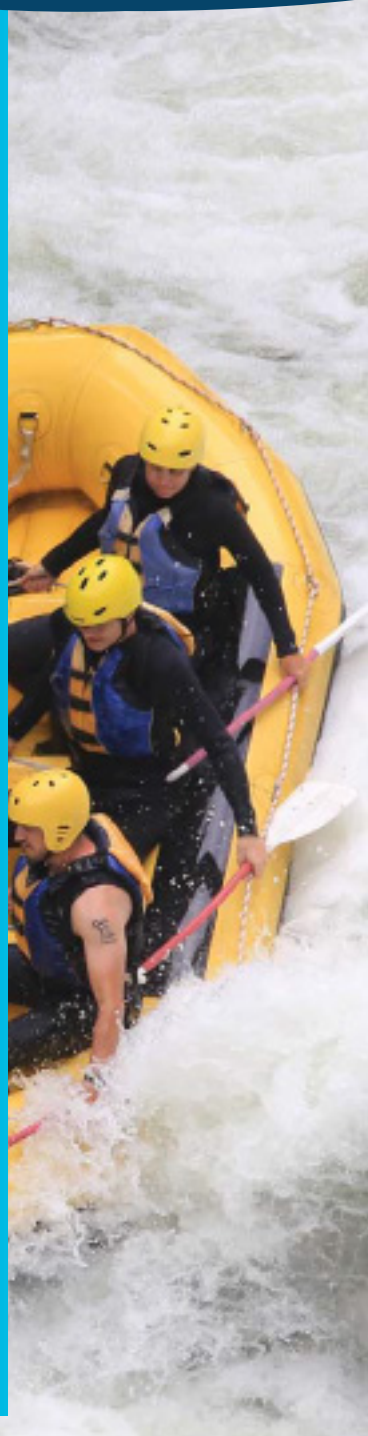
manatiaki kōawa

rivers GROUP

A joint technical interest group of IPENZ & Water NZ

INSIDE THIS ISSUE



NEWSLETTER Issue 21 | March 2018

FROM THE CHAIR

Mark Hooker

Welcome to our first newsletter for 2018, and my first one as Chair of the Rivers Group.

I'd like to start by thanking Kyle on behalf of our Group for his three years as Chair. Kyle has done a great job and given a lot of time to this role, and I'm personally very pleased (and relieved) that he's staying on the committee. One area where Kyle has really contributed has been in bringing different people and groups together - which often involves a lot of work behind the scenes that members won't see. This act of connecting people, their ideas and their skills is fundamental to our group.

I'd also like to thank our committee members who stepped down at last year's AGM. Jon and Simon have got other plans for 2018 and we wish you both well! We welcome Heide Friedrich, Catherine Knight and Selene Conn to the committee this year. As Chair, I'm very happy to be working with such a diverse and passionate committee. I hope I can stay afloat with all the ideas and inspiration that are flooding in! We plan to introduce you to your committee members through this newsletter during the year.

I come to the role of Chair from a background in engineering consultancy and more recently working at Wellington Regional Council. My personal interest in rivers has mainly involved travelling along them or across them (tramping and climbing) and my professional interests are around river management and flood risk, with a healthy dose of water infrastructure/water resources from my past work. I'm particularly interested in how we communicate technical topics and encourage sound evidence-based or risk-based decisions. It's encouraging to hear through talking with other professionals that this is also a strong area of interest for others. For our group, I want to see us achieving as much as possible and delivering what our members want through stronger relationships both within our membership and with other organisations. I would also like to raise the profile of the Rivers Group.

Thanks to those of you who participated in the member survey earlier this year. The committee discussed the survey results at our annual face-to-fact meeting last month and the results strongly influenced the direction we set for 2018. Some headlines from the survey were:

- Members really value regional events, the annual conference, being part of the NZ rivers community… and this newsletter!
- Members would like to have more opportunities to make connections with other professionals and share information about technical reports/case studies
- Members overwhelmingly would recommend Rivers Group membership to their colleagues (so please do recommend us to your colleagues).

Using this information the committee set some priorities for 2018. Much of the survey feedback indicated support for what we currently do, so there are no sharp departures from the past, but some key priorities will be:

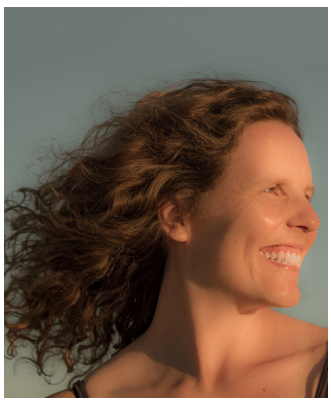
- Delivering more regional events, in more places, and sharing the presentations with members around the country
- Better describing our identity and how we position ourselves/work together with other groups and stakeholders
- Revamping how we communicate both with our members and with people who aren't our members. This newsletter will remain a cornerstone of our com-munication with members.

