WATERLINES

ISSUE 2, 2018

WATER TECHNOLOGY
WATER, COASTAL & ENVIRONMENTAL CONSULTANTS

Coastal adaptation in action

ANDREW McCOWAN
- Managing Director

Welcome to our latest issue of **Waterlines**

Whether it is trip to the beach, casting a line into the ocean or sailing the wide blue, the coast is an integral part of life for many of us.

Understanding, preparing for, and responding to the pressures on our coastal environment is central to the projects we undertake. Across Australia we are working with local governments in the development of coastal hazard and adaptation strategies. The development of these strategies includes engagement and collaboration with the local community to better understand their needs and values to support improved planning and prioritisation decisions. By way of example, a recent Western Australian project for the Denham Township that we have undertaken has provided the council with a coastal foreshore plan to optimise use options and to plan for climate change impacts.

In this edition of Waterlines, we showcase recent projects undertaken by Water Technology staff supporting our clients with innovative solutions and understandings of their coastal challenges:

- Designing a breakwater reconstruction to improve boat launch safety;
- Providing a multi-disciplinary approach to foreshore rejuvenation; and
- Understanding coastal groundwater processes and response to climate change.

Other projects in this edition include flood recovery and response activities in Tasmania and supporting the renewable energy boom.

Thank you for taking the time to read Waterlines. Please do not hesitate to contact me or any of the Water Technology team at any stage if we can be of assistance.

South Burnie breakwater **reconstruction and extension**

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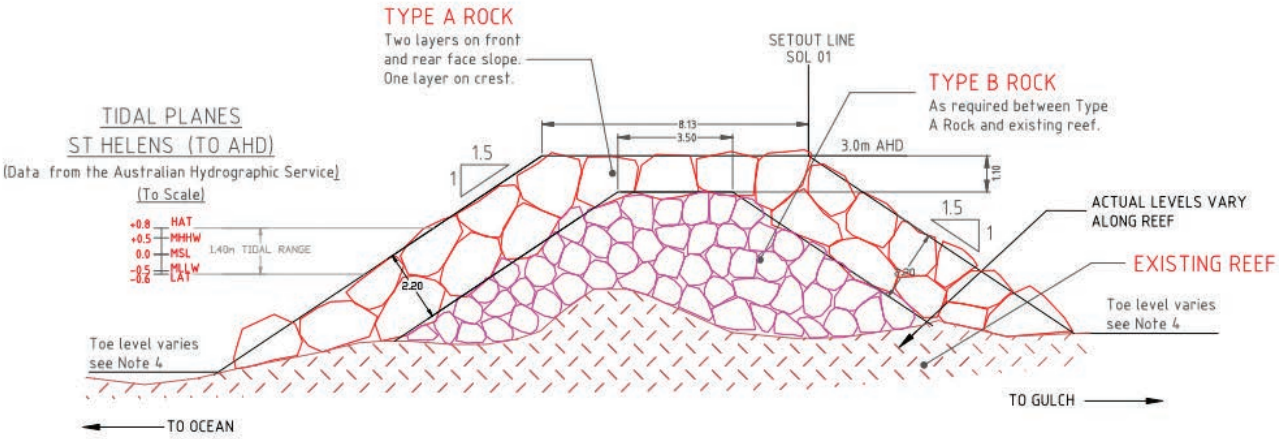

The Emu Bay boat ramp located in South Burnie on the north-west coast of Tasmania is an important recreation and emergency services boat launch site. During storm events in June and October 2016, an existing outer breakwater protecting the boat ramp was severely damaged. Reconstruction of the breakwater was required to provide safe boat launch access during low tide condtitions.

Burnie City Council engaged Water Technology to design the reconstruction and an extension to the breakwater to provide safe conditions at the boat launching site.

An approximate 100m long breakwater was designed to protect against Bass Strait storm events. The design incorporated the reuse of existing rock at the site to minimise expense and included an extension of the existing breakwater footprint to enhance safe boat launching conditions.

