

# WEATHERING THE STORM

**INVERCARGILL / WAIHŌPAI**

**1–4 DECEMBER 2020**

NZHS, NZ Rivers Group & NZFSS Joint Conference

## CONFERENCE HANDBOOK



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



[www.nzhsrivers2020.co.nz](http://www.nzhsrivers2020.co.nz)



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# SPONSORS

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Thank you to all our sponsors. This conference is made possible only through the commitment of many individuals and groups.

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## EXHIBITORS





# WELCOME

## Tēnā koutou katoa | Greetings!

The NZ Hydrological Society, Rivers Group and Freshwater Science Society warmly welcome you to their joint conference to be held in Invercargill | Waihōpai. The conference theme, "Weathering the Storm", is particularly apt given the extraordinary events that have occurred during 2020, and reminds us of the challenges and opportunities facing our precious natural resources in Aotearoa New Zealand and beyond.

We have three days of oral and poster presentations covering all aspects of hydrology, river system management and freshwater science, as well as some interesting plenary speakers, followed by a day of field trips. We hope you take the opportunity to make the most of the conference and the related events, whether that occurs in person or virtually. We thank you for choosing to attend and support this conference. Thank you also to the conference sponsors for providing valuable financial support.

Invercargill is a superb venue for our conference and is a gateway to some of New Zealand's ultimate nature and wildlife destinations, including the stunning Stewart Island | Rakiura. From hiking trails, cycling routes or fishing paradise, the deep south provides for a range of outdoor pursuits and tourist attractions to complement your stay.

The conference committee trusts you will find the programme challenging and informative, and that you enjoy the hospitality of the deep south.

Ngā mihi nui

Karen Wilson  
**Conference Chair**

On behalf of the organising committee

## Conference Committee

Karen Wilson (chair) | Environment Southland – NZHS

Kyle Christensen | Christensen Consulting – Rivers Group

Sarah Mager | University of Otago – NZHS

Fiona Smith | Environment Southland – NZHS

Jane Kitson | Kitson Consulting – NZFSS and rōpū Māori

Brett Cockeram | GWRC – NZFSS and rōpū Māori

Andrew Willsman | NIWA Dunedin – NZHS

Elaine Moriarty | Environment Southland – NZHS and NZFSS



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[www.cawthron.org.nz](http://www.cawthron.org.nz)

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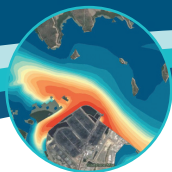
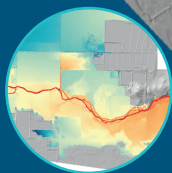


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## Water New Zealand Membership

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**If the water is healthy, the land is healthy, the people are healthy**

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[www.waternz.org.nz](http://www.waternz.org.nz)

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The New Zealand Water & Wastes Association Waiora Aotearoa

# SOCIETY WELCOMES

It is my pleasure to welcome everyone to Invercargill for the joint conference of the New Zealand Hydrological Society, Freshwater Society of New Zealand and the IPENZ Rivers Group. It's the first time that the NZ Hydrological Society has had its annual Conference in Invercargill! It is great that we have common synergies with other groups and societies and are able to run this joint conference considering the Covid-19 pandemic disruptions. The conference theme this year is: "Weathering the Storm". This is a very appropriate theme considering the challenges we face and are emerging in freshwater hydrology. I would like to thank all the sponsors for the ongoing support of our Society's conference and the Society itself. Congratulations to the joint organising committee who have done a brilliant job and OnCue who have put a lot of effort into this event. I wish everyone a great and safe conference and for those attending to be every mindful of all health and safety protocols, notices and requirements. I sincerely hope all of you enjoy your stay in Invercargill. I look forward to the opportunity of meeting as many of you as possible.

Ngā mihi nui  
Joseph Thomas  
**NZHS President**



Tēnā koutou katoa,  
Nau mai ki Waihōpai me Murihiku! A warm welcome to all delegates for our joint meeting in Invercargill, Southland. I'm very pleased that we have been invited to participate in this year's joint meeting and to get together science and resource management professionals across our three societies. After a year of significant disruption, uncertainty and challenges it is wonderful that we have this opportunity to meet and to share our work in person, and for those who are unable to travel to join online. I hold fond memories of our last conference in Invercargill and the warm manaaki from the people of Murihiku. I am sure this year's conference will be as great a success and I wish you all an excellent time full of sharing, knowledge and connection.

Ngā mihi  
Kate McArthur  
**NZFSS President**



On behalf of the NZ Rivers Group management committee, I welcome all participants who weathered the storm to join us in-person or virtually for our 2020 NZHS, NZ Rivers Group & NZFSS Joint Conference. Each year our conference is designed to target a specific theme. This year, getting together in person must be seen as the biggest accomplishment for everyone involved. From the participants to the organisers, all having done a stellar job working amidst the disruptions and uncertainties. A lot of us have not seen each other for over a year, and I hope Invercargill/Waihōpai as our host city will provide plenty of opportunity to discuss how we are going to tackle the pressing issues we are faced with whilst working together to promote good river management. We are looking forward to a hui of mingling, learning, sharing and discussing, and using spare time to explore the beautiful sights of Southland!

Nau mai haere mai!  
Heide Friedrich  
**Rivers Group Committee Chair**





# GENERAL INFORMATION



## REGISTRATION DESK

If you require any assistance throughout the conference please see the conference organisers at the Registration Desk in the main foyer of the Ascot Park Hotel.



## INTERNET

Wireless internet broadband is provided free to conference delegates.

**WiFi:** Ascot Park Conference

**Password:** H2O



## NAME TAGS

Delegates are requested to wear their name tags to all sessions and social functions.

Student assistants can be identified by the orange strip on their name tag

Committee identified by the green strip.

On the back of your name tag – the coloured dots indicate what you are registered to attend.



## CELL PHONES

Please ensure that cell phones are turned off or on silent, during all presentations.



## PARKING

Free parking is available all day at the venue.



## NO SMOKING

There is no smoking allowed inside the venue.



## CONFERENCE CONTACT

For assistance during the conference, please call Tracy Young from On-Cue Conferences on 021 164 7820



## TAXIS & SHUTTLES

Blue Bubble Invercargill 03 217 7777

Super Shuttle Invercargill 09 522 5100

The Invercargill airport is approximately 10 minutes' drive from the conference venue.



## MEALS

All catering will be in the Exhibition Area. If you have advised us of your special dietary requirements, these have been forwarded to the caterers and will be available on a separate table individually marked.



At the Conference Dinner, please make yourself known to the wait staff and they will make the necessary arrangements for your special meal.

If you have any dietary requirements that we are not aware of, please see the Conference Organisers at the Registration Desk on arrival at the conference.

As part of the Covid Safety Plan all meals will be served in individual packaging (brown paper bags) and there will be 2 main catering areas. Please follow chair instructions prior to each food break to minimise queuing and ensure you are at the closest catering area. Packaging is non-plastic and has been minimised as much as possible while ensuring minimum risk around food service.



## LOADING PRESENTATIONS

Please take your presentation on a USB stick to the AV desk in the Waihopai Room – this should be done at the start of the day that you are scheduled to present on.



## POSTER PRESENTATIONS

Poster session will be on Wed 2nd Dec during lunch, 12:30 – 2pm. Posters are located in the Waiau, Oreti and Aparima rooms and will be on display all week.

Poster numbers can be found on page 21 as well as the conference website.

Please put your poster up on arrival. Posters should remain up all week and be removed at lunchtime Thursday.



## SESSION CHAIRS

Please can all session chairs be in their room at least 5 minutes prior to the start of the session. Please introduce yourself to the AV tech in the room. There will be a student assistant in each room, to help with Q&A. It is very important that presentations do not run over their allocated time so please ensure presenters start and finish on time.



## EXHIBITORS

Don't forget to visit and chat with the exhibitors, located in the main foyer. Check the app for more details about our exhibitors and how you can be in to win the conference prize!

Remember to visit the virtual exhibitor by jumping onto onAir, during a break, and win extra points.

# GENERAL INFORMATION



## CONFERENCE APP

The conference committee are excited to advise that you can access all of your conference information, including presenter abstracts on the conference app. Your login information was sent to you last week, if you haven't downloaded the app yet, just follow these instructions:

1. Go to the app/play store and search for eventsair, download the app
2. Once downloaded, enter the event code **2020invercargill**
3. Login: your email address (used for conference registration)
4. PIN: check the back of your name tag for your PIN

You are now set up to see the latest conference programme and receive alerts. All onsite delegates will also go in the draw to **win a Go Pro**, to be awarded at the conference closing ceremony, Thursday 3 Dec at 4:40pm. The winner must be present to collect the prize.

## Covid-19

The health and wellbeing of our members, attendees, speakers and sponsors are at the forefront of all decision making and we want to ensure that you are confident that we have taken all appropriate steps to keep you as safe as possible whilst encouraging you to enjoy, network and make the most of the 2020 joint conference.

The Conference Organisers are following the principles outlined in the "Event Sector Voluntary Code during NZ COVID-19 Level 1", as well as putting in place additional CovidSafe planning procedures, which includes:

- Registrants should stay home if they're sick
- Should an attendee arrive at an event looking unwell or presenting any symptoms of cold or flu, we will respectfully request that they do not attend in order to protect others
- Mandatory use of the NZ COVID Tracer app
- Hand sanitiser/soap will be available on arrival and through-out the Conference
- Good hygiene principles will be reinforced, including hand washing and covering coughs and sneezes
- Adequate equipment and facilities will be available to support good hygiene practices, e.g. soap/hand sanitizer, tissues, rubbish bins and some face masks (face masks will be available at the registration desk)
- Caterers will be encouraged to be extra vigilant with hand hygiene and they will not work if they feel unwell
- Our registration staff will be behind a Perspex screen during registration
- Delegate nametags will be laid out in advance for delegates to collect their own
- There will be signage about Covid19 protocols
- There will be Covid health and safety announcements throughout the Conference and reminders via the Conference App

NZHS, Rivers Group and NZFSS and the Conference Organisers have implemented plans to help minimise the risk for those in attendance, however you are reminded that all individuals are responsible for their own personal hygiene and decision to attend.

Thank you for helping us stay safe.

## Medical & Emergency Info



### NEW ZEALAND EMERGENCY SERVICES

Ambulance, Fire and Police. Dial 111 from any public, private telephone or mobile phone in New Zealand.



