FOLSOM JOINT FEDERAL PROJECT

FORECAST OPERATIONS STUDY

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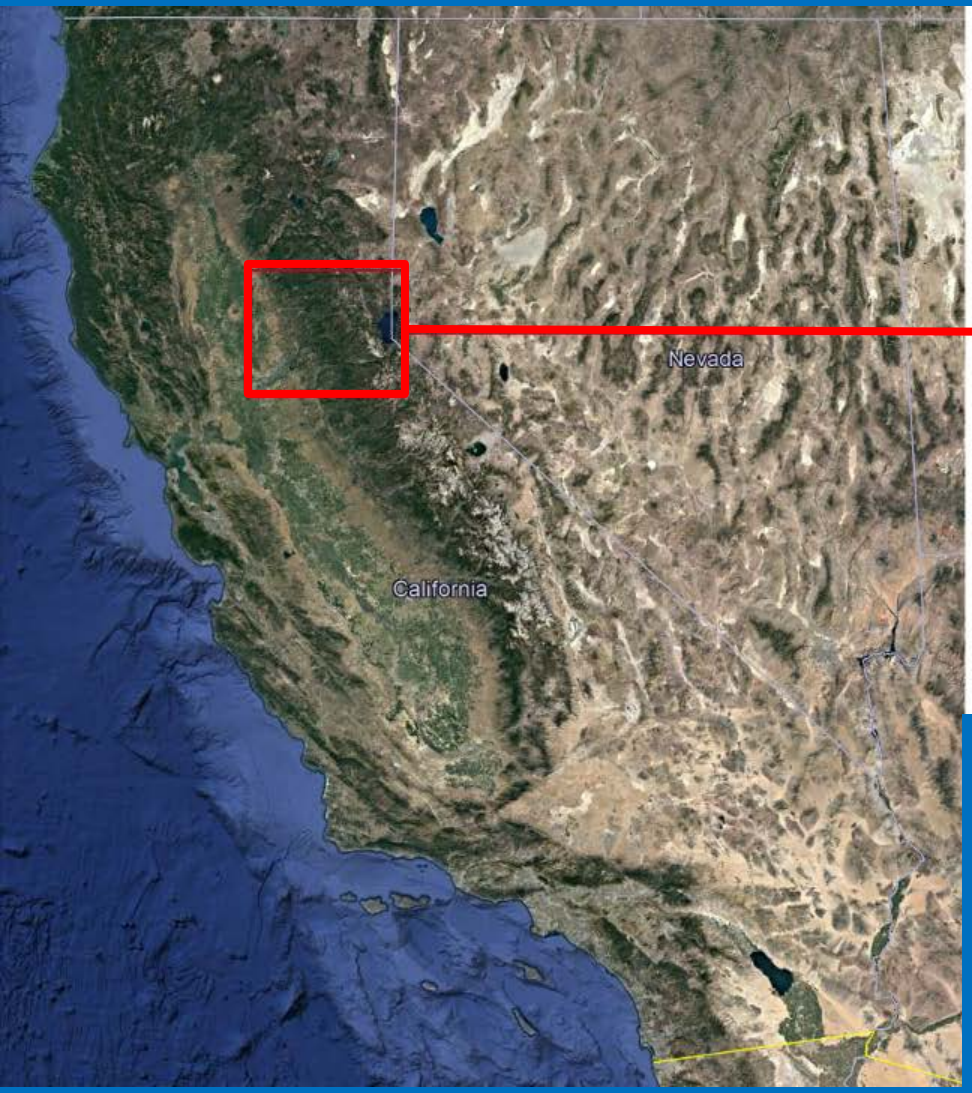
NOAA
NATIONAL WEATHER SERVICE
U.S. DEPARTMENT OF COMMERCE-NOAA
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
RECLAMATION
Managing Water in the West
DEPARTMENT OF WATER RESOURCES
STATE OF CALIFORNIA
SAFCA
Sacramento Area Flood Control Agency

FOLSOM LAKE



Storage Capacity: 976,000 acre feet (1.204×10^9 m^3)

Watershed: 1,861 square miles (4,820 km^2)

Multi-Objective Reservoir

High Refill Potential

Upstream of Urban Area - Sacramento

AMERICAN RIVER HYDROLOGIC MODEL

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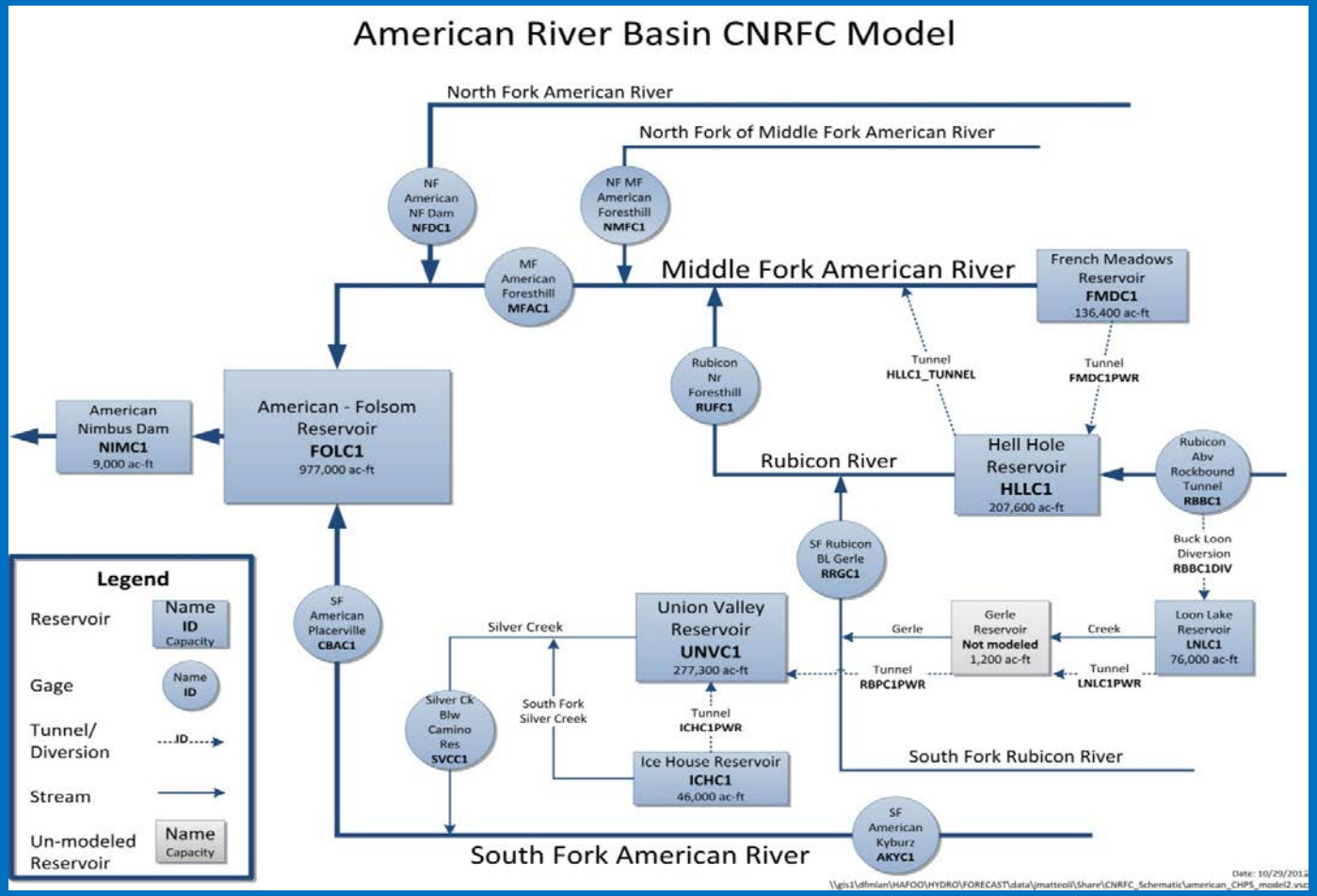