The project included working with Council to coordinate surveys and to set out the location of the breakwater. A technical investigation of design storm conditions was used to specify crest heights and rock size to be used as armour rock, as well as a preferred alignment extension length. Detailed design documentation was produced, including set-out and detailed sections, along with technical specifications for the rock armouring and a schedule of estimated material quantities. This design documentation was used by Council to go to tender. Council consulted Water Technology throughout the tender phase to confirm construction methodologies and material specifications.

During the construction phase of the project, Water Technology aided Council with a series of site inspections documenting whether the breakwater was constructed appropriately.

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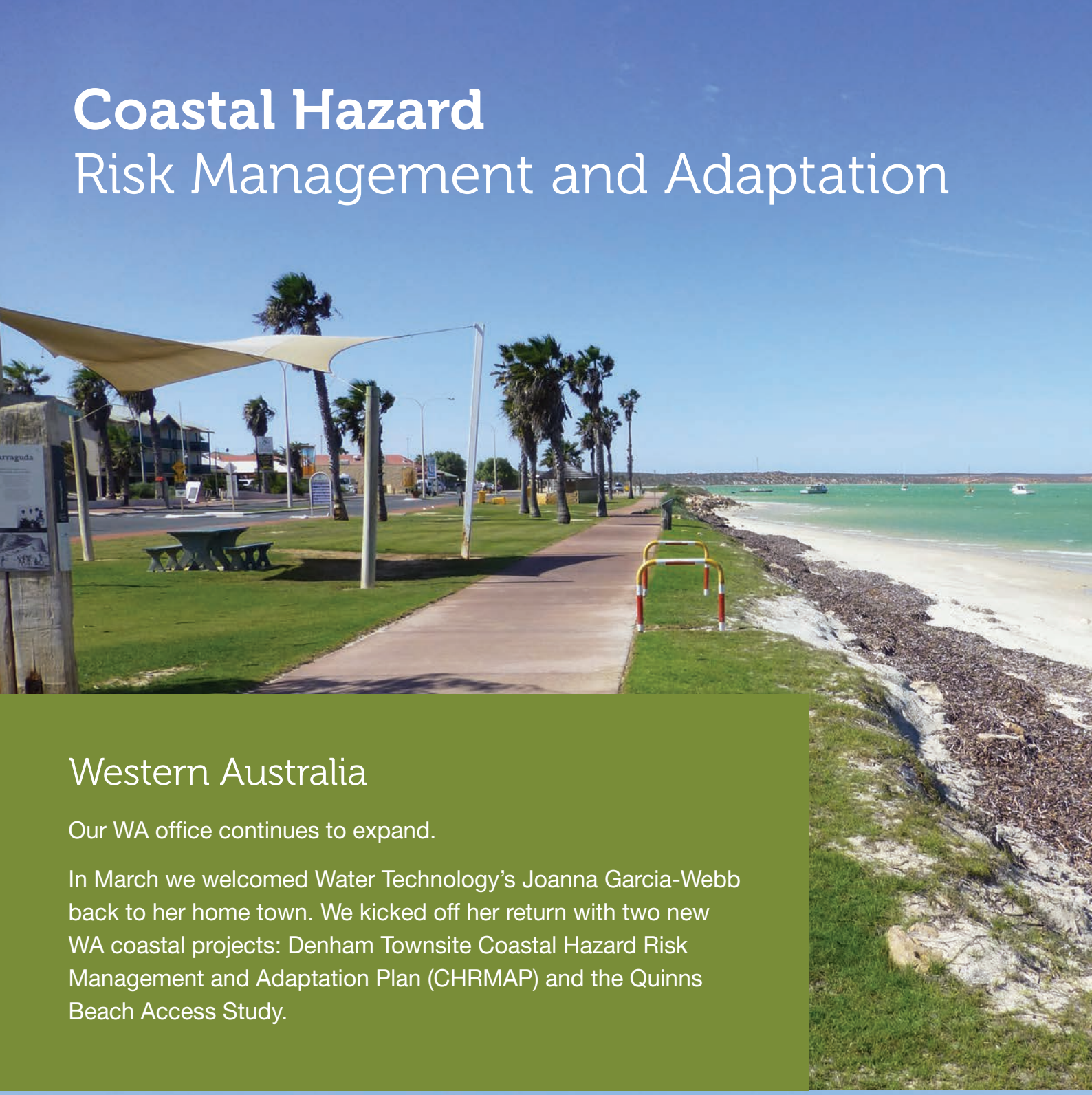
Coastal Hazard
Risk Management and Adaptation



Western Australia

Our WA office continues to expand.

