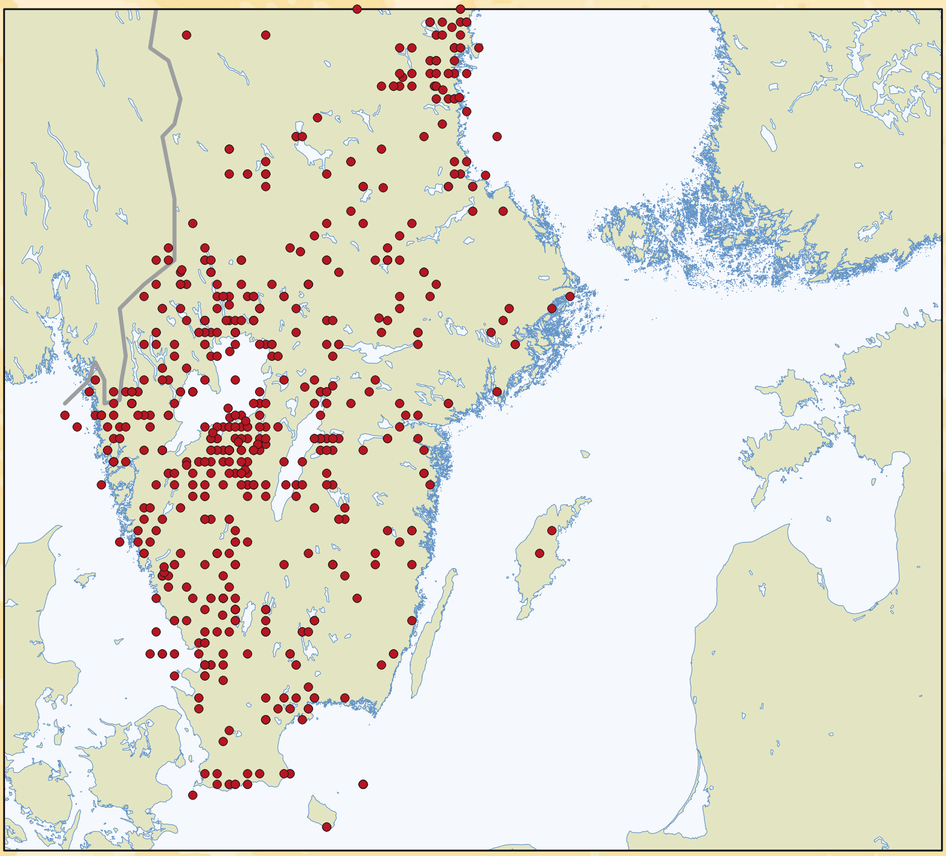
SGU Research Paper C 837

Research Paper C 837

Macroseismic observations of Swedish earthquakes from 1375 to 2000

Ota Kulhanek & Leif Persson



Macroseismic observations of Swedish earthquakes from 1375 to 2000

SGU
Sveriges geologiska undersökning
Geological Survey of Sweden

Research Paper C 837

Macroseismic observations of Swedish earthquakes from 1375 to 2000

Ota Kulhanek & Leif Persson

Sveriges geologiska undersökning
2011

ISSN 1103-3371
ISBN 978-91-7403-120-1

Cover: Earthquakes felt in southern Sweden during the period 1375–2000.

Layout: Jeanette Bergman Weihed, SGU
Tryck: Danagård LiTHO AB, Ödeshög

CONTENTS

ABSTRACT

Kulhanek, O. & Persson, L., 2011: Macroseismic observations of Swedish earthquakes from 1375 to 2000. Sveriges geologiska undersökning, C 837, 32 pp.

We present a macroseismic catalogue of Swedish earthquakes. It comprises 883 events and covers the time period from 1375 to 2000. The catalogue is a compilation of information accumulated by a number of observers who used different and scattered sources. We performed a homogenization of the catalogue with respect to the macroseismic magnitude and focal depth throughout the reviewed time period. The geographic distribution of epicentres exhibits similar patterns for the historical (prior to 1950) and the instrumental (beyond 1950) era. We estimate the catalogue to be complete for $M_M \geq 3.3$ during the period between 1891 and 2000. For the period 1700–1891 the catalogue is incomplete even for the largest magnitudes ($M_M \geq 4$). All entries are in parametric form, while original macroseismic reports and in some cases also macroseismic maps can be found in referred publications.

Ota Kulhanek, Uppsala University, Department of Earth Sciences, Seismology, Villavägen 16, SE-752 36 Uppsala, Sweden.
Leif Persson, Swedish Defense Research Agency (FOI), Gullfossgatan 12, SE-164 90, Stockholm, Sweden.

INTRODUCTION

We present a catalogue of macroseismic observations (hereafter catalogue) comprising 883 entries and covering more than six centuries, from 1375 to 2000. Only events with epicentres within Swedish borders are considered. Consequently, some of the large Fennoscandian earthquakes, like e.g. the 1759 earthquake (northern Kattegat), the 1819 shock (coast of Norrland, Norway) or the 1904 event (Oslo fjord) are not included, in spite of the fact that they were also felt over large areas of Sweden. The catalogue starts with a doubtful Gotland event of 1375 (possibly a cyclone, according to Kjellén 1910), which is the oldest report on a Swedish event mentioned in various catalogues of historic Swedish earthquakes. For the sake of completeness, we wish to add that Båth (1954) with reference to Svedmark (1904) mentions, without further details, an event in 1073 which was felt in the southernmost part of Sweden. The present list ends with earthquakes in 2000 when a systematic collection and analysis of macroseismic reports of Swedish earthquakes was regrettably ended. The objective of this work is to make use of the scattered data-sets (historical publications, earthquake catalogues, special studies and reports, questionnaires, newspaper articles and other descriptive materials) and compile a homogeneous (magnitudes, focal depths) and reasonably complete macroseismic catalogue of Swedish earthquakes, extending over both the pre-instrumental and the instrumental era. It provides a data base suitable for any type of application, such as tectonophysical studies or engineering evaluation of ground motion.

Starting in around 1950, there was a decline in interest in macroseismic observations, mainly due to the extremely improved power of instrumental monitoring. However, since the middle 1970s a strong revival of interest in the subject took place. It has then been realized that macroseismic data are essential for the revision and completion of historical seismicity which in turn is of great importance in assessments of seismic hazard. The building of nuclear power plants, nuclear waste storages, high dams and other critical structures increase the need for seismic hazard and risk analyses. The instrumental era in Sweden and the rest of Fennoscandia is only about 100 years old. With respect to the relatively low seismic activity in the region, meaningful statistical studies, therefore, require observational periods that significantly exceed the instrumental era. By making use of macroseismic data we can expand existing instrumental earthquake catalogues back in time. Engineering requests for accurate and complete information on ground motion are nowadays far greater than earlier. In Sweden, as yet, no systematic ground-motion measurements have been carried out. To a certain extent, macroseismic reports can abridge this shortcoming. Macroseismic data and studies are also vital for calibrating historical events, for local attenuation studies, insurance policies and for making first approximation of focal depth of local and regional shocks, which otherwise is usually difficult to achieve. For these (and other) purposes, we believe it is important to establish a well-quantified and reasonably homogeneous and complete catalogue of macroseismic observations. The present list covers a time period of more than five centuries of purely macroseismic data, about 50 years of macroseismic information in some cases complemented by instrumental readings (mainly origin time, OT) provided by old-fashioned seismographs, and approximately 50 years of macroseismic data confirmed by instrumental solutions (OT, epicentral location, magnitude). The major contribution of instrumental records is the fact that they are not subjected to such restrictions in space and time as macroseismic information is. Nevertheless, macroseismic data still play an important role as a supplement to instrumental solutions.

Generally speaking, Sweden belongs to a plate interior devoid of major seismic activity; larger earthquakes ($M > 4$) are scarce. Swedish earthquakes reveal a rather diffuse geographical pattern of epicentres, low rate of occurrence and shallow focal depth, usually around 15 km. Several national and regional earthquake catalogues already exist for Fennoscandia (Finland, Sweden, Norway) or some of its parts. Among those of special importance, in particular for the pre-instrumental period 1375–1890, are works of Ahjos & Korhonen (1984) together with an updated version by Ahjos & Uski (1992). For the area of Sweden, the most valuable information for the period 1891–1975 is found in studies by Båth (1954, 1956, 1979). His data collection, comprising the period 1891–1950 (Båth 1956), is considered to be one of the most complete (almost exclusively macroseismic) records for the seismicity of non-seismic regions in the world (Miyamura 1962). The present catalogue makes use of these sources. However, when compiling an event list covering several centuries with inherent quality variations, we face certain limitations. Certainly, many events are missing, as a direct effect of population distribution and density. For events from the pre-instrumental period, magnitude estimates are heterogeneous and there are large inaccuracies in time, epicentral location and focal depth estimations. To minimize these deficiencies we also consulted other sources including Kjellén (1910), Linnarsson (1879), Sahlström (1911, 1913, 1919, 1926, 1931, 1936, 1941, 1953), Sahlström & Båth (1948) and Svedmark (1884a, 1884b, 1889, 1892, 1897), among others. To extend the period of the catalogue to 2000, we made use of results presented by Kulhanek & Wahlström (1981, 1985, 1992, 1996) and by Holmqvist et al. (2007).

SOURCES OF MACROSEISMIC DATA

Accuracy, homogeneity, and completeness of data listed in the catalogue are not the same for the whole time period covered. Population distribution, awareness of natural phenomena, improved communication, deployment of seismographs, etc., influence the quality and amount of collected information. In Sweden, systematic collection of macroseismic information commenced first towards the end of the 1880s (Båth 1954). Figure 1 exhibits the cumulative number of felt events as a function of time. The diagram in Figure 1 shows several distinct gradients, i.e. number of felt events per unit time. From 1375 to approximately 1700 (merely macroseismic information, Ahjos & Uski 1992), 17 events were reported, i.e. 0.052 events per year. Communications in those days were difficult and certainly, many events are missing. Note that prior to 1660 only four events enter the catalogue. During the period from 1700 to approximately 1890 (merely macroseismic information, Ahjos & Uski 1992), the number of felt events increased dramatically to 1.69 events per year, most likely due to rise of literacy, centres of documentation and growing interest in science and natural phenomena. Muir Wood (1993) presents an interesting comparison of newspaper production with reported earthquakes between 1699 and 1849. It can to a certain extent explain the sudden increase in reported events starting around 1750 (Figure 1). The first seismographs were deployed in 1904 in Uppsala and in 1905 in Bergen. Between 1891 and 1950 (macroseismic information, only exceptionally completed with instrumental data; Båth 1956) 367 events are listed in the catalogue, i.e. 6.12 events per year. During the time interval 1891–1930, Båth (1954) gives 6 earthquakes per year. In the early 1950s a vast expansion of new seismographic stations took place in Sweden. Between 1951 and 2000 (macroseismic data confirmed by instrumental observations; Båth 1979, Kulhanek & Wahlström 1981, 1985, 1992, 1996, Holmqvist et al. 2007), 177 entries are listed in the catalogue, i.e. 3.54 events per year. About 62% of events listed in the catalogue took place after 1890, i.e. during the last 17% of the total length of the time period reviewed. The increase in the number of felt events since the fourteenth century does, of course, not mean that the seismicity has coincidentally increased. It merely shows that observations and reporting have improved. The diagram in Figure 1 reveals that after around 1890, the number of felt events per year remains, within narrow limits, roughly constant with a mean rate of about 5 events per year. It indicates that, at least for the last century, the list of felt earthquakes is in general complete (cf. Ahjos & Korhonen 1984). Kjellén (1903) rather optimistically postulates that the available list is relatively complete already from 1846. For the pre-1890 era, there is an evident seismological deficit which makes seismicity statistics almost impossible, except for the largest magnitude events. Because of the inherent differences in accuracy and homogeneity of the old and more recent data, we are using the term "historical" for events occurring during the pre-instrumental and early instrumental era, i.e. roughly prior to mid 1950s.

COLLECTION AND CLASSIFICATION OF DATA

The catalogue comprises source parameters in this order: event number, date, origin time, epicentre location, data quality, maximum felt intensity, radius of perceptibility, felt area, homogenized magnitude, homogenized focal depth and remarks. Dynamic source parameters, even if available, have been left out. Sometimes foreshocks and aftershocks were reported felt. Notes on these are given in remarks. The geographic distribution of epicentres for three different time intervals is displayed in Figure 2. The maps do not reveal any major deviation from each other. The Swedish seismic belt extends from the area of Lake Vänern in the south to the northern part of the Bay of Bothnia in the north. There is a high concentration of events in south-western Sweden and along the coast of Bay of Bothnia, whereas the vast area along the Norwegian border and in northern Sweden is essentially without macroseismic reports. The geographic distribution exhibited in Figure 2 is in good agreement with the current seismicity monitored by 60 Swedish seismographic stations.

Contamination by aseismic events is one of the problems we meet when compiling event catalogues from different sources which often also cover different time intervals. Collection of macroseismic

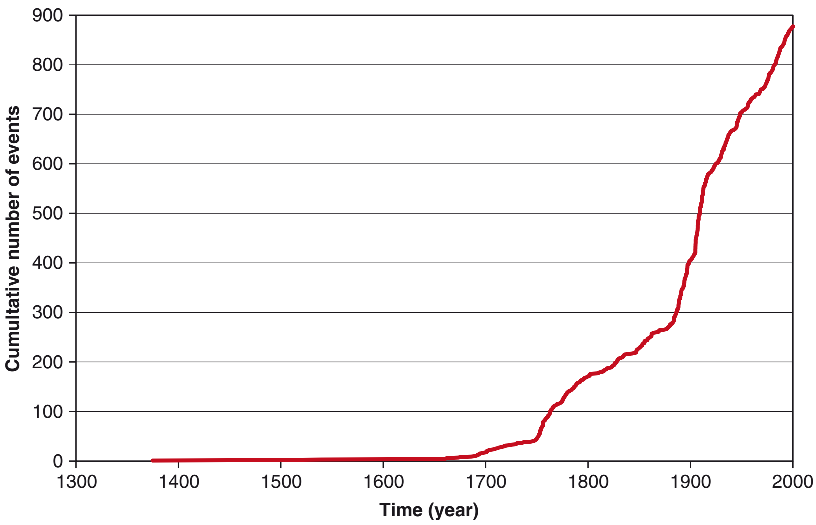


Figure 1. Cumulative number of earthquakes felt in Sweden between 1375 and 2000, altogether 883 events.

information includes various uncertainties and often events of aseismic origin will also appear in the list, in particular in its historical part, in spite of critical examinations performed by some workers (Båth 1956). Sources of aseismic Swedish events, often misinterpreted as earthquakes, are e.g. frost shocks in ice covers of lakes or sea, following a sudden decrease in temperature. These events can be felt at distances as far as 20–30 km from the "epicentre" (Kjellén 1903). Figure 3 displays the seasonal distribution of events from the catalogue. The diagram with earthquakes $M < 3$ exhibits a clear maximum in January but for the rest of the year there is no obvious sign of annual variation. Frost shocks are in general weak events, so the seasonal dependence should reduce when only stronger shocks are considered. This effect is demonstrated in the diagram with earthquakes $M \geq 3$ in Figure 3. Thus, frost shocks seem to be a plausible explanation for the observed annual variation. A discussion on the frost shocks and their influence on macroseismic observations is presented e.g. in Båth (1954). Båth speculates that January maxima in event counts may be explained by the often rapid variability of the atmospheric pressure during this month. When considering the whole of Europe and earthquakes with $M \geq 4.5$, the discussed seasonal variation disappears (Kárník 1971). Diurnal variations, which are sometimes observed but not confirmed by instrumental measurements, are ascribed to the daily rhythm of human observers and can here be neglected. Other sources of errors are mining explosions. We believe that misinterpretation of explosions (macroseismic observations) is less crucial. Explosions are usually performed at known sites, around fixed hours and are felt only in the vicinity of mines. Also, local population can, due to long experience, reliably distinguish between effects of earthquakes and explosions. A problem which still remains is the recognition of rockbursts. All possible aseismic events are mentioned in remarks as events with questionable seismic origin. During the post-instrumental era some events were felt but not recorded by seismographs. A typical example is sonic booms from airplanes. Such events must nowadays be treated with suspicion, and they are classified as doubtful in remarks. Several procedures are available to make the discrimination more reliable. Firstly, the focal depth. Events deeper than, say, 3 km are earthquakes. Secondly, the origin time. Industrial explosions are made during regular working hours fixed for any given site.

