



# Improving Flood Intelligence for the Sacramento and San Joaquin River system using National Weather Service Forecast Data

**2018 ASFPM Conference**

**June 22<sup>nd</sup> 2018**

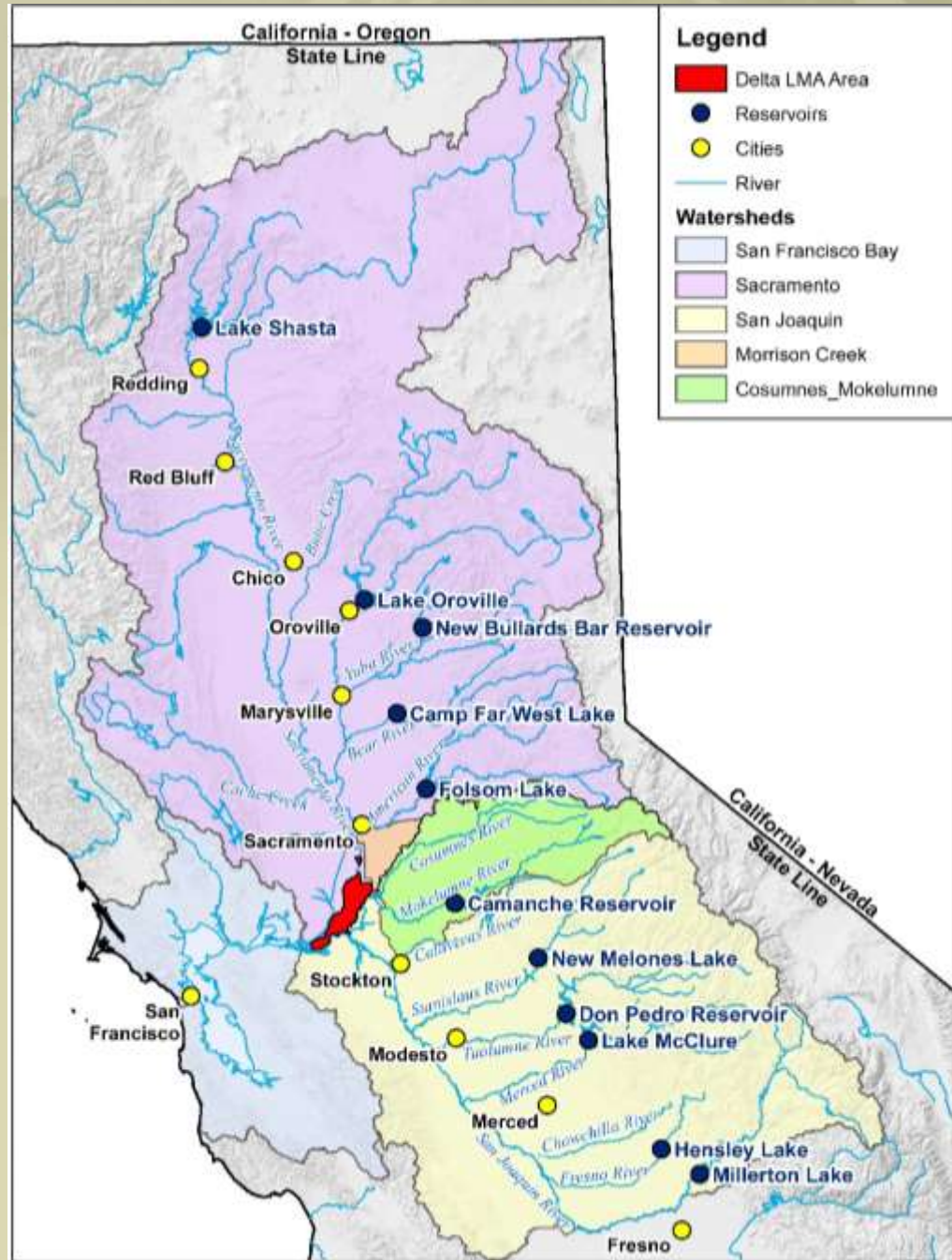


# Tool Purpose

- Import NWS Data from the California/Nevada River Forecast Center (CNRFC)
- Develop Forecast Flows and Stages at all hydraulic model cross sections in the system
- Generate Flood Inundation Maps Quickly
- Send maps to (Internal Web Server) for Decision Makers
- Validate and Calibrate Hydraulic Model in Real-Time

