WATERLINES

ISSUE 2, 2023

WATER TECHNOLOGY
WATER, COASTAL & ENVIRONMENTAL CONSULTANTS

research and innovation

STEVE CLARK
Managing Director

Welcome to our latest issue of Waterlines

"We are proud to continue our long history of partnering with organisations to undertake research that supports developing new knowledge that can lead to innovative solutions."

This edition showcases our team's efforts to work with our clients to provide innovative solutions across a broad range of areas.

I have enjoyed reflecting on the last 23 years of Water Technology and in particular the range of research and innovation initiatives that we have been involved in.

We are also proud to continue our long history of partnering with organisations to undertake research that supports developing new knowledge that can lead to innovative solutions being delivered.

I am also pleased to introduce our two new directors to the Water Technology Board that bring diversity and new insights.

As we reflect on our year, I would like to extend my sincere appreciation to our Water Technology team and our valued clients and partners with whom we collectively address challenges and help provide solutions.

Thank you for taking the time to read Waterlines and I would like to extend good wishes to everyone for 2024.

Please do not hesitate to contact me or any of the Water Technology team at any stage if we can be of assistance.

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Research and Innovation:

A fundamental part of Water Technology's history and a core component of its culture and future

Water Technology celebrated its 23rd birthday during 2023, where it has grown from one person in a room in a suburban home in Victoria to a team of more than 140 people spread across Australia. Since the outset, Research and Innovation have been a core component of Water Technology.

As part of the celebrations, founder and now Chair of the Water Technology Board, Dr Andrew McCowan, shared some of his insights about Research & Innovation:

> ***"Right from the beginning, Research & Innovation was intended to take a leading role in the development of Water Technology. This was one of the reasons for including Technology as part of our name. Our involvement in Research & Innovation is our way of keeping the Technology in Water Technology."***

What Andrew has enjoyed most about Research & Innovation is the background thinking required and the working through and evaluation of possible options:

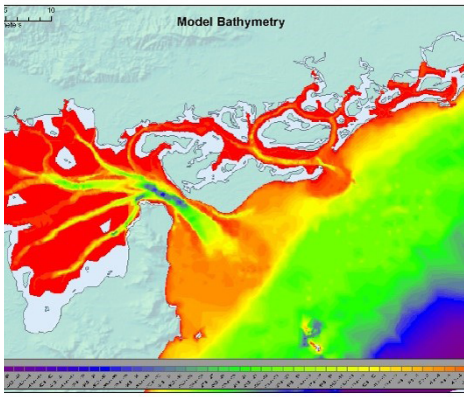
> ***"It can be quite frustrating at times, and very time consuming. A successful conclusion can, however, be very rewarding."***

What has surprised Andrew the most about some of the Research & Innovation he has been involved with is that:

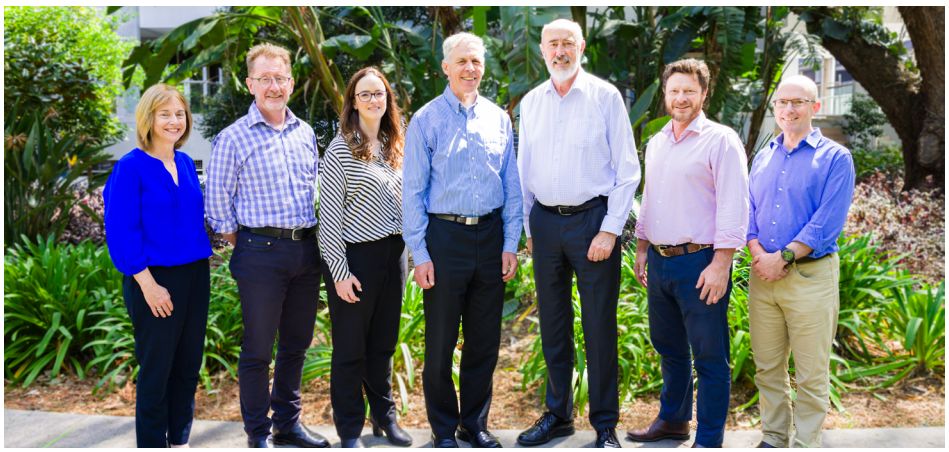
> ***"After weeks and sometimes months of painstaking analysis and evaluation you can finally come to a result that, in retrospect, is quite logical if not immediately obvious. This then raises the question as to "Why didn't I think of that before?""***

Above: the first office of Water Technology

Above: the first two employees of Water Technology - Andrew and Steve



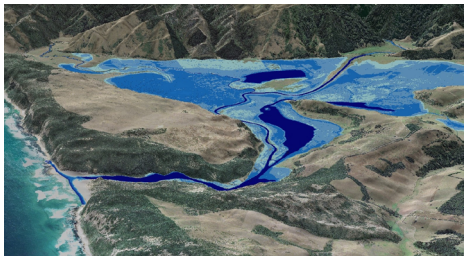
Above: outputs from some early modelling work