### INVERCARGILL POLICE

Phone 03-211 0400 from within Invercargill. The police station is located at 117 Don Street, Invercargill



### SOUTHLAND HOSPITAL

Kew Road, Kew, Invercargill  
Phone 03-218 1949



### INVERCARGILL MEDICAL CENTRE

160 Don Street  
03-218 9116

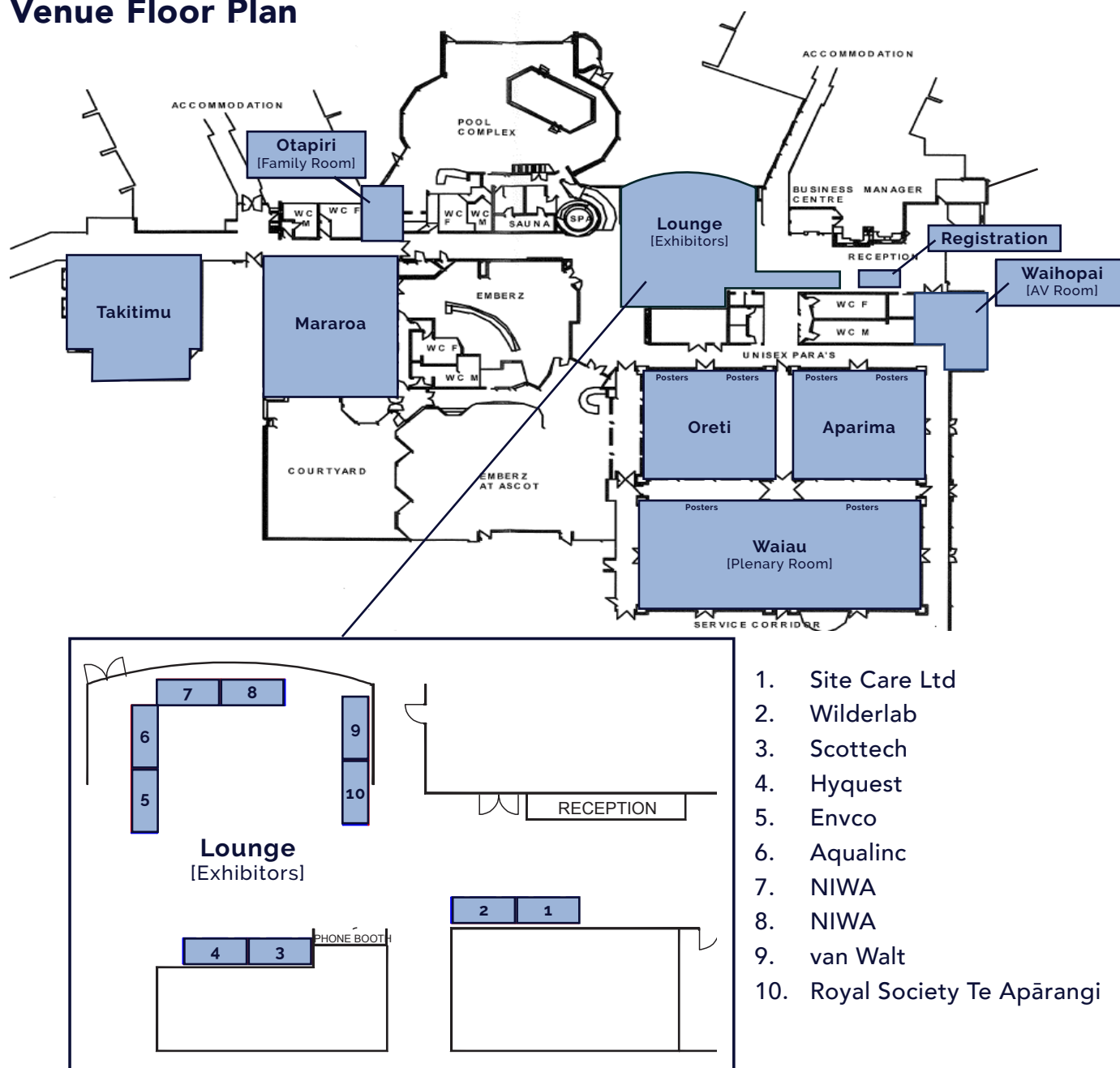


### CHEMIST/PHARMACY

Countdown Pharmacy Invercargill  
172 Tay Street, Invercargill  
03-2178572  
Hours 9am – 8pm daily

# CONFERENCE VENUE

## Venue Floor Plan



1. Site Care Ltd
2. Wilderlab
3. Scottech
4. Hyquest
5. Envco
6. Aqualinc
7. NIWA
8. NIWA
9. van Walt
10. Royal Society Te Apārangi

## Venue Information

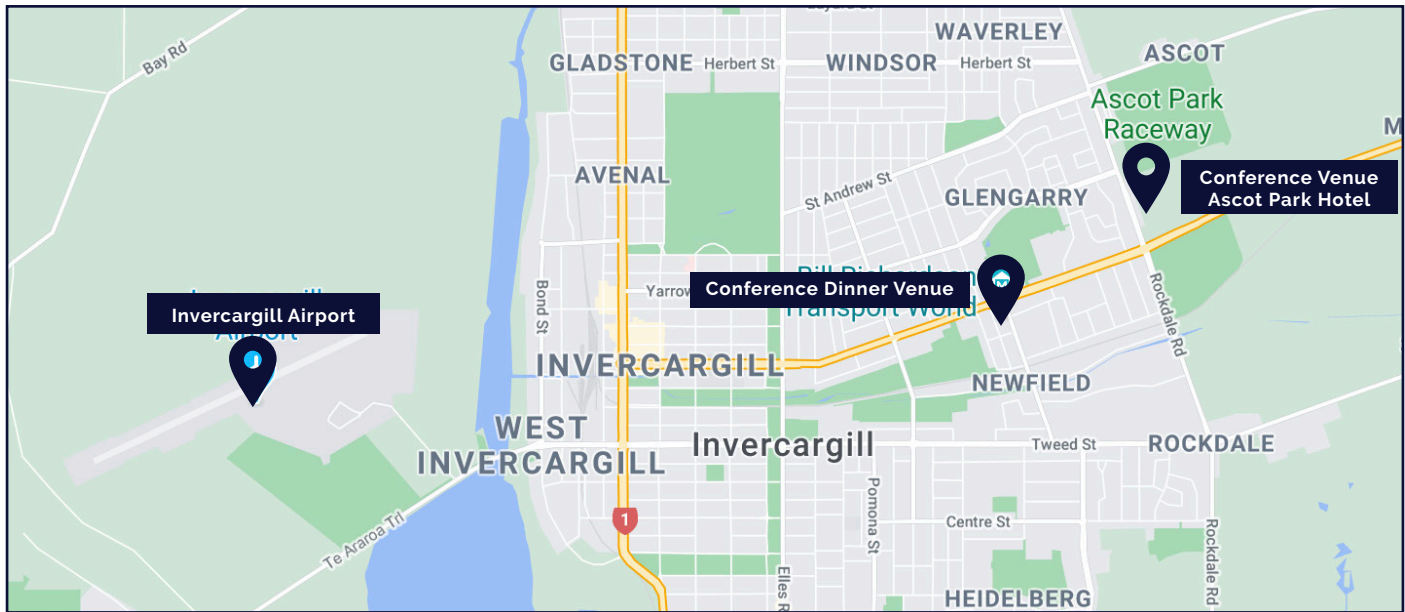
The Conference Venue is the Ascot Park Hotel, located on the corner of Tay Street and Racecourse Road.  
[ascotparkhotel.co.nz](http://ascotparkhotel.co.nz)  
 Ph. 03 219 9076

## Venue Emergency Information

In the event of an earthquake, stop, drop and cover. When the shaking stops make your way out of the building to the assembly point.  
 This information will be covered each day in conference housekeeping, preceding the Keynote presentation.



# INVERCARGILL CITY MAP



## SOCIAL FUNCTIONS

### WELCOME FUNCTION

**WHEN:** Tues 1 Dec, 6 - 8pm

**WHERE:** Ascot Park Hotel, Waiau Room

This function gives you the opportunity to re-connect with colleagues from around NZ and make new connections with those who have recently become part of the Hydrological, Rivers and Fresh Water Communities.

### ENVCO NETWORKING FUNCTION

**WHEN:** Wed 2 Dec, 7pm

**WHERE:** Ascot Park Hotel, Sports Bar

This informal function gives delegates the opportunity to network in a relaxed environment. Bar snacks and a complimentary drink will be provided, thanks to Envco, the function sponsor.

### CONFERENCE DINNER

**WHEN:** Thurs 3 Dec, 6:30pm  
(buses will depart from the Ascot starting at 6pm)

**WHERE:** Bill Richardson Transport World - 491 Tay Street, Hawthorndale

**THEME:** Weathering the Storm

**TICKETS:** \$120 pp + GST

This event is a wonderful opportunity to celebrate the year with your colleagues. The evening will feature the Conference Awards as well as entertainment from local band: In The Pocket.



# FIELD TRIPS

## ORETI CATCHMENT KI UTA KI TAI

The Oreti headwaters start at the Thompson Mountains, located east of North Mavora Lake. It flows south across the Southland Plains to its outflow into Foveaux Strait via New River Estuary at the south-eastern end of Oreti Beach.

This field trip will start at the Estuary and travel towards the headwaters of the Oreti River, where we will discuss and explore the cultural landscape – the history, values and people that are shaped by, and dependent on, this river.

**DEPARTS:** 8:15am - Please meet in the Ascot foyer from 8am

**RETURNS:** 6:30 pm to the Ascot Park Hotel



## WAITUNA / MATAURA

Visit Waituna Lagoon and hear about the challenges it is facing and what projects are underway to improve its health. This will be followed by lunch at the Fortrose Café. Then it's on to Mataura to hear from some speakers who will be discussing the flood. Please bring a high-vis vest.

**DEPARTS:** 8:15am - Please meet in the Ascot foyer from 8am

**RETURNS:** 4:00 pm to the Ascot Park Hotel after a 3:30pm drop-off to the Invercargill Airport



## PLEASE BRING:

Please bring along the following list of items to both of the field trips above:

- Sunscreen/Hat
- Jacket (for bad weather)
- Water bottle
- Sturdy shoes for walking
- High-vis vest (if you have one)
- **Lunch will be supplied**





# KEYNOTE SPEAKERS



## DR. SUSIE WOOD

### Cawthron Institute

Susie Wood is a Scientist at the Cawthron Institute in Nelson, New Zealand. She obtained her PhD from Victoria University (Wellington, New Zealand) in 2006 specialising in algal blooms in rivers and lakes. Susie leads and contributes to multiple research programmes, supervises students, and regularly undertakes consulting projects for government departments and regional authorities on a range of topics related to cyanobacteria, water quality, molecular ecology and biomonitoring. Her cyanobacterial research is divided between understanding bloom formation and toxin production in New Zealand's lakes, and more recently investigating environmental drivers of benthic toxin-producing cyanobacteria in rivers. She has been particularly active in advocating for the incorporation of molecular tools in biomonitoring and biodiversity projects, including the development of novel molecular-based indices. She co-leads a nationwide programme that aims to obtain an overview of the health for 10% of New Zealand's lakes ([www.lakes380.com](http://www.lakes380.com)) using paleo-environmental reconstructions.

