

# RECLAMATION

*Managing Water in the West*

## Flaming Gorge Working Group Meeting

### Hydrology and Forecasted Operations

April 19, 2015



U.S. Department of the Interior  
Bureau of Reclamation

Heather E. Patno  
Hydraulic Engineer (hydrologic)  
Upper Colorado Region

# Presentation Outline

- Record of Decision – Process
- Record of Decision – Parameters
- Forecasted 2016 Operations (Review 2011)
- Questions / Discussion

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# Flaming Gorge Decision Process

## Operations under the Record of Decision (2006 ROD)

### Four Step Process for Decision Making

1. Recovery Program Request for Research Flows  
<http://www.coloradoriverrecovery.org/>  
ESA Section 7 Compliance and allows the States of Colorado, Utah, and Wyoming to continue utilizing their authorized apportionment under the 1922 Compact
2. Flaming Gorge Technical Working Group  
Informal Section 7 Compliance
3. Flaming Gorge Working Group  
Public Input and Comments
4. Reclamation makes the final decision of how to operate.

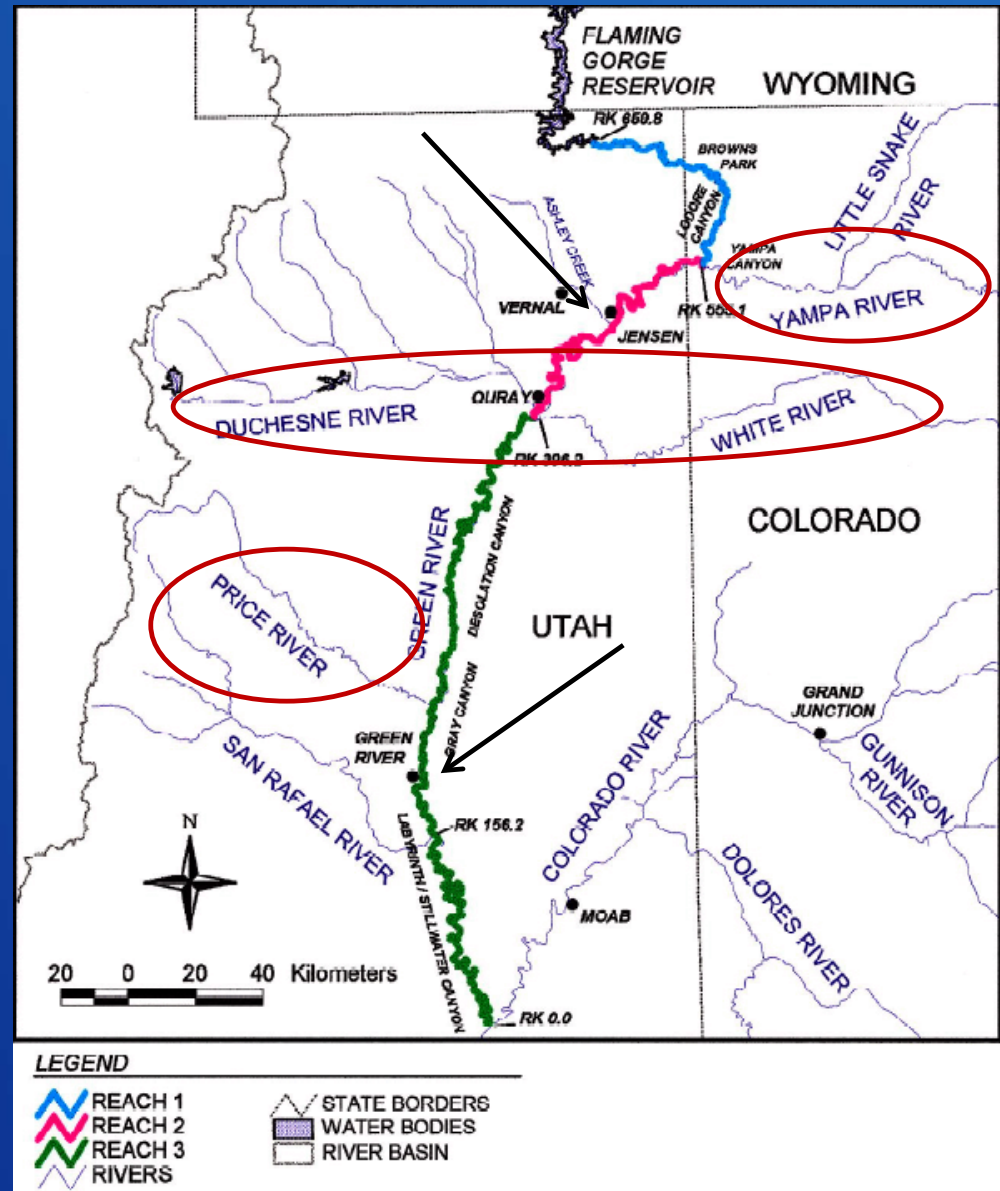
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# Geographic Scope

- Reach 1 (Blue)
  - Flaming Gorge Dam to Yampa River Confluence
- Reach 2 (Pink)
  - Yampa River Confluence to White River confluence
- Reach 3 (Green)
  - White River confluence to confluence of Green and Colorado Rivers



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# Percentage Exceedances and Hydrologic Classifications

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## Hydrologic Classification

## Percentage Exceedance Range

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Wet

<10

Moderately Wet

30 to 10.1

Average

70 to 30.1

Moderately Dry

90 to 70.1

Dry

>90

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**Condensed Table 5.5.—Flow and temperature recommendations by hydrologic condition for Reach 2 (Yampa River to White River) to benefit endangered fishes in the Green River downstream of Flaming Gorge Dam.<sup>a</sup>**

	<b>Hydrologic Condition <sup>b</sup></b>				
	<b>Wet (0 to 10% Exceedance)</b>	<b>Moderately Wet (10 to 30% Exceedance)</b>	<b>Average (30 to 70% Exceedance)</b>	<b>Moderately Dry (70 to 90% Exceedance)</b>	<b>Dry (90 to 100% Exceedance)</b>
<b><i>SPRING PEAK FLOW</i></b>					
<b><i>Magnitude</i></b>	≥ 26,400 cfs	≥ 20,300 cfs	≥ 18,600 cfs in 1 of 2 avr yrs; ≥ 8,300 cfs in other avr yrs	≥ 8,300 cfs	
<b><i>Duration</i></b>	>22,700 cfs 2 weeks +, and >18,600 cfs >4 weeks	>18,600 cfs for 2 weeks or more	>18,600 cfs at least 2 weeks in 1 of 4 avr yrs.	at least 1 week.	2 days or more except in dry years (≥ 98% exceedance)
<b><i>Timing</i></b>	<b>Peak flows should coincide with peak flows in the Yampa River</b>				
	<b>Hydrologic Condition <sup>b</sup></b>				
	<b>Wet (0 to 10% Exceedance)</b>	<b>Moderately Wet (10 to 30% Exceedance)</b>	<b>Average (30 to 70% Exceedance)</b>	<b>Moderately Dry (70 to 90% Exceedance)</b>	<b>Dry (90 to 100% Exceedance)</b>
<b><i>SUMMER THROUGH WINTER BASE FLOW</i></b>					
<b><i>Mean flow</i></b>	2,800 - 3,000 cfs	2,400 - 2,800 cfs	1,500 - 2,400 cfs	1,100 - 1,500 cfs	900 - 1,100 cfs
<b><i>Approximate period</i></b>	Aug 15 to Mar 1	Aug 15 to Mar 1	Aug 15 to Mar 1	Aug 15 to Mar 1	Aug 15 to Mar 1



