Eastern Victoria Geoscience Initiative –
Southeast Lachlan Deep Crustal Seismic Reflection Survey

The survey is part of a program to build large-scale knowledge of Victoria's geological architecture and will focus on rock types, faults and their distribution.

The Southeast Lachlan Crustal Transect program partners also working together to acquire additional datasets such as gravity and magnetotellurics that will contribute to the processing and analysis of the seismic dataset.

MORE INFORMATION

For more information on the Eastern Victoria Geoscience Initiative

Visit the Department of Jobs, Precincts and Regions' Earth Resources website at https://earthresources.vic.gov.au/projects/eastern-victoria-geoscience-initiative
to download the Fact Sheets

- *Eastern Victoria Geoscience Initiative Project Overview*
- *The geology of eastern Victoria*
- *Understanding a deep crustal seismic reflection survey*
- *Southeast Lachlan Deep Crustal Seismic Reflection Survey*
- *Southeast Lachlan Ground Gravity Survey*
- *Southeast Lachlan Magnetotelluric Survey*

Visit Geoscience Australia's Onshore Seismic and Magnetotelluric project webpage for information about deep crustal seismic surveys across Australia.
www.ga.gov.au/about/projects/resources/seismic

The Geological Survey of Victoria (GSV), an agency of the Department of Jobs, Precincts and Regions, Geoscience Australia and AuScope Limited completed 511 km of deep crustal seismic reflection surveying along the Southeast Lachlan Crustal Transect in eastern Victoria during the first half of 2018.

The seismic survey is part of the Eastern Victoria Geoscience Initiative, a program to develop a greater understanding of Victoria's underlying "geological architecture". New survey data builds on existing knowledge gathered by Geological Survey of Victoria to provide insights into the rocks and geological structures from near the surface to approximately 60 km deep within the Earth.

The surveys added to Victoria's geological knowledge base and will contribute to future scientific research. They will also help government to make better informed earth resource and land management decisions.

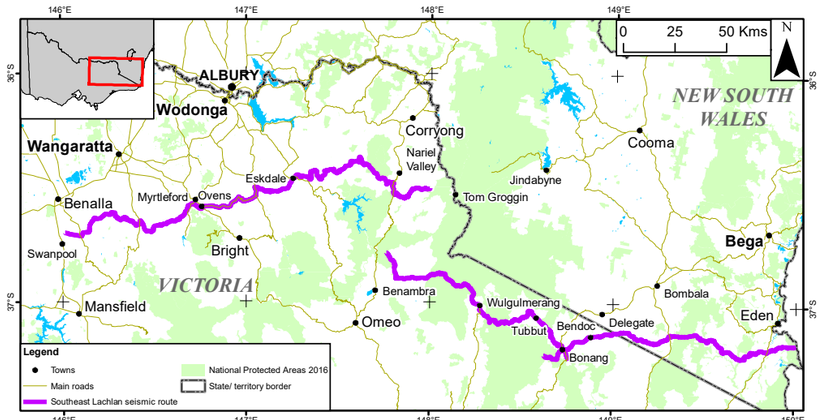

Figure 1. Map showing seismic survey route in Victoria and New South Wales.

THE SURVEY

The survey is part of a greater collaborative scientific research project across southeast Australia in Victoria and New South Wales: the Southeast Lachlan Crustal Transect. Project partners are the Geological Survey of Victoria, Geoscience Australia, the Geological Survey of New South Wales and AuScope Limited.

The focus of the survey was to develop a greater understanding of Victoria's underlying "geological architecture"; the rock types, faults and their distribution.

Seismic reflection surveys are low impact and this survey did not affect the environment or physical infrastructure. A crew of up to 50 geoscientists and technical staff performed the survey over 48 days. They used state-of-the-art vibroseis trucks and wireless geophones to record sound waves reflected off rocks up to 60 kilometres below the surface.

SURVEY ROUTES

The survey was conducted from February March to June April 2018 along three lines as shown on Map 1.

- *Starting south of Benalla and travelling approximately 306 km eastwards towards Tom Groggin.*
- *Starting north of Benambra and travelling approximately 154 km south eastwards to near Bonang*
- *Starting west of Bonang and travelling approximately 45 km east through Bendoc and into New South Wales to finish at the coast south of Eden.*

Figure 2. Seismic survey Vibroseis trucks in northeast Victoria. Photo: Geological Survey of Victoria.

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The survey travelled along local roads, across private properties, Crown land and through national parks.

The survey passed through Tatong, Edi, Merriang South, Myrtleford, Ovens, Rosewhite, Kancoona, Running Creek, Eskdale, Bucheen Creek, Nariel Valley, Tom Groggin, Cobberas, Brumby, Wulgulmerang, Wulgulmerang East, Deddick Valley, Tubbut, Bonang West, Bonang and Bendoc in Victoria.

FIRST SEISMIC SURVEY OF EASTERN VICTORIA

This was the first time the geology of eastern Victoria has had been surveyed husing a deep seismic reflection survey. The most recent surveys of this type were conducted by the Geological Survey of Victoria in central Victoria in 2006 and western Victoria in 2009 (see Figure 3).

The survey of eastern Victoria will add to the State's public geological knowledge base. It will contribute to future scientific research, which may include but not be limited to further geological mapping, determining the age and chemistry of the rocks, earth resource studies and natural hazard assessments.

A unique aspect of this survey is that eastern Victoria is still seismically active – the strongest earthquake in the state in recent decades occurred in 2012 in the region, recording a magnitude of 5.4 at Moe and damaging local buildings.

