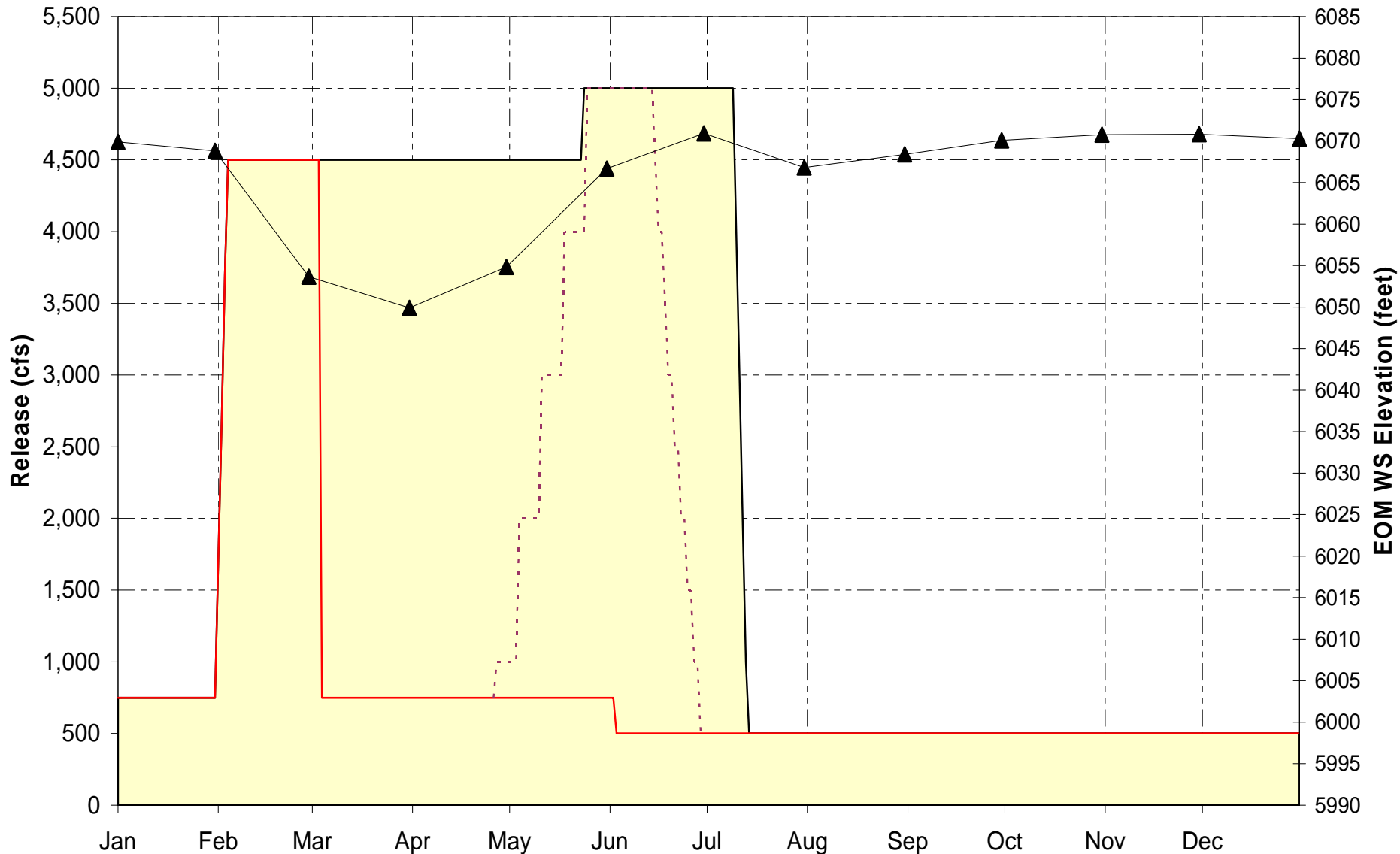
AVAILABLE WATER	PATH
Min Prob: 608,000 af	#2
Most Prob: 1,049,000 af	#6
Max Prob: 1,464,000 af	#6

Navajo Reservoir Daily Releases and End-Of-Month WS Elevation based on the MidJan Minimum Probable Forecast



Total Navajo Release
 Min Allowable Release
 Std #1 Fish Release Hydrograph
 EOM WS Elevation

Navajo Reservoir Daily Releases and End-Of-Month WS Elevation based on the MidJan Maximum Probable Forecast