Finally, in news hot off the press, I want to congratulate Rivers Group member David Leong on being awarded Fellowship of Engineering New Zealand last week. David is a previous recipient of our Arch Campbell award and his Fellowship is thoroughly deserved. Well done David.

Chairman

MEET THE COMMITTEE

Heidi Friedrich



Heide Friedrich is the Head of the Water Engineering Laboratory at the University of Auckland, New Zealand and leads the Water-worked Environments Research Group (water.auckland.ac.nz). She is also the Deputy Head Research in the Department of Civil and Environmental Engineering. She has over 15 years' experience, both in industry and academia, having worked and lived in Germany, Taiwan, UK, Australia and NZ. Her main research focus is on studying the physical processes in natural aquatic environments, such as rivers, and how water interacts with and shapes its surroundings. She has been involved with the Rivers Group since 2014.
Twitter https://twitter.com/heide_friedrich

Catherine Knight

Dr Catherine Knight is an author and independent consultant based in the Manawatu, specialising in policy and communication. She also holds an Honorary Research Associate role in the School of People, Environment and Planning, Massey University. She is the author of New Zealand's Rivers: An environmental history (Canterbury University Press, 2016), which was longlisted for the Ockham New Zealand Book Awards 2017, short-listed for the New Zealand Heritage Book Awards,and selected as one of the Listener's Best Books for 2016. Her 2014 book Ravaged Beauty: An environmental history of the Manawatu (Dunmore Press) won the J.M. Sherrard Award in New Zealand Regional and Local History, and Palmerston North Heritage Trust's inaugural award for the best work of history relating to the Manawatu. Her third book, Beyond Manapouri: 50 years of environmental politics in New Zealand, published by Canterbury University Press, will be released in May 2018.

Jo Hoyle

Jo has a PhD in river geomorphology and a natural resources engineering degree. Jo worked as a river engineer for MWH in the Tasman District prior to completing her PhD at Macquarie University in Australia. She has spent the past 10 years working for NIWA in Christchurch, where she manages the Sediment Processes group. Jo's research focuses on how river geomorphology influences river ecosystems, and feedback relationships between flow, vegetation and geomorphology. Her current research is focused on braided river systems. Jo is also a keen whitewater kayaker and spends much of her spare time playing in rivers.

REGIONAL EVENTS

Call For Assistance

Our members are always telling the committee that they love our regional events and they'd like to see more. Regional events provide an opportunity to share information and news, and to network with other professionals who are working in rivers. However, the committee can't deliver these events all by itself – especially in places where we don't have a committee member (which tend to be outside the main centres).

Helping to make a regional event happen is very satisfying and provides a much better networking opportunity than simply attending an event. You'll also have the everlasting gratitude of your fellow members and especially the committee! Do you have an idea for a local event, or a topic you'd like to present on, or maybe you can provide a venue? If so then please contact our Regional Events Coordinator Sjaan Bowie (sjaanbowie@doc.govt.nz).

We've discussed needing help to put on events this year in:

- Hawkes Bay
- Tauranga
- Dunedin or Invercargill
- Hamilton

but if you can help us with an event in another location then please get in touch.

ARTICLES

Characteristics of the Very Rare Whakatāne Flood of 6 April 2017 and Implications for Design (Abstract)

Peter Blackwood Principal Environmental Engineer Bay of Plenty Regional Council & Peter West Blue Duck Design Limited

On 6 April 2017 the Whakatāne River experienced a flood well beyond the size of those in recorded history. At the Valley Road gauge the peak flood level was 0.63m higher than the 1% AEP (1 in 100 year) flood of 2004. The peak flood flow upstream was even greater, as three stopbanks built to the 100 year with 500mm freeboard were significantly overtopped. A key contributor to the extraordinary flood flows was an intense band of rain at the tail of the storm producing almost the "perfect flood".

This is yet another in a series of large floods relating to the negative phase of the Interdecadal Pacific Oscillation. Conversely for the 25 year period preceding 1998 no floods exceeded 20% AEP (1 in 5 year). The probability of that non-occurrence is remote at 0.8^25.

