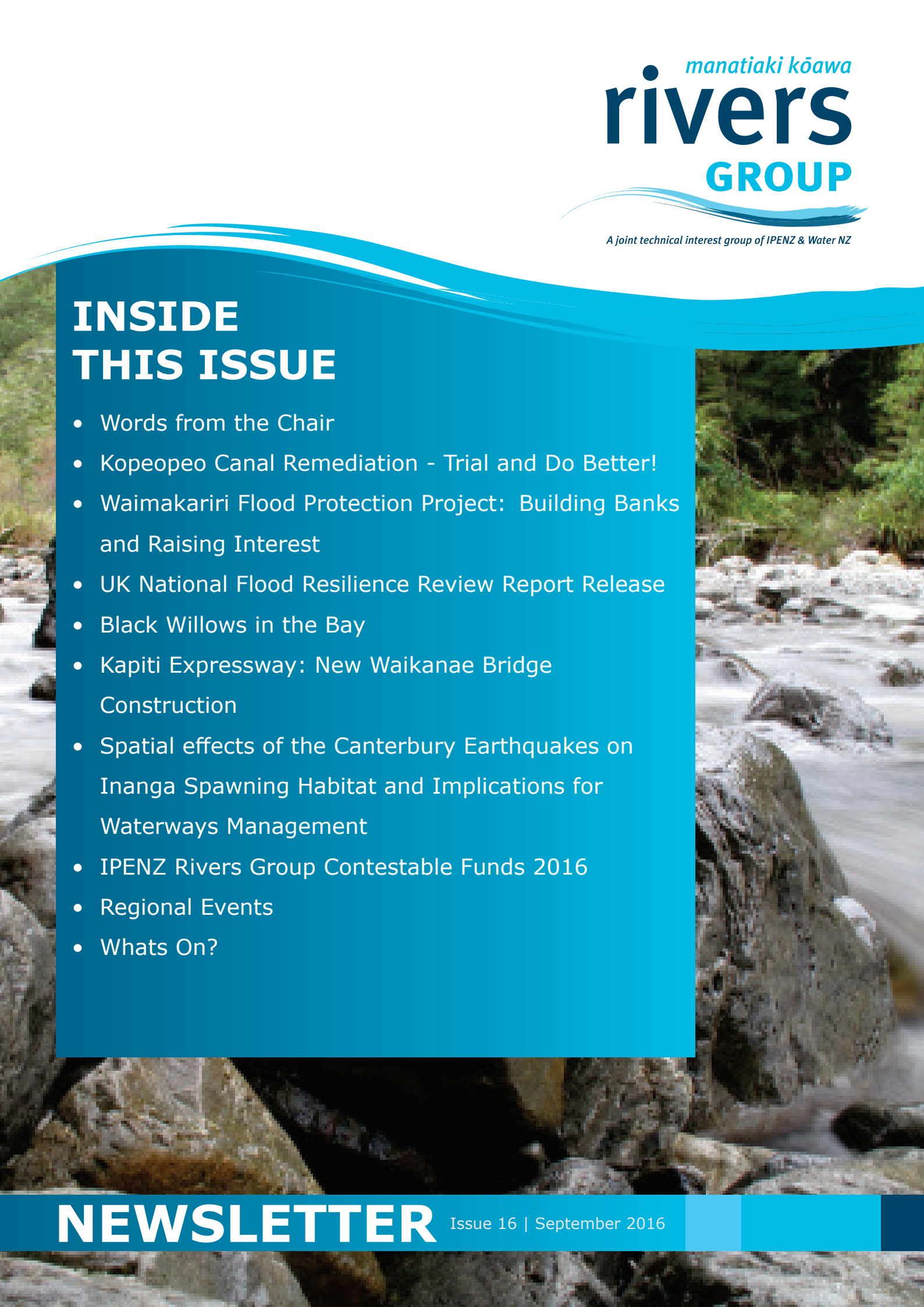
manatiaki kōawa

rivers GROUP

A joint technical interest group of IPENZ & Water NZ



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NEWSLETTER

Issue 16 | September 2016

FROM THE CHAIR

Kyle Christensen

WELCOME to Issue 16 of the Rivers Groups Newsletter, "Flow", our third for 2016.

In this message from the Chair I'm going to talk about one of the key objectives of the Rivers Group and how we have been tracking in achieving it.

The particular objective I'm going to discuss is:

1. To facilitate cross-disciplinary interaction between individuals, communities and professionals involved in catchment management, flood risk management and river management throughout New Zealand.
(You can find the full set of objectives here - http://www.ipenz.org.nz/riversgroup/About.cfm)

In my mind the achievement of this objective is all about collaborating and networking with other technical societies and interest groups across the wide spectrum of disciplines that are needed for successful catchment management, flood risk management and river management.
A real highlight of our achievement of this objective is the joint conferences we hold with other societies. This years conference coming up in Queenstown at the end of November is a perfect example where we are jointly running this event with the NZ Hydrological Society and the Engineers Australia Water Division. The science of hydrology is so fundamental to all the work we do so having a close, collaborative relationship with the NZ Hydrological Society and learning from what our Aussie counterparts are doing is of enormous value. It is also with great pleasure that I can announce that our 2017 conference will be a joint conference with the NZ Freshwater Sciences Society and the International Society for River Science http://isrs2017.com from the 19 – 24 of November in Hamilton. This again highlights the fundamental importance of freshwater ecology in the work we do and the value of learning and interacting with European, African, Asian and American professionals grappling with the same issues that we are.

Another very key group for us is Water NZ, you will note that our full name is the IPENZ/Water NZ Rivers Group and we are in fact a joint technical group of both organisations although all our group administration is run through IPENZ. The key Water NZ groups we interact with are the Stormwater Special Interest Group (SIG) https://www.waternz.org.nz/StormWater and the Modeling SIG https://www.waternz.org.nz/Modelling. The Water NZ stormwater SIG has more of an urban focus than the Rivers Group but there is a huge amount of cross over particularly when dealing with urban streams and open channels where more of the geomorphology, hydrology and ecology disciplines come into play. To further strengthen our links with Water NZ I have accepted a nomination to run for the Water NZ Board. The election is currently running through an online voting system so if you are also a Water NZ member I would encourage you to view the profiles of nominees and vote for who you think would deliver value in collaborating across the water management sector in NZ.

The collaboration and networking doesn't always have to focus on conferences and formal committees. Another great example is an event I am attending in Wellington this evening, this is a joint event with the NZ Institute of Landscape Architects, NZ Planning Institute, NZ Institute of Surveyors and the Rivers Group. There is a brief technical talk at the start but this is more of an informal social event where people who work in closely related disciplines can get together and find out a bit more about each other.

In summary I think we are doing really well at achieving our No.1 objective and would welcome feedback on any other groups you think we should be collaborating with more.

