# Alberta's seismic pulse gets a reading

KEITH GEREIN
*Journal Staff Writer*
EDMONTON

When it comes to earthquakes, Alberta is hardly a hot spot of seismic activity compared with say, California, Sumatra or Japan.

Yet the ground beneath Albertans' feet is not as stable as some might think.

On Dec. 30, 2006, a 3.5-magnitude tremor struck near the city of Lethbridge.

Rocky Mountain House has also seen its share of shakes and rumbles, while a quake gauged around 5.0 — about as big as it gets in Alberta — hit north of Edmonton earlier this decade.

Such tremors are usually too small for people to notice, yet they are of major interest to a team of University of Alberta geophysicists working to develop a picture of the province's underbelly.

The team has deployed 11 high-tech seismometers in a rough grid around central and southern Alberta — giving the province its first "passive broadband seismic network," says project leader Jeff Gu.

"We can use it to analyze the Earth's structures, from the surface to hundreds of kilometres of depth," he says. "It can tell us a lot about the history of our region, the present as well as the past."

Gu recognizes that being an earthquake scholar in Alberta might seem as rewarding as being a fisherman in the Sahara. After all, compared with the 8.0-magnitude quake that hit China last year, or the 9.0 quake that caused the Indian Ocean tsunami in 2004, Alberta sees little more than gentle jiggles.

RYAN JACKSON, EDMONTON JOURNAL

**University of Alberta geophysics professor Jeff Gu**

Yet there is much that can be learned from the tiny tremors, and that's why the U of A team has worked hard over the last two and half years to set up and maintain the seismic network, Gu says.

In establishing the grid, the scientists placed the 11 units about 150 to 200 kilometres apart. Most are in farmers' fields, on patches of land that are high, dry and relatively quiet.

Each station costs about $35,000 and uses several pieces of equipment, including a battery and solar panels to keep the instruments powered up all year.

The seismometer itself is a sphere-shaped device suspended on a tripodal.

*See EARTHQUAKE / B4*

## Network can detect old faults reactivated by industrial activity

EARTHQUAKE
*Continued from B1*

The sensor operates on a "broadband" scale, meaning it reads vibrations from a wide range of frequencies and can distinguish between earthquakes and industrial noise.

"We can record it all and we can filter it, eliminating either the high or low end of the range to focus on what we want," Gu says.

The sensor is placed in a large blue barrel, and concrete is poured to provide a flat and level surface. Then the barrel is buried in the ground to keep it insulated in the winter.

A digital recording unit at each site stores the seismometer's readings on a memory card, which is retrieved by scientists every six months and brought back to the U of A for downloading.

Eventually, Gu would like to have the stations equipped with wireless communications technology, allowing the data to be broadcast back to campus automatically.

"The way we do it now, it's a lot of driving," he says.

The seismometers are state-of-the-art and highly sensitive, capable of detecting earthquakes from all around the world, including the 7.1-magnitude quake that shook Honduras last month.

The U of A scientists, however, are mostly interested in the ones that hit locally.

The network's readings can provide insight on where and when a quake happened, and where a fault might be located.

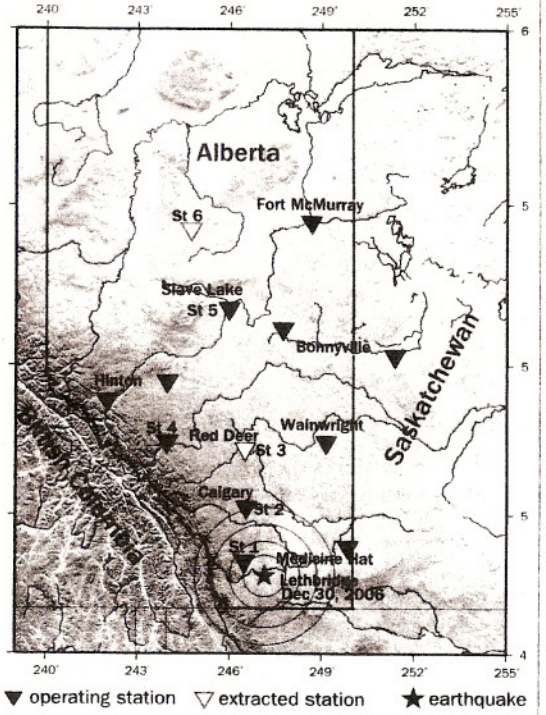
Alberta is not on any major fault lines in the Earth, which is why it doesn't have major quakes. Yet there is some concern about old faults that could be reactivated by industrial activity, Gu says.

Specifically, it's believed that if water is injected into the ground — as is currently done in the extraction of petroleum — the water can potentially get into an old fault and make it easier for it to slip, he says.

When that happens, it's known as an induced seismic event, Gu says.

Earthquake monitoring is just one part of the project.

The other component involves using the seismic data to gain insight about rock formations and the structure of the upper mantle region 200 kilometres beneath the surface.




SUPPLIED

**Triangles mark the seismometer station locations on the U of A's network.**

> "The ground beneath us is flowing. We can use the data to infer the direction of mantle flow and learn about the current tectonic regime."
>
> Jeff Gu, University of Alberta geophysics professor

"The ground beneath us is flowing," Gu says. "We can use the data to infer the direction of mantle flow and learn about the current tectonic regime."

Potentially, the readings could even be used to research where and when diamonds might have formed.

The seismic array is known as "passive" technology because it sits quietly listening to the Earth's movements.

Other seismic methods involve explosions or vibrations deliberately sent into the ground.

"Ours is more environmentally friendly," Gu says.

The U of A is currently working with the University of Calgary to expand the grid with six more stations, which would be placed in northern Alberta, he says.

*kgerein@thejournal.canwest.com*

# Release of killer riles

## Association deman

STEPHANE MASSINON
*Calgary Herald*
CALGARY

The revelation that a man accused of killing three people in Calgary on New Year's Day had been released from custody days earlier is prompting calls from police and government officials for national bail reform.

Real Christian Honorio, 25, was charged Tuesday with three counts of first-degree murder in the shooting at a Calgary restaurant.

Court documents show the man was arrested on Dec. 22, 2008, along with four other people as part of a gang bust in the Calgary area.

Police alleged that Honorio was found with guns, bombs, ammunition and body armour, and living in a house with a sophisticated surveillance system. Honorio was then released on $2,000 bail — three days before the fatal shooting.

"This is the most outrageous thing.

## Fast changes for special-nee

WORRIED
*Continued from B1*

"I walk away from this very optimistic still," Fankhanel said Tuesday. "But my realistic side says please do not create high expectations and then pull them away by saying 'there's not enough funding'."

Parents also said they hope children will not have to wait too long to see real change in their education, given how precious every year of school is, particularly in the early years.

"A year in a child's life is like three or four years in an adult's," said Marcy Henschel, a mother of two twin boys affected by autism. She works as a parent liaison with an autism services agency.

Henschel, like others at the forum, said they hope school districts and