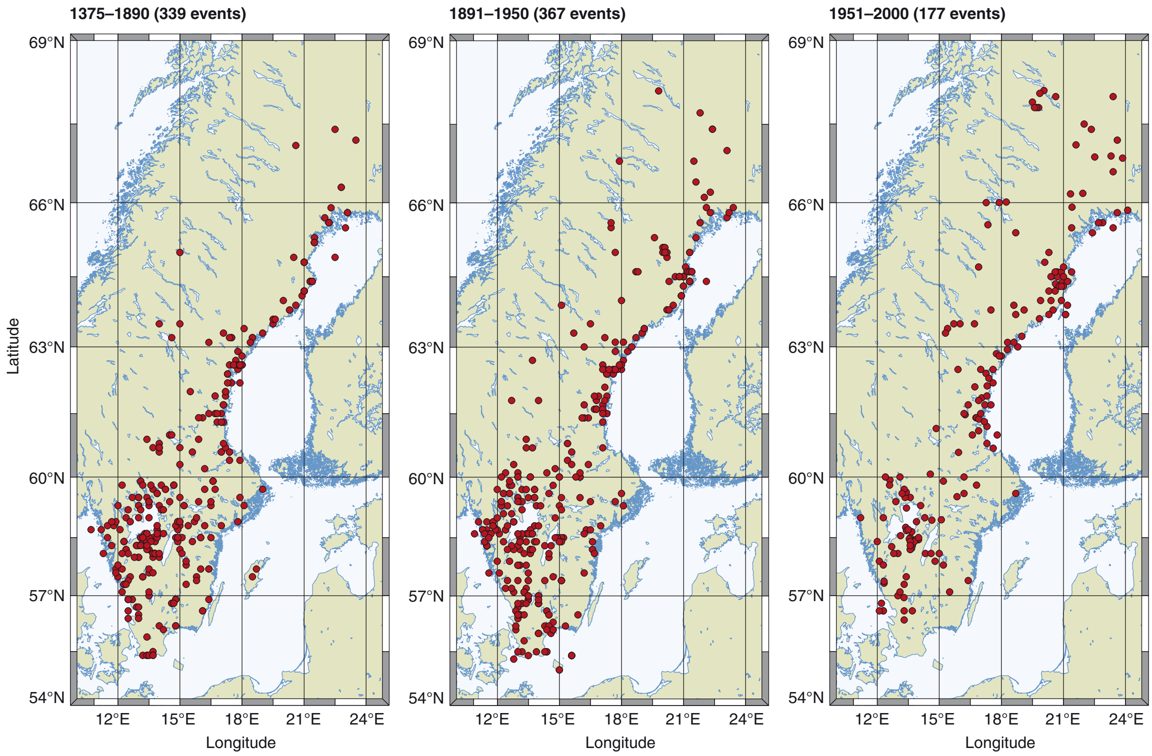


Figure 2. Geographic distribution of earthquakes felt in Sweden during three time periods.

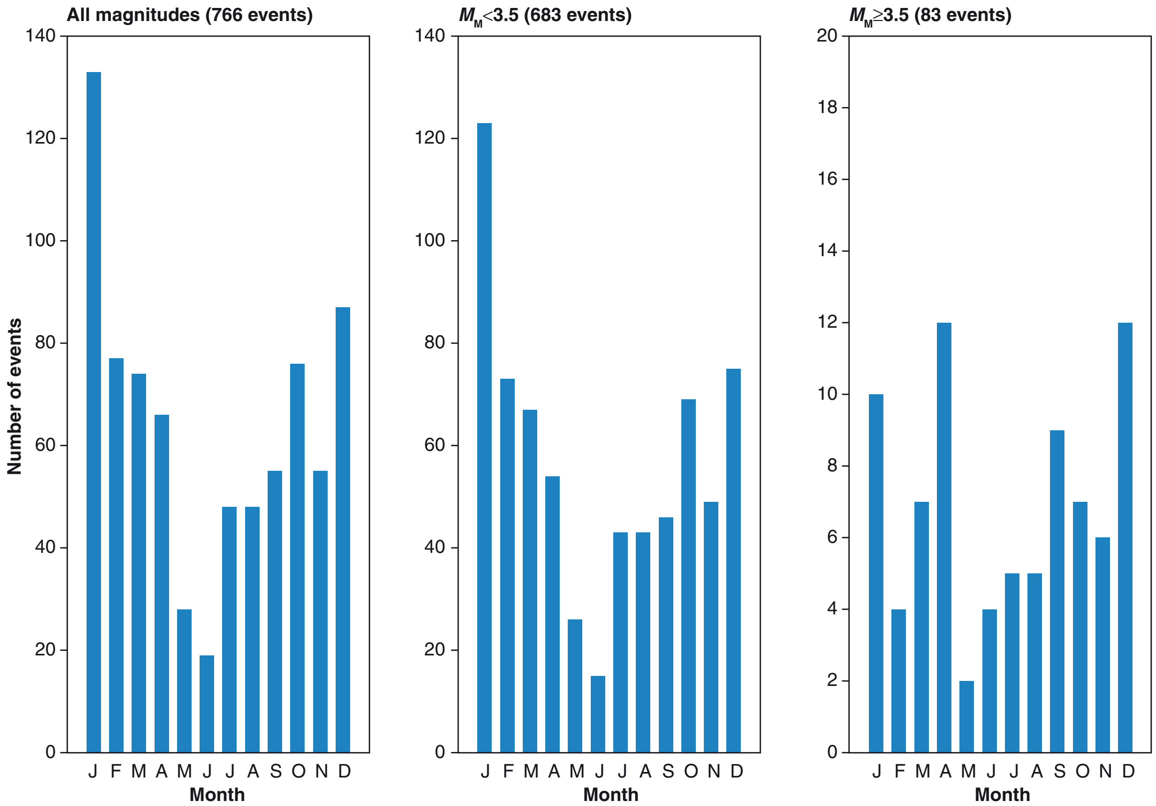


Figure 3. Monthly distribution of events.

Thirdly, epicentral locations. Blasting areas are known and often located outside well-established seismic belts. Sequences of events also support classification as artificial origin. Lastly, magnitude. Artificial events usually generate low magnitudes, in most cases less than 2.5 (Båth 1979).

ENTRIES OF THE CATALOGUE

The catalogue is arranged in chronological order. For reference purposes the events are numbered throughout the catalogue. The following notations are used:

A	felt area, km^2
a	ground amplitude, µm, also constant in eq. (10)
C	station correction and instrument type constant, eq. (4)
$F(\Delta, T)$	calibrating function (Båth et al. 1976)
h	macroseismic focal depth, km
h_i	instrumental focal depth, km
h_M	homogeneous macroseismic focal depth, km
I	intensity, Modified Mercalli Scale, MM56 (Båth 1979)
I_0	maximum intensity
I_1	intensity at distance r_1
I_p	intensity of perceptibility
I_n	intensity of degree n
k	coefficient of attenuation
M_M	regional homogeneous macroseismic magnitude, eq (1)

M_L	regional instrumental magnitude, eq (4)
M_{LB}	regional instrumental magnitude, eq (3)
OT	origin time
r_p	radius of perceptibility, km
r	epicentral distance, km
r_n	radius of area limited by intensity I_n
T	wave period, s
V(T)	magnification of the standard Wood-Anderson seismograph, eq. (4)
Δ	epicentral distance, km

Date and origin time

The date is given in the Gregorian calendar and the origin time, OT, in Universal Time, UT. This means that when necessary, all local times have been converted to UT. Note that Sweden used the Julian calendar until 1752/1753. Dates prior to 1753 in the catalogue have been converted from the Julian calendar (Ahjos & Uski 1992). For readers who might be interested in consulting original materials we also present, in the field remarks, dates corresponding to the Julian calendar, whenever available. For a number of historical events the only time information of the occurrence is the year or the year and month. First around 1755 the day is also given. If the dating is uncertain, a corresponding note is made in remarks. When based merely on macroseismic observations, OT usually refers to the time of strongest motion. Many pre-instrumental events lack any information about the origin time, some give the hour and sporadically also minutes. The error of OT, for the historical data, may be large. First starting in 1891, minutes are also included. Installation of seismographs in Sweden, Denmark and Norway in the beginning of the last century made it possible, in some cases, to report OT to the nearest second. Since the installation of the Swedish Seismographic Station Network in the 1950s, OT is given to the nearest tenth of a second (starting 1953).

Epicentral location

Epicentral locations (latitude and longitude) deduced from macroseismic data, refer to the site of maximum felt intensity or to the centre of the area of perceptibility (Ahjos & Uski 1992). This is inevitably a rather judgemental process with a certain degree of subjectivity. On the other hand, comparison made with instrumental epicentre determinations (Båth 1979) reveals good agreement between results achieved with the macroseismic and instrumental procedures. This is rather surprising since instrumental (accurate) epicentres are usually shifted to one side of the pleistoseismal area (Kárník 1971). Muir Wood (1993) argues that in areas of low population, like large parts of Sweden, the location uncertainty is commonly not better than 20 km. Macroseismic epicentral locations become especially uncertain for events located near or outside the coast. There are differences between old seismicity maps and recent maps exhibiting instrumentally determined epicentres. However, in general, zones of activity in Sweden have been consistent from the historical period through to the instrumental era (Fig. 2). Similarly to the case of the origin time, location quality varies with time. There are several reasons for poor location quality: a) macroseismic determinations from observations close to or outside the coast, b) determinations made in thinly populated areas, and c) events with large areas of perceptibility but poorly defined centre. Epicentral locations listed in the catalogue are those presented by Ahjos & Uski (1992) for the period 1375–1890 and 1999–2000, by Båth (1956, 1979) for the period 1891–1976 and by Uppsala monthly Seismological Bulletins for the period 1977–1998.

Quality of origin times and epicentral locations

As mentioned above, source information for historical events may be rather poor. For events prior to 1951, the quality of OT and epicentral location are chacterized by two-digit numbers. The first digit refers to OT, while the second digit corresponds to location. Båth (1956) introduced three uncertainty classes for both the OT and epicentral location. For OT (first digit in column quality) class 1 = time error ≤5 min, class 2 = time error >5 min but ≤30 min, and class 3 = time error >30 min. Poor or no OT information is indicated by a "minus" sign. For epicentral locations (second digit in column quality) uncertainty classes are: 1 = location error ≤0.2°, 2 = location error >0.2° but <1°, and 3 = location error ≥1°. Quality estimates for the period 1375–1890 are those given by Ahjos & Uski (1992) and for the period 1891–1950 by Båth (1956). All entries from the instrumental era (approximately after 1952) are of quality 1. Corresponding epicentral locations from instrumental and macroseismic data generally agree with each other within their respective error limits (Båth 1979). Data of quality 1 can be used for research, while entries of quality 2 or 3 (OT or location) should be treated with utmost care and regarded merely as complementary information.

Maximum felt intensity, I_0

The maximum felt intensity presented in the catalogue is rated according to the 12-degree Modified Mercalli Scale, MM56 (Richter 1958). More recent scales like the Medvedev-Sponheuer-Kárník scale, MSK (Kárník 1969) or the European Macroseismic Scale, EMS (Grunthal et al. 1993), are not applicable for Swedish earthquakes. This is due to scarcity of data which does not allow a probabilistic approach in assessing the felt effects or damage. Some sources, e.g. Sahlström (1926, 1931, 1936, 1953), employ the Rossi-Forel Scale of 1883. Such estimates were converted to the MM56 scale. Maximum intensities listed in the catalogue vary between II and VII, the uncertainty being half to one intensity degree (Ahjos & Uski 1992). Within this intensity interval, the MM56, MSK and EMS are comparable with each other. For many events, it is difficult to choose between two successive intensity degrees and half-degree estimates are given. Most of the shocks provide only the maximum intensity and the radius of perceptibility. When other than maximum intensities are also available, we present them in the field remarks, together with radii of corresponding isoseismal lines.

Radius of the area of perceptibility, r_p

The radius of perceptibility, r_p, corresponds to the macroseismic area A, i.e. $\pi r_p^2 = A$. For many historical events, evaluation of r_p is difficult. Hence, for local shocks (1891–1950) felt only at a few places, the radius of 10 km was assigned (Båth 1956). For events prior to 1891, felt at two or more localities, the radius of 20–40 km is considered (Willmore 1979, Ahjos & Uski 1992). The intensity at the limit of human perception was set to 2. Intensity 1 practically means "not felt" and intensity 2 seems, therefore, to be a natural limit. Scarcely, other isoseismal radii are also given in the field remarks.

Felt area, *A*

Several sources report the felt area, instead of the radius of perceptibility, as initial information. If this is the case, we also present the area in square kilometres and perform the conversion into the radius of perceptibility. For strong events close to the Norwegian border, the area *A* listed in the catalogue may include also large parts of Norway.

Magnitude

The use of macroseismic information can provide surprisingly robust measures of earthquake size. This is an important part of macroseismic investigations, as in this way earthquake catalogues can be extended into historical eras with consistent magnitude estimates. Various data sources have made use of different formulae (based on macroseismic or instrumental data) to calculate magnitudes of Fennoscandian earthquakes. To achieve consistency between macroseismic and instrumental magnitudes, Wahlström & Ahjos (1984) derived a calibration formula

$$M_M = 0.38 + 1.14 \log_{10} r_p + 0.23 I_0 \quad (1)$$

An alternative formula presented in Båth (1979) reads

$$M_{MB} = 0.61 I_0 + 1.78 \log_{10} h - 1.33 \quad (2)$$

According to Ahjos & Uski (1992), the uncertainty in macrosesimic magnitudes is 10% at best. This is under the assumption that the uncertainties in I_0 and r_p are half a degree and 10%, respectively. For the time period 1891–1952, magnitudes have been determined from macroseismic data through a procedure developed by Båth (1954). He made use of the radius of perceptibility and focal depth and assessed the energy of each event. Energy was subsequently converted into magnitude. Those who are interested in more details should consult Båth (1954, 1956). After 1952, instrumental magnitudes have been calculated from amplitude and period measurements in a regional M_{LB} scale developed by Båth et al. (1976)

$$M_{LB} = \log_{10} (100a) + F(\Delta, T) \quad (3)$$

The calibrating term $F(\Delta, T)$ is tabulated in detail in Båth et al. (1976). For a few events with only macroseismic data available, M_{LB} is calculated through eq. (2) and subsequent conversion of M_{MB} to M_{LB}. Båth (1979) also presents formulae to convert M_{LB} into body-wave and surface-wave magnitudes, ground acceleration and seismic moment. Relation (3) has been later replaced by a new formula (Wahlström & Ahjos 1982)

$$M_L = \log_{10} a + \log_{10} V(T) + 1.61 \log_{10} \Delta - 3.22 + C \quad (4)$$

After June 1981, regional instrumental magnitudes have been determined through formula (4). Magnitude estimates deduced from eq. (3) and eq. (4) are compatible and reveal only minor differences, M_{LB} being on average 0.07 units larger when compared with M_L (Wahlström 1978). During the period 1953–1976, all amplitude and period measurements have been made on seismic records from Swedish seismographic stations. After 1976, measurements made on Finnish seismograms were also included. The resulting magnitudes M_{LB} or M_L are found in Uppsala monthly Seismological Bulletins. Contrary to focal depths, macroseismic and instrumental magnitudes show remarkably good correlation (Båth 1979). To convert the macroseismic magnitude into instrumental magnitude, we employ the relation

$$M_M = 0.684 (\pm 0.181) M + 1.037 (\pm 0.102) \quad (5)$$

where M is either M_{LB} or M_L. Relation (5) has been deduced from 174 parallel measurements of instrumental and macroseismic magnitudes of events occurring between 1953 and 2000 (Fig. 4).

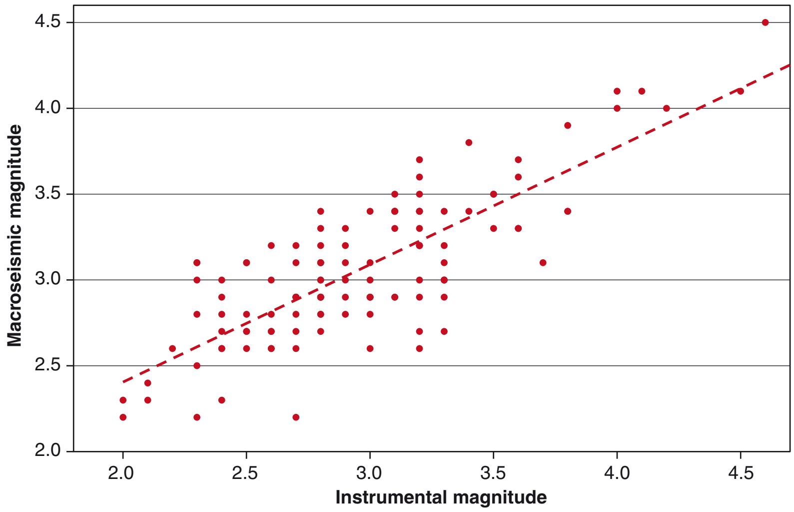


Figure 4. Macroseismic magnitude, M_M, calculated through formula (1) as a function of reported instrumental magnitude M_{LB} (1953–May 1981) or M_L (June 1981–2000). The dashed line is the least-squares fit to data.

Focal depth, h

The quality of instrumental focal depth determination (local and regional events) depends on a number of parameters such as the velocity model applied, the number and type of seismic phases recorded, the distribution of seismic stations, etc. More accurate depth assessments are obtained only for events located inside a dense seismic network providing relatively short source-to-station distances, usually not exceeding approximately twice the depth. Thus, alternative macroseismic depth estimates are of importance not only for historical events but often also as supplementary depth information for shocks from the instrumental era. Equations to calculate macroseismic focal depth make use of the fact that shallow events tend to generate highly concentrated effects, while more deep events produce a more gradual change of intensity as we move away from the epicentre. With only a few exceptions, formulae at hand are various modifications of the Blake-Shebalin equation (see e.g. Kárník 1969)

$$I_0 - I_p = k \log_{10} \frac{D_f}{h} \qquad (6)$$

where $D_f^{\,2} = r_p^{\,2} + h^2$. The choice of parameters I_p and k in eq. (6) gives rise to a number of derivatives. For example, Kárník (1969) recommends a value of $k = 3.5–3.6$ for shallow earthquakes in the Baltic Shield, Båth (1979) suggests $k = 3$, Ahjos & Korhonen (1984) use $k = 4$ and Willmore presents $k = 2.5–5.0$ for different regions. Likewise, different sources ascribe different values to the intensity of perceptibility, I_p. For instance, Gutenberg & Richter (1942) use $I_p = 1.5$, Båth (1954) suggests $I_p = 2.5$ for weaker shocks ($I_0 < 5$). For events within the Fennoscandian Shield, Korhonen & Ahjos (1979) make use of $I_p = 2.5$. In their later work, Ahjos & Korhonen (1984) apply $I_p = I_p\,2.0$. Similarly, Båth (1979) is using $I_p = 2.0$. Since all events listed in the catalogue are presuming crustal shocks, the possible depth dependence of k has been neglected. Focal depth, h, is compiled from sources using different forms of the Blake-Shebalin formula (6). In Table 1 we summarize values of parameters I_p and k entering formula (6) for different time periods and data sources.

