Geophysical Research Abstracts,
Vol. 10, EGU2008-A-02922, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-02922
EGU General Assembly 2008

Relationships of Degassing and Seismicity at Quiescent Volcanoes in New Zealand

C. Werner (1), S. Sherburn (2), B. Christenson (3), T. Hurst (3), K. Britten (2), J. Cole-Baker (2)

(1) US Geological Survey, Cascade Volcano Observatory, WA, USA (cwerner@usgs.gov / +01-360-993-8983), (2) GNS Science, Wairakei Research Centre, New Zealand, (3) GNS Science, Lower Hutt, New Zealand

White Island and Ruapehu volcanoes in New Zealand are active andesitic volcanoes that have both erupted in the last 20 years, but are currently in a state of quiescence. Both volcanoes emit CO_2 and SO_2 and display seismicity that varies on timescales of months to years, however each volcano displays differences in the timing between the peaks of degassing and seismicity. At Ruapehu volcano, a peak of seismicity in 2004 coincided with crater-lake heating, but several months prior to the peak in CO_2 and SO_2 emissions. In contrast, at White Island the peaks of CO_2 emissions over several years coincided with peaks in seismicity, directly linking the process of degassing with certain seismic waveforms. At White Island the cycling of degassing and numbers of earthquakes showed clear annual variability which was found to be most likely related to increases in strain on the volcano during sea level and atmospheric pressure highs. At Ruapehu, annual cycling was less obvious and trends were most related to the cyclic crater-lake heating events, demonstrating the influence of a well-established hydrothermal system on energy release from the volcano.