

## CONFERENCE PROGRAMME

The conference programme is set out over the following pages. First authors' surnames are given. Where the presenting author differs from the first author, the presenter's name is listed in brackets. All authors' names appear in the full abstracts. \* = student member of GSNZ, NZGS, GSAust, or GSAm. There are 3 concurrent oral sessions, with 1 plenary talk each day. Abstracts are listed alphabetically by first author name.

The symposia, and convenors, are:

**Geological and geophysical signatures of earth deformation and fluid flow:**

Ake Fagereng, Julie Rowland, Virginia Toy.

**Paleo-environments and basin evolution:** Miko Fohrmann, Jon Lindqvist, Gary Wilson.

**Magmatism and volcanic hazards:** Alan Cooper, Karoly Nemeth, James White.

**Fiordland revealed:** Donna Eberhart-Phillips, Mike Palin, Mo Turnbull.

**Seismotectonics of Southern New Zealand: from the Alpine Fault to the Otago shelf:** Paul Denys, Richard Norris, Phaedra Upton.

**New frontiers and general earth science:** Nick Mortimer.

**Applied geoscience:** Dave Craw, Phil Glassey, Candace Martin.

**Origin of the New Zealand biota:** Ewan Fordyce, Daphne Lee.

## Conference Programme for Tuesday 24 November

|               |  |   |  |
|---------------|--|---|--|
| 07:30         | <b>Registration open, Oamaru Opera House</b>   |   |  |
|               | <b>AUDITORIUM</b>  |   |  |
| 08:00 – 08:30 | Conference opening and notices   |   |  |
| 08:30 – 09:00 | PLENARY - <b>Toshihiko Shimamoto</b> : Impacts of Rick Sibson on fault mechanics   |   |  |
|               | <b>AUDITORIUM</b>  | <b>INKBOX</b>   | <b>EMPIRE</b>  |
|               | <i><b>Deformation &amp; Fluid Flow Symposium</b></i>   | <i><b>Magmatism &amp; Volcanic Hazards Symposium</b></i>  | <i><b>New Frontiers &amp; General Earth Science #1</b></i>   |
| 09:00 – 09:15 | <b>Cox_SF</b> - Fault weakening during dissolution-mediated frictional sliding on bare interfaces at hydrothermal conditions | <b>Lindsay</b> - The age of the Auckland Volcanic Field   | <b>Cassidy</b> - Archaeomagnetism of SW Pacific ceramics: a tool for geomagnetic and archaeological research   |
| 09:15 – 09:30 | <b>Toy</b> - Diverse habitats of pseudotachylite in the Alpine Fault Zone and implications for seismicity distributions      | <b>McGee*</b> - Geochemical and petrographic variations and the inner workings of monogenetic basaltic fields   | <b>Quigley</b> - Use of cosmogenic nuclides in tectonic geomorphology research   |
| 09:30 – 09:45 | <b>Nortje (Oliver)</b> - Variable fault cohesion and reactivation on a Proterozoic fault array                               | <b>Booden*</b> - Genesis of the Miocene volcanic succession of the North Island in light of new isotope and trace element data                                      | <b>Eccles</b> - Imaging through seismically attenuative volcanics: investigating below basalt in the North Atlantic                                      |
| 09:45 – 10:00 | <b>Blenkinsop</b> - A footnote on fault reactivation   | <b>Ilanko*</b> - Pyroclastic successions of a tuff ring in a monogenetic field: Barriball Road tuff ring, South Auckland  | <b>Nobes</b> - Do englacial channels have a characteristic radar response and are they correlated with surface topography? Some preliminary observations |
| 10:00 – 10:30 | <b>Refreshments – Oamaru Opera House</b>   |   |  |
| 10:30 – 10:45 | <b>John</b> - The character of oceanic detachment faults   | <b>Stewart</b> - Evidence of multiple scoria cones and cone collapse at Pouerua volcano, Northland volcanic field, New Zealand                                      | <b>Smith</b> - Biomineralisation in an urban environment: a carbonate budget for Otago Harbour   |
| 10:45 – 11:00 | <b>Cheadle</b> - The structure & rheology of oceanic detachment faults: why are mylonites rare?                              | <b>Lefebvre*</b> - Challenges in determining the volcano-structural level of a maar-diatreme remnant: East Standing Rocks, Hopi Buttes Volcanic Field, Arizona, USA | <b>Macmillan*</b> - Comparative sedimentology and paleoecology of giant fossil oyster beds in Tertiary strata in New Zealand and Argentina               |

