

Induced Seismicity

What is Induced Seismicity?

Seismicity refers to the geographic and historical distribution of earthquakes. Induced seismicity is a seismic event resulting from human activity, and can be caused by industries such as mining, dam impoundment and natural gas development.

What is the link to Hydraulic Fracturing?

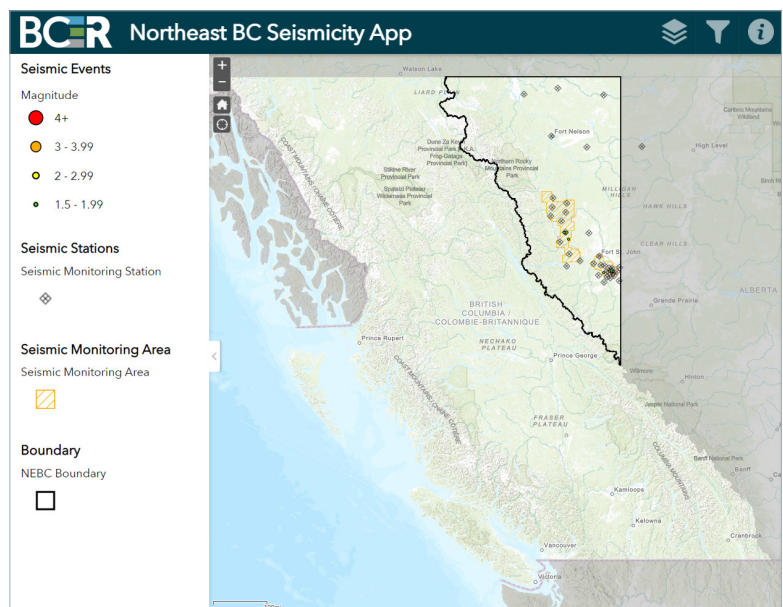
Hydraulic fracturing is the process of injecting fluid (usually water) at high pressures to create fractures or open existing fractures in hydrocarbon-bearing rocks deep underground. A hard granular substance called proppant (usually sand) mixed with the fluid holds the cracks open once the pressure is lowered. Hydraulic fracturing allows the natural gas to flow from the formation to the wellbore. As hydraulic fracturing fluid is injected, microseismic events can be created as the rock is fractured. In some cases, where there is a susceptible pre-existing fault, slippage on a fault plane may occur causing a seismic event.

Measuring Earthquakes

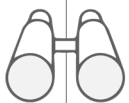
The BCER has a seismic monitoring array in northeast B.C. (NEBC) that includes over 40 seismometers for recording the location and magnitude of seismic events.

Our [Northeast B.C. Seismicity Map](#) (image at right) displays recent and past seismic events of greater than local magnitude 1.5 that were recorded in the northeast region of British Columbia.

Seismic events are analyzed by the BC Seismic Consortium, which is a joint partnership between the BCER, Geoscience BC and the BC Oil and Gas Research and Innovation Society (BC OGRIS).



Learn more:



Induced Seismicity online

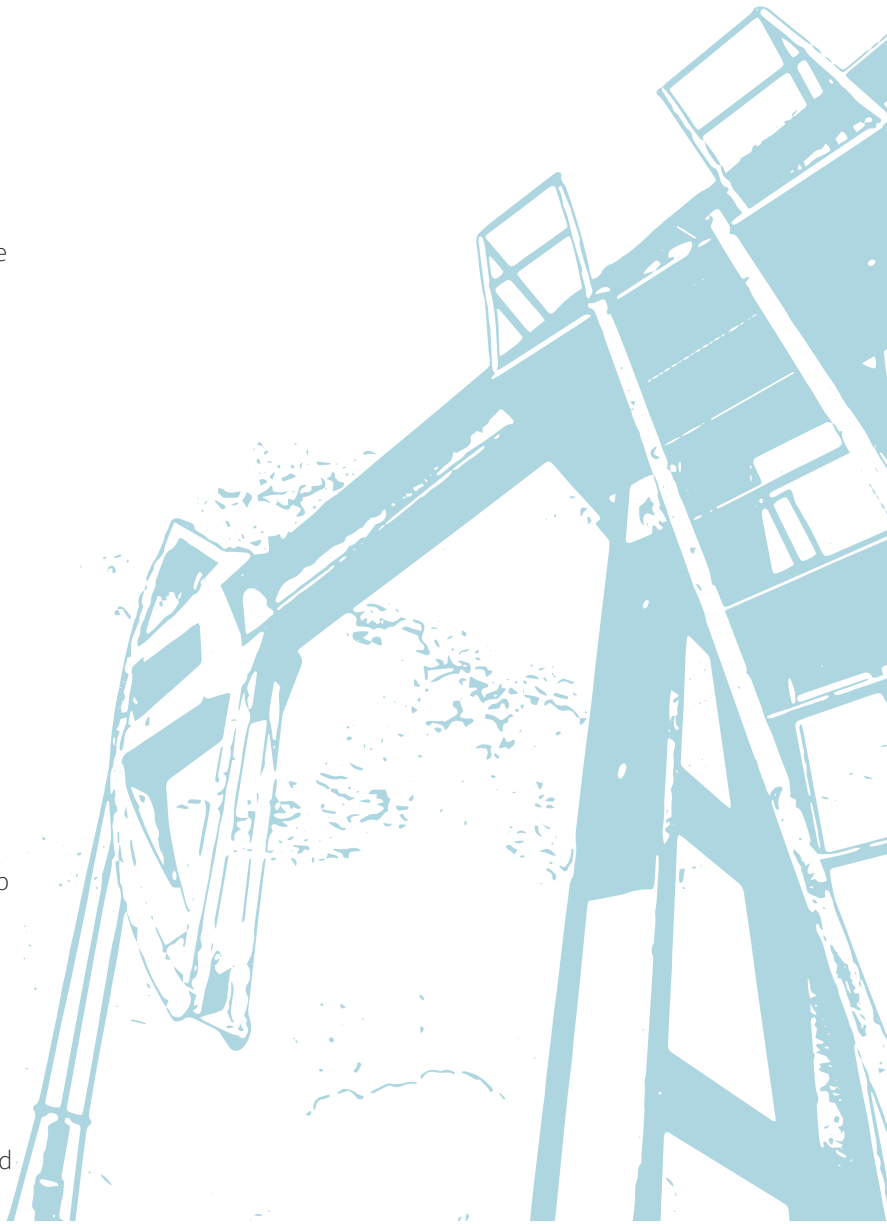
The bc-er.ca website has more information on induced seismicity and how it has partnered with land owners to study hydraulic fracturing operations.

Stay Informed

If you'd like to join our mailing list, please send us an email at Communications@bc-er.ca and add 'Information Updates Sign-Up' to the subject line.

How Are We Providing Oversight?

- Drilling and Production Regulation province-wide require the immediate suspension of injection activities if a magnitude 4.0 or greater event is recorded and linked to the activity, as well as the mandatory reporting of felt events.
- The Kiskatinaw Seismic Monitoring and Mitigation Area special project order came into effect in May 2018. It contains stipulations with regards to hydraulic fracturing in the area, including community engagement ahead of hydraulic fracturing activities, the completion of seismic hazard pre-assessments and lower suspension thresholds.
- Additional permit conditions as of June 2016 and updated January 2018, requires the presence of ground motion monitoring during hydraulic fracturing activities for areas where previous seismic activity occurred, as well as reporting of events.
- Risk assessments are required for disposal wells, which operate under strict pressure and reporting conditions.
- Since 2017, the BCER has maintained a research partnership with McGill University focused on examining induced seismicity in the Farmington region of NEBC.
- On-going research funded by Geoscience BC and the BC Oil and Gas Research and Innovation Society, along with several academic institutions, continue to further the BCER's understanding of the mechanism causing induced seismicity and strategies to reduce the likelihood of induced seismic events.



Emergency Response

The BCER plays an integral role in emergency management for natural gas and oil related activities, including:

- Receiving reported incidents and complaints.
- Confirming emergency response needed and assessing potential risks.
- Oversight of permit holders' response actions including the notification of appropriate land owners, stakeholders and/or other agencies.
- Liaising with and coordinating interagency emergency operations.



24-hour Industry Incident Reporting

[1-800-663-3456](tel:1-800-663-3456)

(via Emergency Management
and Climate Readiness)