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Managing Water in the West

CRFS Technical Meeting
LC Operations Update

March 27, 2012

U.S. Department of the Interior
Bureau of Reclamation

Topics

- Operations Update
- Real-time Evaporation Project
- Side Inflow forecast comparison

Lower Basin Operations Water Year 2012

Lake Mead elevation at end of WY 2011: 1116.04 feet

- Water Use in the Lower Basin has been slightly higher than expected in CY 2012
  - California and Arizona are currently projected to come in higher than their annual apportionments
  - Mexico deliveries are expected to be reduced this year under provisions of Minute 318
- Currently projecting Lake Mead's surface water elevation decrease approximately 0.84 feet over course of WY
- Lower Basin temperatures have been above average, precipitation below average

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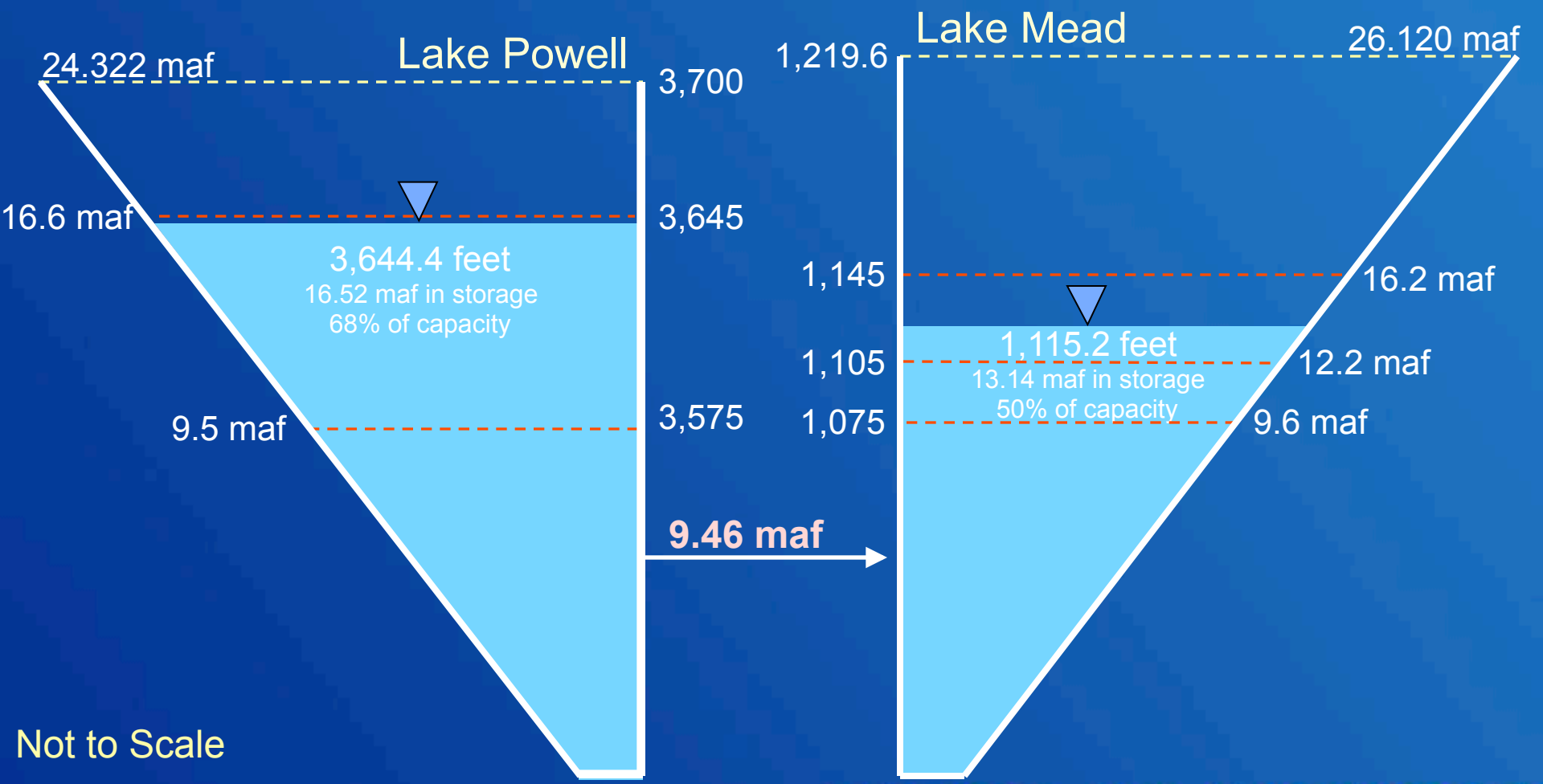
Water Year 2012 Projections

