Seismic Monitoring Station

Satellite equipment on Mount Crandell.
(Photo: Parks Canada/Edwin Knox)

Little known to most Waterton visitors or residents is the presence of a seismic monitoring station situated unobtrusively about 75 metres off the Bear's Hump trail, one of the most well-used trails in the park.

In clear view from the marina, the station consists of a small flat-roofed cement block building, an antenna and a small satellite dish which links the park to the Pacific Geoscience Centre (PGC) in Sidney, British Columbia and ties into the Canadian National Seismograph Network. The PGC receives a continuous data stream from the Waterton facility in order to monitor the location and magnitude of earthquakes which occur in the region. Professional seismologists at the PGC analyse all the data collected from the seismic system. Waterton is the network's only 3-component broadband seismic station in Alberta, at this writing.[1]

The seismic station equipment was installed at the site following an inter-agency agreement signed in May, 1993 between the Canadian Parks Service and Energy, Mines and Resources Canada.[2] The decommissioning of the seismic station at Suffield, Alberta resulted in the move and an equipment update prior to its installation at Waterton.[3] The seismic station, entirely scientific in nature, is on a tiny piece of land on Mount Crandell but is governed by strict adherence to the National Parks Act, the National Parks Lease and Licence of Occupation Regulations, the Environmental Assessment and Review Process and other applicable statues and regulations.[4] While the number of earthquakes in Alberta is small, aftershocks from earthquakes in the greater region can sometimes be felt in Waterton. Tiny earthquakes, those that can only be recorded by seismographs, occur somewhere in Canada every day, with larger events felt somewhere in this country every week but damaging earthquakes can be years apart. The results of the monitoring and associated research is used to learn more about the hazard in an area and the information is incorporated into the National Building Code of Canada.[5] A surprising number of earthquake tremors have been felt in Waterton over the years, the first ones noted by residents in late June, 1925 when both Great Falls and the Gallatin Valley in

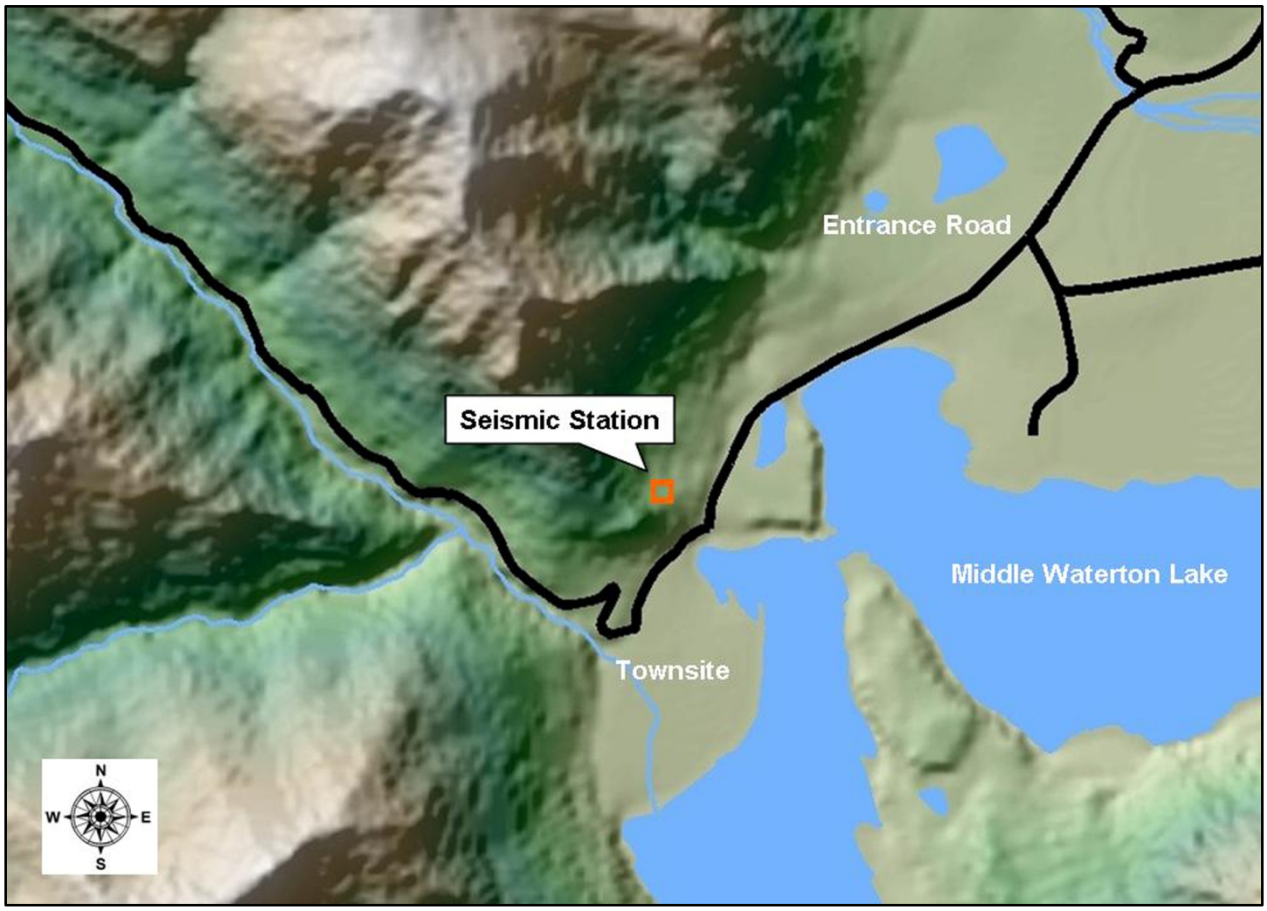
This innocuous concrete block building is an essential part of the seismic monitoring operation.
(Photo: Parks Canada/Edwin Knox)