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# Flaming Gorge Working Group

## Meeting April 2016

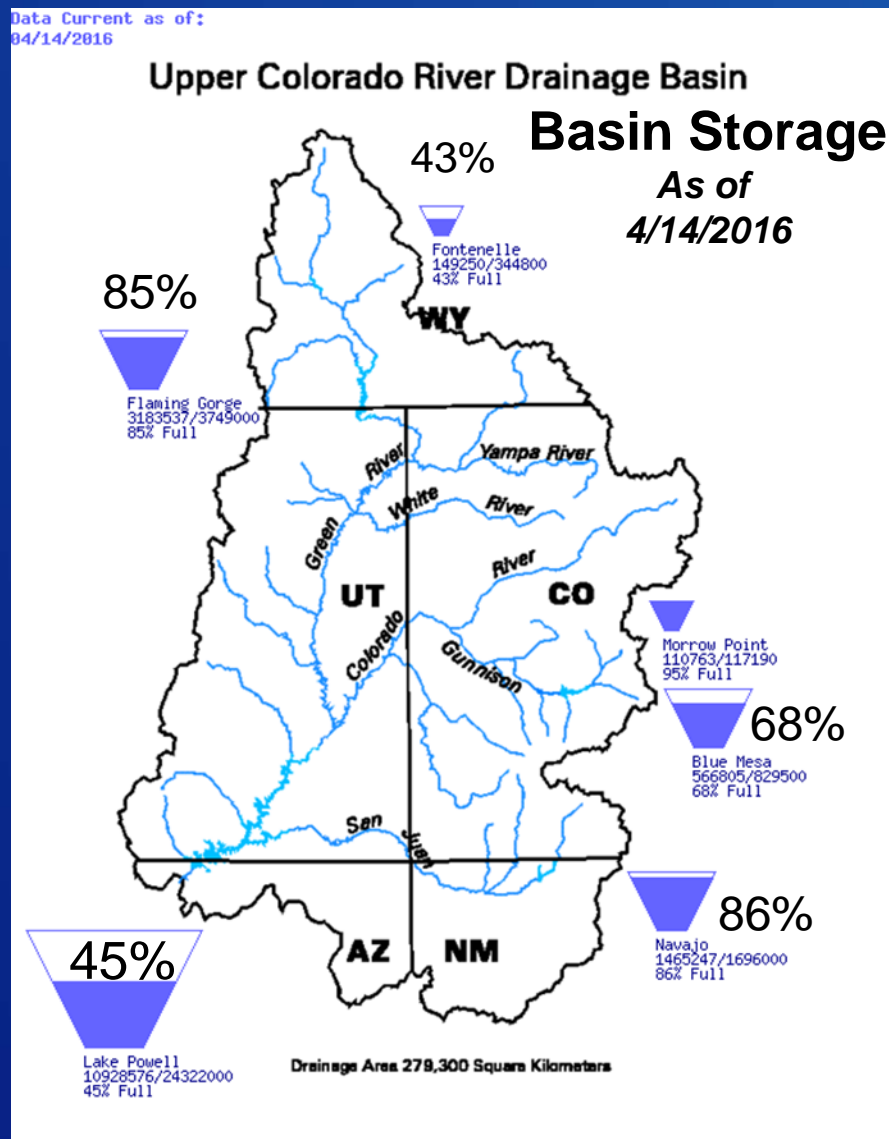
Live Capacity	3.752	MAF
<u>Capacity on 4/15/16</u>	<u>3.180</u>	<u>MAF</u>
Available Space	.572	MAF
Percentage of Full	85	%

Reservoir Elev. (Min Power)	5908.00	feet
<u>Elevation on 4/15/16</u>	<u>6025.63</u>	<u>feet</u>
Elevation above (Min)	117.63	feet

Average Inflow	1,780	cfs
Average Release	815	cfs

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# Upper Basin Storage



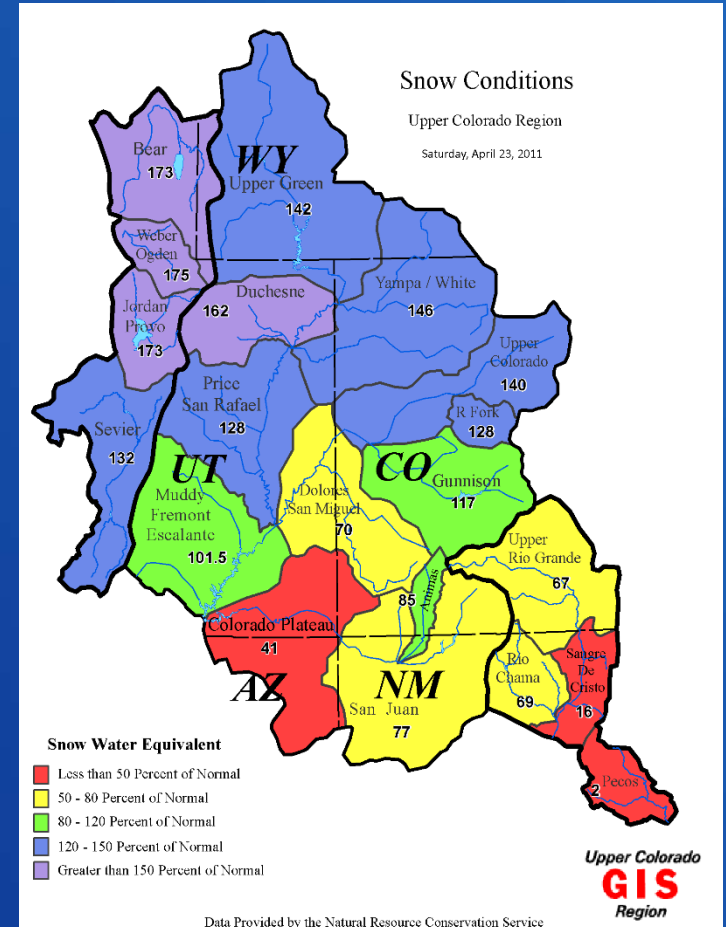
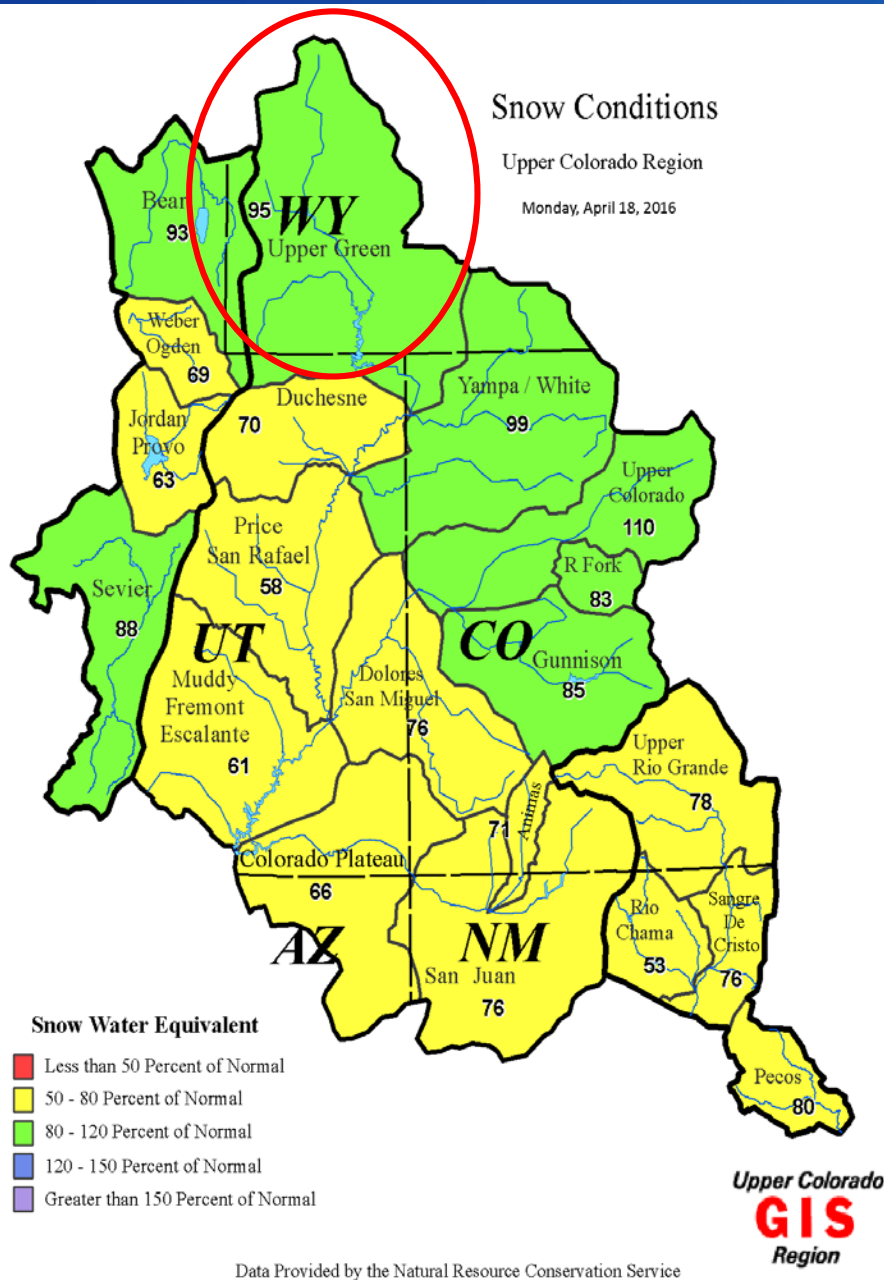
## April to July 2016 Forecasted Inflow

