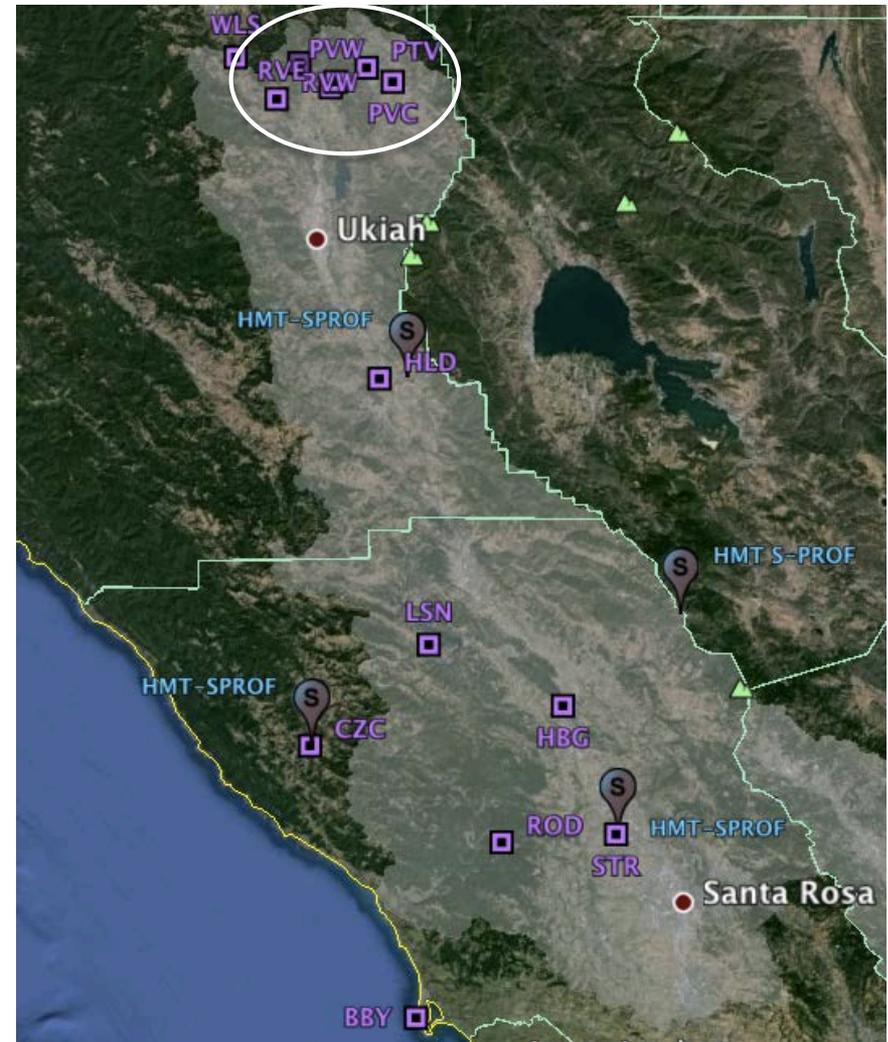


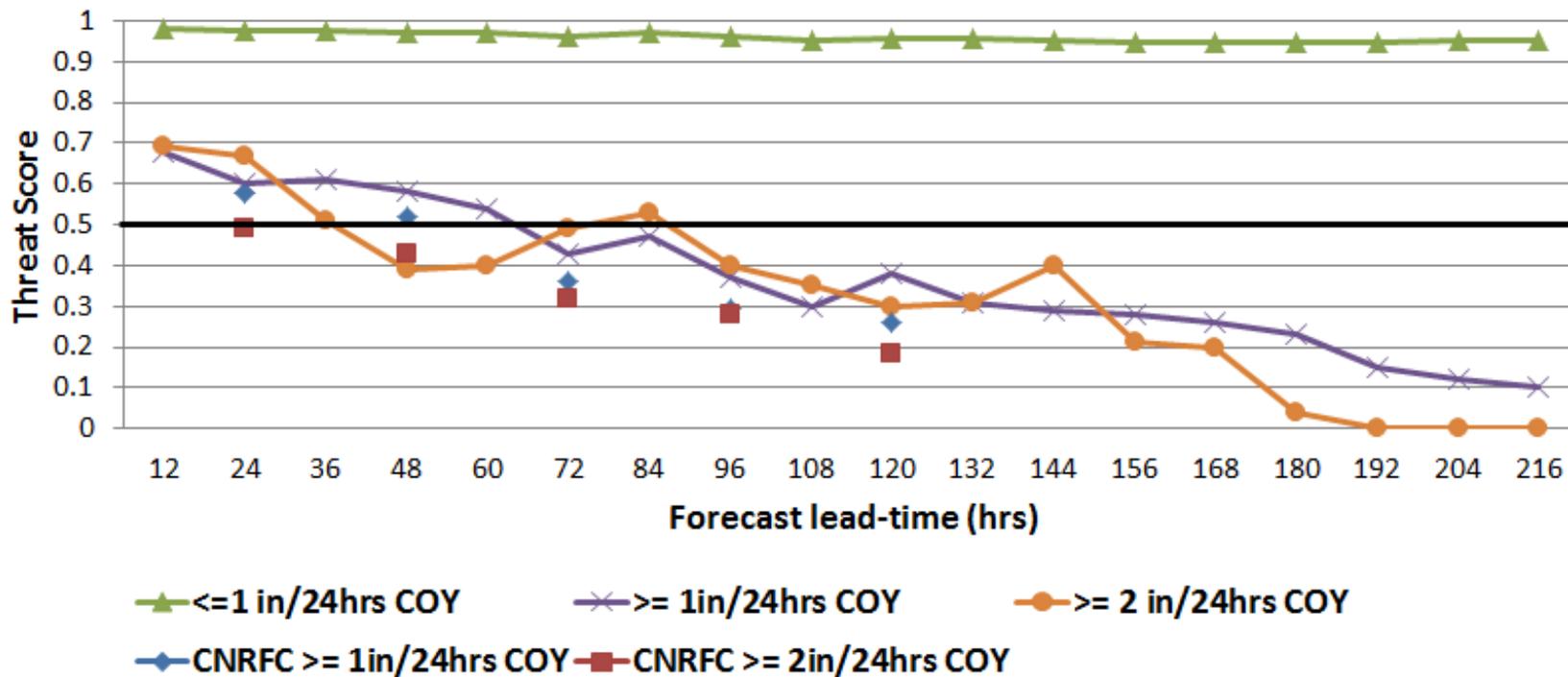
NOAA Research Topics to Support FIRO

- 5 new soil moisture sites installed
- HMT Charter developed in partnership with Weather Prediction Center
 - *“Improving forecasts of extreme precipitation and forcings for hydrologic predictions”*
- Assessment of National Water Model performance in Russian
 - R&D version setup at PSD
- QPF and reservoir management
 - No rain forecast has much better skill than rain forecast



QPF Skill: Rain vs No-Rain

Consensus Model QPF 24 hr rainfall 2014-2016
 CNRFC Nov 2000- Jan 2016
 Coyote Dam





Blueprint Forecast-Based Operations Optimization (FBO-O) Project

- ▶ Researching methods to optimize the performance realized from the water resources of the basin with respect to:
 - ▶ Flood risk
 - ▶ Water supply - volume and reliability
 - ▶ Environmental flow targets reliability
- ▶ Currently working on an implicit stochastic dynamic programming model of the basin
 - ▶ Currently focusing on the upper basin and monthly and daily time steps
- ▶ It is intended that the optimization models implement the logic included in the simulation models developed by the USACE and SCWA
- ▶ Future planned work includes implementing machine learning techniques which can 'learn' the optimal policies



Blueprint Forecast-Based Operations Optimization (FBO-O) Project

- ▶ Optimization process will incorporate ensemble forecasts produced by the NWS
- ▶ Questions:
 - ▶ What information do these ensembles provide?
 - ▶ How can we use this information to make risk-based decisions?
- ▶ A package of 'hindcasts' has been developed for several points in the basin
 - ▶ How well do these forecasts perform?
 - ▶ What can we use as verification measures?



Blueprint Forecast-Based Operations Optimization (FBO-O) Project

▶ Project Staff

- ▶ Matt Peacock, PhD Candidate, Civil and Environmental Engineering
- ▶ Dr. John Labadie, Professor, Civil and Environmental Engineering
- ▶ Dr. Lynn Johnson, Senior Research Hydrologist, Cooperative Institute for Research in the Atmosphere