New Zealand is very young and active geologically and therefore is prone to geohazards. By monitoring, modelling and detecting geohazards people can be more prepared for them. In New Zealand the GeoNet project (funded by EQC) does the monitoring.

Understanding and monitoring seismic activity

GNS Science is the custodian of the GeoNet project and is monitoring our earthquakes, large and small, and our active fault lines in order to understand past events, and prepare for the future.

To better understand earthquakes scientists work on;

- identifying faults and measuring movement
- locating earthquakes
- finding out how often earthquakes occur on specific faults
- maintain a national network of seismographs
- place strong motion sensors in areas prone to large earthquakes near buildings and bridges to monitor how structures perform in earthquakes
- use GPS equipment to pinpoint where strain is building up or being released in the Earth’s crust
- model earthquake effects on communities
- develop design requirements and engineering solutions to improve survival rates and protect buildings and infrastructure

Monitoring active volcanoes

There are 12 active volcanic areas in New Zealand. Although the probability of an eruption affecting a large area is relatively low in any one year, New Zealand needs to be prepared for a range of styles of volcanic eruptions.

The GeoNet project (GNS Science) maintains permanent surveillance at active and potentially active volcanoes to detect the early signs of increased seismic and volcanic activity. This equipment is also used to analyse the impacts of eruptions and model future eruptions.

Tsunami detection and modelling
To better understand tsunami and the risk for New Zealand scientists work on;

- identifying tsunami sources and modelling waves
- studying offshore faults and earthquakes that may produce local tsunami
- identifying tsunamis that have occurred in the past and measuring their impact
- working with scientists from other countries to share information and research
- monitoring earthquakes that could produce tsunami
- LINZ maintain a network of tide gauges to detect arrival and height of tsunami waves
- modelling local tsunami produced by earthquakes, undersea landslides and volcanoes
- educating the public so people know what to do if there is a tsunami

**Monitoring and modelling landslides**

Unstable land, intense rainfall, earthquakes and people developing the land can lead to landslides. Studying ground stability, landslide events and triggers and locating faults can help us to understand landslides better.

Survey equipment can be used to measure movement and modelling landslides can help identify areas at risk and inform decisions on land use.

**Understanding and monitoring seismic activity**

GNS Science looks after the GeoNet project and is monitoring our earthquakes, large and small, and our active fault lines to understand past events, and prepare for the future.

To better understand earthquakes scientists work on;

- finding faults and measuring movement
- finding out where earthquakes begin
- finding out how often earthquakes happen on certain faults
- looking after a national network of seismographs
- looking at how buildings cope with earthquakes
- use GPS equipment to pinpoint where stress is building up or being released in the Earth’s crust
- model earthquake effects on communities
- develop designs to improve the safety and strength of buildings and services

**Monitoring active volcanoes**

There are 12 active volcanic areas in New Zealand. Although the probability of an
eruption affecting a large area is low in any one year, New Zealand needs to be prepared for different kinds of volcanic eruptions.

The GeoNet project (GNS Science) monitors active volcanoes to find the early signs of volcanic activity. This equipment is also used to study the impacts of eruptions and model future eruptions.

**Tsunami detection and modelling**

To better understand tsunami and the risk for New Zealand, scientists work on;

- finding tsunami sources and modelling waves
- studying offshore faults and earthquakes that may cause local tsunami
- finding tsunami that have happened in the past and looking at their impact
- working with scientists from other countries to share information and research
- monitoring earthquakes that could cause tsunami
- tide gauges are used to record the arrival and height of tsunami waves
- modelling local tsunami produced by earthquakes, undersea landslides and volcanoes
- teaching the public so people know what to do if there is a tsunami

**Monitoring and modelling landslides**

Unstable land, heavy rainfall, earthquakes and people changing the land can lead to landslides. Studying the strength of the ground, landslide events and triggers and locating faults can help us to understand landslides better.

Māori keywords:

<table>
<thead>
<tr>
<th>aroturuki</th>
<th>to monitor</th>
</tr>
</thead>
<tbody>
<tr>
<td>whakaatu</td>
<td>to model</td>
</tr>
<tr>
<td>rū whenua</td>
<td>earthquake</td>
</tr>
<tr>
<td>tai āniwhaniwha</td>
<td>tsunami</td>
</tr>
<tr>
<td>horo</td>
<td>landslide</td>
</tr>
<tr>
<td>puia</td>
<td>volcano</td>
</tr>
<tr>
<td>ine</td>
<td>to measure</td>
</tr>
</tbody>
</table>

Audio Māori keywords:

- aroturuki [4]
- whakaatu [5]
- rū whenua [6]
- tai āniwhaniwha [7]
- horo [8]
- puia [9]
- ine [10]
Visit the GeoNet website [11] to learn more about monitoring geohazards.

Visit the GeoNet website [11] to learn more about monitoring geohazards.

GNS Science looks after the GeoNet project which monitors earthquakes, volcanoes, landslides and tsunami. This is a seismometer to measure ground movement; how do you think it works? Image: LEARNZ.

Devices such as this make up the Eruption Detection System on Mount Ruapehu. Why is a warning system so important on Mount Ruapehu? Image: LEARNZ.
A tsunami gauge recording showing the tsunami at Raoul Island after the 2011 7.6 magnitude earthquake in the Kermadec Islands. Image: GeoNet.

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Links