

Bayou Meto Water Supply and Flood Control Study



Bridge crossing Big Bayou Meto

Groundwater depletion in the Arkansas River basin has left farmers in the Bayou Meto region without a reliable supply of irrigation water. The U.S. Army Corps of Engineers, Memphis and Vicksburg Districts, plans to mitigate this problem by constructing diversion channels from the Arkansas River to the Bayou Meto area.

To assist with the design alternative analysis, WEST Consultants, Inc., (WEST) developed existing condition hydrologic and hydraulic models of the 1,400 square-mile Bayou Meto area. WEST used ArcView Spatial Analyst and 3-D Analyst to define the hydrologic and hydraulic parameters of the watershed. The Bayou Meto study involved the following components:

Flood Frequency Analysis. WEST developed rating curves, period-of-record discharges, and discharge probability curves for five gaging stations in the Bayou Meto Watershed.

HEC-RAS Model Development/Calibration. WEST reviewed, modified, and calibrated HEC-RAS models provided by the Corps.

HEC-HMS Model Development/Calibration. WEST developed an existing condition hydrologic model of the Bayou Meto watershed using HEC-HMS. The hydrologic model was comprised of nearly 300 subbasins. The HEC-HMS models were calibrated using streamflow gaging station data and regional regression equations.

HEC-RAS Water Surface Profiles. WEST developed a series of water surface profiles for the 1- through 500-year peak discharges using the results from the HEC-HMS models.

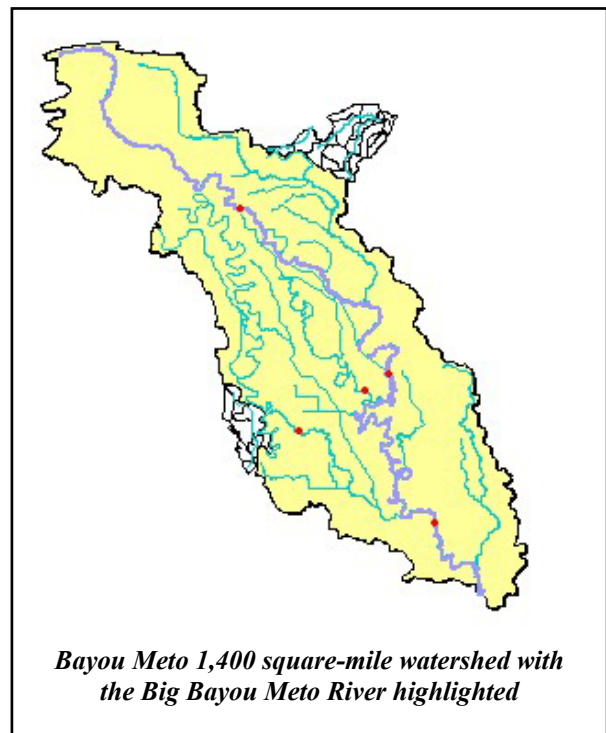
Rainfall Database Development. WEST used HEC-DSS to develop a rainfall database for hourly period-of-record (1949-1997) rainfall for two rainfall gaging stations.

HUXRAIN Calibration. WEST developed unit hydrographs from the HEC-HMS results and used HUXRAIN to develop period-of-record discharge hydrographs. The HUXRAIN results were calibrated to observed streamflow gage data by adjusting the Antecedent Precipitation Index (API). HUXRAIN is a program developed by the U.S. Army Corps of Engineers, Memphis District.

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Bayou Meto 1,400 square-mile watershed with the Big Bayou Meto River highlighted