

**Glen Canyon Dam Adaptive Management Work Group**  
**Agenda Item Information**  
**May 18, 2011**

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Agenda Item

Basin Hydrology and Operations

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Action Requested

Information item only.

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Presenters

David Trueman, Resource Management Division Manager, Upper Colorado Region, Bureau of Reclamation

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Previous Action Taken

N/A

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Relevant Science

N/A

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Background Information

The presentation is intended to provide pertinent information to AMWG members on current water supply and forecasted hydrologic conditions within the Upper Colorado River Basin. The presentation will focus on projected reservoir conditions and operations at Lake Powell/Glen Canyon Dam during water year 2011 and provide a general outlook for 2012.

The presentation will cover the implementation of the *Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations of Lake Powell and Lake Mead* and equalization releases from Lake Powell in water year 2011. Such information is provided to assist the AMWG in developing recommendations to the Secretary on the operation of Glen Canyon Dam, particularly when such recommendations are near-term in nature.

# RECLAMATION

*Managing Water in the West*

## **Glen Canyon Dam Operation Status WY2011/2012 Colorado River Basin Hydrology**

**AMWG Meeting  
May 18, 2011**



U.S. Department of the Interior  
Bureau of Reclamation

# Colorado River Basin: Update on 2011 Coordinated Operations

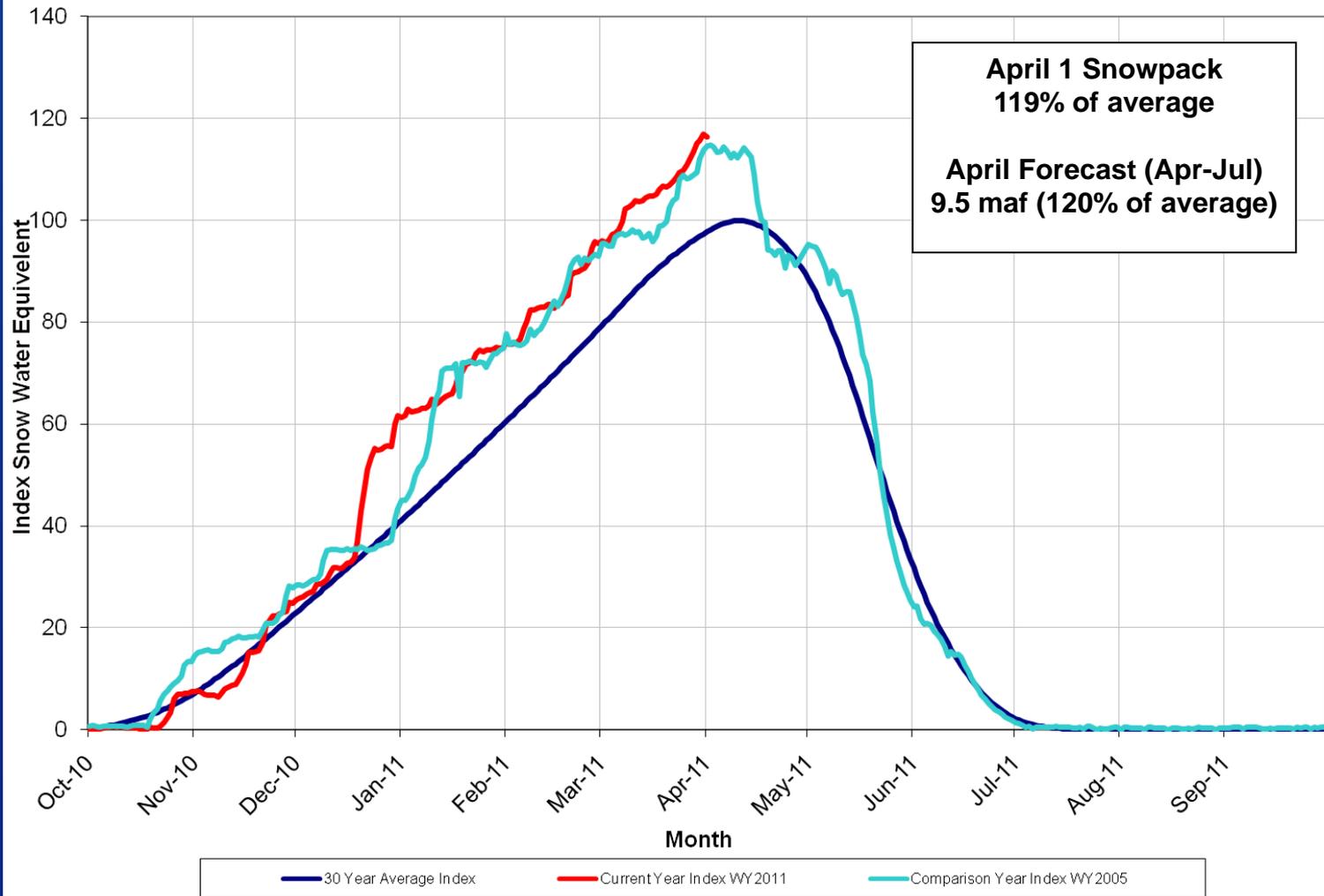
- WY 2011 Hydrology Update
- Glen Canyon Dam Operations
  - Current status for the remainder of WY 2011
  - Projected water year release conditions for WY2012

# Hydrologic Update

RECLAMATION

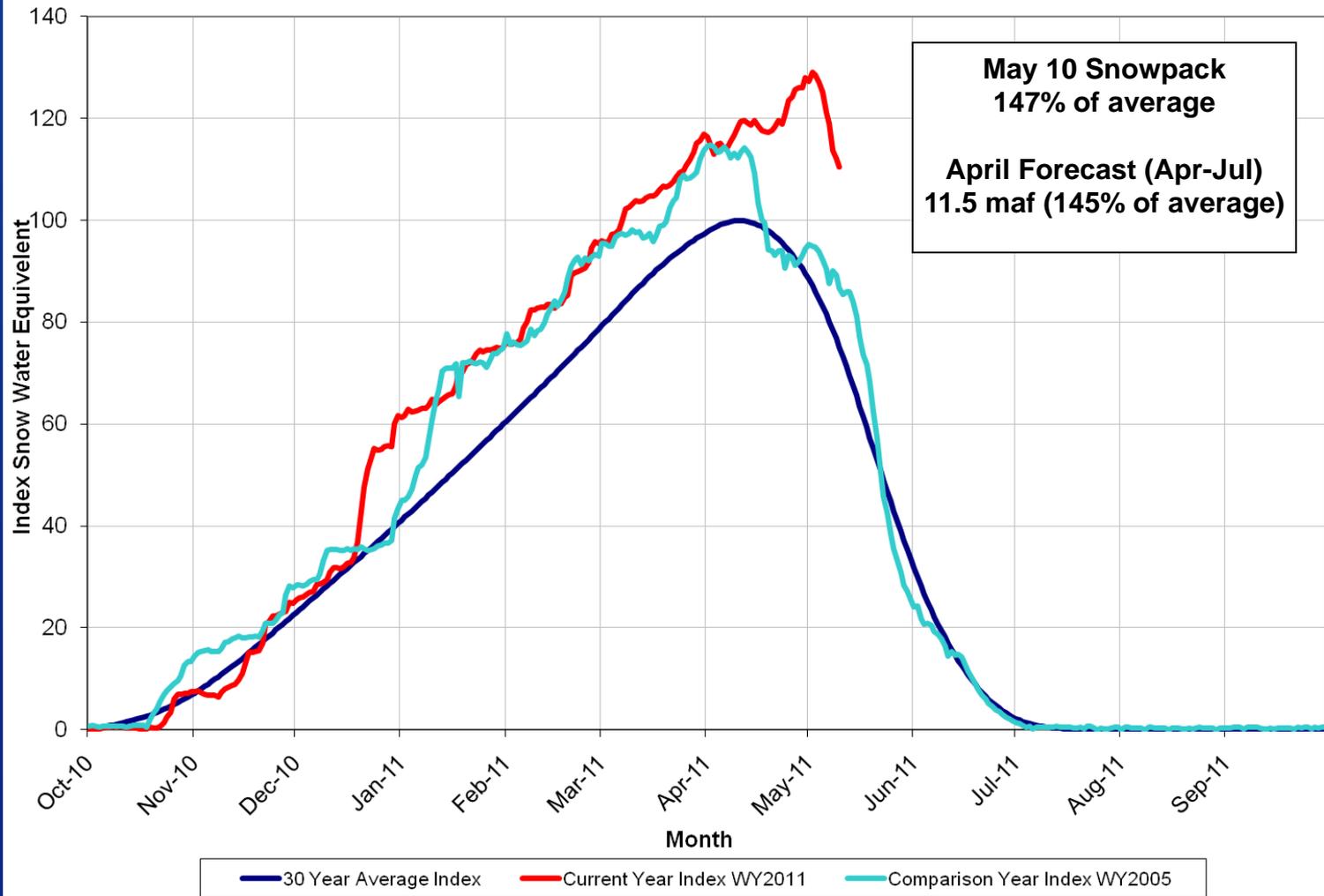
# Upper Basin Hydrology Update

Upper Colorado River Basin Snotel Tracking  
Aggregate of 115 Snotel Sites above Lake Powell