# Central Valley Watersheds

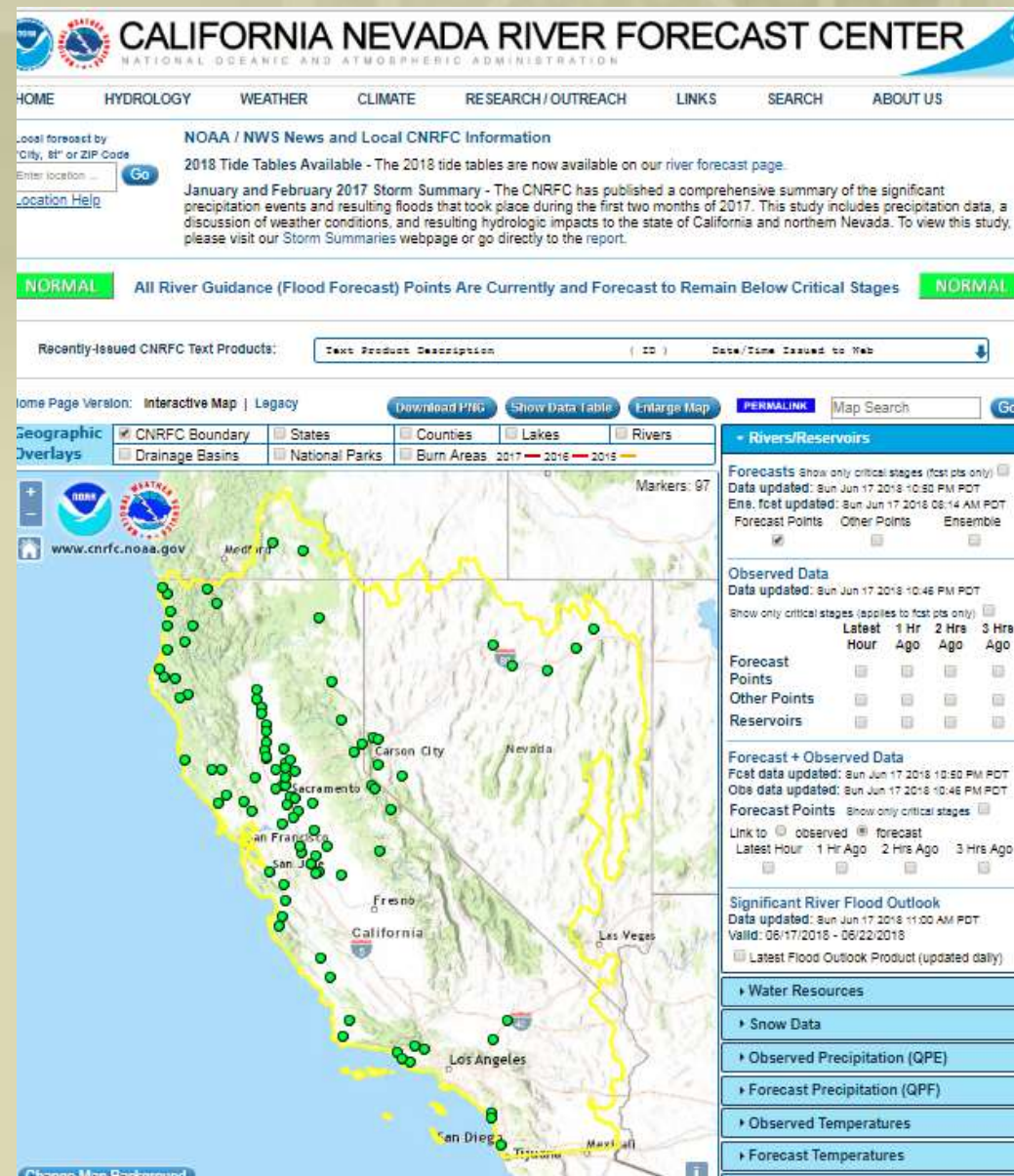
- **Sacramento River**  
**(27,000 sq. mi.)**
- **San Joaquin River**  
**(15,000 sq. mi)**
- **Cosumnes River**  
**(725 sq. mi.)**
- **Morrison Creek**  
**(125 sq. mi.)**
- **California Surface Area**  
**164,000 sq. mi.**