Kyle Christensen
Chairman

KOPEOPEO CANAL REMEDIATION - TRIAL AND DO BETTER!

Ken Tarboton, Brendon Love & Bruce Crabbe - Bay of Plenty Regional Council

Like many regions throughout the country, the Bay of Plenty has its fair share of contaminated sites, particularly from historic mill waste. Like many councils, we are working through the challenges of responding to community concerns, managing, prioritising, remediating and treating these sites.

One of the highest profile sites, and one of the most significant, is the Kopeopeo Canal on the outskirts of Whakatāne (Figure 1). The canal was contaminated between the 1950s and late 1980s as a result of stormwater discharges from a former sawmill, which treated timber using Pentachlorophenol (PCP). While unknown at the time, PCP imported into New Zealand for use in the timber processing industry also included a percentage of impurities that contained dioxins.

Remediation of approximately 40,000 m3 of contaminated sediment over a length of 5km of the canal is now needed. This will address the long-term health risk to the community associated with dioxin exposure, improve the quality of the aquatic habitat within the canal and wider drainage network and facilitate future drainage and flood relief within the Rangitaiki Drainage Scheme.

Time and money

It shouldn't come as a surprise that remediation projects like this take a long time and cost significant sums of money. After almost 10 years of investigations, risk assessments, technical assessments, remediation option evaluations, planning and consenting, physical works are expected to commence in late 2016. The Ministry for the Environment through their Contaminated Site Remediation Fund are supporting the project and co-funding 50% of the eligible project costs.

The latest cost estimate for the project is $15.5 million for the 5km stretch of the canal to be remediated. Further contamination has since been found outside the project area and investigation is underway to determine how to best remediate that.

Community involvement

Contaminated sites are an emotive issue and the community will become involved one way or another.

Early trials of a bioremediation process using myco- and phytoremediation methods to break down the contaminants in the soil were led by a community grouping made up of impacted groups, iwi and government agencies. The success of these trials is reflected in the final project design that will use bioremediation once the contaminated sediment has been safely contained.

Through the consenting process, community positions on the Kopeopeo Canal Remediation Project became polarised with emotions and concerns high around dioxin contamination, and disagreement on the proposed methodology and location of the containment sites.

To address this, and start healing the rift in the community, a Community Liaison Group (CLG) was formed to facilitate two-way sharing of project information with the community. Submitters on the consent (both supportive and opposed) were invited to help form the CLG set up to be a forward-looking group seeking the best outcomes for the project and the community by ensuring the free flow of information, transparency and provision of practical advice to the project.

The CLG has genuinely engaged in the process and is now an integral and crucial part of the Project. They help filter information

into and out of the project team and provide a touchstone for sensitive topics and things that the public don't feel have been explained adequately.
To better engage the public, the project also holds regular public meetings and open days including on the dredging trial. The public is kept informed through the webpage, a newsletter and a regular presence in the local paper and on the radio.

Dredging trials

The method initially approved (and consented) was to remove the contaminated sediment by dewatering the canal in sections, excavating the sediment and transporting it to the containment sites in trucks.
The community was concerned with this methodology, particularly the heavy traffic movement, potential spillage and associated dust, which is one of the highest risk exposure pathways for dioxin. Control measures to mitigate these potential effects also required a rigorous monitoring regime to ensure that they performed adequately.
Technology and expertise in New Zealand have advanced in the past ten years and there are now more options on the table.
To address community concerns and reduce potential health risks, a trial was undertaken to evaluate dredging as an alternative method to extract and transfer the contaminated sediment to the containment area. The trial (Figure 2) used a cutter suction dredge on the end of a long reach digger to extract sediment from the canal and transfer it as sediment slurry by pipe directly into small Geotube®s contained in bins at the trial sites. In the remediation itself, the dredging would take place from a barge and the sediment slurry would be pumped up to 3km to large (15-30m long) Geotube®s in a bunded containment area).
Following positive trial results, a variation to the consented methodology has been lodged. It is expected that the consent variation and appointment of a principal works contractor will take place in September 2016 and works on the project site will start in October 2016 with dredging of contaminated sediment starting in early 2017.

Do better

With physical works finally expected this construction season, it is timely to reflect on how we could have done some things differently or better to help others faced with similar large-scale remediation works.
While trials of the bioremediation approach were undertaken early, it was only after award of the consent, and under immense community pressure that a dredging trial was undertaken and an alternative approach designed. Undertaking the dredging trial prior to lodging the consent application could have better involved the community and helped maintain greater community unity and support through the project.
In our case, a full-time project manager with contaminated site remediation expertise was engaged only after award of the consent. Having this project manager on board has been instrumental in building community confidence in the project. Early engagement of a project manager with subject expertise is highly recommended.
Using more external expertise early would help establish the best option early in the process to save re-working later on. It provides reassurance to the community that the approach taken is industry best practice and will provide the best solution for generations to come.
In short, gather the right expertise, engage with the community, trial and do better!
You can find out more about the project at www.boprc.govt.nz/kopeopeo