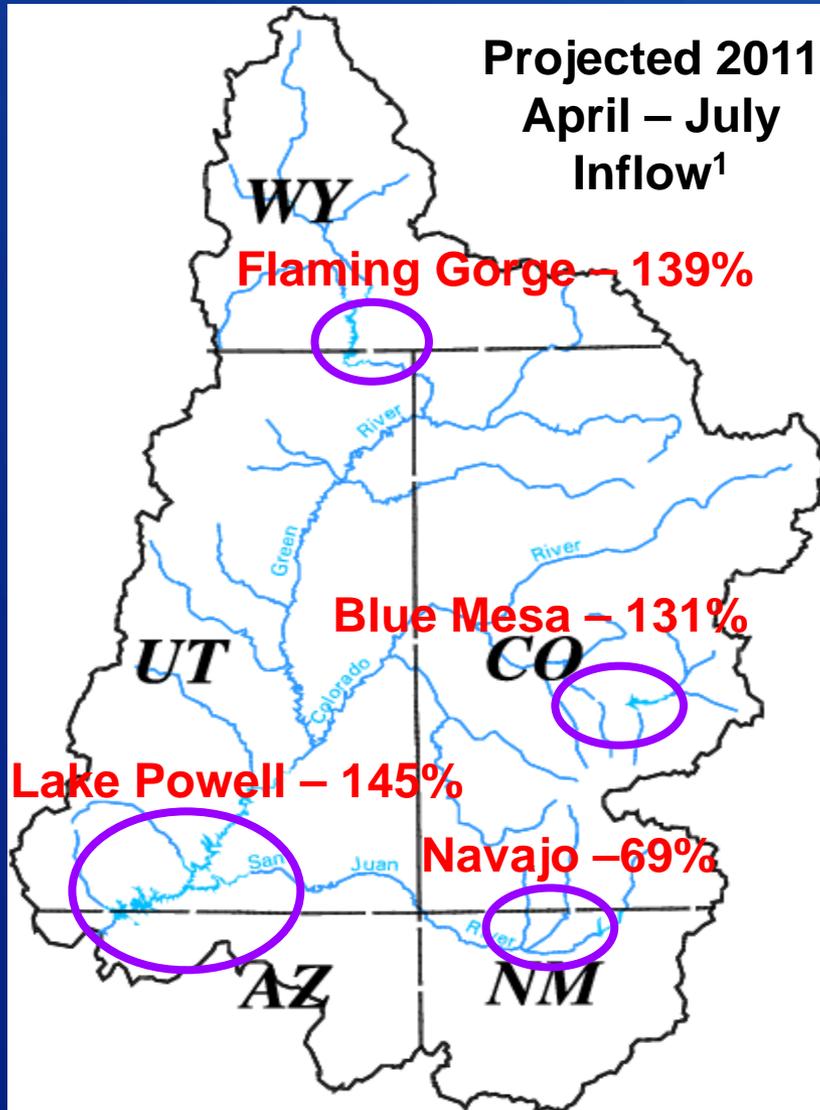
# Upper Basin Hydrology Update

Upper Colorado River Basin Snotel Tracking  
Aggregate of 115 Snotel Sites above Lake Powell



# CBRFC Unregulated Inflow Forecasts

## dated May 4, 2011



Period in 2011	Inflow (KAF)	Percent of Average <sup>1</sup>
April (observed)	983	100
May	3,000	130
June	5,200	169
July	2,300	148
April – July	11,500	145
Water Year Projection	15,380	128

<sup>1</sup> Percentages and percent of average based on period of record from 1971-2000.

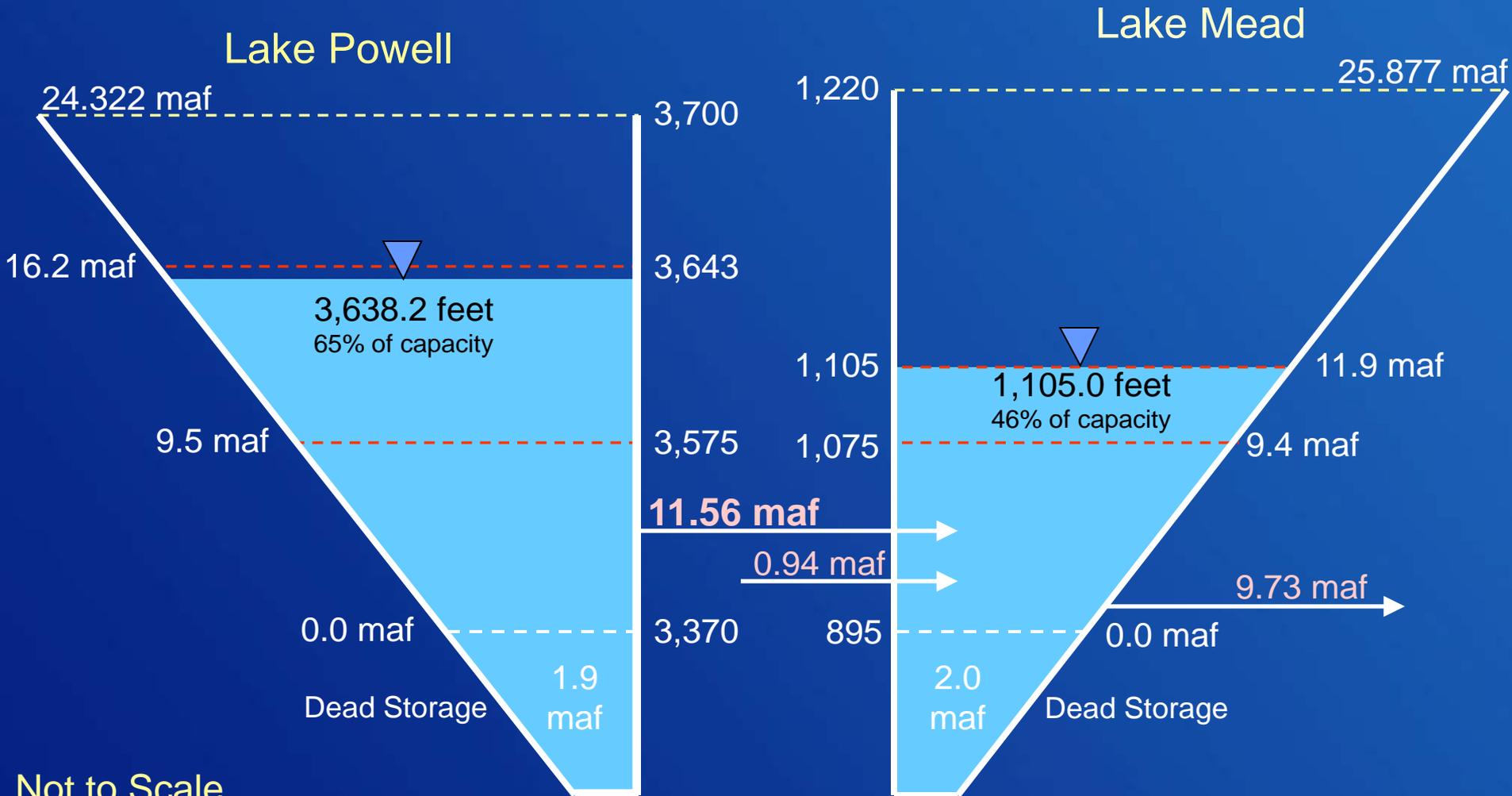
**Projected Operations  
for the Remainder of WY 2011**

RECLAMATION

# Water Year 2011 Projections

## April 2011 Most Probable Inflow Scenario

Projected Unregulated Inflow into Powell<sup>1</sup> = 13.11 maf (109% of average)

