

NATIONAL MEETING

Integrated Urban Water Management

ONLINE

DATE & TIME

10th November 2017

10.30 am – 17.30 pm

ICE, One Great George Street
London, SW1P 3AA

£45 IWF and BHS members

£25 students

£80 non-members ***

*** This includes one year free membership
of either IWF or BHS, please email Moira
Doherty Moira.Doherty@ice.org.uk

Urbanisation is typically associated with detrimental changes in water resources, including modified flow regimes, reduced water quality, increased sediment transport, and degraded ecosystems. The frequency and intensity of water-related hazards, such as floods, droughts and pollution events, can increase with population growth and climate change, and in turn put greater stress on systems for water treatment, stormwater and sewage treatment. These changes may have knock-on impacts downstream of urban centres. Reversing degradation to water and other natural resources, whilst meeting the increased demand for ecosystem services, requires significant changes in management practices. This meeting explores aspects of managing freshwater, wastewater and stormwater, in and from urban areas, as components of a basin-wide water resource management plan.

REGISTRATION

To attend this event and read more info,
please visit:

<https://www.ice.org.uk/events/integrated-urban-water-management-london>

PROGRAMME

10:15 Arrival, registration and refreshments

10:45 Welcome

10:50 Keynote by **Dustin Garrick** (University of Oxford)

11:30 **Pete Harrison**, Jessica Morrissey and Valeria Pini
(Landell Mills)

Urban water management in the Hindu-Kush

12:00 **Michael Henderson** and **Melinda Davies** (AECOM)
Integrated urban water management: lessons from London

12:30 Discussion with the morning's speakers

13:00 Lunch

14:00 **Ana Mijic**, Leyang Liu and Jimmy O'Keeffe
(Imperial College London)
Systems modelling for integrated urban water management

14:30 **Mike Hutchins** and James Miller (Centre for
Ecology & Hydrology) ***Predicting future change in water flows and quality in urbanising catchments***

15:00 Refreshment Break

15:30 **Shaun Maskrey** (University of Nottingham)
Urban flood resilience in an uncertain future

16:00 **Thea Wingfield**, Kim Peters and Neil Macdonald
(University of Liverpool),
Jack Spees (Ribble Rivers Trust), and Karen Potter (Open
University)
Is the urban landscape being excluded from natural flood management?

16:30 Discussion with the afternoon's speakers

17:00 End of meeting



SPEAKERS and ABSTRACTS

DR DUSTIN E GARRICK (UNIVERSITY OF OXFORD)

Farm to tap? Resilient cities and rural livelihoods in a water stressed world

An exploration of how water stress and severe drought have placed cities under pressure, threatening the engines of growth and strategic national interests. The presentation starts by framing the water resource allocation challenges facing cities competing with agriculture for scarce water supplies to enhance resilience to climate shocks. After a summary of the hotspots and dynamics of rural-urban competition for water globally, the rapid innovations in allocation policy, infrastructure governance and digital water solutions to measure and manage water risk are surveyed. These experiences from fast growing cities and rural towns of Africa and Latin America illustrate the challenges and opportunities for innovation to sustain growth, reduce inequality and enhance freshwater resilience.

PETE HARRISON JESSICA MORRISSEY AND VALERIA PINI (LANDELL MILLS)

Urban water management in the Hindu-Kush

In Kabul, Afghanistan, a city that is growing faster than almost any other in Asia, Landell Mills are helping to investigate if Managed Aquifer Recharge techniques can provide a solution to the city's dwindling water supplies. Challenges not only include security and land availability, but also the poor fluvial water quality and lack of urban water treatment. In Kathmandu, Nepal, the Bagmati River is one of the holiest sites in Nepal but also one of the dirtiest. Landell Mills are helping the Government to improve the fluvial corridor through restoration and landscaping works as well as improving water quality through the construction of aerating weirs and water treatment plants. The presentation reports on the challenges from these locations and lessons that can be applied to other contexts.

