manatiaki kōawa
rivers
GROUP

A joint technical interest group of IPENZ & Water NZ

INSIDE THIS ISSUE

NEWSLETTER

Issue 18 | June 2017

FROM THE CHAIR

Kyle Christensen

WELCOME to Issue 18 of the Rivers Groups Newsletter, "Flow", our second for 2017.

In this opening message for the newsletter I'm going to discuss a New Zealand Standard that I hope you're familiar with - NZS 9401:2008 Managing Flood Risk – A Process Standard. When NZS9401 first came out I will admit that I was a little disappointed, I had been expecting specific, quantitative information on hydrological and hydraulic modelling, geomorphic analysis, freeboard and the design of stopbanks and river control works. None of these technical aspects of managing flood risk are provided in NZS9401, what it does provide is a "risk-based approach for the comprehensive management of flood risk". Within NZS9401 there are six general categories (22 sub-categories) of outcomes that should result from the successful application of the process described within the standard.

The six categories of outcomes are –

1 Engaging Communities and Stakeholders;
2 Understanding Natural Systems and Catchment Processes;
3 Understanding the Interaction of Natural and Social Systems;
4 Decision Making at the Local Level;
5 All Possible Forms and Levels of Management;
6 Residual Risk.

Engaging the community and stakeholders in the development and agreement on the flood risk management options is fundamental to the process but is also very time consuming and difficult to achieve. There will always be diversity in the degree of risk aversion and financial freedom within individual communities, so coming up with a combination of management options that meets everyone's needs and is affordable will be difficult. It is worth elaborating on the point that there are a number of forms that flood risk management can take and it is the combination of four key, interrelated elements that provide the overall flood risk management solution.

The four key elements are –

- Structural works (stopbanks, flood diversion channels, pump stations, detention dams etc);
- River management/maintenance works (rock work, willow planting, channel and beach recon touring, gravel extraction etc);
- Emergency Management/Resilience/Insurance (evacuation plans, flood proofing, insurance etc);
- Planning Controls (flood maps and building restrictions often in district plans).

By way of an example, imagine a community considering two combinations of options -

Option 1 – Large stopbanks designed for the current 200 year return period flood (100 year including climate change) located close to the active river channel. This choice of structural option then necessitates relatively intensive river management to ensure the stopbanks are not eroded and the capacity of the main channel is maintained in its design condition. There is a need for emergency management and resilience for managing events in excess of the design standard but there is a relatively low likelihood of the capacity of the system being exceeded. Likewise, the planning controls will not be particularly restrictive as they are for managing residual risk in the event of a failure or exceedance of capacity. Development would still be generally directed away from the higher risk areas close to the stopbanks.

Option 2 – Small stopbanks designed for the current 50 year return period flood (20 year including climate change) located further away from the active channel. This choice of structural option provides the opportunity for less intervention in terms of active management of the river channel and reduces the need for rock lining or rock groynes as the river can erode without immediate threat to the stopbanks. In this situation emergency management, resilience and insurance is much more important as it is more likely that the structural works (stopbanks) will be overwhelmed. Planning controls will also need to be more restrictive in this situation due to the higher likelihood of property being inundated.

FROM THE CHAIR CONTINUED...

Kyle Christensen

Both of these options provide equally valid forms of flood risk management and it should be up to the community and stakeholders to decide which combination of flood risk management elements provides them with an acceptable level of risk for an acceptable cost.

Some excellent examples of implementation of this general process are provided within the Floodplain Management Plans undertaken by the Greater Wellington Regional Council over the past 20 years.

http://www.gw.govt.nz/otaki-river-floodplain-management-plan/

http://www.gw.govt.nz/assets/Our-Services/Flood-Protection/Hutt/FP-Hutt-River-FMP.pdf

http://www.gw.govt.nz/assets/Our-Services/Flood-Protection/Waikanae-River/FP---Waikanae-FMP.pdf

I would encourage you all to read or re-read NZS9401 and think about how you can use the approach described in the standard on individual projects or large community/catchment schemes.

I would also like to take this opportunity to send my thoughts out to the people of the Bay of Plenty affected by Cyclone Debbie back in April, particularly the residents of Edgecumbe that have had their homes destroyed or significantly damaged by the event. I know an enormous amount of work is going into undertaking repairs and helping out the communities that have been affected.

I feel very privileged to have been given the opportunity to be part of the review panel being led by Sir Michael Cullen to understand the circumstances that led to the breach of the Rangitaiki River stopbank in Edgecumbe and to come up with recommendations for future actions that the Bay of Plenty Regional Council might take. The review panel is using NZS9401 as the framework for undertaking this work.

