# CIVER Chartered Institution of Water and Environmental Management

## **Central Southern Branch**

Does modelling deliver? River Suite, Crowne Plaza, Reading RG1 8BD 25<sup>th</sup> May 2016 at 09:00 (refreshments) for a 09:30 start, 16:30 close

This year's annual conference seeks to delve into the analytical world of modelling with a broad range of speakers from across the industry looking at different ways modelling is being utilized.

We are especially pleased to welcome Caroline Duckworth, Senior Advisor, Environment Agency who will be speaking on *Planning decision making* and the new climate change allowances. This follows the publication by the EA of the updated climate change allowances guidance 'Flood risk assessments: climate change allowances' in February 2016.



We have a further seven speakers at this one day seminar:

David Fortune, Director of Innovation, XP Solutions – Does modelling deliver? Well in drainage design it certainly does.

Andy Tagg, Technical Director, HR Wallingford – The use of modelling tools to improve emergency management plans for floods

Stephen Brown, Associate, WSP | PB - Onshore Spill Modelling, Application of **TUFLOW** 

Mark Senior, Head of Government Sales, Airbox Systems - MOSAIC, Bringing all the pieces together to successfully deal with flooding events

Dr Paul Williams - Royal Society University Research Fellow Department of Meteorology, University of Reading - The use of climate models to predict the impacts of climate change on aviation

Dr Joe Clarke, Water Engineer, CH2M – Making sense of flood modelling: from data to decisions.

Stefan Laeger, Senior Technical Advisor, EA - What's the chance? New approaches and tools for assessing the joint probability of flooding from multiple sources and locations and their impacts for emergency planning and preparedness

Members and non-members are very welcome. If you're not yet a member, come along and find out what CIWEM is all about! If you would like to attend please book by following this <u>link</u>.

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Delegate*	£83.33 + £16.67 VAT = £100
Retired/student delegate*	£41.67 + £8.33 VAT = £50
Corporate package**	£291.67 + £58.33 VAT = £350

\*Delegate packages include lunch and refreshments – please let us know of any special dietary requirements

\*\* Corporate package consists of: 2 day delegate spaces, space for a stand to promote your company and the addition of your company's logo on/in the event information booklet

If you would like to know more about our corporate packages or have any other questions about the event, please contact James Berryman at: <u>James.Berryman@wspgroup.com</u>

### Synopsis

**Delegate Booking Fees** 

Caroline Duckworth, Senior Advisor, Environment Agency – *Planning decision making and the new climate change allowances* 

The Environment Agency published updated climate change allowances guidance 'Flood risk assessments: climate change allowances' in February 2016. This session will provide:

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#### Guidance

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#### Flood risk assessments: climate change allowances

 From:
 Environment Agency

 First published:
 19 February 2016

 Last updated:
 12 April 2016, see all updates

 Part of:
 Flooding and coastal change

 Applies to:
 England

Find out when and how to use climate change allowances i strategic flood risk assessments.

- An overview to the main changes to the climate change allowances for flood risk assessments
- Describe why it is important to assess a range of climate change allowances to understand future flood risk and how to do this
- Set out the key principles to identify an appropriate level for flood risk mitigation based on the assessed range on a case by case basis.

David Fortune, Director of Innovation, XP Solutions – Does modelling deliver? Well in drainage design it certainly does.

The scope of design modelling has increased over time, starting with rules of thumb and the Rational Method. This evolved to full hydrodynamic modelling of pipe and manhole networks. Then 2D surface flow was added. And now design modelling incorporates detailed representation of SuDS treatment trains. So is design modelling the same as modelling for analysis?

Analysis tries to establish the truth of what happened, for example "what was the cause of a flood at a particular location at a particular time?" Whereas design looks towards an uncertain future: "to what extent is flooding likely to happen?" There will be many assumptions made about rainfall, blockages, condition, etc. – we are not looking for a particular truth. But design should be relatively accurate: one design may be 20% better than another, for example.

Analysis and design are both valid and interesting uses of modelling, with somewhat different purposes, and differences in the way that modelling is used.

# Andy Tagg, Technical Director, HR Wallingford – *The use of modelling tools to improve emergency management plans for floods*

This presentation will outline the issues involved in effective emergency management during flood events, and will provide a description of the Life Safety Model (LSM). LSM is an agent-based model that can be used to simulate evacuation plans and determine the fate of people, vehicles and buildings under a range of different types of flood conditions.

The presentation will concentrate on case studies where a positive outcome was achieved using these types of models. This formed part of the Government's H19 assessments for the East Coast of England, where a tiered modelling approach was used to investigate the requirements for mass evacuation in the event of a major storm surge, such as occurred in 1953 and 2013. This considered two study areas: Lincolnshire & Norfolk and Humberside. Three levels of modelling were used: a static, macro model (the Dutch Evacuation Calculator) to gain insight of the effectiveness of different strategies; a meso-dynamic model (OmniTrans) to identify local bottle necks in the road network; and an agent-based, micro model (Life Safety Model) to investigate individual people behaviour at the local or micro scale. This tiered approach provided detailed and valuable insight of the issues associated with data collection and the modelling assumptions, and was used to inform the current emergency plans in the two areas.

