

AAPG HEDBERG CONFERENCE
Geological Carbon Sequestration: Prediction and Verification
August 16-19, 2009 – Vancouver, BC, Canada

The CO₂ Storage Potential of the Canterbury-Otago Region, New Zealand

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Geological storage of CO₂ has been identified as a viable means of reducing greenhouse gas emissions to the atmosphere. This study evaluates the CO₂ storage potential of the onshore Canterbury-Otago region of the South Island, New Zealand. The impetus for the study is that North Otago currently hosts a lime works which may soon be joined by a coal-fired cement works. The combined CO₂ emissions generated could be ~0.95 Mt per annum.

The early Canterbury Basin (Figure 1) developed as a passive margin following Late Cretaceous seafloor spreading in the Tasman Sea. Transpression between Australian and Pacific tectonic plates then reversed subsidence onshore and deformed existing Tertiary strata. Uplift of the Southern Alps since the Mid-Late Miocene has resulted in rapid sedimentation east of the foothills. These events have produced reservoir-seal pairs suitable for CO₂ storage and containment. Investigation of some of these reservoir units has resulted in only sub-commercial hydrocarbon discoveries. However, three structural closures were identified that have the potential to trap CO₂.