2019 Annual Operating Plan

April 1 Runoff Forecast

RECLAMATION
Managing Water in the West

US Army Corps
of Engineers®
Albuquerque District

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 VII: 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 relinquishment credit.

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/The Water Authority – Albuquerque Bernalillo County Water Utility Authority (ABCWUA)

NRCS – Natural Resources Conservation Service

Supplemental water – Water leased by Reclamation to augment flows in support of the Rio Grande Silvery Minnow as outlined in the 2016 Biological Opinion

P&P – Prior & Paramount

What Drives the Process

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

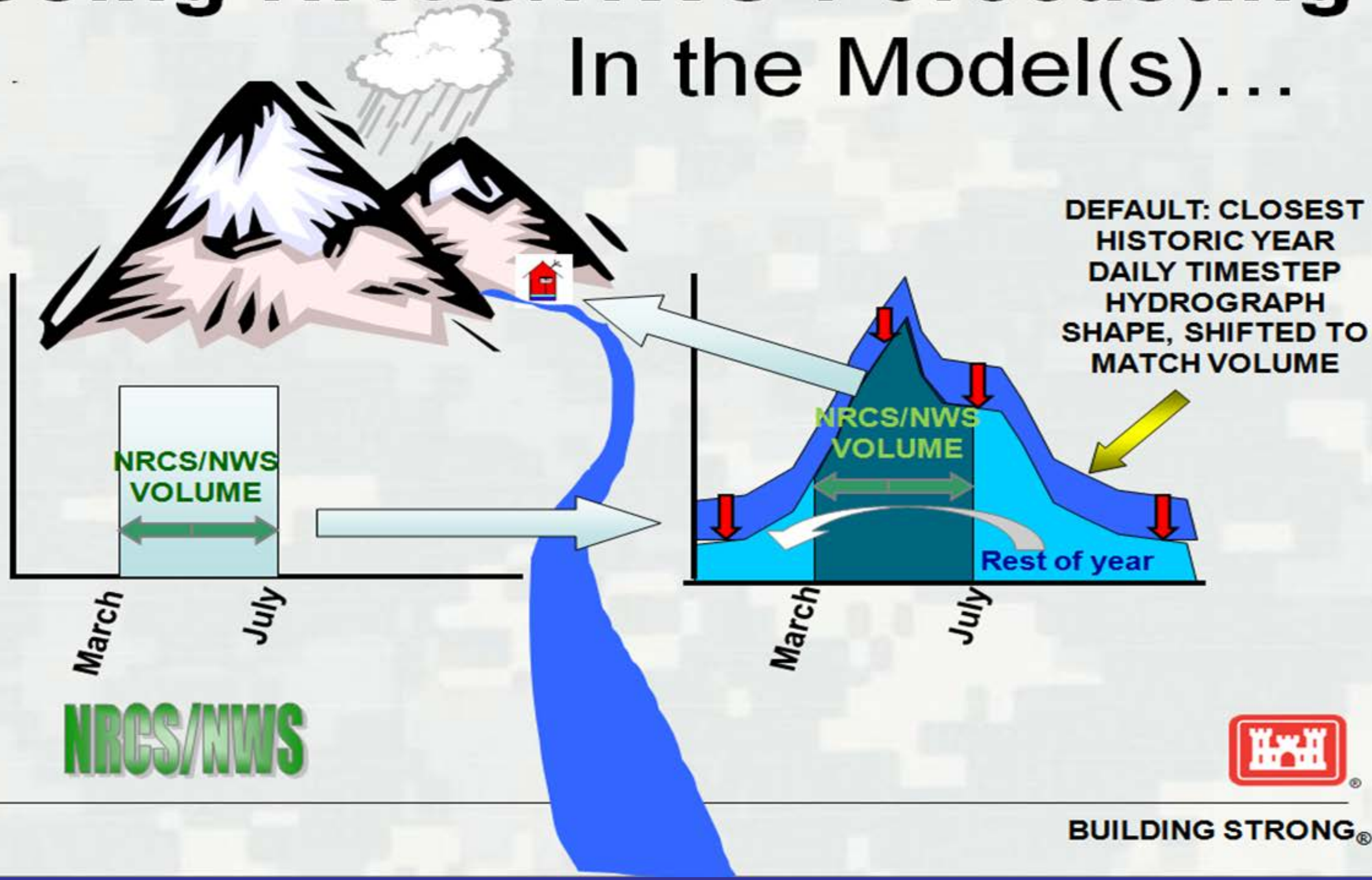
Choose similar year based on similar volume
Actual hydrograph vs. average hydrograph
Can tweak timing of hydrograph to best match forecasted conditions (warm spring vs. cool spring)

Inflows/Outflows based on nature and policies

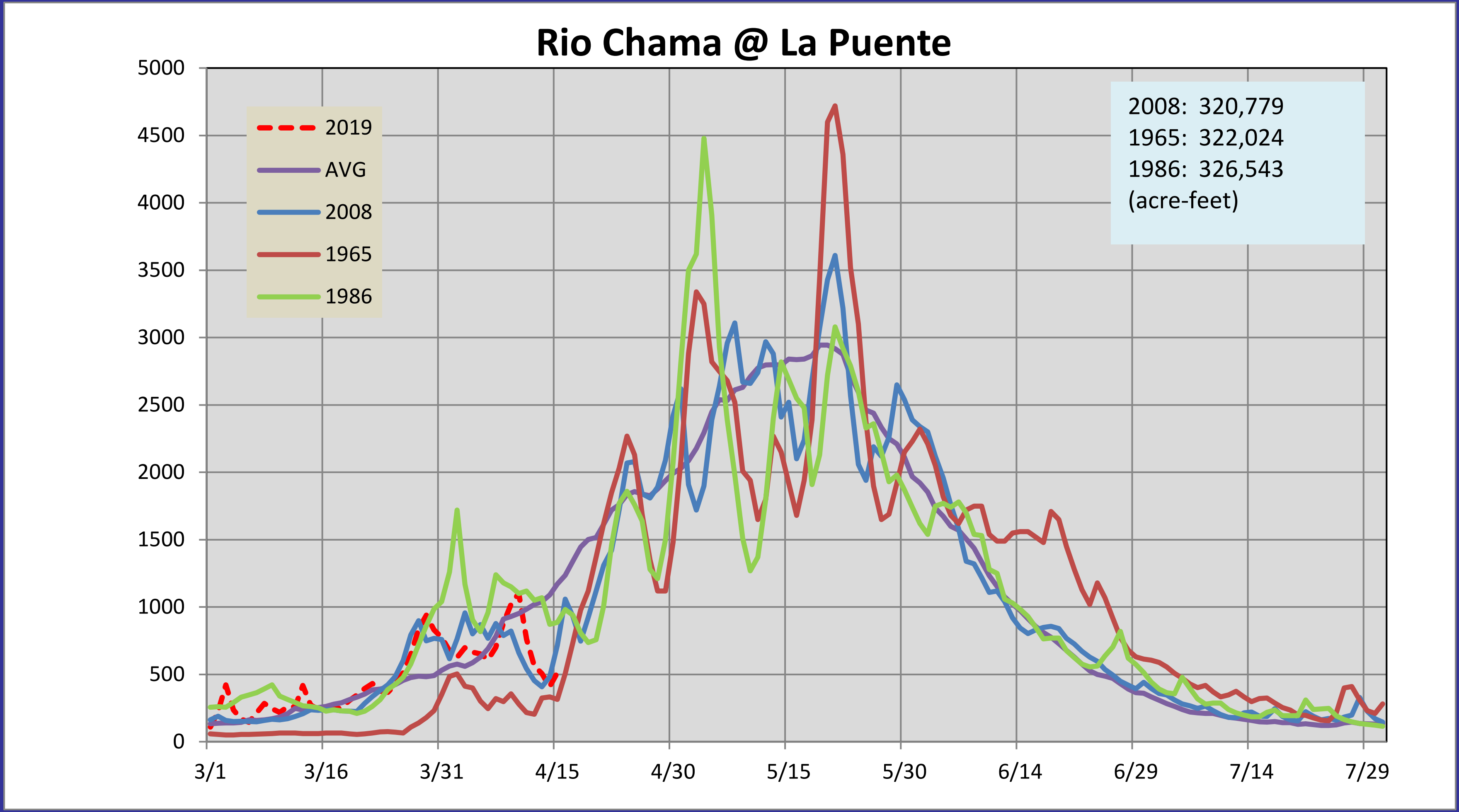
Article VII restrictions
Flood control and channel capacity
Timing of water deliveries
Demand curves from water users

Using NRCS/NWS Forecasting

In the Model(s)…



Similar Year Hydrographs

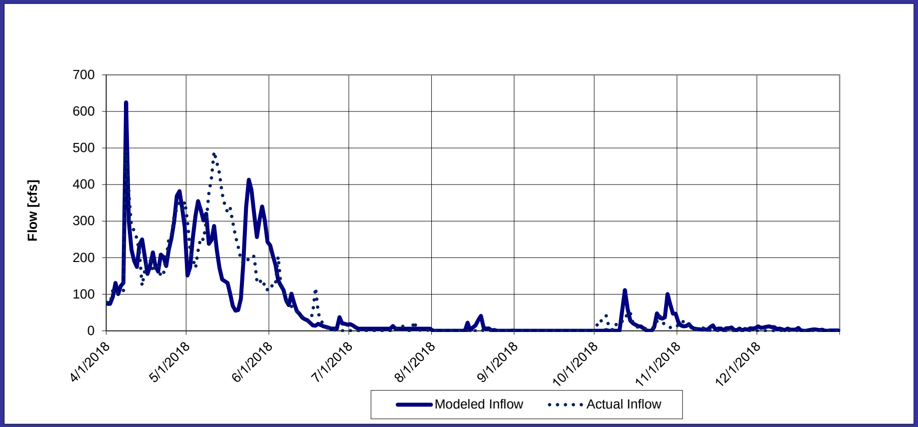


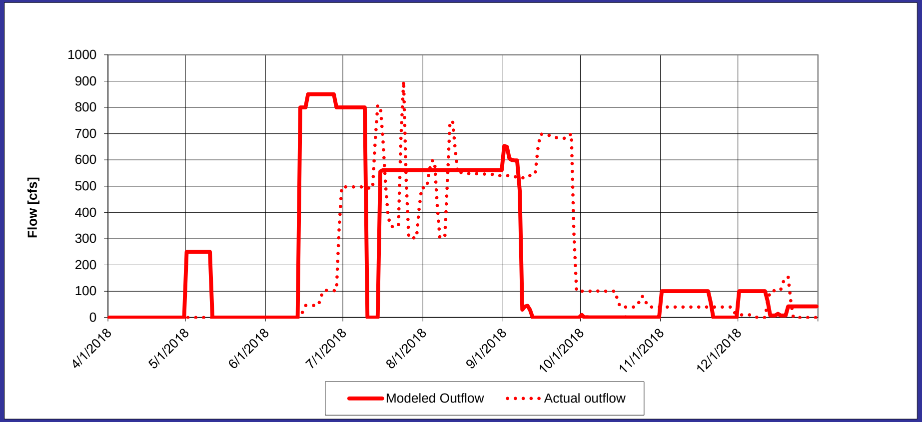
SJC RG

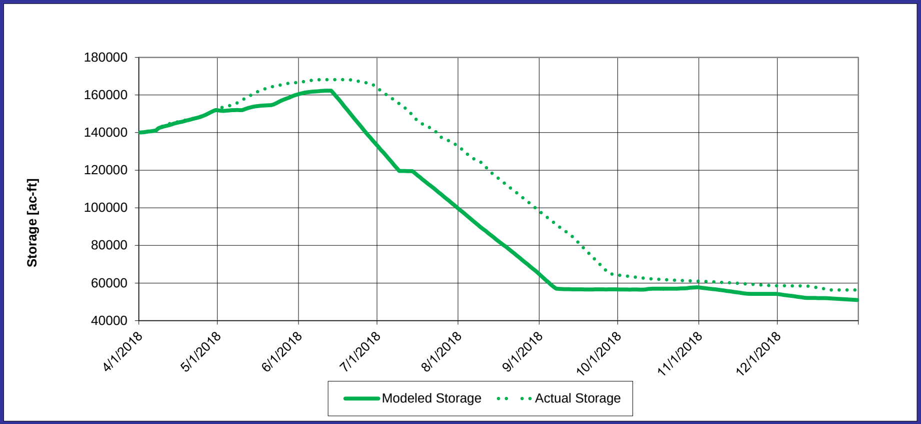
Operated By: Dams:	Reclamation	Corps	Water Supply	Recreation	Flood Control	Sediment Control
HERON	☺		■	■		
EL VADO	☺		■	■	■	
ABIQUIU		☺	■	■	■	■
NAMBE FALLS	☺		■	■		
GALISTEO		☺			■	■
COCHITI		☺	■	■	■	■
JEMEZ CANYON		☺			■	■
ELEPHANT BUTTE	☺		■	■	■	
CABALLO	☺		■	■		

