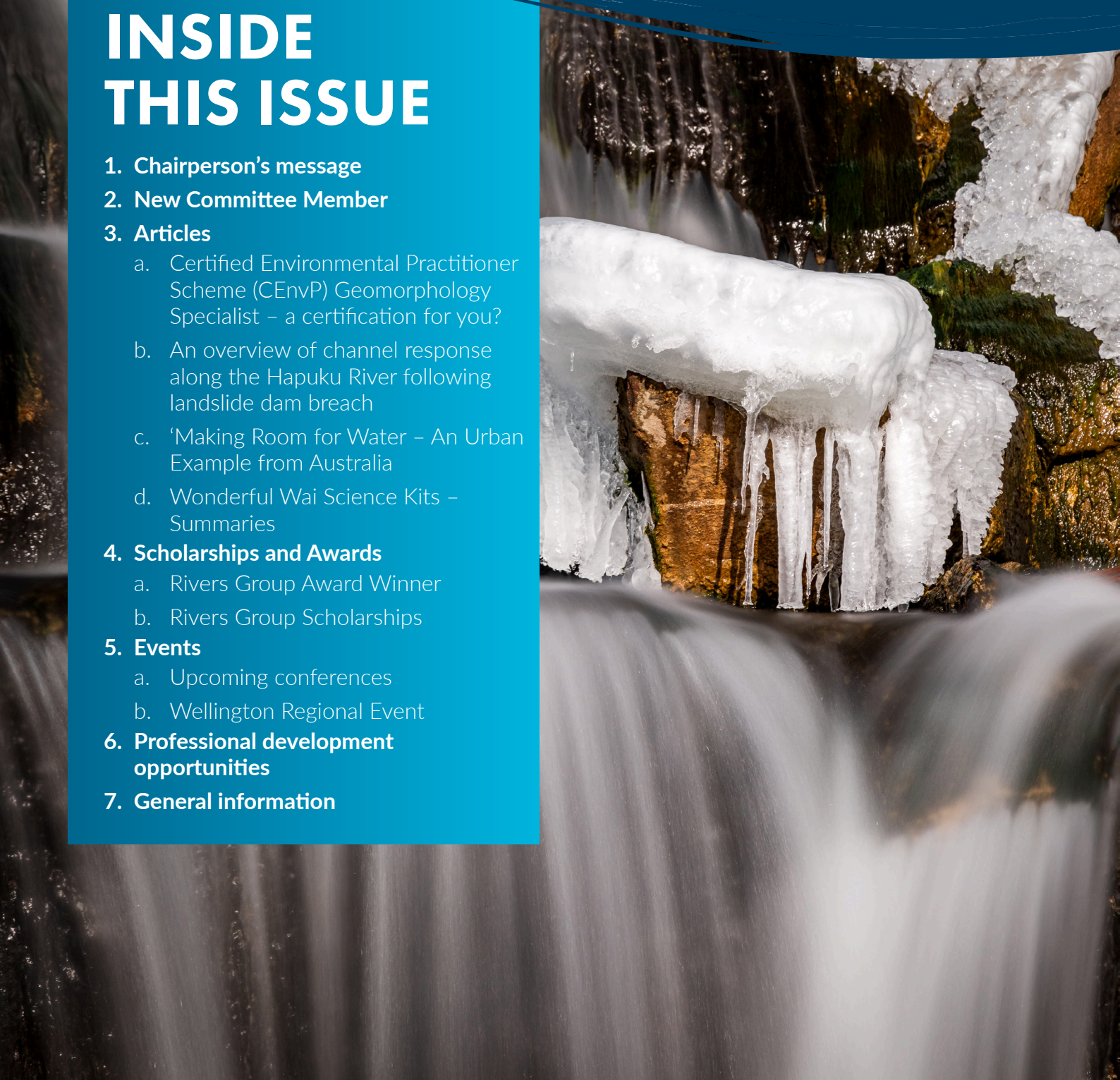
flow

manatiaki kōawa
rivers
GROUP

A joint technical interest group of Engineering New Zealand & Water NZ

INSIDE THIS ISSUE



NEWSLETTER

Issue 43 | June 2024

FROM THE CHAIR

Richard Measures

Kia ora koutou,

Welcome to the June edition of Flow.

Since the last newsletter, we've welcomed Damian Velluppillai onto the committee. Damian has previously helped with organising last year's conference in Nelson, and he will be a valuable addition to the team. Our committee are all volunteers, and the group wouldn't function without them!

In March, I was pleased to represent the Rivers Group at a forum hosted by Engineering New Zealand for their technical groups, branches, and young engineers groups. One highlight for me was connecting with some of the other technical groups, including the Coastal Society, Hydropower Group and Society on Large Dams. The Coastal Society, in particular, has lots in common with our group, dealing with similar issues around flood and erosion protection, environment and climate change. Both groups are linked to Engineering New Zealand but have a wide membership outside of the engineering profession. We discussed similarities and differences between the groups and what we can learn from each other. We also talked about the potential for hosting some joint river/coastal events in the future, so hopefully we can make that happen. Another highlight was the presence of the young engineers. Their enthusiasm was inspiring, and supporting these groups with speakers etc. for their regional events would be a good way to promote their involvement in river related work. Following the forum, I attended the ENZ awards dinner where two Rivers Group members received fellowship status. A well-deserved recognition of their leadership, expertise and contribution. Congratulations to Helen Shaw and Paul Morgan!

In April, the committee made a submission regarding the government's proposed fast-track approvals bill. Radio New Zealand picked up on our concerns around increased development in floodplains for a written article and then interviewed me on the topic. The process was slightly stressful, but hopefully helps our concerns to get traction. I also got the opportunity to present our submission orally to the Environment Select Committee, fingers crossed they will make some improvements to the bill.

I'd like to thank the members who reached out with offers to help organise face-to-face events following the last newsletter. We now have an event organised for Wellington (details in this newsletter) and a few ideas for other events. Email rivers.group@engineeringnz.org if you have an idea for an event.

This year's conference will be on 6–8 November in Napier and should be another excellent event. Please lock the date into your diaries if you haven't already. The programme is still being finalised and there is an excellent lineup of speakers and field visits.

It's a busy time of year for many people, and there is a lot of economic uncertainty around with reductions in central government spending and related flow on effects. In closing, I'd like to encourage everyone to be patient with each other and try not to feel too overwhelmed.

Noho ora mai,

Richard Measures
Chair

NEW COMMITTEE MEMBER

Damian Velluppillai

Damian joined the Rivers Group committee in February 2024, on the back of supporting the conference organising committee with its 2023 conference in Nelson. He has many childhood memories of floating down the various rivers of the Manawatū, particularly the Rangitikei, Oroua and Pohangina Rivers. The Manawatū floods of 2004 were particularly memorable and formative. He has worked as a stormwater and flooding engineer for Tonkin + Taylor for the last 20+ years, most of these in Nelson in the fields of flood modelling, urban stormwater, levee/dams, and communicating flood risk to the public. He especially enjoys the engineering challenge of working in the nexus of people and place – finding ways to help humans and the environment coexist better than we've done in the past. Outside work, Damian spends a lot of time on the side of the hockey turf at his kids' games, and enjoys mountain-biking, tennis and flying small planes.

Certified Environmental Practitioner Scheme (CEnvP) Geomorphology Specialist – a certification for you?

Ian Fuller (Massey University, Tonkin + Taylor)
Selene Conn (Tonkin + Taylor)

Many of you reading FLOW will be certified Engineers, since the Rivers Group is a Technical Group of Engineering New Zealand! But given the breadth of our membership, there's also a strong chance that you're (a) not an engineer and (b) don't have a professional practice certification/accreditation. This article is for you. Even if you are a certified Engineer and find yourself working on projects involving fluvial geomorphology, read on...

Our Regional and District Plans have required that persons undertaking specified activities need to be 'suitably qualified'. Often the determination of suitably qualified is based on having chartership/registration/accreditation, or if the practitioner has a 'number' of practice years under their belt. The onus is then on the Regional/District Councils to make sure the practitioner is 'suitably qualified', and if the practitioner is not on a list of chartered professionals, checking for 'suitably qualified' can be a bit of a minefield and a drain on time and resources.

The Victoria Government Department of Energy, Environment and Climate Action (DEECA) now require that any waterway project tenders likely to need fluvial geomorphological expertise funded by DEECA Waterway Programs funds (either commissioned directly by DEECA or by catchment management authorities [CMAs]) will give preference to tenderers with CEnvP Geomorphologist specialists. This will demonstrate to CMAs and DEECA that the projects are being undertaken by practitioners suitably qualified in fluvial geomorphology.

This is in line with international trends, where often river type projects require a 'suitably qualified geomorphologist' to sign off on projects, often alongside a chartered engineer. Geosciences are regulated in Canada, with a professional body overseeing accreditation of Geoscience specialists, and it is required by law to be certified.

So how does being a CEnvP Geomorphology Specialist demonstrate your proficiency as a practicing fluvial geomorphologist?
The CEnvP Scheme is the leading certifying body for environmental and social practitioners in Australia and Aotearoa New Zealand. The Scheme was established in 2004 under the Environmental Institute of New Zealand and Australia (EIANZ) By-Law 16 and is open to all persons who meet the criteria of verified experience, ethical conduct, and competence. The CEnvP certification process has two levels: 'General Practitioner' to demonstrate experience, training and ethical conduct of practitioners in the Environment industry, and specialist certifications demonstrating competency in a given field. Both levels of certification require certain criteria to be met, and rigorous interviews with a peer-based panel to confirm practical conduct and competency. Because of this rigorous process, CEnvP certification provides organisations and regulatory authorities' assurance that a practitioner is 'suitably qualified' in their field of expertise, in accordance with ISO 17024 Conformity assessment – General requirements for bodies operating certification of persons.

