Pre-conference Short Course **September 3 ~ 5, 2011**

Modeling of River Migration at Multiple Scales

A GIS-based toolbox for river restoration

Registration fee: 100.00USD

Jorge D. Abad
University of Pittsburgh, Department of Civil and Environmental Engineering, PA, 15206, USA

Eddy J. Langendoen
United States Department of Agriculture, National Sedimentation Laboratory, Oxford, Mississippi, USA

Davide Motta
University of Illinois at Urbana-Champaign, Department of Civil and Environmental Engineering, Urbana, 61801, USA

Marcelo H. Garcia
University of Illinois at Urbana-Champaign, Department of Civil and Environmental Engineering, Urbana, 61801, USA

This intensive course will be taught over 3 days, comprising six one-hour/day lectures on theory and modeling aspects of river meandering and streambank erosion across multiple spatial and temporal scales.

Additionally, one-hour lectures of application cases related to the short course will be presented at the end of the first and second day. The Course is intended for students, professionals, and scientists.

Courses Content

Day	Topic	Lecturer
Sept, 3 M	**Review of the basic theory of the hydrodynamics and bed morphodynamics of meandering rivers**: a) Hydrodynamics of meandering rivers; b) Bed morphodynamics of meandering rivers.	JDA
Sept, 3 A	**Overview of the state-of-the-art modeling of meandering rivers:** a) Review of the 2D depth-averaged and 3D governing equations and turbulence closures; b) Applications using 2D depth-averaged models; c) Applications using 3D models.	JDA
Sept, 3 E	**Overview Lecture relating the first-day topics by Marcelo H. Garcia:** How channelization affects flooding, sediment transport and bed morphodynamics: the case of Kankakee River in Illinois, USA.	MHG
Sept, 4 M,A	**Review of the theory and modeling of streambank erosion processes:** a) Theory of streambank erosion processes; b) Modeling of streambank erosion processes; c) Applications using the 1D model CONCEPTS.	EJL
Sept, 4 E	**Overview Lecture relating the second-day topics by Marcelo H. Garcia:** Performance of bendway weirs and other bank protection technologies: the case of Sugar Creek in Illinois, USA.	MHG
Sept, 5 M	**RVR Meander + CONCEPTS: A new physically-based platform to assess river migration for engineering applications:** a) Pre-processing tool; b) Statistical tool; c) 2D model of hydrodynamics and bed morphodynamics; d) Physically-based model of streambank erosion; e) Methodology for river migration; f) Impact on migration patterns and prediction.	DM
Sept, 5 A	**Sample applications:** a) Re-meandered channel: Trout Creek ? Lake Tahoe (California, USA); b) Natural river: Mackinaw River. (Illinois, USA). **Limitations of RVR-Meander + CONCEPTS:** a) Sharp and narrow bends; b) Sensitivity to parameters; c) Progressive bedforms.	DM
Sept, 5 A	**Modeling short-term meander evolution**	JDA
Sept, 5 E	**Open discussion and closing of the short-course**	ALL

M: morning, A: afternoon, E: evening