Kyle Christensen
Chairman

Minimising The Environmental Effects of Dredging – Wharemauku Stream

Kyle Christensen[1], Disna Pathirage[2] , Paul Halliday[2], Rita O'Brien[2], Guy Forrest[3]

[1]Christensen Consulting Limited, [2]Kapiti Coast District Council, [3]Goodman Contracting Limited

ABSTRACT
The regular removal of sediment that builds up in natural waterways is a vital part of ensuring that the capacity of the channel is maintained so the agreed level of service is provided. This also applies to the stormwater networks that discharge into the natural waterway which can be significantly affected by elevated tailwater conditions or in worst case scenarios completely buried outlets. Cross section survey of the Wharemauku Stream in Paraparaumu (Kapiti) revealed that bed levels had built up by up to 800 mm above the 1994 design baseline. This degree of build-up was affecting the capacity of the main channel but also drowning a number of stormwater outlets that serve residential and commercial areas as well as creating backwater effects up tributary drains. The removal of sediment from within waterways has the potential to have adverse environmental effects, particularly on fish which can be excavated with the material being taken out of the stream. This was recognised as a significant risk and a methodology was developed that involved deploying fish proof nets at the upstream and downstream extent of a reach and electric fishing and relocating fish before any excavation was undertaken. Using this methodology resulted in the safe relocation of many hundreds of eels as well as numerous Red Fin Bullies, Banded Kokopu, Bluegill Bullies & Koura. The project successfully excavated over 3000 m3 of sediment from the waterway to achieve the required design standard whilst minimising environmental effects using a best practice methodology that went beyond resource consent requirements.

KEYWORDS
Sediment, dredging, stormwater, fish, waterway capacity, consent conditions.

INTRODUCTION
The dredging or extraction of gravel, silt and sand from waterways has long been used as a mechanism for maintaining waterway capacity to reduce the effects of flooding. The areas where sediment is most likely to deposit in fluvial systems is where the gradient begins to flatten as the river/stream approaches a downstream control, most commonly the ocean. As the gradient flattens the ability of the stream to keep incoming sediment entrained reduces and a depositional regime will dominate. The flatter areas adjacent to rivers and streams were often where communities established as the river or stream provided and important source of food, water and transport. Over time, as development intensified in these areas, stopbanks and stormwater networks were constructed to manage the risks of flooding. The design of this infrastructure was often based on the particular river bed levels evident at the time the design was undertaken.

The issue then arises when sediment builds up in the main channel which reduces its capacity resulting in an increased likelihood of stopbanks overtopping as well as non-performance of the stormwater network due to high tailwater levels or in the worst case buried outlets. The sediment build up can be managed by building higher stopbanks and with pumping stations for stormwater outlets but the solution that is often considered the most cost effective is physical excavation or dredging of the deposited material.

The two primary issues with physical excavation of the deposited material are the high cost, due to the often difficult working conditions within active waterways and the potential for significant environmental impact, particularly on the freshwater ecology. The cost of extraction can be highly variable relating to the type of material being excavated, whether it is contaminated and the constraints with working around the site. In some instances, contractors will pay a royalty or concession to extract gravel as it can be used as a resource. In other instances, particularly where contamination is an issue, costs can be as high as $500/m3 (Hutt City Council, 2010).

The impacts on freshwater ecology are particularly relevant during the physical works with habitat disturbance, physical removal (and subsequent fatality), sediment smothering and as well as the possibility of ongoing effects with habitat destruction.
The above generalisations can apply to any community established next to a river or stream but for the purposes of this paper the particular issues presented by the Wharemauku Stream and the community of Paraparaumu on the Kapiti Coast will be examined with discussion of how a dredging programme can be undertaken with less than minor adverse environmental effects to achieve the agreed level of service for the flood protection assets as well as the stormwater network.

Click the link to view the full paper online: https://www.dropbox.com/s/1odmuvxgrnju4au/Christensen_2017STORMWATERCONFERENCE.pdf?dl=0

MASSEY RESEARCH PROJECT UPDATES

Hydrological limits setting: The missing tool for river management

Andrew Neverman

The IPENZ Rivers Group have provided me with a Student Research Grant to carry out further work using impact plate geophones to identify bedload transport thresholds. This work aims to establish a new approach for setting environmental flows (flushing flows/hydrological limits) where physical process thresholds are used to identify what flows are required to achieve desired ecological outcomes. In this case, we are looking at the role of bedload transport in removing excess periphyton in gravel-bed rivers. The Rivers Group started supporting the project with a Student Research Grant in 2015 which supported the development of a prototype impact plate (see FLOW Issue 14, March 2016). Following the last update on the project we have installed a second impact plate in the Rio Cordon, in the Italian Dolomites, to test the ability of the impact plate to detect bedload transport alongside the famous Rio Cordon bedload monitoring station. This project has been a success, with the impact plate recording two small bedload events last year, which were validated by other data sets collected at the monitoring station.

Figure 1. Location of the impact plate at the Rio Cordon monitoring station. View is from the top of the grate in figure 2.

Figure 2. Bedload material is sepearetd from the flow and collectedin a pile. The pile is then surveyed for volume and grain size distribution. This data can be used to validate the geophone data.

The impact plate has also recorded a number of bedload transport events at the Pohangina River, Manawatu, New Zealand between September 2016 and January 2017. Alongside the impact data we have also recorded near-bed velocity and groundwater seepage in an attempt to identify thresholds for the initiation of motion. We are currently analysing this dataset and will have a paper on the results this year as I finish my PhD project. Preliminary results from this work have been presented at Hydro Soc 2016, ANZGG 2017, and EGU 2017.

