

Watershed and Reservoir Model Calibrations for Locations in the South Central United States

U.S. NATIONAL WEATHER SERVICE

PROJECT SUMMARY

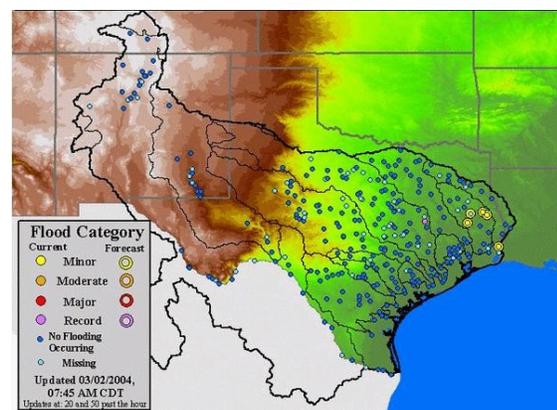
The U.S. National Weather Service desires improved flood forecasting capabilities for basins located in Texas, Colorado, and New Mexico. Working with the West Gulf River Forecast Center, Riverside Technology, inc. analyzed historical data and utilized several models to calibrate simulations at various forecast points. As a result, this information is currently being used to improve flood forecasting within the West Gulf River Forecast Center service area.

LOCATION
Texas, Colorado, New Mexico, U.S.A.

PERIOD
2004 – Present

PROJECT DETAILS

The National Weather Service (NWS) West Gulf River Forecast Center (WGRFC) implemented Advanced Hydrologic Prediction Services (AHPS) in Texas within several basins beginning in 2004. Hydrologic modeling within Texas is complicated by a number of water supply reservoirs as well as several U.S. Army Corps of Engineers (USACE) flood control reservoirs resulting in significant regulation in many basins. Riverside Technology, inc. (Riverside) assisted WGRFC by developing reservoir operation models for both the Trinity and Brazos basins that simulate the daily operation of the reservoirs and are suitable for developing long-range forecasts. Additionally, Riverside performed calibration of the Sacramento Soil Moisture Accounting (SAC-SMA) model for 63 sub-basins for incorporation into the forecast system for the Brazos, Neches, Sabine, and Lavaca-Navidad Rivers in Texas. LAG/K routing model calibration was also performed on several river reaches within these basins.



WGRFC Flood Category of Highest Forecast River State

Riverside calibrated a total of 21 reservoir operations models for the Trinity and Brazos basins so that they adequately simulate normal and flood control operations based on hydrologic model inputs. The USACE flood control reservoirs in both the Trinity and Brazos are operated as a system to control floods at a series of control points on the mainstem and tributaries to the rivers. Special treatment of these reservoirs was required to reflect interaction between the reservoirs.

Riverside’s approach to the development, calibration, and implementation of the reservoir models included an initial analysis of the system, its operational procedures, and associated historical data, followed by consultation with WGRFC staff to outline an appropriate overall design consistent with the constraints of an operational forecast office. Prior to detailed calibration of the individual reservoirs, Riverside developed initial system models to test the designs. A more complete calibration of each reservoir within the system models followed, concluding with the presentation of model results and implementation assistance to the WGRFC. The SAC-SMA model was calibrated as the rainfall-runoff model for each sub-basin. Following the assignment of initial model parameters based on physiographic data and review of previous models, the sensitive SAC-SMA parameters were identified and adjusted based on visual and statistical comparison with historic data. Similarly, LAG/K models were developed based on comparisons with available instantaneous discharge.

RELATED PROJECTS

Watershed and Model Calibrations for the Lower Mississippi River Basin

Watershed and Model Calibrations for the Ohio River Basin

Lower Tar River FLDWAV Calibration and Implementation

Calibration of the St. Marys and Milk Rivers

St. Johns River Basin Analysis and Model Calibration

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