Figures: Size as appropriate

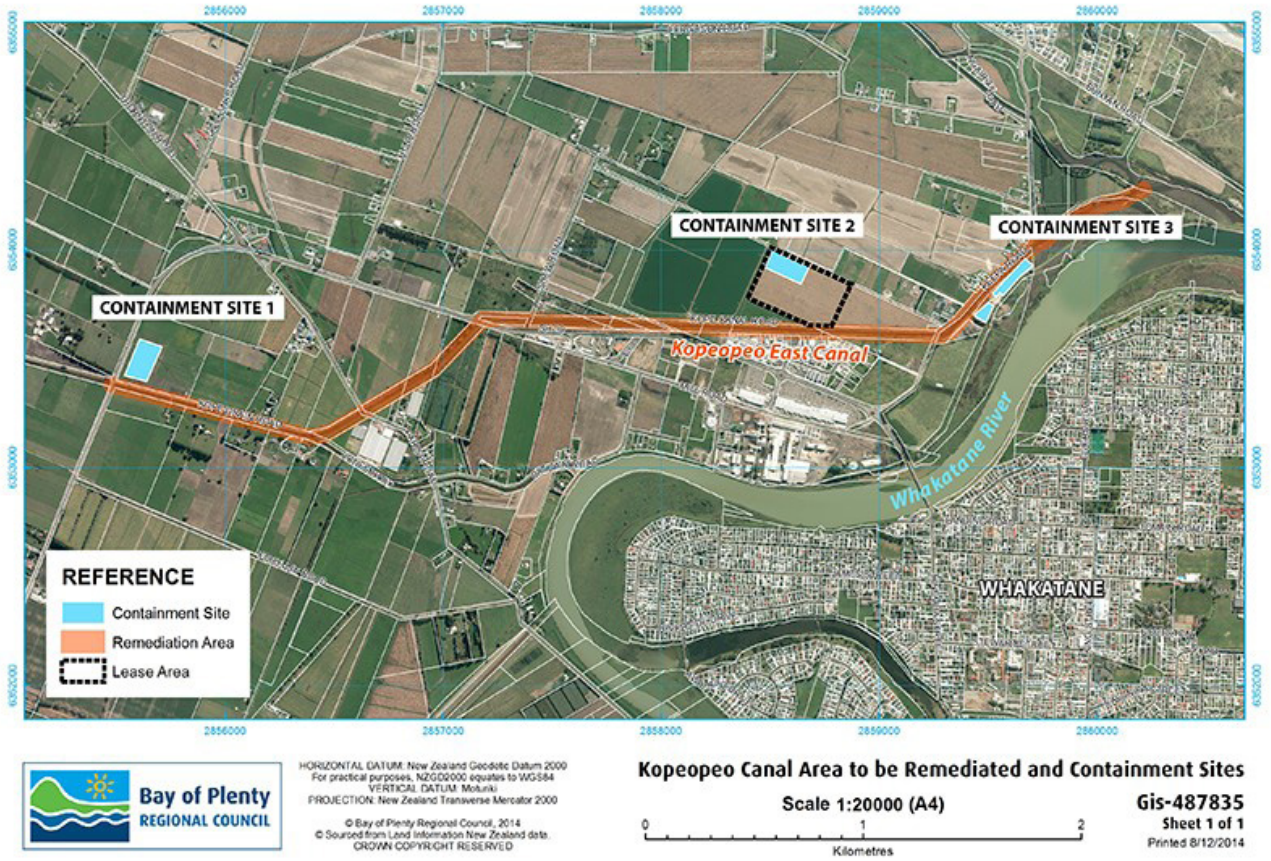


Figure 1. Kopeopeo Canal Area to be Remediated and proposed containment

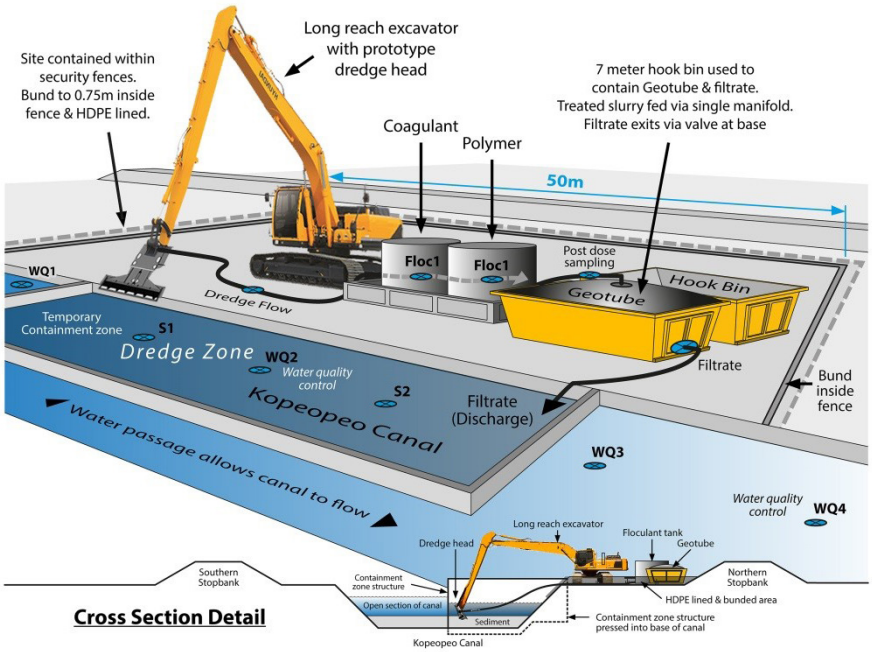


Figure 2. Kopeopeo Canal sediment dredging trial process

WAIMAKARIRI FLOOD PROTECTION PROJECT: BUILDING BANKS AND RAISING INTEREST

Annette Sweeney - Principal Enviornmental Engineer, Good Earth Matters Consulting Limited

ABSTRACT

The Waimakariri Flood Protection Project is a 10 year programme to improve the level of flood protection for the districts of Waimakariri, Selwyn and Christchurch. Recognising the devastating effects that would occur from a large breakout of the primary flood protection system, this project is creating a secondary line of defence that will give these communities one of the highest levels of theoretical flood protection in the country.

This paper looks at the benefits this project is bringing to improve community resilience not just in the extreme flood event, but also the wider resilience benefits achieved during its implementation phase and prior to the "big one" occurring. These include improved understanding, awareness and preparedness of those on the floodplain through the development of a Flood Warning and Emergency Evacuation Plan; contributing to ecological resilience by coordinating physical works with planting improvements; designing and constructing improvements to the recreational assets within the affected area; and using the project's delivery to upskill and develop a pool of contractors with a detailed knowledge of the river and the flood protection scheme.

This paper takes a holistic approach to resilience. It demonstrates that the flood protection benefits which need to be realised in the event of a large flood rely on the community having an understanding of river behaviour, having a connection to the river corridor, and understanding and valuing the role of flood protection assets. These connections provide a system-resilience that will ensure the flood protection assets currently being constructed will be maintained and "fit for purpose" when a large flood occurs in the future.

KEYWORDS

Waimakariri River; stopbanks; flood protection; resilience

PRESENTER PROFILE

Annette is an Environmental Engineer and Planner specialising in the consenting and delivery of infrastructure projects. She was personally responsible for undertaking the consultation on the Waimakariri Flood Protection Project and has since been retained to assist in the project implementation phase. Annette is a Principal of Good Earth Matters.

1 INTRODUCTION

"*The Waimakariri could be the most historically interesting of all our rivers, … it has threatened – and continues to threaten – more people and property than any other in the country.*"

Waimakariri, An Illustrated History
Robert Logan, 2008

The Waimakariri River, with a total catchment area of 3,564 km2, has its source in the Southern Alps to the west of Christchurch, with a length of approximately 46 km of the Alps draining in to the Waimakariri (Logan, 2008). The River flows across the Canterbury Plains and passes to the north of Christchurch, with its current mouth to the Pacific Ocean being between Christchurch and Kaiapoi. Historically, however, the braided River has moved

across the alluvial Canterbury plains and has, prior to European settlement, had its mouth as far south as Lake Ellesmere to the south of Banks Peninsula. The city of Christchurch therefore sits within the northern and southern bands of where the River has historically flowed.

Since the mid 1800s, successive attempts have been made to keep the Waimakariri River in its current position and away from Christchurch. The period between the earliest recorded flood protection efforts in the 1860s and the construction of what is now known as the primary flood protection system in the 1960s-1980s is described in a history of the River as "The Hundred Years War" (Logan, 2008).