In 1980, Båth developed a new formula (Båth 1980)

$$h = \frac{r_p}{\sqrt{10^{0.63(I_0-3)} - 1}} \qquad (7)$$

however, to the best of our knowledge, formula (7) has not generally been used.

Table 1. Macroseismic parameters.

Time period	I_p	k	Reference
1375–1950	2	4	Ahjos & Uski (1992)
1951–1976	2	3	Båth (1979)
1977–1979	2	3	Kulhanek & Wahlström (1981)
1980–1995	2.5	4	Kulhanek & Wahlström (1985, 1992, 1996)
1996–2000	2	4	Holmqvist et al. (2007)

It is difficult to assess the accuracy of macroseismic focal-depth estimates. As follows from eq. (6) or (7), they depend on the reliability of maximum intensity, I_0, and radius of perceptibility, r_p. Ahjos & Uski (1992) assume that even the most reliable macroseismic depths are uncertain by more than 30%, provided that the error in intensity is not more than half a degree and in the area of perceptibility 10%. A similar estimate is also made by Ahjos & Korhonen (1984). For events between 1951 and 1976, Båth (1979) measured travel time differences between different crustal phases (P_g–P_n, S_n–P_n, S_b–S_g, pP_n–P_n) to deduce instrumental focal depths, h_i. From 53 pairs of calculated macroseismic and instrumental depths, he found the following relation

$$h = h_i \pm 9 \quad (8)$$

i.e. a standard deviation of 9 km between the two focal-depth estimates. While h is calculated exclusively from kinematic data, h_i is calculated from dynamic data and both are subject to large errors. Crustal phases to be used in calculations are often hardly discernible on seismic records and cannot be identified and measured reliably in seismograms. Note that h_i is available only for 51 events during the period from 1953 to 1976. From both the instrumental and macroseismic depth measures, Båth (1979) derived for Swedish shocks the same average focal depth of 16 km.

Arvidsson et al. (1992), Muir Wood (1993) and Arvidsson & Kulhanek (1994) present 15 Swedish earthquakes (1967–1988) in the magnitude range between 3.1 and 4.5 with focal depth determinations through synthetic seismograms, arrival times or R_g waves. Comparing with macroseismic depth estimates in the present catalogue, we find a surprisingly low standard deviation of 2.8 km between the two depth measures. Due to a very short event series used, it is, however, not possible to draw any definite conclusion from this result.

Homogeneous macroseismic magnitude M_M and focal depth h_M

As follows from the above discussion, the present catalogue is a compilation of highly heterogeneous input information obtained from a number of various sources. Different workers employ different formulae to assess the macroseismic magnitude and focal depth. In many cases, instrumental data are used instead of macroseismic data. Inevitably, the original list of macroseismic source parameters is rather heterogeneous. To minimize this shortcoming and to make the catalogue applicable, we introduced listed I_0 and r_p into relations (1) and (4) and recalculated macroseismic magnitudes and macroseismic focal depths throughout the list from 1375 to 2000. These magnitudes are presented in the column labelled M_M while focal depths are given in the column h_M. To evaluate and homogenize h_M throughout the whole catalogue, we introduced $I_p = 2$ and $k = 4$ into eq. (6), so that

$$h_M = \frac{r_p}{\sqrt{10^{0.5(I_0-2)} - 1}} \quad (9)$$

COMPLETENESS OF THE CATALOGUE

Any method of recording earthquakes will only provide a complete list above some threshold magnitude. No earthquake catalogue can be properly comprehended unless thresholds of catalogue completeness are defined. These thresholds vary from region to region and from age to age. Naturally, the completeness of a macroseismic catalogue cannot be warranted for shocks at sea and for events in areas with low or no population. The present catalogue covers a period of 625 years and temporal inconsistencies of the degree of completeness cannot be avoided. For the time window 1953–2000, instrumental solutions (OT, location, size) are available. Thus, we can examine the completeness of the present macroseismic list against available instrumental solutions. The completeness of instrumental data (1967–1976, 155 events) has been studied by Båth (1979). His results suggest that instrumental data collected from the then-Swedish network of six stations are complete for $M_{LB} \geq 2.3$. This result is also supported by a work of Shapira et al. (1981). They made use of a statistical model and revealed that 90% of Swedish shocks with magnitude $M_{LB} \geq 2.0$ are detected by at least one, out of six, Swedish seismographic stations. With respect to detectability performance, instrumental data are superior to macroseismic observations. To assess the threshold magnitude, or in other words the completeness, of the present macroseismic catalogue, we compare two data populations. Figure 5 shows event counts with respect to M_{LB} for the time period from 1951 to June 1981. After June 1981, M_L is used instead of M_{LB}. The dashed line in Figure 5 corresponds to events instrumentally determined but not reported as felt. As can be seen in Figure 5, the event count decreases rapidly for magnitudes less than 2.3, in good agreement with the prediction of Båth (1979). The solid line refers to events instrumentally determined and felt. One can speculate that the former will dominate in the low magnitude range and will decrease rapidly towards high magnitudes. The latter will dominate in the high magnitude range. The two curves will cross each other close to the lowest magnitude for which at least 50% of events taking place in Sweden were felt. Figure 5 shows that the crossing takes place close to magnitude 2.8. The ratio of felt shocks increases to 65% for magnitudes above 2.9 and for magnitudes 3.5 and larger, the catalogue is complete. The statistics given here applies to events on land and in reasonably populated areas. Figure 5 refers to instrumental magnitudes M_{LB} or M_L, nevertheless it also provides an idea about the threshold magnitude for the homogeneous macroseismic magnitude, M_M, used in the catalogue. Introducing the magnitude of 3.5 into eq. (5) we obtain the corresponding macroseismic threshold magnitude of 3.4.

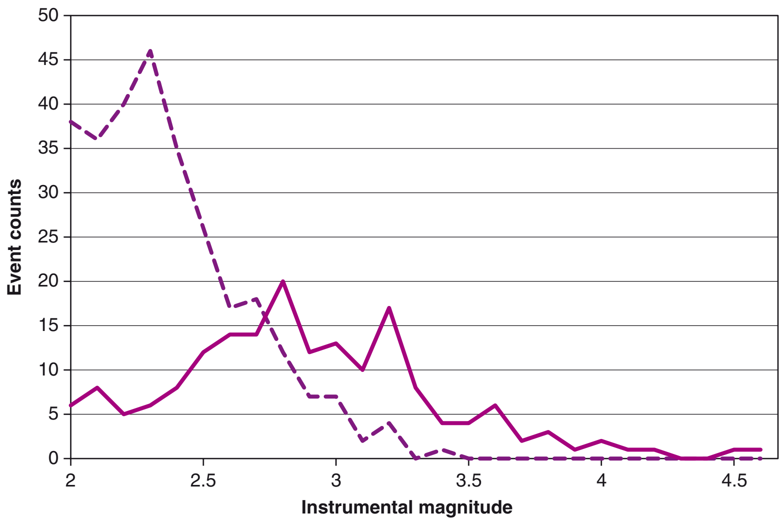


Figure 5. Event counts (1951–2000) as a function of instrumental magnitude M_{BL} or M_L. Dashed line = instrumentally determined but not felt events; solid line = instrumentally determined and felt events.

Another possibility to assess the magnitude of completeness of M_M is to apply the standard procedure by making use of the empirical relation of Gutenberg & Richter (1942)

$$\log_{10} N = a - bM \quad (10)$$

where N is the cumulative number of events, a and b are positive constants and M is any magnitude. The threshold magnitude is determined as a magnitude where the frequency-magnitude curve starts to deviate from a linear trend (10). The employment of eq. (10) requires that the magnitude population entering the test of completeness shows a certain degree of homogeneity which is realized for the magnitude M_M. Figure 1 shows that the annual event counts remain practically constant after approximately 1890. We employ the period from 1891 to 2000 and plot log N versus M_M (Fig. 6). As can be seen in Figure 6, observations (circles) follow closely the distribution predicted (dashed line) by the Gutenberg & Richter formula approximately for magnitudes 3.3 and larger. At magnitude 3.2, observations start to deviate from predicted values and this becomes more and more evident as we approach lower magnitudes. This is in good agreement with the magnitude distributions shown in Figure 5. We may conclude that, within the time interval 1891–2000, the macroseismic catalogue is complete for events with $M_M \geq 3.3$. The situation is different for the time period prior to 1891. For the interval 1700–1890, there is a large deficit of reported events when compared with the period 1891 and beyond (see also Fig. 1). This deficit is significant even for the largest magnitudes given in the catalogue. Comparing the two time intervals, i.e. 1891–2000 and 1700–1890, the ratio of reported events is 2.4 in the magnitude range $M_M \geq 3$ and 2.8 in the magnitude range $M_M \geq 4$. Many events from the early time period have most likely been consistently underestimated due to poor reporting. Note that many shocks have been assigned a radius of perceptibility of 10 or 20 km, simply because of incomplete observations. It seems that location of events in populated areas is more important for perception than the magnitude. With all available felt reports at hand, we conclude, that for the era prior to 1891, it is not possible to establish a reliable threshold magnitude for complete macroseismic observations.

ACKNOWLEDGEMENTS

This work was carried out jointly at the Department of Earth Sciences, Uppsala University, Uppsala, Sweden and the Swedish Defence Research Agency (FOI), Stockholm, Sweden. The text was greatly improved by remarks proposed by A.J. Anderson and A. Bodare. The authors express their thanks.

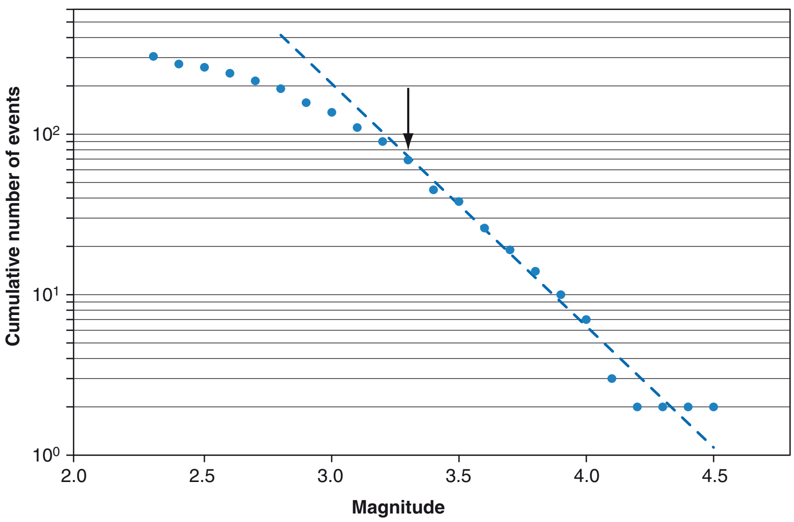


Figure 6. Frequency-magnitude distribution with respect to the homogeneous macroseismic magnitude, M_M. 451 events in the time interval from 1891 to 2000 have been used. Arrow indicates the threshold magnitude. The dashed line is the best linear fit for $M_M \geq 3.3$.

REFERENCES

Ahjos, T. & Uski, M., 1992: Earthquakes in northern Europe in 1375–1989. *Tectonophysics 207*, 1–23.

Ahjos, T. & Korhonen, H., 1984: On a catalogue of historical earthquakes in Fennoscandian areas. *Institute of Seismology, University of Helsinki, Report S-10*, 24 pp.

Arvidsson, R., Gregersen, S., Kulhanek, O. & Wahlström, R., 1991: Recent Kattegat earthquakes – evidence of active intraplate tectonics in southern Scandinavia. *Physics of the Earth and Planetary Interiors 57*, 275–287.

Arvidsson, R., Wahlström, R. & Kulhanek, O., 1992: Deep-crustal earthquakes in the southern Baltic Shield. *Geophysical Journal International 108*, 767–777.

Arvidsson, R. & Kulhanek, O., 1994: Seismodynamics of Sweden deduced from earthquake focal mechanisms. *Geophysical Journal International 116*, 377–392.

Båth, M., 1954: Seismicity of Fennoscandia and related problems. *Gerlands Beitrage Zur Geophysik 63*, 173–208.

Båth, M., 1956: An earthquake catalogue for Fennoscandia for the years 1891–1960. *Sveriges geologiska undersökning C 545*, 52 pp.

Båth, M., 1979: Earthquakes in Sweden 1951–1976. *Sveriges geologiska undersökning C 750*, 79 pp.

Båth, M., 1980: A method for mapping seismic intensities applied to Sweden. *Tectonophysics 66*, T11–T18.

Båth, M., Kulhanek, O., van Eck, T. & Wahlström, R., 1976: Engineering analysis of ground motion in Sweden. *Seismological Institute, Uppsala, Technical Report 5-76*, 21 pp.

Grunthal, G. (ed.), 1993: *European macroseismic scale 1992.* Centre Européen de Géodynamique et de Séismologie, Luxembourg, 79 pp.

Gutenberg, B. & Richter, C.F., 1942: Earthquake magnitude, intensity, energy and acceleration. *Bulletin of the Seismological Society of America 32*, 163–191.

Holmqvist, C., Kulhanek, O. & Persson, L., 2007: Macroseismic observations in Sweden 1996–2000. *Sveriges geologiska undersökning C 835*, 19 pp.

Kárník, V., 1969: *Seismicity of the European Area. Part 1.* Riedel, Dordrecht, 364 pp.

Kárník, V., 1971: *Seismicity of the European Area. Part 2.* Riedel, Dordrecht, 218 pp.

Kjellén, R., 1903: Meddelande om jordstötar i Sverige före 1846. *Geologiska Föreningens i Stockholm Förhandlingar 220*, 129–228.

Kjellén, R., 1910: Sveriges jordskalf. *Göteborgs Högskolas Årsskrift 15*, 211 pp.

Korhonen, H. & Ahjos, T., 1979: A contribution to the macroseismic investigations of earthquakes felt in Finland. *Institute of Seismology, University of Helsinki, Report S-4*, 22 pp.

Kulhanek, O., John, N., Meyer, K., van Eck, T. & Wahlström, R., 1980: *The Bergshamra earthquake sequence of December 23, 1979.* Seismological Section, Uppsala, SKBF/KBS, Technical Report, 26 pp.

Kulhanek, O. & Wahlström, R., 1981: Macroseismic observations in Sveden 1977–1979. *Sveriges geologiska undersökning C 776*, 13 pp.

Kulhanek, O., van Eck, T., John, N., Meyer, K. & Wahlström, R., 1981: *The Otterbäcken, Sweden, earthquake of February 13, 1981.* Seismological Section, Uppsala, Technical Report, 42 pp.

Kulhanek, O. & Wahlström, R., 1985: Macroseismic observations in Sweden 1980–1983. *Sveriges geologiska undersökning C 808*, 28 pp.

Kulhanek, O. & Wahlström, R., 1992: Macroseismic observations in Sweden 1984–1990. *Sveriges geologiska undersökning C 825*, 38 pp.

Kulhanek, O. & Wahlström, R., 1996: Macroseismic observations in Sweden 1991–1995. *Sveriges geologiska undersökning C 829*, 24 pp.

Linnarsson, G., 1879: Jordskalfvet i mellersta Sverige den 2 februari 1879. *Geologiska Föreningens i Stockholm Förhandlingar IV*, 37 pp.

Miyamura, S., 1962: A note on Fennoscandian seismicity. *Institute of Seismology, University of Helsinki 50*, 1–10.
Muir Wood, R., 1993: A review of the seismotectonics of Sweden. *SKB Technical Report 93-13*, 225 pp.
Richter, C.F., 1958: *Elementary seismology*. Freeman, 578 pp.
Sahlström, K.E., 1911: Jordskalv i Sverige 1907–1910. *Sveriges geologiska undersökning C 238*, 95 pp.
Sahlström, K.E., 1913: Jordskalv i Sverige 1911–1912. *Sveriges geologiska undersökning C 247*, 31 pp.
Sahlström, K.E., 1919: Jordskalv i Sverige 1913–1918. *Sveriges geologiska undersökning C 293*, 16 pp.
Sahlström, K.E., 1926: Jordskalv i Sverige 1919–1925. *Sveriges geologiska undersökning C 341*, 34 pp.
Sahlström, K.E., 1931: Jordskalv i Sverige 1926–1930. *Sveriges geologiska undersökning C 370*, 52 pp.
Sahlström, K.E., 1936: Jordskalv i Sverige 1931–1935. *Sveriges geologiska undersökning C 407*, 35pp.
Sahlström, K.E., 1941: Jordskalv i Sverige 1936–1940. *Sveriges geologiska undersökning C 440*, 23 pp.
Sahlström, K.E., 1953: Jordskalv i Sverige 1941–1950. *Sveriges geologiska undersökning C 532*, 33 pp.
Sahlström, K.E. & Båth, M., 1958: Jordskalv i Sverige 1951–1957. *Sveriges geologiska undersökning C 562*, 19 pp.
Shapira, A., Kulhanek, O. & Wahlström, R., 1981: Detection probabilities for earthquakes in Sweden. *Journal of Geophysics 49*, 243–244.
Svedmark, E., 1889: Jordstötar i Sverige. *Sveriges geologiska undersökning C 107*, 18 pp.
Svedmark, E., 1892: Jordstötar i Sverige. *Sveriges geologiska undersökning C 122*, 22 pp.
Svedmark, E., 1894a: Jordstötar i Sverige. *Sveriges geologiska undersökning C 137*, 36 pp.
Svedmark, E., 1894b: Jordstötar i Sverige. *Sveriges geologiska undersökning C 142*, 46 pp.
Svedmark, E., 1897: Jordstötar i Sverige. *Sveriges geologiska undersökning C 167*, 29 pp.
Svedmark, E., 1904: Jordbävningen den 23 oktober 1904. *Geologiska Föreningens i Stockholm Förhandlingar 230*, 456–464.
Wahlström, R., 1978: Magnitude-scaling of earthquakes in Fennoscandia. *Seismological Section, Uppsala, Technical Report 3-78*, 44 pp.
Wahlström, R. & Ahjos, T., 1982: Determination of local magnitude and calibration of magnitude scales for earthquakes in the Baltic Shield. *Seismological Section, Uppsala, Technical Report 1-82*, 39 pp.
Wahlström, R. & Ahjos, T., 1984: Magnitude determination of earthquakes in the Baltic Shield. *Annales Geophysicae 2*, 553–558.
Willmore, P.L. (ed.), 1979: *Manual of seismological observatory practice*. World Data Center A for Solid Earth Geophysics, Report SE-20, NOAA, Boulder.