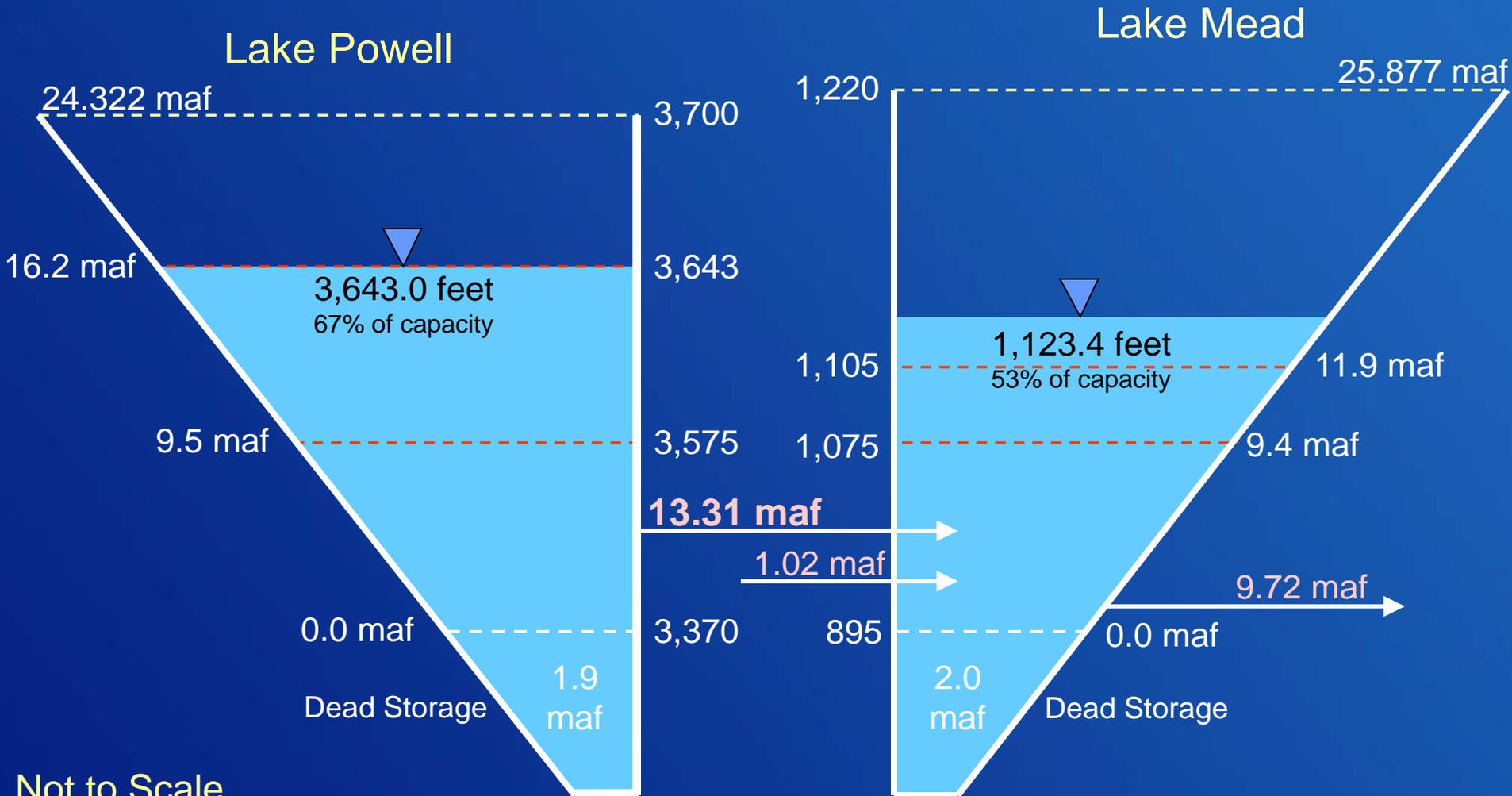


<sup>1</sup> Projected elevations from the April 2011 24-Month Study which is based on the CBRFC inflow forecast dated April 4, 2011

# Water Year 2011 Projections

## May 2011 Most Probable Inflow Scenario

Projected Unregulated Inflow into Powell<sup>1</sup> = 15.38 maf (128% of average)



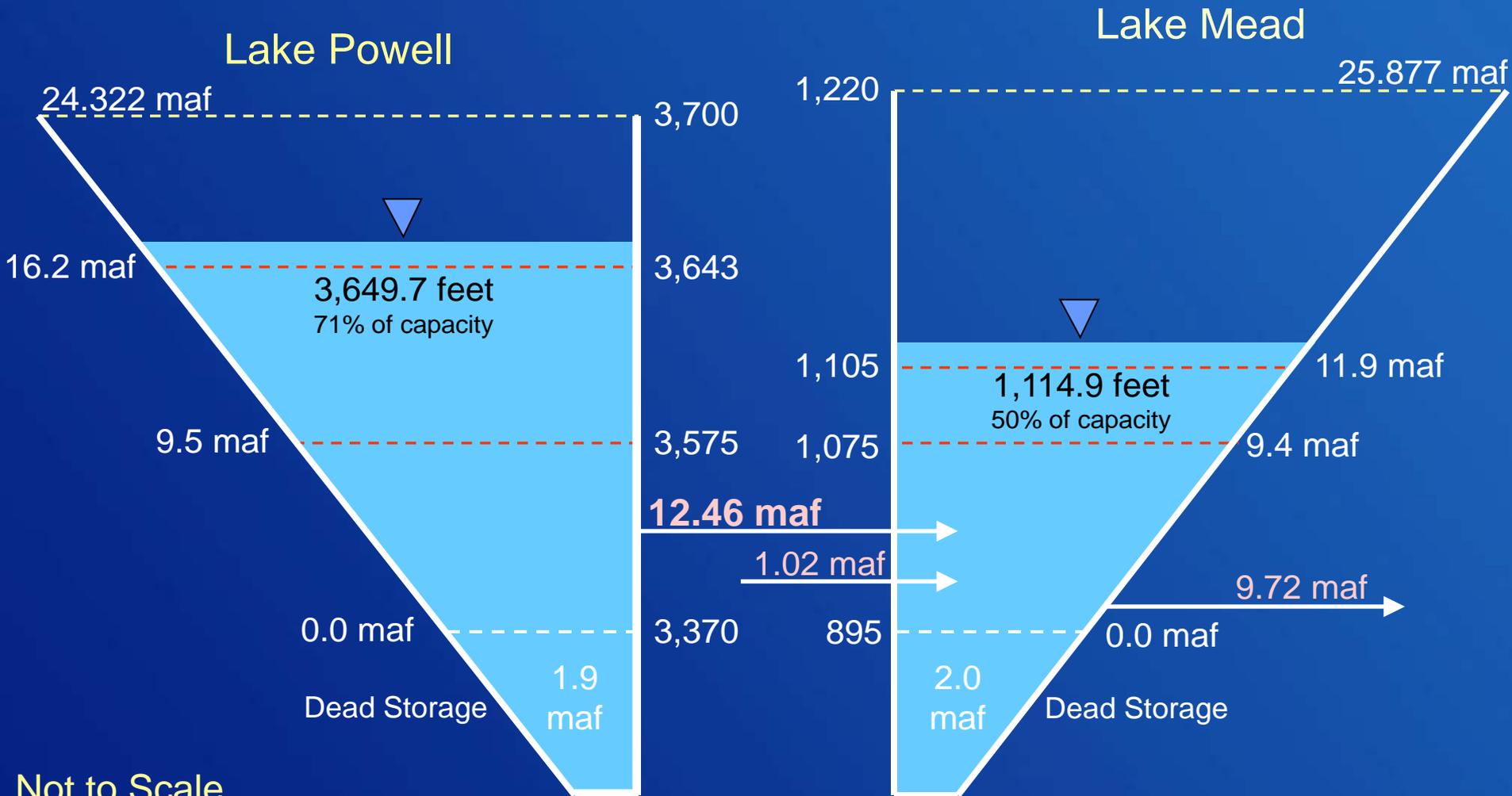
Not to Scale

<sup>1</sup> Projected elevations from the May 2011 24-Month Study which is based on the CBRFC inflow forecast dated May 4, 2011

# Water Year 2011 Projections

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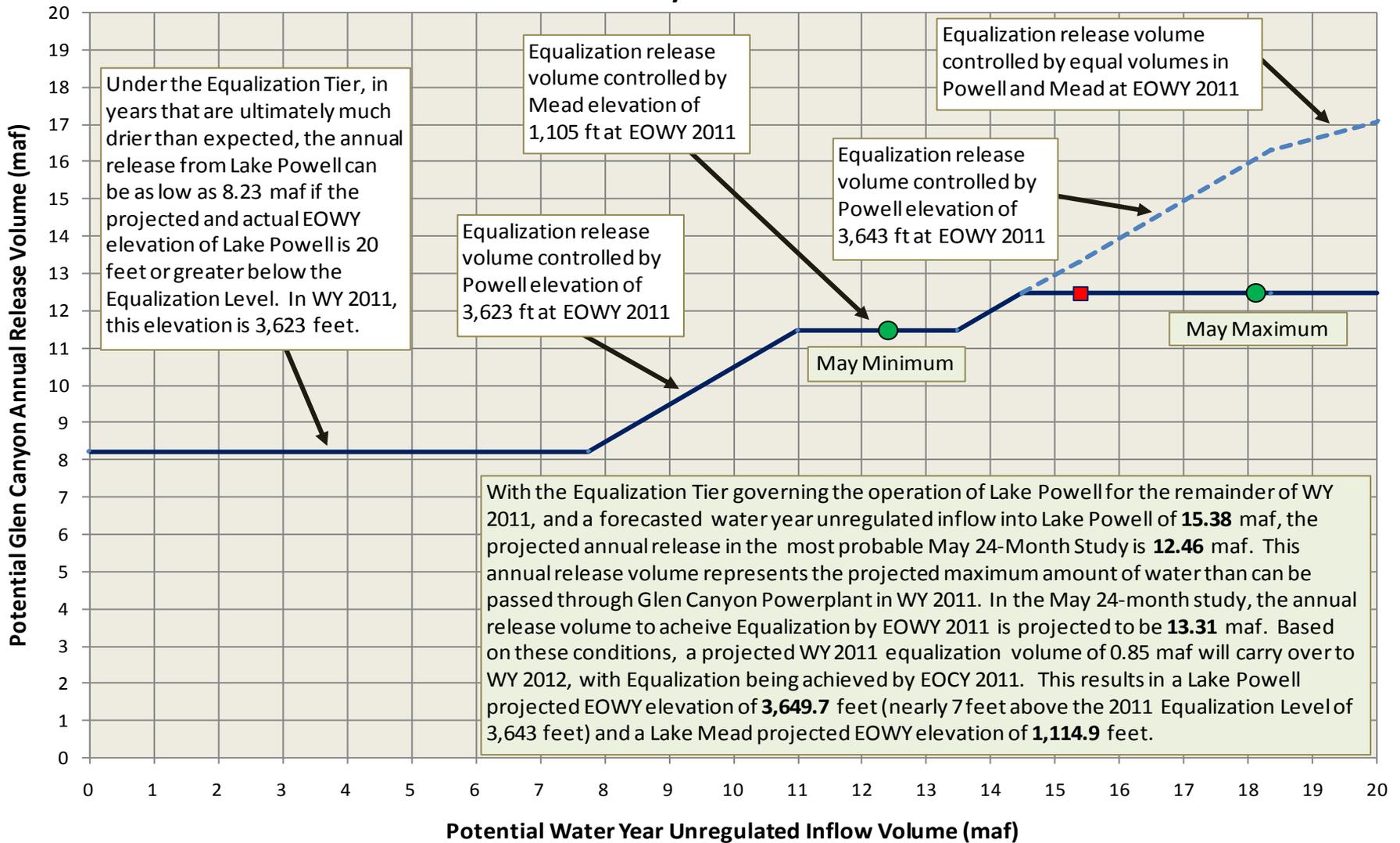
Not to Scale

