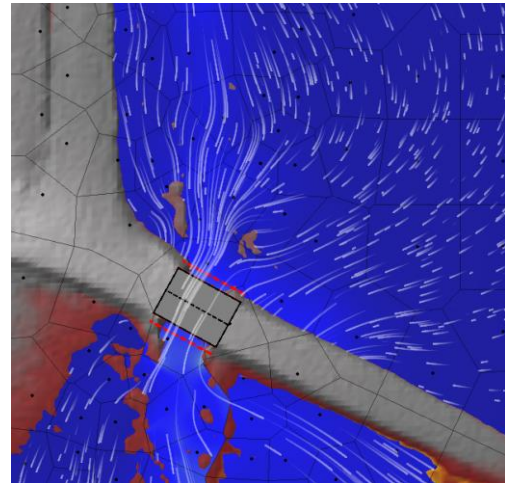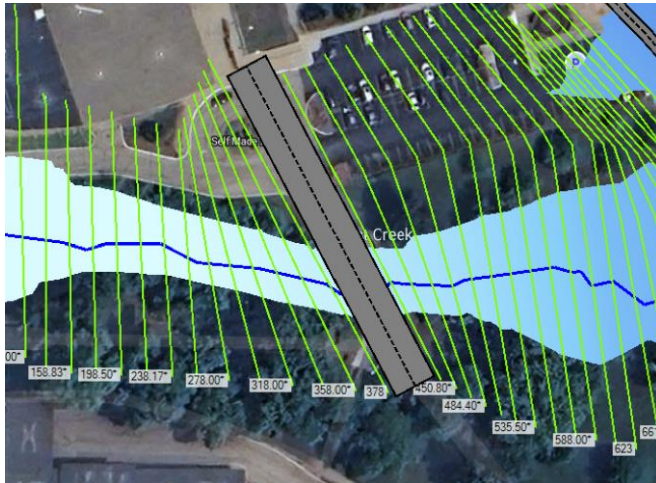**ASCE** American Society of Civil Engineers

Presents a four-week winter professional development course on:

1D/2D Modeling with HEC-RAS 6.4.1

Course: January 10 – February 7
On-line Content with Live Sessions on January 10, 17, 24, 31, and February 7

ASCE Inland Empire Section is pleased to present a four-week workshop on the use of the hydraulic modeling tools in HEC-RAS. This workshop will feature an on-line asynchronous course with live and pre-recorded lectures and hands-on computer workshops that will give you a solid understanding of the theory behind the model as well as a practical ability to work the model effectively. We will use version 6.4.1 of HEC-RAS. In addition to the program itself, you'll receive valuable resources and references. This course qualifies for 20 PDH continuing education hours.

The instructor for the workshop is Sue Niezgoda, Ph.D., P.E., with Gonzaga University.

For this on-line course, you will need a windows laptop that has:
- Version 6.4.1 of HEC-RAS (can be downloaded through USACE, look in Archived Versions to find version 6.4.1)
- A high-speed internet connection
- Adobe Acrobat Reader or other reader to be able to open and read PDFs
- Microsoft Excel

Course Outline:
- Offered over 4 weeks, with pre-recorded content, exercises, and a 1.5-hour Live session each week on Fridays (Noon – 1:30 pm PT).
- A recording will be made available of the live session for those who cannot attend.
- Participants should expect to spend 4-5 hours per week on the course.
- This format offers significant flexibility for working professionals and can accommodate a variety of schedules.
- The source for the pre-recorded content and workshops is being finalized and registrants will be notified prior to January 10, 2025 regarding access.
- Live Sessions will be held through Microsoft Teams.

Course Overview:
This is a foundational course for using 1D and 2D HEC-RAS and will give you hands-on workshop experience applying HEC-RAS to real-world problems.

In this course, you will:
- Learn differences between 1D and 2D modeling and better understand situations when you would apply 1D, 2D, or 1D/2D modeling
- Learn about 1D hydraulic modeling theory and bridge hydraulics
- Build and run a 1D HEC-RAS model including a Bridge and examine different bridge modeling approaches
- Learn about 2D hydraulic modeling theory and how to include bridges in 2D models
- Learn about RAS Mapper and its many functions for building 1D and 2D models, and improving 2D modeling computations
- Build and run a 2D HEC-RAS modeling including a Bridge
- Build a 1D/2D HEC-RAS model to examine hydraulics related to a river restoration project
- Learn how to troubleshoot 1D and 2D models
- Benefit from hands-on applications throughout the course

Some prior limited experience with 1D HEC-RAS is required.

