

Topic	Reports and bulletins
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## 1 General information

The results of seismogram analyses are published in reports, event lists, bulletins and data catalogues (called "products"), which are the basis of data exchange between seismological institutions, data centers and for informing the public. The parameter data, primarily source and/or phase parameter values, should be stored in a digital database and presented in a clear and uniform manner. The predefinition of an appropriate format depends on the requirements for the major usage of the product, for example whether a product is intended for further applications on a computer or for human readability. A description of the individual used format should be given as a reference or directly attached to the product.

The products contain source and/or phase parameters. Products which include source parameters represent the seismicity within a given time period for a pre-defined area and above a reliable magnitude threshold. These limitations have to be taken into account, in order to provide a high quality product which claims to be of a high degree of completeness and accuracy.

Comprehensive products based on networks of stations distributed world-wide are published by the World Data Centre for Seismology (WDC) (operated by NEIC, Golden, Colorado, USA) (<http://neic.usgs.gov>), the International Seismological Centre (ISC) (Newbury, England) (<http://www.isc.ac.uk>), and the International Data Centre of the Comprehensive Nuclear-Test-Ban Treaty Organisation (Vienna, Austria) (<http://www.ctbto.org>). The precision of these products is  $0.001^\circ < \Delta D < 1^\circ$ .

In general, the products of national data centers and observatories provide data for events within an area that is well covered by the station network used for the data analysis. How complete these products are depends on the spacing between the stations, which has a major influence on the magnitude threshold. An example of such products is given by the German local bulletin at the following internet addresses: <http://www.szgrf.bgr.de/bulletins.html> and [http://www.seismologie.bgr.de/catalog/catalogue\\_ger.html](http://www.seismologie.bgr.de/catalog/catalogue_ger.html). The precision of this product is  $0.001^\circ < \Delta D < 0.1^\circ$ .

Publication of teleseismic epicenter data from a regional network is useful only if the precision of the data is known or reliable calibration values for the correction of systematic location errors are available. Such a calibration for the GRF array/GRSN is used by the SZGRF for determinations of epicenters world-wide in its teleseismic bulletin (<http://www.szgrf.bgr.de/bulletins.html>). The precision in the distance range  $D = 13^\circ - 100^\circ$  is  $\Delta D < \pm 3^\circ$ .

However, if only phase parameters are available, it is also important for these to be reported to the international data centers, because these values are indispensable to improvement in the accuracy and comprehensiveness of their products. ISC, for example, compiles a data catalog

based on reported phase parameter values received from a number of observatories (<http://www.isc.ac.uk/collection.html>).

The information provided by a product also depends on how long after the event the product is to be published. For example:

## 2 Fast determination of epicenters of strong earthquakes

Information is provided for a single event immediately after it is detected and recognised as a strong earthquake or an earthquake which could cause substantial damage. The parameter values are obtained by automatic processing or manual analysis. They are published within minutes or hours after the event and are distributed mainly by e-mail or made available on the WWW. WDC publishes an event list with about 20 recent earthquakes, which is updated immediately after each new major event is determined (<http://neic.usgs.gov/neis/bulletin/bulletin.html>). This information is also available with the 'finger'-command: >finger quake@gldfs.cr.usgs.gov. For local and/or regional purposes in Central Europe, fast epicenter determinations are also provided by the European Mediterranean Seismological Centre (EMSC) ([http://www.emsc-csem.org/Html/ALERT\\_main.html](http://www.emsc-csem.org/Html/ALERT_main.html)) and the “Schweizerischer Erdbebendienst” (SED) (<http://seismo.ethz.ch/>).

## 3 Preliminary products

Information is provided for all routinely analysed events at regular time intervals, typically daily, weekly or monthly. This information may be subject to modification if phase readings from additional stations or arrival times of later phases are identified at a later stage of the analysis. NEIC publishes, for example, their preliminary products on a daily basis (<ftp://ghftp.cr.usgs.gov/pub/weekly/qedevents.txt>). Events within 7 days of real time are still being revised and republished as new data are received from contributing observatories. The SZGRF produces a preliminary event list of local, regional and world-wide seismic events with a time delay of 1 – 3 days. It is published on the WWW (<http://www.szgrf.bgr.de/seisevents.html>). Revised German products are the monthly distributed German local bulletin and the regional and teleseismic bulletin (<http://www.szgrf.bgr.de/bulletins.html>). All German products are based on the GRF array, GRSN, GEOFON and, for local events, on local station data.

## 4 Final products

The most complete and precise data on seismic events is published when all of the available data has been analysed. These products are published up to several years after the events. ISC, for example, distributes their final products (<http://www.isc.ac.uk/Products/>) on compact disc. These products are used for scientific studies at universities and research facilities. As a local example, in Germany, the “Data Catalogue of Earthquakes in Germany and Adjacent Areas” is published by the “Bundesanstalt für Geowissenschaften und Rohstoffe” (BGR).

### Additional references

USGS/NEIC, <http://neic.usgs.gov/neis/bulletin/bulletin.html>  
ORFEUS software library, <http://orfeus.knmi.nl/>