



The 2010 Val-des-Bois Quebec Earthquake

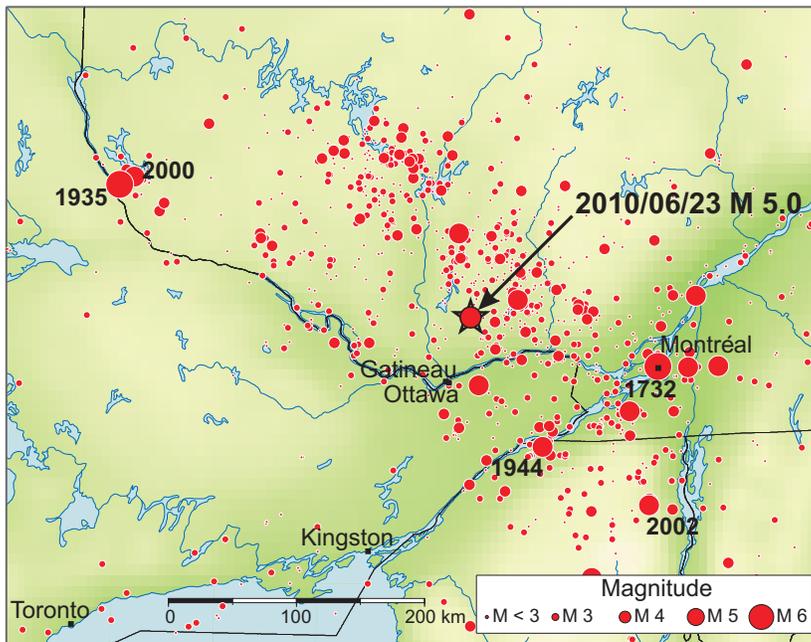
Earthquake Summary

Origin Time June 23, 2010 1:41 pm EDT
Magnitude (Mw) 5.0
Latitude 45.88 °N Longitude 75.48 °W Depth 22 km

The June 23, 2010 Val-des-Bois, Quebec earthquake was the one of the largest recent events in eastern Canada. This earthquake produced the strongest shaking ever felt in Ottawa. It was felt widely in Ontario and Quebec, and it was also felt into the United States as far as Kentucky. Some damage occurred in the epicentral region.



Damage to a church from a falling chimney in Gracefield, QC (Adrian Wyld, The Canadian Press)

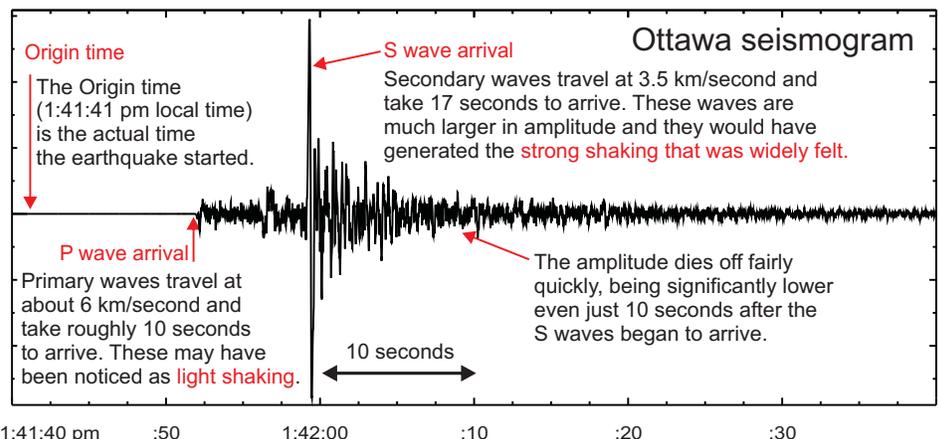


The West Quebec Seismic Zone

The magnitude (M) 5.0 Val-des-Bois, Quebec earthquake occurred in a region of moderate earthquake activity known as the West Quebec seismic zone. This broad region of activity extends from northern New York State through eastern Ontario and western Quebec (see map). On average, 150 earthquakes, most of them too small to be felt, are recorded here each year. The largest historically damaging earthquakes in this region include a M6 near Montreal (1732), a M6.2 near Timiskaming (1935) and a M5.8 near Cornwall (1944). Recently, 2 moderate earthquakes have occurred near Timiskaming (2000, M 4.7) and Plattsburgh, NY (2002, M 5.1). Like the Val-des-Bois event, both of these moderate sized earthquakes were widely felt in Ontario, Quebec and the northern United States.