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|-------------------|---|--|---|
| 11:00 – 11:15     | <b>Korchinski*</b> - Tectonic interpretation of titanium-in-quartz temperatures from high pressure rocks, D'Entrecasteaux Islands, Papua New Guinea | <b>Nemeth</b> – Morphology of glassy pyroclasts from soft substrate controlled versus open vent phreatomagmatic eruptions                  | <b>Fildes*</b> - Provenance studies of Miocene mass transport deposits  |
| 11:15 – 11:30     | <b>Gillam*</b> - Shear bands near the mylonitic/non-mylonitic transition, Tatare Stream, South Island, New Zealand                                  | <b>Murtagh*</b> - The Ilchulbong Tuff Cone, Jeju Island, South Korea: recent observations and development                                  | <b>McKay</b> - Did Antarctic cooling ~3.3 million years ago help facilitate Northern Hemisphere glaciations?  |
| 11:30 – 11:45     | <b>Fagereng*</b> - Incrementally developed 'dilatational hydro-shears' forming at high angles to $\sigma_1$ in foliated mélangé matrix              | <b>Schipper*</b> - Intra-vesicular extrusions: sensitive indicators of submarine explosive conduit dynamics                                | <b>McColl*</b> - International summer school on rockslides and related phenomena  |
| 11:45 – 12:00     | <b>Butler</b> - Thrust zone localization in poorly lithified submarine sandstones: theory and examples from seismic and outcrop                     | <b>Pittari</b> - Textural alteration styles and processes in volcanoclastic kimberlite deposits at the Fort à la Corne Field, Saskatchewan | <b>Burlinson</b> - Gold exploration using fluid inclusions  |
| 12:00 – 13:00     | <b>LUNCH - Kingsgate Hotel Brydone</b>  |  |   |
| 12:15 – 13:00     | Lunchtime Meeting: Paleontology Special Interest Group - THE CHAMBERS   | Lunchtime Meeting: Historical Studies Group - THE BOARD ROOM   | Lunchtime Meeting: International Scientific Drilling Partnership - EMPIRE ROOM  |
| <b>AUDITORIUM</b> |   |  |   |
| 13:00 – 13:45     | <b>GSNZ &amp; NZGS GENERAL ASSEMBLY</b>   |  |   |
|                   | <b>AUDITORIUM</b>   | <b>INKBOX</b>  | <b>EMPIRE</b>   |
|                   | <i>Deformation &amp; Fluid Flow Symposium</i>   | <i>Magmatism &amp; Volcanic Hazards Symposium</i>  | <i>New Frontiers &amp; General Earth Science #2</i>   |
| 13:45 – 14:00     | Benson ( <b>Stern</b> ) - Crustal and upper mantle structure of the Central North Island from the MORC Survey, 2005                                 | <b>Doyle</b> - Temporal and spatial changes of evolving and coalescing lahars at Semeru, Indonesia   | <b>Adams</b> - Mind the gap: investigating some apparent stratigraphic breaks in Permian, Triassic and Jurassic successions of the Torlesse and Waipapa terranes using detrital zircon ages |
| 14:00 – 14:15     | <b>Browne</b> - Mineralogical signals of fluid flow in geothermal systems   | <b>Moebis*</b> - Characterisation of highly fragmented ash derived from Ruapehu and Ngauruhoe, New Zealand                                 | <b>Jugum*</b> - A continuation of the Jurassic Waipapa-Aspiring Terrane in the Otago Schist: Evidence from detrital zircons   |
| 14:15 – 14.30     | <b>De Ronde</b> - Hydrothermal systems of intraoceanic arcs - a 10 year odyssey of exploration  | <b>Jolly</b> - Waveform modelling for repeating earthquakes at Ngauruhoe volcano in Tongariro National Park                                | <b>Ireland</b> - Geochronology of granulites from the Kakanui Mineral Breccia   |

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|--------------------------------|--|---|---|
| 14:30 – 14:45                  | <b>Leary</b> - Catching up with Rick Sibson at the outcrop: computing fracture-fluid interactions in the crust | <b>Zernack*</b> - Hot zone development beneath a long-lived andesite stratovolcano: magmatic evolution of Mt Taranaki, NZ   | <b>Waterhouse</b> – Stratigraphy of the southeast Torlesse                          |
| 14:45 – 15:00                  | <b>McLellan</b> - Spatial and numerical analysis of ancient and modern epithermal systems                      | <b>Seebeck*</b> - Dike intrusion and displacement accumulation at the intersection of the Okataina Volcanic Centre and Paeroa Fault zone, Taupo Rift, New Zealand | <b>Rattenbury</b> - The transition from Otago Schist to Alpine Schist, Haast region |
| <b>KINGSGATE HOTEL BRYDONE</b> |  |   |   |
| 15:00 – 17:00                  | <b>POSTERS</b>   |   |   |
|                                | <i>Deformation &amp; Fluid Flow Symposium</i>  | <i>Magmatism &amp; Volcanic Hazards Symposium</i>   | <i>New Frontiers &amp; General Earth Science</i>                                    |
|                                |  | <b>INKBOX THEATRE</b>   |   |
| 17:00 – 18:00                  |  | <b>GSNZ AGM</b>   |   |

