

GeoPRISMS Planning Workshop for New Zealand
Te Papa Museum, Wellington, NZ
April 15-17, 2013
Final Program

Sunday, April 14,

6:30-8:30 pm: **Icebreaker and registration* at Foxglove Restaurant, Wellington waterfront**

**Note that participants can also register at Te Papa during the days of the workshop. The registration desk at Te Papa will be open from 8:00 AM on April 15, and will be located in front of the Soundings Theatre or in the reception area of the Telstra Centre*

Monday, April 15 (Day 1):

Moderators: Laura Wallace and Susan Ellis

8:30-8:40: Welcome from the conveners and housekeeping issues

8:40-8:50: Welcome from Prue Williams (the NZ Ministry for Business, Innovation and Employment)

8:50-8:55: Welcome from Kelvin Berryman (NZ Natural Hazards Platform Manager)

8:55-9:10: Welcome from Julia Morgan (GeoPRISMS Office) and Bilal Haq (NSF), and introduction to the aims of the workshop and the GeoPRISMS Program

Talks introducing New Zealand's subduction zones and the primary topics in subduction margin evolution and behavior.

9:10-9:45 *Nick Mortimer (GNS Science)*, Overview of Zealandia and its subduction record since the Paleozoic.

TOPIC 1: What are the geological, geochemical, and geophysical responses to subduction initiation and early arc evolution and how do they affect subduction zone formation?

9:45-10:10: *Mike Gurnis (Caltech)*, Causes and consequences of subduction initiation

10:10-10:35: *Rupert Sutherland (GNS Science)*, The expression of subduction initiation in New Zealand.

10:35: Morning Tea: Posters will be available for viewing during all morning and afternoon teas and lunches. There will also be an extended afternoon tea on Day 3 for more poster viewing.

Moderators: Adam Kent and Richard Wysoczanski

TOPIC 2: What are the pathways and sources of magmas and volatiles emerging in the arc and forearc, and how do these processes interact with upper plate extension?

11:05-11:30: *Brad Hacker (University of California-Santa Barbara)*, Volatile fluxes at subduction zones, the model perspective

11:30-11:55: *Paul Wallace (University of Oregon)*, Volatile fluxes and arc magmatism: The observational record and unresolved questions

11:55-12:20: *Christian Timm (GNS Science)*, The Kermadec Arc system: our understanding about the present and past

12:20-12:45 *Colin Wilson (Victoria University of Wellington)*, Taupo Zone volcanism, extension and large silicic eruptions

12:45 Lunch

Moderators: Kathleen Marsaglia and Demian Saffer

TOPIC 3: What controls subduction thrust fault slip behaviour and its spatial variability?

1:40-2:05: *Satoshi Ide (University of Tokyo)*, Global perspective on controls on megathrust slip behaviour

2:05-2:30: *Laura Wallace (University of Texas, Institute for Geophysics)*, Overview of Hikurangi margin subduction tectonics and megathrust slip behaviour.

TOPIC 4: Feedbacks between climate, sedimentation, and forearc deformation:

2:30-2:55: *Mike Underwood (University of Missouri)*, Global overview of interaction among subduction margin sedimentation, climate, eustasy, and forearc deformation

2:55-3:20: *Alan Orpin (NIWA)*, The passage of sediment from mountain source to ocean sink: Results from the MARGINS S2S Waipaoa sedimentary system, Hikurangi Margin

3:20-3:45 *Phil Barnes (NIWA)*, Offshore Hikurangi Margin: tectonic deformation – sedimentation – climate interactions

3:45: Afternoon tea

4:15: First breakout sessions, based around the 4 main topics. The goal for these breakouts will be to identify the most exciting science that can be done in NZ to help address each main Topic.

TOPIC 1: What are the geological, geochemical, and geophysical responses to subduction initiation and early arc evolution and how do they affect subduction zone formation?

Breakout leaders: Mark Reagan (University of Iowa), Tim Stern (Victoria Univ. Wellington)

Scribes: Justin Ball (Univ. Colorado), Katrina Jacobs (VUW, Wellington)

TOPIC 2: What are the pathways and sources of magmas and volatiles emerging in the arc and forearc, and how do these processes interact with upper plate extension?

Breakout leaders: Ian Smith (University of Auckland), Kaj Hoernle (GEOMAR)

Scribes: Madison Myers (Univ. of Oregon), Melissa Rotella (VUW, Wellington)

TOPIC 3: What controls subduction thrust fault slip behaviour and its spatial variability?