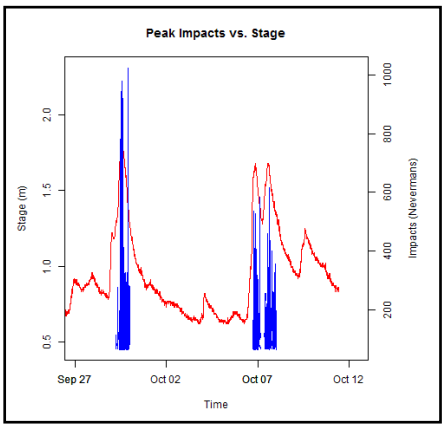

Figure 3. An example of what can be done with the geophone data, comparing stage to bedload movement. The blue lines indicate the magnitude of clast strikes on the plate (i.e. bedload movement) and the the red lines represent stage.

I would like to thank the Rivers Group for supporting this project.

Andrew Neverman
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PROJECTS UPDATE CONTINUED...

Application and Evaluation of Sediment Fingerprinting Techniques in the Manawatu River Catchment, New Zealand.

Simon Vale

Dr Simon Vale graduated in May having completed a Ph.D. investigating, Application and Evaluation of Sediment Fingerprinting Techniques in the Manawatu River Catchment, New Zealand. Simon was supervised by Dr Ian Fuller & Dr Jon Procter at Massey, and Dr Les Basher and Dr John Dymond at Landcare Research. He is now working as a Scientist-Geomorphology at Landcare Research.

Abstract

Suspended sediment is an important component of the fluvial environment, contributing not only to the physical form, but also the chemical and ecological character of river channels and adjacent floodplains. Fluvial sediment flux reflects erosion of the contributing catchment, which when enhanced can lead to a reduction in agricultural productivity, effect morphological changes in the riparian environment and alter aquatic ecosystems by elevating turbidity levels and degrading water quality. It is therefore important to identify catchment-scale erosion processes and understand rates of sediment delivery, transport and deposition into the fluvial system to be able to mitigate such adverse effects. Sediment fingerprinting is a well-used tool for evaluating sediment sources, capable of directly quantifying sediment supply through differentiating sediment sources based on their inherent geochemical signatures and statistical modelling.

Confluence-based sediment fingerprinting has achieved broad scale geochemical discrimination within the 5870 km2 Manawatu catchment, which drains terrain comprising soft-rock Tertiary and Quaternary sandstones, mudstones, limestones and more indurated greywacke. Multiple sediment samples were taken upstream and downstream of major river confluences, sieved to < 63 µm and analysed through step-wise discrimination, principle component analysis and a rangeof geochemical indicators to investigate and identify the sub-catchment geochemical signatures. Discrimination between the main sub-catchments was attained despite each sub-catchment containing similar rock types, albeit with varying proportions of specific lithologies. This meant that source groups were categorized as a mixture of both lithological and geomorphological sources in order to best capture the unique sediment origins. Comprehensive sampling quantified 8 geomorphological sediment sources using two mixing models; the traditional mixing model after Collins et al. (1997) and the Hughes et al. (2009) mixing model which were each optimized using a 'Generalized Reduced Gradient |(GRG) Nonlinear' and an 'Evolutionary' technique providing fourmixing model scenarios. These models showed good agreement attributing mudstone derived sediment (≈ 38 – 46 %) as the dominant source of suspended sediment to the Manawatu River. Sediment contributions were also estimated from the Mountain Range, ≈ 15 – 18 %; Hill Surface, ≈ 12 – 16 %; Hill subsurface, ≈ 9 – 11 %; Loess, ≈ 9 – 15 %; Gravel Terrace, ≈ 0 – 4 %; Channel Bank, ≈ 0 – 5 %; and Limestone, ≈ 0 %. Intra-storm analysis of sediment sources was investigated through hourly suspended sediment samples taken in the lower Manawatu River during a 53 hour storm event to detect changes in sediment sources. The suspended sediment samples displayed high hourly variability which was attributed to model uncertainty and sedimentpulses occurring between sampling. Mudstone proportions fluctuated ≈ 20 – 60 % throughout the storm duration from a range of erosion processes, while Mountain Range sediment fluctuated from ≈ 24 – 46 % and Hill Subsurface and Hill Surface both reached near 0 %, but approached upper values of ≈ 23 % and ≈ 24 % respectively. Significant shifts in sediment source proportions were observed between 2:00 – 8:00 am 29th November 2013 in relation to flow dynamics of the Pohangina River and shifting flow dominance from the Pohangina River to the Upper Manawatu. The geochemical suite was reanalysed to determine the variability of source groups and individual geochemical elements, in order to evaluate the suitability and impact of changing the geochemical suite used in estimated relative sediment source proportions. Mountain Range sediment displayed the highest average S.D. % of 39.4, followed by Gravel Terrace (S.D. % = 34.6) and Loess (28.1), while the lowest was found in Limestone (S.D. % = 18.1) and Channel Bank (S.D. % = 18.3). The highest variability of individual elements was found in the transition elements such as Cu, Ni, Cr, and Mn, as well as Ca, and Tm. Revised mixing models were run based on two geochemical tracer suites which removed elements with S.D. percentage of > 40 and > 35 respectively. The revised mixing model estimated Mudstone terrain to contribute 59.3 % and 61.8 % respectively, with significant contributions estimated from Mountain Range (12.0 % and 11.4 %) and Hill Surface (11.5 % and 11.3 %) respectively, indicating that Tm, Ni, Cu, Ca, P, Mn and Cr have an influence on sediment source estimations.