Issued April 18, 2016

Reservoir	A-J Forecast (KAF)	Percent of Average <sup>1</sup>
Fontenelle	565	78%
Flaming Gorge	740	76%
Blue Mesa	515	76%
Navajo	515	70%
Powell	5,300	74%

<sup>1</sup> percent of average based on period 1981-2010.

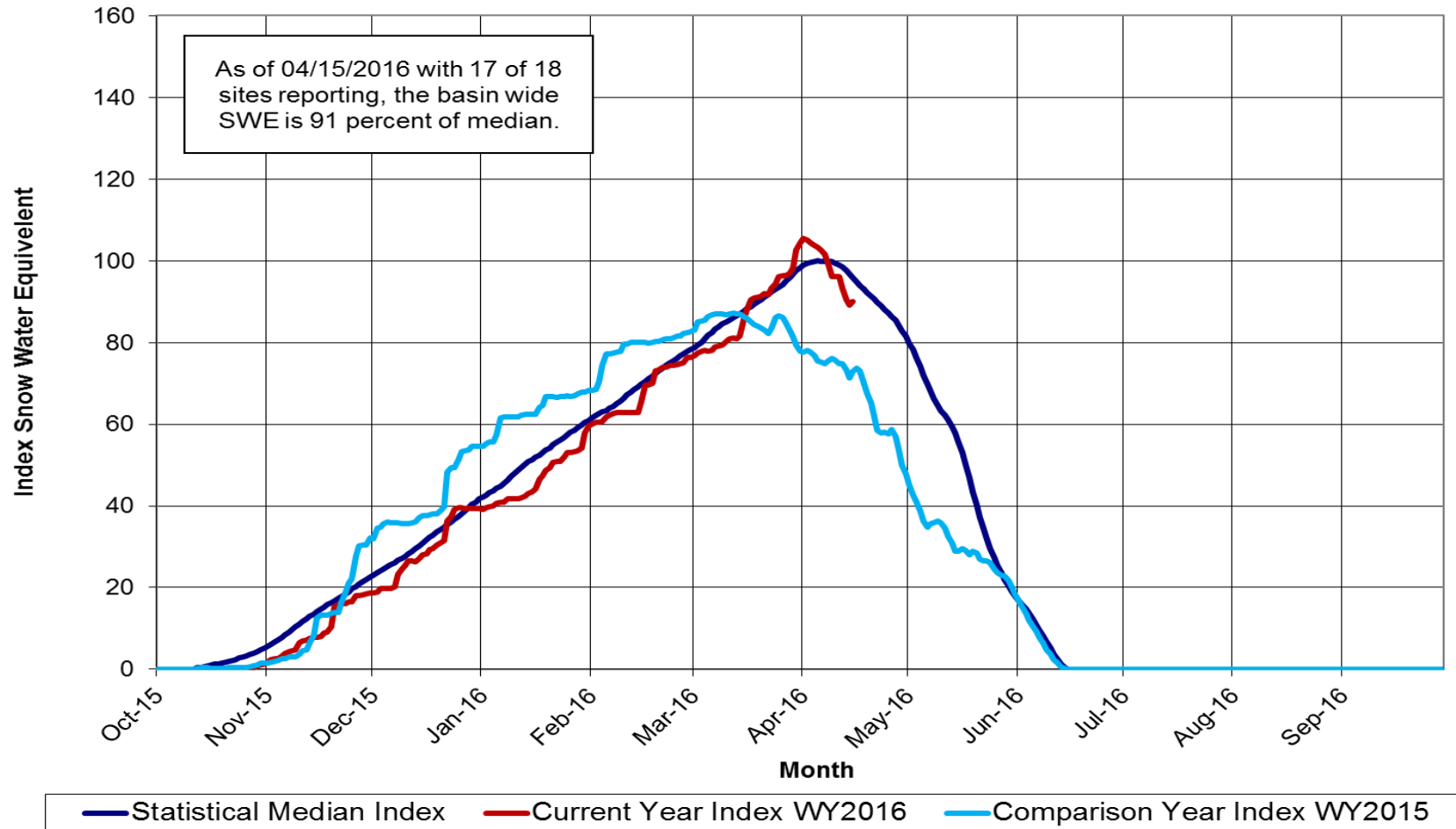
# Snow Water Equivalent (SWE) Current Conditions



