Modelling Group Newsletter

The Water New Zealand Modelling Group e-Newsletter

MODELLING SYMPOSIUM 2022

Water New Zealand's Modelling Group held its annual symposium on March 16-17. Due to the uncertainty of the COVID-19 situation, the 2022 symposium was a fully virtual event.

Peter Jackson, chair of the Wellington Tenths Trust, began the event with a mihi to welcome more than 50 attendees.

The first keynote speaker was Dr Judy Lawrence, Climate Change Commissioner. Judy is currently focusing on climate change adaptation as a Senior Research Follow at Te Herenga Waka Victoria University of Wellington. Judy gave a very engaging presentation on the cascading impacts of climate change on infrastructure.

This year Water New Zealand Modelling Group is celebrating its 22nd anniversary. The second keynote was David Ward, who was instrumental to the Modelling Group's integration into Water New Zealand when he was Chair of the Group and a Board Member of Water New Zealand. David shared some of the Group's history and his thoughts on how it needs to shape and move into the future.

There was a virtual site visit to the MetService on the first afternoon of the Symposium. The presenters revealed where the weather forecasting is carried out and some of the processes followed to generate forecasts and warnings.

Day two opened with the Modelling Group AGM before the third keynote speaker, Michael Howden, who is the Data & Insights Manager a Taumata Arowai. Michael shared his thoughts on the data requirements for Taumata Arowai going forward. The final keynote was Rob Blakemore, Wellington Water, who talked about his project of capturing information about water supply sources before the information is lost.

The papers presented at the symposium covered a wide range of topics across three waters modelling, ranging from model calibration and communicating model results to our communities, through to flood forecasting and assessing flood impacts. This year an award was given for the best paper, which was judged by Gillian Blythe, Water New Zealand Chief Executive. The winning paper was *Rainwater Tank Calculator Tool to Optimise Rainwater Tank Size,*

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presented by Wui-Shen Tay from Auckland Council. The presentation was interesting and informative, got people thinking and provoked plenty of questions at the conclusion. *Abstract below*

For many symposium attendees, one of the main appeals of the event is the chance to network with other modelling practitioners. Unfortunately, the virtual format of the symposium and the Covid settings meant that evening drinks were not held this year. However, members are looking forward to having some regional events later in the year, where they can catchup in person.

RAINWATER TANK SIZING TOOL

Wui-Shen Tay & Jahangir Islam – Auckland Council

New Zealand experienced serious drought in the summer of 2019. Auckland was especially hard hit with 77 continuous days of drought in 2020 contributing to the city's driest January-April on record. In May 2020, Auckland's water storage lakes were down to just 42% of full capacity, which prompted resulted in severe water restrictions. The drought has prompted big changes in the way water is used and made domestic rainwater harvesting rainwater tanks more popular.

The use of rainwater tanks for the supply of non-potable (e.g., outdoor activities, toilet, laundry) and potable water (drinking water) in rural and urban areas has substantial benefits to potable mains water savings as it can help enhance the sustainability of urban water use, reducing the abstraction, treatment, and conveyance cost of water. Moreover, the uptake of rainwater tanks for non-potable uses provides resilience to the overall domestic water supply system and could offset new water sources being required. Therefore, there was a need to develop an easily available and consistent calculation tool for people to use to size their rainwater tanks according to their individual needs and acceptable reliance on tank water supply.

An online calculator was developed to determine the optimal sizing of rainwater tanks for various household water usages within the Auckland region. The rainwater tank sizing options are computed by long-term daily water balance analysis using long-term consumptions and rainfall time series data in Auckland. The online calculator enables rapid sizing of optimal rainwater tanks for various water usages, including the percentage reliance on tank water supply and savings on potable water drawn from water mains. This online tool so far has seen a lot of usage by public, especially the residents in Auckland, and positive feedback has been received regarding the ease of use or user friendliness of the tool.

Long-term water balance analysis shows a non-linear relationship between roof area and rainwater tank size and demonstrates that the use of rainwater tanks for the supply of non-potable water in urban areas could provide substantial mains water saving benefits. The tool can also provide better understanding of potential use and sizing of rainwater tanks in the future which will be useful in three-waters modelling. The analysis provides relationships between the potential mains water savings, roof areas, rainwater tank sizes, number of people in household and reliance on tank water supply (%). The tool can be used in other parts of New Zealand to quantify better performance assessment of rainwater tanks for household water usage.

