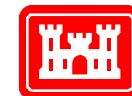


2012 Annual Operating Plan

April 1 Runoff Forecast



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

Minnow water (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

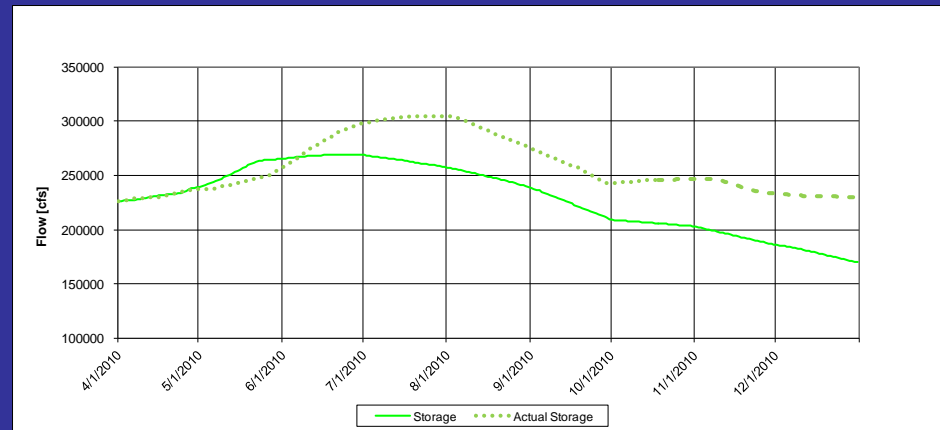
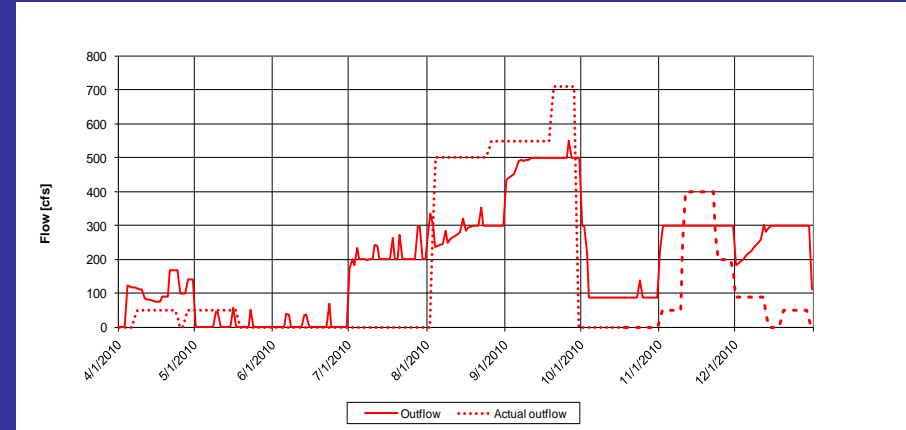
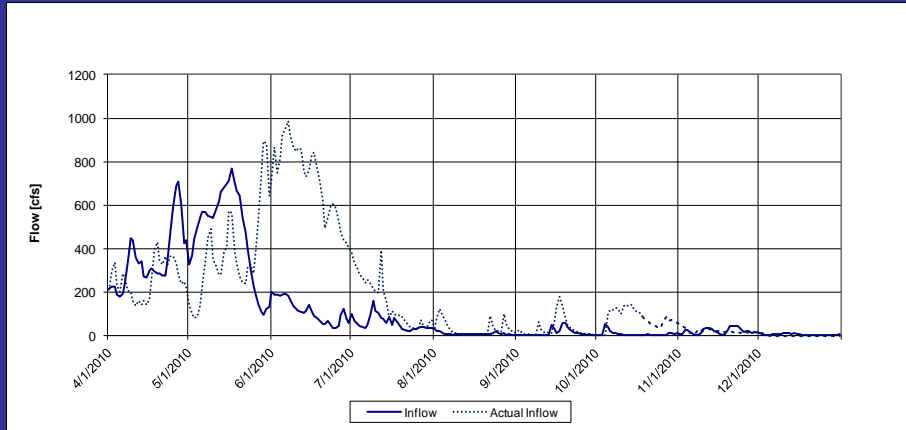
Requirements of the 2003 Biological Opinion

Reservoir storage based on inflow/outflow

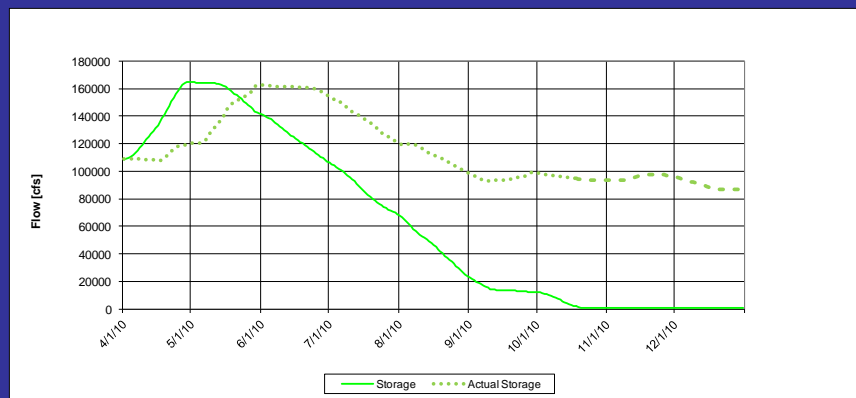
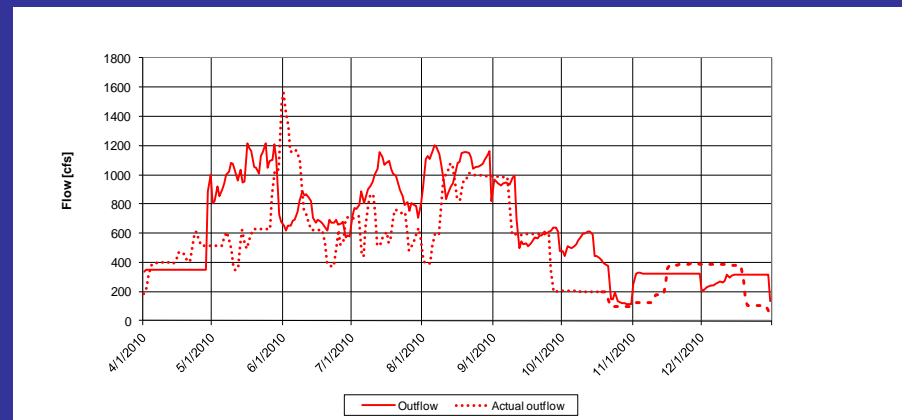
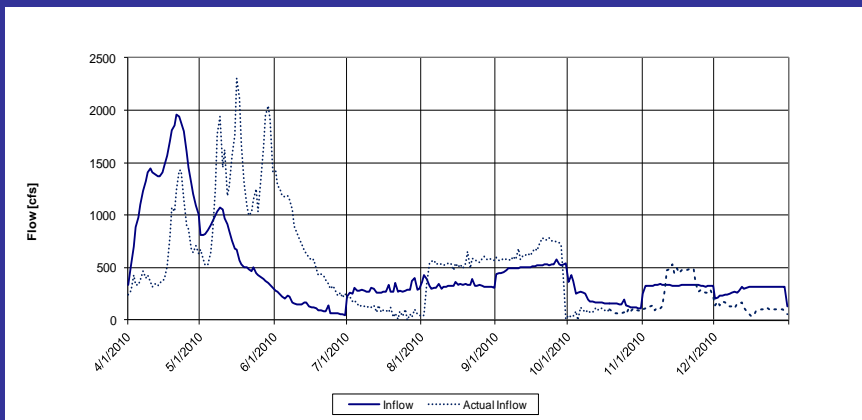
<u>Operated By:</u> <u>Dams:</u>	Reclamation 	Corps 	Water Supply	Recreation	Flood Control	Sediment Control
HERON						
EL VADO						
ABIQUIU						
NAMBE FALLS						
GALISTEO						
COCHITI						
JEMEZ CANYON						
ELEPHANT BUTTE						

2011: The Year in Review

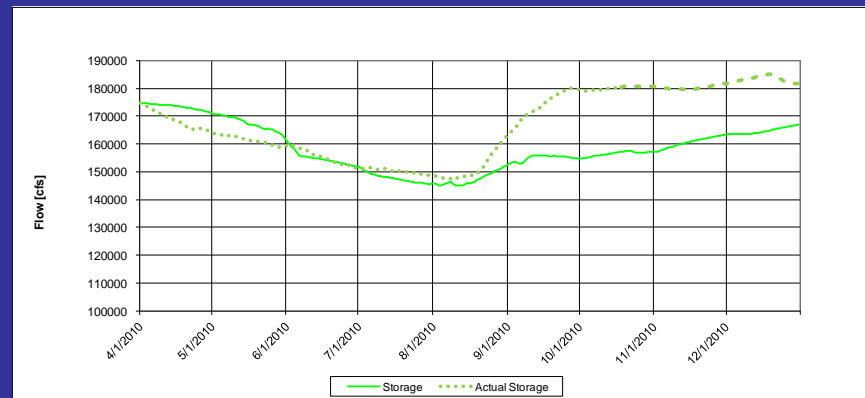
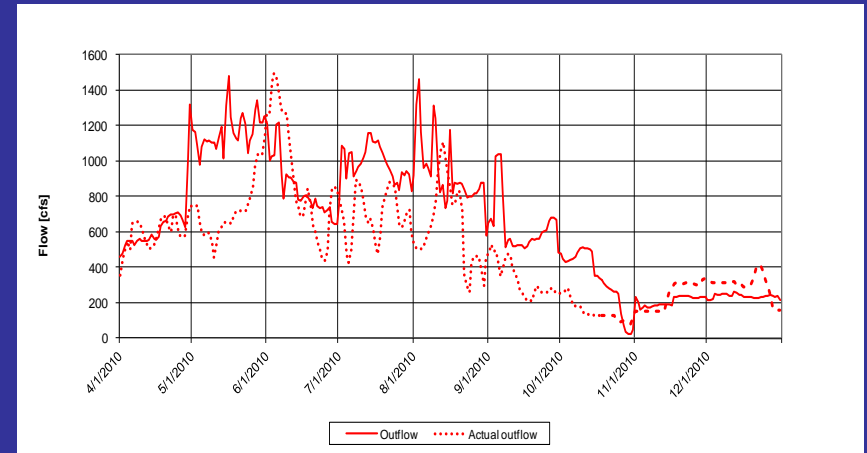
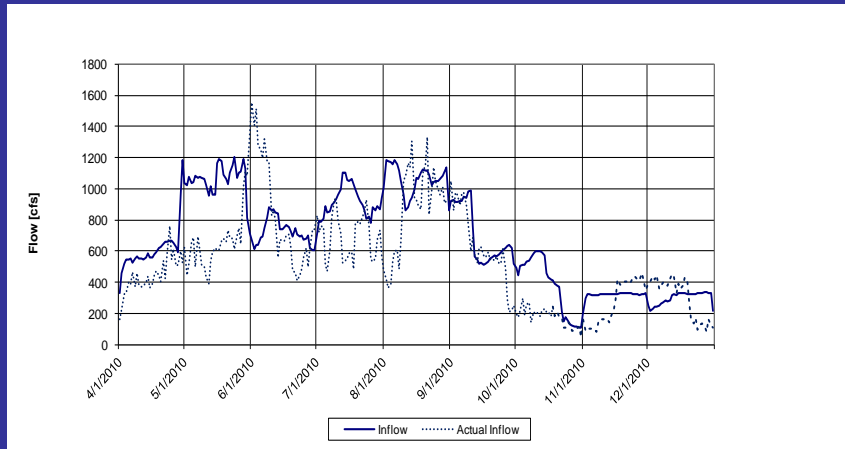
Heron Reservoir