Above: current Water Technology Board members (L to R: Karen Boyce, Tony McAlister, Johanna Theilemann, Steven Molino, Andrew McCowan, Steve Clark, Warwick Bishop)

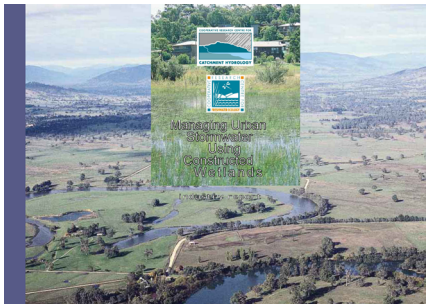
Research and innovation partnership highlights over the last 23 years

Working with the Danish Hydraulic Institute (DHI) on the original development of the two-dimensional (2D) flood modelling package, MIKE Flood. Dr Andrew McCowan was responsible for improving the wetting and drying algorithm, improving model stability and introducing the ability to model super-critical flows. This integrated 1D-2D model went on to be widely used for flood modelling around the world.



Dr Yafei Zhu, Principal Engineer, undertook a PhD with Monash University as part of an Australian Research Council (ARC) linkage project on algal blooms in the Gippsland Lakes, which improved the understanding of nutrient cycling processes.

Warwick Bishop undertook a Masters at Monash University with Professor Tony Wong on constructed wetland hydrodynamics. This informed the Cooperative Research Centre (CRC) for Catchment Hydrology industry report on constructed wetlands in 1998, which was a key document that influenced subsequent wetland design guidelines around the country.



Dr Yafei Zhu worked with the CRC for Water Sensitive Cities where Water Technology played a key role in the development of the "Sponge City Brain". This was a decision support system for optimising the management of water quantity and water quality in the polders of the lower Yangtze River near Shanghai.

CRC for
Water Sensitive Cities

Partnering with Hydrologic in the Netherlands to introduce HydroNET into the development of water management and decision support tools in Australia. This has been the catalyst for us now having our own research and innovation team (*see article in this edition*).

Being a project partner in the WaterSENSE research project being funded from the European Union's Horizon 2020 Research and Innovation Programme with novel research focusing on scalable information services, based on satellite water monitoring and advanced big-data processing algorithms.

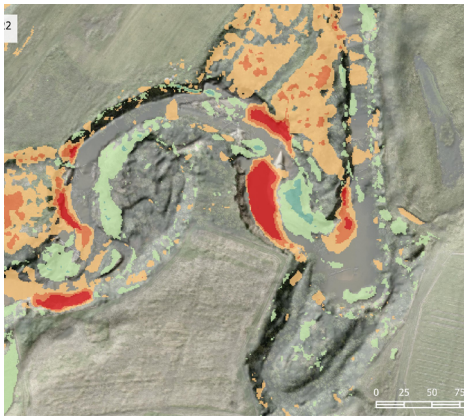
Partnering in an ARC Linkage project which is investigating nutrient offsets from establishing a new mangrove wetland at the Southern Redland Bay Wastewater Treatment Plant site in Queensland.

Being a project partner in research work on "Incorporating First Nations Knowledge in Water Modelling" funded by the Queensland Water Modelling Network (Queensland Department of Environment and Science) (*see article in Waterlines Issue 1 2023*).

Being a partner in the OneBasin CRC which was established to focus on a collaborative approach to building shared understanding and co-design solutions to meet the needs of the Murray Darling Basin (*see article in this edition*).

Some of the key Research & Innovation moments in Water Technology's history have involved:

- Improvements to flood modelling, with Water Technology being an early adopter of the use of LiDAR survey, of Finite Volume flexible mesh modelling techniques, of rainfall on grid modelling and of the use of radar rainfall in hydrologic model calibration. In addition, we are also using the new science of palaeoflood hydrology to inform flood risk analysis.
- The use of physical modelling in the development of innovative breakwater and boat ramp design.
- 2D modelling for geomorphic investigations.
- The co-development of the Estuary Flows method with Lance Lloyd.
- The development and trialling of ecological monitoring methods.
- The use of a combination of full-scale testing, physical modelling and numerical modelling for the development of innovative desalination plant outfall diffuser designs.



Water Technology has been involved in Research & Innovation initiatives through a range of mechanims including:

- Being subject matter experts and contributors to Cooperative Research Centres and Australian Research Council projects
- Directly partnering on initiatives
- Supporting staff to undertake further study in the form of Masters or PhD degrees

There are many benefits of supporting the advancement of knowledge and generation of new knowledge and also the early adoption of that knowledge to innovate in the approaches utilised.