## Conference Programme for Wednesday 25 November

| <b>ONE DAY FIELD TRIPS</b>   |  |   |                           |
|--|--|---|---------------------------|
| All field trips depart from the Oamaru Opera House, except Trip 8, which leaves from the Oamaru i-SITE |  |   |                           |
| DEPARTS  | TRIP NUMBER  | TITLE   | LEADERS                   |
| 08:00  | <b>1</b>   | <b>Gold in Central Otago</b>  | Craw                      |
| 08:00  | <b>2</b>   | <b>Faults, fractures, and fluid flow in basement assemblages</b>    | Toy, Sibson, Mortimer     |
| 08:00  | <b>4</b>   | <b>The Waihemo Fault System, North Otago</b>                        | Curran, Norris            |
| 08:00  | <b>6</b>   | <b>Aviemore - a dam of two halves</b>                               | Barrell, Read, Van Dissen |
| 08:00  | <b>7</b>   | <b>Vanished world</b>   | Fordyce                   |
| 09:00  | <b>3</b>   | <b>coastal Otago - Oamaru to Kakanui</b>                            | Lee                       |
| 10:30  | <b>5</b>   | <b>Waiareka-Deborah Volcanics: volcanoes of the Paleogene shelf</b> | White                     |
| 14:00  | <b>8</b>   | <b>Victorian Oamaru - a dramatised experience</b>                   | Elliffe                   |
| 17:30  | Buses depart from Oamaru Opera House for barbeque at Burnside Historic Homestead, 527 Burnside Road, Enfield |   |                           |
| 18:00  | <b>Barbeque</b>  |   |                           |

## Conference Programme for Thursday 26 November

|               |  |   |   |
|---------------|--|---|---|
| 07:30         | <b>Registration open, Oamaru Opera House</b>   |   |   |
|               | <b>AUDITORIUM</b>  |   |   |
| 08:15 – 08:30 | Notices  |   |   |
| 08:30 – 09:00 | PLENARY - <b>Robert DeConto</b> : Plio-Pleistocene variations of the Antarctic Ice Sheet: implications for future sea level    |   |   |
|               | <b>AUDITORIUM</b>  | <b>INKBOX</b>   | <b>EMPIRE</b>   |
|               | <i><b>Deformation &amp; Fluid Flow Symposium</b></i>   | <i><b>Paleo-Environments &amp; Basin Evolution Symposium</b></i>  | <i><b>New Frontiers &amp; General Earth Science #3</b></i>  |
| 09:00 – 09:15 | <b>Berryman</b> - Progress towards deciphering a c. 7kyr record of surface ruptures on the Alpine Fault                        | <b>Nodder</b> - Temporal variability in organic and inorganic carbon vertical flux to the deep ocean, and implications for paleoceanographic reconstructions  | <b>Herzer</b> - Seafloor spreading in the Tertiary backarc basins north of New Zealand - new results                                      |
| 09:15 – 09:30 | <b>Cochran</b> - Linking an off-fault paleoenvironmental record to surface-rupturing earthquakes on the Alpine Fault           | <b>Troup*</b> - Sedimentology and petrology of Miocene cold-seep carbonates in southern Hawke's Bay: Geological evidence for past sea-bed hydrocarbon seepage | <b>Leonard</b> - Episodic, shifting volcanism and rifting in central Taupo Volcanic Zone: results from QMAP Rotorua and new geochronology |
| 09:30 – 09:45 | <b>Norris</b> - Fluid evolution during uplift of schist in the hanging wall of the Alpine Fault: evidence from oxygen isotopes | <b>Naish</b> - The stability of the Antarctic ice sheets during the early Pliocene climatic optimum   | White_P ( <b>Tschirter</b> ) - The Taupo Volcanic Zone in three dimensions  |
| 09:45 – 10:00 | <b>Ninis*</b> - The Wellington Fault - Holocene displacement and slip rate at Emerald Hill, Wellington                         | <b>Kolodziej*</b> - Reconstruction of sea surface temperatures in the eastern Tasman Sea over the last 480,000 years  | <b>Johnson*</b> - A high-resolution benchmark of spatial variations in seismic anisotropy around Mount Ruapehu volcano                    |
| 10:00 – 10:30 | <b>Refreshments – Oamaru Opera House</b>   |   |   |
| 10:30 – 10:45 | <b>Malin</b> – F $\Phi$  | <b>Hollis</b> - Ice in the greenhouse: New Zealand's evidence for Antarctic glaciation in the Late Paleocene  | <b>Williams_S*</b> - Numerical models of TVZ with mixed Neumann and Dirichlet boundary conditions   |
| 10:45 – 11:00 | <b>Townend</b> - States of stress in the crust and at plate boundaries: what do small and large faults feel?                   | <b>Figueira*</b> - Preliminary results of salt marsh foraminiferal proxy records of sea-level rise in the South Island, New Zealand                           | <b>Kennedy_B</b> - Torturing volcanic rocks until they tell us everything they know   |

