

4-2015

2015 Annual Operating Plan

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

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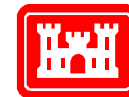
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2015 Annual Operating Plan

April 1 Runoff Forecast



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Reclamation's Water Operations Web Page

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RECLAMATION

Upper Colorado Region *Managing Water in the West*

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- **Releases from Heron Reservoir**
- **San Juan-Chama Water at Otowi**
- **Rio Grande Basin Water Storage**
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 - SNOTEL Snow-Precipitation Update
 - Drought Conditions: New Mexico
 - ET ToolBox
 - Intellicast Weather
 - NOAA Weather
 - Wunderground Weather
 - Upper Rio Grande Basin Water Operations Review
 - Upper Rio Grande Water Operations Model

Stream gages

Map labels: Rio Blanco, Little Navajo River, Navajo River, Rio Chama, Lobatos, Heron Reservoir, Azules Willow, Cerro, Red River, La Fuente, El Vado Reservoir, Rio Pueblo de Taos at Los Cordovas, Abiquiu Reservoir, Embudo, Rio Grande, Otowi, Santa Fe, Jemez near Jemez, San Felipe, Galisteo, Cochiti Lake, Jemez Canyon Reservoir, North Floodway Channel, Albuquerque, South Diversion Channel, Rio Puerco, Bernardo, San Acacia, San Marcial, Elephant Butte Reservoir

(**Map is not to scale)

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<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

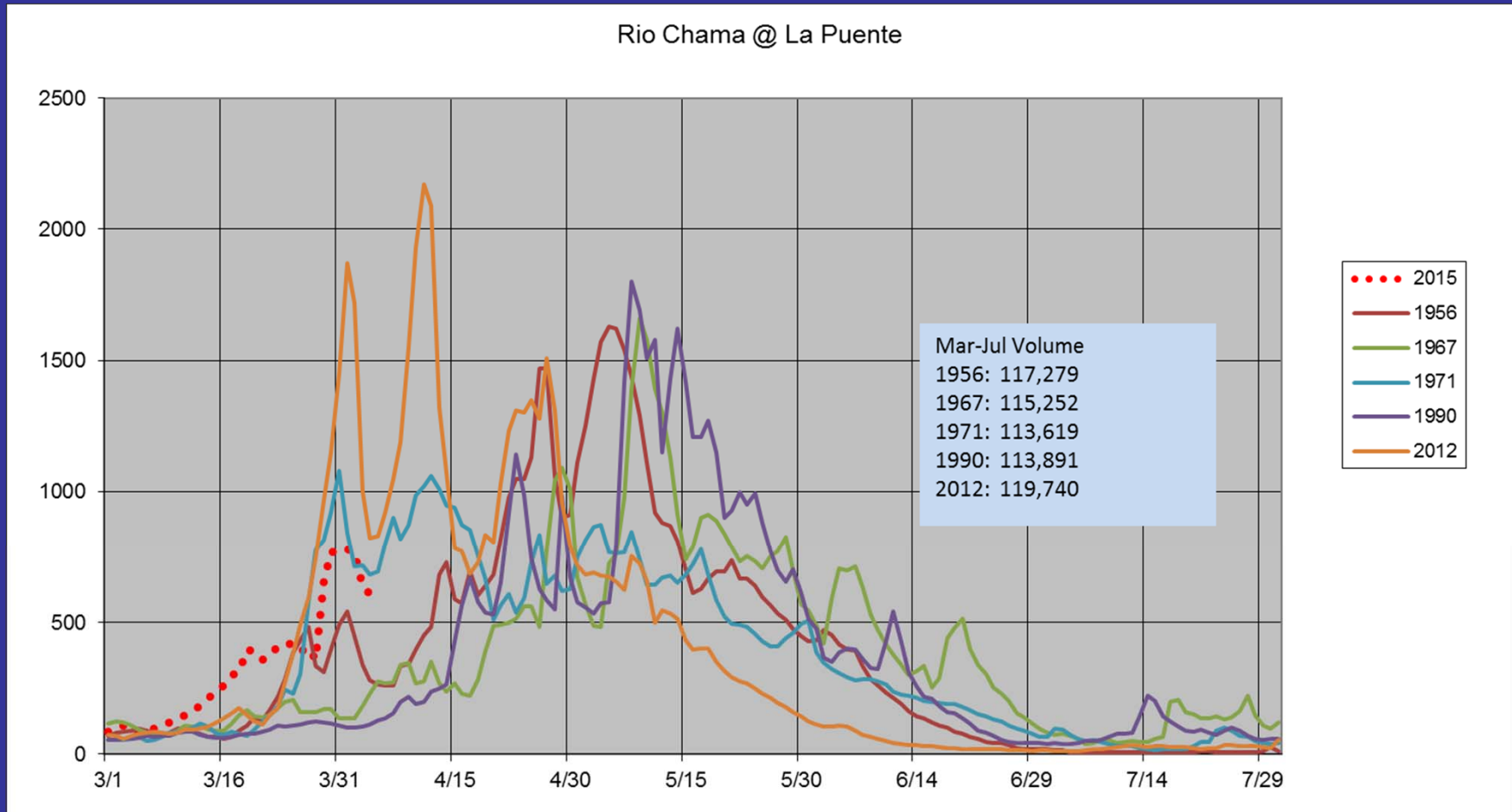
Flood control and channel capacity





























Timing of water deliveries

Demand curves from water users

Requirements of the 2003 Biological Opinion

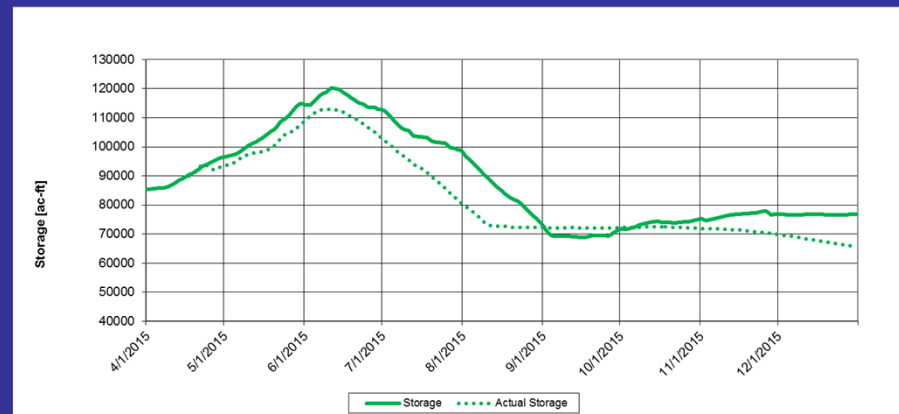
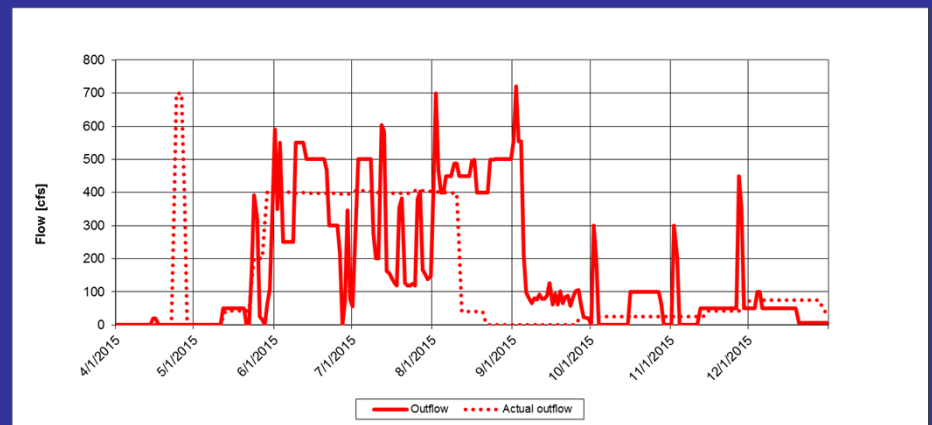
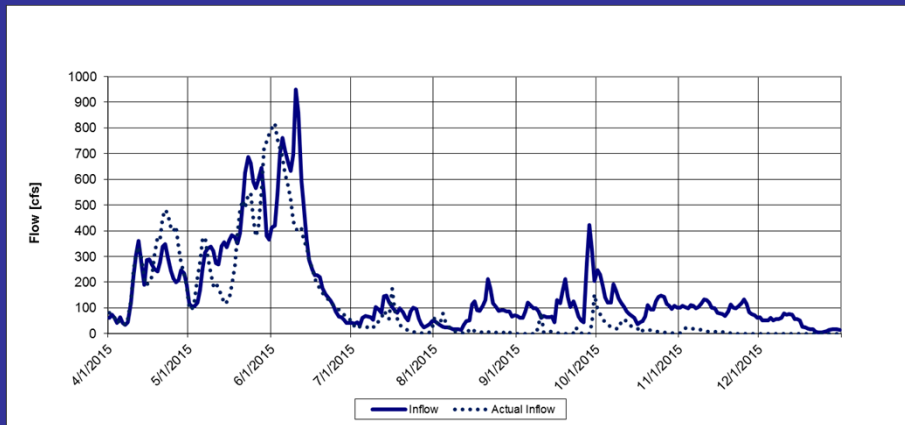
Similar Year Hydrographs



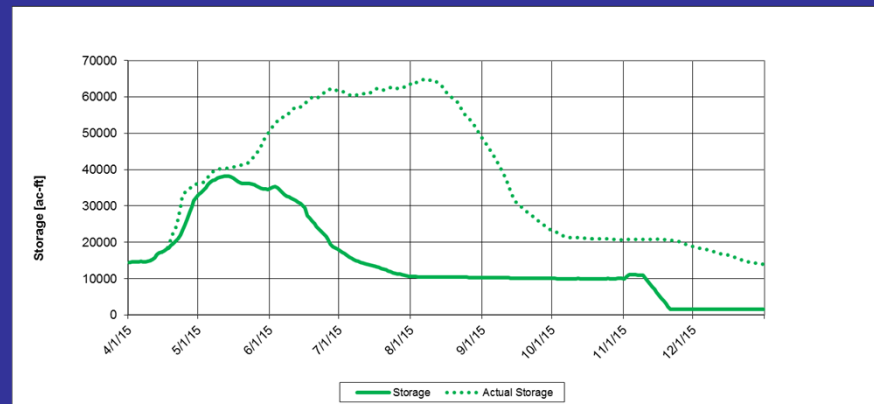
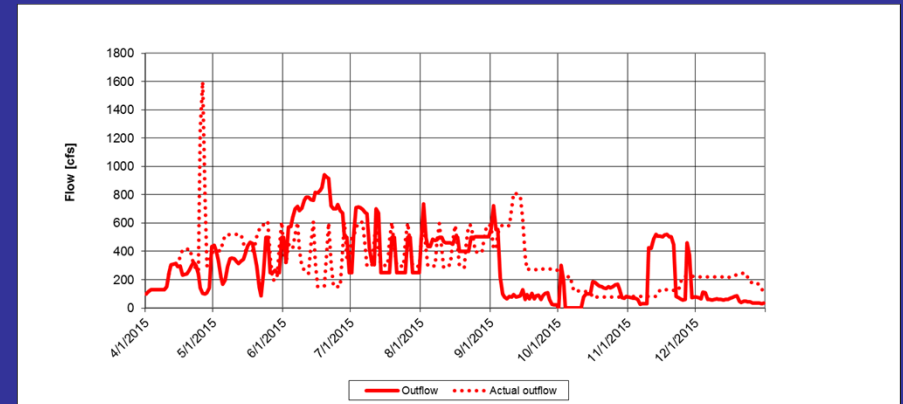
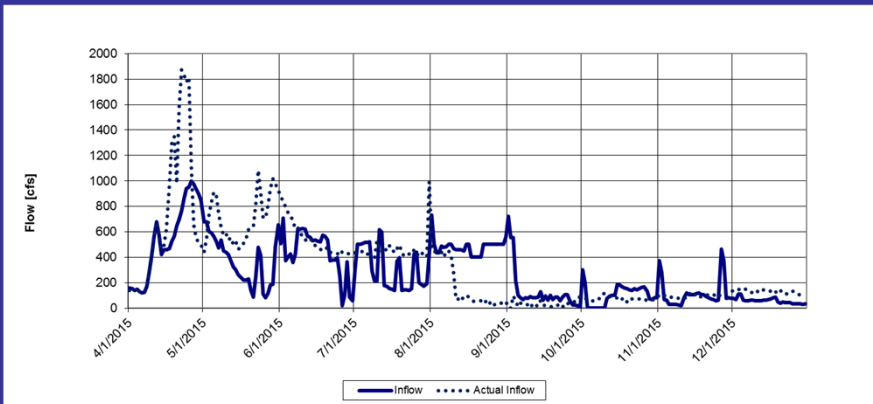
<u>Operated By:</u>	Reclamation	Corps	Water Supply	Recreation	Flood Control	Sediment Control
<u>Dams:</u>						
HERON						
EL VADO						
ABIQUIU						
NAMBE FALLS						
GALISTEO						
COCHITI						
JEMEZ CANYON						
ELEPHANT BUTTE						