Further investigations will be carried out to assess the effects of spatial variability of rainfall on the optimal sizing of rainwater tanks based on long-term water balance analysis using daily rainfall time series data from various rainfall gauges across the Auckland Region. The tool will also be used to quantify the sensitivity of sizing rainwater tanks based on future long term rainfall time series data in Auckland.

The 2022 Modelling Symposium programme, abstracts and presentations can be found here
https://www.waternz.org.nz/Resources/Article?Action=View&Article_id=2163

MODELLING SYMPOISUM 2023 – SAVE THE DATE!

It's time to start planning and drafting abstracts for the 2023 Symposium! Next year's symposium will be a long-awaited face-to-face event to be held on 15-16 March at the Copthorne Hotel in Wellington.

This symposium is a fantastic opportunity for three waters modellers, engineers and data analysts to meet and keep abreast of the latest developments in this rapidly changing area of water management and design.

This years' theme is Modelling for an uncertain future! Keep an eye on the website and your inbox for further updates.

Do you have a problem or burning question that might benefit from a workshop at the symposium? Send your request to [Katrina Guy](#) by 1st December 2022.

If you need help in getting your abstract across the line, there is a webinar on 8th November where you can ask questions. Click [here](#) to register.

REGIONAL MEETING

The 29th September saw the return of face-to-face events in Auckland, where 60+ Modelling and Stormwater professionals heard Auckland Council's Principal - Hydrometric Analysis, Kris Fordham presenting his Stormwater 2022 Conference paper on [Where is the rain? – The future of Rainfall Data,](#) and 5S YWP Conference Attendance winner from the 2021 Water New Zealand Conference and Expo, Ashleigh Dick, on Young Water Professionals embracing the culture shift in the three waters sector.

[Fiona Macdonald](#), Chair of the Modelling Group, welcomed everyone. Fiona noted how fantastic it was to feel the energy in the room at this joint event with the Stormwater Group. The Modelling Group will be holding other regional events over the next few months – watch this space!

[Clare Feeney](#), Chair of the Stormwater Training & Education sub-group, said she was delighted when Fiona suggested that The Stormwater Training & Education group co-host this event. Our Special Interest Groups have a lot to offer each other and meetings like these help us make a real difference in the water world. Through Water New Zealand we can amplify that.

Modelling & Stormwater Regional Meeting

Elliot Egan and Kris Fordham

Elliot Egan and Ashleigh Dick

Thanks to Hydraulic Analysis for their sponsorship and ongoing support, and in particular to Elliot Egan for his organisation of the event logistics.

COMMITTEE MEMBER PROFILE

Alistair Osborne (Symposium Portfolio Lead)

What organisation do you work for and what is your role?

I work at Wellington Water as a Senior Modeller in the Modelling Team. I mostly work on stormwater modelling projects , generating, and interpreting model results, and collaborating with consultants.

Tell us about your career background and how you got to this position/role?

I started out in geology and discovered I didn't really enjoy that. I then switched to hydrogeology and didn't really enjoy that either and then switched to hydrology. This is what I did enjoy. And then with the GIS skills I had picked up along the way, I got pulled into hydraulic modelling. The first 18 years of my career were spent in various consultancies so when role at Wellington Water came up, I was very keen to see what life was like on the other side of the industry.

What has been your favourite modelling project and why?

I participated in the design and testing (in a model) of a proposed tidal barrage for the Tutong River in Brunei. I relished the process of building a representation of the catchment in a model. While I didn't get to travel to Brunei, I became very familiar with the layout and topography of the catchment via the various sources of data available. It was great to spend roughly 6 months just working on one project fulltime.

What's the hardest job you've ever done and why?

Preparing groundwater extraction resource consent applications. I had to prepare three applications to extract groundwater for some farmers who had already drilled some very expensive bores. I was using modelling that had been created by others and which I had no access to. The local regional council were far better prepared, and the applications were rejected. I felt for the

farmers who had spent a lot of money setting up bores they were not legally allowed to use.

Why modelling?

I love GIS and hydrology, and these are key components of hydraulic modelling, particularly the model building process. I also enjoy problem solving which is useful for debugging models and I am an introvert so am very happy to spend a lot of time by myself singularly focused on a task.

USEFUL LINKS

Modelling Group [Webpage](#)

Modelling Group LinkedIn [page](#)

[Water New Zealand Modelling Symposium 2022 Conference Papers](#)

WATER NEW ZEALAND MODELLING GROUP