



Alice Harrison

Principal Engineer

02 8071 9867 | a.harrison@wrl.unsw.edu.au | <https://www.wrl.unsw.edu.au/staff/alice-harrison>

Alice is a Senior Project Engineer at the UNSW Water Research Laboratory. She has the unique qualifications of being a specialist water engineer with a background in economics, having completed both a Bachelor of Civil Engineer (Hons 1) and Bachelor of Commerce in 2015.

Alice is interested in estuary and coastal processes and works to bridge the gap between engineers, economists, and decision makers to improve coastal and estuary management. Her work is highly varied, from detailed hydrodynamic modelling to inform coastal floodplain and estuary management, to extensive fieldwork in both pristine and degraded environments, to completing cost-benefit analysis for large scale wetland restoration projects in NSW. Alice is particularly interested in the growing and evolving field of environmental economics, with a focus towards ensuring that the true value of the environment is acknowledged and accounted for by decision makers.

Qualifications and affiliations

BE Hons 1 (Civil Engineering), UNSW, 2015

BComm (Finance), UNSW, 2015

MIEAust: Engineers Australia

Expertise

- Coastal floodplain modelling & management
- Environmental economics
- Environmental data collection
- Wetland processes

Summary of relevant experience

Floodplain management and wetland restoration

NSW coastal floodplain prioritisation project

Assessment of overtopping of Bray Park weir

Big Swamp restoration monitoring

Upland peat swamps hydrological monitoring and modelling

Environmental economics

Big Swamp cost benefit analysis

Cooperook Swamp cost benefit analysis

Key fish habitat offsets: ecosystem services approach

Site level Environmental Economic Accounting for blue carbon restoration projects

Coastal processes

NSW Beach Profile Database

Eurobodalla coastal hazard study

Professional history

2023-Current: Principal Engineer, UNSW WRL

2022-2023: Senior Project Engineer, UNSW WRL

2015-2021: Project Engineer, UNSW WRL

2013-2014: Undergraduate Engineer, Leighton Contractors

- Plume dispersion
- Economic analysis in coastal zone projects
- Cost benefit analysis techniques
- Beach geomorphology and coastal stabilisation

Coastal tailwater levels: Adventure Bay and Snug Bay

Lake Illawarra entrance channel management study

Sea level rise impacts at Margate, Tasmania

Numerical modelling in estuaries

Manly Lagoon hydrodynamic modelling

Tuckean Swamp hydrology and hydrodynamic study

Botany Bay stormwater modelling

Port Stephens – sewage overflow impacts to oysters

Hastings River - sewage overflow impacts to oysters

Sewage overflow impacts on oyster harvest areas in NSW estuaries

Plume dispersion

Merimbula outfall – dye tracing experiment

Burwood outfall - modelling and marine assessment

Cooks River dye tracing

Publications

Selected journal and conference papers

Waddington, K., **Harrison, A.J.**, Rayner, D.S., Tucker, T.A. and Glamore, W.C. (2023) Hypoxic Blackwater Events - Identifying High Risk Catchments in Estuaries Now and Under Future Climate Scenarios. *Authorea*.

Ruprecht, J.E., King, I.P., Dafforn, K.A., Mitrovic, S.M., **Harrison, A.J.**, Birrer, S.C., Crane, S.L. and Glamore, W.C. (2022) Implications of bacterial mineralisation in aquatic ecosystem response models. *Water Research*, 209, p.117888.

Ruprecht, J.E., King, I.P., Mitrovic, S.M., Dafforn, K.A., Miller, B.M., Deiber, M., Westhorpe, D.P., Hitchcock, J.N., **Harrison, A.J.** and Glamore, W.C., (2022) Assessing the validity and sensitivity of microbial processes within a hydrodynamic model. *Water Research*, 218, p.118445.

Ruprecht, J.E., Birrer, S.C., Dafforn, K.A., Mitrovic, S.M., Crane, S.L., Johnston, E.L., Wemheuer, F., Navarro, A., **Harrison, A.J.**, Turner, I.L. and Glamore, W.C., (2021) Wastewater effluents cause microbial community shifts and change trophic status. *Water Research*, 200, p.117206.

Harrison, A.J., Carley JT, Coghlan IR, Drummond CD (2019) Methodology for modelling dynamic coastal tailwater levels In Proceedings of the Australasian Coasts & Ports Conference 2019.

Coghlan I, Short A, Carley J, **Harrison A**, Vos K, Lenehan N, Wiecek D (2018) BROULEE: AN ISLAND NO MORE? 27th NSW Coastal Conference, Merimbula

Harrison, A.J., Miller, B.M., Carley, J.T., Turner, I.L., Clout, R. and Coates, B.,(2017) NSW Beach photogrammetry: A new, online database and toolbox. In Proceedings of the Australasian Coasts & Ports Conference 2017.

Selected technical reports

Montano, L., Miller, B.M., and **Harrison, A.J.** (2023) Methodology to estimate ecological impacts of flow alterations due to constructions of water regulating infrastructure, WRL TR2022/24

Rayner, D. S., **Harrison, A. J.**, Mason, M. and Doherty, Y. (2023) Assessing the impact of sewage overflows on oyster harvest areas: Hastings River estuary, WRL TR 2022/26

Harrison, A.J., Cairns, J., Mason, M., Rayner, D.S. and Glamore, W.C. (2023) Upland Peat Swamps of the Woronora Plateau – hydrological monitoring and water balance modelling, WRL TR 2021/25

Harrison, A. J. and Rayner, D.S. (2023) Tuckean Swamp Wetland Remediation: Cost Benefit Analysis, WRL TR 2022/05

Harrison, A. J., Henderson, B., Glamore, W.C. (2022) Key fish Habitat Offsets: An Ecosystem Services Approach, WRL TR2021/03

Harrison, A. J., Rayner, D. S., and Glamore, W.C. (2021) Cooperook Remediation Feasibility Assessment and Cost Benefit Analysis WRL TR2020/39

Rayner, D. S. and **Harrison, A. J.** (2020) Moto Wetland Remediation Feasibility Assessment – Roche Group property WRL TR2020/43

Rayner, D. S., **Harrison, A. J.**, and Glamore, W.C. (2020) Tuckean Swamp Hydrologic Options Study WRL TR20219/21

Harrison, A. J., Glamore, W.C. and Costanza, R. (2019) Cost Benefit Analysis of Big Swamp Restoration Project WRL TR 2019/19

Drummond, C.D., Howe, D., **Harrison, A. J.**, and Lanceman, D. (2019) Analysis of Aerial Monitoring of the Central Coast: Survey 4, June 2019 WRL TR 2019/30

Harrison, A. J. and Rayner, D.S. (2018) Manly Lagoon Estuary Dynamics and Entrance Modelling WRL TR2018/13

Carley, J.T, Coghlan, I.R., Miller, B.M., Drummond, C.D and **Harrison, A.J.** (2018) Renewal of the South Steyne Stormwater Outlet, Manly WRL TR2018/09

Harrison, A.J., Carley, J.T and Coghlan, I.R. (2017) Roches Beach Coastal Hazard Lines Reassessment WRL TR2017/19

Miller, B.M., Rahman, P.F., Deiber, M. and **Harrison, A.J.** (2016) Calibrated Modelling of Botany Bay WRL TR2016/02