2014: The Year in Review

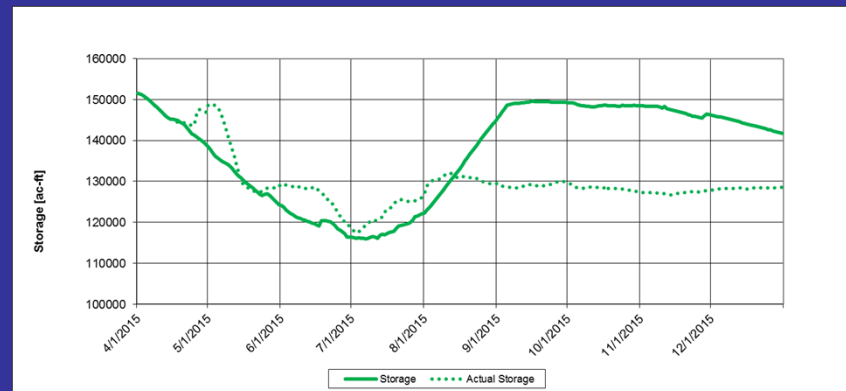
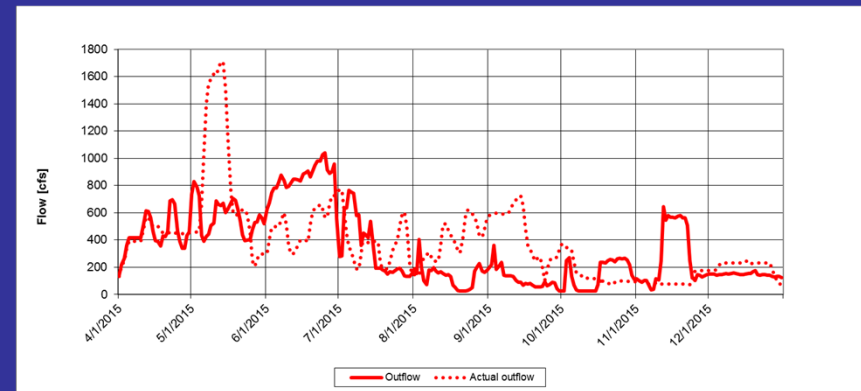
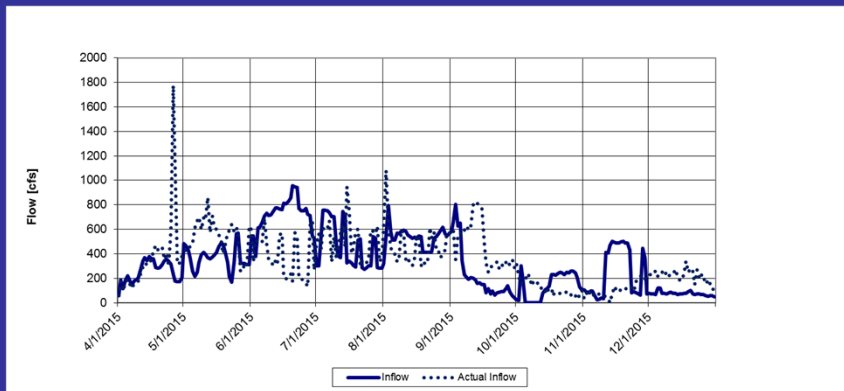
Heron Reservoir



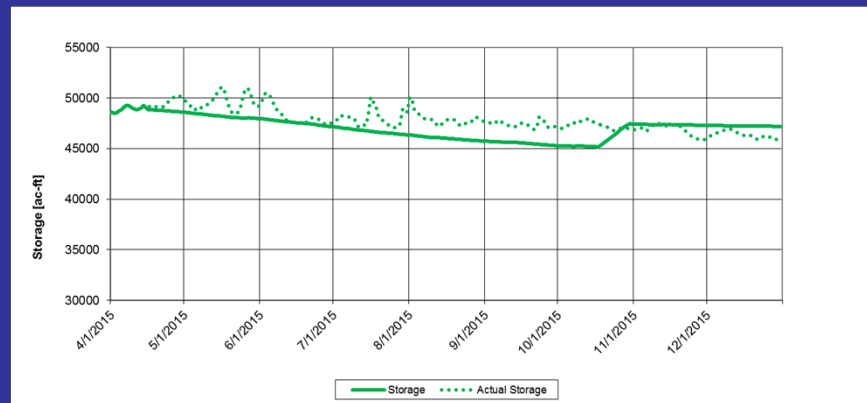
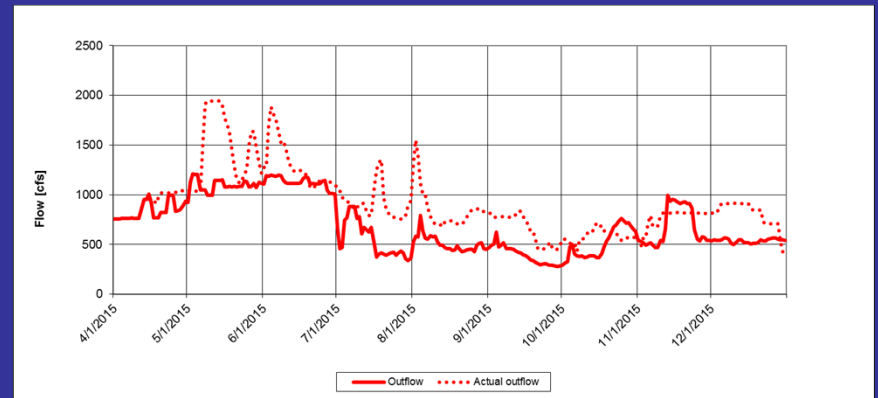
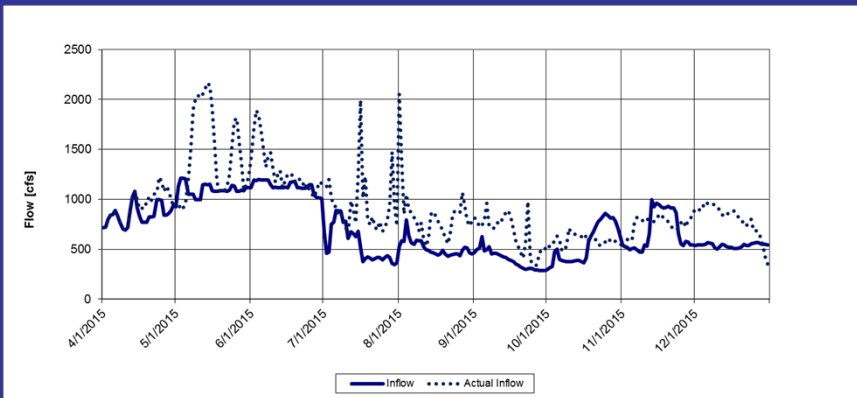
El Vado Reservoir



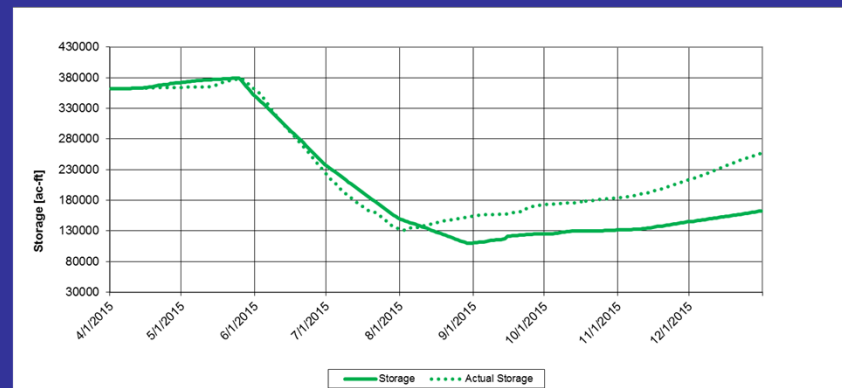
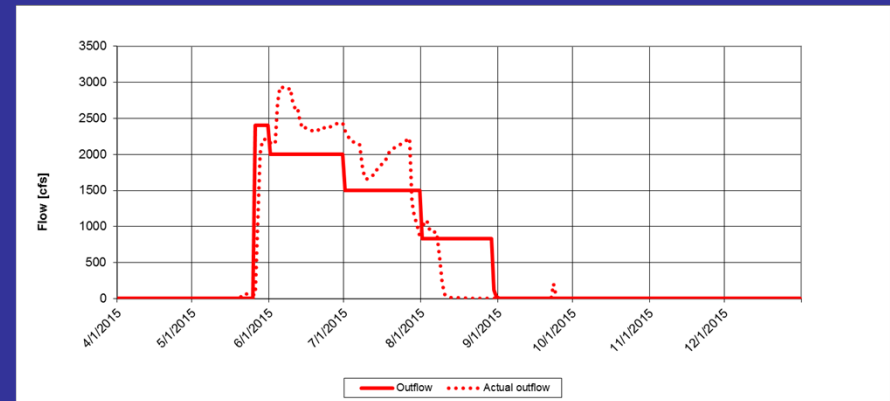
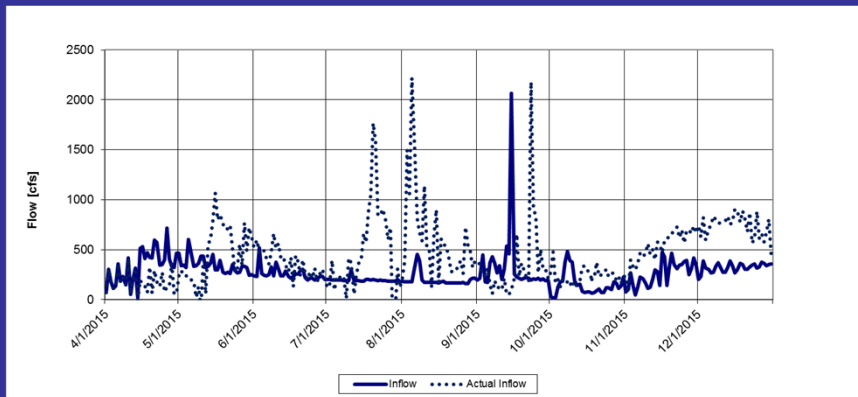
Abiquiu Reservoir



