



Bundesamt für
Kartographie und Geodäsie

GeoDatenZentrum

Topographic

Spatial Base Data Germany



Nature of the task

Official geotopographic spatial base data

Acquiring, documenting and providing and maintaining up-to-date information on the topography of the earth's surface in accordance with specific user needs existing in the fields of administration, economy, science, education, and national defence, constitutes a legal order to be performed by the surveying authorities of the Länder (states) of the Federal Republic and – on the basis of administrative agreements between the Federal Government and the Länder – by the Bundesamt für Kartographie und Geodäsie (BKG) (Federal Agency for Cartography and Geodesy).

Official geospatial base data having been provided until a few years ago mainly in the form of the analog Topographic Map Series, digital products and online services are now dominating this sector.

By means of the digital data of the “Amtliches Topographisch-Kartographisches Informationssystem” (ATKIS[®]) (Authoritative Topographic-Cartographic Information System) the German National Survey provides information about our living space and supplies a spatial reference for expert data and technical information systems of the most different areas of use.

The GeoDatenZentrum

The GeoDatenZentrum (GDZ), Geodata Centre of the Bundesamt für Kartographie und Geodäsie constitutes a central distribution and information service for the provision of official topographic geospatial base data covering the territory of the Federal Republic of Germany.

The GeoDatenZentrum's tasks comprise

- the verification, harmonization and provision of geospatial base data of the Länder (states) at the scales 1 : 5.000 to 1 : 100.000 in the case of Länder-crossing requests for data,
- the user-specific editing and distribution of the datasets generated by BKG itself at the scale 1 : 200.000 and smaller as well as
- the operation of a centrally organized information service (meta information system) on the availability and the quality of analog and digital geotopographic data of Germany within the frame of an interlinked

Provision of services

The following services are offered:

- a **central service** with comprehensive information about the availability, quality, applicabilities, terms and conditions of use and purchase of the official geospatial base data,
- **harmonization** of the geodatasets of the individual Länder (states) thus facilitating purchase and distribution of Länder-crossing datasets,
- **short-term** provision of the data in usual standard formats, different cartographic projections and geodetic reference systems as well as in any selections with respect to content and desired spatial segments,
- supply of the data on **different media** such as CD-ROM, DVD, DAT or **online** via the internet,
- the offer of manifold **online services** such as coordinate transformations or Germany-wide interactive maps including the search for place names and other geographic features,
- comprehensive online offers for **downloads** of test data, documentations, map sheet systems, tile indexes et al.,
- **user-oriented counselling** and provision of aids as well as custom-designed data editions as special services.

All online services and a lot of more extensive information are available to you under **www.geodatenzentrum.de**.

*Section from
internet
geographical
names search*



Product types

Official topographic geospatial base data are maintained and distributed by the GeoDataCentre throughout Germany in manifold specifications, which means mainly datasets of ATKIS within the scale range 1 : 5.000 and 1 : 1.000.000.

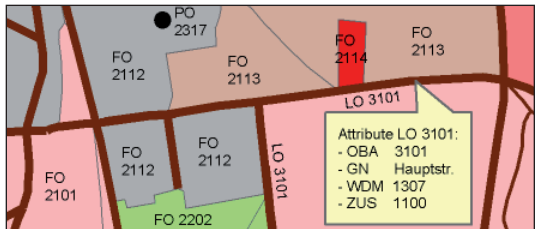
The data in two forms are basically available as

- object-structured vector data and
- pictorial raster data.

Vector data

describe the landscape by means of digital topographic data through single points or sequences of support points forming lines or surfaces. By connecting this geometry with appropriate factual attributes objects are generated. Geoinformation Systems (GIS) allow visualization, search and complex evaluation of these data.

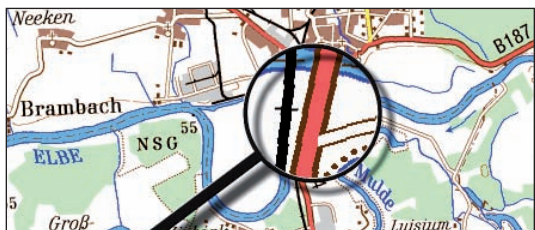
Point, line and surface objects (PO, LO, FO) with indication of their ATKIS feature type and further attributes



Raster data

are presently generated by the scanning of map material and show the objects pictorially, the overall area being divided into a regular grid of image points (pixel). They are often derived from the Digital Landscape Models (DLM) in an automation-assisted manner.

Section from a raster data image with enlargement



Vector data

For the purpose of a uniform description of the territory of the Federal Republic of Germany Digital Landscape Models and Digital Terrain Models, at different information density levels, are established and provided with an up-to-date status by the German National Survey within the frame of ATKIS®. Furthermore, the administrative boundaries and Geographical Names of Germany are updated and published by BKG in separate datasets.

