



Documentation TopPlusOpen



Product as of August 2024

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1 Overview of the dataset

Product:	TopPlusOpen
Content:	The TopPlusOpen product provides a free consistent worldwide map in different levels of detail, ranging from a global overview map to the detailed city map in Germany.
Area:	The web map is divided into different display areas depending on its georeferencing. The area of the worldwide map in the small-scale range, the area of Europe in the middle-scale range and the area of Germany as well as parts of the neighbouring foreign countries on a large scale is shown below for the zoom levels and the reference systems Web Mercator and UTM32: Pseudo-Mercator Projection (EPSG:3857) <i>Zoomlevel 0 – 10 (World)</i> X/Y-Values lower left -20037508,34 / -20037508,34 X/Y-Values upper right 20037508,34 / 20037508,34 <i>Zoomlevel 11 – 16 (Europe)</i> X/Y-Values lower left -3757032,81 / 2504688,54 X/Y-Values upper right 5009377,09 / 12523442,71 <i>Zoomlevel 17 – 18 (Germany + parts of neighbouring foreign countries)</i> X/Y-Values lower left 469629,10 / 5831228,01 X/Y-Values upper right 1878516,41 / 7514065,63 UTM32 (EPSG:25832) <i>Zoomlevel 0 – 10 (Europe)</i> X/Y-Values lower left -2550821,71 / 2544186,73 X/Y-Values upper right 2458555,37 / 7553563,81 <i>Zoomlevel 11 – 13 (Germany + parts of neighbouring foreign countries)</i> X/Y-Values lower left 149545,62 / 5127146,79 X/Y-Values upper right 1049668,07 / 6222948,02

Spatial structure:	Further details on spatial structure are listed in chapter 3.1.
Layer:	The web map is provided in 90,7 dpi monitor resolution with following layers: Layer: web, web_grau Description: worldwide consistent web map. Color version and grayscale version Area: worldwide (for a detailed description, see area above) Layer: web_scale Description: worldwide consistent web map. Color version Area: worldwide with upscaling from lower scales for missing areas
Spatial reference:	The online services support the following reference systems: - WMS = EPSG:3034, 3035, 3044, 3045, 3857, 4258, 4326, 4647, 4839, 5243, 5650, 5676, 5677, 5678, 5679, 25832, 25833, 31466, 31467, 31468, 31469 und CRS: 84 - WMTS = EPSG:3857, 25832
Currentness:	annual update
Resolution:	90,7 dpi (Monitor resolution) for the web services
Data formats:	- The online services provide the following graphic formats: WMTS = PNG WMS = JPEG, PNG, TIFF - The tile archives of the TopPlus web map can be obtained in Mapproxy SQLite format. (see https://mapproxy.org/docs/1.11.0/caches.html#sqlite)
Data supply:	- Online-service via WMS or WMTS - Download of a Tile-Database in Mapproxy SQLite-Format
Data volume:	Tile archive of the TopPlusOpen web map im Mapproxy SQLite-Format in EPSG:3857: 1750 GB Tile archive of the TopPlusOpen web map im Mapproxy SQLite-Format in EPSG:25832: 536 GB
Data source:	Various data, see list: https://sqx.geodatenzentrum.de/web_public/gdz/datenquellen/datenquellen_to_pplusopen.html

* Please note that not all forms of delivery can be provided with each reference system and data format. If you have any questions, feel free to contact the Service Centre (DLZ).

2 Description of the dataset and online services

2.1 Content

The TopPlusOpen product provides a free consistent worldwide map in different levels of details, ranging from a global overview map to the detailed city map in Germany.

The product presents free official geospatial data of the Federal Republic of Germany and of the OpenData states Berlin, Brandenburg, Hamburg, Hesse, North Rhine-Westphalia, Saxony, Saxony-Anhalt, Schleswig-Holstein and Thuringia. Furthermore Mecklenburg-Western Pomerania and Rhineland-Palatinate are providing their official geospatial data for the TopPlusOpen as part of a cooperation agreement. The named federal states are represented exclusively by official data.

