

CNRFC Updates

California Cooperative Snow Surveys
59th Annual Meeting of Cooperators
November 6-8, 2013

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National Weather Service
<http://www.cnrfc.noaa.gov>



CNRFC Website Design Update

- Design updated to match the main NWS web site (www.weather.gov).
- New integrated Google™ maps interface that consolidates all the elements of the various Google™ pages contained in the old site into one page.

CNRFC Home Page

CNRFC - California Nevada River Forecast Center - Windows Internet Explorer

http://www.cnrfc.noaa.gov

McAfee

CALIFORNIA NEVADA RIVER FORECAST CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

HOME HYDROLOGY WEATHER CLIMATE RESEARCH / OUTREACH LINKS SEARCH ABOUT US

Local forecast by "City, ST or ZIP Code" Enter location: [Go] Location Help

NOAA / NWS News and Local CNRFC Information

Today is day two of California Flood Preparedness Week! Today focuses on Riverine Floodplains, which can pose a threat in both urban and rural environments. To learn more about Riverine Flooding, heading to the following link!

Water Resources Survey - The American Meteorological Society's (AMS) Board on Enterprise Planning (BEP) Integrated Water Resources (IWR) Annual Partnership Topic (APT) Committee needs your help. If you use water resources information, the AMS invites you to take their survey. Your responses will help the committee form a vision and path forward for enhanced integrated water resources services and the science required to deliver them. The committee is undertaking research to improve water resources information services and better inform water-related decisions in support of adaptive planning, management, use, operations, preparedness, and response activities. To take the survey, which will likely take no more than 30 minutes to complete, please click here.

NORMAL All River Guidance (Flood Forecast) Points are Currently and Forecast to Remain Below Critical Stages **NORMAL**

Recently-Issued CNRFC Text Products: [Product Description] (ID) [Date/Time Issued to Web]

Home Page Version: Google Maps | Legacy Version

Map Search: [Go] PERMALINK

Boundaries CNRFC Area of Responsibility Counties Drainage Basins 2013 Burn Areas

Rivers/Reservoirs

Forecasts Show only critical stages (fast pts only)
Data updated: Tue Nov 05 2013 at 9:20 AM PST
Ens. fcst updated: Tue Nov 05 2013 at 8:12 AM PST
Forecast Points Other Points Ensemble

Observed Data
Data updated: Tue Nov 05 2013 at 9:16 AM PST
Forecast Points Show only critical stages
Latest Hour 1 Hr Ago 2 Hrs Ago 3 Hrs Ago

Other Points
Latest Hour 1 Hr Ago 2 Hrs Ago 3 Hrs Ago

Reservoirs
Latest Hour 1 Hr Ago 2 Hrs Ago 3 Hrs Ago

Water Resources

Snow Data

Observed Precipitation

Forecast Precipitation

Observed Temperatures

Forecast Temperatures

Freezing Levels

Flash Flood Guidance

Water Temperatures

Reset View Clear All Overlays

River Forecast Centers

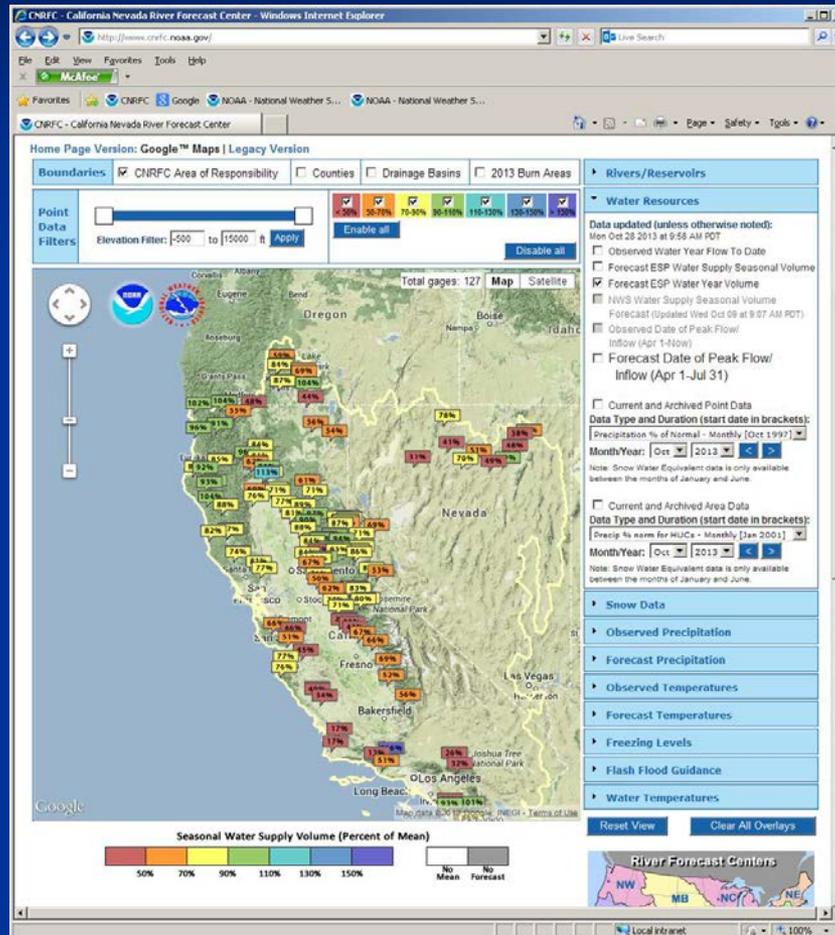
Legend: No Monitor or Flood Stage Available Normal Conditions Above Monitor Stage Above Flood Stage Above Danger Stage