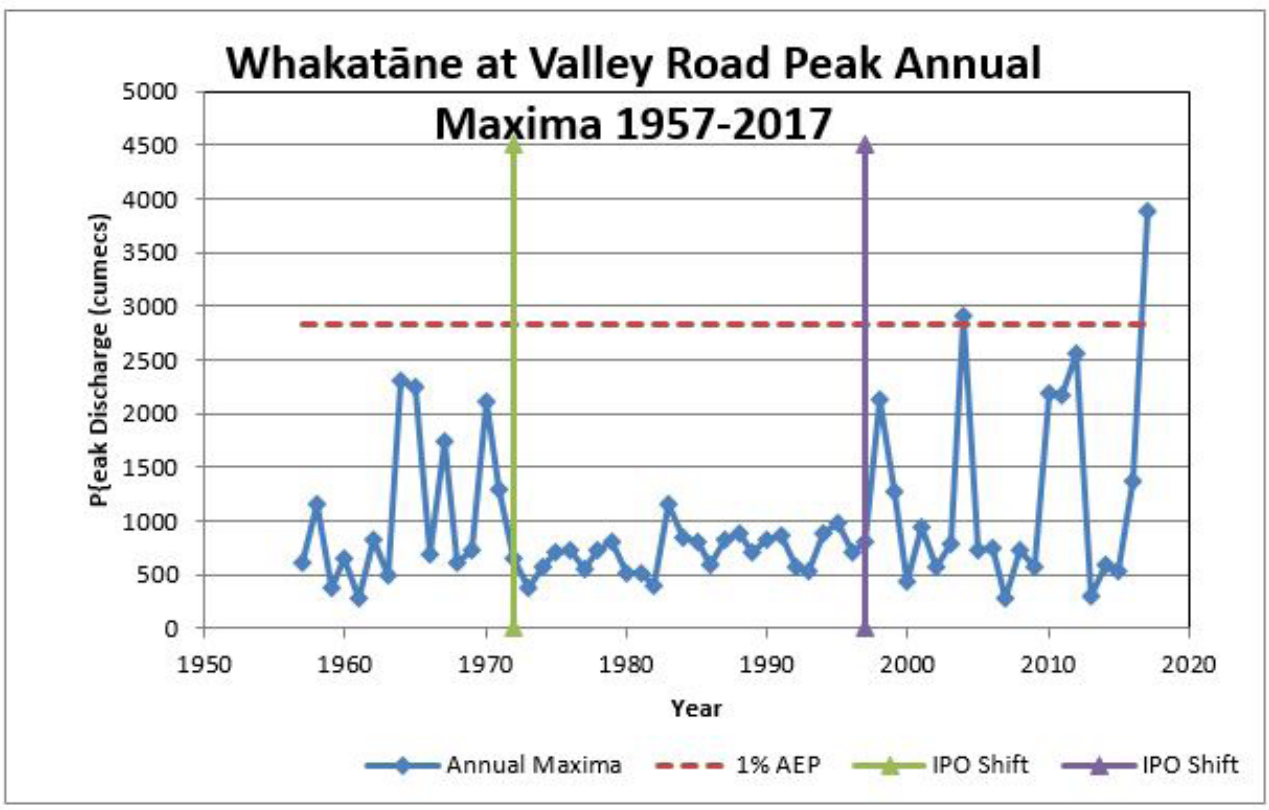
This paper describes the challenges in estimating the flood size and corroborating that size; and secondly, reassessing frequency distributions.

A further feature of this flood was the performance of the "spit-fuse" alongside the Whakatāne Western Training Wall. This operated far better than in the 2004 flood, but still provides a challenge.

The final point traversed is the detailed project investigating means of mitigating climate change for the Whakatāne and other major rivers in the Bay of Plenty.

For full paper contact Peter Blackwood at Bay of Plenty Regional Council

Note: also refer to the EngNZ Webinar on the EngNZ website about the Edgecumbe Flood with Charlie Price , Review panel member (1 hr of CPD credits)


Whakatāne at Valley Road Peak Annual Maxima 1957-2017
P{eak Discharge (cumecs)
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
1950
1960
1970
1980
1990
2000
2010
2020
Year
Annual Maxima
1% AEP
IPO Shift
IPO Shift

ARTICLES

Large Woody Debris (LWD) Research in New Zealand – PhD Project

Gabriel Spreitzer, PhD Student – Department of Civil and Environmental Engineering, UoA
Heide Friedrich, Supervisor – Department of Civil and Environmental Engineering, UoA
Jon Tunnicliffe, Co-Supervisor– School of Environment, UoA
Contact: gspr390@aucklanduni.ac.nz

River systems in forested catchments are affected by organic debris material reaching the stream channel and influencing hydraulic flow conditions. Changes in hydraulic flow conditions present challenges at higher discharge rates, such as during flood events, where flow-sediment-wood interaction processes become complex, and potentially disastrous. We observe this complex interplay globally, and are working together with our colleagues in Europe and North America; however, especially for New Zealand, with its unique landscape and natural hazards, there is a risk for our river crossing infrastructure, nearby properties and ecosystems. Landslides, caused by storm events and earthquakes, are assumed to be the main suppliers of large woody debris (LWD) from both, natural (e.g. mass wasting) but also anthropogenic (forestry) sources. Due to the impacts on property, infrastructure and environment, a better understanding of these interaction processes between LWD and flow hydraulics is required.