Water Technology Director and National Innovation and Technology lead, Warwick Bishop, explains why Research & Innovation will remain a key component of Water Technology's culture now and into the future:

> ***"Being curious and striving for better outcomes through technical investigations is part of our DNA. Investing in Research & Innovation enables Water Technology to contribute to broader industry advancements that ultimately benefit our clients and the whole community. They also provide opportunities to attract and retain people with the desire to make a difference across all the sectors we operate in. Participation in Research & Innovation also provides professional development opportunities for our teams.***
>
> ***Going forward we need to provide space for thinking and testing ideas, and room to fail."***

Collaborating in the One Basin CRC

Research to support the future of the Murray Darling Basin

The Murray-Darling Basin (the Basin) is one of Australia's most valuable natural assets. The Basin supports a population of 2.2 million people, including more than 40 Aboriginal Nations, has a $24 billion per year agriculture industry, an $8 billion per year tourism industry and high value freshwater ecosystems. Water in the Basin is managed across four states and a territory covering one million square kilometres. Over two thirds of Australia's irrigation occurs in the Basin.

The amount of water available across the Basin is limited and with increasing water demands, declining water availability and increasing climate variability, there is a need to explore long term solutions for the Basin's communities, industries and the environment.

The One Basin Cooperative Research Centre (CRC) was established to focus on a collaborative approach to building shared understanding and co-design solutions to meet the needs of the Basin. Commencing in 2022, the One Basin CRC consists of 85 partner organisations across Australia and will operate for ten years. Water Technology is proud to be one of those partner organisations.

Four challenge areas have been identified for the One Basin CRC to work on over the first three-year period:

1. Building capacity to confront climate change together
2. Capturing value from digital technologies to support the irrigated agriculture sector
3. Enhancing the water supply system to deliver for multiple uses
4. Realising value from and within rural industries and communities

There are six focus areas for each of the four challenge areas and specific projects are currently being identified and defined using a co-design approach. Each project will have a team working on it with representatives from industry, government and research.

ONE BASIN CRC

"Water Technology is proud to be one of the partner organisations"

Since January, Water Technology Director of Innovation and Technology, Warwick Bishop, has been leading Challenge 2 through the focus area identification process and project development co-design. This has involved widespread engagement with industry and academic partners.

A key outcome of the Challenge 2 interactions has been that most people consider there are, generally, appropriate tools and technologies available to the irrigation industry. The main obstacle to improved efficiency and outcomes is the integration and adoption of digital technologies across the Basin in different commodities and regions. The way in which data is gathered, stored, processed and shared has also emerged as a key area of focus for the future.

In August, Warwick Bishop and Brian Jackson (digital technology specialist at Water Technology) attended the first One Basin CRC Annual Event in Albury on Lake Hume. This proved to be an exceptional opportunity to meet and collaborate with other partners from a wide range of Universities, agencies and companies involved with the CRC.

Water Technology decided to become a part of this CRC because we have an active history of involvement in various aspects of the Basin from environmental watering and eco-hydraulic investigations to farm water balance and flood warning services. We believe that our contribution can assist in delivering real change in the Basin and provide a legacy of improved water management.

Above: Warwick Bishop presenting at the One Basin CRC event in Albury

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Looking into the Past to Inform our Future

Applying the new science of palaeoflood hydrology

The 2022 floods in South-East Queensland and New South Wales took over 20 lives, caused many more injuries, loss of homes and business and resulted in over $5 billion in damages.

The understanding of rare and extreme floods in Australia is limited by short gauge records, and the problem with many of these gauges is that they become damaged or stop operating during large events.

The design flood used in risk assessment and planning policy is typically derived from traditional Flood Frequency Analysis (FFA), but it is widely acknowledged that this approach has limitations owing to short gauging record length and inadequate representation of high magnitude events.

To advance flood risk management and policy planning there is a need to improve our understanding of the frequency and magnitude of extreme flood events especially in anticipation of more severe storms expected due to the trajectory of climate change.

Whatever view is taken about the relevance of the past being able to inform the future, history will continue to provide the only reliable information about the extremes that nature is capable of. Gauged record lengths are too short to be reliably used for accurate fitting of probability distributions for calculation of extreme events because floods are typically erratic and sometimes clustered in time, with short-term characteristics not necessarily representative of long-term behaviour.

However, there is an established method which can be useful to reduce the risk and uncertainty in flood risk assessments which is termed ***Palaeoflood Hydrology***. Water Technology's Dr Daryl Lam has been a key part of developing this methodology in Australia.

Palaeoflood Hydrology is an interdisciplinary science of reconstructing the timing and magnitude of past large flood events that occurred prior to historical observations and systematic measurements (i.e. gauging).

Palaeological evidence (e.g. fluvial sediments) can extend short gauge records and provide vital information of past extreme events, which are often missing or inaccurately represented. This provides the opportunity to better account for the frequency and magnitude distribution of discharge records.