March 2012 24-Month Study Most Probable Inflow Scenario

Projected Unregulated Inflow into Powell[1] = 8.70 maf (80% of average)



Not to Scale

[1] WY 2012 unregulated inflow volume is based on the CBRFC forecast dated 3/2/2012. Percent of average inflow is based on the 30-year period of record from 1981-2010.

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Lower Basin Side Inflows
Glen Canyon to Hoover in WY/CY 2012[1,2]

	Month in WY/CY 2012	Intervening Flow Glen Canyon to Hoover (KAF)	Intervening Flow Glen Canyon to Hoover (% of Average)	Difference From 5-Year Average (KAF)
HIST	October 2011	66	135%	+17
	November 2011	36	78%	-10
	December 2011	84	78%	-24
	January 2012	56	72%	-22
	February 2012	45	46%	-53
PROJECTED	March 2012	78		
	April 2012	76		
	May 2012	64		
	June 2012	33		
	July 2012	54		
	August 2012	103		
	September 2012	74		
	October 2012	49		
	November 2012	46		
	December 2012	108		
WY 2012 Totals		**769**	**89%**	**-92**
CY 2012 Totals		**786**	**91%**	**-75**

[1] Values were computed with the LC's gain-loss model for the most recent 24-month study.

[2] Percents of average are based on the 5-year mean from 2007-2011.

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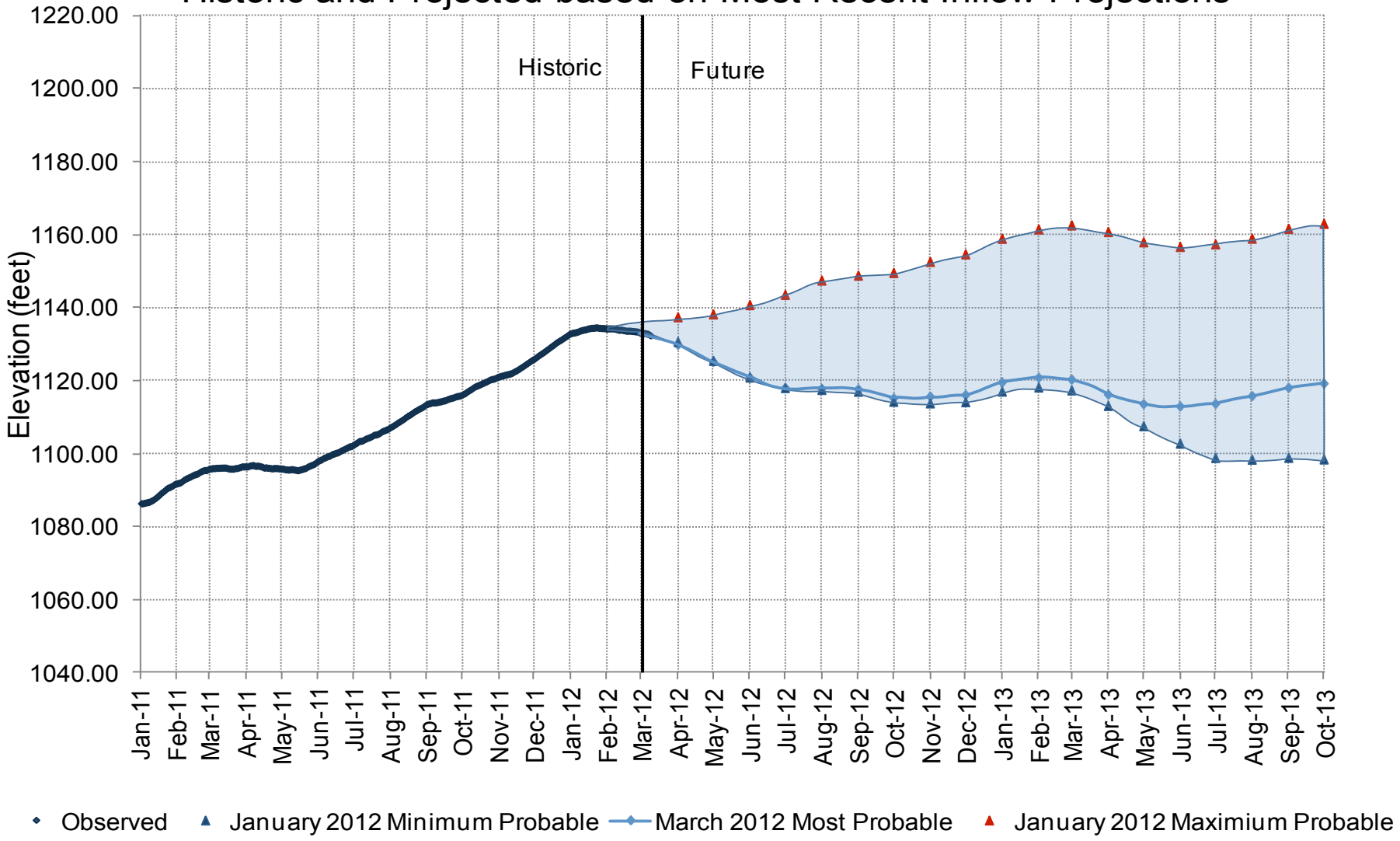
Lake Mead Elevations

