Open Government Case Study: GeoNet

Which high-value public data have been released for re-use?

GeoNet: real-time geological hazard monitoring system

GeoNet provides a real time geological hazard monitoring system in New Zealand comprising a network of geophysical instruments, automated software applications, and expertise to detect, analyse and respond to earthquakes, volcanic activity, large landslides and tsunami. This means providing free access to high quality and timely data and information for emergency management, research, industry use and to the public.

GeoNet also has a Continuous Global Positioning System (CGPS) network which, in partnership with LINZ, provides the LINZ geospatial positioning service, PostioNZ-RT. While GeoNet is in the unique position of providing a necessary hazard monitoring service, this capital investment is potentially leveraged to stimulate economic growth in a multitude of sectors through the PositioNZ-RT partnership.

GeoNet is sponsored by the New Zealand Government through its agencies: Earthquake Commission (EQC), GNS Science and Land Information New Zealand (LINZ).

Release rationale

All data and images are available for free through the GeoNet project

The data collected by GeoNet are derived from seismometers, accelerometers, tsunami gauges and the CGPS network. All data and images are made available for free, and in an open format, through the GeoNet project to facilitate research into hazards and assessment of risk; and to provide precision measurement services to benefit a range of industries and organisations.

How data are being used

Most notable re-use providing new products, services and knowledge includes:

Data are being re-used to create new products and services

- Businesses and consultancies, for example:
  - Geosystems: supplying global positioning systems, measuring instruments, geospatial and technical software design, and surveying solutions
  - Global Survey: positioning solutions for surveying, construction, machine control, and agriculture
  - Coffey Geotechnics – geotechnical consultancy for infrastructure projects, including roads, rail, bridges, marinas and ports, dams, desalination plants, pipelines, nearshore structures such as seawalls, and underground works such as tunnels.
- District and regional councils and the Ministry of Civil Defence and Emergency Management: scientific advice, planning, policy development, hazard monitoring and emergency and risk management
- Universities and research organisations, both nationally and internationally, for research and teaching:
  - Geophysics
  - lithospheric structure (crustal and uppermost solid mantle) and anisotropy
  - geodetic and seismic modelling and seismic research
  - slow slip and subduction zones
  - earthquake engineering
  - geology, mathematics and statistics and surveying.

Risk mitigation

GeoNet undertake international strategic reviews of their service every 4 years

The open formats and availability of GeoNet data provides a legal risk of liability should it be misused, misunderstood or result in problems from its use. GeoNet manages these risks through providing a liability statement on their website.

They also mitigate any data accuracy, quality or service issues through international strategic reviews of the service every four years. The result of these reviews informs improvements to coverage, services, data access tools and specialist skills and expertise.

Economic and social impacts

Data inform research that is used to improve building structures and engineering

The timely accurate supply of data to research, emergency management and engineering communities is difficult to quantify in economic and social terms but it clearly forms an integral part in managing the safety of people, buildings and the land. For example engineers are using strong motion records from stations in Christchurch to understand soil profile data, bridge and building performance, liquefaction potential and performance of stopbanks to inform future risk mitigation.

Data used by Canterbury Quake Live website

A specific example of GeoNet data being used as a social service is through the Canterbury Quake Live website setup by Cantabrian, Chris Crowe, not long after the September 2010 earthquake. This website is specifically established as a resource to help inform people in Canterbury about aftershock sequences and locations of quakes. This service is provided for the community by a private individual who takes a raw data feed from GeoNet and displays it in a localised context. It is supported by local businesses and other freely supplied data sources.

Earthquake engineering researchers and students download both the filtered raw acceleration and displacement traces to their computer models of buildings or bridges to see how the structures would response to particular ground accelerations. This research is used to improve building structures and engineering which ultimately has both economic and social impacts.

Transparency impacts

Enables better-informed planning decisions about future land use or risks with current use

GeoNet's data are used to inform and encourage active participation in government policy development, particularly emergency and risk management. It also enables better-informed planning decisions about future land use or risks associated with current use.

Efficiency impacts

Providing free access to high quality and timely data and information reduces the need for duplication – it is a national, and international, resource. Private industry leverages this service and PositioNZ-RT by augmenting it with data from their own networks, providing additional customer support and expertise to others who need to consume it. For example for providing localised GPS information for surveyors, engineers, and construction firms.