A 1989 review of the scheme (Reid et al, 1989) identified there was a residual risk of breakout of the primary system and a suite of works which became to be known as the Waimakariri Flood Protection Project (WFPP) was developed. These works were initially unable to be fully implemented due to planning and regulatory constraints. Following devastating 2004 floods in the North Island (Manawatu, Bay of Plenty), the Canterbury Regional Council prioritised the improvements and charged the project team with securing resource consent and commencing implementation as soon as possible.

Resource consents for the WFPP were secured in June 2009 and construction works commenced October 2010. The Project is now in its sixth year of the 10 year physical works programme.

This paper considers how the design and project implementation is contributing to increasing the resilience of the communities living on, and adjacent to, the Waimakariri River floodplain.

2 BACKGROUND

2.1 HISTORY OF FLOOD PROTECTION ON THE WAIMAKARIRI RIVER

The threat to Christchurch City from the River's movement was understood early in the period of European settlement which lead to the City. In 1860, Samuel Butler described early attempts to tame the river, noting that the River could easily move from its current position and move through Christchurch (Logan, 1980, emphasis added):

"Besides this old channel it has others which it has discarded with fickle caprice for the one in which it happens to be flowing at present, and which there appears some reason for thinking it is soon going to tire of. If it eats about a hundred yards more of its gravelly bank in one place the river will find an old bed several feet lower than its present. This bed will conduct it into Christchurch. Government had put up a wooden defence, at a cost of something like two thousand pounds, but there was no getting any firm standing ground, and a few freshes carried embankment, piles and all, away, and ate a large slice off the bank into the bargain; there is nothing for it but to let the river have its own way."

The period between the 1860s and the 1960s has been described by Logan as *"The Hundred Years War" which was "to make the Waimakariri go, not where it wanted, but where the engineers dictated"* (Logan, 1980). Work in the late 1800s was successful in keeping floods out of Christchurch, although the focus at the time was protection of land on the southern side of the River only. It wasn't until the Waimakariri River Improvement Act of 1992 that official efforts became focused on protecting both sides of the River.

Significant advancements in the level of protection were achieved in the late 1920s with the Eyre River Diversion; early 1930s with stopbanks on the south branch from Halkett to Harewood and the cutting-off of the South Branch by the construction of Crossbank. However, two large floods in the 1950s which resulted in break-outs of the river and flooding of adjoining land led to a major scheme review and a works programme commencing in the 1960s, at an estimated cost of £1.6million.

The 1960s scheme – eventually completed in the early 1980s – resulted in a continuous line of primary stopbanks between the mouth of the Waimakariri River and upstream of Mcleans Island. Further upstream from this point, the River became naturally constrained by topography with assistance from the construction of some spur groynes.

The 1960s scheme is shown in Figure 1.

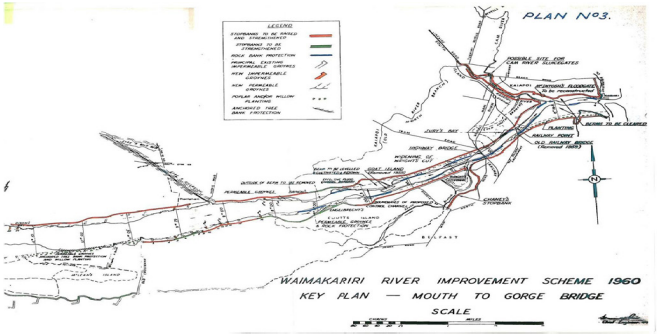


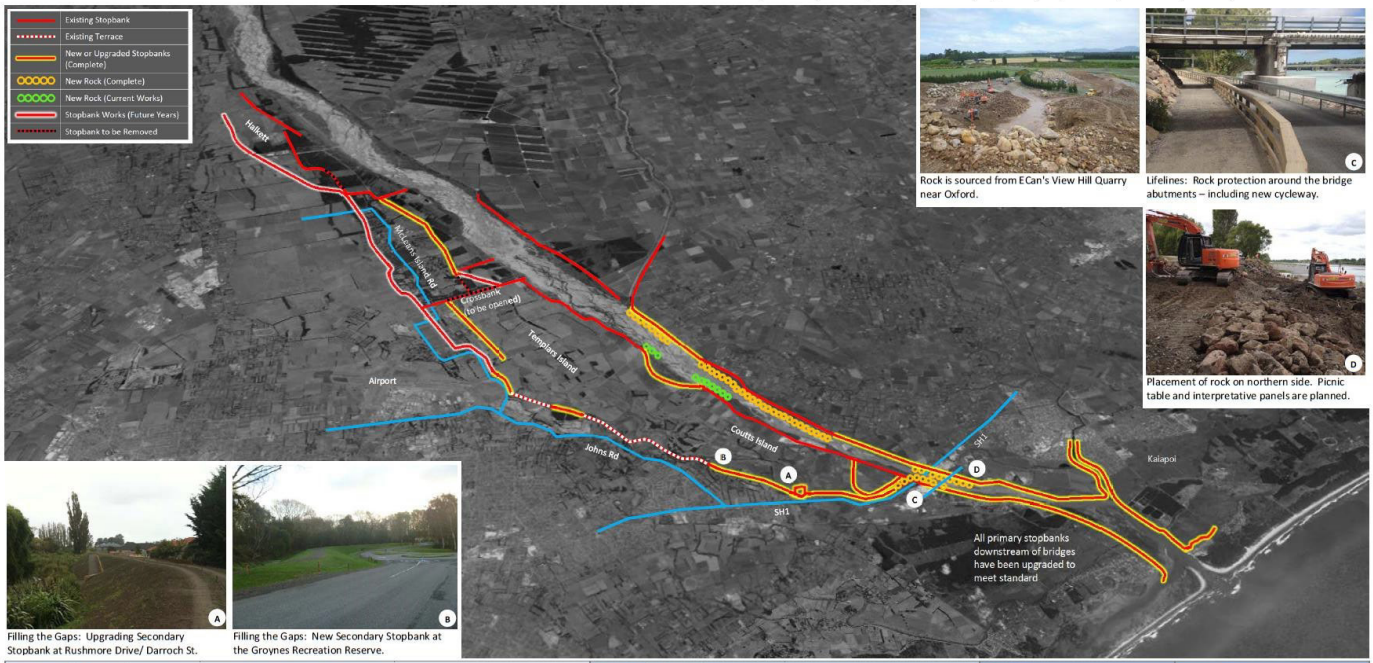
Figure 1: 1960s Waimakariri River Improvement Scheme

2.2 RISKS AND CONSEQUENCES OF A LARGE FLOOD EVENT

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

WAIMAKARIRI FLOOD PROTECTION PROJECT

Project Overview; July 2015:
The project objective is to provide Primary (500 year return period) and Secondary Waimakariri River flood protection to Waimakariri and Selwyn Districts and Christchurch City. It is a 10 year works programme to provide two layers of flood protection. Works are focused on stopping four potential breach paths where there is potential to flood Kaiapoi; Coutts/Templars Island, Belfast, Kainga and Styx Mill areas; Northern Christchurch; and Central and greater Christchurch. The two layers of flood protection differ along the north and south sides due to the natural topography and expected river behaviour. On the north side, the two layers are a rock lining and primary stopbank system. On the south side, the two layers are a primary and secondary stopbank system, with rock protection at potentially vulnerable locations.