For all other federal states and in foreign countries OpenStreetMap data mainly is used in corresponding zoom levels. From the BKG's point of view those data satisfy all quality standards and can be combined almost seamlessly with official data.

The web services for the TopPlusOpen are provided by the standardised interfaces WMS and WMTS and are highly performant.

There are 4 different layouts:

Layout	Description
TopPlusOpen	• Many details, much content, colorful
TopPlusOpen Graustufen	• Details and content identical to TopPlusOpen layout • Greyscale generated automatically by WMTS/WMS
TopPlusOpen Light	• Content reduced, fewer details • Subtle, light colours
TopPlusOpen Light Grau	• Content reduced, fewer details • Greyscales and few muted colours for water and boundaries

As standard, the TopPlusOpen web map is available in the widespread Pseudo-Mercator Projection (EPSG:3857) and in the reference system UTM32 (EPSG:25832).

For the Pseudo-Mercator projection, the web map is divided into 19 different scale levels and 3 different areas of interest:

- Worldwide presentation for small scales
- Across Europe presentation for medium scales
- Detailed presentation for Germany and adjacent foreign countries in large scales

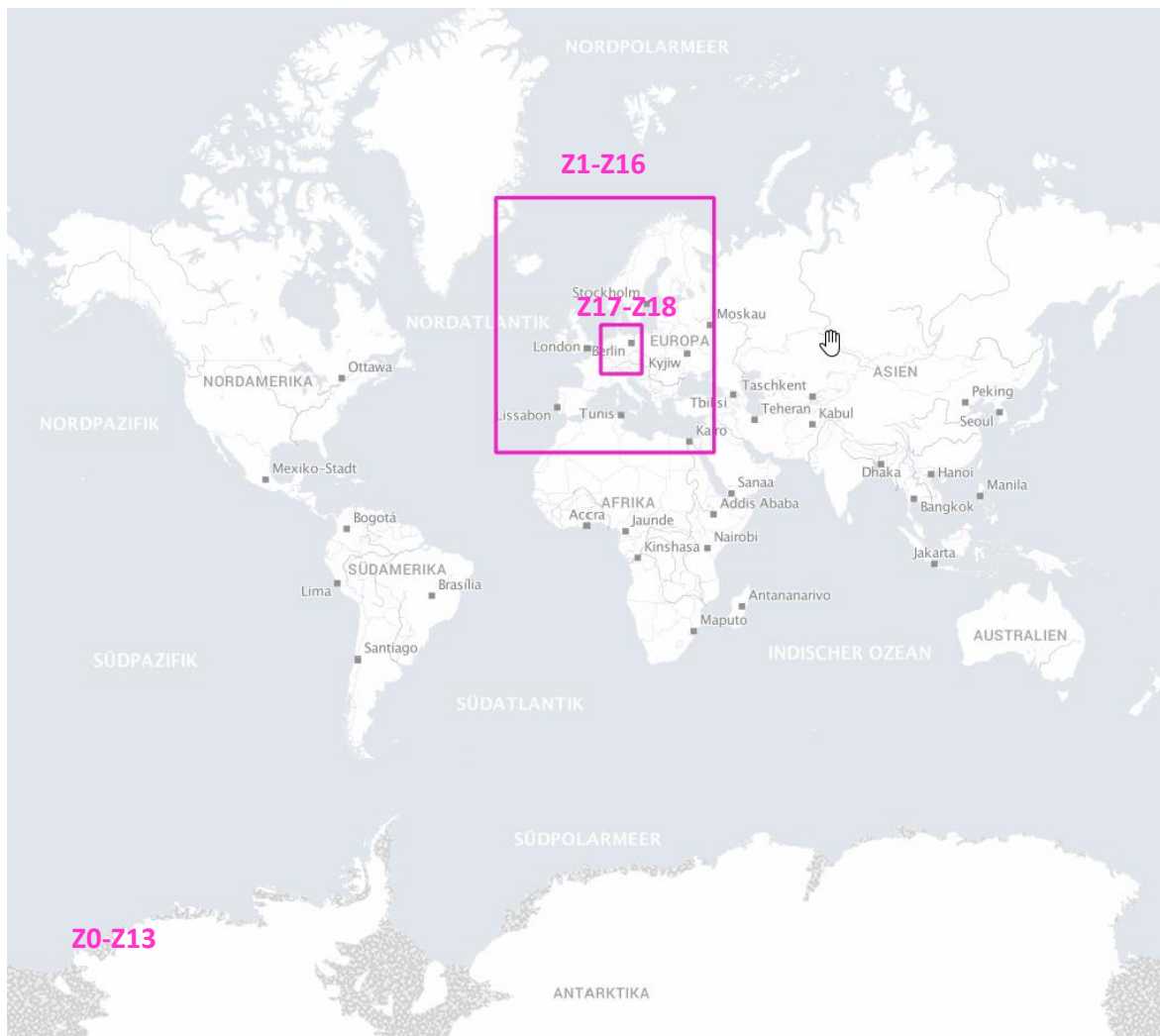


Illustration 1 – Area of interest Pseudo-Mercator projection

For the UTM32 projection the web map is divided into 14 different scale levels and two different areas of interest

- Across Europe presentation for medium scales
- Detailed presentation for Germany and adjacent foreign countries in large scales