MACROSEISMIC CATALOGUE OF SWEDISH EARTHQUAKES BETWEEN 1375 AND 2000

Event no	Date yyyy mm dd	Origin time h m sec	Epicentre N (°)	E (°)	Quality	I_0	r_p (km)	A (km²)	M_M	h_M (km)	Remarks
1	1375		57.5	18.5	–3	6	100		4.0	10	Seismic origin questionable. Uncertain felt area.
2	1497 01 20	23	59.5	15.0	23	7	300		4.8	17	Uncertain felt area. By Julian calender, January 10.
3	1540		57.7	18.7	–2	7	100		4.3	6	Uncertain felt area.
4	1659 10 03	06	61.0	14.5	32	5	20		3.0	4	St. Mateus day, by the Julian calender.
5	1661	00	56.8	14.6	–1	5	10		2.7	2	Seismic origin questionable.
6	1662 09 13	13	61.0	14.5	22	5	20		3.0	4	By Julian calender, September 1.
7	1673 05		58.5	11.5	–2	5	80		3.7	15	Uncertain felt area.
8	1676		57.7	11.9	–2	6	10		2.9	1	Seismic origin and date questionable. Uncertain felt area.
9	1686 01 13		58.4	15.6	–1	4	10		2.4	3	By Julian calender, January 1.
10	1690		58.2	12.4	–2	4	20		2.8	7	Questionable date.
11	1691 02 19	03	56.2	14.0	22	5	20		3.0	4	By Julian calender, February 6.
12	1693		59.5	13.0	–2	4	20		2.8	7	Seismic origin questionable.
13	1693		58.2	12.4	–3	4	20		2.8	7	
14	1694	00	58.1	12.5	–2	5	20		3.0	4	Seismic origin and date questionable.
15	1694 01 14	07	58.8	11.8	31	3	10		2.2	7	Multiple shock. By Julian calender, January 1.
16	1697 03 02	19	57.0	13.5	23	6	100		4.0	10	Uncertain felt area. By Julian calender, February 17.
17	1698 07 08	16	59.9	16.6	21	5	10		2.7	2	Multiple shock. By Julian calender, June 25.
18	1701	00	56.8	14.6	–1	5	10		2.7	2	Seismic origin and date questionable.
19	1701 01 06	01	60.6	17.4	21	4	10		2.4	3	Seismic origin and date questionable. By Julian calender, December 25.
20	1701 01 06	23	60.6	17.4	21	5	10		2.7	2	Seismic origin and date questionable. By Julian calender, December 26.
21	1702 04		59.5	17.9	–1	5	10		2.7	2	Seismic origin and date questionable.
22	1703 03 03	05	57.5	12.6	22	5	20		3.0	4	By Julian calender, February 19.
23	1706		63.8	20.3	–2	4	20		2.8	7	Questionable date.
24	1708 10 15	14	58.0	14.0	22	5	100		3.8	18	Uncertain felt area. By Julian calender, October 3.
25	1709 07		62.5	17.8	–2	5	30		3.2	5	
26	1711 09 23		58.5	13.5	–2	4	20		2.8	7	Uncertain felt area. By Julian calender, September 11.
27	1712 10 10		58.5	14.8	–2	3	20		2.6	14	Seismic origin questionable. By Julian calender September 27.
28	1715 01 06	08	58.8	15.0	22	5	20		3.0	4	By Julian calender, December 24, 1714.
29	1716 08 09		58.9	15.0	–1	4	10		2.4	3	By Julian calender, July 27.
30	1718 11		59.5	13.0	–2	5	20		3.0	4	Uncertain felt area.
31	1718 12		62.6	18.0	–2	5	20		3.0	4	Several shocks.
32	1723 08	18	62.6	18.0	–2	5	150		4.0	27	Questionable date.
33	1725 02		58.1	11.3	–2	4	10		2.4	3	Seismic origin questionable
34	1729 10 26	06	58.4	12.3	32	5	20		3.0	4	By Julian calender, October 13.
35	1730		63.1	16.4	–1	4	10		2.4	3	Questionable date.
36	1730 08 06	00	61.5	17.0	32	4	20		2.8	7	Uncertain felt area. By Julian calender, July 25.
37	1736		58.5	13.2	–1	4	10		2.4	3	Seismic origin questionable.
38	1736 11 19		58.8	11.5	–2	5	20		3.0	4	Seismic origin questionable. By Julian calender November 6.
39	1744 01		62.6	18.0	–2	4	20		2.8	7	
40	1746 01 19	12	62.6	18.0	22	4	20		2.8	7	By Julian calender, January 6.
41	1747 08 07	15	64.2	21.0	22	5	20		3.0	4	Double shock. By Julian calender, July 25.
42	1748 03 25	09	62.7	17.7	22	5	40		3.4	7	Multiple shock. By Julian calender, March 12.
43	1749 04 09	00	64.2	21.0	32	4	20		2.8	7	By Julian calender, March 27.
44	1749 10 06	21	64.2	21.0	21	3	10		2.2	7	By Julian calender, September 23.
45	1749 10 06	23	64.2	21.0	22	4	20		2.8	7	By Julian calender, September 23.
46	1749 12 08	11	64.2	21.0	21	3	10		2.2	7	By Julian calender, November 25.
47	1750 05 26	04 30	63.5	15.0	22	5	40		3.4	7	Double shock. By Julian calender, May 13.
48	1750 11 12		65.6	22.2	–1	5	10		2.7	2	By Julian calender, October 30.
49	1751 03 09	09	65.3	21.5	21	4	10		2.4	3	
50	1751 06 05	18 30	58.0	13.7	21	4	10		2.4	3	
51	1751 11 11	14 30	65.9	22.3	21	3	10		2.2	7	
52	1751 11 14		63.5	19.5	–2	6	150		4.2	15	By Julian calender, November 1.
53	1752 01 05	11	56.5	13.0	22	5	20		3.0	4	
54	1752 02 26	15	60.6	15.6	22	5	30		3.2	5	Felt area mapped in Kjellén (1910).
55	1752 12 04		63.2	18.5	–2	5	30		3.2	5	
56	1752 12 06	00	66.3	22.8	–1	5	10		2.7	2	Questionable date.
57	1752 12 10	05	66.3	22.8	21	5	10		2.7	2	
58	1752 12 11	18	63.2	18.5	22	5	50		3.5	9	

Event no	Date yyyy mm dd	Origin time h m sec	Epicentre N (°)	E (°)	Quality	I_0	r_p (km)	A (km²)	M_M	h_M (km)	Remarks
59	1752 12 19	03 30	62.9	17.8	22	5	80		3.7	15	Uncertain felt area.
60	1753		63.6	19.5	–2	4	20		2.8	7	Seismic origin and date questionable.
61	1753 01 11	23 30	62.8	18.0	22	5	40		3.4	7	
62	1753 11 16	15	57.4	12.5	21	3	10		2.2	7	
63	1754 01		59.3	16.5	–2	5	20		3.0	4	
64	1754 01 23		58.3	13.0	–1	3	10		2.2	7	
65	1754 02 02		58.3	12.9	–1	3	10		2.2	7	
66	1754 02 02		65.2	21.5	–2	5	60		3.6	11	Uncertain felt area.
67	1754 04 07	20	61.3	17.1	22	4	20		2.8	7	
68	1754 12 28	18	58.3	12.9	31	3	10		2.2	7	Questionable date.
69	1755 03		57.3	12.3	–2	3	20		2.6	14	
70	1755 04		63.8	20.3	–2	4	20		2.8	7	
71	1755 12 13		58.3	13.3	–2	3	30		2.8	20	Seismic origin questionable.
72	1755 12 16		65.2	21.5	–2	5	60		3.6	11	Uncertain felt area.
73	1755 12 18		65.2	21.5	–2	5	60		3.6	11	Uncertain felt area.
74	1755 12 24	21	63.2	17.5	22	3	20		2.6	14	
75	1755 12 25	00	64.4	21.3	21	4	10		2.4	3	
76	1755 12 27	00	63.2	17.5	32	3	20		2.6	14	
77	1755 12 28	20 30	57.3	12.3	22	4	20		2.8	7	
78	1756 02 11	06	60.6	17.0	31	3	10		2.2	7	Seismic origin questionable. Multiple shock.
79	1756 02 11	19	60.6	17.0	21	3	10		2.2	7	Seismic origin questionable.
80	1756 08 25	15 30	59.5	12.7	22	5	20		3.0	4	
81	1756 12 27	11	57.7	12.2	21	3	10		2.2	7	
82	1757 11 27	05 30	65.5	23.0	22	5	80		3.7	15	
83	1757 12 16	04 30	61.9	16.7	22	5	50		3.5	9	
84	1758 02 24	07	59.8	12.2	22	3	20		2.6	14	
85	1758 08 13		62.6	17.9	–2	4	20		2.8	7	
86	1758 12 10	06	61.3	16.8	31	5	10		2.7	2	Seismic origin questionable.
87	1759 05		57.3	15.3	–1	3	10		2.2	7	
88	1760 01 15	02 30	61.4	16.1	22	5	20		3.0	4	Seismic origin questionable.
89	1760 08 22	12 30	57.7	16.4	21	5	10		2.7	2	Seismic origin questionable. Double shock.
90	1760 11 21	04	57.7	16.4	21	5	10		2.7	2	Seismic origin questionable.
91	1760 12 25		58.7	13.9	–2	4	20		2.8	7	
92	1761 01 24		62.6	17.9	–2	4	20		2.8	7	
93	1761 12 20	16	58.6	14.0	21	4	10		2.4	3	
94	1762 05 25		64.8	21.0	–1	4	10		2.4	3	
95	1762 07		64.4	21.3	–1	4	10		2.4	3	
96	1762 09 25	21 30	61.9	17.2	22	5	30		3.2	5	
97	1762 11 25		58.4	13.3	–2	4	20		2.8	7	
98	1762 12 16		64.8	21.0	–1	5	10		2.7	2	Several shocks.
99	1762 12 27	01	62.6	17.9	22	4	20		2.8	7	
100	1762 12 30	21 30	62.6	17.4	22	5	20		3.0	4	
101	1763 02 15		63.5	14.0	–1	5	10		2.7	2	
102	1763 09 18	09	64.8	21.0	21	4	10		2.4	3	
103	1763 09 18	09 30	64.8	21.0	21	3	10		2.2	7	
104	1764 02 15	00	62.6	17.9	32	4	20		2.8	7	
105	1764 12 13	18	63.6	19.6	31	3	10		2.2	7	Seismic origin questionable.
106	1765 02 12		58.4	13.4	–2	4	10		2.4	3	
107	1765 07 14	19	64.9	22.5	22	5	110		3.9	20	
108	1765 07 17	20 30	64.8	21.0	21	3	10		2.2	7	Seismic origin questionable.
109	1766 01 27		62.6	17.8	–2	5	20		3.0	4	
110	1766 01 28	02 30	56.4	13.0	21	4	10		2.4	3	
111	1766 12 29	04	67.2	23.5	21	5	10		2.7	2	
112	1767 12 06	00 30	58.4	13.2	21	3	10		2.2	7	
113	1768 12 30	05 30	59.3	12.0	22	5	60		3.6	11	
114	1769 06 07		58.4	13.4	–2	4	10		2.4	3	
115	1769 09 05	21 45	56.6	12.5	12	4	40		3.1	13	Double shock.
116	1772 01 01		58.4	13.4	–2	4	10		2.4	3	
117	1772 12 31	22 30	58.4	12.3	21	6	10		2.9	1	Seismic origin questionable.
118	1773 01 14	00	57.8	12.0	31	4	10		2.4	3	Seismic origin questionable.
119	1773 11 25		58.4	13.4	–2	4	10		2.4	3	
120	1774 11 12		58.4	13.4	–2	4	10		2.4	3	
121	1774 12 24		58.4	13.4	–2	3	20		2.6	14	

Event no	Date yyyy mm dd	Origin time h m sec	Epicentre N (°)	E (°)	Quality	I_0	r_p (km)	A (km²)	M_M	h_M (km)	Remarks
122	1775 01 01	04	58.3	13.1	21	4	10		2.4	3	
123	1775 01 02	05 30	58.4	13.4	22	4	20		2.8	7	
124	1775 05 23	11	59.9	16.6	22	5	20		3.0	4	Rockburst.
125	1775 07 18		58.4	13.4	–2	4	10		2.4	3	
126	1775 10 14		64.1	20.9	–1	4	10		2.4	3	
127	1776 01 10		58.4	13.4	–2	4	10		2.4	3	
128	1776 10 26		58.4	13.4	–2	4	10		2.4	3	
129	1776 11 02	13	60.4	17.4	22	5	60		3.6	11	
130	1776 12 24		62.6	17.9	–2	4	20		2.8	7	
131	1777 05 29		58.4	13.4	–2	4	10		2.4	3	
132	1777 11 14	17 30	62.4	17.3	21	4	10		2.4	3	
133	1777 12 04	22 30	64.0	20.0	22	4	30		3.0	10	Uncertain felt area.
134	1778 04 10	21	63.3	17.1	21	4	10		2.4	3	
135	1778 12		59.9	13.1	–2	4	20		2.8	7	
136	1779 01 01	00	59.9	13.1	31	5	10		2.7	2	
137	1779 05 06		57.3	12.3	–1	4	10		2.4	3	Several shocks.
138	1779 07 14		61.5	16.7	–2	4	20		2.8	7	Uncertain felt area.
139	1779 12 21	21 30	59.3	14.0	22	4	30		3.0	10	
140	1780 12 25	00	58.9	11.9	32	5	20		3.0	4	
141	1781 03 29		58.4	13.4	–2	4	10		2.4	3	
142	1782 04 21		58.6	14.2	–2	5	20		3.0	4	
143	1783 07 15		58.5	16.0	–2	4	20		2.8	7	Uncertain felt area.
144	1783 09 28	00	58.5	13.1	31	5	10		2.7	2	
145	1784 03 22	16 30	56.9	12.7	21	4	10		2.4	3	
146	1785 02 04	20 30	58.5	13.7	22	5	20		3.0	4	
147	1785 12 21		58.4	13.4	–2	4	10		2.4	3	
148	1786 03 04		56.9	12.5	–1	4	10		2.4	3	
149	1786 03 21		58.4	13.4	–2	4	10		2.4	3	
150	1786 04 20	08 30	59.7	16.2	21	4	10		2.4	3	
151	1787 01 10	23 30	58.4	13.4	22	5	20		3.0	4	
152	1787 11 21		59.7	13.7	–1	4	10		2.4	3	
153	1788 02 24		56.9	12.5	–1	4	10		2.4	3	
154	1788 04 24	13	58.4	13.4	22	5	10		2.7	2	
155	1788 05 26		60.2	16.2	–1	4	10		2.4	3	
156	1788 10 26	01	65.6	22.2	21	5	10		2.7	2	
157	1789 03 30	20 30	58.9	14.9	22	5	20		3.0	4	
158	1790 01 28	00	62.0	17.2	32	3	20		2.6	14	
159	1791 08 16	03 30	58.4	13.8	22	4	20		2.8	7	
160	1792 06 07		58.5	13.1	21	4	10		2.4	3	
161	1792 07 06	01	58.4	13.8	22	3	20		2.6	14	
162	1793 01 20	08	59.3	13.0	22	3	20		2.6	14	
163	1793 01 20	09 30	59.3	13.0	22	5	20		3.0	4	
164	1794 12 11	04	60.6	14.0	22	5	60		3.6	11	
165	1795 08 15	22	58.1	13.8	22	5	20		3.0	4	
166	1796 02 21	15	58.7	14.9	22	4	30		3.0	10	
167	1796 02 28	06	58.1	13.8	31	4	10		2.4	3	
168	1796 09 13	22	58.9	14.9	22	5	20		3.0	4	
169	1798 08 17	17	59.8	13.2	22	5	100		3.8	18	
170	1799 03 12	09 45	58.5	13.9	12	5	50		3.5	9	Foreshock.
171	1799 11		59.2	13.1	–2	4	20		2.8	7	
172	1801 07 26	06 30	58.5	13.5	22	4	20		2.8	7	
173	1801 07 30	13	58.4	13.6	22	4	30		3.0	10	
174	1801 08 20	12	58.9	15.7	22	5	30		3.2	5	
175	1801 09 05	00	58.0	13.0	22	5	80		3.7	15	
176	1802 07 04	03	58.8	14.8	22	4	20		2.8	7	
177	1809 01 19		58.0	13.0	–2	4	20		2.8	7	Uncertain felt area.
178	1810 06		58.5	16.0	–2	4	20		2.8	7	Uncertain felt area.
179	1811		57.5	12.0	–2	4	20		2.8	7	Questionable date.
180	1814		57.5	12.0	–2	4	20		2.8	7	Questionable date.
181	1814 01 20		58.8	17.0	–1	4	10		2.4	3	
182	1815 09 08	21 30	57.8	15.3	22	4	30		3.0	10	Double shock.
183	1816 03 01		58.9	14.9	–1	4	10		2.4	3	
184	1816 03 29	11	57.6	11.9	22	5	20		3.0	4	