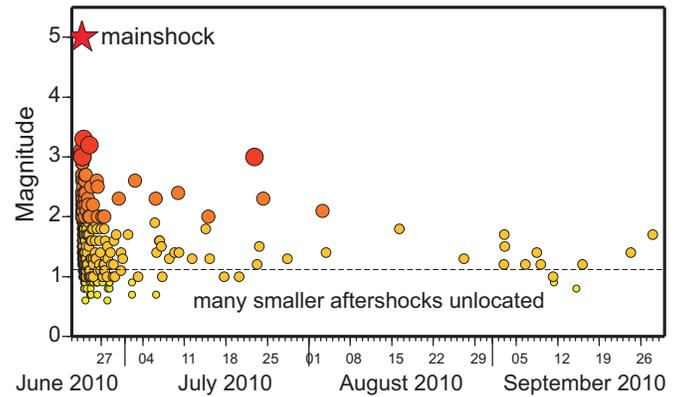
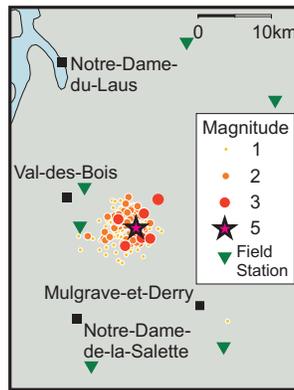
Record of the shaking in Ottawa

The shaking experienced in Ottawa from the Val-des-Bois earthquake is probably the strongest that the city has experienced in the past 200 years. Despite this, the estimated shaking from the recorded ground motions for Ottawa are well below the design level of shaking used in the 2005 National Building Code of Canada. For one or two storey structures the shaking from the Val-des-Bois event is about one fifth the design shaking.



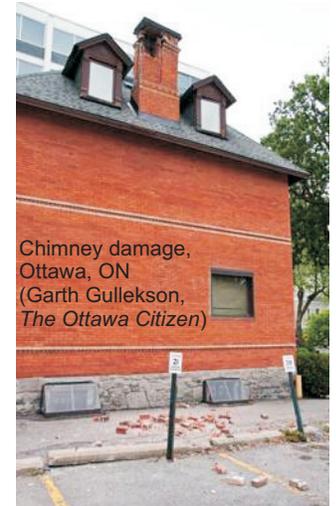
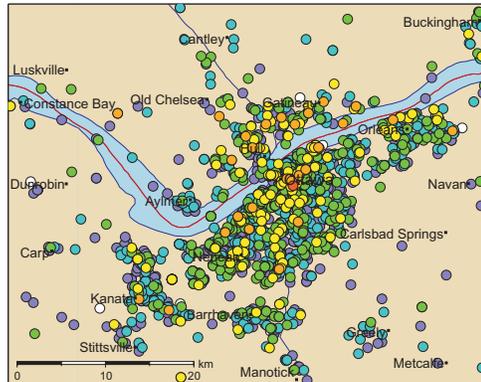
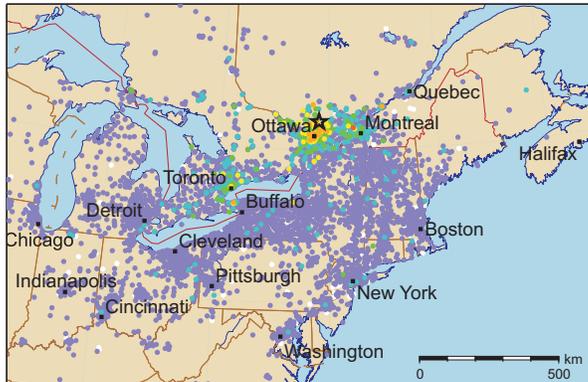
Aftershocks and Field Stations

In the hours following the earthquake, six portable seismographs were installed to record aftershocks. To the end of September, 2010 288 aftershocks were located. The majority of these (244) occurred in the first week following the event. The largest aftershock was magnitude 3.3 – five of the aftershocks were reported felt.



Distribution of Val-des-Bois aftershocks in space (left) and time (right)

Damage and Intensity Reports



Chimney damage, Ottawa, ON (Garth Gullekson, *The Ottawa Citizen*)

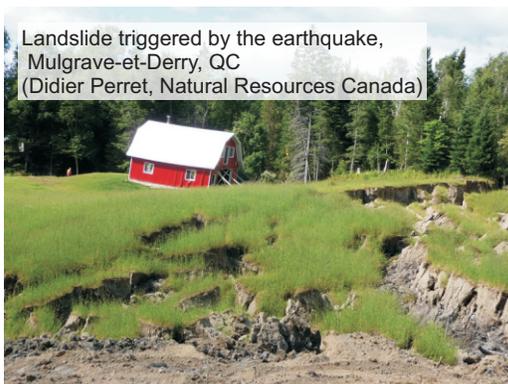
INTENSITY	I	II - III	IV	V	VI	VII	VIII	IX	X+
SHAKING	Not felt	Weak	Light	Moderate	Strong	Very Strong	Severe	Violent	Extreme
DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy



Embankment failure south of Bowman, QC (Jean Levac, *The Ottawa Citizen*)



Damage to supermarket contents, Gracefield, QC (Stéphane Kelly, *Mon Topo*)



Landslide triggered by the earthquake, Mulgrave-et-Derry, QC (Didier Perret, Natural Resources Canada)



Landslide triggered by the earthquake, Notre-Dame-de-la-Salette, QC (Ministry of Transport, Quebec)

Government of Canada work on earthquakes is undertaken by Natural Resources Canada's Earth Sciences Sector.

For more information on earthquakes visit the Geological Survey of Canada, NRCAN website: EarthquakesCanada.nrcan.gc.ca

Geological Survey of Canada
7 Observatory Crescent
Ottawa, ON K1A 0Y3

Tel: 613-995-5548 (English)
Tele: 613-995-0600 (French)
info@seismo.nrcan.gc.ca

Canada