



California Nevada River Forecast Center Updates

**California Cooperative Snow Surveys
Annual Meeting**

November 6th, 2014

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Sacramento, CA**

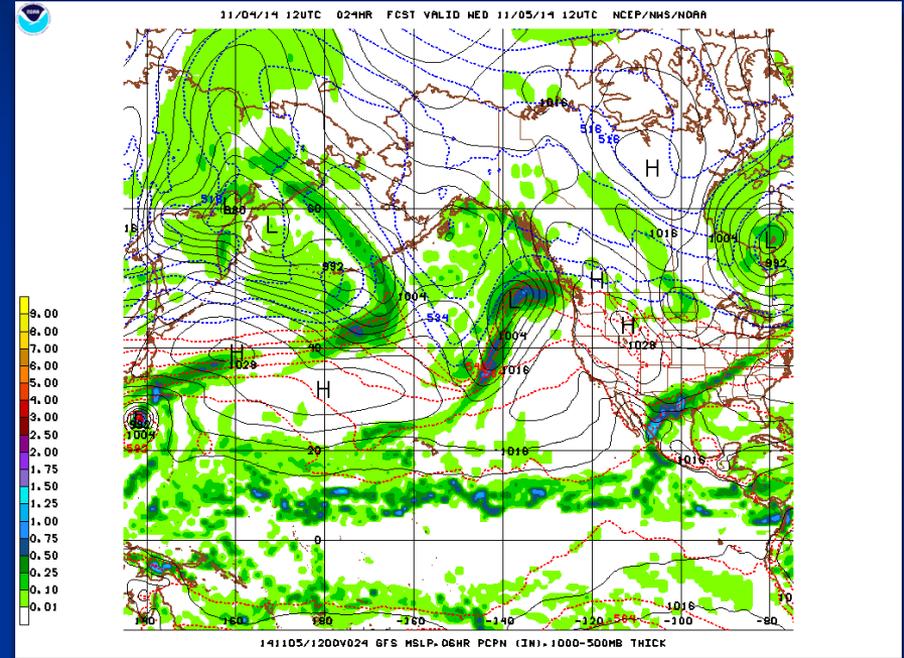
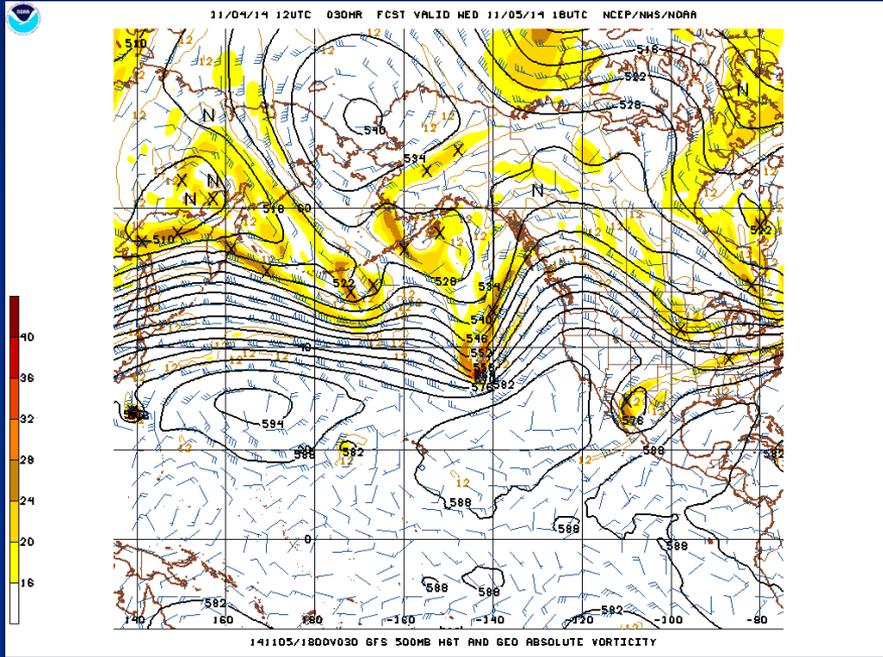


CNRFC Update

- Weather Forecast
- Big picture – what's happening in the NWS
- Summary of past year's hydrology and forecast issues
- CNRFC operations overview & changes for WY 2015
- CNRFC development activities



Weather Forecast



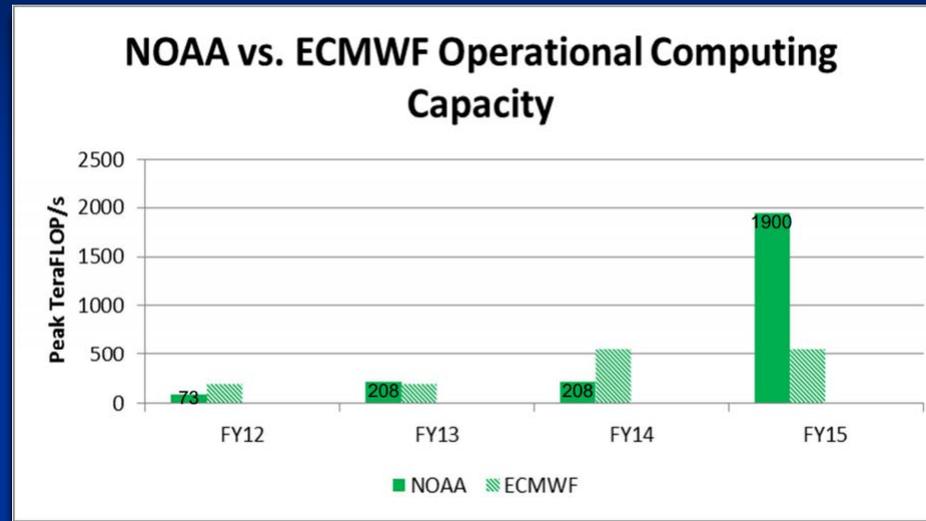
$$\left(\nabla^2 + \frac{f^2}{\sigma} (\zeta + f) \frac{\partial^2}{\partial p^2} \right) \omega$$
$$= \frac{f}{\sigma} \frac{\partial}{\partial p} (\mathbf{V} \cdot \nabla \zeta_a) + \frac{R}{\sigma p} \nabla^2 (\mathbf{V} \cdot \nabla T) - \frac{R}{\sigma p} \nabla^2 \left(\frac{\dot{Q}}{c_p} \right). \quad (2)$$

