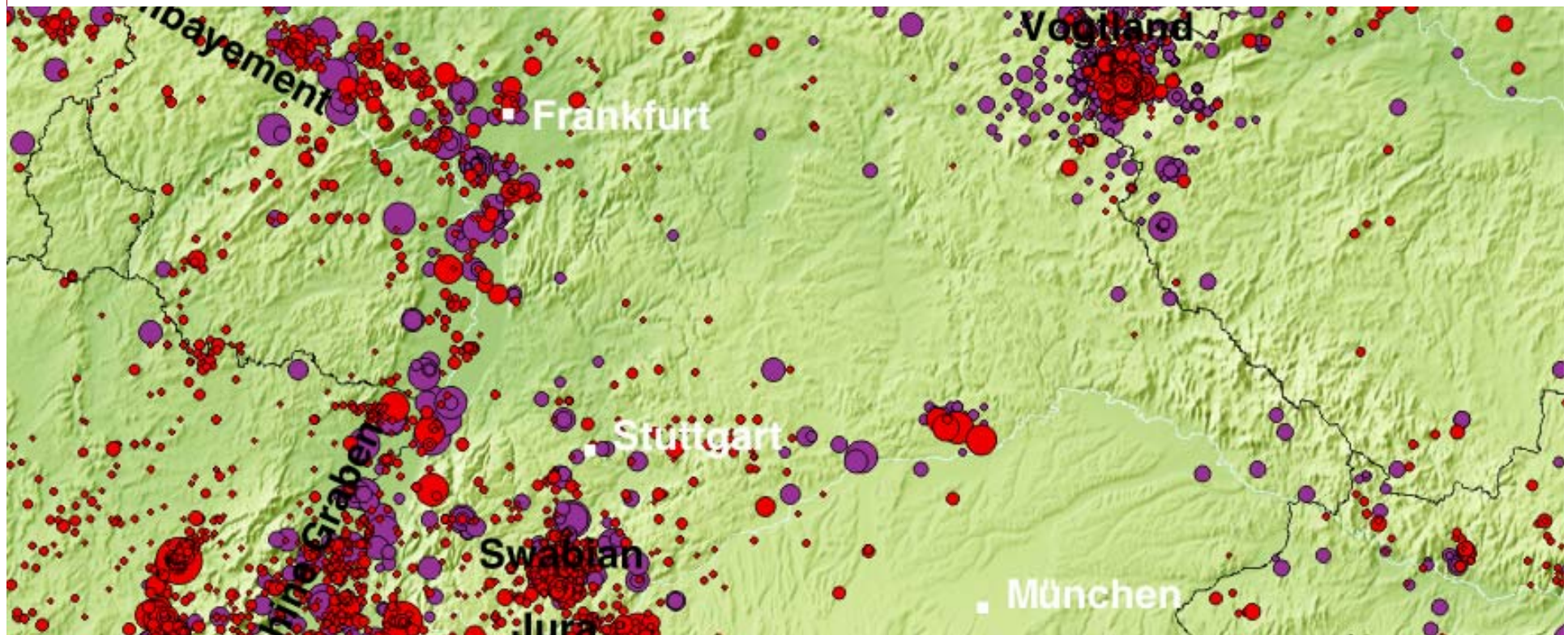


# Earthquake Database of Germany

Diethelm Kaiser, Gernot Hartmann

Federal Institute for Geosciences and Natural Resources (BGR), Hannover



Bundesanstalt für  
Geowissenschaften  
und Rohstoffe

GEOZENTRUM HANNOVER

## A short look back into a long history

### C H R O N I K

DER ERDBEBEN

UND VULCAN-AUSBRÜCHE.

MIT

VORAUSGEHENDER ABHANDLUNG

ÜBER DIE NATUR DIESER ERSCHEINUNGEN

VON

KARL ERNST ADOLF VON HOFF.

- Primary Sources

- Compilations

- von Hoff (1840, 1841)
- Lersch (1897)
- Gießberger (1922, 1924)
- Sieberg (1940)
- Sponheuer (1952)
- ...

DEUTSCHE AKADEMIE DER WISSENSCHAFTEN ZU BERLIN  
Mitteilungen  
des Deutschen Erdbebendienstes  
Herausgegeben von dem Zentralinstitut für Erdbebenforschung in Jena  
Direktor Gerhard Krumbach  
Heft 3