In March we welcomed Water Technology's Joanna Garcia-Webb back to her home town. We kicked off her return with two new WA coastal projects: Denham Townsite Coastal Hazard Risk Management and Adaptation Plan (CHRMAP) and the Quinns Beach Access Study.

Many coastal communities face coastal erosion and inundation risks. It is anticipated that projected sea level rise and more intense storms from a changing climate may increase and extend these risks to areas currently at low or no risk. These effects have the potential to significantly impact the livelihoods and lifestyles of coastal residents and the natural environment. Decisions and actions that help to prepare for the adverse consequences of a changing climate, as well as taking advantage of the opportunities, are known as climate adaptation.

To assist in understanding and adapting to variations in climate, the Shire of Shark Bay is developing a Coastal Hazard Risk Management and Adaptation Plan (CHRMAP). Water Technology personnel prepared a CHRMAP for the township of Denham which delivers a blueprint for adapting and addressing coastal hazards likely to affect Denham. The CHRMAP provides strategic guidance for coordinated, integrated and sustainable decision making by the Shire of Shark Bay regarding future land use planning and management within the project area. The project includes consideration of climate change, including sea level rise, and its impacts on the coastal zone within Denham. It will enable the Shire to optimise its current use of the coastal foreshore and to plan for how this may change in the future.

A high level of community and stakeholder engagement to support ownership of the CHRMAP and acceptance of its outcomes was required for this project. Our first engagement activity included an interactive community workshop to collate the community's values. The collaboration with the local community identified areas and assets in the coastal zone of high social, environment and cultural significance for incorporation into the plan.

The Quinns Beach Access Study is an options assessment and detailed design of a new beach access through the dunes at Quinns Beach, one of the northern beaches in Perth. While meeting the City of Wanneroo's functional requirements, the design footprint will be kept to a minimum to reduce impacts on dune flora and fauna. The seaward interface of the access way will allow for coastal processes and climate change over the design life of the structure.

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Groundwater and Coastal Environments

Coastal groundwater systems vary widely and are influenced by local geology, groundwater flow processes and connectivity to the marine environment. The impacts on coastal groundwater systems of climate change range from varied recharge/inflow, rising water tables and land salinisation to restricted discharge to marine environments.

Water Technology is involved in a variety of projects that consider the interactions between shallow groundwater systems and adjacent coastal environments.

At Anglesea, in Victoria, investigations are being undertaken to understand if the near-shore movement of groundwater is facilitating the erosion of coastal cliffs and threatening the built environment. These investigations involve understanding the groundwater flow direction in relation to the eroding cliffs and the competency of the materials that form the host aquifer and how they might respond if groundwater levels build-up behind the cliff face.

On Kangaroo Island (SA), Water Technology is providing advice on how groundwater processes may respond to climate change. As these shallow groundwater systems discharge to the marine environment, if there is a rise in sea level, how will groundwater levels respond inland – particularly in low-lying coastal zones, will water tables become shallower,

will low lying land surfaces be increasingly subjected to inundation or salinization? With predicted altered rainfall patterns, how will current groundwater recharge and discharge processes respond and what ramifications may be expected within coastal zones to altered water table fluctuations. The built environment also needs consideration as natural systems respond to predicted change.

Signs of how groundwater systems might express themselves within the natural coastal environment include the presence of seeps and springs at the toes of cliffs, or whether beaches remain saturated at low tide. Additionally, observations of native water birds as they congregate at certain parts of the shore or whether some forms of shellfish, that prefer occasional fresh waters concentrate, indicate near-shore discharge of groundwaters. On your next 'day at the beach' have a look around and you may well be surprised at what you can deduce of natural groundwater systems.

