4-2015

2015 Annual Operating Plan

U.S. Department of the Interior, Bureau of Reclamation

2015 Annual Operating Plan

April 1 Runoff Forecast

RECLAMATION
Managing Water in the West

US Army Corps
of Engineers®
Albuquerque District

Water Operations Contacts

Reclamation

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USACE

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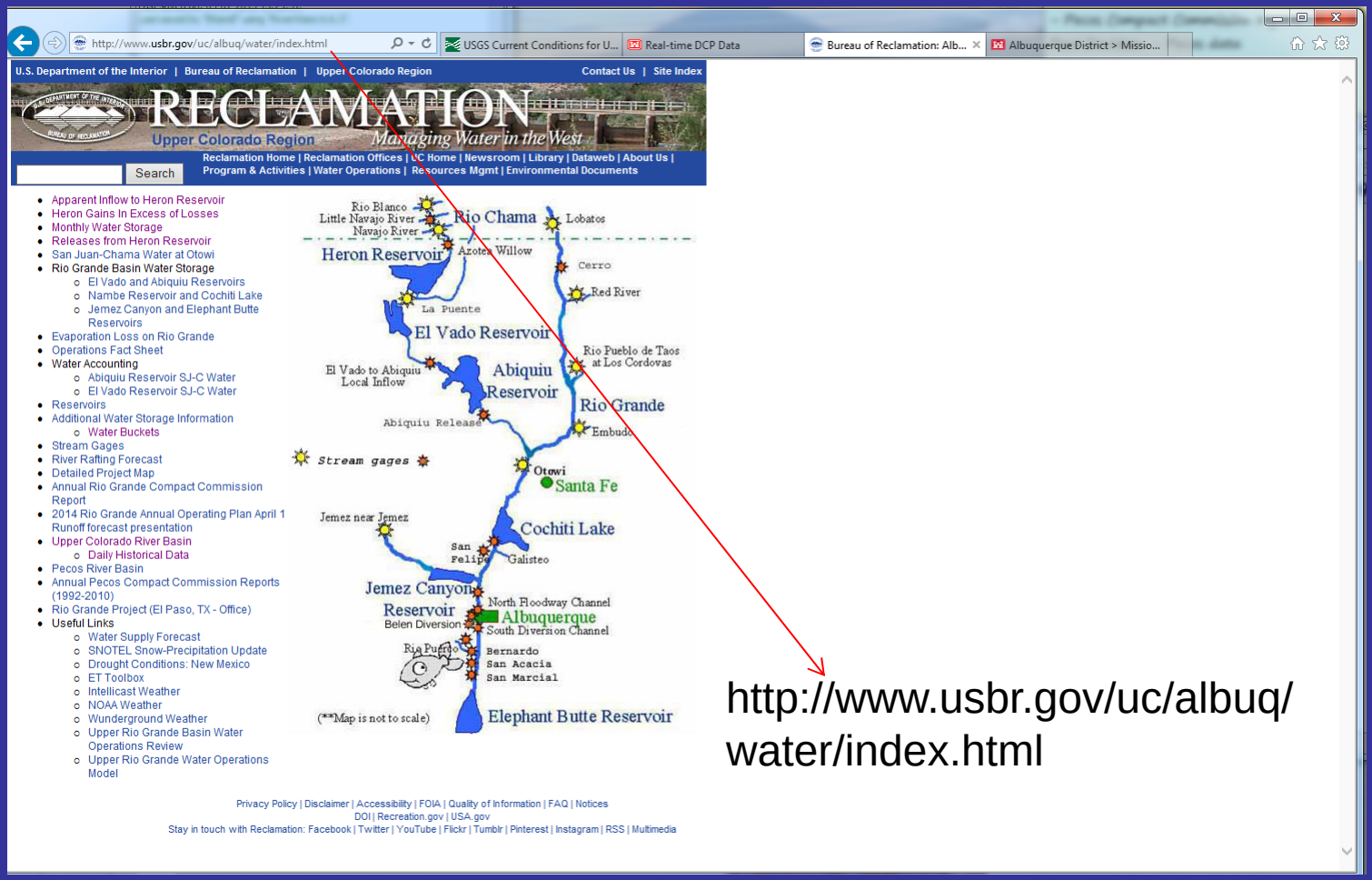
- Marc Sidlow, URGWOM modeler, Marc.S.Sidlow@usace.army.mil
- Jason Woodruff, Acting Rio Grande Basin Coordinator, Jason.R.Woodruff@usace.army.mil

Reclamation's Water Operations Web Page



http://www.usbr.gov/uc/albuq/water/index.html

Definitions

Native/Natural Rio Grande water: Water that comes directly from the Rio Grande Basin

San Juan-Chama water: Water that is imported into the Rio Grande Basin from the San Juan Basin through the San Juan-Chama Project

Rio Grande Compact: Agreement between the states of Colorado, New Mexico, and Texas that apportions Rio Grande water between the three states.

Article 7: Section of the Rio Grande Compact that dictates storage in reservoirs. If Rio Grande Project storage is less than 400,000 ac-ft at Elephant Butte and Caballo, no storage of Rio Grande water can take place at El Vado except to satisfy Native American needs or as part of the Emergency Drought Water Agreement.

Definitions (cont.)

cfs- cubic feet per second (roughly 7.5 gallons/second)

Acre foot = approximately 326,000 gallons or 43,560 cubic feet

Hydrograph – graph of flow rate per unit time

The District – Middle Rio Grande Conservancy District (MRGCD)

The City – City of Albuquerque now Albuquerque Bernalillo County Water Utility Authority (ABCWUA)

NRCS – Natural Resources Conservation Service

Supplemental water – Water leased by Reclamation to meet flow targets specified in the 2003 Biological Opinion

P&P – Prior & Paramount

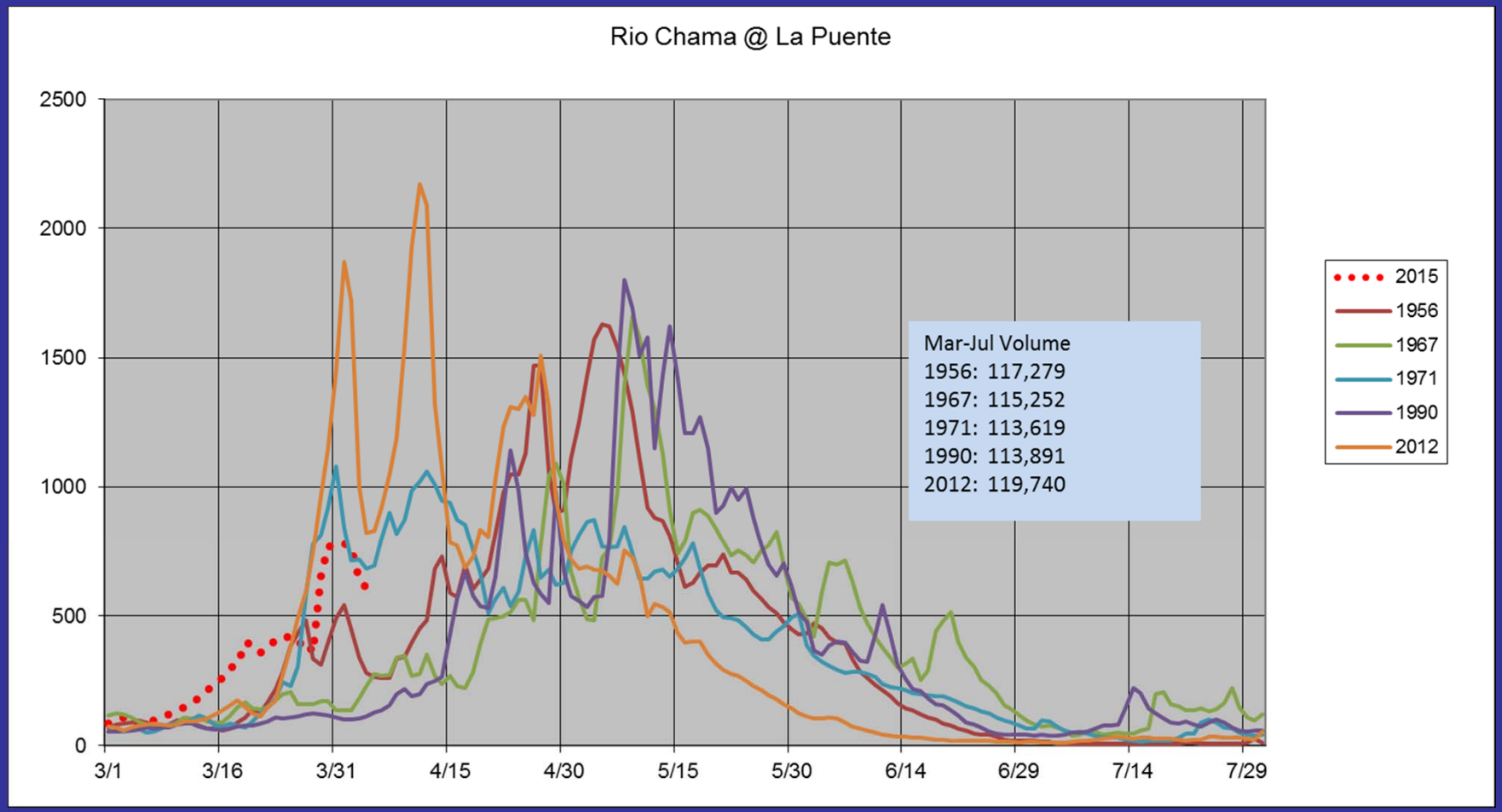
What Drives the Process

Volume Forecast from the NRCS
Based on snowpack, soil moisture, climate forecast

Choose similar year based on similar volume
Actual hydrograph vs. average hydrograph
Can tweak timing of hydrograph to best match forecasted conditions (warm Spring vs. cool Spring)

Inflows/Outflows based on nature and policies
Article VII restrictions
Flood control and channel capacity
Timing of water deliveries
Demand curves from water users
Requirements of the 2003 Biological Opinion

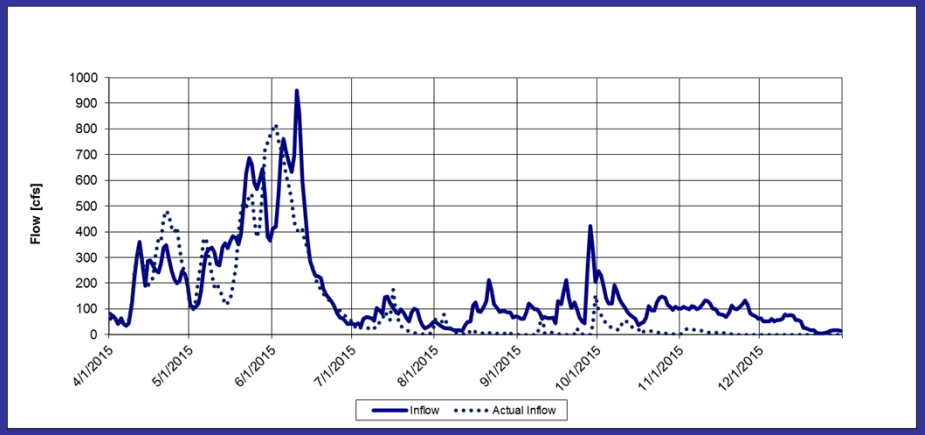
Similar Year Hydrographs

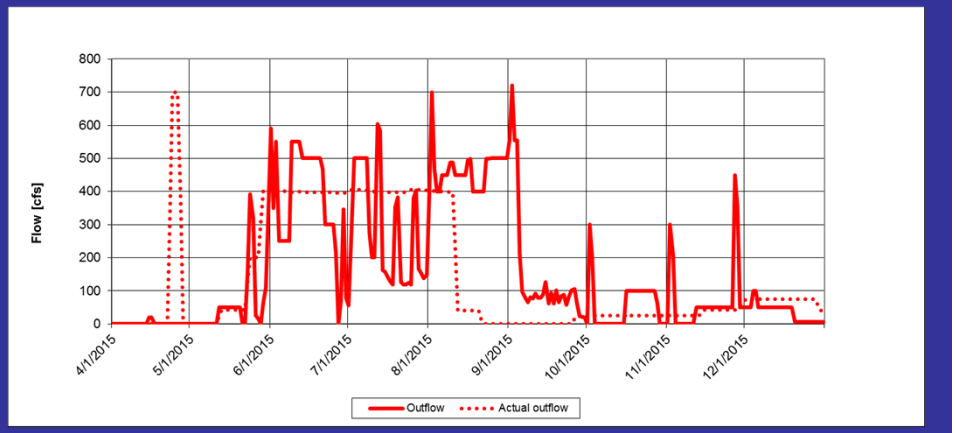


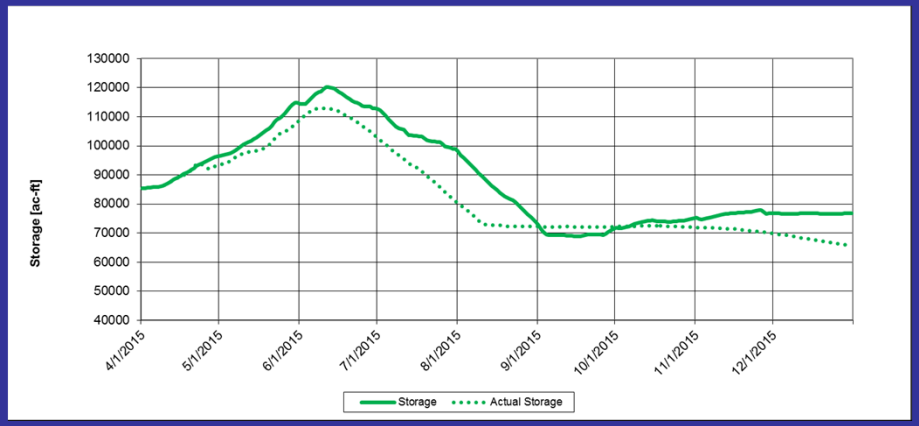
Operated By: Dams:	Reclamation	Corps	Water Supply	Recreation	Flood Control	Sediment Control
HERON	☺		☐	☐		
EL VADO	☺		☐	☐		
ABIQUIU		☺	☐	☐	☐	☐
NAMBE FALLS	☺		☐	☐		
GALISTEO		☺			☐	
COCHITI		☺		☐	☐	☐
JEMEZ CANYON		☺			☐	☐
ELEPHANT BUTTE	☺		☐	☐		

