

DHI UK & IRELAND SYMPOSIUM 2017

27
JUNE

USER AND DHI PRESENTATIONS

PROGRAMME OVERVIEW

Tuesday 27 June 2017

08:30 - 09:00	Registration and Coffee
09:00 - 09:15	Welcome to the Symposium—An introduction to the conference, DHI and MIKE Powered by DHI Steve Flood (Software Manager, DHI Water Environments UK Ltd)
09:15 - 09:30	MIKE Powered by DHI 2017 and a practical application of our latest technology-Part 1 Poul Kronborg, Global Sales Executive, Marine Infrastructures & Marine Software Products
09:45 - 10:15	KEYNOTE: Standards for modelling of flooding in open coasts and large estuaries Hakeem Johnson (Ch2m) & Niall Hall (Environment Agency)
10:15 - 10:35	Assessing the risk of Salmon Lice disease spreading in Norwegian salmon farms using Agent-based Modelling Mads Joakim Birkeland (DHI Denmark)
10:35 - 11:00	Morning Coffee & Cakes
11:00 - 11:20	Fit for Purpose Modelling – choosing the right tool for the job Fernando Alvarez (Intertek)
11:20 - 11:40	Development of a MIKE 21 FM HD model to assess the risk of flooding from MIKE wave overtopping and tidal inundation of a site in Co. Clare, Ireland Kevin Barry (Arup)
11:40 - 12:00	Dawlish Warren Beach Management Scheme Josh Gibson and Andy Wareing (Atkins)
12:00 - 12:20	MIKE Operations Henrik Refstrup Sørensen (DHI)
12:20 - 13:30	Lunch
13:30 - 13:50	River Thames Scheme (RTS) Mike Streetly (ESI)
13:50 - 14:10	Influencing Aquaculture Expansion in Scottish Waters Alan Hills (SEPA)
14:10 - 14:30	Storm water management from an integrated hydrological perspective – a modelling study from Vänersborg, Sweden, using MIKE URBAN and MIKE SHE Maria Roldin (DHI Sweden)
14:30 - 14:50	Modelling hydrodynamics and sediment transport around a temporary jetty structure in the River Thames Oliver Way (Arcadis)
14:50 - 15:10	Afternoon Tea and Biscuits
15:10 - 15:30	Assessing the potential impact of a tidal lagoon hydropower scheme on coastal processes using MIKE 21 FM Adam Fulford (ABPmer)
15:30 - 15:50	Dealing with hydrologic and hydraulic uncertainty in two-dimensional free surface flow modelling Mark Britton (DHI Australia)
15:50 - 16:05	MIKE Powered by DHI 2017 and a practical application of our latest technology-Part 2 Poul Kronborg, Global Sales Executive, Marine Infrastructures & Marine Software Products
16:05 - 16:10	Close—Speakers please see DHI staff before you leave

ABSTRACTS

Standards for modelling of flooding in open coasts and large estuaries.

[Presenter \(CH2M\)](#) and [Niall Hall \(Environment Agency\)](#)

CH2M and Environment Agency will deliver a keynote presentation on new standards for modelling of flooding in open coasts and large estuaries. More than 2.5 million people and £150 billion in assets are at risk from coastal flooding in the UK.

Coastal flood models are important because they are used to underpin key investment decisions to manage coastal flood risk, provide flood information for emergency response, and provide the evidence to prevent inappropriate development in the flood plain. However, existing models are not currently designed to nationally consistent standards. The consequences of this are a lack of clarity of what is good enough, model quality can vary widely, and no systematic approach to model maintenance (a challenge with limited resources). Hakeem Johnson (CH2M) will present on the work to develop nationally consistent standards for coastal flood modelling and a national baseline of model standards for existing coastal flood models. Niall Hall (Environment Agency) will present the next steps that the Environment Agency is taking regarding modelling standards.

Assessing the risk of Salmon Lice disease spreading in Norwegian salmon farms using Agent-based Modelling

[Mads Joakim Birkeland \(DHI Denmark\)](#)

Fit for Purpose Modelling—choosing the right tool for the job

[Fernando Alvarez \(Intertek\)](#)

The natural world we live in is three-dimensional and complex, and we now have very sophisticated modelling tools and software that can be used to represent our aquatic environments. However, using the most complex technique available is not always necessary, or even appropriate. This presentation will discuss the topic of selecting the right tool for the job, and the importance of developing a fit for purpose modelling approach to address the question being asked on a case by case basis.

Development of a MIKE 21 FM HD model to assess the risk of flooding from wave overtopping and tidal inundation of a site in Co. Clare, Ireland

[Kevin Barry \(Arup\)](#)

A very significant storm event in January 2014 resulted in severe coastal erosion and flooding to Cloughaninchy beach in Co. Clare on West Coast of Ireland. A coastal flood and erosion risk management feasibility study of the site was subsequently commissioned to understand the level of risk at the site and also to develop an engineering solution to mitigate the associated risks. This presentation details the construction, calibration and running of the MIKE 21 FM hydrodynamic model that was developed as part of the study. The detailed approach taken to estimate the flood risk from wave overtopping will also be discussed. The results of the modelling indicate that extensive areas of the site are at risk of flooding from wave overtopping. The results also suggest that a more simplified approach to estimating the wave overtopping flood risk at the site may not have been sufficient to highlight the risk.

