

NZHS MSNZ 2025 Conference Programme

	Monday 1 December 2025			
	Workshops + Special Interest Groups			
	Tuesday 2 December 2025			
	OPENING CEREMONY			
8.30 - 9.15am	Mihi and Karakia Timatanga + Society Welcomes - NZHS MSNZ KWRA <i>Session Chair: Nicki Wilson</i>			
9.15 - 9.45am	Antoine Coffin - Waikato River Authority Tooku awa koiora – river of life			
9.45 - 10.00am	Richard Williams: GNS-NIWA merger			
10.00am - 10.35am	Morning Tea Kai Whakanoa			
Location	Heaphy 1	Brooklyn 1	Brooklyn 2	Brooklyn 3
Session Chair	Clare Houlbrooke	Matt Dumont	Daniel Kingston	Mark Schwarz
Theme	Groundwater Quality and Quantity I (1)	Modelling Techniques (2)	Climate Change: observations & modelling I (3)	Meteorology & weather forecasting I (4)
10.40am-11.00am	GROUNDWATER FLOW, CHEMISTRY AND NUTRIENTS ALONG A TRANSECT NORTH OF ASHBURTON Philippa Aitchison-Earl	GENERATING NON-STATIONARY GEOSTATISTICAL FIELDS WITH ANISOTROPIC SPATIAL CORRELATION Wes Kitlasten	How do New Zealand’s downscaled CMIP6 climate projections compare with CMIP5? Ashley Broadbent	What if Gabrielle had hit Auckland: Sensitivity of track, rainfall and wind to terrain shifts Richard Turner
11.00am-11.20am	HOW LOW CAN WE GO? GROUNDWATER NUTRIENTS IN A FARMED HIGH COUNTRY AREA, CANTERBURY Sameen Bushra*	Advancing hydrological Data Assimilation with Particle Filters and dynamical meteorological ensembles in New Zealand Maxime Rio	National CMIP6 downscaling: An overview of research findings and some important remaining scientific questions Peter Gibson	The current and future changes in the inner-core structure of Tropical Cyclone Debbie (2017) Difei Deng
11.20am-11.40am	A GROUNDWATER QUALITY MULTI-TRACER SITE INVESTIGATION Matthijs Van Soest	A framework for using MLops approaches in decision support modelling Jeremy Bennett	Downscaling with AI reveals large role of internal variability in fine-scale projections of climate extremes Neelesh Rampal*	A Real-World Demonstration of the Forecast Process Neal Osborne
11.40am-12.00pm	Sulfur-35 for Young Groundwater Dating Vanessa Trompetter	Forecasting inundation maps in real-time with machine learning Deidre Cleland	Machine learning predictions of summertime warming jumps on decadal timescales Emily Gordon	Reasons for Different Predictability of Tropical Cyclone Tracks in Western North Pacific and Atlantic Oceans Feifan Zhou
12.00pm-12.20pm	LIGHTNING TALKS 12.00pm Assessing Air Quality in New Zealand <i>Jamie Halla</i>	National-scale geospatial modelling of recommended riparian buffer zone widths Evelyn Uuemaa	Using AI Climate Projections to Assess Future Droughts in New Zealand Hamish Lewis	Deploying LLMs for Forecasting: Why Evaluation Comes First Maxime Rio
12.20pm-1.30pm	Lunch Break (and Student Function) Kindly Sponsored by Te Miro Water			

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Location	Heaphy 1	Brooklyn 1	Brooklyn 2	Brooklyn 3
Session Chair	Nicki Wilson	Evelyn Uuemea	Daithi Stone	Nicolas Cullen
Theme	Groundwater Quality and Quantity II (5)	Data informing modelling (6)	Climate Change: observations & modelling II (7)	Climate & Cryosphere (8)
1.30pm-1.50pm	ASSESSING DRINKING WATER SECURITY USING A MULTI-FACETED EVIDENTIAL APPROACH Helen Rutter	How Much Blood Can We Squeeze From A Turnip?: Extracting New Information From Old Models Matt Dumont	Changing rainfall extremes with climate change in New Zealand Suzanne Rosier	Progress simulating seasonal snow across Aotearoa Jono Conway