2018: The Year in Review

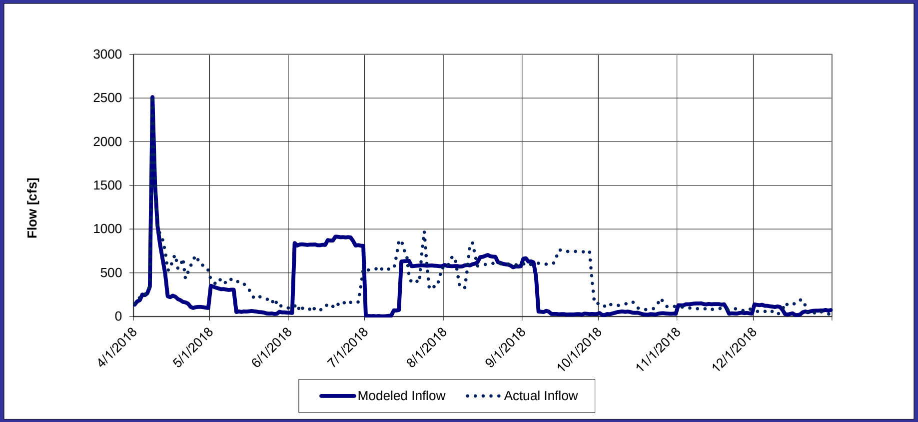
Heron Reservoir

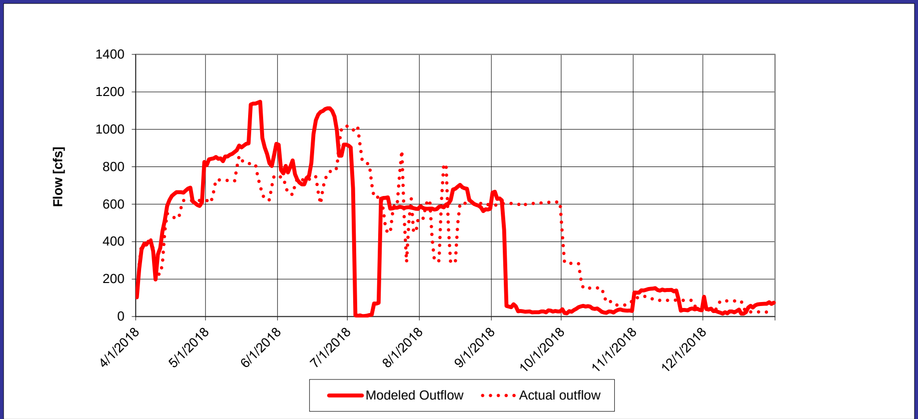


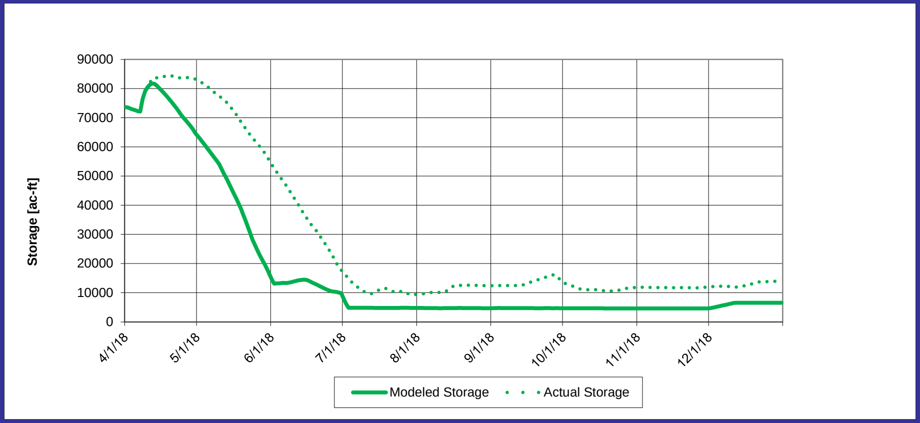




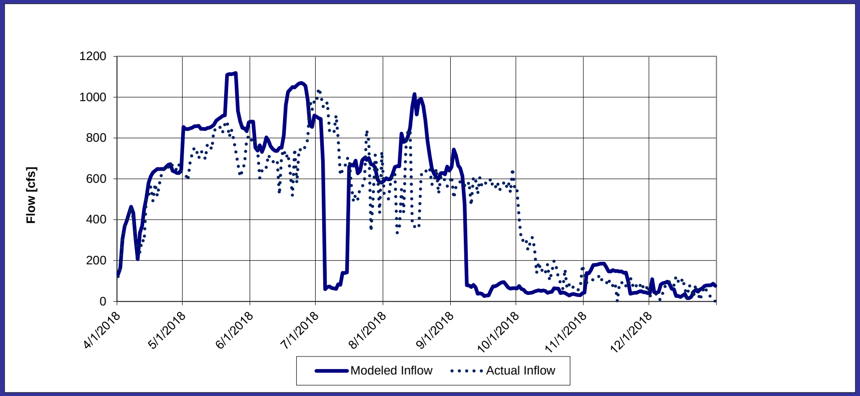
El Vado Reservoir

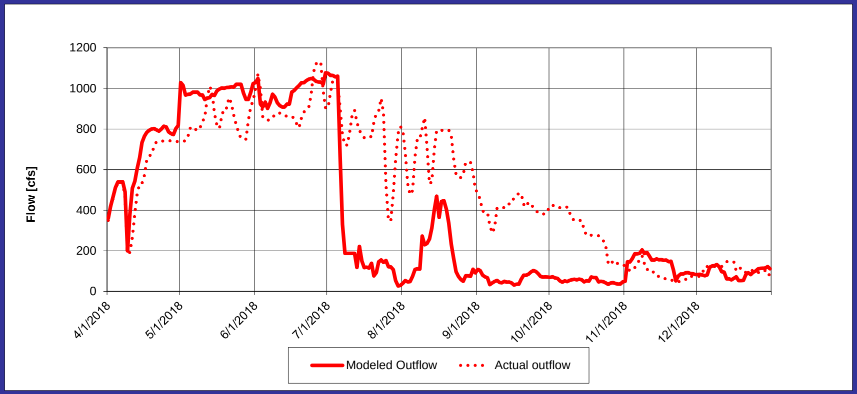


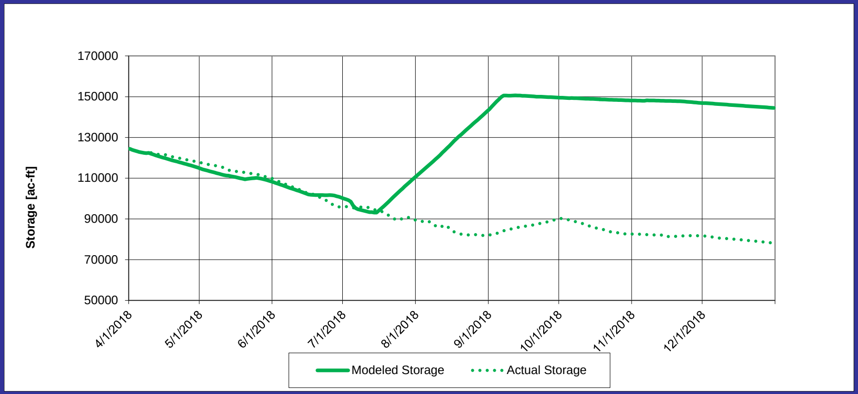




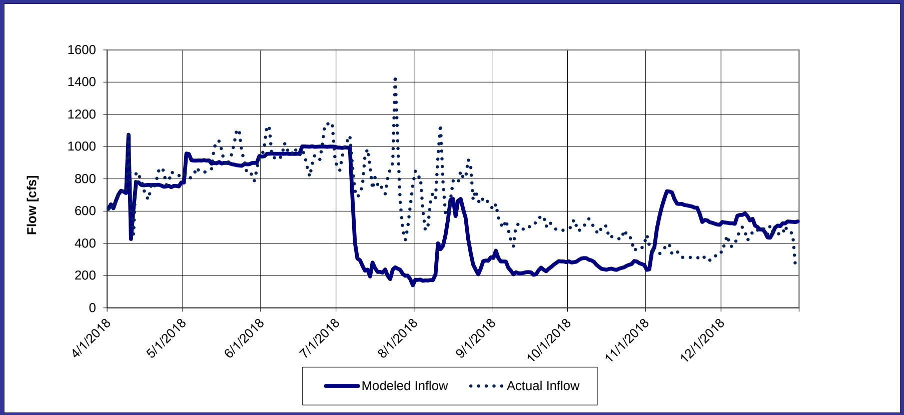
Abiquiu Reservoir

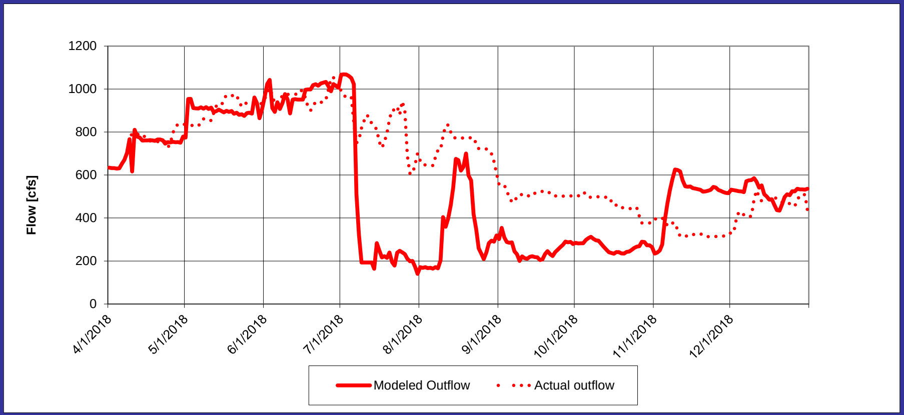


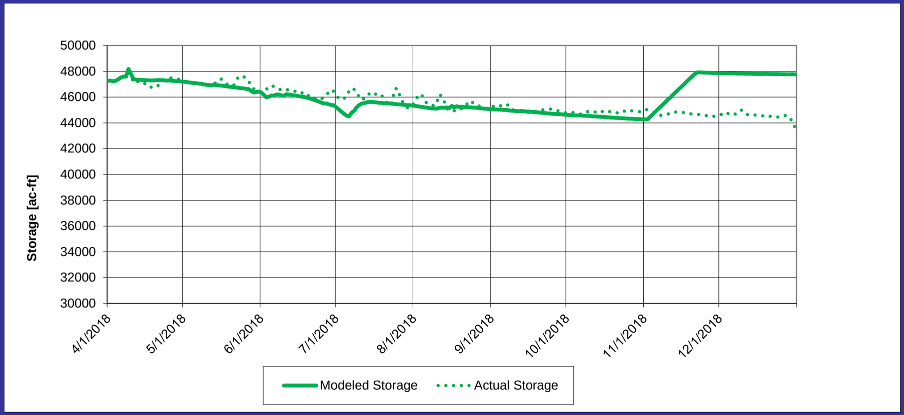