Dawlish Warren Beach Management Scheme

[Josh Gibson and Andy Wareing \(Atkins\)](#)

Atkins have delivered the design of the beach management scheme at Dawlish Warren, at the mouth of the Exe Estuary, with an estimated construction cost of over £14 million. Our presentation will describe the key marine and coastal environmental services we provided which included wave, tide and dredge plume (at dredge site and at discharge site) modelling for a near-shore dredge site on Pole Sands. This supported a WFD assessment, Habitats Regulations Assessment, Environmental Impact Assessment and Coastal Impact study. The successful modelling and associated reporting allowed the EA to secure the necessary MMO and Crown Estate permissions at the first time of asking.

River Thames Scheme (RTS)

[Mike Streetly \(ESI\)](#)

Mike Streetly will describe a series of MIKE 11 and MIKE SHE models used to support the Environment Agency's River Thames Scheme – a series of proposals designed to reduce flood risk from the River Thames near Heathrow, the largest area of undefended floodplain in England.

Influencing Aquaculture Expansion in Scottish Waters

[Alan Hills \(SEPA\)](#)

Expansion of the Aquaculture industry in Scotland is ongoing. As a regulator, SEPA seeks to influence this activity to ensure the environment is protected. We believe that the Aquaculture industry can benefit from the use of numerical modelling. However this is not restricted to demonstrating regulatory compliance. Output from numerical models, combined with observational data, have the capacity to yield better resource use within the industry. This is a key objective of SEPA's new One Planet Prosperity regulatory strategy. Our presentation will outline the development of MIKE modelling tools which are helping us to shape future industry expansion.

ABSTRACTS CONTINUED

Stormwater management from an integrated hydrological perspective – a modelling study from Vänersborg, Sweden, using MIKE URBAN and MIKE SHE

[Maria Roldin \(DHI Sweden\)](#)

The development area of Nordkroken in Vänersborg, Sweden, is exposed to flooding risks from several directions. It is a low-lying area close to Sweden's largest lake (Vänern), has high groundwater levels and is located at the lower end of a relatively large catchment. In order to plan for a sustainable development of the area, and design a stormwater system able to cope with both the current situation and future scenarios (including climate change effects), we have used an integrated hydrological approach with a coupled MIKE URBAN - MIKE SHE model. The results of the modelling study can be used to evaluate the effects of future developments and a new stormwater drainage system on both the overall water balance of the area as well as on flooding risks for each individual property.

Modelling hydrodynamics and sediment transport around a temporary jetty structure in the River Thames

[Oliver Way \(Arcadis\)](#)

A MIKE 21 FM HD model was developed to simulate the effects of a temporary jetty structure on the local hydrodynamics in the River Thames. Boundary conditions and validation data were obtained from the Thames Estuary TE2100 model. Simulated velocities were used to calculate scour around the jetty piles using the Whitehouse Scour Time Evolution Predictor method. Sediment sampling informed sediment modelling by coupling MIKE 21 MT to the MIKE 21 FM HD model to show the fate of suspended sediments released during dredging operations at the jetty head. These sediments were potentially contaminated and so regions of simulated sediment accumulation informed an assessment of environmental impacts due to the dredging operations.

Assessing the potential impact of a tidal lagoon hydropower scheme on coastal processes using MIKE 21 FM

[Adam Fulford \(ABPmer\)](#)

The recent independent Government Review into The Role of Tidal Lagoons (The Hendry Review, 2016) supported the development of a 320 MW 'Pathfinder Project' in Swansea Bay, South Wales. The Project, proposed by Tidal Lagoon Swansea Bay Ltd (TLSB), received a Development Consent Order in 2015, and encompasses an 11 km 'U shaped' breakwater, built out from the coast, incorporating a bank of hydro turbines and sluice gates. The presentation will detail the physical process EIA studies, including the representation of the exchange structures within the MIKE 21 FM models, and their subsequent application within the hydrodynamic, wave and sediment transport assessment.

Dealing with hydrologic and hydraulic uncertainty in two-dimensional free surface flow modelling

[Mark Britton \(DHI Australia\)](#)

The new ARR guidelines, as a minimum, requires an ensemble of 10 temporal patterns for each ARI/duration combination where previously a single temporal pattern was acceptable. DHI-AU has developed a suite of web-based tools around the latest ARR guidelines to assist MIKE users generate the required ensemble inputs.

While hydraulic uncertainty is outside of the scope of the ARR, DHI-AU has undertaken scientific studies and developed methodologies to randomise the significant hydraulic parameters of roughness and ground elevation for use in two-dimensional flood models (MIKE 21). This new uncertainty approach has been shown to significantly change predicted flood extents, depths and velocities. A web-based tool is under development and will soon be shared with all MIKE users.

THE ACADEMY BY DHI

THE ACADEMY offers a palette of courses and capacity building packages designed to fit your needs and challenges. We offer standard and/or tailored training.

MIKE Powered by DHI courses focus on practical skills, hands-on exercises and teaching you how to get the most out of your software. These courses also enable you to understand the power of the MIKE tools for building decision support systems.

Thematic courses allow you to apply concepts, applications and decision support principles to the entire business process within current areas: aquaculture & agriculture, energy, climate change, flooding, coast & marine, surface & groundwater, urban water, industry, environment & ecosystems, product safety & environmental risk, etc.

Our trainers are experienced professionals, many of whom are recognised international experts in their fields. The use of highly skilled trainers guarantees the quality of THE ACADEMY courses.

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