Erdbebenkatalog Deutschlands  
und der angrenzenden Gebiete  
für die Jahre 1800 bis 1899

von

W. Sponheuer

Mit 31 Textkarten

DIE ERDBEBEN  
BAYERNS

II. TEIL

Von

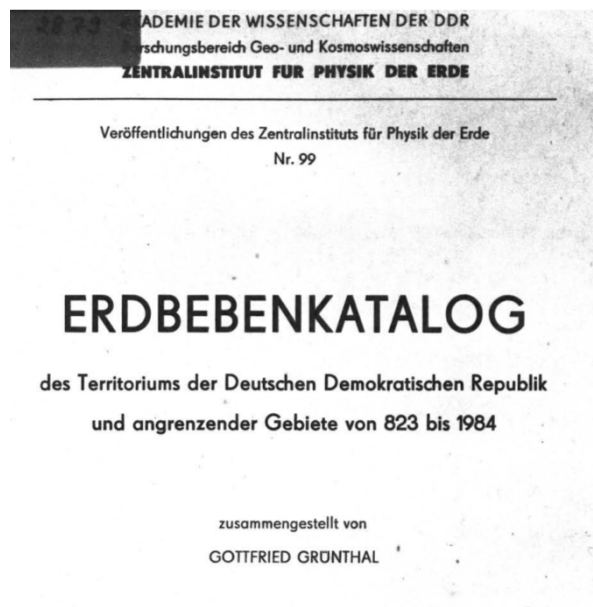
Dr. Hans Gießberger  
Professor



MÜNCHEN 1924

RICHARD PFLAUM VERLAG A.G.

# A short look back into a long history



## Parametric Catalogues

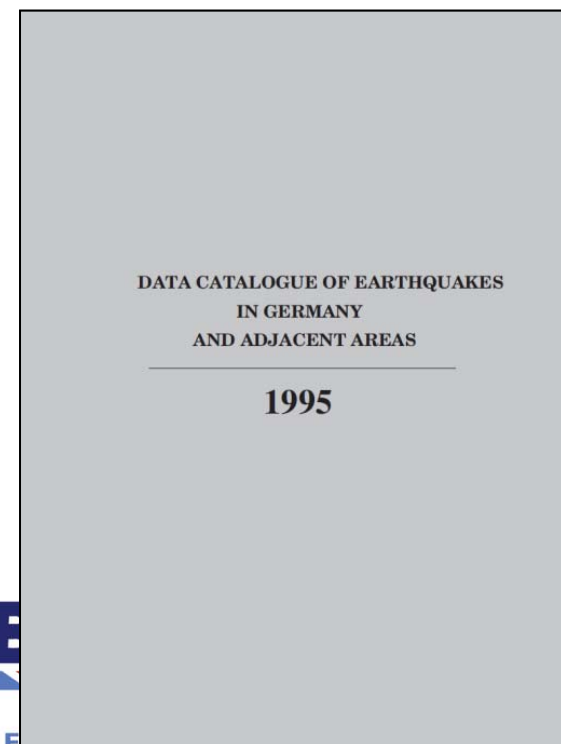
- Rothé & Schneider (1968)
- Leydecker (1986, 2011)
- Grünthal (1988)

## Bulletins

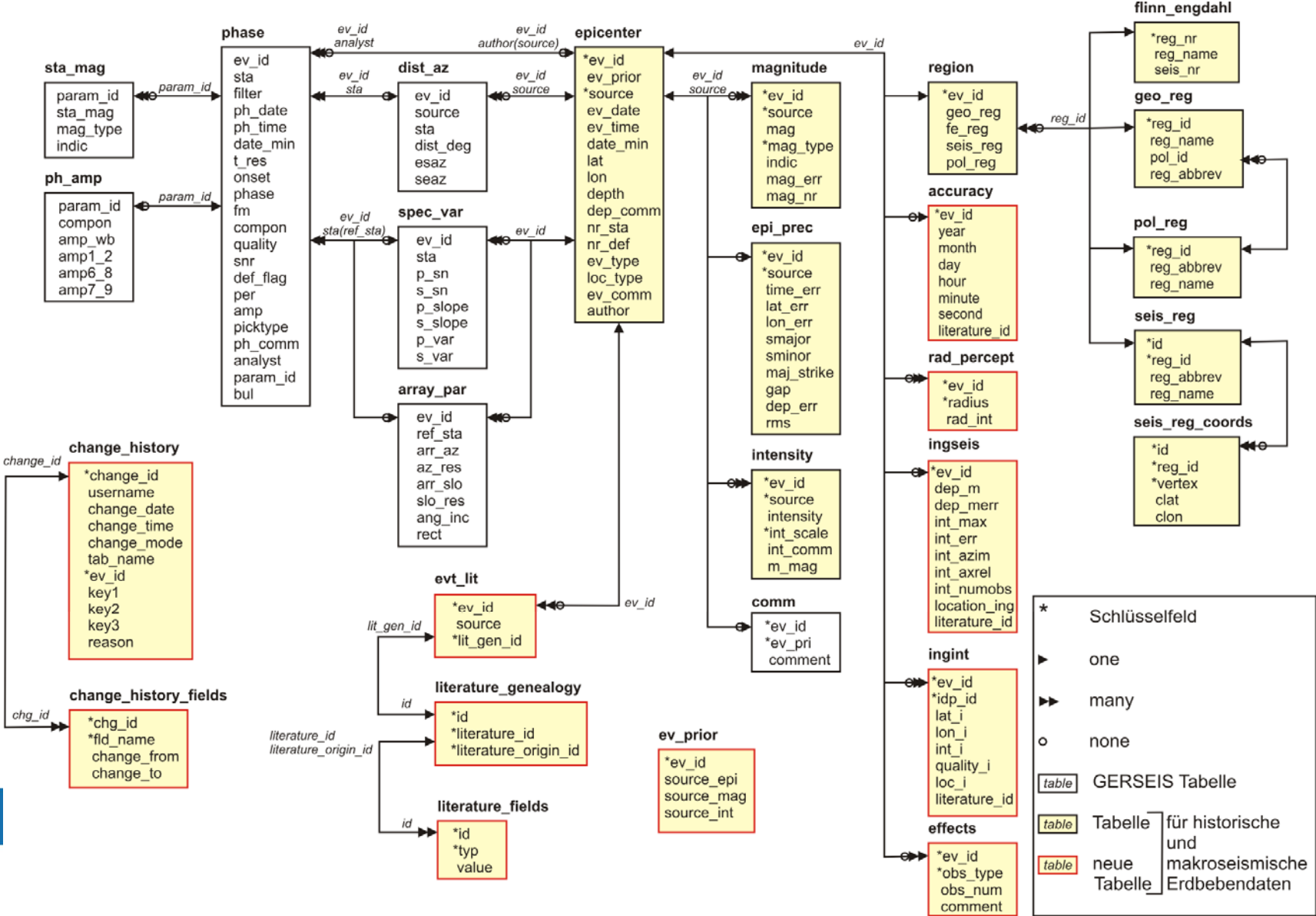
Earthquake Catalogue for  
Germany and Adjacent Areas  
for the Years 800 to 2008