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# Flaming Gorge SWE

## Upper Green River Basin Snotel Tracking Aggregate of 18 Snotel Sites above Flaming Gorge Reservoir

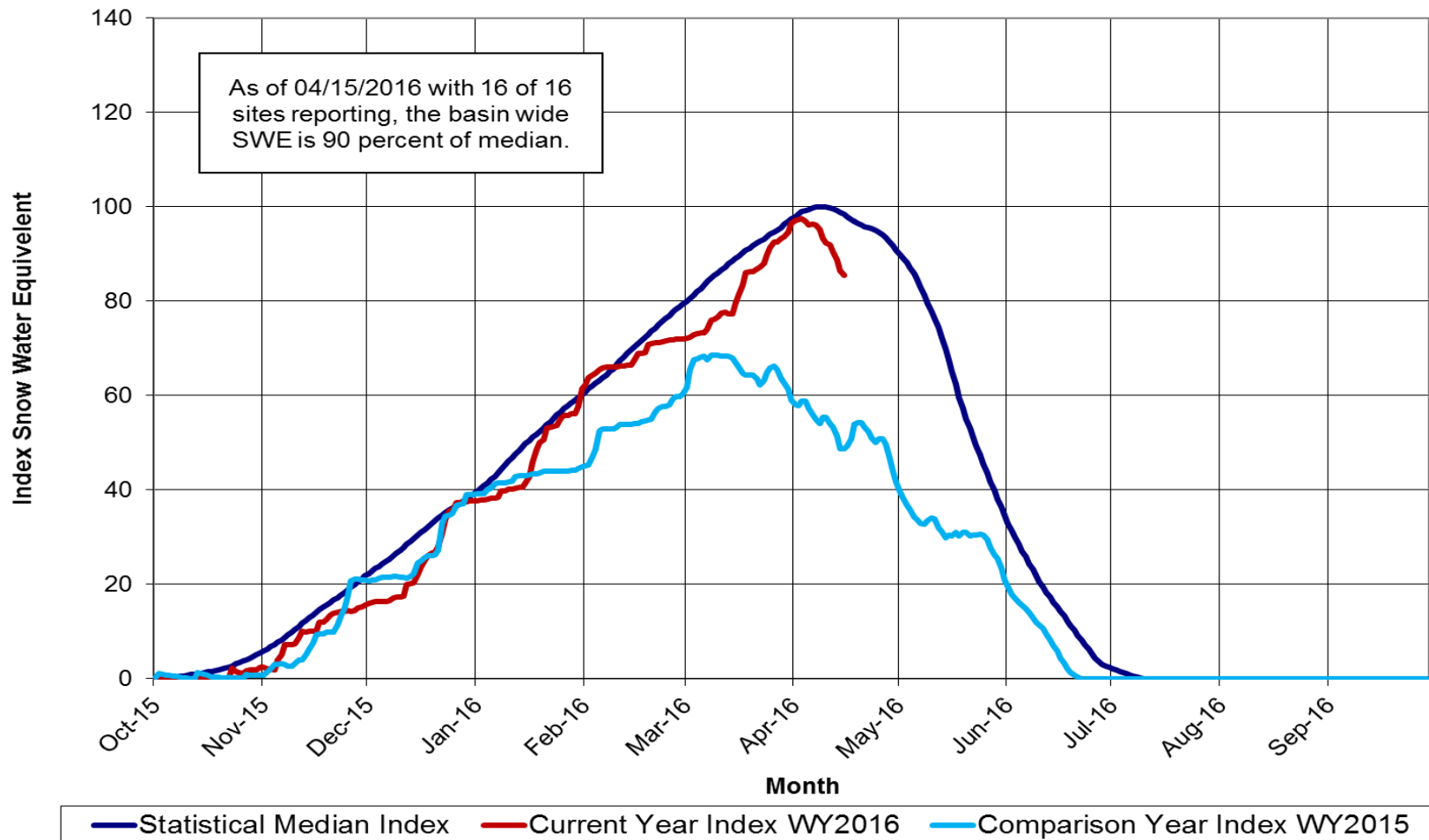


Data Provided by the Natural Resource Conservation Service

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# Yampa River SWE

## Upper Yampa River Basin Snotel Tracking Aggregate of 16 Snotel Sites above Green River Confluence



Data Provided by the Natural Resource Conservation Service

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# Larval Trigger Study Plan

**TABLE 2. Matrix to Be Used in Studying the Effectiveness of a Larval Trigger**

Peak Flow (x) as Measured at Jensen, Utah	Proposed Study Wetlands <sup>(a, b)</sup>	Number of Days (x) Flow to Be Exceeded and Corresponding Hydrologic Conditions <sup>(c)</sup>		
		$1 \leq x < 7$	$7 \leq x < 14$	$x \geq 14$
$8,300 \leq x < 14,000$ cfs	Stewart Lake (f), Above Brennan (f), Old Charley Wash (s)	Dry	Moderately dry	Moderately dry and average (below median)
$14,000 \leq x < 18,600$ cfs	Same as previous plus Thunder Ranch (f), Bonanza Bridge (f), Johnson Bottom (s), Stirrup (s), Leota 7 (s)	Average (below median)	Average (below median)	Average (below median)
$18,600 \leq x < 20,300$ cfs	Same as previous	Average (above median)	Average (above median)	Average (above median)
$20,300 \leq x < 26,400$ cfs	Same as previous plus Baeser Bend (s), Wyasket (s), additional Leota units (7a and 4), Sheppard Bottom (s)	Moderately wet	Moderately wet	Moderately wet
$x \geq 26,400$ cfs	Same as previous	Wet	Wet	Wet

(a) f = flow-through wetland, s = single-breach wetland

(b) Up to eight wetlands would be sampled in a given year with the three in the lowest flow category being sampled in all years.

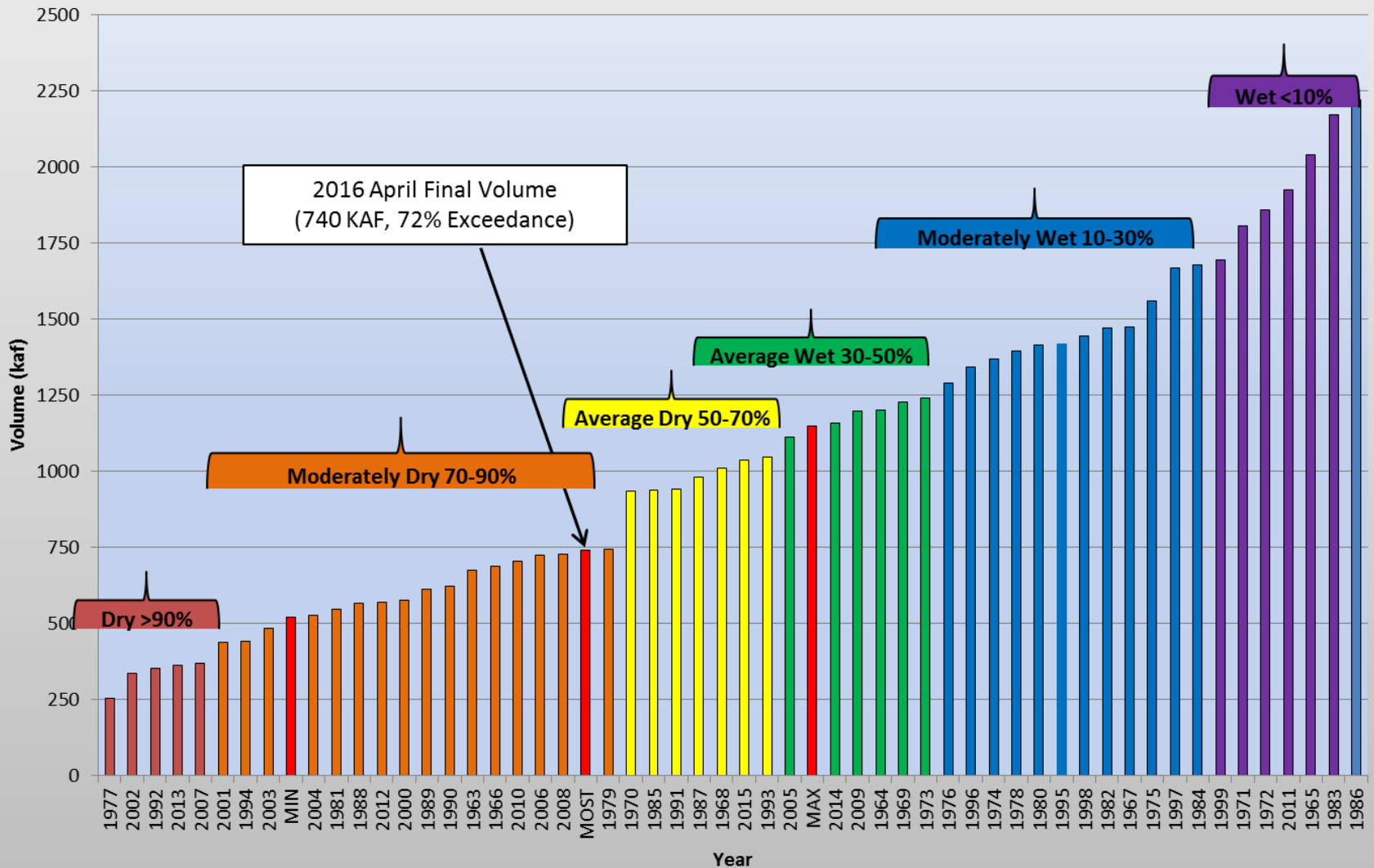
(c) Refer to Table 1 for exceedance percentages and peak flow recommendations for each hydrologic condition. Note that the hydrologic conditions presented are the driest that could support a particular combination of peak flow magnitude and duration. For any combination, wetter hydrology could also support an experiment.