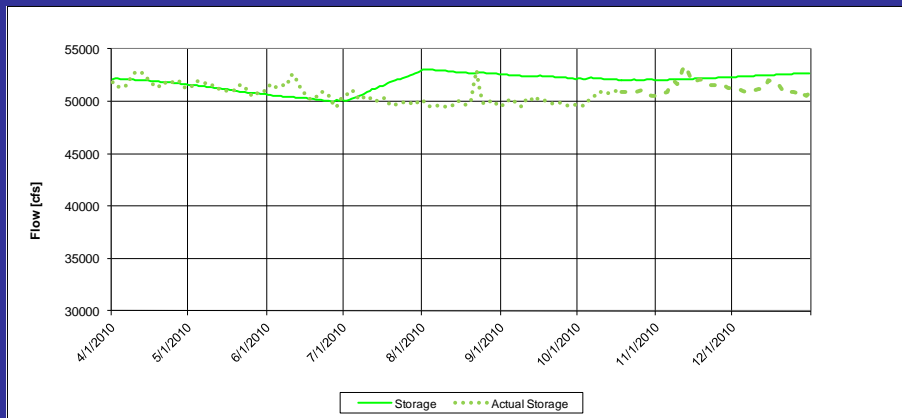
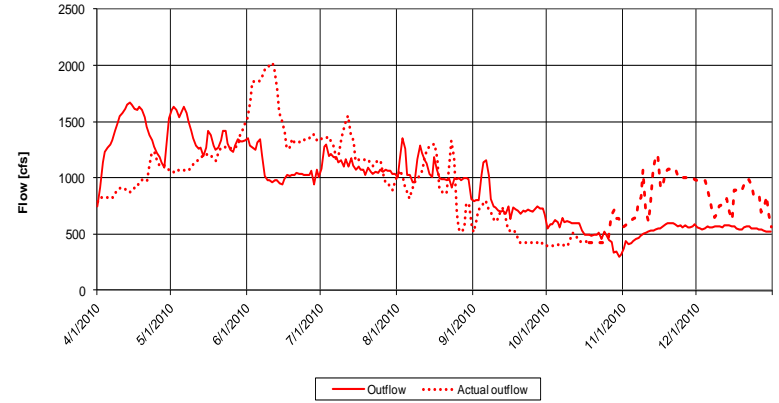
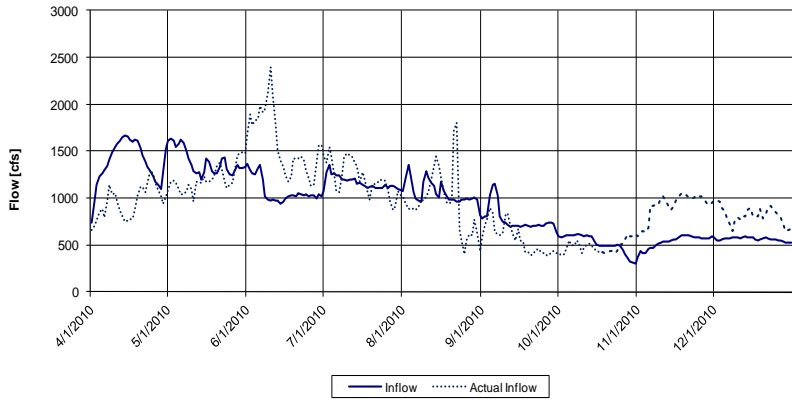
El Vado Reservoir



Abiquiu Reservoir

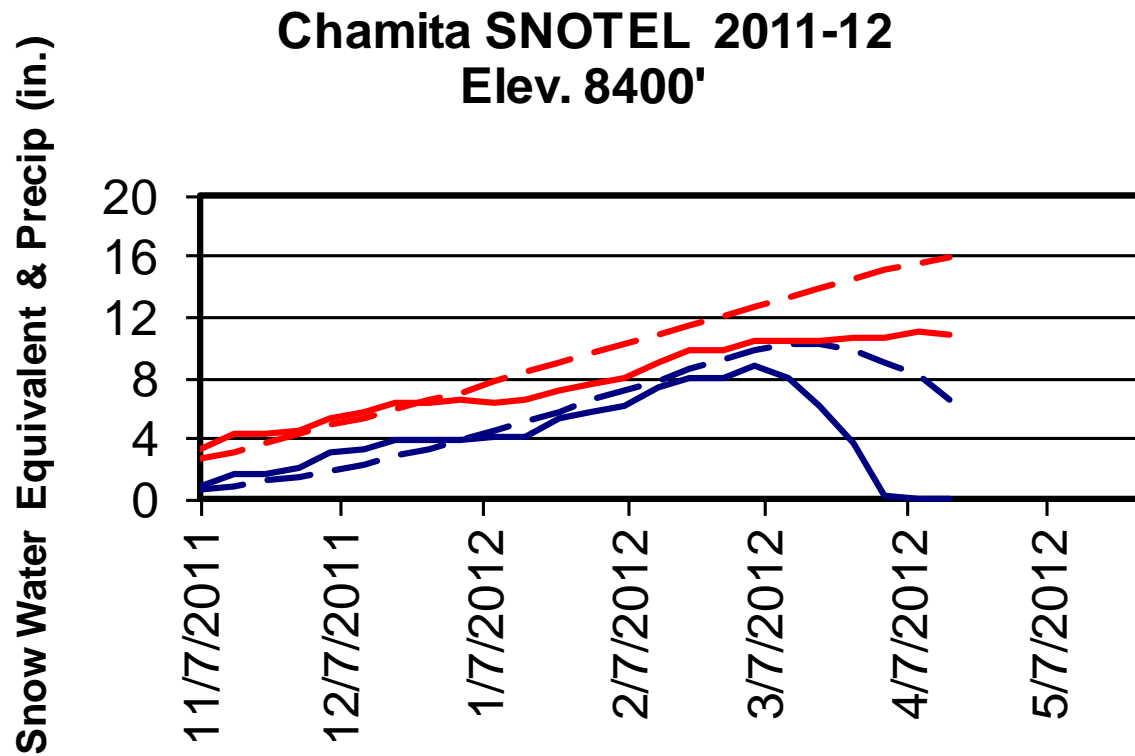


Cochiti Reservoir



Current Snow Conditions

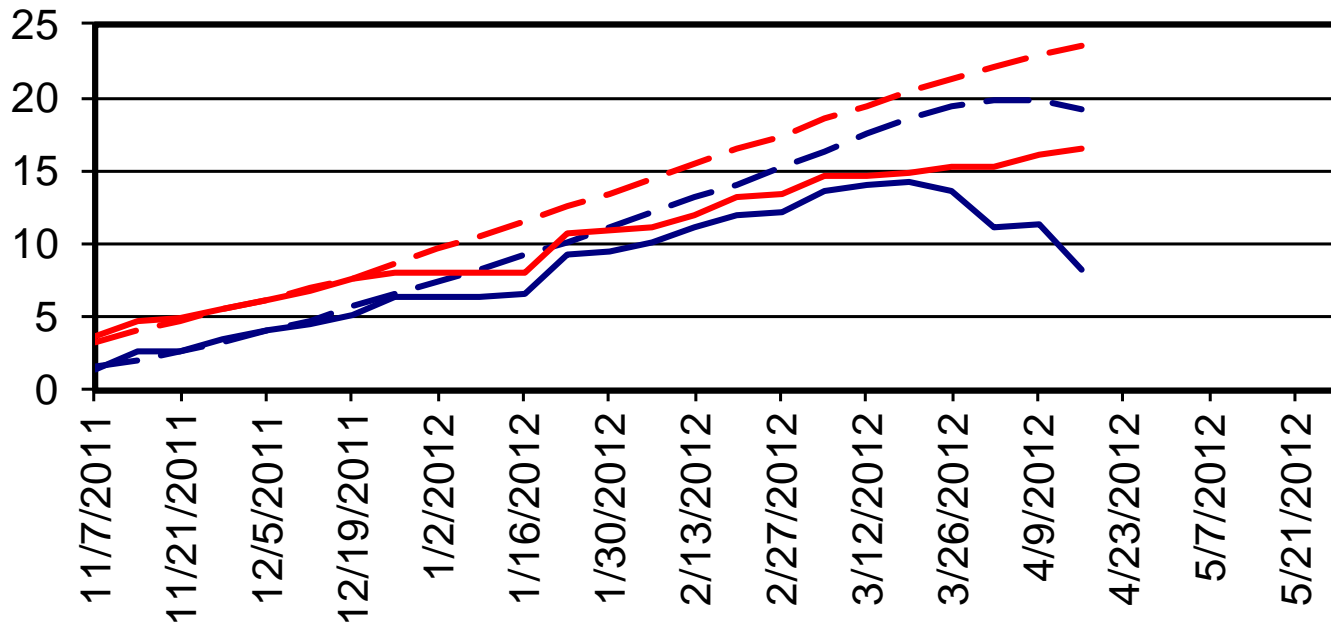
Rio Chama Snow Data



Rio Chama Snow Data

Snow Water Equivalent & Precip (in.)