1.50pm-2.10pm	Risk assessment of dewatering-induced seawater and contaminant intrusion at Te Maunga Wastewater Treatment Plant, Tauranga Rocky Parsons	AquiferWatch Reloaded: (Near) Real-Time Visualisation of Wairau Aquifer Storage Thomas Wöhling	Projections of future hourly precipitation extremes in New Zealand Stephen Stuart	Simulating Past and Future Snowpack Dynamics on the Craigieburn Range in Aotearoa New Zealand Maya Berg*
2.10pm-2.30pm	Evaluation of West Wairarapa Aquifer Storage and Recovery (ASR) Scheme for Recycled Water Clare Houlbrooke	TEST DRIVING HYDROSTRATIGRAPHIC MODELLING OF AIRBORNE ELECTROMAGNETIC DATA IN THE NEW ZEALAND CONTEXT Maiwenn Herpe	Regional analysis for the purposes of designing a reference climate station network in New Zealand Raghav Srinivasan	The development of an automated avalanche terrain exposure scale in the Southern Alps, New Zealand Philip Elder*
2.30pm-2.50pm	WHAT TO EXPECT WHEN YOU'RE NOT EXPECTING – DRILLING IN TAURANGA GEOTHERMAL SYSTEM Rochelle Gardner	Detection of drainage ditches from LIDAR dtm using U-Net and transfer learning Alexander Knoch	Strengthening Water Resource Planning using Climate Modelling Shane Sullivan	MAPPING WEATHER EXTREMES TO CIRCULATION REGIMES IN AOTEAROA NEW ZEALAND Nicolas Fauchereau
2.50pm-3.10pm	AQUIFER DRINKING WATER FOR CENTRAL OTAGO COMMUNITIES Jens Rekker	Improving the performance of flood forecasting models by reducing uncertainty in rating curves Bridget Bosworth	Future Proofing Groundwater: Buffering Climate Change effects on water availability and quality Catherine Moore	Gravity Waves as Precursors to Mesoscale Warming Events in Antarctica Sam Walls
3.10pm-3.30pm		AI for Quality Management of Water Level Data in South Korea Chanwoo Kim	Scope of potential seawater intrusion to 2150 in Aotearoa New Zealand Allanah Kenny	SEASONAL SNOW, VOLCANIC SUPER ERUPTIONS AND NEW ZEALAND ELECTRICITY CRISES Blair Fitzharris
3.30pm - 4.00pm	Afternoon Tea			
Location	Heaphy 1	Brooklyn 1	Brooklyn 2	Brooklyn 3
Theme	GW-SW interaction I (9)	Modelling for power generation (10)	Climate Change: observations & modelling III (11)	Meteorology & weather forecasting II (12)
Session Chair	Thomas Wilding	Nicole Calder-Steele	Jamie Baldwin / Maya Berg	Richard Turner
4.00pm-4.20pm	Conceptual characterization of a culturally important spring: Tracing spring source and flux, Heretaunga Plains, NZ Tara Forstner*	The hydrology of the Lake Onslow pumped storage scheme Earl Bardsley	HALO-South – Flight planning from the ANZ team Adrian McDonald	HYBRID STATISTICAL DOWNSCALING OF RAINFALL USING REANALYSIS DATA IN BANGLADESH Marin Akter*
4.20pm-4.40pm	When surface flow disappears below: Mapping dry river reaches using field observations and satellite imagery Laura Somerville	Flood Meteorology and Hydrology, Patea Hydro-Electric Power Scheme Oscar Barrett-Garnier	HALO-South – Field Campaign and Data Collection from the ANZ team Daniel Morrish	When the Rain Falls Mainly on the Plain: Mechanisms of Extreme Rainfall in Unusual Places Mark Schwarz
4.40pm-5.00pm	Field Investigations of Groundwater-Surface water interaction in the Upper Taiari Scroll Plain, Central Otago Amir Levy	Climate driven variability of wind energy resources across selected locations in Fiji Shiraz Ali*	Downscaling Climate Projections using Fourier Neural Operators Owen Liu*	Precipitation downscaling to km and sub-hourly scale using generative AI: Demonstrating worldwide applicability Julius Polz