Hindcasting

Hindcast:

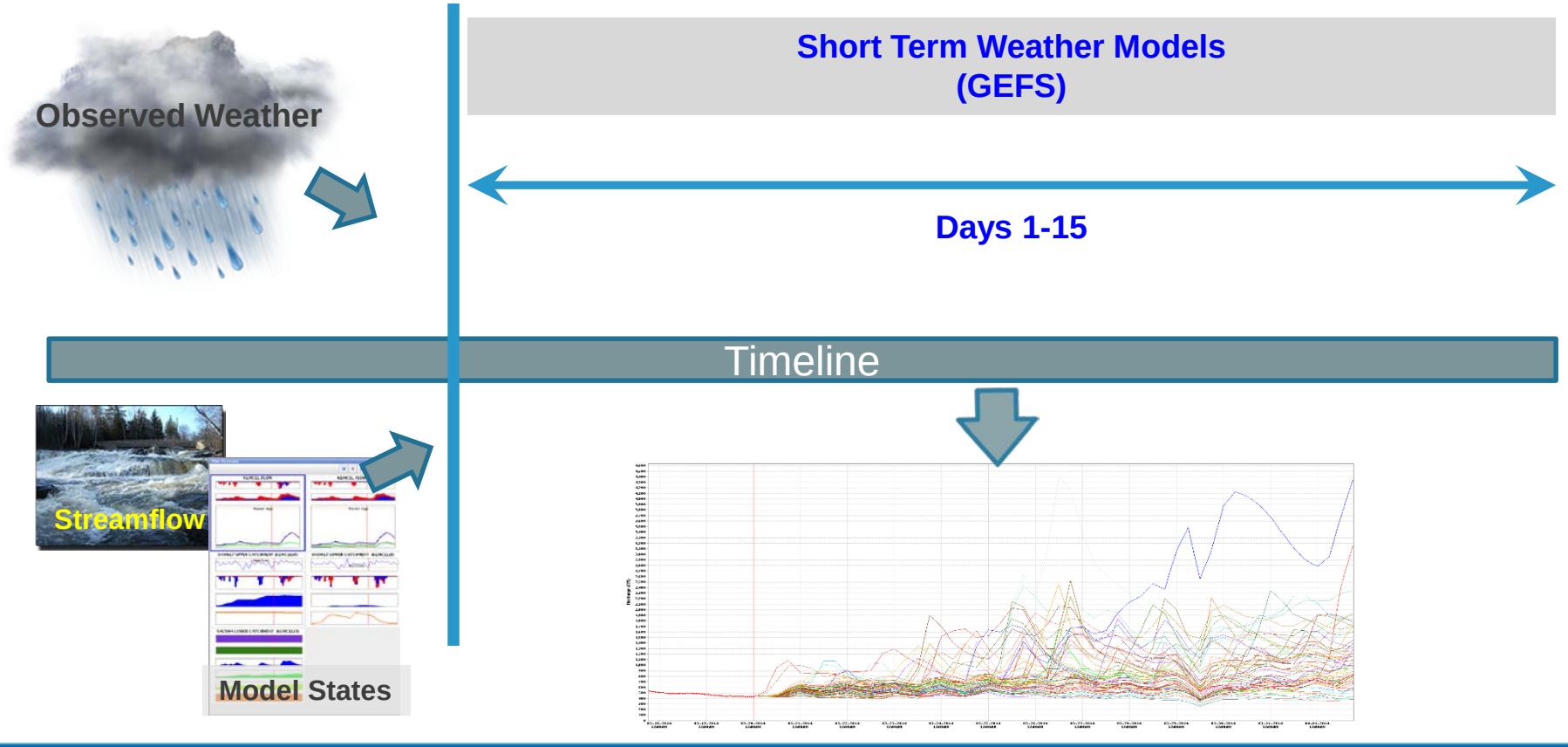
- *Ensemble forecast performed for historical time period using current forecasting methodology (1985-2010)*
- *Meteorological Ensemble Forecast Preprocessor (MEFP) using GEFSv10 precip and temp*
- *Run the forcings through our hydrologic models*

Value of Hindcasts:

Provide a large and consistent sample for verification

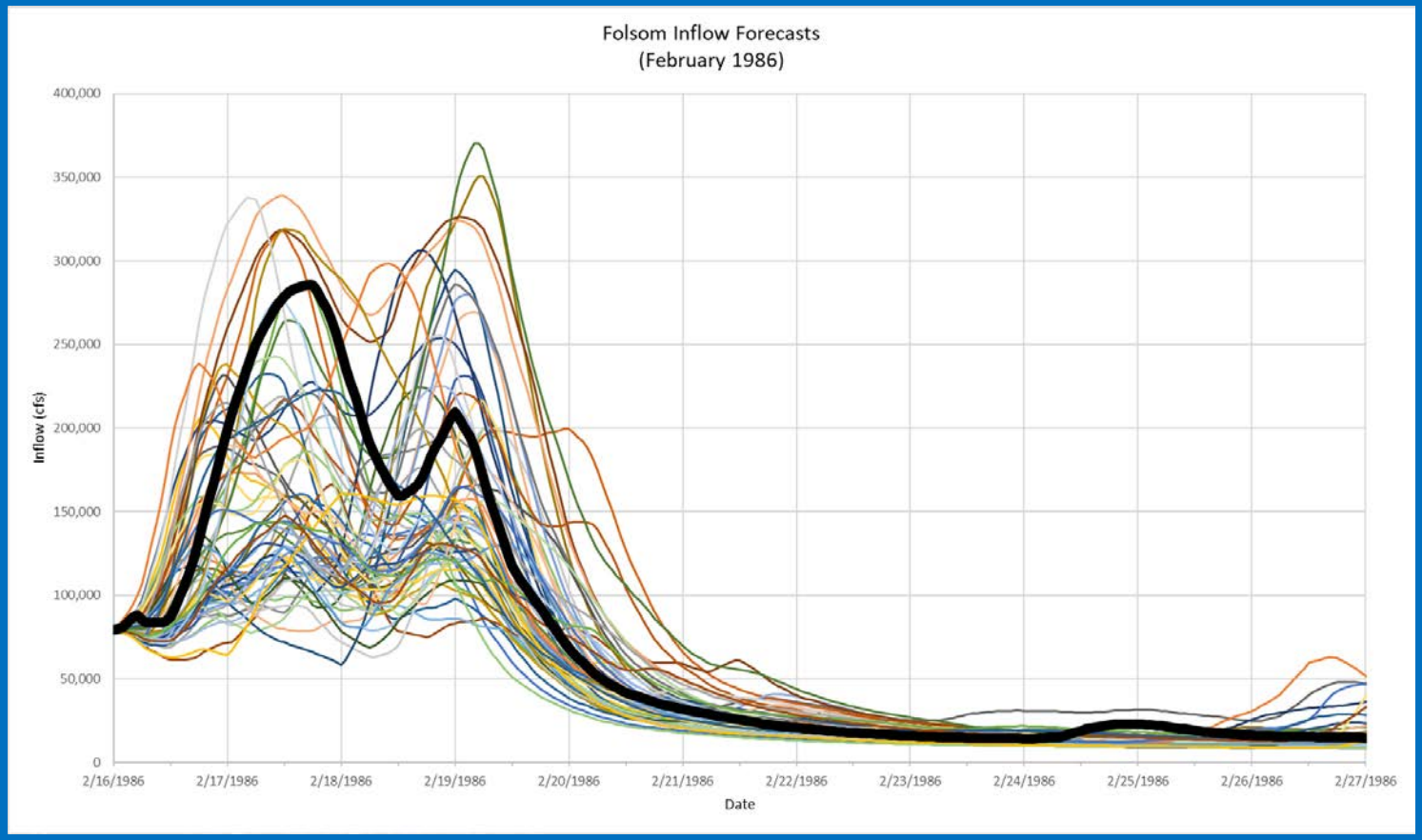
Bottom Line: demonstrate forecast quality/reliability

