



EPP 221 – River Restoration, Part 1: Physical Processes

Course Summary: This course introduces participants to the River Restoration Professional Certificate Program and also serves as a prerequisite for the Restoration Design course. The primary goal of this class is to provide a wide-angle view of the constantly evolving science and technology of river restoration, giving you an understanding of the physical science and engineering skills needed to develop and implement a river restoration project. The course is designed for consultants, natural resources managers, regulators, environmental planners, contractors and others that have an interest in river restoration. The course is led by Drs. Janine Castro and Sue Niezgoda, national experts and practitioners in river restoration, geomorphology, and river engineering.

Duration: 3 days.

Topics:

- Case Study: Site evaluation, design process, permitting, and construction.
- Climate: Predicted changes in low and flood flows and water temperature in the PNW, and how this may impact future stream restoration.
- Ecomorphology: Introduction to morphologic adjustments due to vegetation, large wood, and aquatic and terrestrial species.
- Hydraulic Modeling and Applications: HEC-RAS and an introduction to advanced techniques.

- Hydraulics: Continuity equation, energy distributions, shear stress, flow types/regimes, discharge definitions, 1, 2, & 3D flow, hydraulic roughness, and turbulence.
- Hydrology: Rainfall runoff, hydrographs, modified hydrology, and flow frequency.
- Introduction to Modeling: Types, complexity, assumptions & sensitivity.
- Process & Form: Linking drivers to stream processes that result in channel forms and habitat types.
- Principles of Channel Adjustment, Part I: Stream Evolution; Part II: Bank Erosion.
- Soils: Type and classification, planting medium, interpretation and resources.
- Stream Energy: Flooding v. erosion, total system energy, potential and kinetic energy, energy dissipation, and channel and floodplain roughness.
- Sediment Dynamics: Sources, scour mechanisms, mobilization, transport, deposition, measurement techniques, sediment transfer, and long-term budgets.
- Vegetation: Physical effects of vegetation.

Fee: All instruction and program facilitation, resource manual, transportation to/from the field (if applicable), morning coffee/tea; a certificate of completion for this offering is provided.

Available Professional Credit: 3.1 CEU, 31 PDH.