Cochiti Reservoir

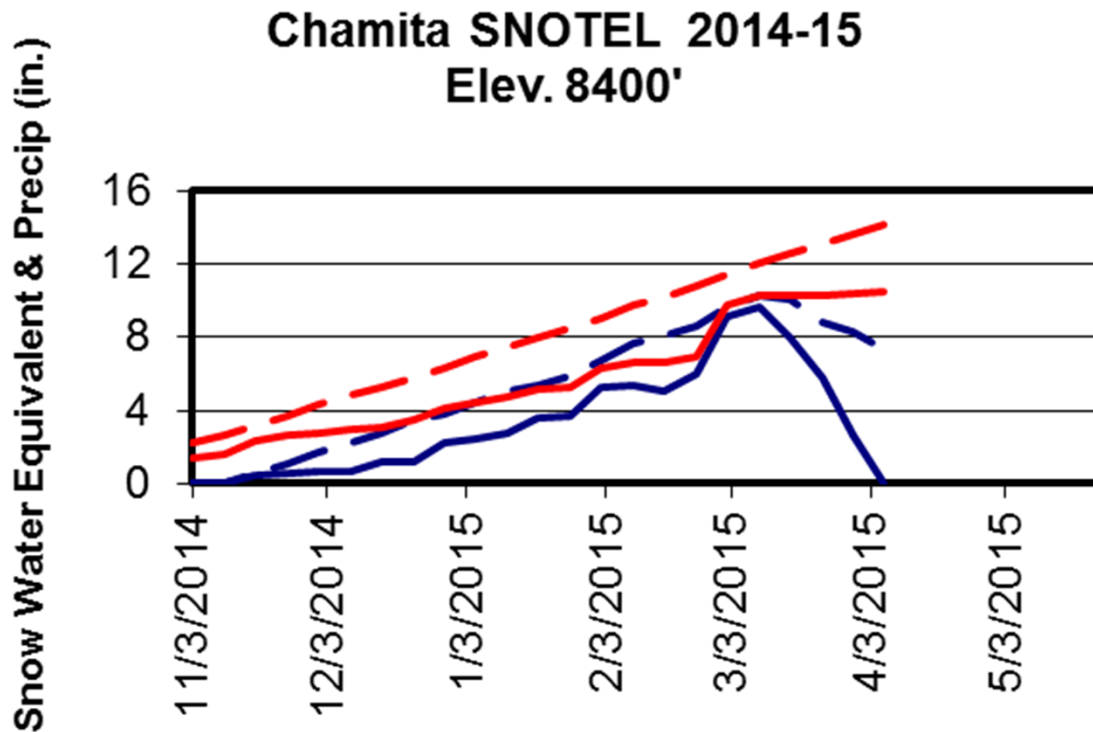


Elephant Butte Reservoir



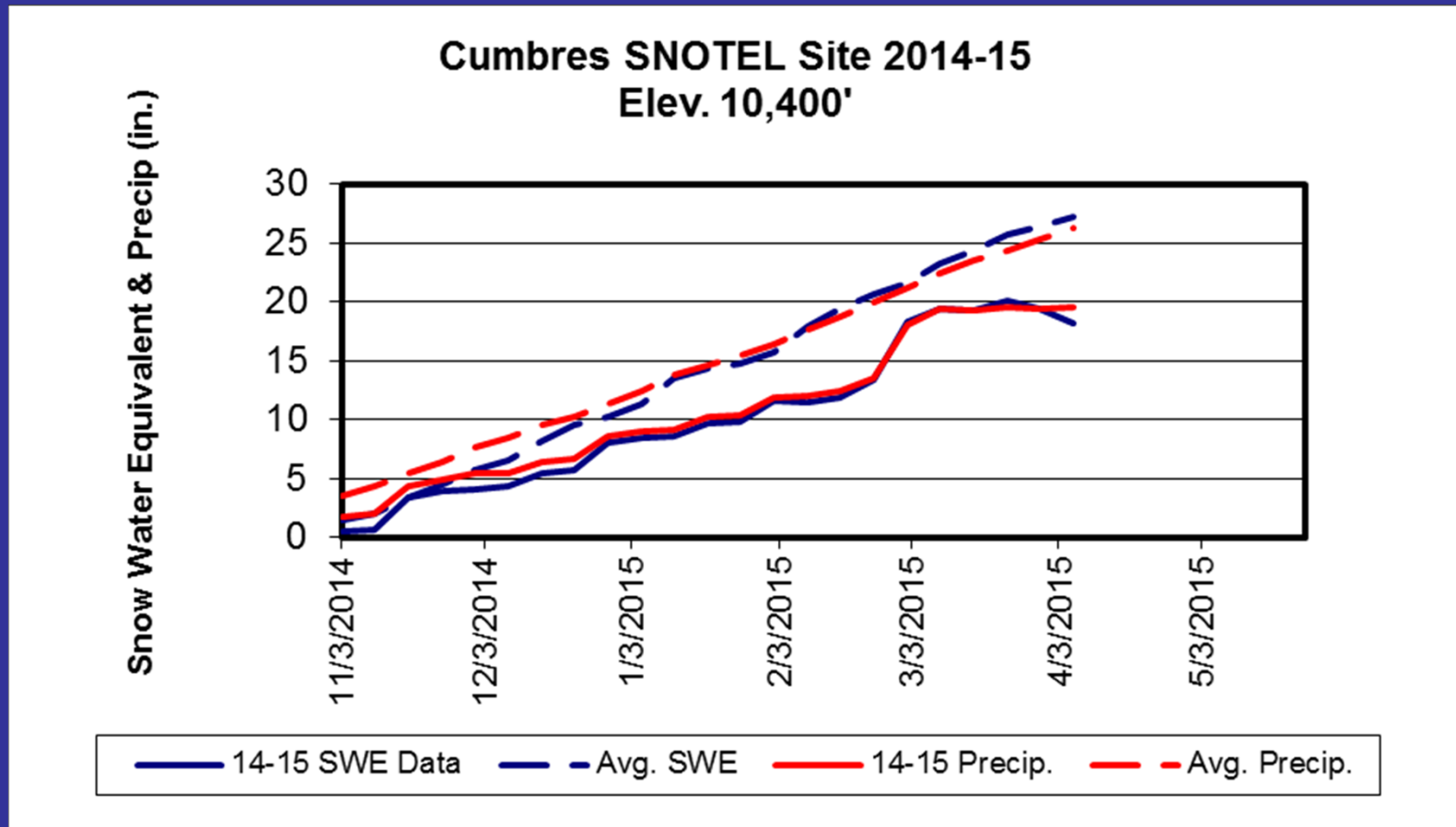
Current Snow Conditions

Rio Chama Snow Data

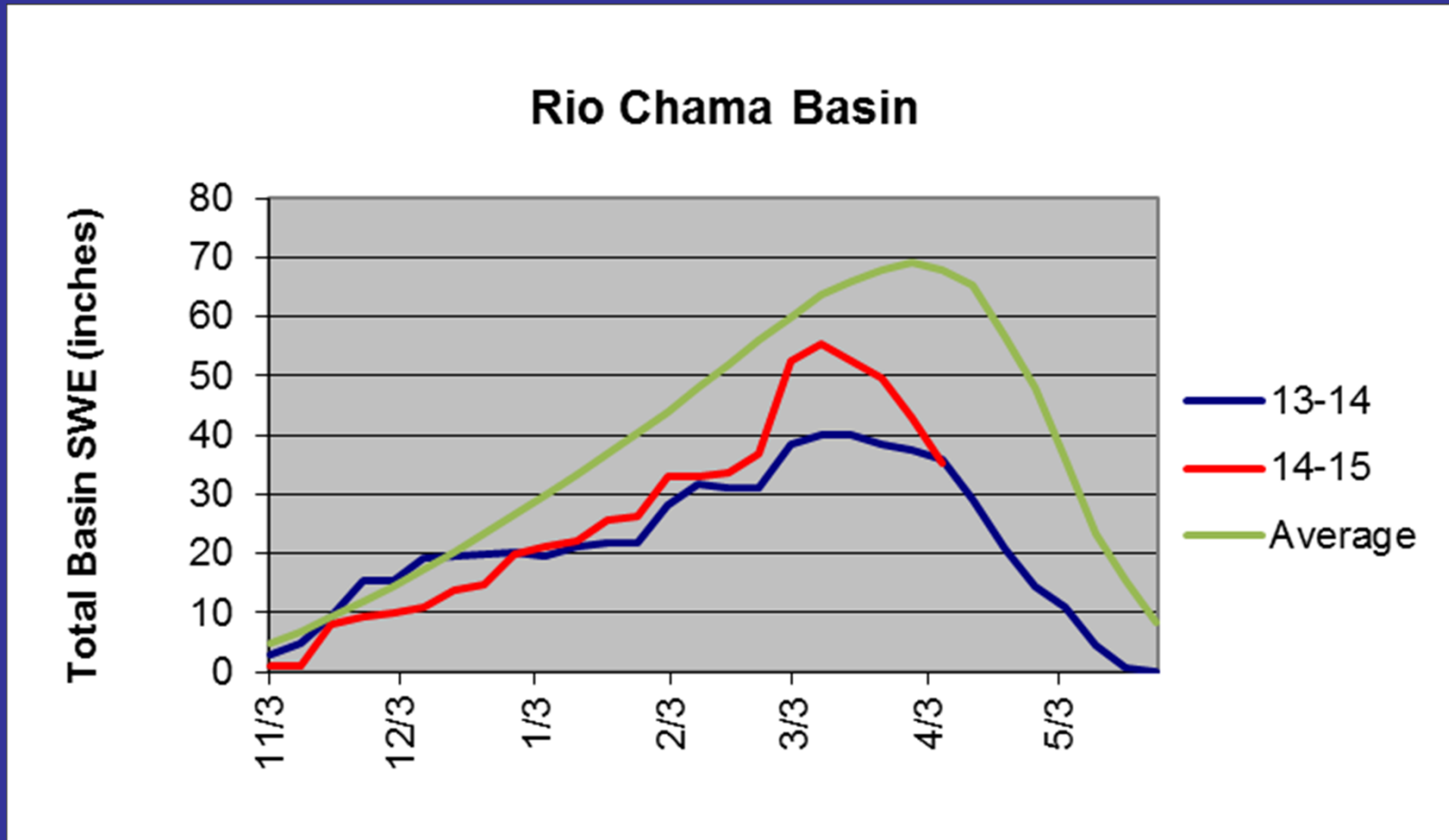


— 14-15 SWE Data - - Avg. SWE — 14-15 Precip. - - Avg. Precip.