Event no	Date yyyy mm dd	Origin time h m sec	Epicentre N (°)	E (°)	Quality	I_0	r_p (km)	A (km²)	M_M	h_M (km)	Remarks
185	1817 09	20 30	58.6	13.3	–2	4	20		2.8	7	
186	1818 01 20		58.6	13.4	–1	4	10		2.4	3	
187	1818 02 02		58.2	13.5	–2	3	10		2.2	7	
188	1820 11 12	23 45	57.5	13.2	12	5	40		3.4	7	
189	1822 09 10	21	59.0	13.0	22	5	60		3.6	11	
190	1822 11 01		59.7	19.0	–2	4	30		3.0	10	
191	1823 07 27	04	58.6	13.4	22	4	20		2.8	7	
192	1823 11 24	17	59.4	14.5	22	6	250		4.5	25	Double shock. Felt area mapped in Kjellén (1910).
193	1824 08 14	10 30	57.5	13.2	22	5	20		3.0	4	
194	1825 09 03	22	57.9	15.3	22	5	20		3.0	4	
195	1825 11 18		58.1	13.8	–1	4	10		2.4	3	
196	1825 11 24	21	59.0	12.4	22	5	20		3.0	4	Double shock.
197	1826 02 07		62.2	17.5	–1	4	10		2.4	3	
198	1826 02 11		62.4	17.3	–1	3	10		2.2	7	
199	1827 11 17		58.1	13.7	–2	3	20		2.6	14	
200	1827 11 24		58.1	13.7	–2	3	20		2.6	14	
201	1827 12 03	12	57.5	13.2	22	4	20		2.8	7	
202	1828 03 08	05 15	56.7	12.9	12	5	20		3.0	4	Double shock.
203	1828 09 24	00	58.0	12.8	32	5	20		3.0	4	
204	1828 09 30	01	58.1	13.7	22	5	70		3.6	13	Multiple shock.
205	1829 03 19	00	60.7	13.7	31	5	10		2.7	2	
206	1829 07 31	21	59.9	16.6	22	5	20		3.0	4	
207	1829 12 20	00	60.8	14.0	32	5	50		3.5	9	
208	1831 11 17	05 45	60.9	15.9	12	4	20		2.8	7	
209	1833 01 13	19	58.2	15.0	22	5	50		3.5	9	Double shock.
210	1833 12 01	06	59.2	12.5	22	5	40		3.4	7	Double shock.
211	1834 04 21	11	59.6	13.9	22	5	20		3.0	4	
212	1834 04 23		59.6	13.9	–2	4	20		2.8	7	Questionable date.
213	1834 11 08	00	60.9	13.4	31	5	10		2.7	2	
214	1835 04 01	10 30	65.0	15.0	23	5	70		3.6	13	
215	1835 06 07	10 30	58.1	13.7	22	4	20		2.8	7	
216	1838 12 23	18	62.0	15.5	22	5	20		3.0	4	
217	1843		56.6	16.1	–1	5	10		2.7	2	Seismic origin questionable.
218	1845	02	58.1	13.8	–2	5	20		3.0	4	Seismic origin questionable.
219	1846 11 18	00 30	58.5	13.2	22	4	20		2.8	7	
220	1846 12 08	21	58.1	12.2	22	5	20		3.0	4	Questionable date.
221	1847 02 02	20	58.2	13.4	21	5	10		2.7	2	
222	1847 03 12	07	58.8	13.9	21	4	10		2.4	3	Double shock
223	1847 03 18	19	58.9	15.0	22	5	60		3.6	11	Felt area mapped in Kjellén (1910).
224	1847 10		61.4	15.9	–1	5	10		2.7	2	
225	1847 11 07	21 45	63.1	18.4	12	5	20		3.0	4	
226	1848 10 23	03	62.2	17.3	22	5	80		3.7	15	
227	1849 04 08	02 30	58.7	12.1	22	5	40		3.4	7	Double shock.
228	1849 10 24		56.9	14.8	–2	4	20		2.8	7	
229	1850 08 01	17	58.1	14.0	22	5	20		3.0	4	
230	1850 09 11	14 30	62.4	17.3	21	4	10		2.4	3	
231	1851 04 13	12 00	58.7	10.7	12	6	180		4.3	18	Felt area mapped in Kjellén (1910).
232	1851 10 28	13	57.1	13.5	22	5	20		3.0	4	
233	1852 10 20	00	67.1	20.6	31	5	10		2.7	2	
234	1852 12 29		61.5	16.4	–1	5	10		2.7	2	
235	1853 01 13	02	58.4	12.3	21	5	10		2.7	2	
236	1853 01 21	01 30	59.3	18.1	21	5	10		2.7	2	
237	1853 11	18	58.3	11.7	–2	4	20		2.8	7	
238	1855		56.2	14.8	–1	5	10		2.7	2	Seismic origin questionable. Several shocks.
239	1855 01 14	23 30	59.3	13.5	22	5	20		3.0	4	
240	1855 01 15	01 30	57.6	13.5	21	5	10		2.7	2	
241	1855 01 15	04 30	57.7	13.5	22	5	20		3.0	4	
242	1855 02 20		57.1	12.2	–2	4	20		2.8	7	
243	1856 02 14	13 30	60.7	15.0	21	5	10		2.7	2	
244	1857 12 11	20 15	62.6	17.6	12	5	20		3.0	4	
245	1858 01 03	12	58.6	13.9	22	4	20		2.8	7	
246	1858 02 10	23	61.0	14.6	21	5	10		2.7	2	Several shocks.
247	1858 04 24	19	61.7	17.1	21	4	10		2.4	3	

Event no	Date yyyy mm dd	Origin time h m sec	Epicentre N (°)	E (°)	Quality	I_0	r_p (km)	A (km^2)	M_M	h_M (km)	Remarks
248	1859 01 18	17	58.9	11.7	22	5	40		3.4	7	Double shock.
249	1859 12 13	20 45	60.7	17.2	11	4	10		2.4	3	
250	1860 08 12	21 30	56.1	14.2	22	5	20		3.0	4	
251	1861		61.3	17.0	–1	5	10		2.7	2	
252	1861 12 15	01	55.9	13.4	22	4	20		2.8	7	
253	1861 12 19	00	65.8	23.1	–1	4	10		2.4	3	Questionable date.
254	1862 01 07	00	57.6	13.7	32	5	20		3.0	4	
255	1862 01 23		59.2	14.1	–2	4	20		2.8	7	Double shock.
256	1862 02 07		56.2	14.8	–2	5	20		3.0	4	Several shocks.
257	1862 02 09	11	65.8	23.1	22	4	20		2.8	7	
258	1863 04 30	02	64.2	21.0	22	5	70		3.6	13	Felt area (uncertain) mapped in Kjellén (1910).
259	1864 02 28	19	63.4	18.1	22	4	30		3.0	10	
260	1866 12 13	00	59.7	16.7	31	4	10		2.4	3	
261	1869		55.4	13.4	–1	5	10		2.7	2	Questionable date.
262	1869 01 22	04 25	65.7	22.0	12	4	20		2.8	7	
263	1869 03 30	07	60.8	17.1	22	5	20		3.0	4	
264	1869 07 19	20	55.4	13.2	22	5	30		3.2	5	
265	1874	08	58.9	12.6	–1	5	10		2.7	2	
266	1875 12 22	09	58.7	11.2	21	5	10		2.7	2	
267	1877 03 05	12 50	58.8	15.4	12	6	60		3.8	6	Multiple shock. Felt area mapped in Kjellén (1910).
268	1877 04 25	14	60.4	17.9	21	5	10		2.7	2	Several shocks.
269	1878		59.0	13.5	–2	3	20		2.6	14	Seismic origin questionable.
270	1878 01		57.3	12.3	–2	4	30		3.0	10	Questionable date.
271	1879 02 02	17 20	58.8	16.2	12	6	100		4.0	10	Macroseismic map in Linnarsson (1879). Felt area mapped also in Kjellén (1910).
272	1879 07 29	04 20	56.7	13.0	11	4	10		2.4	3	
273	1880 01 18	03	59.8	14.7	21	4	10		2.4	3	Rockburst.
274	1880 01 18	07	59.8	14.7	21	4	10		2.4	3	Rockburst.
275	1880 01 26	02	60.3	15.0	22	5	100		3.8	18	Felt area for events 275 and 276 mapped in Kjellén (1910).
276	1880 03 03	20	59.8	13.6	22	5	60		3.6	11	
277	1882	00	55.5	13.7	–1	5	10		2.7	2	Questionable date.
278	1882 01 28	04 45	62.6	17.6	12	4	20		2.8	7	Multiple shock.
279	1882 02 01	08 15	64.4	21.3	11	4	10		2.4	3	
280	1883 01 05	19 50	56.6	16.1	11	5	10		2.7	2	
281	1883 03 25	16 35	57.3	12.4	12	4	20		2.8	7	
282	1883 07 29	20	59.0	15.8	22	4	20		2.8	7	
283	1883 11 04	10	67.4	22.5	22	5	20		3.0	4	
284	1883 11 04	16 20	59.2	14.2	11	5	10		2.7	2	
285	1883 12 20	20 30	57.5	15.8	22	5	20		3.0	4	
286	1884 01 08	03 30	59.4	15.9	21	4	10		2.4	3	
287	1884 01 08	21 25	63.2	17.4	11	5	10		2.7	2	
288	1884 01 09	23 10	56.9	16.4	11	5	10		2.7	2	
289	1884 01 28	20 45	59.3	15.2	11	4	10		2.4	3	
290	1884 01 31	08	59.8	14.7	21	5	10		2.7	2	Rockburst.
291	1884 02 28	21 30	58.3	13.4	21	4	10		2.4	3	
292	1884 12 12	23 30	62.2	17.9	21	5	10		2.7	2	
293	1885		58.5	14.9	–1	3	10		2.2	7	Seismic origin questionable.
294	1885 01 02	19	59.5	13.4	22	4	20		2.8	7	
295	1885 04 08	21	62.6	17.9	21	4	10		2.4	3	Several shocks.
296	1885 09 22	20	62.6	17.9	21	5	10		2.7	2	
297	1885 10 09	08 30	58.9	17.8	21	5	10		2.7	2	Seismic origin questionable.
298	1886 01 18	04	62.6	17.9	22	4	20		2.8	7	Double shock.
299	1886 01 18	21	62.6	17.9	22	5	20		3.0	4	
300	1886 01 31	21 30	65.6	22.2	21	3	10		2.2	7	
301	1886 09 17		59.4	16.5	–1	5	10		2.7	2	Seismic origin questionable. Several shocks.
302	1886 10 29	10 30	63.2	14.6	22	3	20		2.6	14	Seismic origin questionable..
303	1886 12 21	21 15	62.0	17.2	12	6	80		3.9	8	Felt area (uncertain) mapped in Kjellén (1910).
304	1886 12 21	23	61.7	17.1	21	4	10		2.4	3	
305	1886 12 23	14	55.4	13.4	31	4	10		2.4	3	
306	1886 12 23	22 10	56.4	12.5	11	5	10		2.7	2	
307	1888 01 11	21 10	59.3	15.2	11	3	10		2.2	7	
308	1888 01 30	22 00	56.9	14.8	12	4	20		2.8	7	Double shock.
309	1888 01 31	03	57.4	15.8	22	5	20		3.0	4	

Event no	Date yyyy mm dd	Origin time h m sec	Epicentre N (°)	E (°)	Quality	I_0	r_p (km)	A (km²)	M_M	h_M (km)	Remarks
310	1888 03 28	00	56.9	14.8	31	4	10		2.4	3	
311	1888 04 08	00	59.4	13.5	21	5	10		2.7	2	Multiple shock.
312	1888 04 08	03	59.4	13.5	21	5	10		2.7	2	
313	1888 04 11	06	56.8	14.7	31	4	10		2.4	3	
314	1888 04 15	21	58.5	16.5	21	5	10		2.7	2	
315	1888 04 17	00	57.7	16.0	31	4	10		2.4	3	
316	1888 05 29	00	55.4	13.5	31	3	10		2.2	7	Multiple shock.
317	1888 06 01	06 30	62.6	18.0	22	5	20		3.0	4	Double shock.
318	1888 07 23	03 30	58.4	14.9	21	5	10		2.7	2	
319	1888 07 28	01 55	63.3	19.0	12	6	90		4.0	9	Possibly July 29. Felt area (uncertain) mapped in Kjellén (1910).
320	1888 08 02	11	58.5	15.1	21	4	10		2.4	3	
321	1888 08 13	12	58.5	14.9	21	4	10		2.4	3	Seismic origin questionable.
322	1888 08 17	18	55.4	13.7	31	5	10		2.7	2	Seismic origin questionable.
323	1888 08 18	06	55.4	13.7	31	4	10		2.4	3	Seismic origin questionable.
324	1889 01 13	15	59.8	14.1	21	4	10		2.4	3	Rockburst.
325	1889 02 12		59.4	13.5	–2	5	20		3.0	4	Several shocks.
326	1889 02 19	20	62.6	17.9	21	4	10		2.4	3	
327	1889 04 03	08 15	61.7	17.1	11	4	10		2.4	3	
328	1889 11 17	08	64.9	20.5	22	5	40		3.4	7	
329	1889 12 27	15 30	63.9	20.6	12	5	60		3.6	11	Felt area (uncertain) mapped in Kjellén (1910).
330	1890 02 09	11	58.1	15.1	21	4	10		2.4	3	
331	1890 02 10	00	60.7	14.0	32	5	30		3.2	5	
332	1890 02 11	03 20	60.7	14.0	12	4	20		2.8	7	
333	1890 02 11	04 40	60.7	14.0	12	5	20		3.0	4	
334	1890 03 07	18 45	64.4	21.4	12	5	20		3.0	4	
335	1890 06 25	21 00	61.5	16.8	12	6	60		3.8	6	Felt area (uncertain) mapped in Kjellén (1910).
336	1890 10 16	03 30	65.6	22.2	21	5	10		2.7	2	
337	1890 12 04	00 15	64.4	21.4	12	5	20		3.0	4	
338	1890 12 11	22	59 7	14.3	21	5	10		2.7	2	Seismic origin questionable.
339	1890 12 12	00	59.7	14.3	21	4	10		2.4	3	Seismic origin questionable.
340	1891 01 13	05	63.9	15.1	22	3.5	10		2.3	5	
341	1891 01 18	01 45	58.2	16.6	21	4	10		2.4	3	
342	1891 01 18	01 52	58.2	16.6	21	2					
343	1891 01 28	00 43	61.7	17.1	11	3	10		2.2	7	
344	1891 03 04	08 15	60.1	13.0	11	4	18		2.7	6	
345	1891 03 29	15 00	62.4	17.6	22	3.5	10		2.3	5	Double shock.
346	1891 07 27		62.7	18.1	–2	3	10		2.2	7	
347	1891 10 09	19 08	61.4	16.4	11	3.5	10		2.3	5	
348	1892 01 20	17 11	64.4	21.3	12	3	10		2.2	7	
349	1892 10 14	23 00	56.6	14.4	21	4	10		2.4	3	
350	1892 10 15	01 30	56.6	14.4	21	2					
351	1893 02 05		58.8	13.8	1	3	10		2.2	7	
352	1893 04 05	07 15	62.4	17.6	12	3.5	10		2.3	5	
353	1893 04 05	11 00	62.4	17.3	32	3	10		2.2	7	
354	1893 04 07	17 43	64.4	21.3	12	3	10		2.2	7	
355	1893 09 26	18 00	58.4	13.4	21	3.5	10		2.3	5	
356	1893 10 05	04 10	61.4	16.2	11	4.5	20		2.9	5	Felt area mapped in Kjellén (1910).
357	1893 10 22	14 00	65.1	20.0	21	3	10		2.2	7	
358	1893 11 06	22 10	64.4	21.3	12	3	10		2.2	7	
359	1894 01 02	22 00	60.0	15.0	–3	4.5	500		4.5	122	Several shocks. Uncertain felt area. Macroseismic map in Svedmark (1894a).
360	1894 01 03	02	60.0	15.0	–3	4					
361	1894 01 05	06 00	58.7	16.3	32	3.5	35		2.9	16	
362	1894 01 22	20 30	58.7	12.4	11	4	10		2.4	3	
363	1894 01 22	23 00	58.7	12.4	11	2					
364	1894 01 24	16 30	60.4	15.4	12	3	25		2.7	17	
365	1894 04 21	03 30	55.5	14.4	12	2					Foreshock.
366	1894 04 22	21 32	55.5	14.4	12	5	80		3.7	15	A small foreshock and a few aftershocks. Macroseismic map in Svedmark (1894b). Felt area (uncertain) mapped also in Kjellén (1910).
367	1894 04 25		62.5	17.2	–1	3	10		2.2	7	
368	1894 04 30	19 07	55.5	13.2	12	3	10		2.2	7	
369	1894 10 04	16 30	61.6	16.7	21	3	10		2.2	7	

