EuroDEM

Pan-European Height Dataset at Medium Scale

Specification

- Version for EuroDEM 2023 -

Product Manager: EuroGeographics AISBL

Production Manager: Federal Agency for Cartography and Geodesy (Germany)

OME2

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1.0a	2. April 2008	Michael Hovenbitzer	
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Change history: Specification EuroDEM

Version:	Date:	Author:	Comments:
EuroDEM 2023	10.10.2023	Sebastian Claus, Regine Elling, Victoria Persson, Angela Baker	Complete revision of the product description to create the specification

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1 Scope

This document defines the content and structure of European height dataset at regional level of detail based on requirements set at the European level. It facilitates the production of a seamless[1] and harmonised dataset that is produced in cooperation by the National Mapping and Cadastral Agencies (NMCAs), using the official national databases.

The product defined is referred to as EuroDEM.

The purpose of these specification is to provide a description of the content, accuracy, data format and design philosophy of EuroDEM. Conformance to this specification will insure uniformity among all NMCAs engaged in a co-coordinated production and maintenance program for the product range.

1.1 Information about the specification

The basis for this specification is the Product Description, which refers to EuroDEM 1.0, released in April 2008. This document has been designed according to ISO 19131 (Geographic Information – Data product specifications) to provide all information needed to use the EuroDEM product.

The document has been checked before issuing it, and every effort has been made to ensure that the contents are accurate. If you find an error, omission, or have a suggestion about how it can be improved, please contact EuroGeographics at the address under chapter 1.3 Contact Information.

If you have problems using EuroDEM or have any questions about the dataset or its use, please also contact EuroGeographics.

1.2 Normative references

The documents listed in this section have served as a reference for concepts applicable for this specification.

ISO 19115	Geographic Information – Metadata
ISO 19131	Geographic Information – Data product specifications
ISO 19157	Geographic Information – Data quality
ISO 3166	Codes for the Representation of Names of Countries

1.3 Contact Information

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[1] The term "seamless" means that there are no gaps between graphical objects initially derived from different sources.

1.4 Product description

EuroDEM is a pan-European height dataset in a scale of approximately 1:100 000. This digital dataset describes the terrain relief (bare earth) of Europe, consisting of a regularly distributed terrain grid. Using the official national databases EuroDEM was produced in cooperation by the National Mapping and Cadastral Agencies (NMCAs) of Europe. It is seamless and harmonised at the borders of the countries.

Data is produced using ESRI Software.

1.5 Purpose

EuroDEM is ideal for a wide range of uses, including ortho-rectification of imagery, watershed analysis, flight simulations, cartographic publishing and so on, or in combination with other datasets for rendering three-dimensional visualisations, for instance.

1.6 Geographic extent

Coverage NMCA data:

> Austria, Belgium, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France including Monaco, Germany, Greece, Hungary, Iceland, Ireland, Italy including San Marino and Vatican City, Latvia, Lithuania, Luxembourg, Malta, Moldova, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain including Andorra and Gibraltar, Sweden, Switzerland including Liechtenstein, United Kingdom (Northern Ireland)

Coverage MERIT data:

> Albania, Bosnia and Herzegovina, Bulgaria, Kaliningrad, Kosovo[2], Montenegro, North Macedonia, Romania, Serbia, United Kingdom (Great Britain)