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|---------------|--|--|---|
| 11:00 – 11:15 | <b>Miller</b> - Fluid-driven aftershocks and controls on Omori decay rates   | <b>Hannah_J</b> - Mean sea level changes around New Zealand as estimated from JASON 1 and TOPEX altimetry data, and from GPS and tide-gauge time series data | <b>Kroeger</b> - 3D heat-flow regimes in the Taranaki Basin   |
| 11:15 – 11:30 | <b>Nuechter</b> - Dynamic and complex states of stress related to the seismic cycle  | <b>Ohneiser*</b> - Magnetostratigraphic records, Eocene-Miocene equatorial Pacific, IODP321-322  | <b>Nicol</b> - History of the Marlborough Sounds during the last 5 million years  |
| 11:30 – 11:45 | <b>Savage</b> - Automatic shear wave splitting, with application to time-varying stress  | <b>Lilly</b> – Defining past volume of grounded ice in the Ross Sea  | <b>Marx_R*</b> - Late Miocene volcanoclastic deposits at Kaiaua Bay and Marau Point, East Coast Basin   |
| 11:45 – 12:00 | <b>McSaveney</b> - The answer is "elastic-strain energy", but what are the questions?  | <b>Barrett</b> - NZ geosciences contribution to 5th IPCC Assessment Report   | <b>Duffy*</b> - Indonesian geodynamics and paleoceanography revealed in an exhumed Pliocene forearc basin, Timor Leste  |
| 12:00 – 13:00 | <b>LUNCH - Kingsgate Hotel Brydone</b>   |  |   |
| 12:15 – 13:00 | Lunchtime Meeting: Fossil Record File Subcommittee - THE CHAMBERS  |  | Lunchtime Meeting: Deep Fault Drilling Project - EMPIRE ROOM  |
|               | <b>AUDITORIUM</b>  | <b>INKBOX</b>  | <b>EMPIRE</b>   |
|               | <i><b>Deformation &amp; Fluid Flow Symposium</b></i>   | <i><b>Paleo-Environments &amp; Basin Evolution Symposium</b></i>   | <i><b>Fiordland #1</b></i>  |
| 13:00 – 13:15 | <b>Sibson</b> - Coupled VMS/lode-gold mineralizing scenarios associated with intra-arc compressional inversion in NE Honshu, Japan                   | <b>Lee</b> - A window into Early Miocene New Zealand: a progress report on research on the Foulden Maar  | <b>Allibone</b> - The Median Batholith in southern New Zealand after QMAP   |
| 13:15 – 13:30 | <b>Poulson</b> - Gold "breaks": Southern Abitibi Greenstone Belt, Canada   | <b>Ryan*</b> - A 210 ka terrestrial palynomorph record from a marine sediment core, West Coast, South Island   | <b>Jongens</b> - Ross-Delamerian Orogen in Fiordland revisited  |
| 13:30 – 13:45 | <b>Wilson_C</b> - Fault control on gold mineralisation in the central Victorian portion of the Lachlan fold belt, Australia                          | <b>Bland_K</b> - An allostratigraphic framework for the Cretaceous-Recent fill of Taranaki Basin: insights from the Kupe area                                | <b>Tulloch</b> - Autochthonous inheritance of zircon in the Arthur River Complex, Fiordland, New Zealand  |
| 13:45 – 14:00 | <b>Barker</b> - Variations in fluid flow pathways and fluid pressures during crustal shortening: examples from the Taemas Vein Swarm, NSW, Australia | <b>Fohrmann</b> - Intra basinal erosion through time: the 4D Taranaki Project  | <b>Milan</b> - Complexity of U-Pb-Hf isotope patterns in zircon during arc magma genesis: evidence from a high-P, Cretaceous granulite / eclogite facies arc root, Fiordland, New Zealand |

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|---------------|--|---|---|
| 14:00 – 14:15 | <b>Nuriel*</b> - Timing and mechanism of calcite-filled vein formation in a contractional strike-slip setting, the Dead Sea Fault                            | <b>Baur*</b> - From source to sink: visualization of a west-flowing Miocene slope channel mega-system, Taranaki Basin   | <b>Cooper</b> - Arc magmatism on the Gondwana margin: Borland Road, Southland   |
| 14:15 – 14:30 | <b>Ilg</b> - Relationships between normal faults and gas migration in South Taranaki, New Zealand  | <b>Lindqvist</b> - Puysegur Group deepwater lacustrine turbiditic facies, southwest Fiordland: evidence of hyperpycnal flow processes & implications for the preservation of organic matter in New Zealand mid-Cretaceous rift basins | <b>Daczko</b> - Metastable persistence of pelitic assemblages during high-P granulite facies metamorphism of intermediate-mafic orthogneiss, Fiordland, New Zealand |
| 14:30 – 14:45 | <b>Gale</b> - Natural fractures in shales: timing, mechanisms of formation, and relevance for shale-gas reservoirs   | <b>Ghisetti</b> - Modulation of the Westland foredeep through ongoing compressional inversion   | <b>De Paoli*</b> - The eclogite - granulite transition: mafic and intermediate assemblages at Breaksea Sound, Fiordland   |
| 14:45 – 15:00 | Weinberger ( <b>Mortimer</b> ) - Formation of systematic joints in metamorphic rocks due to release of Cretaceous residual strain, Otago Schist, New Zealand | <b>Jones</b> - A tool for creating an interactive chronostratigraphic framework   | <b>Powell</b> - Metamorphism and deformation in southern Fiordland: correlation with northern and eastern Fiordland   |
| 15:00 – 17:00 | <b>KINGSGATE HOTEL BRYDONE</b>   |   |   |
|               | <b>POSTERS</b>   |   |   |
|               | <b>FIORDLAND SYMPOSIUM</b>   | <b>PALEO-ENVIRONMENTS &amp; BASIN EVOLUTION SYMPOSIUM</b>   | <b>APPLIED GEOSCIENCE SYMPOSIUM</b>   |
|               | <b>SEISMOTECTONICS SYMPOSIUM</b>   | <b>NEW ZEALAND BIOTA SYMPOSIUM</b>  |   |
| 19:00         | <b>CONFERENCE DINNER - The Barrel House, NZ Malt Whisky Co., 14-16 Harbour St., Oamaru</b>   |   |   |