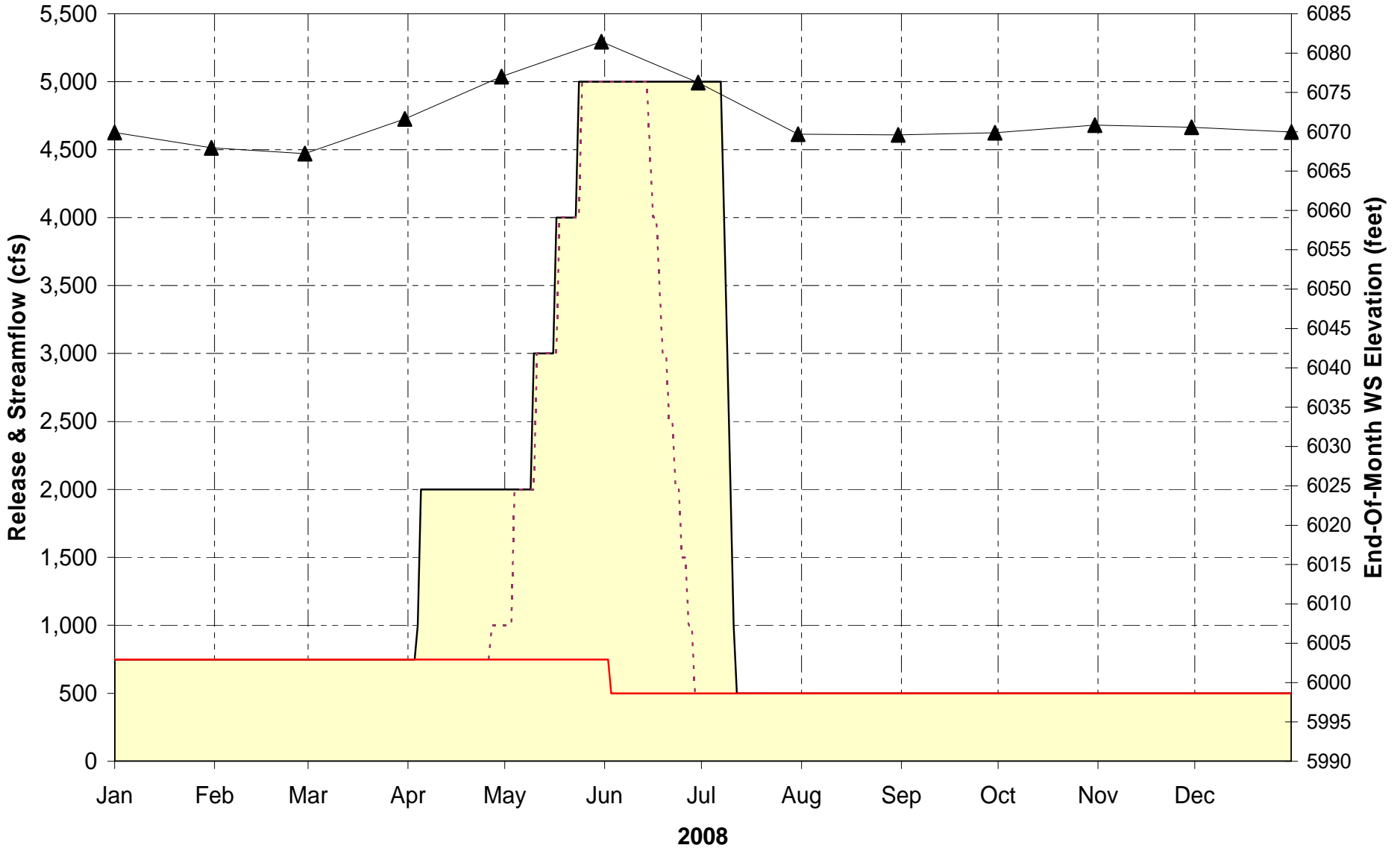
Total Navajo Release
 Min Allowable Release
 Std #4 Fish Release Hydrograph
 EOM WS Elevation

Most Probable Inflow Forecast

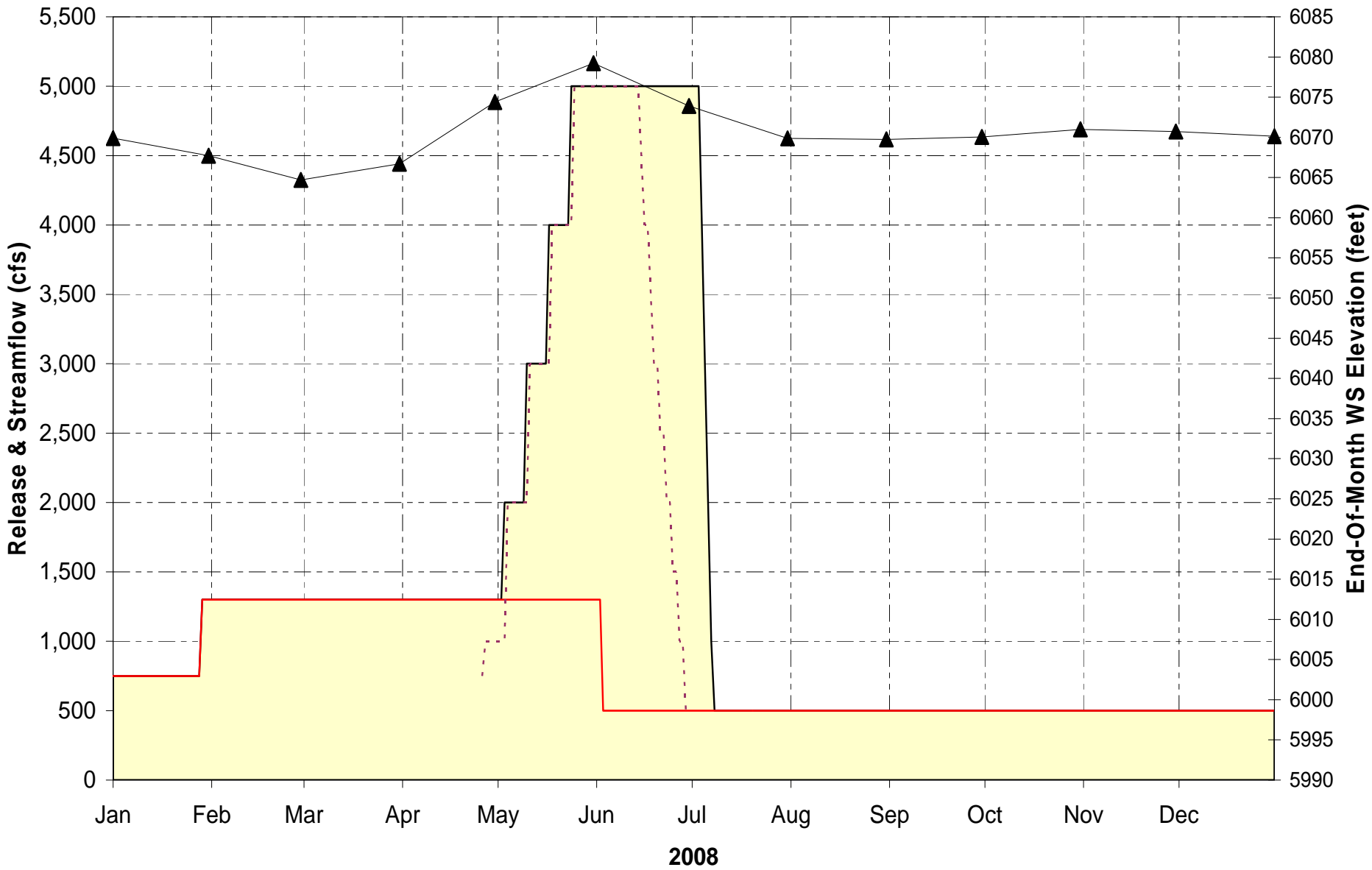
Alternative Release Options

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Option #1: Navajo Reservoir Daily Releases and End-Of-Month Contents Based on the Mid January Most Probable Forecast.