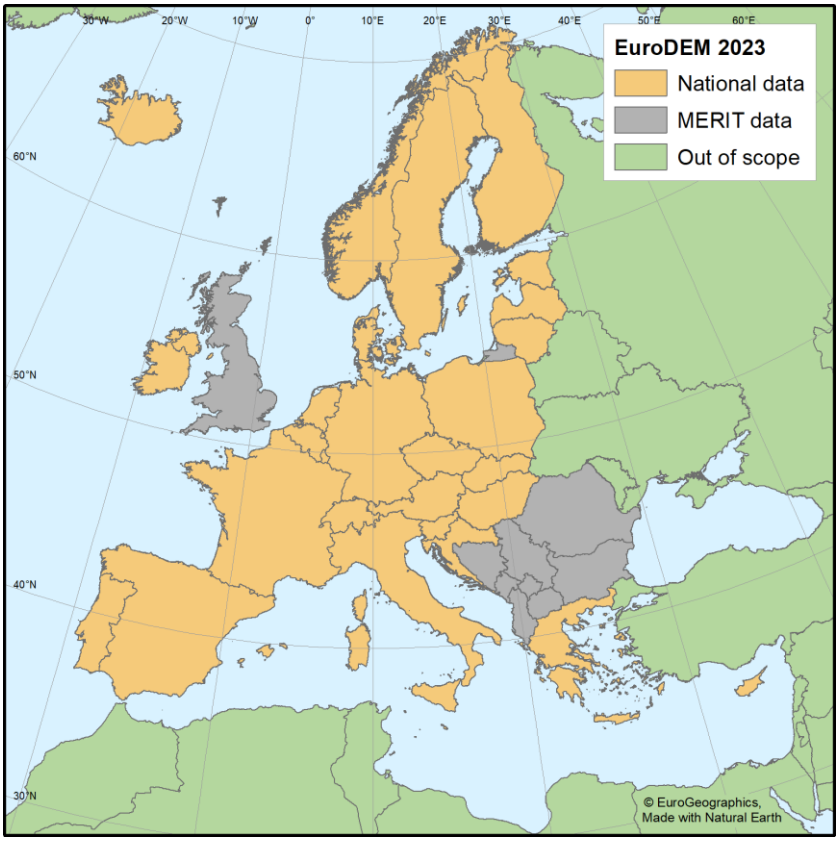


Figure 1: Geographic extent of EuroDEM (overview)

[2] Referred to throughout in the context of United Nations Security Council resolution 1244 [1999]

1.7 What you need to use EuroDEM

Hardware	EuroDEM can be used with any computer platform from a PC to a mainframe. There are no specific hardware requirements for managing EuroDEM data.
Software	EuroDEM is a dataset and is delivered without a user interface for displaying or analysing it. Whatever you want to do with the data, you need to have appropriate software. EuroDEM can be used directly with the ESRI ArcGIS system and may also be imported into other GIS software packages.
Spatial reference	See chapter 3

2 Data content and structure

Raster data (GeoTIFF)

The data is stored in these proprietary formats with integer values of the heights (which means height resolution in meters).

3 Reference systems

Geodetic Datum: ETRS89

Vertical Datum: European Vertical Reference System (EVRS)

Coordinate System: Lat/Lon in arc seconds

Resolution of the height: Height value in meters (Integer value)

Geographic Coordinate System: ETRS89

- Datum: D_ETRS_1989
- Spheroid: GRS_180
- Semi major Axis: 6378137
- Semi minor Axis: 6356752.3141403561

Note: In practice it is considered WGS84 = ETRF89 = ETRS89 = GRS80.

4 Data quality

The quality of the product depends on the original dataset that were delivered by the country. Information can be found in the linage file of the country.

The MERIT DEM is an openly accessible DEM. It was used to fill areas, for which national data was either not available or the permission of use was not granted by the NMCAs, see chapter 1.6. The original data was projected, to fit the specifications of the EuroDEM.

Category:	Elevation data (‘bare earth’ heights)
Coordinate system, horizontal:	Geographical coordinates in seconds (longitude, latitude) and based on the ETRS89 spatial reference system, (which corresponds to the WGS84 reference system).
Coordinates system, vertical:	Height values in meters based on EVRS
Scale:	approximately 1:100 000
Vertical accuracy:	8 – 10 meters
Grid width:	2 arc seconds (approximately 60 m in meridian direction, E/W dimensions vary according to the latitude)
Type of spatial representation:	Raster

5 Data capture and production

The production process consists of the following stages:

- Collecting the national datasets.
- Transforming the elevation data into a uniform projection and height system.
- Eliminating differences resulting, for example, from different dates and methods of data acquisition, in overlaps at national boundaries.
- Resampling of the elevation data to a uniform grid width and subdividing into tiles.
- Controlling data quality of the end product using check points of levelling networks.
- Changing format and tiles with respect to the EuroGeographics' licensing requirements.

6 Maintenance

The acquisition date differs between national datasets (mostly from 1990 to 2007).