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**TUES 1 DEC | 9:30 - 10:15AM**

### Rocky rivers and lake learnings

Every summer many of our lakes and rivers experience severe toxic cyanobacteria blooms which impact ecosystem health and compromise human recreational activities. Our team has used a gene to ecosystem approach incorporating field and laboratory-based studies to explore why they bloom, what regulates toxin production and the ecological role of the toxins. Things don't always go as planned....but sometimes this is when we learn the most.



# KEYNOTE SPEAKERS



## DR. JENNY WEBSTER-BROWN

### Our Land and Water National Science Challenge

Jenny Webster-Brown is the current Director of the Our Land and Water National Science Challenge. Her career as a water quality scientist spans nearly 40 years, and encompasses research, teaching and consultancy, focussing on the impacts of land use and mineral/energy extraction on our natural freshwater systems. She is a graduate of Otago University and the University of Western Australia, and began her career with DSIR Chemistry Division in Wellington in 1981, moving with her environmental chemistry colleagues into ESR when the CRIs were formed in 1992. She lectured in water quality, geochemistry and environmental science at the University of Auckland for 13 yrs, before moving to Canterbury in January 2010 to take up the position of Professor of Water Resource Management at the University of Canterbury, and set up the Waterways Centre for Freshwater Management; a teaching and research centre created by the University of Canterbury and Lincoln University to help improve freshwater resource management in New Zealand. She commenced her role with OLW National Science Challenge in May 2020. Based on her experience across the science and research sectors in this country, she sees a critical role for collaborative, interdisciplinary and biculturally-empathetic science, and effective communication and uptake of research findings, in the sustainable management of freshwater resources in Aotearoa.

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**WED 2 DEC | 8:30 - 9:15AM**

### **Storms to Come: Can science provide a better umbrella than it has in the past?**

Even the briefest overview of the man-made "storms" that have assailed our water environment in the past shows that science, even great science, has too often failed to help us avoid, remedy or mitigate their effects. The legacies of these storms are with us still; biodiversity loss, freshwater diversion and depletion, nitrate contamination, faecal contamination, urban stream syndrome, fine sediment deposition ... to name but a few of the impacts that we study and (largely) understand, but continue to live with. Common obstacles to the implementation of science-based solutions are also relatively well known; socio-economic drivers, population growth, escalating expectations of our natural resources, traditional practises and various aspects of basic human behaviour... again to name just a few. It seems that there is a counterproductive disconnection between understanding the issue and using this knowledge to solve the problem.

Surveys of recent university science students and graduates reveal their enthusiasm to create a difference in the world, by tackling some of the environmental issues that previous generations have not only found impossible to solve, but have very often exacerbated. We must change those aspects of the traditionally accepted science "system" that actively hinder science's contribution to society and environment, if we are to help these future scientists contribute more constructively to the protection of our natural resources.

# KEYNOTE SPEAKERS



## PROF. PETER WILCOCK

Utah State University

Peter Wilcock specializes in erosion and sedimentation processes and their application to stream and watershed restoration and management. His research spans grain-scale mechanics, sediment-channel interactions at the reach scale, and the control and management of sedimentation at the watershed scale. Applications include channel restoration, reservoir and channel response to dam removal, and reservoir operations for downstream channel maintenance. He has worked in experimentation, field observation, and computer simulation of sediment systems and has published more than 100 peer-reviewed articles. Dr. Wilcock provides expert and litigation consultation to industry and government agencies. Dr. Wilcock received his PhD in Earth Science from MIT in 1987. After serving on the faculty of the Whiting School of Engineering at the Johns Hopkins University for 27 years, he joined Utah State University to serve as Head of the Watershed Sciences Department in the Quinney College of Natural Resources from 2014 to 2020. Prof. Wilcock is a Fellow of the American Geophysical Union and received the Hans Albert Einstein Award from the American Society of Civil Engineers for outstanding contributions to the understanding of sediment transport in gravel-bed rivers. He hopes to spend 2021 marveling at the gravel-bed rivers of the Canterbury Plains.

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**THURS 3 DEC | 8:30 - 9:15AM**

### **River Channel Response to Changes in Water and Sediment Supply**

We understand that river channels must adjust their composition, shape, slope, and pattern in response to changes in the supply of water and sediment. It is fair to say that this understanding is more acute after (rather than before) channel change has occurred. We will use principles of mixed-size sediment transport to update the classic concept of channel grade and its application to forecasting channel change. We will consider examples of extreme increases (followed by decreases) in water and in sediment supply to test the controls of channel response and evaluate our understanding.

# PROGRAMME

Monday 30 November 2020					
Workshops + Special Interest Groups					
Tuesday 1 December 2020					
OPENING CEREMONY - Waiau					
8.15 - 9.00am	Powhiri and Society Welcomes				
9.00am - 9.30am	Morning Tea				
9.30 - 10.15	Keynote speaker - Susie Wood, Cawthron Institute (NZFSS)				
Room	Waiau	Oreti	Aparima	Mararoa	Takitimu
Theme	1) Fish & Aquatic Species	2) Next Generation Riparian Buffers	3) Modelling Development, Prediction and Data Assimilation	4) Lake Catchments & Management	5) Groundwater & Surface Water Interaction
Session Chair	Joanne Clapcott	Fleur Matheson	Catherine Moore	Ben Woodward	Frederika Mourot
10.20am-10.40am	Development of a molecular approach to detect freshwater fish communities in Aotearoa New Zealand  Laura Kelly Cawthron Institute	Prioritising areas for riparian management within the Te Awarua-o-Porirua Harbour area.  Bram Mulling Cardno NZ	Are Canterbury rivers warmer during lower flows when all other conditions are equal?  Doug Booker NIWA	Can we predict the potential distribution and effects of invasive zooplankton (Daphnia spp.) in New Zealand?  Carolyn Burns University of Otago	Quantifying the elusive: using a radon mass balance approach to estimate groundwater discharge into a large coastal lagoon  Katie Coluccio Waterways Centre for Freshwater Management
10.40am-11.00am	Using environmental DNA to detect long-and short-finned freshwater tuna (eel)  Georgia Thomson-Laing Cawthron Institute	Freshwater restoration trials (and tribulations): creating native fish habitat in a Waituna Lagoon tributary Robin Holmes Cawthron Institute	A Canterbury flood forecast model using random forest machine learning  Michael Kittridge Environment Canterbury	Our lakes health; past, present and future. Investigating trends in lake health at a national scale  Marcus Vandergoes GNS Science	State of the Environment groundwater quality data for Otago  Amir Levy Otago Regional Council
11.00am-11.20am	Monitoring kākahi (freshwater mussel; Echyridella) using environmental DNA  Konstanze Steiner Cawthron Institute	Riparian Characteristics of Pastoral Waterways in the Waikato Region  Matt Norris Waikato Regional Council	Source protection zone delineation: using numerical and analytical models to guide decision making Helen Rutter Aqualinc Research	Science communication matters: lessons learnt from a nationwide lakes research programme  McKayla Holloway Cawthron Institute	Heretaunga Plains 3D Groundwater age: What it can tell about the aquifers  Uwe Morgenstern GNS Science
11.20am-11.40am	Understanding longfin and shortfin glass eel recruitment variation in a large regulated river  Siobhan Nuri University of Waikato	What makes a riparian buffer most effective for improving ecological outcomes?  Elizabeth Graham NIWA	Application of a bayesian chemistry-assisted hydrograph separation (BACH) model for 48 diverse catchments in Waikato, Hawke's Bay and Taranaki Jungbo Park Lincoln Agritech	Tracing the sources of nitrate using isotopes: 10 years of progress for New Zealand freshwater  Troy Baisden University of Waikato	Use of symbolic regression to estimate groundwater age distributions from hydrochemistry, Heretaunga Plains  Chris Daughney NIWA
11.40am-12.00pm	Shading and temperature control fish biomass in Taranaki streams  Morgan Riding University of Waikato	Effect of riparian widths for reducing contaminants from dairy-farm laneways  John-Paul Praat Groundtruth Ltd Katrina MacIntosh DairyNZ	Development of a Flood Hazard Modelling Standard for the Wellington Region  Susan Borrer / Carrie Hopkirk Cardno NZ		Subsurface processes in braided rivers – hyporheic exchange and leakage to groundwater  Jo Hoyle NIWA
12.00pm-1.00pm	Lunch				
Room	Waiau	Oreti	Aparima	Mararoa	Takitimu
Theme	6) Fish & Aquatic Species	7) Next Generation Riparian Buffers workshop	8) Modelling Development, Prediction and Data Assimilation	9) Lake Catchments & Management	10) Water Quality
Session Chair	Eleanor Gee	Fleur Matheson/Electra Kalaugher	Varvara Vetrova	Carolyn Burns	Megan Devane
1.00pm-1.20pm	Prioritising DOC's fish passage management  Sjaan Bowie Dept of Conservation	Contaminant attenuation by riparian buffers revisited: a review and guidelines development Fleur Matheson NIWA	Ground-based EM surveys for estimation of water table and geological contacts  Patrick Durney Lincoln Agritech	Green bottoms: understanding drivers of near-shore benthic filamentous algae proliferations in oligotrophic lakes Simon Stewart Cawthron Institute	Arsenic in Canterbury groundwater: sources, triggers and spatial occurrences  Andrew Pearson Environment Canterbury
1.20pm-1.40pm	Taking steps to improve fish passage management in the Wellington Region  Katrina Smith Greater Wellington Regional Council	Mind the (riparian) gap: evaluating targeted buffer designs to intercept agricultural runoff Brandon Goeller NIWA	Modelling cumulative catchment streamflow depletion due to abstractions  Channa Rajanayaka NIWA	Investigating rhizosphere oxygen dynamics and phosphorus fractionation under a submerged macrophyte, Isoetes kirkii. Ben Woodward NIWA	Motueka/ Riwaka plains groundwater quality survey 2019 virtual  Melanie Westley Tasman District Council
1.40pm-2.00pm	Development of lamprey passage structures  Cindy Baker NIWA	Productive Riparian Buffers  Electra Kalaugher Dairy NZ	Transition probability analysis of lithology data: implications for numerical delineation of well capture zones Theo Sarris ESR	Patterns of periodicity in phytoplankton biomass in New Zealand lakes  Marc Schallenberg University of Otago	Development and updating of risk maps for nitrate in Canterbury groundwater  Marta Scott Environment Canterbury
2.00pm-2.20pm	Developing strategic pathways - fish passage  Mara Wolkenhauer Dept of Conservation	The evidence base for riparian setback distances - the wider the better  Andrew Fenemor Landcare Research Manaaki Whenua	Assessing the randomness in transport processes of contaminants in groundwater using mathematical modelling Parul Tiwari Lincoln University	Trace metal limitation of phytoplankton growth in lakes of the Taupō volcanic zone  Markus Dengg University of Otago	An effect of Australia on New Zealand precipitation  Mike Stewart GNS Science