ENSEMBLE RIVER FORECASTS

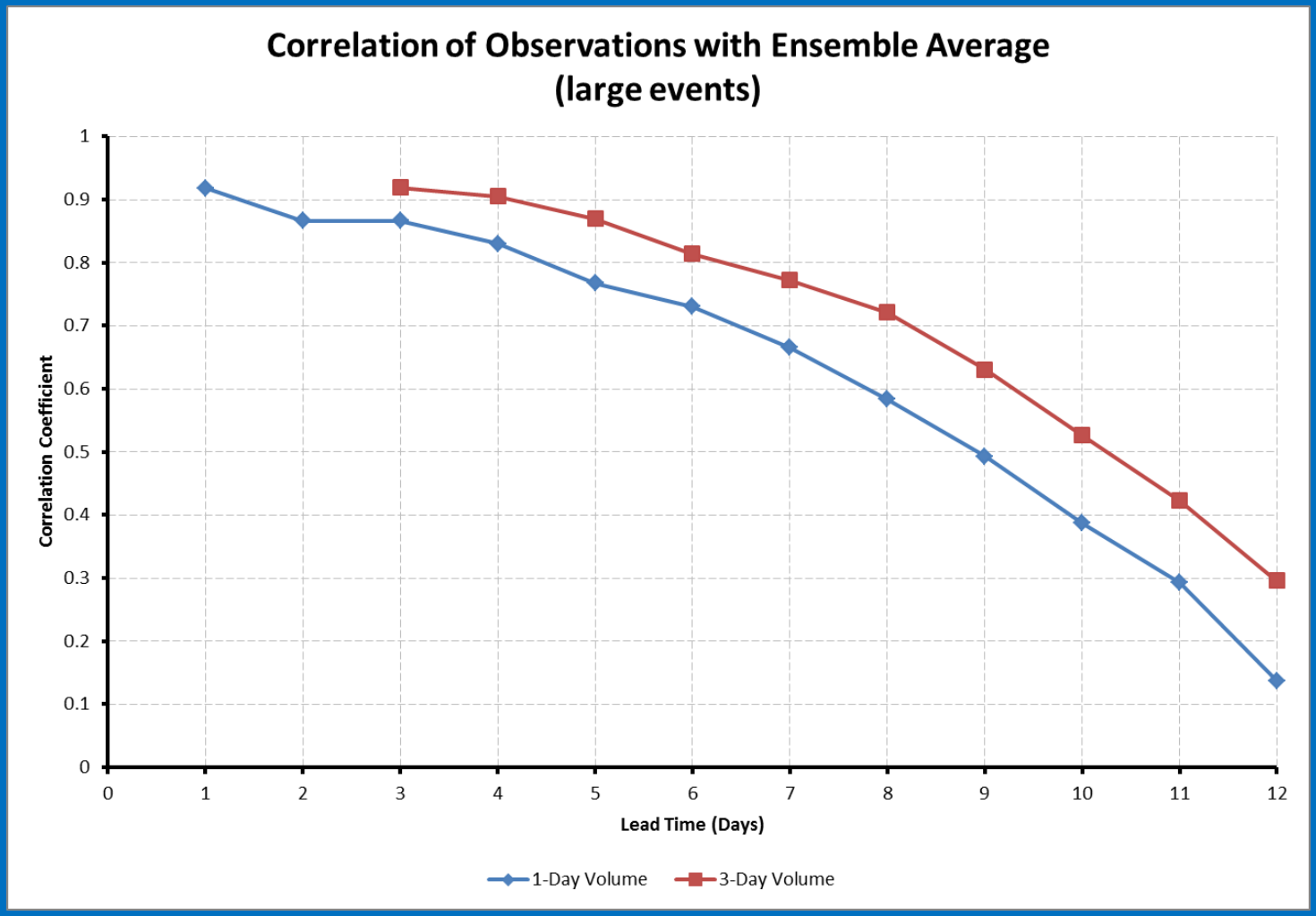


HINDCAST FINAL PRODUCTS

- *Hourly ensemble inflow forecasts to Folsom*
  - *61 traces per day*
- *Daily forecasts for 1985-2010*