Event no	Date yyyy mm dd	Origin time h m sec	Epicentre N (°)	E (°)	Quality	I_0	r_p (km)	A (km²)	M_M	h_M (km)	Remarks
370	1895 01 12	09 30	56.4	13.0	21	3.5	18		2.6	8	
371	1895 01 28 02 00	02 00	56.8	14.0	31	3.5	10		2.3	5	
372	1895 03 23	19 13	64.4	21.3	12	3	10		2.2	7	
373	1895 05 15		62.4	17.3	–2	3.5	10		2.3	5	
374	1895 06 30	19 24	62.5	18.0	12	4	55		3.3	18	Felt area (uncertain) mapped in Kjellén (1910).
375	1895 07 01	02 00	62.6	18.0	22	3	10		2.2	7	
376	1895 07 08		62.4	17.3	–2	3	10		2.2	7	
377	1895 10 01		62.4	17.3	–2	3	10		2.2	7	
378	1896 03 01	12 43	64.4	21.3	12	3	10		2.2	7	Seismic origin questionable.
379	1896 09 10	20 30	57.0	14.0	22	4.5	55		3.4	13	Macroseismic map in Swedmark (1897). Felt area mapped in Kjellén (1910).
380	1896 09 10	23 30	57.0	14.0	12	2					Seismic origin questionable.
381	1896 09 21	22 45	57.0	14.0	12	2					Seismic origin questionable
382	1896 09 22		58.7	16.5	–3	4	30		3.0	10	Uncertain felt area.
383	1896 10 12	18 40	64.4	21.3	12	3	10		2.2	7	Seismic origin questionable.
384	1896 10 14	23 23	61.5	17.3	12	4	40		3.1	13	
385	1896 10 21	16 25	56.5	14.5	22	3	10		2.2	7	
386	1896 10 21	17 00	56.5	14.5	22	3	10		2.2	7	Uncertain felt area.
387	1896 10 22	15 20	58.2	13.1	21	3	10		2.2	7	
388	1896 11 08		59.7	13.2	–1	3.5	10		2.3	5	
389	1896 12 12	12 45	59.0	14.8	21	3	10		2.2	7	
390	1896 12 13	07 22	59.5	13.0	12	5	100		3.8	18	Felt area mapped in Kjellén (1910).
391	1897 01 09	01 04	56.0	14.0	22	2					
392	1897 01 09	01 15	56.0	14.0	22	4.5	45		3.3	11	Felt area (uncertain) mapped in Kjellén (1910).
393	1897 01 09	01 45	56.0	14.0	22	2					
394	1897 02 04		56.8	14.0	–2	5	20		3.0	4	
395	1897 02 04		56.8	14.0	–2	4	10		2.4	3	
396	1897 02 05		56.8	14.0	–2	4.5	10		2.6	2	
397	1897 06 16	12 30	58.5	13.1	21	3	10		2.2	7	
398	1898 05 02	09 30	56.1	12.9	21	3.5	10		2.3	5	Several shocks.
399	1898 07 04	21 00	62.1	17.2	22	4	65		3.4	22	Felt area mapped in Kjellén (1910).
400	1898 07 06	04 16	64.1	20.9	12	3	10		2.2	7	
401	1898 07 08	23 15	61.6	16.8	22	3	10		2.2	7	
402	1898 07 17	00 15	61.6	16.8	22	3	10		2.2	7	
403	1899 01 02		58.5	15.0	–1	4	10		2.4	3	
404	1899 02 11	17 15	61.6	16.8	11	3.5	10		2.3	5	
405	1900 03 16	11 03	64.4	21.3	11	3.5	10		2.3	5	
406	1900 07 02	20 30	65.0	20.0	12	3.5	60		3.2	28	Uncertain felt area.
407	1900 12 27	22 00	57.1	12.8	21	3	10		2.2	7	Seismic origin questionable.
408	1901 01 13	19 45	61.6	17.1	22	3	30		2.8	20	
409	1901 03 11	23 30	58.6	16.2	21	3.5	10		2.3	5	
410	1901 11 09	22 58	59.7	13.8	11	5	166		4.1	30	Felt area mapped in Kjellén (1910).
411	1901 11 10	01 30	59.7	13.8	22	2					
412	1902 04 29	13 15	57.2	13.4	21	5	70		3.6	13	Uncertain felt area.
413	1902 10 12		55.5	13.9	–2	3	10		2.2	7	Double shock. Seismic origin questionable.
414	1903 01 02	23 30	63.8	20.2	11	3.5	10		2.3	5	
415	1903 04 11	19 30	59.6	18.0	21	4.5	20		2.9	5	Uncertain felt area.
416	1903 08 26	17 58	59.8	14.7	11	4.5	55		3.4	13	
417	1903 09 19	17 15	58.5	15.2	21	5	25		3.1	5	
418	1903 10 04	16 25	63.9	20.5	11	4	35		3.1	12	Uncertain felt area.
419	1904 08 05	09 00	59.8	12.6	31	3	10		2.2	7	
420	1904 09 27		58.3	14.6	–1	3	10		2.2	7	
421	1904 10 10	01 00	59.5	16.0	31	3	10		2.2	7	Questionable date.
422	1904 10 17	21 30	57.6	16.2	21	3	10		2.2	7	
423	1904 10 18		62.7	13.7	–1	3	10		2.2	7	
424	1904 10 20	03 50	62.5	17.6	22	3	10		2.2	7	
425	1904 10 20		59.3	18.1	–1	3.5	10		2.3	5	
426	1904 10 20	13 55	62.5	17.8	11	3	10		2.2	7	
427	1904 10 21	03 15	57.6	12.1	11	3.5	10		2.3	5	
428	1904 10 23	00 45	61.3	17.1	21	3.5	10		2.3	5	
429	1904 10 24	01 45	60.7	17.1	11	3.5	10		2.3	5	
430	1904 10 26	00 30	58.8	11.8	22	4	10		2.4	3	
431	1904 10 26	01 00	55.8	13.3	21	4	10		2.4	3	

Event no	Date yyyy mm dd	Origin time h m sec	Epicentre N (°)	E (°)	Quality	I_0	r_p (km)	A (km²)	M_M	h_M (km)	Remarks
432	1904 10 26	02 46	56.2	12.9	11	4	10		2.4	3	
433	1904 10 29	00 20	58.3	13.0	11	3	10		2.2	7	
434	1904 12 09	00 30	58.6	12.1	11	3	10		2.2	7	
435	1904 12 11	21 45	58.7	11.3	12	3	10		2.2	7	
436	1904 12 12	02 10	58.7	11.3	12	2					
437	1904 12 13	21 51	58.7	11.3	12	4.5	100		3.7	24	
438	1905 01 05	23 25	59.5	13.5	11	3.5	10		2.3	5	Several shocks.
439	1905 01 08		58.7	11.5	–2	3	10		2.2	7	
440	1905 01 13	22 00	60.0	16.0	32	4.5	70		3.5	17	
441	1905 01 13	23 02	60.0	16.0	12	4					
442	1905 01 14	02 00	60.0	16.0	32	3					
443	1905 01 15	10 35	56.5	13.1	11	3.5	32		2.9	15	
444	1905 01 15	21 00	58.8	11.8	21	3	10		2.2	7	
445	1905 01 16	04 00	58.8	11.8	21	2					
446	1905 01 18		58.7	11.3	–2	3	10		2.2	7	
447	1905 02 03	08 30	58.8	11.8	21	3	10		2.2	7	Seismic origin questionable.
448	1905 03 16	00 54	57.8	13.1	11	3.5	10		2.3	5	
449	1905 03 20	11 30	58.8	11.8	21	3	10		2.2	7	
450	1905 04 21	07 30	59.5	15.1	21	3.5	10		2.3	5	
451	1905 07 03	21 27	58.6	10.9	12	4	60		3.3	20	
452	1905 09 07	13 48	58.5	15.1	11	3	10		2.2	7	
453	1905 10 09	12 07	59.3	13.9	12	3.5	60		3.2	28	
454	1905 11 07	08 45	58.6	11.6	11	3.5	50		3.1	23	
455	1905 11 07	08 45	58.9	11.5	11	3.5	10		2.3	5	
456	1906 03 24	03 30	56.5	13.0	21	4	17		2.7	6	
457	1906 04 14		57.4	15.1	–1	3	10		2.2	7	Several shocks.
458	1906 05 07	16 43	57.4	15.1	11	3	10		2.2	7	
459	1906 05 27	13 53	64.9	20.2	11	3.5	18		2.6	8	
460	1906 05 27	14 30	65.0	17.7	21	4	10		2.4	3	
461	1906 08 22	04 28	57.4	15.1	11	3	10		2.2	7	
462	1906 08 22	05 13	57.4	15.1	11	2					
463	1906 10 07	01 13	62.9	18.3	11	3	10		2.2	7	
464	1906 10 07	21 20	65.1	20.1	11	3	10		2.2	7	
465	1906 11 07	21 45	65.3	19.6	11	3	10		2.2	7	
466	1907 01 09	05 30	59.6	12.3	12	2					Seismic origin questionable.
467	1907 01 09	20 00	59.2	13.2	21	3	10		2.2	7	
468	1907 01 10	00 32 52	59.6	12.3	12	5.5	184		4.2	25	I_1=4.5, r_1=70. Origin time according to Uppsala readings. A few small foreshocks and aftershocks during the same night; a probable foreshock also on January 9, 05 30.
469	1907 01 11	22 22	59.5	13.0	13	3.5	10		2.3	5	
470	1907 01 14	03 32	58.8	12.5	11	4	10		2.4	3	
471	1907 01 15	05 00	56.7	13.0	21	3	10		2.2	7	Questionable date.
472	1907 01 17	12 30	59.4	13.1	21	3	10		2.2	7	
473	1907 01 20	03 30	58.7	12.0	22	3	30		2.8	20	
474	1907 01 29		56.8	13.2	–1	3	16		2.4	11	
475	1907 01 31	03 30	56.9	14.0	21	3	17		2.5	12	
476	1907 02 06	17 00	58.1	13.6	21	4	14		2.6	5	
477	1907 02 23	04 45	62.4	17.3	21	3.5	10		2.3	5	
478	1907 03 02	22 30	56.9	13.5	21	3	10		2.2	7	
479	1907 03 03	02 00	56.9	13.5	31	3	10		2.2	7	
480	1907 03 22	21 00	58.2	13.6	21	3	10		2.2	7	
481	1907 03 22	21 30	58.2	13.6	21	4	10		2.4	3	
482	1907 04 05	01 25	58.4	13.1	22	5	70		3.6	13	Macroseismic map in Sahlström (1911).
483	1907 04 05	01 40	58.4	13.1	22	2					Seismic origin questionable.
484	1907 04 09	20 30	58.2	12.8	21	3	10		2.2	7	Seismic origin questionable.
485	1907 05 26	10 32	64.4	20.3	12	5	113		3.9	20	Possibly May 27. Macroseismic map in Sahlström (1911).
486	1907 09 11	09 45	58.7	11.9	11	3.5	14		2.5	7	
487	1907 12 28		67.7	21.8	–2	4	11		2.5	4	
488	1908 01 04	07 00	58.3	12.7	31	3	12		2.3	8	
489	1908 01 08	19 00	58.3	11.5	21	2					
490	1908 01 08	20 00	58.3	11.5	21	2					
491	1908 01 08	22 30	58.3	11.5	21	5	111		3.9	20	Macroseismic map in Sahlström (1911).
492	1908 01 09	01 00	58.3	11.5	21	2					
493	1908 01 09	02 45	58.3	11.5	21	2					

Event no	Date yyyy mm dd	Origin time h m sec	Epicentre N (°)	E (°)	Quality	I_0	r_p (km)	A (km²)	M_M	h_M (km)	Remarks
494	1908 02 01	01 30	58.9	12.8	21	3	10		2.2	7	
495	1908 02 03	18 20	58.9	12.8	21	2					
496	1908 02 03	18 35	58.9	12.8	21	3.5	18		2.6	8	
497	1908 12 08	17 00	65.5	17.5	32	4	10		2.4	3	
498	1908 12 31	21 17	64.4	22.1	12	4	65		3.4	22	Uncertain felt area.
499	1909 01 10		58.0	14.5	–1	3	10		2.2	7	
500	1909 01 18	04 17	58.5	14.9	11	3	10		2.2	7	
501	1909 01 21	23 45	58.8	17.0	11	3	10		2.2	7	
502	1909 02 03		59.4	16.5	–1	3.5	10		2.3	5	
503	1909 02 06	16 00	62.5	17.7	21	3	10		2.2	7	
504	1909 02 08		56.6	12.9	–1	3.5	10		2.3	5	
505	1909 03 05	19 53	58.6	11.4	12	4	65		3.4	22	Macroseismic map in Sahlström (1911).
506	1909 03 12	13 00	62.6	17.1	21	3.5	10		2.3	5	
507	1909 03 14		56.5	15.9	–1	3	10		2.2	7	
508	1909 03 16		61.4	16.1	31	3.5	10		2.3	5	Several shocks.
509	1909 03 16	09 40	58.6	11.7	21	3	10		2.2	7	
510	1909 04 08	20 15	58.4	15.1	21	4	20		2.8	7	
511	1909 04 10	08 56	62.6	17.9	11	4	12		2.5	4	
512	1909 07 27		56.0	14.0	–1	4.5	15		2.8	4	
513	1910 02 12	22 00	58.5	14.9	31	3	10		2.2	7	
514	1910 02 16	22 00	60.7	13.4	31	4	24		2.9	8	
515	1910 03 08	05 00	63.3	19.0	21	3	10		2.2	7	
516	1910 03 11	21 00	63.3	19.0	31	3	10		2.2	7	
517	1910 03 15		56.3	14.7	–1	3.5	12		2.4	6	
518	1910 05 03	21 30	61.8	16.8	21	3.5	15		2.5	7	
519	1910 05 15		61.5	17.1	–1	3	10		2.2	7	
520	1910 05 15	23 00	59.4	17.7	31	3.5	10		2.3	5	
521	1910 10 04	22 37	58.3	14.3	11	3.5	10		2.3	5	
522	1910 12 27	21 20	61.7	16.2	11	3.5	10		2.3	5	
523	1911 01 09	05 00	55.5	14.3	31	4	10		2.4	3	
524	1911 01 11	09 00	61.8	12.7	31	3	10		2.2	7	
525	1911 01 29	20 45	63.2	17.2	11	4	10		2.4	3	
526	1911 01 29	23 30	59.5	13.8	22	2					
527	1911 01 30	01 45	59.5	13.8	22	4.5	60		3.4	15	Macroseismic map in Sahlström (1913).
528	1911 01 30	05 00	59.5	13.8	32	2					
529	1911 01 31		60.3	12.8	–1	4	10		2.4	3	
530	1911 02 20	21 03	57.9	12.0	11	4.5	33		3.1	8	
531	1911 03 11	22 15	64.7	21.1	12	3	10		2.2	7	
532	1911 03 22	20 10	64.6	21.2	12	4	53		3.3	18	
533	1911 04 16	02 55	60.6	15.6	11	3	10		2.2	7	
534	1911 04 20	23 30	61.9	17.3	22	4	60		3.3	20	
535	1911 06 25	00 03	58.4	12.3	11	3	10		2.2	7	
536	1911 08 08	10 00	56.5	13.1	31	3.5	10		2.3	5	
537	1911 12 09	05 40	58.6	13.4	11	3	10		2.2	7	Questionable date.
538	1912 01 22	03 25	58.9	11.8	11	3	10		2.2	7	
539	1912 01 23	03 30	58.9	11.8	31	3	10		2.2	7	
540	1912 01 23	20 45	63.0	18.5	11	4	35		3.1	12	
541	1912 01 28	23 20	58.8	11.8	11	3	10		2.2	7	
542	1912 02 02	05 00	60.3	16.4	31	4	10		2.4	3	Seismic origin questionable.
543	1912 03 18	11 15	65.0	21.3	22	3.5	15		2.5	7	
544	1912 03 18	11 45	65.0	21.3	22	3.5	15		2.5	7	
545	1912 03 30	00 00	58.5	14.8	31	4.5	20		2.9	5	
546	1912 05 15	10 00	63.5	16.5	31	3	10		2.2	7	
547	1912 06 30	02 20	60.1	12.4	11	4.5	28		3.1	7	
548	1912 07 26	18 55	60.7	13.7	12	4.5	35		3.2	9	
549	1912 07 28		62.4	17.3	–1	3	10		2.2	7	Several shocks. Seismic origin questionable.
550	1912 08 13	15 30	63.8	20,3	21	3	10		2.2	7	
551	1912 09 18	20 48 24	60.2	14.8	11	5	70		3.6	13	Origin time according to Uppsala readings. Macroseismic map in Sahlström (1913).
552	1912 09 21	09 08	59.6	12.6	11	4	42		3.2	14	
553	1912 10 29	19 00	57.5	14.7	31	3	10		2.2	7	
554	1912 12 04	04 30	59.4	12.2	21	4.5	45		3.3	11	
555	1913 02 27	03 00	56.2	15.3	31	3.5	10		2.3	5	