<sup>1</sup> Projected elevations from the May 2011 24-Month Study which is based on the CBRFC inflow forecast dated May 4, 2011

# Coordinated Operations of Lake Powell and Lake Mead

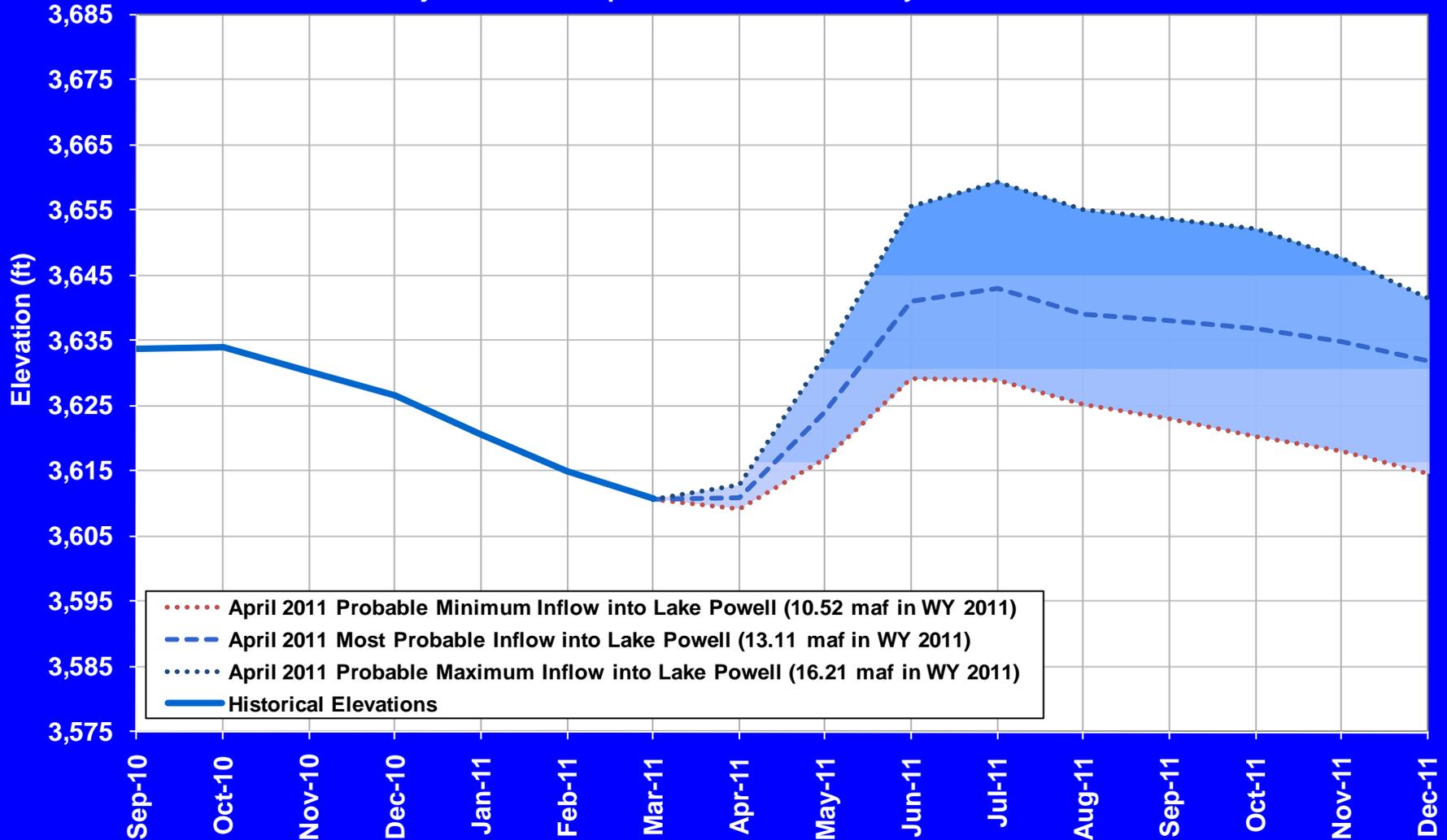
## Annual Release Volume as a Function of Unregulated Inflow Volume

