Status of Canada's Earthquake Early Warning Project

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Abstract

In 2019, Natural Resources Canada began the development of a national Earthquake Early Warning (EEW) system in areas of Canada subject to moderate to high seismic risk, to provide seconds to tens of seconds of warning before strong shaking arrives. Interoperability with the United States' EEW system is assured through the use of the USGS ShakeAlert® software and the sharing of data between the two countries, noting that alerts in Canada will be disseminated using Canada's National Public Alerting System (NPAS/AlertReady). Design of the sensor network's coverage was informed by the assessment of areas at risk in Canada and an optimized station spacing of 20km, as determined by modelling system triggering and warning times. Statistical modelling of expected system performance over a 100 year period was completed using a synthetic earthquake catalog. Furthermore, system performance has also been assessed using historical earthquakes as real-world examples.

Instrumentation procurement has been completed, station installations are ongoing, and the EEW system is on track to be operational in 2024. Continued efforts for system readiness are directed towards software development, testing, cyber security measures, implementation of alerts through NPAS, technical partner engagement, and public education. Future endeavours will include an assessment of the possible integration of GNSS data from the Western Canada Deformation Array (WCDA).