Tetra Tech was contracted to develop and calibrate a watershed and in-stream water quality model for Floyds Fork in Kentucky. Floyds Fork is a major tributary of the Salt River. Its drainage area is 285 sq. miles and is within the Salt River basin which represents a significant part of central Kentucky. A total of 6 counties (Bullitt, Henry, Jefferson, Oldham, Shelby and Spencer) are partially located in the Floyds Fork watershed, making the watershed very important to a wide-range of communities. The watershed is located in northwestern Kentucky, approximately 10 miles NE of the city of Louisville. The east side of the watershed is dominated by agricultural land use while the west side by urban land use.

The Loading Simulation Program C++ (LSPC) was used to develop a watershed model to represent the hydrological and water quality conditions in the Floyds Fork watershed. The watershed model was calibrated to daily flows and discrete water quality data measured by KDOW, USGS, local municipalities, counties and other data sources. Once calibrated, LSPC was linked to the in-stream water quality model, the Water Quality Analysis Simulation Program (WASP) by providing flows and concentrations at tributaries and local drainage areas to simulate inflow to Floyds Fork. The WASP model was used to address the nutrient loadings and the water quality standards for chlorophyll-a and dissolved oxygen in the main stem and tributaries of Floyds Fork. For the model development, inputs included 73 point source discharges, nearly 1,000 sink holes, over 20 springs and over 200 SSO events, making Floyds Fork watershed model quite complex.

An important component of the model development process was the interaction with the Environmental Protection Agency (EPA), Kentucky Division of Water (KDOW), a Stakeholders group as well as a Technical Advisory Committee (TAC). In addition to the overall TAC, the TAC had various subcommittees whose responsibility was to focus on a particular issue or dataset for the model development. For example, there was a subcommittee on land use who focused on fertilizer and manure application rates specifically for Cropland and Pastureland land uses. Through this process there were a number of positives, as well as some negatives, that Tetra Tech had to deal with. In the end, there was a mutual respect that was obtained between all parties involved.

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