

## *River Mechanics and Sediment Transport*

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The staff of Anderson Consulting Engineers, Inc. includes recognized experts with unique capabilities in sediment transport modeling. Staff members have experience with computer code for coupled and uncoupled sediment routing, sediment routing by size fractions, various schemes to analyze long-term river bed aggradation/degradation and sediment distribution on the bed and predictive methods for local scour. Sediment transport models used by ACE staff include the US Army Corps of Engineers HEC-6 (Scour & Deposition in Rivers and Reservoirs), HEC-2SR (HEC-2 Sediment Routing), QUASED (Quasidynamic Sediment Routing), and KUWASER (known Discharge, Uncoupled Water and Sediment Routing).

### **Representative projects illustrating ACE experience in river mechanics and sediment transport include:**

- *Sediment Engineering and Channel Stability Analysis of the Napa River, CA*: ACE conducted the investigation to evaluate the impacts of proposed channel improvements by the Army Corps of Engineers. Tasks included field investigation, hydrologic investigation, geomorphic evaluation, and hydraulic modeling of the study reach. ACE developed a sediment continuity model of the river to assess the potential for scour and deposition throughout the study area.



**East Fork Carson River Study Reach Near Carson River, Nevada**

- *Carson River Stabilization Study, Minden, NV*: Sediment transport modeling and a geomorphic assessment were conducted along with HEC-2 hydraulic modeling to develop a streambank stabilization plan for the Carson River near Minden, Nevada.
- *Fluvial Study of the Santa Clara River System, Los Angeles County, CA*: This study included the quantitative analysis and modeling of hydrology, hydraulics and sediment transport for the extensive river system. HEC-2 and the Quasi-Dynamic Sediment Routing Model (QUASED) were applied to a total of 55 miles of the Santa Clara River and its tributaries. Modeling efforts included both subcritical and supercritical flow regimes, coupled to provide a continuous analysis routine for the entire system.
- *Little Medicine Bow Channel Relocation Project, Shirley Basin, WY*: This investigation involved the generation of design discharges (HEC-1); development of channel hydraulics to support floodplain and sediment transport investigations; geomorphic evaluations of the existing river channel and watershed and generation of design parameters for the proposed channel; generation of sediment rating curves and application of sediment continuity principles and modeling to determine the impact of sediment transport through the proposed channel realignment; and design of associated hydraulic structures.