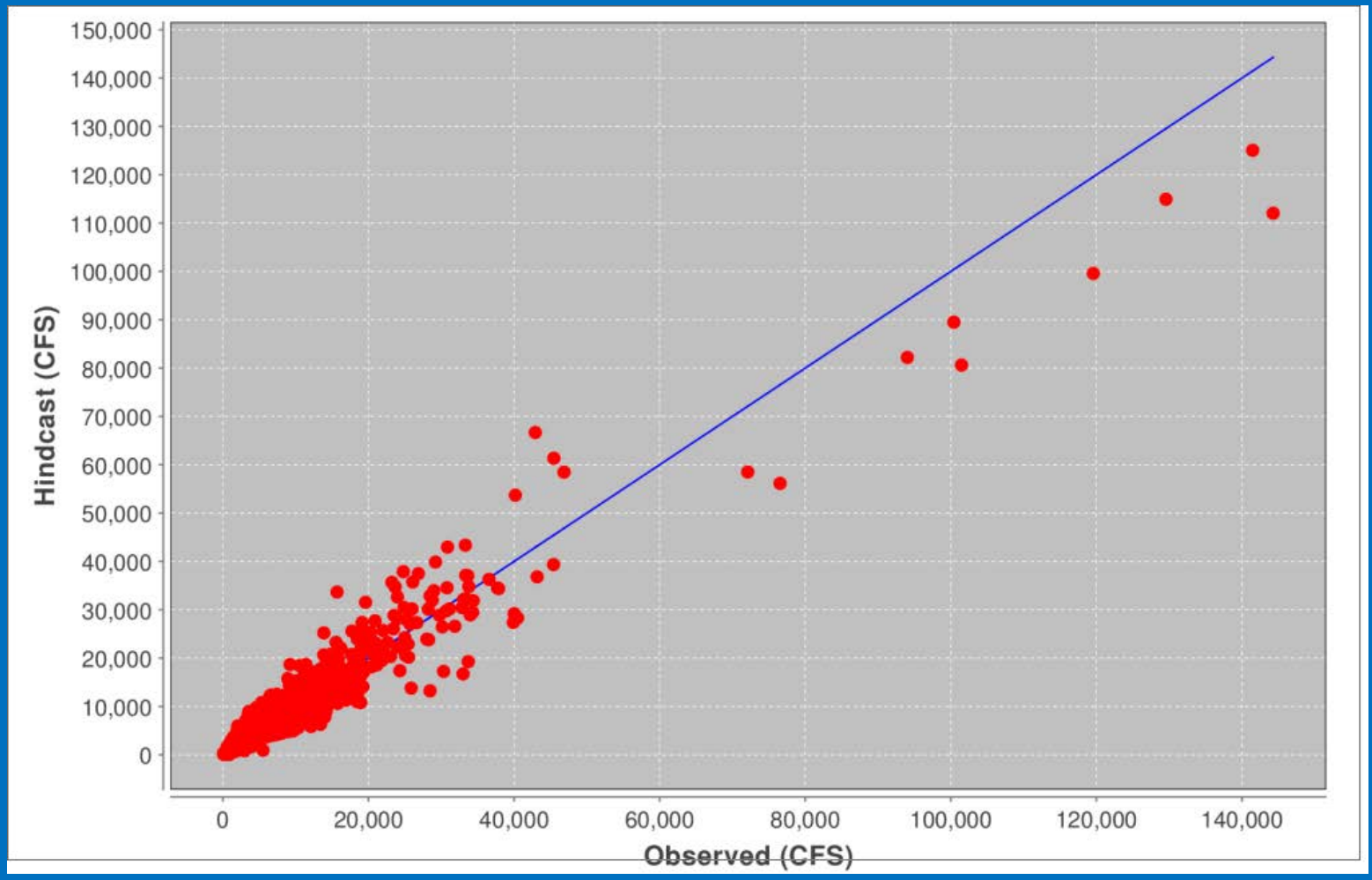


HINDCAST VERIFICATION OF RESULTS



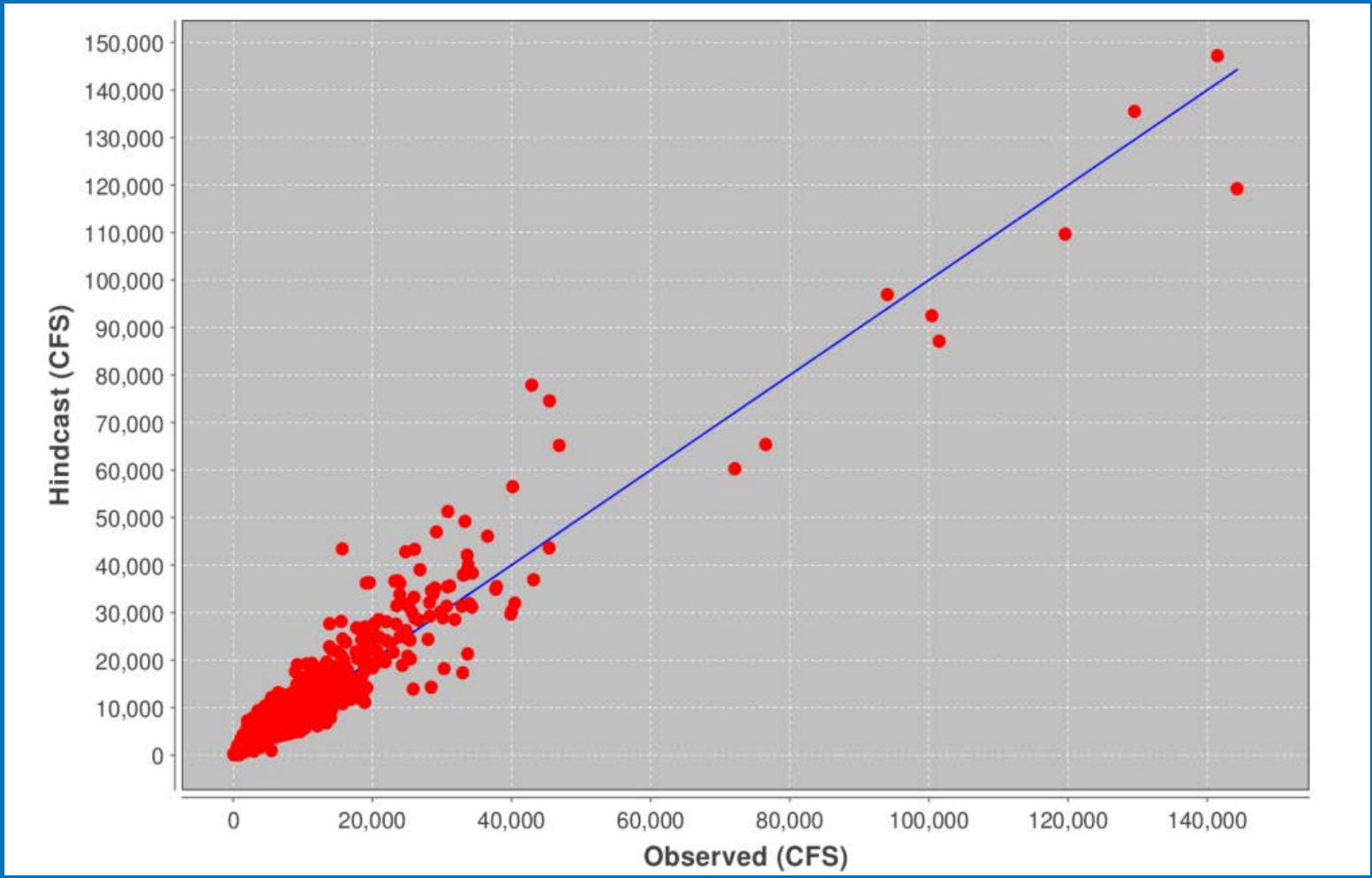
FOLSOM 3-DAY AVERAGE FLOW

(MEAN ENSEMBLE FORECAST VS. OBSERVED)