# Main Steps in the Forecast Tool

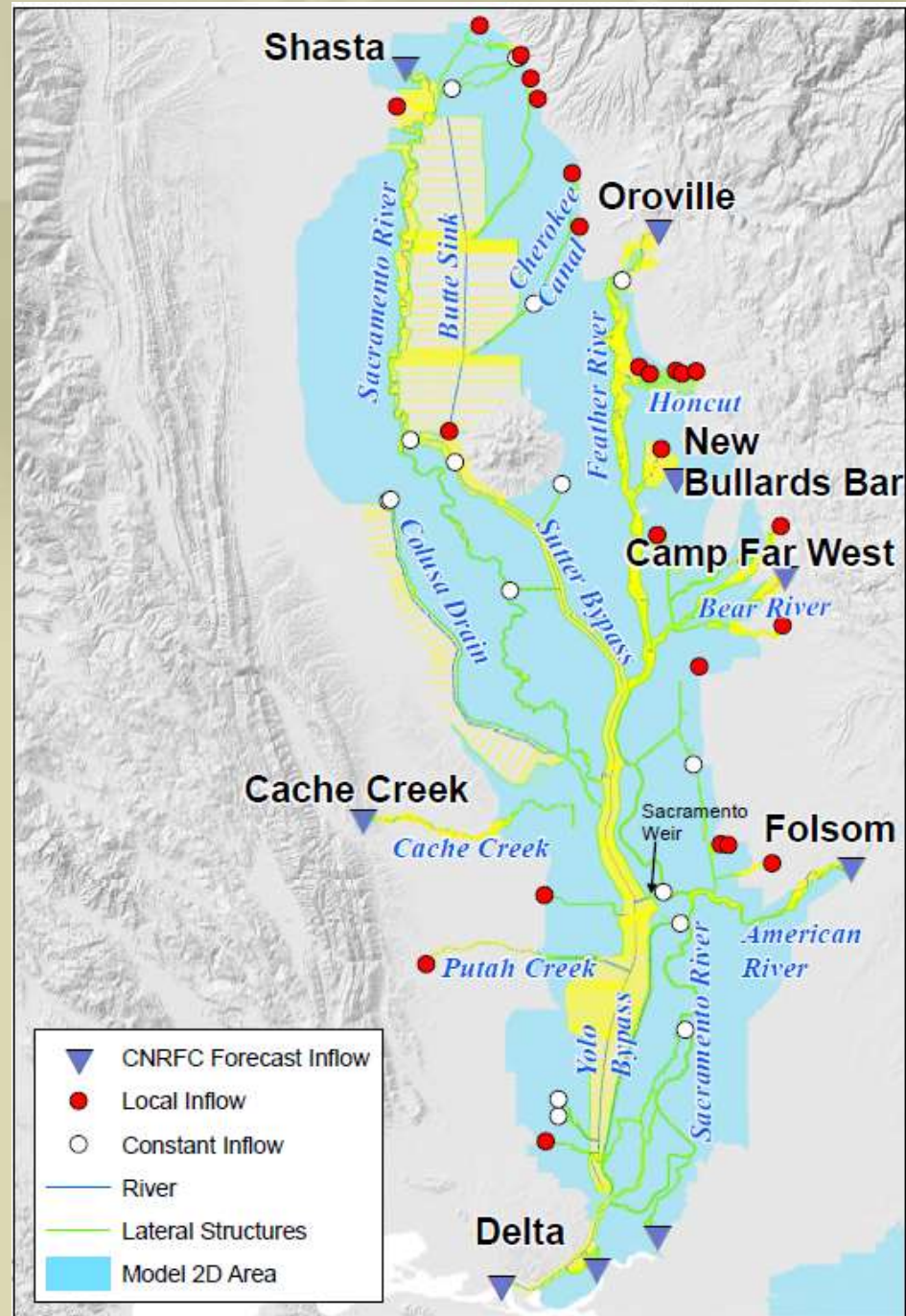
- Insert CNRFC 5-Day Hindcast and 5-Day Forecast Data
- Run Hydraulic Model Simulation
- Develop Forecast Results; Mapping and Animation