The integration of palaeoflood records with gauged data can:

- Achieve a more representative discharge estimation of events with larger Annual Recurrence Intervals (ARIs) with greater certainty.
- Significantly reduce uncertainty in FFA.
- Increase the credible limit of extrapolation of the ARIs by more than an order of magnitude. This allows for more robust representation of very rare and extreme events.

"Palaeoflood Hydrology is an interdisciplinary science of reconstructing the timing and magnitude of past large flood events that occurred prior to historical observations and systematic measurements"

Since acquiring a formal name in the early 1980s, Palaeoflood Hydrology has developed significantly and is being increasingly applied. In addition, research continues to demonstrate its potential applications and value. For example, in Australia:

- Research in the Lockyer Valley, Queensland, suggests the January 2011 flood may not be uncommon. In fact, floods of that size have occurred at least five times in the last 1000 years.
- Palaeoflood investigations in the East Alligator River gorge, Northern Territory, provided key information for the design rainfall event in the modelling of the artificial landform at the Ranger uranium mine.
- The City of Bundaberg, Queensland, located on the mouth of the Burnett River, experienced one of the largest recorded floods in 2013. Palaeoflood evidence suggests floods of the same order of magnitude have happened at least ten times in the last millennium.
- The integration of palaeoflood records with the combination of gauge flows and reverse routed inflows provided considerable confidence of the 0.1% Annual Exceedance Probability (AEP) event for the Burdekin Falls Dam, Queensland.

The use of historical and palaeoflood records, in combination with gauge records, is recommended by Australian Rainfall and Runoff (AR&R) for the estimation of design floods.

However, there are limited examples of its use in Australia. This may be attributed to the idea that sites where palaeoflood evidence can be found are limited to bedrock gorges.

A recent study in Southeast Queensland has shown that palaeoflood evidence can be found in semi-alluvium channels.

But how and where can you find palaeoflood evidence?

The first step is looking for physical evidence in our "natural archives" of flood stage height such as flood sediments, fluorescent bands in corals, cave deposits, erosional features, flood debris (including boulder deposits), tree rings and tree damage or the absence of vegetation within flood zones.

In terms of assessing flood sediments, state of the art dating techniques are utilised that can measure the last time the sediment was exposed to light or by dating minerals such as quartz or feldspar. To work out how big the event was, hydraulic modelling is used to estimate the minimum amount of discharge that is required to carry and deposit the sediments where they are located.

The potential applications of Palaeoflood Hydrology include:

- Large infrastructure design and improvements.
- Mine Closure design.
- Flood risk and hazard mapping.
- Deriving extreme flood records where there are few or none available.

In Australia, Water Technology has been working with clients to obtain and use palaeoflood records to better understand extreme floods in their catchments.

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Awards

Urban cooling project wins award

The Pasadena Biodiversity Corridor has been awarded the 2023 Australian Institute of Landscape Architects SA Chapter Award for Parks and Open Space. The project was also awarded a Special Mention in the Healthy Parks Healthy People category.

Co-funded by the City of Mitcham, and the South Australian and Federal governments, the project has transformed two formerly dry and hot reserves into green, biodiverse and cool spaces, thanks to innovative engineering by Water Technology that diverts stormwater to the surface.

Launched in October 2022, the Corridor features a new playground and nature play elements that encourage the community to interact with nature. Native vegetation is now thriving along 300 metres of reinstated creek line, improving the biodiversity and amenity of the reserves in metropolitan Adelaide.

The project was designed and delivered in collaboration with Outerspace Studios, Beltrame Civil and the City of Mitcham.

Young professional award win

Scientists and engineers from across Australia came together in the Sunshine Coast to attend the 50th bi-annual Australasian Coasts and Ports Conference in August. The event was a great success with 460 delegates and 160 presentations. A true wealth of information was presented and discussed.

Above: Toby Devlin, 3rd from left, receiving his award.

"Working Together" was the theme of the conference and given the escalation of coastal challenges, it is more important than ever to openly discuss and integrate our collective knowledge at forums such as these.

Some of our team were in attendance, presenting their work in coastal engineering and science.

Toby Devlin presented on "The Point Richards rock groyne for deflecting seagrass wrack" and was a joint winner of the PIANC "Young Professional Award." Toby received great feedback on his presentation.

Gildas Colleter, our National Practice Lead (NPL) of Coasts and Marine, was one of the nominees for the Best Presentation of the Conference – the "Kevin Stark Award". We thank Gildas for his ongoing contribution to the industry and his assistance with organisation of the conference.

Above: Gildas Colleter, NPL of Coasts & Marine

Mapping Vegetation Changes

Using satellite imagery and machine learning

Reedy Lake is a large, shallow, brackish wetland located at the estuarine end of the Barwon River system and forms part of the Lower Barwon Wetlands, to the southeast of Geelong, Victoria. The Lower Barwon Wetlands were formally recognised as part of the Port Phillip Bay (Western Shoreline) Ramsar site in 1983. The wetlands are also recognised as an area of cultural heritage significance and sensitivity as they are part of an area that has long been used by Wadawurrung Traditional Owners for sourcing food, medicine, and resources.