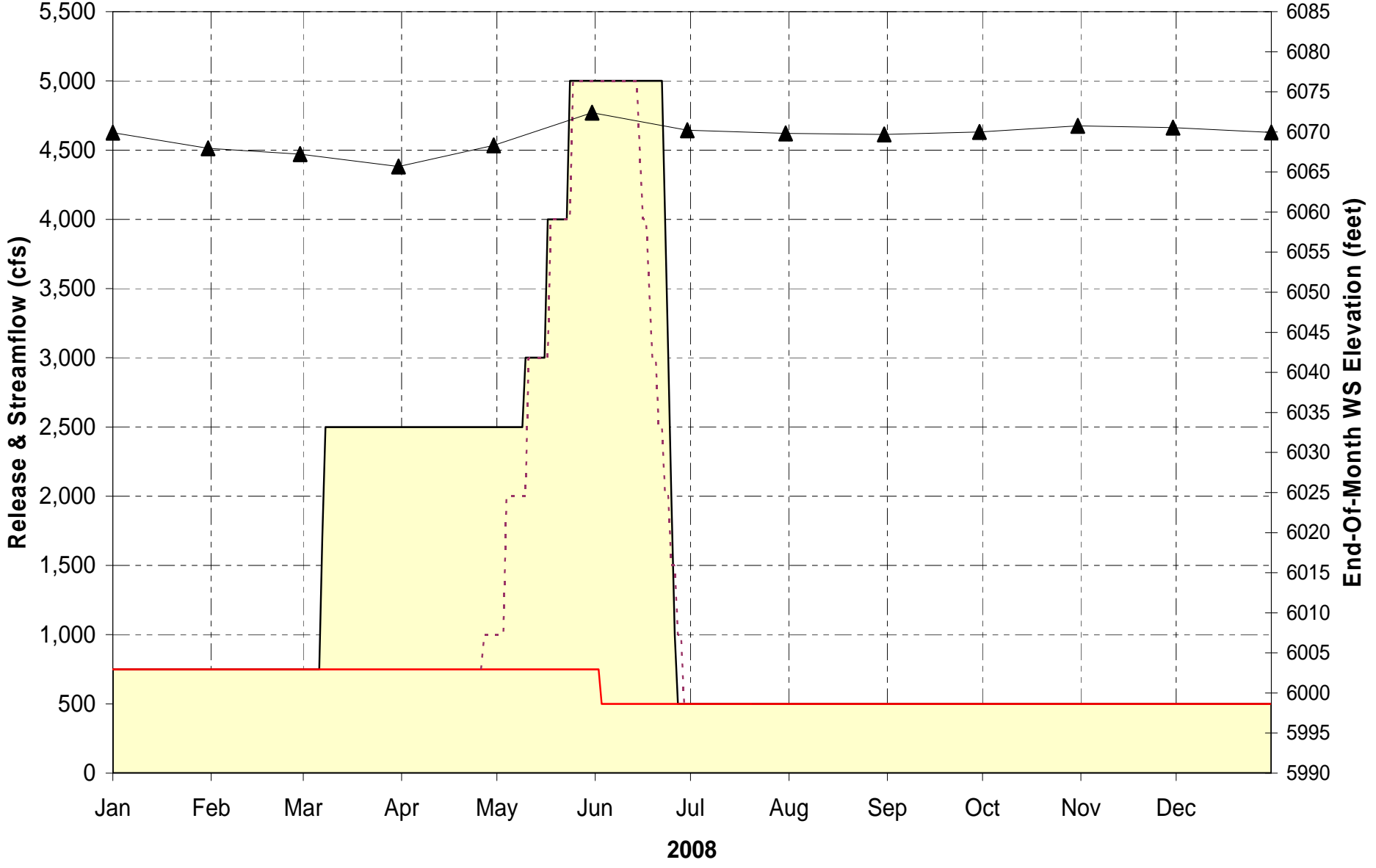


Option #2: Navajo Reservoir Daily Release and End-Of-Month Content based on the Mid January Inflow Forecast



Total Navajo Release
 Min Allowable Release
 Std #4 Fish Release Hydrograph
 EOM WS Elevation