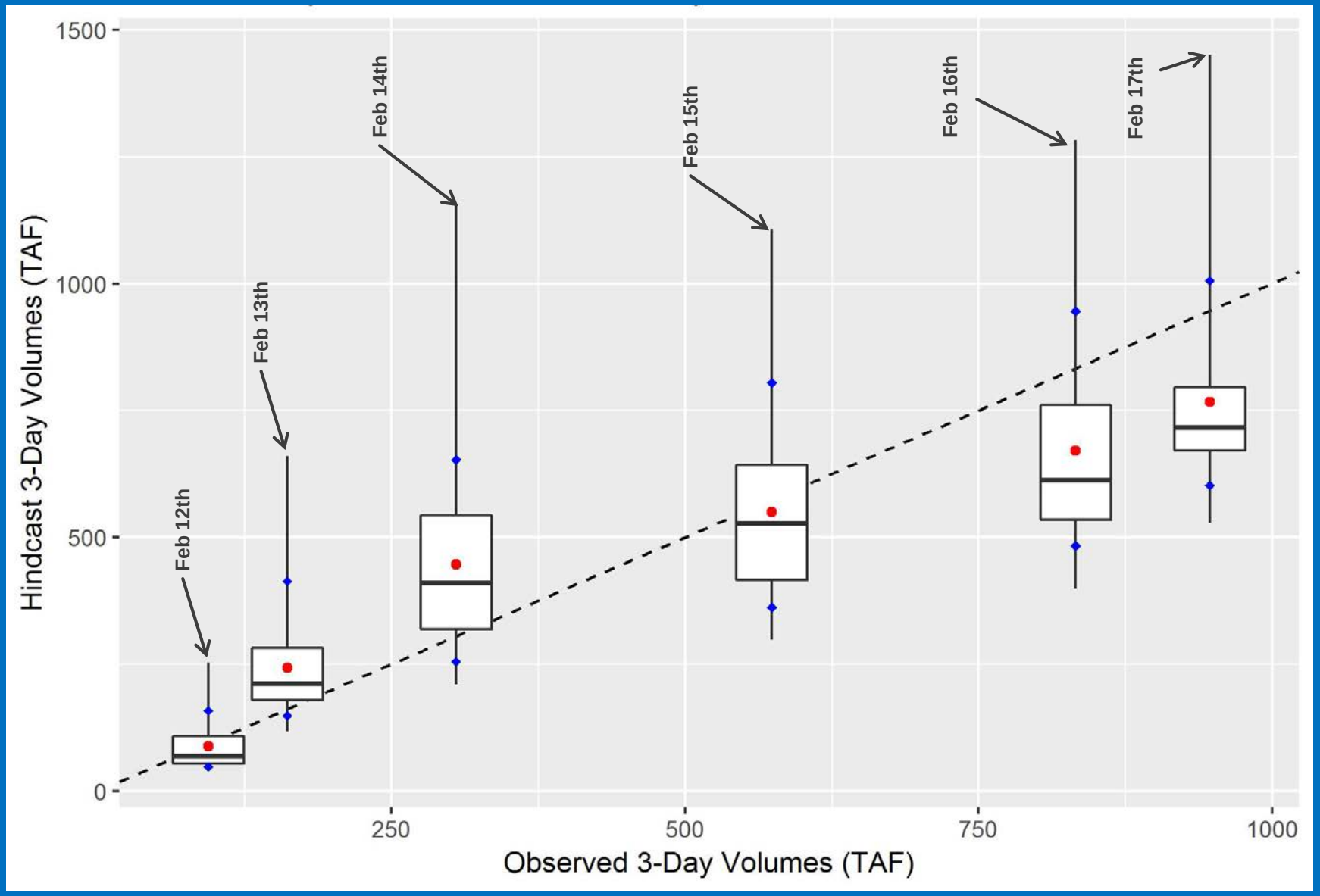


FOLSOM 3-DAY 25% EXCEEDENCE FLOW

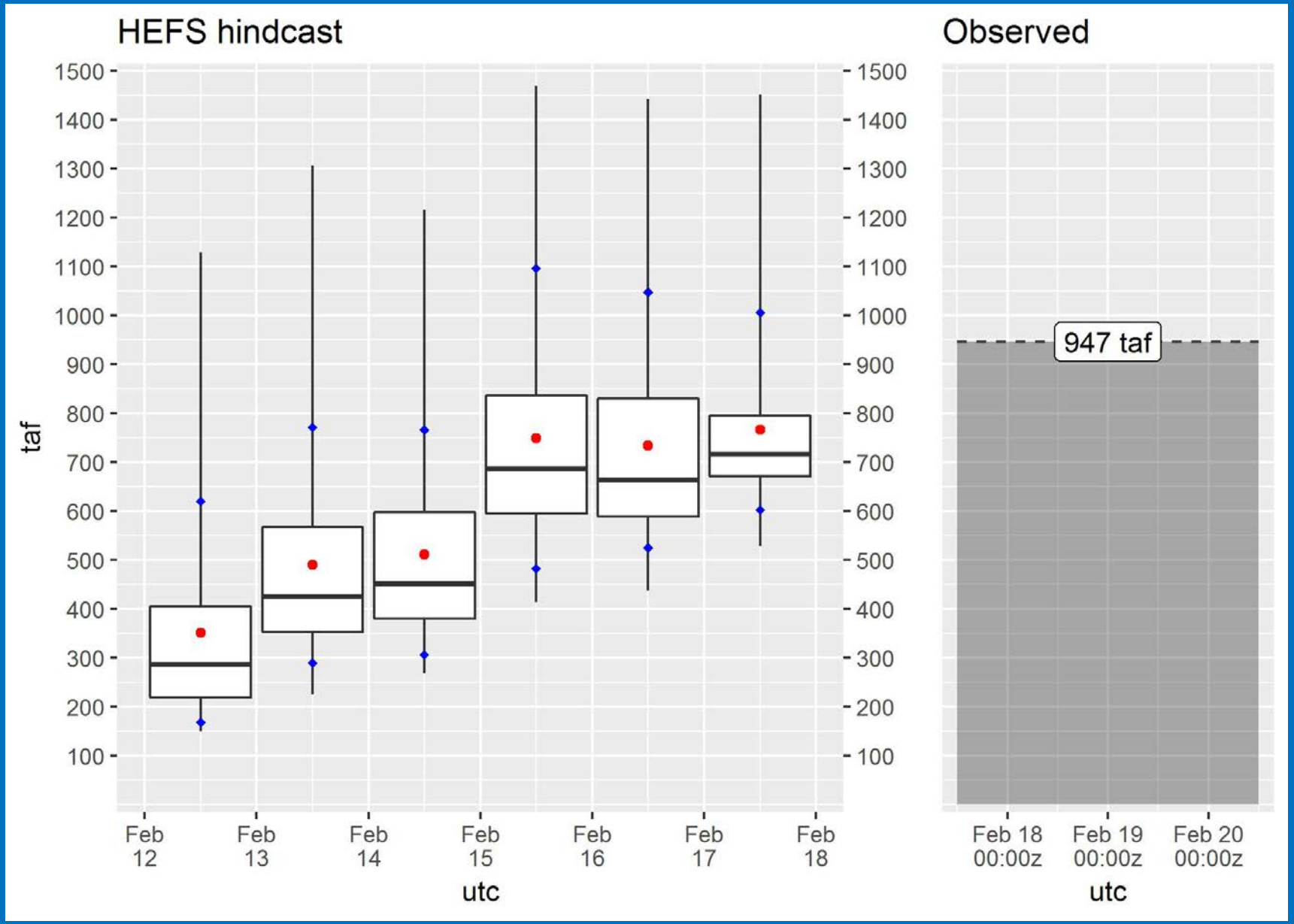
(MEAN ENSEMBLE FORECAST VS. OBSERVED)