75%

Home Page with river forecast points displayed.

To access pages that were linked on the left-hand menu of the old design, use the pop-up menus across the top of the web site.

CNRFC Home Page



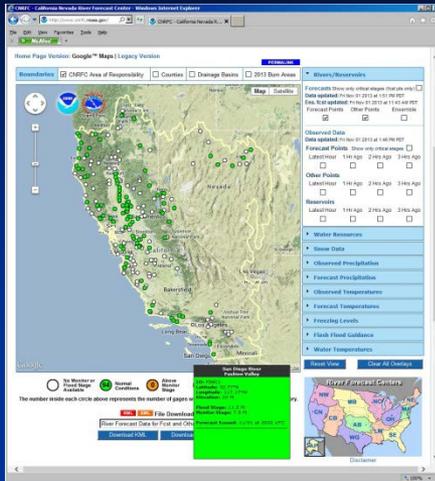
Map displayed is forecast ESP Water Year Volume.

Google™ Maps Interface slider menu on the right:

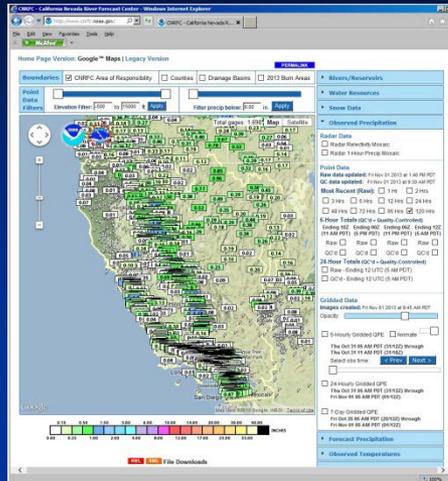
- Rivers/Reservoirs
- Water Resources
- Snow Data
- Observed Precipitation
- Forecast Precipitation
- Observed Temperatures
- Forecast Temperatures
- Freezing Levels
- Flash Flood Guidance
- Water Temperatures