Hopewell SNOTEL Site 2011-12
Elev. 10,000'



— 11-12 SWE Data

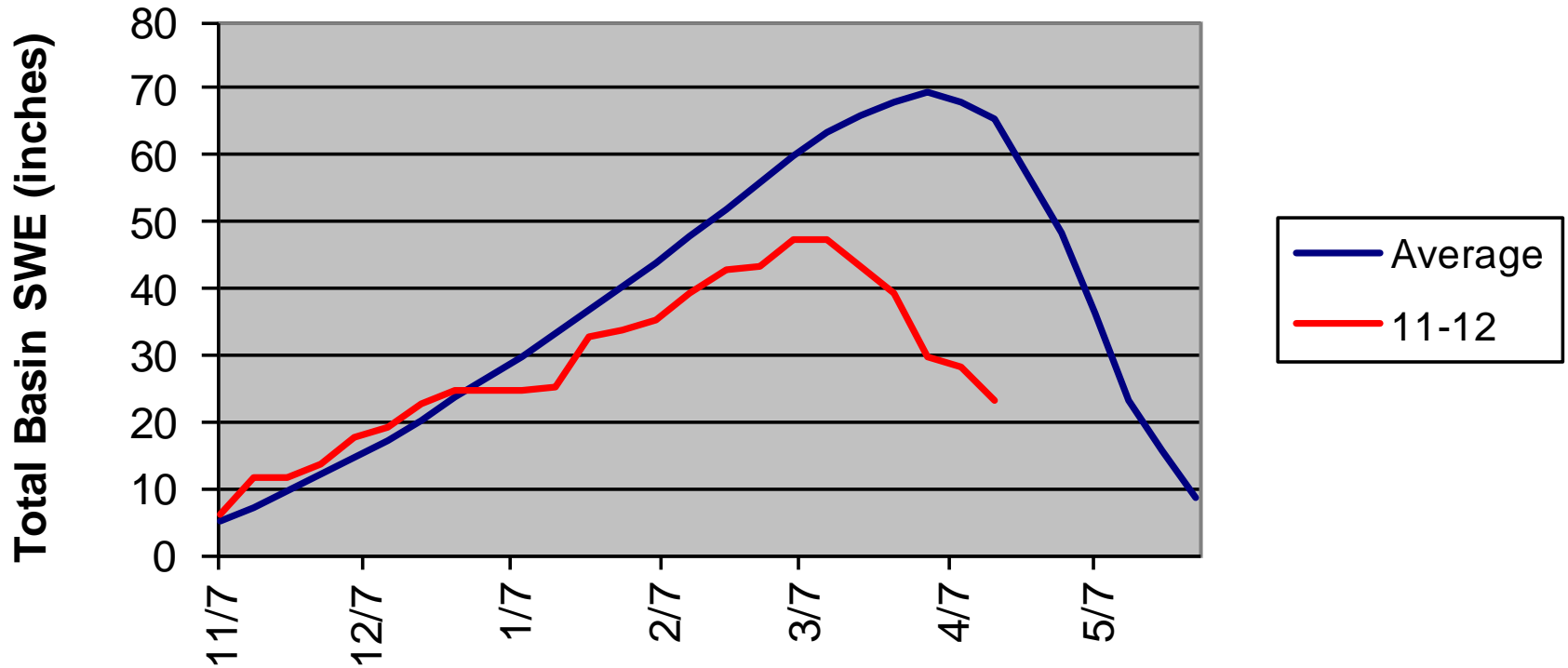
- - - Avg. SWE

— 11-12 Precip.

- - - Avg. Precip.

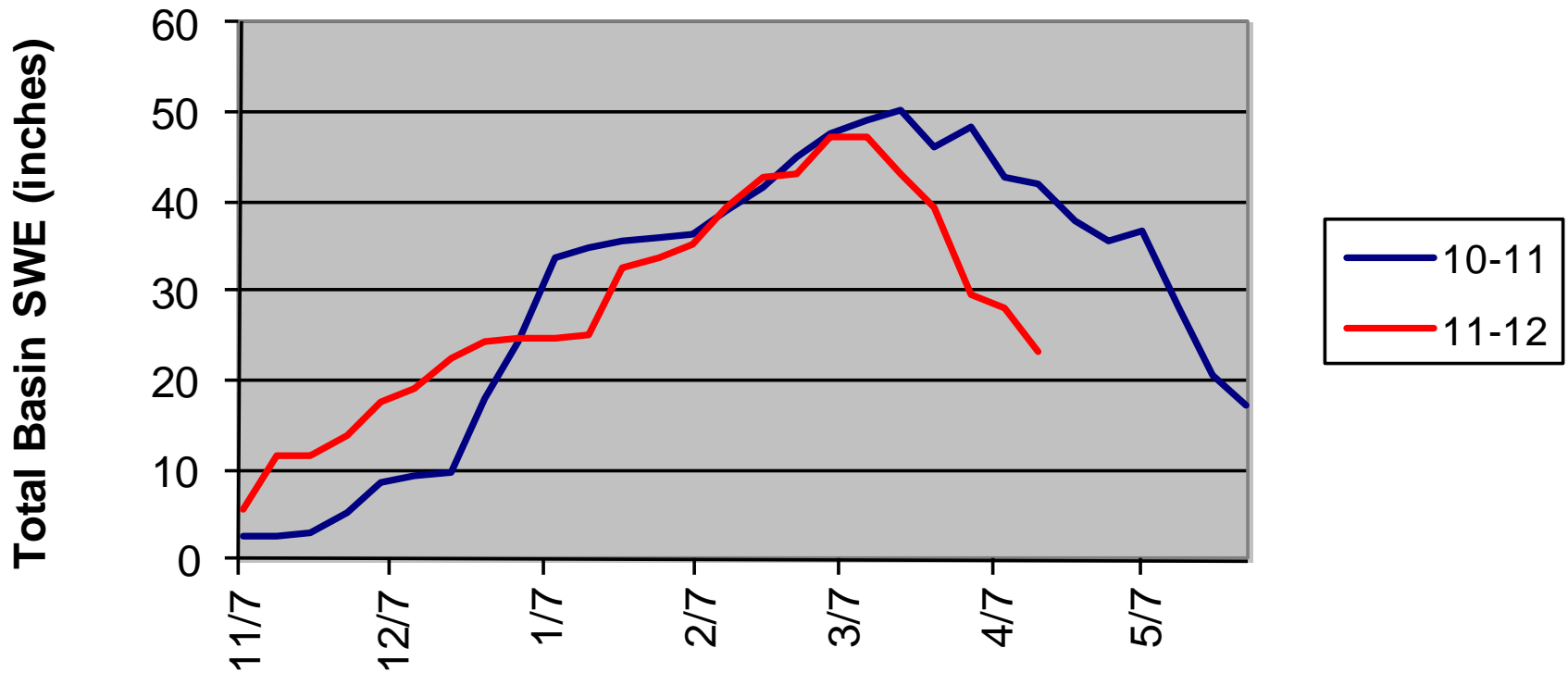
Rio Chama Snow Comparison

Rio Chama Snowpack Comparison



Rio Chama Snow Comparison

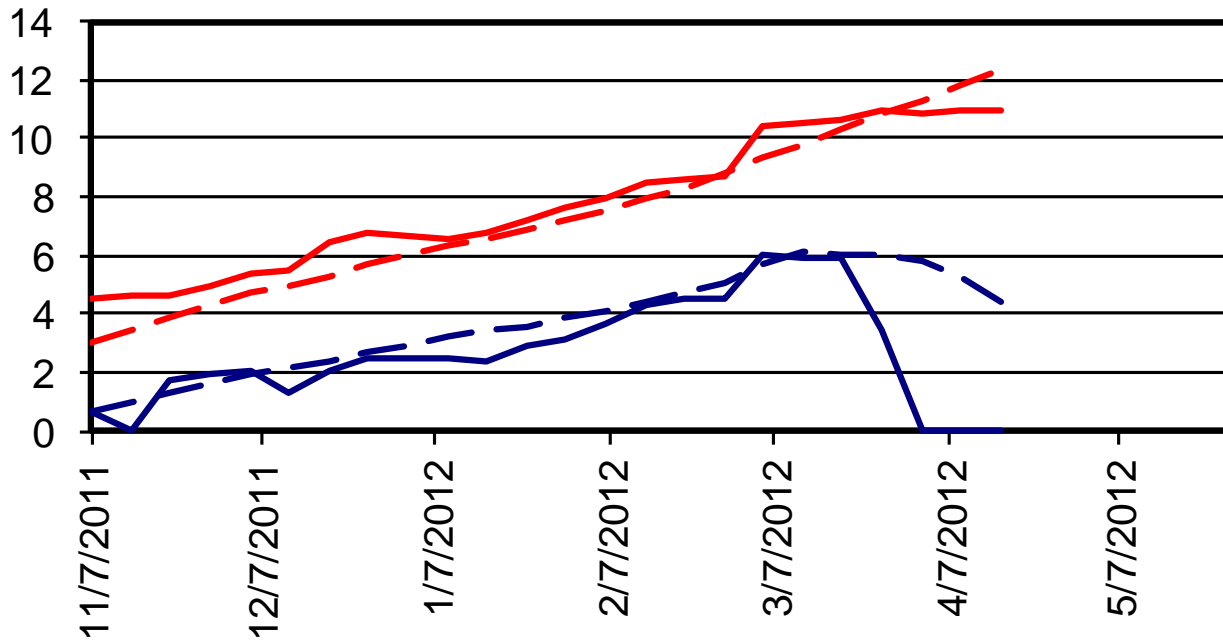
Rio Chama Snowpack Comparison



Rio Grande Snow Data

Upper Rio Grande SNOTEL 2011-12
Elev. 9,400'

Snow Water Equivalent & Precip (in.)

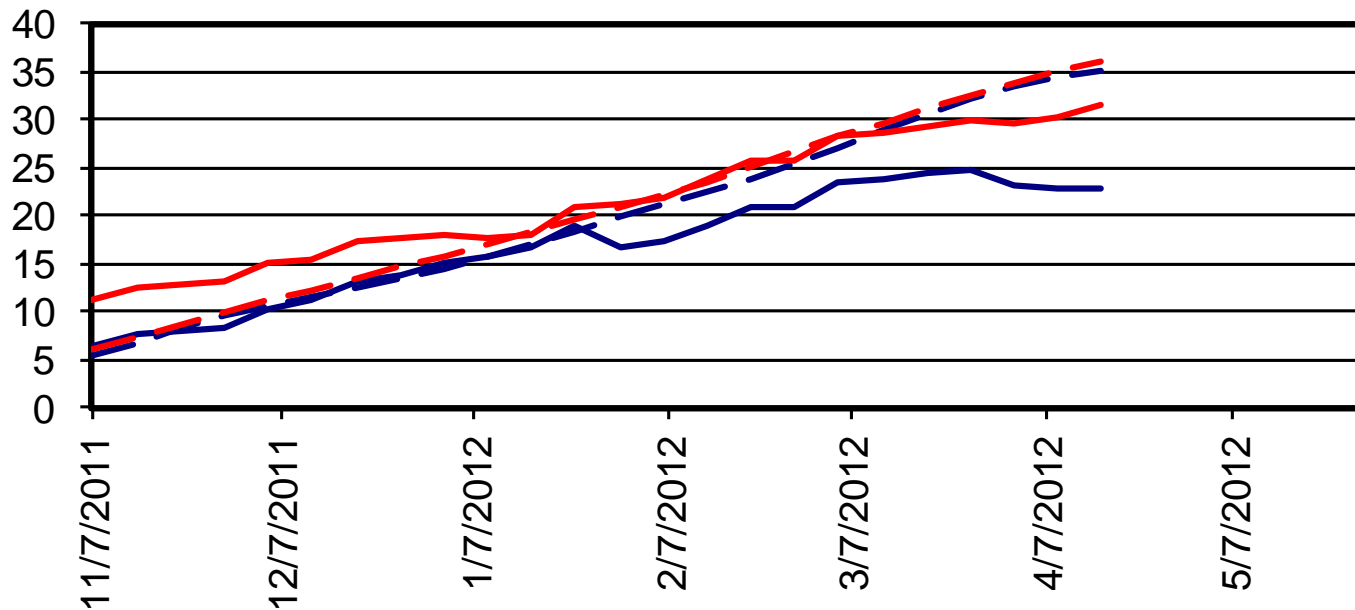


— '11-12 SWE data - - - Avg. SWE — '11-12 Precip. data - - - Avg. Precip.