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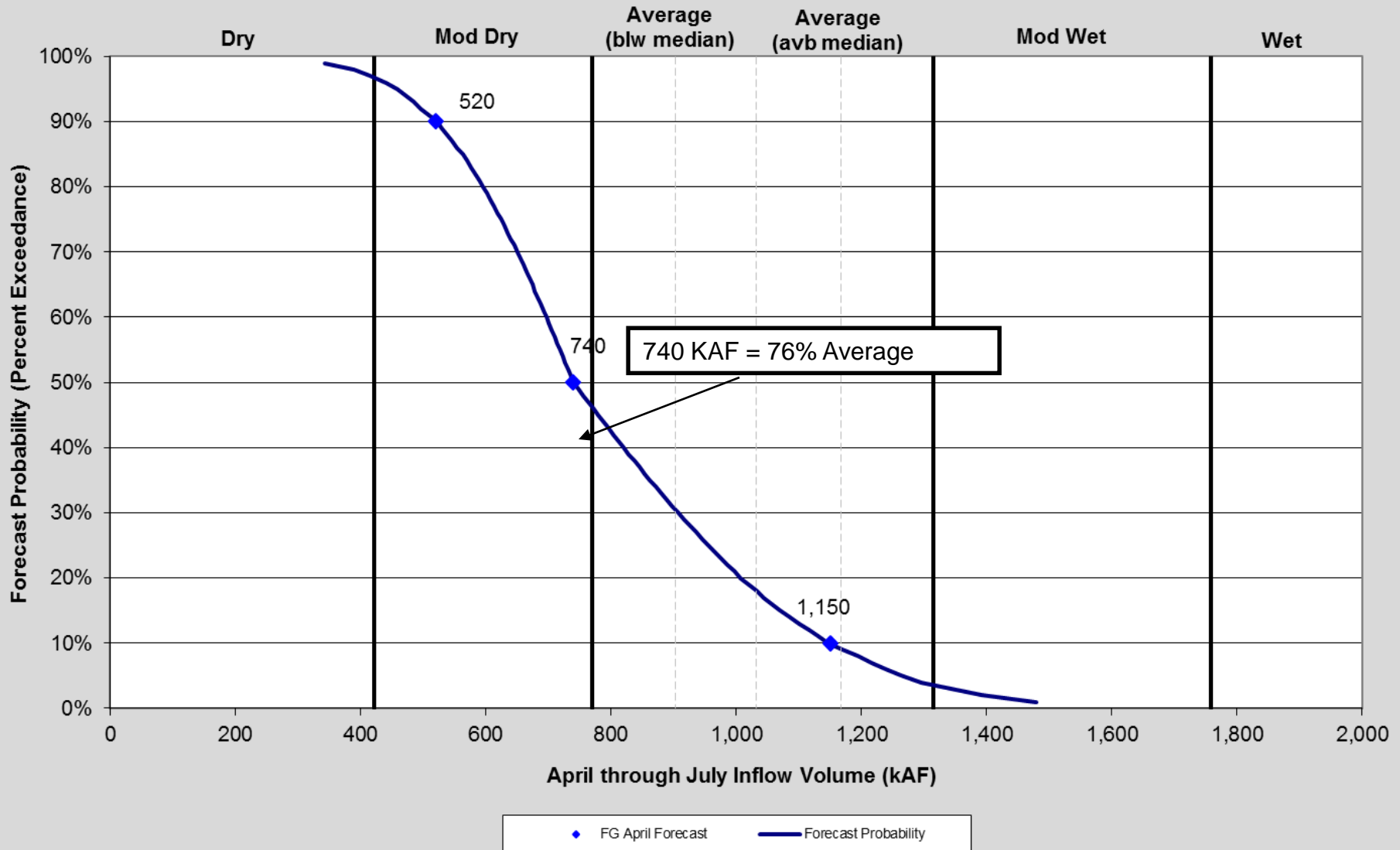