The wetlands also have high recreational value to the communities surrounding Geelong.

Changes to the hydraulics and management of Reedy Lake from 1970 until 2016 resulted in summer flooding in most years, which changed the natural wetting and drying cycle of the wetland. There was concern that prolonged periods of full water levels had reduced vegetation diversity, flooded out threatened communities such as coastal saltmarsh and reduced bird diversity by restricting the formation of shallow wading habitat and sandbars.

In 2016, Corangamite Catchment Management Authority (CMA) incorporated a change in management practice at Reedy Lake to start a long-term process to rebalance the diversity of habitats and restore the site's threatened ecological values. This included lowering water levels to create a partial drying regime over the summer-autumn period, which was designed to maximise the diversity of habitats and prevent any one vegetation group or habitat type dominating the wetland. Variation in water levels was seen as necessary to support a variety of plant types from those that thrive in most conditions to those that require periods of drying and increased salinity to flourish.

The CMA was keen to understand whether the Ramsar Limits of Acceptable Change (LAC) and the environmental watering objective were being met at Reedy Lake. This

CORANGAMITE CMA

Above: Dave Carew amongst the Phragmites at Reedy Lake

is assessed by determining if the ecological character and the relative proportions of differing vegetation classes have been maintained. The primary tool for managing habitat balance is through water regime management.

Water Technology, Lloyd Environmental and Carew Environmental worked together with the CMA to develop a consolidated time-series of the change in extent of vegetation types from 1983 to the present, mapped to a consistent classification, with those changes assessed against the prevailing hydrological regime for Reedy Lake.

The team applied an innovative remote sensing approach, optimised for use in the wetlands by Water Technology. The approach relied on automated satellite imagery classification to detect vegetation types and extents for each time-step of interest. The result was the generation of an almost 40-year time series of change.

Satellite imagery combined with powerful machine learning algorithms that are trained to recognise different types of vegetation in the satellite image is a technique that we are increasingly using for management purposes. The approach is cost effective and efficient and generates accurate results based on sample locations of known vegetation type on the ground.

Satellite imagery is a great resource and is improving all the time.

Satellites such as Landsat have been taking coarse resolution (900m^2 pixel size) images since the late 1970s. More recently launched satellites are taking imagery at much higher resolutions (between 4-100m^2).

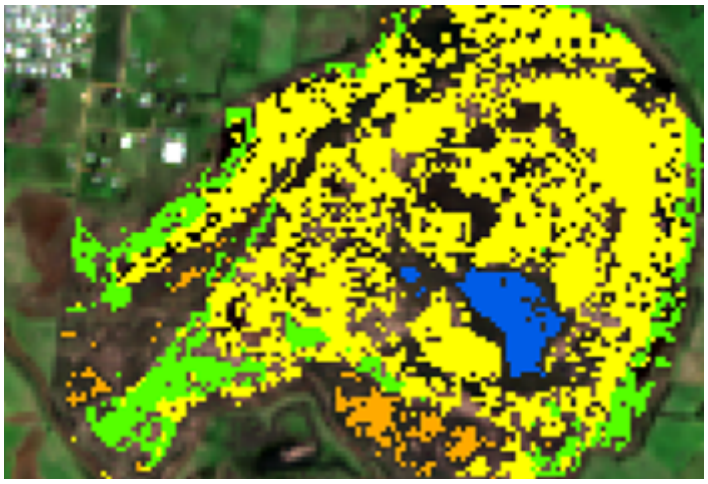
Water Technology used a combination of 30m resolution Landsat (United States Geological Survey) and 10m resolution Sentinel-2 (European Space Agency) imagery provided in Analysis Ready format by Geoscience Australia. A finding from the work is that the Sentinel-2 imagery performs better in the classification than the Landsat imagery, with vegetation extents more accurately classified, because of the higher spatial and spectral resolution.

There is now a robust and cost effective method the CMA can use to monitor future changes in vegetation extents every two years, building on the baseline we have established in this study.