# Sacramento River System Model Layout

- 44 total boundary conditions
  - ▼ 9 CNRFC forecast locations
    - 3 CNRFC downstream tidal
  - 22 Local Watersheds
  - 10 Constant flow conditions
    - Sacramento Weir 48 Gates

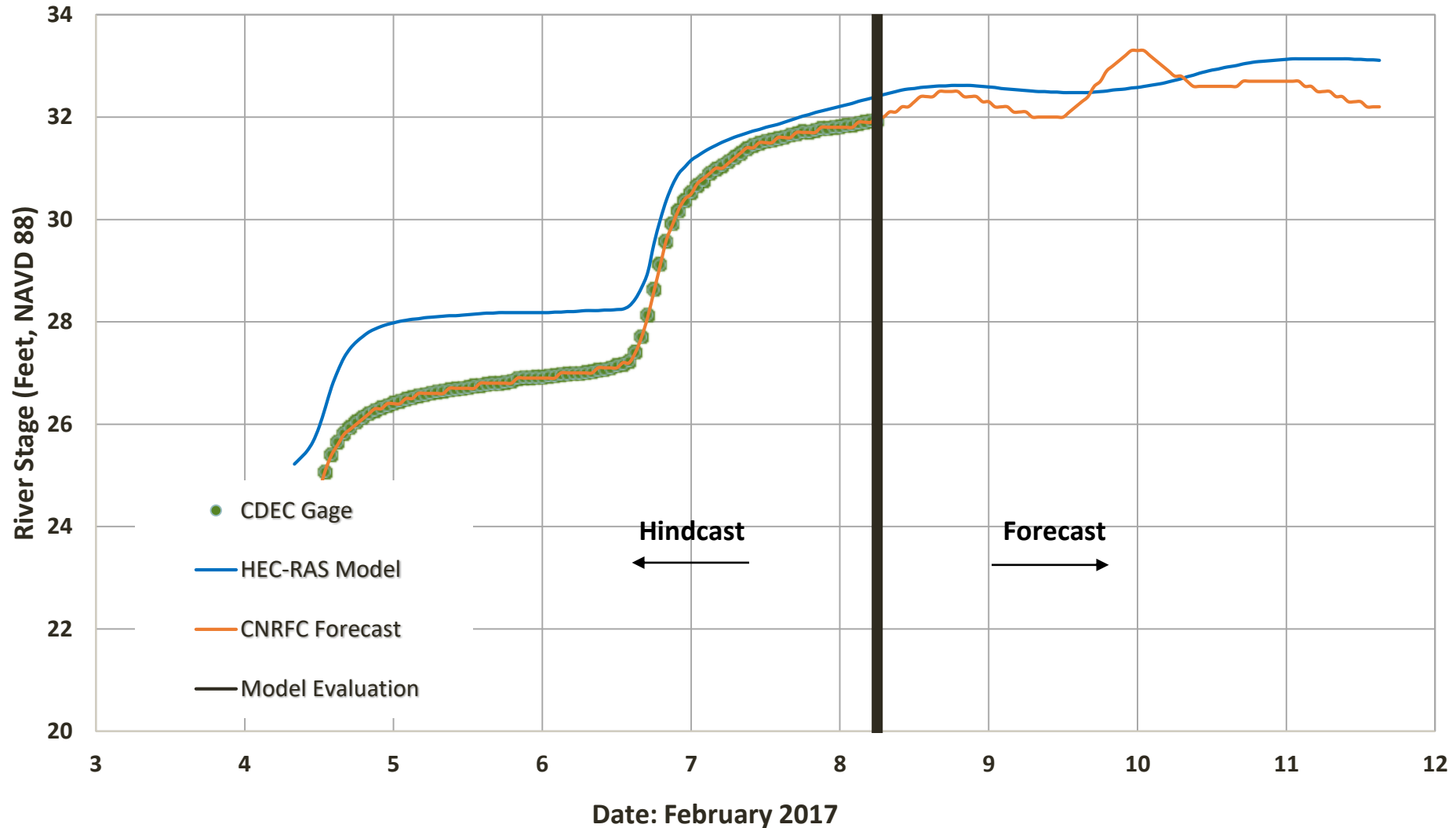
Model 2D Extents



# Testing the Forecasting Tool

## February 2017 Results

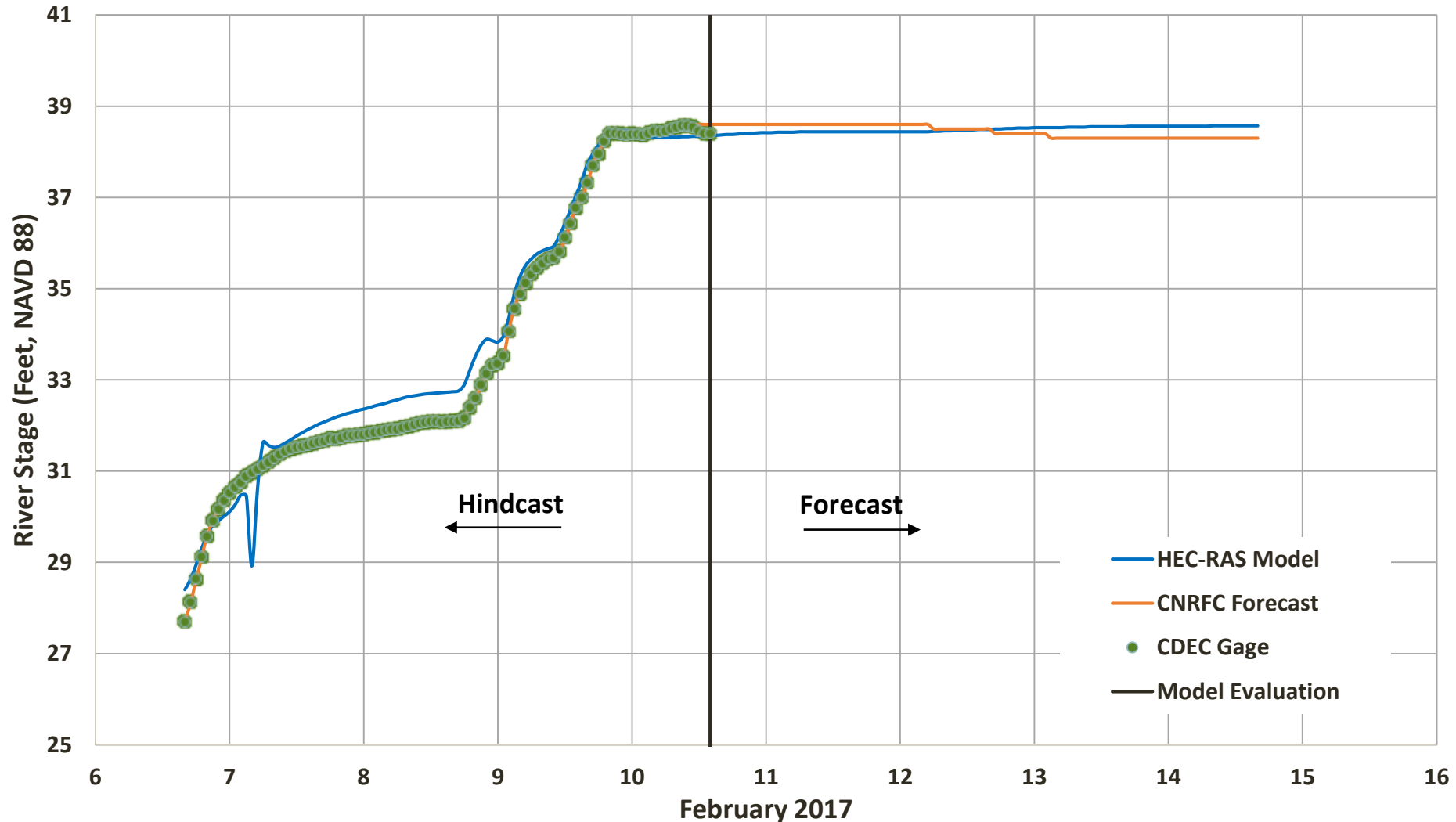
February 8, 2017 Forecast Model Results  
American River at H Street



