

Water Research Laboratory

Ben Modra

Principal Coastal Engineer



Ben is a Principal Engineer with the Water Research Laboratory. He holds a Bachelor of Engineering/Arts and a Masters of Engineering Science (Coastal Engineering), and has over 13 years of experience providing specialist expertise to the coastal and water engineering community in NSW and Australia.

Ben specialises in studies relating to coastal and hydraulic engineering, and is a leader in physical modelling for these fields. He is experienced in the inspection, design and testing of coastal structures. Ben is experienced in the deployment of instrumentation for both laboratory and field investigations and has a strong reputation for the analysis of environmental data. Ben is also a specialist in the assessment of stormwater treatment devices.

Qualifications and affiliations

MEngSc (Coastal Engineering), UNSW, 2008
 BE/BA Hons (Computer Systems), Uni of Adelaide, 2002
 Certificate of Aviation, Elizabeth TAFE, 1992
 MIEAust (Engineers Australia)
 Former Chair of the NSW Coastal, Ocean & Port Engineering Panel (Engineers Australia)

Professional history

2015-current: Principal Coastal Engineer, UNSW WRL
 2007-2014: Coastal Engineer, Manly Hydraulics Laboratory
 2005-2006: Electronics Engineer, Jaltec Systems Ltd (UK)
 2004-2005: Electronics Engineer, ExceptionEMS (UK)
 2001-2003: Electronics Engineer, Tytronics Ltd

Expertise

- Coastal processes and management
- Design and assessment of coastal structures
- Physical modelling of coastal and hydraulic structures
- Performance testing of stormwater treatment devices
- Advanced instrumentation for field and laboratory studies
- Project management

Summary of relevant experience

Coastal physical modelling

Kingscliff Beach seawall 2D
 Coffs Harbour boat ramp basin 3D
 Lenthalls Dam 3D
 Warragamba gate arms 3D
 Lawrence Hargrave Drive revetment 2D
 Cockatoo Island seawall 2D and 3D
 Abbot Point 2D
 Wheatstone submarine pipe berm 2D & 3D
 Cape Lambert 2D and 3D
 Busselton seawall 2D
 Oakajee Port 2D and 3D
 Port Coogee seawall 2D
 West Pilbara 2D
 Sydney Harbour damped pontoon 3D
 MHL flume upgrade, MHL 3D wave paddle Upgrade, 2D and 3D profiling

Coastal investigations

Nearshore wave transformation toolbox
 NSW Tide Chart generation program
 NRDP coastal tailwaters in NSW
 Directional wave spectra, MHL website

NSW tidal planes report
 MHL tidal methodology review
 Macquarie Lakes water level rise
 NSW tidal anomaly analysis
 NSW hydrographic survey collection (tsunami)
 Eden Harbour wave study
 Tuggerah Lakes water level rise
 Narrabeen sand bypass study
 NSW tidal planes analysis

Coastal structure design

South West Rocks seawall design
 Clarence northern breakwater repair
 Hastings northern breakwater repair
 Clarence River half-tide walls repair
 Flynn's Beach seawall
 Breakwater condition surveys NSW (over 20 sites)
 Port Botany scour blanket study

Hydraulic and dam investigations

Lake Macdonald Dam 3D model
 Somerset Dam 3D model
 Vehicle flood stability

Stormwater device evaluation

SPEL Filter performance testing
 SPEL StormSack performance testing
 Retaw SDU performance testing
 SPEL Enviroceptor performance testing
 Rubicon irrigation flow monitoring unit
 Humes Jellyfish performance testing
 Humes Hydrofilter performance testing

Field data collection

NSW Waverider buoy program
 NSW ocean tide network
 Horizontal ADCP pilot study
 Sydney Ferries wave program
 SCA hydrographic network
 Hunters Hill wave study
 Sydney Ferries Terminal upgrade wave study

Selected publications

Smith G., Modra B., Felder S (2019) *Full-scale testing of stability curves for vehicles in flood waters* Journal of Flood Risk Management

Jayewardene, I., Modra, D., Campbell, D., Chamizo D. (2012) *2D and 3D Physical Modelling of Current and Wave Interactions for Rock Berm Design*, Journal of Shipping and Ocean Engineering

Modra B, Felder S, Montano L, Mathieu D, Martin C, Wiltshire C, Raymond M, Maher B. *Exploring the potential of advanced instrumentation in physical hydraulic modelling for spillway design* ANCOLD 2018 Conference

Smith GP, Modra B, Felder S. *Experimental Testing of Flood Hazard Curves for a Partially Submerged Vehicle* 13th Hydraulics in Water Engineering Conference, Sydney, 13 Nov 2017 - 16 Nov 2017.

Callaghan, D. P., Couriel, E., Hanslow, D., Modra, B., Fitzhenry, M., Jacobs, R. (2017) *Comparing extreme water levels using different techniques and impact of climate indices* Australasian Coasts and Ports 2017 Conference