Integrated Google™ Map Interface

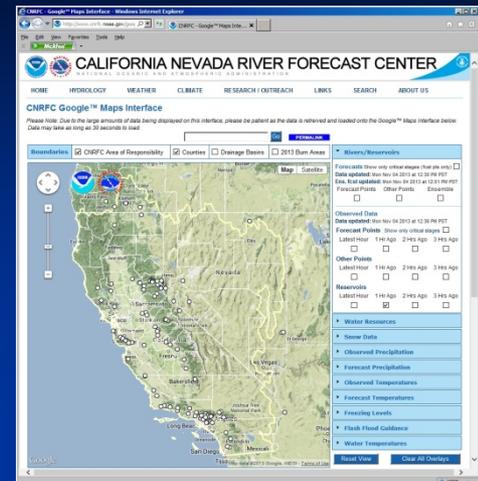
Observed Data



Forecast Points
Other Points



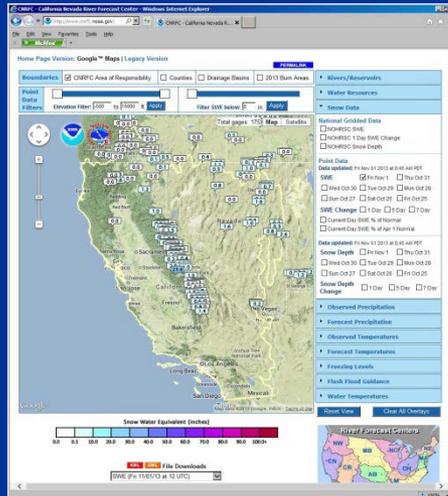
Precipitation



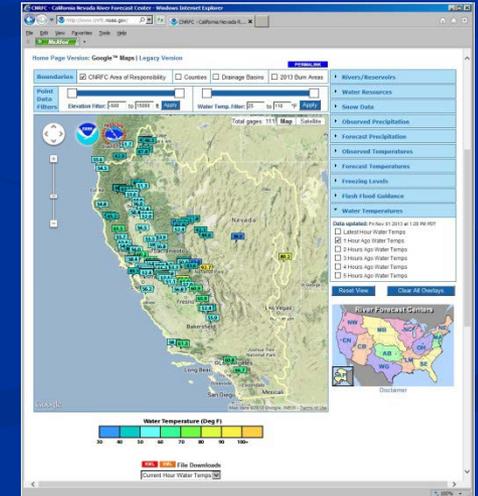
Reservoirs



Gridded QPE

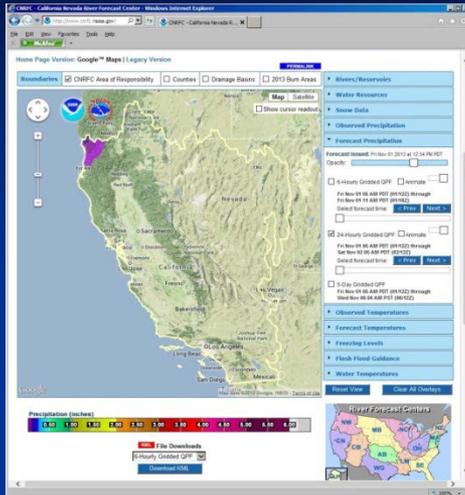


Snow

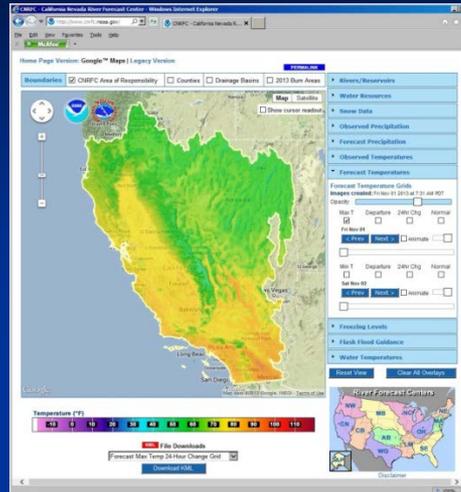


Water Temperature

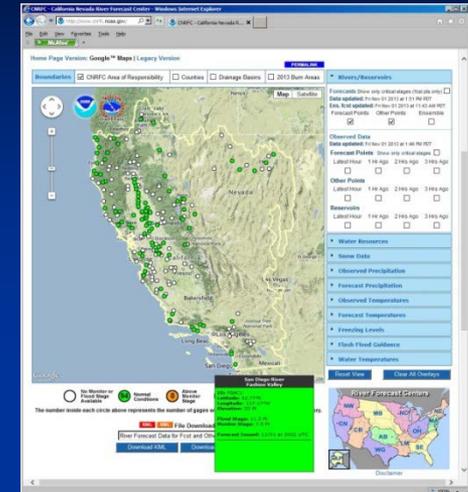
Forecasts



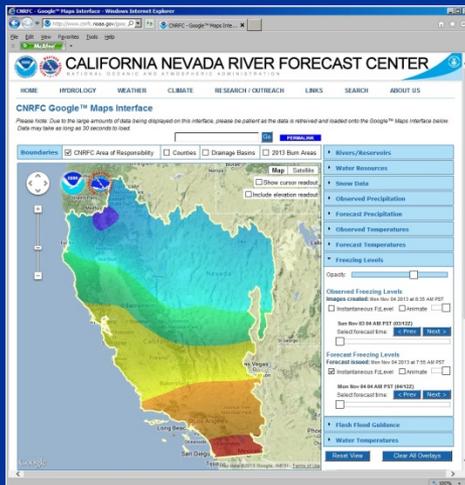
Forecast Precipitation, Gridded



Forecast Temperature, Gridded



Rivers/Reservoirs

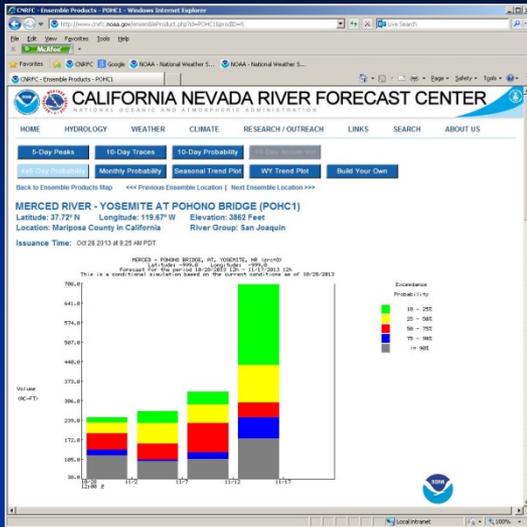


Freezing Levels

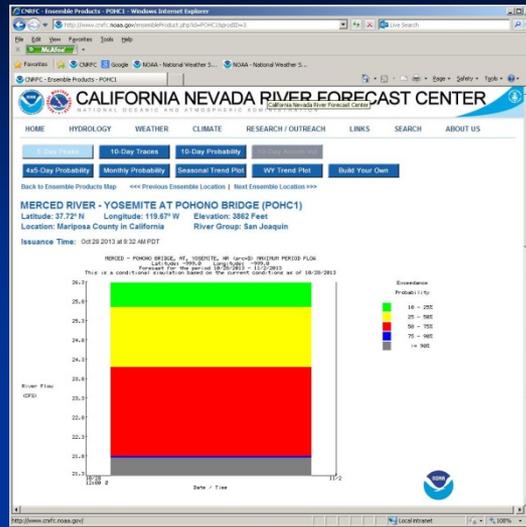


Flash Flood

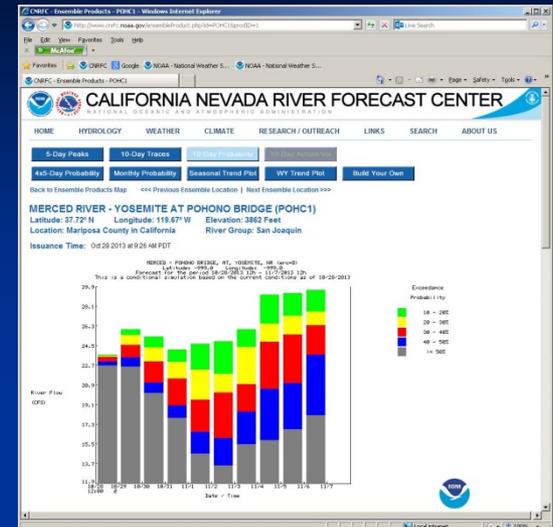
CNRFC Short-Term Forecasts