Rio Grande Snow Data

Wolf Creek Summit SNOTEL 2011-12
Elev. 11,000'

Snow Water Equivalent & Precip (in.)



— '11-12 SWE data

- - - Avg. SWE

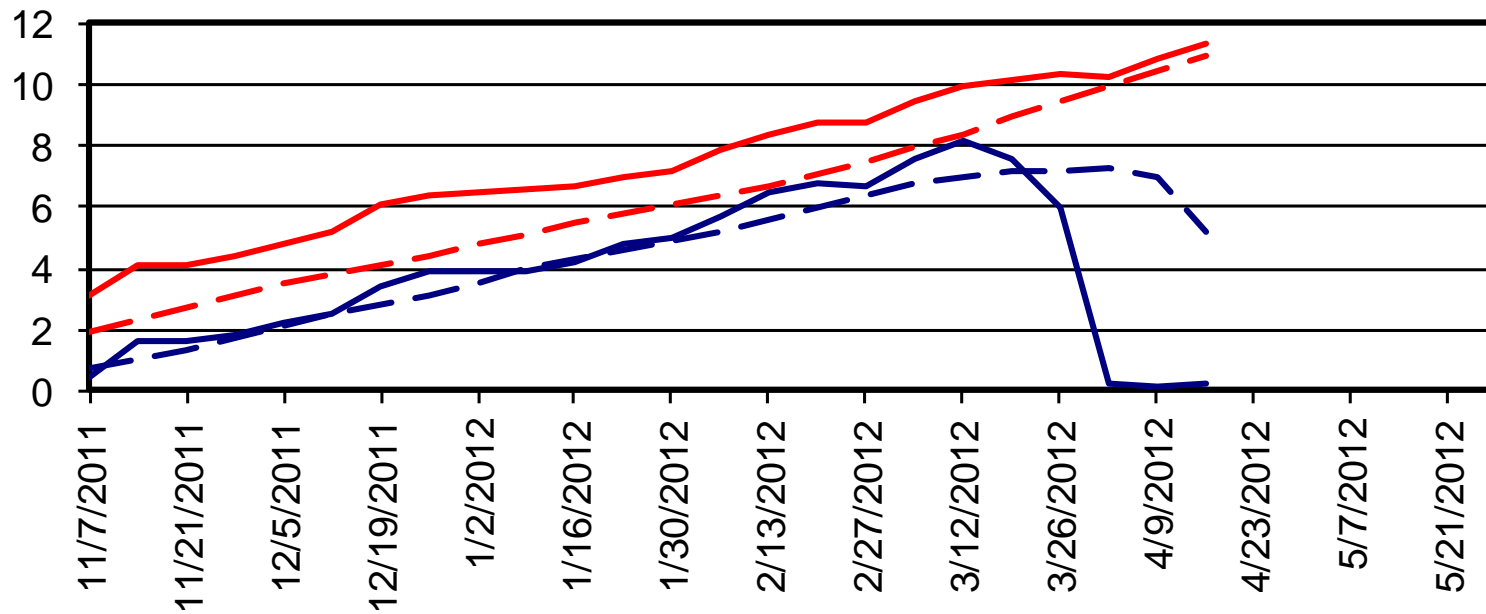
— '11-12 Precip. data

- - - Avg. Precip.

Sangre de Cristo Snow Data

Red River Pass SNOTEL 2011-12
Elev. 9,850'

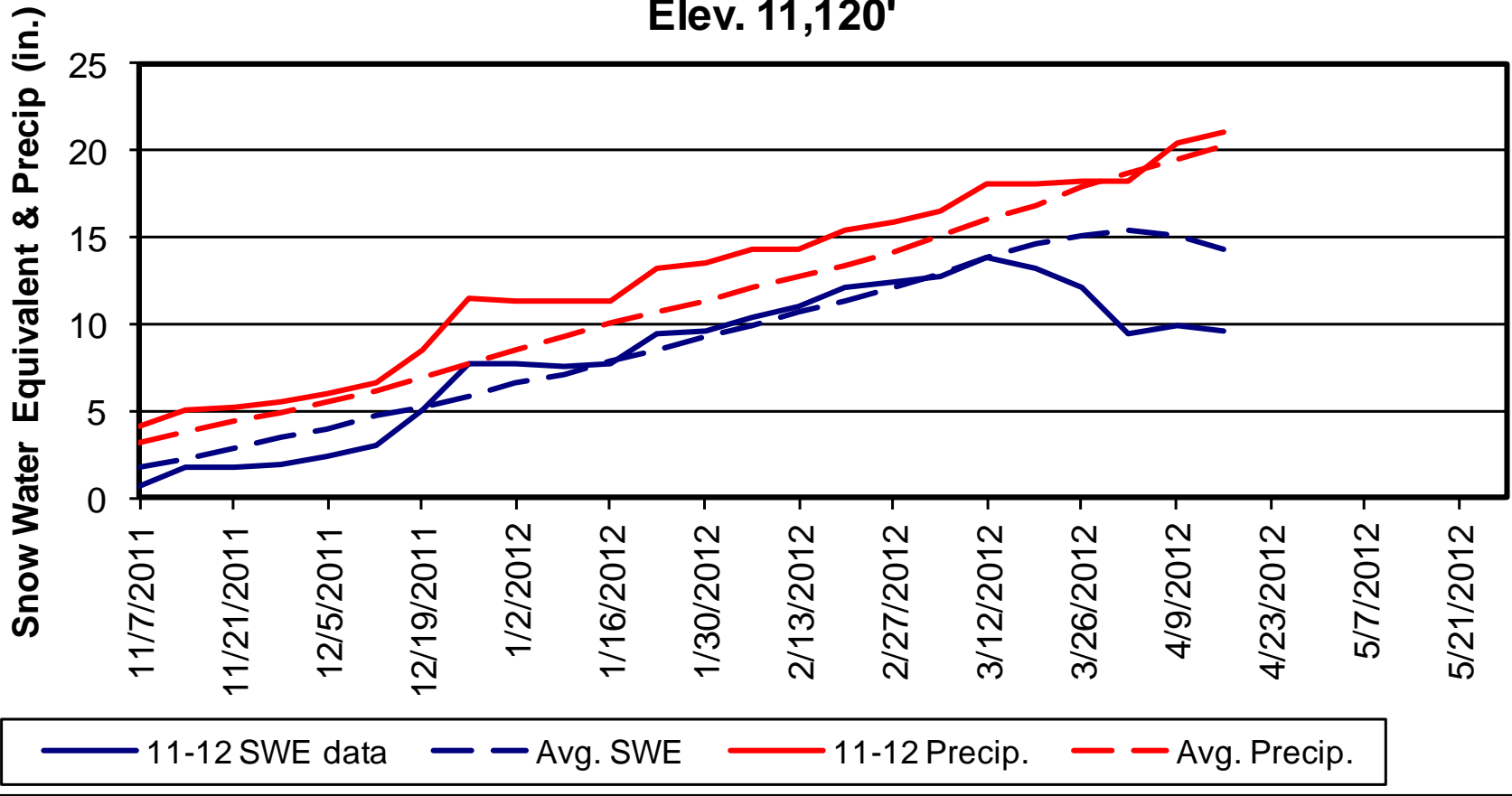
Snow Water Equivalent & Precip (in.)



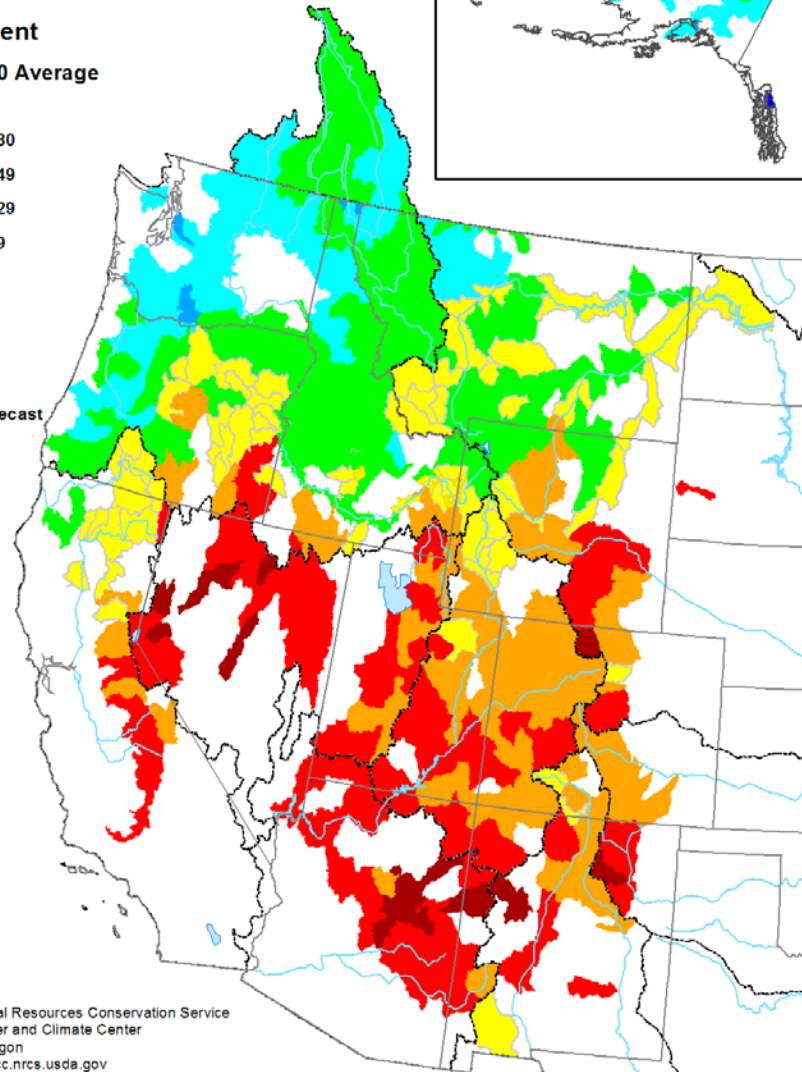
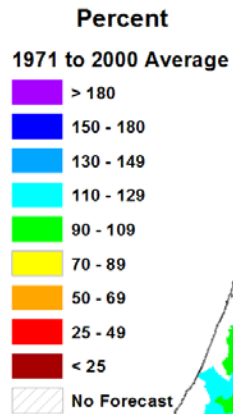
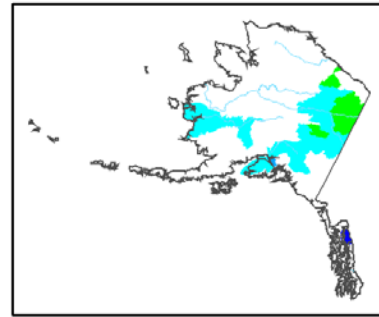
— 11-12 SWE data - - - Avg. SWE — 11-12 Precip. - - - Avg. Precip.