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PROJECT UPDATES CONTINUED...

Flood Histories Project

Work is continuing in the Physical Geography Group at Massey to investigate flood histories using sediment archives. Preliminary results from the Manawatu were presented at the Queenstown Conference in November 2016. Further exploratory work is underway in the Whanganui, with an 8.6 m core extracted from the Atene valley cutoff in March this year. The core is currently being analysed using XRF core scanning to distinguish and detect flood units. Radiocarbon dating of the core suggested this sediment archive extends over ca. 2,000 yr. If this is correct, this work presents a unique opportunity to develop a high resolution flood archive in this system. The research is being led by Dr Ian Fuller in the Institute of Agriculture & Environment at Massey, and Prof Mark Macklin who shares an appointment between Massey and the University of Lincoln (UK). Field assistance was provided by David Feek (Geography Technician) and Erica Malloy (Masters student). Core scanning is being undertaken by Dr Jon Turner at University College Dublin, making this work a truly international collaboration.

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PHD PROJECT UPDATE

River channel change and sediment transfers in the Ruamahanga catchment

Will Conley

I initiated my PhD investigation of coarse sediment and channel dynamics in the upper Ruamahanga catchment in November 2016 associated with a partnership between Massey University and Greater Wellington Regional Council (GWRC). The thesis is supervised by Ian Fuller, Mark Macklin, Russell Death and Sam McColl at Massey, and Jon Tunicliffe at Auckland.

Preliminary results have identified multiple contemporary river paths that differ from prevailing prehistoric alignments with signs that changes may have been abrupt (e.g. avulsion). Forced channel, floodplain, and terrace forms and proximity to tectonic landforms suggest modern channel locations and patterns are under-ongoing influence of the southern North Island Fault System. Morphotectonic mapping is underway that will assist establishing fluvial process domains as well as inform contingency planning (e.g. for co-seismic events). Several valley segments with higher potential for break-out flooding and/or avulsion that would i pact Masterton, Carterton, and Greytown and surrounding areas have been identified for more detailed (segment/reach scale) investigation.

Though envelope analysis of the cross-sectional data record (initiated ca 1989) indicates general bed deflation, evaluation of intervals (3-5 years) indicates considerable spatial variability including transient, localized aggradation. Field observations between March and May of 2017 identified multiple instances of bar-scale sediment accretion that were not intersected by monumented cross-sections. Event-based sediment translocation and channel changes associated with discharges less than half of the annual recurrence flood were also observed.

Structure-from-Motion (SfM) processing is in-progress on six UAV-based imagery collections from two valley segments. SfM outputs will provide high-resolution surfaces for hydraulic modelling and inform morphological sediment budgeting and characterize coarse sediment flux. The spatially -continuous nature of the collection is expected to capture flux in a more robust manner that, coupled with increased sampling frequency, will facilitate more targeted future river management response.

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Ian Fuller: Lies, dam(ned) lies and flood statistics

CHRISTEL YARDLEY/FAIRFAX NZ

Building higher stopbanks is not the answer to preventing floodwaters from submerging homes, says Ian Fuller.

OPINION: So, another "500-year" flood event in the Bay of Plenty. The last was in 2005 at Matata.

Of course, this doesn't mean that in either Edgecumbe or Matata we need to wait another 500 years before seeing a repeat of such a big event.

As ably put by Niwa hydrologist Roddy Henderson in Q&A: What is a one in 500-year flood, and does that really apply to Edgecumbe?, it's about probabilities: a 500-year flood has a 0.2 per cent likelihood of happening in any one year.

These are rare events. No doubt the exact statistic assigned to Edgecumbe's flood will be debated.

What matters most is that it exceeded stopbanks designed to protect Edgecumbe, and did so by 30 per cent, according to the Bay of Plenty Regional Council.

As noted by Henderson, the problem with flood statistics is that they are derived from short records; just 65 years in the Rangitaiki River.

We do not have data to reliably determine how often such large floods recur. The likelihood of the largest floods occurring during short periods of data measurement is inevitably small. Further complicating the issue is climate, which changes. If the climate shifts to a more extreme phase, frequent larger floods can be expected. Models cannot take this into account, because they use only existing data. We need to better understand the nature of the problem. How does last week's flood compare with floods that occurred earlier than 65 years ago? What documentary evidence do we have for floods in our rivers that occurred before measuring flows?

Beyond that, what insight can tangata whenua provide, using oral histories spanning 800 years or so? At Massey University, we are now looking at deposits left behind by floods in the sediments that make up floodplains in order to extend flood records. In the Manawatu River we have a flood history spanning at least 2000 years, and we are currently working on sediment extracted from 5m and 8m cores in the Whanganui valley.

Ian Fuller: Lies, dam(ned) lies and flood statistics continued...