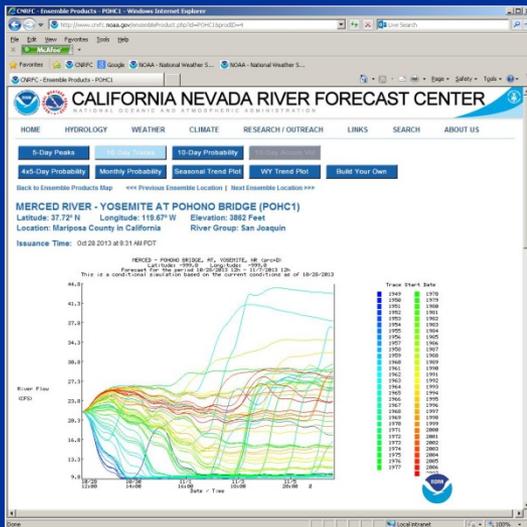
4 X 5 Day Histogram



5 Day Peak



10 Day Histogram



10 Day Traces



5-Day Deterministic

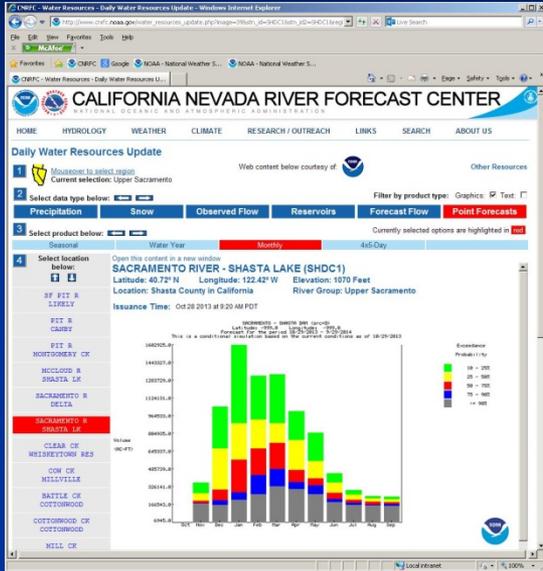
CALIFORNIA NEVADA RIVER FORECAST CENTER
 AHPS / ESP Trace Analysis

- Select a Location:
 merced-river-yosemite-at-pohono-bridge-(pohc1)
- Select an Accumulation Type:
 Peak
 Interval
 Maximum
 Summation
- Select an Interval:
 Day
 Week
 Month
 Entire Period
- Select a Distribution Type:
 Uniform
 Variable
- Select a Starting Date:
 Month: Nov Day: 20 Year: 2013
- Select an Ending Date:
 Month: Nov Day: 20 Year: 2013
- Select a Plot Option and Generate:
 Trace
 Probability
 Exceedance
 Excessance
- Select a Table Option and Generate:
 Forecast Only
 Quantile
 F-Flood Quantile