## Conference Programme for Friday 27 November

|               |   |  |  |
|---------------|---|--|--|
| 07:30         | <b>Registration open, Oamaru Opera House</b>  |  |  |
|               | <b>AUDITORIUM</b>   |  |  |
| 08:15 – 08:30 | NOTICES   |  |  |
| 08:30 – 09:00 | PLENARY - <b>Bruce Hayward</b> : Natural experiments in the dispersal and evolution of deep sea biota following the Messinian extinction in the Mediterranean Sea     |  |  |
|               | <b>AUDITORIUM</b>   | <b>INKBOX</b>  | <b>EMPIRE</b>  |
|               | <b>Fiordland #2</b>   | <b>New Zealand Biota Symposium</b>   | <b>Applied Geoscience Symposium</b>  |
| 09:00 – 09:15 | <b>Richards*</b> - U-Pb ages of detrital zircon from Eocene-Oligocene sediments in Te Anau Basin and provenance implications  | <b>Stein*</b> - A subtropical biota from a Late Oligocene rocky shore, Waimumu, Southland  | <b>Onacha</b> - Do earthquakes generate electromagnetic signals?   |
| 09:15 – 09:30 | <b>Sutherland</b> - Exhumation history of Fiordland, southwest New Zealand, during subduction initiation, with implications for thermochronologic analysis strategies | <b>Marx_F*</b> - Climate, critters and cetaceans - Cenozoic drivers of the evolution of modern whales  | Rhodes ( <b>Van Dissen</b> ) - It's Our Fault: re-evaluation of Wellington Fault conditional probability of rupture      |
| 09:30 – 09:45 | <b>Upton</b> - Upper crustal hydraulic conductivity between Lake Manapouri and Doubtful Sound, Fiordland  | <b>Fordyce</b> - New Zealand shark-toothed dolphins (Family Squalodontidae)  | <b>Semmens*</b> - It's Our Fault: geological and geotechnical characterisation of the Wellington central commercial area |
| 09:45 – 10:00 | Davies ( <b>Dykstra</b> ) - The evolution of Milford Sound - a temperate fiord on a transform plate boundary  | <b>Thomas*</b> - Evolution of the humeral plexus in penguins   | <b>Grenfell</b> - Holocene evolution of the tectonically-active Wairau coastal area                                      |
| 10:00 – 10:30 | <b>Refreshments – Oamaru Opera House</b>  |  |  |
|               | <b>Seismotectonics Symposium</b>  | <b>New Zealand Biota Symposium</b>   | <b>Applied Geoscience Symposium</b>  |
| 10:30 – 10:45 | <b>Langridge</b> - Late Holocene paleoseismicity of the Alpine Fault at the Toaroha River, West Coast: preliminary results  | <b>Scofield</b> - Rapid somatic expansion causes the brain to lag behind: the case of the brain and behaviour of New Zealand's Haast's Eagle ( <i>Harpagornis moorei</i> ) | Mogren ( <b>Al-Jasser</b> ) - Detailed environmental and geophysical study of Wadi Hanifah in central Saudi Arabia       |