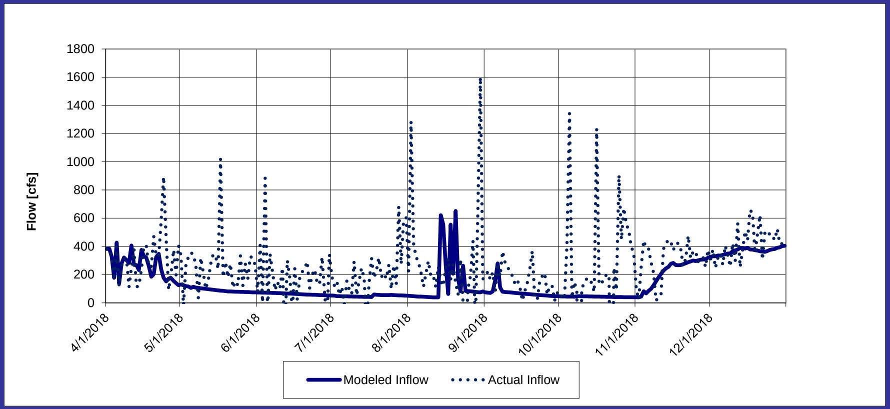
Cochiti Reservoir

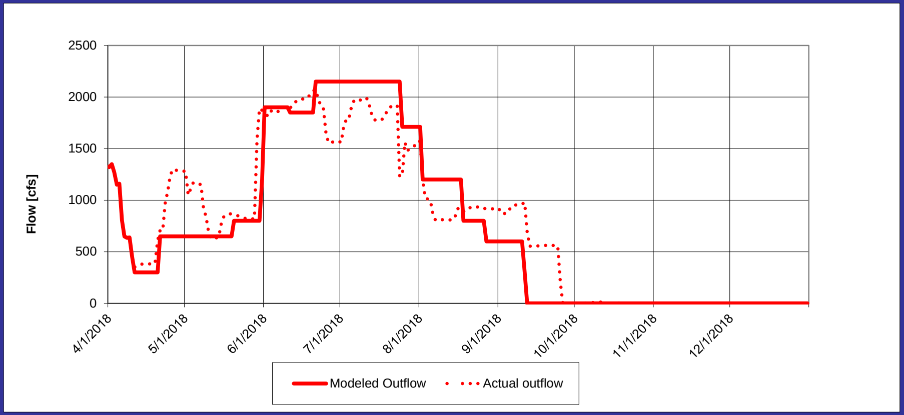


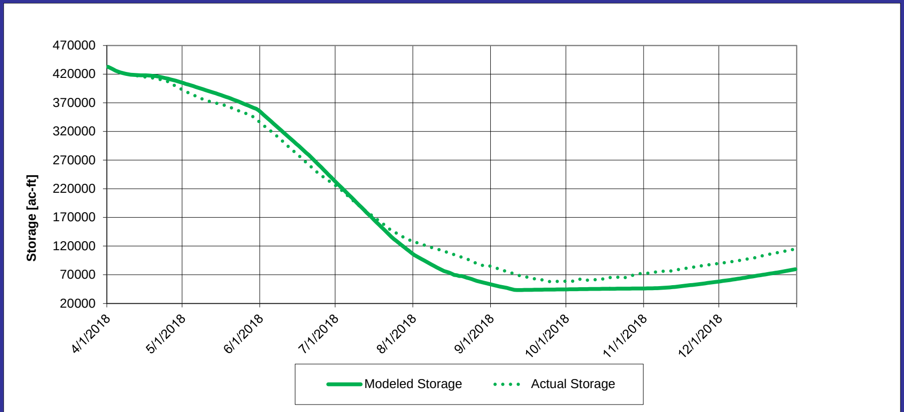




Elephant Butte Reservoir

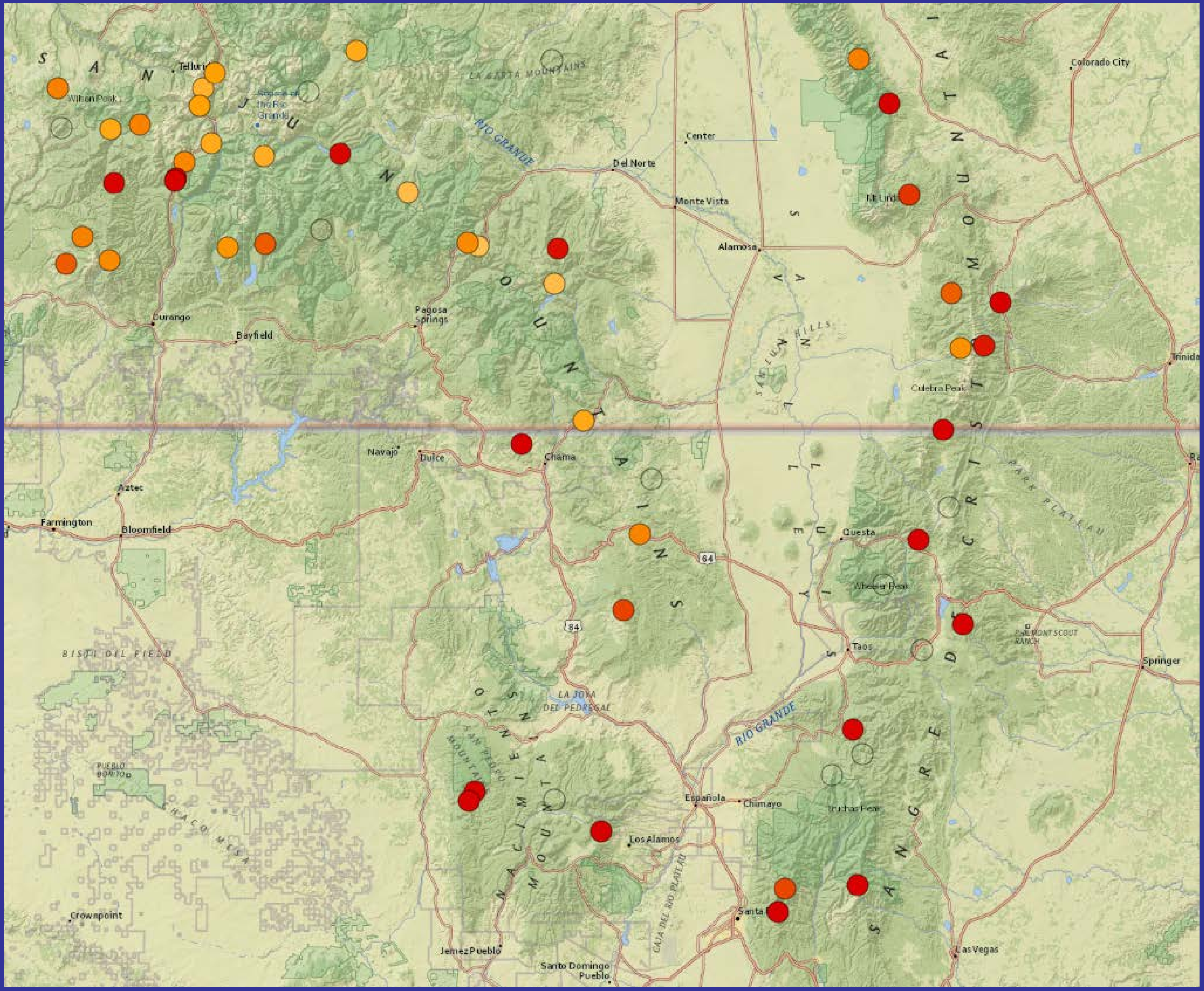




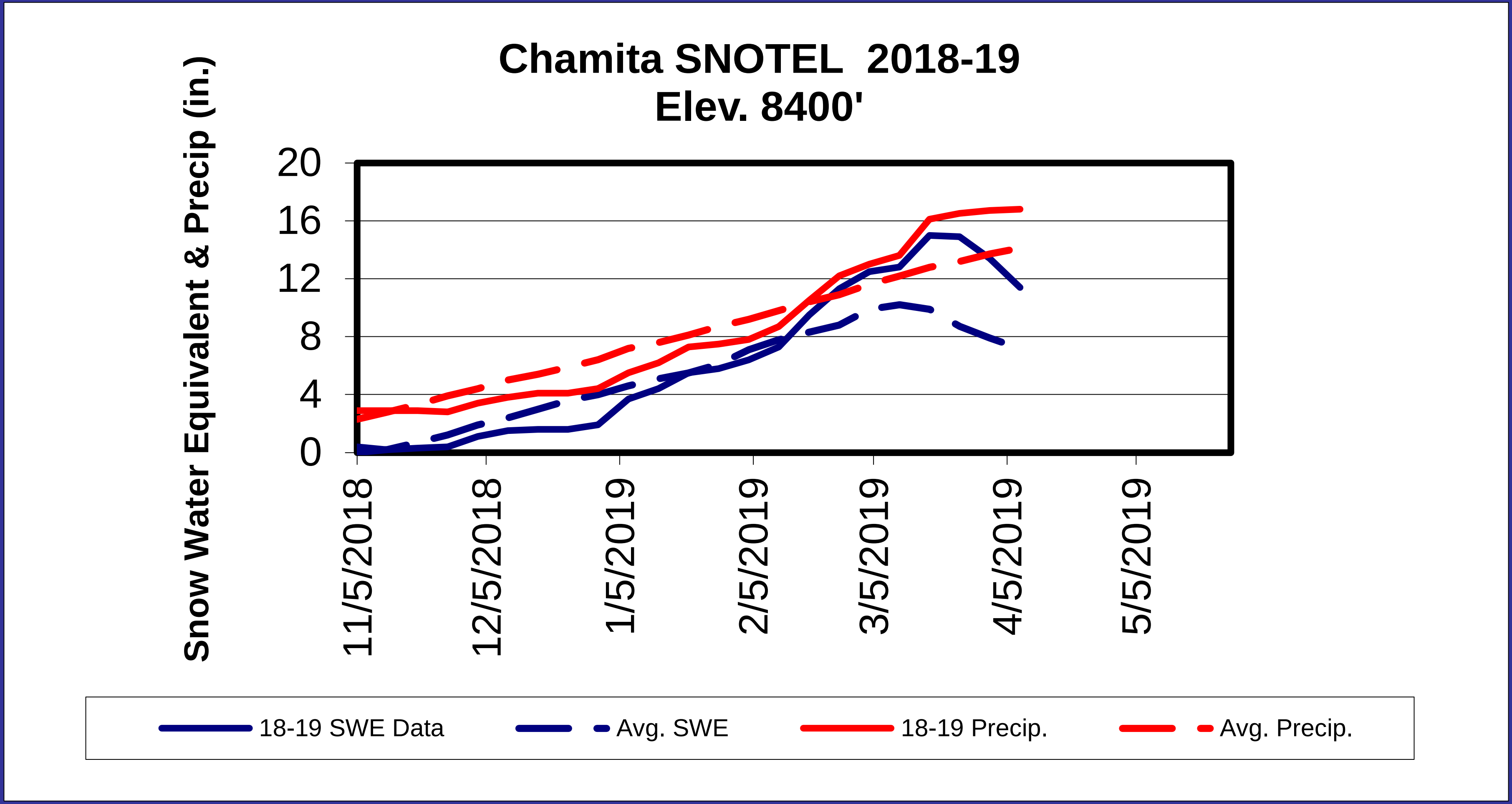


Current Snow Conditions

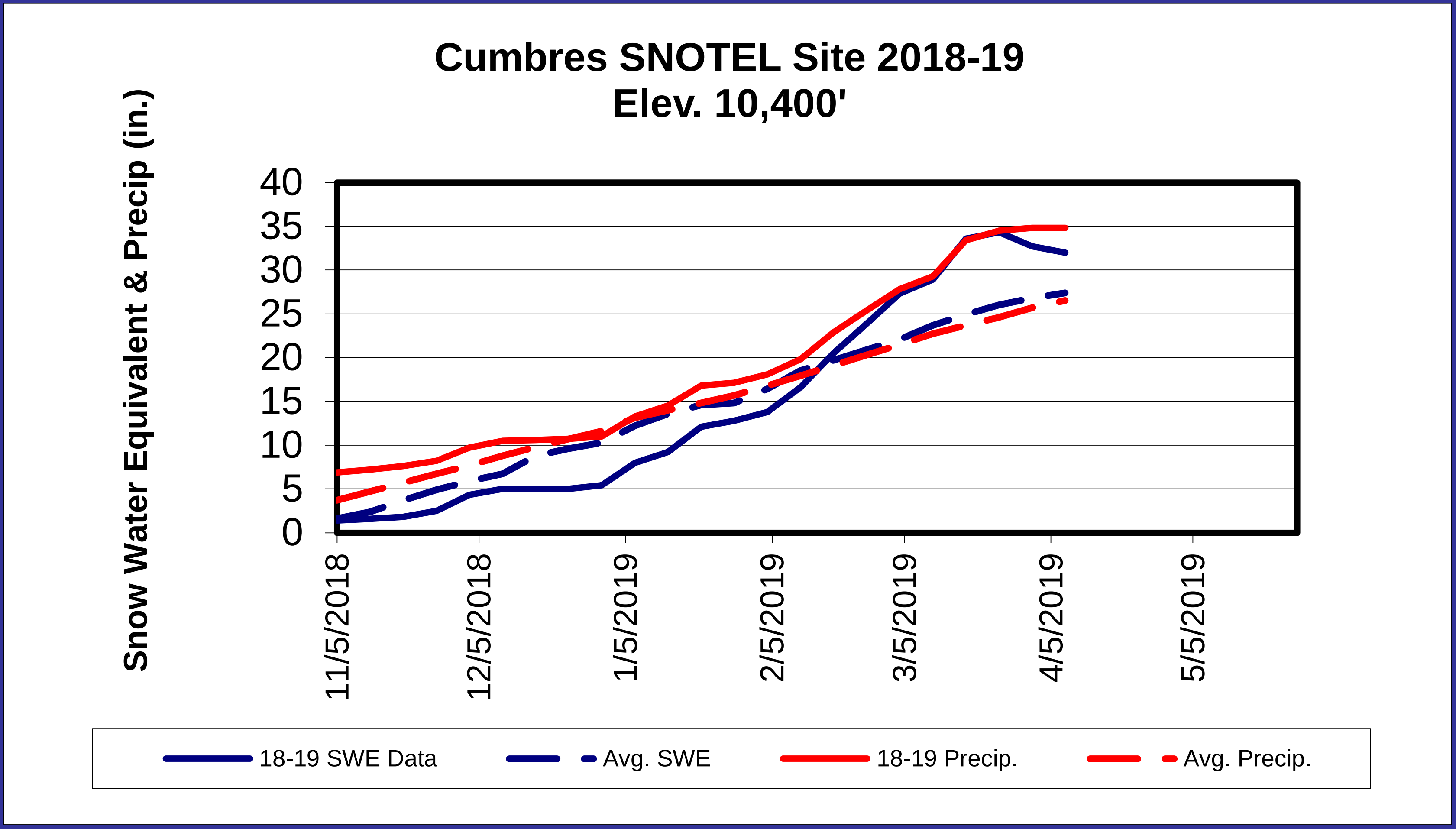
SNOTEL Locations



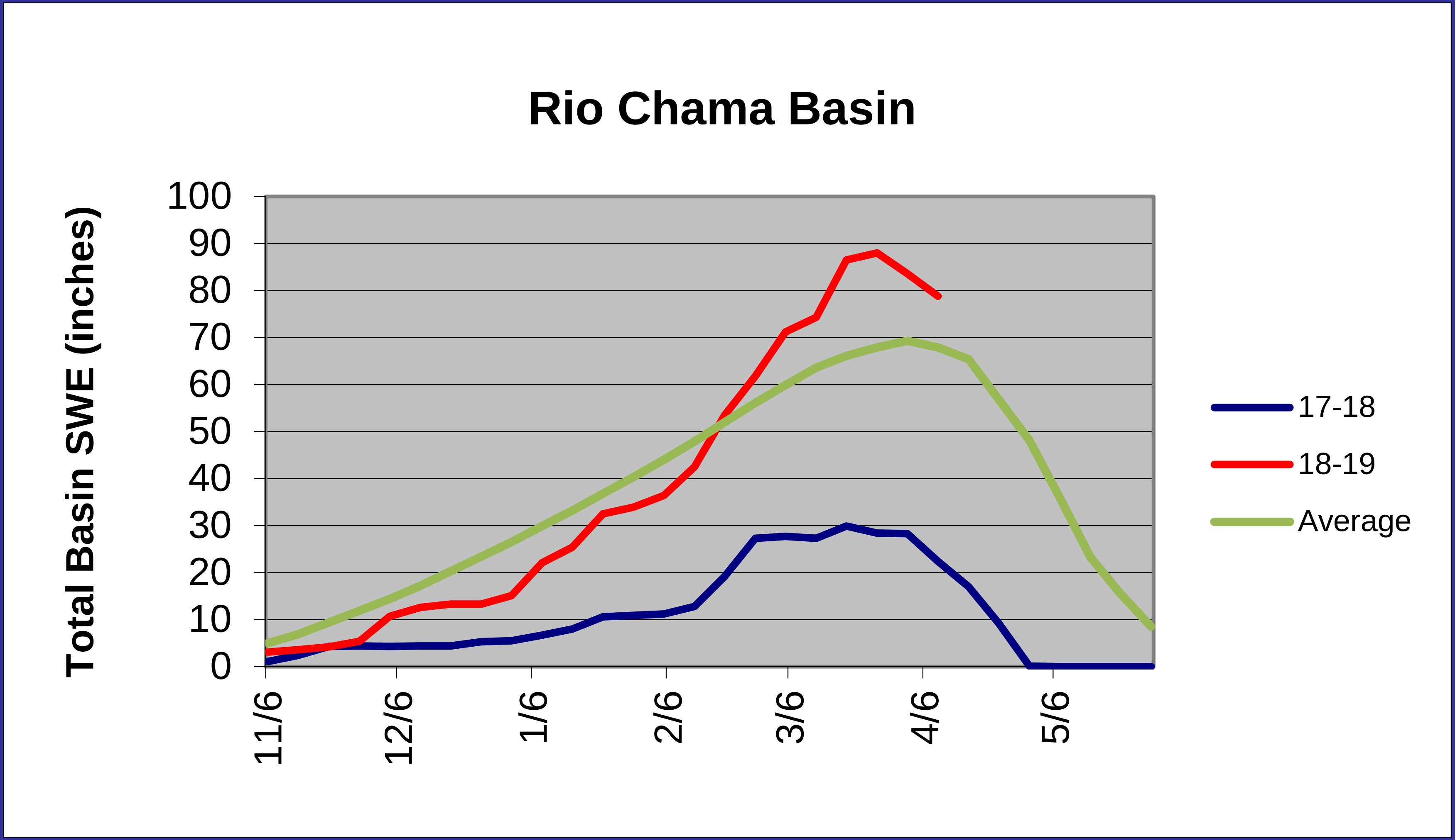
Rio Chama Snow Data



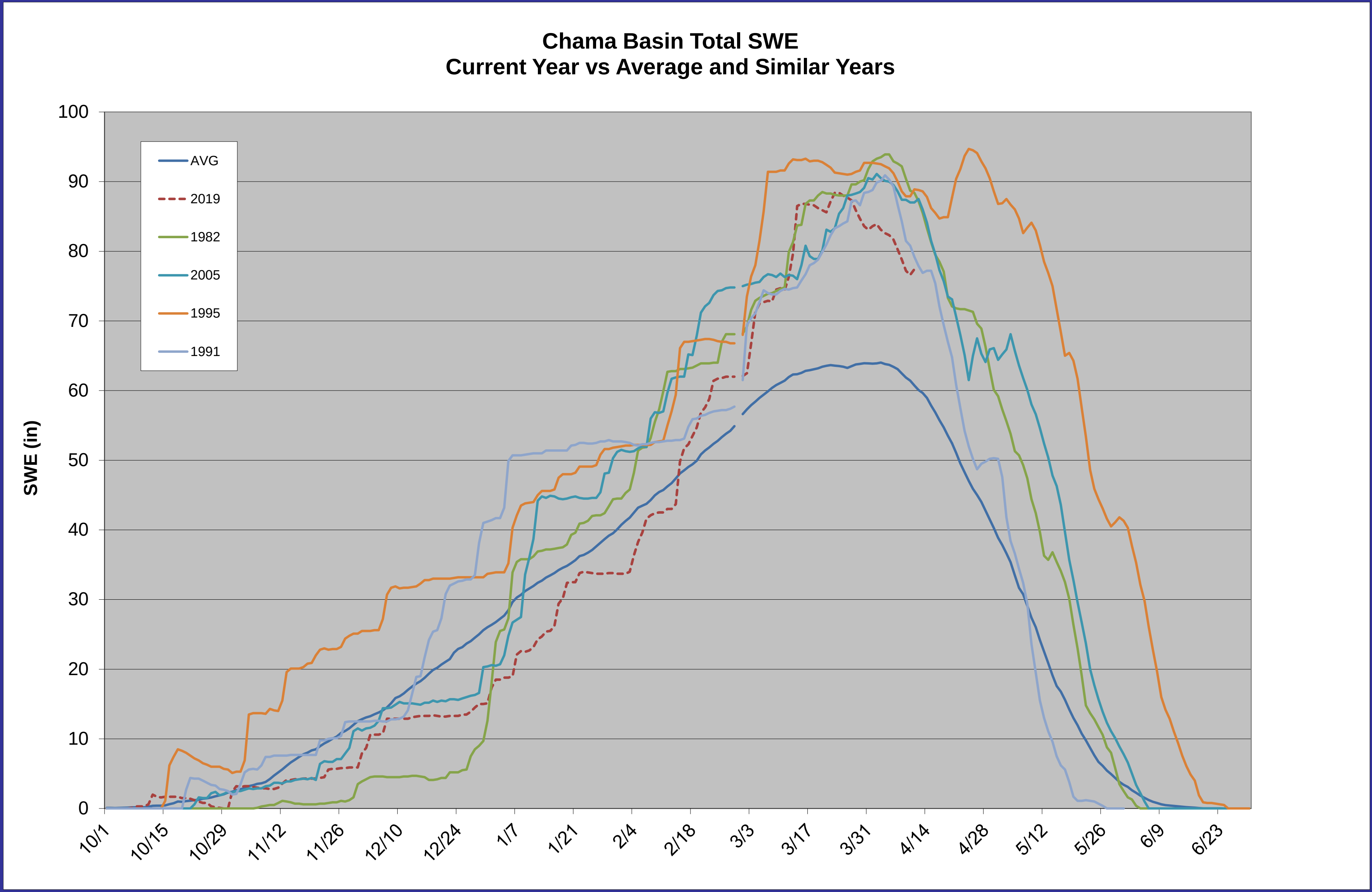