Omega Equation





Massive Computational Changes



- peak of 208 teraflops in FY13 to 1900 teraflops by end of FY15 – a 900% increase in capacity!
- This will enable implementation of higher resolution models
- NWS GFS model horizontal resolution going to ~10km in Dec 2014 (currently 27km)
- Expect further improvements in model physics, data assimilation, boundary layer, and additional resolution improvements
- Improvements should translate into improved hydro model inputs



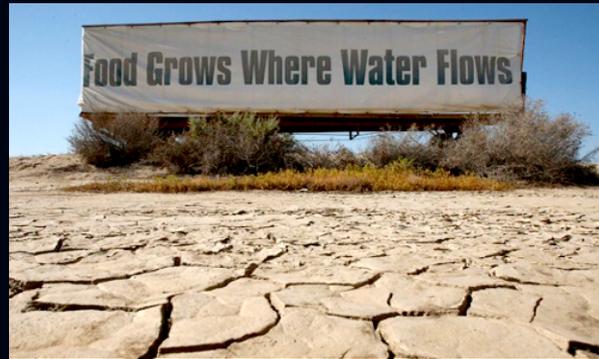
National Water Center

- Construction of National Water Center
 - Building completed Feb 2014, occupied Apr 2014
 - Initial operating capability expected by Apr 2015 (45 people)
 - Baseline operating capability expected by FY 2019 (165 people)
 - Full Operational capability expected by FY 2024 (244 people)
 - Facilitate NWS hydrologic services vision to address challenges
 - Summit-to-sea & treetop-to-bedrock hydrologic analysis
 - deliver integrated products and services