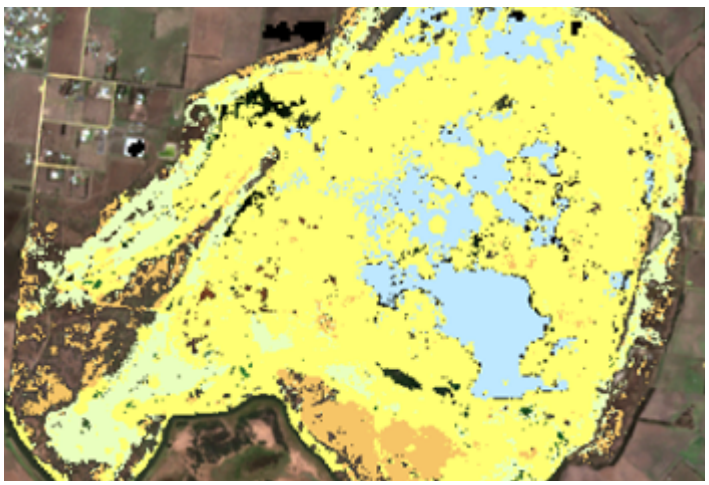
We look forward to seeing how the approach applied can help maintain the health of this ecologically and culturally significant site into the future and support adjustments to management in response to changes in climatic conditions.

Our analysis showed that the Tall Reed and sedge/rush vegetation communities of Reedy Lake are dynamic, exhibiting strong seasonal and inter-annual variations in extents; and that this pattern of variation has persisted since 1983. This is expected for healthy wetlands, and diverse and dynamic wetlands are known to be resilient to outside influences such as climate change and urbanisation. This variation was explained by interpretation of the habitat preferences and lifecycle characteristics of these vegetation types in response to the key influencing environmental variables being water levels and associated soil salinities from shallow groundwater. The evidence suggests that the ecological character of Reedy Lake is being maintained within the Ramsar Limits of Acceptable Change.

Our analysis further showed that the overall extent of Tall Reeds was trending toward an increase prior to the CMA initiating the water regime in 2016 and that the periodic drying of the wetland in 2016, 2017 and 2018 had an impact on reducing the extent of Tall Reed, particularly Typha, within the wetland at elevations influenced by the range of water levels that can be controlled with the watering regime (being 0-0.8 mAHD). At the same time, sedges/rushes have expanded significantly around the wetland's margins.



Above: Landsat imagery



Above: Sentinal-2 imagery

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Introducing Water Technology's New Directors

A restructure of the Water Technology Board is now complete with the addition of two new positions aimed to increase the diversity of the Board. We are pleased to introduce our two new directors to you in the profiles below. Karen and Jo bring skills, experience and industry insights to the Board that will help strengthen and lead Water Technology into the future.

Left to Right: Johanna Theilemann and Karen Boyce.

Johanna Theilemann

Johanna (Jo) joined the Board of Water Technology in July 2023 as the Shareholder Representative, and is the group manager of Water Technology's Floodplains and Catchments Team in Victoria.

Jo has been with Water Technology for over 10 years, working from our Geelong office. Most of her 20-year career has been spent working in floodplain, drainage and river management. She started her career at the Glenelg Hopkins CMA and spent considerable time working on secondment with the City of Greater Geelong and Corangamite CMA, giving her a unique perspective working across both the private and public sectors. She enjoys the challenges associated with complex stormwater and flood management.

Beyond her professional life, Jo is most comfortable at the beach and enjoys swimming and stand-up paddleboarding with her husband and three kids.

An advocate for women in engineering, Jo is resolute in her commitment to foster a supportive and collaborative workforce. Two powerful quotes encapsulate her philosophy: "You can't be what you can't see," and Theodore Roosevelt's timeless words, "It is not the critic who counts..."

She stands by these principles because she knows that sometimes taking the initiative and putting in the hard work can lead to progress. In a world that often questions things, she believes that those who get involved are the ones who bring about change and influence others to do the same. She takes pride in the fact that her work makes a real difference for the clients and communities she supports.

Karen Boyce

Karen Boyce has been appointed as a Non-Executive Director of Water Technology, effective from 1 October 2023.

Karen is based in Perth and has an engineering background specialising in risk management.

Karen's experience includes 25 years in industrial operations working in the areas of sustainability, environment, and risk with large chemical, mining, and energy companies. Karen's work has taken taken her across all states of Australia and New Zealand. She has also spent some time in South East Asia and the Netherlands.

Karen is an experienced Non-Executive Director and Chair, having more than 14 years' experience as a company director and chair of committees and boards. Karen is currently Chair of the South West Catchment Council in WA, and is a Non-Executive Director on a number of Not-For-Profits, including an Indigenous Corporation in Northwest WA.

Outside of her Board roles you will find Karen out in nature. Karen volunteers as a bushwalking guide for the Bibbulmun Track Foundation, taking groups out on overnight hikes to experience nature, particularly the wildflowers of WA. She also swims in pool sprint events and participates in social ocean swims.

A Flood Intelligence Portal

How it can help communities and authorities before, during and after a flood event

In 2018, the Goulburn Broken Catchment Management Authority (CMA) in Victoria identified the need for improved public access to flood information to improve community flood resilience, and worked with Water Technology to develop the Goulburn Broken Community Flood Intelligence Portal (the Portal), covering 12 at-risk communities across the catchment.

