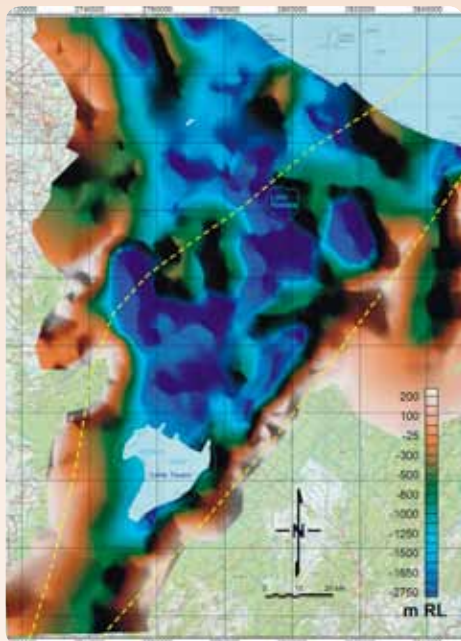


geothermal geophysics

Combined geophysical methods for exploration and monitoring.



GNS Science can design geothermal exploration and monitoring programmes, undertake geophysical surveys, and process and interpret geophysical data.

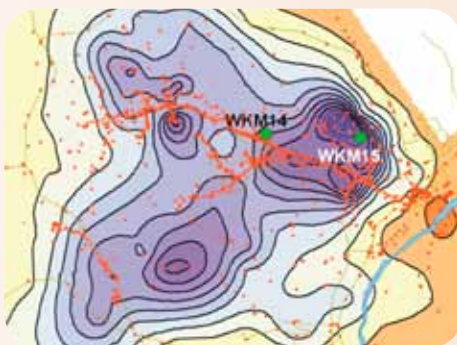
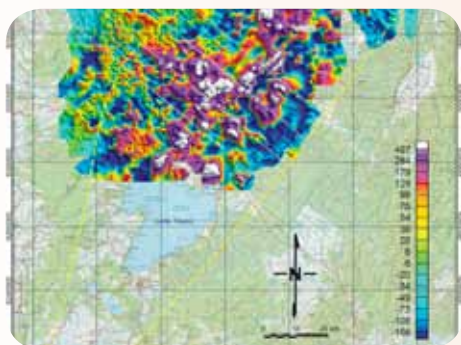
Geophysical understanding is integrated with geological and geochemical expertise for accelerated geothermal exploration, and improved field management.

We can provide a comprehensive understanding of geothermal reservoirs in New Zealand and internationally.

GNS Science has pioneered many aspects of geophysical techniques used in geothermal investigation. We underpin these services with broad ranging research in the use of geophysical techniques to identify heat sources, locate permeability, understand time-spatial changes to fields, characterise rock properties, understand shallow thermal conditions, investigate deformation mechanisms and induced seismicity

at a glance →

- **Reconnaissance** Review of existing geoscientific data. Recommendations for exploration programmes and feasibility studies.
- **Exploration** Detailed survey design and data collection for MT, TDEM, seismics, gravity, thermal infra-red and magnetics to identify heat sources, permeability structures, fluid flow and drilling targets.
- **Interpretation** Data processing, modelling and interpretation for reduced exploration risk and improved field monitoring.
- **Integration** Combination of geophysical understanding with geological and geochemical expertise for an integrated approach to understanding geothermal reservoirs.
- **Field management** Geophysical monitoring of heat flow, subsidence, micro-seismicity, field depletion and cold water intrusion.
- **Research** Development of new methods and interpretive capability. Use of geophysical techniques for exploration, development and field monitoring.



geophysical techniques & interpretation →

- **Electromagnetics** Resistivity, MT and TDEM for imaging the geological subsurface, delineating geothermal resources, and detecting faults and cap rock. Innovative modelling methodologies, including deconvolution of shallow resistivity data from deeper MT measurements.
- **Magnetics** Identification of Curie point temperatures and depth to demagnetisation. Definition of field boundaries.
- **Seismology** Multichannel seismic reflection and refraction acquisition, processing and interpretation. Expertise in VSP modelling, cross-hole tomographic reconstruction and waveform modelling for structural interpretation and well siting. Passive seismic studies to locate and characterise micro-earthquakes.
- **Gravity** Defining lateral density variation related to the deep magmatic body/heat source. Microgravity for monitoring field depletion and detection of cold water invasion.
- **Thermal** Definition of temperature distribution and identification of areas of enhanced thermal gradient. Baseline heat flow assessment for environmental impact.

about us →

The GNS Science geothermal team is internationally recognised for innovative, robust geoscientific research, expertise and consultancy advice. We have been supporting the geothermal community in New Zealand and internationally for over 50 years.

Our experienced professionals integrate geology, geophysics, geochemistry and modelling expertise for exploration, drilling, environmental sustainability, field development, optimal production, and ongoing resource management

contact us →

Contact us to find out how we can address your unique question, and support the success of your project.

VISIT www.gns.cri.nz/geothermal

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