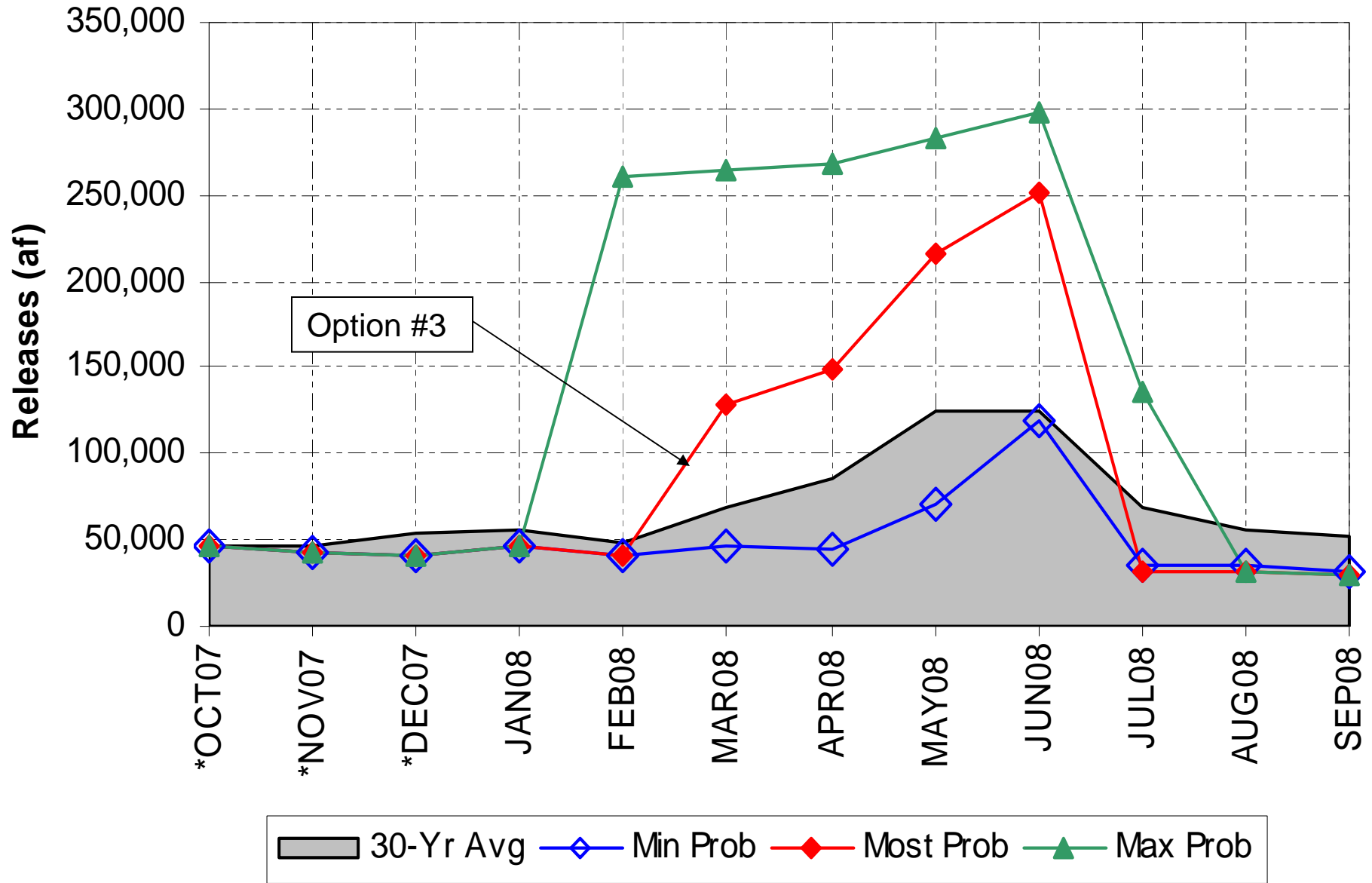
Option #3: Navajo Reservoir Daily Release and End-Of-Month Content based on the Mid January Inflow Forecast



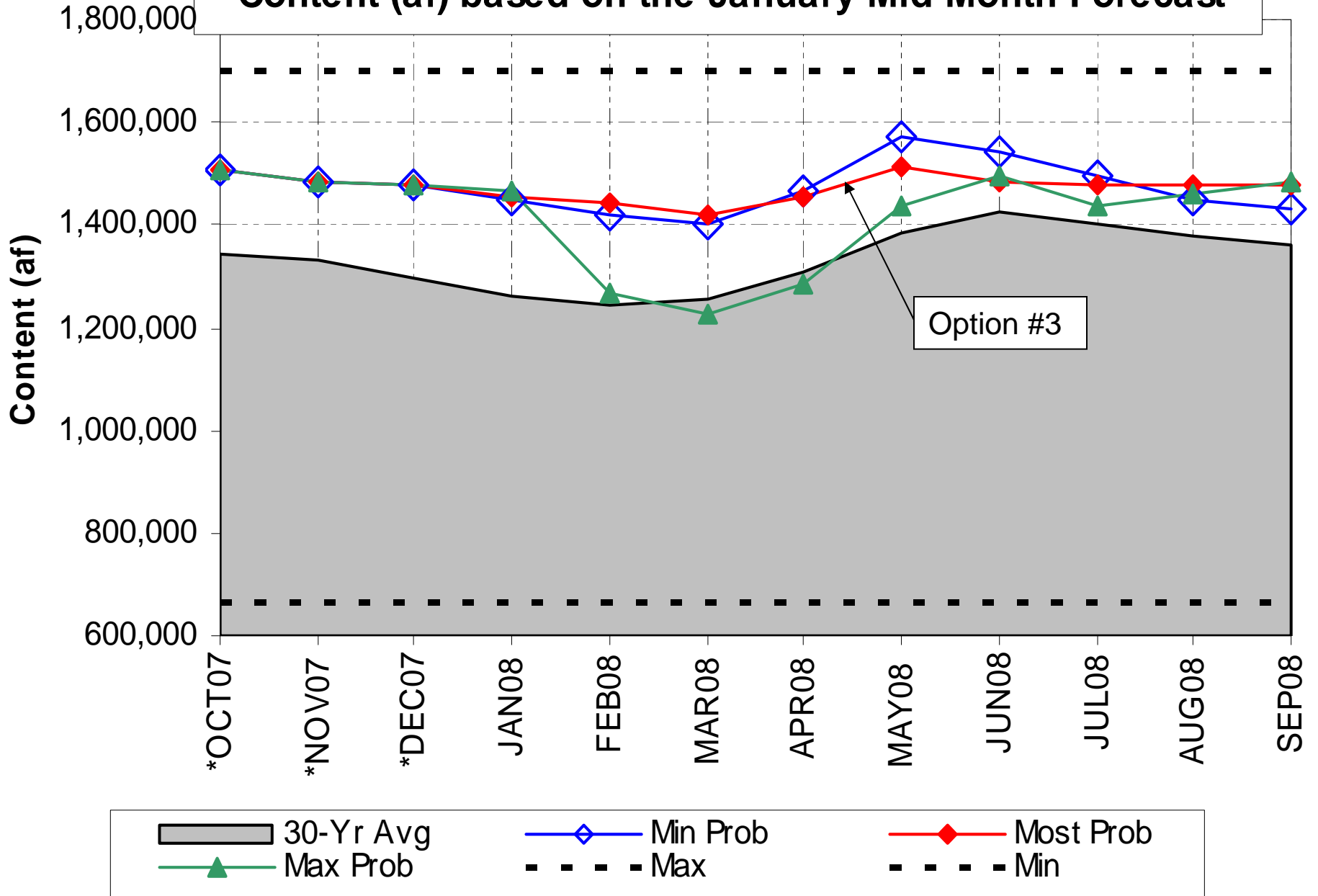
Total Navajo Release
 Min Allowable Release
 Std #4 Fish Release Hydrograph

