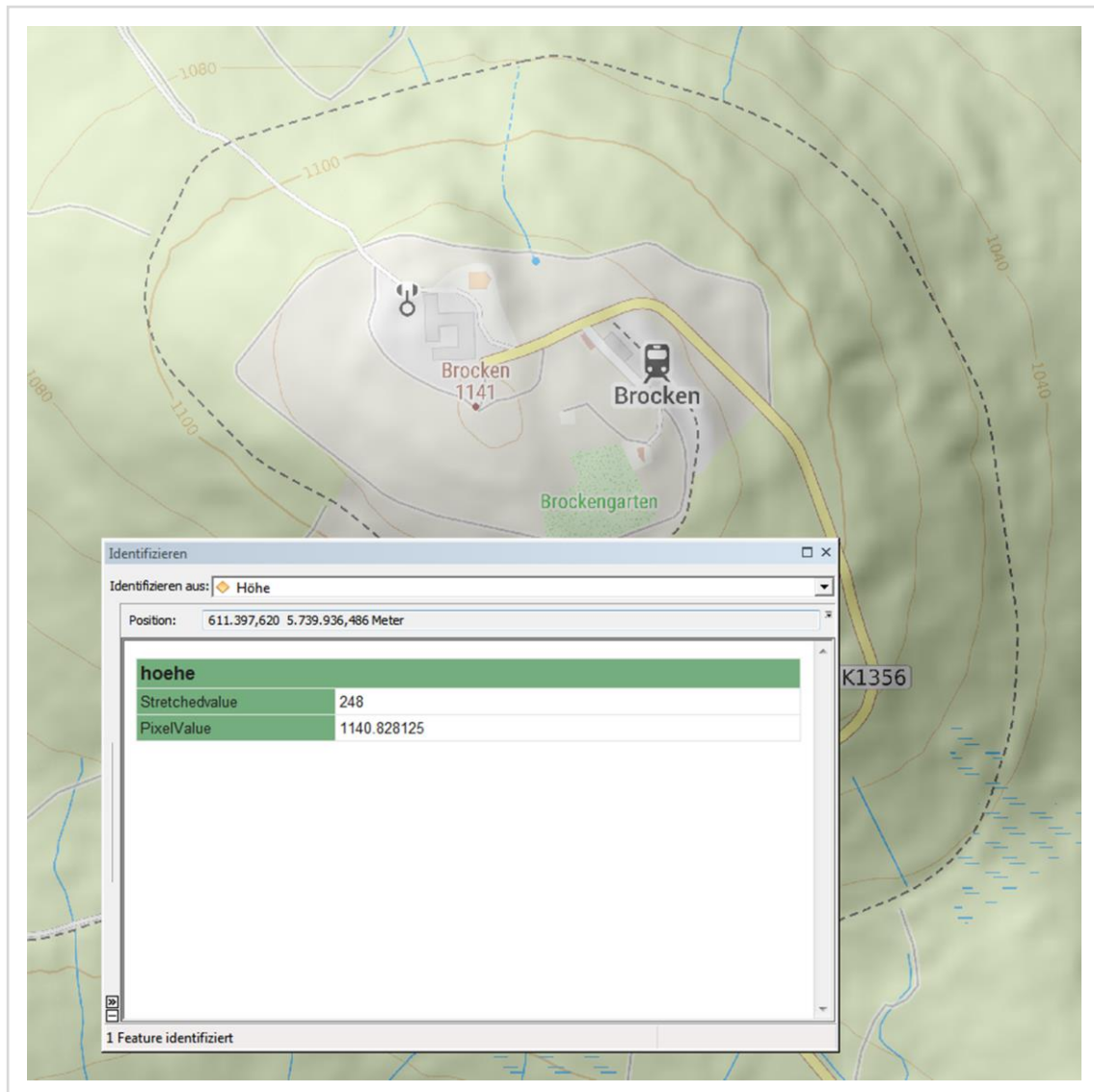




Documentation

Web Feature Service “Altimeter”

wfs_altimeter



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1 Overview of the dataset

Product:	wfs_altimeter
Content:	Through the “Altimeter” height service an interface is provided for the request of height data referring to given coordinates, which can be integrated into other applications. This service has been realized as a standardized Web Feature Service.
Area:	Bundesrepublik Deutschland (Federal Republic of Germany)
Currentness:	see www.bkg.bund.de under the heading „Produkte und Services“ in the description of this product
Data supply:	Web Feature Service (WFS) Version 1.1.0
Data source:	DGM10