FOLSOM 1986 3-DAY INFLOW VOLUME

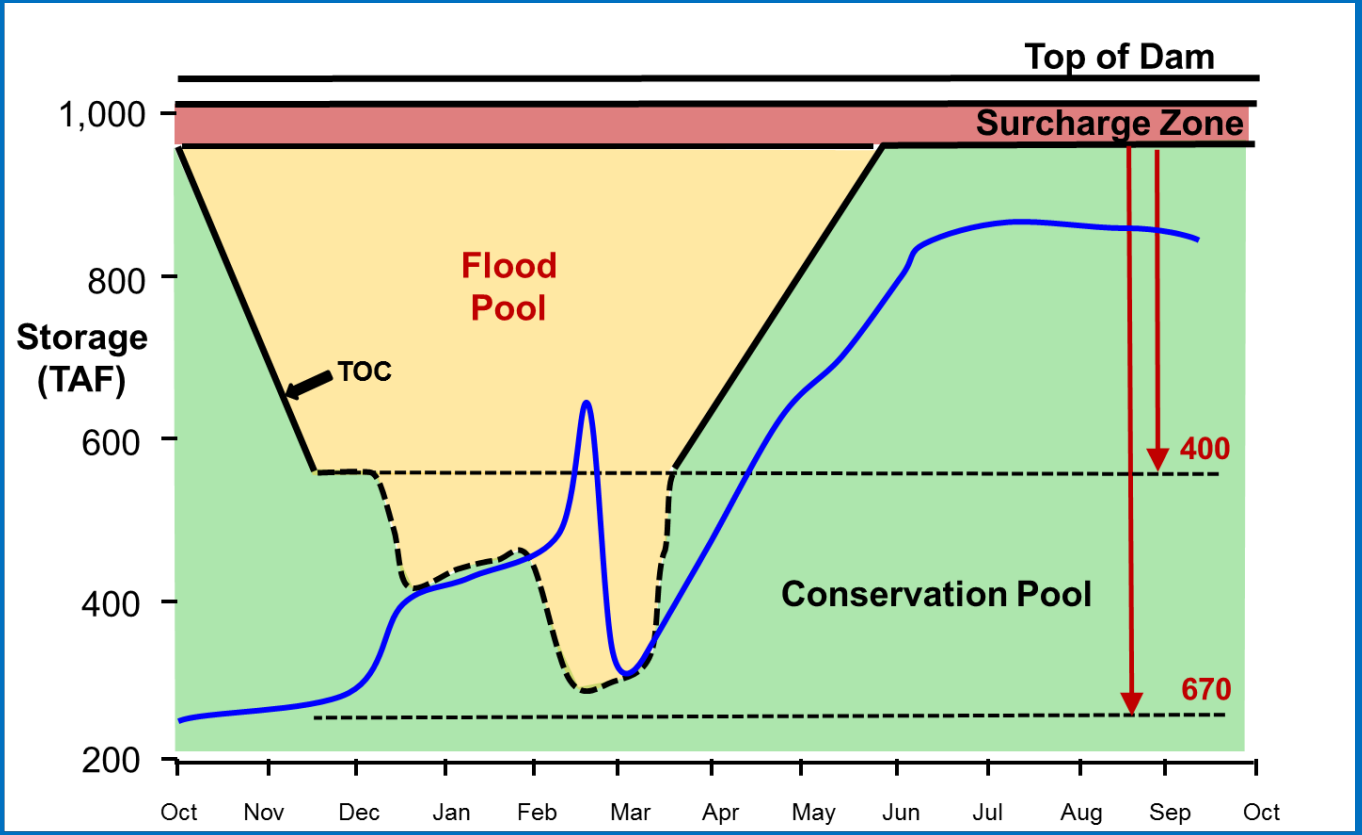


FOLSOM FEB18-20 (3-DAY) VOLUME FORECAST PROGRESSION



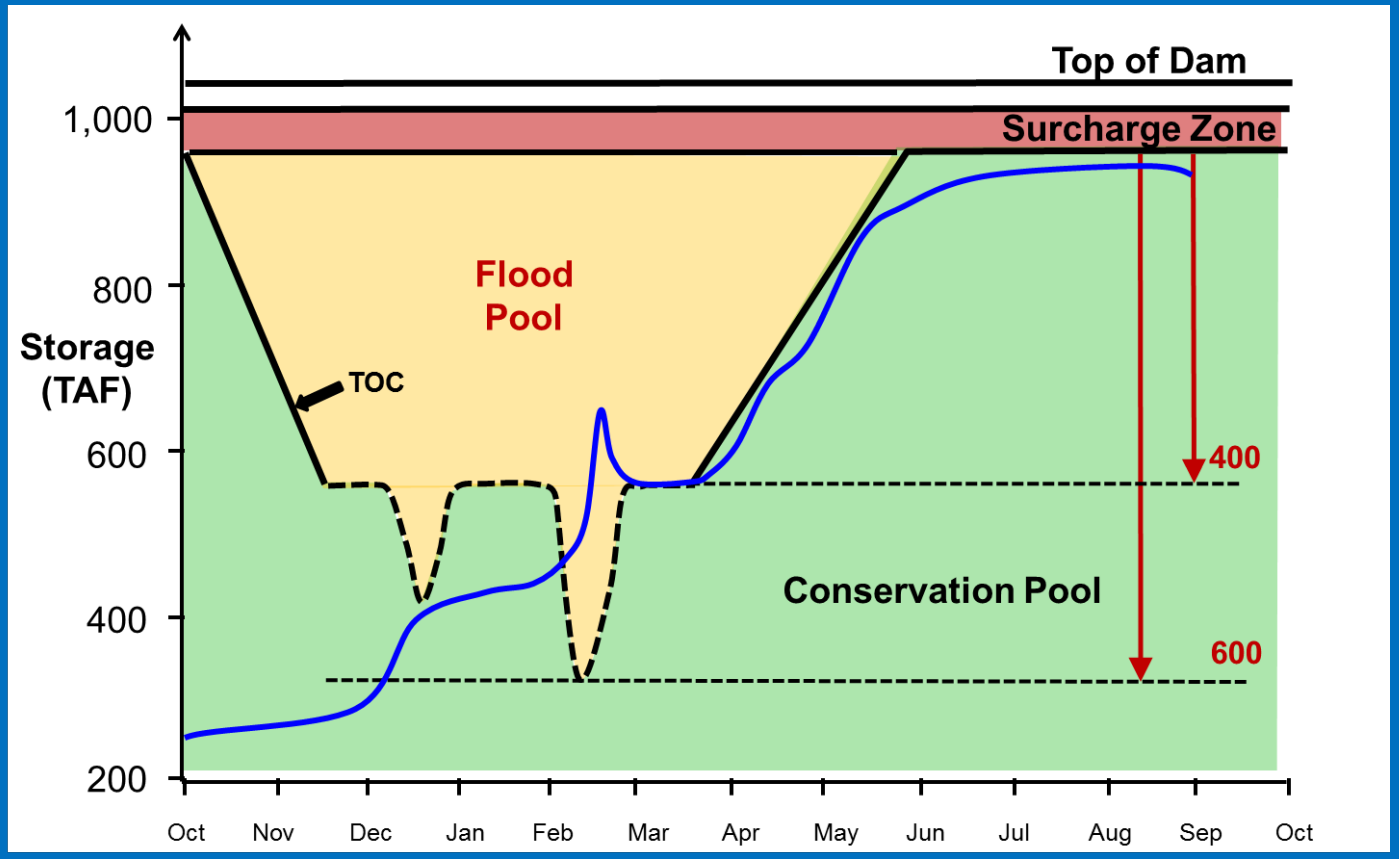
FLOOD MANAGEMENT PARADIGM SHIFT

- ***Old – Upstream Storage Credit***
  - *Conservative from a flood protection perspective*
  - *Precipitation measurements already "on the ground"*
  - *Leverage existing flood reserve space*