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Flood recovery in Tasmania

Agricultural Landscape
Rehabilitation Scheme

In June 2016, Tasmania was subject to widespread flooding that resulted in significant loss of land, property, stock infrastructure and unfortunately life. In response to the flooding, the Tasmanian State Government developed the Agricultural Landscape Rehabilitation Scheme (ALRS) to assist flood-affected landowners and communities by funding projects aimed at the rehabilitation of land and stream systems damaged by the June 2016 floods. The focus of the program was to restore the capacity of the primary production sector and reduce impacts of future floods on productive land.

Water Technology has worked with NRM North to complete a large number of site assessments across northern Tasmania as part of the ALRS program. Specifically, the project involved undertaking site assessments to provide geomorphic and river engineering advice for individual landholders with consideration of the processes, issues and threats occurring across each site/reach and to prepare preliminary mitigation strategies that can be employed to improve flood resilience and protect assets across the project area into the future.

A series of workshops involving key project stakeholders and affected landholders were undertaken throughout the project. The workshops provided an opportunity for the community to ask direct questions about their circumstances to better understand their recovery and rehabilitation options. Water Technology subsequently developed over 20 designs of waterway management works at specific flood-damaged sites across the State.

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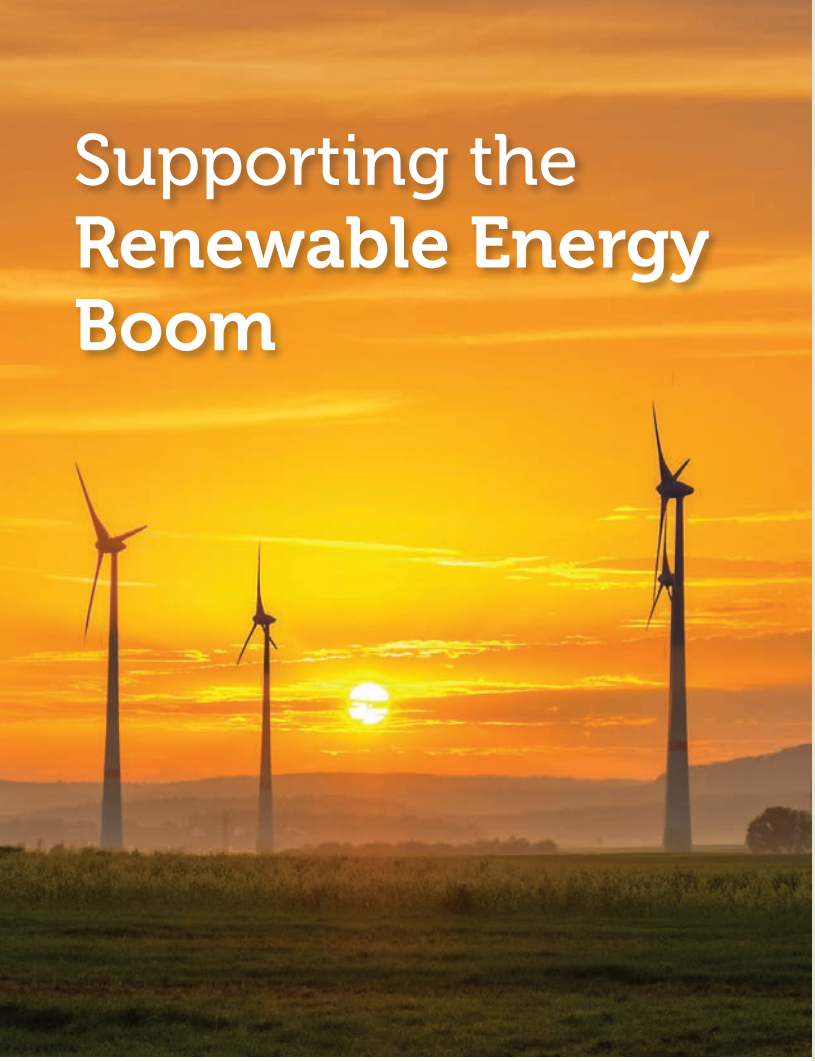
Supporting the Renewable Energy Boom



The last few years have seen remarkable growth in renewable energy. In recent years, Water Technology has helped several clients secure planning approvals for some of the largest renewable energy projects in Australia. We are excited by the growth in the renewables sector and believe that this work closely aligns with our company purpose, “to make a difference”.