The Portal was co-designed with the CMA to provide the public (property owners, developers and other interested stakeholders) with easy access to the latest available fit-for-purpose flood inundation maps and property specific flood risk reports in support of individual flood response, flood risk awareness, flood insurance, development applications, land use planning, building controls and other similar needs.

The Portal was then developed by Water Technology and Hydrologic and first launched in 2019.

The Portal is hosted in the cloud and provided as a Software as a Service (SaaS) subscription.

The Portal connects to flood study grids and VicMap property and address data at source to enable the latest information to be displayed in the Portal.

Reports are generated at the time of request which ensures the latest data is used.

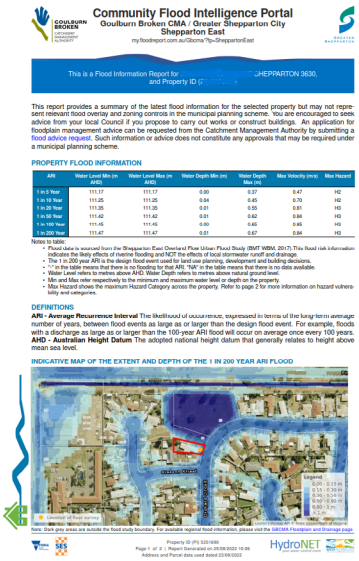
Significant research and innovation was required to enable the implementation of the desired generation of reports.

HydroNET

The Portal enables users to:

- Visualise flood risk at varying scales and for different flood events based on flood AEP (annual exceedance probability), gauge height (where relevant) or historic flood events (where available).
- Download a property report which provides detailed, property specific, flood risk information. This includes whether the dwelling will flood above floor for a given event (where floor level survey data is available) and what levels at the local gauge (if applicable) mean for flood depths at the property.

Analytics capability added in August 2021 shows people have been regularly accessing the Portal for general views and property download reports.


Community Flood Intelligence Portal
Goulburn Broken CMA / Greater Shepparton City
Shepparton East

PROPERTY FLOOD INFORMATION

DEFINITIONS

INDICATIVE MAP OF THE EXTENT AND DEPTH OF THE 1 IN 200 YEAR ARI FLOOD

BENALLA RURAL CITY · GREATER SHEPPARTON · moira SHIRE · MITCHELL SHIRE COUNCIL · Murrindindi Shire Council · Strathbogie shire · GOULBURN BROKEN CATCHMENT MANAGEMENT AUTHORITY

"The flood in Spring 2022 was the first large flood event in the area since the Portal was launched."

Prior to implementation of the Portal, publicly available information across the Goulburn Broken Catchment was limited to flood level contours for the 1 in 100 AEP flood event (presented on pdf maps ranging in scale from 1:10,000 to 1:50,000).

Flood depth information and flood intelligence relating to other AEPs, gauge heights and historic flood events could only be obtained through a flood information request to the CMA.

More general information at a town or regional scale was available through the Local Flood Guide and the Municipal Flood Emergency Plan.

The flood in Spring 2022 was the first large flood event in the area since the Portal was launched.

The community was encouraged to access the Portal during information sessions held by the VIC SES and CMA in the lead up to and during the flood. This led to a noticeable increase in the number of people accessing the Portal.

The benefits of improved access to, and understanding of, flood information was demonstrated during the Spring 2022 floods for these communities.

Insightful research, conversations and investigations into the 2022 floods are underway to understand more about the actions taken leading up to the flood, what occurred during the flood, how the portal faired, and how people are coping with flood recovery.

The findings so far reiterate that raising community awareness and knowledge about flooding and providing easy access to credible information to help make informed decisions is crucial to minimising the impact of floods. Access to real time data in the lead up to and during floods is also essential.

The Portal has recently been improved following the lessons learnt from the 2022 floods. It now has a simpler interface, is faster and is better able to manage the increased traffic during flood events. Lastly, it also provides near real-time river level information.

You can view the portal here:

https://my.floodreport.com.au/gbcma

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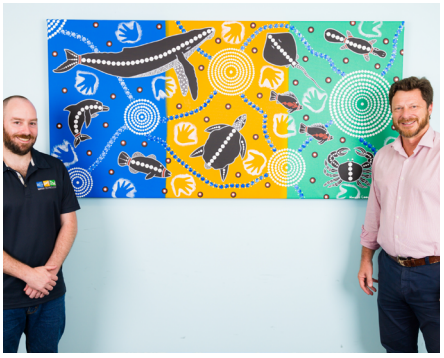
Out & About

What have our Techers been up to?



Neil Dufty, our Social Dimensions National Practice Lead, proudly met with artist Maurice Goolagong to receive a special piece of artwork commissioned by Water Technology. The artwork visualises the important connections we have to water, and the cultural significance of journeys taken by traditional custodians of our land to meeting places, where communities connect with each other around waterways.