FLOOD MANAGEMENT PARADIGM SHIFT

- ***New***
  - *Harness forecasting technology*
  - *Increase flood preparation "Advanced-release"*
  - *Increase water supply use efficiency*

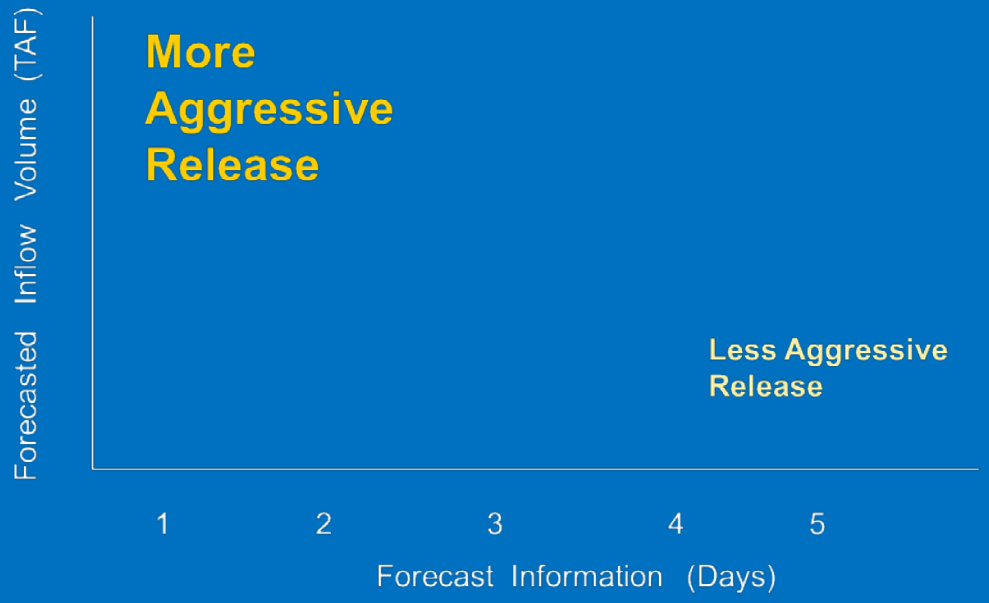


MANAGEMENT GOALS

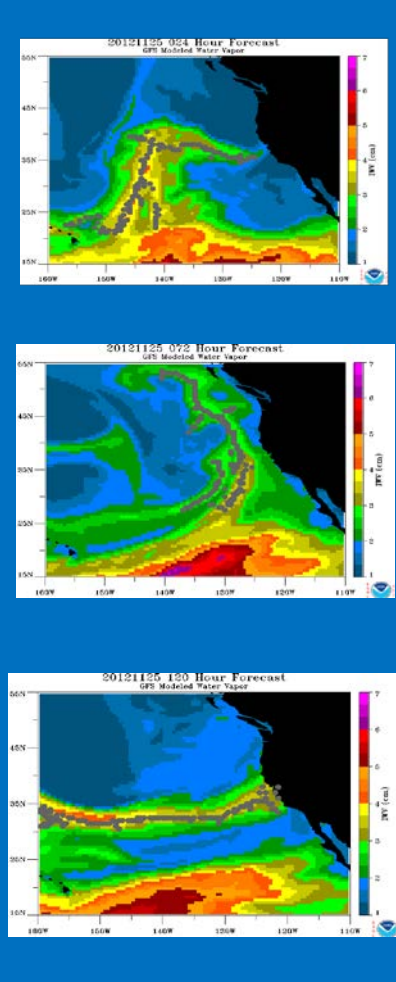
1. *Use advanced release to improve flood risk*
2. *Reduce Safety of Dams and high release risks*
3. *Increase water supply use efficiency*

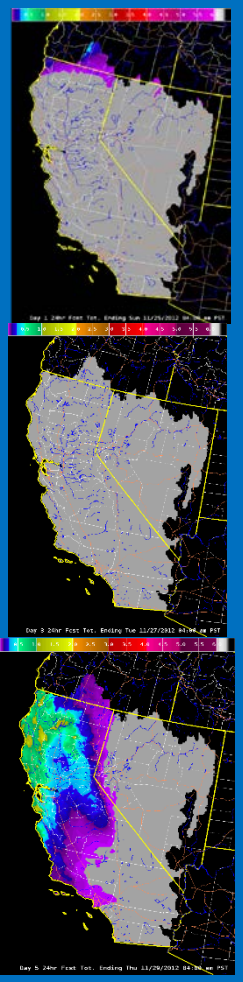
FORECAST INFORMED DESIGN STRUCTURE

1. *Advance Release "Blue Sky Action"*
2. *Evacuate storage prior to a storm event*
3. *Communication Opportunities*
4. ***Forecast Dynamics***