Water Technology has provided expertise on surface water, groundwater and biodiversity, assessing the risks of major wind and solar projects for Environmental Effects Statements, proposing appropriate mitigation measures to minimise risk, and recommending approaches to manage residual risk.

The five most recent wind and solar farm projects Water Technology has worked on will provide enough electricity to power up to 975,000 homes sustainably, now that is truly making a difference!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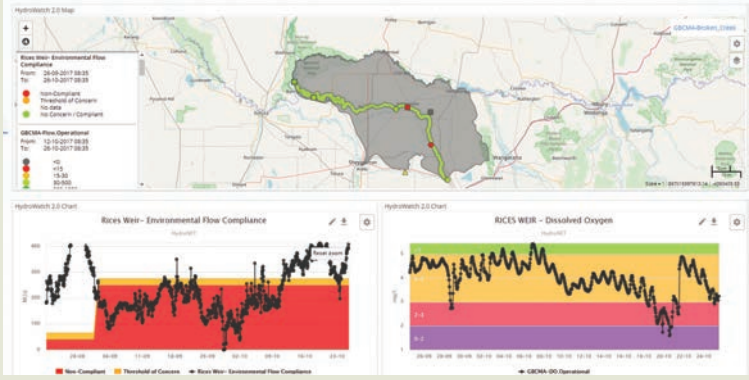
HydroNET
your water control room

Improving timely access to data with the HydroNET Water Control Room

Managing and accessing data from multiple sources is a common challenge faced by many organisations. The Goulburn-Broken CMA needed a solution that allowed timely access of data to inform better decision making. An innovative cloud-based platform was developed and implemented by Water Technology for the CMA using HydroNET. The platform connects various data sources and provides personalised dashboards and information anywhere, anytime. This enables staff to securely and easily view, watch and report on real-time water quality, rainfall and river flow data from an external database via personalised web dashboards.



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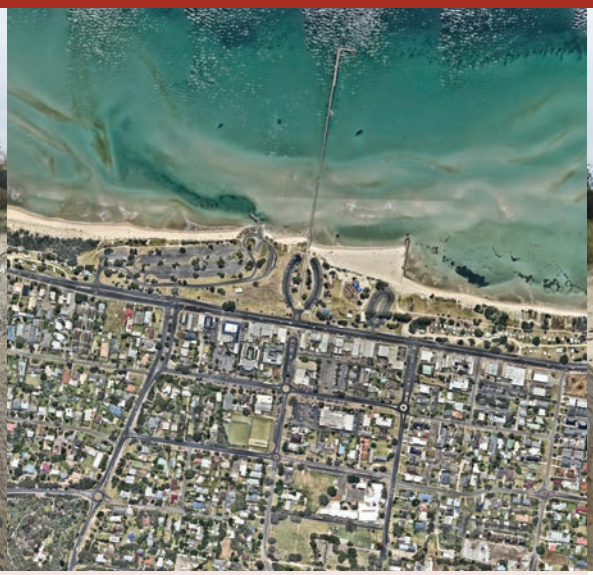
Coastal Water Sensitive Urban Design



WSUD options assessment and investigation

The Rye Foreshore on the Mornington Peninsula, Victoria is a popular recreation area with white sandy beaches and turquoise waters. Protecting and improving the health of the foreshore, and Port Phillip Bay, is a priority for the area. Mornington Peninsula Shire Council (MPSC), Melbourne Water and active community members progress a number of initiatives every year aimed at improving water quality in the Bay.