### based on May 2011 Conditions



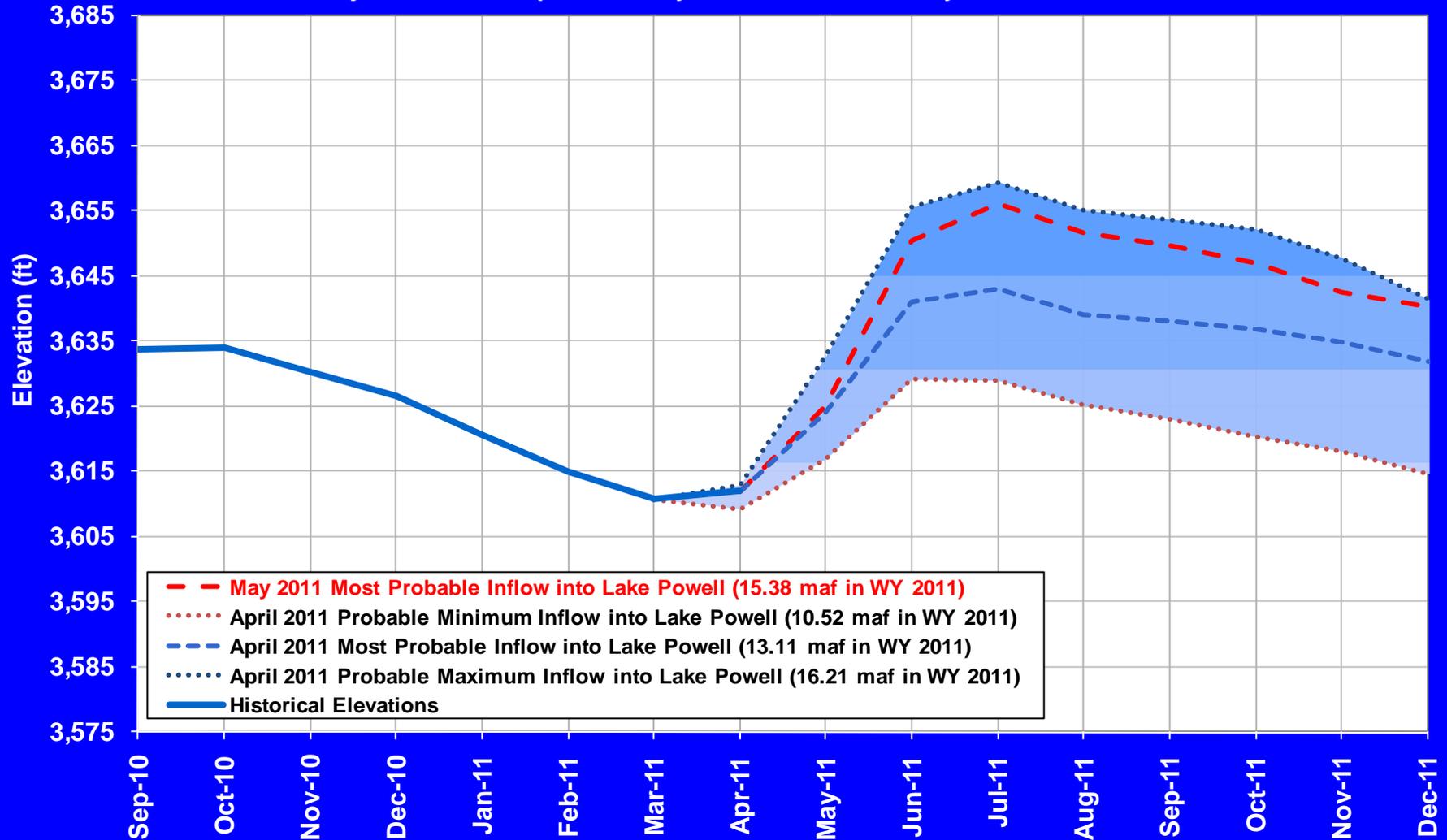
# Lake Powell End of Month Elevation

Projections from April 2011 24-Month Study Inflow Scenarios



# Lake Powell End of Month Elevation

## Projections from April and May 2011 24-Month Study Inflow Scenarios



# Glen Canyon Dam Projected Operations for Remainder of WY2011

RECLAMATION

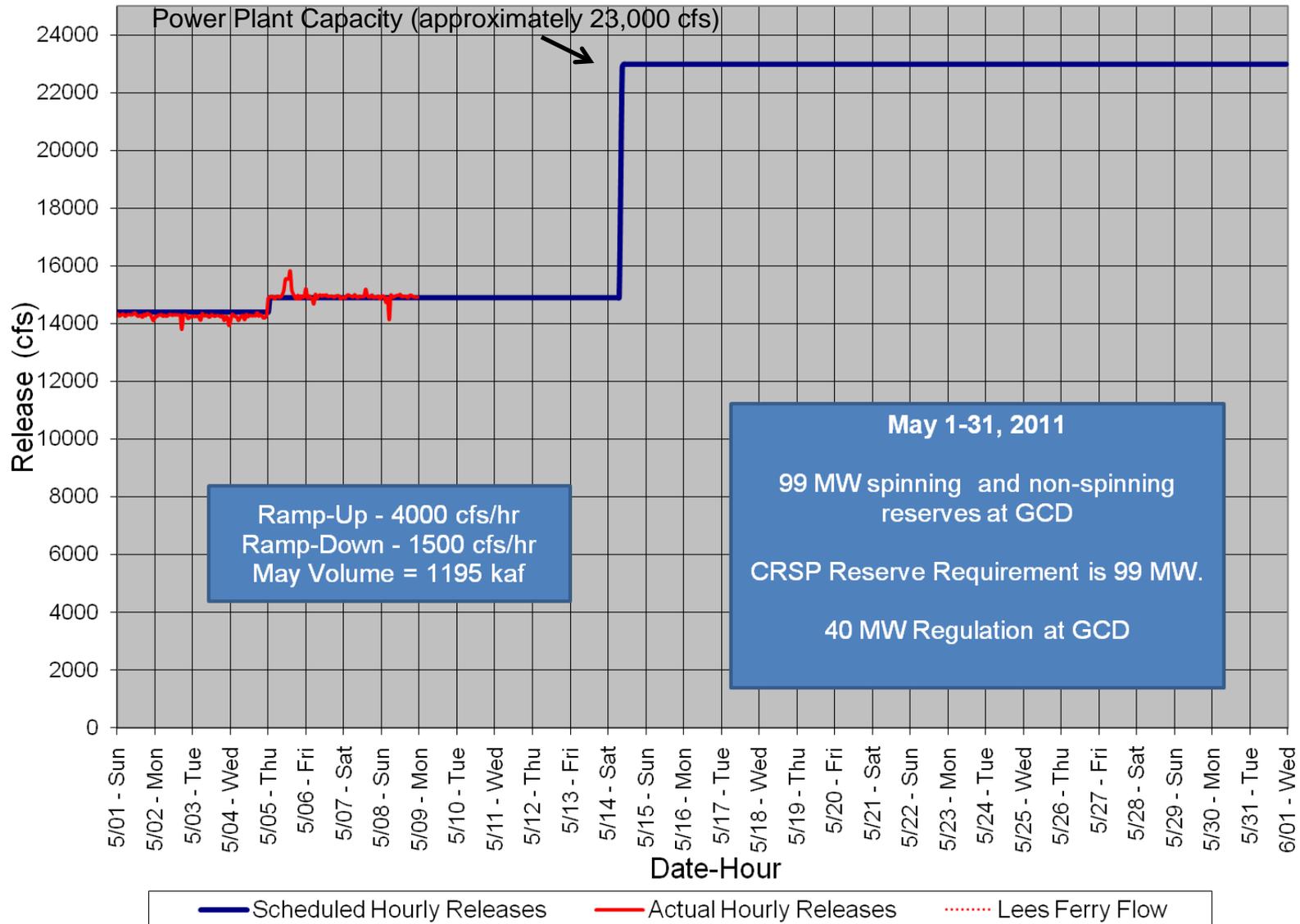
# Glen Canyon Power Plant Planned Unit Outage Schedule for Water Year 2011

(updated 5-9-2011)

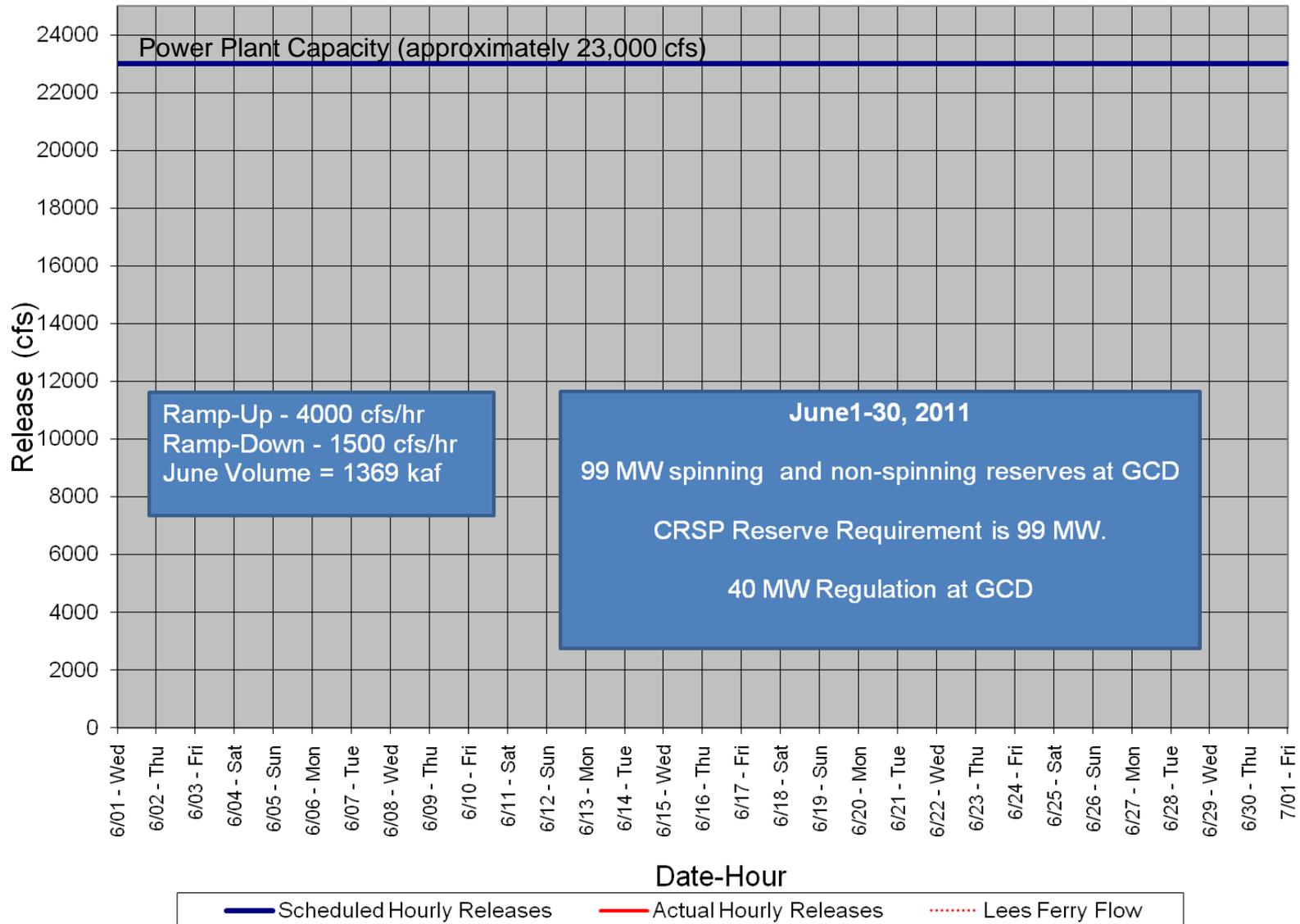
Unit Number	Oct 2010	Nov 2010	Dec 2010	Jan 2011	Feb 2011	Mar 2011	Apr 2011	May 2011	Jun 2011	Jul 2011	Aug 2011	Sep 2011
1												
2												
3												
4												
5												
6 (3/4 Unit)												
7												
8												
Units Available	4.75	5.75	6.75	6.75	4.75	4.75	4.75	4.75 / 6.75	6.75	6.75	6.75	5
Capacity (cfs)								14,400 / 23,000	23,000	23,825	23,825	14,840
Capacity (kaf/month)	990	1180	1350	1350	1080	1036	944	1195	1369	1465	1465	883
Max (kaf)	495	810	847	997	964	1033	940	1195	1369	1465	1465	883
Most (kaf)	495	810	847	997	964	1033	940	1195	1369	1465	1465	883
Min (kaf)	495	810	847	997	964	1033	940	1195	1179	1226	1037	714