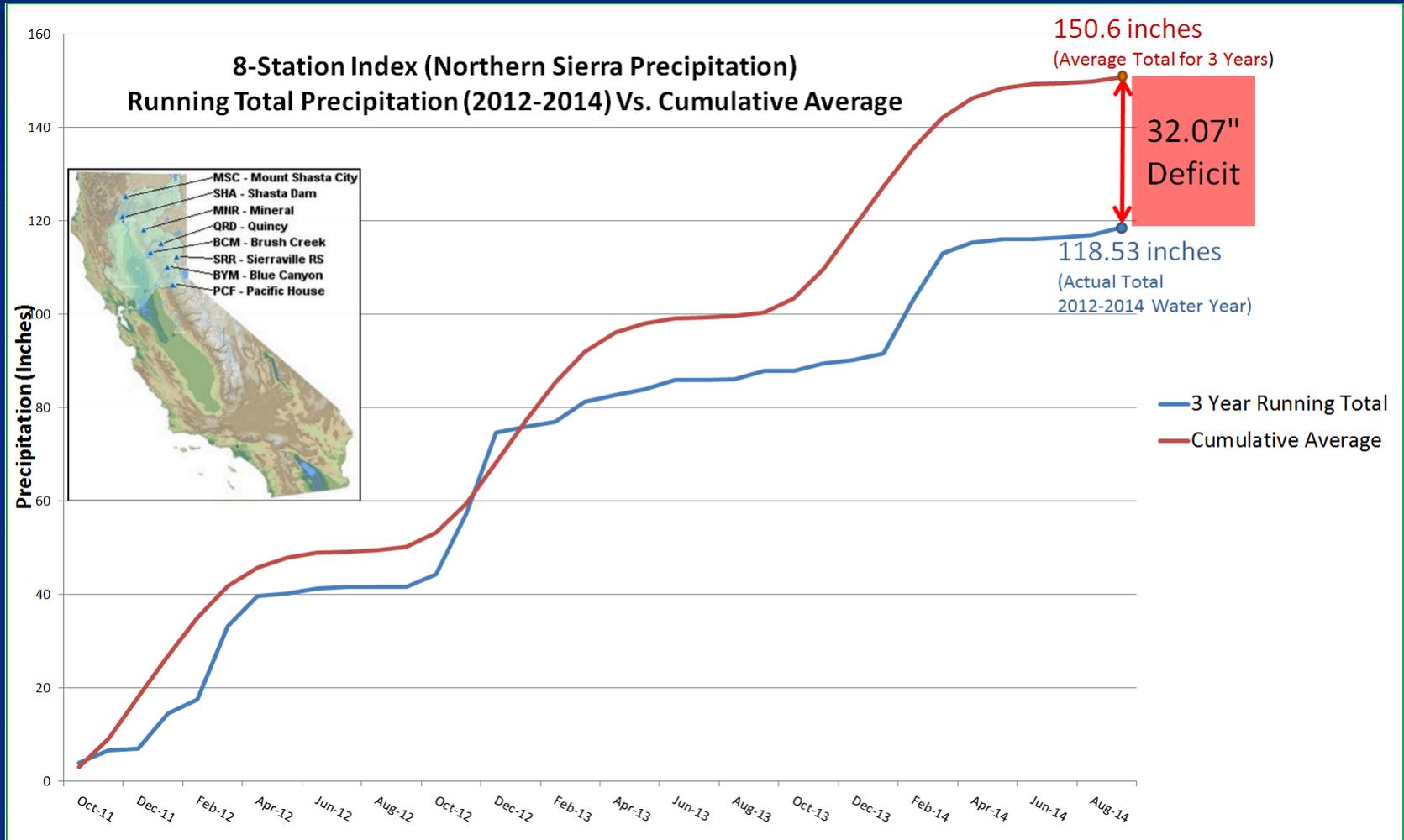


California Drought



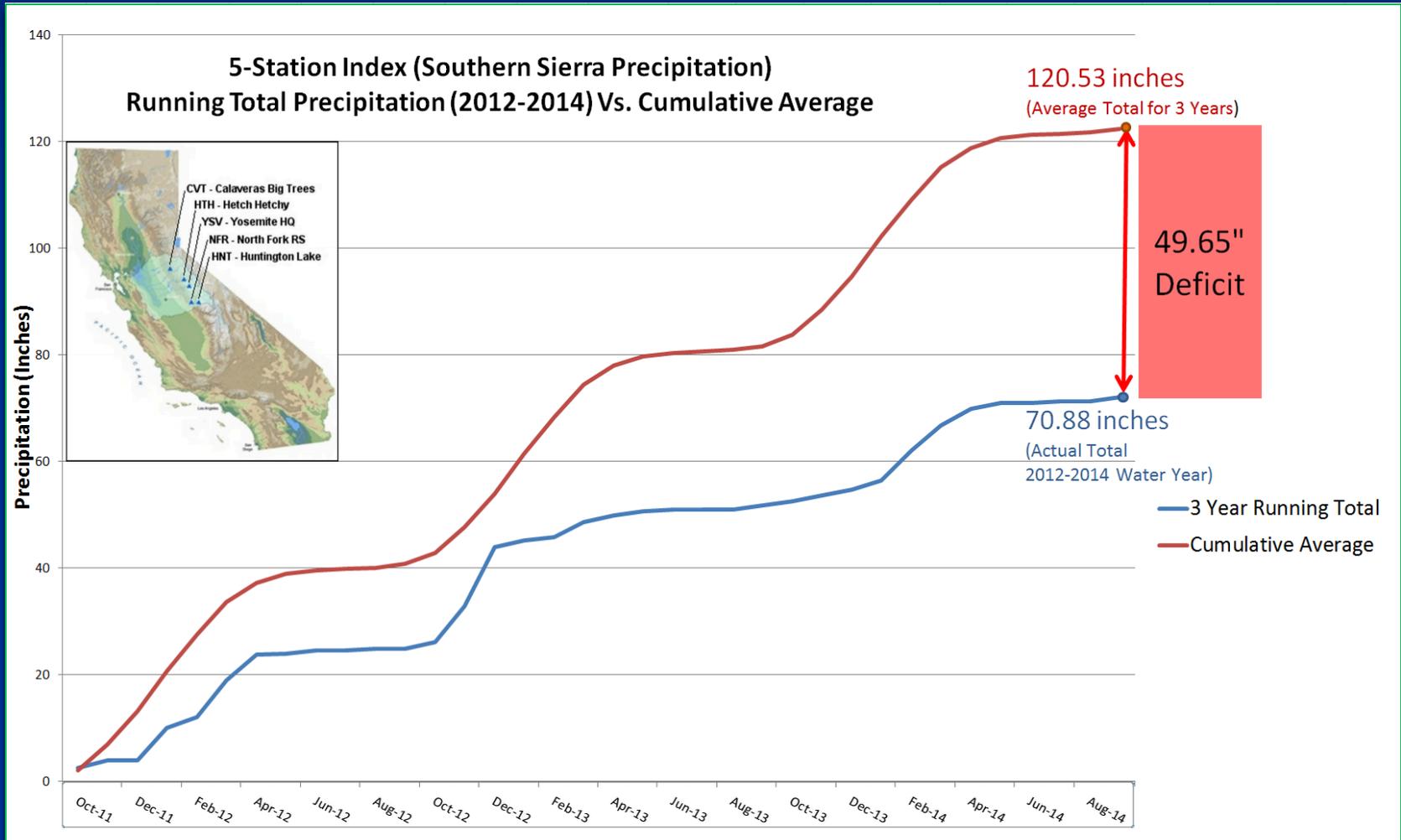


8-Station Index (2012-2014)





5-Station Index (2012-2014)