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|---------------|--|---|--|
| 10:45 – 11:00 | Herman ( <b>Cox_SC</b> ) - Low-temperature thermochronology and thermo-kinematic modeling of deformation, exhumation and development of topography in the central Southern Alps, New Zealand | <b>Tennyson</b> - The Miocene St Bathans fauna: an update   | <b>Pillans</b> - The Gravestone Project - weathering rates from the dead   |
| 11:00 – 11:15 | <b>Dougherty</b> - Paleoseismic insight gained by augmenting LiDAR with GPR  | <b>Kaulfuss*</b> - A preliminary account of the fossil arthropod fauna and insect-plant relationships in the Foulden Maar (Early Miocene, Otago)                        | <b>Orpin</b> – Resource evaluation, exploration and current prospecting interests of West Coast ironsands, North Island, New Zealand |
| 11:15 – 11:30 | <b>Carne*</b> - Development of deformational bulges along the active strike-slip Wairarapa Fault, New Zealand  | <b>Homes</b> - Preliminary review of Late Cretaceous and Cenozoic fern macrofossils from South Island, New Zealand  | <b>Reid_N*</b> - Downstream variation in mineralogy of bedload sediment, Taieri River: an application of quantitative XRD            |
| 11:30 – 11:45 | <b>Bell</b> - Hikurangi Margin tsunami earthquake generated by slip over a subducted seamount  | <b>Maciunas*</b> - <i>Phormium</i> and <i>Asteliaceae</i> macrofossils from New Zealand: using leaf cuticular details to determine phylogenetic affinities              | <b>McCann*</b> - Gold and platinum deformation, aeolian deformation and toroid development in beach placer deposits, Southland       |
| 11:45 – 12:00 | <b>Reyners</b> - Putting earthquakes in their (right) place: new insights into seismotectonics of the South Island   | <b>Conran</b> - A review of the New Zealand macrofossil monocot flora   | <b>Craw</b> - Mineralogy and geochemistry of antimony at Reefton and Macraes gold mines, South Island, New Zealand                   |
| 12:00 – 13:00 | <b>LUNCH - Kingsgate Hotel Brydone</b>   |   |  |
|               | <b>AUDITORIUM</b>  | <b>INKBOX</b>   | <b>EMPIRE</b>  |
|               | <b><i>Seismotectonics Symposium</i></b>  | <b><i>New Zealand Biota Symposium</i></b>   | <b><i>New Frontiers &amp; General Earth Science #4</i></b>   |
| 13:00 – 13:15 | <b>Fry</b> - A multiple-discipline approach to understanding the Mw=7.6 Dusky Sound earthquake of 2009   | <b>Bannister</b> - A review of the flora of the Foulden Diatomite   | <b>Crowley*</b> - Explosive volcanism in the Chatham Islands: origin of the Rangiauria Breccia                                       |
| 13:15 – 13:30 | <b>Power</b> - The Fiordland 2009 tsunami: observations and interpretation   | <b>Mildenhall</b> - Newvale Mine, seam W6 - palynomorphs from a tree-fall depression in a Late Oligocene-Early Miocene autochthonous swamp forest, southern New Zealand | <b>Hikuroa</b> - Realising New Zealand's energy potential: a kaitiaki approach to geothermal development                             |
| 13:30 – 13:45 | <b>Beavan</b> - Coseismic and early postseismic slip distribution of the 15 July 2009 Dusky Sound earthquake   | <b>Jordan</b> - Conifers: once and future kings?  | <b>Kayani</b> - Identifying a meteorite ablation debris near village Lehri in Potohar region of Pakistan                             |

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|---------------|--|---|--|
| 13:45 – 14:00 | unassigned                             | <b>Carpenter</b> - New and remarkable Proteaceae leaf fossils from southern New Zealand | <b>Skinner</b> - A strange occurrence of pyrite-coated granitic cobbles at Lee Bay on Stewart Island |
| 14:00 – 14:15 | <b>AUDITORIUM - CLOSING CEREMONIES</b> |   |  |

## CONFERENCE POSTERS LISTED BY SYMPOSIUM & BOARD NUMBER

### *Symposium 1: Geological and geophysical signatures of earth deformation and fluid flow*

|      |   |
|------|---|
| Tu02 | <b>Caldwell</b> - Conductivity structure of the Ohaaki geothermal system: insights from magnetotelluric measurements  |
| Tu04 | <b>Crispini</b> - Gold-bearing veins in Northern Victoria Land (Antarctica): structure, hydrothermal alteration and implications for the paleo-Pacific margin of Gondwana |
| Tu06 | <b>Little</b> - How were the world's youngest eclogites (D'Entrecasteaux Islands, Papua New Guinea) exhumed?  |
| Tu05 | <b>Mountjoy</b> - Relationship between out-of-sequence upper plate thrust faulting and interplate coupling on the central Hikurangi margin                                |
| Tu03 | <b>Rowland</b> - The Coromandel to Taupo Volcanic Zone transition: quasi-predictable structural control on ascending hot water  |
| Tu01 | <b>Seward</b> - P-wave travel time residuals across the western North Island: implications for variations in thickness of the mantle lithosphere                          |

### *Symposium 2: Paleo-environments & basin evolution*

|      |   |
|------|---|
| Th22 | <b>Arthur*</b> - Sedimentation in the Waioce Formation (Middle Miocene, Southland): local tectonics or orbital cycles?  |
| Th19 | <b>Doughty*</b> - Using computer models to quantify New Zealand glacier fluctuations over the past 13,000 years   |
| Th25 | <b>Fox*</b> - A Miocene terrestrial sediment core from Foulden Maar, Otago  |
| Th18 | <b>Fraser*</b> - The extent of ice on Campbell Island at the Last Glacial Maximum   |
| Th20 | <b>Hannah_M</b> - Palynomorphs recovered from the ANDRILL SMS sediment cores provide first proximal environmental characterization of the Middle Miocene climatic optimum                         |
| Th23 | <b>Hicks*</b> - Ecological and sedimentological evolution of the volcanically active Eocene-Oligocene continental shelf, northeast Otago, New Zealand   |
| Th28 | <b>King*</b> - Paleomagnetic environmental record of MD152-2991 core, offshore West Coast South Island, New Zealand   |
| Th30 | <b>Lennon*</b> - Geophysical investigation of shallow basin-margin structures east and west of Stewart Island   |
| Th27 | <b>Lurcock*</b> - A palaeomagnetic study of the Fairfield Quarry section, Otago   |
| Th29 | <b>Nelson*</b> - Magnetite grain-size trends, Challenger Plateau, New Zealand   |
| Th21 | <b>Sabaa</b> - Causes of evolution and extinction of deep-sea benthic foraminifera in the Indian Ocean  |
| Th24 | <b>Samuel*</b> - Depositional history of Paleogene strata in the Canterbury Basin   |
| Th26 | Tinto ( <b>Dagg</b> )* - The Marshall Paraconformity in the Tengawai-1 drillcore, South Canterbury: erosion and deposition associated with early development of the Antarctic Circumpolar Current |
| Th31 | <b>Wilson</b> - Use of gravity data to characterise geological structures beneath the sea floor, New Harbour, Antarctica  |

