



EES 210: Field Investigations

VOLCANOES, EARTHQUAKES AND GLACIERS IN NEW ZEALAND

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Rocks preserve the most extensive record of the evolution of the planet, from which we are able to retrace Earth’s history over 4.5 billion years, and field geology plays a particularly important role in decoding this complex record. In this course, we will learn the methods of field geology and will apply them to understand geologic processes at an active plate boundary in the North and South Islands of New Zealand. We will study a variety of topics in Earth and Environmental Sciences in the field, by exploring the varied and diverse geologic activity of New Zealand. Topics will include current and past volcanic activity, earthquake geology and hazards, geothermal energy, and glacial geology.

Significant emphasis will be placed on natural hazards and resources in a geologically active region: we will study volcanic supereruptions and their deposits, associated hazards, and energy resources associated with magmatic systems in the Taupo Volcanic Zone of the North Island; mountain building and destruction processes, effects of glaciers on landforms, earthquakes and associated hazards in the South Island. And we will do so while visiting much of New Zealand and exploring fantastic scenery in the South and North Islands.

Part of the field work performed during the course will directly contribute to an active NSF-funded project focusing on the evolution of supereruption-forming magma bodies, and it will contribute to and benefit from active collaboration with faculty and students of Canterbury University.

PROGRAM: The course will start in Auckland on May 03 and finish in Christchurch on May 29, 2015. It will be divided into 3 main parts, focusing on different areas in New Zealand:

- AUCKLAND (North Island): Introduction to field methods; Volcanic and sedimentary rocks.
- TAUPO VOLCANIC ZONE (North Island): Volcanoes, magma bodies at depth and their eruptions; Volcanic hazards; Geothermal energy harvesting. We will traverse much of the North Island, from Auckland to Mount Ruapehu, spending time at national parks and several towns in the North Island. Field research on supereruption deposits, in connection with NSF-funded project on the evolution of magma bodies that lead to supereruptions.
- CHRISTCHURCH AND QUEENSTOWN (South Island): Glaciers as agents of surface transformation; Hydroelectric power generation and use; Earthquakes and their hazards. We will travel from Queenstown to Christchurch, and we will study glaciers and glacial terrain along the way. We will also study the 2010-2011 Christchurch earthquake damage.

EVALUATION: Course evaluation will be based on participation, field exercises (outcrop descriptions, geologic cross-sections and maps), and oral presentations.

REQUISITES: Students with all levels of expertise in geology are encouraged to apply. Activities will be adjusted to take into account prior experience and course-work. **CREDITS:** 3 (MNS)

EXPENSES: The course fee includes tuition, lodging, transportation, most meals (depending on the location), and entrance fees to National and State Parks. It does not include airfare from Nashville to Auckland or from Christchurch to Nashville, transportation from and to airports, regular meals in major cities, and incidental expenses.

FINANCIAL SUPPORT: For information on the Global Summer Fellowship Program, offering scholarships of up to \$8,500, consult GEO: www.vanderbilt.edu/studyabroad.

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TO APPLY: www.vanderbilt.edu/summersessions/study_abroad.php