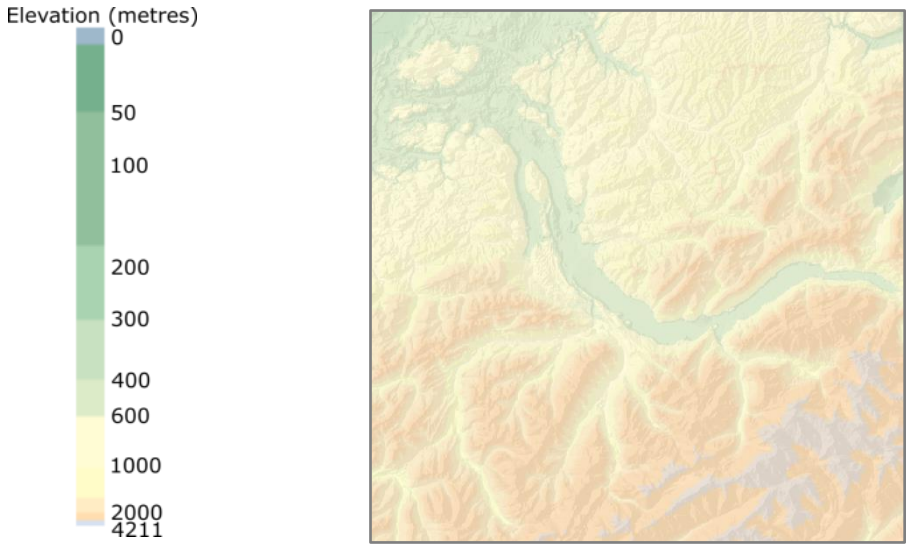
It is currently a static dataset.

7 Portrayal

7.1 Cartographic projection

EuroDEM is available in arc seconds (ETRS89-WGS84) and suitable for the whole of Europe.

7.2 Map legend and map example



8 Delivery

8.1 Product publication

For more information on EuroDEM visit the Open Maps for Europe website:

https://www.mapsforeurope.org/datasets/euro-dem

8.2 Product delivery formats

The dataset can be provided as a download (GeoTIFF) or consumed as a web map service (WMS).

8.3 Distribution media

Download or web service via Open Maps for Europe website:

https://www.mapsforeurope.org/

9 Metadata

The metadata files are in accordance with the ISO19115 standard.

There is one metadata file in XML format describing the entire dataset and to find the dataset in the European Data Portal.

The metadata for the country datasets are provided in Excel and Word format. The national level datasets contain information on data quality and the production process (source, producer organisation, production date, reference date of data, accuracy, completeness and consistency).

9.1 File naming convention of metadata

Each country contribution is identified by the ICC code of the producing country (ISO 3166 two-character country code), with the exception of Northern Ireland which has the code “NI”.

Refer to: https://www.iso.org/obp/ui/#search/code/

Metadataset Coding	Country contribution description
AL	Albania
AT	Austria
BA	Bosnia and Herzegovina
BE	Belgium
BG	Bulgaria
CH	Switzerland including Liechtenstein
CY	Cyprus
CZ	Czechia
DE	Germany
DK	Denmark
EE	Estonia
ES	Spain including Andorra and Gibraltar
FI	Finland
FR	France including Monaco
GB	United Kingdom (Great Britain)
GR	Greece
HR	Croatia
IE	Ireland
IS	Iceland
IT	Italy including San Marino and Vatican City
KO	Kosovo
LT	Lithuania
LU	Luxembourg
LV	Latvia
MD	Moldova
MK	North Macedonia
MT	Malta

Metadataset Coding	Country contribution description
NI	United Kingdom (Northern Ireland)
NL	Netherlands
NO	Norway
PL	Poland
PT	Portugal
RO	Romania
RS	Serbia and Montenegro
RU	Kaliningrad
SE	Sweden
SI	Slovenia
SK	Slovakia

The naming convention for the metadata is:

- <Metadataset Coding>_EuroDEM_Metadata.xls
- <Metadataset Coding>_EuroDEM_Lineage.doc

Example:

- AT_EuroDEM_Metadata.xls
- AT_EuroDEM_Lineage.doc

10 Additional information

No additional information.