# DAY 1—TUE 1 DEC

Room	Waiau	Oreti	Aparima	Mararoa	Takitimu
Theme	6) Fish & Aquatic Species	7) Next Generation Riparian Buffers workshop	8) Modelling Development, Prediction and Data Assimilation	9) Lake Catchments & Management	10) Water Quality
Session Chair	Eleanor Gee	Fleur Matheson/Electra Kalaugher	Varvara Vetrova	Carolyn Burns	Megan Devane
2.20pm-2.40pm	Fish pathway assessment for small-bodied fish  <b>Dipendra Magaju</b> <i>University of Auckland</i>	Special Session Facilitated Discussion  <b>Fleur Matheson</b> NIWA	Now you can do UQ too: improving access to uncertainty quantification and decision support modelling techniques <b>Brioch Hemmings</b> GNS Science	Using fossilised pigments to understand cyanobacterial blooms in New Zealand lakes  <b>Jonathan Puddick</b> Cawthron Institute	Reducing contaminant loads to the Wairoa River - making big improvements to small wastewater treatment plant  <b>Gemma Wadworth</b> <b>Raymond Chang</b> Beca
2.40pm-3.00pm	Methods not critical – Inanga swimming performance is not affected by choice of critical swimming protocol  <b>Eleanor Gee</b> NIWA	Freshwater sediment attributes and urban development  <b>Jacqui McCord</b> <i>Morphum Environmental</i>	Dynamic catchment modelling (swat) within steep north island hill-country catchments  <b>Linh Hoang</b> NIWA	Trophic level bioaccumulation of cadmium in mahinga kai of the Te Arawa Lakes  <b>Nicholas Ling</b> Waikato University	
3.00pm - 3.30pm	Afternoon Tea				
Theme	11) Fish & Aquatic Species	12) Estuaries, Catchments & their Management	13) Extremes, Hazards, Impacts & the Effects of Climate Change	14) Community Ecology & Biological Interactions	15) New Zealand Water Model workshop
Session Chair	Greg Burrell	David Plew	Daniel Collins	Jonathan Tonkin	Christian Zammit / Rogier Westerhoff
3.30pm-3.50pm	Waterfowl hunting wetlands as habitat for two New Zealand eel species  <b>Cohen Stewart</b> <i>Southland Fish and Game</i>	Rapid survey of g transient plumes in coastal waters with a portable underway flow-through sampler (PUFTS-rapid) <b>Rob Davies-Colley</b> NIWA	The relationship between flooding and atmospheric moisture and its variability throughout New Zealand <b>Hamish Prince</b> University of Otago	Stuck in the mud: Using environmental DNA to investigate shifts in lake sediment core bacterial communities <b>John Pearman</b> Cawthron Institute	Update on the New Zealand Water Model Hydrology Project  <b>Christian Zammit</b> NIWA
3.50pm-4.10pm	Effects of food and suspended solids on respiration, clearance and waste production rates of New Zealand's freshwater mussel <i>Echyridella menziesii</i> <b>Karen Thompson</b> NIWA	ETI Tool 3: Assessing estuary trophic state using a Bayesian belief network  <b>John Zeldis</b> NIWA	Rain-on snow in the Southern Alps: Hydrometeorology and impacts  <b>Rasool Porhemmat</b> University of Canterbury	The little plankton that could: understanding the success of picocyanobacteria across lake trophic states using an eco-genomics approach <b>Lena Schallenberg</b> University of Otago	Providing soil hydrological data to New Zealand water model (NZWaM)  <b>Linda Lilburne</b> Landcare Research <i>Manaaki Whenua</i>
4.10pm-4.30pm	Effects of temperature on swimming capabilities of native New Zealand fishes  <b>Rachel Crawford</b> University of Waikato	Developing attributes for Southland estuaries  <b>Nick Ward</b> Environment Southland	Too much data (the 1999 and 2019 extreme floods in the Clutha Catchment)  <b>Malcolm Taylor</b> University of Waikato	Perch ( <i>Perca fluviatilis</i> ) induced trophic cascade in two eutrophic New Zealand lakes – A biomanipulation perspective <b>Samiullah Khan</b> University of Otago	Overview of groundwater research activities in the New Zealand Water Model  <b>Rogier Westerhoff</b> GNS
4.30pm-4.50pm	Red-eared turtles are widespread in NZ  <b>Nicholas Ling</b> University of Waikato	Estimating reference conditions in Southland estuaries  <b>Keryn Roberts</b> Environment Southland	Impacts of El Nino Southern Oscillation on flood risk in New Zealand  <b>Michael Drayton</b> Risk Management Solutions	Explaining trophic structure of mudfish-dominated rainforest pools: inverted biomass pyramids, methanotrophs and size-structured food webs <b>Angus McIntosh</b> University of Canterbury	An improved pedotransfer function for soil water response  <b>Linda Lilburne</b> Landcare Research <i>Manaaki Whenua</i>
4.50pm-5.10pm	Murihiku Kanakana monitoring – what have we learnt?  <b>Cindy Baker</b> NIWA	An R shiny web app to explore monitoring data and model predictions related to stream and estuary eutrophication  <b>Simon Woodward</b> NIWA	Current and future risks of saltwater intrusion in coastal groundwater <i>virtual</i> <b>Amandine Bosserelle</b> Golder Associates	Across taxa diversity in Aotearoa groundwater: Can groundwater depend ecosystems weather the storm?  <b>Louise Weaver</b> ESR Ltd	Delineating groundwater contributing areas to surface water catchments  <b>Christian Zammit</b> NIWA
6.00pm-8.00pm	Welcome Function - Ascot Park Hotel				

# DAY 2—WED 2 DEC

Wednesday 2 December 2020					
8.30am - 9.15am	Keynote Speaker: Jenny Webster-Brown, Our Land and Water National Science Challenge (NZHS)				
Room	Waiau	Oreti	Aparima	Mararoa	Takitimu
Theme	16) Fish & Aquatic Species	17) Citizen Science	18) Data Monitoring, Visualisation & Management	19) Catchments & Communities	20) Water Quality
Session Chair	Susan Clearwater	Troy Baisden	Richard Muirhead	Elaine Moriarty	Gemma Wadworth
9.20am - 9.40am	Dogs detect pest fish scent in water with remarkable sensitivity  <b>Melissa Collins</b> University of Waikato	Reform of vocational education as an opportunity to reform the state of microplastics quantification in New Zealand <b>Christine Liang</b> Southern Institute of Technology	High frequency nitrate in the lower Maitai River <i>virtual</i> <b>Lucy McKergow</b> NIWA	Development of a flood forecasting system for Greater Wellington  <b>Hamish Smith</b> Tonkin Taylor	AQUIFERWATCH 2.0: Operational prediction of groundwater heads for the Wairau Aquifer using rainfall-runoff and Eigenmodels <b>Thomas Wöhling</b> <i>virtual</i> TU Dresden/Lincoln Agritech
9.40am-10.00am	Auckland pest fish decision support tool  <b>Andrew Rossaak</b> Morphum Environmental	Unlocking the value of volunteer freshwater data: progressing a national quality assurance (QA) framework <b>Amanda Valois</b> NIWA	Chatham Islands freshwater investigations  <b>Bas Veendrick / Laura Drummond</b> Pattle Delamore Partners	Awareness, response, and warning – Greater Wellington's comprehensive flood risk management programme <b>Andy Brown</b> Tonkin Taylor	Assessment of the potential of LUCI to estimate heavy metal loads in urban catchments  <b>Thuy Nguyen</b> University of Canterbury
10.00am-10.20am	Kōura and agrichemicals in Aotearoa New Zealand  <b>Susan Clearwater</b> Dept of Conservation	Water, water everywhere: musings of a backyard hydrogeologist  <b>Ross Hector</b> Aqualinc Research	Acoustic doppler devices and data nuances  <b>Phil Hook</b> Pattle Delamore Partners	Looking at how landscape assessment, planning and design can contribute to catchment management for communities <b>Sara Gerard</b> Gerard Environmental Design	A novel method for calculating nitrate removal rates in woodchip bioreactors using data from high-frequency monitoring <b>Aldrin Rivas</b> Lincoln Agritech