Rock is sourced from ECan's View Hill Quarry near Oxford.

Lifelines: Rock protection around the bridge abutments – including new cycleway.

Placement of rock on northern side. Picnic table and interpretative panels are planned.

Filling the Gaps: Upgrading Secondary Stopbank at Rushmore Drive/ Darroch St.

Filling the Gaps: New Secondary Stopbank at the Groynes Recreation Reserve.

Years 1 to 3 (Complete)

Filling the Gaps:
Making the most of remnant stopbanks and natural river terraces, secondary stopbanks were constructed to create a continuous secondary line from Crossbank to SH1 on the south side. This provides protection to Christchurch.

Lifeline Protection:
Rock protection around the north and south abutments of the SH1, Main North Road and Railway bridges.

Downstream Primary System:
In conjunction with earthquake repair works, the primary system stopbanks from the SH1 to the sea were repaired and upgraded to design standard.

Years 4-5 (In Progress)

Rock Strengthening:
Creating a continuous rock lining on the northern side of the river including groynes between the bridges to provide protection of the berm and stopbank. Rock lining at historic breach zone on south side (Engelbrechts).

Preparing for Crossbank Works:
Making sure the entire system downstream of Crossbank meets the scheme standard. Works include Stoneyhurst Sawmill Ring Bank, Isaac stopbank, minor upgrade of primary stopbanks and McLeans Island primary stopbank.

Years 6-8

Crossbank and McLeans Island:
Part removal of Cross Bank and realignment of primary stopbank to create controlled flow path between primary and secondary stopbanks. Upgrading secondary stopbanks.

Years 9-10

Halkett:
Construction of a new secondary stopbank to capture and return potential breach flows which, if uncontrolled, could lead to significant flooding in central and greater Christchurch.

UK NATIONAL FLOOD RESILIENCE REVIEW: SEPTEMBER 2016

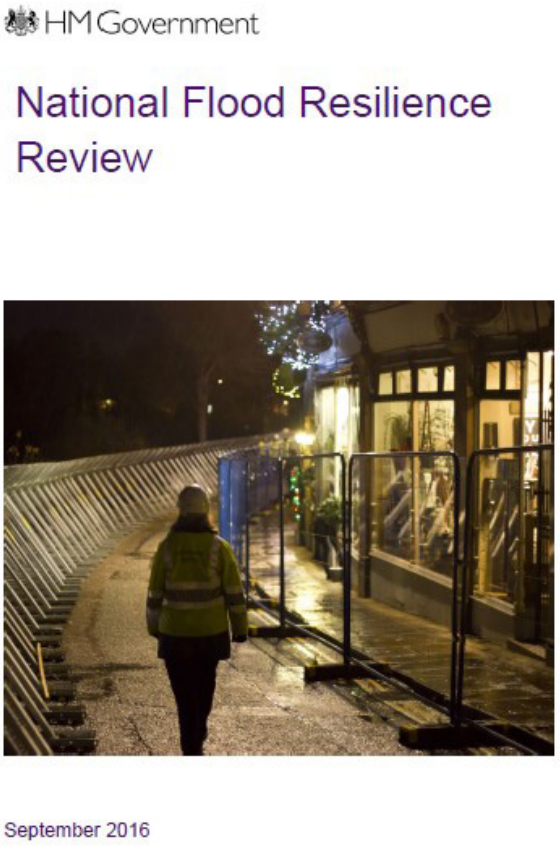
Following extreme flooding events in the UK, the UK government established a panel to complete a National Flood Resilience Review. This review has looked at how the UK:

- Understand the risks of river and coastal flooding from extreme weather in the UK over the next 10 years
- Assess the resilience of key local infrastructure (such as energy, water, transport and communications), and identify ways to protect it better
- Improve how we respond to flood incidents, including through new temporary flood defences

The review was set up in January 2016 to assess how the country can be better protected from future flooding and extreme weather events such as during December 2015.

The review was chaired by the then Chancellor of the Duchy of Lancaster, with a team including Cabinet Office, Defra, the Environment Agency, the Met Office, and the government's Chief Scientist.

Their report was published on 8 September 2016, and is available to download at; https://www.gov.uk/government/publications/national-flood-resilience-review



BLACK WILLOWS IN THE BAY

"Recently concerns have been raised publically by Ian McIvor, general manager of the Poplar and Willow Research Trust. He says that this season has seen GWA extend its range throughout the country and extend its active period by around two months. "It is having a devastating effect."

Black willows in the Bay

A black sooty covering over the trunks and branches of willows around the Bay of Plenty is becoming a regular sight and may have flow-on effects for bee-keepers, gardeners and councils that use the tree for riverbank stabilisation work.

The blackening is sooty mould which feeds on the honeydew deposited on leaves and branches by the Giant Willow Aphid. The aphid taps into the sugar flow in the stem of the willow and the pressure of sap through the aphid produces honey dew.

The giant willow aphid, which measures 5-6mm, was first sighted and reported in Auckland in December 2013 and quickly spread throughout the North Island and as far south as Invercargill.

Bay of Plenty Regional Council Principal Works Engineer, Tony Dunlop, said that the sight of black willow trees around the Bay had become the norm over the last two seasons.

"There were pockets of the aphid across the Bay a couple of years ago, but the mild winter this year seems to have allowed the aphid to spread to the point that I would go so far as to say that it is rare now to see a willow without a black trunk. This is potentially a big issue for river edge protection works as the willow is a key tool for strengthening river banks against erosion," Mr Dunlop said.

Ian McIvor, general manager of the Poplar and Willow Research Trust, said that the spread had been rapid across the country in the last couple of years and the effect had been devastating.

"There is no evidence it harms the tree but we've not seen it as extensive as this season and the giant willow aphid so far into the winter period," Mr McIvor said.

Willows are the only recognised host plant and the impact has been seen in ornamental and decorative trees in plants and gardens. Wasps also fed on the honey dew and the increased wasp numbers may be creating potential issues for members of the public with a higher risk of wasp stings. If the tree health is harmed, there are also flow-on effects for the habitat and shade they provide for trout and tuna/eels and the insects they feed on. A key concern for regional council is the potential loss of the trees on riverbanks providing erosion control and bank stabilisation.