# Flaming Gorge Reservoir

## Historic April-July Unregulated Inflow Volume Ranking (1963-2015)



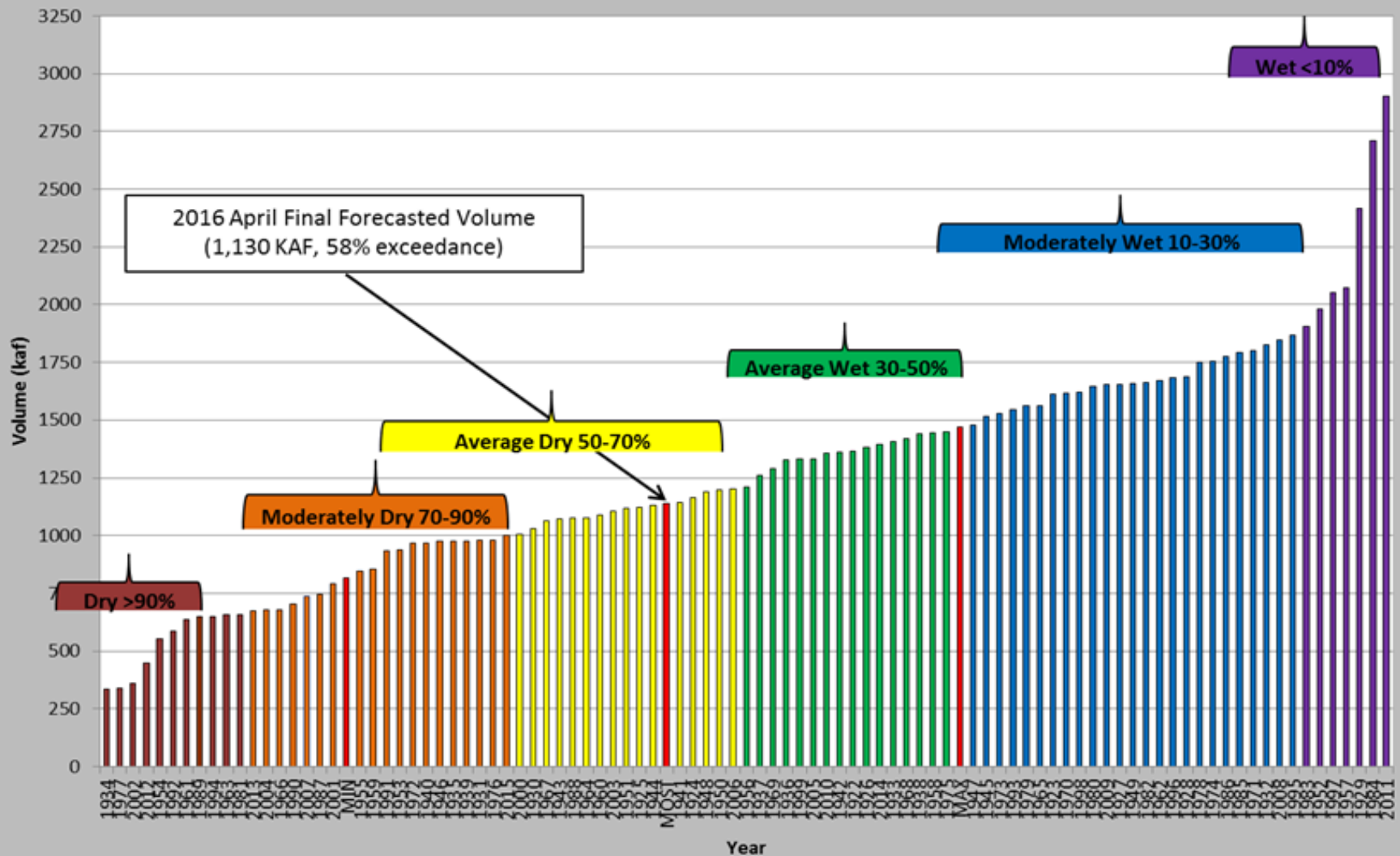
**Flaming Gorge Reservoir**  
**April through July Historic Inflow (1963-2015)**  
Related to Flow Recommendation Percent Exceedances



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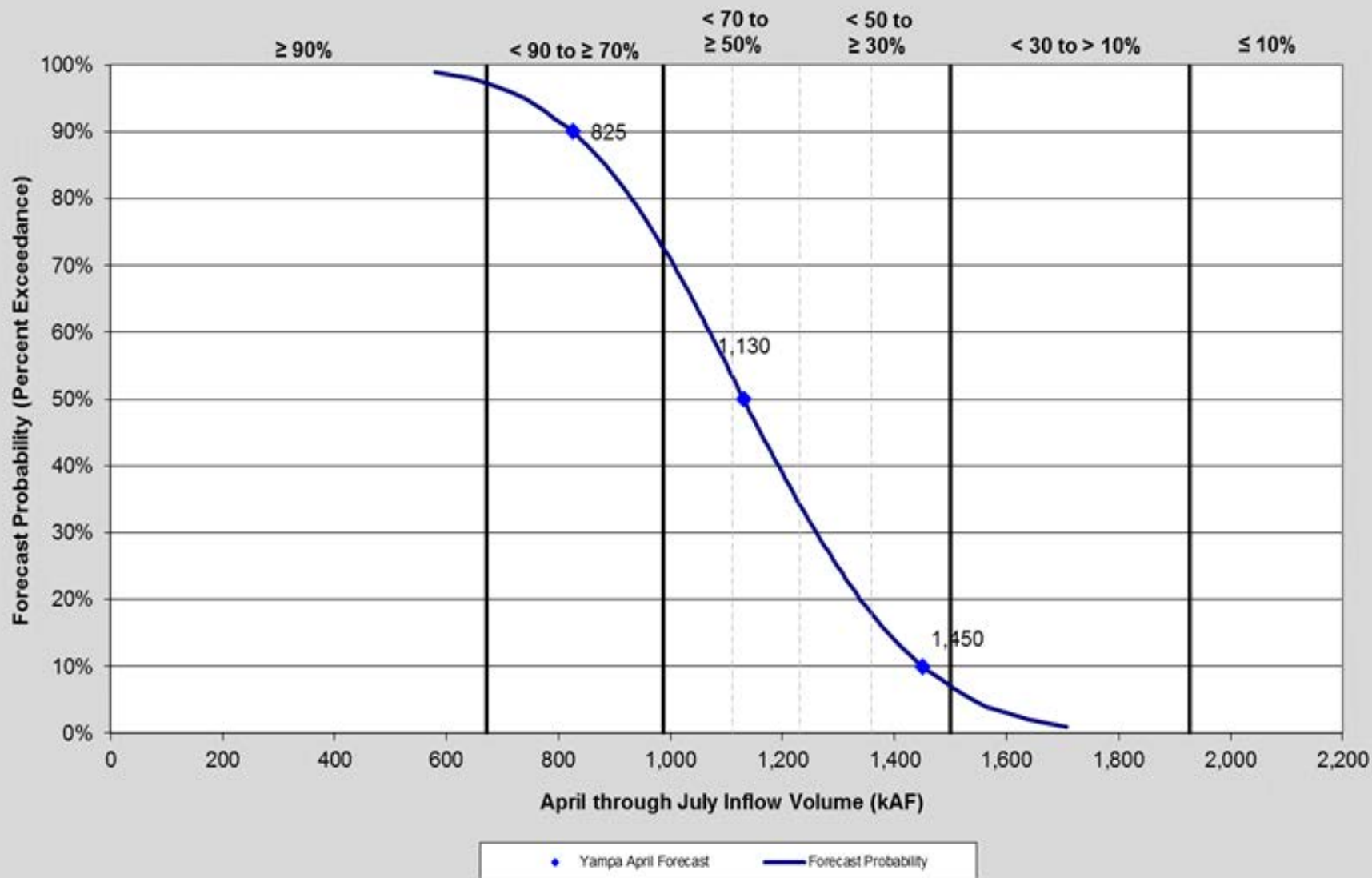
# Yampa River Basin - Maybell Plus Lily