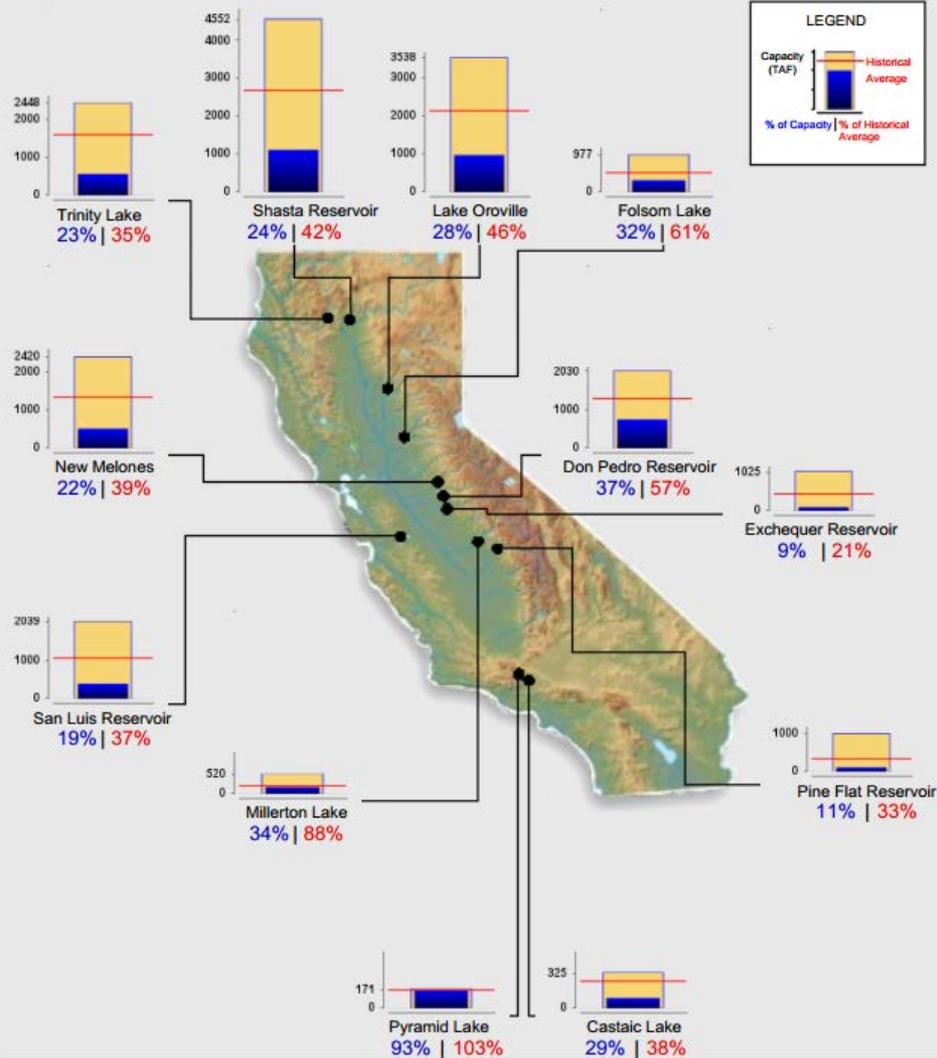




Reservoir Conditions

Ending At Midnight - October 27, 2014

CURRENT RESERVOIR CONDITIONS



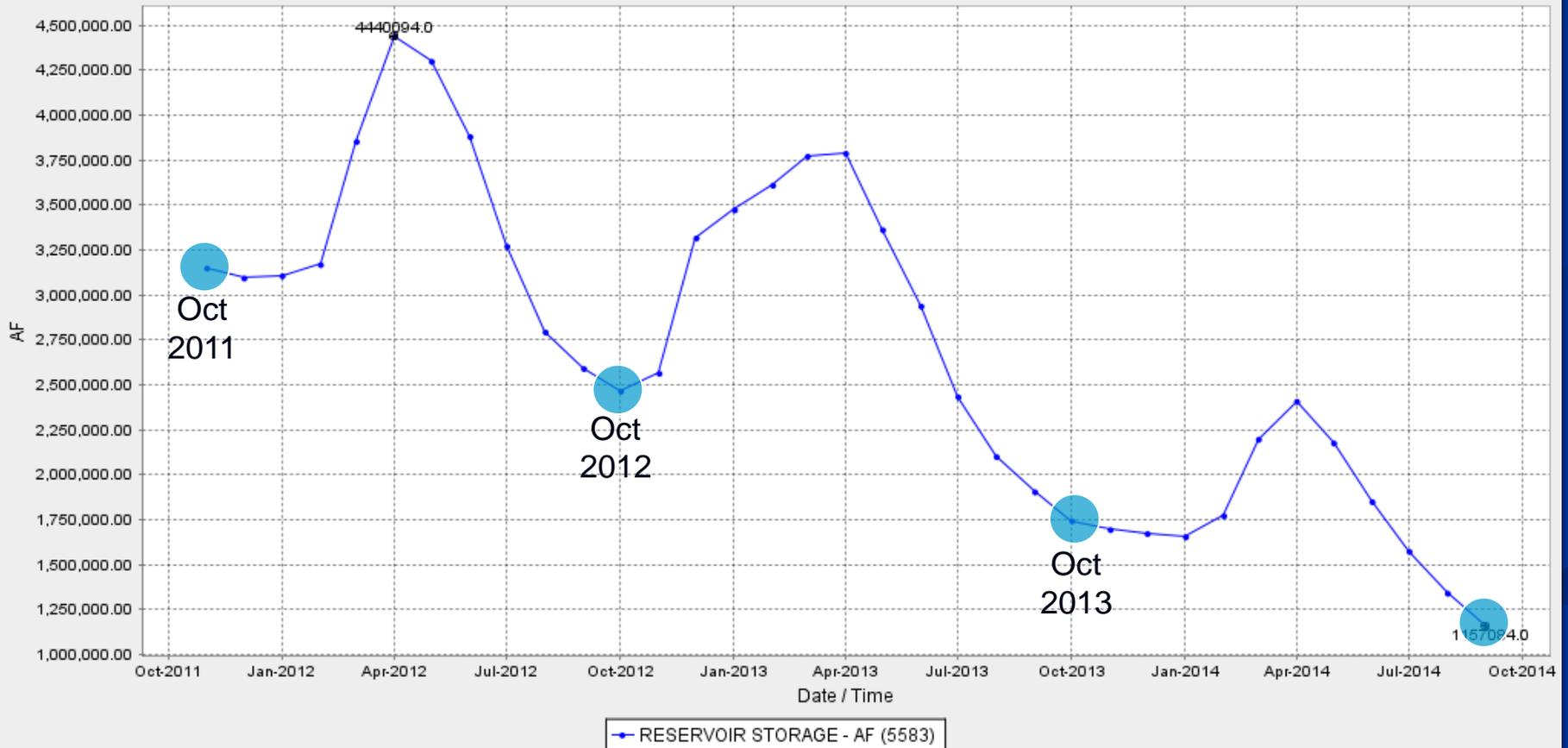


Cumulative Effects on Storage

SHASTA DAM (USBR) (SHA)

Date from 10/16/2011 10:49 through 10/15/2014 10:49 Duration : 36 Months

Max of period : (04/01/2012 00:00, 4440094.0) Min of period : (09/01/2014 00:00, 1157084.0)





