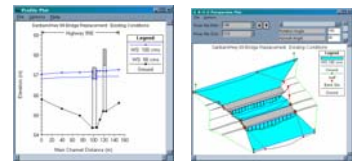




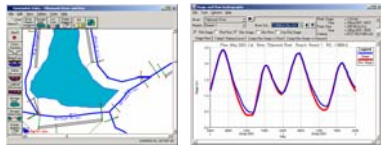
## Training Workshops and Seminars

WEST Consultants, Inc., recognized as experts in the application of hydrologic and hydraulic computer models, routinely offers training courses on throughout the United States and abroad to government agencies and the private sector. These services include teaching courses on the use of the U.S. Army Corps of Engineers Hydrologic Engineering Center's (HEC) River Analysis System (HEC-RAS), Hydrologic Modeling System (HEC-HMS), and on the subjects of sedimentation, stream stabilization, and toe scour. The content, duration, location, and cost of all our training courses can be customized to meet the specific needs of the participants. Most courses can be taught in both English and Spanish.

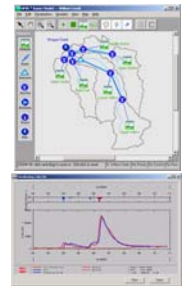
**HEC-RAS Introductory Course.** This intensive, hands-on, seminar and computer workshop provides practical training in basic steady flow modeling. Participants gain experience constructing RAS models, including developing bridge geometry and performing floodplain analyses. Lectures also discuss modeling culverts and modeling techniques.



**HEC-RAS for Unsteady Flow Applications Course.** This advanced training course provides comprehensive instruction and hands-on experience in how to use RAS for modeling unsteady flow conditions. Lectures discuss the intricacies of constructing unsteady flow models, and steps and model features for developing a stable and calibrated simulation. Additional presentations provide guidance on modeling inline and lateral structures (e.g. levees), bridges, and storage areas. Detailed workshops related to the lectures provide application experience in using the program.



**HEC-HMS Short Course.** HMS is HEC's latest hydrologic model, succeeding the widely used HEC-1 program. Our training course shows participants how to construct watershed models in HMS, and calibrate the model parameters through optimization methods. Students gain valuable hands-on experience in applying the model through numerous computer workshops. Hydrologic principles and their application to HMS modeling are discussed throughout the course. Basin rainfall, precipitation loss rates, unit hydrograph transformation, and channel routing model components are explained, in addition to GIS preprocessing capabilities and applications.



**Predicting Bed Scour for Toe Protection Design for Bank Stabilization Projects.** In our course you will learn the concepts of channel stability analysis, causes and characteristics of bank scour, how to recognize various types of toe failures, and how to perform assessment of vertical and lateral stability and understand their influence on toe scour. You will also gain knowledge on evaluating various design methods, determining which toe protection method is applicable, and making recommendations for inspection and maintenance. In addition, the influence of channel bends on scour depth and length of protection and a brief discussion of other toe design features are discussed.

**Additional Courses.** WEST also teaches courses on culvert, bridge, and channel restoration design, riprap design, scour analysis, and HEC-6 (Scour and Deposition in Rivers and Reservoirs).

**Previous Experience.** We have taught half-day to five-day short courses for organizations such as the American Society of Civil Engineers (ASCE) (Contact John Casazza, (800) 548-2723), the National Highway Institute (Contact Lynn Cadarr, (703)-235-0528), various U.S. Army Corps of Engineer Districts, Counties, and Departments of Transportation across the nation, the U.S. Forest Service, the International Erosion Control Association (IECA), the Floodplain Management Association (FMA) and a numerous consulting firms.