# Testing the Forecasting Tool

## February 2017 Results

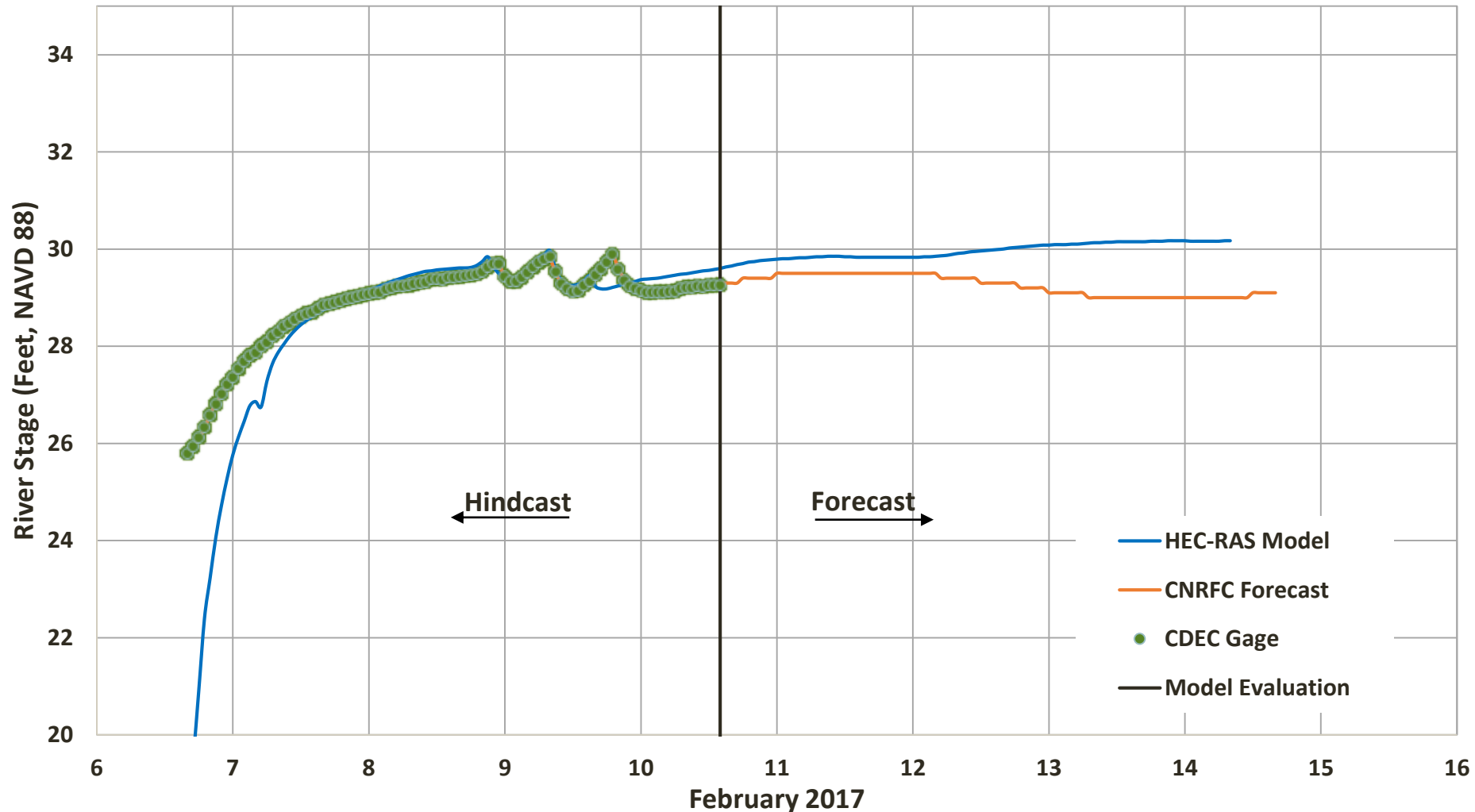
American River at H Street (AME, R01, RS: 6.591)  
Model Evaluation: February 10, 2017, 1:00 P.M.



# Testing the Forecasting Tool

## February 2017 Results

Sacramento River at I Street (SAC, R08, RS: 59.789)  
Model Evaluation: February 10, 2017, 1:00 P.M.





