



Hands-on Seminar on Erosion and Sediment Transport

One-day classroom-seminar, 8-PDH



This participatory classroom-seminar offers fundamentals of erosion and sediment transport with the following objectives:

- To determine when and how erosion and sedimentation occur
- To estimate the magnitude of sediment transport
- To get familiar with applications in such fields as river engineering, stormwater management, roads, culvert design, dam removal, and fisheries
- To introduce the erosion-related policies and practices in Michigan

Special Features

- Class participation in hands-on exercises using sediment samples and models
- Several computational aids (software)
- Case studies in Michigan
- A collection of technical literature and educational video clips
- Experienced guest speakers from the industry (MDOT, MDEQ, MDNR, Consultants)

Outline

- Introduction to Hydraulics
- Sediment Properties
- Modes of Sediment Transport
- Velocity and Concentration Distributions
- Beginning of Motion and Suspension
- Sediment Load Types
- Sediment Transport Estimators:
 - Stream-specific vs. general equations
 - Three types of sediment load:
 - Bed-load
 - Suspended-load
 - Total load
- Bridge Scour Prediction and Protection
- Common Mistakes in Sediment Management
- Publicly Available Software
- Special Topics (guest speakers):
 - Erosion control during construction (MDOT)
 - Overview of SESC/CSW Program in Michigan (MDEQ)
 - Ecological impacts of river erosion and sedimentation (MDNR)
 - Sediment Retention Barriers, SRB's (Bergmann Associates)
- A Comprehensive Problem with Brief Solution
- Five Take-away Messages

Who Should Attend

Engineering, water resources, and environmental professionals from public agencies or private firms with 0 to 20 years of experience dealing with erosion and sedimentation problems in civil and infrastructure projects.

What to Bring

Please bring your calculator and laptop. We will use online computational aids during the seminar.

Instructor

Saied Saiedi, Ph.D., P.Eng.

Senior Discipline Specialist, Bergmann Associates

Dr. Saied Saiedi is a civil engineer with 29 years of engineering and academic experience in Iran, Australia, Malaysia, Canada, and USA. His hydrotechnical interests cover a wide range: Free surface flow (hydraulic structures, sediment transport, hydropower dams, river engineering), water and power tunnel design, coastal structures and processes, floating offshore structures, flood studies, stormwater management, and dam safety review. He has developed, managed, and reviewed several numerical and physical modeling works. His COUPFLEX model (J. of Hydraulic Engineering, ASCE, May 1997; [link](#)) is among the first coupled simulations of unsteady river-sediment flow.

Dr. Saiedi designed and oversaw the construction of a flume for river, wave, and sediment studies at Water Research Laboratory (UNSW, Sydney, Australia) in 1991-1992. The facility has been since used for many projects involving riverine flows and coastal waves ([link](#)).

For several years in the 2000's, Dr. Saiedi served NAHRIM (National Association of Hydraulic Research in Malaysia) as the senior adviser for coastal engineering projects. He also managed and technically led a design project on erosion protection and rehabilitation works related to a major TNB hydropower facility in Malaysia in 2006-2007. While working for PETRONAS (Malaysian national oil and gas company), he trained several groups of engineers from various engineering disciplines to enter the realm of marine engineering ([link](#)). In 2006-2008, Dr. Saiedi conceptually designed a large wave flume and a large wave basin for the "Offshore Engineering Lab." ([link](#)) at UTP for applied research projects in the areas of coastal and offshore engineering.

While working in Canada, Dr. Saiedi led or participated in design and investigations for hydropower plants and dam facilities in Canada and overseas. He has also shared over the years his hydrotechnical experience with professional engineers through several short-courses on hydraulic structures ([link](#)), sediment transport ([link](#)), water tunnels ([link](#)), coastal and marine structures ([link](#)), hydropower facilities ([link](#)), and physical modeling ([link](#)). He has extensive concurrent academic experience as an Associate Professor in Civil Engineering.

Dr. Saiedi is a Senior Discipline Specialist at Bergmann Associates, Midwest Region, USA. While in Canada, he was the Director of Progress International Consultants and the former Hydrotechnical Discipline Lead (Western North America) of Hatch based in Vancouver.

Guest Speakers (½-hr each)

Bob Batt

Region Resource Specialist, MDOT

Bob has worked for MDOT as the Region Resource Specialist for the University Region for 27 years. His primary responsibilities include environmental compliance, roadside vegetation management, and contract administration. The environmental compliance duties include work with stormwater and soil erosion and sedimentation control inspections and reviews for MDOT projects and facilities. He is a contributor to MDOT's current Soil Erosion and Sedimentation Control Manual.

Bob will present an overview of MDOT's erosion control practices and policies, with case studies.

Cheryl Petroski-Wilson

SESC/CSW Program Specialist, MDEQ

Cheryl has worked with MDEQ SESC/CSW Program for over 12 years. She has provided SESC (Soil Erosion and Sedimentation Control) advice on various types of projects across Michigan.

Cheryl will present an overview of the SESC and CSW (Construction Storm Water) Programs, with case studies.

Patrick Ertel

Senior Resource Analyst, Fisheries Division, MDNR

Patrick has 11 years of experience in tackling river-based issues across the State of Michigan in projects related to zoning, hydropower, sediment dynamics, stream restoration, and the ecological impacts of dam removal.

Patrick will discuss project examples for erosion control and habitat enhancement through working "with" rivers rather than rigid control methods.

James Ensign, PE

Project Manager, Bergmann Associates

James has designed and built stormwater projects in Michigan for the last decade. Due to their proximity to Waters of the State, most projects located in a stream or wetland that required innovative plans to prevent erosion and remove sediment within the project site.

James will share his experience on Sediment Retention Barriers (SRB's).