We need sedimentary archives linked with gauged, documentary and oral history information to produce a robust understanding of floods in our catchments. A multi-layered approach will help understand how large past floods have been and link these episodes of flooding to past climate, or other significant events affecting our rivers.

This knowledge is fundamental if we are to protect our communities.

Building higher stopbanks is not the answer, I believe. Higher stopbanks actually increase the risk of devastating failures such as we saw in Edgecumbe. When they fail, the power of the water at the breach is far greater than it would be in a naturally rising flood spreading across the floodplain.

There will always be an upper limit to flood defences, determined largely by how much society is willing to pay. Even if defences could be built that would withstand the 500-year flood, there remains the risk posed by the 1000-year flood. Inevitably flood defences fail and the higher the stopbank the greater the devastation.

In New Zealand many flood protection schemes simply have not been designed to accommodate very large floods, nor, practically, can they be.

We need to learn to live with floods by allowing more (although not necessarily all) floodwaters to spill on to floodplains. We saw this in Edgecumbe last week, when breaches were made in stopbanks upstream to relieve pressure downstream. Having to respond in such a way does suggest that we haven't quite got it right.

Nevertheless, the principle is sound: by permitting flooding in areas where people don't live, areas where people do live can be better protected. Inevitably in intensively farmed floodplains, this principle means losses in the agricultural sector, but compared with devastating loss sustained by communities like Edgecumbe, this may be a price society at large should consider paying.

Floodplain development should be restricted. Encroachment of housing, industry and infrastructure on floodplains puts people in harm's way. Past mistakes should not be perpetuated. Controlled flooding, flood-proof housing and floodways re-routing floodwater are all part of the answer. In some cases, managed retreat may be the best option. It's been suggested that the Matahina Dam was responsible for Edgecumbe's flooding. In reality, dams are effective in moderating impacts of small floods, but have less capacity to mitigate very large floods. It's easy to apportion blame after the fact, and community anger and frustration are entirely understandable. What is now required is a response that learns from the past, so that we can better prepare for the future and build a more resilient response to coming floods, which are 100 per cent likely to recur.

Dr Ian Fuller is an Associate Professor in Physical Geography in Massey University's Institute of Agriculture and Environment, working with Professor Mark Macklin (University of Lincoln, UK) on New Zealand flood histories.

- The Dominion Post

CONTESTABLE FUNDS

2017 Rivers Group Contestable Funds – Call for Applications

The call is now open for applications to the 2017 IPENZ Rivers Group Public Project Grant and the Student Research Grant. The closing date is August 18th, 2017.
Grants of up to $3,000 are available to support public sector groups (e.g. local government, community groups, not-for-profit, iwi/Maori) in works related to river management and restoration for one year, depending on the merits of the project proposal and the level of competition in a given year. The Student Research Grants are aimed at postgraduate researchers working on issues related to advancing river science and improving river management, depending on the merits of the project proposal and the level of competition in a given year.

The successful applicants from 2016 were supported for work on the following projects:

Manu Caddie, Hikurangi Huataukina Trust: "Assessing sustainable water extraction rates for maintaining ecosystem function within the Waiapu river system"
Dianne Christenson and Sarah Neighbours, Koraunui School, Lower Hutt - "Koraunui Kaitiaki - Inanga Action Group"

Andrew Neverman, Massey University: "Hydrological limits setting: The missing tool for river management"

Brandon Goeller, School of Biological Sciences, U Canterbury: "Trialling denitrifying bioreactors to remove nitrate-nitrogen and improve stream health in Canterbury agricultural waterways"

Stephen Pohe, School of Biological Sciences, U Canterbury: "Understanding the ecology of New Zealand Ephemeroptera: important food-webs and water quality monitoring"

Details and application forms can be found here: http://www.ipenz.org.nz/riversgroup/Funding_Opportunities.cfm.

Please send any questions and queries to j.tunnicliffe@auckland.ac.nz; completed applications are to be sent to <TechGroups@ipenz.org.nz> with subject line prefix [RG_Fund].

Geomorphic Principles and Applied Techniques in River Management

An IPENZ Rivers Group Workshop 16 and 17 November 2017,University of Auckland

manatiaki kōawa rivers GROUP
A joint technical interest group of IPENZ & Water NZ

THE UNIVERSITY OF AUCKLAND NEW ZEALAND	MACQUARIE University SYDNEY·AUSTRALIA	MASSEY UNIVERSITY TE KUNENGA KI PŪREHUROA UNIVERSITY OF NEW ZEALAND
Gary Brierley Jon Tunnicliffe	Kirstie Fryirs	Ian Fuller

We are please to offer a 2-day workshop to introduce essential concepts in fluvial geomorphology to tackle river management, as well as some practical perspective on usage and application of emerging technologies. The first day will provide an essential background in geomorphic principles, as well as new frontiers in river research and the implications for river management. A discussion session will serve to exchange ideas and issues in the context of New Zealand rivers.

Day Two will provide an overview of state-of-the-art techniques in river surveying, for the purposes of assessing inundation extents, and monitoring river change. A series of talks will review the capabilities and limitations of LiDAR, Structure-from-Motion and other point-cloud survey data, and the workflow from field to desktop. A hands-on demonstration will provide participants with an appreciation of new software tools and the potential for moving toward exploratory modelling flows and sediment transport using digital elevation data.