5.00pm-5.20pm	MANAGING GROUNDWATER, STORMWATER, AND SEAWATER INTERACTIONS AT A COASTAL AIRPORT Helen Rutter	A smart webtool for efficient irrigation water management Channa Rajanayaka for Jing Yang	Paradigm Shift Toward Smart Hydrological Surveys for Climate Resilience: The Role of KIHS in Korea Eunjeung Shim	
5.30pm - 7.30pm	Welcome Function - Exhibition Hall			

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	Wednesday 3 December 2025			
9.00 - 9.45am	Shari Gallop and Akuhata Bailey-Winiata: PDP Resilience in action: Insights from Māori-led adaptation to natural hazards and climate change Session Chair: Roland Stenger			
9.45am - 10.15am	Morning Tea			
Location	Heaphy 1	Brooklyn 1	Brooklyn 2	Brooklyn 3
Theme	Water Cycle Changes & Extremes I (13)	Land surface recharge and groundwater modelling (14)	Climate Change: observations & modelling IV (15)	Special Session: Hydrogeology of NZ coastal aquifer systems I (16)
Session Chair	Neelesh Rampal	Catherine Moore	Emily Gordon	Rogier Westerhoff, Paul White
10.20am-10.40am	Drought propagation in undisturbed catchments of the Southern Alps of New Zealand	Tūranganui-a-Kiwa, Poverty Bay Flats Groundwater Modelling	NEW ZEALAND AND SURROUNDING OCEANS SURFACE TEMPERATURE TRENDS : 1870 - 2024	BEYOND GLOBAL ESTIMATES: CLASSIFYING SEA-LEVEL RISE IMPACTS ON GROUNDWATER AT A NATIONAL-SCALE FOR NEW ZEALAND
	Daniel Kingston	Joanne Ferry	Blair Fitzharris presenting for James Salinger	Leanne Morgan
10.40am-11.00am	Compound droughts in New Zealand: low-flow drivers and process heterogeneity	Land Surface Recharge -- Allocation, variability, and does S-MAP matter?	The Role of Marine Heatwaves in Amplifying Compound Weather Extremes in New Zealand	INTEGRATED MODELLING OF CLIMATE CHANGE AND SLR FOR COASTAL GROUNDWATER RESILIENCE IN INVERCARGILL
	Sameen Bushra*	Matt Dumont	Matthew Chinappa*	Channa Rajanayaka
11.00am - 11.20am	Advancing precipitation monitoring: the operational QPE system at MetService	Inferring alpine river recharge of groundwater using principal component analysis with inorganic chemistry	ENSO AND SEASONALITY MODULATION OF TROPICAL CYCLONE GENESIS EVALUATED IN DOWNSCALED CLIMATE MODELS.	ESTIMATING ASSET EXPOSURE TO SEA-LEVEL RISE INDUCED WATER TABLE RISE ACROSS NZ USING LOCAL-SCALE MODELS
	Lu Sun	Matt Silver	Tolulope Emmanuel Oginni*	Connor Cleary
11.20am-11.40am	Incorporating historical non-stationarity into HIRDS	Toward efficient multiobjective optimization in applied groundwater modeling	The life and times of Zonal Wave Three	DEVELOPMENT OF 3D FACIES MODELS OF COASTAL AQUIFER SYSTEMS FOR NEW ZEALAND
	Trevor Carey-Smith	Jeremy White	James Renwick	Maria Narvaiza
11.40am-12.00pm	Future changes in hydro-climate extremes estimated using large ensembles of coupled climate-hydrology modelling.	Effective Groundwater Modelling: Tips From Experience	ENSO Forecasting in a Warming Climate: Development of deterministic and probabilistic Relative Oceanic Niño Index forecasts	ESTIMATING SHALLOW GROUNDWATER: AIMING FOR 'ONE SOURCE OF TRUTH' FOR DECISION MAKERS
	Suzanne Rosier	Julian Weir	Nicolas Fauchereau	Rogier Westerhoff