Sangre de Cristo Snow Data

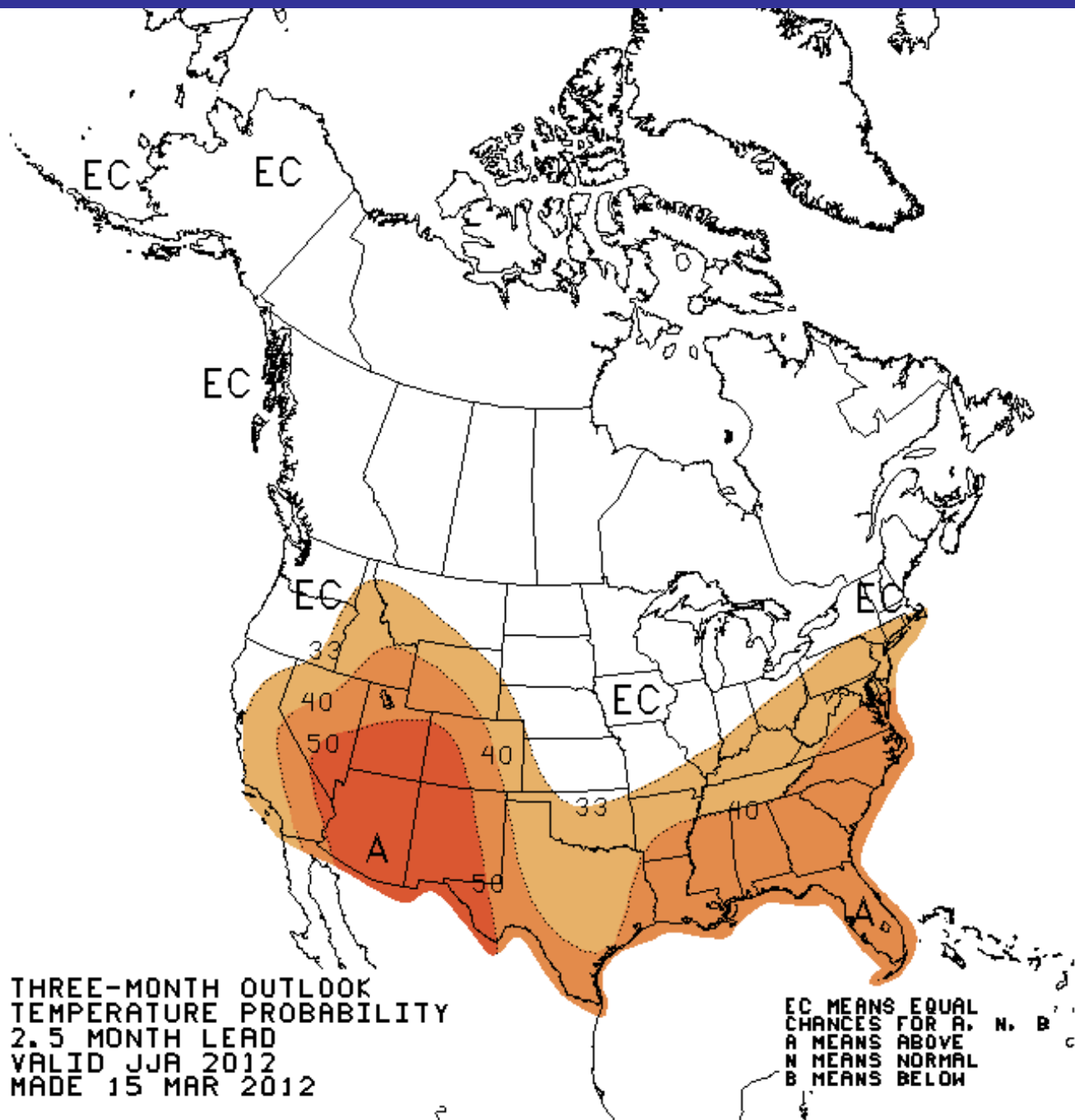
Wesner Springs SNOTEL 2011-12
Elev. 11,120'

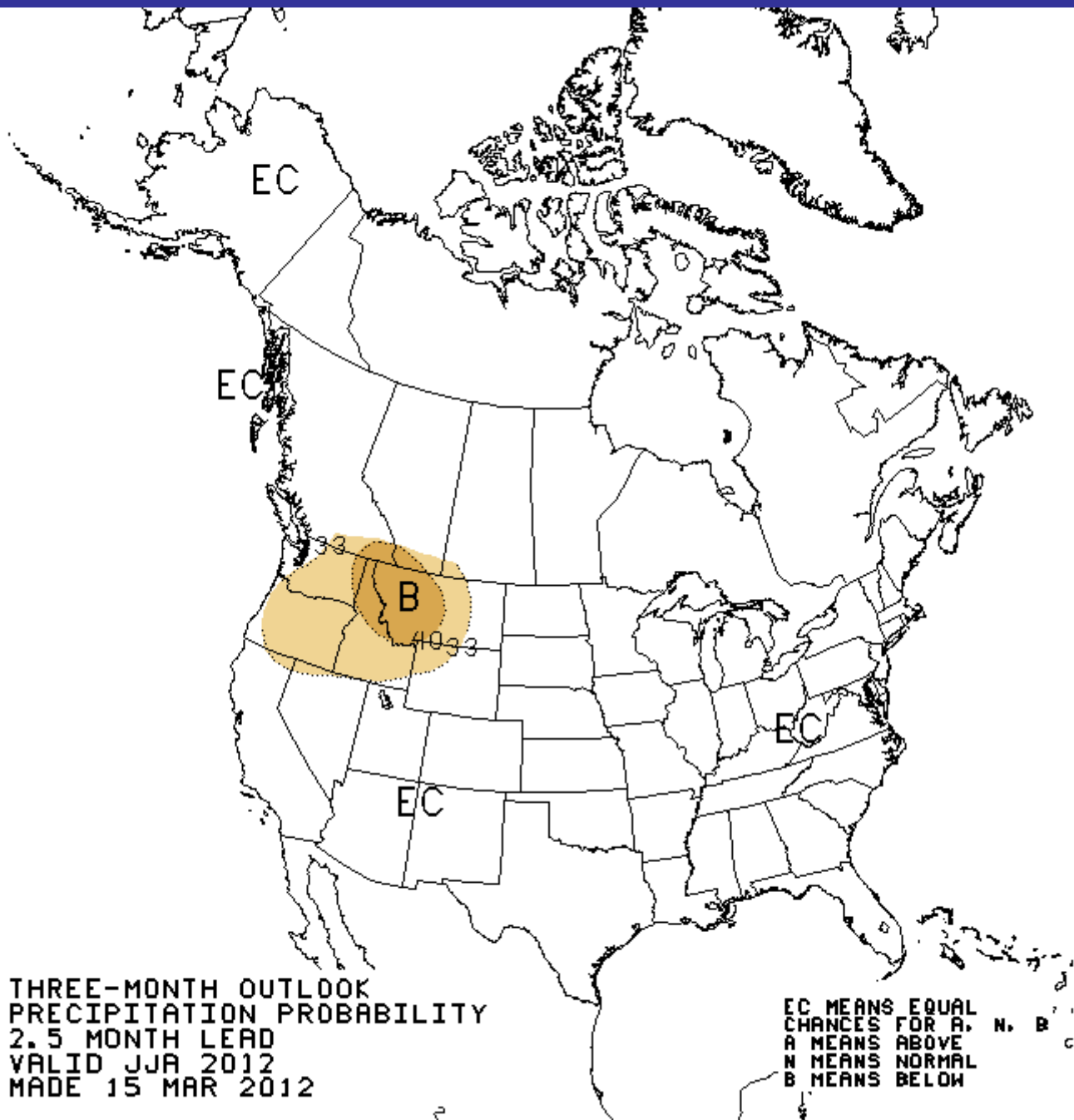


Spring and Summer Streamflow Forecasts as of April 1, 2012



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





2012 Water Operations Modeling

March 2003 BiOp Flow Requirements – Dry Year

Nov 16 – June 15

June 16 – Nov 15

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San Acacia

San Marcial



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 MRGCD
- Storage of water for Prior & Paramount lands

April Forecast Data

	Most Probable Percent of Average		April 1 50% Probability Volume, ac-ft
	2011	2012	2012
Rio Grande nr Del Norte	73%	71%	375,000
El Vado Reservoir Inflow	71%	49%	115,000
Rio Grande at Otowi	49%	44%	335,000
Santa Fe River nr Santa Fe	26%	62%	2,900
Jemez blw Jemez Dam	18%	43%	19,500
Heron Reservoir Inflow	49%	62%	60,000