Rio Chama Snow Data

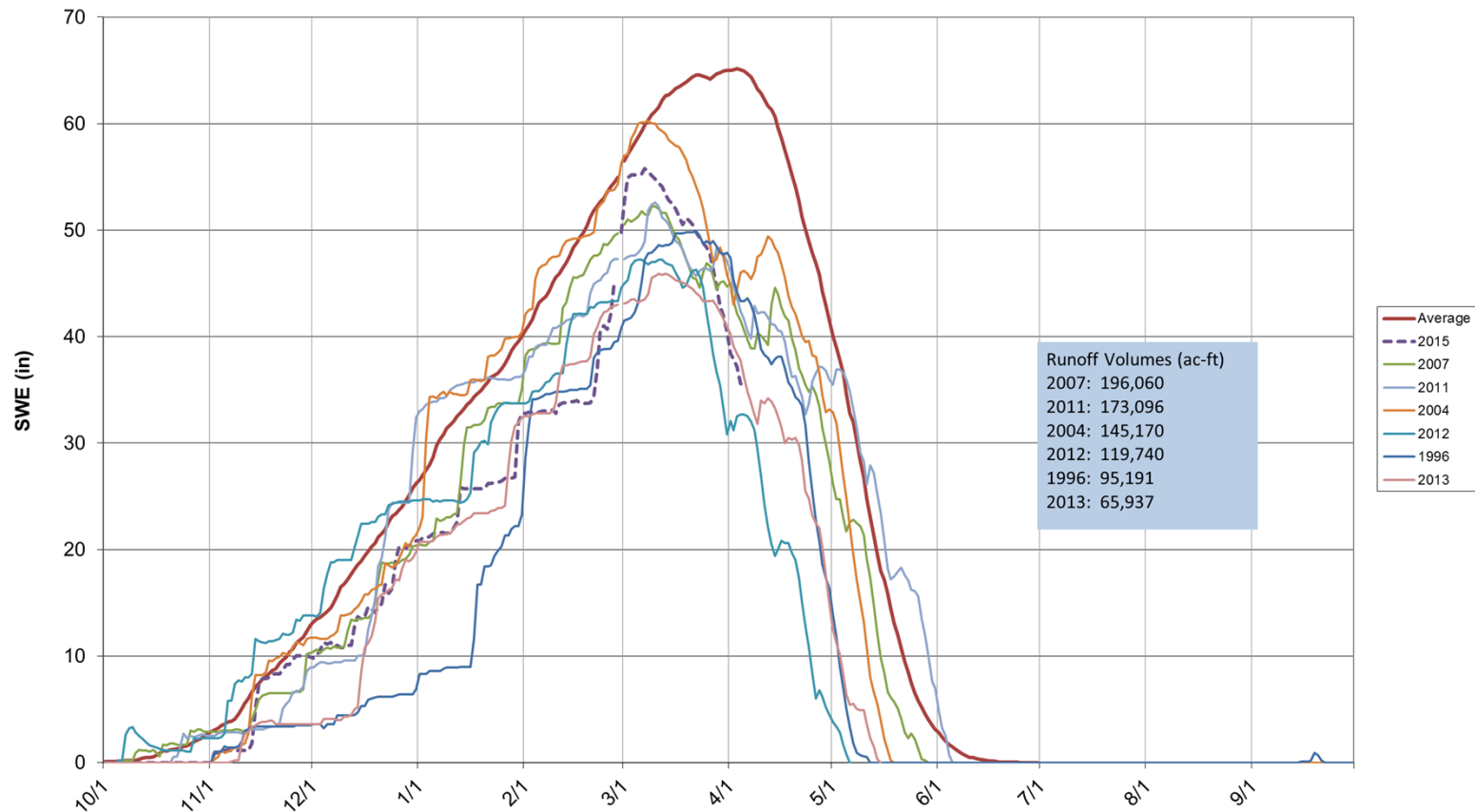


Rio Chama Snow Comparison

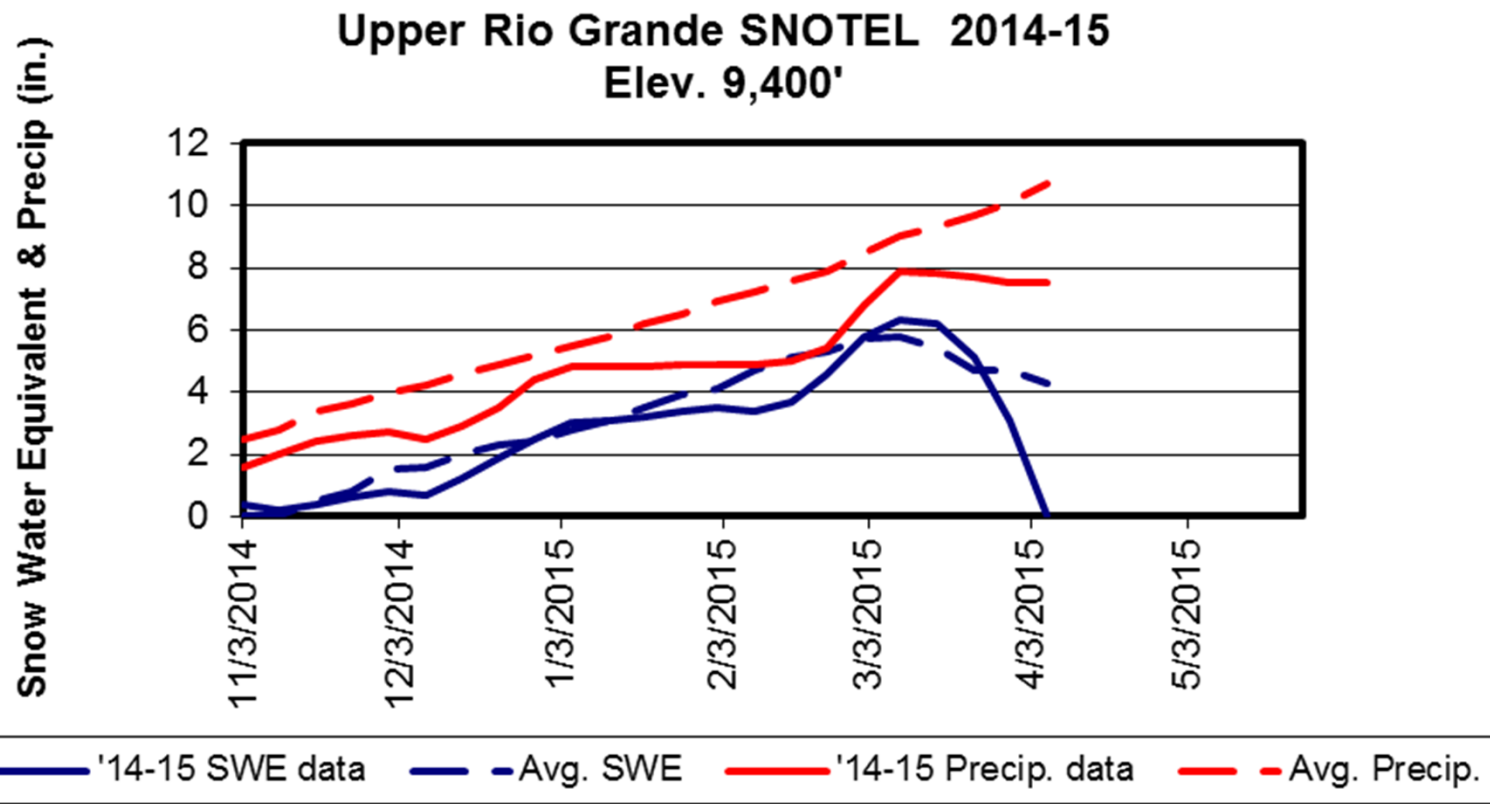


Similar Snowpack Years

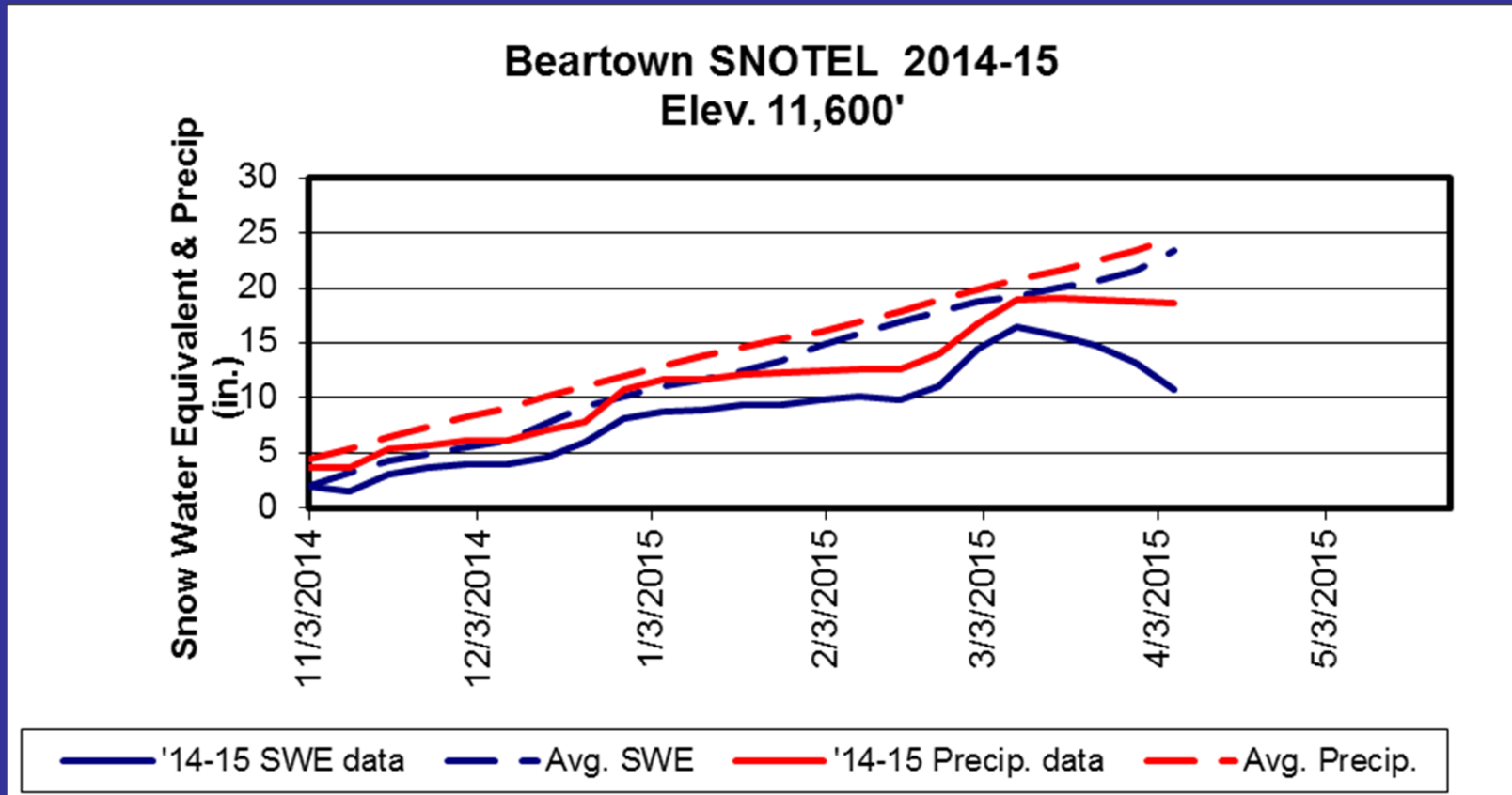
2015 vs. Similar Years, and Average Rio Chama Snowpack Index