12.00pm-12.20pm	LIGHTNING TALKS 12.00pm The New Zealand Reanalysis <i>Stuart Moore</i>	EXPLORATION OF GROUNDWATER SALINISATION RISK IN THE LOWER HUTT GROUNDWATER ZONE	CarbonWatch-Urban: Granular CO2 emissions information for every town and city in New Zealand	Open discussion
	12.05pm OPERATIONAL NOWCASTING OF UV INDEX <i>Tristan Meyers</i> 12.10pm Costing Future Climate Disasters — MBIE Smart Idea <i>Nathanael Melia</i>	Brioch Hemmings	Jocelyn Turnbull	Rogier Westerhoff
12.20 - 1.50pm	Lunch and Poster Session			

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Location	Heaphy 1	Brooklyn 1	Brooklyn 2	Brooklyn 3
Session Chair:	Andrew Hughes	Doug Booker	James Renwick	Rogier Westerhoff, Paul White
Theme	Surface water Quality and Quantity I (17)	River flow and flood modelling I (18)	Climate Change: adaptation, mitigation, impacts & solutions I (19)	Special Session: Hydrogeology of NZ coastal aquifer systems II (20)
1.50pm-2.10pm	LINKS BETWEEN FLOOD HYDROLOGY AND FINE SEDIMENT DEPOSITION	Flood mapping tools: Using SAR to quantify fluvial and pluvial flooding in Canterbury (April/May-2025 event)	A first national assessment of future flood hazard for Aotearoa New Zealand	CHRISTCHURCH CITY GROUNDWATER CATCHMENT AND THE WAIMAKARIRI COASTAL AQUIFER SYSTEM: SHALLOW HYDROGEOLOGY AND CATCHMENT BOUNDARY
	Arman Haddadchi	Hamish Biggs	Alice Harang	Paul White
2.10pm-2.30pm	THE COMPOUND FLOOD DURING EX-TC GABRIELLE COULD HAVE BEEN FORECASTED WITH OPERATIONAL FLOOD MODEL	Rainfall-Runoff Modelling of Extreme Floods Using Machine Learning	Climate change risk assessment for the urban Ōpāwaho/Heathcote catchment, Christchurch	3D FACIES MODELLING AND HOLOCENE MARINE INCURSION IN COASTAL AQUIFERS IN THE COROMANDEL PENINSULA
	Zhonghou Xu	Thomas Jamieson-Lucy	Daniel Collins	Tusar Sahoo
2.30pm-2.50pm	Flood measurement systems: Stereoscopic camera stations, drones with RTK-GPS, towed depth-sounder systems, and aerial GPR	BETTER VOLUME ESTIMATES USING THE RDI HYDROLOGICAL MODEL FOR THE PORT HILLS CATCHMENTS IN CHRISTCHURCH	Forecasting evolving landslide hazard and impacts in Aotearoa New Zealand under a changing climate	BEDROCK AQUIFER POTENTIAL CHARACTERISATION AND BASIN-SCALE GROUNDATER SYSTEM BEHAVIOUR IN THE RUAMAHANGA VALLEY, NEW ZEALAND
	Hamish Biggs	Antoinette Tan	Livio Dreyer*	Daniel Tekā Berhe
2.50pm-3.10pm	ELUCIDATING WATER CHEMISTRY AND ECOSYSTEM CHANGE THROUGH HIGH-FREQUENCY MONITORING	FLOW SIMULATION MODEL APPLICATION TO FLOODS IN AN URBAN DISTRICT	Understanding past record-shattering drought events in New Zealand	HYDROGEOLOGICAL MAPPING IN THE RUAMĀHANGA CATCHMENT, WAIRARAPA VALLEY
	Roland Stenger	Jaehyun Shin	Adam Brown*	Tusar Sahoo
3.10pm-3.30pm	An assessment of the water allocation of the Otaika catchment	SAFER WATER (Service For Advanced Flood Emergency Response)		MODELLING GROUNDWATER DISCHARGE AND SALTWATER INTRUSION AT POCKMARKS IN THE WELLINGTON HARBOUR
	Tichatonga Gonah	Rick Leifting		Connor Cleary
3.30pm-4.00pm	Afternoon Tea			
Location	Heaphy 1	Brooklyn 1	Brooklyn 2	Brooklyn 3
Session Chair	Trevor Carey-Smith	Alice Harang	Jocelyn Turnbull	Rogier Westerhoff, Paul White
Theme	Water Cycle Changes & Extremes II (21)	River flow and flood modelling II (22)	Wider perspectives (23)	Special Session: Hydrogeology of NZ coastal aquifer systems III (24)