Data Catalogue of  
Earthquakes in Germany and  
Adjacent Areas. Since 1995

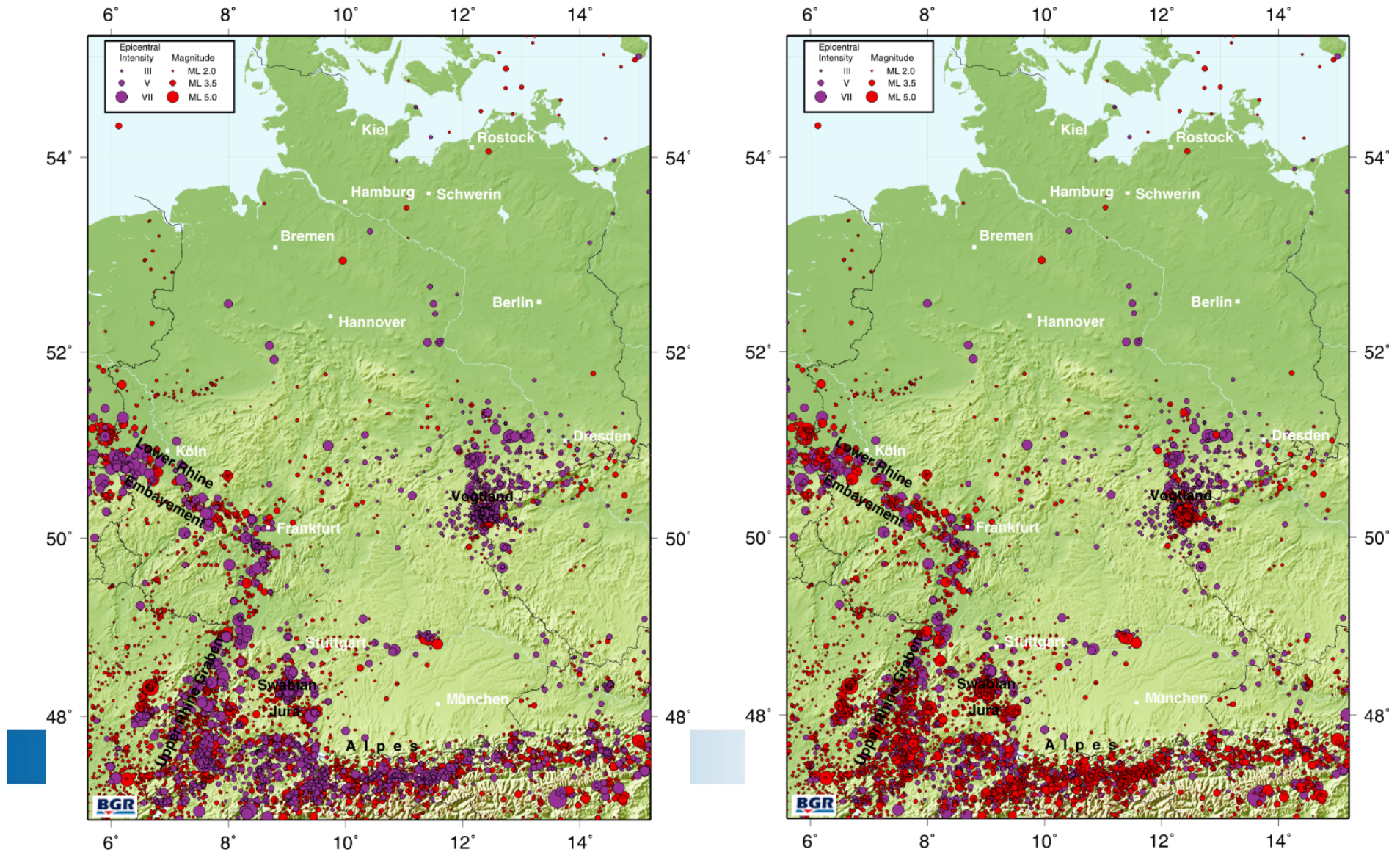


# Earthquake database GERSEIS for instrumental and macroseismic parameters



# Earthquake Database GERSEIS 800-2017

> 43,000 earthquakes



# Earthquake Database GERSEIS

## Main Parameters

Date, time

Epicentre coordinates, quality