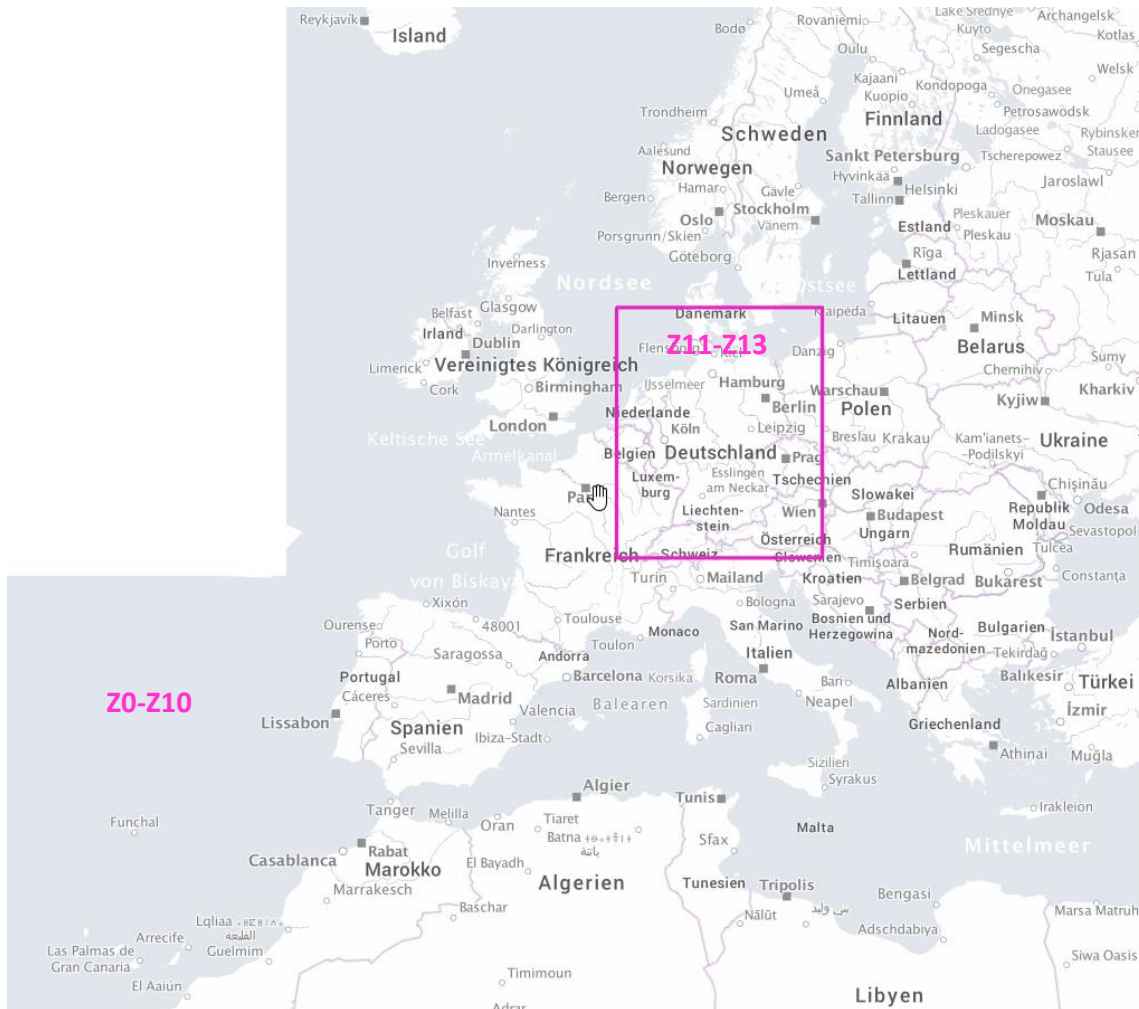


Illustration 2 – Area of interest UTM32 projection

2.2 Reference Systems

As standard, the TopPlusOpen web map is available in the widespread Pseudo-Mercator Projection (EPSG:3857) and in the reference system UTM32 (EPSG:25832). Via the WMS interface, the web map may also be used in further common projections.

2.3 Data Source