RECLAMATION

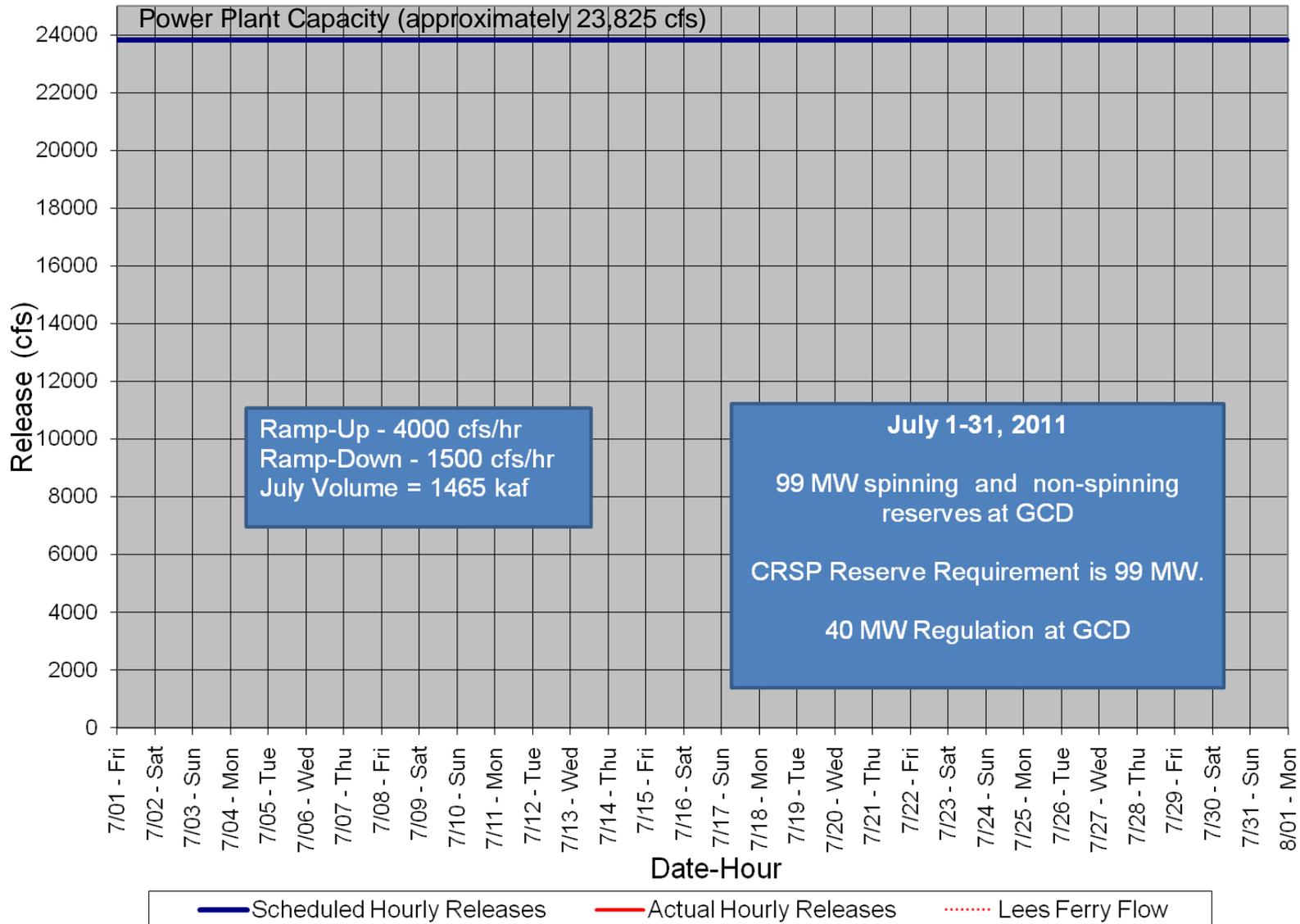
# Glen Canyon Dam Hourly Release Pattern MAY 2011



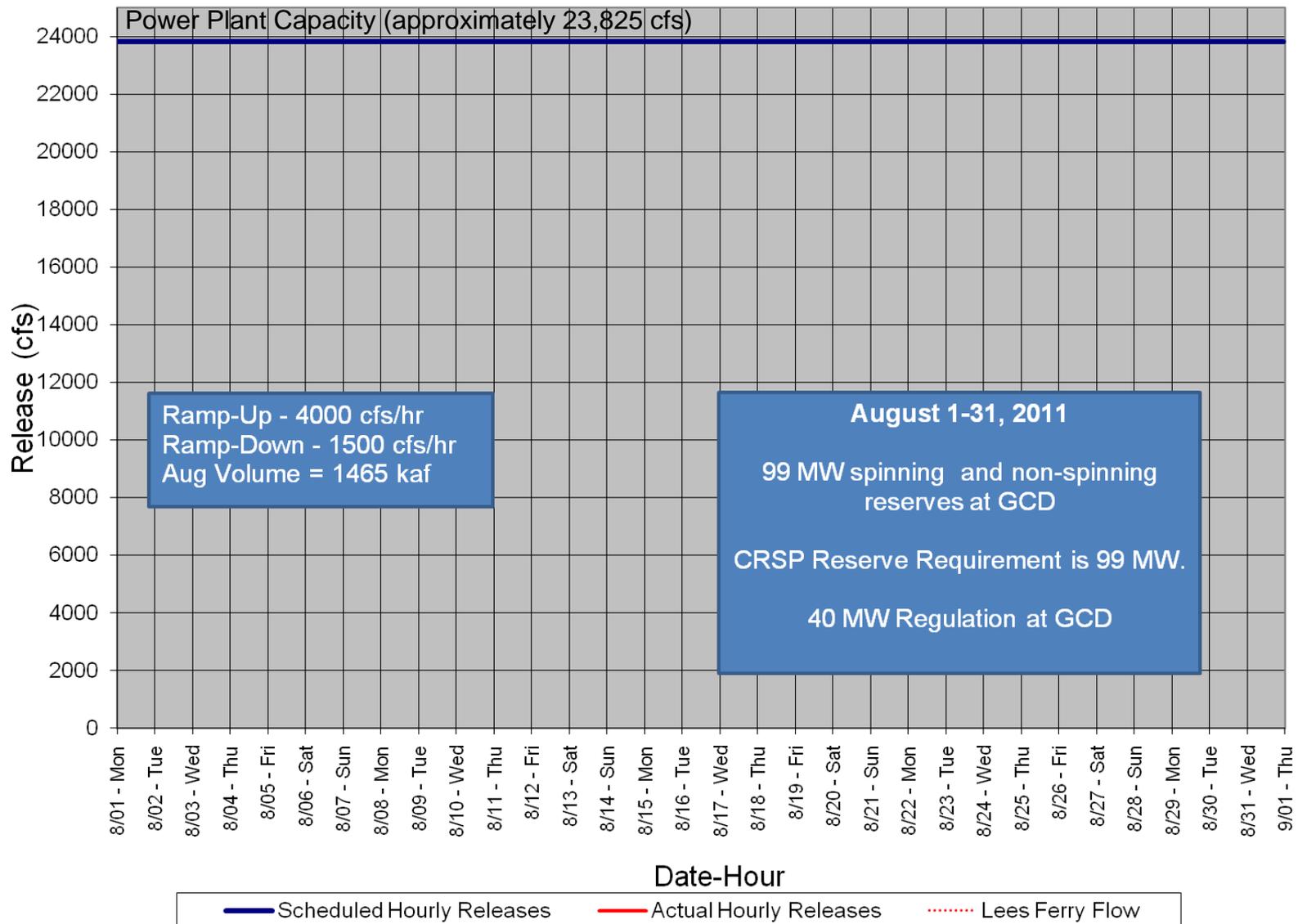
# Glen Canyon Dam Hourly Release Pattern JUN 2011