Montana were rocked. That earthquake was felt in four states and two provinces.[6] The most recent earthquake, anecdotally reported in Waterton, as of this writing, was July 26, 2005 at 10 p.m.[7] A magnitude 5.6 quake occurred near Dillon, Montana.[8]

Originally the seismic monitoring site had been made available in 1961 to the Waterton Lakes Television Association for establishment of a translator station giving residents the opportunity to receive television service which became a reality in 1963. In December, 1991 a major wind storm knocked out the television equipment and residents spent the winter without television reception. The solution to the repairs came the following spring when new antennae were installed on the water tower of the Prince of Wales Hotel.[9] This new installation negated the need for the old site below the Bear's Hump so the improvements were sold to Natural Resources Canada. It was a welcome opportunity for the television association to recycle a facility it no longer needed and receive $16,000 in the process which it handed over to the newly-formed Waterton Park Community Association.[10] The two antennae on the hotel water tower continue to operate for all those who do not have satellite subscription service, generally small motels, some residential leaseholders and campers with recreational vehicles.

The view from the seismic monitoring site.
(Photo: Parks Canada/Edwin Knox)

From early park television to seismic data transfer, the building off the Bear's Hump trail has played a role in demonstrating how an existing structure can be both adapted and recycled to provide a home for equipment in the ever-changing world of science and technology in an otherwise laid back mountain location. Collection of seismic information helps to provide people with a friendly reminder that earthquakes occur and information gathered on each event is scientifically useful.[11]


Entrance Road
Seismic Station
Middle Waterton Lake
Townsite
N
W
E
S

[1] Real time monitoring of Waterton's seismic activity can be seen at: http://earthquakescanada.nrcan.gc.ca/stndon/wf-fo/index-eng.php?channel=WALA.BHZ

[2] At the time of the agreement, Parks Canada was known as Canadian Parks Service and Natural Resources Canada was known as Energy, Mines and Resources Canada. The agreement is not a lease but rather a "letter of permission." Box 130, item 2.

[3] *Alberta Earthquake Catalogue*, version 1.0, Alberta Geological Survey, 4, available on line: http://www.ags.gov.ab.ca/publications/ofr/PDF/ofr_2013_15.pdf

[4] Letter to Garry Rogers, Energy, Mines and Resources Canada, Geological Survey of Canada, Sidney B. C. from Sandra B. M. Davis, Director General, Western Region, Canadian Parks Service, Calgary, Alberta, May 28, 1993.

[5] J. F. Cassidy, G. C. Rogers, et al., "Canada's Earthquakes" The Good, the Bad and the Ugly, *Geoscience Canada*, Volume 37, Number 1, March, 2010, 1-16.

[6] "Mother Earth's Convulsions do $500,00 Damage," *Lethbridge Herald,* June 29, 1925, front page.

[7] "You Weren't Imagining Things," *Lethridge Herald*, July 27, 2005, front page. (Anecdotal word on the street in Waterton the next morning was that this earthquake was felt by a number of people in the park. There was no documentation to substantiate this.)

[8] http://earthquake.usgs.gov/earthquakes/eqarchives/poster/2005/20050726.php

[9] Chris Morrison, "Tube returns to Waterton; TVs Back After Five-Month Silence," *Lethbridge Herald*, May 16, 1992, 2.

[10] Letter of Permission, Parks Canada to EMR, May 20, 1993 re: Seismic Installation, WLNP and Letter from Brian Baker, WLTA, to Duane Barrus, Acting Superintendent, WLNP, May 25, 1992. F. C8601/W2-100, Parks Canada, Calgary Office. The television association was then dissolved.

[11] J. F. Cassidy, G. C. Rogers, et al., "Canada's Earthquakes" The Good, the Bad and the Ugly, *Geoscience Canada*, Volume 37, Number 1, March, 2010, 5-6.