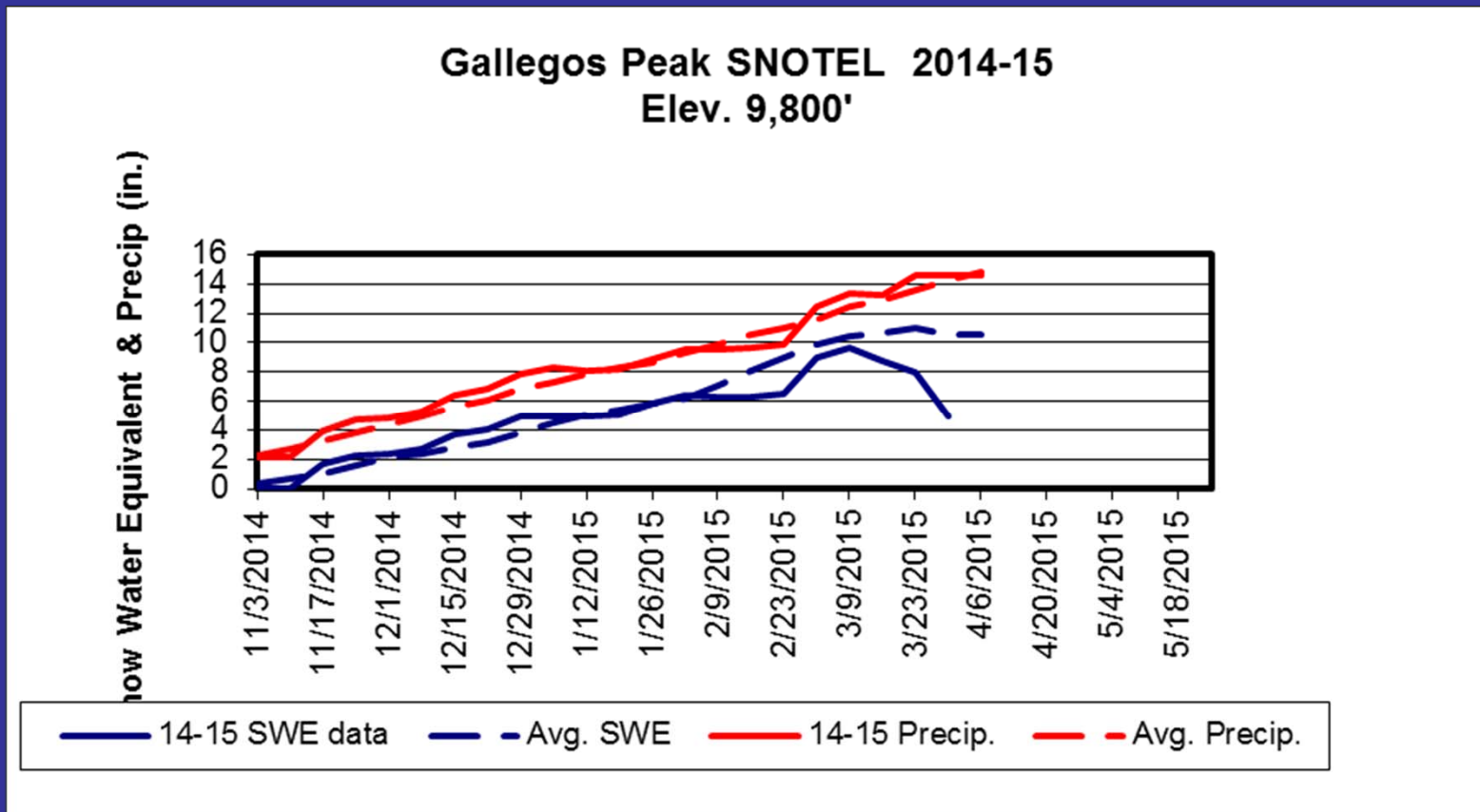
Rio Grande Snow Data



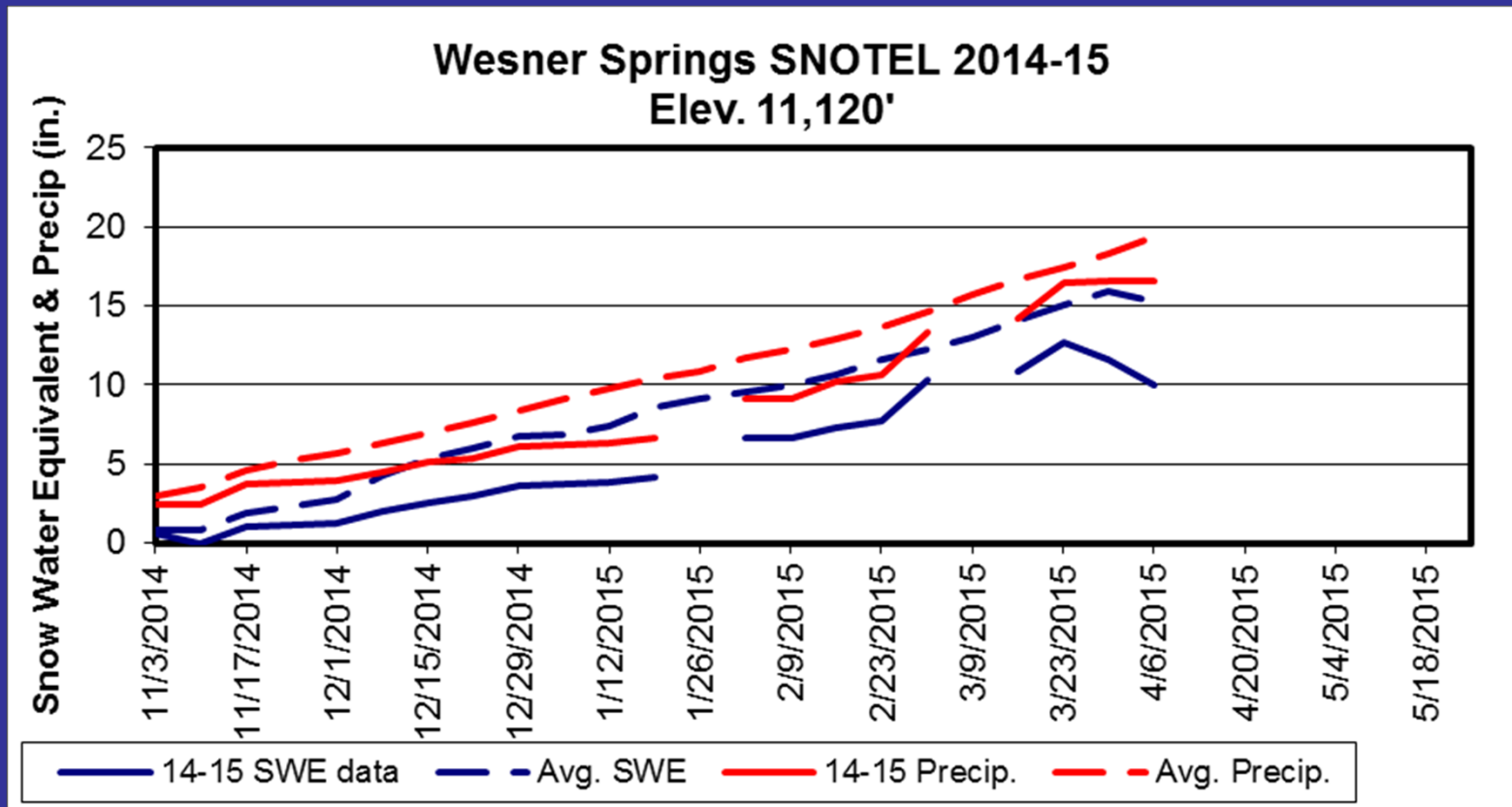
Rio Grande Snow Data



Sangre de Cristo Snow Data



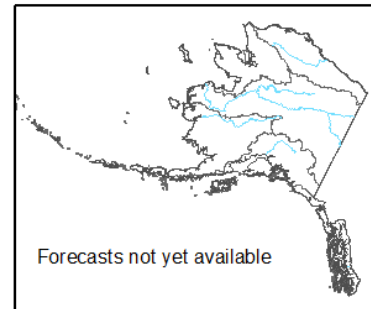
Sangre de Cristo Snow Data



Spring and Summer Streamflow Forecasts as of April 1, 2015

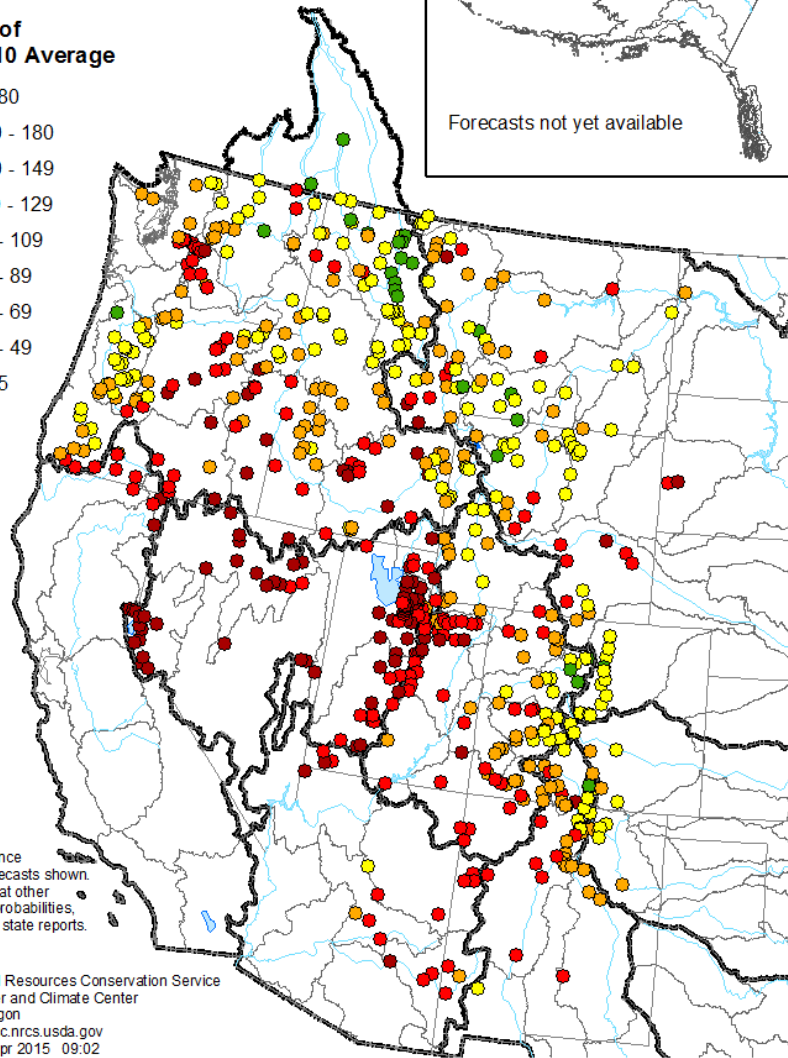
Percent of
1981-2010 Average

- > 180
- 150 - 180
- 130 - 149
- 110 - 129
- 90 - 109
- 70 - 89
- 50 - 69
- 25 - 49
- < 25

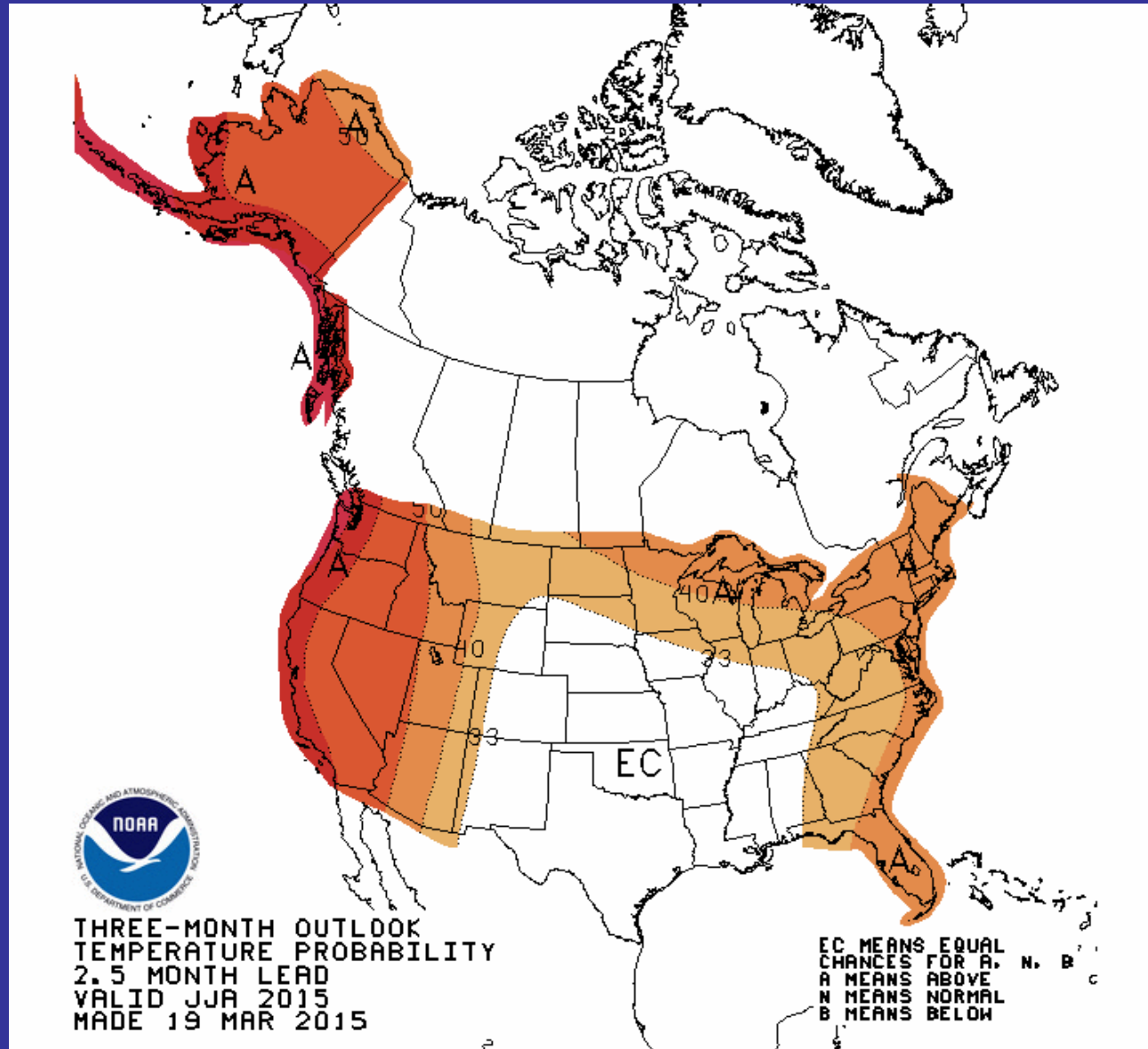


50% exceedance probability forecasts shown. For forecasts at other exceedance probabilities, see individual state reports.

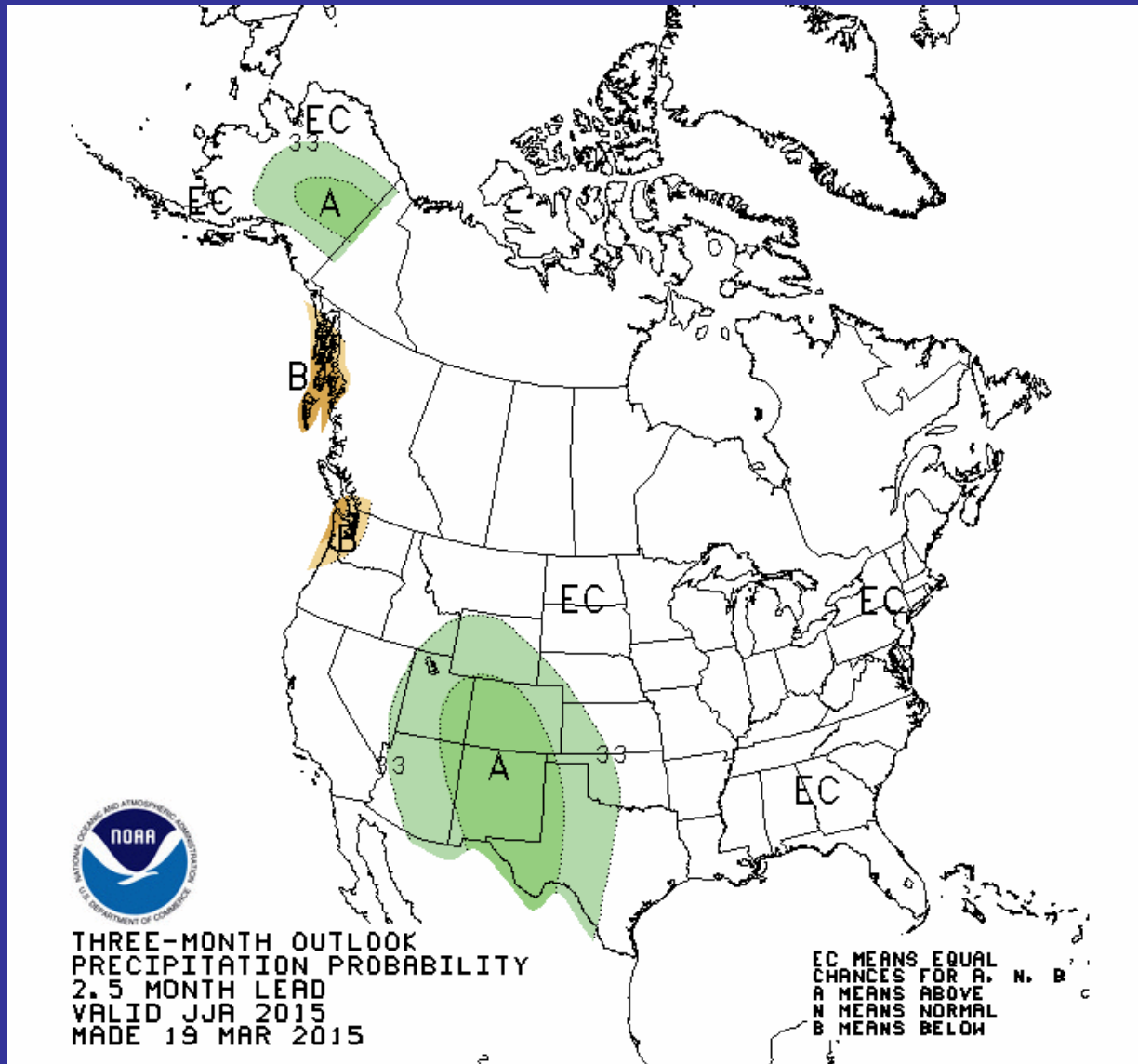
Prepared by:
USDA Natural Resources Conservation Service
National Water and Climate Center
Portland, Oregon
<http://www.wcc.nrcs.usda.gov>
Created: 7 Apr 2015 09:02