## Historic April-July Unregulated Inflow Volume Ranking (1922-2015)



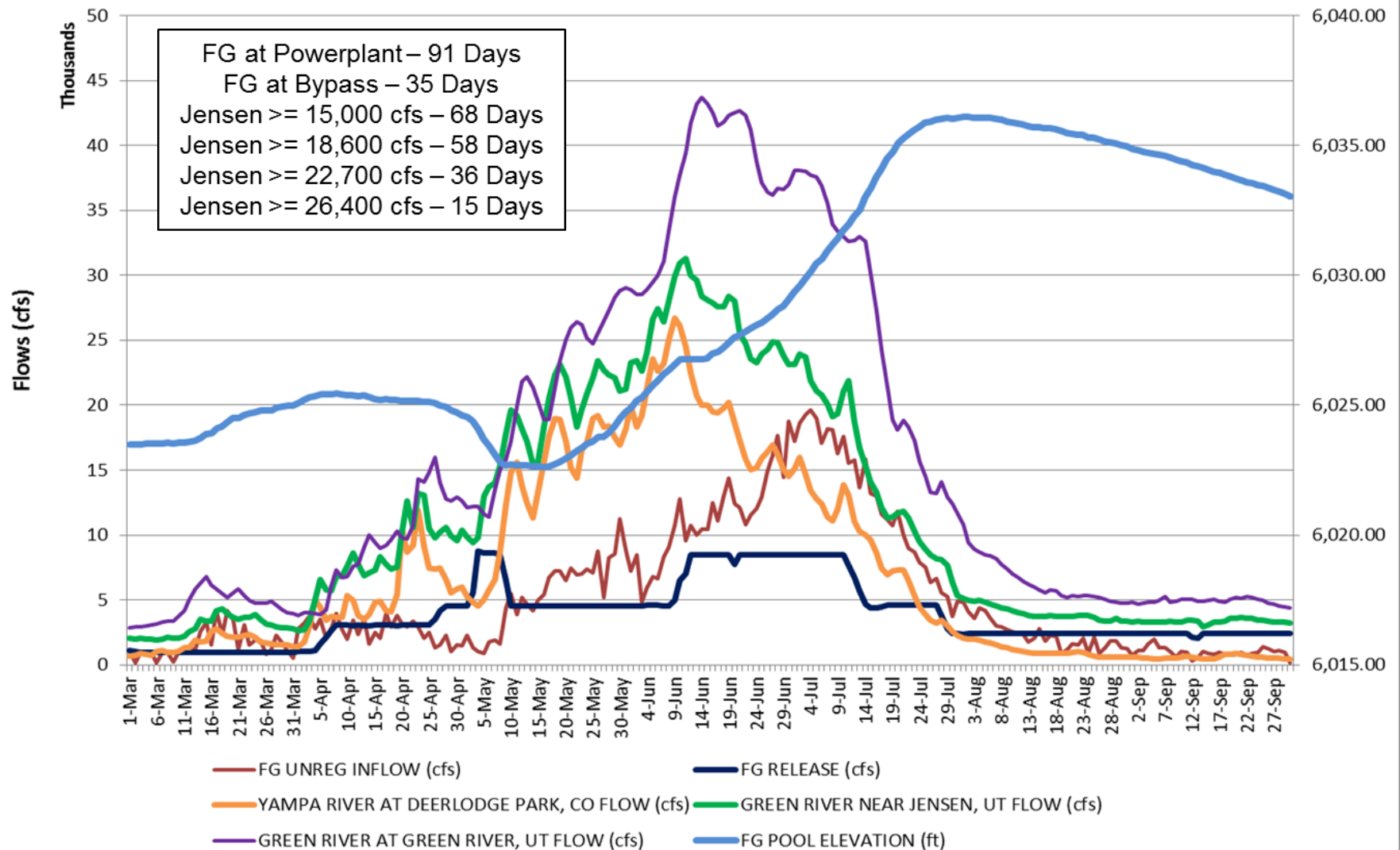
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**Yampa River - Maybell Plus Lily**  
**April through July Historic Inflow (1922-2015)**  
Related to Flow Recommendation Percent Exceedances



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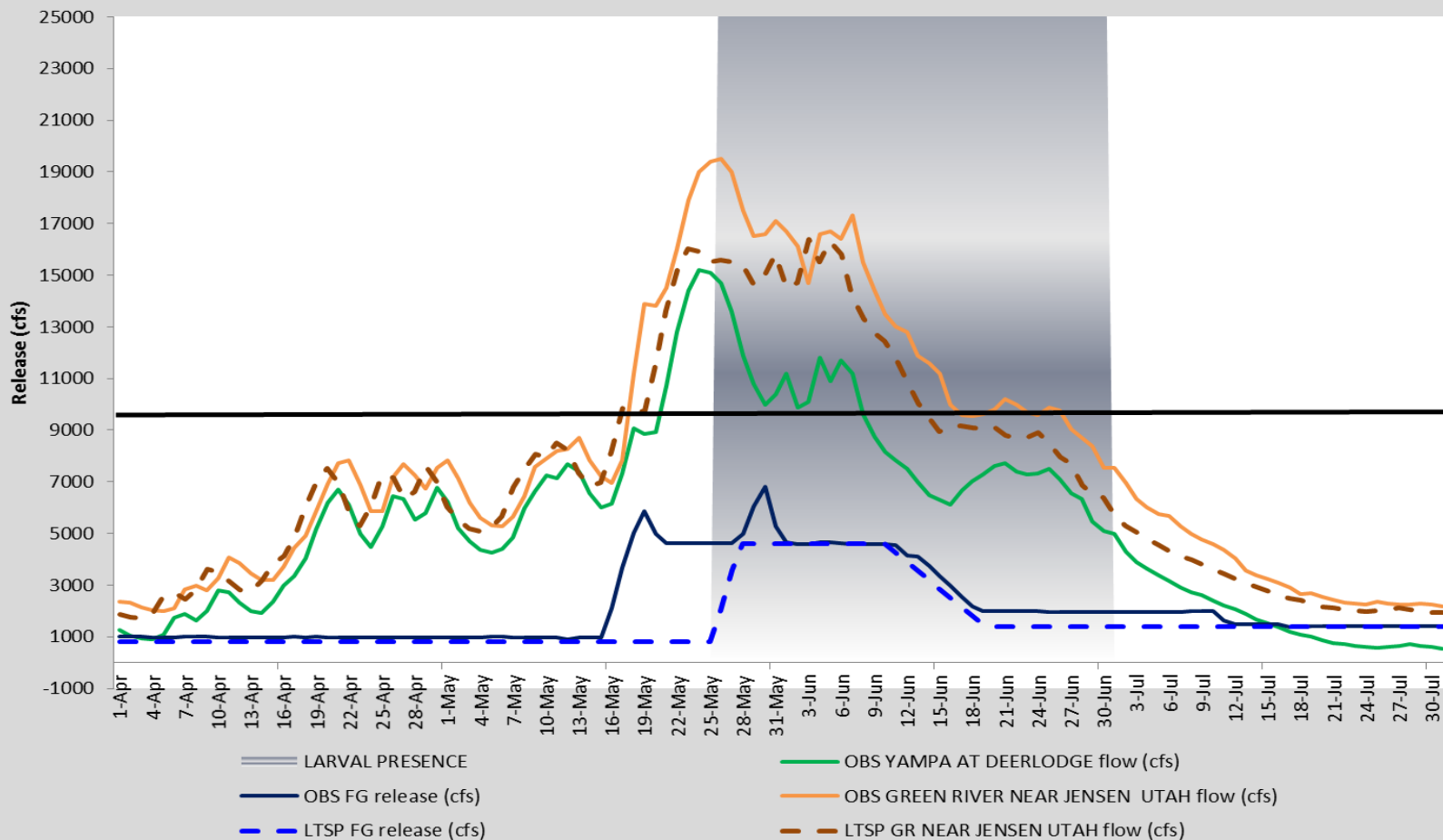
# Flaming Gorge Releases and Green and Yampa River Flows 2011



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# Flaming Gorge LTSP Estimates