### ***Symposium 3: Magmatism & volcanic hazards***

|      |  |
|------|--|
| Tu08 | Al-Damegh ( <b>Mogren</b> ) - Geophysical investigations on the active Al-Ais area of Saudi Arabia   |
| Tu17 | <b>Ashwell*</b> - Playing Vulcan: re-creating the subterranean conditions that spawn rocks   |
| Tu20 | Auer ( <b>White_J</b> ) - Sedimentary response to debris avalanche & eruption - stream-plain deposits on the slopes of Mt. Ruapehu                               |
| Tu26 | <b>Baines*</b> - Miocene detrital zircon megacrysts from East Otago  |
| Tu09 | <b>Bennie</b> - Magnetotelluric imaging of the Tongariro volcanic system, New Zealand: preliminary results   |
| Tu13 | <b>Brenna*</b> - Evolution of a monogenetic basaltic magma batch: comparison of Crater Hill, Auckland Volcanic Field and Udo tuff cone, Jeju Island, South Korea |
| Tu10 | <b>Hill</b> - Structure of the Mount St. Helens magmatic system: insights from magnetotelluric imaging   |
| Tu21 | <b>Gorny*</b> - Snaebylisheidi, Iceland: lava-hyaloclastite sheet of a voluminous subglacial eruption  |
| Tu23 | <b>Kilgour</b> - Magma residence beneath Mt Ngauruhoe from fluid inclusions  |
| Tu12 | <b>Le Corvec*</b> - Structural controls on monogenetic basaltic volcanism  |
| Tu19 | <b>Lube</b> - Capturing the secrets of a lahar wave  |
| Tu15 | <b>May*</b> - The Rotomahana eruption of 1886: a basaltic fissure eruption through an intensely active geothermal system   |
| Tu22 | <b>Mazot</b> - Gas geochemistry of New Zealand volcanoes: previous work and future perspectives  |
| Tu16 | <b>Pardo*</b> - Plinian to subplinian eruptions of andesitic volcanoes: from lithofacies to eruption dynamics  |
| Tu18 | <b>Phillips*</b> - Forecasting the consequences of the failure of the eastern rim of Crater Lake, Mt Ruapehu - a research outline                                |
| Tu11 | <b>Smid</b> - DEVORA: Year 1 of determining volcanic risk in Auckland  |
| Tu14 | <b>Sorrentino*</b> - Quantifying vesicularity on semi-consolidated and altered Paleogene surtseyan deposits, Chatham Islands, New Zealand                        |
| Tu24 | <b>Turnbull_R*</b> - Construction and evolution of a mafic-felsic magma chamber: an example from Stewart Island  |

### ***Symposium 4: Fiordland revealed***

|      |   |
|------|---|
| Th03 | <b>Sagar*</b> - High-grade gneisses & granitoids of the Glenroy & Granite Hill complexes, West Coast region |
| Th02 | <b>Smillie*</b> - Provenance of quartz-rich sandstones in the Cenozoic basins of Western Southland          |
| Th01 | <b>Turnbull_I</b> - QMAP Fiordland  |

**Symposium 5: Seismotectonics of southern New Zealand**

|      |  |
|------|--|
| Th08 | <b>Bassett_D*</b> - 3-D velocity structure of the northern Hikurangi margin: implications for crustal growth   |
| Th05 | <b>Bland_L</b> - Scientific response to the Dusky Sound earthquake, July 15th 2009   |
| Th10 | <b>Boese*</b> - Microseismicity in the central Southern Alps   |
| Th15 | <b>Boulton*</b> - Creating coseismic fault rocks   |
| Th13 | <b>Bruce*</b> - Characterisation of an active offshore coast-parallel fault system on the shallow southeast continental shelf of the South Island, New Zealand   |
| Th11 | Cox_SC ( <b>Strong</b> ) - Insights to crustal fluid-flow near the Alpine Fault: monitoring experiments at Copland warm spring   |
| Th14 | <b>Curran*</b> - Investigating Trotter's Gorge and offshore Shag Point: understanding the Waihemo Fault  |
| Th12 | <b>Davey</b> - Crustal seismic reflection profile across the Alpine Fault and coastal plain at Whataroa, South Island  |
| Th16 | <b>Easterbrook*</b> - The Alpine Fault Zone along the Waitangi-taona River: mapping in 3D and AMS in fault gouge   |
| Th09 | <b>Ellis</b> - Short-term interactions between strike-slip faults across a plate boundary zone at the transition from subduction to collision: comparison to the Marlborough Fault System, New Zealand |
| Th07 | <b>Karalliyadda*</b> - Deformation mechanisms in the South Island: implications from shear-wave splitting of local S waves   |
| Th06 | <b>Ristau</b> - Three years of regional moment tensor analysis in New Zealand  |