"We just don't know enough about how this problem affects the trees long term. While research is being done and many people are keeping an eye on the issue, we have to take a wait-and-see approach. So far, it doesn't look like there is an impact on the overall tree health, but as I say, it is a fairly recent problem so it may take time before issues become obvious. Our neighbour Council, Horizons Regional Council, is conducting field trials to find out more about the impact on tree health and growth and we have a small trial underway at our Te Rahu nursery and that will also provide some more for us to go on," Mr Dunlop said.

Beekeepers are also keeping an eye on the issue and carrying out their own research into possible solutions as bees harvest the honey dew, which can change the characteristics of their honey including raising its melting temperature, creating a grainy

texture and causing discolouration.
The National Beekeepers Association has received funding assistance from regional councils and the MPIs Sustainable Farming Fund to investigate biological controls for the aphid, willow tolerance to the pest and its effect on honey quality.

KAPITI EXPRESSWAY: NEW WAIKANAE BRIDGE CONSTRUCTION

Iain Smith – Associate – Civil Engineering Beca

On the 27 April 2016 the first Super Tee bridge deck beams were placed over the Waikanae River as part of NZ Transport Agency's new Mackays to Peka Peka (M2PP) Expressway on the Kāpiti Coast. The structural engineers and constructors will tell you that the Waikanae River Bridge is 180m long with five spans supported on twin piers. They'll say the bridge involves ground breaking and innovative engineering: it has the first 1825mm deep Super-Tee beams used in NZ, it has the longest precast beams used in NZ at 38m long, these were lifted with the largest crawler crane in NZ, the bridge has the biggest bored piles ever attempted in NZ at 3m diameter and that is before we get into how it was designed to handle earthquakes and the novel construction technique of 'cage plunging' (does away with pile caps). However, a rivers engineer will tell you a different story about the reason the bridge is there in the first place, that is, the river.

The Waikanae River is relatively narrow (often less than 20m wide) as it crosses the coastal floodplain. It spills its banks about once a year on average and has a 100yr ARI peak flow (with climate change to 2115) of about 500m3/s. This gives a flood depth of 2m over the floodplain and a maximum velocity of 3m/s (interestingly, down a public walking trail). It is actually the 5m clearance for maintenance vehicles, rather than freeboard to a flood level, that sets the height of the bridge. The wider river works associated with the bridge included adjusting about 150m of the main channel to better align with GWRC's sinuous design corridor. The new banks will be planted in willows interspaced with native trees. Rock rip rap was used around the bridge structure to protect the piles from scour (D50=400mm).

The bridge was delivered by an Alliance between the Transport Agency, Beca, Higgins and Fletcher Construction (with significant help along the way from several Greater Wellington Regional Council officers) over a period of six years from the concept stage, through a Board of Inquiry, detailed design and now it is well through construction. A walk to the bridge along the Waikanae River trail makes for an excellent excursion on a sunny weekend. The reader is also referred to the YouTube video clips that are well worth a watch: https://www.youtube.com/watch?v=tx_o3w8LATE and https://www.youtube.com/

SPATIAL EFFECTS OF THE CANTERBURY EARTHQUAKES ON INANGA SPAWNING HABITAT AND IMPLICATIONS FOR WATERWAYS MANAGEMENT

Spatial effects of the Canterbury earthquakes on inanga spawning habitat and implications for waterways management.

Shane Orhcard, University of Canterbury

ABSTRACT

The Canterbury earthquakes resulted in numerous changes to the waterways of Ōtautahi Christchurch. These included bank destabilisation, liquefaction effects, changes in bed levels, and associated effects on flow regimes and inundation levels. This study set out to determine if these effects had altered the location and pattern of sites utilised by inanga (Galaxias maculatus) for spawning, which are typically restricted to very specific locations in upper estuarine areas. Extensive surveys were carried out in the Heathcote/Ōpāwaho and Avon/Ōtākaro catchments over the four peak months of the 2015 spawning season. New spawning sites were found in both rivers and analysis against pre-earthquake records identified that other significant changes have occurred. Major changes include the finding of many new spawning sites in the Heathcote/Ōpāwaho catchment. Sites now occur up to 1.5km further downstream than the previously reported limit and include the first records of spawning below the Woolston Cut. Spawning sites in the Avon/Ōtākaro catchment also occur in new locations. In the mainstem, sites now occur both upstream and downstream of all previously reported locations. A concentrated area of spawning was identified in Lake Kate Sheppard at a distinctly different location versus pre-quake records, and no spawning was found on the western shores. Spawning was also recorded for the first time in Anzac Creek, a nearby waterway connected to Lake Kate Sheppard via a series of culverts. Overall the results indicate that spawning is taking place in different locations from the pre-quake pattern. Although egg survival was not measured in this study, sites in new locations may be vulnerable to current or future land-use activities that are incompatible with spawning success. Consequently, there are considerable management implications associated with this spatial shift, primarily relating to riparian management. In particular, there is a need to control threats to spawning sites and achieve protection for the areas involved. This is required under the New Zealand Coastal Policy Statement 2010 and is a prominent objective in a range of other polices and plans.

IPENZ RIVERS GROUP CONTESTABLE FUNDS 2016

The IPENZ Rivers group is pleased to announce the following projects have been successful in their applications for support funding from the Rivers Group. We wish them every success in achieving their project objectives and look forward to sharing updates on their progress and outputs in future newsletters and Rivers Groups events. Eight applications were received for consideration. Thank you very much to all those that put forward a proposal, it is unfortunate that we could not fund them all and help our rivers.

Proponent	Project Title	Project Aims
Public Group Projects		
Koraunui School (Stokes Valley) *Contacts; Dianne Christenson and Sarah Neighbours*	Koraunui Kaitiaki - Inanga Action Group	Restore fish passage by remediating barriers and restore habitat by undertaking planting
Hikurangi Huataukina Trust (Ruatoria) *Contact: Manu Caddie*	Assessing sustainable water extraction rates for maintaining ecosystem function within the Waiapu river system.	To assess sustainable water extraction rates for maintaining ecosystem function within the Waiapu River system
Student Projects		
Brandon Goeller, University Canterbury School of Biological Sciences	Trialing denitrifying bioreactors to remove nitrate-nitrogen and improve stream health in Canterbury agricultural waterways	Reduce the export of leached nitrate-nitrogen from subsurface tile drains into receiving waterways
Stephen Pohe University. Canterbury School of Biological Sciences	Understanding the ecology of New Zealand Ephemeroptera: important insects in river food-webs and water quality monitoring.	To support DNA sequencing, enable taxonomic validation and establish distributional ranges of mayfly fauna in New Zealand Rivers.
Andrew Neverman, Massey University	Hydrological limits setting: The missing tool for river management	To develop a new model for hydrological limit setting to manage periphyton in New Zealand Rivers.