A list of all used data sources can be found here:

https://sgx.geodatenzentrum.de/web_public/gdz/datenquellen/datenquellen_topplusopen.html

A visual overview over the used data sources is provided by following illustrations:

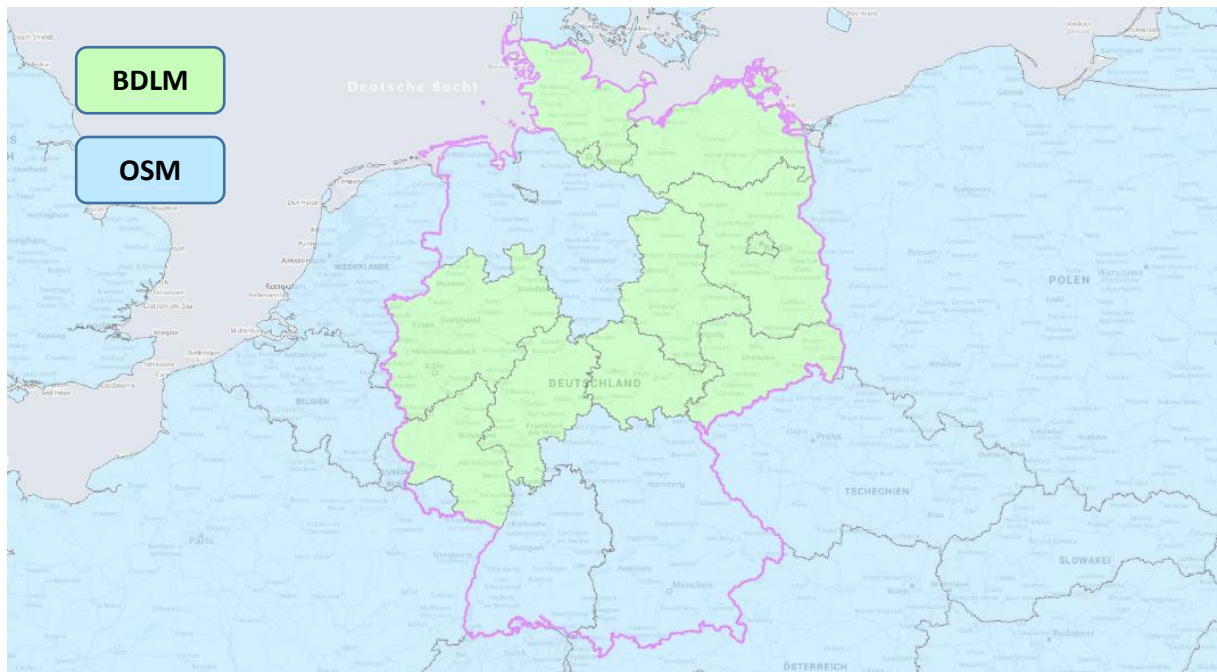


Illustration 2 - Main data sources for large zoom levels (Pseudo-Mercator 13-18 / 8-13, UTM32 8-13)