Focal depth, quality and method

Magnitudes ML, Mw, Ms, mb, Md, Mk

Macroseismic data:

Intensity Scale (5480 MSK-1964, 483 EMS-98, 262 Mercalli-Sieberg, 2 MCS)

Epicentral or maximum intensity, quality

Isoseismal radii, III-VIII

Effects

Type

Region

Reference, Source

*Priority*

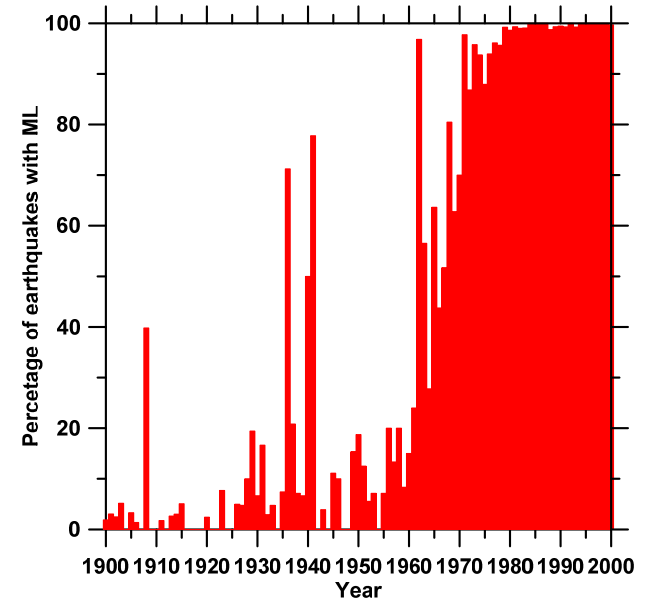
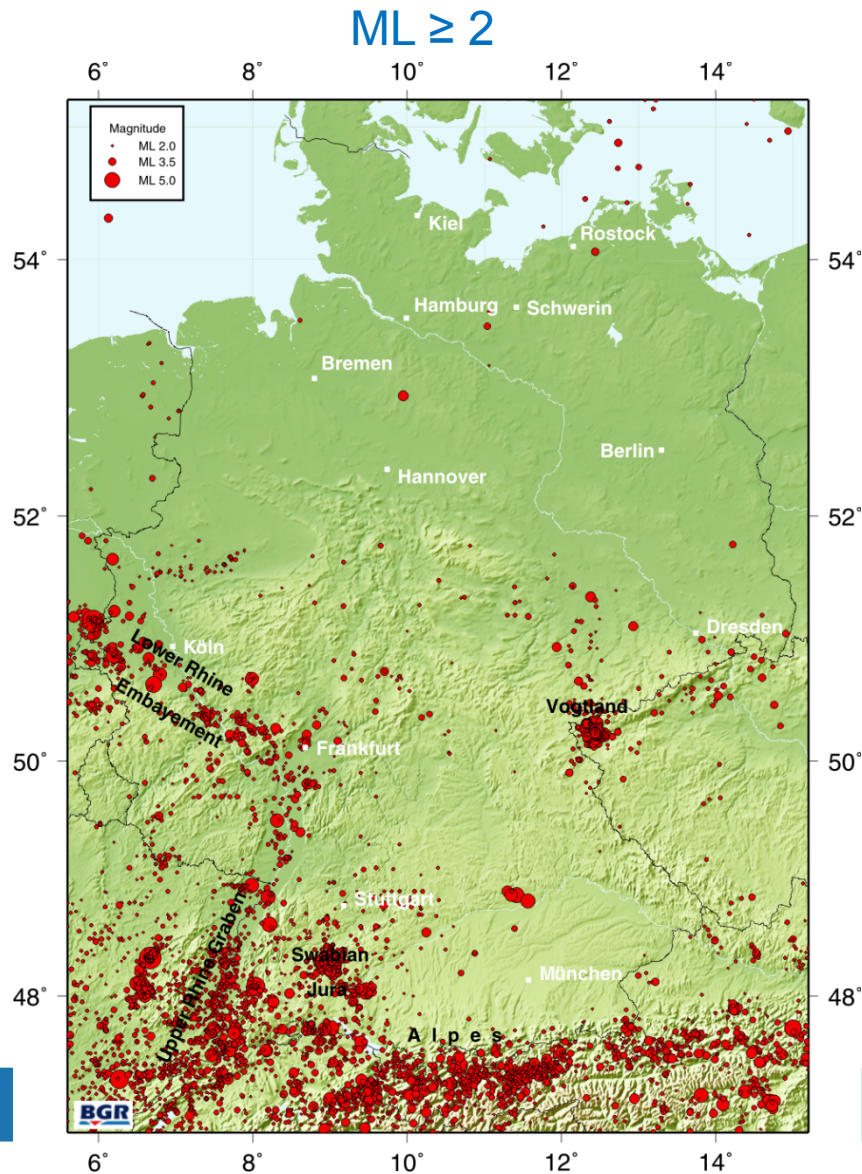