10.20am-10.50am	Pattle Delamore Partners Morning Tea				
Room	Waiau	Oreti	Aparima	Mararoa	Takitimu
Theme	21) Fish & Aquatic Species	22) Mātauranga Māori/Indigenous Knowledge	23) Catchments & Communities	24) Water Quantity / General Session	25) Groundwater & Surface Water Interaction
Session Chair	Mara Wolkenhauer	Brett Cockeram	Hamish Smith	Jens Rekker	Katie Coluccio
10.50am-11.10am	Freshwater biological invasion – how metaphors of military power, killer aliens and biocontamination influence public awareness, policy and scientific methods <b>Calum MacNeil</b> <i>Cawthron Institute</i>	He Puna Whakaata o Mātauranga: A Visualisation Tool for the Murihiku Cultural Water Classification System to Enable Articulation of Required States for Cultural Uses <b>Jane Kitson/Stevie Blair</b> <i>Kitson Consulting</i>	Restoring Lake Hayes – A community journey into catchment management <b>Alexandra Badenhop</b> <i>e3Scientific</i>	The One Billion Trees Programme & Potential Impacts on Groundwater Quantity Allocation Limits <b>Frederika Mourot</b> <i>GNS Science</i>	Real Time Stream Depletion Analysis and River Flow Naturalisation <b>Peter Callander</b> <i>Pattle Delamore Partners</i>
11.10am-11.30am	Consequences of landlocking for body shape of New Zealand common smelt, Retropinna retropinna <b>Motia Gulshan Ara</b> <i>University of Otago</i>	Stygofauna – a practical indicator for assessing the mauri and wairua of groundwater and dependent ecosystems <b>James Dommisie</b> <i>Stantec</i>	Using catchment collectives to achieve water quality outcomes: insights from a leading-edge approach in the Hawke's Bay <b>Justin Connolly</b> <i>Deliberate</i>	Invercargill shell-bed aquifer – municipal supply source? <b>Jens Rekker</b> <i>JH Rekker Consulting</i>	Are we underestimating stream depletion in thick alluvial aquifers and understanding deep groundwater abstraction? <b>Zeb Etheridge</b> <i>Komanawa Solutions Ltd</i>
11.30am-11.50am	Blinded by the light: the influence of LED light on adult insects in Canterbury rivers <b>Jessica Schofield</b> <i>University of Canterbury</i>	Springs: The nexus between geology, history, and culture – Investigation of Te Puna Rere A Maru <b>Kenneth Alexander</b> <i>Beca</i>	What do rural communities have on their minds when discussing land management actions that help improve water quality? <b>Kati Doebling</b> <i>Cawthron Institute</i>	Advantages and issues with the use of ground source heat pump technology in Christchurch <b>Helen Rutter</b> <i>Aqualinc Ltd</i>	Managed aquifer recharge pre-feasibility for central Hawkes Bay <b>Clare Houlbrooke</b> <i>WGA NZ</i>
11.50am-12.10pm	Conservation of threatened freshwater-dependant plants: case studies <b>Paul Champion</b> <i>NIWA</i>	Kaupapa Maori methodologies – what's out there? <b>Hannah Rainforth</b> <i>Perception Planning Ltd</i>	Making the link: stream bank erosion and socio-economic drivers in Southland <b>Tim Ellis</b> <i>Environment Southland</i>	Systems Thinking – what is it and ways to apply it <b>Justin Connolly</b> <i>Deliberate</i>	Investigating coastal groundwater resources at Hahei virtual <b>John Hadfield</b> <i>Waikato Regional Council</i>
12.10pm-12.30pm	A research strategy on migratory fish species <b>Marine Richarson</b> <i>Dept of Conservation</i>		Council reflections on the community engagement approach to freshwater limit-setting in Southland <b>Sam McLachlan</b> <i>Environment Southland</i>	The Southern annular mode and rainfall around the 45th parallel <b>Malcolm Taylor</b> <i>University of Waikato</i>	
12.30 - 2.00pm	Lunch + Poster Session				
Room	Waiau	Oreti	Aparima	Mararoa	Takitimu
Theme	26) Community Ecology & Biological Interactions	27) Te Mana o te Wai workshop	28) Irrigation, Drainage Recharge & Allocation	29) Water Quantity	30) Sediment Quality & Quantity workshop
Session Chair	Louise Weaver	Joanne Clapcott	MS Srinivasan	Helen Rutter	Sarah Mager
2.00pm-2.20pm	Projecting fish community responses to altered flow regimes using interaction-neutral models: does the community context matter? <b>Jonathan Tonkin</b> <i>University of Canterbury</i>	Ki Uta ki Tai, Te Mana o te Wai, Mauri and Hauora –Ngai Tahu ki Murihiku and Southland context <b>Ailsa Cain</b> <i>Waitaha / Kati Mamoe / Ngai Tahu - Murihiku</i>	Agile, adaptive water allocation policy <b>John Bright</b> <i>Aqualinc Research</i>	Understanding low flow behaviour in Christchurch city's spring-fed rivers <b>Carey Lintott</b> <i>Environment Canterbury</i>	Nephelometric turbidity applications in water quality – ramifications of poor sensor comparability <b>Rob Davies-Colley</b> <i>NIWA</i>
2.20pm-2.40pm	Reigniting healthy resilience: using disturbance to overcome negative resistance and resilience in stream restoration <b>Isabelle Barrett</b> <i>University of Canterbury</i>	Application of Hauora in developing the draft Southland Murihiku Freshwater Objectives <b>Jane Kitson &amp; Maria Bartlett</b> <i>Kitson Consulting Ltd</i>	Integrated water management for regional development <b>Andrew Dark</b> <i>Aqualinc Research</i>	Space Time Image Velocimetry (STIV) use in Southland <b>Michael McDonald</b> <i>Environment Southland</i>	Predicting erosion source attributes for use in modelling sediment-related water quality <b>Simon Vale</b> <i>Manaaki Whenua Landcare Research</i>
2.40pm-3.00pm	Temporal patterns of glochidia infestation on host fish: A field investigation in three Waikato streams <b>Nicole Hanrahan</b> <i>Waikato Regional Council</i>	Incorporating mātauranga and science to inform the freshwater objective process <b>Ned Norton &amp; Karen Wilson</b> <i>Environment Southland</i>	The impact of shallow groundwater on irrigation requirements <b>Ian McIndoe</b> <i>Aqualinc Research</i>	Synoptic flow gaugings/stream amplings to unravel hydrological and hydrochemical heterogeneity within catchments <b>Roland Stenger</b> <i>Lincoln Agritech</i>	Fingerprinting sediment source contributions to the February 2020 flood event in the Ōreti River, Southland <b>Hugh Smith</b> <i>Manaaki Whenua Landcare Research</i>
3.00pm-3.20pm	Bacterial community variants of spatial, temporal and environmental gradients in stream ecosystem <b>Anju Gautam</b> <i>University of Auckland</i>	Facilitated Panel Discussion <b>Joanne Clapcott</b> <i>Cawthron Institute</i>	Radiocarbon groundwater ages provide insight to recharge rates for the loess-covered south canterbury downlands <b>Lee Burberry</b> <i>ESR</i>	Snow Storage Estimation System for the Upper Rakaia River <b>Tim Kerr</b> <i>Rainfall.nz</i>	Variation of suspended sediment load along the Ōreti River, Southland <b>Arman Haddadchi</b> <i>NIWA</i>
3.20pm-3.50pm	Afternoon Tea				
Theme	31) Urban Catchments	32) Policy & Implementation	33) Data Monitoring, Visualisation & Management	34) Catchments & Communities	35) Sediment Quality & Quantity
Session Chair	Elaine Moriarty	Rick Stoffels	Graeme Smart	Alexandra Badenhop	Rob Davies-Colley
3.50pm-4.10pm	Reporting State of the Environment data for the Auckland Regions <b>Brett Stansfield</b> <i>EIA Ltd</i>	Monitoring the freshwater benefits of management actions: monitoring design framework <b>Olivier Ausseil</b> <i>Aquanet Consulting Ltd</i>	The challenges of integrating multiple sensor technologies into a live water quality dashboard <b>Richard Muirhead</b> <i>Agresearch</i>	Ngā Awa: DOC's priority river restoration programme <b>Rosemary Miller</b> <i>Dept of Conservation</i>	The role of geomorphology in suspended sediment budgets and how continuous sediment monitoring can help us tell the story <b>Michelle Hitchcock</b> <i>Trustpower</i>
4.10pm-4.30pm	Sediment discharges from small scale land disturbing activity: should we be concerned? <b>Todd Redman</b> <i>Pattle Delamore Partners</i>	Monitoring the freshwater benefit of management actions: identification of monitoring technologies <b>Rogier Westerhoff</b> <i>GNS Science</i>	Using the existing cellphone infrastructure as a novel technology platform for high-resolution, real-time rainfall monitoring <b>Ali Shokri</b> <i>University of Waikato</i>	Reinstating access after a seismic shift in the Waiau Toa/Clarence River <b>Kate Purton</b> <i>Beca Ltd</i>	River confinement and aggradation in the Waiho, a modelling perspective <b>John Montgomery</b> <i>NIWA</i>

## DAY 2—WED 2 DEC

Theme	31) Urban Catchments	32) Policy & Implementation	33) Data Monitoring, Visualisation & Management	34) Catchments & Communities	35) Sediment Quality & Quantity
Session Chair	Elaine Moriarty	Rick Stoffels	Graeme Smart	Alexandra Badenhop	Rob Davies-Colley
4.30pm-4.50pm	Built to poison? Leaching from instream structures  Belinda Margetts Christchurch City Council		Drones in freshwater sciences: remote sensing toxic cyanobacteria and river flow  Hamish Biggs NIWA	Regulatory challenges for implementation of farm-scale diffuse source pollution mitigation measures Juliet Milne NIWA	Estimating sediment transport in a lowland river catchment and the implications for restoration  Christopher Meijer University of Canterbury
5.00pm-6.00pm	NZFS AGM	NZHS AGM	Rivers Group AGM		
from 7.00pm	ENVCO Student Function   Venue TBC				