**Symposium 6: New frontiers & general earth science**

|      |  |
|------|--|
| Tu35 | <b>Bassett_K</b> - Provenance of the Devonian Taylor Group, Lower Beacon Supergroup, Antarctica  |
| Tu29 | <b>Begg</b> - QMAP Rotorua - what's new besides volcanoes?   |
| Tu46 | <b>Behr*</b> - Love and Rayleigh wave phase velocity maps of New Zealand obtained via cross-correlation of ambient seismic noise: updated national models and preliminary estimates of radial anisotropy |
| Tu44 | <b>Bilderback*</b> - The role of deep-seated landslides in the evolution of the Waipaoa sedimentary system   |
| Tu36 | <b>Black</b> - Bathymetry of the Ross Sea and adjacent Southern Ocean  |
| Tu37 | <b>Chambord*</b> - Position of New Zealand, Australia and Antarctica during the Paleogene and Late Cretaceous  |
| Tu30 | <b>Heron</b> - The QMAP 1:250 000 Geological Map of New Zealand  |
| Tu39 | <b>Jacobs*</b> - Temporal evolution of earthquake sequences (swarms) in the Central Volcanic Region  |

|      |  |
|------|--|
| Tu31 | <b>Lukovic</b> - A seamless 1:250 000 geological dataset   |
| Tu33 | <b>Pledger*</b> - Structure, faulting and gas accumulation, southeast Wanganui Basin, New Zealand  |
| Tu34 | <b>Sadaf*</b> - Characterisation of the Waipawa Formation, East Coast Basin, New Zealand   |
| Tu45 | <b>Syuhada*</b> - Seismic attenuation anisotropy in the southern part of Taupo Volcanic Zone   |
| Tu48 | <b>Tenzer</b> - A compilation of the detailed map of atmospheric correction to observed gravity (case study for New Zealand)                 |
| Tu28 | Tonkin ( <b>Barrell</b> ) - A geomorphic history of the Lower Waitaki Plain, interpreted from loess and soil stratigraphy                    |
| Tu32 | <b>Townsend</b> - The QMAP 1:250 000 geological map of the Hawke's Bay area: new features and updates  |
| Tu47 | <b>Unglert*</b> - Crustal cracks in areas of active deformation: correlation of GPS and seismic anisotropy                                   |
| Tu41 | <b>Wang</b> - Slow rupture of the March 1947 Gisborne earthquake suggested by tsunami modelling  |
| Tu43 | <b>Welch</b> – Evaluating tsunami threats  |
| Tu40 | <b>Williams_C</b> - The effects of material inhomogeneity and topography on the predicted surface deformation for Hikurangi slow slip events |
| Tu38 | <b>Wysoczanski</b> - Morphology and structure of the southern Kermadec Arc - Havre Trough  |

***Symposium 7: Applied geoscience***

|      |   |
|------|---|
| Th43 | <b>Ashenden</b> - GeoNet hazard monitoring - the continuous GPS and seismic networks                              |
| Th47 | <b>Cross*</b> - Greenhills Complex dunite: mineralogy, geochemistry and potential for carbon sequestration        |
| Th44 | <b>Dykes*</b> - Seismic detection of iceberg calving at Tasman Glacier, New Zealand                               |
| Th45 | <b>Forsyth</b> - Planning on a retreating coastline: Oamaru, North Otago, New Zealand                             |
| Th46 | <b>Johansen</b> - Groundwater potential of the Te Onepu Limestone, central Hawke's Bay - an unconventional source |
| Th42 | <b>Page</b> - GeoNet: monitoring New Zealand's natural hazards  |

***Symposium 8: Origin of New Zealand biota***

|      |   |
|------|---|
| Th34 | <b>Beu*</b> - Castlecliffian-Haweran marine molluscan biostratigraphy and climate change at the MIS scale at Wanganui |
| Th35 | <b>Collins*</b> - Preliminary stratocladistic study of New Zealand crassatellid bivalves                              |
| Th36 | <b>Hiller</b> - Brachiopods from the <i>Ostrea</i> bed (Broken River Formation), Upper Cretaceous of North Canterbury |

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|------|---|
| Th37 | <b>Kennedy_E</b> - New Zealand's floral origins and the Oligocene land crisis: a work in progress |
| Th40 | Morrison ( <b>Simes</b> ) - National Paleontological Databases programme achievements             |
| Th39 | <b>Ortega*</b> - Early Miocene dolphins from Awamoa Beach, North Otago                            |
| Th38 | <b>Reid_C</b> - Following in Darwin's footsteps in Van Diemen's Land                              |
| Th41 | Simes ( <b>Terezow</b> ) - The National Paleontological Collection - a virtual tour               |
| Th33 | <b>Van Kerckhoven*</b> - Paleocene-Eocene evolution of deep-sea benthic foraminifera              |