Event no	Date yyyy mm dd	Origin time h m sec	Epicentre N (°)	E (°)	Quality	I_0	r_p (km)	A (km²)	M_M	h_M (km)	Remarks
556	1914 01 06	21 00	60.0	16.0	21	3.5	15		2.5	7	
557	1914 01 11	02 18	57.8	13.0	11	4	10		2.4	3	Seismic origin questionable.
558	1914 01 11	02 23	57.8	13.0	11	2					Seismic origin questionable.
559	1914 01 24	22 14	64.5	21.0	11	4.5	55		3.4	13	
560	1914 01 24	22 50	64.5	21.0	11	2					
561	1914 07 02	06 30	56.8	13.4	21	3.5	15		2.5	7	
562	1914 07 22	01 30	55.5	13.0	22	3	10		2.2	7	
563	1915 01 05	21 00	60.1	16.0	21	3.5	15		2.5	7	
564	1915 01 07	09 35	60.9	13.4	11	3.5	10		2.3	5	
565	1915 01 24	00 30	64.5	21.0	22	4	10		2.4	3	
566	1915 02 04	10 00	64.3	21.0	21	3	10		2.2	7	
567	1915 02 22	20 20	64.3	21.0	11	3.5	10		2.3	5	Questionable date.
568	1915 02 23	03 00	65.9	23.4	31	4	20		2.8	7	
569	1915 08 30	18 00	64.6	21.3	21	4	36		3.1	12	
570	1915 11 10	11 35	59.1	12.7	11	4	35		3.1	12	
571	1916 02 17	00 30	57.1	13.3	22	3	10		2.2	7	
572	1916 02 24		57.1	13.3	–2	3	10		2.2	7	Several shocks. Seismic origin questionable.
573	1916 03 07	06 20	57.1	13.3	22	3.5	10		2.3	5	Seismic origin questionable.
574	1916 03 07	06 55	57.1	13.3	22	2					Seismic origin questionable.
575	1916 09 27	02 45	59.3	12.5	12	4	53		3.3	18	
576	1916 10 28	18 00	63.2	18.7	22	4.5	60		3.4	15	
577	1916 11 04	23 05	58.6	13.2	12	4.5	47		3.3	12	Possibly November 5 at 11 05. Macroseismic map in Sahlström (1919).
578	1917 01 30	14 30	58.4	15.0	11	3.5	33		2.9	15	
579	1917 01 31	19 00	57.2	12.4	21	3	15		2.4	10	
580	1918 06 08	03 15	57.8	13.4	12	4	30		3.0	10	
581	1918 08 20	23 00	64.4	21.3	21	3.5	10		2.3	5	
582	1918 11 21	01 15	64.5	20.6	11	3	10		2.2	7	
583	1920 01 09	09 05	57.4	13.0	11	4	44	6000	3.2	15	Macroseismic map in Sahlström (1926).
584	1920 02 28	01 11 35	59.7	13.4	11	4.5	68	14500	3.5	17	I_1=4, r_1=38. Origin time according to Uppsala readings. Macroseismic map in Sahlström (1926).
585	1920 10 22	00 40	57.4	14.3	11	3	10		2.2	7	
586	1920 10 27	04 45	58.2	12.5	11	3	10		2.2	7	
587	1920 12 15	04 27	64.6	18.7	11	3	10		2.2	7	
588	1921 08 23	22 00	55.0	15.0	23	5	65		3.6	12	Two main shocks of comparable magnitude. Uncertain felt area. Macroseismic map in Sahlström (1926).
589	1921 08 23	23 45	55.0	15.0	23	5					
590	1922 06 11	12 43 31	59.6	14.5	11	4.5	116	42500	3.8	28	I_1=4, r_1=54. Origin time according to Uppsala readings. Macroseismic map in Sahlström (1926).
591	1922 08 17	01 07 24	59.3	15.0	12	4.5	56	10000	3.4	14	Origin time according to Uppsala readings. Macroseismic map in Sahlström (1926).
592	1922 08 24		59.4	13.2	–1	3	10		2.2	7	Several shocks.
593	1922 10 27	05 09 32	59.7	12.0	12	4.5	103	33000	3.7	25	Origin time according to Uppsala readings. Macroseismic map in Sahlström (1926).
594	1923 02 26	05 00	60.0	13.0	21	4	36	4000	3.1	12	
595	1923 03 03	20 35 42	59.8	12.7	11	4	44	6000	3.2	15	Origin time according to Uppsala readings. Macroseismic map in Sahlström (1926).
596	1923 10 05	23 15	59.1	12.3	11	4	33	3500	3.0	11	Possibly October 6 at 11 15.
597	1923 10 13	04 00	58.3	11.5	32	3.5	28	2500	2.8	13	
598	1924 01 19	21 05	59.2	15.1	11	4	16	800	2.7	5	Macroseismic map in Sahlström (1926).
599	1924 08 25	11 25	59.9	12.6	11	3.5	14	600	2.5	7	
600	1924 10 05	21 30	66.1	22.0	21	4	36	4000	3.1	12	Macroseismic map for events 600 and 601 in Sahlström (1926).
601	1925 05 07	05 30	65.9	22.1	21	4	22	1500	2.8	7	
602	1926 10 03	00 30	65.7	23.1	32	4	10		2.4	3	Seismic origin questionable.
603	1927 02 15	16 55	57.6	13.5	11	3.5	18	1000	2.6	8	Macroseismic maps for events 603–608 in Sahlström (1931).
604	1927 02 16	20 25	68.1	19.8	11	3.5	25	2000	2.8	12	
605	1927 03 02	08 45	58.6	13.6	11	4	17	900	2.7	6	
606	1927 12 01	04 00	59.3	14.1	31	3.5	12	700	2.4	6	
607	1928 03 20	03 35	58.2	13.6	11	4	23	1100	2.9	8	
608	1928 04 02	04 00	58.4	11.4	31	4	26		2.9	9	
609	1928 04 02	09 00	58.4	11.4	31	3	10	1600	2.2	7	
610	1928 04 27	22 31 55	60.0	15.8	11	4	24	1800	2.9	8	Origin time according to Uppsala readings. Macroseismic maps for events 610–612 in Sahlström (1931).
611	1928 07 27	14 54 57	58.8	14.0	11	4	24	1800	2.9	8	Origin time according to Uppsala readings.

Event no	Date yyyy mm dd	Origin time h m sec	Epicentre N (°)	E (°)	Quality	I_0	r_p (km)	A (km²)	M_M	h_M (km)	Remarks
612	1929 04 13	08 05 22	65.3	21.6	12	4.5	82	14000	3.6	20	Origin time according to Abisko readings.
613	1929 10 26	09 15	57.0	13.5	11	3					Foreshock.
614	1929 10 26	11 00	57.0	13.5	11	3					Foreshock.
615	1929 10 26	13 43 30	57.0	13.5	11	5	89	25000	3.8	16	I_1=4.5, r_1=20. Origin time according to Copenhagen and Uppsala readings. Macroseismic map in Sahlström (1931).
616	1929 10 26	20 30	57.0	13.5	11	3					Aftershock.
617	1929 12 01	19 10	58.1	16.7	21	4	28	2500	2.9	9	Macroseismic maps for events 617–619 in Sahlström (1931).
618	1930 01 10	12 05	60.0	13.0	11	4	42	5500	3.2	14	
619	1930 03 10	22 36	62.9	17.7	12	4.5	80	20000	3.6	20	
620	1930 05		55.4	13.5	–2	3	10		2.2	7	
621	1930 08 31	01 30	56.5	13.3	21	4	18	1000	2.7	6	Macroseismic map for events 621 and 622 in Sahlström (1931).
622	1930 09 23	15 11 41	59.3	12.2	11	4.5	59	11000	3.4	14	Origin time according to Uppsala readings.
623	1930 10 02	17 05	58.4	16.6	11	3	10		2.2	7	Seismic origin questionable.
624	1930 10 31	23 16 40	55.3	12.8	11	5	135		4.0	24	Origin time according to ISS. Possibly a small foreshock during the night October 8–9,
625	1930 11 12	04 55	58.4	13.8	11	4	61	11500	3.3	20	Macroseismic map in Sahlström (1931).
626	1931 01 26	02 00	58.4	13.9	31	3	10		2.2	7	
627	1931 09 27	09 48	58.6	13.7	11	4	12	400	2.5	4	Macroseismic map in Sahlström (1936).
628	1932 01 04	21 17	61.8	14.0	11	3.5	10		2.3	5	Seismic origin questionable.
629	1932 02 11	16 32 51	56.0	14.6	11	4	52		3.3	17	Origin time according to Lund and Copenhagen readings. Felt area of more than 5000 km². Macroseismic map in Sahlström (1936).
630	1932 04 12	06 55	56.2	14.3	11	3	10		2.2	7	
631	1932 04 12	20 09	56.2	14.5	11	3	10		2.2	7	
632	1932 07 02	02 00	59.0	12.0	31	4	10		2.4	3	
633	1932 09 03	19 06 17	58.6	13.0	11	4.5	103	33000	3.7	25	Origin time according to Uppsala and Lund readings. Macroseismic map in Sahlström (1936).
634	1933	04	60.0	13.6	–1	4	13		2.6	4	Seismic origin questionable.
635	1933	05	60.0	13.6	–1	3					Seismic origin questionable.
636	1933 08 05	23 57 52	59.4	13.0	11	5	125	45000	3.9	23	I_1=4.5, r_1=31. Origin time according to Uppsala and Lund readings. Macroseismic map in Sahlström (1936).
637	1933 11 24	03 00	63.4	19.1	21	3					
638	1933 11 24	16 00	63.4	19.1	21	4	10	100	2.4	3	
639	1934 01 03	13 45	64.6	18.8	21	4	59	11000	3.3	20	Macroseismic map in Sahlström (1936).
640	1934 03 01	11 30	66.4	21.6	21	4	10		2.4	3	
641	1934 03 23	20 00	66.2	22.3	21	4	54	9000	3.3	18	Small aftershocks during the following night. Macroseismic maps for events 641–643 in Sahlström (1936).
642	1934 03 24	07 00	67.0	23.1	21	3	11	400	2.3	8	
643	1934 07 24	22 30	61.9	16.9	21	4	18	1000	2.7	6	
644	1934 10 03	19 15	65.0	20.1	11	4	10		2.4	3	
645	1935 01 07	17 32	65.0	20.2	11	4.5	80	2000	3.6	20	Macroseismic maps for events 645 and 646 in Sahlström (1936).
646	1935 03 31	14 59	58.7	13.6	12	4	18	1000	2.7	6	
647	1935 04 24	03 54	63.1	17.7	11	5	10		2.7	2	
648	1935 08 13	22 30	57.4	13.5	21	4	34	3700	3.0	11	Macroseismic maps for events 648 and 649 in Sahlström (1936).
649	1935 10 10	05 51 36	62.5	17.1	11	5	74	14000	3.7	13	I_1=4.5, r_1=24. Origin time according to Uppsala readings.
650	1935 12 31	22 25	65.0	20.1	11	3	10		2.2	7	
651	1936 01 01	02 19	61.8	17.2	11	4	16	800	2.7	5	
652	1936 03 23	19 30	57.9	12.6	21	4	23	1700	2.9	8	Macroseismic maps for events 652–656 in Sahlström (1941).
653	1936 04 05	21 22	64.0	18.0	12	4	98	30000	3.6	33	Several shocks.
654	1936 09 12	13 40	59.4	12.2	11	4	18	1000	2.7	6	
655	1936 09 19	16 17	63.1	18.1	11	4	17	900	2.7	6	
656	1936 12 02	10 10	63.3	15.7	11	4	36	4000	3.1	12	
657	1937 01 02	01 00	65.6	17.5	31	3.5	10		2.3	5	
658	1937 03 05	16 55	56.5	13.0	11	4	20	1200	2.8	7	Macroseismic map in Sahlström (1941).
659	1937 03 06	01 00	56.5	13.0	11	3					
660	1937 10 09	21 03 04	56.8	13.0	11	4.5	46	6600	3.3	11	Origin time according to Copenhagen readings. Aftershock at 23 30. Macroseismic map in Sahlström (1941).
661	1938 03 11	09 40	58.9	11.1	22	3	23		2.6	16	
662	1938 05 19	11 40	66.8	17.9	11	4	42	5500	3.2	14	Macroseismic maps for events 662–667 in Sahlström (1941).
663	1938 09 27	20 42	58.1	13.3	11	4	33	3400	3.0	11	
664	1938 12 08	16 08 56	58.6	13.5	11	4	43	5800	3.2	14	Origin time according to Uppsala readings.
665	1939 01 05	03 45	65.8	22.3	11	4	38	4400	3.1	13	
666	1939 12 09	03 00	65.6	21.8	21	4	34	3500	3.0	11	

Event no	Date yyyy mm dd	Origin time h m sec	Epicentre N (°)	E (°)	Quality	I_0	r_p (km)	A (km²)	M_M	h_M (km)	Remarks
667	1940 02 04	11 00	64.5	20.8	21	4	54	9000	3.3	18	Several small aftershocks at 11 40, 12 30, 13 10 and possibly also at 14 00 and 15 00.
668	1942 02 20	06 30	57.6	11.6	22	3	25		2.7	17	Seismic origin questionable. Uncertain felt area.
669	1942 10 05	15 45	66.8	21.5	11	4.5	38	4500	3.2	9	Macroseismic map for events 669–673 in Sahlström (1953).
670	1943 03 13	21 00	67.4	22.4	21	4	21	1400	2.8	7	
671	1944 01 14	12 21 33	60.1	14.4	11	4.5	69	15000	3.5	17	Origin time according to Uppsala readings.
672	1944 05 08	13 04 23	60.3	15.6	11	4.5	24	1800	3.0	6	Origin time according to Uppsala readings.
673	1944 11 04	13 00	63.0	16.2	21	4.5	26	2200	3.0	6	
674	1944 11 06	21 00	62.5	17.4	22	4	10		2.4	3	Seismic origin questionable.
675	1945 01 12	02 15	57.4	12.5	11	4	26	2200	2.9	9	Macroseismic map in Sahlström (1953).
676	1945 02 18	20 45	64.1	20.9	12	3	10		2.2	7	
677	1945 03 12	02 30	64.1	20.9	22	3	10		2.2	7	Macroseismic map in Sahlström (1953).
678	1945 03 12	04 43	64.5	21.0	12	4.5	56	10000	3.4	14	
679	1945 03 12	05 05	64.5	21.0	12	3					
680	1945 03 12	06 00	64.5	21.0	12	3					
681	1945 03 12	07 00	64.5	21.0	12	3					
682	1945 04 26	19 30	56.1	14.4	21	3	10		2.2	7	
683	1945 04 27	02 00	56.1	14.7	21	4	16	800	2.7	5	Foreshocks on April 26. Macroseismic map in Sahlström (1953).
684	1945 04 27	19 00	56.1	14.7	21	4	16		2.7	5	
685	1946 03 15	19 50	61.9	16.7	11	4	20	1200	2.8	7	Macroseismic map in Sahlström (1953).
686	1946 04 24	17 45	55.4	15.6	22	4	50	20000	3.2	17	Uncertain felt area.
687	1946 04 24	18 30	55.4	15.6	22	5	100		3.8	18	Uncertain felt area.
688	1946 04 24	19 10	55.4	15.6	22	5					Several shocks of which those at 18 30 and 19 10 appear as the strongest. Foreshocks on April 24, 10–11, 11 30, 15–16 30. Aftershocks on April 24, at 20 30 and 21 22; April 25 at 10 30, 11, 11 30, 12–12 30, 12 45, 13 25, 14, 14 30 15, 17 30, 20; April 26 at 04 45 and 06. Macroseismic map in Sahlström (1953).
689	1946 08 20	15 45	58.1	14.5	21	4	25		2.9	8	Seismic origin questionable.
690	1946 11 30	21 55	58.5	11.6	11	4	39	4700	3.1	13	Macroseismic maps for events 690 and 691 in Sahlström (1953).
691	1946 12 07	03 47	58.2	13.7	11	4	20	1200	2.8	7	
692	1947 02 03	10 25	60.8	15.4	11	3					Seismic origin questionable.
693	1947 02 03	10 45	60.8	15.4	11	4	19	1100	2.8	6	Macroseismic maps for events 693–697 in Sahlström (1953).
694	1947 02 27	22 42	57.4	13.5	11	4.5	39	4800	3.2	10	
695	1947 10 15	09 00	67.4	22.4	21	4	13	500	2.6	4	
696	1948 03 04	06 45	58.6	13.7	11	4	25	2000	2.9	8	
697	1948 05 08	22 00	57.2	12.7	21	4	15	700	2.6	5	
698	1948 07 01	11 00	64.6	21.4	22	3					Seismic origin questionable.
699	1948 07 01	18 30	64.6	21.4	22	4	10		2.4	3	
700	1948 07 01	18 40	64.6	21.4	22	4	10		2.4	3	Possibly a few more shocks in the same district July 1, at 11 00 and 19 30 and on July 8 at 09 30, all doubtful.
701	1948 07 22	19 15	55.4	15.6	22	4.5	75	5000	3.6	18	Uncertain felt area. Two shocks, one hour apart, the second probably the strongest. Macroseismic map in Sahlström (1953).
702	1948 07 22	20 15	55.4	15.6	22	4.5	75		3.6	18	
703	1949 02 25	22 30	65.8	23.2	21	4	13	500	2.6	4	
704	1950 03 29	10 12	64.5	20.8	11	4	22	1500	2.8	7	Macroseismic map in Sahlström (1953).
705	1950 04 03	05 10	64.5	20.8	11	4	13	500	2.6	4	
706	1950 09 01	18 05	60.0	12.2	11	4.5	30	2800	3.1	7	Macroseismic map in Sahlström (1953).
707	1951 02 21	18 45	63.8	19.1		3	10		2.2	7	Doubtful, instrumentally not recorded.
708	1951 10 09		66.0	17.9		3	10		2.2	7	Doubtful, instrumentally not recorded.
709	1952 12 27	21 30	63.1	18.3		4	18	1000	2.7	6	
710	1953 09 22	19 44 21.4	61.4	16.77		4	15		2.6	5	
711	1953 11 11	22 30 03.7	62.5	17.0		4	40	5000	3.1	13	
712	1954 10 27	08 10 15.6	58.94	14.64		4	17	900	2.7	6	
713	1955 05 24	21 10 00	64.3	20.7		4	28	2000	2.9	9	Doubtful, instrumentally not recorded,
714	1955 08 30	15 21 15.4	59.5	13.6		4	32	3300	3.0	11	
715	1955 11 15	08 48 56.2	58.3	13.7		4	25	2000	2.9	8	
716	1955 12 05	00 00	58.2	13.6		3	17	900	2.5	12	Doubtful, instrumentally not recorded.
717	1956 01 01	04 55 31.7	61.4	16.8		4	25	2000	2.9	8	
718	1956 01 21	01 51 05.4	66.00	17.27		4	44	6000	3.2	15	
719	1956 02 15	03 50 10.0	57.5	13.4		4	31	3000	3.0	10	
720	1956 07 08	23 16 23.0	58.1	13.0			10				
721	1956 07 09	20 36	58.5	13.6		3	10		2.2	7	Doubtful, instrumentally not recorded.
722	1956 08 26	08 09 56.7	62.11	16.72		4.5	38	4500	3.2	9	

