

NELSON DISCUSSION GROUP – MARCH

‘Enjoying learning from each other’

Friday 10 March 2017

Fast Facts

Discussion Leader/Presenter:

Dr Rick Sibson

Topic:

The 2016 M7.8 Kaikoura Multi-Rupture Earthquake

When:

Friday 10 March
5:00pm

Where:

Richmond Library-Constance
Barnicoat Room,
280 Queens St
RICHMOND

Cost:

Free for all to attend

Our Discussion Group welcomes all persons with engineering, geotechnical, general geoscience and environmental interests.

Our regular gatherings are held on the second Friday of each month from 5:00pm. We learn from each other through relaxed and facilitated discussion in-the-round.

Includes:

Refreshments of drinks and gourmet finger foods

Please RSVP your interest to **Carol Foote** on 03 548 1707 or CFoote@golder.co.nz for catering purposes

The Nelson Discussion Group series is brought to you by local geoscientists and engineers supported and funded by local professional enterprises, individuals and the AusIMM and worth 2 PD hours



The 2016 M7.8 Kaikoura Multi-Rupture Earthquake

Rick Sibson graduated BSc(Hons) in Geology from the University of Auckland and then gained a PhD from Imperial College, London, on the structure of the Outer Hebrides Thrust in NW Scotland. He taught at Imperial College (1973-1982) and UC Santa Barbara (1982-1990) before returning to NZ in 1990 as Professor of Geology in the University of Otago, retiring in 2009. His research has centred on the structure of crustal fault zones in relation to earthquake source mechanics, with additional interests in structural permeability and the role of fluids in fault processes. A current focus is fault-controlled fluid redistribution leading to mineralization in different tectonic settings. He has contributed short courses to the mineral industry in Australia, Canada, the United States, Chile, South Africa and Europe.

Big damaging earthquakes ($M > 7$) arise from the rupture of large dimension fault structures. Earthquake activity in NZ was high in the first 100 years of European settlement but since 1943 activity has been comparatively low (only the 1968 M7.1 Inangahua EQ) until the 2010-2012 Canterbury sequence and now the M7.8 Kaikoura earthquake of Nov 14 2016.

The Kaikoura earthquake occurred in a critical region along the plate boundary occupying the transition between subduction of the oceanic crust and continental transform tectonics. Mainshock rupturing propagated 160km to the NE from a hypocenter northeast of Culverden at a depth of ~15km over a period of about 90 seconds, terminating east of Cape Campbell. Surprisingly, the rupture sequence appeared to “hurdle” the major, fast-moving Hope Fault, triggering only minor localized slip on that structure. To date over 10 distinct new fault ruptures have been mapped reaching a maximum displacement of 10-12m on the Kekerengu Fault and broad coastal uplift of 1-3 metres. The broad distribution of rupturing implies that a large area of the crust was critically stressed to the edge of failure. Discussion will centre on the important lessons to be learned from this complex rupture sequence. Areas of concern include the four or more major strike-slip faults near Wellington and the locked subduction thrust interface directly underlying the entire southern North Island.

Future Meetings:

Thursday 20 April: Geoff Chapple “Terrain-Travels through a deep landscape”.

Note Thursday date.

Friday 12 May: Murray Gillon “Stabilising the Clyde Dam Reservoir Landslides”.