End-to-End River Forecast Process

Nationally Available NWS Data Sources
- AWIPS
- OHD-HADS
- EMC
- WPC
- NOHRSC
- CPC

Nationally Available External Data Sources
- USGS Rating Depot
- USGS NWIS
- NSSL
- PRISM

Regionally Available External Data Sources
- USACE
- USBR
- DOE
- TVA Hydro Power

GeoSpatial Data
- USGS EROS
- NRCS

State or Locally Available External Data Sources
- Mesonets
- ALERT Networks
- States, Water Districts, or Industry

Streamflow Obs
Surface Obs
NWS products
QPF
NWP guidance
Snow Obs
Ensemble Weights
Stream Gage Ratings
Streamflow Obs
Q2 Radar Est.
Precip & Temp Climatologies
Reservoir Operations
Reservoir & Diversions Operations
Reservoir Operations
Reservoir Operations
DEM
LandUse/LandCover
Hydrographic Data
Soils Data

Surface Obs
Surface Obs
Streamflow Obs.
Local Reservoir Diversions & Use
Quality Controlled Data

1: Data Acquisition, Quality Control and Real-Time Preprocessing

- Observed Hydro. - Met. Forcings — Obs. Freezing Lev. Precip Temperature
- Forecast Hydro. - Met. Forcings — Fcst. Freezing Lev. Precip Temperature
- Model States information — Snow Water Equivalence Climate weights for ESP
- Observed Stream Flow and Regulation — Ratings Streamflow Reservoirs Diversions
- Projected-Future Regulation — Reservoir Storage Release Diversion Use

2: Hydrologic and Hydraulic Modeling (Community Hydrologic Prediction System)

- Snow — rain + melt
- Rainfall Runoff
  - Precipitation
  - Evapo-transpiration
  - F: Free water
  - T: Tension water
  - Impervious
  - Upper zone
  - Lower zone
  - Primary
  - Supple.
  - Reserved
  - Direct runoff
  - Baseflow
  - Subsurface outflow
- runoff
- Hydrologic routing
- Adjust Flow
- Forecaster Adjustment
- Headwater or Local Segment Definition

- Reservoir
  - Inflow
  - Evaporation
  - Spillway
  - Seepage
  - Sedimentation
  - Outlet
- outflow
- Hydrologic routing
- HEC-RAS River Analysis System
- Forecaster Adjustment
- Adjust Flow
- Reservoir Segment Definition

- Distributed Hydrologic Model
- Gridded Flash Flood Guidance
- Hydrologic Ensemble Forecast System
- End Fcst. Group

Operational Support and Development
- Local Database & Archive
- Local Service Backup
- Model Development and Calibration
- model states
- Calibrated Hydrologic, Reservoir and Hydraulic Models

Forecast Coordination

4: Limited Forecast and Model Evaluation
- Warning Verification (FLW & FFW)
- RFC Forcast Verification (Deterministic & Ensemble)
- NPVU QPF Verification — Discontinued

3: Product Generation, Dissemination and Decision Support
- Supporting Obs Data
- Watch Warning Advisory
- Weather Forecast Offices
- NWS Web
- AHPS Web
- Forecast Time Series
- StormDat
- RVF via SBN
- Probabilistic Fcst. Graphics
- Product Generation
- Local Web
- Stage III QPE
- Gridded Flash Flood Guidance
- Decision Support Services for Stakeholders
- NCEP