For the purposes of certification, geomorphology is defined as the study of landforms and landscapes and the physical processes that create and shape them at or near the Earth's surface. For us, this means working with the fundamentals of rivers: how they work, function, respond, react, behave, evolve – in space and time. Many of you will be doing work that requires these fundamental processes to be taken into account and understood, often using a combination of field observations, physical experiments, and modelling. A comprehensive grasp of these river landscape dynamics, encompassing tasks like pinpointing the origins of sediment pollution in water bodies, prioritising remedial actions, managing erosion and flooding,

and facilitating disaster recovery, is becoming a highly valued proficiency sought after in our sector by a range of agencies including governmental bodies, Planning Agencies, Regional Councils, landowners, and the construction sector. Responding to the growing demand from industry and professionals alike, the Certified Environmental Practitioner (CEnvP) Geomorphology Specialist certification offers recognition to geomorphologists in both Australia and Aotearoa New Zealand.

The CEnvP Scheme's Geomorphology Specialist certification is the only standalone geomorphology certification in Australia and New Zealand and is designed to promote and embed sound practice by recognising ethical and professionally competent practitioners in the field. It is now required to practice in parts of Australia.

Why should you become a CEnvP Geomorphology Specialist?
Although agencies in Aotearoa New Zealand have yet to take the same steps as the Victorian and Canadian governments, the certification nevertheless serves as a cornerstone in establishing and elevating the professional benchmarks for geomorphologists engaged in various industry sectors, fostering their ongoing professional growth. The specialised certification in geomorphology fills a crucial gap where there is currently no standard professional certification (unlike Engineering). It assures stakeholders in the industry that practicing geomorphologists (just as much as Engineers) possess the requisite expertise and ethical integrity to conduct their work proficiently, as their qualifications and competencies undergo thorough peer review within the industry.

Embracing the status of a CEnvP Geomorphology Specialist offers numerous advantages:

- Enhancing your professional stature and bolstering your credibility within the industry.
- Instilling confidence among clients, industry partners, and the broader community in your ability to conduct geomorphic assessments and tasks competently.
- Attaining a certification status on par with those established in other disciplines where certification is already a norm.
- Accessing avenues for ongoing professional growth and acknowledgment as a practicing geomorphologist.
- Engaging with a community of fellow geomorphologists in the industry dedicated to advancing professional standards and environmental risk management practices.
- Contributing to a collective ethos that upholds ethical principles benefiting the environment.
- Elevating the recognition and impact of geomorphology as a respected professional field.

Want to know more?
If you're intrigued by the prospect of becoming a CEnvP Geomorphology Specialist and want to delve deeper into eligibility criteria and the application process, please explore the CEnvP Scheme website, Geomorphology Guidance Notes, noting that for some of you just starting your careers, this will be something to work towards, while others will be ready to go!

You can find comprehensive profiles of current Geomorphology Specialists and other CEnvPs, along with their contact information on the CEnvPs directory.

For additional guidance or inquiries, you can reach out to the CEnvP Program Office at info@cenvp.org

Ian Fuller & Selene Conn
Selene led the way and became the first accredited CEnvP Geomorphology Specialist in Australia and New Zealand when the certification was ratified by the CEnvP Scheme in late 2020. Selene and Ian are members of the Geomorphology Specialist Environmental Advisory Committee (GEO-SEAC).

An overview of channel response along the Hapuku River following landslide dam breach

Niraj Bal Tamang
University of Auckland; WSP New Zealand

The 2016 Mw 7.8 Kaikōura earthquake caused widespread generation of sediment sources in the form of co-seismic landslides and landslide dams.The triggering of nearly 30,000 co-seismic landslides (Massey et al., 2020) led to overloading of many steepland streams, including 30 ± 6 Mm^3 and 13 ± 3 Mm^3 of co-seismic debris generated in the Hapuku and Kowhai catchments, respectively (Jones et al., 2023). The Hāpuku catchment was among the directly affected river systems and was notably impacted by one of the biggest mapped landslides in the event which impounded Hapuku Lake (Figure 1). The landslide supplied ~6.6 Mm^3 of sediment directly to the river, forming an 80 m high dam, and impounding a lake (~6500m^2) ~9 km upstream from State Highway 1 (Wolter et al., 2022). Here, I present an overview of the Hapuku channel response to the sediment overloading from the earthquake event over the course of ~5 years (2016 to 2021). We had the exceptional benefit of thirteen airborne LiDAR surveys over this post-earthquake timeframe, which allowed us to study the dynamics of river adjustment to major disturbance over time in detail. The results of the work are detailed in upcoming works from Tunnicliffe et al. (in press) and Tamang et al. (under review).

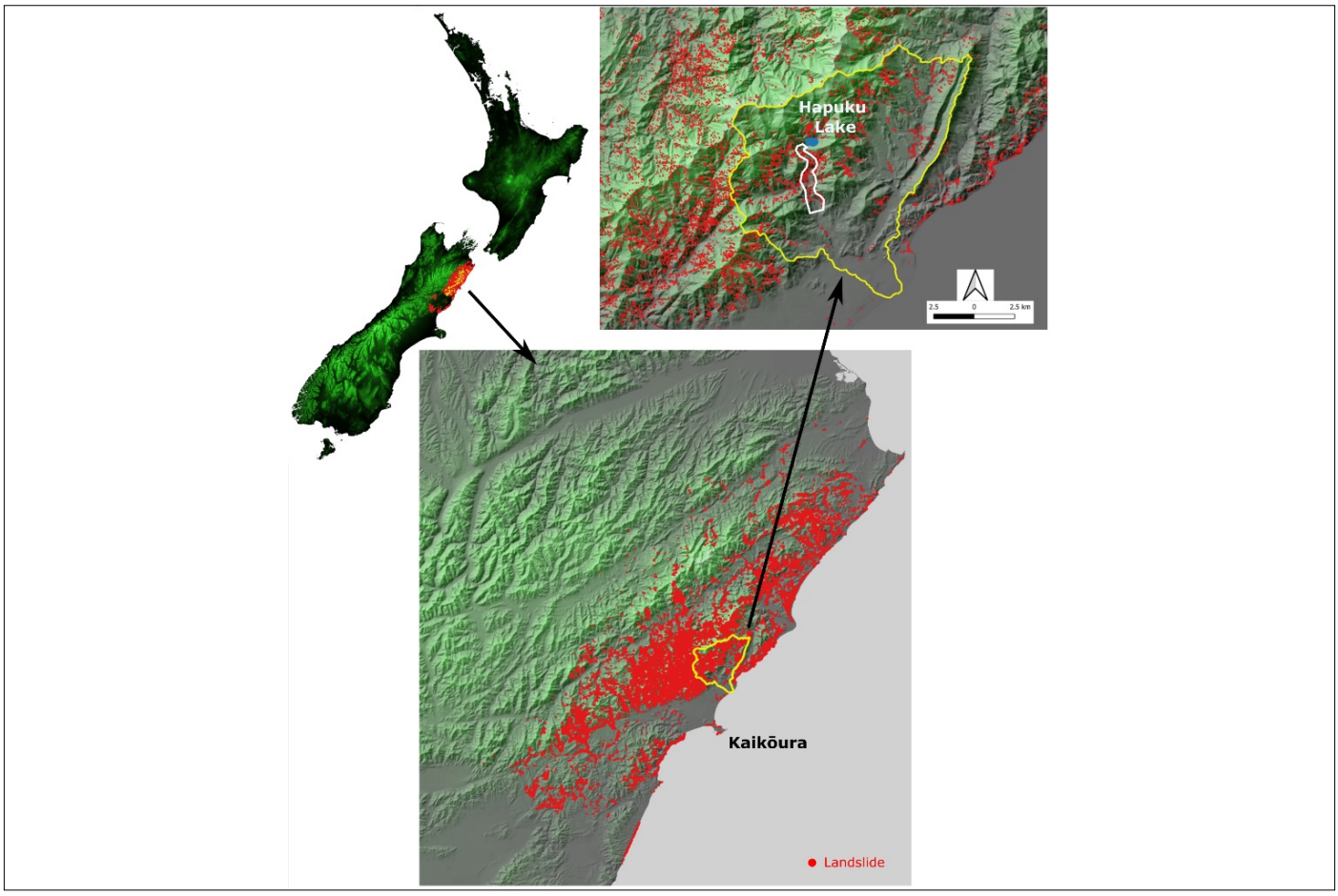


Figure 1: Landslide distribution of the mainly affected area by the 2016 Mw 7.8 Kaikōura earthquake (Prepared from the landslide database of GNS Science). The white polygon in the zoomed catchment map indicates the study channel section.

General Response

Two major evacuations of Hapuku Lake occurred within the first two years of the dam formation, including the initial dam breach and one major storm event. Multiple episodes of sediment aggradation occurred along the Hapuku River channel from the sediment pulses released from the dam and adjacent tributaries, along with the reworking of the deposited materials during channel adjustments. The debris train (Tunnicliffe et al., in press) in the upper valley reached a thickness of 30m. The sequence of sediment transfers began with an initial build up stage in the first 2.5 years, when the upper channel section experienced major deposition (Figure 2, first four panels). The major depositional processes slowed as sediment supply waned, and incision became the dominant and persistent process in 2019. Change in the upper channel subsequently attenuated with comparatively little erosion or deposition in 2020 followed by net erosion associated with a large flood in June 2021.