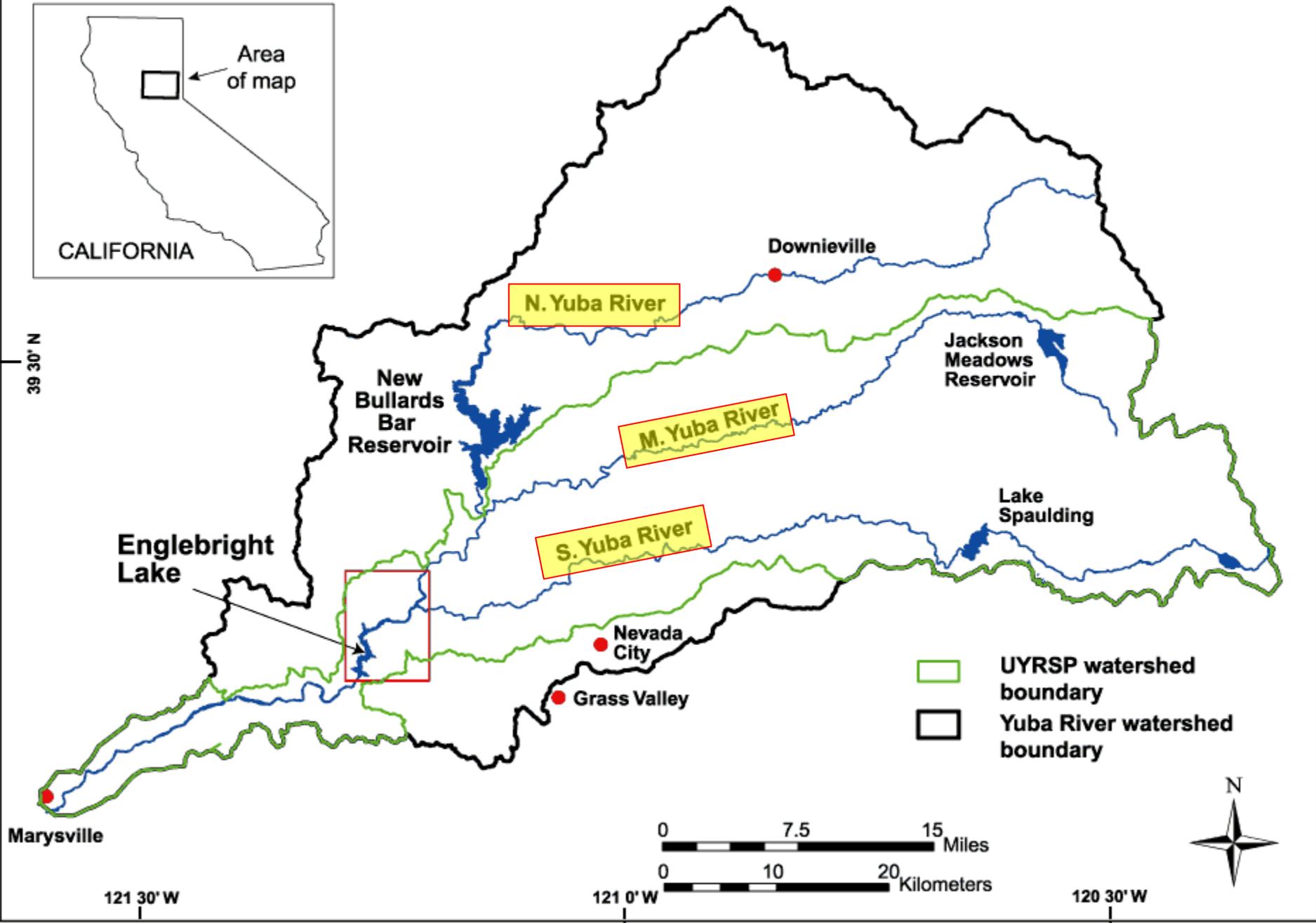
Drought-Related Requests

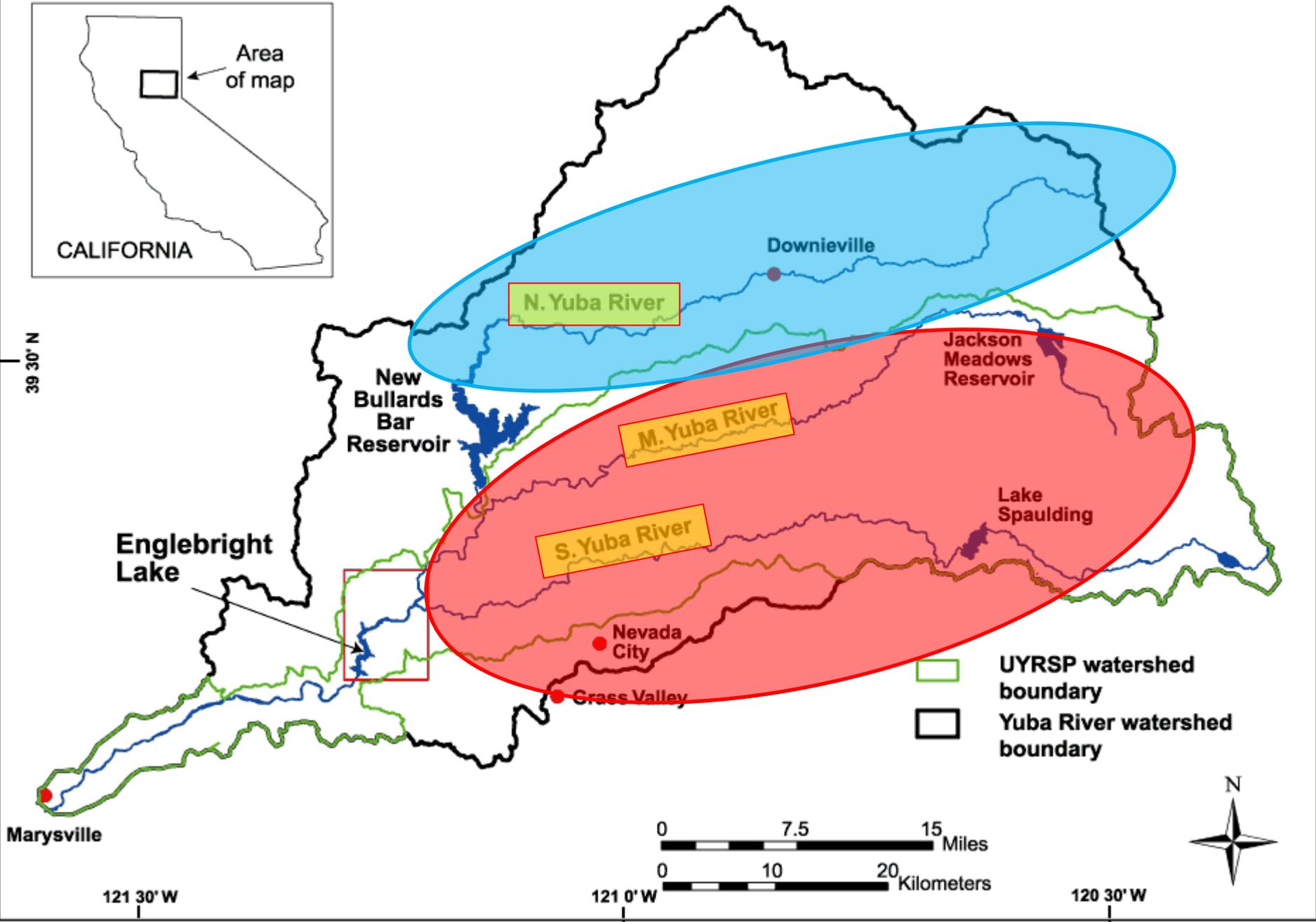
- Media requests (info, interviews, outlooks, etc)
- More calls, meetings, presentations
- Close scrutiny of data and forecasts for low flows
- Increased interest in water balance information
- Expanded interest in ensemble forecasts



