

Historical seismicity in New Brunswick - one key to future earthquake activity

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Most of New Brunswick lies within the Northern Appalachian earthquake source zone with a moderate level of seismicity and potentially damaging earthquakes (>magnitude 5) occurring from time to time. Historical seismicity investigations can therefore provide a guide to the identification of zones of enhanced earthquake activity, which can then be used in the assessment of future earthquake risk. A study of the historical seismicity of New Brunswick has been made using various earthquake catalogues and by scanning selected weekly local newspapers on an-issue-to-issue basis from the early 1800s for references to earthquakes. Lateral searches of other newspapers and diaries at the dates of newly found events and previously listed earthquakes were also made.

Three regions of enhanced activity have been identified in the study: the Central Highlands (Miramichi) region, the Passamaquoddy Bay region and the Moncton region. More than 600 events are listed for the Central Highlands region in the Canadian National Earthquake Database (CNED), the vast

majority of them being earthquakes recorded since the installation of local seismograph stations in the 1980s. Most of the events since 1982 have been identified as aftershocks of the 1982 Miramichi earthquake. From the scanning process, 14 previously unlisted events were found in this region for the period 1826 to 1943. In the Passamaquoddy Bay region, more than 75 events are listed in the CNED, with an additional 12 previously unlisted events found by the scanning process for the period 1811 to 1961. The Moncton region shows the least activity, with 25 events being listed in the CNED and two additional unlisted events being found by the scanning process. The study has also shown that some of the earthquakes listed in the catalogue had been mis-located and other events, listed as earthquakes, were actually explosions or meteorological effects, such as cryoseisms. However, all three regions have experienced at least one earthquake with a magnitude larger than 5 and present day seismograph recordings show continuing activity in each region.