Event no	Date yyyy mm dd	Origin time h m sec	Epicentre N (°)	E (°)	Quality	I_0	r_p (km)	A (km²)	M_M	h_M (km)	Remarks
723	1956 08 31	10 47 51.8	65.56	17.35		4	17	900	2.7	6	
724	1957 06 02	05 50	57.9	14.8		4	18	1000	2.7	6	Doubtful, instrumentally not recorded.
725	1957 10 10	20 20 44.7	61.15	14.85		3	34	3300	2.8	23	
726	1958 01 19	19 45 05.7	67.11	21.61		4	24		2.9	8	
727	1958 08 28	23 12 10.3	66.17	21.34		5	28		3.2	5	
728	1958 09 17	06 22 42.7	58.47	13.55		5	45		3.4	8	
729	1958 09 29	13 40	56.6	13.7		4.5	25		3.0	6	Doubtful, instrumentally not recorded.
730	1958 10 04	00 32 58.2	64.35	20.62		4	26		2.9	9	
731	1959 11 03	07 38 58.4	59.52	15.86		5	26		3.1	5	
732	1960 03 16	14 35 00	58.4	12.00		3.5	17		2.6	8	Doubtful, instrumentally not recorded.
733	1960 10 20	11 50 12.4	56.36	13.3		4	44		3.2	15	
734	1961 04 04	11 48 49.6	56.95	13.29		3	10		2.2	7	Macroseismic information probably incomplete.
735	1962 07 05	21 45	62.5	15.9		3.5	10		2.3	5	
736	1962 09 28	17 22 01.7	64.52	20.54		4.5	60		3.4	15	
737	1963 01 14	12 00 00	65.5	21.4		4	10		2.4	3	Doubtful, instrumentally not recorded.
738	1963 08 05	13 15 00	61.2	17.3		4	20		2.8	7	Doubtful, instrumentally not recorded.
739	1963 10 11	16 39 43.3	58.55	13.13		4	26		2.9	9	
740	1963 10 29	18 28 36.8	65.91	21.42		5.5	35		3.4	5	
741	1967 01 04	04 44 18.9	68.0	20.63		4.5	35		3.2	9	
742	1967 02 04	15 34 54.6	59.5	13.35		5.5	75		3.8	10	
743	1967 04 13	09 03 46.5	63.23	18.99		4	30		3.0	10	
744	1967 08 16	22 44 51.3	59.24	13.41		4	30		3.0	10	
745	1967 11 29	09 25 23.7	60.69	17.61		4.5	10		2.6	2	Uncertain felt area.
746	1968 02 06	01 27 32.0	57.33	12.33		4	31		3.0	10	
747	1968 03 12	07 32 35.6	58.65	13.67		4	23		2.9	8	
748	1968 03 28	03 42 00.1	60.59	15.93		4.5	33		3.1	8	
749	1968 09 03	22 35 17.1	58.45	14.00		5.5	50		3.6	7	
750	1968 09 04	17 09 15.6	66.86	23.86		3.5	20		2.7	9	
751	1970 08 12	19 28 43.3	61.47	16.25		5	21		3.0	4	
752	1971 04 20	23 33 35.6	64.38	20.92		4	55		3.3	18	
753	1971 07 28	23 24 53.7	62.13	17.31		4.5	20		2.9	5	
754	1971 09 07	02 41 28.8	61.37	16.91		4	15		2.6	5	
755	1972 06 12	04 31 31.2	60.07	14.57		5	30		3.2	5	
756	1972 08 20	02 52 35.8	61.86	17.06		4.5	26		3.0	6	
757	1972 12 16	10 09 26.6	63.61	19.84		3.5	25		2.8	12	
758	1973 02 13	00 05 11.9	66.01	18.24		4.5	50		3.4	12	
759	1973 04 11	05 01 35.4	58.76	13.38		5.5	90		3.9	12	
760	1973 04 17	06 17 56.0	68.11	20.06		4.5	20		2.9	5	
761	1973 07 22	04 02 53.7	58.23	13.66		4.5	28		3.1	7	
762	1973 11 26	21 45 35.3	62.94	18.29		5	17		2.9	3	
763	1974 02 05	22 34 01.2	58.1	14.33		4	35		3.1	12	
764	1974 05 21	16 51 18.5	58.27	12.7		5	35		3.3	6	
765	1974 06 04	23 13 49.1	62.41	17.26		5.5	40		3.5	5	
766	1974 09 12	00 31 15.0	66.18	21.94		4.5	30		3.1	7	
767	1974 10 28	21 56 29.5	57 38	12.33		4.5	36		3.2	9	
768	1974 12 01	19 35 56.1	68.06	19.86		4.5	40		3.2	10	
769	1975 08 11	18 28 10.5	67.4	22.35		5	45		3.4	8	
770	1975 08 29	04 42 21.7	65.85	24.11		4	22		2.8	7	
771	1975 12 01	13 05	65.8	23.6		4	30		3.0	10	Doubtful, instrumentally not recorded.
772	1975 12 13	15 29 54.7	66.88	22.51		4	25		2.9	8	
773	1976 03 12	23 22 18.7	61.31	17.18		4.5	70		3.5	17	
774	1976 03 16	06 27 08.5	58.68	13.41		3.5	23		2.7	11	
775	1976 03 29	14 14 38.4	59.92	12.62		4.5	50		3.4	12	
776	1976 04 30	12 53 52.2	64.4	21.2		5	42		3.4	8	
777	1976 07 03	07 26 01.4	58.45	13.87		4	20		2.8	7	
778	1976 08 17	05 35 53.8	62.85	17.76		5	55		3.5	10	
779	1976 08 25	21 24 28.3	58.95	15.1		4.5	45		3.3	11	
780	1976 09 03	04 28 00.6	58.45	13.87		5	70		3.6	13	
781	1976 09 07	15 21 57.0	59.63	13.4		4	24		2.9	8	
782	1977 08 27	16 14 54	59.0	12.3		4		1500	2.8	7	Macroseismic maps for events 782 and 783 in Kulhanek & Wahlström (1981).
783	1977 09 05	23 40 21	57.0	13.0		5		7100	3.4	9	
784	1977 11 10	15 40 33	65.6	22.9		4.5					

Event no	Date yyyy mm dd	Origin time h m sec	Epicentre N (°)	E (°)	Quality	I_0	r_p (km)	A (km²)	M_M	h_M (km)	Remarks
785	1978 12 14	14 24 48	63.7	21.1		4					
786	1979 01 01	07 17 29	63.5	16.0		3		470	2.3	8	Macroseismic map in Kulhanek & Wahlström (1981).
787	1979 04 02	12 40 34	62.3	17.4							Uncertain location.
788	1979 11 11	23 58 14	61.1	16.9		5		1900	3.1	5	Macroseismic maps for events 788 and 789 in Kulhanek & Wahlström (1981).
789	1979 12 23	14 09 13	59.6	18.7		5.5		150	2.6	1	Macroseismic map also in Kulhanek et al. (1980).
790	1980 04 11	04 19 11	57.9	12.1		4	25		2.9	8	I_1=4, r_1=10. Macroseismic map in Kulhanek & Wahlström (1985).
791	1980 07 25	21 45 12	64.0	20.4		5					Focal depth, h, probably less than 5 km.
792	1980 08 19	01 13 17	61.5	16.2		3					
793	1980 08 26	03 15 46	57.8	15.2		3.5					
794	1980 09 13	07 59 57	64.6	20.7		4	14		2.6	5	Macroseismic maps for events 794 and 795 in Kulhanek & Wahlström (1985).
795	1980 11 25	02 39 52	58.4	13.8		4	17		2.7	6	I_1=4, r_1=9.
796	1980 12 17	18 19 24	61.5	17.0		4					Focal depth, h, probably less than 5 km.
797	1981 02 13	06 39 11	58.9	13.9		4.5	25		3.0	6	Macroseismic map in Kulhanek et al. (1981) and in Kulhanek & Wahlström (1985).
798	1981 05 22	03 42 30	65.5	23.4		4					
799	1981 11 11	02 48 52	57.1	13.1		4	20		2.8	7	I_1=4, r_1=9. Macroseismic map in Kulhanek & Wahlström (1985).
800	1982 03 15	13 57 11	60.0	13.1		3.5					
801	1982 09 26	13 40 18	59.6	16.2		4.5	5		2.2	1	Macroseismic map in Kulhanek & Wahlström (1985).
802	1982 10 08	05 28 56	64.5	20.7		4					
803	1983 04 01	02 50 34	61.7	17.2		4					I_1=4, r_1=9. Macroseismic map in Kulhanek & Wahlström (1985).
804	1983 04 15	23 46 56	57.8	12.3		3					
805	1983 06 18	12 43 44	64.3	20.8		4	19		2.8	6	I_1=4, r_1=7. Macroseismic maps for events 805–809 in Kulhanek & Wahlström (1985).
806	1983 07 12	19 04 30	58.1	14.6		4	24		2.9	8	I_1=4, r_1=10,
807	1983 09 24	02 08 21	58.2	13.6		4	8		2.3	3	I_1=4, r_1=3.
808	1983 09 29	05 03 25	63.8	17.5		5	167		4.1	30	I_1=5, r_1=7; I_2=4, r_2=122.
809	1983 10 03	09 50 41	59.7	13.3		4	13		2.6	4	
810	1984 02 02	03 32 16	61.0	16.6		4					
811	1984 03 02	02 25 31	63.7	21.1		4					
812	1984 03 17	00 09 15	59.0	14.3		3					
813	1984 04 27	19 52 26	63.5	15.7		3.5	18		2.6	8	Macroseismic map in Kulhanek & Wahlström (1992).
814	1984 08 25	19 39 14	67.9	19.5		4.5					
815	1985 01 08	01 50 33	64.8	20.1		5	26		3.1	5	Macroseismic maps for events 815–822 in Kulhanek & Wahlström (1992).
816	1985 04 02	19 29 40	66.9	23.3		5	74		3.7	13	I_1=4, r_1=45.
817	1985 06 15	00 40 21	56.6	12.3		7	168		4.5	10	Uncertain felt area. Macroseismic map in Arvidsson et al. (1991).
818	1985 06 22	14 37 23	64.6	20.9		4	34		3.0	11	I_1=4, r_1=21.
819	1985 08 08	22 45 59	63.5	16.7		4	24		2.9	8	
820	1985 10 31	02 55 52	62.8	18.0		3	21		2.6	14	
821	1986 01 25	23 13 25	61.8	16.9		4	25		2.9	8	
822	1986 04 01	09 56 55	56.6	12.3		6	98		4.0	10	I_1=4, r_1=59. Macroseismic map also in Arvidsson et al. (1991).
823	1986 04 08	10 29 42	64.5	20.4		3					
824	1986 07 14	13 50 37	58.5	14.0		5.5	146		4.1	20	I_1=5, r_1=29. Macroseismic maps for events 824 and 825 in Kulhanek & Wahlström (1992).
825	1986 09 20	22 15 04	60.0	16.2		4	57		3.3	19	I_1=4, r_1=25.
826	1986 10 27	05 46 05	64.3	21.0		3.5					
827	1986 11 02	07 48 00	58.7	13.5		5	79		3.7	14	I_1=5, r_1=5; I_2=4, r_2=16. Macroseismic map in Kulhanek & Wahlström (1992).
828	1987 04 19	12 39 52	67.8	19.8		3.5					
829	1987 04 25	06 52 43	64.7	21.0		4	16		2.7	5	Macroseismic map in Kulhanek & Wahlström (1992).
830	1987 07 23	13 16 19	61.7	17.5		3.5					
831	1987 07 25	05 30 57	60.0	12.4		5	44		3.4	8	I_1=5, r_1=12. Macroseismic map in Kulhanek & Wahlström (1992).
832	1987 08 18	01 11 43	67.8	19.7							
833	1987 10 05	22 51 49	61.9	17.3		3					
834	1987 10 16	20 06 25	56.6	13.3							
835	1988 05 16	23 50 22	67.5	22.0		4	23		2.9	8	Macroseismic map in Kulhanek & Wahlström (1992).
836	1988 10 14	21 02 44	63.4	15.4		4					
837	1989 07 25	10 44 54	63.0	18.8		3.5					Macroseismic map in Kulhanek & Wahlström (1992).
838	1989 09 26	21 46 30	59.3	14.1		4					

Event no	Date yyyy mm dd	Origin time h m sec	Epicentre N (°)	E (°)	Quality	I_0	r_p (km)	A (km²)	M_M	h_M (km)	Remarks
839	1990 03 30	02 16 39	62.8	17.9		4					
840	1990 05 24	09 51 57	56.6	12.1		4					
841	1990 08 22	04 08 32	63.8	20.5		4					Macroseismic maps for events 841 and 842 in Kulhanek & Wahlström (1992).
842	1990 12 12	15 27 28	59.8	16.8		4.5	30		3.1	7	I_1=4, r_1=8.
843	1991 06 06	12 46 13	65.6	22.7		3					
844	1991 06 13	10 48 23	67.8	19.6		4					
845	1991 07 13	01 42 22	68.0	23.4		4					
846	1991 09 23	19 20 28	64.6	21.4		4	91		3.5	30	Uncertain felt area. Macoseimic map in Kulhanek & Wahlström (1996).
847	1991 10 28	16 21 29	64.0	19.9		4.5					
848	1991 11 08	01 20 35	58.1	15.0		4					
849	1991 12 15	15 18 49	62.2	17.6		5	41		3.4	7	Macroseismic maps for events 849 and 850 in Kulhanek & Wahlström (1996).
850	1992 01 10	07 46 36	67.2	23.6		4	35		3.1	12	
851	1992 04 16	10 21 43	64.2	20.6		4					
852	1992 05 22	23 06 28	63.9	21.2		4					
853	1992 08 11	20 43 19	64.5	21.0		4					
854	1992 11 03	00 12 46	65.0	20.3		4	26		2.9	9	Macroseismic maps for events 854 and 855 in Kulhanek & Wahlström (1996).
855	1993 01 05	10 19 35	64.7	16.9		5.5	113		4.0	15	I_1=4, r_1=48.
856	1993 02 15	08 44 25	64.3	20.9		4					
857	1993 04 11	20 14 59	59.9	15.2		4	28		2.9	9	Macroseismic maps for events 857 and 859 in Kulhanek & Wahlström (1996).
858	1993 11 12	19 54 36	59.8	12.6		5	47		3.4	9	
859	1994 02 11	00 11 20	59.4	12.9		3.5					
860	1994 09 30	23 32 40	64.0	20.9		3.5					
861	1994 11 30	00 08 05	61.0	17.8		4					
862	1995 02 01	21 33 00	58.4	13.6		5	39		3.3	7	I_1=4, r_1=17. Macroseismic map in Kulhanek & Wahlström (1996).
863	1995 02 22	12 42 09	62.5	17.6		2.5					
864	1995 04 17	13 48 13	64.6	20.6		5					
865	1995 10 04	20 49 42	56.8	12.2		6	103		4.1	10	Uncertain felt area. Macroseismic map in Kulhanek & Wahlström (1996).
866	1996 03 17	10 13 02	64.2	20.3		4					
867	1996 03 19	11 39 11	63.7	18.7		5	36		3.3	7	Macroseismic map in Holmqvist et al. (2007).
868	1996 03 28	20 56 07	57.4	16.4		4					
869	1996 09 24	19 42 08	63.3	15.3		4	37		3.1	12	Macroseismic maps for events 869–872 in Holmqvist et al. (2007).
870	1997 02 15	19 32 18	63.9	18.6		4	73		3.4	24	
871	1997 08 28	06 02 38	59.6	13.2		4	53		3.3	18	
872	1997 10 19	19 50 58	65.4	22.4		5					Uncertain felt area.
873	1998 10 12	04 57 29	63.1	18.6		3.5					
874	1998 11 16	01 49 03	60.8	17.3		4					
875	1999 04 08	03 19 33	66.6	23.4		4.5	13		2.7	3	Macroseismic maps for events 875–878 in Holmqvist et al. (2007).
876	1999 09 09	18 16 40	58.3	13.6		4	41		3.1	14	
877	1999 10 10	16 27 31	58.1	12.8		4	21		2.8	7	
878	2000 05 01	21 38 51	65.4	18.7		5	43		3.4	8	
879	2000 05 23	16 41 57	57.1	15.5		2.5					
880	2000 05 23	18 58 59	63.7	20.3		3					
881	2000 09 10	08 15 03	61.7	16.4		4.5	14		2.7	3	Macoseismic maps for events 881 and 882 in Holmqvist et al. (2007).
882	2000 11 29	22 07 54	59.0	11.2		5					
883	2000 12 20	14 16 01	57.3	13.3		4					

Geological Survey of Sweden
Box 670
SE-751 28 Uppsala
Phone: +46 18 17 90 00
Fax: +46 18 17 92 10
www.sgu.se

Uppsala 2011
ISSN 1103-3371
ISBN 978-91-7403-120-1
Print: Danagård LiTHO AB, Ödeshög