Changes for WY 2015 Operations

- Calibration focus areas were:
 - Yuba & Feather
 - Southern California
- New Middle and South Fork of Yuba sub-basins
- New Santa Ana & Santa Margarita sub-basins
- New Reservoir Inflows
- New simulation points





39 30' N

Englebright Lake

New Bullards Bar Reservoir

N. Yuba River

Downieville

M. Yuba River

Jackson Meadows Reservoir

S. Yuba River

Lake Spaulding

Nevada City

Grass Valley

UYRSP watershed boundary
Yuba River watershed boundary

Marysville

0 7.5 15 Miles

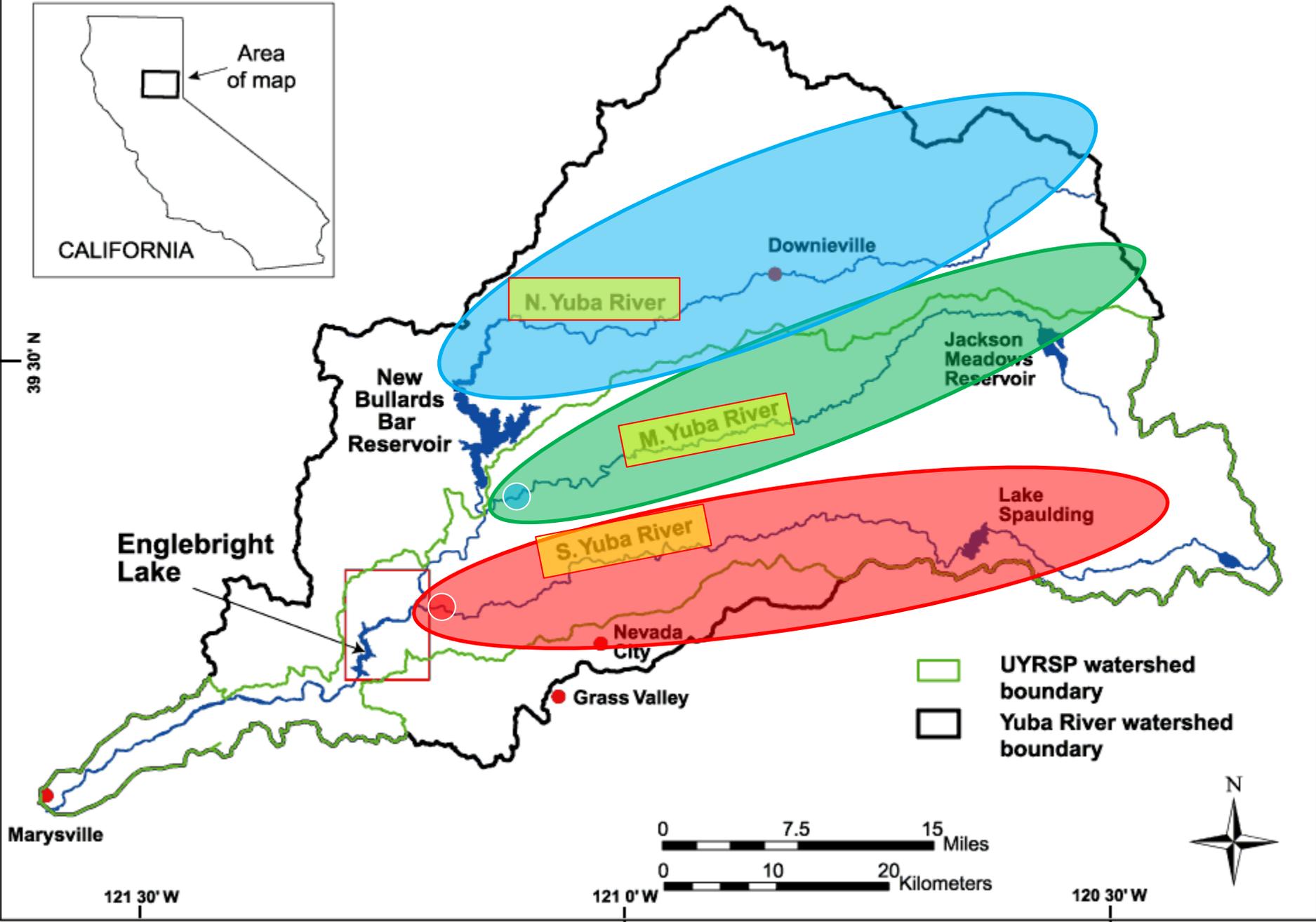
0 10 20 Kilometers

121 30' W

121 0' W

120 30' W





 UYRSP watershed boundary
 Yuba River watershed boundary



New Reservoir Inflows

- Jackson Meadows
- Bowman Reservoir
- Fordyce Lake
- Lake Spaulding
- Scott's Flat Reservoir
- Merle Collins Reservoir
- Rollins Reservoir
- Vail Lake