 EOM WS Elevation

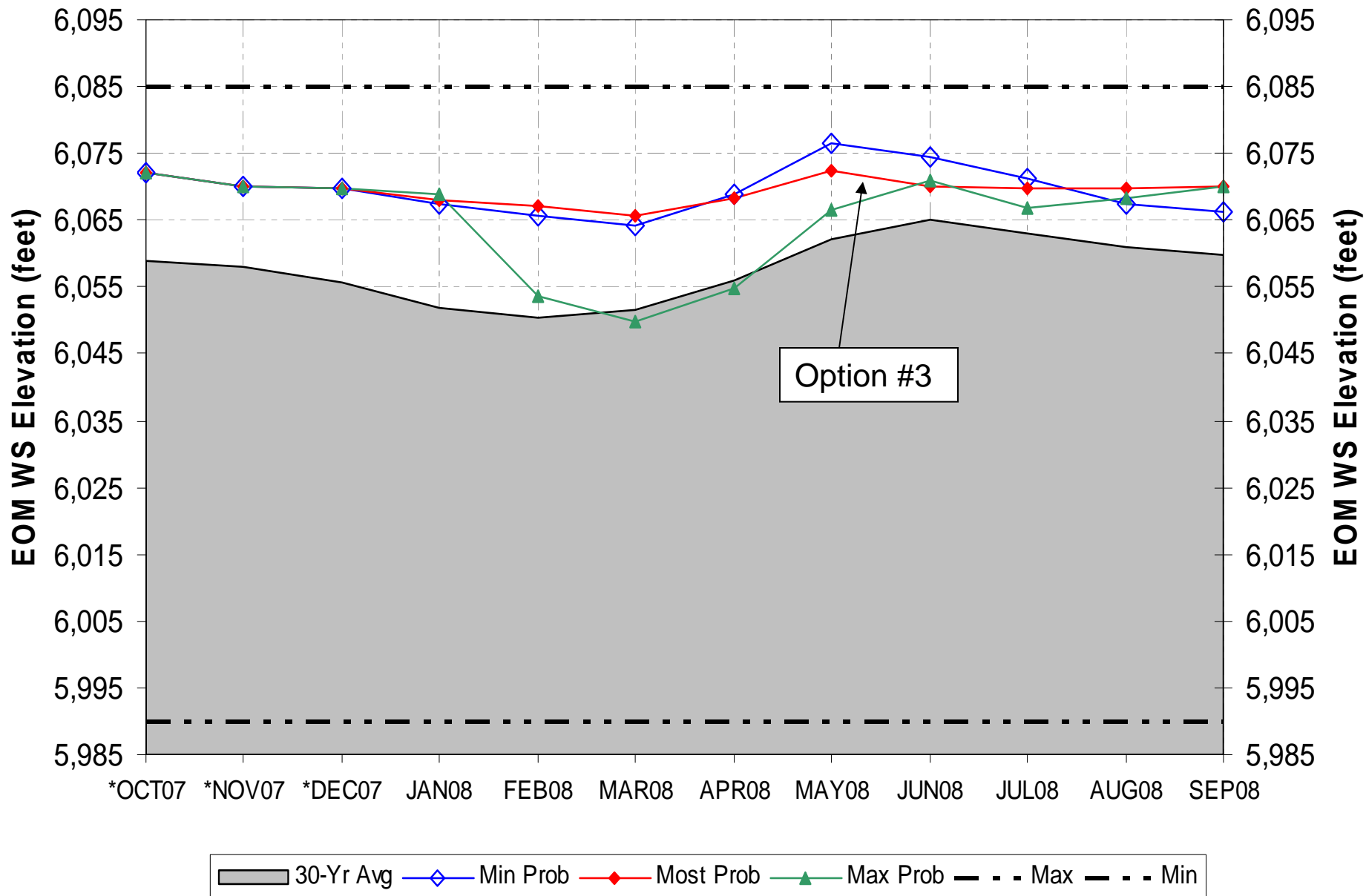
Navajo Reservoir Most, Maximum and Minimum Probable Releases based on the January Mid Month Forecast