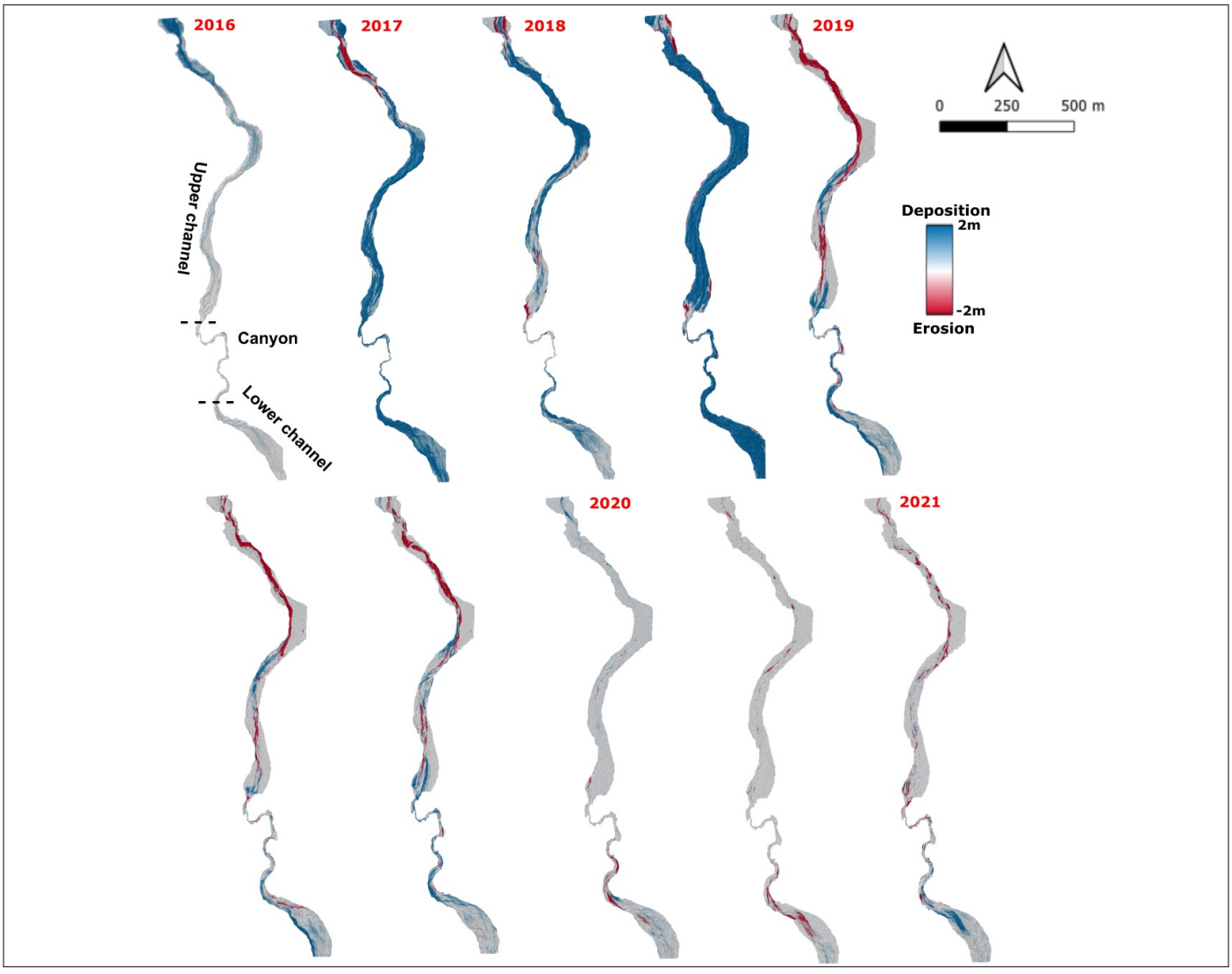


Figure 2: DEMs of Difference (DoDs) of 1m LiDAR DEMs between 2016 and 2021 showing the sediment transfer pattern from the tail of the landslide dam to ~6 km downstream. The channel section under study was divided into upper channel, canyon and lower channel.

Upper channel response

The channel section above the canyon experienced major deposition, with tens of meters of deposition. Deposit materials ranged from boulders of several meters (closer to the dam) to fine sand with dominant gravels. The incision of the debris train between the landslide dam and the canyon offers a rare opportunity in mountain river sedimentology. By examining the longitudinal cross-section of the deposit (Figures 3 & 4), we can observe the sedimentary texture from the initial surge of unsorted debris in the lower layers to the upper, fine sheets of pebbly sands resulting from subsequent fluvial processes. The repeat LiDAR surveys reveal captivating insights into how the river dynamically adjusts its morphology in response to significant changes in sediment supply upstream.

Figure 3: Terraces along the upper channel section formed from incision and channel widening on the deposits from the landslide dam breach. The massive (~7.5m) exposure showing multiple layers of sediments deposited during different flow environments.

Figure 4: Exposed bedrocks from rapid sediment reworking within the canyon. The stepped terraces present at the end of the canyon.

Canyon and lower channel

The steep and narrow terrain of the Hapuku's canyon section (Figure 4, left) passes sediment directly through without deposition. Upon entering the unconfined valley section of the lower channel, a confined fan has formed. Over the observation time, the river has carved stepped terraces as it incises into the fan (as shown in Figure 4, right). The deposits in this area are finer and better sorted, highlighting how the mixture of grain sizes changes as the landslide disturbance moves downstream. In contrast to the terrace deposits, deposition of reworked sediments (Figure 5) from upstream during subsequent flood events can be observed along the downstream section (~2km from canyon) of the Hapuku River.

Figure 5: Gravel deposits in the lower valley of the Hapuku River where the impact is mainly from the succeeding streamflow flood events. Floodplain vegetation downstream of the canyon has been buried by sheets of gravel.

Sediment distribution and potential implications

Surprisingly, approximately 80% of the mobilized material remains within the upper valley. This observation prompts several intriguing and significant questions regarding the lingering risk posed by this resident landslide debris. While many mountain valleys naturally accumulate such landslide materials over long periods, does this predispose the system to higher sediment yield during major storms? Our ongoing modelling efforts aim to precisely address this question. More descriptive work on the nature of the deposits and the pace of change can be found in the papers of Tunnicliffe et al (in press) and Tamang et al (under review).

Acknowledgements: This work is a part of the EILD funded PhD project of the author under the supervision of Jon Tunnicliffe and Gary Brierley, School of Environment, University of Auckland. I am grateful to Clare Wilkinson (NIWA), Dina Fieman and Jamie Howarth (Victoria University) and Charline Dalinghaus (UoA) for support in field. I am grateful to WSP NZ for supporting me in writing this article.

References

EILD – Earthquake-induced Landscape Dynamics - GNS Science | Te Pū Ao

Jones, Katie E. and Howarth, Jamie and Massey, Chris and Sirguey, Pascal and Luković, Biljana, *Turning Connectivity on its Head: Using a Difference Model to Identify Where Co-Seismic Landslide Debris Originates and Where it Resides after a Major Earthquake- an Example from the Mw 7.8 2016 Kaikōura Earthquake, New Zealand.* Available at SSRN: ssrn.com/abstract=4509884 or dx.doi.org/10.2139/ssrn.4509884

Massey, C. I., D. T. Townsend, B. Lukovic, R. Morgenstern, K. Jones, B. Rosser, and S. de Vilder. *"Landslides triggered by the MW 7.8 14 November 2016 Kaikōura earthquake: an update."Landslide" 17 (2020): 2401-2408.*

Tamang, N.B., Tunnicliffe, J., Brierley, G.J., (under review). *Sedimentology and mass balance analysis of a co-seismic landslide dam-break sequence.*

Tunnicliffe, J., Howarth, J., & Massey, C. (in press). *Controls on fluvial sediment evacuation following an earthquake-triggered landslide: Observation from LiDAR timeseries. Science Advances.*

Wolter A, Gasston C, Morgenstern R, Farr J, Rosser B, Massey C, Townsend D and Tunnicliffe J (2022) *The Hapuku Rock Avalanche: Breaching and evolution of the landslide dam and outflow channel revealed using high spatiotemporal resolution datasets. Front. Earth Sci. 10:938068. doi: 10.3389/feart.2022.938068*

‘Making Room For Water’ – An Urban Example from Australia

Nicole Wheeler (Australia and New Zealand Geomorphology Group (ANZGG) Executive and, formerly, Hydrobiology QLD Pty Ltd)
Ben Pearson (Hydrobiology QLD Pty Ltd, River Basin Management Society Australia (RBMS), Vice President)

Introduction

Brisbane is known internationally for its thriving and connected greenspaces and waterways. The Kedron Brook (Figure 1) is an urban waterway example that is one of the most used by the community, where urbanisation of the catchment has resulted in a number of modifications, including waterway and floodplain confinement, velocity increases, erosion, impacts to infrastructure, poor water quality and reduced riparian habitat.

The waterway is now confined by infrastructure with the primary function of flood conveyance, leaving little room for the waterway to move. Through erosion of the channel across sandy soils, the waterway is now responding to impacts and reactivating its floodplain. In recent 2022 State-wide flooding, flooding and erosion occured within the catchment that severely impacted infrastructure, resulting in increased focus on the management of the catchment from government and stakeholders.

Hydrobiology undertook a geomorphic assessment of the catchment that used desktop and field assessments to understand current waterway condition, the stages of waterway evolution and trajectory towards equilibrium throughout the catchment. This was used to identify higher risk reaches and to provide short to long term strategic planning to ‘make room for water’ to provide greater sustainability and climate resilience in the future.