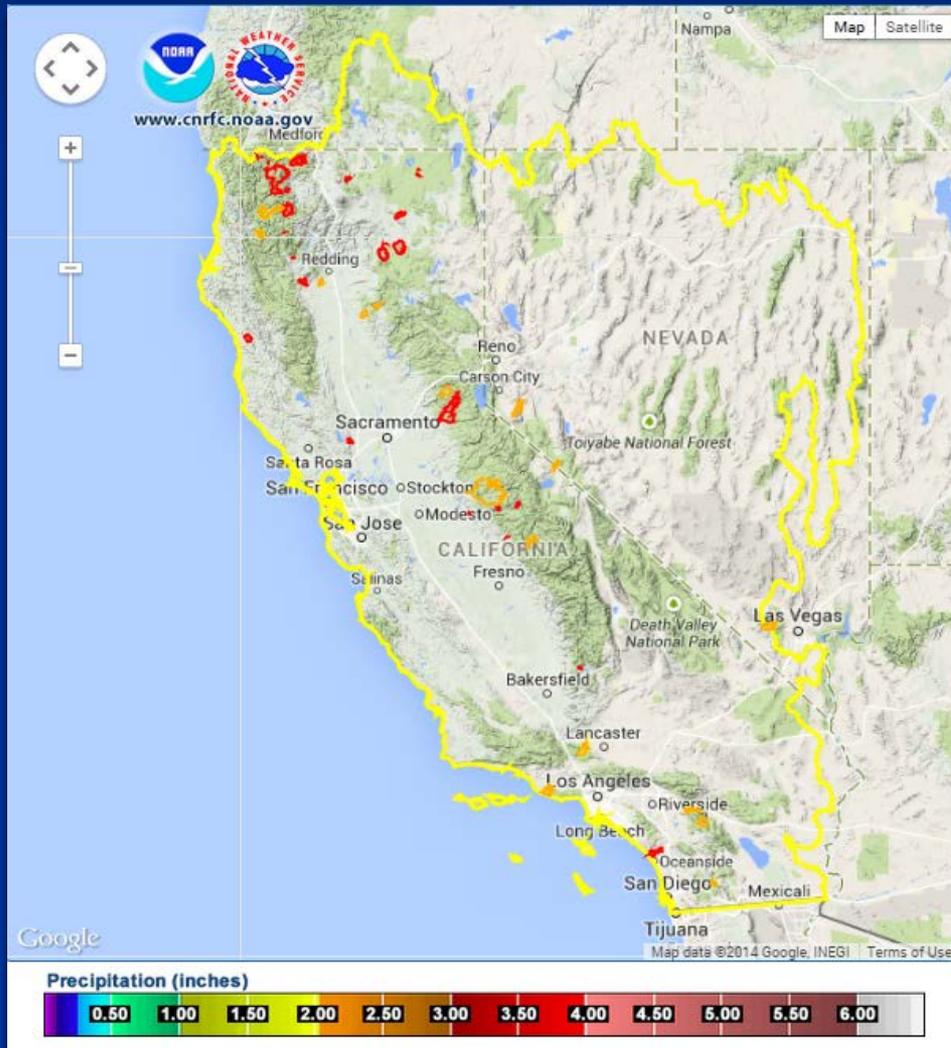


New Simulation Points

- East Branch of North Fork Feather River
- Middle Fork of Yuba River at Our House
- South Fork of Yuba River at Jones Bar
- Deer Creek at Smartville