Monsoon Season Temperature Outlook

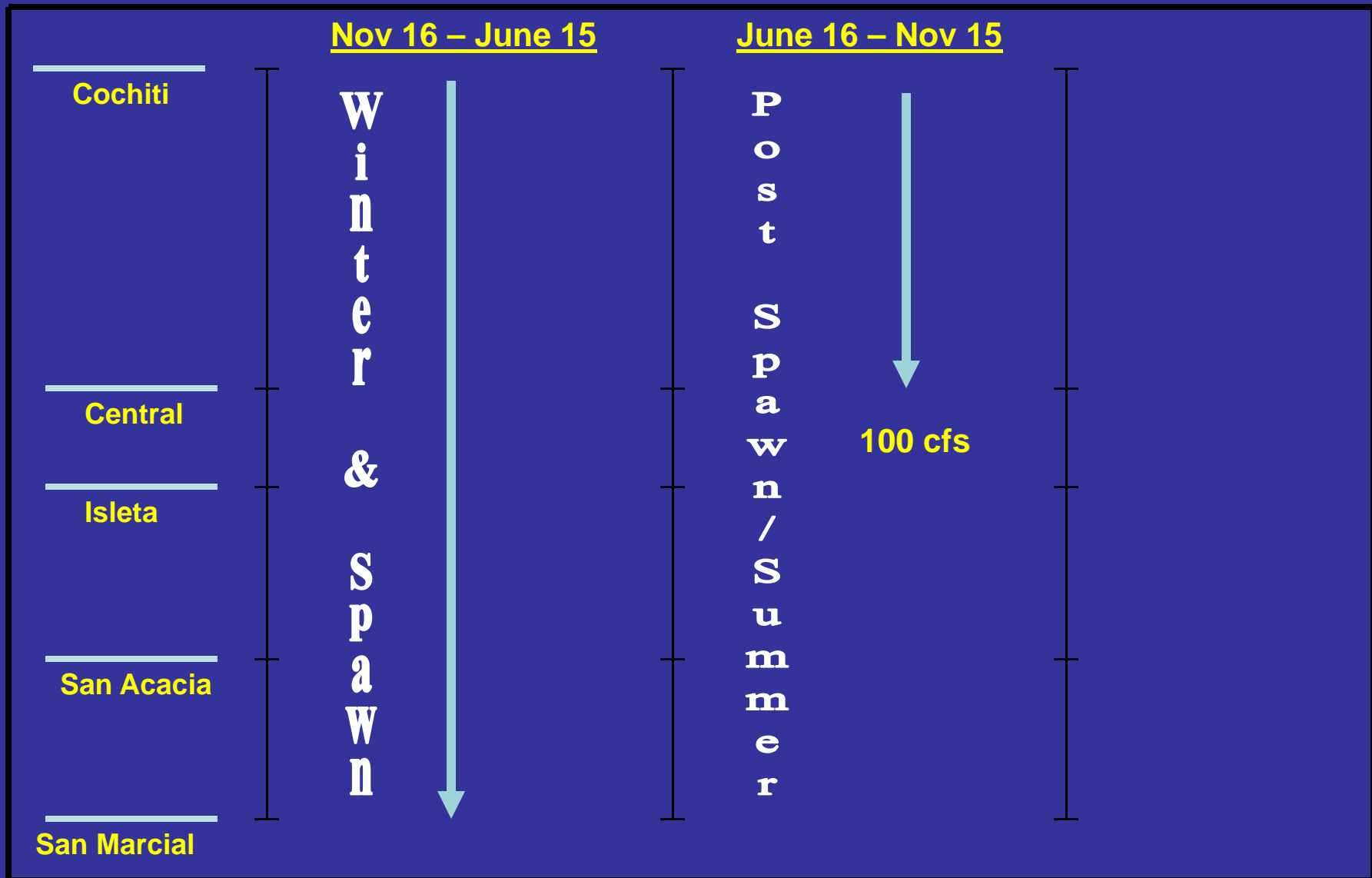


Monsoon Season Precipitation Outlook



2015 Water Operations Modeling

March 2003 BiOp Flow Requirements – Dry Year



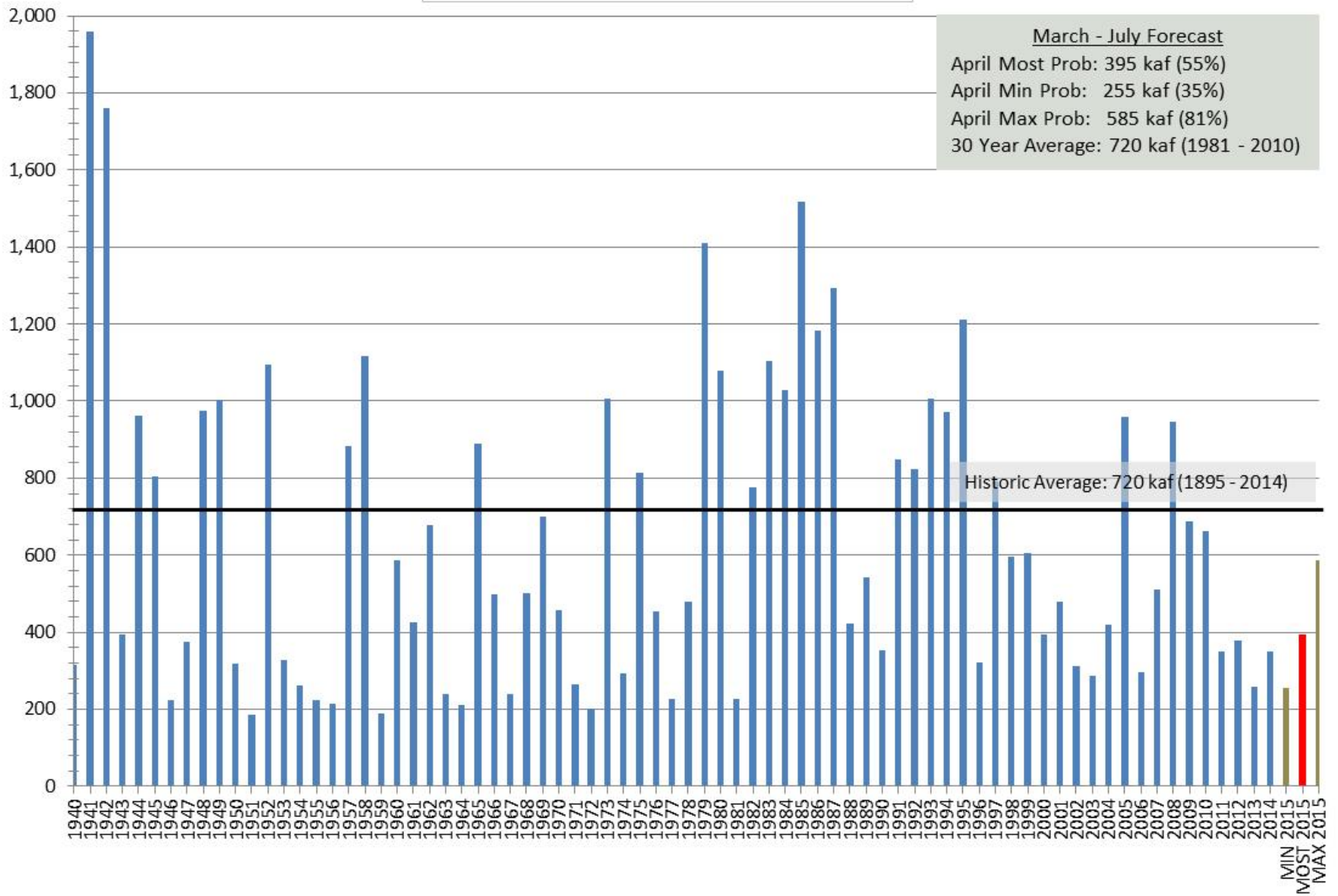
Major Assumptions

- 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

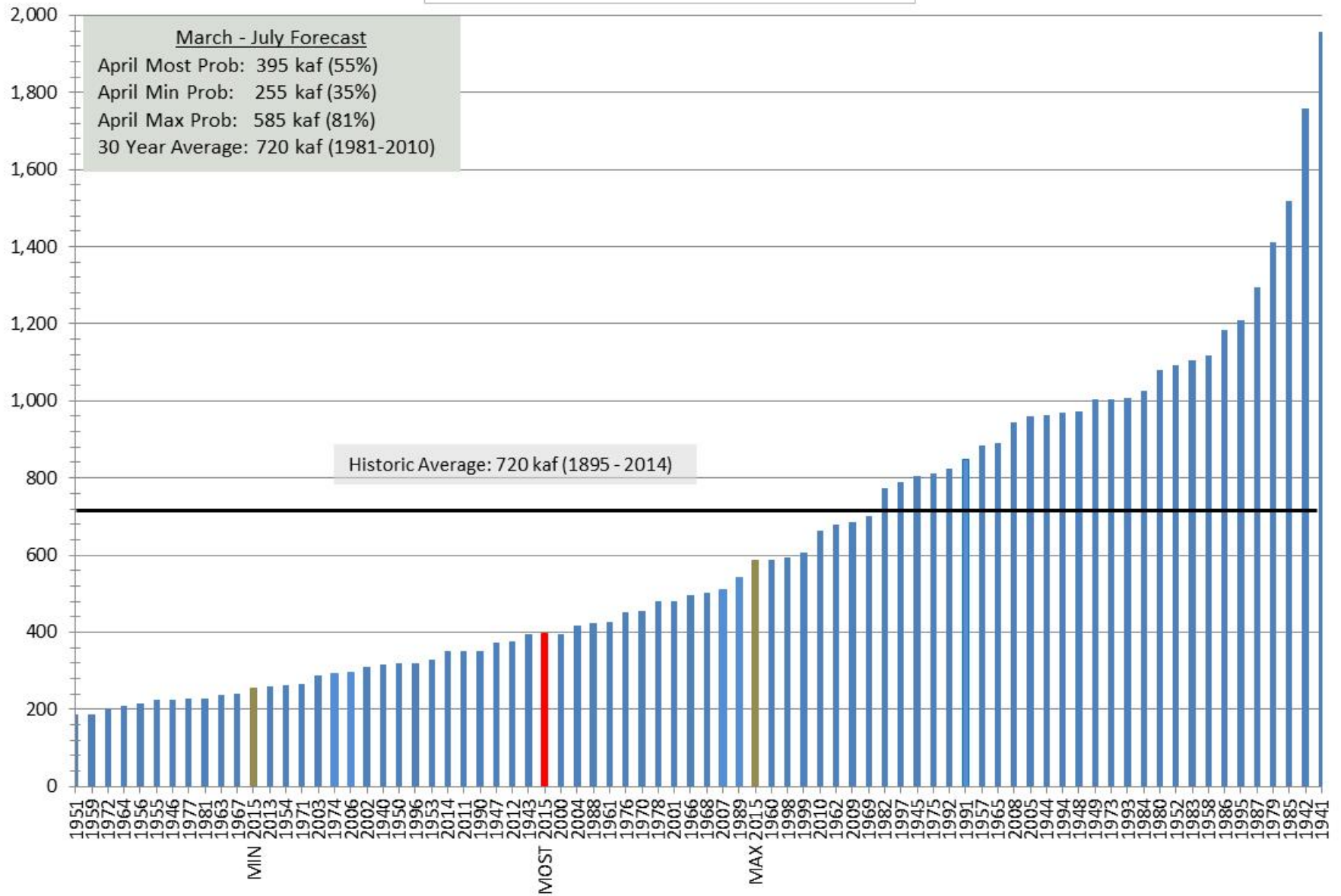
April Forecast Data

	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)**



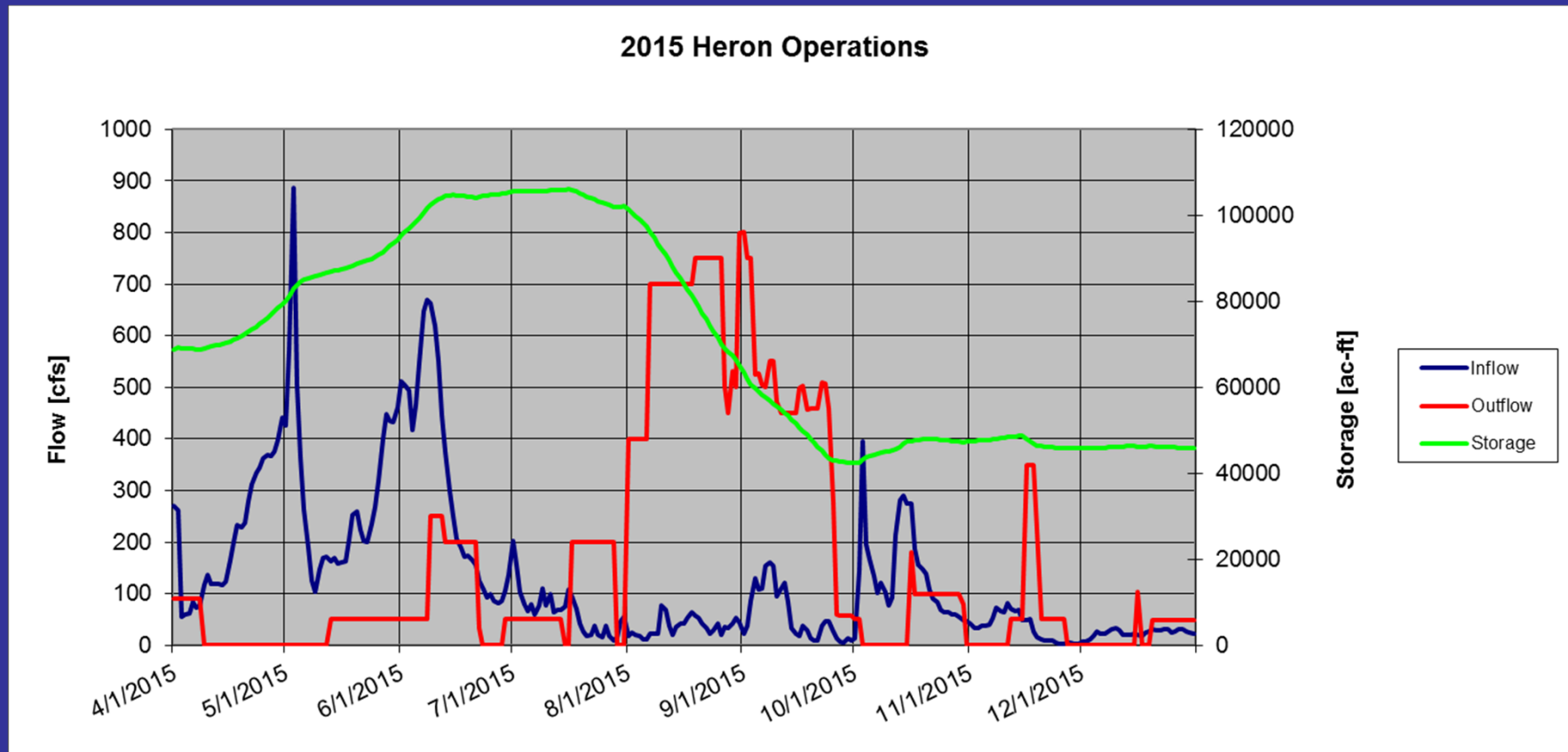
March - July Volume at Otowi (kaf)
(2015 is NRCS forecast volume)