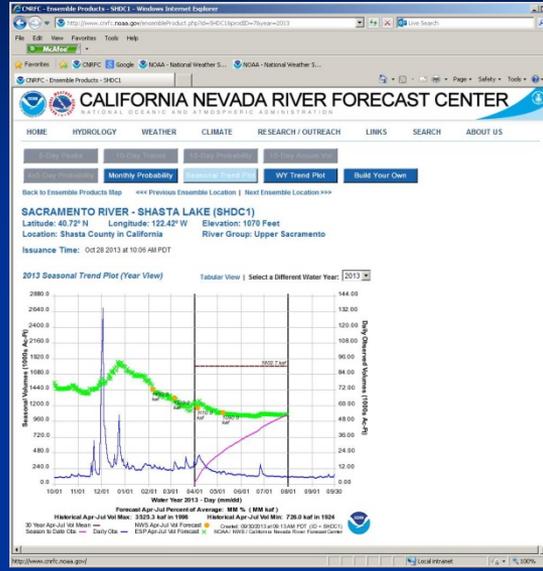
Buttons: Generate Plot, Generate Table

AHPS/ESP Trace Analysis Interface

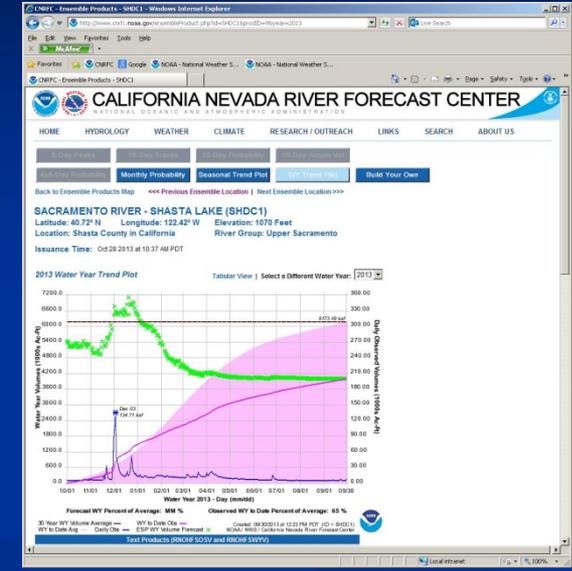
CNRFC Point Forecasts



Monthly



April-July

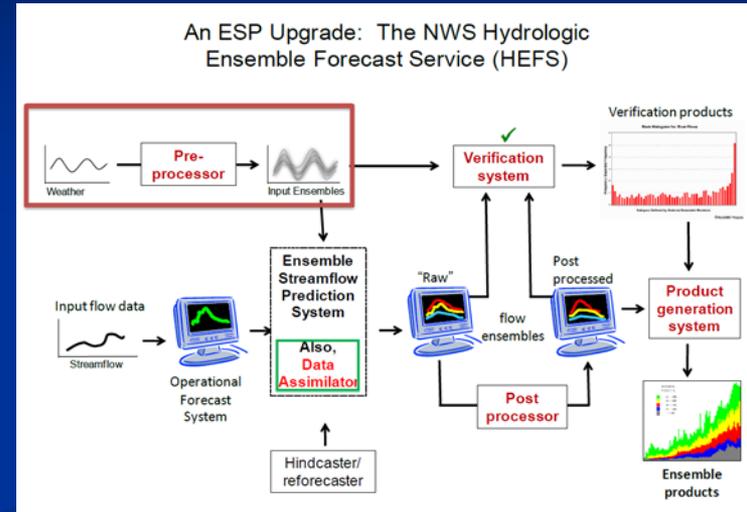


Water Year

HEFS – Hydrologic Ensemble Forecasting System

■ Objective

- Quantify and reduce uncertainties in ESP due to
 - Future weather
 - Calibration
 - Initial conditions
- Provide unbiased and skillful forecast ensembles
- Generate reforecast dataset consistent with real-time forecasts



■ HEFS - CNRFC is one of four prototype RFCs testing Version 1.0.

- Has Post-processing capability to deal with bias and timing errors.
- Hindcasting capability for validation of performance over a historical period.