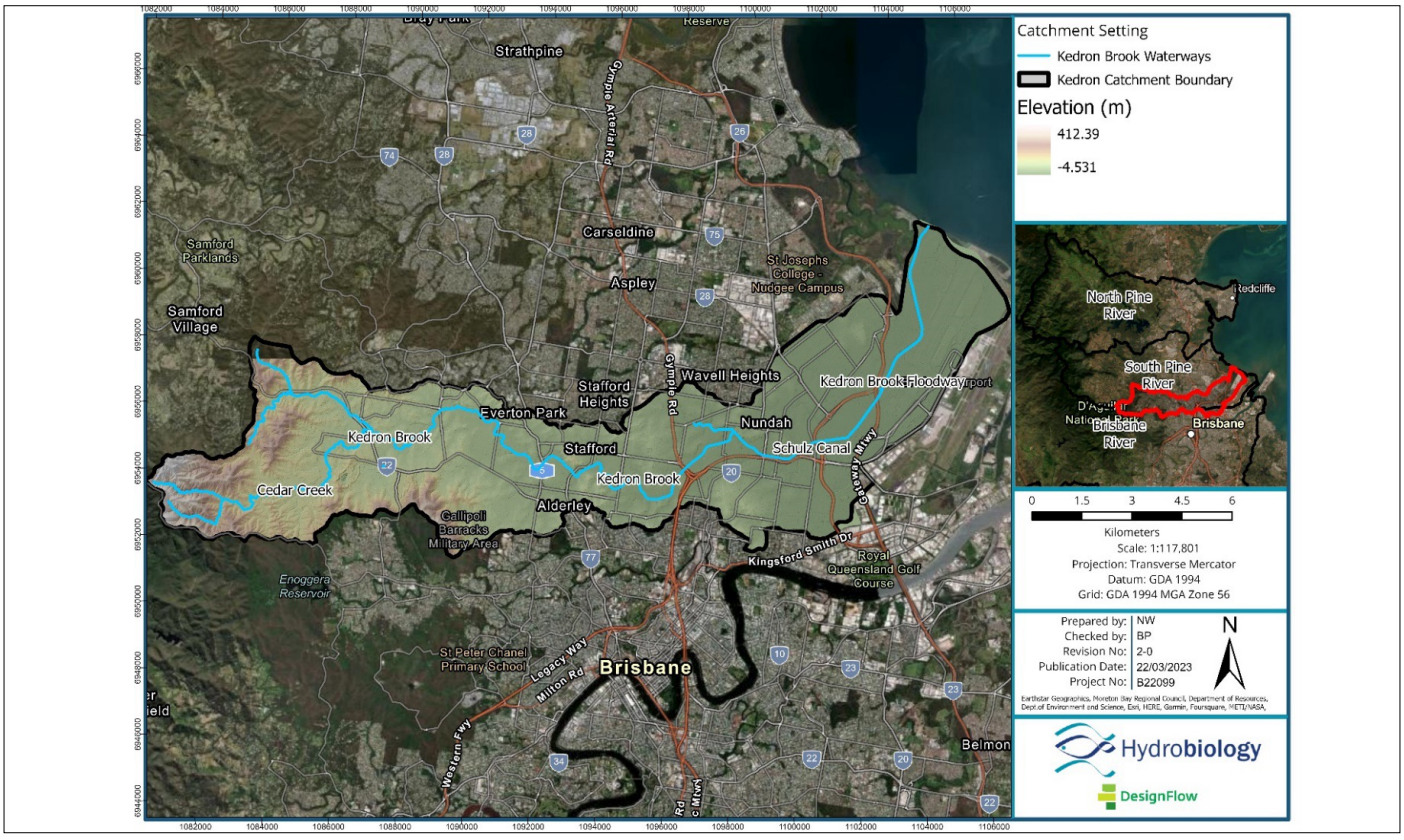


Figure 1: Location of the Kedron Brook Catchment and suburbs with Brisbane, Australia.

Approach

The approach included a number of field and desktop tasks, including:

Field Tasks:

- Reach Characterization – Stage 1 River Styles Framework.
- Geomorphic Condition Proforma – Stage 2 River Styles Framework.
- Geomorphic Evolution Stages Assessment.
- Mapping of erosion/active geomorphic processes/bank stability issues.
- Mapping of Infrastructure issues.

Desktop Tasks:

- Literature Review of previous studies.
- Mapping of geomorphic condition.
- Mapping of geomorphic evolution stages.
- Geomorphic Change Detection – LiDAR Differencing.
- Mapping of 'geomorphic hotspots'.
- Flood Mapping – velocity, bed shear stress, inundation.
- Erosion Severity Mapping.
- Priority Zone Mapping.

Results

Reach types

The reaches were broken up into 10 distinct morphological reaches, based on the River Styles Framework. At a higher level, these included:

- 'Natural' more intact reaches (Reaches 1 and 2).
- Dynamic reaches undergoing geomorphic adjustment (Reaches 3–7).
- The managed Floodway reaches (Reaches 8 and 9).
- The Estuary Reaches (Reach 10).

Geomorphic condition and channel evolution

Geomorphic condition ranking is shown in Figure 2. Overall, reaches in the upper catchment that are still relatively undisturbed by land use change were ranked between Good and Good-Moderate geomorphic condition. Moving downstream, geomorphic condition decreased as reaches became more impacted and disturbed, resulting in channel degradation, erosion, loss of habitat and riparian cover. Reaches 8 and 9 that form the constructed floodway were ranked as Moderate-Poor condition due the decrease in geomorphic habitat and vegetation cover.

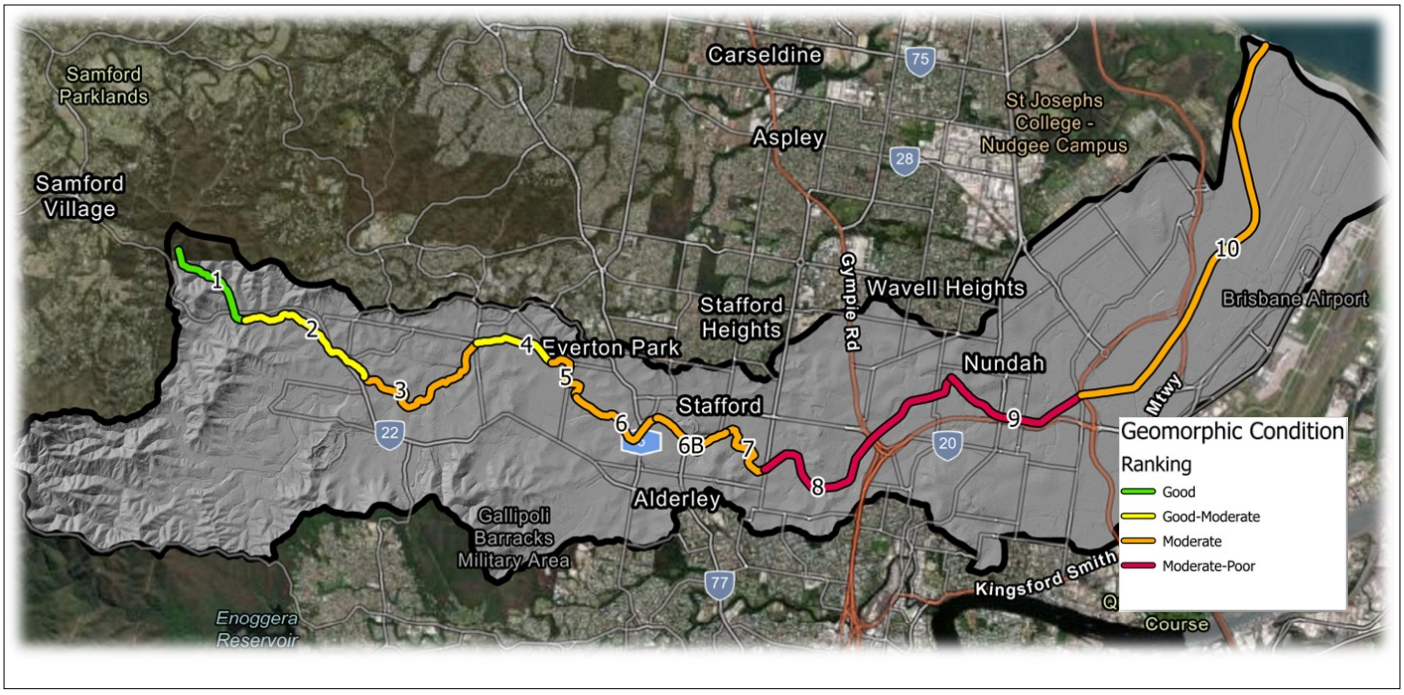


Figure 2: Geomorphic condition ranking of the different River Style Reaches.

Geomorphic condition of the reaches and geomorphic issues are strongly related to the stages of channel evolution across the waterway (Figure 3), as the system has responded to land use change, urbanisation and increases in runoff. The upper catchment was identified as being in the Stage 1 (pre-modified), whereas reaches downstream move through a number of stages as the system responds in a downstream pattern to disturbance. These stages include degradation, widening, aggradation, and quasi-equilibrium in the lower reaches. Such stages then relate to many of the issues seen throughout the waterway, particularly in the middle reaches where a widening phase is resulting in bank erosion issues.