Heron Reservoir



Proposed 2015 Heron Operations

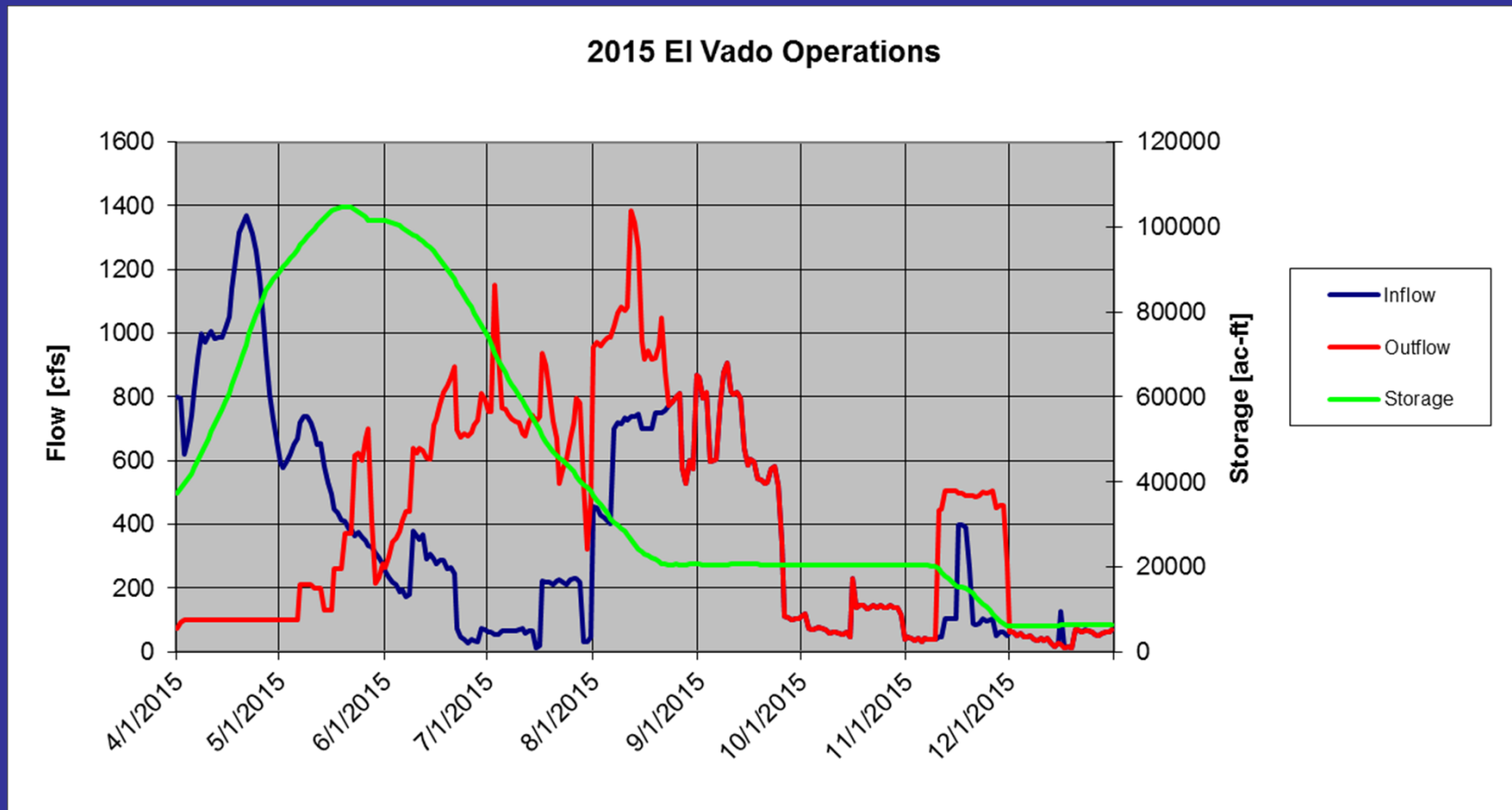


Reservoir will drop 14 feet from beginning of year to end

El Vado Reservoir



Proposed 2015 El Vado Operations



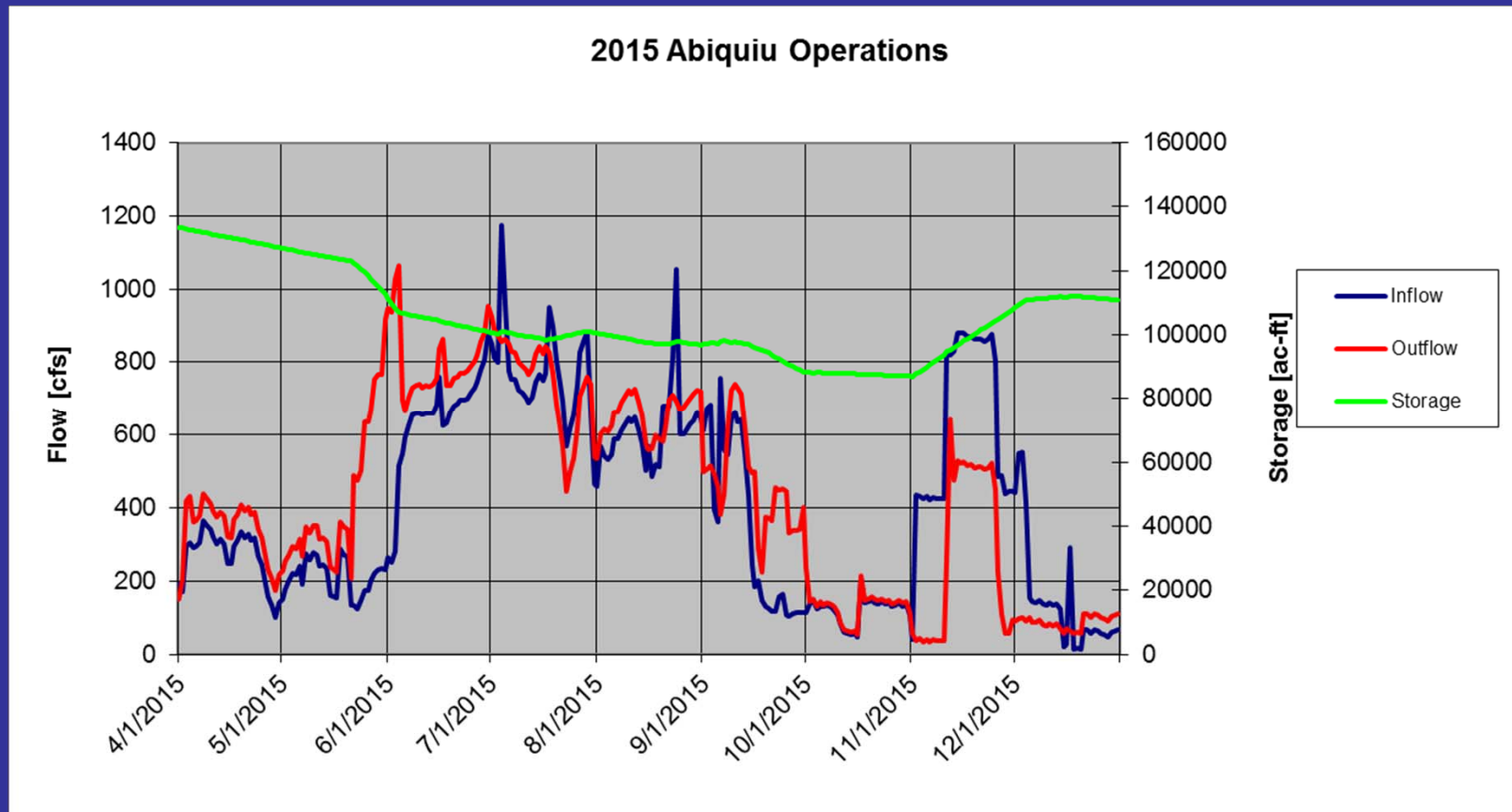
El Vado Reservoir:

