



Duncan Rayner

Principal Engineer - Environmental

Duncan is a Principal Engineer - Environmental at the Water Research Laboratory, specialising in coastal wetlands and estuaries. Duncan is an expert in field investigation and data collection in challenging environments. Duncan's field expertise supports his significant experience in numerical modelling and laboratory investigations, with a strong background in hydraulics. Duncan has led numerous investigations of wetlands, both fresh and tidal, rivers and estuaries, and coastal

shelf environments. Duncan also has significant experience in catchment hydrology and groundwater processes. Both his Bachelor and Master's theses focused on estuarine water quality and hydrodynamics. Previously he has also worked as an engineer in contaminated site remediation encompassing investigation and monitoring.

Qualifications and awards

BE Hons (Environmental Engineering), UNSW, 2006
MEngSc (Water Resources), UNSW, 2011
2015: NSW Green Globe award
2014: Engineers Australia Excellence award (Sydney division)
2013: National Trust Heritage award for environmental conservation

Professional history

2018-Current: Principal Engineer - Environmental - WRL, UNSW
2014-2018: Senior Project Engineer - WRL, UNSW
2007-2014: Project Engineer - WRL, UNSW
2005-2006: Project Engineer - GHD, NSW

Expertise

- Estuarine processes and coastal zone processes
- Wetland hydrology and restoration
- Data collection, surveying and spatial analysis
- Hydrodynamic and water quality modelling

- Climate change impacts
- Numerical and physical studies
- Contaminant fate and transport
- Groundwater monitoring and assessment

Summary of relevant experience

Coastal and estuarine processes

Yamba/Illuka ebb-tide release, Clarence River, NSW
Tutong River estuary, Brunei
Hunter River flow gauging and bathymetry, NSW
Lake Innes hydrological investigation, NSW
Port Fairy coastal hazard assessment
Port Phillip Bay sediment transport monitoring, VIC
Clarence River bed load transport, NSW
Rarotonga climate change investigation, Cook Islands

Wetland hydrology and restoration

Tomago Wetland restoration, NSW
Big Swamp remediation, NSW
Arndilly Wetland hydrological investigation, Clarence River, NSW
Gumma Gumma Swamp hydro assess., Nambucca River, NSW
Woodberry Swamp hydrological study, Hunter Valley, NSW
Everlasting Swamp restoration, Clarence River, NSW
Jersey Avenue wetland remediation, Newcastle, NSW
Area E wetland restoration, Kooragang Island, NSW
Tuggerah Lake saltmarsh, NSW
Lower Shoalhaven River Remediation Action Plan, NSW
Manning River Floodplain Remediation Action Plan, NSW
Remediation of temperate highland peat swamps on sandstone

Numerical modelling

Clarence River water quality, NSW
Shoalhaven River saline dynamics, NSW

Honours Thesis - Impact of light and competition on cyanobacteria
Burwood ocean outfall, NSW
Sydney deepwater ocean outfalls, NSW
Masters Thesis – Acid plume dynamics & buffering within estuaries
Burwood ocean outfall risk based assessment, NSW
Tomago wetland restoration, NSW
Woodberry Swamp floodplain hydrodynamics, NSW

Physical modelling

Penrith Lakes flood risk assessment, NSW
Sydney desalination diffuser, NSW
Melbourne desalination diffuser, NSW
Hay Point coastal protection structures, QLD
Gross pollutant trap (GPT) hydraulic testing, NSW

Environmental monitoring

Tomago wetland restoration, NSW
Clarence River flow gauging and sediment investigation, NSW
Tutong River, Brunei
Hawkesbury-Nepean tidal flow gauging
Brooklyn/Dangar Island outfall, NSW

Computing skills

Modelling: SBEACH, SWMM, Surfer, CEDAS
Programming: Matlab, Python
GIS: ArcGIS, Global Mapper, QT Modeler
Design: AutoCAD