Day 1 - Introduction to Fluvial Geomorphology

1. Catchment perspectives in fluvial geomorphology
2. The diversity of rivers in NZ and overseas
3. Channel geometry and instream geomorphic units.
4. Floodplain forms and processes
   Practical exercise: The character and behaviour of different river types
5. River evolution (change): patterns, connectivity and geomorphic responses to human disturbance
6. River management and prioritisation: River Futures – managing rivers with a history on a trajectory

Discussion Session

Dinner

Geomorphic Principles and Applied Techniques in River Management Continued...

An IPENZ Rivers Group Workshop 16 and 17 November 2017,University of Auckland

Day 2 - The New Geomorphology Toolbox

1. An overview of survey techniques for river studies
2. Processing workflow, from field to desktop
   a. Instrumentation
   b. Quality control, best practices
   c. Specifying error, managing uncertainty
   d. Cleaning and visualising survey results
3. Leveraging new software tools for assessing and visualising channel change
   Practical Exercise: Merging river bathymetry and floodplain topography
4. Applications in modelling I: Flooding extents
5. Applications in modelling II: Morphodynamics
6. Implications for river management

Discussion Session

Closing thoughts: Putting it all together

For further information, please get in touch with Jon Tunnicliffe: j.tunnicliffe@auckland.ac.nz

5th Biennial Symposium of the International Society for River Science

International Society for River Science

INTEGRATING MULTIPLE AQUATIC VALUES

19-24 November 2017 | Hamilton, New Zealand

Waikato River Authority

rivers GROUP

In association with the New Zealand Rivers Group and the New Zealand Freshwater Science Society

REGISTER NOW CLICK HERE

WELCOME

We are pleased to invite you to the 2017 New Zealand Freshwater Sciences Society (NZFSS) Annual Conference, in association with the 5th Biennial Symposium of the International Society for River Science (ISRS) and the annual meeting of IPENZ/Water NZ Rivers Group. These Conferences are being held at Claudelands Events Centre in Hamilton from 19-24 November 2017, in partnership with the Waikato River Authority (WRA).

CONFERENCE THEME

"Integrating multiple values"

Working rivers provide a range of goods and services that are important for biodiversity, ecological functions and human use. Balancing these multiple needs is a key challenge for water resource managers, and achieving outcomes that satisfy growing human demands while protecting environmental values is extremely difficult. This conference will provide a forum for sharing scientific and environmental knowledge underpinning management of rivers for multiple goals.

CALL FOR ABSTRACTS NOW OPEN

Authors are invited to submit oral and poster abstracts under the following sub-themes:

- Environmental indicators and monitoring
- Freshwater restoration
- Community ecology and biological interactions
- Traditional knowledge
- Environmental flows and Ecohydraulics
- Floodplain interactions
- Ecological resilience
- Bioengineering and biomanipulation
- Connectivity
- Water quality

Abstract submissions close 30 April 2017.
Submit your abstract online at www.imav2017.com

WHO SHOULD ATTEND?

The conference is targeted for a multidisciplinary audience of 300-500 delegates from the physical, natural and socio-economic sciences, as well as those who manage, create policy for and use riverine resources and their associated aquatic environments.

CONFERENCE FORMAT

The conference will include plenary speaker presentations as well as special and general contributed sessions, poster displays, a diverse array of exhibits, networking functions, and field trips that showcase New Zealand's unique river environments and attractions.

KEY DATES

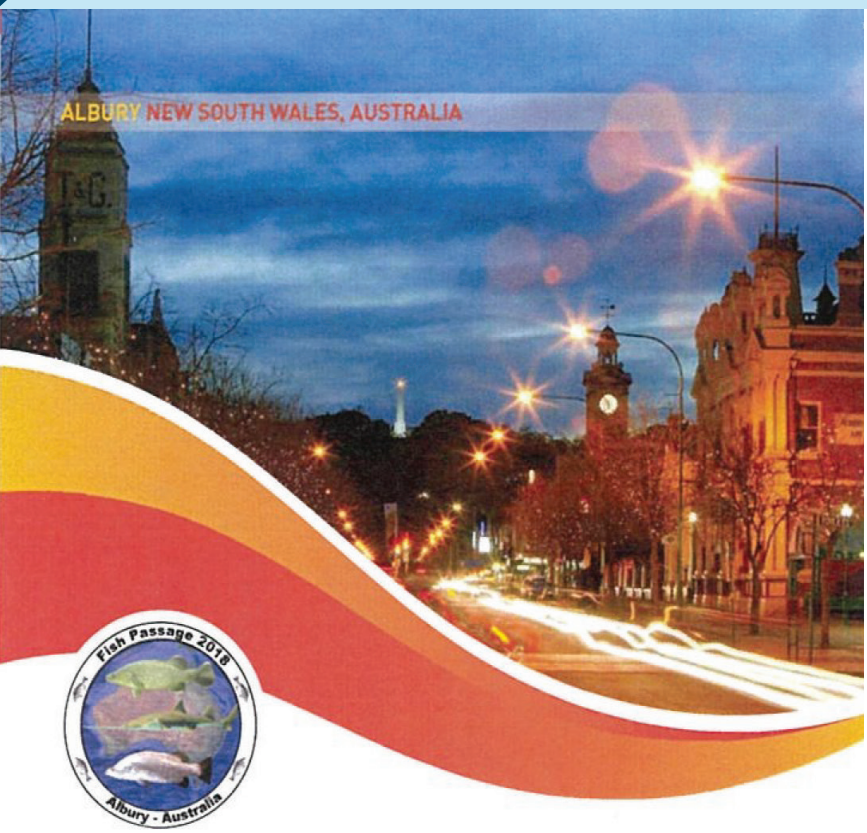
- Special Session Nominations Close **30 NOV 2016**
- Abstracts Open **1 DEC 2016**, Abstracts Close **30 APRIL 2017**
- Registration Opens **1 MARCH 2017**
- Early-bird Registration Close **15 SEPTEMBER 2017**

