



Toby Tucker

Senior Engineer

Toby is a Senior Engineer at the Water Research Laboratory. Since completing his Bachelor of Civil Engineering in 2015 with first class honours, he has gained significant experience working on various projects including groundwater, hydraulic modelling, flood mitigation, floodplain management, estuarine water quality and processes, coastal engineering and wetland restoration. He is an experienced field engineer and adept at data collection; enabling him to develop expertise

in numerical modelling, and a proficiency in using remote sensing and GIS techniques to address complications that arise in the field of water engineering. Toby is currently working on the restoration of estuarine systems and using his skills in hydrodynamics to develop strategies to improve entire estuaries across the New South Wales coastline. Toby is passionate about water engineering, supported by his relevant experience and practical problem-solving skills.

Qualifications

BE Hons 1 (Civil Engineering), UNSW, 2015
Remote Pilot License (RePL) (Multi-rotor $\leq 25\text{kg}$, fixed wing $\leq 7\text{kg}$)

Expertise

- Wetland restoration
- Estuary water quality
- Flood mitigation
- Floodplain management
- Coastal processes and coastal structures

Summary of relevant experience

Wetland restoration

2016: Woodberry Swamp field investigations
2017: Everlasting Swamp field investigations
2017: Big Swamp field investigations
2018-2022: Yeramba Wetland restoration & monitoring
2018: Tuckean Wetlands restoration
2018-2022: Clybucca Wetlands restoration & monitoring
2020: Woodberry Swamp options study
2020-22: Area E wetland restoration
2021: East Kinchela (Swan Pool) remediation feasibility study
2022: Tomago wetlands hydrological monitoring

Estuaries

2017: Hunter River Est water quality field investigations & modelling
2018: Hunter River Estuary tidal pool salinity assessment
2019: Pampoolah riverbank stability & floodplain assessment
2020: NSW coastal floodplain prioritisation (Tweed, Richmond, Clarence, Macleay, Hastings, Manning & Shoalhaven)
2021: Manly Lagoon estuary health assessment
2021-22: Crookhaven River hydrological monitoring
2021-22: Lake Illawarra field investigations & modelling

Flood mitigation / floodplain management

2017: Fullerton Cove and Tilligerry Creek modified floodgate modelling and design
2017: Vehicle stability testing in floodwaters
2018: Narrabeen Lagoon monitoring and dredge design
2019-21: Keith Hall drainage options study

Professional history

2022- Senior Engineer, UNSW WRL
2016-2022: Project Engineer, UNSW WRL
2014-2016: Undergraduate Engineer, Lend Lease

- Beach geomorphology and coastal stabilisation
- Numerical modelling
- Physical model design, construction and testing
- Climate change adaption / blue carbon
- Quality management and control

Coastal engineering

2016: Collaroy-Narrabeen beach erosion assessment
2018: Palm Beach offshore protection physical modelling & testing
2018: Collaroy-Narrabeen Beach nourishment design
2019-22: Collaroy-Narrabeen seawall impacts on beach amenity
2021: Clarkes Beach, Byron Bay emergency protection
2021: Wamberal seawall impacts on beach amenity

Groundwater

2016, 2018: John Fisher Park groundwater monitoring
2017: West Connex EIS Review
2017: Coal Mine EIS Review
2018: Warren WWTP augmentation
2018, 2021: Manly Lagoon monitoring

Hydraulics

2015: Pumping station design
2015: Sewerage networks
2016: Gutter grate inlet capacity testing
2016: Educational flood model development
2017: Dam spillway design and testing

Computing skills

Programming: Excel, C, MATLAB, R, Python, Access
Numerical modelling: MIKE, RMA, ShoreFor, SBEACH, SWAN
Design: AutoCAD, Civil 3D
GIS: ArcMap, QGIS