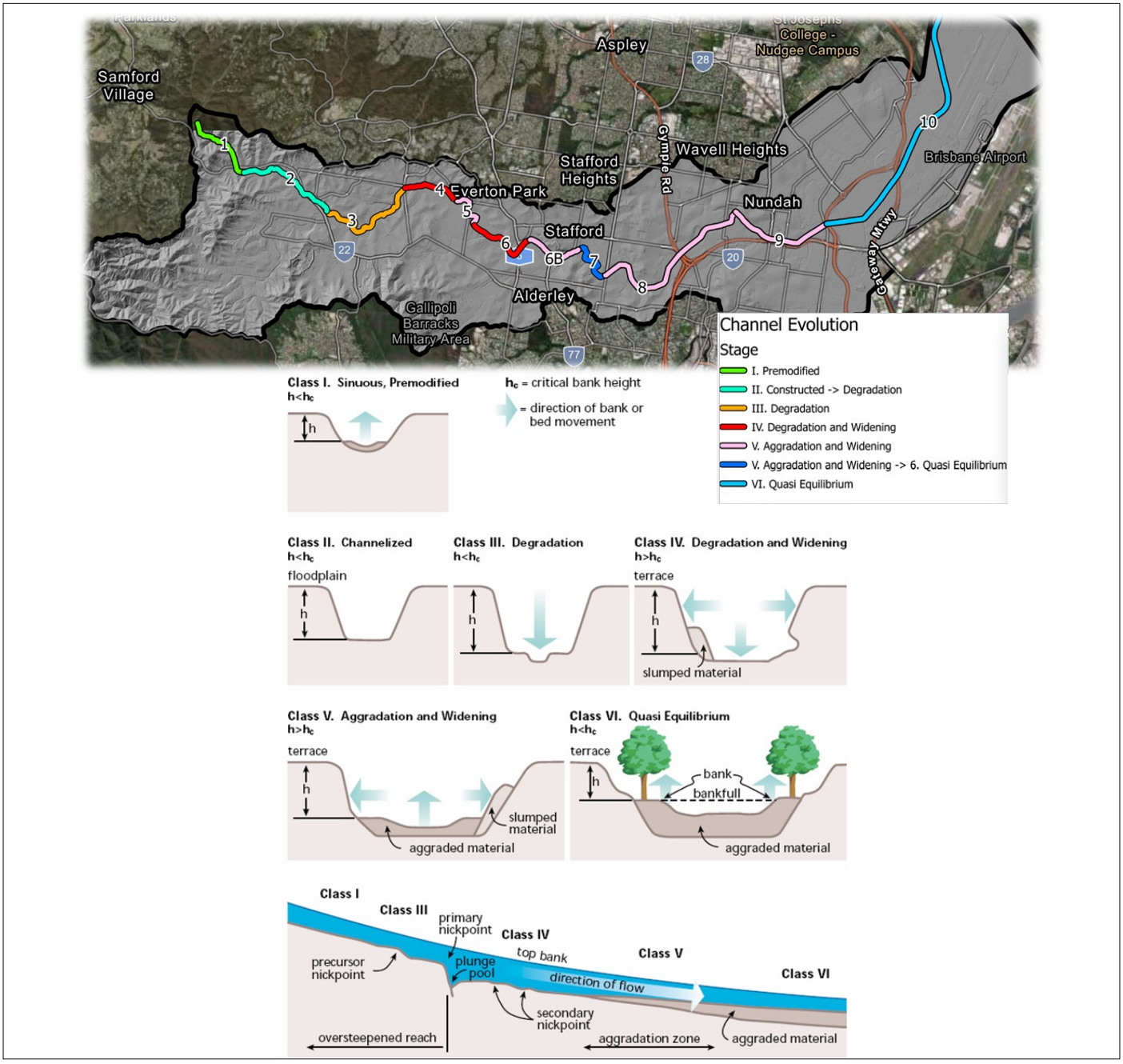


Figure 3: Stages of Channel Evolution (Schumm et al. 1984 and Simon 1989, 1995) for each of the different River Style Reaches. Source: Simon, 1989; 1995.

GCD / Flooding

The results for the LiDAR comparison and flood analysis for the Upper, Middle and Lower reaches showed that hotspots of erosion were particularly evident in the middle reaches, with aggradation becoming more common in the middle to lower reaches. The lower reaches were dominated by aggradation on floodplain surfaces, with isolated erosion focussed on bends resulting in localized bank failures and widening.

The flood analysis showed high velocities, particularly through the middle reaches and straightened middle to lower reaches of the floodway, where flows were concentrated. There was also significant areas of inundation of residential and industrial areas on floodplain close to the channel.

Issues and risk summary

A risk ranking was developed from combining the results above and is presented in Figure 4 which outlines priority reaches for potential management solutions. In summary, the main issues identified in the catchment and future potential risks identified were summarized as follows:

- Upper middle and middle reaches (Reaches 3 to 7) are attempting to widen (degradation/aggradation).
- The lower (fresh) reaches (Reach 8) within the flood mitigation channels are managed but under stress, with several locations observed where widening is occurring despite stabilisation efforts.
- The upper tidal zone (Reach 9) is well vegetated on the local channel banks and less prone to erosion currently but has been stabilized previously and is at risk of future erosion.
- Lower (tidal) reaches are experiencing erosion in certain locations, with this likely to increase with sea level rise.

The main outcomes of this were:

- Climate change will exacerbate changes, particularly due to the prediction of more extreme events and the implication of predicted raised sea levels in the intertidal zone and the freshwater reaches immediately upstream of the current tidal limit.
- Public, private property and infrastructure at risk from channel changes that are likely to result in altered flow/flood dynamics.
- Reactive repair is expensive and only provides a short-term solution.

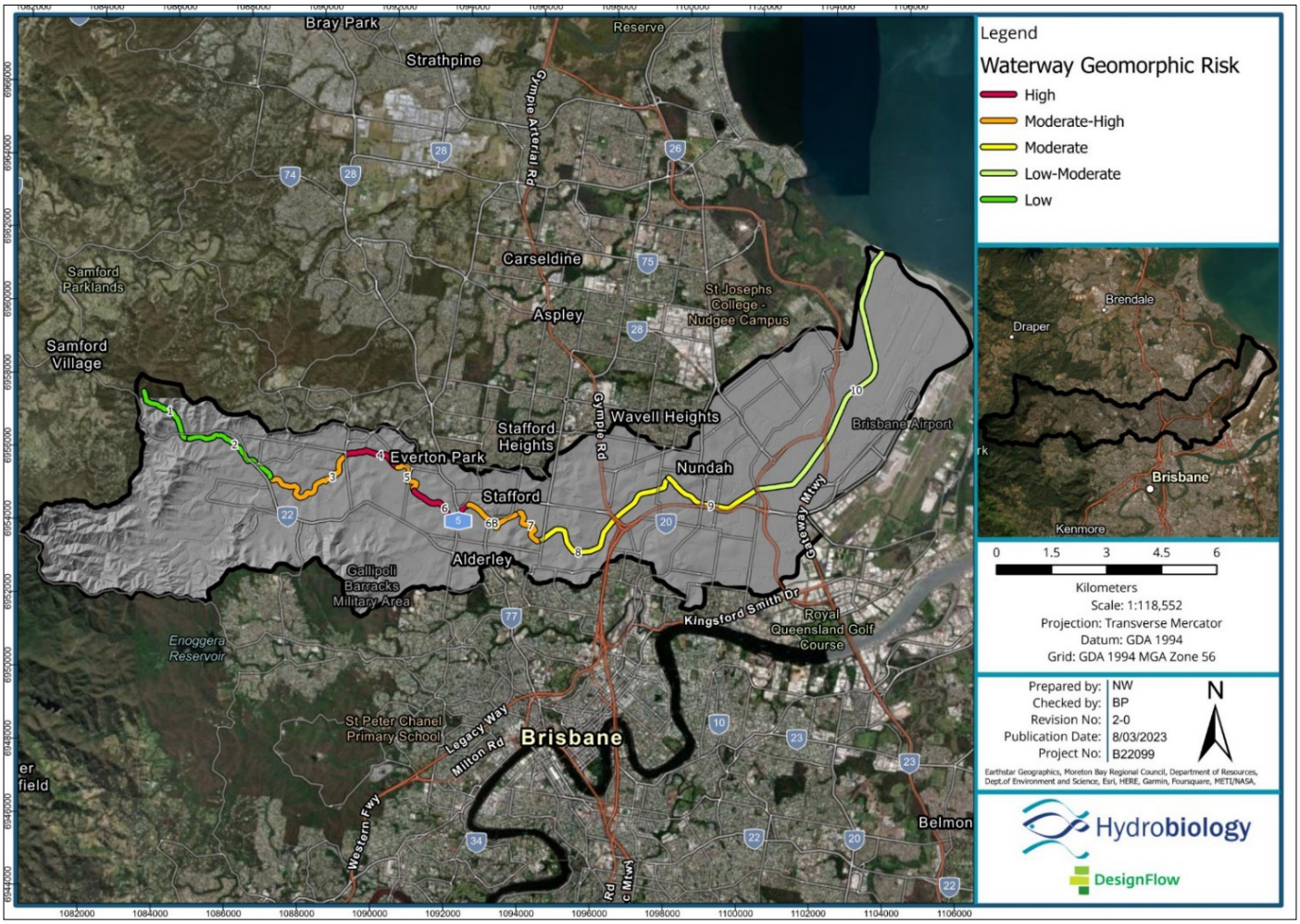


Figure 4: Geomorphic Risk Ranking of the different reaches.

Room for water strategy – potential solutions

The Room for the River concept was first established in the Netherlands with the primary objectives of improving flooding outcomes, channel stability, and habitat. The concept has been increasingly adopted worldwide and, as a result, there is increasing evidence of its success in improving geomorphic outcomes in rivers, particularly in urban environments. Two broad approaches that have been used internationally that could be investigated in Kedron Brook and other South East Queensland catchments include:

1. Dynamic waterway solutions (eg middle reaches)

Potential solutions to dynamic sections of waterway with regard to geomorphic condition, is to allow for (and plan for) the waterway to move. This may include:

- Loss of public and private land being unavoidable in the long term.
- Allow waterway to move and minimize expensive rock stabilization (unlikely to work in long term).
- Rock stabilisation in the short term to protect infrastructure (but plan for further widening).
- Where permissible, lay back eroded sections and revegetate.
- Managed retreat/buy-back for high-risk properties which can add value to strategy.

- Strictly control development and works in waterway corridor.
- Upgrade of pedestrian pathways and bridges (span bridges).
- Upgrade sporting precincts and parks (avoid potential waterway extent ultimately).
- Upgrade services.

2. Managed waterway solutions (eg lower reaches – floodway and estuary)
Potential solutions to managed waterways is to preserve floodway function while improving waterway condition within the channel. This may include:

- Limiting loss of private land (and public land where possible).
- Hold the edges of the waterway (to protect urban areas) i.e., maintain floodway function.
- Allow waterway to move within corridor to reestablish some of the waterway condition (greater geomorphic diversity leads to greater habitat).
- Rectify to the eroded new profile rather than trying to reestablish old profile when widening occurs.
- Upgrade of pedestrian pathways and bike paths – outside of floodway = greater resilience.
- Upgrade bridges – spanning bridges = greater resilience.
- Buy-back scheme for high-risk properties in select locations.