2014: The Year in Review

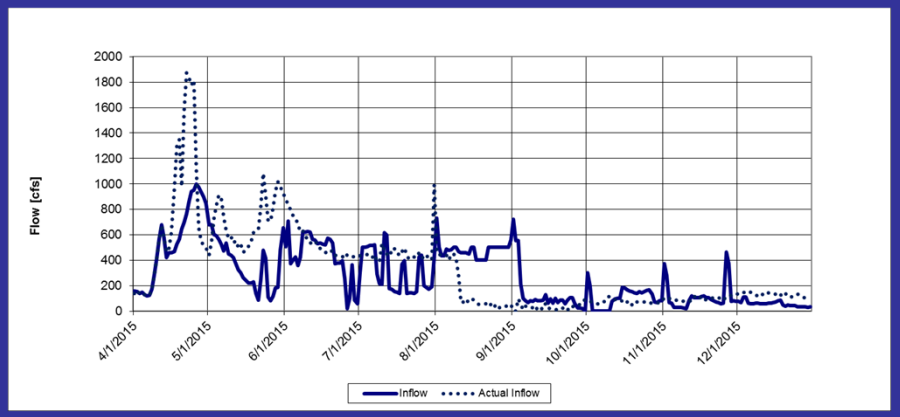
Heron Reservoir

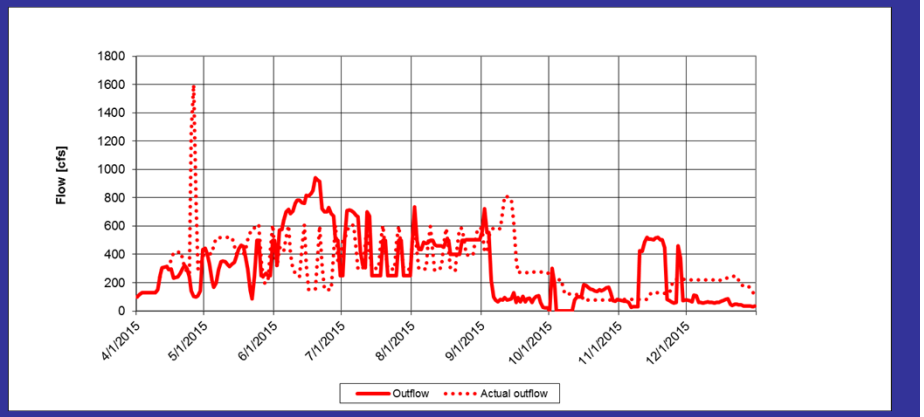


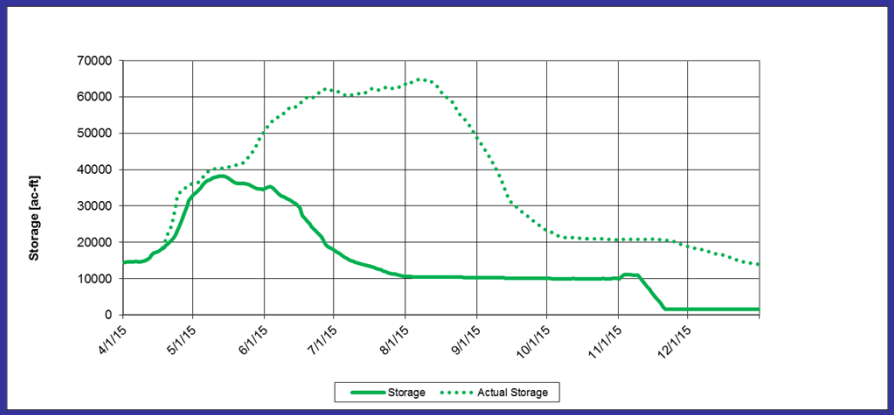




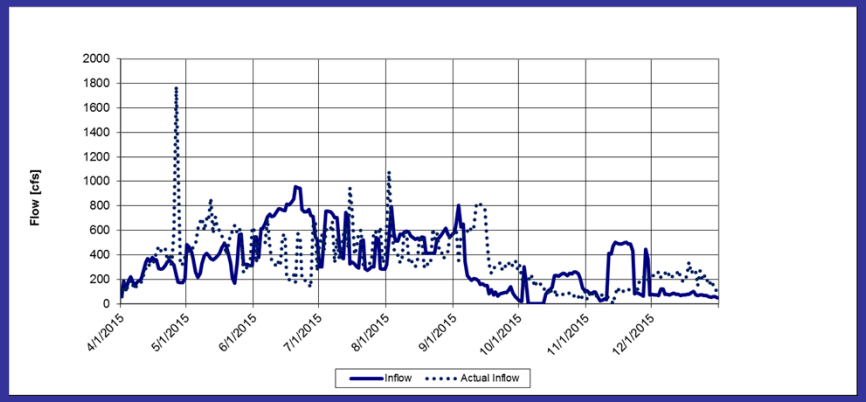
El Vado Reservoir

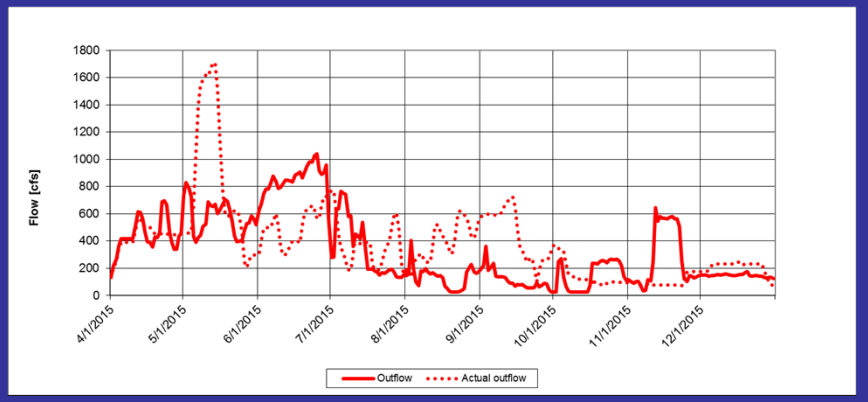


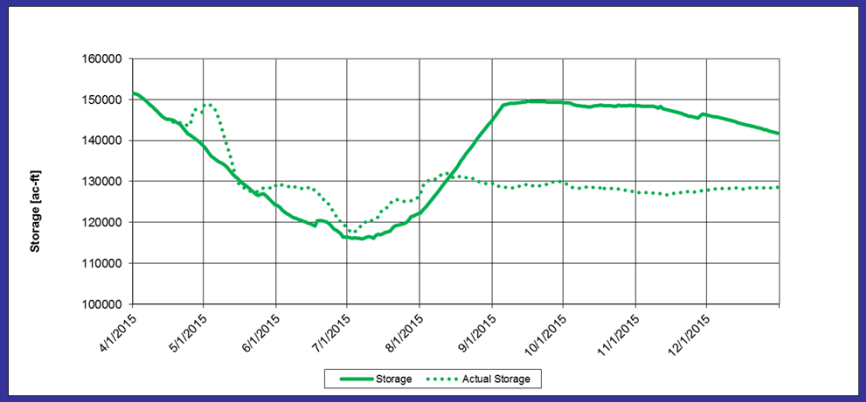




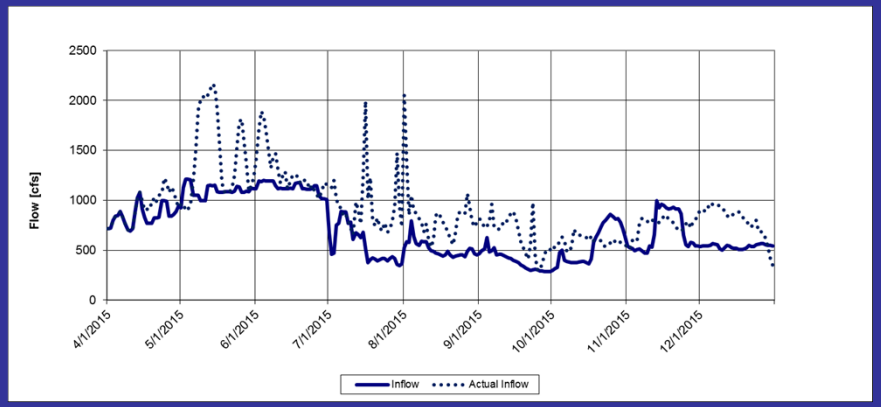