## DAY 3—THR 3 DEC

Thursday 3 December 2020					
8.30am - 9.15am	Keynote Speaker: Peter Wilcock, Utah State University (Rivers Group)				
Room	Waiau	Oreti	Aparima	Mararoa	Takitimu
Theme	36) Wetlands	37) Water Contamination / Restoration	38) Modelling Development, Prediction and Data Assimilation	39) Integrated Management & Holistic Monitoring Approaches	40) River Management
Session Chair	Rebecca Eivers	Brandon Goeller	Channa Rajanayaka	Jane Kitson	Kyle Christensen
9.20am-9.40am	The Whakaora Te Ahuriri constructed wetland: an example of collaboration and consensus  David Murphy Environment Canterbury	Clearing the way to improving water quality using native freshwater mussels (KĀKAHI/KĀEO)  Rebecca Stott NIWA	Methodology for monthly-to-seasonal forecasting of regional climate conditions in New Zealand: a machine learning approach Varvara Vetrova University of Canterbury	Integrated assessment of stream ecosystem health in the Tukituki catchment  Joanne Clapcott Cawthron Institute	Linking multi-disciplinary research to practical application: a case study for river management in the Manawatū  Selene Conn Tonkin Taylor
9.40am-10.00am	Constructed wetlands at a landscape scale: experience from Te Ahuriri  Su Young Ko Environment Canterbury Stu Farrant Morphum	Effect of heavy metals on phenanthrene degradation in stormwater using lightweight filtration media  Lamis Javid University of Auckland	Assessing effective pasture root depth for irrigation scheduling by water balance modelling virtual KC Birendra Aqualinc Research	What's being done? Recording land management actions to improve river health  Roger Young Cawthron Institute	Mapping the spatial distribution of fine sediment in large braided rivers – method development in the Rangitata  Justin Rogers University of Canterbury
10.00am-10.20am	Whakamataara Ahuriri – the journey towards reinstating and restoring a once thriving cultural ecosystem and habitat Mapihi Martin-Paul / Tanya Blakely Boffa Miskell	Plastics: aesthetic nuisance or emerging freshwater contaminant?  Amanda Valois NIWA	Advantages of flexible mesh sub-grid sampling 2D models in assessing flood hazards due to dike breaches Jasmine Kang Tonkin Taylor	Co-creation of freshwater management plans: the case study of Lake Wānaka virtual Simone Daniela Langhans BC3 - Basque Centre for Climate Change	What are the benefits of giving a river more room?  Amanda Death Greater Wellington Regional Council
10.20am-10.50am	Morning Tea				
Room	Waiau	Oreti	Aparima	Mararoa	Takitimu
Theme	41) Wetlands	42) Ecosystem Health Measures & Management	43) Extremes, Hazards, Impacts & the Effects of Climate Change	44) Policy & Implementation	45) River Management
Session Chair	Stu Farrant	Paul Franklin	Magdy Mohssen	Karen Wilson	Selene Conn
10.50am-11.10am	Integration of Radiometric Survey, Satellite Imagery, and Terrain Measures to Support Wetland Identification  Clint Rissman Land and Water Science	Groundwater biodiversity: big bugs, little bugs and everything in between  Annette Bolton ESR	Rivers and climate change: resilience, floods and tipping points  Ian Fuller Massey University	Freshwater Management Tool - a next generation decision-support tool for science, policy and catchment management in New Zealand virtual Tom Stephens Auckland Council	Fish screening: how do the regions compare and what are the implications from new research?  Phillip Jellyman NIWA
11.10am-11.30am	Evaluating the performance of a constructed wetland on nitrogen removal using a linked catchment-wetland model  Linh Hoang NIWA	River fragmentation in New Zealand  Paul Franklin NIWA	Foreseeable impacts of climate change on New Zealand's freshwaters from legal and scientific perspectives Daniel Collins Lincoln University	Sustainable use and protection of freshwater through strengthening national and regional water governance  Bapon Fakhruddin Tonkin Taylor	Integrating flora and fauna habitat into river engineering projects  Sébastien Den Doncker Stream and River Consult
11.30am-11.50am	Nutrient removal and hydraulic performance of a floating wetland treating agricultural pollutants in the Lake Areare catchment  Rebecca Eivers Streamlined Environmental	Effectiveness of aquatic habitat restoration in Hinds drains  Adrian Meredith Environment Canterbury	The impact of climate change on groundwater systems: a case study in Edendale, Southland  Jing Yang NIWA	Statistical uncertainties shape adoption of riverine reference conditions during policy reform  Rick Stoffels NIWA	Hyetographs for flood modelling in Northland  Graham Macky Macky Fluvial Consulting
11.50am-12.10pm	Persistence and growth of faecal indicator bacteria exacerbates removal rates from agricultural wetlands Rebecca Stott NIWA	Defining appropriate resoration targets for freshwater ecosystems: Arawai Kākāriki  Hugh Robertson Dept of Conservation	Climate Change Adjustment of Long Time Series Rainfall  Mike Law Beca	New direction in freshwater policy: what happens next?  Martin Workman Ministry for the Environment	Pumped hydro for energy storage: Onslow and Ngaruroro  Earl Bardsley Waikato University
12.10pm-12.30pm			Climate Change vulnerability assessment of selected freshwater taonga species  Eimear Egan NIWA	The Freshwater Forward policy programme moving into 2021 and beyond  James King Ministry for the Environment	Meeting the needs of fish and people: lessons learnt from dredging a tidal river  Greg Burrell Instream



# DAY 3—THR 3 DEC

12.30-1.30pm	Lunch				
Room	Waiau	Oreti	Aparima	Mararoa	Takitimu
Theme	46) Fish & Aquatic Species	47) Water Contamination / Restoration	48) Extremes, Hazards, Impacts & the Effects of Climate Change	49) Policy & Implementation	50) Data Monitoring, Visualisation & Management
Session Chair	Jane Kitson	Rupert Craggs	Mike Law	Rogier Westerhoff	Ali Shokri
1.30pm-1.50pm	Kēkēwai (crayfish) as a stream restoration tool to disrupt unhelpful biotic interactions and facilitate biological recovery <b>Amy van Lindt</b> <i>University of Canterbury</i>	Effects of artificial sweeteners on groundwater microbes  <b>Karen Houghton</b> <i>GNS Science</i>	Flood Damage Recovery: February 2020 Otago Storm  <b>Ken Tarboton</b> <i>Aqueus Consulting Limited</i>	Out of the dark: communicating groundwater science at a section level  <b>Philippa Aitchison-Earl</b> <i>Environment Canterbury</i>	Hawke's Bay 3D aquifer mapping project using airborne time-domain electromagnetics (Skytem): Overview and update <i>virtual</i> <b>Zara Rawlinson</b> <i>GNS Science</i>
1.50pm-2.10pm	Identification of whitebait spawning zones in the Bay of Plenty  <b>Alastair Suren</b> <i>Bay of Plenty Regional Council</i>	Concentration and Categorisation of Microplastics from Inner-city Waterways in Invercargill  <b>Xinxin Zhang</b> <i>Southern Institute of Technology</i>	Flood forecasting of the Clutha River at Balclutha  <b>Magdy Mohssen</b> <i>Otago Regional Council</i>	Freshwater biodiversity in Aotearoa – knowledge, status and response  <b>Elizabeth Heeg / Hugh Robertson</b> <i>Dept of Conservation</i>	Dealing with incomplete datasets and impacted sites to define natural trend baselines in groundwater quality for environmental reporting <b>Magali Moreau</b> <i>GNS Science</i>
2.10-2.30pm	Performance of whitebait reserves for fisheries conservation  <b>Andrew Watson</b> <i>University of Canterbury</i>	Hydrogeophysics applied to examine the function of a woodchip denitrification wall  <b>Lee Burberry</b> <i>ESR</i>	Examples of geomorphic effects on lowland flood regime  <b>Graham Macky</b> <i>Macky Fluvial Consulting Ltd</i>	New draft National Environmental Monitoring Standards (NEMS) for freshwater periphyton and macroinvertebrates <b>Shirley Hayward</b> <i>Environment Canterbury</i>	Using advanced statistical analysis to optimise groundwater monitoring networks  <b>Fouad Alkhaier / Kurt van Ness</b> <i>Environment Canterbury</i>
2.30pm-2.50pm	Comparison of Kōkopu population characteristics between whitebaited and refuge areas <b>Ben Crichton</b> <i>University of Canterbury</i>	Filamentous algae nutrient scrubbers for treatment and nutrient recovery from agricultural drainage <b>Rupert Craggs</b> <i>NIWA</i>	Hydrograph recession/low flow prediction based on hindcast data  <b>Shailesh Singh</b> <i>NIWA</i>	New guidelines for constructed wetland treatment of pastoral farm runoff  <b>Chris Tanner</b> <i>Te Waiora Joint Institute for Freshwater Management NIWA</i>	The hole story: what do drillers logs actually tell us  <b>Helen Rutter</b> <i>Aqualinc</i>
2.50-3.10pm	What makes an 'outstanding' indigenous fish habitat?  <b>Kate McArthur</b> <i>KM Water</i>	How many snails are too many? High densities of tolerant taxa in post-restoration waterways may hinder recovery through priority effects <b>Kate Hornblow</b> <i>University of Canterbury</i>	Foreseeable future: seamless integration of weather and climate information for long range early warning system  <b>Bapon Fakhruddin</b> <i>Tonkin+Taylor</i>	Modelling suspended sediment baselines and reductions required to achieve freshwater objectives for Southland using SedNetNZ  <b>Andrew Neverman</b> <i>Manaaki Whenua Landcare Research</i>	Auckland flood frequency  <b>Alistair McKerchar</b> <i>NIWA</i>
3.10 - 3.40pm	Afternoon Tea				
Theme		52) Water Contamination / Restoration	53) Modelling Development, Prediction and Data Assimilation	54) Urban Catchments	55) Data Monitoring, Visualisation & Management
Session Chair		Lee Burberry	Doug Booker	Belinda Margetts	Magali Moreau
3.40pm-4.00pm		Investigating shifts in the bacterial community of decomposing cowpats and their impacts on water quality monitoring <b>Megan Devane</b> <i>ESR</i>	NZ river flow forecasts: bias-correction using flow duration curves  <b>Daniel Lagrava Sandoval</b> <i>NIWA</i>	The Magakōtutukutuku urban research hub – water sensitive urban design <i>virtual</i> <b>Lucy McKergow</b> <i>NIWA</i>	Streamflow depletion effects of recorded water abstractions in the Wellington and Manawatu-Wanganui Regions <i>virtual</i> <b>Sean Hudgens</b> <i>Ministry for the Environment</i>
4.00-4.20pm		Indicators and pathogens in New Zealand Rivers – A pilot study  <b>Brent Gilpin</b> <i>ESR</i>	Luxury nutrient uptake by periphyton explains diel variation in dissolved oxygen and instream nutrient concentrations <b>Anika Kuczynski</b> <i>NIWA</i>	Understanding the impact of LED streetlight conversions on flying freshwater insects  <b>Michelle Greenwood</b> <i>NIWA</i>	A review of the flow gauge network in the Wellington Region  <b>Carrie Hopkirk</b> <i>Cardno NZ</i>
4.20pm-4.40pm		On-site wastewater: out of shite, out of mind  <b>Bronwyn Humphries</b> <i>ESR</i>	How up-scaling hydraulic properties undermines the reliability of our decision-support predictions  <b>Catherine Moore</b> <i>GNS Science</i>	Where the rubber hits the road: management of urban waterways in relation to setback consents  <b>Katie Noakes</b> <i>Christchurch City Council</i>	Effects of shallow flows on the ratio of depth averaged velocity to water surface velocity  <b>Graeme Smart</b> <i>NIWA</i>
4.40-5.00pm	Conference Close				
6.00pm	Conference Dinner - Transport World				

# DAY 4—FRI 4 DEC

	Friday 4 December 2020
meet at 8.15am	Field Trips - depart Ascot Park car park at 8.30am