With this goal in mind, as part of the Water-worked Environments Research Group (http://water.auckland.ac.nz/) we developed an experimental setup in the Water Engineering Laboratory at the University of Auckland, to study LWD movement and impacts on channel morphology and hydraulic structures during flood events. The experimental setup consists of a 6 m long, 1.5 m wide and 1 m deep, glass sided flume with sinuous channel course, mobile gravel bed and a constricted cross-section, represented by a New Zealand characteristic 'one-lane-bridge'. A prototype to model scaling of 15:1 was chosen to achieve the best replica of channel characteristics and hydraulic flow behaviour for a catchment of about 100 km2 in size. The scaling ratio also considers an annual flood event with a magnitude of 65 to 80 m3·s-1, which fits a design discharge of up to 75 l·s-1 in the laboratory. A custom designed conveyor-belt feeder supplies gravel and wood to the channel, a short distance downstream the inlet. A photogrammetric surveying tool, Structure from Motion (SfM), is used to capture sequences of channel bed dynamics. Generated digital elevation models (DEMs) then provide information about changes in channel morphology. Furthermore, innovative customized smart sensors are used to allow a novel insight into LWD transport and accumulation dynamics. The smart sensors operate in 9-Degrees of Freedom (9-DoF), allowing real-time measurement of LWD movement. The gained knowledge of this study will inform New Zealand's freshwater and forestry management.

Acknowledgement
This study is supported by the IPENZ Rivers Group Student Research Grant.

Conveyor Belt and Flume

Critical bridge cross section

2017 Conference Report
Kyle Christensen

Our 2017 conference, held in association with the International Society of River Science and the NZ Freshwater Science Society and hosted by the Waikato River Authority was a great success with a total of over 500 delegates including over 150 from around the world. There was a wide variety of papers and keynote speeches that provided plenty of scope for expanding the attendees understanding of the natural systems that we are part of and work with. There was a special session hosted by the Rivers Group titled "Making Room for Rivers" which included a broad range of papers discussing issues and solutions to the question of how wide our rivers should be. A copy of all the presentations from this session will be added to the Rivers Group webpage.

The presentation that made the biggest impact on me was "Relating with rivers as part of best river management practice" presented by Simon Mould from Macquarie University in Australia. My interpretation of Simon's presentation was that we need to focus on enhancing our relationships with rivers so that the river becomes the common focus point that provides the opportunity to enhance relationships with the community who values the river. With improved relationships with our rivers and with each other we can really make positive progress in restoring and enhancing our river systems. This theme is going to flow through into our 2018 conference which is in the early stages of planning at the moment and will be 2-3 days duration during the week commencing 19 November.

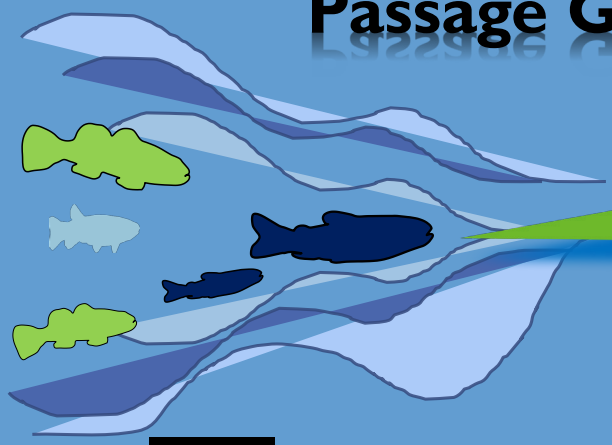
The other real highlight of the conference was the Kaituna River field trip, with close to 50 attendees and a majority (75% +) from overseas this was a really special experience. It started with an exhilarating trip down the upper Kaituna in rafts including a hair raising section down the highest commercially rafted waterfall in the world (Tutea Falls – 7m). The falls is also a culturally significant site which historically served as a place where people would be "returned to the river" following their death. Also included in the field trip was a visit to the Lower Kaituna River where the river is being reconnected to it's estutary to provide wide ranging water quality and cultural benefits https://www.boprc.govt.nz/our-region-and-environment/coast/kaituna-maketu-and-pongakawa-waitahanui-catchments/kaituna-river-re-diversion-and-ongatoromaketu-estuary-enhancement-project/. Pim De Monchy from the Bay of Plenty Regional Council provided a great summary of the project including educating all attendees (including the French delegation!) on what a "chenier" is. It is basically a relatively flat (> 15:1 H:V) sloped, low stopbank in an estuary environment……clearly "chenier" serves as a much more attractive name for it!