Breakout leaders: Bill Fry (GNS Science), Kelin Wang (Canadian Geological Survey, PGC)

Scribes: Noel Bartlow (Stanford University), Dan Bassett (Oxford University)

TOPIC 4: Feedbacks between climate, sedimentation, and forearc deformation

Breakout leaders: Clark Alexander (Skidaway Inst. Oc.), Ingo Pecher (Univ. of Auckland)

Scribes: Corina Cerovski-Darriau (Univ. of Oregon), David Oakley (Penn State)

5:10: Switch up breakout sessions (people migrate to a different breakout session).

6:00: **End of Day 1.**

Tuesday, April 16 (Day 2):

Moderators: Susan Schwartz and Jim Gill

8:30: Introduction to Day 2

8:40: Report from Day 1 breakout leaders, plenary discussion on outcomes of breakouts.

10:00: **Morning Tea**

Moderators: Nicola Litchfield and John Townend

10:30-12:45 Series of talks on existing scientific infrastructure and current initiatives in NZ subduction science, including emerging IODP projects.

10:30-10:50 Ken Gledhill (GeoNet), New Zealand GeoNet: Impacts on geological hazards monitoring and research in New Zealand

10:50-11:05: Nicola Litchfield (GNS Science), The NZ active faults data base and onshore active faulting studies at New Zealand's subduction zones

11:05-11:20: Stuart Henrys (GNS Science), The SAHKE Project: Imaging the subduction plate boundary beneath Wellington

11:20-11:35: Geoffroy Lamarche (NIWA), New Zealand marine geological and geophysical research capabilities and databases

11:35-12:00: Cornel De Ronde (GNS Science), Overview of current knowledge and initiatives on the Kermadec arc volcanoes, including emerging IODP opportunities there

12:00-12:15: Demian Saffer (Penn State), Using IODP drilling to unlock the secrets of slow slip events, the Hikurangi subduction margin

12:15-12:30: Rupert Sutherland (GNS Science), Proposed IODP drilling at the Lord Howe Rise to understand subduction initiation at the Tonga/Kermadec Trench.

12:30 **Lunch**

Moderators: Susan Ellis and Jeff Marshall

Series of talks on the role of subduction science in understanding seismic, tsunami, and volcanic hazards and risk in New Zealand

1:20-1:35: Russ Van Dissen (GNS Science), It's Our Fault: A project to understand earthquake risk posed to the Wellington region

1:35-1:50: David Johnston (GNS Science, Massey University), Developing an effective community response to the next Great East Coast Subduction Zone Earthquake and Tsunami.

1:50-2:05: Gill Jolly (GNS Science), The integrated role of research and monitoring in the assessment of volcanic hazards and risk in New Zealand

2:05-3:30: *A series of short topical talks (10 mins each+2 minutes for questions/discussion).*

Erin Todd (USGS): Variable mantle and subduction components in the sources of Havre Trough backarc lavas

Martin Reyners (GNS Science): Tomographic imaging of the mantle wedge beneath the North Island and relationship to volcanic arc processes

Wiebke Heise (GNS Science): Magnetotelluric imaging studies of the Hikurangi margin--from arc to forearc

Agnes Reyes (GNS Science): Fluids as sentinels of deep crustal changes and history in the Hikurangi forearc

Bill Fry (GNS Science): Seismological studies of slow slip in New Zealand

Yoshihiro Ito (Tohoku University): Episodic tremor and slip at the Japan Trench before the 2011 Tohoku earthquake: Implications for understanding shallow megathrust processes at the NZ focus site

Rob Harris (Oregon State University): Heat flow along the Hikurangi margin

3:30: **Afternoon Tea**

4:00: **Breakout sessions based on the four main geographic regions of NZ subduction:** (1) Hikurangi Margin, (2) Fiordland, (3) Kermadec Arc/Havre Trough (+Colville Ridge, South Fiji Basin, across to Lord Howe Rise), and (4) Taupo Volcanic Zone. These breakouts are intended to develop and discuss the main science priorities in each of these geographic areas, and identify data needed to do the science. Synergies that exist across the four Topics (from Day 1) in each of these locations will also be discussed. Note, the conveners may change the organization and aims of Day 2 breakout sessions depending on the interests emerging from the Day 1 breakouts.