Bundesanstalt für  
Geowissenschaften  
und Rohstoffe

GEOZENTRUM HANNOVER

# Earthquake Database GERSEIS

## Magnitudes

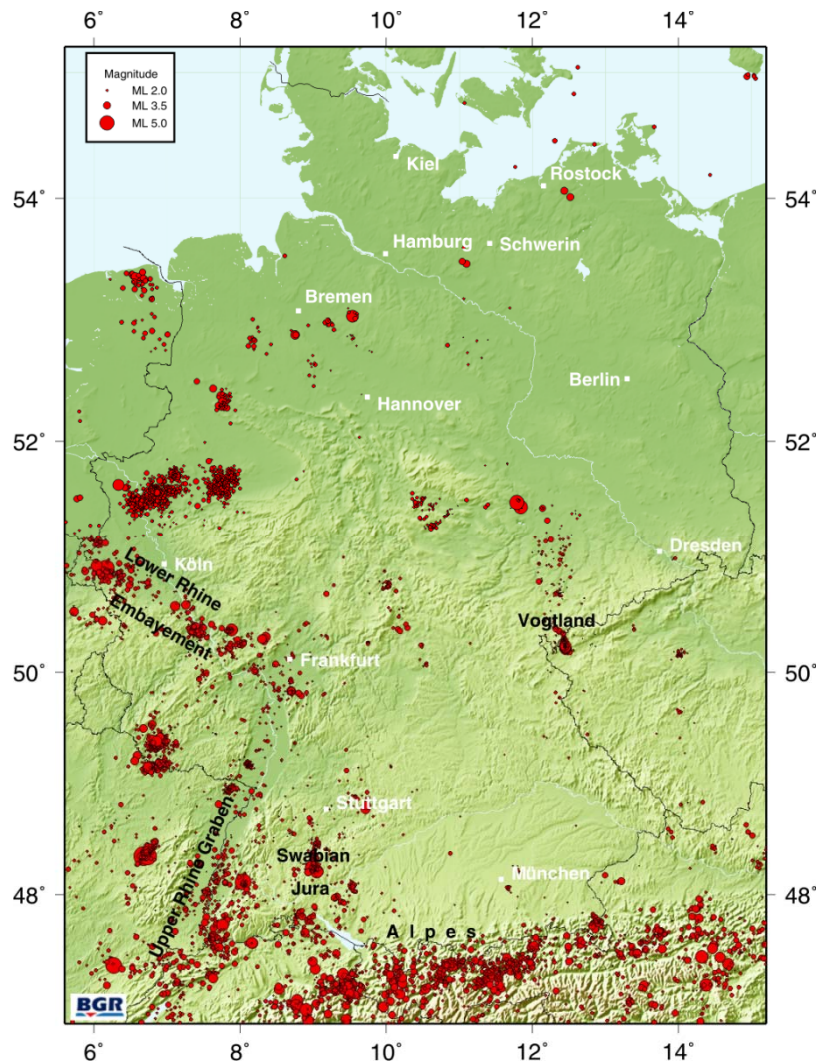


Magnitude	# earthq.
Mw	15
ML	43 510
ML $\geq 2$	22 058
ML (BGR/SZGRF)	26 510
ML (BGR/SZGRF) $\geq 2$	12 334
mb	2 384
Ms	82
Md	6 848
M ?	4 581
MLh	1 321
MLv	4 583