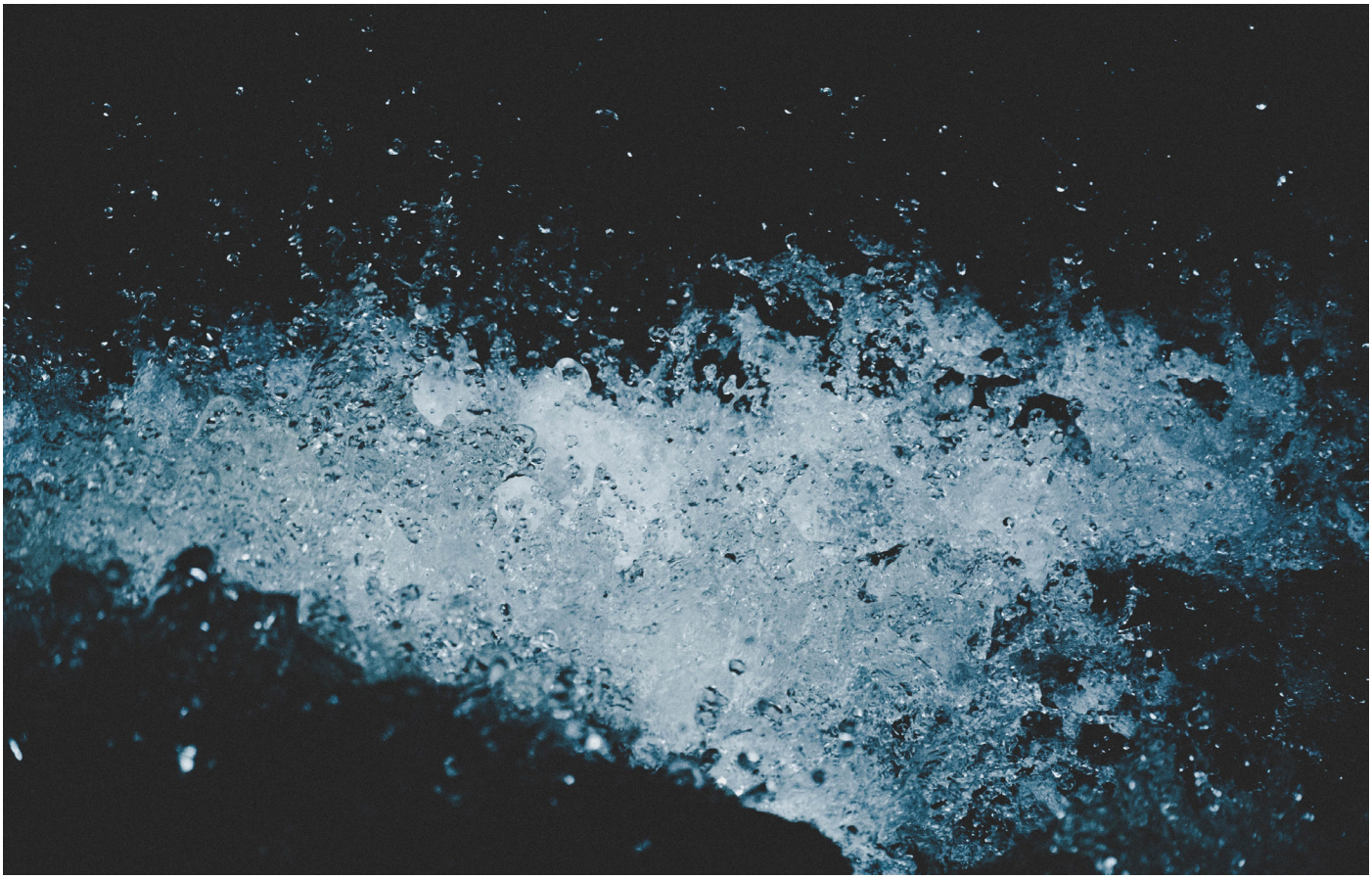
Key take home messages

The main key messages to come from this work included:

- Geomorphology is critical to understanding how our systems are adjusting to urbanization legacy effects.
- Understanding geomorphic and flood risks will be critical when predicting impacts to climate change in the future.
- Geomorphic lines, not just flood lines, should be including on our waterway maps – critical to development planning & managed retreat options.
- Locking a waterway in place is no longer sustainable.

Making room for water and geomorphology is more likely to lead to greater resilience and better cost benefits by living and working with nature, rather than against and very much should be considered in the future to manage riverine geomorphic and flood risks in urban environments.

WONDERFUL WAI SCIENCE KITS – SUMMARIES



Along with Water NZ and Te Uru Kahika, the Rivers Group co-sponsored 16 'Wonderful Wai' House of Science | Te Whare Pūtaiao learning resource kits for young students across Aotearoa late last year. The learning kits have reached almost 6,000 students so far! We were pleased to receive some wonderful feedback and wanted to share that feedback with the wider membership to reflect the Group's contribution. Some of the funds for this effort came off the back of our very successful conferences over the last couple of years – we are grateful to the membership for supporting the Group and are thrilled to be in a position to give back to the community in this way. Here's to growing the next generation of water scientists, engineers, and enthusiasts!

Check out the feedback for yourselves via these summary pages from House of Science | Te Whare Pūtaiao.

HOUSE OF SCIENCE
TE WHARE PŪTAIAO

'Wonderful Wai' kit sponsorship

Report for the period
1 Sept 2023 to 31 March 2024

- 16 kits sponsored
- Booked 80 times
- Used by 240 teachers and 5,840 students

water NEW ZEALAND
The New Zealand Water & Wastes Association Waiora Aotearoa

manatiaki kōawa
rivers GROUP
A joint technical interest group of Engineering New Zealand & Water NZ

Te Uru Kahika
Regional and Unitary Councils Aotearoa

Background

All 16 copies of the kit were in branches by the beginning of September. Many branches had the kit booked out every fortnight and there are already 44 bookings for this year, two branches have bookings until November.

Wonderful Wai teacher feedback

"It was so user friendly and easy to unpack and use straight away. Saved me lots of time:) My students absolutely enjoyed learning about the water cycle and learning about solids, liquids and gas. I feel confident they have developed a better understanding of the water cycle and solids, liquid and gas. I have lots of photos as good evidence. Thank you so much"
Pukepoto School, Far North.

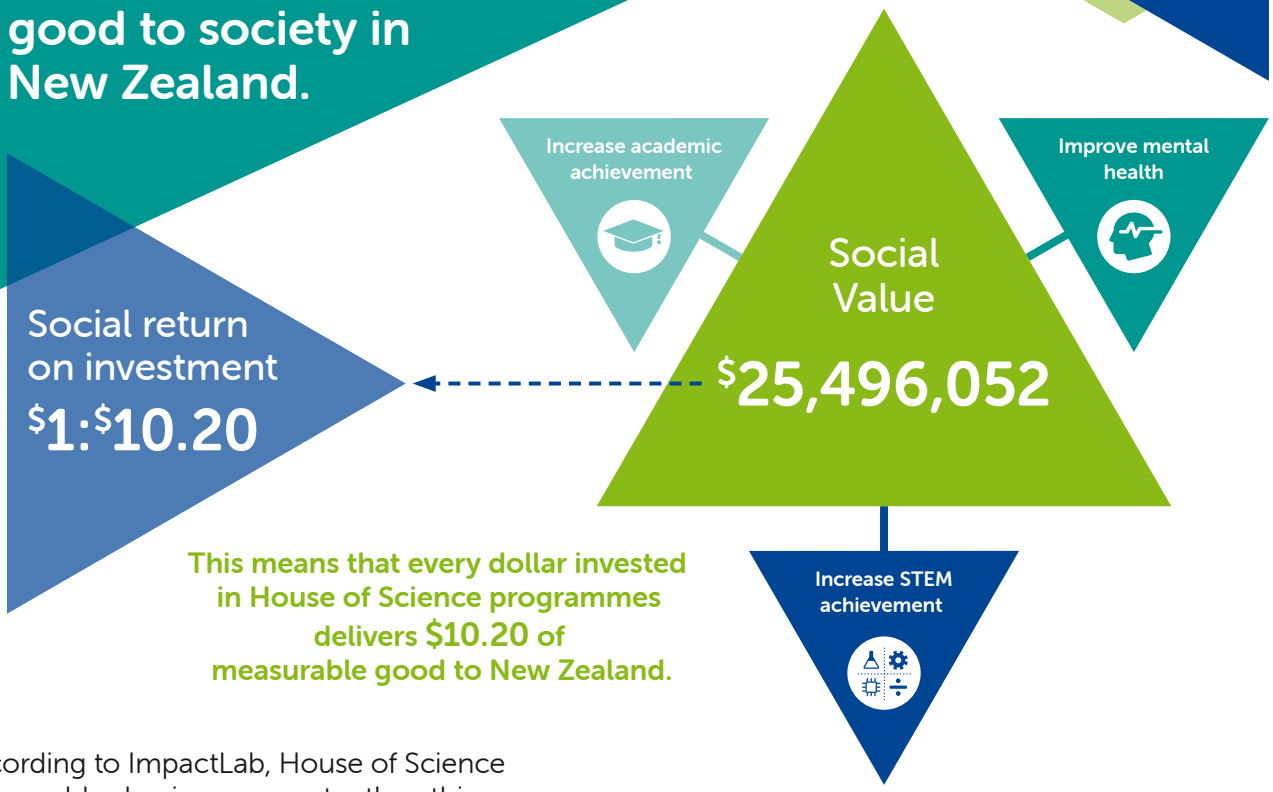
"This was a great kit, I noticed that while doing the water cycle activity it is also a great demo start on of the albedo effect"
Paeroa Homeschool Collective, North Waikato.