Abiquiu Reservoir

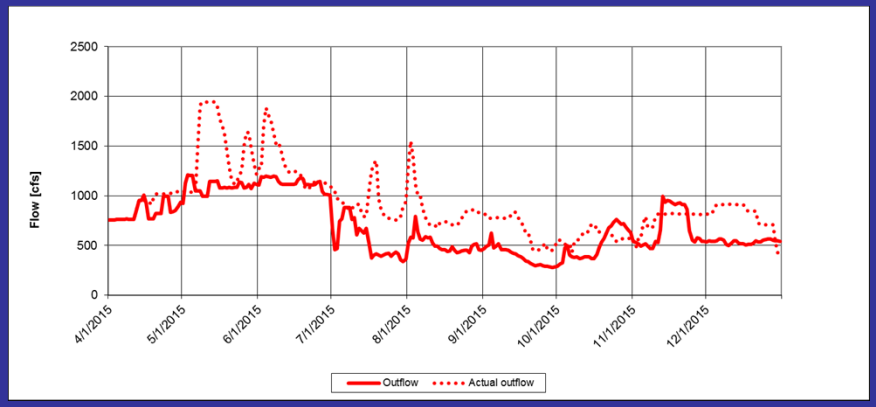


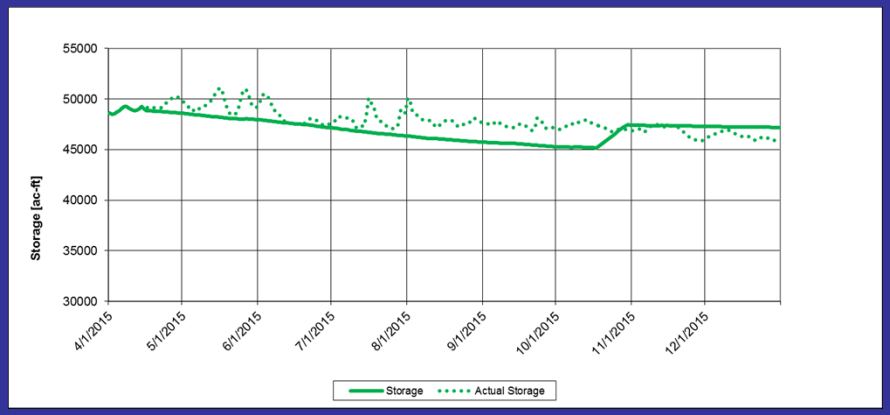




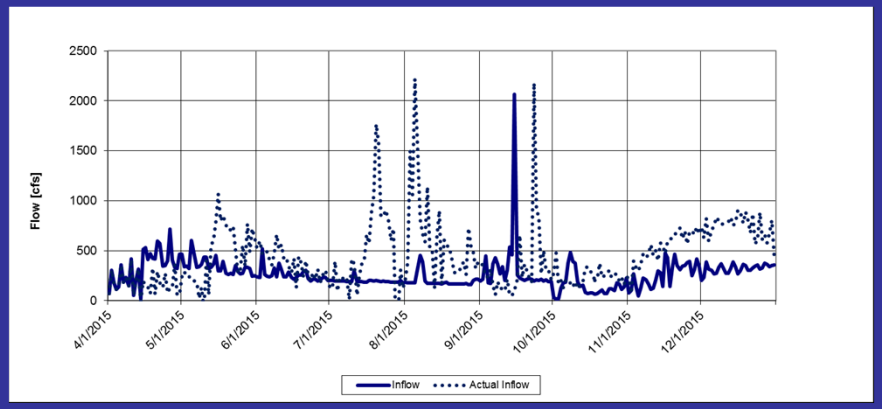
Cochiti Reservoir

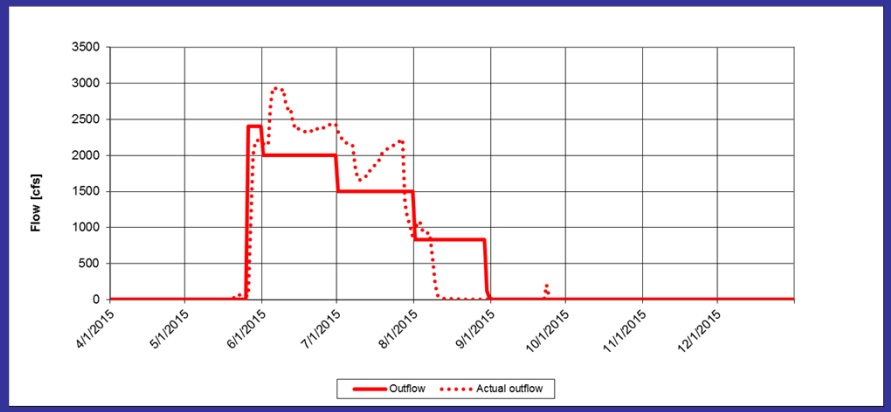


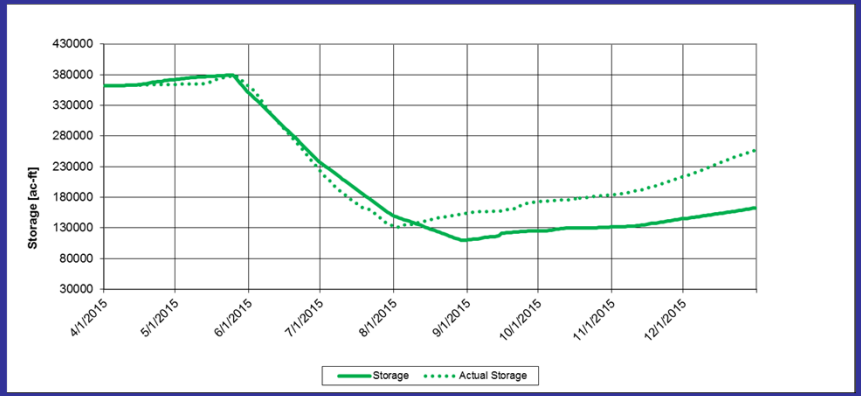




Elephant Butte Reservoir

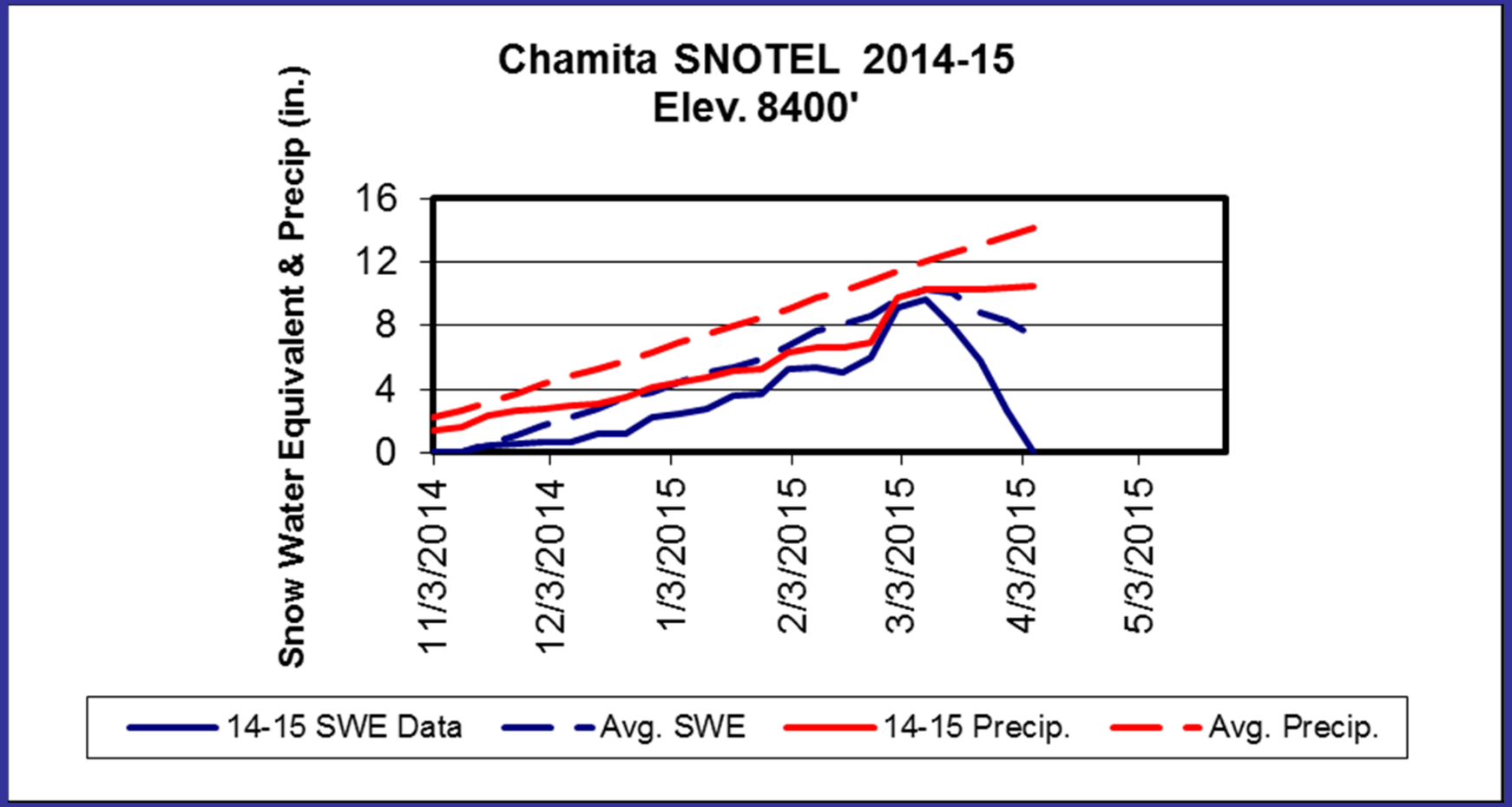