FOR FURTHER INFORMATION
www.imav2017.com
Or Contact On-Cue Conferences
Phone: +64 3546 6330 // lea@on-cue.co.nz

WHAT'S ON

International Conference on Fish Passage 2018, Showcasing Best Practice and Innovations

Albury, NSW, Australia, 14 December 2018



FISH PASSAGE 2018

INTERNATIONAL CONFERENCE ON FISH PASSAGE; SHOWCASING BEST PRACTICE AND INNOVATIONS

ALBURY, NEW SOUTH WALES, AUSTRALIA

MONDAY 10TH – FRIDAY 14TH DECEMBER 2018

Institute for Land, Water and Society, Charles Sturt University

NSW Department of Primary Industries

CONFERENCE KEY DATES

Key dates in the lead up to the conference include:

EVENT	DATE
Sponsorship & exhibitors	Open now
Call for abstracts	1 March 2018
Early-bird registration open	1 April 2018
Oral abstracts close	30 April 2018
Poster abstracts close	15 May 2018
Abstract acceptance	31 May 2018
Award nominations close	30 June 2018
Early bird registration closes	30 September 2018
Short courses	10 December 2018
Conference	11 – 13 Dec 2018
Post meeting tours and events	14 December 2018

WANT TO SPONSOR OR EXHIBIT AT OUR CONFERENCE?

Four levels of sponsorship will be offered (all prices in Australian Dollars) with generous benefits on offer to participating organisations. Refer to the conference website for inclusions and organiser contact details.

- Platinum Sponsor: > $20,000
- Gold Sponsor: $10,000-$20,000
- Silver Sponsor: <$10,000
- Exhibitor: $1,500 per trade stall

Check out our website for conference updates at:
http://fishpassage.umass.edu/fish-passage-2018

or contact the conference co-chairs:

Lee Baumgartner: lbaumgartner@csu.edu.au
Charles Sturt University

Matthew Gordos: matthew.gordos@dpi.nsw.gov.au
Department of Primary Industries NSW (Fisheries)

WHAT'S ON

International Conference on Fish Passage 2018, Showcasing Best Practice and Innovations continued...

Albury, NSW, Australia, 14 December 2018

CONFERENCE VENUE

Fish Passage 2018 will be held at the Albury Convention Centre, which is situated in the heart of the Albury CBD within easy walking distance to major hotels, shops, cafes, and nightlife.

LODGING

A range of lodging options exists in central Albury within convenient walking distance to the conference venue. Special delegate pricing will be negotiated at a range of accommodation tiers:

- Resort Hotels
- Executive Suites
- Mid-Range Hotels
- Dormitories & Backpakers

CONFERENCE OVERVIEW

Fish Passage 2018 will connect engineers, researchers, water managers and users, educators, practitioners, funders, and policy makers from around the world who have a shared interest in the advancement of technical and nature-like fishways, stream restoration, and dam removal projects. The three-day conference will include concurrent sessions in engineering, biology, management and monitoring techniques, with key conference themes being considered, including:

- 40,000 years of Australian fish passage
- Fish passage challenges in developing countries
- Defining what is a "successful" fishway
- Do we really need more fish passage?
- Policy the Achilles-heel of fish passage
- Cost-effective fish passage innovations
- The benefits of prohibiting fish passage
- Cold Water Pollution mitigation – cold hard facts
- Updating fish passage monitoring
- Reconnecting with floodplains & wetlands
- Fish passage for non-salmonids
- How to design a successful fish passage project
- Individuals to populations - quantifying connectivity
- Water extraction versus fish passage
- Dam removal – weir to go now?
- Corporate philanthropy in fish passage
- Estuarine barrier passage
- Downstream fish passage from top to bottom
- Fish and Hydropower

The conference will also feature independently offered short courses, workshops and tours immediately before and after the conference.

