Recent earthquake swarms in New Brunswick, Canada

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An earthquake swarm is a series of earthquakes that occur over a short period of time (days to weeks), in which there is no clear large magnitude earthquake, followed by aftershocks, but there is instead continuing activity of low magnitude events, confined to a small localized region. For the 382 earthquakes recorded with epicentres in New Brunswick during the 4-year period from 01 January, 2012 to 31 December, 2016, 175 events have been associated with three such earthquake swarms. The two most predominant swarms happened close to the village of McAdam in 2012 and in 2015 and 2016. In September and October of 2016, another smaller earthquake swarm was recorded in the Hammondvale area, about 25 km south of Sussex, New Brunswick. In both areas, the earthquakes were shallow focus (less than 5 km deep). As the two sets of swarms occur close to the contacts between metamorphic rocks and granitic intrusions, the similarities of the geology in the McAdam and Hammondvale areas will be examined and the idea explored that these earthquake swarms may be associated with small fractures within weakened and deformed rocks, rather than repeated movement along a single regional-scale fault plane.

It is also of interest to examine the public reaction to the two sets of swarms. The McAdam swarms, with its many felt earthquakes and close proximity to the village, caused widespread public concern. On the other hand, because of the isolation of the area, the Hammondvale earthquakes were not reported felt and caused no public reaction.

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