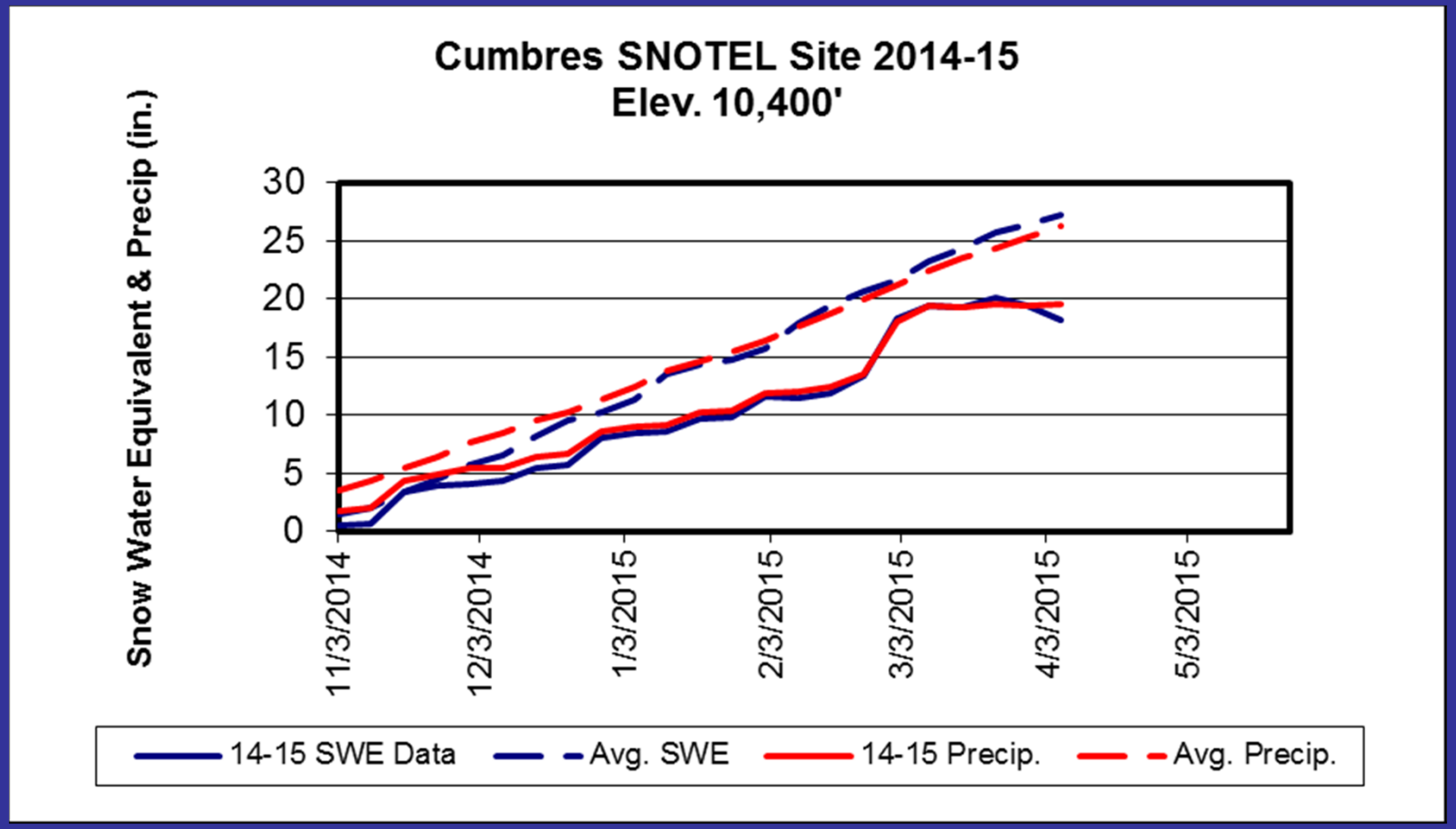


Current Snow Conditions

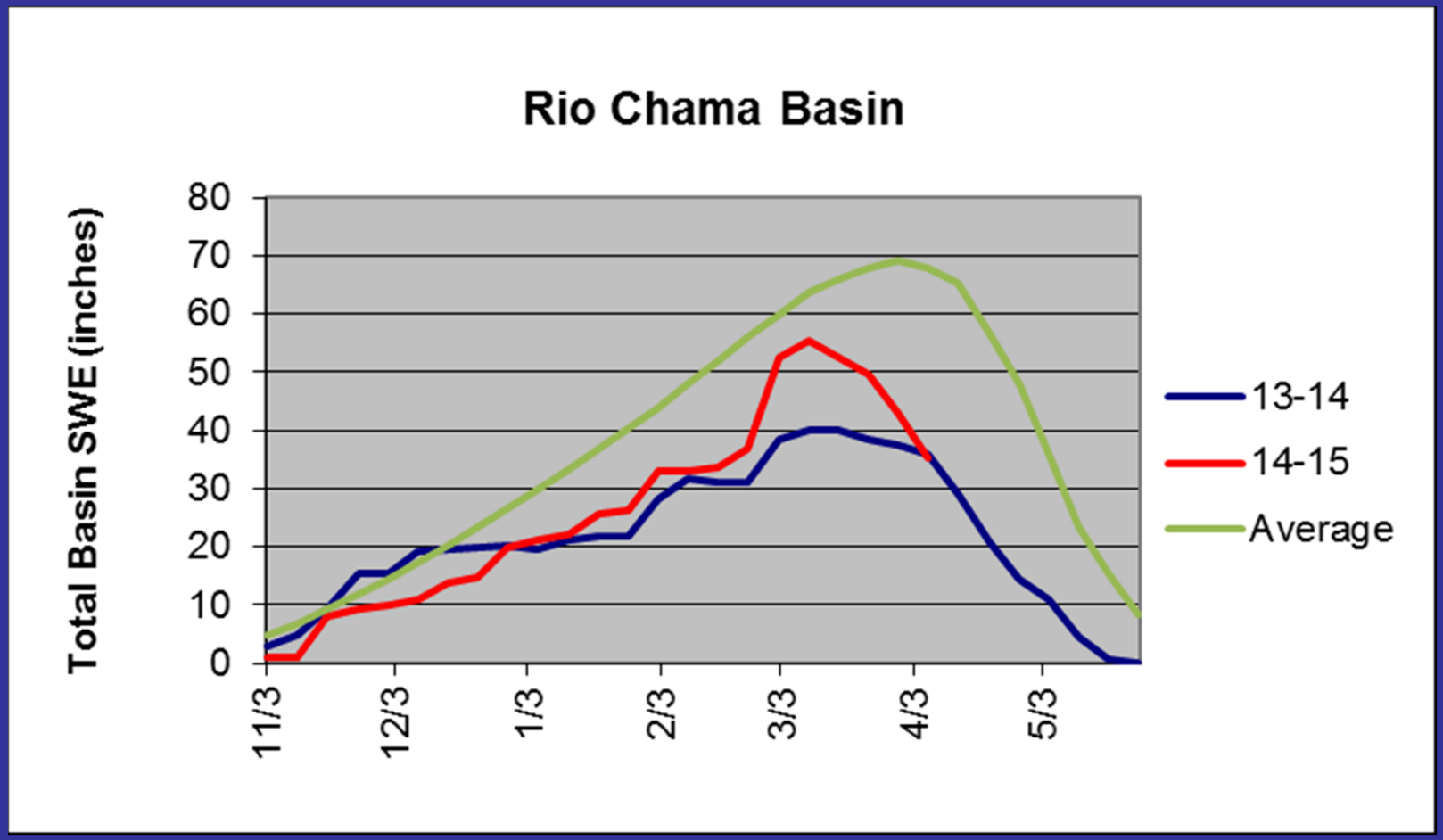
Rio Chama Snow Data



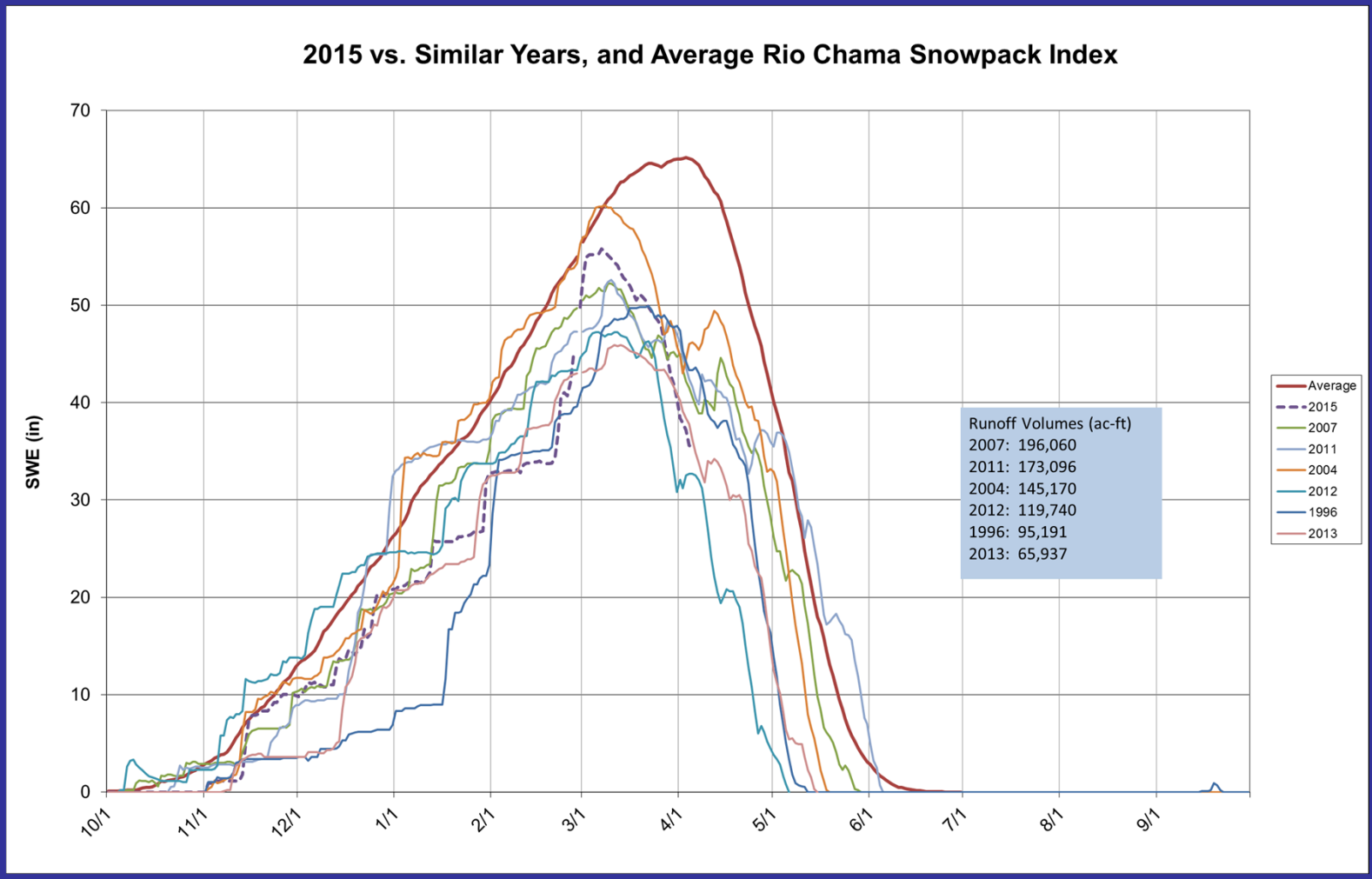
Rio Chama Snow Data



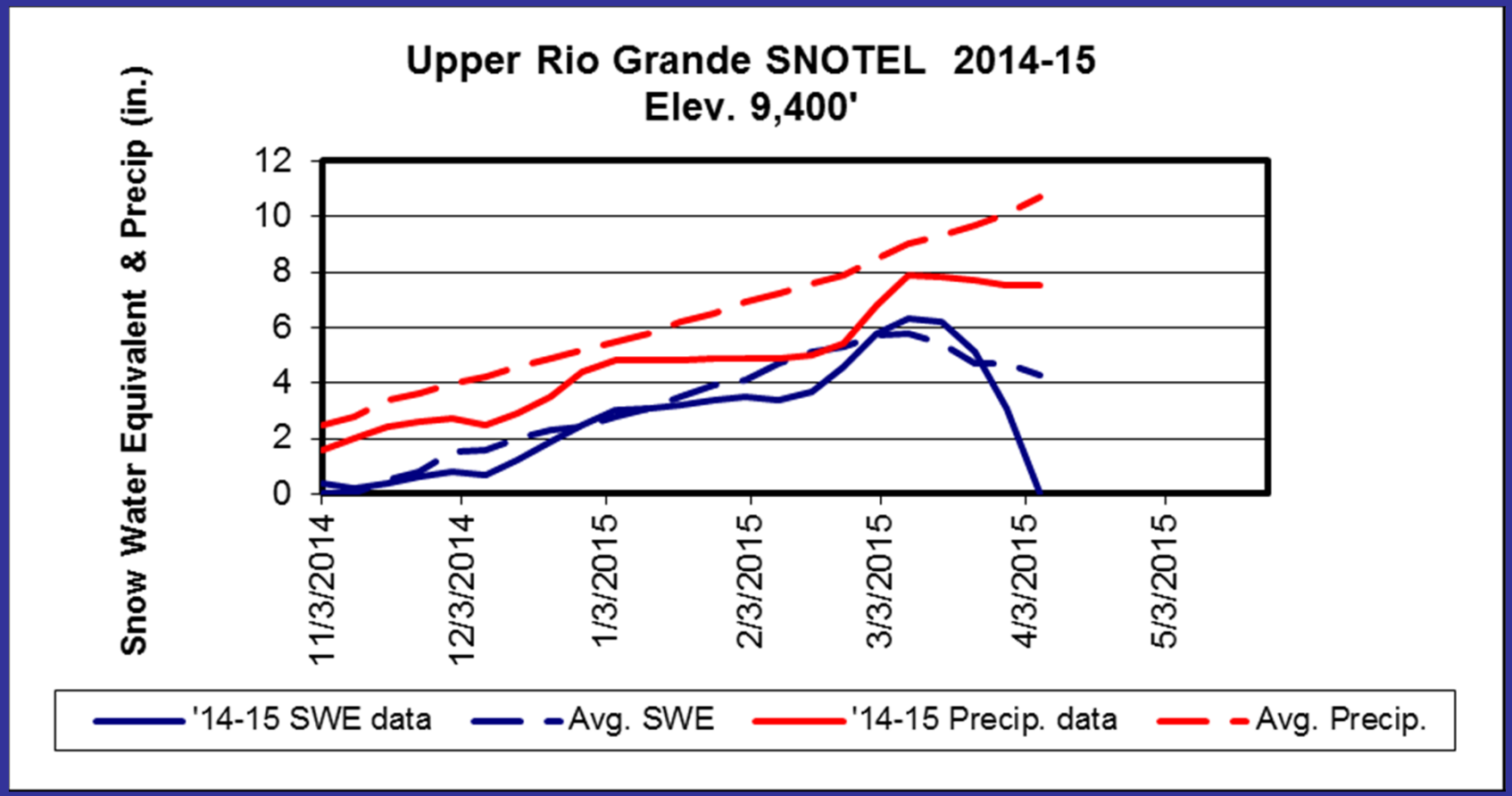
Rio Chama Snow Comparison



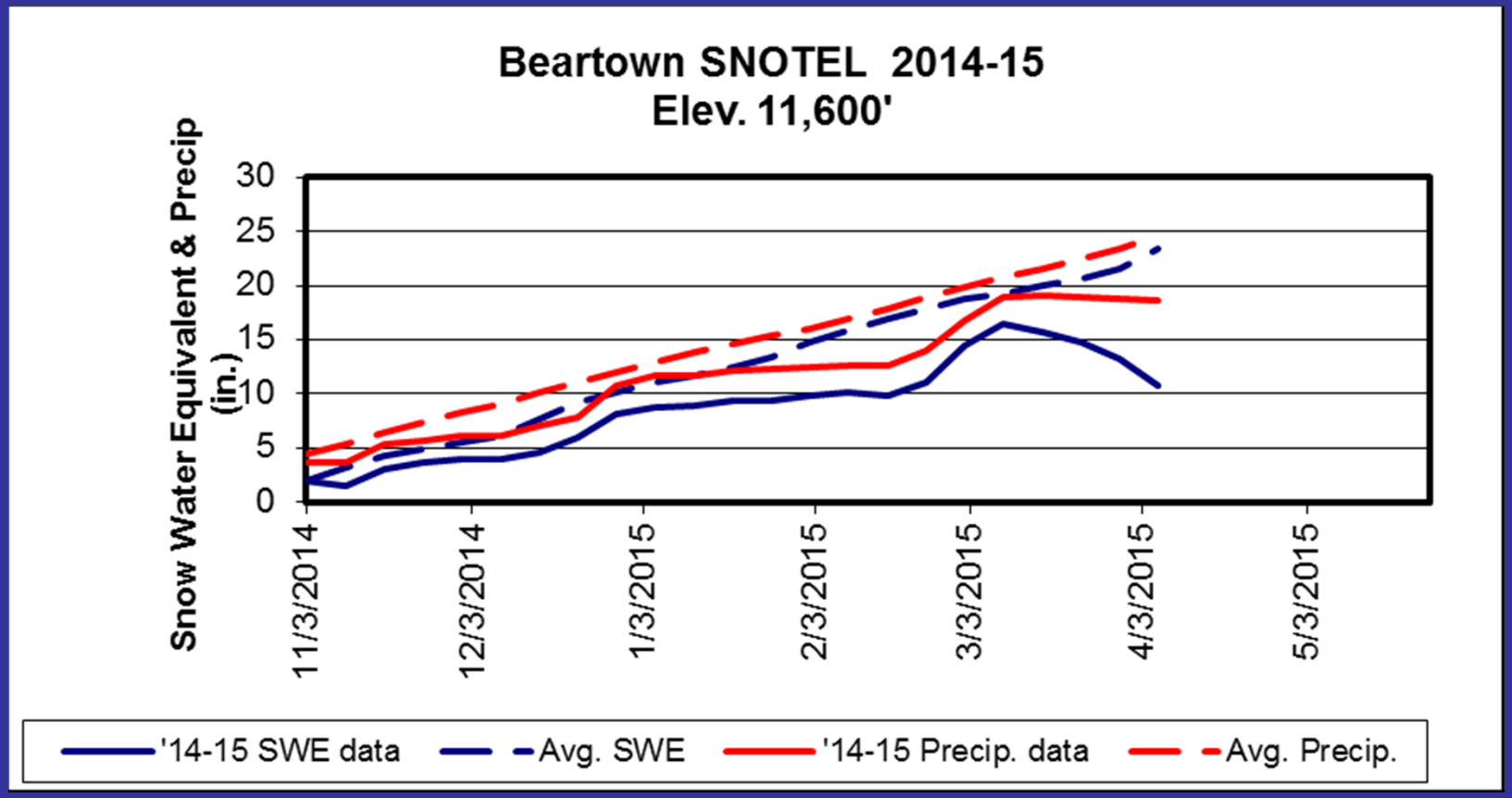
Similar Snowpack Years



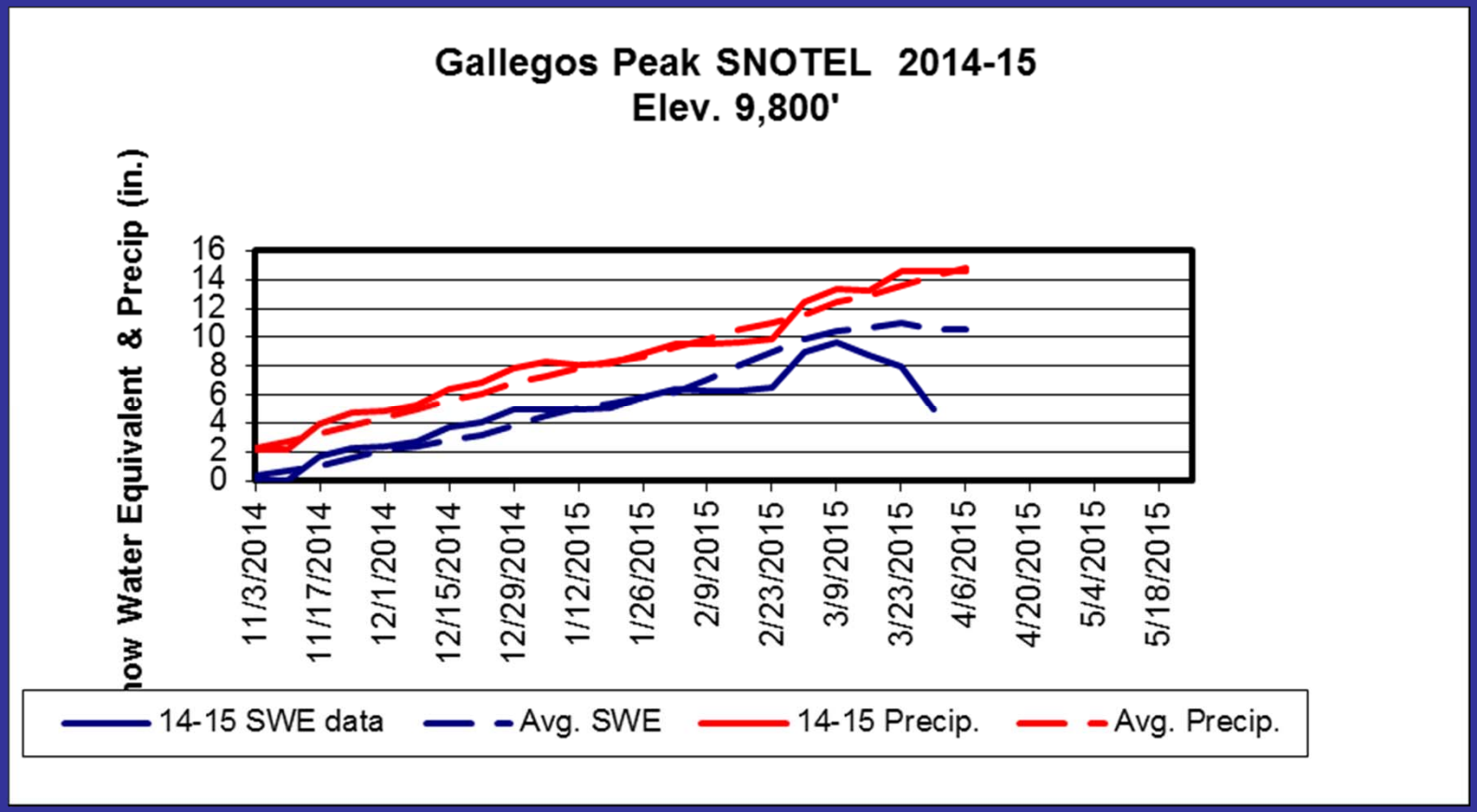