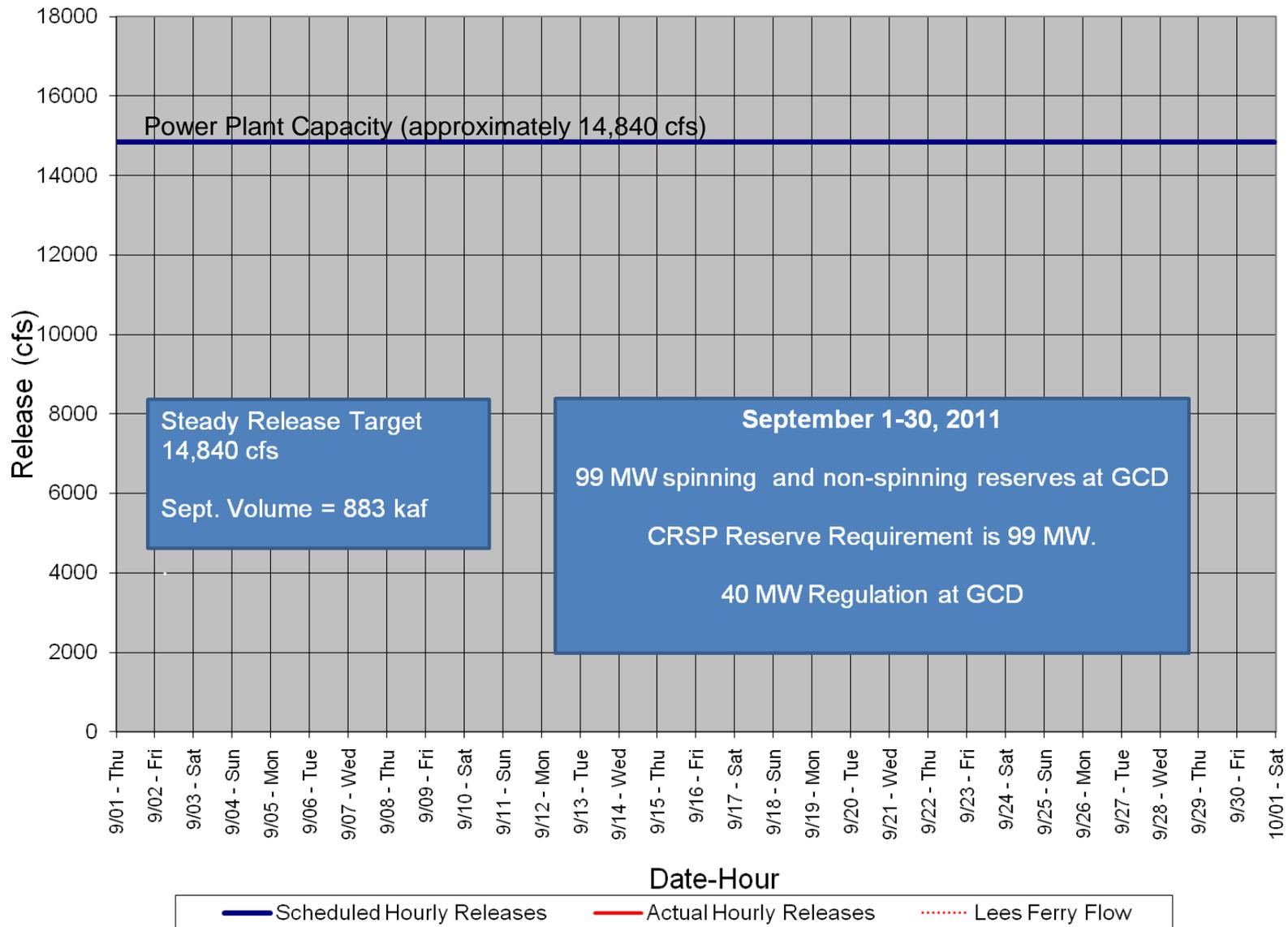
# Glen Canyon Dam Hourly Release Pattern JUL 2011



