



NOAA – NWS – California Nevada River Forecast Center



## CNRFC Development & Collaboration Efforts 7<sup>th</sup> Annual FIRO Workshop

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7<sup>th</sup> FIRO Workshop - August, 2020



## CNRFC Development Efforts



- **New calibration forcings**
  - Moving from a sparse, but high-quality station-based dataset (temperature, precipitation) to a gridded dataset using many more stations
- **Addition of Days 7-10 QPF from the NBM**
  - Hydro model now forced by National Blend of Models QPF Days 7-10
- **New set of HEFS traces**
  - Changes in calibration data set affect HEFS
- **HEFS forcing model moving from GEFSv10 to GEFSv12**
  - GEFSv12 is a higher resolution model with improved physics
- **Verification**
  - Creating DB structures
  - Populating the DB
  - Creating interactive tools



## New Calibration Forcings



- Goal: Align Calibration Forcings with operational methodology
- Impetus: Migration to Baseline operations  
New historical gridded datasets (Analysis of Record – AORC)

Variable	Legacy Data Sources	New Data Sources
Precipitation (MAP)	NWS COOP stations; SNOTEL;	CNRFC Operational MAPs ('04-'19) + Legacy MAPs (WY1980-2004)
Temperature (MAT)	NWS COOP stations	AORC MAT data (WY1980-2019)
Freezing Level (ZELV)	Derived from MAT timeseries	ERA5 (European reanalysis) (WY1980-2019)