Lake Level: 77' of fluctuation between May and Dec

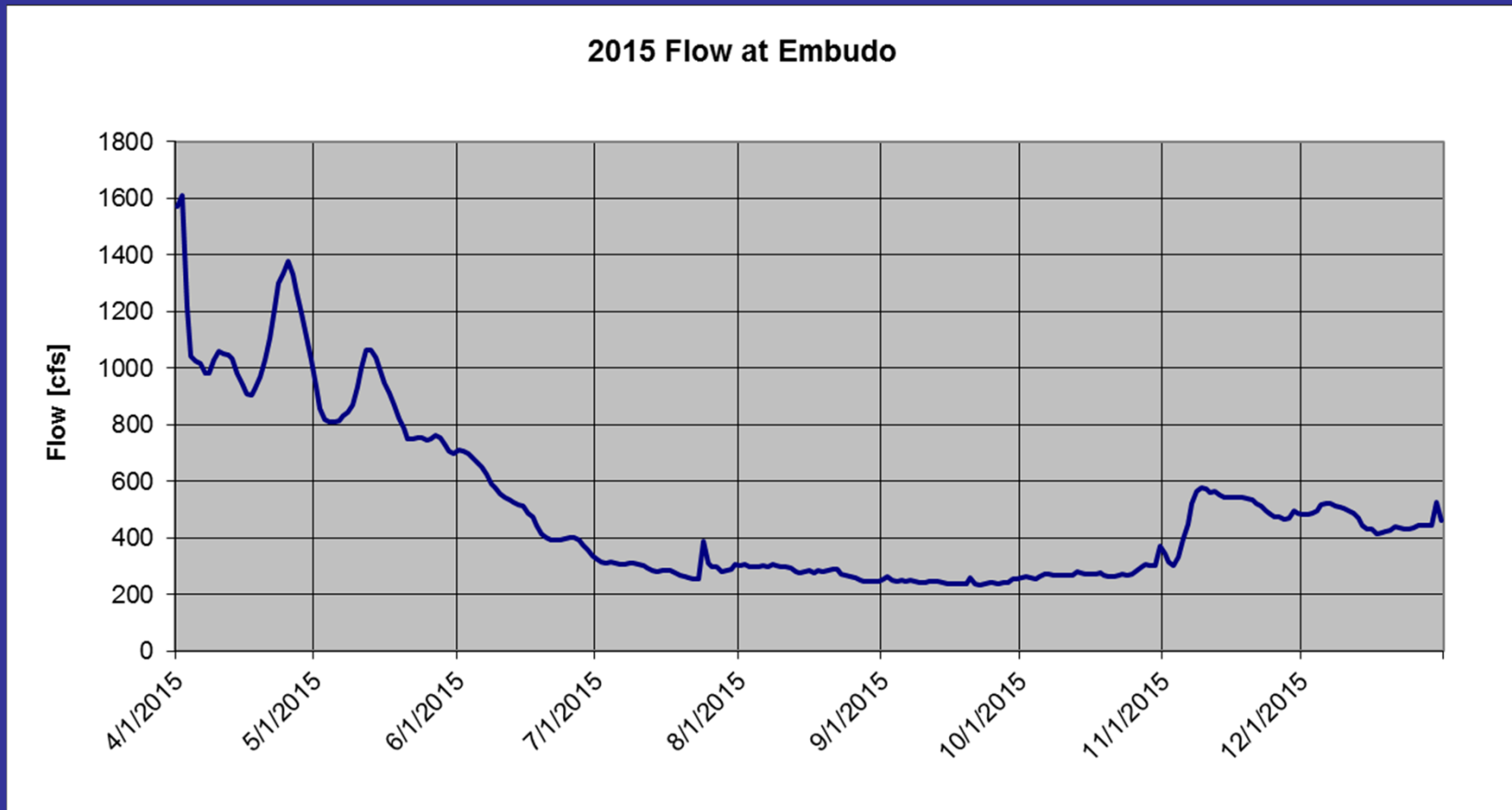
ABIQUIU LAKE



Proposed 2015 Abiquiu Operations



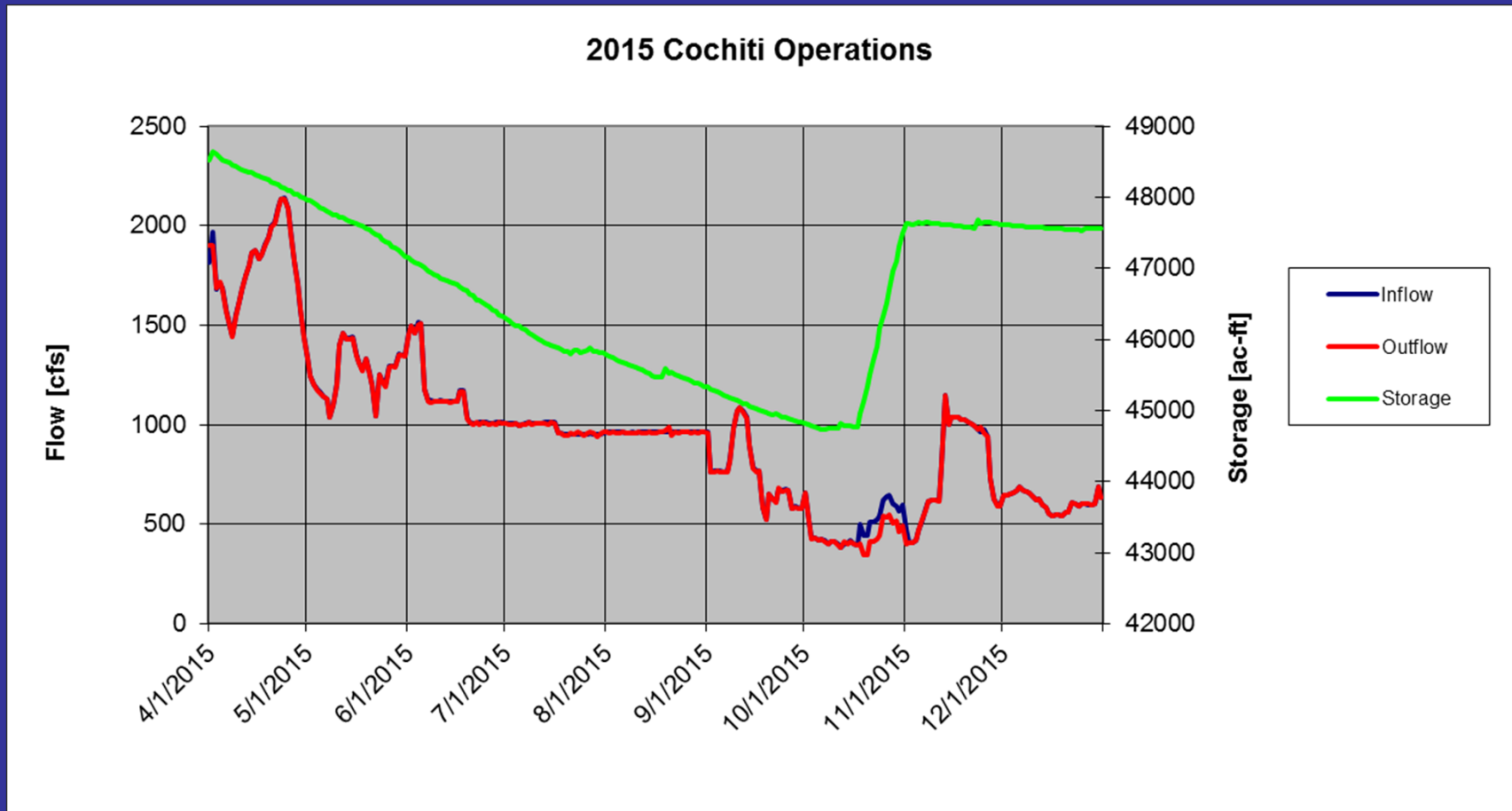
Estimated Hydrograph at Embudo



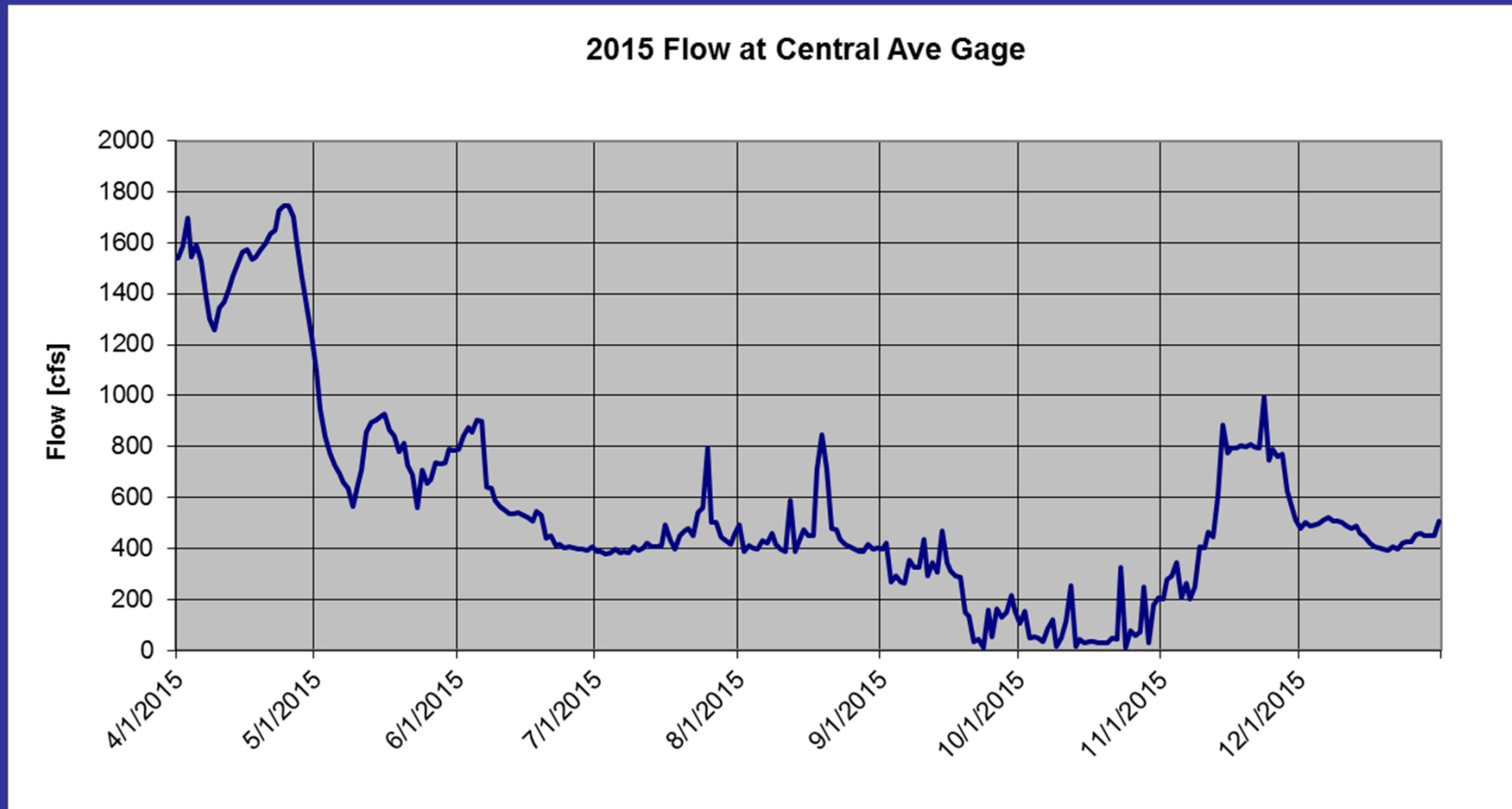
COCHITI LAKE



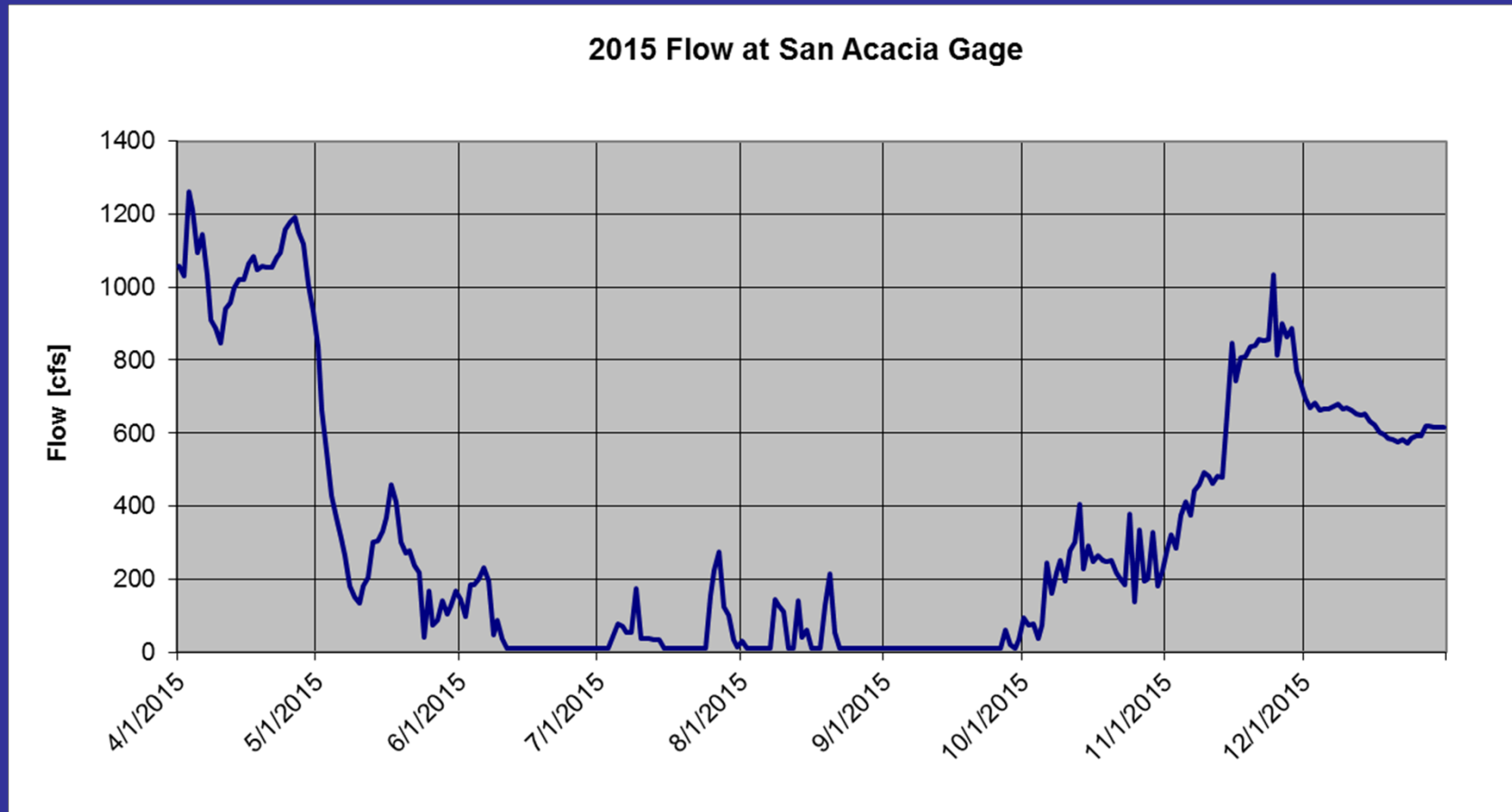
Proposed 2015 Cochiti Operations



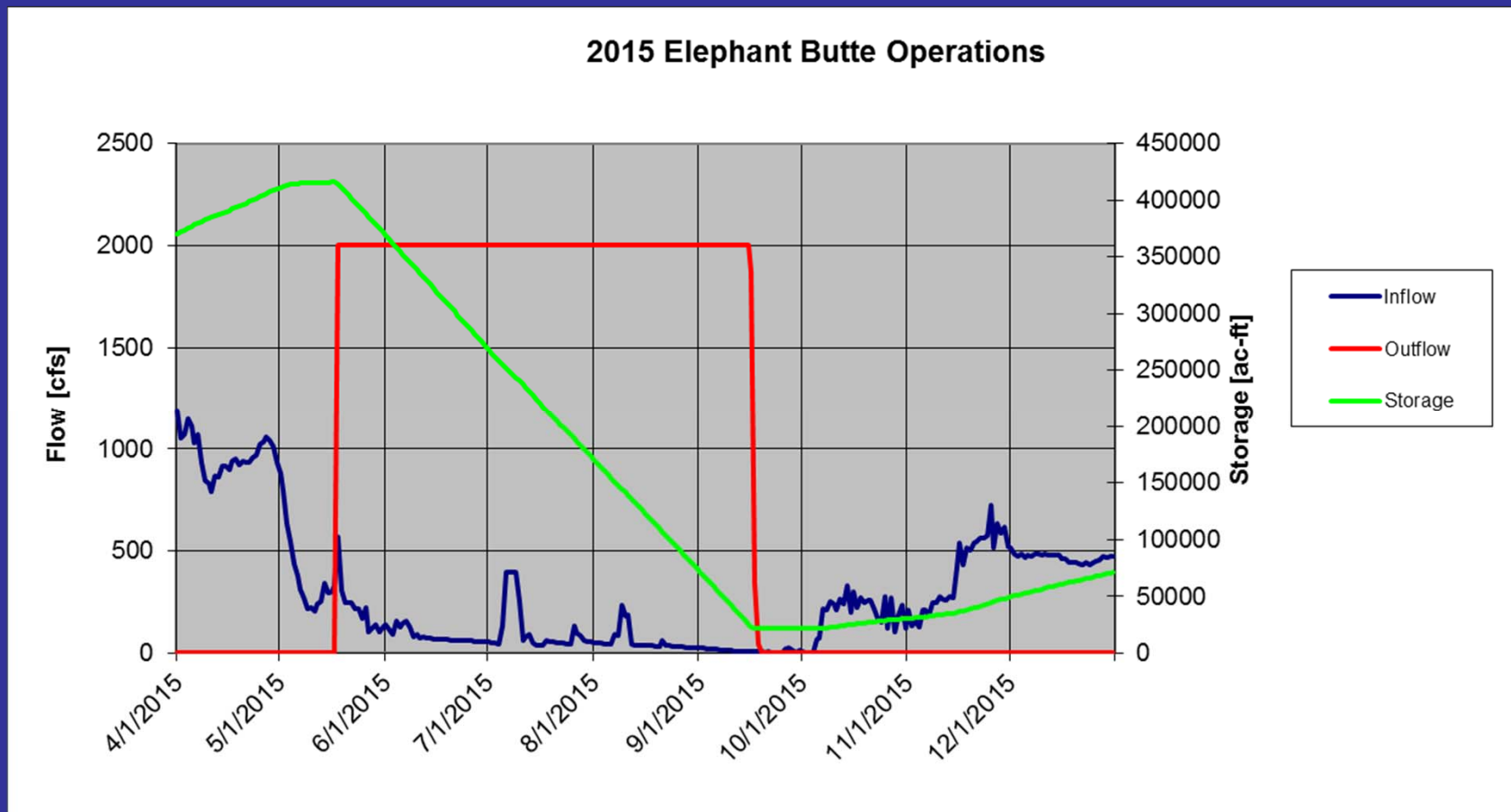
Estimated Hydrograph at Central Ave.



Estimated Flow at San Acacia



Proposed Elephant Butte Operations



Maximum Elevation = 4333.90'. Minimum Elevation = 4271.47'