# Glen Canyon Dam Hourly Release Pattern AUG 2011

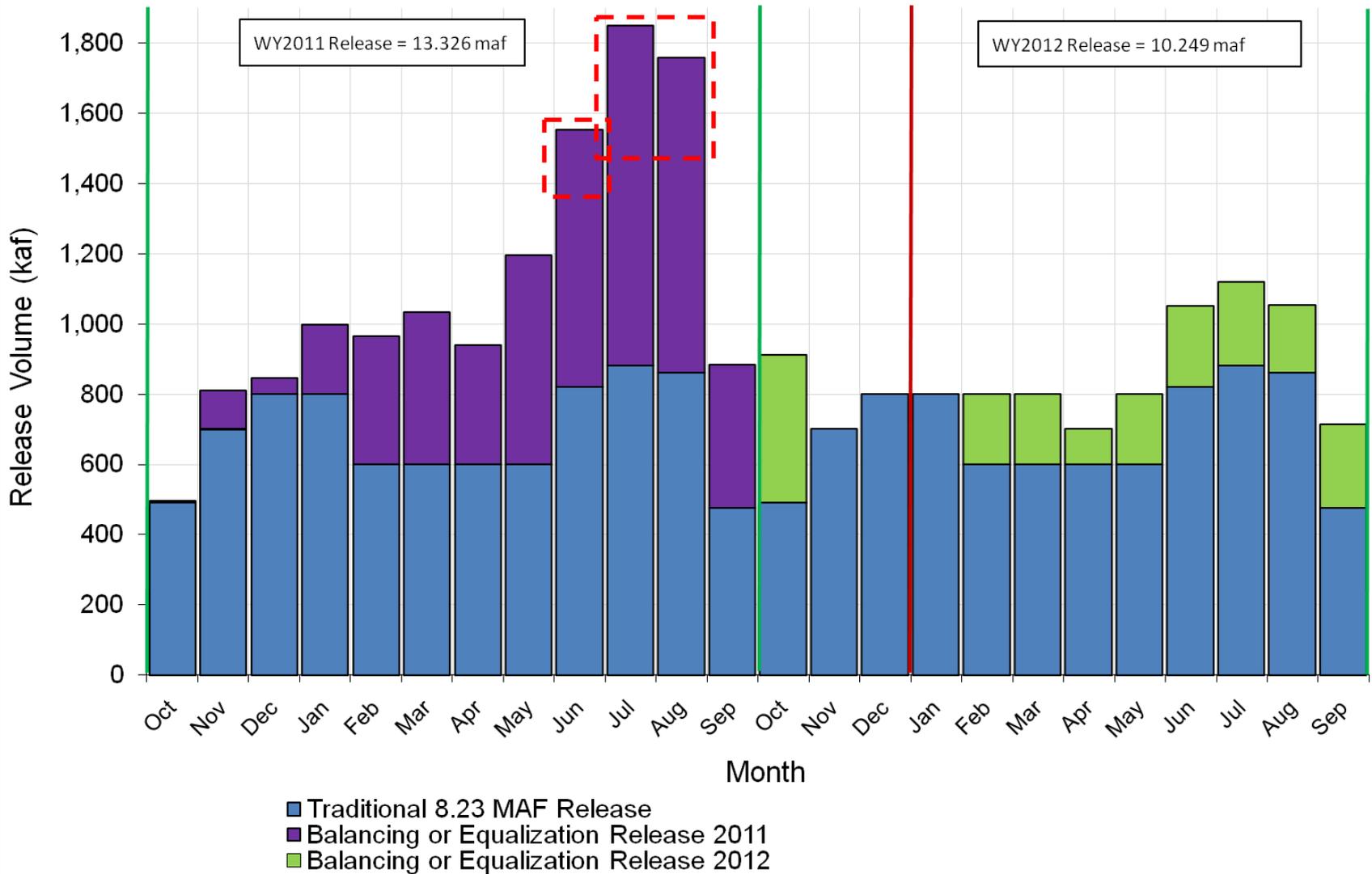


# Glen Canyon Dam Hourly Release Pattern SEP 2011



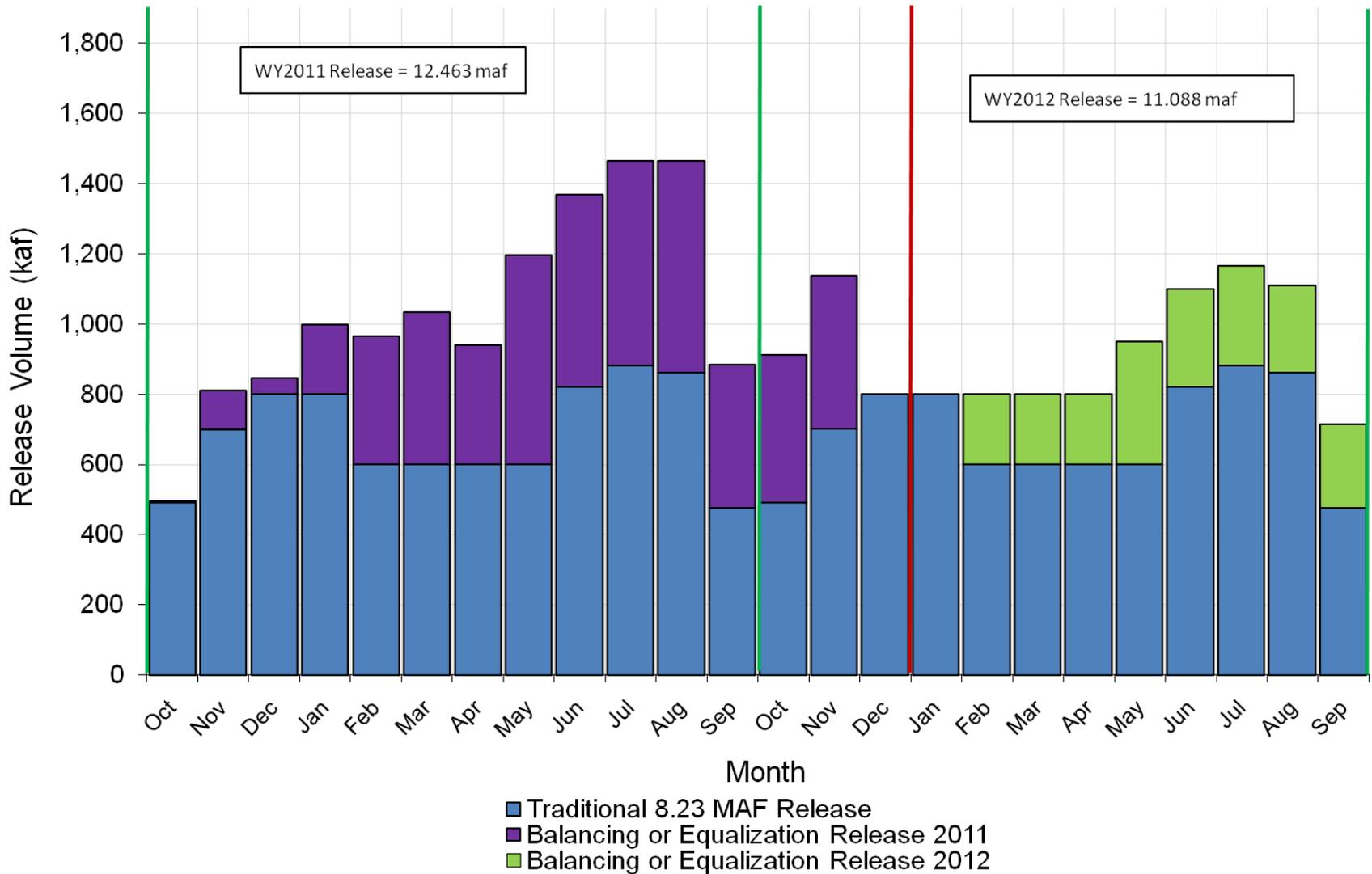
# May 24-Month Study Monthly Release Distribution

May 24-Month Study Exhibit Equalization By End of Water Year



# May 24-Month Study Monthly Release Distribution

May 24-Month Study



# Outlook to WY2012

RECLAMATION

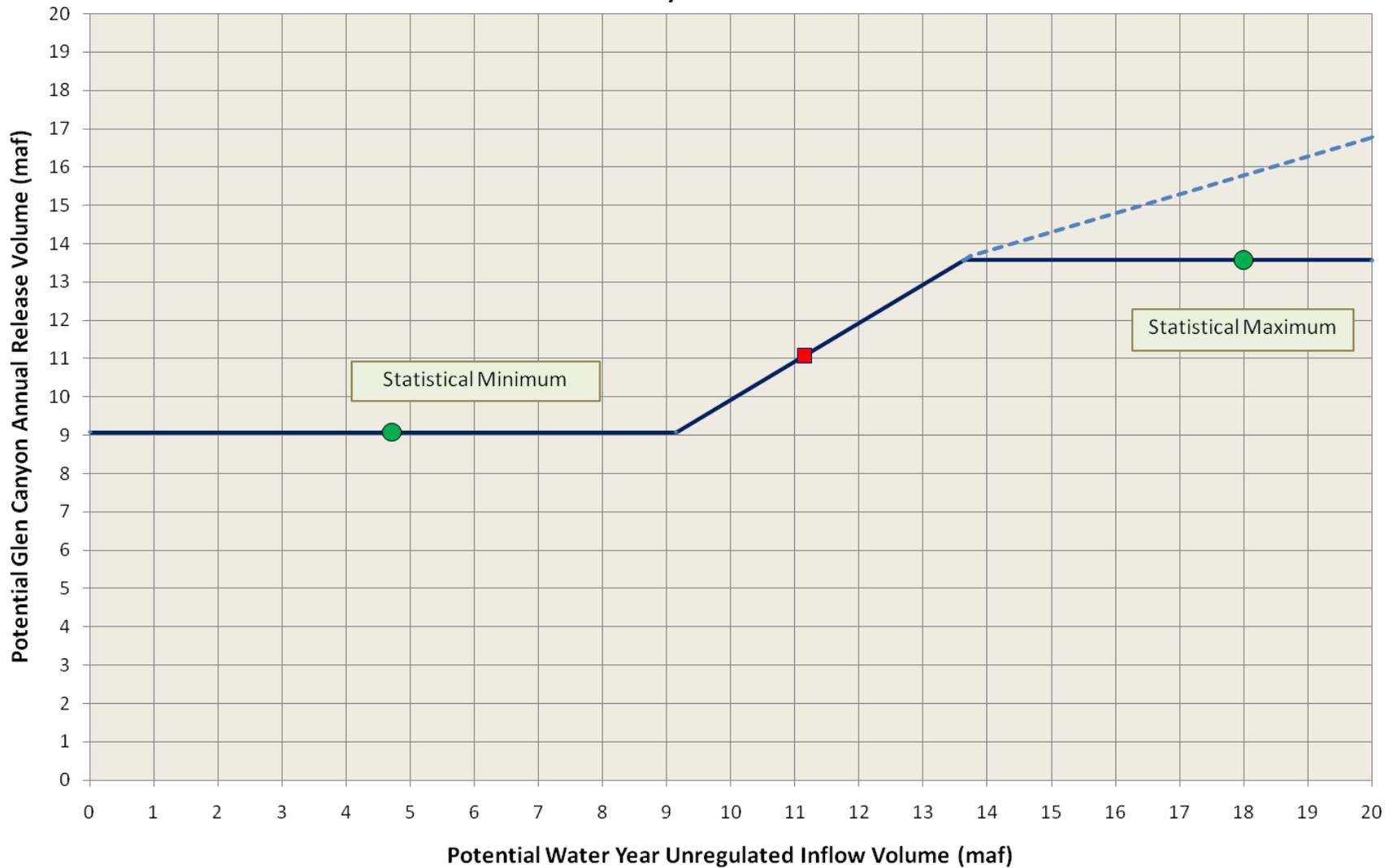
# Glen Canyon Power Plant Planned Unit Outage Schedule for Water Year 2012

(updated 5-13-2011)

Unit Number	Oct 2011	Nov 2011	Dec 2011	Jan 2012	Feb 2012	Mar 2012	Apr 2012	May 2012	Jun 2012	Jul 2012	Aug 2012	Sep 2012
1	[Red Bar]											[Red Bar]
2			[Red Bar]									
3					[Red Bar]							
4					[Red Bar]							
5	[Red Bar]											[Red Bar]
6 (3/4 Unit)	[Red Bar]											
7					[Red Bar]							
8					[Red Bar]							
Units Available	5	6.75	6.75	6.75	4.75	4.75 / 6.75	6.75	6.75	6.75	6.75	6.75	4.75
Capacity (cfs)	14,800	23,800	23,800	23,000	14,400	14,400 / 23,800	23,000	23,000	23,000	23,800	23,800	14,800
Capacity (kaf/month)	1000	1160	1370	1370	940	1110	1370	1370	1370	1460	1460	880
Max (kaf)	912	1138	800	800	900	1110	1370	1370	1370	1460	1460	880
Most (kaf)	912	1138	800	800	800	800	800	950	1100	1165	1109	714
Min (kaf)	912	1138	800	800	700	600	600	600	600	890	864	476

# Coordinated Operations of Lake Powell and Lake Mead

## Annual Release Volume as a Function of Unregulated Inflow Volume for 2012 based on May 2011 Conditions



# May 2011 Results from CRSS

Probabilities of occurrence, values in percent

	Event or System Condition	2012	2013	2014	2015	2016
<b>Upper Basin</b>	Equalization release from Powell	63	54	48	41	44
	Balancing release from Powell	0	0	4	13	13
	8.23 maf release from Powell	37	46	48	37	33
	7.48 maf release from Powell	0	0	0	9	10
	7.00 maf release from Powell	0	0	0	0	0
<b>Lower Basin</b>	Shortage – any amount (Mead $\leq$ 1,075)	0	0	0	5	13
	<i>Shortage – 1<sup>st</sup> level (Mead <math>\leq</math> 1,075 and <math>\geq</math> 1,050)</i>	0	0	0	5	11
	<i>Shortage – 2<sup>nd</sup> level (Mead <math>&lt;</math> 1,050 and <math>\geq</math> 1,025)</i>	0	0	0	0	2
	<i>Shortage – 3<sup>rd</sup> level (Mead <math>&lt;</math> 1,025 )</i>	0	0	0	0	0
	Surplus – any amount (Mead $\geq$ 1,145)	0	30	33	40	39
	<i>Surplus – Flood Control</i>	0	0	4	4	10
	Normal or ICS Surplus	100	70	67	55	48

# Questions/Discussion

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RECLAMATION