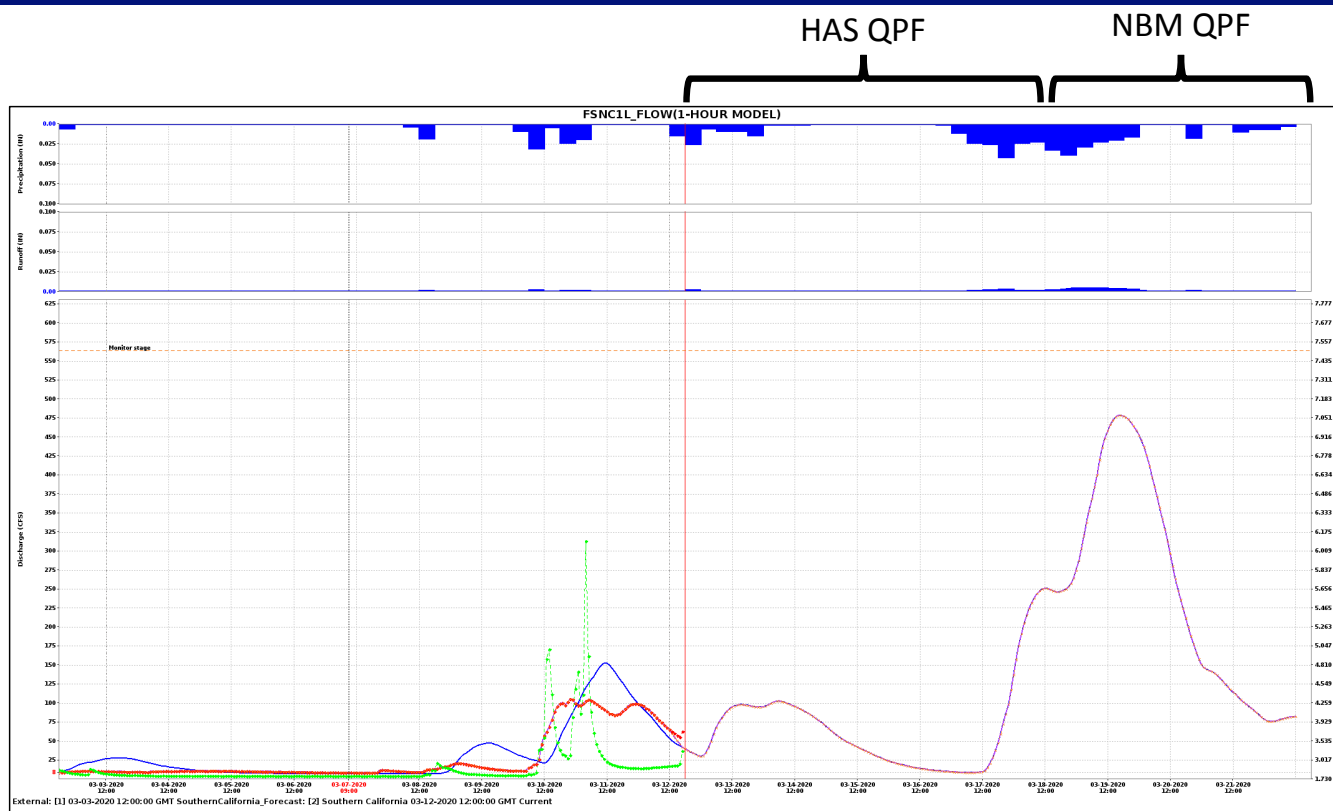


## Addition of Days 7-10 QPF from the NBM



- QPF : Days 7-10

New in WY2020  
Days 7-10 NBM QPF



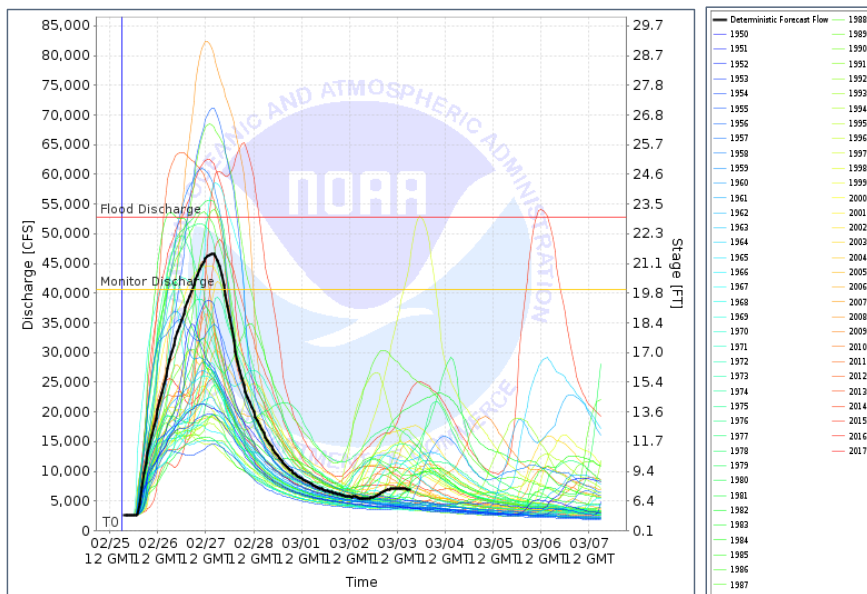
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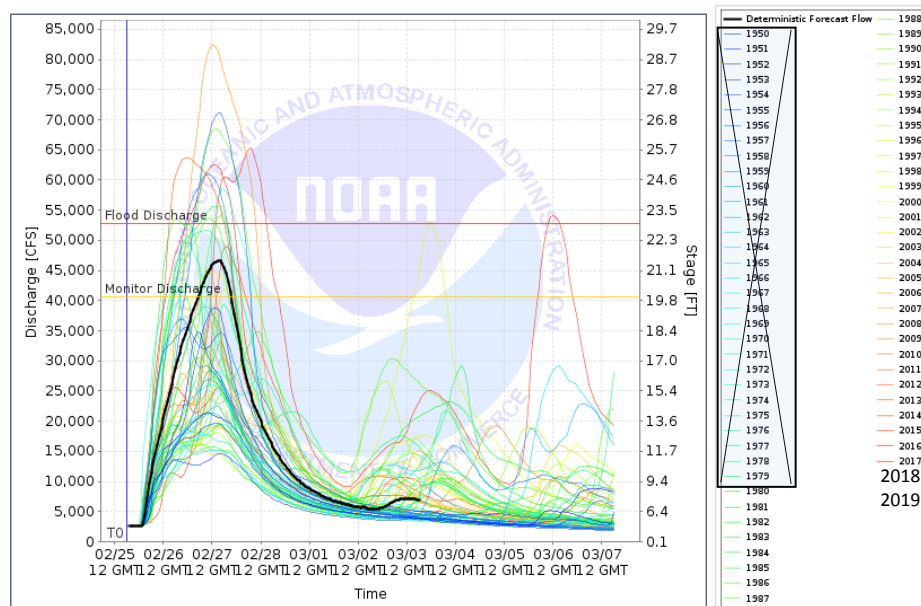
## New Set of HEFS Traces