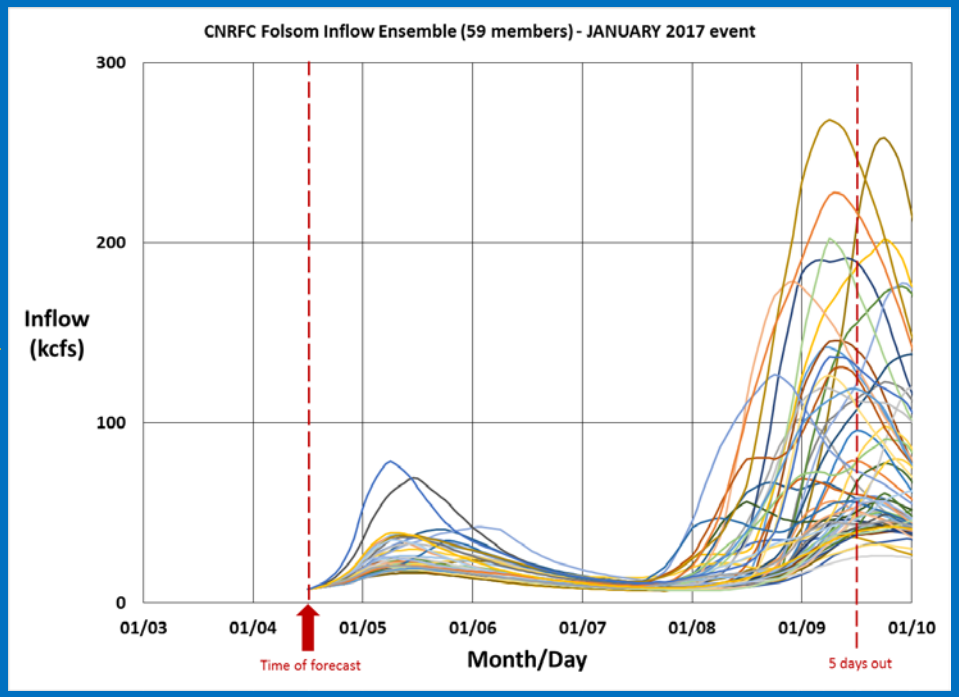


FORECAST INFORMED DECISION MAKING PROCESS



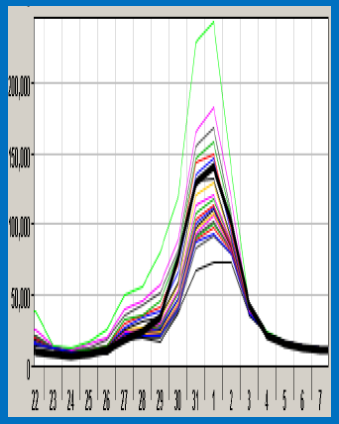


Model Runs



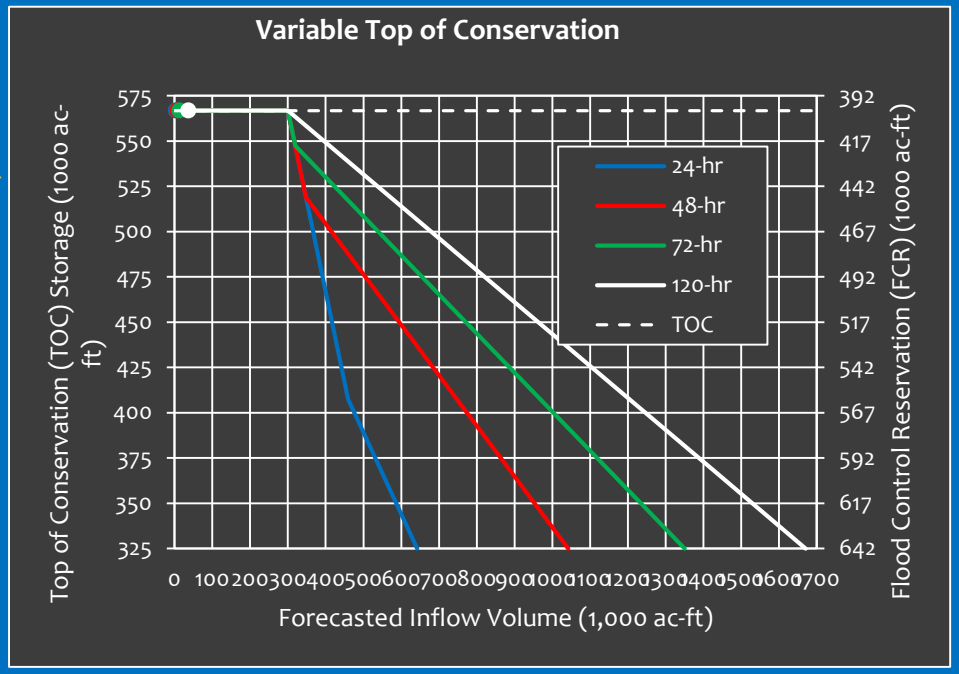
Ensemble

FORECAST INFORMED DECISION MAKING PROCESS



25% Exceedance Probability

Cumulative Volume for Day 1, 2, 3, and 5



Test if Cumulative Volume > 300,000 acre feet

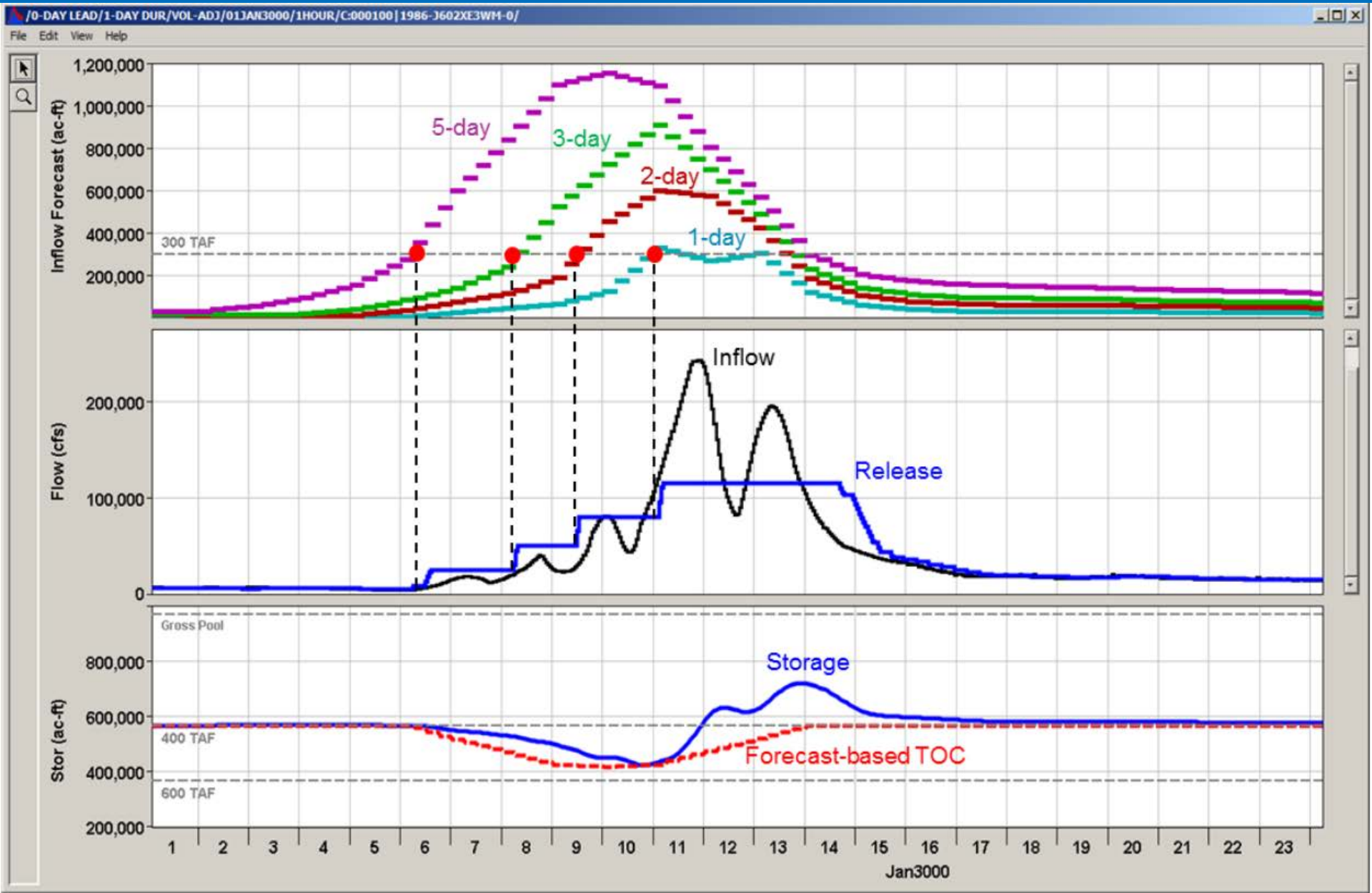
Yes

Increase Release based on Confidence and Risk

No

Maintain current Release

FORECAST INFORMED DECISION MAKING



NEW WATER CONTROL MANUAL SIGNED
(JUNE 12TH 2019)