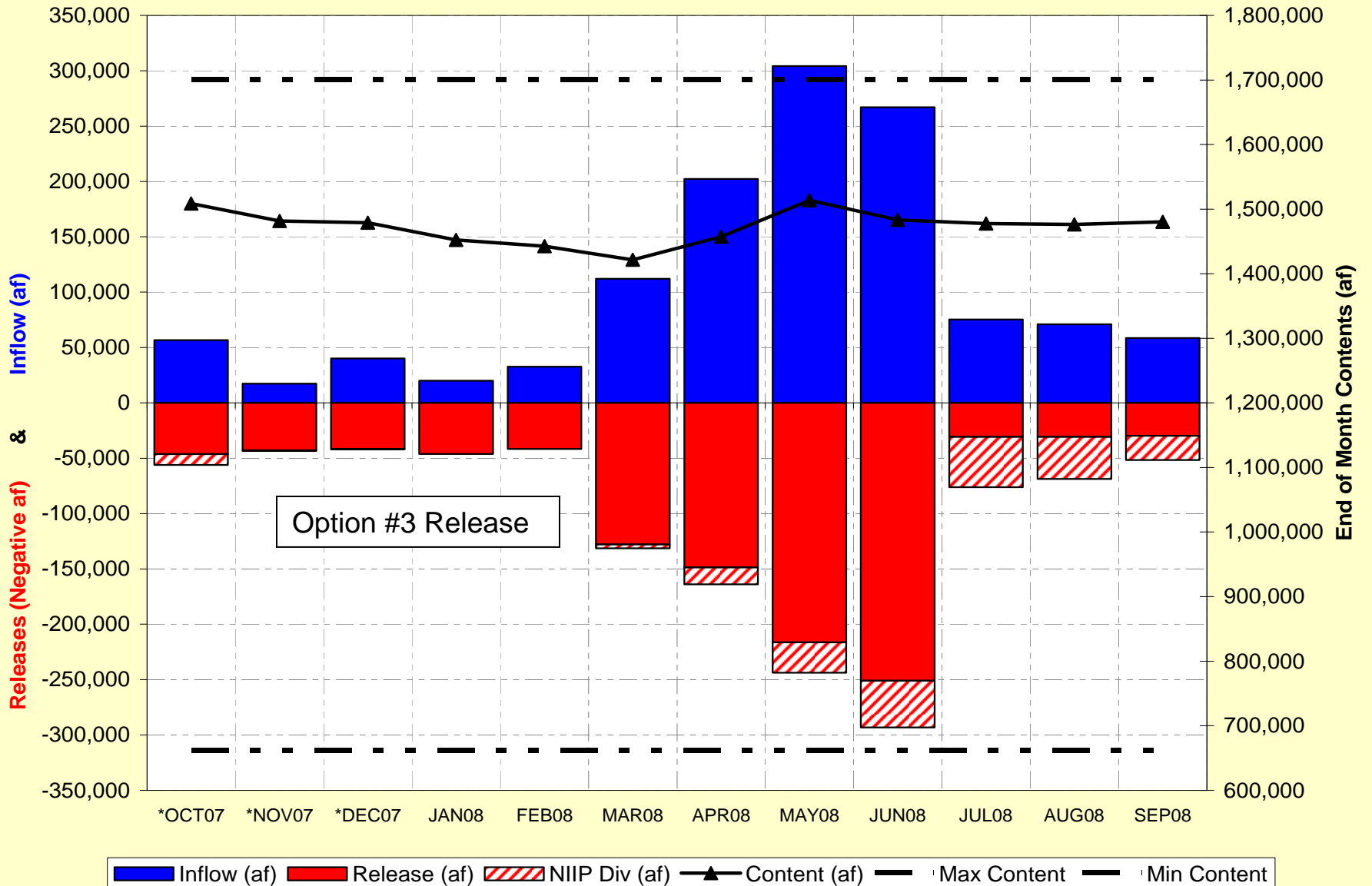
Navajo Reservoir Most, Maximum and Minimum Probable Content (af) based on the January Mid Month Forecast



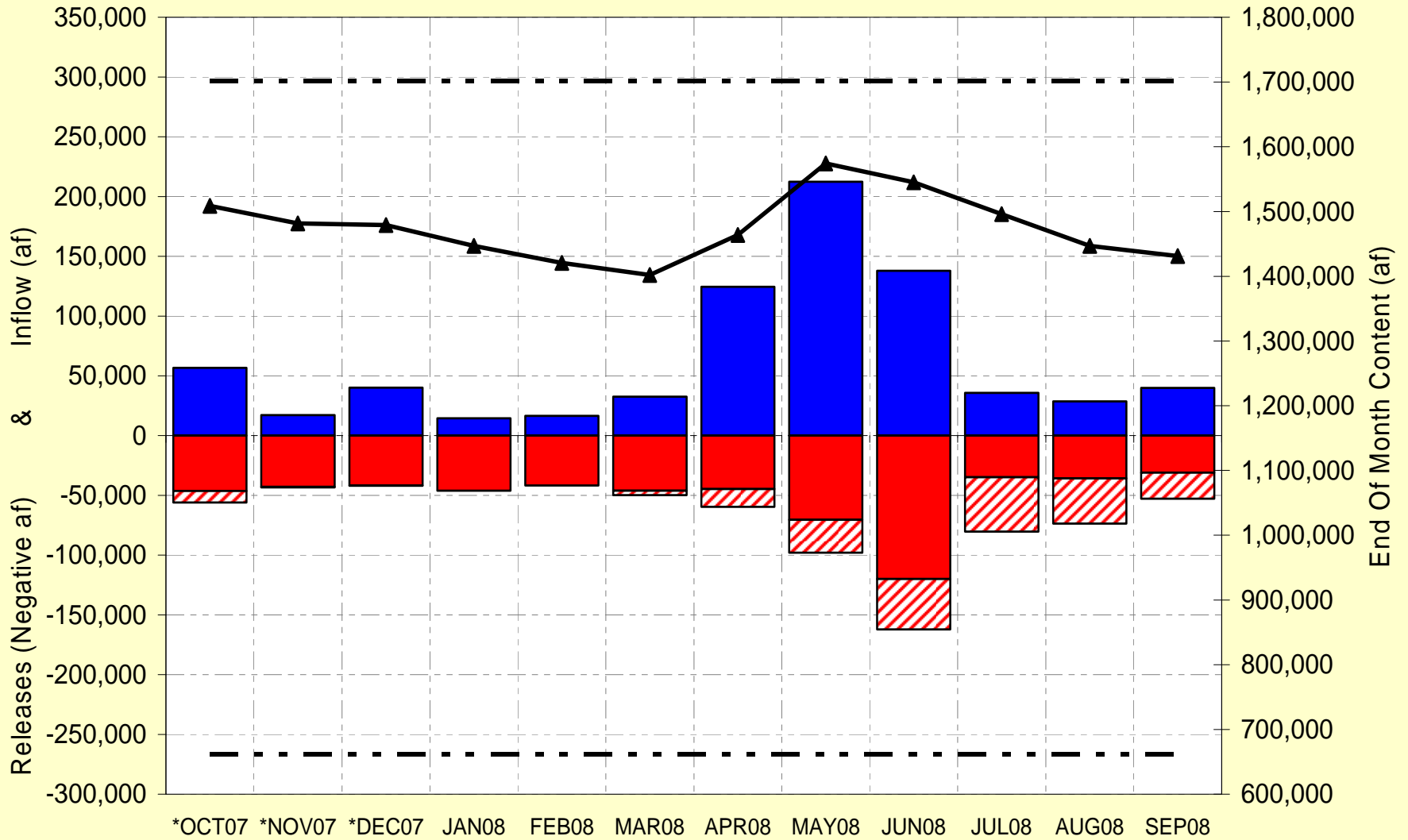
Navajo Reservoir Most, Maximum and Minimum Probable EOM Water Surface Elevation (feet) based on the January Mid Month Forecast