Publications

- Tucker, TA** (2015) *Application of 2D models to examine sand bar recovery at Narrabeen-Collaroy*, Honours Thesis, UNSW.
- Modra, BD, Blacka, MJ, Deiber, M, Drummond, CD, Harrison, AJ, **Tucker, TA** and Miller, BM (2016) *Amrun fishway and spillway physical modelling*, WRL TR2016/17, UNSW Water Research Laboratory.
- Miller, BM, Drummond, CD, **Tucker, TA** and Harrison, AJ (2016) *Grate testing for ACO*, WRL TR2016/07, UNSW Water Research Laboratory.
- Tucker, TA**, Rayner, DS and Anderson, DJ (2016) *John Fisher Park groundwater monitoring 2016*, WRL TR2016/08, UNSW Water Research Laboratory.
- Modra, BD, Drummond, CD, Deiber, M and **Tucker, TA** (2017) *Additional testing of Amrun combined spillway model*, WRL TR2017/10, UNSW Water Research Laboratory.
- Glamore, WC, Ruprecht, JE, Harrison, AJ, **Tucker, TA**, Rayner, DS and Smith, AN (2017) *Everlasting Swamp hydrodynamic modelling study*, WRL TR2017/02, UNSW Water Research Laboratory.
- Glamore, WC and **Tucker, TA** (2017) *Fullerton Cove and Tilligerry Creek modified floodgate design*, WRL TR2017/18, UNSW Water Research Laboratory.
- Anderson, DJ, **Tucker, TA** and Rahman, PF (2017) *Heretaunga Plains Aquifer, New Zealand – groundwater study*, WRL TR2017/15, UNSW Water Research Laboratory.
- Glamore, WC, Rayner, DS and **Tucker, TA** (2017) *Hunter River Estuary water quality model – data assessment*, WRL TR2017/03, UNSW Water Research Laboratory.
- Drummond, CD, Blacka, MJ and **Tucker, TA** (2017) *Palm Beach shoreline protection, large basin modelling*, WRL TR2017/18, UNSW Water Research Laboratory.
- Smith, GP, Modra, BD, **Tucker, TA**, Cox, RJ and Felder, S (2017) *Vehicle stability testing for flood flows*, WRL TR2017/07, UNSW Water Research Laboratory.
- Rayner, DS, **Tucker, TA** and Glamore, WC (2018) *Clybucca Wetlands management options study*, WRL TR2018/32, UNSW Water Research Laboratory.
- Glamore, WC, Deiber, M, Howe, D, Ruprecht, JE, **Tucker, TA** and Dafforn, KA (2018) *Hunter River Estuary tidal dynamic assessment – additional scenarios*, WRL TR2018/05, UNSW Water Research Laboratory.
- Tucker, TA**, Rayner, DS and Simpson, JH (2018) *John Fisher Park groundwater monitoring 2018*, WRL TR2018/14, UNSW Water Research Laboratory.
- Tucker, TA**, Coghlan, IR, Carley, JT and Miller, BM (2018) *Narrabeen Lagoon entrance clearance operation design*, WRL TR2018/16, UNSW Water Research Laboratory.
- Glamore, WC, Rayner, DS, Harrison, AJ and **Tucker, TA** (2018) *Teal Lagoon hydrological study, Everlasting Swamp*, WRL TR2018/06, UNSW Water Research Laboratory.
- Anderson, DJ and **Tucker, TA** (2018) *Warren WWTP augmentation – groundwater monitoring network installation and baseline sampling*, WRL TR2018/05, UNSW Water Research Laboratory.
- Anderson, DJ and **Tucker, TA** (2018) *Warren WWTP augmentation groundwater management and monitoring plan*, WRL TR2018/43, UNSW Water Research Laboratory.
- Rayner, DS, **Tucker, TA** and Glamore, WC (2018) *Yeramba Lagoon restoration action plan*, WRL TR2018/10, UNSW Water Research Laboratory.
- Tucker, TA**, Smith, GP and Rayner, DS (2019) *Approach to re-introducing tidal flows and land management options for Woodberry Swamp*, WRL TR2019/12, UNSW Water Research Laboratory.
- Tucker, TA**, Leaman, CK and Carley, JT (2019) *Review of impacts on beach amenity of coastal protection works at Collaroy-Narrabeen Beach*, WRL TR2019/09, UNSW Water Research Laboratory.
- Ruprecht, JE, **Tucker, TA**, Coghlan, IR and Glamore, WC (2019) *Pampoolah Floodplain remediation investigation and riverbank erosion assessment*, WRL TR2019/18, UNSW Water Research Laboratory.
- Tucker, TA**, Smith, GP and Rayner, DS (2020) *Approach to introducing tidal flushing to Woodberry Swamp SLR assessment*, WRL TR2020/33, UNSW Water Research Laboratory.
- Tucker, TA** and Smith, GP (2020) *Woodberry Swamp community consultation workshop outcomes*, WRL TR2020/15, UNSW Water Research Laboratory.
- Tucker, TA**, Rayner, DS and Lumiatti G (2021) *Keith Hall Drainage Options Study*, WRL TR2021/06, UNSW Water Research Laboratory.
- Tucker, TA** and Rayner, DS (2021) *East Kinchela (Swan Pool) Remediation Feasibility Study*, WRL TR2021/21, UNSW Water Research Laboratory.