REGIONAL EVENTS

Massey University Student Event 2016

The IPENZ Rivers Group hosted a student event at Massey University on the 27th July 2016.The hosting of the event had three key objectives:

1. To promote the IPENZ Rivers Group and its objectives with a view to the students joining the Rivers Group.

2. To celebrate the achievements of the top students taking environmental and river related courses at Massey run by Dr Ian Fuller and Dr Russell Death by an awards ceremony and presentation of the Rivers Group prizes

3. To provide an opportunity for guest speakers to address the students on relevant "river" related topics. This year the event was privileged to have two Group Managers from Horizons , Dr Jon Roygard and Ramon Strong, to appraise students of what Regional Council do and to outline potential career prospects within the Regional Council organisations.

About 30 students and staff attended. A lunch time BBQ followed the formalities

The successful students were: Ashley Lovell received the prize for highest achieving student in river processes (A+ river dynamics), Leia Murcott received the prize for highest achieving student in river management (A+ Applied River Management. Tom Kay received the highest achieving rivers student at 200 level (A+ rivers & slopes).

Photo post the awards ceremony: Ramon Strong, Leia Murcott, Ashley Lovell, Tom Kay, Dr Jon Roygard, Dr Ian Fuller, Dr Russell Death

UPCOMING CONFERENCES

Waterways postgraduate Student Conference 2016

15 November 2016, Lincoln University, Lincoln

The IPENZ Rivers Group again is a gold sponsor of this fantastic annual free event that showcases research of the Waterways Centre for Freshwater Management's Masters and Doctoral students. The Waterways Centre for Freshwater Management is a joint initiative between the University of Canterbury and Lincoln University, focussed on improving knowledge-driven management of freshwater resources in Canterbury. The Waterways Centre incorporates approximately fifty post-graduate students drawn from many spheres of research which include Civil & Natural Resources Engineering, Biological Sciences, Chemistry, Geology, Geography, Soil & Physical Sciences and Environmental management

Last year's Conference was attended by more than 100 participants from both Universities and the water industry, and included more than 20 oral presentations and several poster presentations ranging from freshwater ecology to stormwater management.

Check out www.waterways.ac.nz for more information and to register.

Freshwater Sciences Society Annual conference

5-8 December 2016, Ascot Park Hotel, Invercargill

'Freshwater on the edge' is this year's theme and reflects the push towards the edge of our scientific knowledge, including the scientific innovation to maintain and restore the health of some of our special freshwater resources. In cases, we may be approaching tipping points for some of our lakes, rivers and estuaries. Can we bring them back from the edge?
This conference will provide a forum for sharing scientific and environmental knowledge with the concept of 'ki uta ki tai' running throughout. Leading edge science, restoring important ecosystems and looking to the future of freshwater science are just some of the topics to be covered at this years' conference.

Check out http://on-cue.us4.list-manage2.com/track/click?u=3e0f37a-e44848c72d55ec110e&id=17e-c69a78c&e=964c9ecade
for more information

TAURANGA REGIONAL MEETING
29 September 2016

IPENZ Tauranga Branch, together with the Rivers Group and WaterNZ Modelling and Stormwater Groups are pleased to invite all engineers, environmental practitioners and other interested parties based in the Tauranga area to attend two paired presentations on issues associated with management of an urban stream outletting to the coast. The two presentations will be followed by optional networking across several interest groups. Nibbles will be provided and a cash bar is available at the venue.

Date: Thursday 29 September
Time: 5:30pm for 6:00pm start
Venue: Tauranga Club, Level 5, 72 Devonport Road, Tauranga

Presentations:
Kelvin Hill – Western Bay of Plenty District Council "Two Mile Creek Waihi Beach – Implications today of a 1930's decision"
Coral-Lee Ertel - Western Bay of Plenty District Council "Not a storm in a teacup"

Two Mile Creek was established by the landowners of large agricultural blocks in the 1930's. These blocks were subsequently subdivided and developed, and zoned as both residential and commercial areas. Development has seen what was once flat swamp land being converted to urban environment with a significant shift to hard stand areas with minimal consideration given to stormwater conveyance. This has seen historical settlement patterns increase the consequence of flooding events. During the last 70 years, development has seen both sides of the creek being inundated. Damming at the creek outlet has caused constant wetting and drying of the creek banks. This coupled with storm surge/wave energy from the coastal marine area has led to significant erosion of the banks. The subsequent landowners have reacted with protests to Council about flooding and streams bank erosion issues. They perceive Council to be the owner of the stream based on previous maintenance work, and believe Council has a duty of care to investigate these issues.

RSVP: Please email your attendance to Tauranga.secretary@ipenz.org.nz By 26 September 2016.

For more information:
Contact Mark Pennington
mpennington@tonkintaylor.co.nz.

TALK ENVIRONMENT

THE NZILA, NZIA, NZPI, UDF, NZIS AND THE IPENZ RIVERS GROUP ARE PROUD TO ANNOUNCE:

Wellington's First Annual Party / Dance / Networking Event
For Professionals Working in the Environment

Bringing together Architects, Urban Designers, Landscape Architects, Planners, Engineers, Scientists, Surveyors and more.

Meet professionals from across the region and celebrate the environment we have all helped to create.

7.00pm:	Keynote Speaker - Dr. Jeffrey Wakefield
8:30pm:	DJ Operating
Event Registration Dates:	23/09/2016 6.00pm - 1:00am
Location:	The Boatshed, Wellington
Level:	All Planners

$45 for Professionals
$35 for Students
Tickets include your First Drink Free and Canapés
Click here to register

For more information, visit
http://www.planning.org.nz/Event?Action=View&Event_id=789

If you have any queries, contact Mark Ashby marka@4sight.co.nz




IPENZ'S RIVER GROUP AND WATER NEW ZEALAND'S STORMWATER GROUP JOINT REGIONAL EVENT

IPENZ's River Group and Water New Zealand's Stormwater Group welcomes all members and non-members of both organisations to attend a joint Regional event in Hamilton.

Two presentations will be followed by optional networking across several interest groups.

- Stopbanks Renewal Prioritisation – A Risk based approach for planning asset renewals. Presenter Ghassan Basheer, Waikato Regional Council.

- Hamilton City Council Stormwater Update, Andrea Phillips, Hamilton City Council.

Venue: Tonkin + Taylor, Norris Ward McKinnon House,
Level 5, 711 Victoria Street, Hamilton
Date: Wednesday 5th October 2016
Time: 5.30pm – 7.00pm

Please RSVP to Sarah Basheer Sbasheer@tonkintaylor.co.nz

EARLY BIRD REGISTRATIONS CLOSE 10 OCTOBER 2016

The New Zealand Hydrological Society, Engineers Australia's National Committee on Water Engineering & IPENZ Rivers Group, are pleased to invite delegates to attend the 2016 joint Conference for NZ Hydrological Society, Australian Hydrology and Water Resources Symposium and IPENZ Rivers Group. The Conference is being held in Queenstown, New Zealand from 28 November - 2 December 2016. The Conference promises to be an unforgettable event that will bring together over 400 delegates, who represent all levels of government, universities, students, researchers, contractors, suppliers and consultants. The theme of the Conference is "Water, Infrastructure and the Environment". Over 4 days, Conference delegates will hear from leading experts in hydrology and will include concurrent oral papers and poster presentations which form a major part of the conference programme.
We look forward to seeing you in Queenstown in 2016.