Rio Chama Snow Data 1



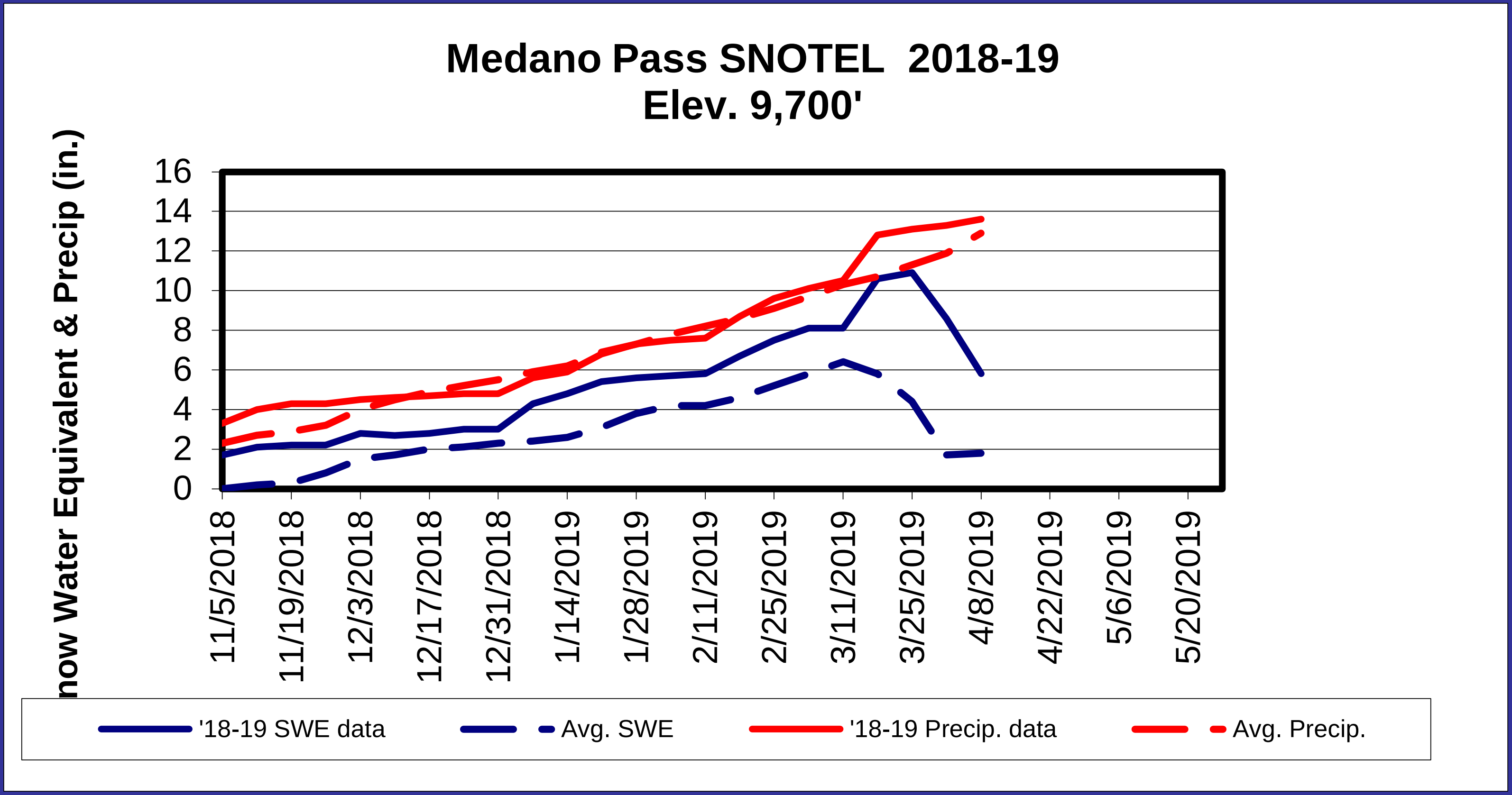
Rio Chama Snow Comparison



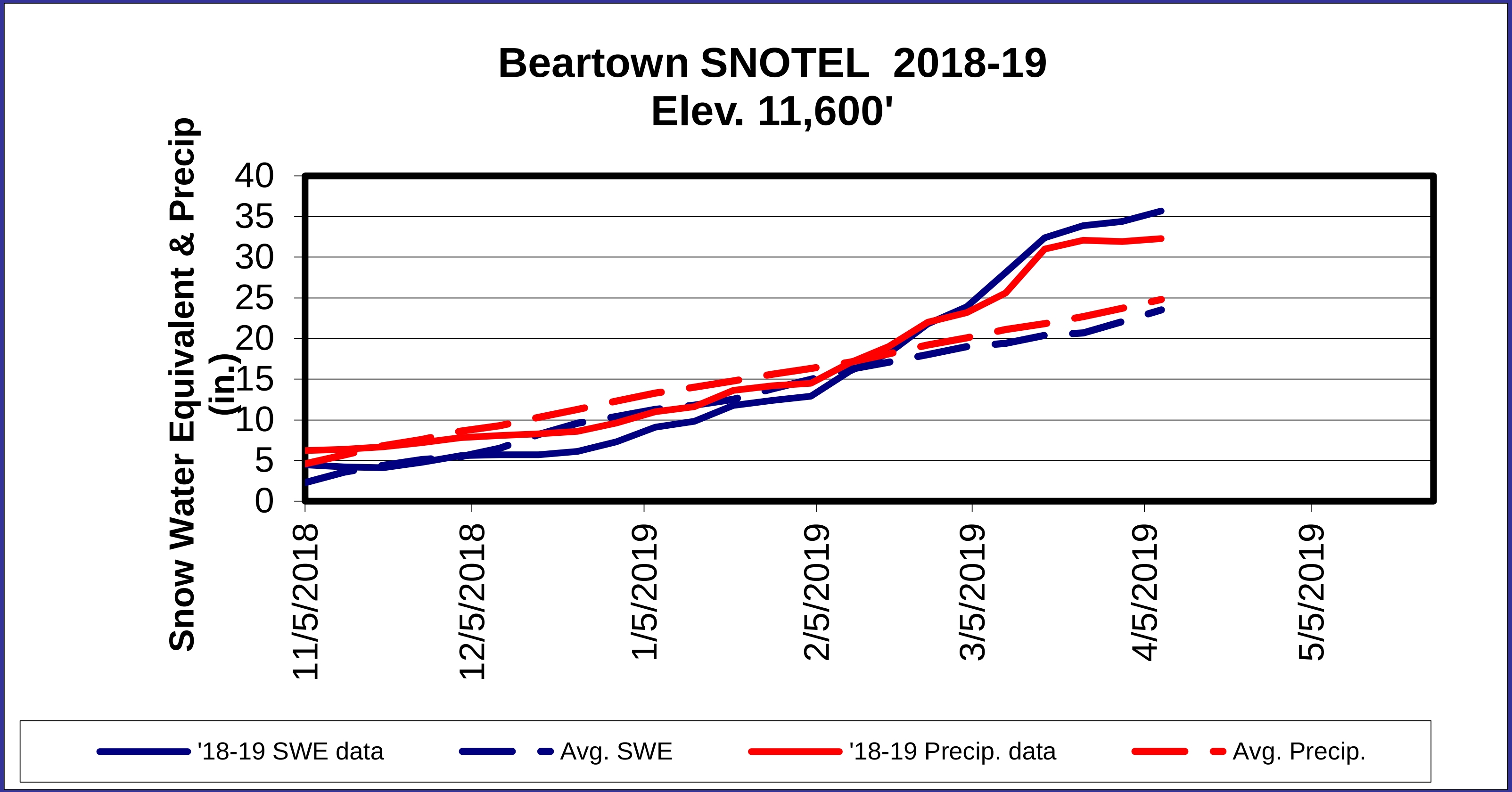
Similar Snowpack Years



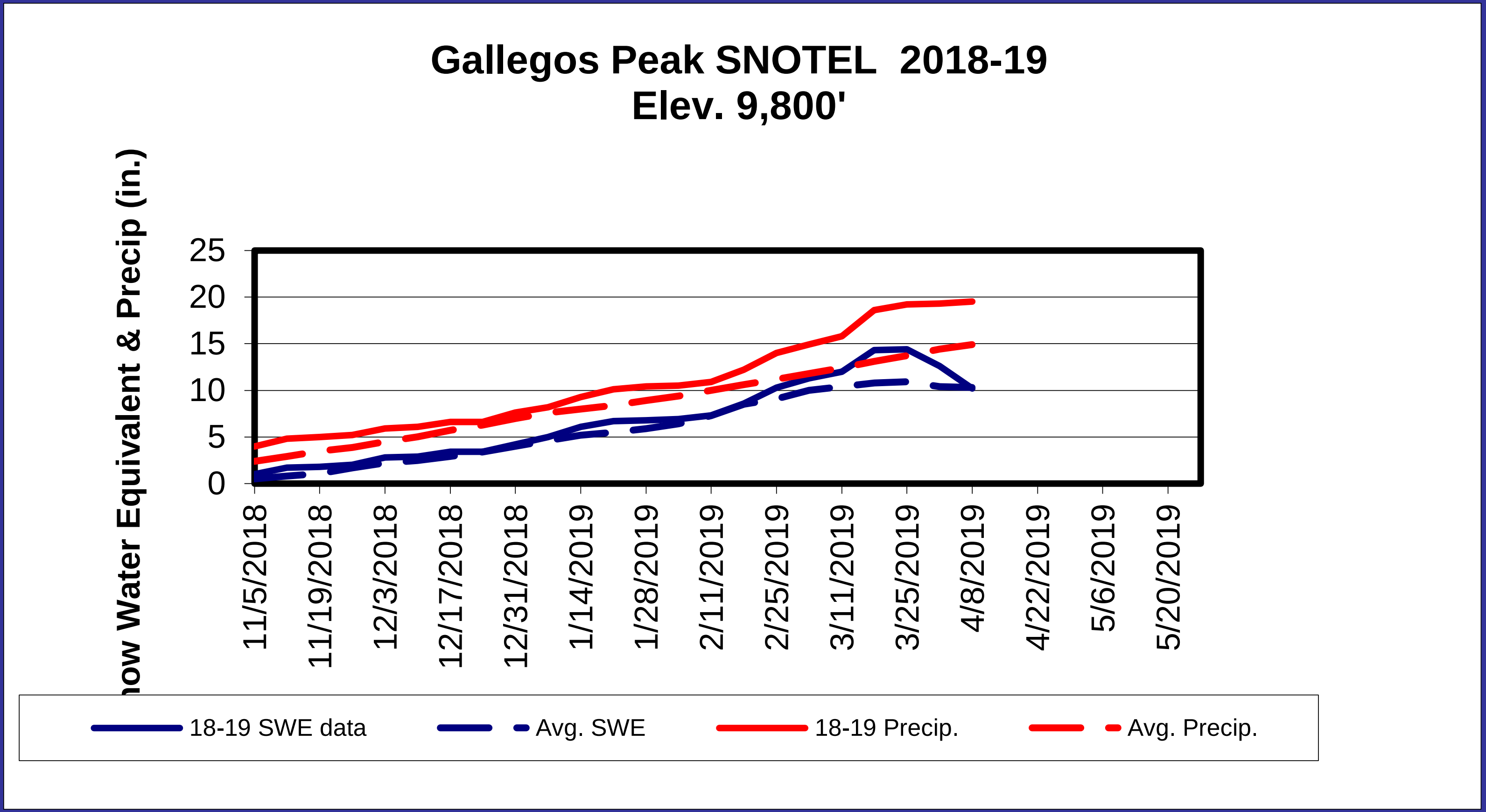
Rio Grande Snow Data



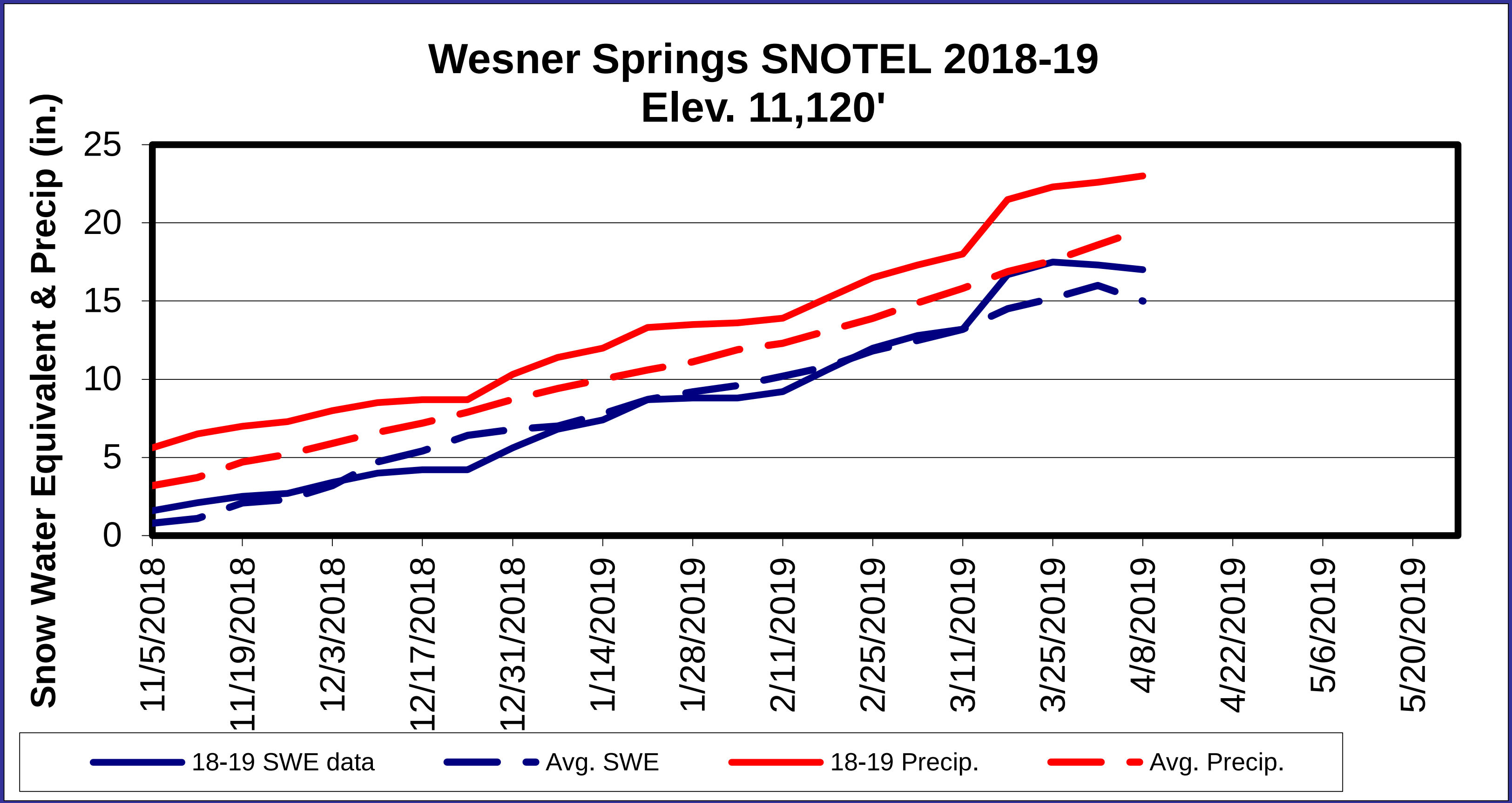
Rio Grande Snow Data 1



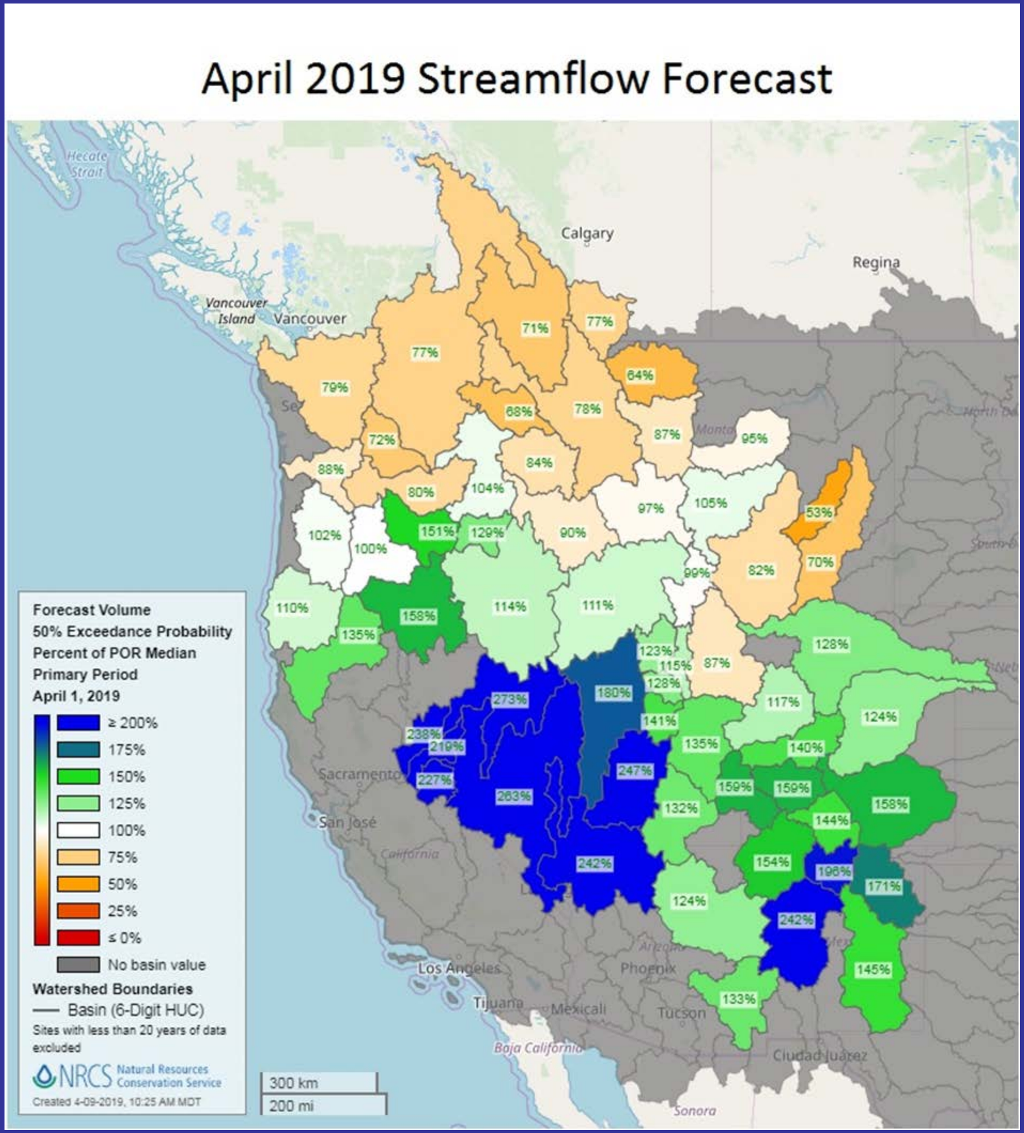
Sangre de Cristo Snow Data



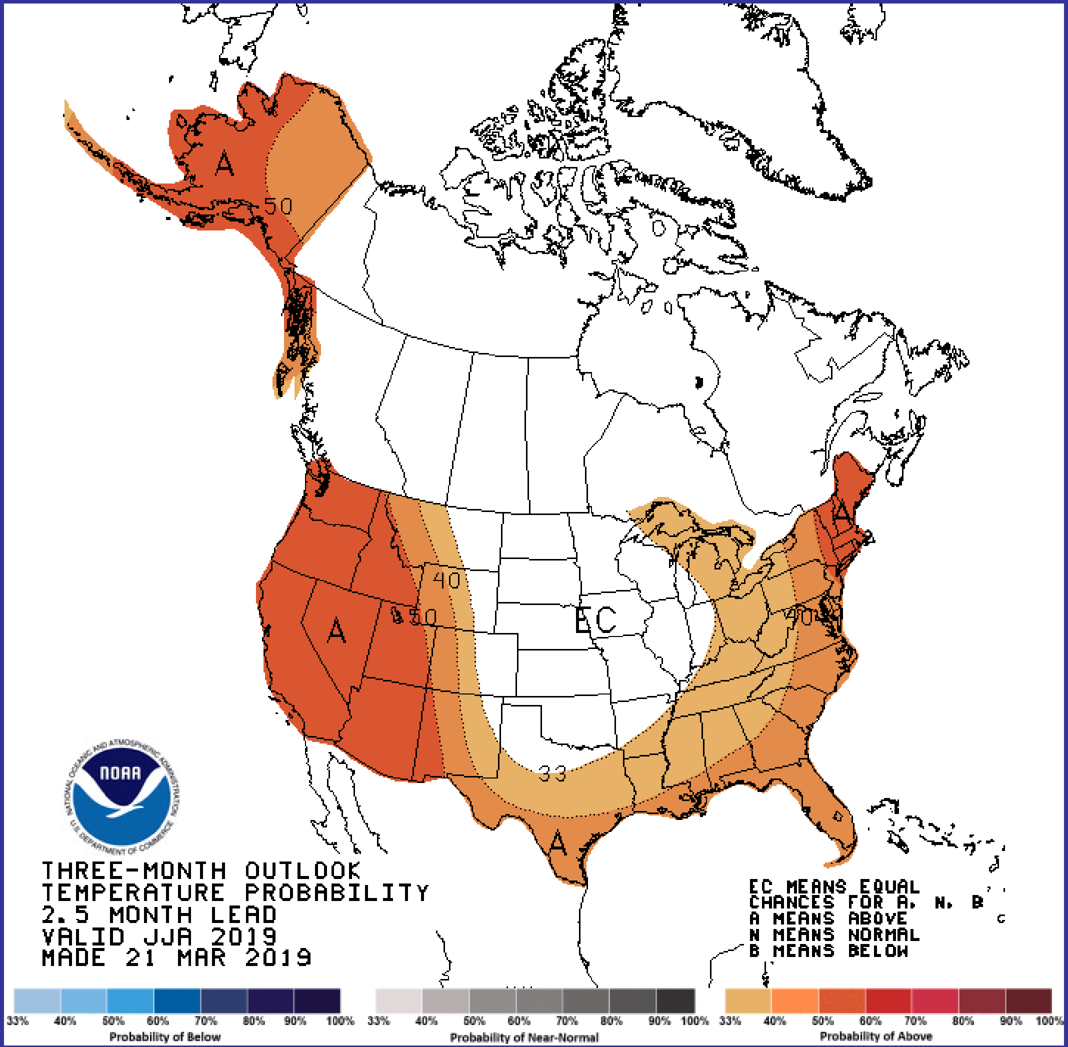
Sangre de Cristo Snow Data 1



