

# Interaction of River and Coastal Flooding

## Discussion of new ARR methodology and guidance



ENGINEERS  
AUSTRALIA

## Water Engineering Panel

### DATE & TIME

6pm,  
Wed 4th November 2015

### VENUE

Engineers Australia Auditorium  
Ground Floor, 8 Thomas St,  
Chatswood NSW 2067

### CPD

Eligible for 2.0 hours CPD

### COST

EA Members: Complimentary  
Non-members: \$30

### RSVP

[REGISTER ONLINE](#)

### CONTACT

For further information contact  
Peter Brady

This is a joint presentation with Seth Westra presenting on the ARR methodology and Duncan McLuckie and Grantley Smith presenting recent work of practical guidance from the NSW Office of Environment and Heritage.

The interaction of catchment flooding and coastal processes is an important consideration in determining flood risk in coastal waterways. This interaction is often complex and may vary due to a number of factors. Coastal processes can significantly impact flooding in the lower reaches of estuaries in two main ways:

- **Ocean Levels:** variations in ocean level, primarily due to tidal fluctuations and meteorological events, can influence the water level gradient and rate of discharge to the ocean, and / or the filling of available storage within the waterway which can affect flood levels in an estuary.
- **Morphological:** entrance water depth and morphology can significantly influence tidal behaviour and discharge through the estuary entrance. Sediment accumulation can constrict entrances and / or result in entrance closure by the development of entrance berms that can act as a downstream control, limiting discharge to the ocean and raising upstream flood levels.

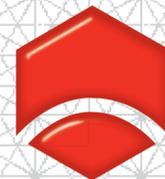
Many of the factors that contribute to ocean water levels are independent of rainfall; however, elevated ocean levels and catchment driven flooding can originate from the same meteorological event affecting both ocean levels at the estuary entrance and rainfall within the catchment. The degree of influence of flooding from these two sources varies significantly with the relative timing of the peaks of these events and the characteristics of the catchment, coastal waterway and floodplain.

A number of key factors need to be considered when determining the overall flood risk and subsequent planning and management measures in the lower reaches of coastal waterways. These include the distance from the ocean, the site elevation, the ocean entrance condition as well as the size and shape of the catchment draining to the ocean.

This joint presentation outlines a methodology for practical consideration of the coincidence of ocean inundation and catchment flooding recommended for use in flood studies undertaken in coastal waterways in NSW and discusses the work involved in its derivation. The information and approaches outlined in this paper are being

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used by OEH in developing guidance in this area to provide practical advice on the interaction of elevated ocean levels and catchment flooding for use in studies undertaken under the State Floodplain Management Program.

### **Speaker: Dr Seth Westra, The University of Adelaide**

Seth is an academic and chartered professional engineer with 13 years of postgraduate experience across academia and industry, with expertise in extreme rainfall and flood risk estimation, hydrological modelling, water resources planning and management, and climate change impact assessments. He leads the University of Adelaide 'Water Systems' research group in the School of Civil, Environmental and Mining Engineering, and chairs the Australian Energy and Water Exchanges (OzEWEX) committee on trends and extremes in Australian natural hazards. He has contributed to several chapters of Australian Rainfall and Runoff, and has won numerous awards including the Water Industry Alliance 'Minister's Award for Excellence in Water Sustainability' for a project on assessing the risk of climate change on Adelaide's water security, and the Australian Institute of Policy and Science 'Tall Poppy' award.

### **Speaker: Duncan McLuckie**

Duncan is the Principal Flood Specialist in the NSW Office of Environment and Heritage and Visiting Fellow at the University of Technology, Sydney.

Duncan has extensive experience in hydrology, hydraulics and water resources, having worked in the field since the 1980's. He is the lead author of the recently released Australian Emergency Management Handbook 7: best practice in flood risk management in Australia and led the development of a range of associated guidelines. He was also a main author of the NSW Government's Floodplain Development Manual (2005) and its supporting technical guidance. Duncan's expertise is in flood risk management. He works at a strategic level with other agencies and industry and on working groups on a range of flood risk management policy, technical issues and industry education initiatives. He has also presented a wide range of papers on a broad range of flood risk management topics to state, national and international audiences over the last two decades.

### **Speaker: Grantley Smith**

Grantley has specialist expertise in water resources management through a hands-on career investigating catchment processes. He is acknowledged by his peers as an expert in modelling catchments and floodplains and was instrumental in the pioneering use of 2D hydrodynamic models for floodplain flow prediction and inundation mapping. Grantley is a lead author and key contributor to reports supporting the national best practice manual *Managing the floodplain - a guide to best practice in flood risk management in Australia (AEMI Handbook 7)* and the revision of Australian Rainfall and Runoff. He has a particular interest in quantifying flood hazard exposure for the community and infrastructure and is looking forward to testing the response of a car in floodwaters at full scale in the near future.