Location 1: Hikurangi Margin

Breakout leaders: Rob Harris (Oregon State University) and Stuart Henrys (GNS Science)
Scribes: Rachel Lauer (Penn. State), Jiao Ruohong (VUW, Wellington)

Location 2: Fiordland

Breakout leaders: Andy Tulloch (GNS Science) and Tracy Rushmer (Macquarie University)
Scribes: Besim Dragovic (Boston University), Samir Naif (UCSD-Scripps)

Location 3: Kermadec Arc/Havre Trough/South Fiji Basin/Lord Howe Rise

Breakout leaders: Fernando Martinez (Univ. Hawaii), Simon Turner (Macquarie University)
Scribes: Sophie Barton (NIWA/VUW), Erin Todd (USGS)

Location 4: Taupo Volcanic Zone

Breakout Leaders: Pilar Villamor (GNS Science), Kari Cooper (Univ. California-Davis)
Scribes: James Muirhead (Univ. of Idaho), Hannu Seebeck (VUW, Wellington)

5:00 Switch up breakout groups.

6:00: **End of Day 2**

7:00: Conference dinner: Dockside Restaurant, Wellington waterfront

Wednesday, April 17 (Day 3):

Moderators: Adam Kent and Rupert Sutherland

8:30: Introduction to Day 3

8:40: Report from Day 2 breakout leaders, plenary discussion on breakout outcomes.

10:15: **Morning Tea**

Moderators: Nicola Litchfield and Clifford Thurber

10:45-12:05 *Series of talks from international partners on scientific infrastructure (e.g., marine vessels, equipment) and potential funding resources for international collaborators to conduct subduction studies in New Zealand.*

10:45-11:05: Bilal Haq (NSF): Review of NSF programs, infrastructure for subduction studies

11:05-11:20: Shuichi Kodaira (JAMSTEC): Japanese perspective

11:20-11:35: Achim Kopf (Univ. Bremen): German perspective

11:35-11:50: Lisa McNeill (Univ. of Southampton): UK perspective

11:50-12:05: Kelin Wang (Canadian Geological Survey, PGC): Canadian perspective

12:05 **Lunch**

12:45: **Breakouts by each of the scientific topics (from Day 1) to develop an implementation plan for collaborative, multinational subduction science in NZ for the next ten years.** This breakout is intended to define the research that is best-suited for GeoPRISMS goals and resources, but is also intended to define a path forward for future NZ-led initiatives and those that international partners would like to contribute to and/or lead. Conveners may decide to modify the focus/organization of the breakouts depending on the outcomes from the previous days' breakout discussions.

TOPIC 1: What are the geological, geochemical, and geophysical responses to subduction initiation and early arc evolution and how do they affect subduction zone formation?

Breakout leaders: Mike Gurnis (Caltech) and Jim Gill (Univ. California-Santa Cruz)

Scribes: Rob Holt (VUW, Wellington) and Saphala Karalliyada (VUW, Wellington)

TOPIC 2: What are the pathways and sources of magmas and volatiles emerging in the arc and forearc, and how do these processes interact with upper plate extension?

Breakout leaders: David Hilton (UCSC-Scripps) and Ken Rubin (Univ. Hawaii)

Scribes: Simon Barker (VUW, Wellington) and Adrian Shelley (VUW, Wellington)

TOPIC 3: What controls subduction thrust fault slip behaviour and its spatial variability?

Breakout leaders: Harold Tobin (Univ. Wisconsin) and Harmony Colella (Miami Univ. Ohio)

Scribes: Pegah Faegh Lashgary (VUW, Wellington) and Erin Todd (Univ. Calif.-Santa Cruz)

TOPIC 4: Feedbacks between climate, sedimentation, and forearc deformation

Breakout leaders: Mike Underwood (Univ. Missouri) and Alan Orpin (NIWA)

Scribes: Calum Chamberlain (VUW, Wellington) and Laurel Childress (Northwestern Univ.)

1:45: **Break for afternoon tea and extended poster session.**

2:45: Switch up breakout groups.

Moderators: Demian Saffer, Laura Wallace, and Richard Wysoczanski

3:45: ***Reconvene for final decisions on implementation plan for NZ focus site***

3:50: The student symposium participants will present their integrated perspective on the priorities and path forward.

4:05: Implementation plan breakout summaries (~10-15 minutes for each breakout)

5:00: **Plenary discussion of the overall implementation plan.** Participants may be asked to decide/vote on the most suitable priorities for the GeoPRISMS implementation plan.

6:00: **Wrap up and closure of meeting.**