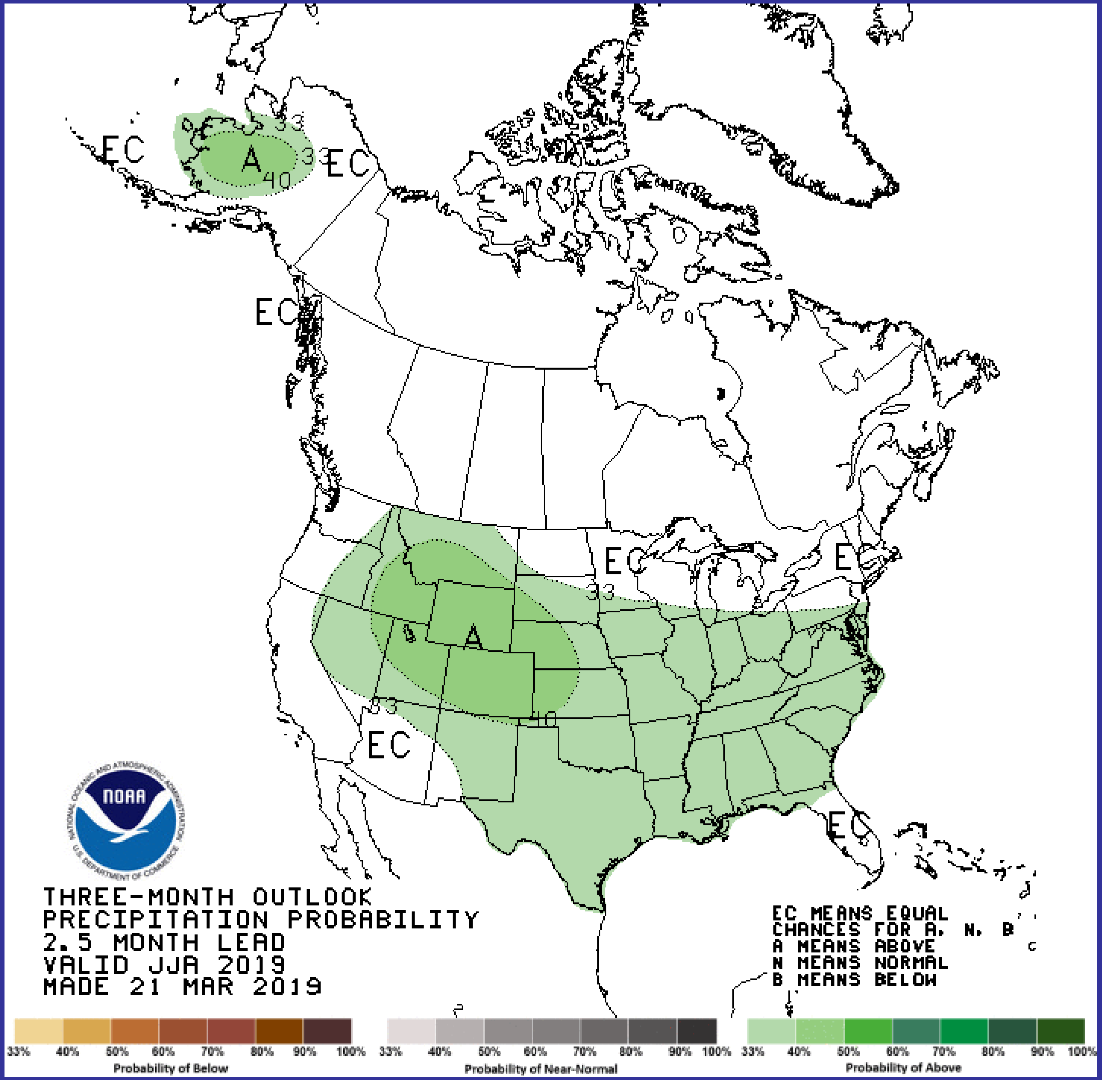
April 2019 Streamflow Forecast



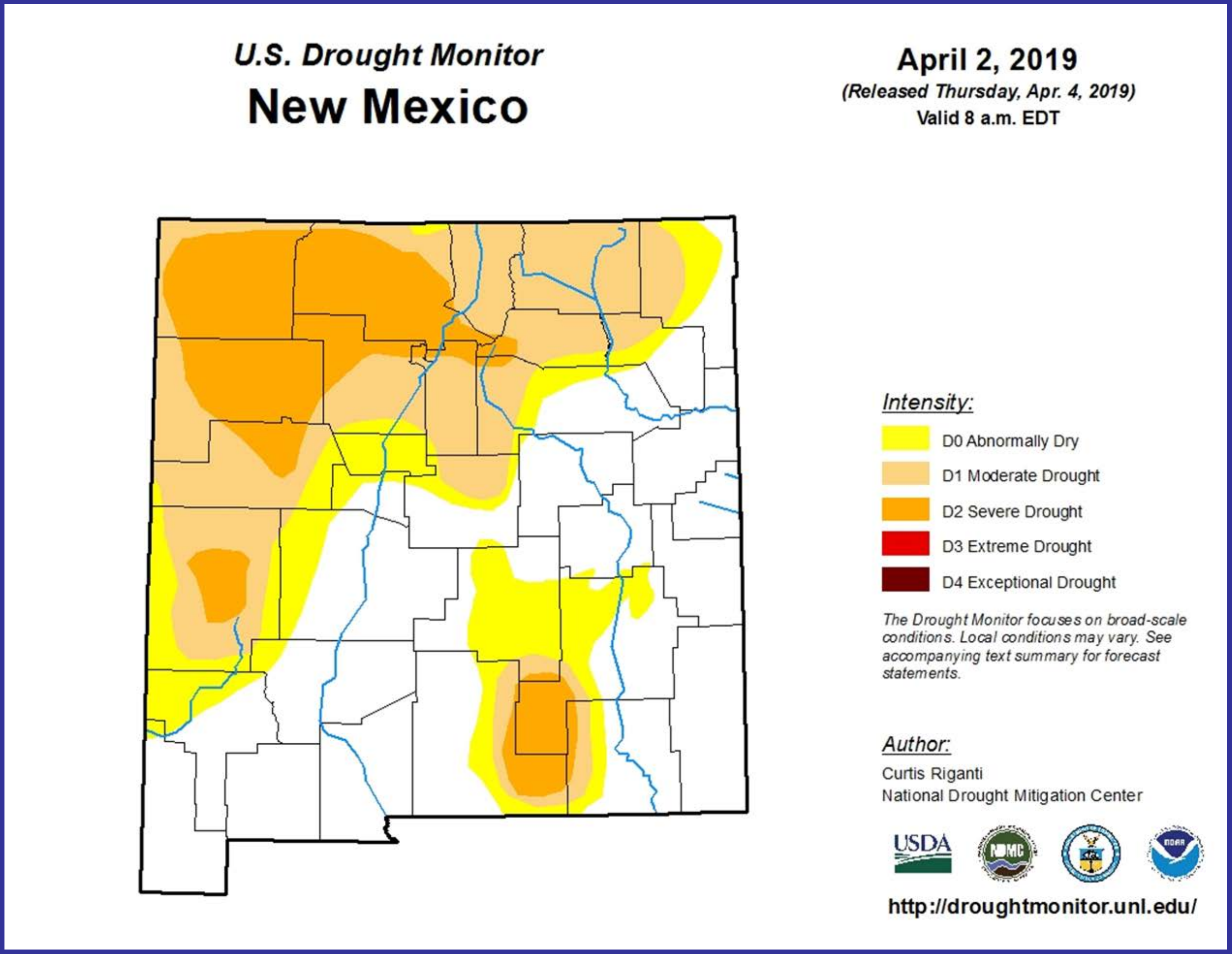
Monsoon Season Temperature Outlook



Monsoon Season Precipitation Outlook



New Mexico Drought Monitor



2019 Water Operations Modeling

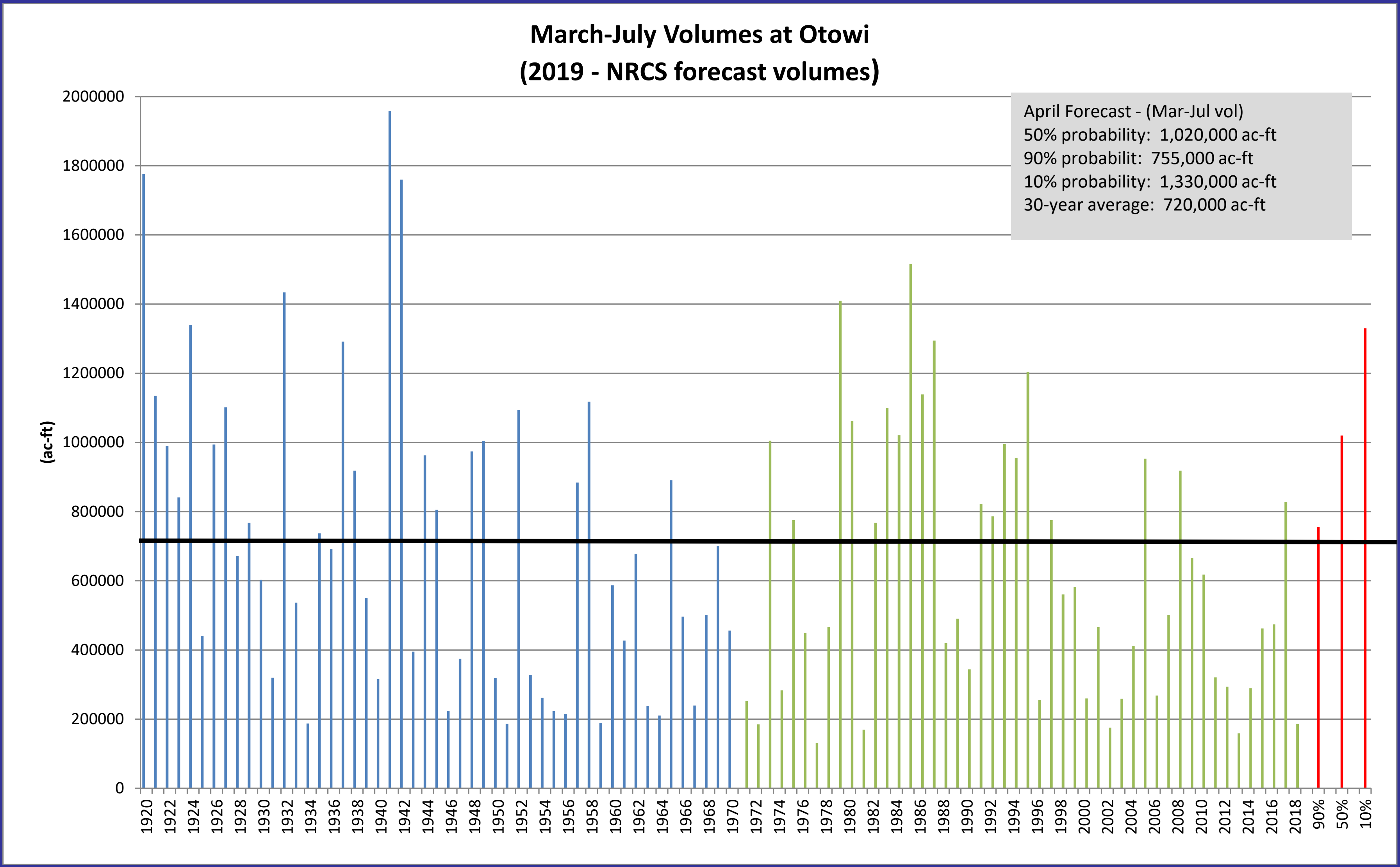
Major Assumptions / Results

- April 1 50% most probable forecast
- Storage of water for Prior & Paramount lands
- Out of Article VII restrictions by May
- MRGCD only stores 40,000 ac-ft while out of Article VII restrictions

April Forecast Data

	Most Probable Percent of Average		April 1 50% Probability Volume, ac-ft
	2018	2019	2019
Rio Grande nr Del Norte	50%	140%	720,000
El Vado Reservoir Inflow	18%	142%	320,000
Rio Grande at Otowi	20%	142%	1,020,000
Nambe Reservoir Inflow	24%	114%	7,400
Jemez blw Jemez Dam	6%	138%	47,000
Rio Blanco @ Diversion	48%	137%	74,000
Navajo River @ Diversion	46%	131%	85,000

