

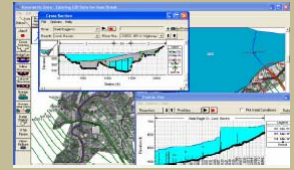
# Unsteady Flow HEC-RAS Workshop

December 1 - 3, 2015

Snohomish County DEM

720 80<sup>th</sup> Street SW, Building A

Everett, WA 98203 (12 CECs for CFMs)



## Summary

This short course provides an opportunity for attendees with prior HEC-RAS modeling experience to learn to use the program for modeling unsteady flow applications in addition to some advanced aspects of steady flow modeling. Workshops throughout the three days give useful hands-on experience in working with HEC-RAS. The instructors are experienced in both applying and teaching others how to use the software.

## Day 1

- New Features in HEC-RAS 5.0
- 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
- Calibration of Unsteady Flow Models
- Computer Workshop on Calibration
- Model Stability, Accuracy, and Sensitivity
- Computer Workshop on Troubleshooting

## COURSE FEES

\$845-NORFMA Members/\$945-Non-members\*

\*Become a member for 2015-2016!

Cancellation Policy: \$50 fee until Nov. 20, no refunds after this date.

This course is subject to cancellation due to insufficient number of students.

**LAPTOPS REQUIRED**

**INSTRUCTOR: Dr. Ray Walton, P.E., D.WRE** is a Lead Hydraulic Engineer with WEST Consultants in Bellevue, Washington. He has over 30 years experience directing water resources projects for a variety of federal, state, local government and private clients. He is a nationally-recognized expert in water resources and computer modeling, including surface water, groundwater, and water quality systems, and has been involved with numerous river and floodplain studies using HEC-RAS. He is a frequent instructor of short courses for ASCE Continuing Education and others in various aspects of numerical modeling using the HEC programs. He received his B.Sc. in Mathematics from University College, London, his M.Sc. in Engineering Hydrology from the University of Newcastle-Upon-Tyne, and his Ph.D. in Hydraulics from the University of Florida.

**WHO SHOULD ATTEND?** Engineers and scientists in water resources working for local, state and federal agencies and consulting firms, as well as water resources planners with prior experience with HEC-RAS.

**COURSE BENEFITS AND OUTCOMES** Participants will: Understand why unsteady flow modeling is important; Understand the differences between steady and unsteady flow theory and modeling techniques; Learn how to use the U.S. Army Corps of Engineer's HEC-RAS computer program to model river unsteady flow hydraulics; Become familiar with the modeling capabilities in HEC-RAS including bridges, culverts, storage areas, gates, and inline and lateral structures; Understand how to develop a stable and calibrated unsteady flow model; Get acquainted with the full capabilities of features included in the program

**REGISTRATION DEADLINE: November 20, 5:00 p.m.** Register by e-mailing the information below to [hhu@westconsultants.com](mailto:hhu@westconsultants.com). **Seating limited to 30 students.**

[Online registration – www.norfma.org](http://www.norfma.org)

**For checks, make payable to "NORFMA" and send to: NORFMA C/O Henry Hu, WEST Consultants, 12509 Bel-Red Road, Suite 100, Bellevue, WA, 98005. Visa or Master Card only.**

## Registrant Information

Name: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City, State, Zip: \_\_\_\_\_

Phone: \_\_\_\_\_

E-mail: \_\_\_\_\_

Circle Applicable Course Fee: \$845 / \$945; TOTAL: \_\_\_\_\_

Card No: \_\_\_\_\_ Sec. code: \_\_\_\_\_

Exp. Date: \_\_\_\_\_ Billing zip code: \_\_\_\_\_

Cardholder Name: \_\_\_\_\_ Signature: \_\_\_\_\_