Rio Grande Snow Data



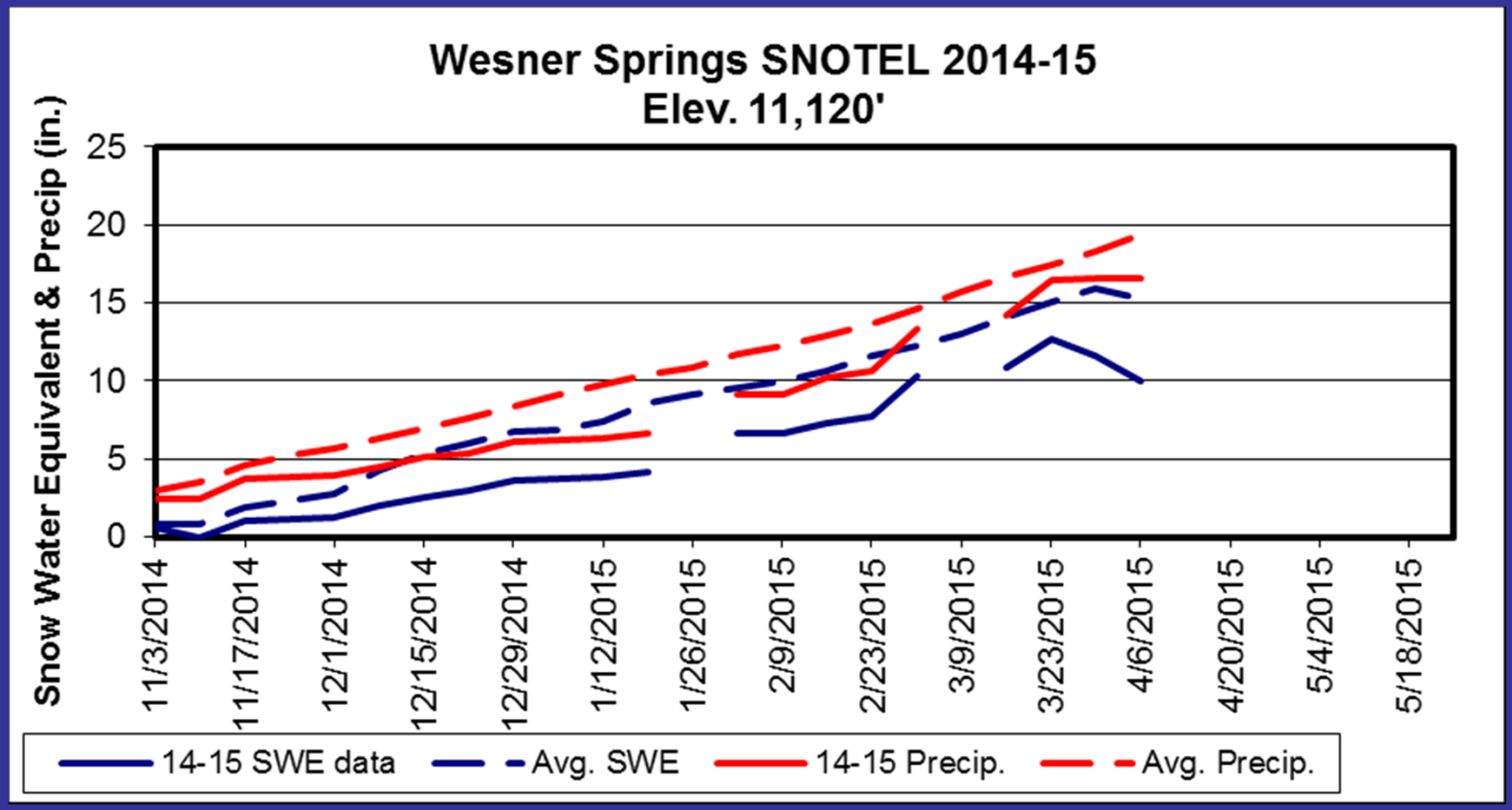
Rio Grande Snow Data



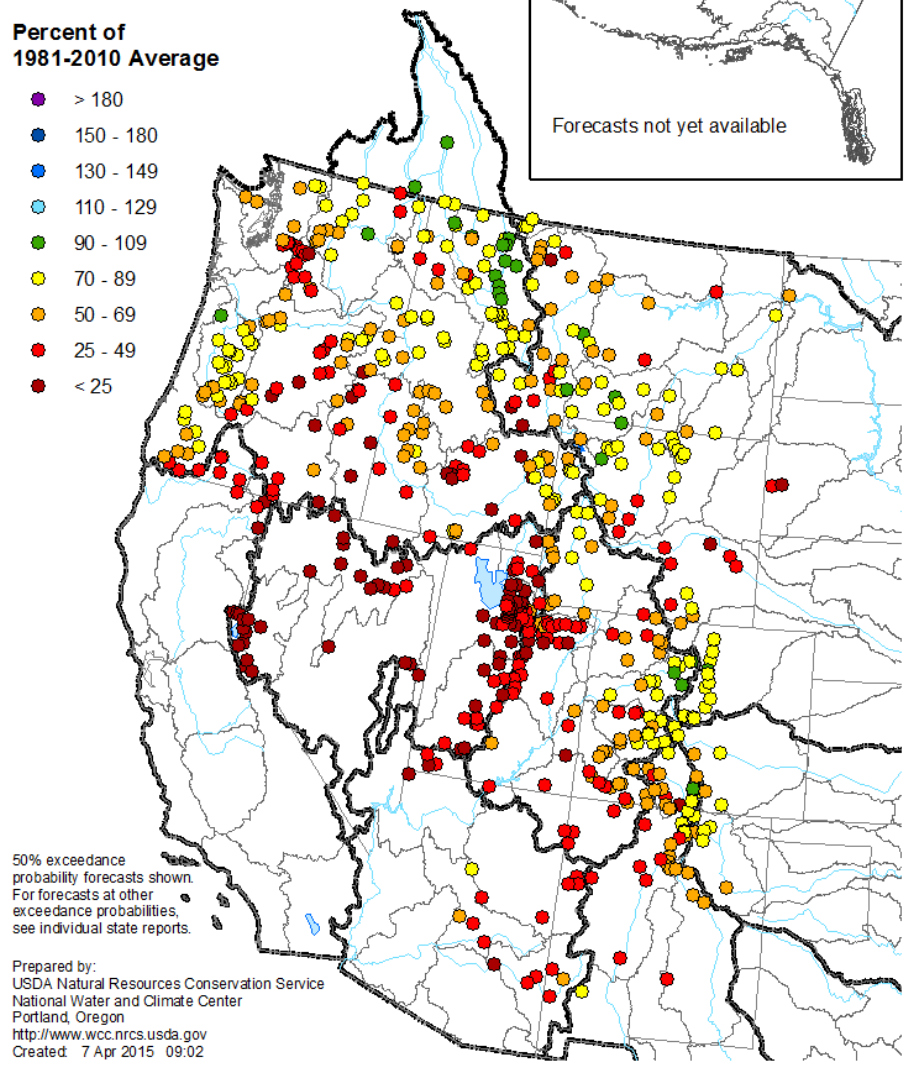
Sangre de Cristo Snow Data



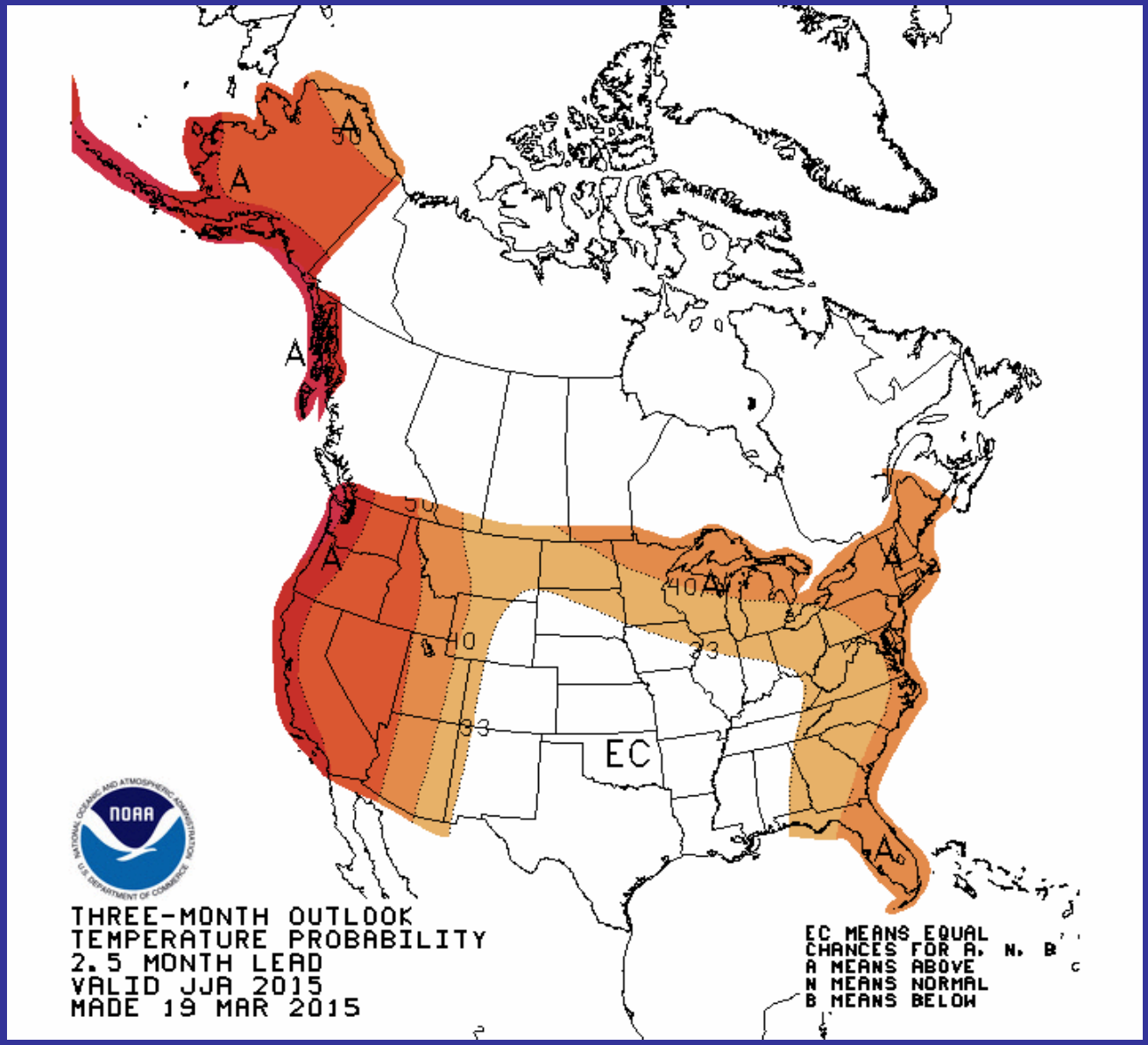
Sangre de Cristo Snow Data



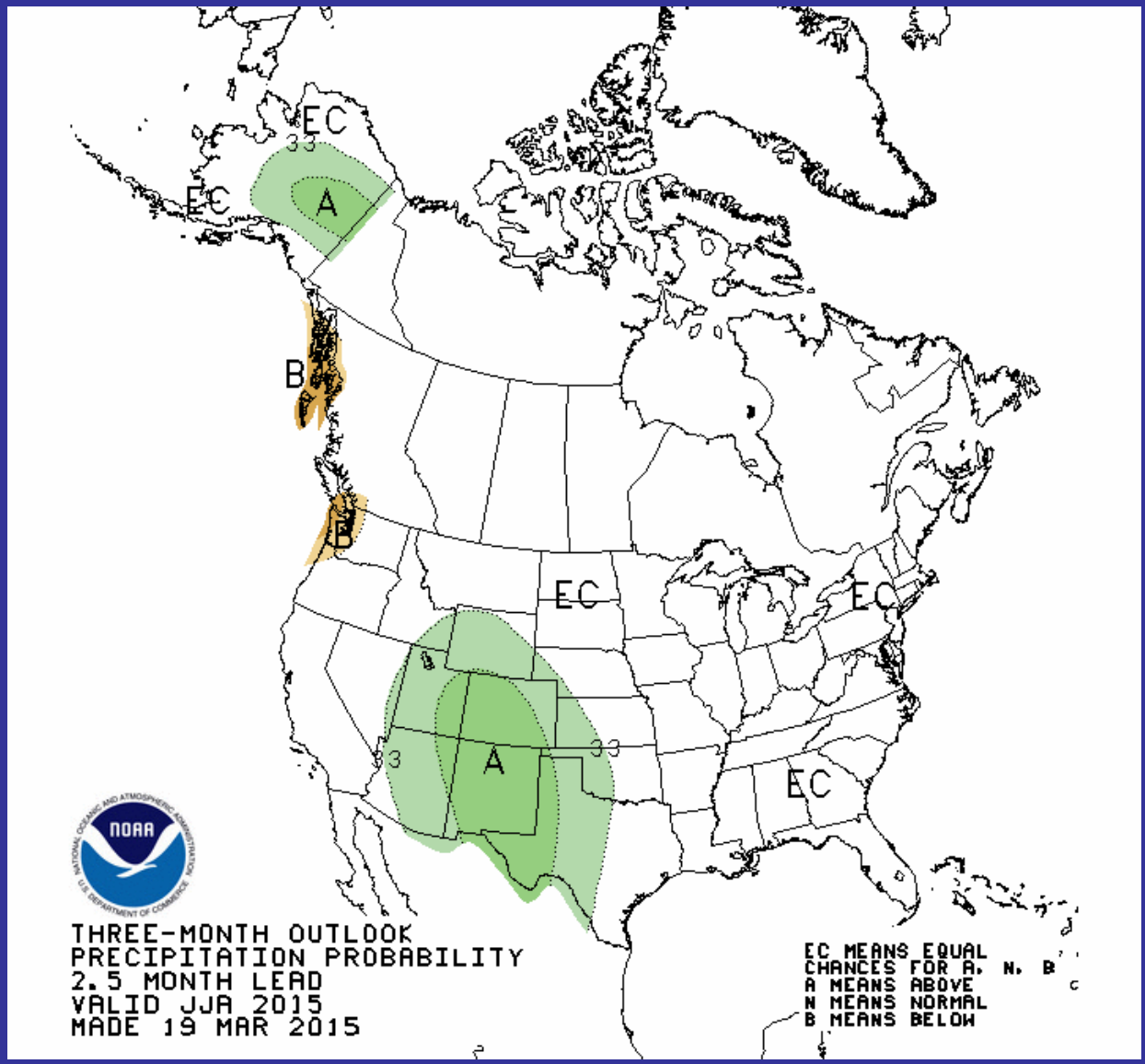
Spring and Summer Streamflow Forecasts as of April 1, 2015