KEYNOTE & GUEST SPEAKERS

We have an exciting line-up of plenary speakers covering a wide range of topics

PETER GOODWIN,
IDAHO UNIVERSITY

Talk Time: 29 November, 9.00am - 9.45am

JEN CRAWFORD,
ANDERSON LLOYD

Talk Time: 30 November, 8.30am - 9.15am

RORY NATHAN,
UNIVERSITY OF MELBOURNE

Talk time: 1 December, 9.00am - 9.45am

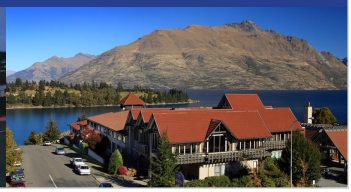
BLAIR FITZHARRIS,
MUNRO ORATION

Talk Time: 30 November, 6.00pm - 7.00pm

ACCOMMODATION

Queenstown offers a wide range of accommodation options to suit all budgets. Get in quick to book your accommodation before it's too late.

Accommodation options can be found on the conference website http://www.nzhs2016.co.nz

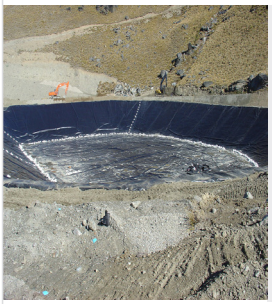


PROGRAMME AT A GLANCE

Please note: This is a provisional programme and is subject to change at the discretion of the conference committee.

MONDAY, NOVEMBER 28, 2016	
	Workshops including Groundwater Forum
5:00 PM - 7:00 PM	Registration and Welcome Drinks, Copthorne Hotel
TUESDAY, NOVEMBER 29, 2016	
	Opening Ceremony
8:30 AM - 9:00 AM	Official Conference Opening, Millennium Hotel
9:00 AM - 9:45 AM	Keynote: Peter Goodwin, Idaho University
10:00 AM - 10:30 AM	Concurrent Sessions
10:30 AM - 11:00 AM	Morning Tea
11:00 AM - 12:00 PM	Concurrent Sessions
12:00 PM - 1:30 PM	Lunch
1:30 PM - 3:00 PM	Concurrent Sessions
3:00 PM - 3:30 PM	Afternoon Tea
3:30 PM - 4:30 PM	Concurrent Sessions
4:45 PM - 5:45 PM	Poster Session
6:30 PM - 7:30 PM	AGM
7:30 PM	Envco Young Professionals Function
WEDNESDAY, NOVEMBER 30, 2016	
8:30 AM - 9:15 AM	Keynote: Jen Crawford, Anderson Lloyd
9:15 AM - 10:00 AM	Concurrent Sessions
10:00 AM - 10:30 AM	Morning Tea
10:30 AM - 12:00 PM	Concurrent Sessions
12:00 PM - 1:30 PM	Lunch
1:30 PM - 3:00 PM	Concurrent Sessions
3:00 PM - 3:30 PM	Afternoon Tea
3:30 PM - 5:00 PM	Concurrent Sessions
6:00 PM - 7.00 PM	Blair Fitzharris, Munro Oration
THURSDAY, DECEMBER 1, 2016	
9:00 AM - 9:45 AM	Keynote: Rory Nathan, University of Melbourne
9:45 AM - 10:30 AM	Concurrent Sessions
10:30 AM - 11:00 AM	Morning Tea
11:00 AM - 12:30 PM	Concurrent Sessions
12:30 PM - 1:30 PM	Lunch Rivers Groups AGM (during lunch)
1:30 PM - 3:15 PM	Concurrent Sessions
3:15 PM - 3:45 PM	Afternoon Tea
3:45 PM - 5:00 PM	Concurrent Sessions
5:00 PM	Conference Close
6:00 PM - Late	Conference Dinner, Skyline Gondola
FRIDAY, DECEMBER 2, 2016	
From 7:00 AM	Field Trips

FIELD TRIPS - FRIDAY, DECEMBER 2, 2016



Cardrona Field Trip

(8:00am - 4:30pm)

The Cardrona trip will depart Queenstown and travel over the famous Crown Range road and up the Cardrona Valley, stopping to take in a distillery, the historic Cardrona pub and an irrigated farm. From there you will visit the Cardrona Ski Field for a tour of the mountain, a short drive on will take you to Lake Wanaka, then back to Queenstown. A packed, picnic lunch will be included.

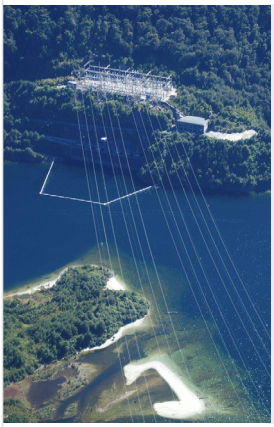
Clyde Dam & Winery Lunch

(8:00am - 4:30pm)

Departing from Queenstown, this trip will include a tour of the Clyde Dam, a stop at NIWAs Lauder Climate Station and a look at the Manuherikia Irrigation Scheme. A visit to Bannockburn Winery Carrick Estate will round out the trip with a return to Queenstown. A winery lunch wil be included.

Dart / Rees River Trip

This trip could be run as a short trip (jet boat ride only) or a full day trip, including a funyak (inflatable kayak) experience for part of the trip. The trip will explore the Dart and Rees rivers.



Manapouri Field Trip

(7:00am - 6:00pm)

After a 2 hour bus trip through some stunning NZ scenery you will have an hour long cruise across Lake Manapouri to West Arm, and a tour of the Manapouri Dam power station. The trip includes a packed lunch.
You will need to bring your own overalls and boots, if possible. Meridian will supply hard hats.

Disclaimer: The Station Tour is subject to close out from unexpected station events, where visitors are not able to be accommodated on the day. If this occurs the Station Tour will be replaced with other places of interest around the Lake, including the control structures.

Water and Wine Bike Tour

(9:00am - 5:30pm)

This field trip is a tour of rivers and wineries by bicycle! Attendees will be provided with mountain bikes, helmets and a safety briefing and will then set off on a scenic ride from Arrowtown along the beautiful Arrow River Trail until it meets the Kawarau River. Total riding distance is < 25 km with an expected riding time of 4-5 hrs, leaving plenty of time to stop and enjoy the scenery, wine and a picnic along the way! This trip includes bike hire, lunch and vehicle support. Wine tastings are optional extras.

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REGISTER ONLINE - EARLY BIRD CLOSES 10 OCTOBER 2016

www.nzhs2016.co.nz