DEGLACIAL CRATONAL NEOTECTONICS: THE SWEDISH CASE

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The glacial isostatic uplift of Fennoscandia amounts to over 800 m in the center of uplift in Sweden. The rates of upplift were tremendeously high at around the time of deglaciation. Values of 40-50 cm/yr in the north and 15 cm/yr in the Stockholm area are recorded (i.e. about 10 times as high as the present sea floor spreading rates). This means 0.5–1.5 mm/day! Therefore, it can hardly be surprising that we have now been able to record a very high seismic activity – in amplitude (around to above M8) as well as in frequency (5 recurrent events within a century) – at around the time of deglaciation. Some 20 events are documented. Thanks to the Swedish varve chronology several of these events can be dated as to a single year (~10,490, 10,469, 10,447, 10,430, ~10,410, 9663, 9428, 9239 BP) or even the season of a year (the autumn of 10,430 BP). Liquefactions have been recorded over wide areas (320 km for 10,430 BP, 80 km for 9663 BP and 60 km for 9428 BP). Tsunami deposits and erosions have been recorded at two events (10,430 and 9663 BP). The event occurring “in the autumn of varve 10,430 BP” created liquefactions over an area far larger than that of the famous Alaskan 1964 event. A 20-year recurrence time is documented for five successive events. The deglacial high-seismicity later transformed into a present day low to moderate seismicity. The high-seismicity will return in connection with future ice ages, which is of great significance in connection with long-term stability/safity esimated of nuclear waste repositories.