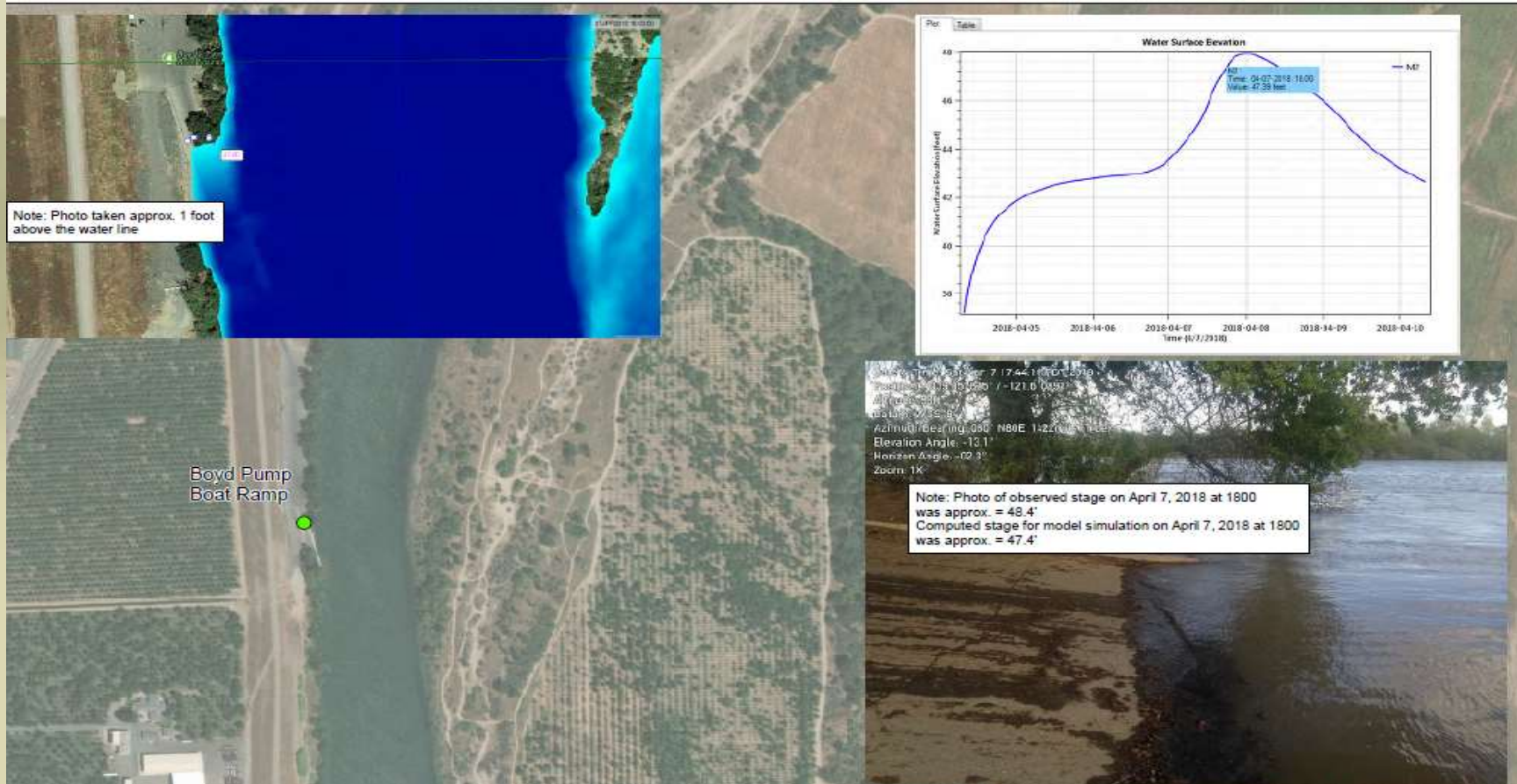
# Cosumnes River Forecast Test

## February 11, 2017

- Map provided 1.5-days prior to Peak
  - Local flow gage was lost.
  - Flood timing was reasonable
  - Computed stage was low by 1-ft.
- 
- Forecast allowed evacuation of small planes and equipment from Franklin Field



# Feather River 4-Way Check on April 8, 2018



- Run Hydraulic Model with Forecast Data
- Field Recorded Real-Time Highwater (Theodolite)
- Stream Gage Recording
- DWR Flow Measurements

# Challenges

- Accurate NWS 6-Hour Forecast
- Communication with Reservoir Operators
- Tracking stream gages in (CDEC) Real time vs. Forecast
- Datums
- Potential Model Failure
- Improve Run Times
- Key is to generate timely floodplain maps

# Questions