Navajo Reservoir - 2008 WY - Annual Operating Plan Most Probable Inflow - January 15th Forecast

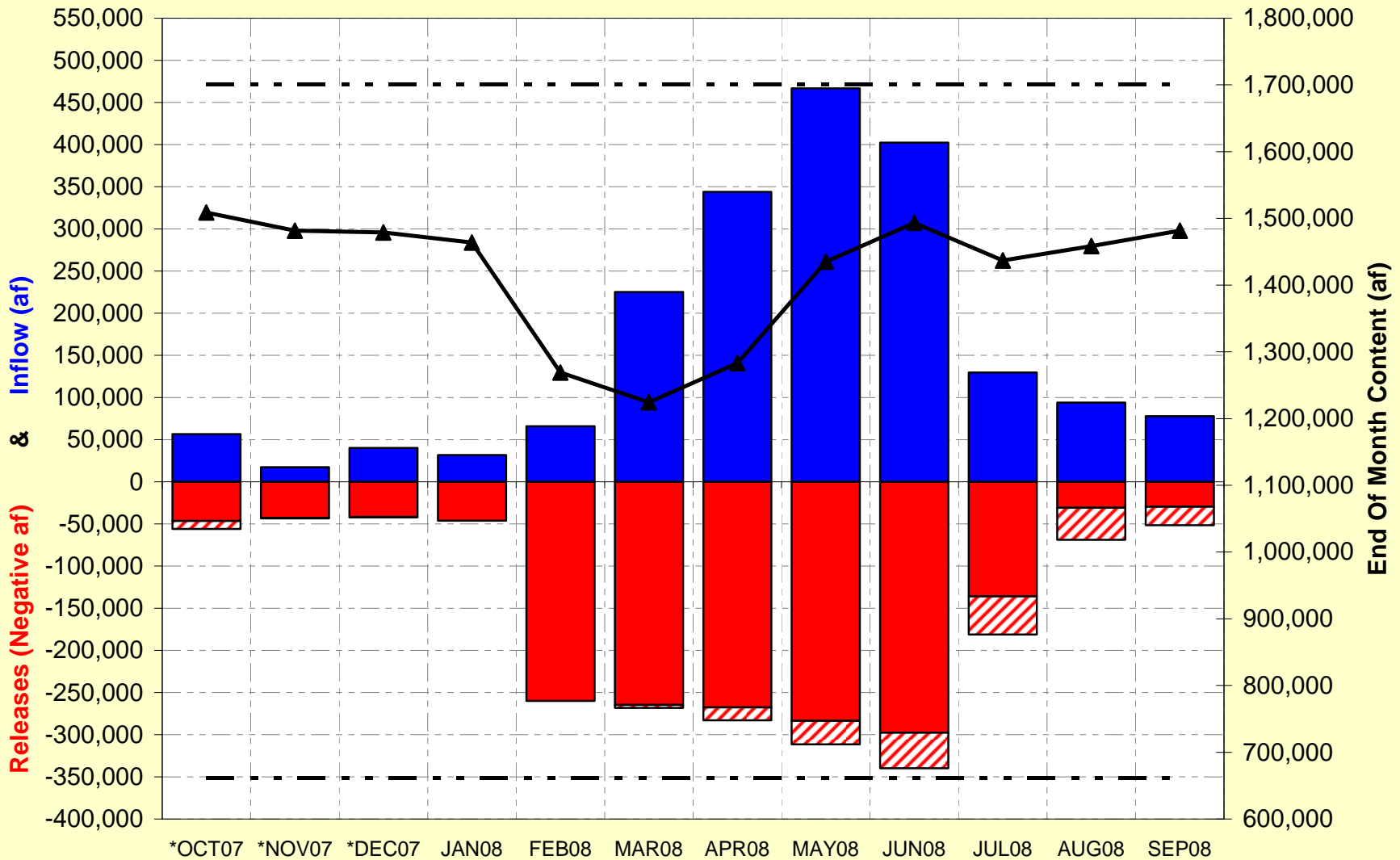


Navajo Reservoir - 2008 WY - Annual Operating Plan
Mimum Probable Inflow - January 15th Forecast