Eastern Victoria includes significant infrastructure such as dams, power stations, powerlines, pipelines and major roads. The survey will help build understanding of the region's seismic hazard potential.

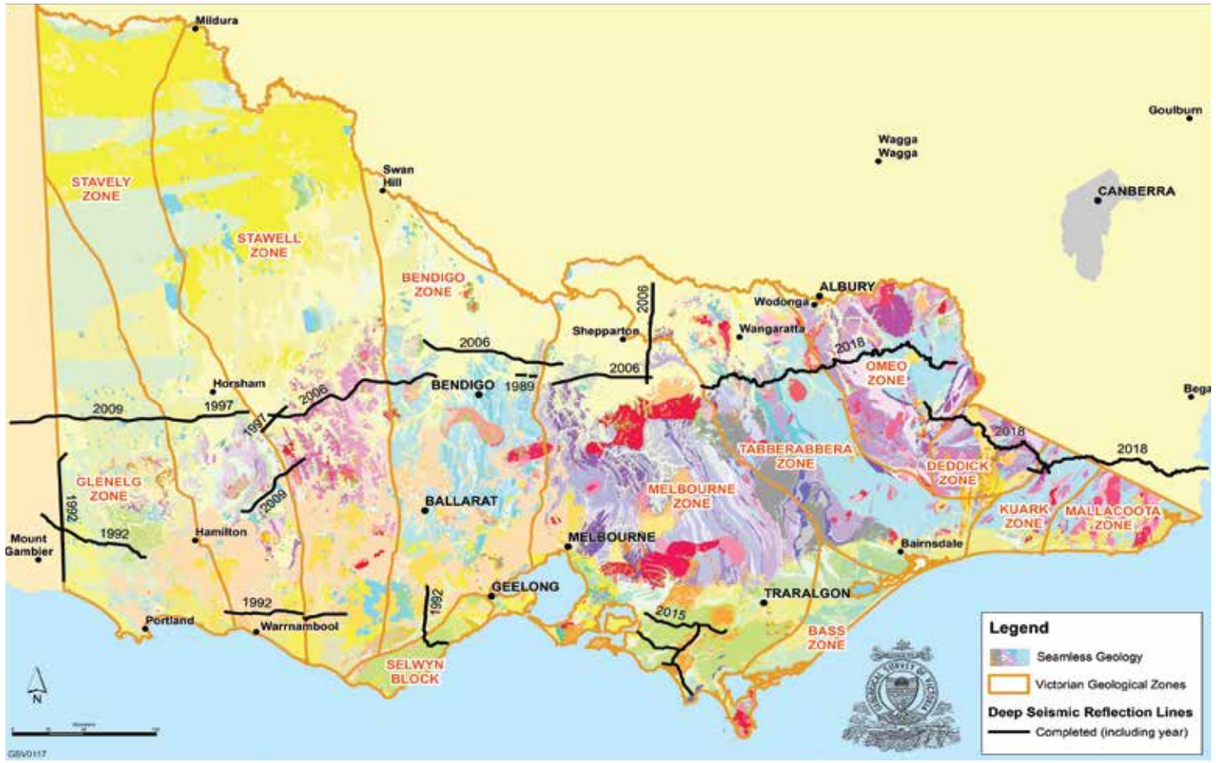

Figure 3 . Deep seismic survey routes in Victoria – previous surveys in blue lines undertaken by the Geological Survey of Victoria and research partners.

WORKING WITH THE COMMUNITY

Property owners and public land managers were consulted during November and December 2017 as the Eastern Victoria survey route was being planned.

Access to properties was discussed with individual landowners, leaseholders and public agencies before the survey started. Any fencing or other infrastructure removed for the survey was replaced once the survey had passed through.

Permits from Department of Environment, Land, Water and Planning, Parks Victoria, VicRoads and local councils were in place for the duration of the survey.

The survey activities contributed around $230,000 directly to regional economies through local purchasing of items such as fuel, accommodation, food and supplies.

SURVEY RESULTS

The raw survey data is available from Geoscience Australia's website as the L208 Southeast Lachlan Seismic Survey 2018.

The data has been processed by a contractor on behalf of the project partners and will be presented as a series of images (Figure 4). Geological interpretation of the images will be undertaken by the research team prior to public release of the data and results later in 2019.

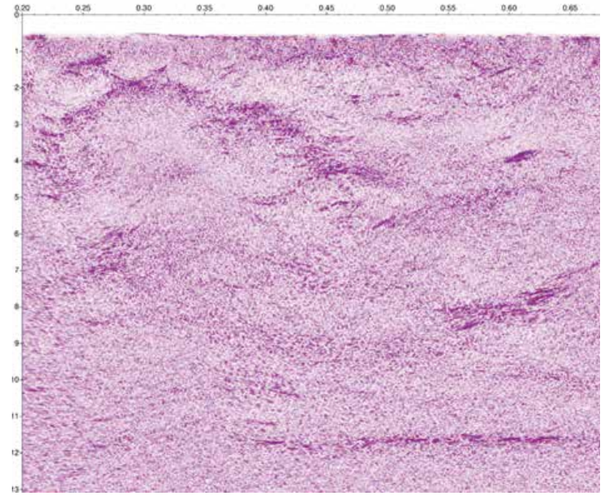

Figure 4 . Example of 2018 reflection seismic data in northeast Victoria.