Extent and quality of the data are in each case geared to the classical map scales which, as a rule, can be inferred from the product names (see below).

Digital Landscape Models (DLM)

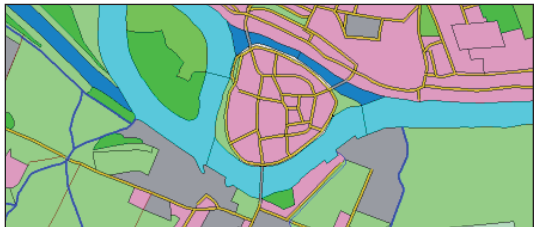
The DLMs describe the topographic landscape objects in the form of vector data. The objects are attributed to a certain object type and characterized by their spatial position, geometric type, descriptive attributes and relations to other objects (relations). Throughout Germany each object has been assigned a unique identification number (identifier). It is laid down in the ATKIS® object type catalog which feature types are contained in a DLM and how the features are formed. (Download under www.adv-online.de/geotopographic/atkis/dlm/download).

The following DLM are available:

- **Base-DLM** (scale 1 : 5.000 – 1 : 25.000)
- **DLM250** (scale 1 : 250.000)
- **DLM1000** (scale 1 : 1.000.000)

The DLM50 is presently being set up.

*Example of a
screen graphics
for the
Base DLM*



Geographical Names (GN)

Digital list of the names of communes, parts of communes, landscapes, mountains, rivers and lakes:

- **GN250** (ca 61.000 entries)
- **GN1000** (ca 13.000 entries)

Administrative Boundaries (AB)

Uniform dataset of the administrative units of Germany down to the communal level:

- **VG250**
- **VG1000**

Digital Terrain Models (DTM)

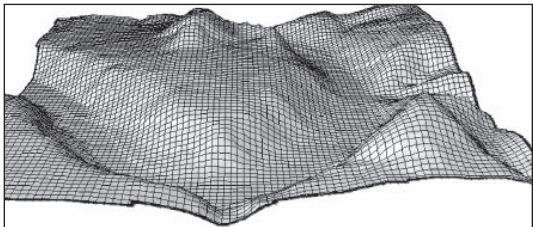
Digital terrain models (DTM) constitute height values arranged in regular grids, which describe the terrain forms of the earth's surface.

The following datasets are available throughout Germany:

- **DGM50-D** (grid width 25 m / 50 m)
- **DGM250** (grid width 200 m)
- **DGM1000** (grid width 1000 m)

A high-resolution DGM5 is partially and at different quality levels available in the different Länder (states).

*3D representation
of a section from
the DGM50-D*



Raster Data

Digital Topographic Maps (DTM)

The Topographic Maps of the German National Survey are in the scale range 1:25 000 to 1:1 000 000 available at an area-wide level as raster data and are designated as Digital Topographic Maps (DTM).

Topographic maps describe the most important natural and artificial objects of the earth's surface and the terrain forms. They are edited as the direct result of the topographic National Survey by the Land (state) survey authorities or by the Bundesamt für Kartographie und Geodäsie for the respective area, which means

- at an area-wide level,
- at different scales,
- in a preset map sheet division and
- in a largely uniform design (contents, character language, colouring).

The following Digital Topographic Maps are maintained by the GeoDataCentre on a Germany-wide level:

DTK25	DTK200
DTK50	DTK500
DTK100	DTK1000

These raster data are available

- in **resolutions** of 100 to 320 pixel/cm,
- as a **colour-coded overall layer** containing the complete map face,
- with the **map contents divided** into several colour-coded or black-and-white layers (such as transport, hydrography, vegetation, ...)
- as **georeferenced single sheets** or as **seamless dataset**.

Online Services

Central Information Service – Meta-Information System (MIS)

Online services are server-based programs which can be accessed via standardized internet protocols and interfaces. Many browser supported web applications are in the background based on online services, which may also be tied into local applications.

The most important web applications with the pertinent GDZ online services are presented in the following.

Information Service – Metainformation System

Metadata are descriptive data referring to the datasets proper. The metadata of the official spatial base data describe their

- contents,
- data structure,
- georeferencing,
- geographical extent,
- quality and topicality,
- costs, terms and condition of use,
- distribution and possibilities of contact.

These metadata are maintained and presented decentrally by the responsible Land (state) survey authorities and by BKG within the frame of the common metainformation system of the GDZ. For the purpose of search engines the metadata are supplied as standardized online service (*Web Catalog Service*).

Interactive Maps and Map Services

In the GDZ portal you will find a number of interactive maps of Germany, among which:

- the small-scale maps DTK200, DTK500 and DTK 1000,
- the Geographical Names GN250 or
- the current administrative boundaries VG1000.