First Day of Course Friday, January 10, 2025   12:00-1:30 PM
Live Session (1.5 hours)
- Introductions (Time: 10 min)
- Objectives of Course, Materials, and Logistics (Time: 45 min)
- Introduction to Week 1 Content (Time: 20 min)
- Open Session: Q&A (Time: 15 min)

Week 1   January 13-17, 2025
1D Modeling
(Time: 4-5 hours depending on HEC-RAS experience level)
Recordings will Cover
- Lecture: Introduction to HEC-RAS 1D/2D Modeling (including when use 1D or 2D) (Time: 1 hour)
- Lecture: 1D Theory and Bridge Hydraulics (Time: 1 hour)
- Lecture: Building a 1D Model with a Bridge (Time: 50 min)
- Workshop 1 Introduction – Creating a 1D Bridge Model
  - Introduction (Time: 10 min)
  - Doing the Workshop (Time: 1 – 2 hours depending on RAS experience)

Live Session   Friday, January 17, 2025   12:00-1:30 PM
- Open Session: Q&A (Time: 30 min)
- Polls/Quiz on 2D or not 2D (Time: 10 min)
- Review of Workshop 1 Results (Time: 30 min)
- Intro to Week 2 (Time: 20 min)

Week 2   January 20-24, 2025
2D Modeling
(Time: 4-5 hours depending on HEC-RAS experience level)
Recordings will Cover
- Lecture: Intro to 2D Modeling and 2D Theory (Time: 1.5 hours)
- Lecture: RAS Mapper (Time: 1.5 hours)
  (Projections, Terrain, Land Cover and Manning's n, Terrain Modifications, Breaklines, Refinement Regions, RAS Mapper Demo)
- Workshop 2 Introduction: Creating a 2D Model and 2D Bridge
  - Introduction (Time: 10 min)
  - Doing the Workshop (Time: 1- 2 hours depending on RAS experience)

Live Session   Friday, January 24, 2025   12:00-1:30 PM
- Open Session: Q&A (Time: 30 min)
- Polls/Quiz on RAS Mapper features (Time: 10 min)
- Review of Workshop 2 Results (Time: 30 min)
- Intro to Week 3 (Time: 20 min)

Week 3   January 27-31, 2025
1D/2D Modeling
(Time: 4-5 hours depending on HEC-RAS experience level)
Recordings will Cover
- Lecture: Building a 1D/2D Model (offline and inline 2D areas) (Time: 1 hour)
- Lecture: 1D/2D Flow Data (Time: 1.5 hours)
  Workshop 3 Introduction: River Restoration (1D vs 2D)
  - Introduction (Time: 10 min)
  - Doing the Workshop (Time: 2-3 hours depending on RAS experience)

Live Session   Friday, January 31, 2025   12:00-1:30 PM
- Open Session: Q&A (Time: 30 min)
- Polls/Quiz on 1D/2D Flow (Time: 10 min)
- Review of Workshop 3 Results (Time: 30 min)
- Intro to Week 4 (Time: 20 min)

Week 4   February 3-7, 2025
Troubleshooting HEC-RAS Models
(Time: 3-4 hours depending on HEC-RAS experience level)
Recordings will Cover
- Lecture: Troubleshooting 1D Models (Errors, Warnings, and Notes) (Time: 1 hour)
- Lecture: Using Output for 2D Model Troubleshooting and Calibration (Time 1.5 hours)
- Workshop 4 Introduction: Troubleshooting HEC-RAS
  - Introduction (Time: 10 min)
  - Doing the Workshop (Time: 1-2 hours depending on RAS experience)

Live Session   Friday, February 7, 2025   12:00-1:30 PM
- Open Session: Q&A (Time: 30 min)
- Polls/Quiz on Troubleshooting HEC-RAS (Time: 10 min)
- Review of Workshop 3 Results (Time: 30 min)
- Quick Discussion of HEC-RAS New Features (e.g., Rain on Grid, Stormwater Pipes, HEC-RAS2025) (Time: 10 min)
- Summary, Review, and Closure (Time: 10 min)

Instructor Bio

Dr. Sue Niezgoda, PE, is a Professor of Civil Engineering at Gonzaga University and a registered licensed engineer. She has an emphasis in water resources engineering and teaches and conducts research in the areas of fluid mechanics, hydraulic engineering, stream restoration, soil erosion and sediment transport, hydrologic and hydraulic modeling, and uncertainty and risk assessment. Dr. Niezgoda is currently working on monitoring the effectiveness of beaver dam analogs to reduce downstream sediment loads and restoring depositional river valleys to a Stage 0 anastomosing channel network. She has also published a body of knowledge for the practice of stream restoration that can be used as a foundation for a national certification. Dr. Niezgoda is an active member of the ASCE EWRI Hydraulics and Waterways Council River Restoration Technical Committee and River Restoration Northwest, a nonprofit organization aimed at advancing the science and standards of practice of river restoration through an interdisciplinary process-based approach.

Registration

Cost: **$800.00**

Education Credit:
2 CEUs (20 PDHs) for attendance of this course.

Deadline Notice:
Space is limited to 40. To ensure participation, enroll early.
Early Registration will close on December 18, 2024.
If space available, late registration after this date will be $1,000.

Registration:

Go to https://ascetechnicalseminar.eventbrite.com to register and provide payment

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