4.00pm-4.20pm	FLOOD FREQUENCY ANALYSIS USING ENVELOPE CURVES FOR EXTREME FLOODS	Machine Learning Predictions of New Zealand River Flows using LSTMs	The art (and science) of New Zealand's water cycle	SEA WATER INTRUSION AT TE WAIKOROPUPŪ SPRINGS
	Shailesh Singh	Gemma Mason	Daniel Collins	Mike Stewart
4.20pm-4.40pm	UPDATE ON CLIMATE CHANGE IMPACT ON RIVERINE FLOODING INVESTIGATIONS UNDER CMIP6	Transfer of hydrological model parameters to ungauged catchments	An overview of the Aquifer Intel Aotearoa regional water assessment programme.	SALINITY SURVEY IN THE ASHLEY-WAIMAKARIRI SHALLOW COASTAL AQUIFER USING WATER QUALITY AND GEOPHYSICS
	Christian Zammit	Doug Booker	Stewart Cameron	Leanne Morgan for Fiona Rodie
4.40pm-5.00pm	Leveraging historical observations to contextualise recent record-shattering rainfall events: a New Zealand case study	HIGH-FLOW HARVESTING FRAMEWORK IMPLEMENTATION: IDENTIFYING OPPORTUNITIES AND BARRIERS	Standardisation – have we gone too far?	FRESHWATER LENSES IN COASTAL AQUIFERS USING ELECTROMAGNETIC IMAGING: FINDINGS FROM PINES BEACH
	Muhammad Fikri Sigid*	Channa Rajanayaka	Thomas Wilding	Riley Hamlyn*
5.00pm-5.20pm	LIGHTNING TALKS		MICROBIAL METABOLIC POTENTIAL IN NEW ZEALAND GROUNDWATERS: REGIONAL PATTERNS AND IMPLICATIONS FOR CLIMATE-RESILIENT MANAGEMENT	Open Discussion
	5.00pm No one likes wet socks <i>Nicole Calder-Steele</i>		Louise Weaver	Paul White
	5.05pm The suffocating weir <i>Thomas Wilding</i>			
	5.10pm A hotter future — certainly, but wetter and/or drier? <i>Nathanael Melia</i>			
5.30-6.30pm	NZHS AGM - Heaphy 1 MSNZ AGM - Brooklyn 1			
from 6:30pm	ENVCO Social Function Hamilton Cosmopolitan Club			

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	Thursday 4 December 2025			
9.00am-9.45pm	Jen Purdie - University of Otago Applying climate knowledge in the energy industry to tackle climate and water challenges <i>Session Chair: Nicolas Cullen</i>			
9.45am - 10.15am	Morning Tea			
Location	Heaphy 1	Brooklyn 1	Brooklyn 2	Brooklyn 3
Theme	Data: monitoring, visualisation and management (25)	Weather/climate modelling (26)	Climate Change: adaptation, mitigation, impacts & solutions II (27)	Surface water Quality and Quantity II (28)
Session Chair	Roland Stenger	Peter Gibson	Daniel Collins	
10.20am-10.40am	Understanding Aotearoa's Groundwater Vulnerability by Characterising Dynamic Responses Scott Wilson	TOWARDS AN OPERATIONAL HIGH-RESOLUTION DATA-DRIVEN WEATHER PREDICTION MODEL FOR NEW ZEALAND Tristan Meyers		CUSTOMISED E. COLI MODEL AND ECONOMIC ASSESSMENT SHOWS RELATIVE BENEFITS OF CURRENT MITIGATIONS IN TARANAKI Annette Semadeni-Davies
10.40am-11.00am	GROUNDWATER INSIGHTS: A NEW TOOL FOR SUSTAINABLE WATER MANAGEMENT IN A CHANGING CLIMATE. Paul Oluwunmi	The Hao Moana WRF Hindcast: Long-Term Dynamical Downscaling over New Zealand Annick Terpstra	SEARCHING FOR GROUNDWATER RESILIENCE SOLUTIONS: DEVELOPMENT OF A CANTERBURY PLAINS CASE-STUDY Andrew Dark	Less flooding, less sediment: effects of pasture-to-pine conversion in a headwater catchment Andrew Hughes
11.00am - 11.20am	GROUNDWATER QUALITY MONITORING OPTIMISATION 1/2 – WAIKATO PROGRAM REVISION Nicki Wilson	Where will the fire go: development of the new coupled atmosphere-fire model PALM-FDS Alena Malyarenko	Recorded Flood Data - should we be concerned? Lennie Palmer	Operational methods for real-time river flow measurement systems for efficient water management Dongheon Oh