"Awesome kits and ideas! So helpful to have everything we need and great guidance information around how to complete the activities and the learning alongside it. We can't wait to use the next one."
Horowhenua.

"I loved the kit. It was so user-friendly and very hands-on with students. I only did the water balloon frozen ice activity. We got a lot of language from the experiment and the impact was immediate with students."
Whanganui.

ImpactLab GoodMeasure results summary

Every year, House of Science Te Whare Pūtaiao delivers $25,496,052 of measurable good to society in New Zealand.



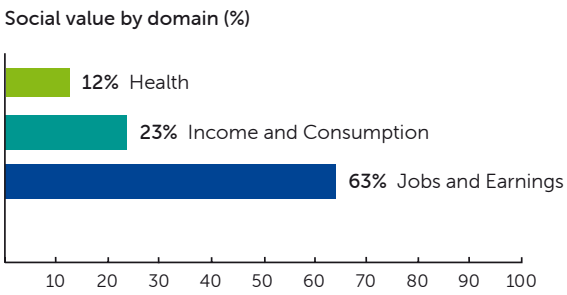
This means that every dollar invested in House of Science programmes delivers $10.20 of measurable good to New Zealand.

According to ImpactLab, House of Science real-world value is even greater than this as some outcomes, such as improve critical thinking, cannot yet be directly quantified with available data.

Social value breakdown

House of Science creates social value across different aspects of people's lives.

The chart below shows the breakdown of social value created according to the Living Standards Framework*. Each domain highlights a different aspect of wellbeing.



When ImpactLab considered the operating costs of House of Science, they estimated the social return on investment that is generated for every dollar that is invested in the programme.

Social value generated for each participant:	$397
Measurable benefits as proportion of programme cost:	1020%
Cost of the programme per participant:	$37

*The Living Standards Framework is a practical application of national and international research around measuring wellbeing. It was designed drawing from the Organisation for Economic Co-operation and Development's (OECD) internationally recognised approach, in consultation with domestic and international experts, and the NZ public.

Definitions

Jobs and Earning: Freedom from unemployment

Income and Consumption: People's disposable income

Health: People's mental and physical health

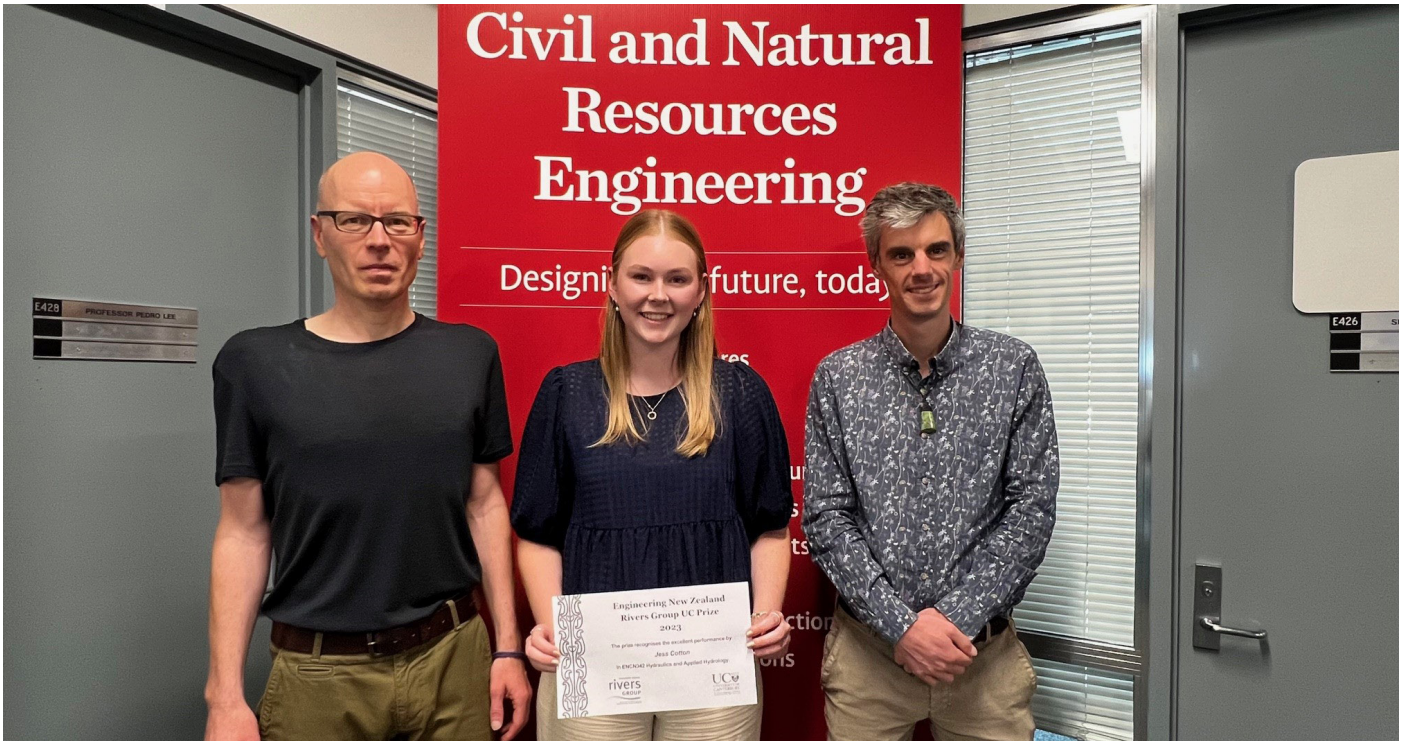
SCHOLARSHIPS AND AWARDS

Engineering New Zealand Manatiaki Kōawa | Rivers Group UC Prize awarded to Jess Cotton

Jess Cotton, final year BE(Hons) student in Civil Engineering at University of Canterbury, has been awarded the Engineering New Zealand Manatiaki Kōawa | Rivers Group Prize in partnership with Te Whare Wānanga o Waitaha | University of Canterbury. The prize recognises excellent performance by undergraduate students at University of Canterbury in the core civil and natural resources engineering course Hydraulics and Applied Hydrology.

From the prize winner:
My name is Jess Cotton, and I am completing my final year of a Be(Hons) in Civil Engineering at the University of Canterbury. I am pursuing a career in geotechnical engineering and have a keen interest in the earthquake space. On the completion of my studies, I am excited to begin my career as a consulting geotechnical engineer at Beca. Alongside my degree, I am also the president of the University of Canterbury Women in Engineering Society and a tutor to first year engineering students in mathematics.

While I am not specialising in an area of water engineering, my knowledge in fluid mechanics, particularly groundwater, has laid a sound foundation for my geotechnical expertise. I recently completed a geotechnical internship at Beca where I worked alongside hydrogeologists in my team and was involved in monitoring and testing piezometers. This highlighted the applicability of fluid mechanics in my chosen field and enabled me to draw from the knowledge I have gained in my fluid mechanics courses.



From left to right: Markus Pahlow (NZ Rivers Group representative), prize winner Jess Cotton and 'Hydraulics and Applied Hydrology' course coordinator Craig McConnochie.

Student research grants

Funding available

The Rivers Group has three $1,000 grants available to student researchers working on issues related to Aotearoa's rivers and catchments. This includes projects relating to for example flood risk management, river geomorphology, water quality or water quantity.

Funding will be provided to support costs related to research such as fieldwork or laboratory related costs, equipment or software. The fund is not intended to cover tuition.

Eligibility

- Applicants must be enrolled at a New Zealand university.
- Honours, Masters and PhD level projects are all eligible for funding.
- Applicants must be members of the NZ Rivers Group (student membership is free!)

Application process

Applications require:

- A short application form.
- A note of support from an academic supervisor.
- An itemised budget for the proposed research.

We are in the process of updating the website – if you can't see the application form on our website please email rivers.group@engineeringnz.org to receive an application form.

Applications will be assessed on the strength of the proposed research and its alignment with the objectives of the rivers group. Grant recipients are expected to prepare a short contribution regarding their research for a future issue of FLOW.

Application deadline: 31 July 2024

Co-funding for industry-led research

Funding available

The Rivers Group offers $15,000 co-funding to support a scholarship for an industry-led Master's research project on a river related topic. This includes, for example, research relating to flood risk management, river geomorphology, water quality or water quantity. This funding represents 50% of the costs of providing a full scholarship for a one-year Master's research project.

We are looking for proposals from organisation who have a suitable project which would benefit from research and can provide the other 50% of funding for a scholarship.

What is required?

- An appropriate research idea: This could be anything river related.
- $15,000 co-funding toward the research scholarship. In return you will benefit from a postgraduate student working full time for one year to research the topic you have identified. This is a substantial amount of research, with expert supervision from university academic staff, which can help deliver knowledge of value to your organisation.
- Optionally, you may also provide some co-supervision of the student project, or potentially host them in your organisation for part of their project – we would encourage both.

Next steps

Before 14 August 2024:

1. Contact us with your idea for a research project (rivers.group@engineeringnz.org or any of the committee members).
2. Identify potential academic supervisors and work with them to flesh out the project scope. If required, we can help identify an appropriate supervisor (you may already have a supervisor in mind – that's fine).

The Rivers Group committee will then select a project to support based on the strength of the proposed project and its fit with the aims of the Rivers Group. Priority will be given to projects which provide knowledge with wide applicability to the industry as whole. Local case-study type projects will be considered provided their findings can be generalised to other similar issues elsewhere.

Once a project is selected for funding, the Rivers Group will work with the organisation and university to set up the scholarship and identify a suitable student.