Historic and Projected based on Most Recent Inflow Projections



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Probabilities of Occurrence of Event or System Condition

Results from January 2012 CRSS[1] Run (values in percent)

	Event or System Condition	2013	2014	2015	2016	2017
Upper Basin – Lake Powell	**Equalization Tier**	**65**	**57**	**57**	**48**	**51**
	Equalization – annual release > 8.23 maf	*58*	*52*	*52*	*45*	*47*
	Equalization – annual release = 8.23 maf	*7*	*5*	*5*	*3*	*4*
	Upper Elevation Balancing Tier	**35**	**43**	**36**	**43**	**38**
	Upper Elevation Balancing – annual release > 8.23 maf	*0*	*1*	*2*	*9*	*11*
	Upper Elevation Balancing – annual release = 8.23 maf	*35*	*42*	*34*	*34*	*27*
	Mid-Elevation Release Tier *(annual release = 7.48 maf)*	**0**	**0**	**7**	**10**	**11**
	Lower Elevation Balancing Tier	**0**	**0**	**0**	**0**	**1**
Lower Basin – Lake Mead	**Shortage Condition – any amount (Mead ≤ 1,075 ft)**	**0**	**0**	**4**	**10**	**13**
	Shortage – 1st level (Mead ≤ 1,075 and ≥ 1,050)	*0*	*0*	*4*	*8*	*10*
	Shortage – 2nd level (Mead < 1,050 and ≥ 1,025)	*0*	*0*	*0*	*2*	*3*
	Shortage – 3rd level (Mead < 1,025)	*0*	*0*	*0*	*0*	*0*
	Surplus Condition – any amount (Mead ≥ 1,145 ft)	**30**	**38**	**41**	**41**	**41**
	Surplus – Flood Control	*1*	*4*	*6*	*10*	*13*
	Normal or ICS Surplus Condition	**70**	**62**	**55**	**50**	**47**

[1] The Colorado River Simulation System (CRSS) is Reclamation's long-term planning model.

