

ICOLD EUROPEAN WORKING GROUP ON OVERFLOW AND OVERTOPPING EROSION:

UPDATE ON DAM & LEVEE EROSION RESEARCH

Location: Online (Zoom)
Timing: 28th March 2022 16:00 – 18:00 CEST
Meeting Link: Confirmed by email following registration
Free to Register: <https://ewgooe.samuidissemination.com/>

Meeting Objectives:

- To provide an overview of recent and ongoing research initiatives related to the erosion and erosion protection of dams and levee

AGENDA

Ref	Item	Time	Speaker / Action
S1	Welcome EWGOOE Chairman	16:00	Jean-Robert Courivaud (EDF, France)
S2	Programme Context / Overview	16:05	Mark Morris (HR Wallingford, France)
S3	Submerged Jet Erodibility Test Methods Research - Overview of research (20 mins) - Q&A (5 mins)	16:15	Tony Wahl (USBR, Denver)
S4	Using Machine Learning in Estimating Erosion Rate of Coarse-Grained Soil Mixes - Overview of research (20 mins) - Q&A (5 mins)	16:40	Ghada Elithy (ERAU, Florida)
S5	The OVERCOME Project - UPM laboratory tests (20 mins) - Q&A (5 mins)	17:05	Rafael Morán & Ricardo Alves (UPM, Madrid)
S6	The POLDER2C'S Project - Overview (20 mins) - Q&A (5 mins)	17:30	Patrik Peeters (Flanders Hydraulics Research, Belgium)
S7	Concluding observations	17:55	Jean-Robert Courivaud (EDF, France)
	Close	18:00	

SUMMARY OF PRESENTATIONS

S1 Welcome

As chairman of the ICOLD European Working Group on Overflow and Overtopping Erosion, **Jean-Robert Courivaud** (EDF, France) will open and chair this webinar.

S2 Programme Context / Overview

Mark Morris (HR Wallingford, France) will provide a brief overview of key erosion research issues, the goals of the OVERCOME Project and how the different initiatives being presented here interrelate.

S3 Submerged Jet Erodibility Test Methods Research

Tony Wahl (Bureau of Reclamation, Denver)

Tony will introduce ongoing research on data analysis methods for the submerged jet test and comparison of mini-JET to larger-scale "original JET". Over the past 2 years several methods for processing JET data have been evaluated, including several methods based on non-linear erosion models. The conclusion has been that linear methods and the simplest data-fitting techniques are the best behaved and most useful. Work is now starting on a phase of the research focused on mini-JET vs. original JET comparisons. Tony is also working on a new ASTM standard for the JET.

Tony will also try to briefly introduce a research project that will be conducted this summer to look at the stability of crest caps applied to embankment dams as an integral part of overtopping protection via RCC stepped overlays.

S4 Using Machine Learning in Estimating Erosion Rate of Coarse-Grained Soil Mixes

Ghada Elithy of Embry-Riddle Aeronautical University (ERAU) (formerly USACE, Engineering Research and Development Center, Vicksburg)

Soil erosion and water depth measurements were taken during flume tests using Shallow Water Lidar (SWL) system scans. The tests were conducted in a 1-m-wide tilting flume on three clean sand and gravel soil mixes with a median grain size D_{50} of 2, 5 and 20 mm. Standard machine learning techniques were used to image soil and water profiles from noisy Lidar data. First the data is filtered using zonal-averaging and then best profiles were selected from a competing set based on the minimum error each profile produces. Once the profiles are obtained, erosion rates and bed shear are computed, and a qualitative assessment is carried out to understand the relationship between temporal and spatial dependence of erosion rate on bed shear and soil particle size."

S5 The OVERCOME Project (laboratory tests)

Rafael Morán and Ricardo Alves of Universidad Politécnica de Madrid (UPM)

Rafael and Ricardo will provide an introduction to and overview of the programme of flume tests being undertaken at UPM as part of the wider OVERCOME Project. The flume test programme started in 2020 and comprises tests at different scales, using coarser grained materials, including real samples from River Rhone levees. Tests so far have shown both surface and headcut erosion processes, along with surface armouring. The influence of an upstream / surface sealant layer

(indicative of a canal lining or levee crest road covering) has also been shown to significantly affect erosion processes.

S6 The POLDER2C'S Project

Patrik Peeters (Flanders Hydraulics Research, Belgium)

Within the Polder2C's project flood resilience measures are developed in a unique way. What is special about POLDER2C's is that not only overflow, wave impact and overtopping tests are carried out, but that emergency repair measures can also be practiced under controlled, and very realistic conditions.

Partners from The Netherlands, Belgium, France and the United Kingdom are working together, sharing expert skills and facilitating knowledge transfer to adapt and protect for the rising sea level and heavy storms that occur more and more frequently.

See <https://polder2cs.eu/>