Seismographs in Canada

Across Canada there are more than 200 seismographs continuously recording local and global earthquake activity.

What is a Seismograph?
Seismographs are instruments that record ground motion. During an earthquake, vibrations created by sudden movement on a fracture in the Earth’s crust (a fault) travel through the Earth. Seismographs detect and record these vibrations, also called seismic activity, which may be too small to be felt by humans.

How Seismographs Work
The part of the seismograph that senses ground movement is called a seismometer. Seismometers convert ground motion vibrations into an electrical signal that in turn is converted into a digital signal. This is sent to Natural Resources Canada (NRCan) processing centres in Ottawa, Ont. and Sidney, B.C. When a number of seismographs detect seismic activity, a computer automatically estimates the source of the disturbance and sends an alert out to seismologists - scientists who study earthquakes.

To record clear earthquake signals, seismometers are often installed on solid rock, far away from sources of noise such as trucks, trains and pounding surf.

Measuring Earthquakes
Earthquake magnitude is a measure of the amount of energy released along a fault. An earthquake produces three types of vibrations or waves. Primary, or P, waves travel most quickly through the Earth and are the first to

Measuring and converting ground motion into a readable graph (seismogram).

Seismographs create seismograms, which are graphs depicting ground motion. This seismogram is for an earthquake about 350 kilometres away (showing P and S waves).
NRCan operates about 125 stations that make up the Canadian National Seismograph Network (CNSN). Other seismographs are part of university or government research networks.

**How is Earthquake Information Used?**

Data gathered by the CNSN is used to determine the location and size of earthquakes. This data, combined with the frequency of earthquakes and other geoscience information, is used to improve the earthquake resistance provisions of the National Building Code of Canada.

If there is a widely felt or damaging earthquake:

- The earthquake’s size and location are rapidly posted on NRCan’s “Earthquakes Canada” web site and information is sent to the news media. Updates are provided as more information is gathered.
- Emergency response agencies, media, government and other key clients, including utility companies and railways, are quickly notified.

**International Connection**

The CNSN also records thousands of earthquakes that occur outside Canada each year. Data is sent to tsunami warning centres and international agencies that produce summaries of worldwide earthquake activity.

The CNSN can also detect nuclear explosions. As part of Canada’s contribution to the Comprehensive Nuclear Test Ban Treaty, NRCan sends seismic and other data to an International Data Centre in Vienna, Austria.