Hydraulic Analysis and Hydraulic Modeling

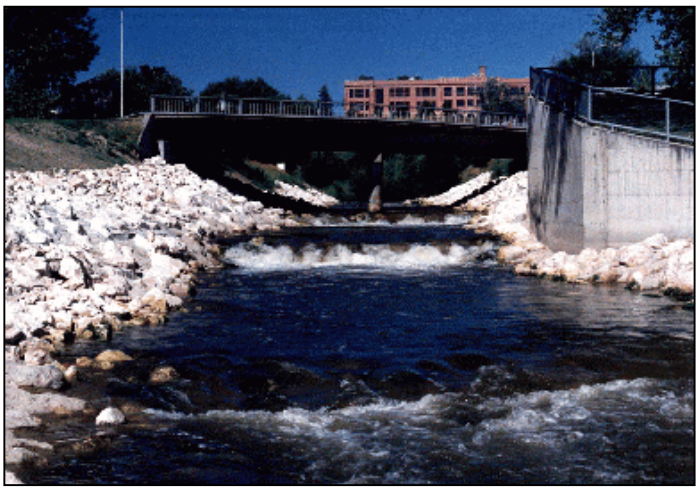
ACE staff have a widely recognized expertise in hydraulic modeling. ACE routinely utilizes HEC-2 or HEC-RAS in the evaluation of channel hydraulics to promote the determination of floodplains, detailed sediment transport evaluation or design of hydraulic structures. The staff frequently attend conferences, seminars and workshops in order to keep abreast of the most recent developments in hydraulic modeling. ACE staff members have presented training courses to environmental agencies within the States of Missouri, Wyoming, Utah and Colorado.

Representative projects illustrating ACE experience in hydraulic modeling include:

- *Hydraulic Design of the Timberline Road Bridge, Fort Collins, CO*: A 340-foot span bridge over the Cache La Poudre River was evaluated. The project included the design of a flood control levee and channel stabilization and restoration measures for the Poudre River, as well as a flood control channel and 50-foot clear span bridges at Mulberry Street (Colo. Highway 14) and Lincoln Avenue for Dry Creek.

Timberline Road/Cache La Poudre River Bridge, Fort Collins, CO

- *Big Goose Creek Drop Structure, Sheridan, WY*: ACE staff designed and supervised construction of a series of drop structures for the City of Sheridan, Wyoming, on the Big Goose Creek. The drop structures promote channel stability and reduce flood hazards within the City. The project replaced an existing vertical drop structure with four sloping, grouted rock drop structures. ***This project won the 1995 Wyoming Engineers Society Project of the Year Award.***



Big Goose Creek Drop Structure, Sheridan, Wyoming

Hydraulic Analysis and Hydraulic Modeling (Continued)

- *Keelung River Investigation, Taipei, Republic of China*: The Keelung River near the City of Taipei, Republic of China was modeled using RMA-1 and RMA-2 computer programs (a two-dimensional flow model developed by Resource Management Associates, Inc.).

- *Colorado River Setback Levee Design, Grand Junction, CO*: Setback levees along the Colorado River at Grand Junction, Colorado were designed as part of a flood control project for the Sacramento District. ACE staff participated as part of a project team that performed all hydraulic, sediment transport, geomorphic and geotechnical analyses.

- *Fossil Creek Stability Study, Fort Collins, CO*: This study included a detailed hydraulic analysis of a highly meandering, alluvial stream. The purpose of the study was to define potential limits of channel meander and bank failure, designate high and moderate erosional hazards, and develop a range of channel bank stabilization alternatives to minimize failure potential.

- *Bear River Hydraulic Investigation, Evanston, WY*: Hydraulic modeling, including split flow analysis, of the Bear River for the City of Evanston was conducted using HEC-2. The purpose of the modeling analysis was to determine: (1) the efficiency of a municipal water intake design, (2) annual cleanout requirements, and (3) channel stabilization alternatives.

ACE staff also have experience with unsteady flow and two-dimensional hydraulic models. Members of our staff are familiar with UNET, RMA-2 (FASTTABS), FLO-2D and the FESWM model and its application.