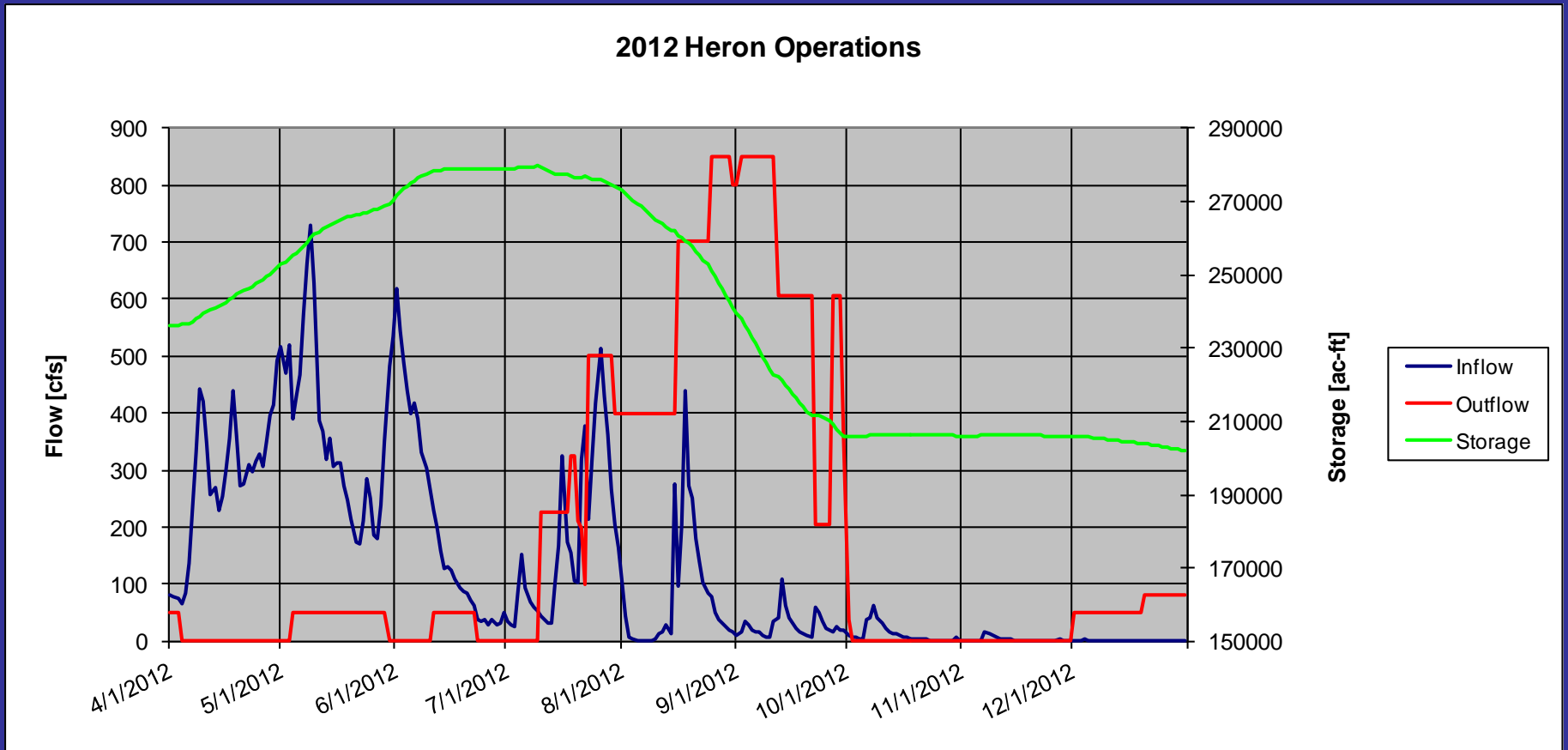
Major Results

- Snowmelt runoff much below normal
- BiOp flow requirements met through out the irrigation season
- Supplemental water releases begin mid-June
- Recreational flows provided for the Rio Chama through all of the Summer
- MRGCD season shortened and/or all storage exhausted

Heron Reservoir



Proposed 2012 Heron Operations

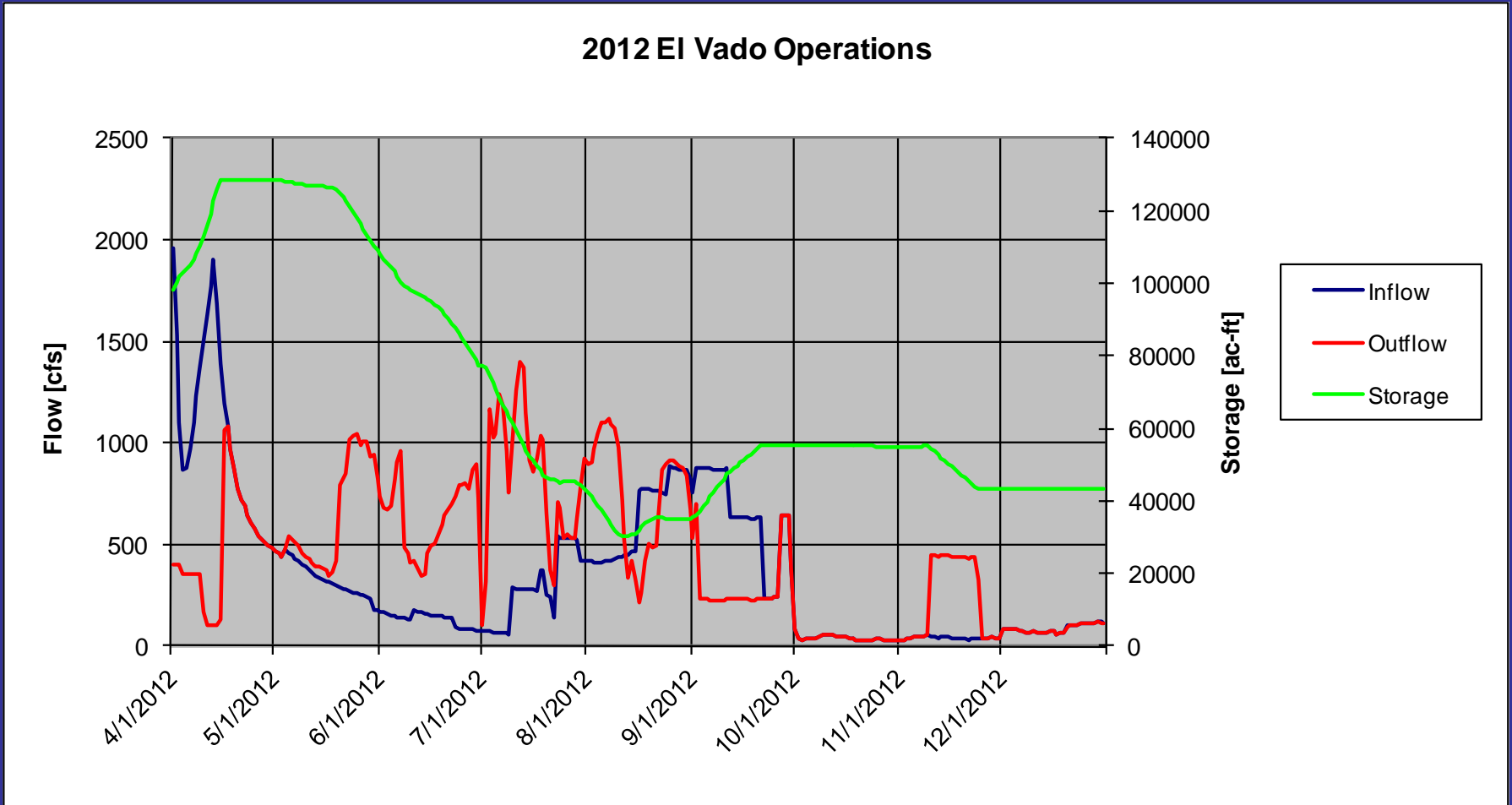


Reservoir will drop 8 feet from beginning of year to end

El Vado Reservoir



Proposed 2012 El Vado Operations



El Vado Reservoir:

