



Earthquake Geology - the Swedish Case

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Geology is the key to a meaningful registration of past seismic activity, and by that a long-term seismic hazards assessment. In Sweden, this is especially clear because the mode of seismic activity has changes dramatically over the last 13,000 years (i.e. the time after the deglaciation). Today, there is a low to moderately low seismic activity with maximum magnitudes around M 4, or just above. The historical data include only three major events, viz. M 5.4 in 1904, M 5.3 in 1759 and M 4.8 in 1497. During the last decades, we have been able to record and date numerous paleoseismic events. The fault scarps of the events in the north tell about mega-events of $M > 8$. In the middle and southern parts of Sweden, the secondary effects provide quite clear information of mega-events, too. Liquefaction events have been recorded and dated as to single years in the Swedish Varve Chronology (in a few cases even the season of a year) allowing us to record the spatial distribution of liquefaction at separate events. This indicates the occurrence of mega-events practically all over Sweden at around the time of deglaciation. Our Swedish Paleoseismic Catalogue by now includes 54 events. 50% of the events occurred 9000-11000 BP during the phase of maximum rates of glacial isostatic uplift. Even during the Middle and Late Holocene, there were high-magnitude events, however. At 6100 BP, there was a major event with venting of course gravel and setting up a tsunami that broke into lakes, at least, 20 m above the sea level of that time. Obviously, we seem to be dealing with a $M > 8$ event. In the last 5000 years, nine M 6-7 events have occurred. This seismicity seems also recorded in old place-named and in legends.

Mörner, N.-A., 2005. An interpretation and catalogue of paleoseismicity in Sweden. *Tectonophysics*, 408, 265-307. Mörner, N.-A., 2004. Active faults and paleoseismicity in Fennoscandia, especially Sweden. Primary structures and secondary effects. *Tectonophysics*, 380, 139-157. Mörner, N.-A., 2003. Paleoseismicity of Sweden - a novel paradigm. Contribution to the INQUA XVI Congress, Reno, Nevada, 2003.

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