Monsoon Season Temperature Outlook

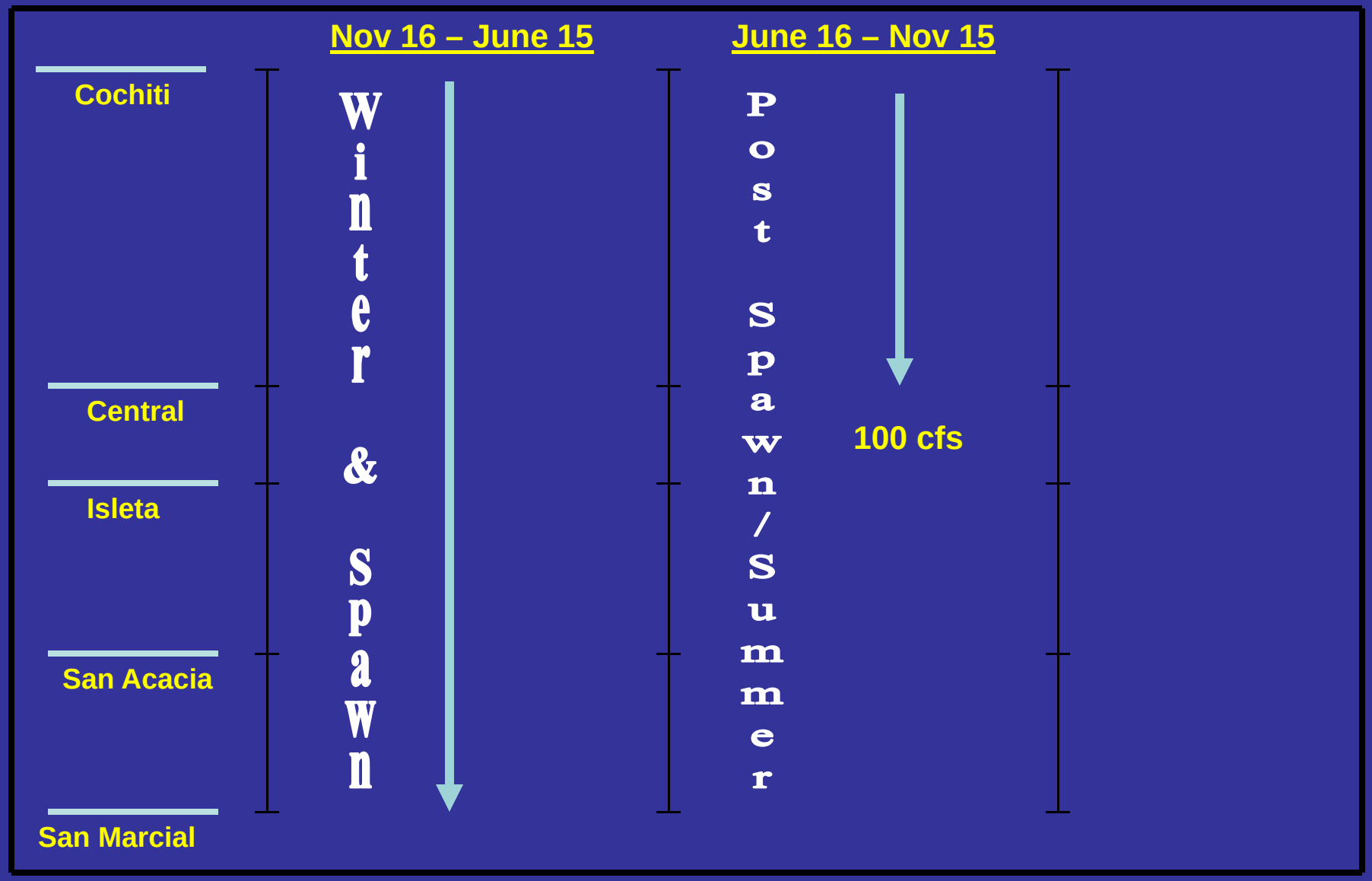


Monsoon Season Precipitation Outlook



2015 Water Operations Modeling

March 2003 BiOp Flow Requirements – Dry Year

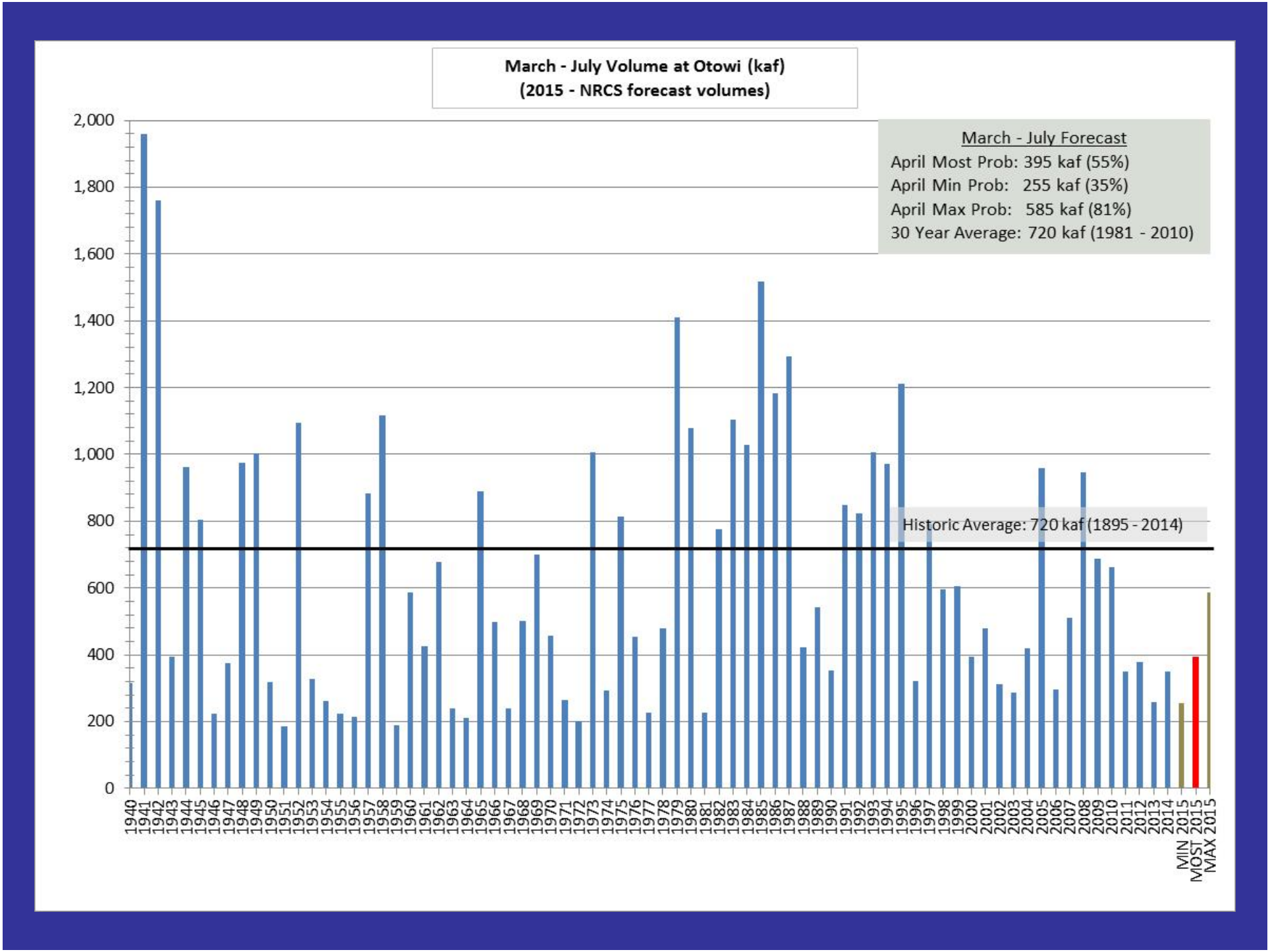


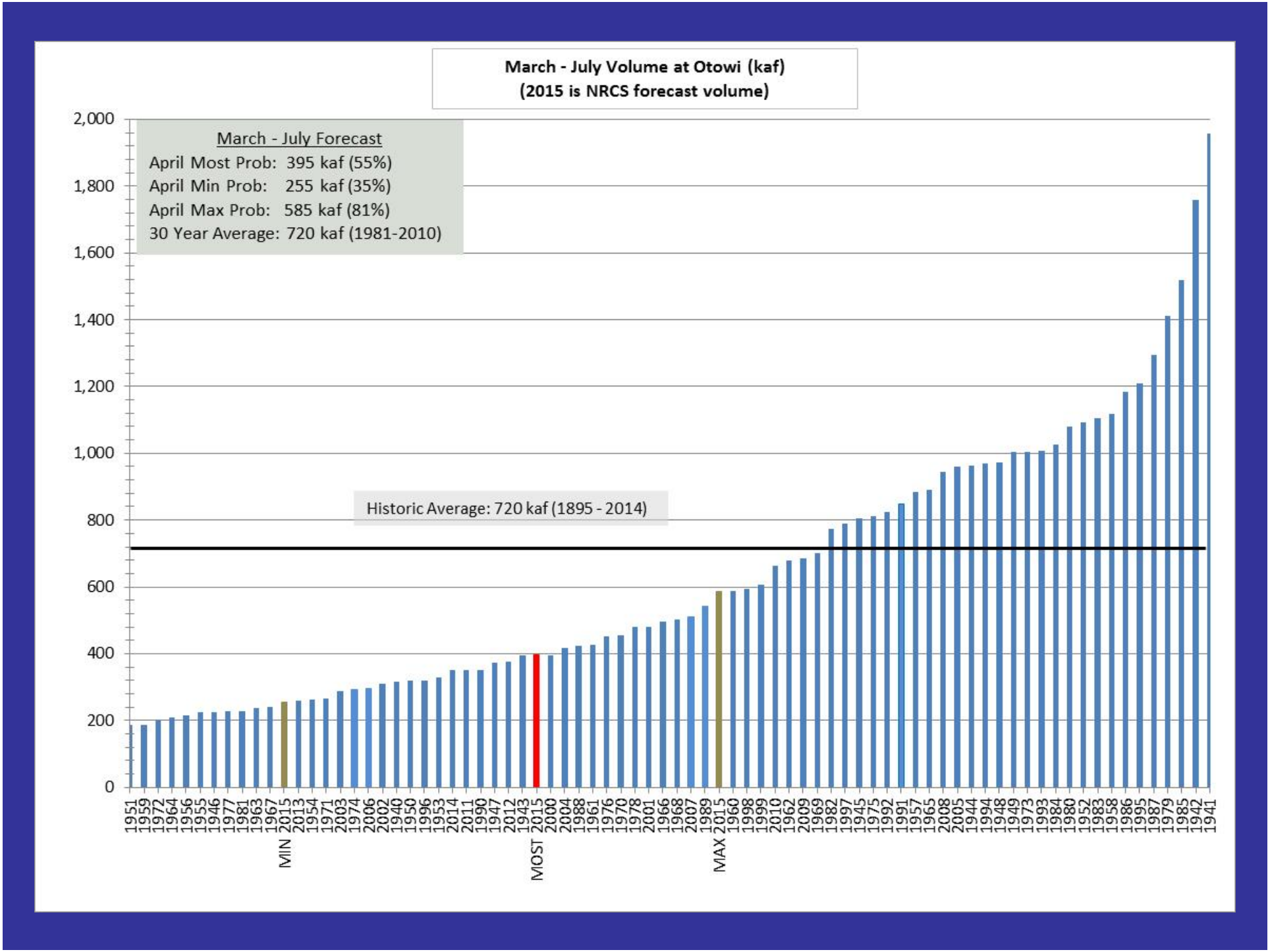
Major Assumptions

- April 1 50% most probable forecast
- Dry year target flow requirements
- Same monsoon conditions as forecast hydrograph year
- Storage occurs under the Emergency Drought Water Agreement for USBR
- Storage of water for Prior & Paramount lands
- Out of Article VII restrictions for several weeks

April Forecast Data

	Most Probable Percent of Average		April 1 50% Probability Volume, ac-ft
	2014	2015	2015
Rio Grande nr Del Norte	80%	58%	300,000
El Vado Reservoir Inflow	28%	53%	119,000
Rio Grande at Otowi	32%	55%	395,000
Nambe Reservoir Inflow	40%	65%	4,200
Jemez blw Jemez Dam	16%	50%	17,100
Rio Blanco @ Diversion	67%	56%	30,000
Navajo River @ Diversion	65%	55%	36,000


March - July Volume at Otowi (kaf)
(2015 - NRCS forecast volumes)
March - July Forecast
April Most Prob: 395 kaf (55%)
April Min Prob: 255 kaf (35%)
April Max Prob: 585 kaf (81%)
30 Year Average: 720 kaf (1981 - 2010)
Historic Average: 720 kaf (1895 - 2014)
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
MIN 2015
MOST 2015
MAX 2015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2,000
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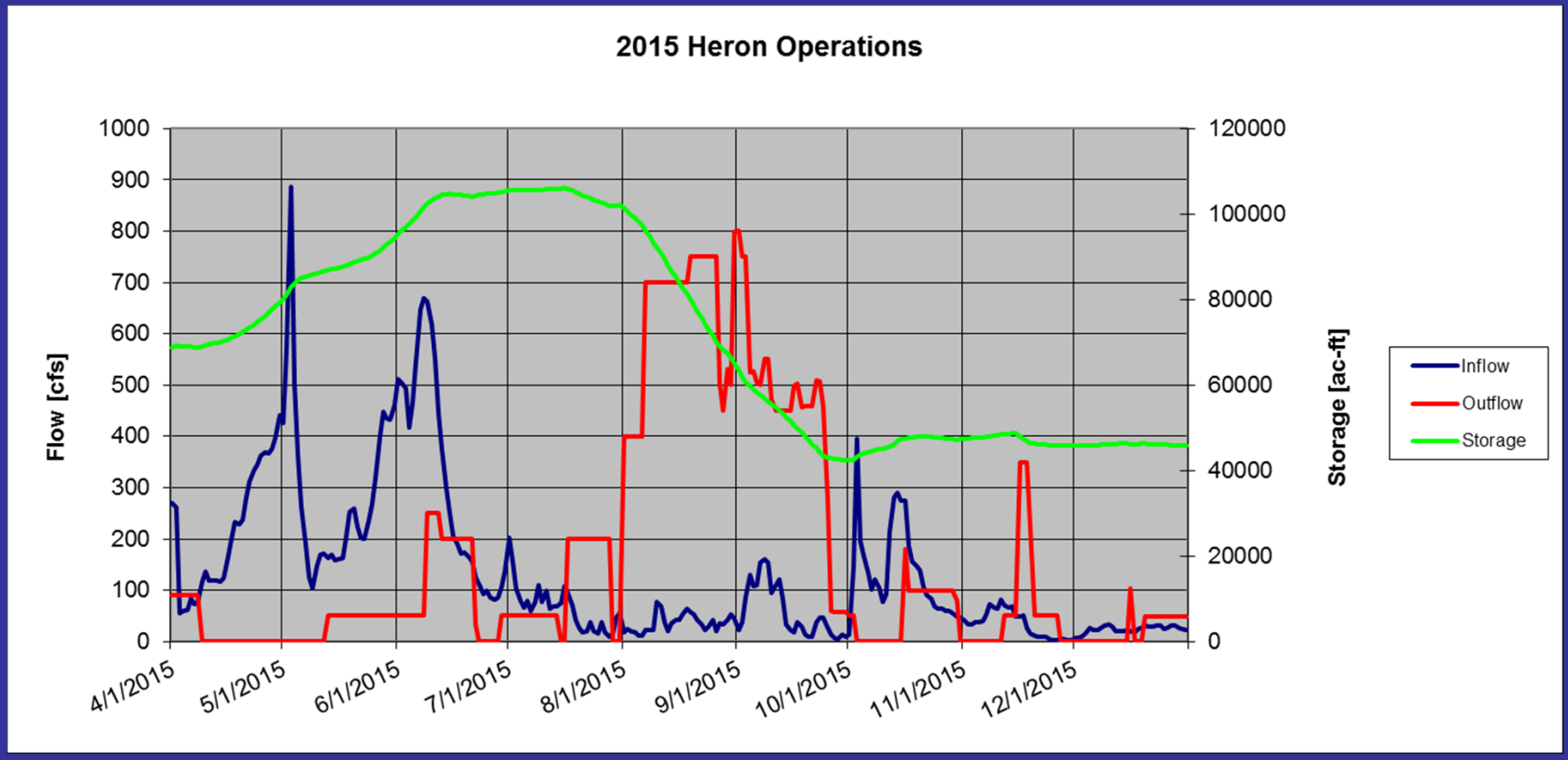
1,400
1,200
1,000
800
600
400
200
0
1951 1959 1972 1964 1956 1955 1946 1977 1981 1963 1967 2015 2013 1954 1971 2003 1974 2006 2002 1940 1950 1996 1953 2014 2011 1990 1947 2012 1943 2015 2000 2004 1988 1961 1976 1970 1978 2001 1966 1968 2007 1989 2015 1960 1998 1999 2010 1962 2009 1969 1982 1997 1945 1975 1992 1991 1957 1965 2008 2005 1944 1994 1948 1949 1973 1993 1984 1980 1952 1983 1958 1986 1995 1987 1979 1985 1942 1941
MIN
MOST
MAX