The symbolism in the artwork includes:

- Seven circles representing each of the States and Territories in Australia where we do our work
- Blue dots between each circle representing the waterways that connect us
- The animals that rely on healthy waterways for their home
- Black and white dots representing all the different communities that we visit in our work
- Hands that are for the people we help on our journey

The artwork is now in our Sydney office and reprints will soon be in our other office locations as well.

Warwick Bishop, Director and member of the Victorian AWA committee, presented at the AWA Young Water Professional's Regional Study Tour in northern Victoria. He presented on work that was undertaken to enhance water dependent ecosystems along the River Murray. As we cycle back to drier conditions, environmental water will also come to the fore.

Warwick thoroughly enjoyed the opportunity to talk with such an enthusiastic group of young professionals in the water industry.

Ben Tate, Victorian Regional Manager, has been supporting a number of Universities in Melbourne over recent months, with a lot of the universities doing a great job of bringing industry, academia and students together.

Water Technology proudly sponsor two Monash University Civil Engineering awards. Ben was at the event to present to the worthy winners.

Ben also attended the Faculty of Engineering and IT Festival of Collaboration at the University of Melbourne. Ben was matched with a number of researchers to explore opportunities for collaboration.

The Victorian team came together to celebrate NAIDOC week and the end of financial year at the Lume Festival in Melbourne.

The team found the Connection Exhibition to be amazing, with beautiful art brought to life with music, stories and digital technology.

NAIDOC week is an important time as we celebrate and recognise the history, culture and achievements of Aboriginal and Torres Strait Islander peoples.

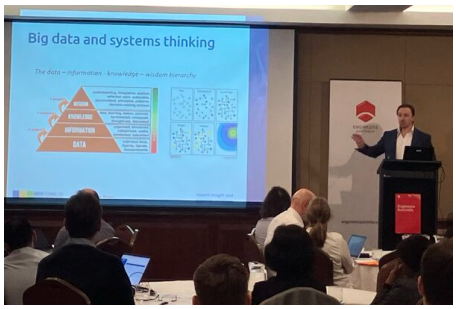
Jamie Kaye, Johanna Slijkerman and Ben Tate, from our Victorian team, were involved in helping to run the annual Wise Water Ways workshops in Beechworth. The workshops have now been running for over 25 years and provide a great hands on learning experience for anyone who is involved with water ways.

A highlight is always the field trips which involved skill sessions on assessing riparian vegetation, undertaking field surveys and macro sampling. Ben Tate presented on Hydrology and Hydraulics, providing great foundational knowledge on floodplains.

Tony McAlister, Director and Regional Queensland Manager, delivered a keynote presentation at the Stormwater Victoria conference in Ballarat. Tony shared insights in how water sensitive developments can become reality, using a case study from Queensland.

The theme of the conference was "Driving Change and Embracing the Challenges" and there were a lot of inspiring discussions around how to drive forward the remaining actions from the Stormwater Management Advisory Committee.

Dr Michael Cheetham, Group Waterways Manager and Principal Scientist in Queensland, and **Tahlia Rossi**, Environmental Planner, have been out and about talking about Nature Based Solutions. There have been a number of events held in Brisbane, working towards gaining a collaborative and cross-functional approach to bring about the changes necessary to transform the land and water environments of Southeast Queensland leading up to and beyond the 2032 Olympic Games.



William Prentice, our National Practice Lead on Resilience and Adaptation, presented at the Engineers Australia Queensland Water Symposium. Will discussed "Transforming Flood Data into Wisdom."

The symposium's theme was "The past. The present. The future."

This opened the program up to many interesting discussions on water resources, water security and coastal management.

Following the monthly Board meeting, which was held in Sydney, members of the Water Technology team came together for an evening of exercise.

The team ran or walked the 5.6km route around Sydney's Centennial Park as part of the JP Morgan Corporate Challenge.

Participating in the event is not only about exercise, fun and spending time with colleagues outside of work, but also raising money for a great cause – the Indigenous Marathon Foundation.

Always striving to be better

At Water Technology we are all about improvement. That's why we value your feedback so much.

We love hearing from our clients through project reviews and client surveys.

A big shout out to all of you who take the time to give us your thoughts.

We are constantly working hard to deliver the best service possible.

Entering the Client Choice Awards 2024

Once again Water Technology have entered into the Client Choice Awards, which are the only awards in Australia and New Zealand where professional services firms are judged solely on feedback received from their clients.

The survey is managed by Beaton Research + Consulting who have run the Client Choice Awards since 2005.

These awards enable firms like ours to collect valuable client feedback to improve our service offering and see how we compare against our peers.

You may soon receive a request to participate in voting for us in the awards and we thank you in advance for taking the time to provide feedback on the service we have provided to you.

Entries will remain open until 14 February 2024.

CLIENTCHOICE Awards 2024

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WA 6160

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Wangaratta
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