Ensembles in CSV Format

- Organized by forecast group in zip file format
 - Upper Sacramento, San Joaquin, North Coast, etc
- Available in hourly and daily format
 - Hourly data out to 14 days
 - Daily data out to 365 days

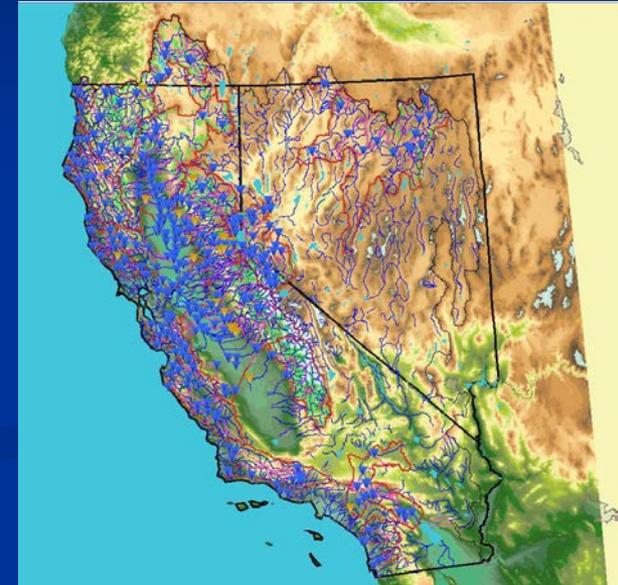
e.g.,

www.cnrfc.noaa.gov/csv/2012110712_San_Joaquin_hefs_csv_hourly.zip

www.cnrfc.noaa.gov/csv/2012110712_San_Joaquin_hefs_csv_daily.zip

CNRFC Model Calibrations

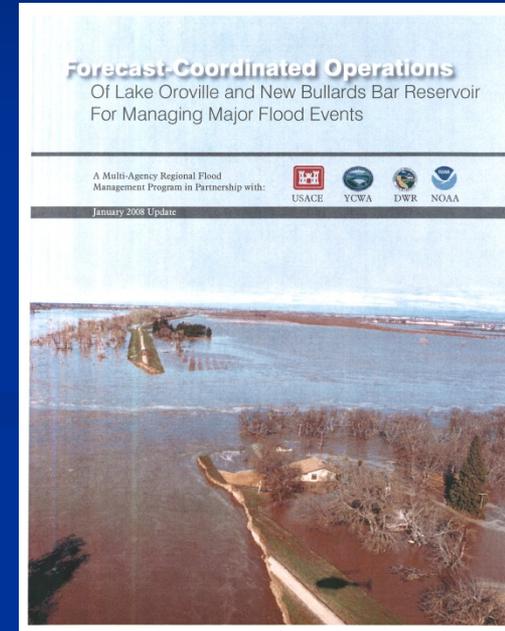
- We only get the forecasting infrastructure from HQ and NWS.
- We supply the basin soil and snow components, and data sets to the model and see how it works historically.
- Each completed basin goes through a tuning process where model parameters are adjusted.
- 6-year rotation to review all watersheds.
- ~300 watersheds, we tune about 50 per summer plus about 10 new ones.
- CNRFC and CADWR forecasters involved.
- 2013
 - North Coast
 - Central Coast
 - Others



Collaborations

Forecast Coordinated Operations

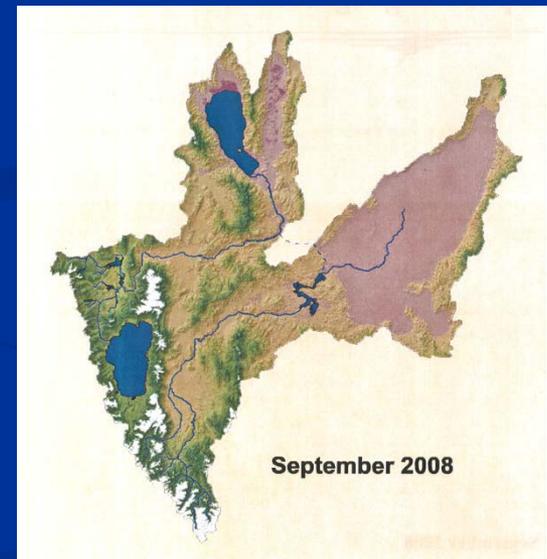
- Streamlined forecast delivery
- Common model for reservoir operations
- Improved coordination and decision making
- Feather – Yuba
- San Joaquin
- Everywhere ... eventually
- CNRFC involved with joint CADWR / YCWA / USACE exercise Oct 10, 2013



Collaborations

Truckee / Carson / Walker Basins

- TR Water Masters Office
 - TROA: Truckee River Operating Agreement
 - USBR
-
- Integrate CNRFC short-term and long-term ensemble forecasts into their decision model
 - Integrate CNRFC ensemble forecasts into USBR RiverWare decision model