Heron Reservoir

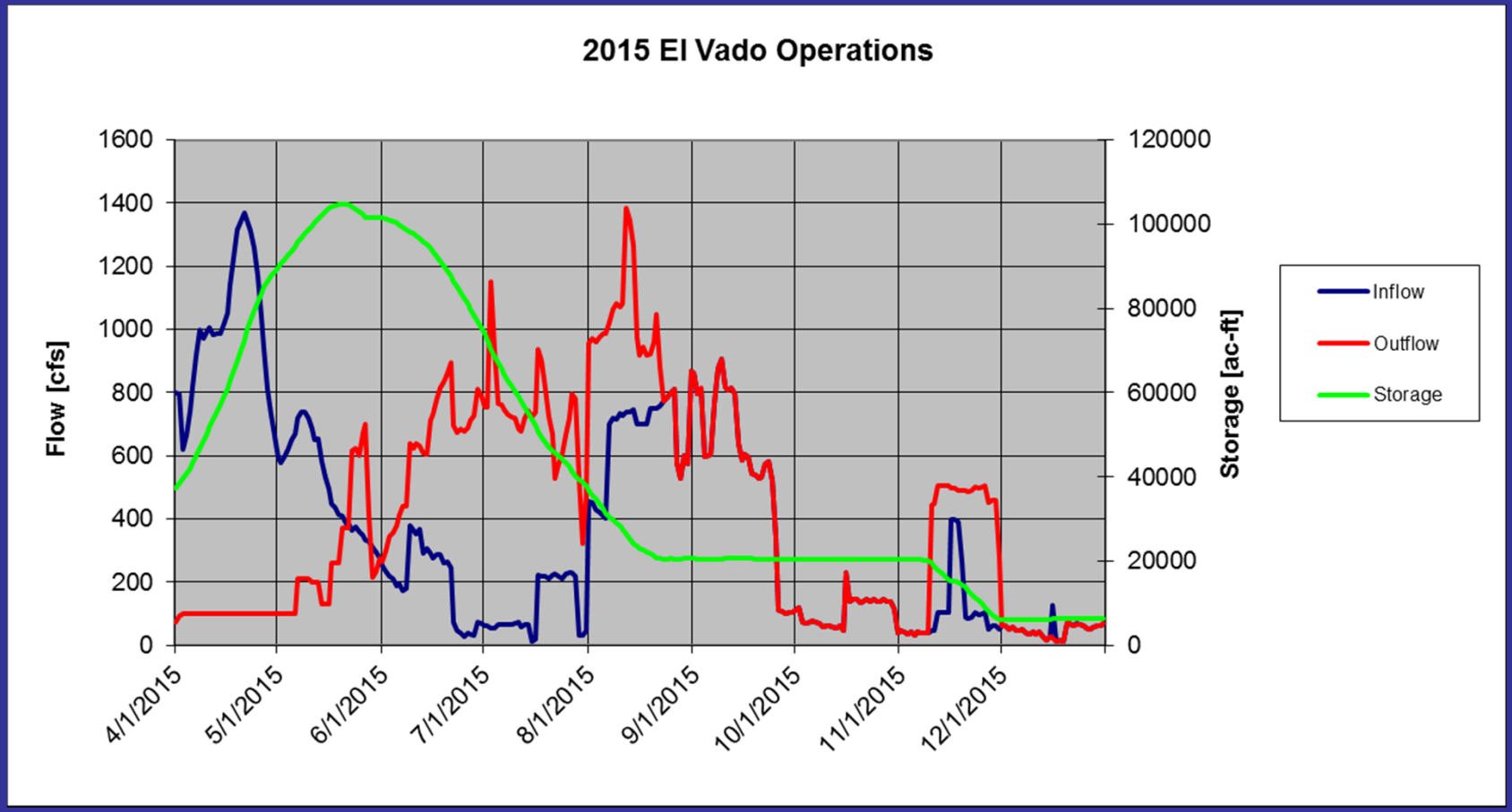
Proposed 2015 Heron Operations



Reservoir will drop 14 feet from beginning of year to end

El Vado Reservoir

Proposed 2015 El Vado Operations

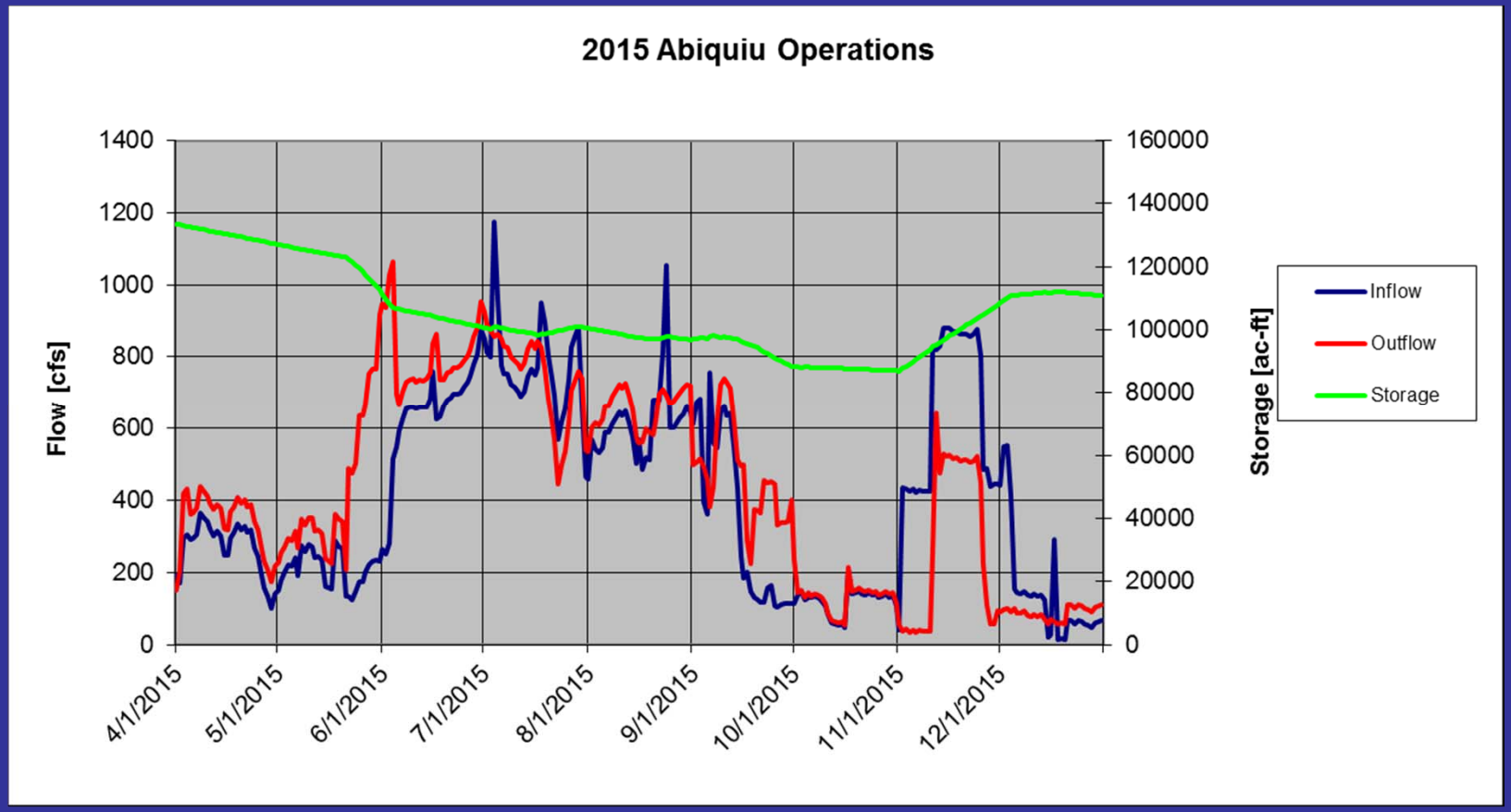


<u>El Vado Reservoir:</u>

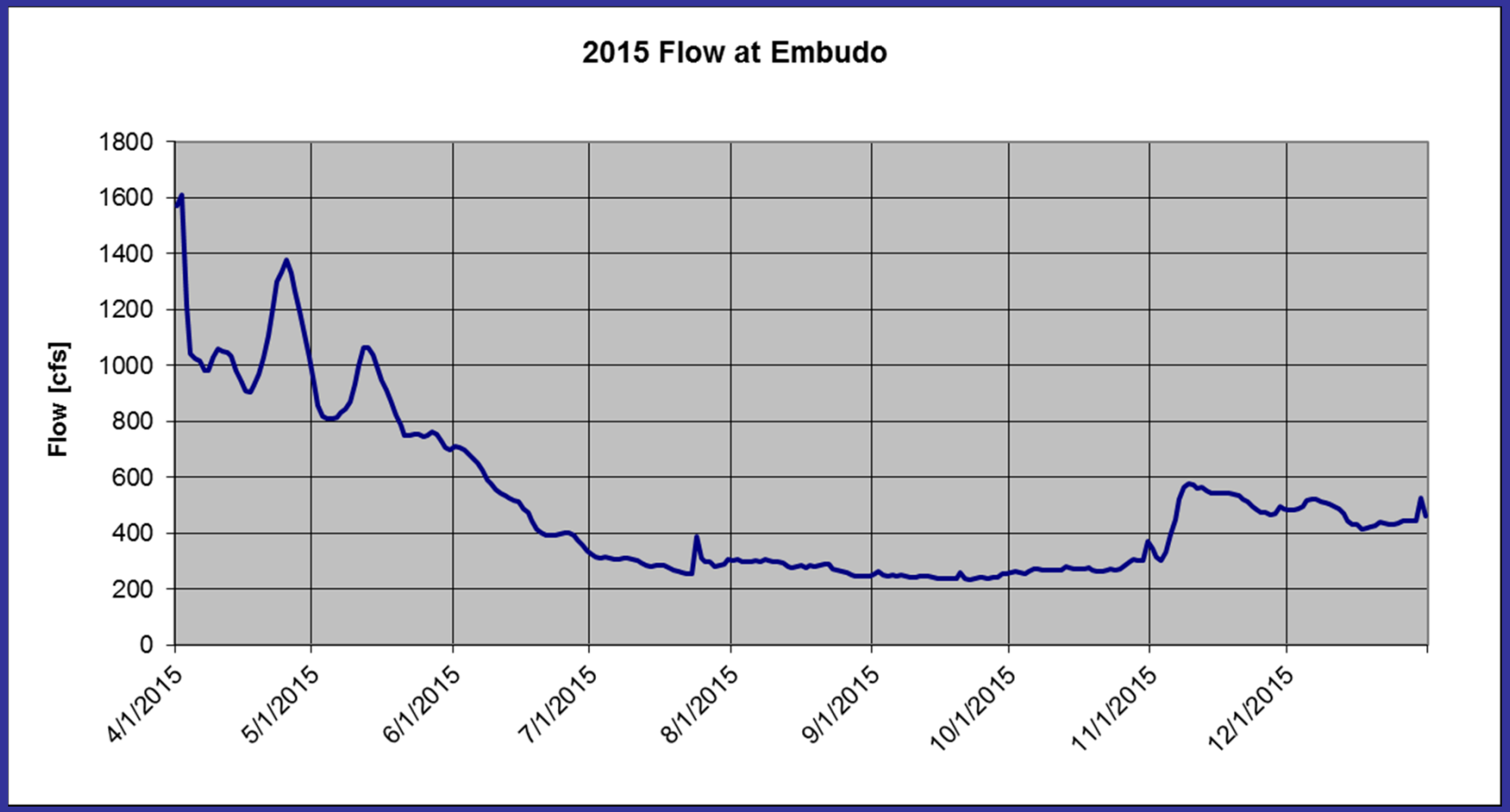
Lake Level: 77’ of fluctuation between May and Dec