Lake Level: Dropping from a peak at elev. 6881' to 6834' by EOY

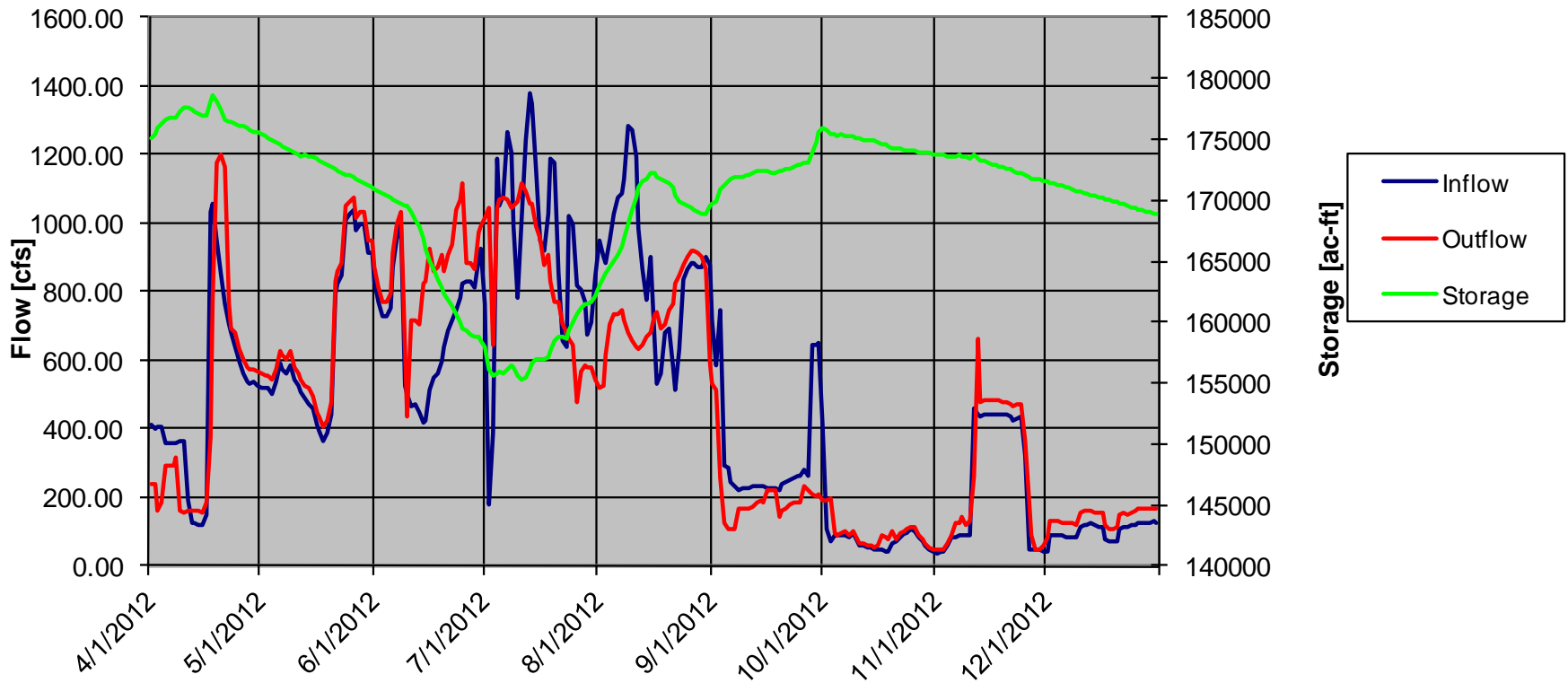
ABIQUIU LAKE



Proposed 2012 Abiquiu Operations

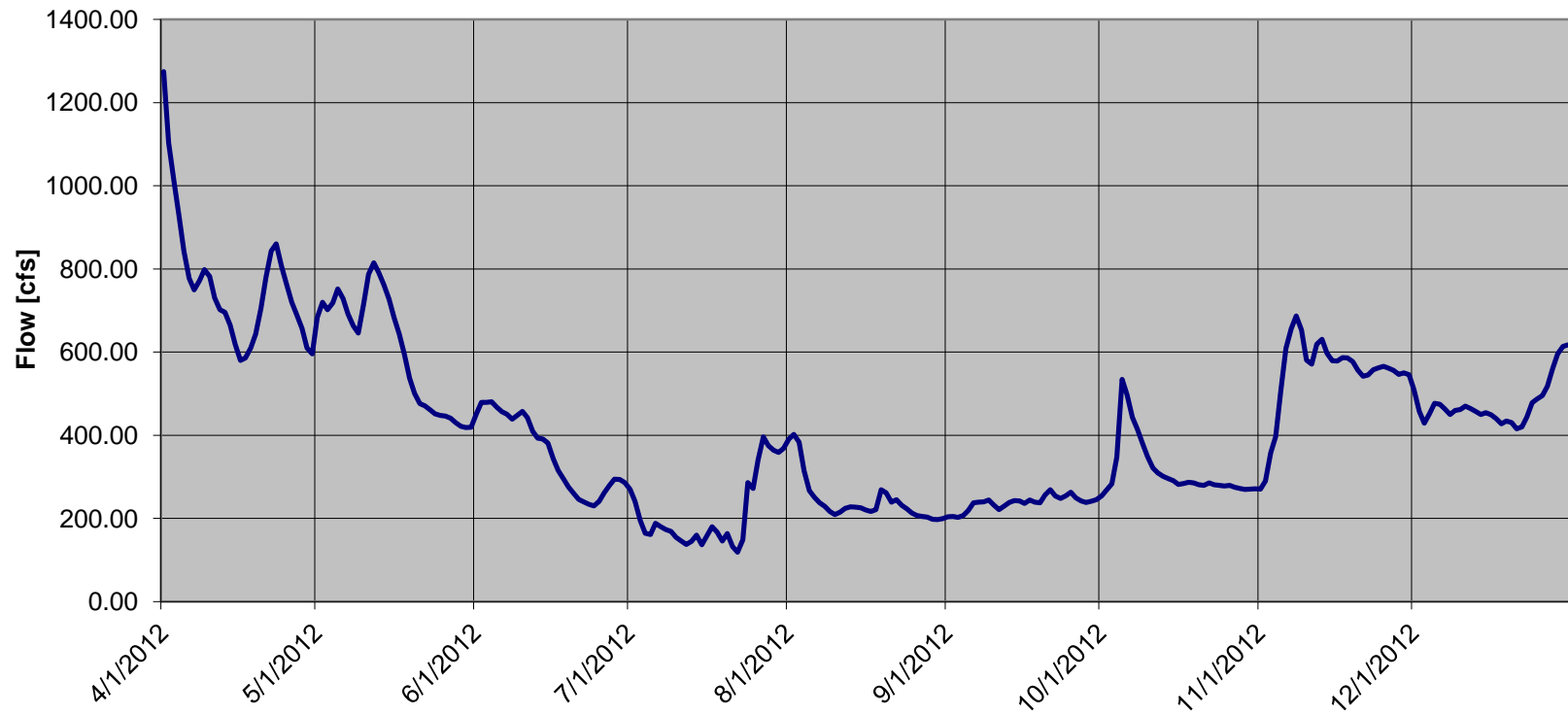
Water Supply SJ-C storage
capacity = 182,000 ac-ft