Collaborations

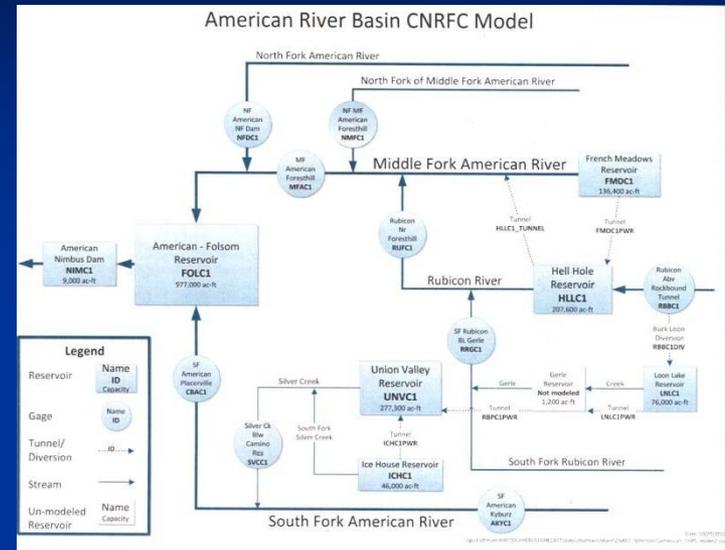
American River

- SMUD / PCWA

Model Topology
Additional Basins

- USACE / Community

Folsom Operations



Modify our model topology a little better so that its more consistent with their information needs.

Participate in process of how to integrate information into the decision model for the operation of Folsom.

“On the Horizon”

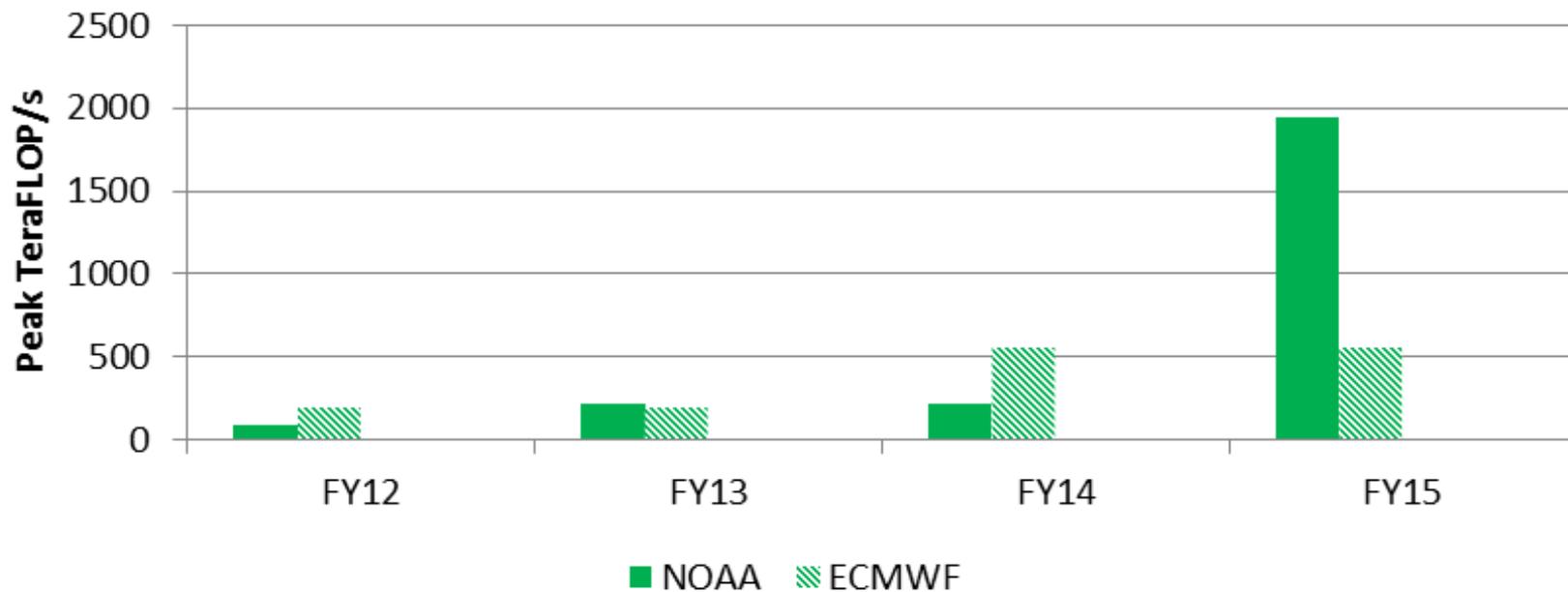
Next Generation Delta Forecasts

- Time for an upgrade
- 5-day duration
- Stage, flow, temperature, salinity
- Everywhere as opposed to a few limited locations

- Major collaborative project
 - Leverage existing/developing modeling
 - Sustained technology infusion

- Implement in CNRFC/DWR *daily* operations.