Illustration 3 - Main data sources for medium zoom levels (Pseudo-Mercator 10-12 / 5-7, UTM32 5-7)

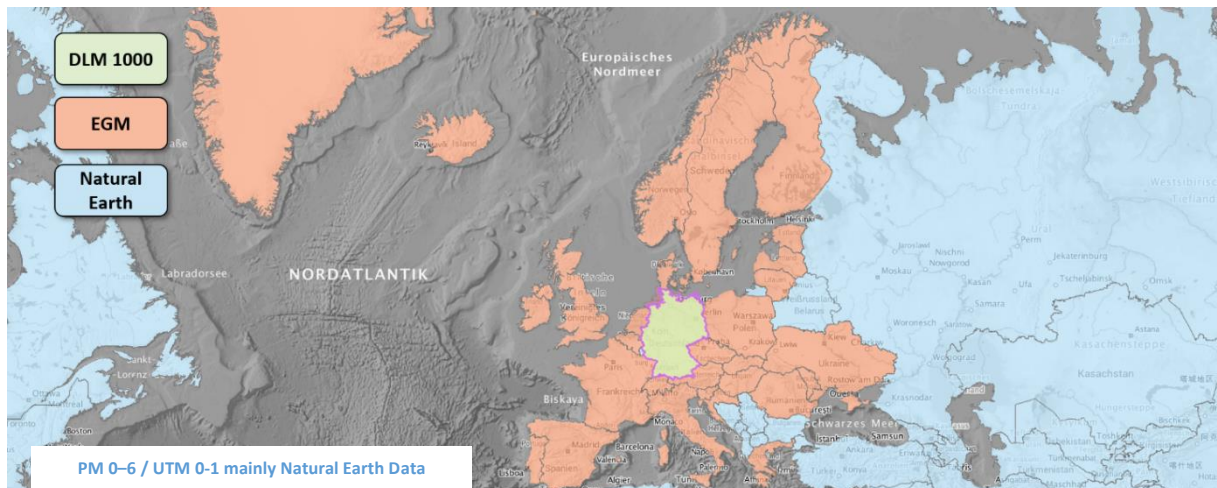


Illustration 4 - Main data sources for small zoom levels (Pseudo-Mercator 6-9 / 1-4, UTM32 1-4)

3 Data acquisition

3.1 Ordering of data and services

The data can be obtained free of charge from our website.

Web services:

<https://gdz.bkg.bund.de/index.php/default/webdienste/topplusopen-produkte.html>

Digital geospatial data:

<https://gdz.bkg.bund.de/index.php/default/digitale-geodaten/topplusopen-produkte.html>

TopPlusOpen web map is available in the following forms of deployment:

- **Web Map Service:**
https://sqx.geodatenzentrum.de/wms_topplus_open?SERVICE=WMS&REQUEST=GetCapabilities
 Contains the web map in color and greyscale.
- **Web Map Tile Service:**
https://sqx.geodatenzentrum.de/wmts_topplus_open/1.0.0/WMTSCapabilities.xml
 Contains the web map in color and greyscale and is provided with the TileMatrixSets WEBMERCATOR (EPSG:3857) and EU_EPSG_25832_TOPPLUS (EPSG:25832) bereitgestellt
- **Tile archive TopPlusOpen:**
 The colored web map in Form of SQLite databases in mbtile format can be downloaded here:
 - https://daten.gdz.bkg.bund.de/produkte/topplus_open/TopPlusOpen/aktuell/mercator/
 - https://daten.gdz.bkg.bund.de/produkte/topplus_open/TopPlusOpen/aktuell/utm32s/

3.1.1 Notes on the tile caches of TopPlus web presentation

The services for the web presentation are using raster tile caches as data source. A raster tile cache is defined by a tileset for fixed zoom levels/scales. Each zoom level is composed by grid of small raster tiles (256 x 256 pixels). Map coordinates can be calculated using the tileset origin and pixel size of the corresponding zoom level.