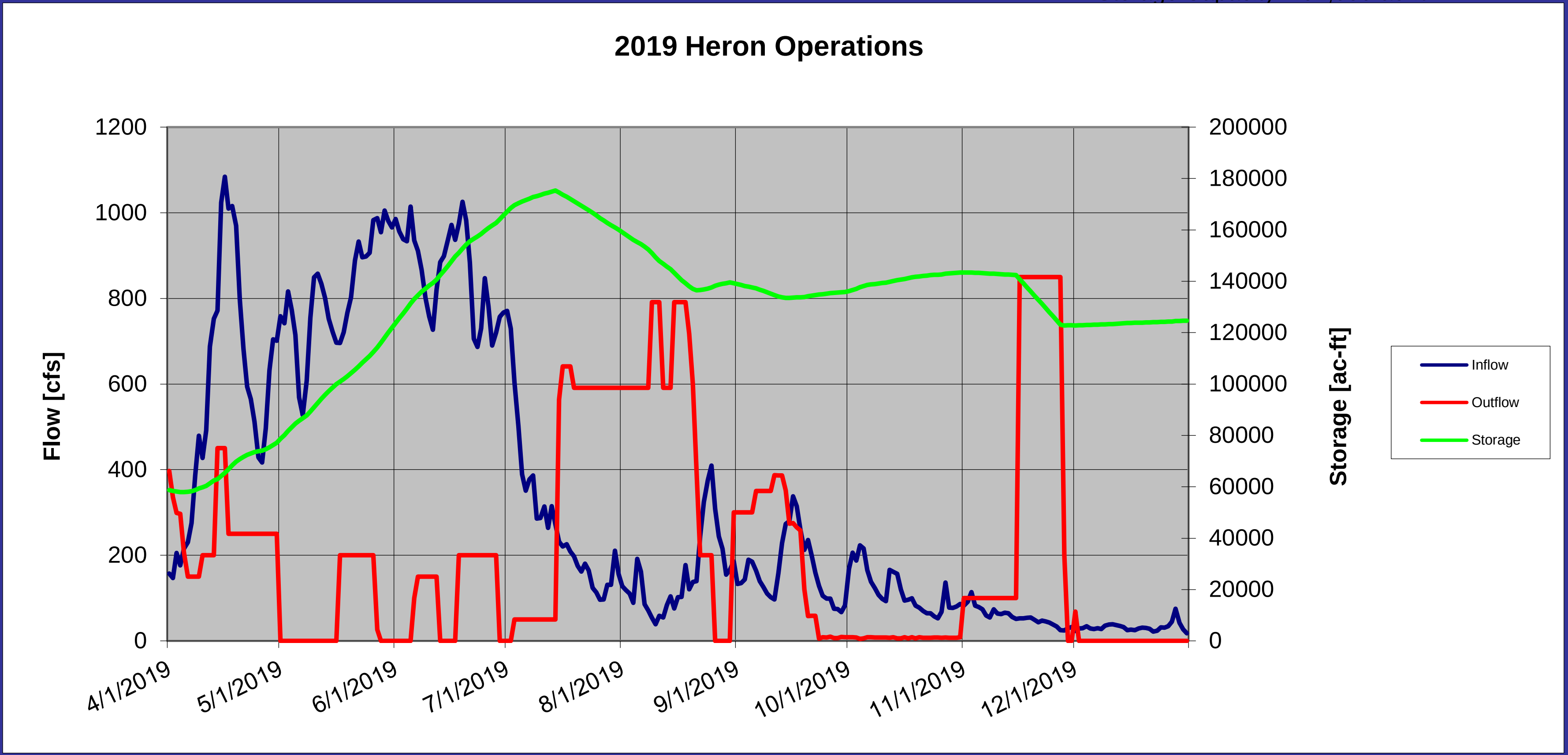
Historic Mar-Jul Flow Volumes at Otowi



Heron Reservoir 2019

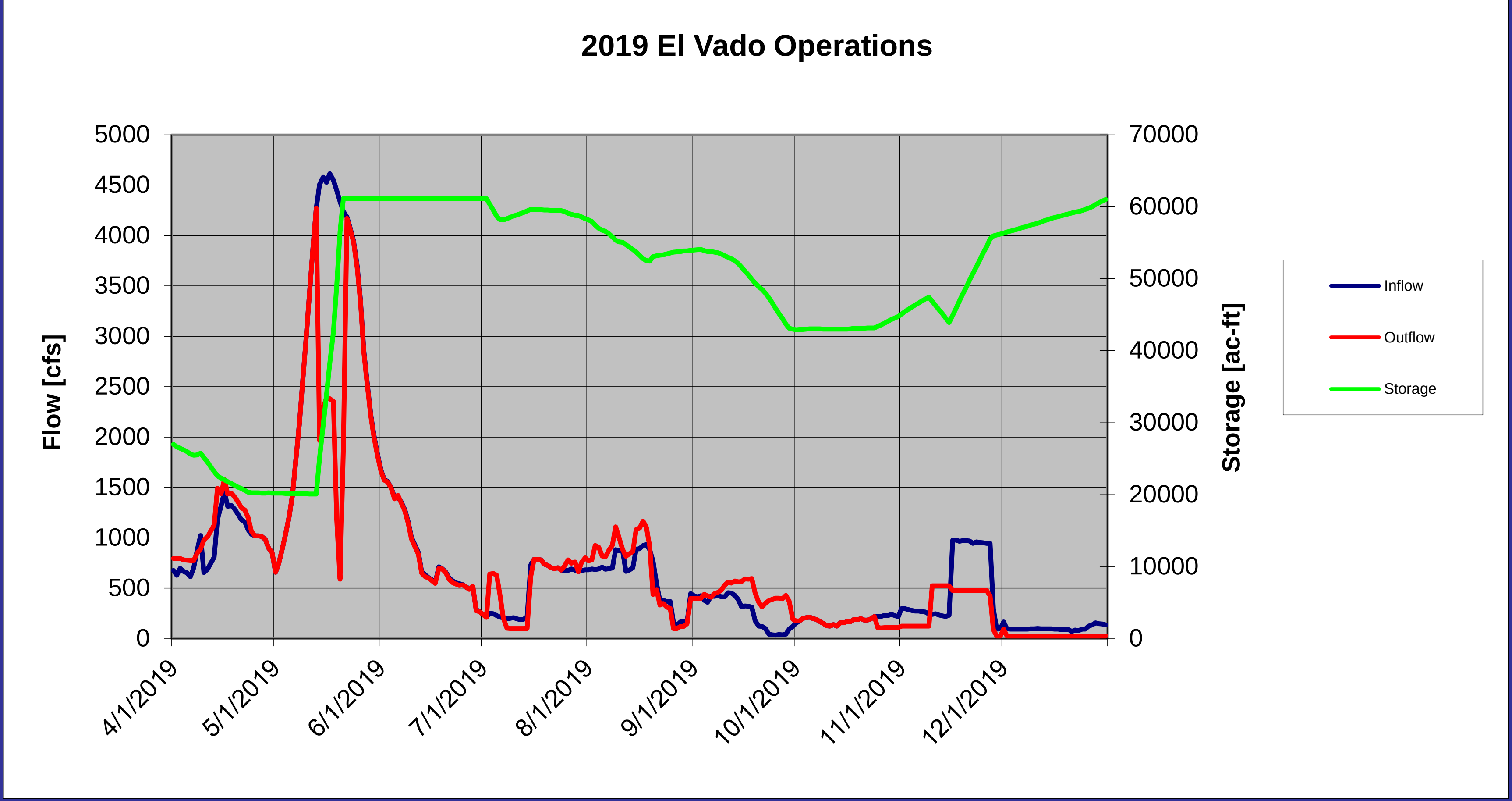
Proposed 2019 Heron Operations

Storage Capacity=401,000 ac-ft



El Vado Reservoir 2019

Proposed 2019 El Vado Operations



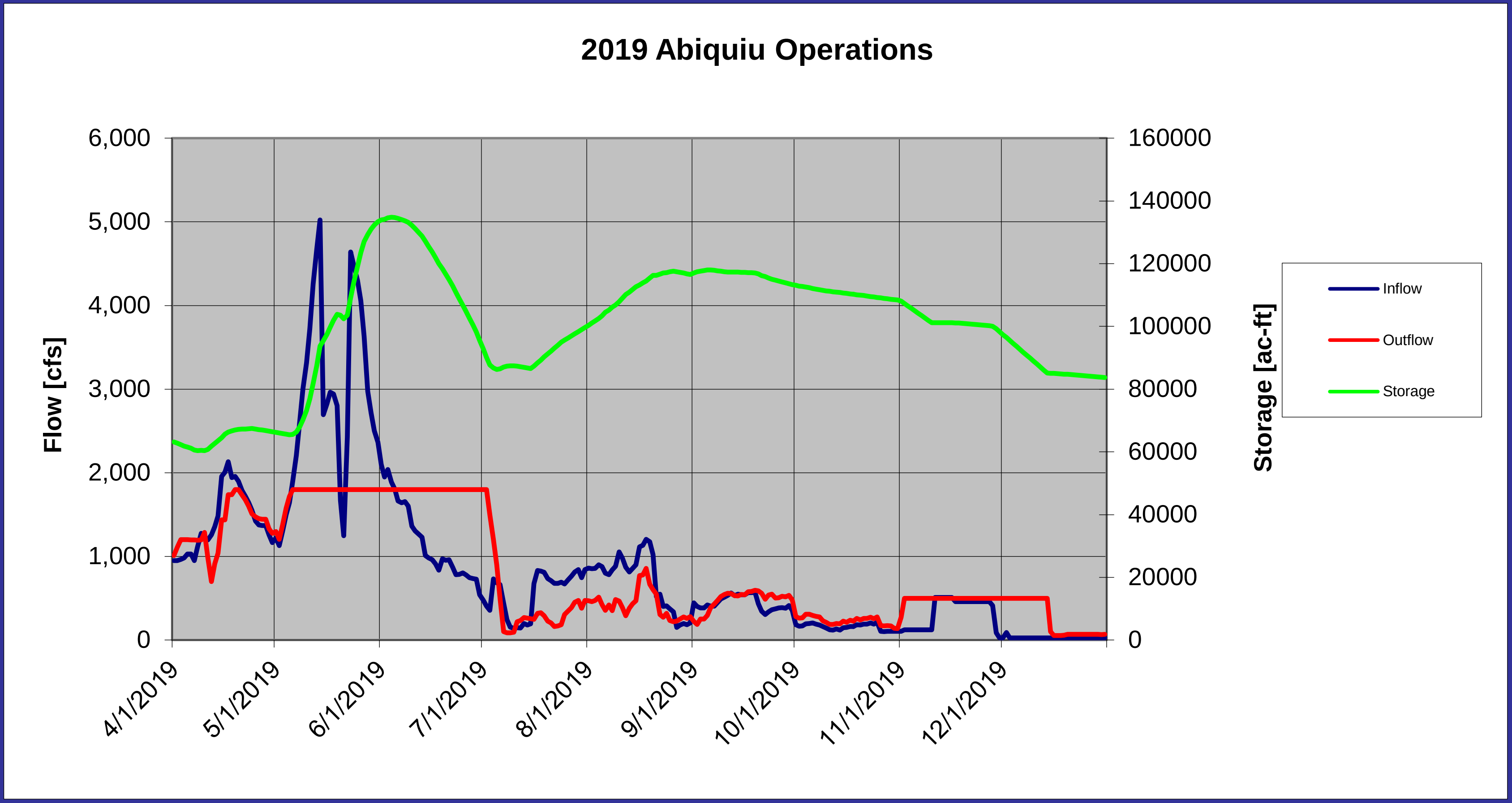
El Vado Dam Corrective Action

- Built by MRGCD 1934, rehabilitated by Reclamation 1954-55; new outlet works built by Reclamation 1965-66 to for San Juan-Chama Project water.

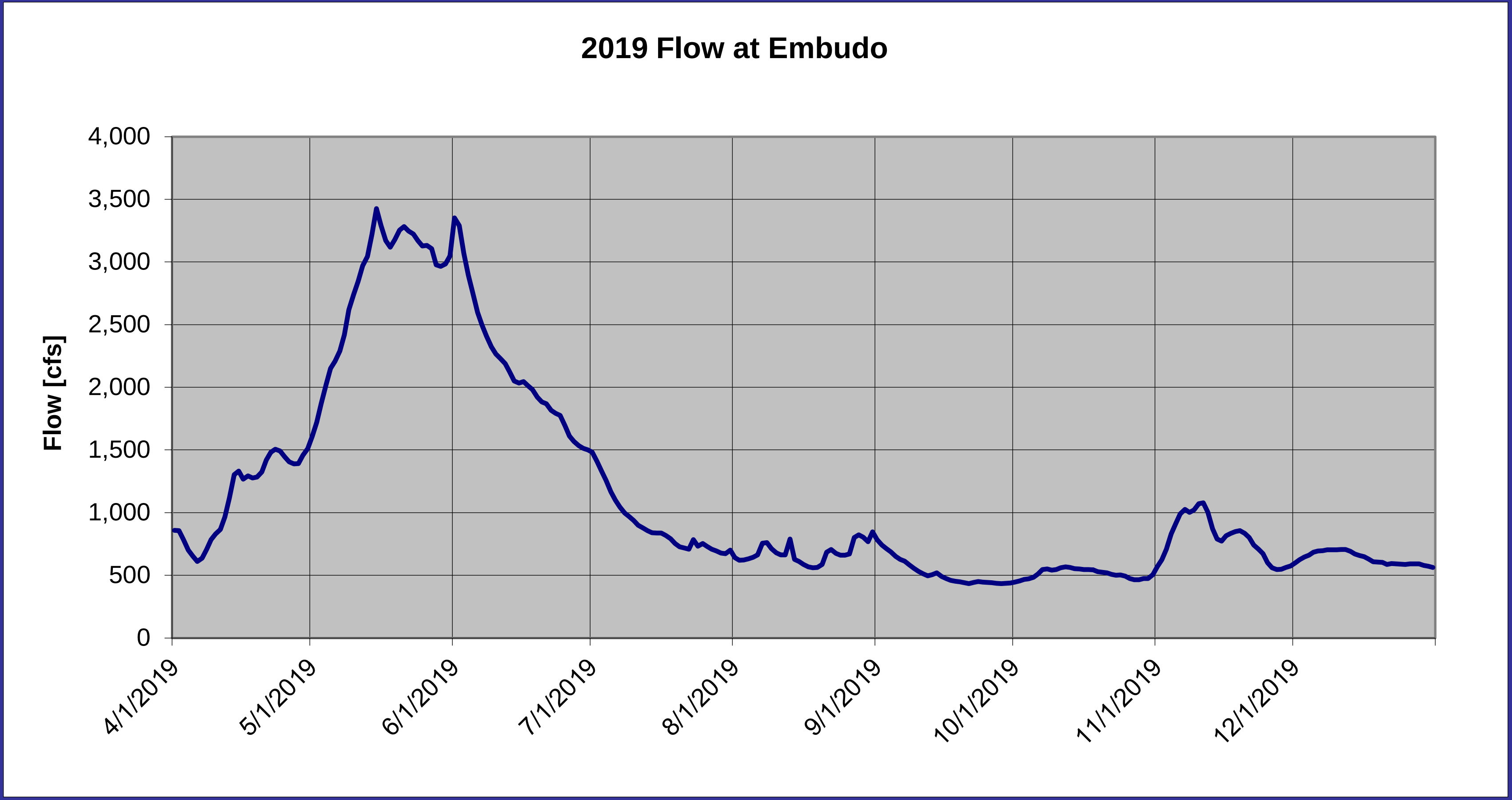
- Preparing for spillway repair or replacement.
- In final stages of evaluating options to stop erosion in dam embankment.
  - Option 1: Geomembrane
  - Option 2: Removal and replacement
  - Option 3: Embankment cut off wall
- Flows during construction being looked at to ensure impacts to water users and water storage adequately addressed.
- Duration of construction estimated at approximately 2 years for both spillway design and steel facing of dam and left abutment.