FG Release and Green River Flows  
April-July 2005

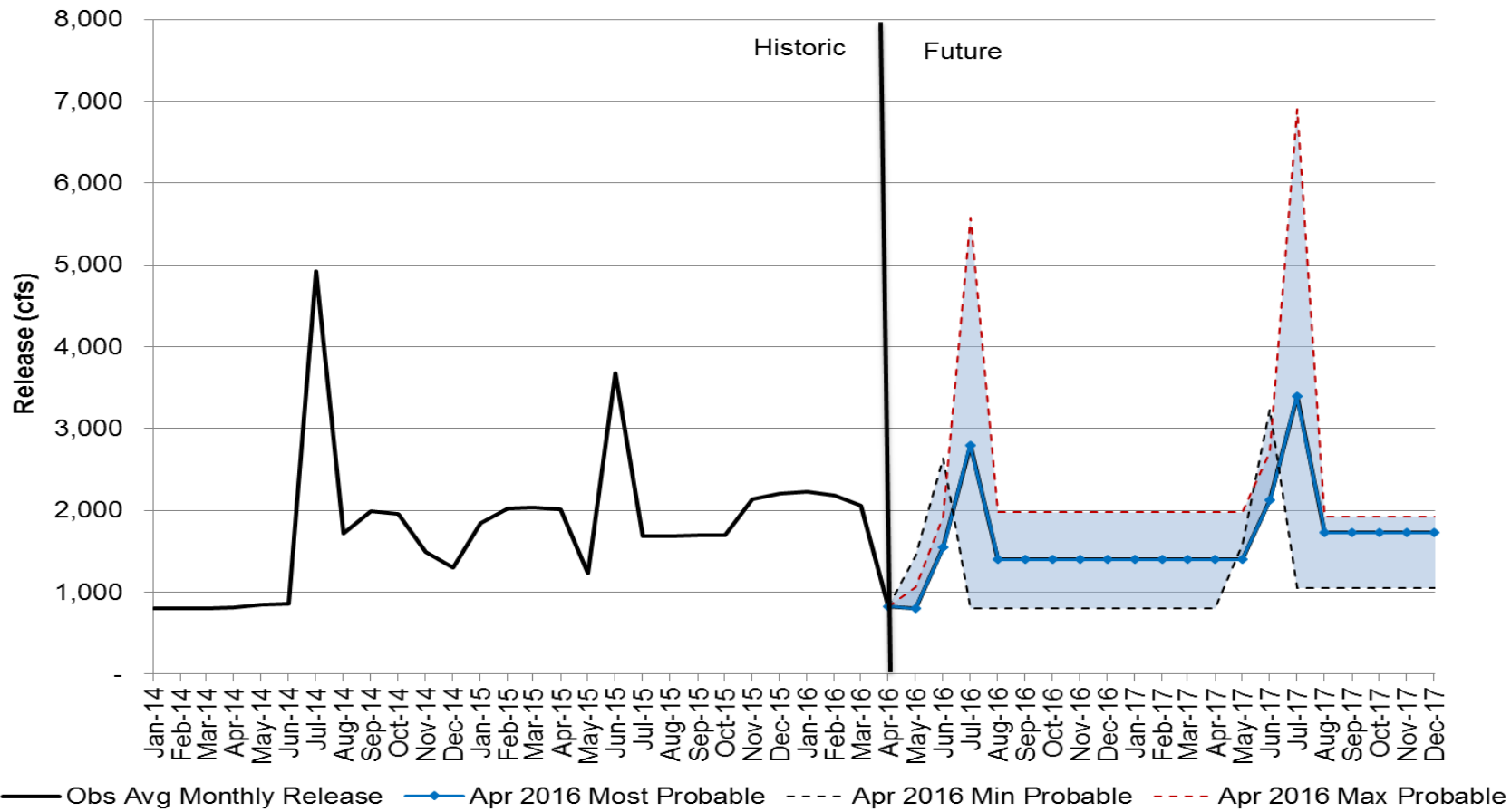


Preliminary Subject to Change

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# Flaming Gorge Working Group

Flaming Gorge Average Monthly Release  
Historic and Projected based on April Modeling



Preliminary Subject to Change

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# Flaming Gorge Working Group

## April 2016

- Questions?
- Heather Patno
- [hpatno@usbr.gov](mailto:hpatno@usbr.gov)
- (801) 524-3883

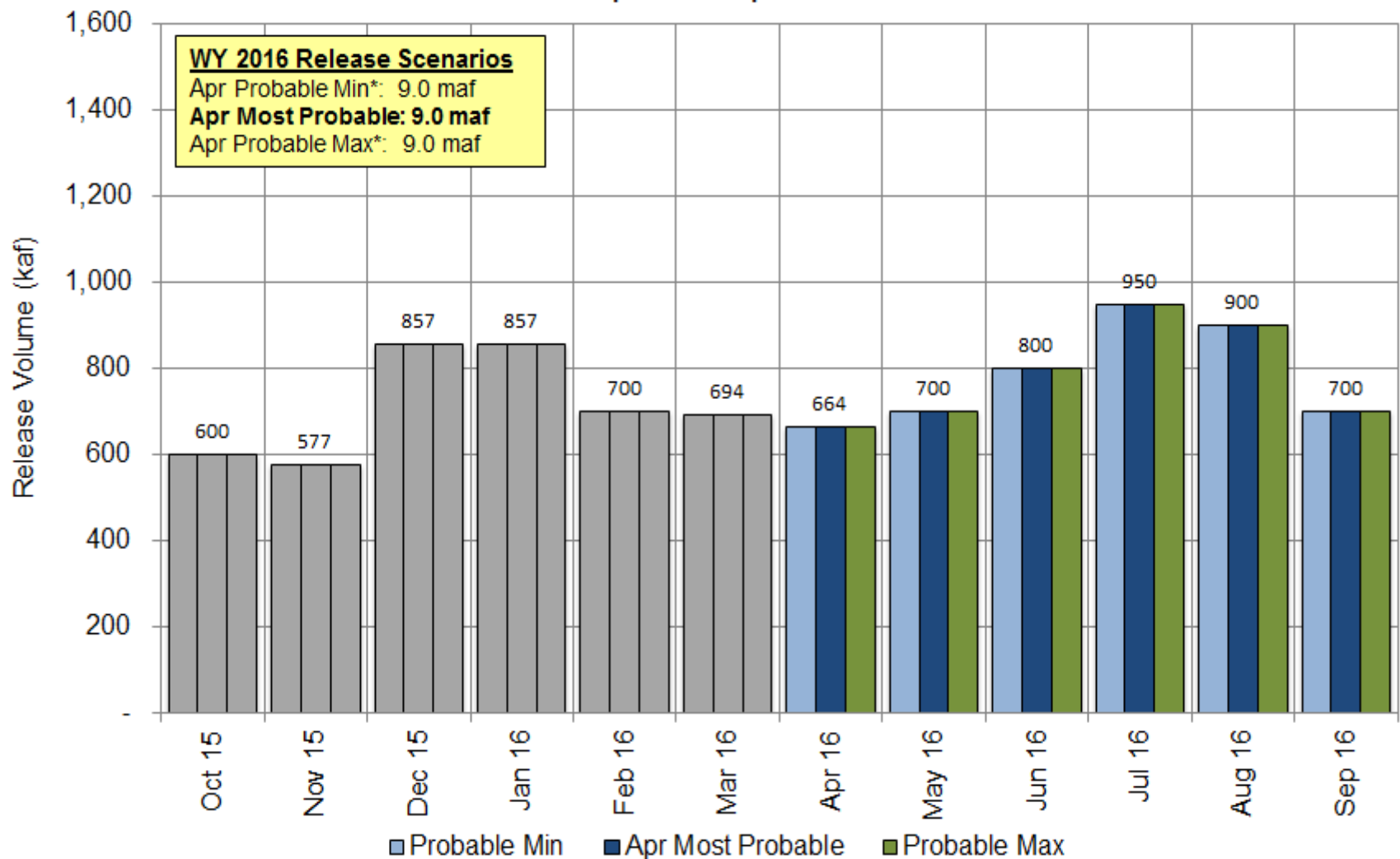


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# Projected Lake Powell Monthly Release Volume Distribution

Release Scenarios for Water Year 2016

Updated April 2016



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# Lake Powell End of Month Elevations

## Historic and Projected based on April 2016 Modeling