WHAT'S ON

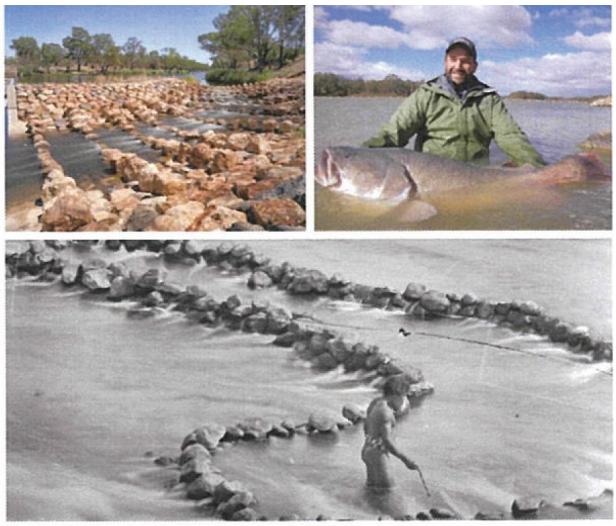
International Conference on Fish Passage 2018, Showcasing Best Practice and Innovations continued...

Albury, NSW, Australia, 14 December 2018

COME VISIT THE MURRAY-DARLING BASIN

For the first time in its history, the International Conference on Engineering and Ecohydrology for Fish Passage will be held in the southern hemisphere in Albury, New South Wales, Australia.

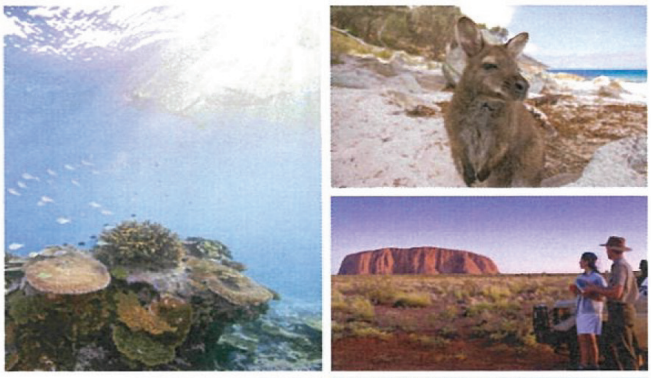
Our chosen location for the conference is at the headwaters of the Murray River, the lifeblood of the largest river basin in Australia. The Murray-Darling Basin embodies a diverse range of fish passage works and is home to an array of innovative solutions that are underpinned by a long-standing cooperative approach between engineers, scientists, managers, and asset owners. Being the centre of fish passage innovation in Australia for well over a decade, it is apt that the Murray-Darling Basin hosts this major international event.



(Top Left) Rock Ramp Fishway - Jason Baldwin, (Top Right) Large Cod – Lee Baumgartner, (Bottom) Aboriginal Fishtrap at Brewarrina (Photography c.1880–1900) Tyrrell Collection, Powerhouse Museum, Sydney – Henry King

AUSTRALIAN MUST-DOs

Defined by its unique wildlife, white sandy beaches, and World Heritage-listed natural wonders, Australia is a dream destination for many, and one of the most beautiful places on earth to visit. If its leisure you are after, then enjoy fine dining and world renowned wineries, or immerse yourself in Australia's unique heritage and indigenous cultural experiences.



I.S.Rivers 2018 – 3rd international conference
Integrative sciences and sustainable development of rivers
From 4 to 8 June, 2018 in Lyon (France)

Following the success of I.S.Rivers 2012 and 2015, the **GRAIE and ZABR are launching the third edition of I.S.Rivers in 2018**, international conference dedicated to research and practices on natural and human-impacted large rivers worldwide.

Promote multidisciplinary approaches, engage all stakeholders and build links

The aim of this international conference is to share research and experiences among scientists and water stakeholders to improve practices for a sustainable management of large rivers. Particular consideration is given to the integration of physical, ecological and social perspectives of the different stakeholders involved in river management (governance, economy, culture).

The main themes for 2018:

TRAJECTORIES, PRESSURES, ADAPTATION > Evolution of fluvial environments and adaptation to global changes
RIVER FUNCTIONING AND MANAGEMENT ISSUES > Rivers: from functional evaluation to integrated management
ECOLOGICAL RESTORATION AND ECOSYSTEM SERVICES > Restoration: feasibility, expected effects and success evaluation
RIVERS AND MEN IN INTERACTION > Rivers and men, governance, stakeholder interactions, and equity

SEPT. 2017 > Launch of the **call for papers**

15 OCT. 2017 > Submission of the **declaration of intent**

20 NOV. 2017 > Submission of the **paper (3 pages)**

MARCH 2018 > **Programme & registration**

I.S.Rivers specificities:

- A conference focusing on **natural or human impacted large rivers**
- In which **all facets** of the rivers may be addressed
- Presentation of **multidisciplinary research occurring in interaction with management**
- **Feedbacks** on innovative operational actions enabling the transferability of good practices for river restoration and management
- **English and French simultaneous translation** in all sessions and technical tours

Key figures of I.S.Rivers 2015:

450 participants (scientists, local authorities, consultants) from **28** countries
2 ½ days of conference
73 rivers represented
+ 190 oral and poster presentations
4 technical tours
3 specialised workshops

Contact: Graie - Conference secretariat | isrivers@graie.org | +33 (0)4 72 43 70 56

More information at: www.isrivers.org