Application deadline: 14 August 2024

EVENTS

2024 Rivers Group Conference

Manatiaki Kōawa | The New Zealand Rivers Group invites you to join us for our 2024 conference from **6–8 November, in Ahuriri | Napier**

Our theme for this year is Ka Mua, Ka Muri | walking backwards into the future. Over two and half days we want attendees to reflect on the past and consider how we best navigate an increasingly uncertain future. We will get out alongside the awa to learn from tangata whenua and others about the past before moving inside to consider kōrero on the future. This year we also want to hear more of your stories, thoughts, experiences, and learnings in a longer open session and a series of 'lightning' talks to accompany posters. Keep your eyes peeled for our website updates with all the details you need, including for registrations and abstracts. We also want to give you an early heads up that we'll be asking for a short paper to accompany any abstracts to help record these stories and learnings for the future. So, what are you waiting for? Mark the dates in your diary and get writing!

Ngā mihi nui,

Amanda Death
Conference Chair

Other Conferences

New Zealand Geographical Society Conference

20–22 November 2024
Tauranga

In light of recent Rivers Group Conferences focusing on living with rivers and living with urban rivers, we plan to run a workshop session at the NZGS Conference where the conference theme is 'Fluid Geographies'. Our session will focus on 'Living with living rivers' and provide a cross-disciplinary opportunity to discuss how we should operationalise Room for the River interventions. How should we make this happen in Aotearoa? To successfully address this question, we need to understand our awa as living entities in our physical, social and cultural landscapes. We invite participation from across the spectrum of the Rivers Group, as well as Geographers in Aotearoa to workshop the challenge of living with living rivers in Aotearoa New Zealand – please join us in Tauranga!

nzgsconference2024.co.nz/

View session details.

Please contact Ian Fuller (i.c.fuller@massey.ac.nz) for any further information on the session.

Ian Fuller and Jon Tunnicliffe (session convenors).

The New Zealand Freshwater Sciences Society Conference

18–22 November 2024
Rotorua

The theme of the NZFSS 2024 Conference is Haere i mua whakakotahi – Moving forward as one. The conference is being held from 19-22 November in Rotorua. See the website for more information on the theme and proposed topics, which range from Indigenous perspectives, science communication, policy and practice, catchment management, waterways resilience, and more!

Abstract submissions are due 23 August, and Earlybird registration changes to Standard on 11 October.

nzfssconf2024.co.nz/

New Zealand Coastal Society Conference

19–22 November 2024
Christchurch

The 2024 New Zealand Coastal Society Conference is being held in Christchurch from 19-22 November. The conference will cover a range of topics related to coastal management. Keep an eye on the website for updates on registration and session details.

coastalsociety.org.nz/conferences/2024/

Join us at Macs Brew Bar, right by the mouth of the Waimapihi awa, for a Wellington Rivers Group gathering. It will be a relaxed social event to discuss our rivers, work experiences, inspirations and to share ideas.

Macs Brew Bar, Shed 22
4 July – (time TBC but likely from 5:30): keep an eye out on our social media platforms for more details

We can't wait to see you!

Professional development opportunities

A great resource to find information about professional development opportunities is the Resilient Rivers Communities professional development programme webpage. Make sure to visit the Resilient Rivers Communities webpage for the most recent updates and detailed information regarding upcoming workshops and webinars. Note that past professional development programme webinar recordings can also be accessed on their webpage. And recall that past NZ Rivers Group webinars can be accessed in the NZ Rivers Group members area.

Some upcoming Resilient Rivers Communities events and webinars are listed below. Please see the Resilient Rivers Communities webpage for more information and to register!

Regionwide Berm Transition project – webinar

10am, Thursday 13 June 2024
Presenter: Greg Stanley (PGDipSCi, BMus)

The recently completed Berm Transition project saw extensive weed control and native planting performed regionwide to complement the flood protection infrastructure of Canterbury's braided river margins. Several novel approaches were used during the installation of the berm transition assets, expanding on the standard techniques used in the restoration industry. Come along to hear the Braided River Revival team give a description of what they did, how they did it and what they hope to see next.

Gravel Management workshop

Wednesday 28 and Thursday 29 August 2024
Wellington
$1,250.00 plus GST

A look at gravel management practices and wider considerations around gravel extraction. Day one will be an introduction to gravel management and cover the fundamentals of fluvial geomorphology for understanding gravel in New Zealand rivers. We will look at a council perspective on changing approaches to assessing gravel volumes to inform extraction. Day two will cover wider considerations around gravel extraction.

Spaces limited. To register interest or more details email rachael.armstrong@hbrc.govt.nz

2021 Canterbury flood recovery field trip

Wednesday 25 – Thursday 26 September 2024 (field trip) plus Tuesday 15 October 12–1pm (post-field trip follow-up)
Ashburton, Canterbury
$1,300.00 plus GST
Host: Environment Canterbury

A two-day field trip to visit various sites damaged by the May 2021 Canterbury Floods, 3 years on from the event. The focus is to show the practical and fit-for-purpose methods used to repair around 350 damaged sites and is applicable to field staff and river engineers. Sites chosen to visit will include.

- Large scour bays repaired with a combination of vegetation and engineered structures.
- Innovative trials of different anchoring methods for anchored tree protection.
- Inclusion of native planting within scour zones.
- Heyman fences used in space limited areas.
- Stop bank repairs including retreat where appropriate.
- Rock groynes, rock drop structures and rock revetments.

You will visit areas where some partial retreat has been possible to make more room for rivers. With repeated floods in the winters of 2022 and 2023, some of the repair methods were shown to not work and different solutions have now been implemented. You will learn the methods used to communicate and manage such a large number of repairs.

The cost of the field trip is inclusive of accommodation in Ashburton, lunch and dinner on day one and breakfast and lunch on day two. Refreshments will be at a personal expense.

Spaces limited. To register email rachael.armstrong@hbrc.govt.nz

Essentials of Engagement: Communication and Engagement Workshop

9am-4pm, Thursday 3rd October 2024
Christchurch, Epic Innovation
$500 plus GST.
Presenter: Chris Meme

This course will explore the role of the engagement practitioner, core values code of ethics contemporary engagement, the five essential elements of engagement practice ('Design Platform'), and quality assurance standards. This course might be right for you if you are:

- wishing to obtain the Certificate in Engagement
- experienced practitioners who are looking for a refresher
- considering a career, or career change, in community engagement
- professionals, such as planners and engineers in related fields.

Benefits of this course include:

- Validate your knowledge of sector best practice
- Clarify how the core models should work in practice
- Ask questions from IAP2's experienced trainers
- Form a professional network

This course is the pre-requisite for the IAP2 Australasia Certificate in Engagement. Engagement Essentials the perfect starting point for anyone involved in community and stakeholder engagement, at any level or function.

For more information check out Engagement Essentials Training | IAP2 Australasia

Participants will receive a certificate and gain 7 CPD hours upon completion.

To register please email rachael.armstrong@hbrc.govt.nz

Auckland Location TBC – If you are interested in this course in Auckland contact rachael.armstrong@hbrc.govt.nz

CALL FOR CONTRIBUTIONS

We are always looking for contributions from our membership for FLOW. Consider submitting an article, case study, update or notice for the next issue of FLOW. News from the different regions are very much appreciated.

The final submission deadlines for 2024 is:

Issue	#	Deadline for contributions
September 2024 issue	#44	Monday 19 August 2024
December 2024 issue	#45	Monday 18 November 2024

Please format your contribution as follows:

- Length of around 500–1,500 words, preferably in Microsoft Word format (articles should include: title, name of the author(s), affiliation(s), and section headings. Note that illustrations and/or tables are strongly encouraged)
- If possible, attach figures/images/artwork, eg. in .jpg format, at high-resolution separately
- Provide credits and captions for your figures/images/artwork.

If you have articles which are longer, please email us and we will work out a way forward together with you.

Email rivers.group@engineeringnz.org to submit your FLOW contributions or any news you want to share. We look forward to receiving your contributions.

RIVERS GROUP MANATIAKI KŌAWA MISSION STATEMENT

The New Zealand Rivers Group Manatiaki Kōawa was formed in 2009 to provide a forum for 'Working with Rivers'. It is a place for people with an interest in rivers, flood risk management and the operational and environmental issues of catchments and river systems to come together.

We currently have over 400 members, and promote a multi-disciplinary approach to river management, reflecting cultural and societal diversity in an integrated and holistic manner. Our membership reflects this, with our members coming from a wide range of river management, science and engineering, and planning backgrounds - working as consultants, or in local, regional and central government, research institutes and universities.

New members can sign up online

RIVERS GROUP COMMITTEE MEMBERS

Chair:
Richard Measures
richard.measures@niwa.co.nz

Vice Chair:
Clare Wilkinson
clare.wilkinson@niwa.co.nz

Secretary:
Jacqui McCord
jacqui.mccord@auckland.ac.nz

Treasurer:
Kyle Christensen
kyle@christensenconsulting.co.nz

Membership Coordinator:
Verity Kirstein
verity.kirstein@ecan.govt.nz

Advocacy:
Tom Kay
t.kay@forestandbird.org.nz

Ian Fuller
i.c.fuller@massey.ac.nz

Student Liaison:
Jacqui McCord
jacqui.mccord@auckland.ac.nz

Communication Coordinator:
Selene Conn
sconn@tonkintaylor.co.nz

Awards and Scholarship Coordinator:
Markus Pahlow
markus.pahlow@canterbury.ac.nz

FLOW Coordinator:
Clare Wilkinson
clare.wilkinson@niwa.co.nz

Academic Liaison:
Ian Fuller
i.c.fuller@massey.ac.nz

Conference Liaison:
Amanda Death
amanda.death@gw.govt.nz

Events Coordinators:
Rachael Armstrong
rachael.armstrong@hbrc.govt.nz

Tim Dodd
tim.dodd@morphum.com

Website Coordinator:
Alex Sims
alexsims@alluviumgroup.co.nz

River Managers Liaison:
Shaun McCracken
shaun.mccracken@ecan.govt.nz

Water NZ Liaison:
Nicci Wood
nicci.wood@waternz.org.nz

New Committee Member:
Damian Velluppillai
dvelluppillai@tonkintaylor.co.nz