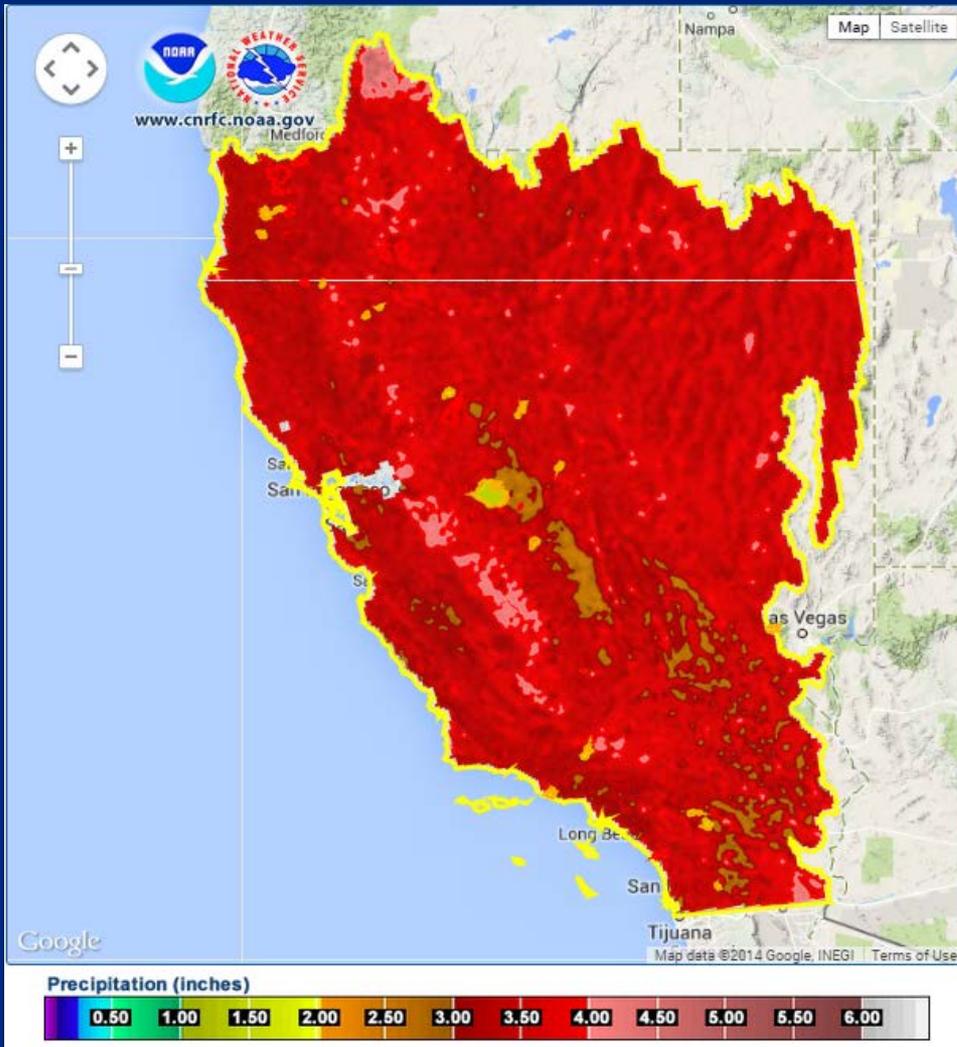


Recent Burn Scars





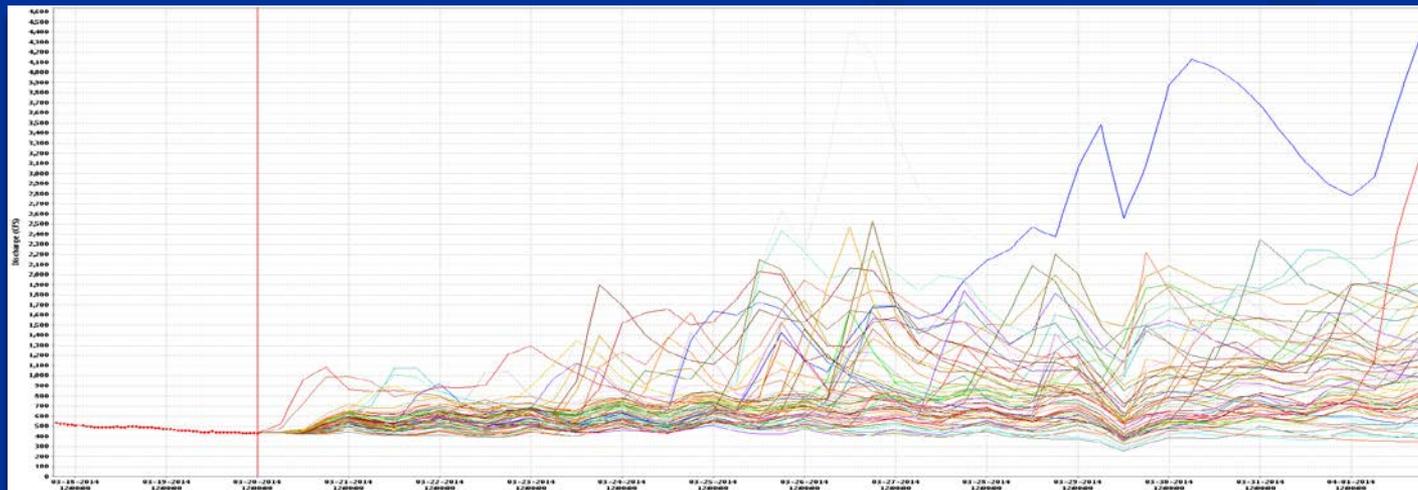
Flash Flood Guidance





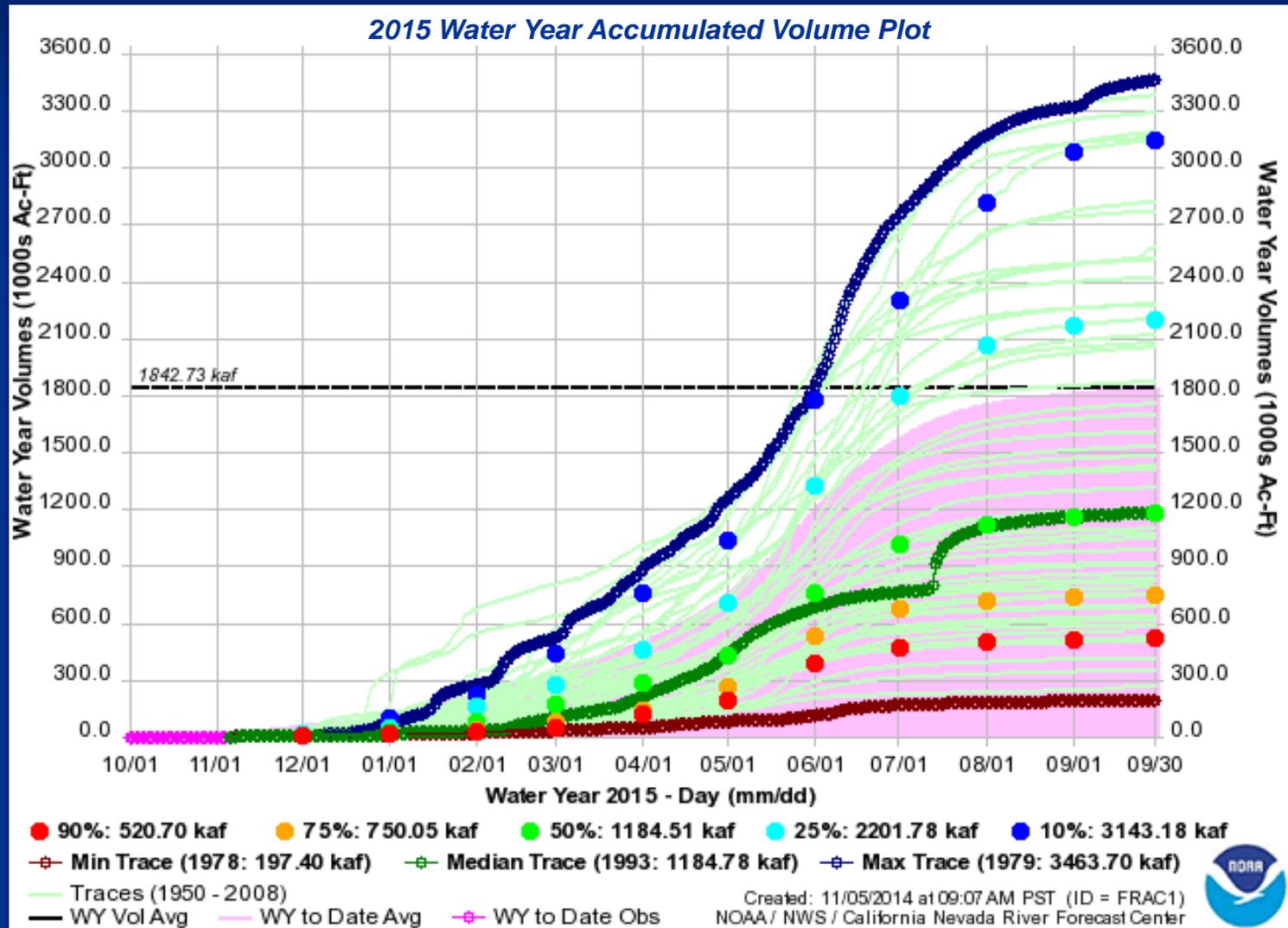
CNRFC Development Activities

- HEFS – Hydrologic Ensemble Forecast System
 - Hindcasts: computationally intensive – will allow us to evaluate reliability of ensemble forecasts
 - Exploring improved handling of extreme events
 - GraphGen – new tool for visualizing probabilistic forecasts





New Ensemble-Based Product





Other Activities

- ARkStorm@Tahoe Simulation
 - Used ARkStorm meteorology to run simulations using CNRFC modeling system (CHPS)
 - Generated hydrographs to support tabletop exercise
- Experimental flood notification service
- Russian River IWRSS Pilot Project



Questions?



California Nevada River Forecast Center



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