Abiquiu Lake 2019

Proposed 2019 Abiquiu Operations

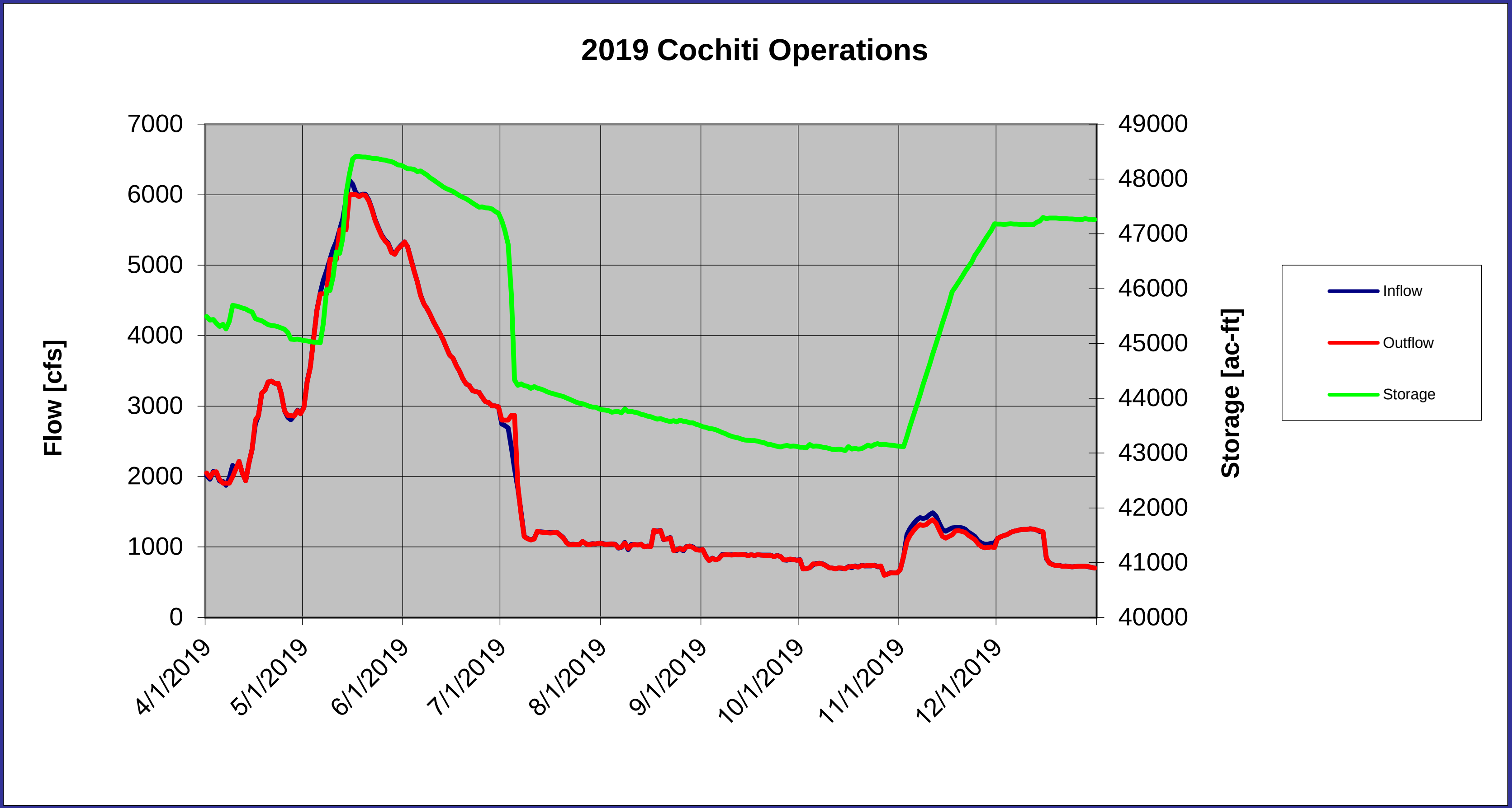


Estimated Hydrograph at Embudo

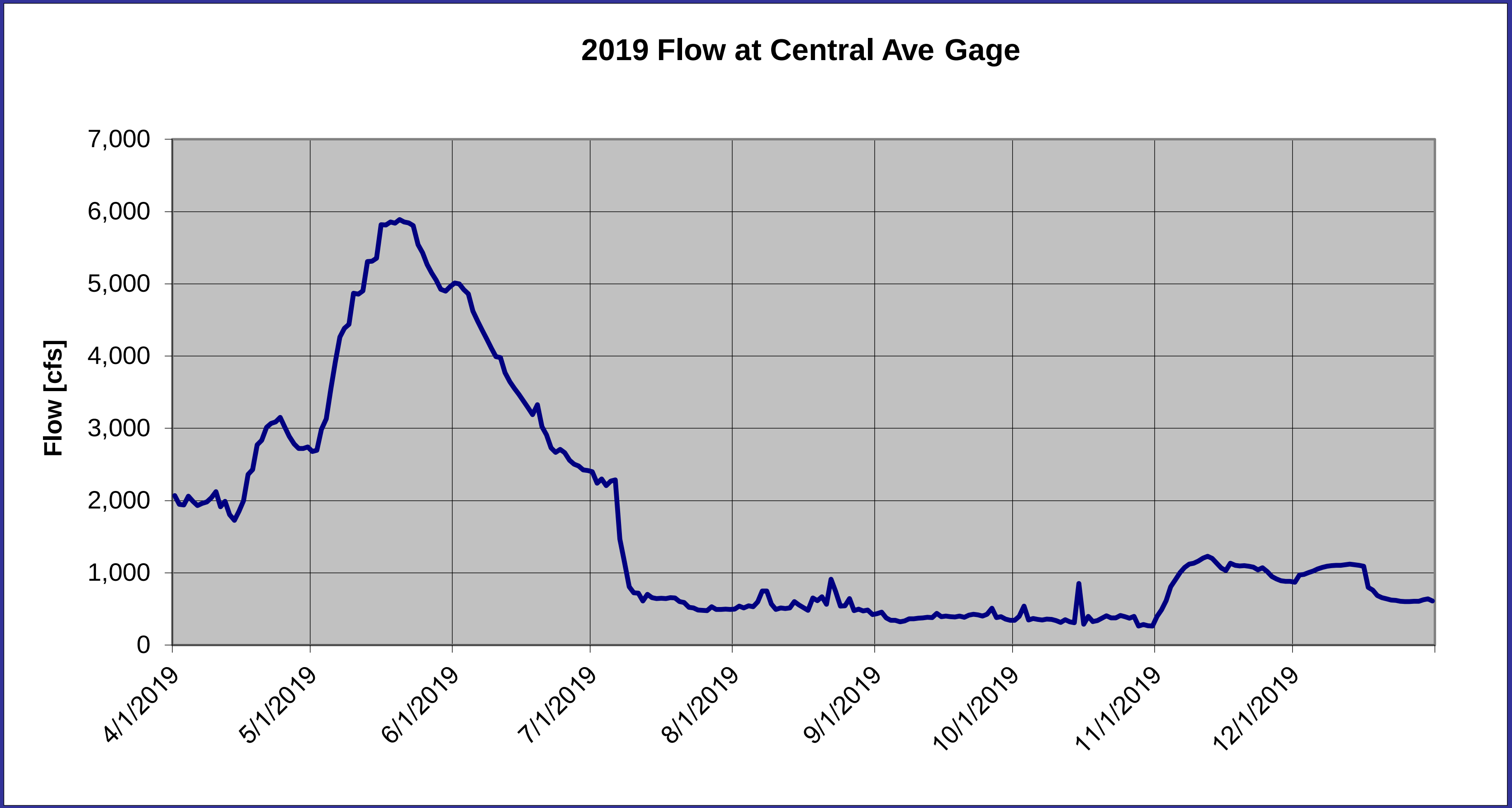


Cochiti Lake 2019

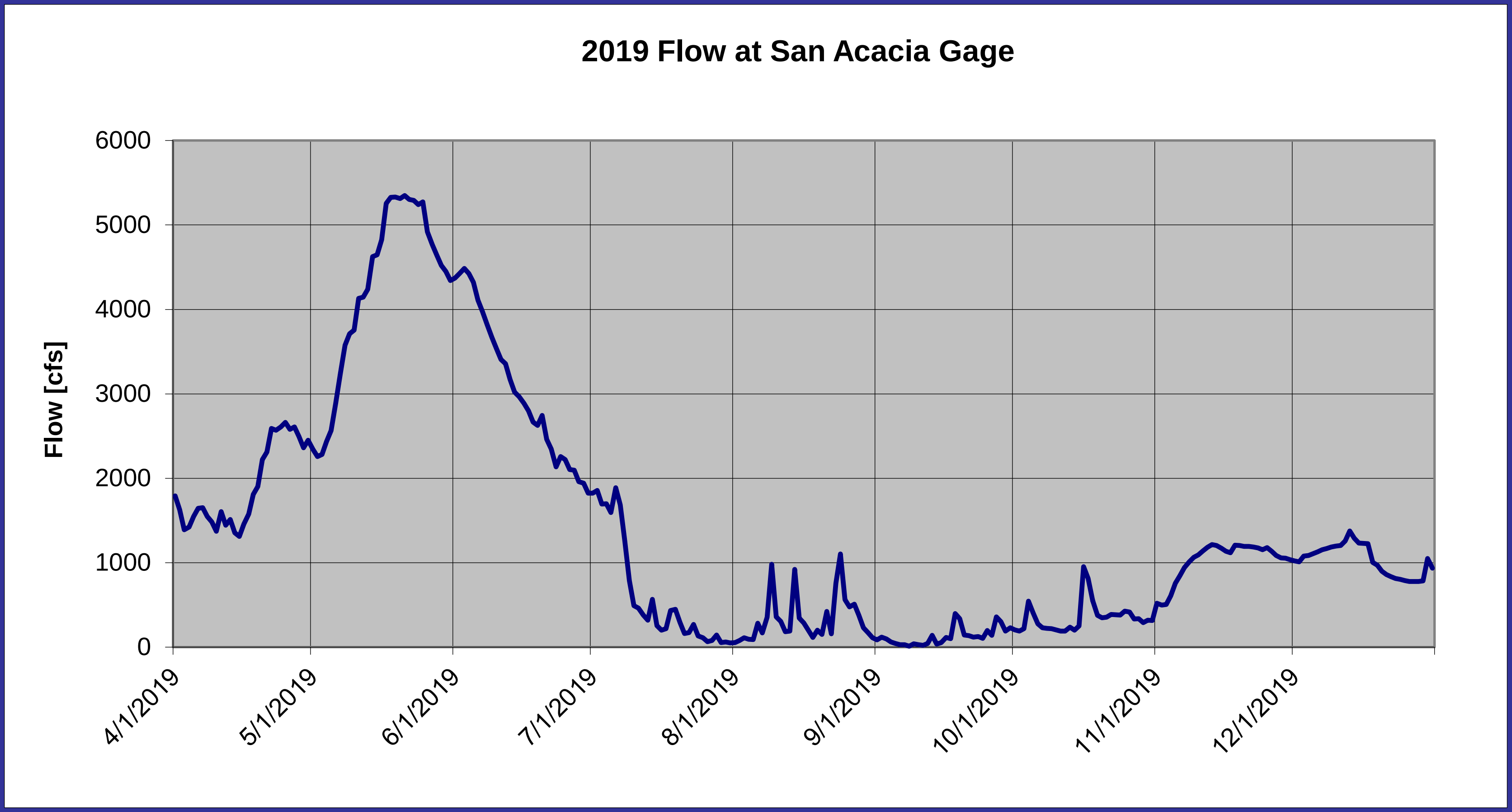
Proposed 2019 Cochiti Operations



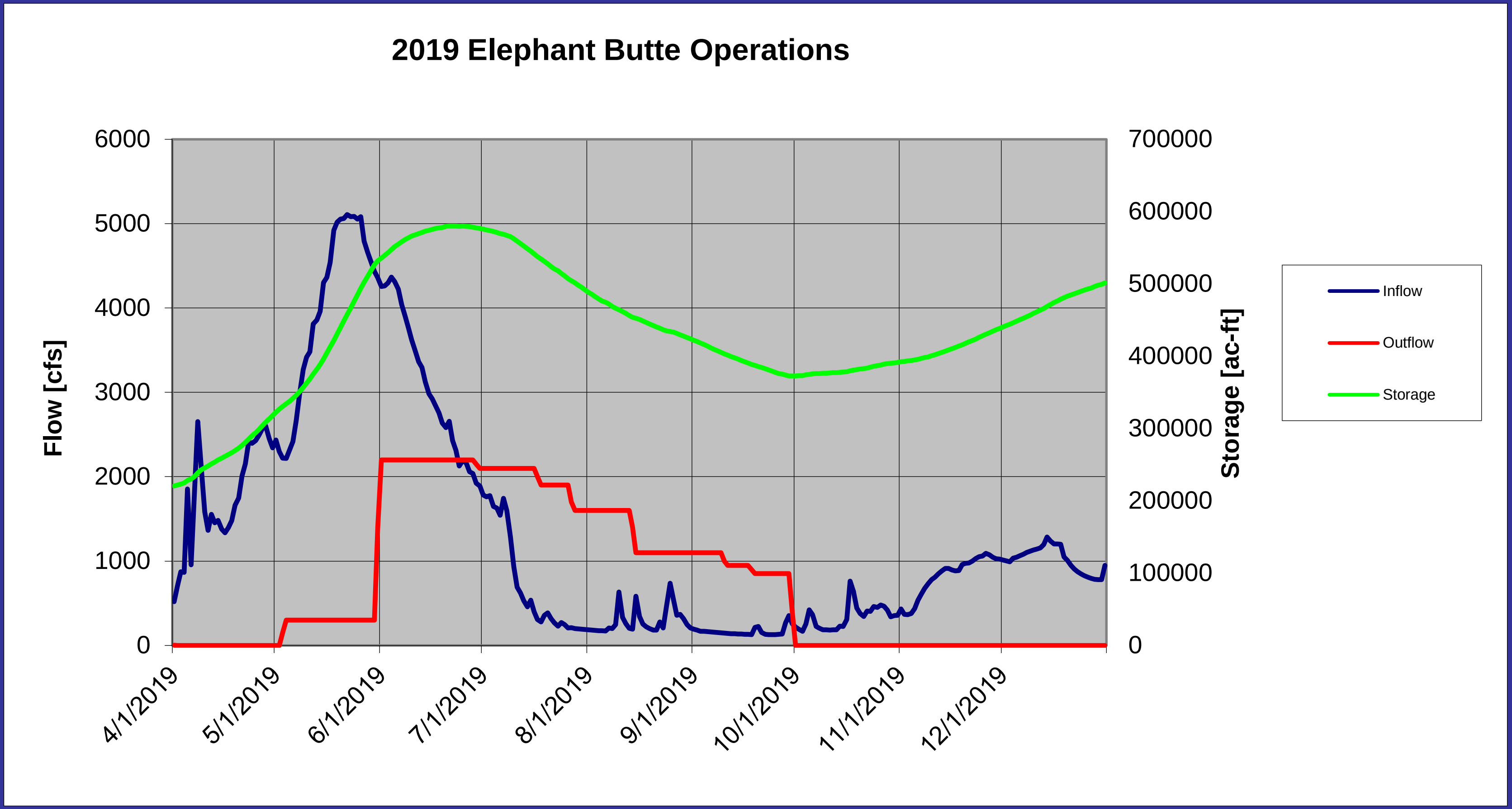
Estimated Hydrograph at Central Ave.



Estimated Hydrograph at San Acacia



Proposed Elephant Butte Operations



Proposed Caballo Operations