ABIQUIU LAKE

Proposed 2015 Abiquiu Operations

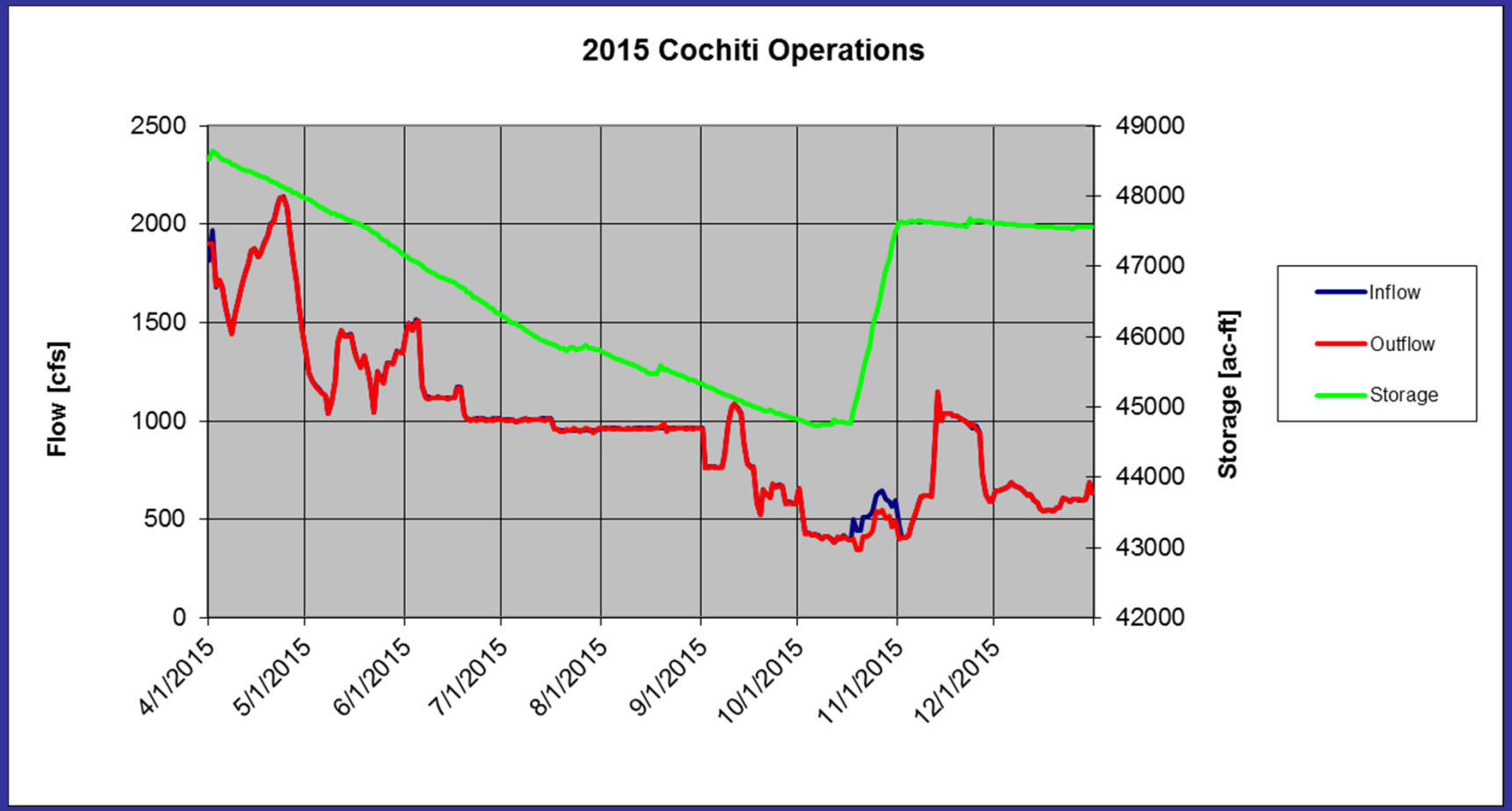


Estimated Hydrograph at Embudo

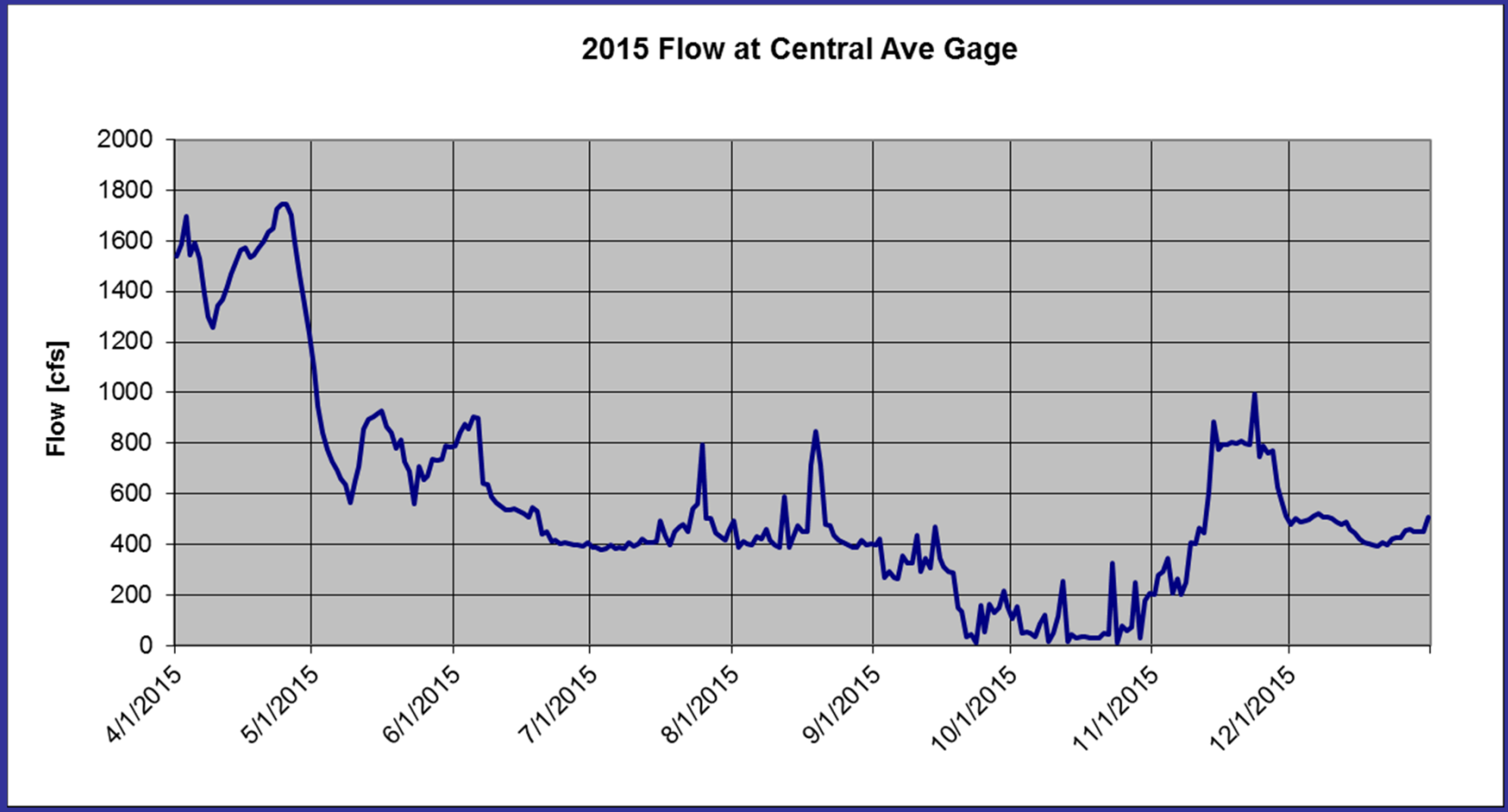



COCHITI LAKE

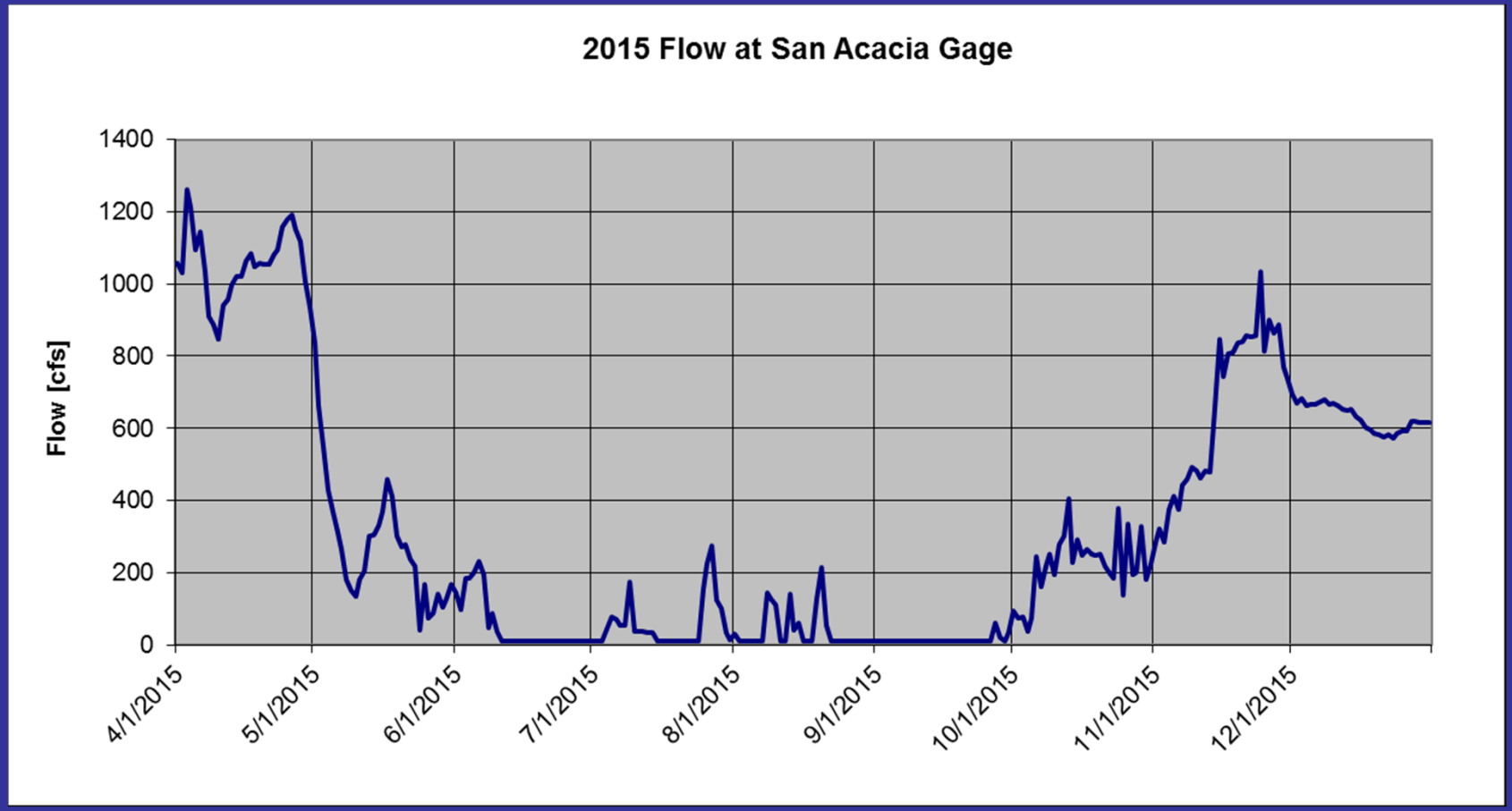
Proposed 2015 Cochiti Operations



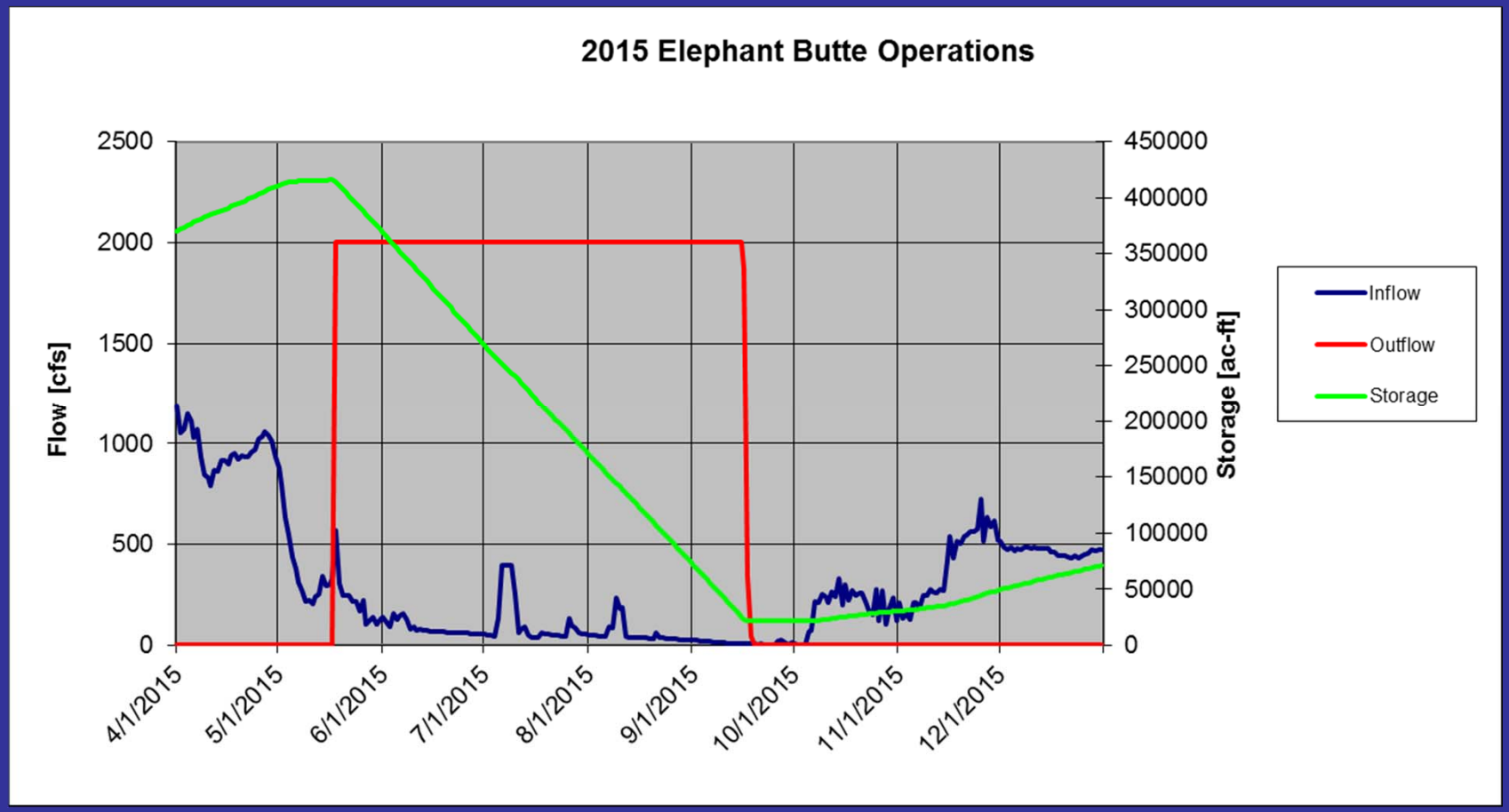
Estimated Hydrograph at Central Ave.



Estimated Flow at San Acacia



Proposed Elephant Butte Operations



Maximum Elevation = 4333.90’. Minimum Elevation= 4271.47’