NOAA vs. ECMWF Operational Computing Capacity



Questions?

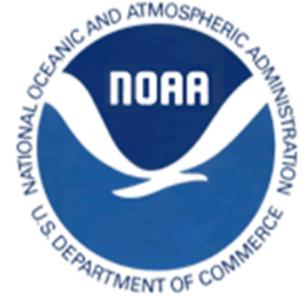


Credit: Dave Rizzardo, CADWR





California Nevada River Forecast Center



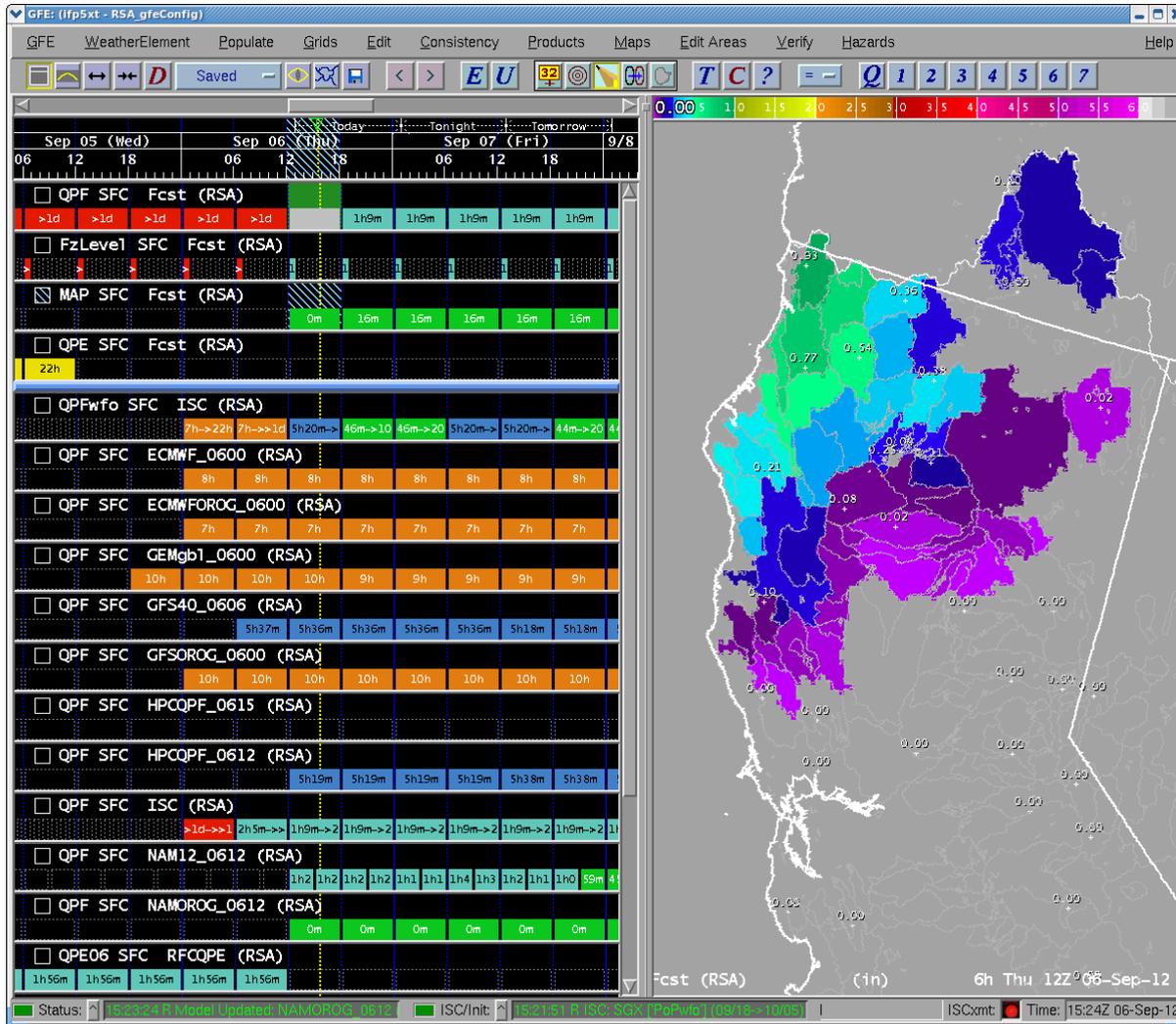
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How Precipitation Forecasts for CNRFC River Models are Made

Gridded 6-Hour MAP Forecast in GFE



A single-value MAP (Mean Areal Precipitation) is calculated for each basin by averaging the forecast precipitation for all grid points that fall inside the basin boundary.