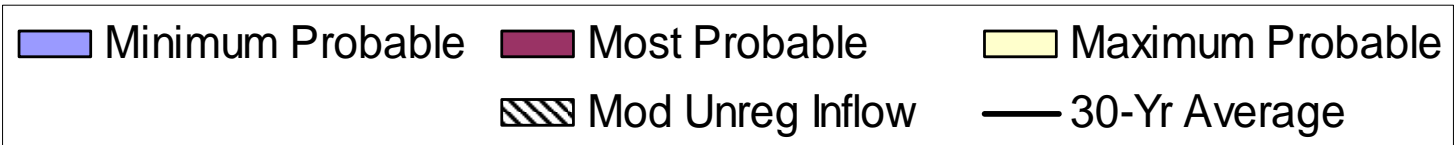
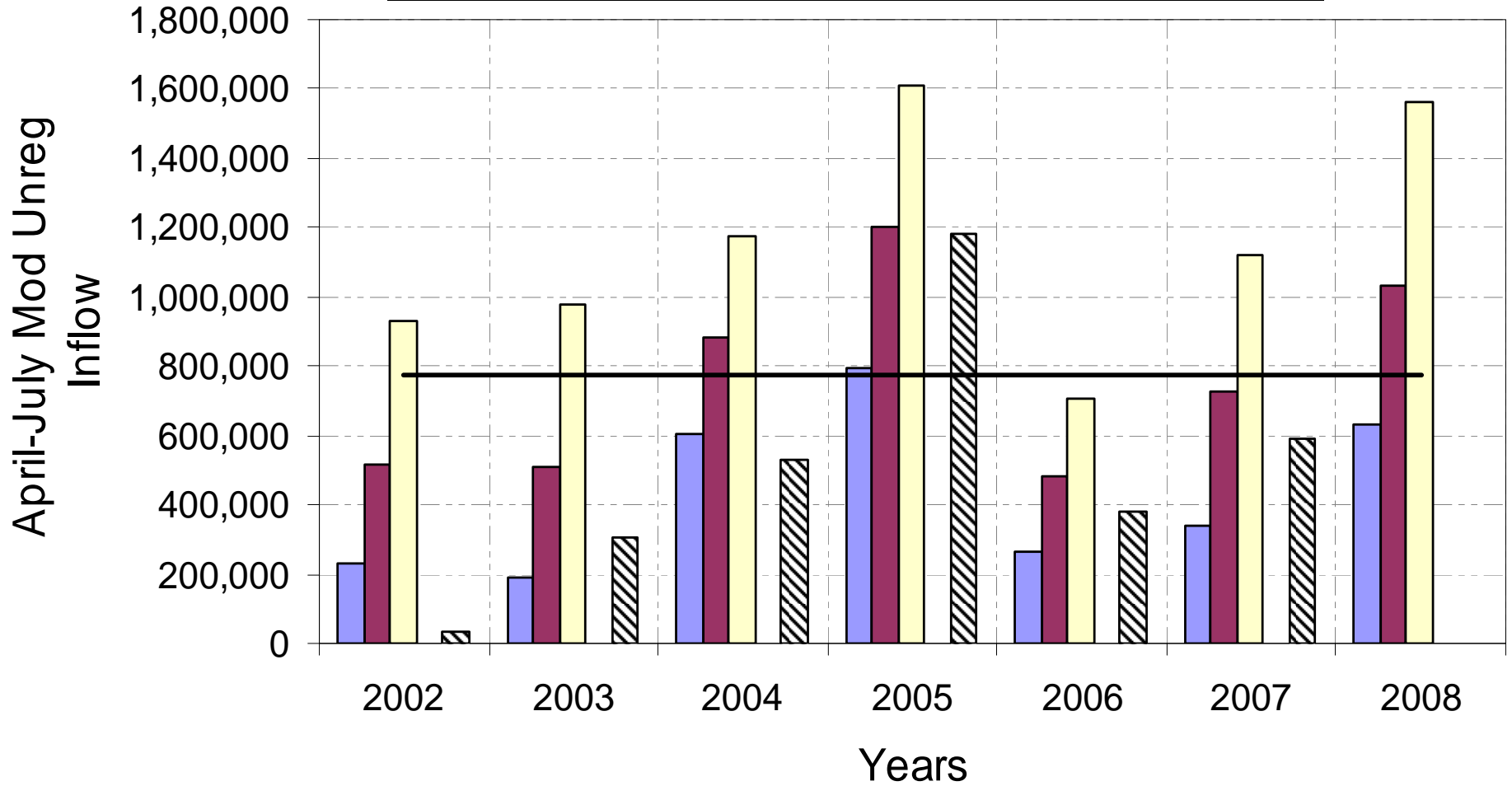
■ Inflow (af)
 ■ Release (af)
 NIIP Div
 ▲ Content (af)
 - - - Max Content
 - - - Min Content

Navajo Reservoir - 2008 WY - Annual Operating Plan Maximum Probable Inflow - January 15th Forecast



■ Inflow (af)
 ■ Release (af)
 NIIP Div (af)
 ▲ Content (af)
 - - - Max Content
 - - - Min Content

April-July Mod Unreg Forecast from Mid January vs Realized Mod Unreg Inflow



2008
Recommendations
for San Juan River
Operation and Administration

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Navajo Dam Maintenance Activities

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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 Audience

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How You Can Access Information

USBR

www.usbr.gov/uc

USGS

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

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Summary

- Forecasts are Very Preliminary.
- Likely Minimum Release:
 - 750 cfs Oct 2006 - May 2008
 - 500 cfs Jun 2008 – September 2008
- Target Baseflow will be 500 -1000 cfs
- A Modified Maximum Fish Spring Release is expected. (21+ Days at 5,000 cfs)
- Next Operations Meeting: April ?, 2008

Thanks for Coming

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