TopPlusOpen raster caches are provided according to the [MBTiles-spezifikation](#) as SQLite-databases. For each zoom level a separate SQLite database is used.

For the TopPlusOpen raster caches for the projections Spherical Mercator and UTM32 are provided. The zoom levels are defined as follow:

zoom level <i>Pseudo-Mercator</i>	zoom level <i>UTM32</i>	pixel size (meter)	scale denominator
0		156543.033928041	559082264.028718
1		78271.5169640205	279541132.014359
2		39135.7584820102	139770566.007179
3		19567.8792410051	69885283.0035897
4		9783.93962050256	34942641.5017948
5	0	4891.96981025128	17471320.75
6	1	2445.98490512564	8735660.375
7	2	1222.99245256282	4367830.188
8	3	611.496226281410	2183915.094
9	4	305.748113140705	1091957.547
10	5	152.874056570353	545978.7735
11	6	76.4370282851763	272989.3867
12	7	38.2185141425881	136494.6934
13	8	19.1092570712941	68247.34668
14	9	9.55462853564703	34123.67334
15	10	4.77731426782352	17061.83667
16	11	2.38865713391176	8530.918335
17	12	1.19432856695588	4265.459168
18	13	0.597164283477939	2132.729584

3.2 Examples of requests to the services

3.2.1 WMS TopPlusOpen

GetCapabilities (GET):

https://sgx.geodatenzentrum.de/wms_topplus_open?request=GetCapabilities&service=wms

GetMap (GET), Layer „web“:

https://sqx.geodatenzentrum.de/wms_topplus_open?service=wms&version=1.3.0&request=GetMap&Layers=web&STYLES=default&CRS=EPSG:25832&bbox=500000,5700000,500200,5700200&width=150&Height=150&Format=image/png

3.2.2 WMTS TopPlusOpen

GetCapabilities (GET):

https://sqx.geodatenzentrum.de/wmts_topplus_open/1.0.0/WMTSCapabilities.xml

Examples for requesting an XYZ-Layer:

Example for requesting an XYZ-Layer "web" (color) and the TileMatrixSet "WEBMERCATOR" (EPSG:3857)

http://sqx.geodatenzentrum.de/wmts_topplus_open/tile/1.0.0/web/default/WEBMERCATOR/{z}/{y}/{x}.png

Example for requesting an XYZ-Layer "web_grau" (grayscale) and the TileMatrixSet "WEBMERCATOR" (EPSG:3857)

http://sqx.geodatenzentrum.de/wmts_topplus_open/tile/1.0.0/web_grau/default/WEBMERCATOR/{z}/{y}/{x}.png

Example for requesting an XYZ-Layer "web" (color) und das TileMatrixSet "EU_EPSG_25832_TOPPLUS" (EPSG:25832)

http://sqx.geodatenzentrum.de/wmts_topplus_open/tile/1.0.0/web/default/EU_EPSG_25832_TOPPLUS/{z}/{y}/{x}.png

Example for requesting an XYZ-Layer "web_grau" (grayscale) und das TileMatrixSet "EU_EPSG_25832_TOPPLUS" (EPSG:25832)

http://sqx.geodatenzentrum.de/wmts_topplus_open/tile/1.0.0/web_grau/default/EU_EPSG_25832_TOPPLUS/{z}/{y}/{x}.png

Some applications also expect the order of TileMatrix, TileRow and TileCol to be specified as a number:

http://sqx.geodatenzentrum.de/wmts_topplus_open/tile/1.0.0/web/default/WEBMERCATOR/{0}/{2}/{1}.png

Example for the request of a single tile from the Layer "web" (color) and the TileMatrixSet "WEBMERCATOR" (EPSG:3857)

https://sqx.geodatenzentrum.de/wmts_topplus_open/tile/1.0.0/web/default/WEBMERCATOR/10/343/549.png

/Datenquellen_TopPlus_Open_08.10.2024.pdf

4 Further Information

Further information concerning the product are available at gdz.bkg.bund.de. In case of any questions, you are welcome to contact our service centre at dlz@bkg.bund.de.

General information regarding the Federal Agency for Cartography and Geodesy can be found on our homepage www.bkg.bund.de.