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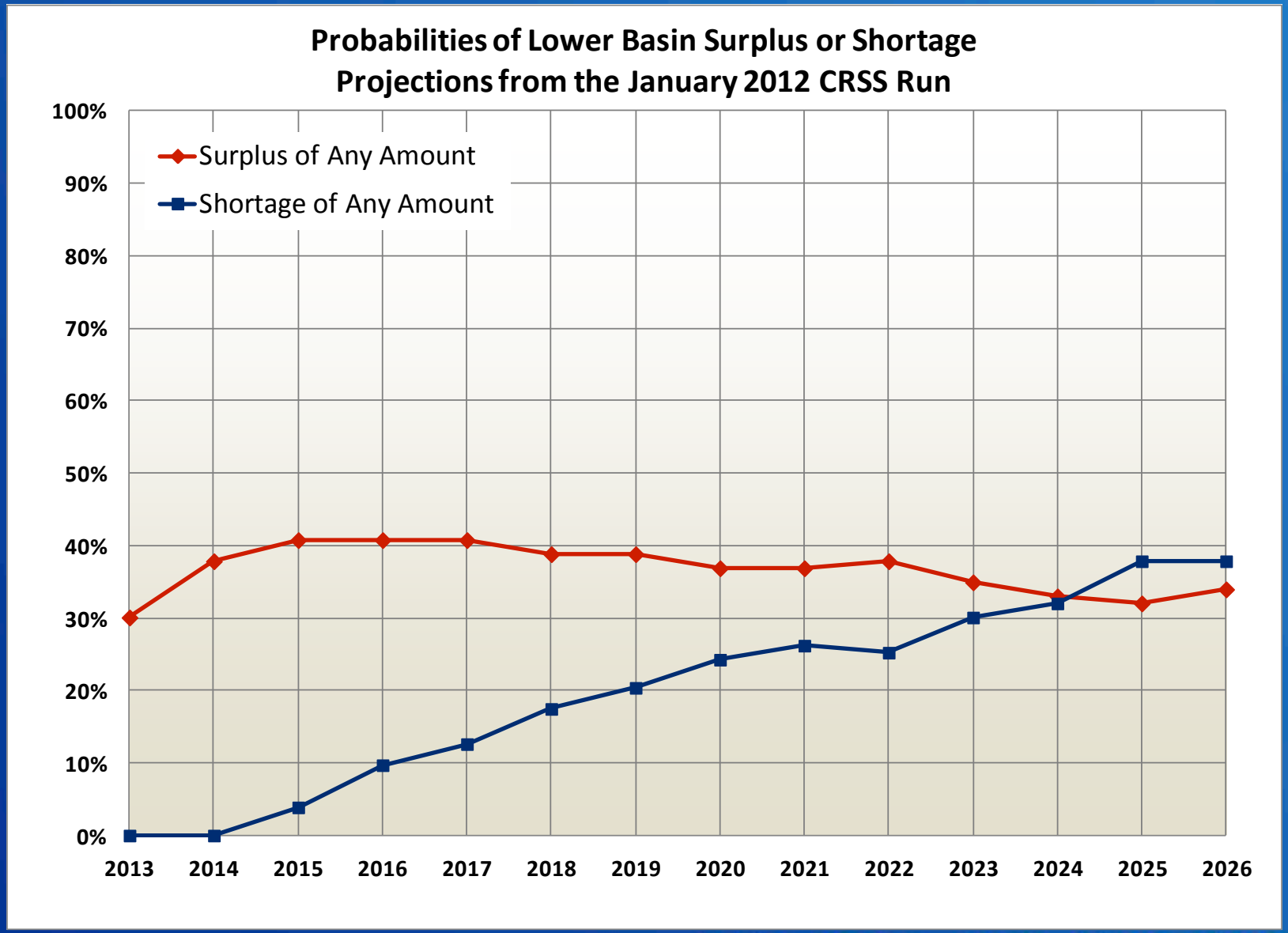
Lower Basin Surplus & Shortage through 2026



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Additional Operational Data
(provisional year-to-date values)

- MX Excess Flows
  - 212 acre-feet
- Brock Reservoir Total Storage
  - 34,100 acre-feet
- Senator Wash Total Storage
  - 19,000 acre-feet
- Groundwater Pumped
  - 16,626 acre-feet

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Real Time Evaporation At Lake Mead

- 5-Year cooperative project with the USGS
  - Project recently extended for another year
- Measure and obtain hourly evaporation rates (and other parameters) from Lake Mead
- Develop new monthly coefficients for use in long-term modeling efforts
- Reconnaissance Study planned for Lake Mohave this year