11.20am-11.40am	Groundwater quality monitoring optimisation 2/2 – National programme revision in the Waikato Magali Moreau	High-Resolution Mesoscale Atmospheric Motion Vectors from FY-4B Geostationary Satellite for Improved Typhoon Track Forecasting Min Min	Some pitfalls of a risk-based approach to adaptation planning for flooding Rob Bell	Special GMDSI Session: Decision support and problem decomposition I (28a) An introduction to decision support modelling Cath Moore, Jeremy White
11.40am-12.00pm	WELLS AOTEAROA NEW ZEALAND: BUILDING AND MAINTAINING A NATIONAL GROUNDWATER WELLS DATABASE Nicki Wilson	Refresh of NWP objective verification at Earth Sciences New Zealand Jorge Bornemann	THE WASHINGTON STATE CLIMATE CORPS NETWORK: EMPOWERING A CLIMATE-READY WORKFORCE THROUGH COMMUNITY SERVICE Matt Glazewski	Case studies in decision support modelling – complexity and communication
12.00pm-12.20pm	DEVELOPING A NATIONWIDE SOIL MOISTURE DATASET FOR HYDROLOGICAL APPLICATIONS IN AOTEAROA NEW ZEALAND Rasool Porhemmat	Earth Sciences NZ's Next NWP Model – Recent Testing, Evaluation and Next Steps Stuart Moore	RESONANCES AND PERCEPTIONS REGARDING CLIMATE CHANGE ADAPTATION Paul White / Pierre Glynn	Case studies in decision support modelling – complexity and communication
12.20-1.30pm	Lunch			

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Location	Heaphy 1	Brooklyn 1	Brooklyn 2	Brooklyn 3
Session Chair:	Magali Moreau	Rasool Porhemmat	Nicolas Cullen	Jeremy Bennett
Theme	GW-SW interaction II (29)	Weather/climate modelling, etc. (30)	Looking back (31)	Special GMSI Session: Decision support and problem decomposition II (32)
1.30pm-1.50pm	GROUNDWATER AND SURFACE WATER CONCEPTUAL FLOW FROM ENVIRONMENTAL TRACER SIGNATURES IN THE TASMAN REGION Uwe Morgenstern	Rapid Review of Radar Quantitative Precipitation Estimation for Urban Modeling Beatriz Reboredo	Aotearoa's first paleoclimate debate: Making sense of the Ice Age in the Southern Alps, 1860–80 Claran Doolin*	PEST++ - open software for parameter estimation and uncertainty analysis Jeremy White
1.50pm-2.10pm	QUANTIFYING FOREST HYDROLOGICAL PROCESSES & RESPONSES TO EXTREME EVENTS WITH TERRESTRIAL AND REMOTE SENSING MESUREMENTS Dean Meason	Quantifying uncertainty in the perceived risk of unprecedented rainfall: a New Zealand case study Muhammad Fikri Sigid*	1981 Kerikeri Storm, and Possible Maximum Precipitation Oscar Barrett-Garnier	PyEMU – making decision support modelling accessible and efficient Brioch Hemmings
2.10pm-2.30pm	FILL, SPILL, BURN, REPEAT: EVOLUTION OF RUNOFF GENERATION IN PEATY BOREAL SHIELD ROCK BARRENS CATCHMENTS Mike Waddington	Exploration of quantitatively forecasting Pinus Radiata pollen in New Zealand Eveanjelene Snee	Lessons from 2023: the year of storms Murray Cave	Rapid model builds and visualisations – rapidly
2.30pm-2.50pm	IMPACTS AND MANAGEMENT OF HAZARDOUS FLOWS IN ICELAND Graeme Smart	SENSOR DATA PIPELINE AND TIME SERIES OPERATION IN THE CLOUD Chen Wang	The Christchurch Artesian System: a historical treatise Helen Rutter	What next for GW modelling in NZ? Cath Moore, Jeremy White
2.50pm-3.15pm	Conference Close			
6.30pm-11.30pm	Conference Dinner - Hamilton Gardens - Bus departs Claudelands at 6.00pm - then picks up at Ibis Hotel, Alma St at 6.15 - arriving at Gardens 6.30pm			
	Friday 5 December			
	Conference Field Trips - depart Claudelands at 8.30am			