'One in 50 years': U of A researchers help solve ice quake mystery at Alberta Beach

By Clare Rayment | Updated: December 16, 2018

The "earthquakes" that shook up several Alberta towns at the beginning of 2018 were actually "ice quakes," researchers at the University of Alberta discovered.

On Jan. 1, residents along Lac Ste. Anne at Alberta Beach reported hearing a very loud bang and woke to find cracks in their homes and on the ground. According to the Alberta Geological Survey, two seismic events were confirmed registering a magnitude of 2.0 on the Richter scale. The quakes were also felt at Pigeon Lake and Gull Lake.

But what cause the quake?

Solving this mystery brought together several researchers from different fields: Jeffrey Kavanaugh, associate professor in the Department of Earth and Atmospheric Sciences; Mirko van der Baan, professor in the Department of Physics; Ryan Schultz, a geophysical research scientist and seismologist at the Alberta Geological Survey, and others.

‘The perfect storm’

There were essentially four weather conditions that came together to form the perfect storm, Kavanaugh said in a phone interview Friday.

First, the dramatic warming over a short period of time caused the ice to expand.

"From 11 p.m. New Year’s Eve to 11 p.m. New Year’s Day, the temperature warmed up about 30 C," Kavanaugh said.

Second was the lack of snow. Kavanaugh said a layer of snow on top of the ice normally acts as an insulator, slowing the speed of the temperature change.

However, there was no snow on New Year’s Day 2018.

Next, the fall of 2017 was wetter than usual, which caused the last two weather conditions: higher lake levels and wetter soil.

The higher lake levels meant the ice expanded closer to lakeshore houses. The wetter soil also froze solid, with the lake ice pressed right up against it. When the ice expanded and cracked, the force traveled right through the frozen ground, shaking homes and properties.

‘One in 50 years’

“Nobody we spoke to, even those who had lived on the lakes for decades, had ever felt an event of this size," Kavanaugh said. “It’s one in 50 years, or one in a century.”

Kavanaugh said he’s unsure what this event means for the future of ice quake research, but it’s an interesting start in looking at how these events come about and how to prevent such damage, especially as the variability of temperatures and precipitation has increased in the last decade.

“The ice tells a really good story.”

Source: Edmonton Journal