# POSTER LIST

Poster	Presenting Author Names	Organization	Paper Title
1	Troy Baisden	University Of Waikato	A science-to-citizen pathway for monitoring using EnviroDIY.org Mayfly stations
2	Shannan Bell	National Institute For Water And Atmospheric Research	Toxicity of common urban and rural freshwater contaminants to juvenile freshwater crayfish ( <i>Paraneopros planifrons</i> or <i>kōura</i> )
3	Rebecca Booth	Waikato University	Ecosystem health in lowland streams: effects of riparian vegetation on temperature, dissolved oxygen, and macroinvertebrate communities
4	Megan Brown	Instream	Movement patterns of eels ( <i>Anguilla</i> spp.) relocated prior to dredging an urban waterway.
5	Susan Clearwater	Department Of Conservation	Ngā Awa River Restoration Research Strategy and on-line River Restoration Hub
6	Susan Clearwater	Department Of Conservation	Developing contaminant criteria protective of sensitive life stages of the native freshwater mussel <i>Echyridella menziesii</i> .
7	Rob Connell	Self	I have lived here a long time – I have seen a flood like this ever.
8	Jay Curtis	GNS Science	Direct push sampling of groundwater in New Zealand
9	Oonagh Daly	National Institute For Water And Atmospheric Research	Gluttonous algae and their appetites
10	Markus Dengg	University Of Otago	Trace metal limitation on phytoplankton growth: a laboratory experiment with three freshwater phytoplankton species
11	Brittany Earl	University of Canterbury	Identifying the Impact of Non-Native Brown Tree Frog, <i>Litoria ewingii</i> , on New Zealand Pond Systems
12	Mark Fenwick	National Institute Of Water And Atmospheric Research	How connected are Waikato river catchment freshwater mussels?
13	Kirsten Forsyth	Ministry For The Environment	Implementing new freshwater policy: A timeline through to 2026 and beyond
14	Stephen Fragaszy	Ministry For The Environment	Drought monitoring tools and drought management in the Middle East and North Africa Region
15	Emily Funnell	Department Of Conservation	Preparing a tuna research strategy in partnership with tangata whenua
16	Amy Gault	Victoria University Of Wellington	Exploring the application of ecological processing indicators in New Zealand riverine environments: A meta-analysis
17	Brandon Goeller	National Institute For Water And Atmospheric Research	Trialling ground penetrating radar for detecting near surface concentrated flowpaths on a Toenepi dairy farm
18	James Griffiths	National Institute For Water And Atmospheric Research	Use of remote sensing data for hydrological model validation
19	Brioch Hemmings	GNS Science	Coupling of the topnet recharge and streamflow uncertainty into modflow
20	Ryan Hodgson	Southern Institute Of Technology	Effectiveness of on-site sketching and arcgis mapping in producing riparian and wetland restoration plans
21	Deborah Hofstra	National Institute For Water And Atmospheric Research	Designing mussel rafts for freshwater bioremediation
22	Sophie Horton	University Of Otago	Suspended Sediment in Granular Detail
23	Karen Houghton	GNS Science	Stimulation of nitrate removal in groundwater
24	Yasaman Karaminik	University Of Waikato	Pumped storage potential of the upper Ngaruroro River

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25	Brennan Mair	Southern Institute of Technology	Investidating technologic advances in water sampling
26	Derrick Mangoro	Lincoln University	Strategies for sustainable water management in Canterbury: An application for the food-eneergy-water nexus for the Rangitata River Basin
27	Helen Mccaughan	Department Of Conservation	Freshwater pests - A hidden threat of extreme events
28	Christopher Meijer	University Of Canterbury	Using simplified river catchment maps to direct future restoration efforts
29	Nicole Mesman	Aqualinc Research Limited	N-Wise Irrigation - Field testing
30	Ashley Mitchell	Greater Wellington	Ecological health of rivers and stream in the Wellington region
31	Bram Mulling	Cardno Nz Ltd.	Prioritising areas for riparian management within the Te Awarua-O-Porirua Harbour area
32	Joseph Pollacco	Manaaki Whenua - Landcare Research	1D vertical scaling of S-map-Hydro using Richards equation for layered soils
33	Shailesh Singh	University Of Canterbury	Spatial and temporal analysis of the baseflow index at national scale in New Zealand
34	Louis Skovsholt	NIWA	Eutrophication Effects on stream Macrophytes
35	Josh Smith	Waikato Regional Council	Freshwater fish monitoring in the Waikato
36	M.S. Srinivasan	Niwa	Tools for operational and strategic management of irrigation in dairy farms
37	Rob Van Der Raaij	Gns Science	Recent developments in excess nitrogen analysis
38	Rob Van Der Raaij	Gns Science	The New Zealand water Model Isotopic Data Layers
39	Rogier Westerhoff	GNS	An inter-comparison of four groundwater models and modules in the Maitara Catchment, New Zealand
40	Amy Whitehead	NIWA	Changing lightscapes: night sky visibility under different streetlighting scenarios
41	Lucy Whitelock-Bell	Tonkin Taylor	Simulating rainfall-runoff response for Auckland's water supply catchments
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43	Mara Wolkenhauer	Department Of Conservation	Mapping sediment research and strategies
44	Jing Yang	Niwa	A-priori Parameterising groundwater parameters of TopNet-GW in New Zealand
45	Sarah Yeo	University Of Otago	Hydrochemistry of Shallow Groundwater in Dunedin, New Zealand
46	Christian Zammit	NIWA	The New Zealand water model - Surface water abstraction module: Simulating actual water use
V	Mathew Allan	Waikato Regional Council	A coupled 3-D hydrodynamic-ecological model of the influence of native bivalve populations of kaaeo on shallow lake water quality
V	Fernando Avendaño	Massey University	Quantifying and reducing nitrogen leaching under intensive vegetable production in temperate regions
V	Moritz Gosses	TU Dresden, Lincoln Agritech	Robust Evaluation of data worth for the Wairau Aquifer using surrogate models
V	Ani Kainamu-Murchie	NIWA	NGĀ TAONGA WAIMĀTAITAI KI MURIHIKU: Co-developing appropriate Mana Whenua approaches to improve estuarine Mahinga Kai Management
V	Gabe Sentlinger	Fathom Scientific Ltd	A Geospatial Multiple Regression Hydrological Model for Water Licensing Decisions in British Columbia, Canada.
V	Meti Yulianti	The University Of Waikato	How a small pastoral catchment response to variation of storm events

V = Virtual Poster



# ATTENDEE LIST

First Name	Last Name	Organization
Philippa	Aitchison-Earl	Environment Canterbury
Kenneth	Alexander	Beca Ltd
Fouad	Alkhaier	Ecan
Mathew	Allan	Waikato Regional Council
Richard	Allibone	Water Ways Consulting Limited
Motia Gulshan	Ara	University Of Otago
Jarred	Arthur	Environment Canterbury
Olivier	Ausseil	Aquanet Consulting Ltd
Dion	Ayers	Envirolink
Alexandra	Badenhop	e3Scientific Ltd
Kate	Bailue	Environment Canterbury
Troy	Baisden	University Of Waikato
Cindy	Baker	Niwa
Toby	Barach	Greater Wellington Regional Council
Earl	Bardsley	University Of Waikato
Isabelle	Barrett	University Of Canterbury
Isobelle	Barrett	Trustpower
Sarah	Basheer	Tonkin + Taylor
Tina	Bayer	Environment Canterbury
Fareeda	Begum	University of Canterbury
Jon	Bell	Horizons Regional Council
Shannan	Bell	NIWA
Hamish	Biggs	Niwa
Stevie	Blair	Awarua/TAMI
Tanya	Blakely	Boffa Miskell
Annette	Bolton	Institute Of Environmental Science And Research Ltd
Doug	Booker	Niwa
Rebecca	Booth	Waikato University
Susan	Borrer	Greater Wellington Regional Council
Amandine	Bosserelle	Golder Associates (nz) Limited
Jane	Bowen	Department Of Conservation
Sjaan	Bowie	Department Of Conservation
Christina	Bright	Landpro Ltd
John	Bright	Aqualinc Research
Andy	Brown	Greater Wellington Regional Council
Kirsty	Brown	Bay Of Plenty Regional Council
Megan	Brown	Instream Consulting
Clare	Browne	University Of Waikato
Stewart	Bull	ORAKA

Lee	Burbery	ESR
Carolyn	Burns	University Of Otago
Greg	Burrell	Instream
Ailsa	Cain	Kauati
Peter	Callander	Pattle Delamore Partners Ltd
Stewart	Cameron	Gns
Graeme	Campbell	Greater Wellington Regional Council
Rose	Cantwell	GNS
Celine	Cattoen-gilbert	Niwa
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Ray	Chang	Beca Ltd
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Joanne	Clapcott	Cawthron Institute
Graeme	Clarke	Environment Canterbury
Mic	Clayton	Snowy Hydro Ltd
Susan	Clearwater	Department Of Conservation
Murray	Close	ESR
Brett	Cockeram	Greater Wellington Regional Council
Daniel	Collins	Lincoln University
Katie	Collins	Department of Conservation
Melissa	Collins	University Of Waikato
Katie	Coluccio	Waterways Centre For Freshwater Management
Selene	Conn	Tonkin Taylor
Rob	Connell	Self
Justin	Connolly	Deliberate
Bruce	Crabbe	Bay Of Plenty Regional Council
Rupert	Craggs	NIWA
Rachel	Crawford	NIWA
Ben	Crichton	University Of Canterbury
Jay	Curtis	GNS Science
Oonagh	Daly	Niwa
James	Dare	Bay of Plenty Regional Council
Andrew	Dark	Aqualinc Research Limited
Chris	Daughney	NIWA
Grace	Davidson	University Of Otago
Katherine	Davidson	Otago Uni
Rob	Davies-Colley	National Institute Of Water And Atmospheric Research Ltd (niwa)
Neil	Deans	Department Of Conservation
Amanda	Death	Greater Wellington Regional Council
Sébastien	Den Doncker	Stream And River Consult
Markus	Dengg	University Of Otago
Megan	Devane	ESR
Kati	Doehring	Cawthron Institute

Michael	Drayton	RMS
Laura	Drummond	Pattle Delamore Partners Ltd
Patrick	Durney	Lincoln Agritech
Brittany	Earl	University of Canterbury
Mike	Ede	Marlborough District Council
Eimear	Egan	NIWA
Imogen	Eglesfield	Student
Rebecca	Eivers	
Graham	Elley	NIWA
Sandy	Elliott	NIWA
Dianne	Elliott	Aquatech Environmental Data Collection Limited
Ciara	Espiner	The University Of Canterbury
Zeb	Etheridge	Komanawa Solutions Ltd
Bapon	Fakhruddin	Tonkin +taylor, Nz
Stu	Farrant	Morphum Environmental
Andrew	Fenemor	Landcare Research
Mark	Fenwick	National Institute Of Water And Atmospheric Research
Paul	Fisher	Nelson City Council
Shona	Fordyce	ORAKA
Kirsten	Forsyth	Ministry For The Environment
Stephen	Fragaszy	MfE
Paul	Franklin	NIWA
Ian	Fuller	Massey University
Emily	Funnell	Department Of Conservation
Matthew	Gardner	Land River Sea Consulting Ltd
Peter	Gardner	Gns Science
Amy	Gault	Victoria University Of Wellington
Anju	Gautam	School Of Biological Sciences, The University of Auckland
Eleanor	Gee	Niwa
Sara	Gerard	Gerard Environmental Design
Philippe	Gerbeaux	Department Of Conservation
Aprille	Gillon	Greater Wellington Regional Council
Brent	Gilpin	ESR
Brandon	Goeller	National Institute For Water And Atmospheric Research
Claire	Graeme	Ministry For The Enviornment
Elizabeth	Graham	Niwa
Hamish	Graham	Environment Canterbury
Emily	Gray	Environment Canterbury
Michelle	Greenwood	Niwa
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Klaas	Haagh	Xylem Water NZ
Arman	Haddadchi	NIWA
John	Hadfield	Waikato Regional Council