en

R

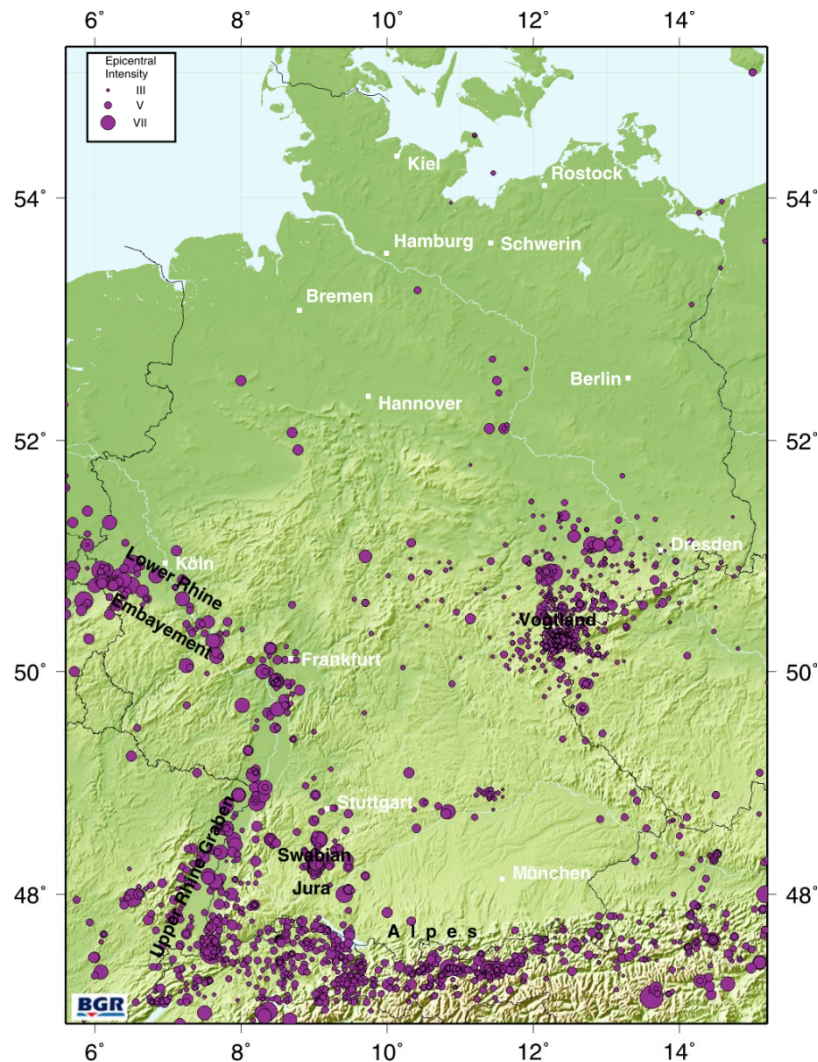
# Magnitudes



**Homogenously determined  
ML (BGR/SZGRF) since 1995  
for 11,000 earthquakes.**



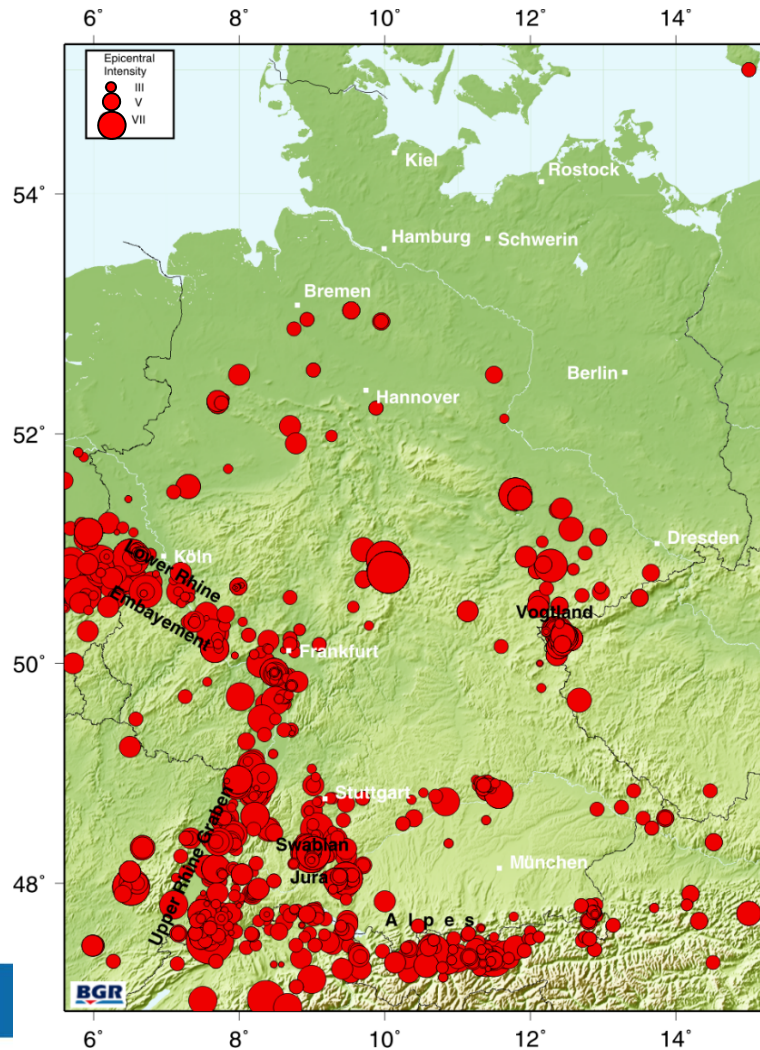