Kyle Christiansen
Chairperson IPENZ Rivers Group

LAUNCH AND WORKSHOP
NZ FISH PASSAGE GUIDELINES 18 APRIL 2018

The New Zealand Fish Passage Advisory Group invites you to the:

LAUNCH of the 'New Zealand Fish Passage Guidelines'

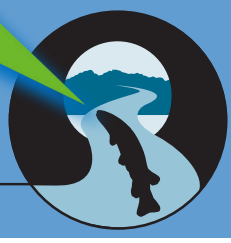


"LET'S GIVE OUR MIGRATING FISH A VOICE"

LAUNCH IT WITH US!
Join us for this multi-disciplinary **WORKSHOP** if you are involved in designing, planning and monitoring of instream structures and fish passage management.

YOU WILL FIND OUT ABOUT
Best practice for fish passage management, how the guidelines work and how to improve fish passage at new and existing structures

SAVE THE DATE:
18th APRIL 2018
9:30-17:30
MfE, Wellington



WORLD FISH MIGRATION DAY

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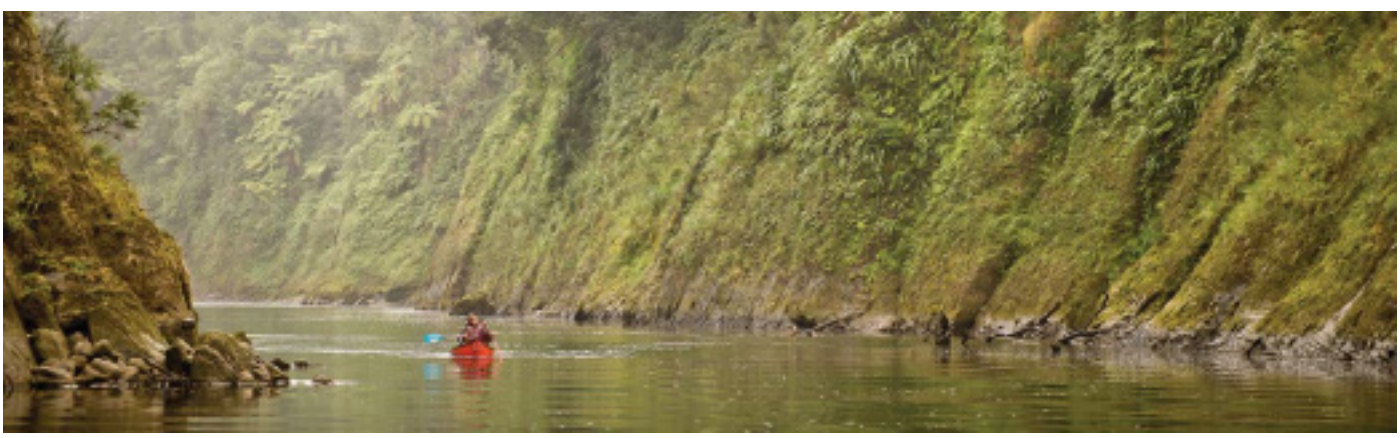
A joint technical interest group of Engineering New Zealand & Water NZ

New Zealand **Fish Passage** Advisory Group

advisorygroup@fishpassagenz.org • doc.govt.nz/fishpassage

RIVERS GROUP ANNUAL CONFERENCE
19 - 24 NOVEMBER 2018

Rivers Group Annual Conference, Whanganui, 19-24 November 2018
More details to come...



ANNOUNCEMENTS

PRIZE WINNERS FOR RIVERS GROUP SURVEY

Members' Survey Results

Thank you for all who responded . Overall the committee felt we had an excellent response. Based on the survey responses, the committee will attempt to tailor Rivers Group activities and membership benefits to meet consensus member interests as far as is practicable in the coming year.

For those interested please see below the link to the summary of the survey results:

https://www.surveymonkey.com/results/SM-GG988M5G8/

Lucky winners of our Members survey respondents spot prizes:

Verity Kirstein Environment Canterbury

Tallulah Kaegi Aurecon

Greg Bennett Waimakariri District Council

Alastair Barnett Hydra Software

Tony Miller GHD

Colin Whittaker University of Auckland