



## REAPPRAISING HISTORICAL EARTHQUAKES IN THE GULF OF BOTHNIA AREA IN NORTHERN EUROPE

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Efforts have been taken to investigate earthquakes in the Gulf of Bothnia area in northern Europe from the early 1700s to early 1900s. Historical earthquakes with magnitude in the range 4-5 have no modern counterparts there.

Primary written documentary materials were consulted. The main sources of information were the national and local newspapers, reports by contemporary scholars, academic theses and parish histories by the clergy. An attempt was made to uncover usable administrative documents.

Known earthquakes were reappraised, and earthquakes unknown to catalogues as well as fake earthquakes were searched for. The reappraisal often improved the area of perceptibility of known historical earthquakes. The uncovered reports sometimes helped to identify localities on the outskirts of the area of perceptibility, which increased the confidence in the respective macroseismic magnitude. In some cases, the uncovered reports improved the intensity assessment for a given place. A few previously unknown historical earthquakes were uncovered. They were reported only in one or two places. This supports the notion that the larger earthquakes have not passed unnoticed by earlier compilers of seismological works. Alternatively, some areas of perceptibility were incompletely reported and cannot be resolved using the documentation available.

The revised macroseismic datasets were used to prepare Macroscopic Data Point maps of historical earthquakes and seismic histories of localities on the Gulf of Bothnia between 1720 and 1920.

It is well recognized that macroseismic intensity cannot always be assessed for a given place, because the information extracted from the available written materials is not sufficient. On the other hand, there are reports of effects not used when assessing intensity. A typical case in the area is that only an underground roar was reported. Information on earthquakes felt over an area such as a whole municipality should be included on the maps. There are sometimes recollections about previous earthquakes at a given locality. Recording the gaps is usable information when investigating the seismic history and when assessing the completeness of reporting. All available information should be incorporated in the output.

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