Nicole	Hancock	DOC
Dougal	Harding	Hyquest Solutions
Roger	Hardy	Scott Technical Instruments
Mike	Harkness	Greater Wellington Regional Council
Jane	Harvey	Taranaki Regional Council
Monique	Harvey	Tasman District Council
Shirley	Hayward	Environment Canterbury
Nick	Hazard	Hazard Consulting
Fei	He	Royal Society Te Apārangi
Ross	Hector	Aqualinc Research Limited
Elizabeth	Heeg	Te Papa Atawhai
Brioch	Hemmings	Gns Science
Roddy	Henderson	Niwa
Steffi	Henkel	Marlborough Distric Council
Mike	Hickford	University of Canterbury
Brendan	Hicks	University Of Waikato
Michelle	Hitchcock	Trustpower
Linh	Hoang	Niwa
Roger	Hodson	Environment Southland
Deborah	Hofstra	Niwa
McKayla	Holloway	Cawthron Institute
Robin	Holmes	Cawthron Institute
Phil	Hook	Pattle Delamore Partners
Carrie	Hopkirk	Cardno (NZ) Ltd
Olivia	Hore	University of Canterbury
Kate	Hornblow	University Of Canterbury
Graeme	Horrell	Graeme Horrell Consultancy Limited
Sophie	Horton	University Of Otago
Karen	Houghton	Gns Science
Clare	Houlbrooke	WGA NZ
Dave	Houlbrooke	Our Land And Water, AgResearch
Jo	Hoyle	NIWA
Sean	Hudgens	Ministry For The Environment
Bronwyn	Humphries	Esr
Trevor	James	Tasman District Council
Dennis	Jamieson	CWMS
Bart	Jansma	Te Korowai O Ngaruahine Trust
Teoti	Jardine	ORAKA
Bill	Jarvie	Fish and Game Southland
Lamis	Javid	University Of Auckland
Phillip	Jellyman	NIWA
Shane	Jellyman	Tasman District Council
Chris	Jenkins	Environment Southland
Muriel	Johnstone	ORAKA

Sarah	Johnstone	E3scientific
Connaugh	Jones	SiteCare Limited
Ryan	Jones	Awa Environmental Ltd
Ani	Kainamu-murchie	NIWA
Electra	Kalaugher	Dairynz
Jasmine	Kang	Tonkin And Taylor Ltd
Yasaman	Karaminik	University Of Waikato
Birendra	KC	Aqualinc Research Ltd
Lawrence	Kees	Environment Southland
Johlene	Kelly	Alchemists Limited
Laura	Kelly	Cawthron Institute
Scott	Kelly	GNS Science
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Tim	Kerr	Rainfall.nz
Liz-Marie	Keyser	Premium Marine Technology
Samiullah	Khan	Department Of Zoology, University of Otago
Gustaaf	Kikkert	Bloxam Burnett & Olliver
James	King	Ministry For The Environment
Daniel	Kingston	University Of Otago
Verity	Kirstein	Environment Canterbury
Jane	Kitson	Kitson Consulting Ltd
Michael	Kittridge	Headwaters Hydrology
Su Young	Ko	Environment Canterbury
Amber	Kreleger	Environment Canterbury
Anika	Kuczynski	NIWA
Abigail	Kuranchie	Massey University
Laddie	Kuta	E2 Environmental Ltd
Daniel	Lagrava Sandoval	NIWA
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Richard	Levy	Gns Science Limited
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Carey	Lintott	Environment Canterbury
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Graham	Macky	Macky Fluvial Consulting Ltd

Calum	MacNeil	Cawthron Institute
Dipendra	Magaju	University Of Auckland
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Brennan	Mair	Southern Institute of Technology
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Belinda	Margetts	Christchurch City Council
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Helen	Mccaughan	Department Of Conservation
Jacqui	McCord	Morphum Environmental
Michael	McDonald	Environment Southland
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Alistair	McKerchar	NIWA
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Adrian	Meredith	Environment Canterbury
Nicole	Mesman	Aqualinc Research Limited
Bryony	Miller	e3Scientific Limited
Rosemary	Miller	Department Of Conservation
Juliet	Milne	NIWA
Ashley	Mitchell	Greater Wellington
Mark	Mitchell	Horizons Regional Council
Magdy	Mohssen	Otago Regiona Council
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Magali	Moreau	Gns Science
Uwe	Morgenstern	Gns Science
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Francie	Morrow	Greater Wellington Regional Council
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David	Murphy	Environment Canterbury
Andrew	Neverman	Manaaki Whenua - Landcare Research
Thuy	Nguyen	University Of Canterbury



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Ludovico	Nicotina	Rms
Katie	Noakes	Christchurch City Council
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Ned	Norton	LandWaterPeople
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Lisa	Pearson	Land and Water Science
Kate	Pepper	Premium Marine Technology
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Michael	Pingram	Waikato Regional Council
David	Plew	Niwa
Joseph	Pollacco	Manaaki Whenua - Landcare Research
Anastasia	Ponomareva	Scottech
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Hannah	Rainforth	Perception Planning Ltd
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Marine	Richarson	Department Of Conservation
Clint	Rissmann	Land & Water Science Ltd
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Hugh	Robertson	Department of Conservation
Justin	Rogers	University Of Canterbury
Karyne	Rogers	GNS Science
Lucia	Roncaglia	Gns Science
Carlos	Rosado	Environment Canterbury

Andrew	Rossaak	Morphum Environmental Ltd
Helen	Rouse	Niwa
Helen	Rutter	Aqualinc Research Limited
Eloise	Ryan	Waikato Regional Council
Theo	Sarris	Institute Of Environmental Science And Research
Lena	Schallenberg	University Of Otago
Marc	Schallenberg	University of Otago
David	Schmale	Virginia Tech/ University of Waikato
Jessica	Schofield	University Of Canterbury
Gemma	Scott	Pattle Delamore Partners Ltd
Marta	Scott	Environment Canterbury
Ali	Shokri	University of Waikato
Bikesh	Shrestha	Otago Regional Council
Zach	Simpson	Lincoln University
Shailesh Kumar	Singh	NIWA
Michael	Skerrett	Waihopai
Louis	Skovsholt	NIWA
Graeme	Smart	Niwa
Fiona	Smith	Environment Southland
Hamish	Smith	Tonkin + Taylor
Hugh	Smith	Manaaki Whenua - Landcare Research
Josh	Smith	Waikato Regional Council
Katrina	Smith	Greater Wellington Regional Council
Kerry	Smith	Bay Of Plenty Regional Council
Nicole	Squires	Waikato Regional Council
M.S.	Srinivasan	Niwa
Brett	Stansfield	Eia Ltd
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Konstanze	Steiner	Cawthron Institute
Roland	Stenger	Lincoln Agritech Ltd
Tom	Stephens	Auckland Council
Michele	Stevenson	Environment Canterbury
Cohen	Stewart	Southland Fish And Game
Michael	Stewart	GNS Science
Simon	Stewart	Cawthron Institute
Rick	Stoffels	NIWA
Rebecca	Stott	National Institute Of Water And Atmospheric Research
Ramon	Strong	Horizons Regional Council
Alastair	Suren	Bay Of Plenty Regional Council
Chris	Tanner	NIWA / Te Waiora Joint Institute for Freshwater Management
Ken	Tarboton	Aqueus Consulting Limited
Malcolm	Taylor	University Of Waikato
Millie	Taylor	Wcrc
Wilco	Terink	Environment Canterbury

Joseph	Thomas	Tasman District Council
Bubba (William)	Thompson	Awarua
Gail	Thompson	Awarua
Karen	Thompson	NIWA
Georgia	Thomson-Laing	Cawthron Institute
Hugh	Thorpe	Retired
Fleur	Tiernan	Envirolink Ltd
Parul	Tiwari	Lincoln University
Jonathan	Tonkin	University Of Canterbury
Mark	Townsend	Bay Of Plenty Regional Council
Vanessa	Trompetter	Gns Science
Conny	Tschritter	Gns Science
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Asaeli	Tulagi	Waikato Regional Council
Kate	Turner	The Deep South Challenge
Marcus	Tūwairua	
Steffi	Uhlemann-Elmer	Rms
Simon	Vale	Manaaki Whenua - Landcare Research
Amanda	Valois	Niwa
Rob	Van Der Raaij	Gns Science
Amy	Van Lindt	University Of Canterbury
Kurt	Van Ness	Environment Canterbury
Dirk	Van Walt	Van Walt Ltd
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Luiz Rafael	Vasconcelos	Trustpower
Bas	Veendrick	Pattle Delamore Partners Ltd
Varvara	Vetrova	University Of Canterbury
Eugene	Vodjansky	Bloxam Burnett & Olliver
Gemma	Wadworth	Beca
Andrew	Watson	University Of Canterbury
Louise	Weaver	ESR Ltd
Jenny	Webster-Brown	Our Land and Water
Rogier	Westerhoff	GNS
Melanie	Westley	Tasman District Council
Dean	Whaanga	Awarua/TAMI
Maureen	Whalen	Environment Canterbury
Steve	White	Pattle Delamore Partners Ltd
Amy	Whitehead	NIWA
Lucy	Whitlock-Bell	Tonkin Taylor
Simon	Whitton	Natural Resources Wales
Ben	Wilkins	Environment Canterbury
Graeme	Wilson	SiteCare Limited
Karen	Wilson	Environment Southland
Nicola	Wilson	University Of Waikato

Morgan	Witton	University Of Waikato
Thomas	Wöhling	TU Dresden, Lincoln Agritech
Mara	Wolkenhauer	Department Of Conservation
Susie	Wood	Cawthron
Ben	Woodward	Niwa
Simon	Woodward	Niwa
Martin	Workman	Ministry for the Environment
Sarah	Worthington	Environment Canterbury
Tarryn	Wyman	Greater Wellington Regional Council
Jing	Yang	Niwa
Amy	Yasutake-Watson	University of Waikato/ Te Waioira: Joint Institute for Freshwater Management
Sarah	Yeo	University Of Otago
Roger	Young	Cawthron Institute
Christian	Zammit	National Institute Of Water And Atmospheric Research
Hisham	Zarour	Stantec
Xinxin	Zhang	Southern Institute Of Technology
Malea	Zygodlo	Bay Of Plenty Regional Council



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