The geodata are provided via so-called *Web Map Services* (WMS), which can also be addressed directly from local

applications, provided that these applications support accesses in accordance with the standards of the Open Geospatial Consortium (OGC), which means that they may also combine their local geodata online with those of the GDZ.

Apart from the data already specified above WMS are, among others, also available for:

- the Digital Orthophotos of Germany (DOP),
- the large and small-scale raster data DTK25, DTK50 and DTK100 or
- the Digital Landscape Models (DLM).

Object-structured geodata services

Standardized *Web Feature Services* (WFS) allow access to individual vector-based geobjects. Among others, by the GDZ are provided services for the Geographical Names of Germany, georeferenced addresses as well as the Digital Landscape Models. The web application “Geographical Name Search” shows the operating mode of this Service through a transparent representation of the standardized enquiries made to the service and the answers of the latter.

Online coordinate transformations

Which georeference networks (coordinate systems with reference to the earth) are commonly used in Germany? The GeoDatenZentrum gives an overview of the systems together with the most important hints on their use.

For the transformation of smaller point masses between these systems you may refer to our online transformation, conversions being carried out with an accuracy meeting cartographic requirements of the scale range 1 : 25.000 and smaller.

Download Services

You may make use of test data for any products and product specifications distributed by the GDZ, which have been edited in precisely the same way as the data proper. For instance, you may in principle fully test the structure of tile systems for raster data and how to deal with them in your

geoinformation system before placing an order with the GDZ. Also, you may analyze the Digital Landscape Models as to their object structure and searchability and clarify beforehand the demands on your visualization system. To be able to examine the simultaneous employment of different products all data are offered for harmonized areas.

Besides the description given in the meta information system each product is additionally explained by uniformly designed documentations, which can be directly viewed or downloaded as Acrobat Reader documents (PDF).

All map sheet and tile indexes of the GDZ are for each relevant product available as PDF files and, in addition, as geodata in the form of SHAPE files, which can be integrated into geoinformation systems for the purpose of evaluation and for data organization.

Furthermore, we offer freely available software for download, which also includes special auxiliary programs for the user-specific restructuring of file names and structures of indexes.

Online Ordering

The GeoDatenZentrum offers in connection with the distribution of official geospatial base data a comprehensive service in all matters. The convenient online ordering system gives transparent insight into the data. The different parameters of the order such as contents, georeferencing, format, portioning of the data, area etc are queried in a clear manner and data volumes as well as the fees for data use determined. In this context the rich graphics choice of the areas for selection, a flexible navigation in the ordering process and the transparent calling up of all former orders, e.g for the purpose of updates, must be pointed out.

Online Distribution

Beyond that, Federal institutions may immediately load the data online from the GeoDatenZentrum's servers. They obtain the relevant data on the basis of an administrative agreement between the Federal Government and the Länder (states).

Data Distribution

Tailored to the orderer's specific needs the data are edited and distributed as follows:

- in manifold spatial sections (map sheets, standard tiles, freely rectangular surfaces, arbitrary surfaces) and for the whole territory of the Federal Republic of Germany, respectively,
- in any selections with respect to contents (complete products or selected object spaces or raster image layers),
- in different cartographic projections (Gauss-Krüger, UTM, Lambert, ...) and geodetic reference systems (WGS 84, ETRS89, Potsdam Datum, ...),
- as homogenized datasets in the usual data exchange formats ArcInfo-COVERAGE, ArcInfo-EXPORT, ArcInfo-SHAPE, DXF, TIFF-GROUP4, TIFF-LZW, etc,
- on the data carriers CD-ROM and DVD as well as online via the Internet and also per email.

Sales and Marketing

Licenses and royalties/user fees

The topographic geospatial base data distributed by the Bundesamt für Kartographie und Geodäsie (Federal Agency for Cartography and Geodesy) are protected by law. Distribution and supply of these data therefore require from the customer acknowledgement of the terms and conditions of use.

These terms provide, among others, that

- the use of the relevant data is restricted to the authorized and intended purpose of use,
- the data must be protected against any unauthorized access by third parties,
- dissemination of original data or reworked data is allowed only if a special license is obtained beforehand.

As a rule, basic or multi-station fees are charged for distribution and use of the topographic spatial base data. Additional exploitation fees may have to be paid for any data, maps and products derived therefrom, which have been reproduced, published, sold or disseminated by the licensee.

Further information

More detailed information may be obtained

- in special leaflets of the GeoDatenZentrum on vector data and raster data,
- via the GeoDatenZentrum's Internet portal www.geodatenzentrum.de,
- as well as in related publications of the Land survey administrations and of BKG.

Blank space reserved for additional notes



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