2012 Abiquiu Operations



Estimated Hydrograph at Embudo

2012 Flow at Embudo

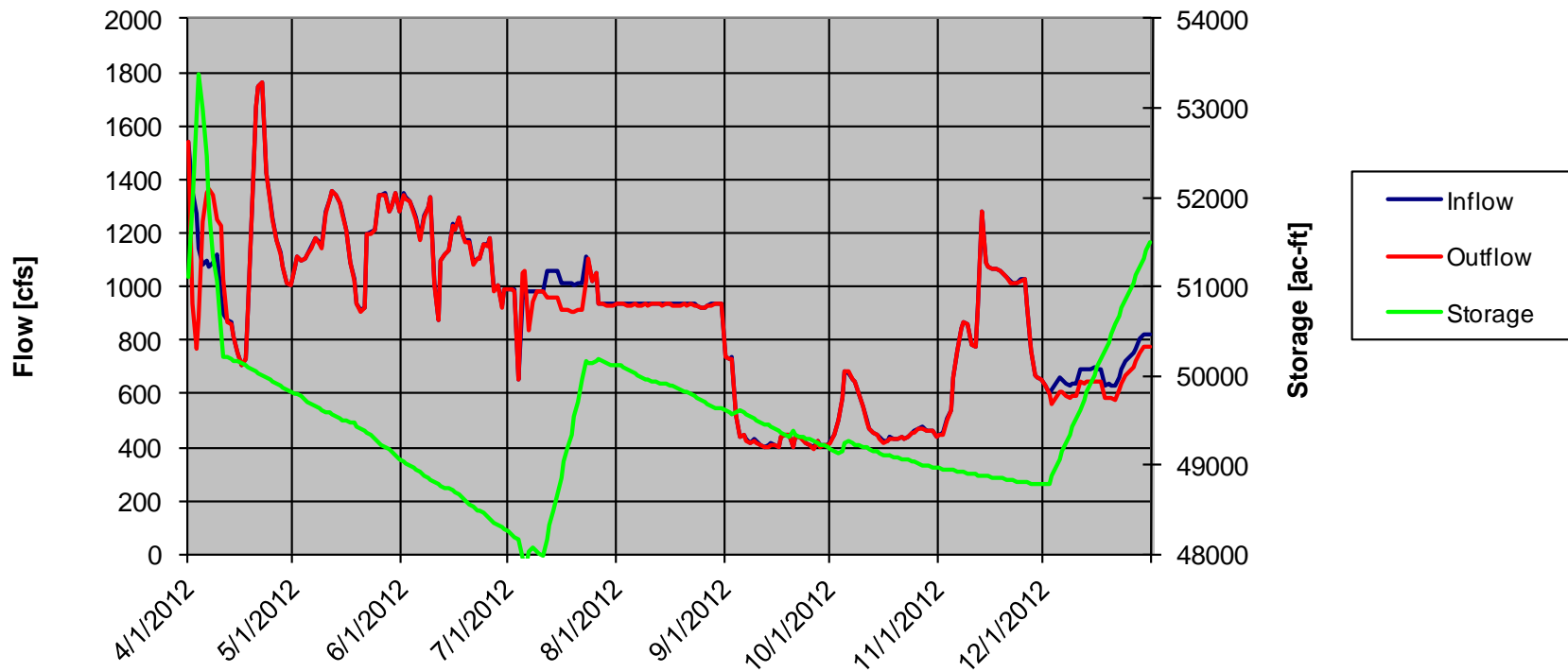


COCHITI LAKE



Proposed 2012 Cochiti Operations

2012 Cochiti Operations

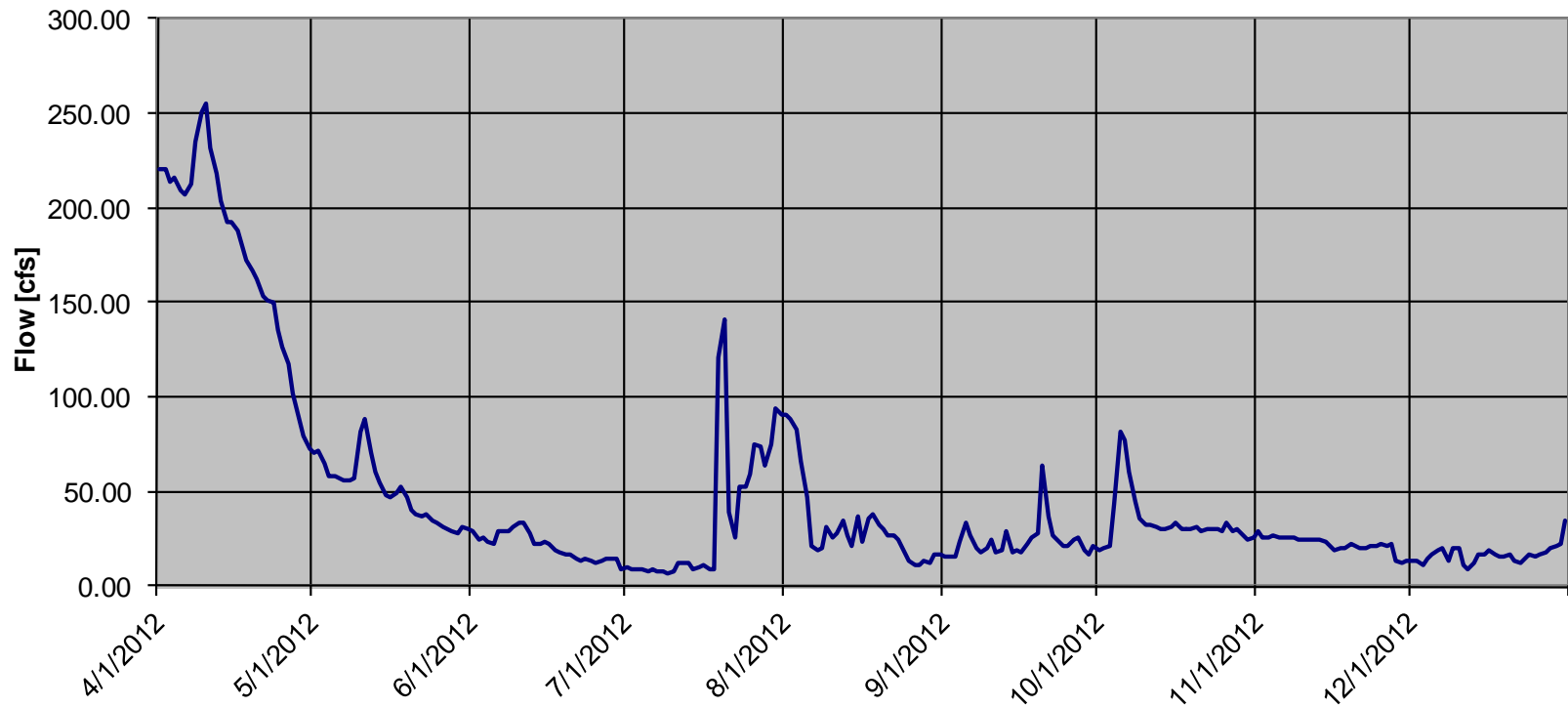


JEMEZ CANYON DAM



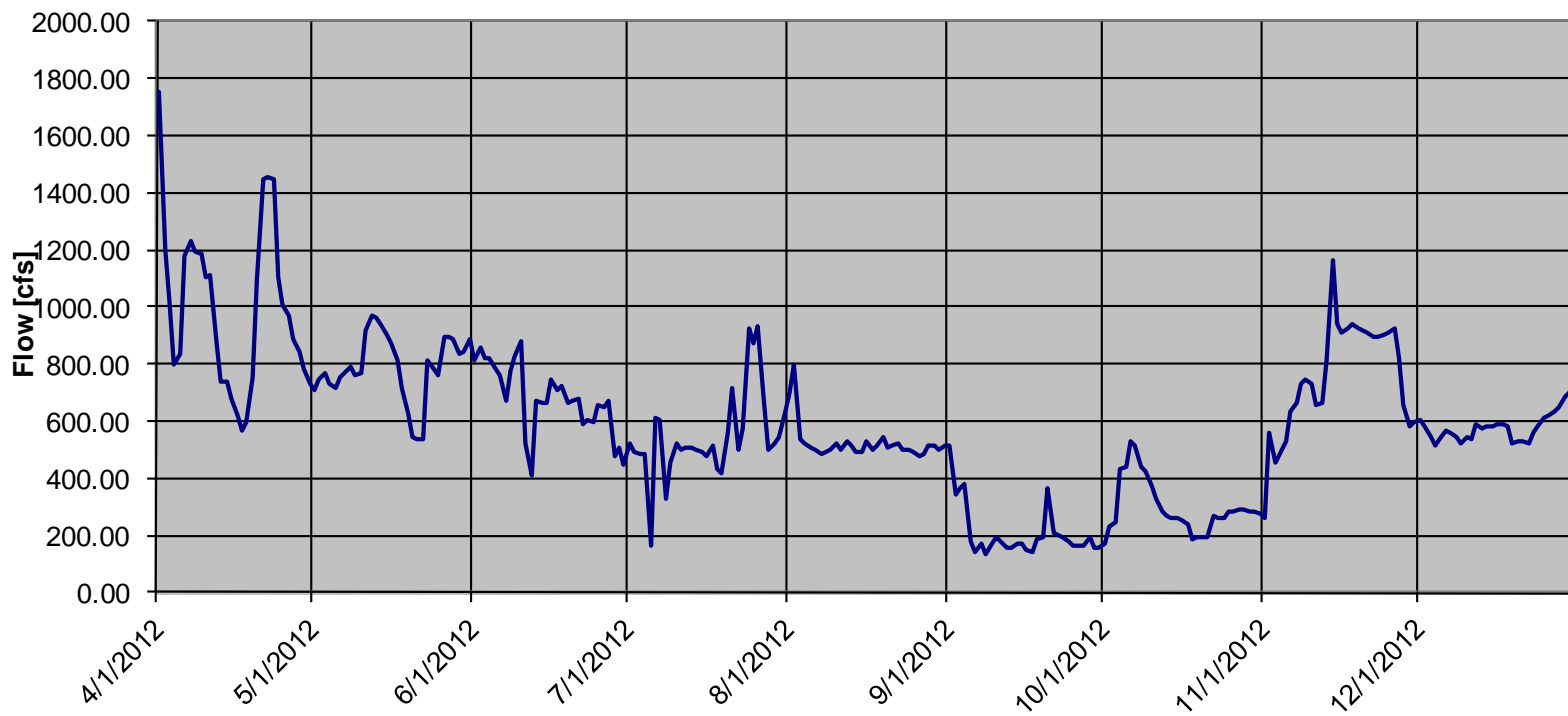
Estimated Hydrograph below Jemez Reservoir

2012 Flow below Jemez Dam



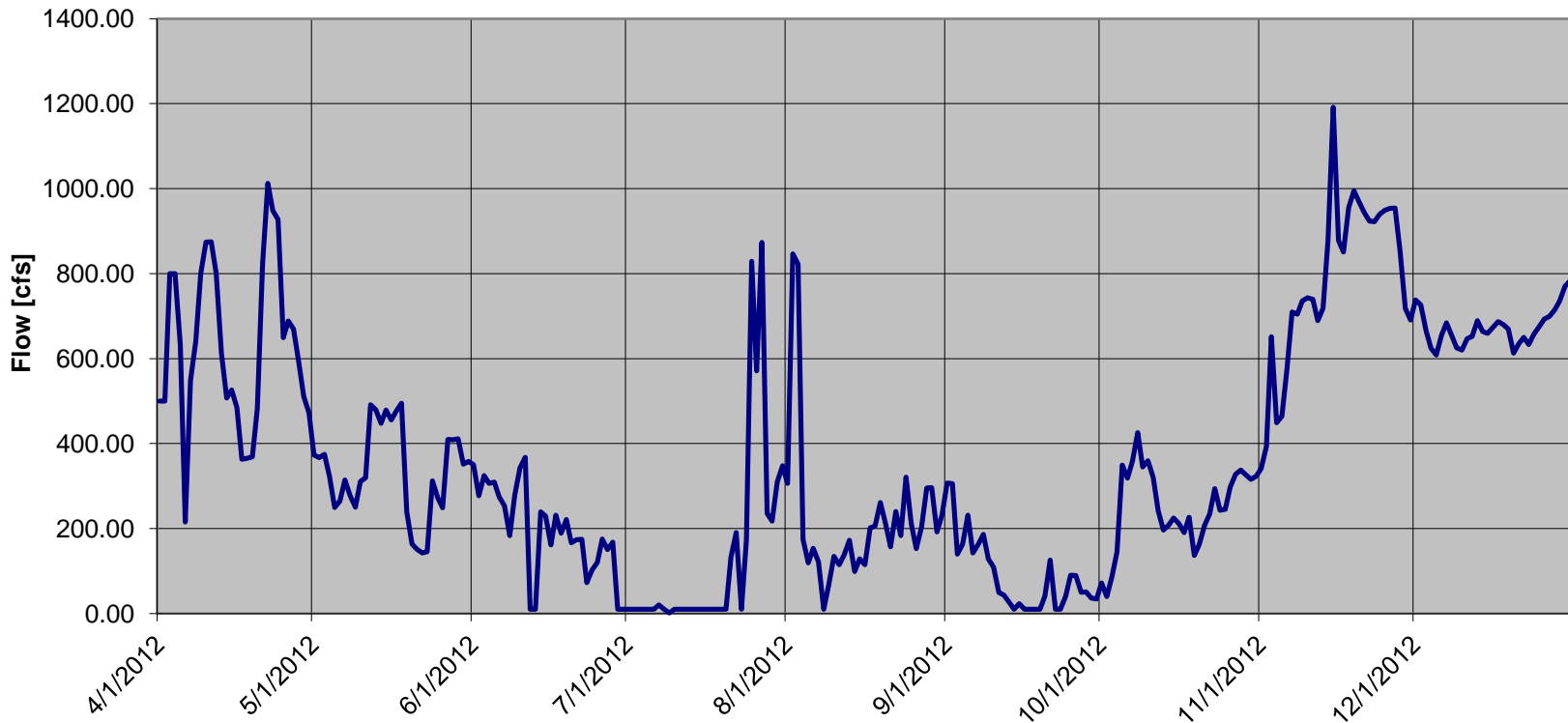
Estimated Hydrograph at Central Ave.

2012 Flow at Central Ave Gage



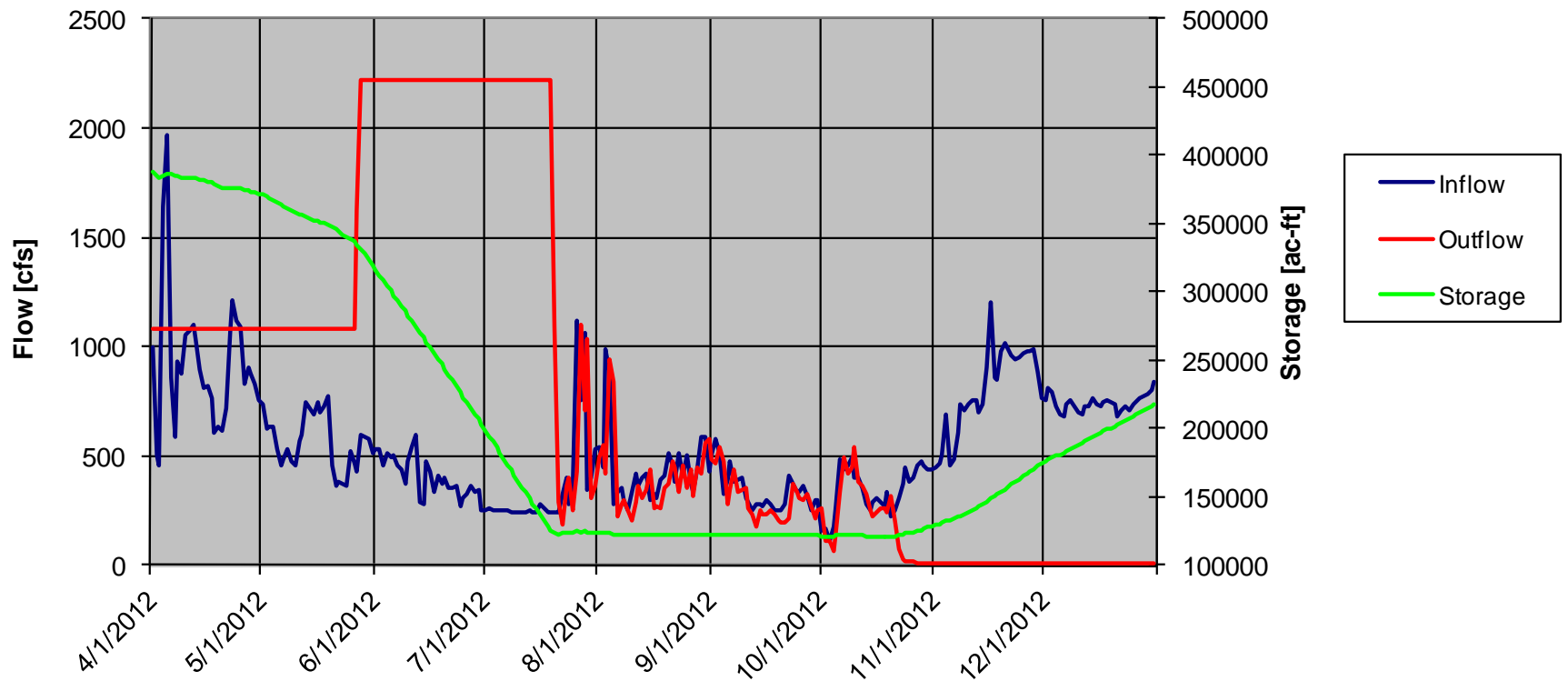
Estimated Flow at San Acacia

2012 Flow at San Acacia Gage



Proposed Elephant Butte Operations

2012 Elephant Butte Operations



Maximum Elevation = 4331'. Minimum Elevation= 4299'