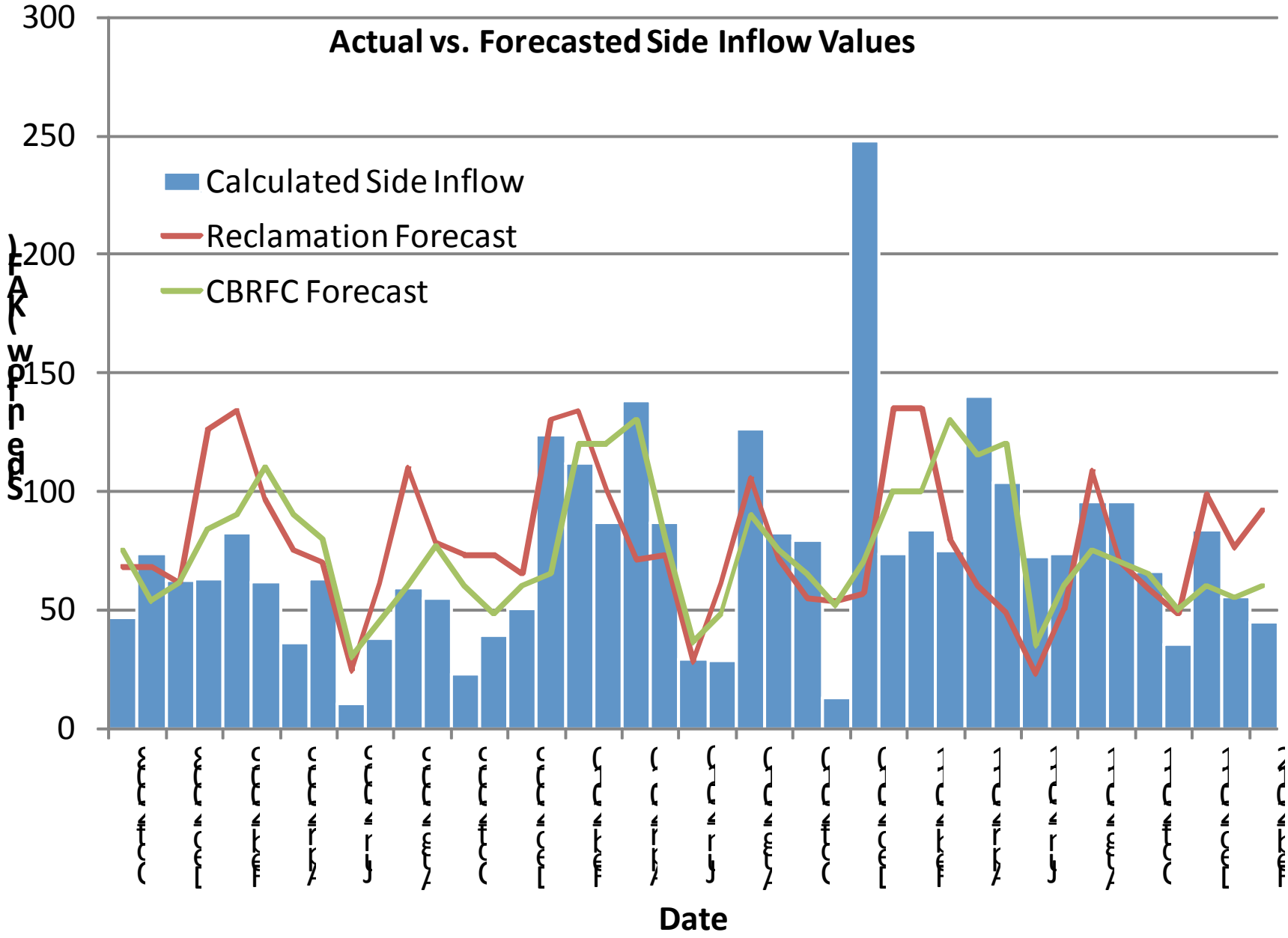
Comparison to Evaporation Rates in 24 Month Study

Month	24-Month Study (KAF)	USGS Measured (KAF)	Difference
Mar 2010	33	28	5
Apr 2010	41	36	5
May 2010	47	47	0
Jun 2010	55	49	6
Jul 2010	68	66	2
Aug 2010	70	73	-3
Sep 2010	59	61	-2
Oct 2010	42	55	-13
Nov 2010	42	55	-13
Dec 2010	37	30	7
Jan 2011	31	20	11
Feb 2011	29	31	-2
Mar 2011	33	25	8
Apr 2011	40	34	6
May 2011	47	46	1
Jun 2011	57	52	5
Jul 2011	73	54	19
Aug 2011	80	61	19
Sep 2011	67	54	13
Oct 2011	49	58	-9
Nov 2011	50	59	-9
Dec 2011	45	55	-10
Jan 2012	37	35	2
Feb 2012	34	28	6

*provisional

Real Time Evaporation at Lake Mead

- About a 10% decrease from Year 1 (Mar 2010 through Feb 2011) to Year 2 (Mar 2011 through Feb 2012)
- Potential for forecasts of evaporation
- Lower Basin is actively working with CBRFC to forecast side inflows as well
  - We have been comparing CBRFC forecasts with Reclamation's 5-year average



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