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Lower Saxony – Scotland Joint Forum 2020

24 November 2020

Session VII – 1 pm CET

Environmental Hydraulics – Research Challenges and Opportunities in Lower Saxony and Scotland

Workshop Organizers

Jochen Aberle, *Technische Universität Braunschweig*

Bernhard Vowinckel, *Technische Universität Braunschweig*

Vladimir Nikora, *University of Aberdeen*

Description

Environmental hydraulics deals with the movement of water and the transport processes in water bodies such as streams, lakes, estuaries, oceans, and underground aquifers as well as the exchange at their interfaces. This cross-disciplinary academic field combines technological, environmental and human-sociological interests with the objective to provide professionals working in water-related areas with technology and knowledge to ensure a sustainable management of the water environment that provides adequate water resources for upcoming generations. Moreover, environmental hydraulics promotes the implementation of fluid mechanical concepts into environmental and ecological theories and is therefore relevant for many ecological research areas.

Presently, climate change effects (e.g., extreme floods and droughts), the anthropogenic use of water bodies (e.g., energy production, navigation, irrigation), and the EU-water legislation (requiring a good ecological status of water bodies by 2027) represent major challenges for scientists and practitioners working in the field of environmental hydraulics. Resolving these challenges at an acceptable social, economic and environmental cost requires an improved understanding of the processes linking biological and hydromorphological quality components of water bodies.

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The aim of the present workshop is to showcase ongoing research at universities in Lower Saxony and Scotland in the field of environmental hydraulics. The contributions cover a wide variety of topics including but not limited to river hydraulics, coastal hydraulics, sediment transport, eco-hydraulics, renewable energy that will be highlighted from both, scientific and practical perspectives.

Programme

(The times of the programme items are indicated in CET.)

1 pm **Welcoming Addresses**

Vladimir Nikora, *School of Engineering, University of Aberdeen*

Jochen Aberle, *Leichtweiß Institute for Hydraulic Engeneering and Water Resources, Technische Universität Braunschweig*

Bernhard Vowinckel, *Leichtweiß Institute for Hydraulic Engeneering and Water Resources, Technische Universität Braunschweig*

1:10 pm **Environmental Hydraulics – Freshwater and Estuaries**

Experimental Ecohydraulics in the Laboratory and the Field

Jochen Aberle, *Leichtweiß Institute for Hydraulic Engeneering and Water Resources, Technische Universität Braunschweig*

Open-Channel Flow Hydrodynamics: Aberdeen Experience

Vladimir Nikora, *School of Engineering, University of Aberdeen*

Sediment Transport: Numerical Simulations

Bernhard Vowinckel, *Leichtweiß Institute for Hydraulic Engeneering and Water Resources, Technische Universität Braunschweig*

Ecogeomorphodynamics Research: Glasgow Experience

Manousos Valyrakis, *University of Glasgow*

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2:00 pm **Environmental Hydraulics – Estuaries and Coasts**

Flows Past Bivalve-Covered Surfaces

Nils Goseberg, *Technische Universität Braunschweig/Forschungszentrum Küste*

Modelling of Buoyancy-Driven and Stratified Flows

Alan Cuthbertson, *University of Dundee*

The Narrative of Green vs. Gray

Torsten Schlurmann, *Leibniz Universität Hannover/Forschungszentrum Küste*

Boundary Layer Flow, Sediment Transport and Vegetation Dynamics under Waves

Tom O'Donoghue, *University of Aberdeen*

2:50 pm **Discussion & Closing**

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