MPSC engaged Water Technology to assist in the delivery of environmental benefits as part of the Rye Foreshore Plaza re-development. A multi-disciplinary team, including an ecologist, coastal engineers and integrated stormwater management specialists worked collaboratively with Council Officers to identify potential water sensitive urban design options for the site and to prepare detailed design documentation of the preferred assets.

This site was considered an ideal location to realise community and environmental benefits associated with water sensitive urban design. As a result, a range of stormwater treatment solutions, including permeable paving, bioretention systems and infiltration systems were identified as being suitable for the site. Additionally, solutions and plant selections considered the potential influence of sea level rise and were designed to holistically integrate into the Plaza and the broader coastal environment. The ultimate design exceeds Best Practice targets, provides ample opportunities for education signage in an area likely to have high visitation and effectively integrates indigenous plants with nutrient removal abilities.

Rejuvenating Rye Foreshore

- Revegetate and protect sand dunes
- Improve connectivity of the foreshore
- Increase accessibility to the beach and park
- Improve stormwater drainage and treatment

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NEWS

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Partnering with the Australian Sailing Team for the Tokyo 2020 Olympics

Water Technology is pleased to announce that we have again been selected to partner with the Australian Sailing Team in their endeavours for the next Olympics. The Tokyo 2020 Games will include sailing at E-no-Shima, a popular yachting and coastal area west of Tokyo. E-no-Shima and the Race Area is on the northern coast of Sagami Bay which has depths below 1000m with surface currents which may be impacted by the large range in temperature from surface to bottom waters.

We will again be accompanying our sailors to the games site during preparation and training for the games so we can collect data with which to calibrate models. We wish our sailors success again and look forward to cheering them on the road to Tokyo.

In the Twittersphere

WaterTechnology
@WaterTechPtyLtd

Local knowledge informing better outcomes. Talking floods with the community of Briagolong for the township Flash #Flood Study @wellingtonshire @westgippscma @DELWP_Vic @vicsesnews

Promotions

Ben Hughes – Principal Engineer
Elise Lawry – Principal Engineer
Johanna Theilemann – Senior Engineer
Richard Connell – Principal Engineer
Thomas Cousland – Principal Engineer

New Staff

Jenna Parker – Scientist
Astrid Stuer – Senior Engineer
Will Edge – Coastal Project Engineer
Johanna Slijkerman – Principal Scientist
Sam Savini – Scientist
James Weidmann – Project Engineer

Staff Profile

Andrew Thompson

Senior Engineer

Andrew is a senior engineer with over 15 years' experience in floodplain management, flood mitigation design and waterway assessment and management in the South East Queensland region. Since joining Water Technology in 2015, Andrew has broadened his experience as a floodplain manager and is currently the Assistant Group Manager of the Brisbane Water Resources team. His specific expertise lies in numerical flood modelling and flood impact assessment work. Andrew has extensive experience in forensic flood assessments having previously undertaken numerous site-specific property inspections following the 2011 (Brisbane), 2012 (Moree and NSW Riverina areas), 2013 (Bundaberg) and 2017 (Northern NSW) flood events.

Andrew completed a Master of Environmental Engineering in 2003 majoring in land and water processes and hazardous waste management. Faced with the prospect of either working all day in the hot sun sampling various landfills or assessing the health and management of waterways, Andrew chose to delve into floodplain hydraulics, garnering experience in a wide variety of software platforms. In addition to flood modelling, Andrew also enjoys being involved in community consultation having recently assisted a local SEQ council in undertaking a catchment-wide, community-led flood mitigation program.

In addition to working out which way water flows, Andrew is a part-time stand-up comedian, and writer and is currently enjoying a tenure as a featured panellist on ABC Radio Brisbane. Andrew is a seasoned stand-up performer with over a decade of experience, having cut his teeth on the flourishing Brisbane comedy circuit where he quickly established himself as a consistent and confident performer and a lively storyteller.

In his spare time, he likes to regale his two young sons with stories about former glory on the football field and tries to ignore the persistent eye-rolling from his long-suffering wife.

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