MICHAEL HENDERSON AND MELINDA DAVIES (AECOM)

Integrated urban water management: lessons from London

AECOM has been leading a series of Integrated Water Management Strategies (IWMS) for the strategic Opportunity Areas in London. The IWMS holistically consider the water cycle flows within the development area to identify opportunities for reducing the discharge to the sewer networks and use of surface or waste water as a resource in order to reduce potable water demands. Understanding the way in which the water cycle works within a development site also helps embed water into the urban design of the masterplan. By supporting and promoting the delivery of innovative approaches to water efficiency, multi-functional green infrastructure and fit-for-purpose water harvesting and reuse, these IWMS are contributing to the planning and delivery of exemplar and water-sensitive future developments within London.

ANA MIJIC, LEYANG LIU AND JIMMY O'KEEFFE (IMPERIAL COLLEGE LONDON)

Systems modelling for integrated urban water management

Rapid urbanisation requires design and construction of supporting infrastructures, and generates huge demand for natural resources. Due to limited production within urban cells, this demand is predominantly satisfied by extraneous supply from rural or suburban areas, which generates transboundary flows. Urban agglomerations become nodes of these fluxes, and connect with each other, forming nexuses on large spatial scales. In order to evaluate the sustainability and reliance of urban infrastructure within these nexuses, a holistic and systematic approach is required to quantify these fluxes. A novel spatially distributed water balance model is developed that can simulate both urban and rural hydrological cycles, and is applied to analyse the water security of Patna in India.

MIKE HUTCHINS AND JAMES MILLER (CENTRE FOR ECOLOGY & HYDROLOGY)

Predicting future change in water flows and quality in urbanising catchments

Hydrological changes due to climatic stressors are likely to swamp signals of more extreme flow regimes resulting from urbanisation. Existing estimates suggest the climate expected by 2050 will likely trigger more frequent incidence of low dissolved oxygen in the River Thames. Population growth also affects these estimates, though urban expansion is unlikely to continue progressing at recent rates with growth largely accommodated through densification. New continuous monitoring showed that chronic impacts resulting from wastewater overflows were no more severe than summer low flow conditions when water quality is most vulnerable. A basin-scale modelling framework was assembled to identify impacts of change in multiple-stressor combinations. Sensitivity analysis identified those possible regimes of future population and climate under which changes in management-related stressors will bring about severest deteriorations and synergistic impacts.

SHAUN MASKREY (UNIVERSITY OF NOTTINGHAM)

Urban flood resilience in an uncertain future

The Achieving Urban Flood Resilience in an Uncertain Future project addresses questions such as: How we can adapt urban flood and water quality management in our cities to meet the challenges posed by changes in climate, the economy, governance and society?; How can our models be adapted to meet these challenges?; and How can engineering solutions be better aligned with natural systems? The project adopts methods and models that are locally defined, but spatially linked through the stormwater cascade, a concept where water is viewed as both a hazard and a resource as it passes through the urban environment. It uses whole systems perspectives that recognise interconnections with other urban systems, including transport and energy. This adds to understanding of the multiple benefits of blue-green infrastructure, where it is used to complement traditional grey systems.



THEA WINGFIELD, KIM PETERS AND NEIL MACDONALD (UNIVERSITY OF LIVERPOOL),
JACK SPEES (RIBBLE RIVERS TRUST), AND KAREN POTTER (OPEN UNIVERSITY)

Is the urban landscape being excluded from natural flood management?

Natural Flood Management (NFM) refers to a number of interventions, which perform together, to slow the flow of water throughout the catchment as one integrated system, including the urban environment. There is a perception that NFM is a technique of rural land and river management. However, if 'natural' is taken to refer to hydrological processes, then sustainable drainage and green infrastructure, more readily associated with an urban environment, become indistinct from NFM. The presentation critically analyses barriers to the adoption of catchment-wide NFM. There is an opportunity to capitalise on existing widespread interest in NFM, sustainable drainage and green infrastructure. However, the objectives and practices of different professional sectors must be integrated before NFM will, and can, be successfully employed at a scale which fully realises its potential.