

HEC-RAS Computer Workshop for Unsteady Flow Applications

Purpose and Background

This seminar provides an opportunity for those with prior HEC-RAS modeling experience to use the program for modeling unsteady flow applications as well as advanced aspects of steady flow modeling. Experienced instructors will walk attendees through a number of learning modules and provide valuable hands-on experience while working with HEC-RAS software.

This ASCE On-Site Training provides an introduction to the unsteady flow component of HEC-RAS. The course lecture will expound upon unsteady flow theory, steps for developing an unsteady flow simulation, and procedures for creating a stable and calibrated model. Instructor guidance will provide techniques on modeling bridges and storage areas in the unsteady flow environment. Attendees are shown the inline and lateral weir features, which can be added in both steady and unsteady flow models. Workshops accompanying these lectures provide practical application experience in HEC-RAS unsteady flow modeling. New features in the latest release of HEC-RAS are also discussed as part of the class. This seminar is held in conjunction with ASCE's Environmental and Water Resources Institute (EWRI).

Seminar Instructors

Raymond Walton, Ph.D., P.E., D.WRE, F.ASCE, is Vice President, Bellevue, Washington Office Manager for West Consultants and former Region 8 Governor. Dr. Walton has over 35 years of experience directing water resources studies throughout the US and abroad. He is a nationally-recognized expert in multi-dimensional modeling of surface water, groundwater and water quality systems. Prior to joining WEST, he worked at the Hydraulics Research Station in the UK, taught at North Carolina State University, and spent 15 years with large nationwide consulting engineering firms. He has written over 50 professional papers in the fields of hydraulics, environmental engineering, groundwater and surface water hydrology, and instructs HEC-RAS nationwide. He has worked with ASCE and ASTM committees on Environmental Software and wetlands monitoring developments, and reviews technical papers for several ASCE journals. Dr. Walton chaired ASCE's International Water Resources Conference in Seattle in August 1999, was the Technical Chair for the 2005 ASCE/EWRI conference in Anchorage, and will chair the 2014 ASCE/EWRI Congress in Portland, Oregon.

Martin J. Teal, P.E., P.H., D.WRE, F.ASCE, has worked with hydraulic models for more than 20 years and is currently a Vice President with WEST Consultants. His experience includes working as a hydraulic engineer for the U.S. Army Corps of Engineers and as a civil engineer for a large multinational firm in Chile. As a private consultant with WEST, he has dealt with complex hydraulic, hydrologic, and sedimentation problems. He has used computational models, such as HEC-RAS and HEC-6, as a principal tool to deal with these problems for clients in both the public and private sectors throughout the United States and internationally. His sedimentation modeling experience includes reservoir sedimentation studies of main stem dams on the Missouri River, investigation of effects of in-stream sand and gravel mining, and other studies for rivers and washes from coast to coast. Mr. Teal earned his BS in Civil Engineering from the University of California, Berkeley, and his MS in Civil and Environmental Engineering (Hydraulics) from the University of Iowa. He has taught HEC-RAS courses since 1997 throughout the U.S. and Latin America.

- For group training, contact John Wyrick (JWyrick@asce.org) or Stephanie Tomlinson (STomlinson@asce.org)

Seminar Benefits

- Recognize the importance of unsteady flow modeling
- Discern the differences between steady and unsteady flow theory and modeling techniques
- Understand the modeling capabilities in HEC-RAS including bridges, culverts, storage area, gates, and inline and lateral structures
- Recognize how to develop a stable and calibrated unsteady flow model
- Distinguish the full capabilities of features included in the program
- Gain intensive, hand-on experience in model applications
- Learn from real-life cases

Who Should Attend?

- Consulting Engineers
- Water Resource Planners
- Local, State, and Federal Engineers
- Participants with some experience in floodplain hydrology and hydraulics and prior experience with HEC-RAS or completion of a basic HEC-RAS course

Summary Outline

DAY 1

- New Features in HEC-RAS 4.1
- Introduction to Unsteady Flow Modeling with HEC-RAS
- Detailed Output and Results for Unsteady Flow Modeling
- Computer Workshop on Unsteady Flow Modeling
- River Mechanics and Unsteady Flow Theory
- Additional Geometric Data for HEC-RAS Unsteady Flow Models
- Computer Workshop on Pre-Processing for HEC-RAS Unsteady Flow Models

DAY 2

- Boundary and Initial Conditions in the HEC-RAS Unsteady Flow Data Editor
- Modeling Bridges and Culverts using HEC-RAS Unsteady Flow
- Computer Workshop on Modeling Bridges
- Modeling Inline and Lateral Weirs
- Advanced Unsteady Flow Features
- Computer Workshop on Inline and Lateral Weirs

DAY 3

- Modeling Storage Areas and Hydraulic Connections
- Computer Workshop on Adding Structures to an Unsteady Flow Model
- Calibration of Unsteady Flow Models
- Computer Workshop on Calibrating an Unsteady Flow Model
- Model Stability, Accuracy, and Sensitivity
- Computer Workshop on Troubleshooting
- Who Should Attend
- Consulting Engineers
- Water Resource Planners
- Local, State, and Federal Engineers
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ASCE seminars are available for On-Site Training. For details regarding On-Site Training and/or needs-based training opportunities, please contact:

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