Stephen Brown, Associate, WSP | PB – Onshore Spill Modelling, Application of TUFLOW

Between 2000 and 2015 over 400,000 Barrels (Oil) of hydrocarbon and industrial products have been released to the onshore environment as a result of pipeline failures (material, accidental or vandalism) in the USA. Catastrophic failures of storage tanks (although rarer) can release up to 180,000 Barrels (Oil) per tank failure. The movement and fate of the fluids released from these failures should be considered as part of a robust risk assessment for existing and proposed facilities. TUFLOW forms part of a toolkit to evaluate the fate and transport of various failure modes, and has been used to inform risk management plans and to identify where environmental protection measures should be developed.

The presentation provides an overview the modes of failure that have occurred both to the pipeline and to large atmospheric storage tanks (LAST). It outlines typical LAST design, and the requirements for the provision of secondary containment (bunds) and how this is achieved in practice. It provides reference to the existing Health and Safety Executive methods of assessment and outlines how this has been developed into a numerical method of prediction, using TUFLOW and provides some example result outputs.

Stefan Laeger, Senior Technical Advisor, EA - What's the chance? New approaches and tools for assessing the joint probability of flooding from multiple sources and locations and their impacts for emergency planning and preparedness

Joint probability analysis is needed to gain a realistic understanding of the true likelihood for many real flood events to enable effective emergency planning and preparation. Important scenarios to consider include high water levels in estuaries caused by extreme river flows coinciding with storm surges, flood flows on multiple tributaries in a catchment or widespread, nationally-significant flood events.

Based on current evidence and methods, we cannot routinely answer questions such as

- Why do '1 in 100' floods seem to happen so often when viewed from a national perspective?
- What is the chance that many different locations will be affected by severe flooding around the same time and what does this mean for our ability to respond?

This paper introduces the outputs of recent Environment Agency R&D which translated advances in statistical theory into practical tools for operational flood risk management. It has delivered on two aims:

1) To use state-of-the-art methodology to develop plausible, extreme but realistic scenarios for nationally significant flooding to inform the UK National Risk Assessment 2016.

2) To develop practical tools that can be applied more readily by trained practitioners for joint probability analysis in operational flood risk management, with case studies and supporting guidance.

The paper will illustrate these new developments and their benefits with practical examples and case study events for widespread river and surface water flood risk, extremes at river confluences and combined inland and coastal flooding.

Mark Senior, Head of Government Sales, Airbox Systems – *MOSAIC, Bringing all the pieces together to successfully deal with flooding events* 

Marks's presentations will demonstrate situation awareness innovations in search and rescue (SAR) mission in response to flooding event. He will explore using mobile devices (tablets and smartphones) capabilities to aid search and rescue in flood emergency, this includes offline mobile mapping, GPS, Tracking, messaging, annotations and live incident streaming on MOSAIC platform. Thanks to government's open data initiative, flood data such as Environment Agency's flood risk maps, Real time flood monitoring, and measurements of water levels and flows etc are openly available to be integrated with any platform. He will show integration of various flood data in MOSAIC.

Unmanned Aerial vehicle (UAV, Drones) applications have been in rapid development recently, Mark will demonstrate UAV mapping which will be projected to MOSAIC mobile map view in real time.

Dr Paul Williams – Royal Society University Research Fellow Department of Meteorology, University of Reading - *The use of climate models to predict the impacts of climate change on aviation* 

It has long been recognised that aviation affects the climate. However, it is becoming increasingly clear that the interaction is two-way and that climate change has important consequences for aviation. This talk will illustrate the use of climate models to analyse and quantify some of these impacts. For example, climate models suggest that the amount of transatlantic clear-air turbulence will double in the coming decades, and that the average turbulence strength will increase by 10-40%.

Climate models also suggest that the prevailing transatlantic jet-stream winds will strengthen, causing eastbound flights to significantly shorten and westbound flights to significantly lengthen, resulting in an extra 2,000 flight hours each year. These results provide further evidence of the two-way interaction between aviation and climate change.

Dr Joe Clarke, Water Engineer, CH2M – *Making sense of flood modelling: from data to decisions.* 

Good decision-making requires a strong evidence base. A string of major flood events, and the public scrutiny which inevitably follows, alongside a push towards ever-greater efficiencies, are making it increasingly important for people to understand flood risk and be able to defend decisions.

Joe will be discussing some of the ways that flood modelling provides that evidence base to help us make and justify decisions. He will be exploring how data can be processed, visualised and shared to meet the needs of different users, from practitioners to the public, and the challenges in conveying meaningful information to such a wide range of people. He will also look at some of the tools and technology which enhance that experience, from the present day and looking forward to the future.

# Travelling to Crowne Plaza By train



It is a 0.5 mi / 0.8 km walk from the train station. Leave the station following signs to Caversham. The hotel is situated just before the Caversham Bridge on left.

Alternatively, there is a taxi rank outside the main station building.

# By Car



From the M4, leave at J11 and follow signs for Reading then Caversham.

The hotel postcode is RG1 8BD

Complimentary on-site parking available.