## Macroseismic data



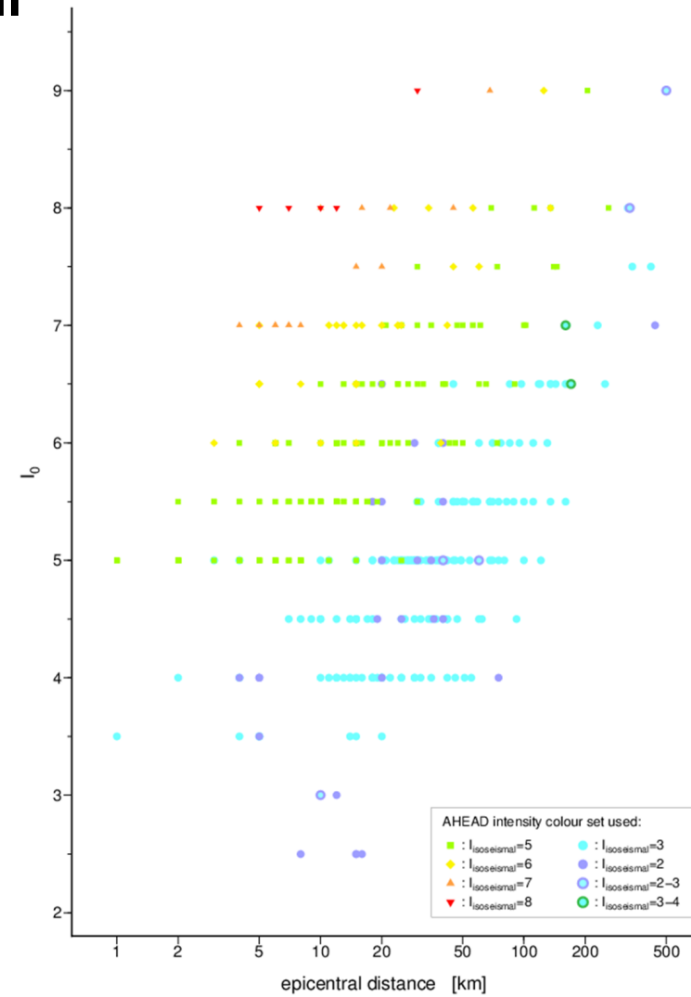
- 6,700 earthquakes with macroseismic parameters
- mostly epicentral intensity
- epicentral intensity most common parameter for earthquakes < 1970