WY 2020 – 68 Traces (WY1950-2017)



WY 2021 – 40 Traces (WY1980-2019)





## HEFS forcing model moving from GEFSv10 to GEFSv12



### **What's Happening?**

- OWP is working on re-forecasts for GEFSv12 this summer
- Parameter estimations should be complete by end of summer
- GEFSv12 – based ensembles will be available in the early fall for evaluation
- CNRFC plans to go operational with GEFSv12 ensembles by late fall 2020
- NCEP plans to retire GEFSv10 production no later than January 2021
- Period of record will be 1990-2019, will also include Jan 15 – Mar 11 1986

### **Advantages of GEFSv12:**

- Higher resolution model
- Better physics and data assimilation



## CNRFC Collaboration Efforts



- **Forecast Informed Reservoir Operations (FIRO)**

- Partnering with other water management agencies and researchers to help better manage water resources
- Partnering with CW3E on filling data gaps, identifying forecast issues to focus research efforts, helping to review scientific publications

- **CPC/ESRL/DWR Collaboration**

- Working with the Climate Prediction Center (CPC), NOAA's Earth System Research Laboratory (ESRL) and the CA Dept. of Water Resources (DWR) to improve sub-seasonal hydrologic forecasts

- **Internal Collaboration with OWP and the NWC on HEFS**

- Working with the Office of Water Prediction (OWP) and the National Water Center (NWC) to improve HEFS performance during extreme events
- Working with OWP and NWC on flood inundation mapping



## Three FIRO Projects in Different Phases



### Lake Mendocino in the Russian River watershed

Initial project that evolved from a NOAA Habitat Focus Area in 2013

A Preliminary Viability Assessment (PVA) was completed for this project

Group currently working on a Final Viability Assessment geared toward facilitating an updated Water Control Manual

CNRFC provides consulting, data, hindcasts, scaled events etc.



### Lake Prado in the Santa Ana River watershed

2<sup>nd</sup> FIRO project in CA

Project evolving faster than Lake Mendocino FIRO

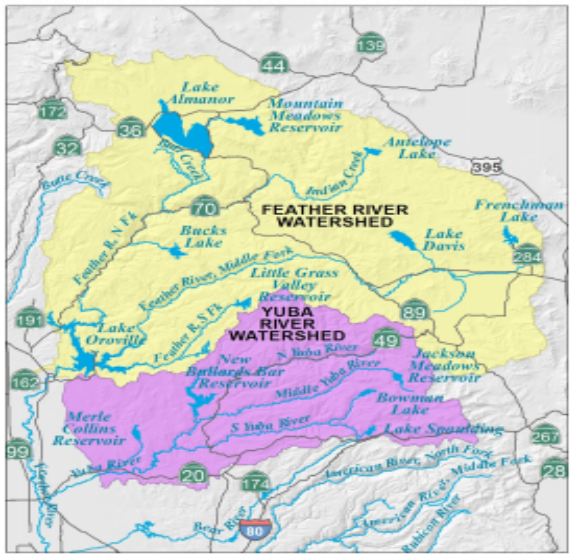
Water management issues very different from Lake Mendocino

CNRFC has provided hindcasts and other support for the project





## Three FIRO Projects in Different Phases



### Yuba & Feather watersheds

3<sup>rd</sup> FIRO project in California

Project benefits from previous Forecast-Coordinated Operations project

Project also benefits from the two other FIRO projects

Things are proceeding very quickly compared to the other two FIRO projects

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