# Macroseismic data

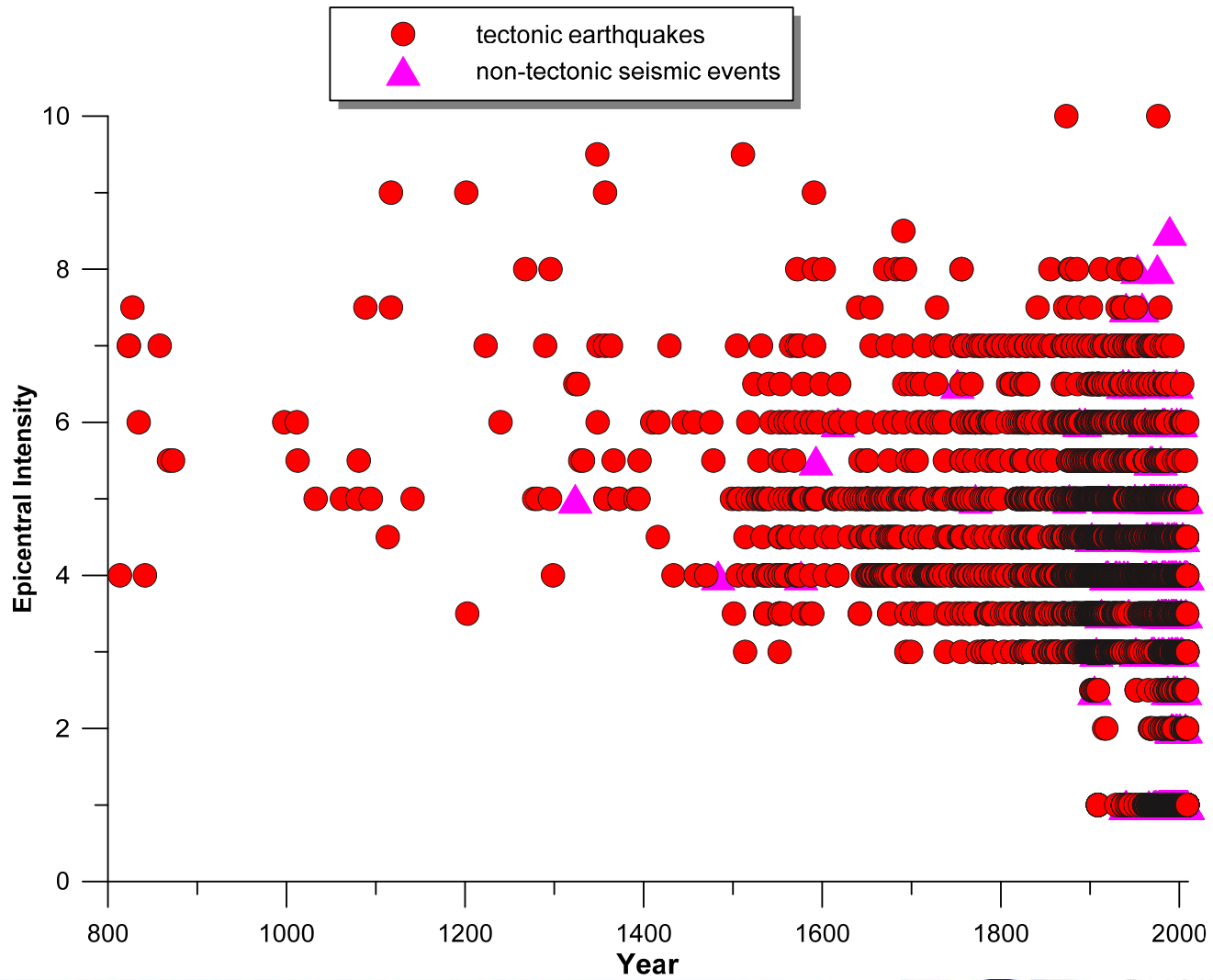
## Isoseismal radii



III	1078
V	148
VI	41
VII	22
VIII	8



# Macroseismic data



# Accessibility of GERSEIS

## Web map service (WMS)

BGR Productcenter <https://produktcenter.bgr.de>

The screenshot displays the BGR Productcenter website interface. At the top left is the BGR logo and the text 'Produktcenter'. To the right is the logo of the Bundesministerium für Wirtschaft und Energie and a short description of the institution. A navigation bar contains links for 'FAQ', 'KONTAKT', 'IMPRESSUM', 'DATENSCHUTZERKLÄRUNG', 'GEORSS', and 'HILFE'. On the left side, there is a search menu with options like 'Produktsuche', 'Kategorien', and 'Karten'. The main content area shows a search result list titled 'Ergebnisliste' with 50 of 62 results. The first result is 'Deutscher Erdbebenkatalog' (German Earthquake Catalog), which is a dataset and also available as a WMS. The second result is 'Earth Magnetic Anomaly Grid 1:35,000,000 (2 arc-minute resolution) (EMAG2)'. The third result is 'Hubschrauber-Elektromagnetik (HEM)'. On the right side, there is a map of Europe with a yellow and blue color scheme, and a toolbar with various map navigation icons.

# Accessibility of GERSEIS

Interactive query, map display, and data download  
BGR Geoviewer <https://geoviewer.bgr.de>.

**BGR Geoviewer** Basemap: Topo Language: English

Placename global

Query Geodata

Links to BGR

Themes

- Deselect all
- Boundaries and Places
- Soil
- Geology
- Geophysics
- Groundwater

GERSEIS

- Seismometerstationen
- Ereignis aktuell
- Ereignisse letzte Woche
- Ereignisse letzter Monat
- Ereignisse letztes Jahr

## A short look into the future

- Build macroseismic database
- Determine magnitude values ( $M_w$ ) for all earthquakes from instrumental and macroseismic data
  - Moment tensor inversion
  - Coda waves
  - Relationships with other magnitudes
  - Macroseismic data points
  - Iseismal radii
  - Epicentral intensity
- Investigate important historical earthquakes from their original sources