2 Description of the online service

2.1 Content

The Service is based on the dataset of the *Digitales Geländemodell Gitterweite 10 m* (DGM10) (Digital Terrain Model Grid Width 10 m). The DGM10 describes the terrain forms of the earth's surface by means of a point set arranged in a regular grid and georeferenced in position and height. The heights themselves have been stored in metres with an accuracy of three decimal places.

Height values for coordinates not located on the grid points are linearly interpolated using the neighbouring height values. Height values not collected are defined in the grid points by the value -9999. These values occur, among others, beyond the borders of Germany.

If a coordinate lies exactly on the connecting line of two neighbouring grid points, the height of the latter is calculated through interpolation of the heights of the two respective grid points. If a coordinate is located within a grid cell, the heights of all four corner points are included into the interpolation. Even if only one of the heights referred to contains the value -9999, also the result of interpolation is with -9999 recognized as not defined.

2.2 Web Feature Service (WFS) according to OGC

The Service meets the Web Feature Service Implementation Specification Version 1.1.0 and provides a basic WFS featuring the GetCapabilities, DescribeFeatureType and GetFeature methods. The relevant request may be made per HTTP-GET and HTTP-POST. Besides the request via key-value pairs (KVP – Key-Value Pairs) POST requests can also be placed in XML according to the Web Feature Service Implementation Specification Version 1.1.0.

Please note that when using key-value pairs:

- the keys are *case-insensitive*, i.e. no distinction is made between capital and small letters
- the values are *case-sensitive*, i.e. the indicated use of capital and small letters is to be observed.

2.3 URL of the service

The URL of the Service reads as follows:

`http://sg.geodatenzentrum.de/wfs_altimeter`

For the respective call the parameters SERVICE, VERSION and REQUEST must be indicated. The following values apply to SERVICE and VERSION:

- SERVICE=WFS
- VERSION=1.1.0

The REQUEST key may assume one of the three values "GetCapabilities", "DescribeFeatureType" or "GetFeature".

2.4 GetCapabilities

Via the call "GetCapabilities" all properties of the service may be requested, in particular the "Features" provided and the possible filters for "GetFeatures".

The GET request via KVP reads:

```
http://sg.geodatenzentrum.de/wfs_altimeter?SERVICE=WFS&VERSION=1.1.0&
REQUEST=GetCapabilities
```

The corresponding POST request per XML is as follows:

```
<?xml version="1.0" ?>
<GetCapabilities service="wfs" version="1.1.0"
  xmlns="http://www.opengis.net/wfs"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.opengis.net/wfs
http://schemas.opengis.net/wfs/1.1.0/wfs.xsd"/>
```

GetCapabilities returns an XML document defined according to the Web Feature Service Implementation Specification Version 1.1.0 for the description of the Service. For the service wfs_altimeter this document contains exactly one FeatureType called "gdz:Altitude".

2.5 DescribeFeatureType

When calling "DescribeFeatureType" the feature "gdz:Altitude" provided under GetCapabilities can be described in more detail:

```
http://sg.geodatenzentrum.de/wfs_altimeter?SERVICE=WFS&VERSION=1.1.0&
REQUEST=DescribeFeatureType&TYPENAME=gdz:Altitude
```

If the key-value pair "typeName" is omitted, the entire XML schema definition of the service is returned. In the present case both results are identical.

XML requests may be made according to the following scheme:

```
<?xml version="1.0" ?>
<DescribeFeatureType version="1.1.0" service="wfs"
  xmlns="http://www.opengis.net/wfs"
  xmlns:gdz="http://www.geodatenzentrum.de/altimeter"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.opengis.net/wfs
http://schemas.opengis.net/wfs/1.1.0/wfs.xsd">
  <TypeName>gdz:Altitude</TypeName>
</DescribeFeatureType>
```

With this request, too, the TypeName can be omitted.

DescribeFeatureType supplies an XML document in accordance with the Web Feature Service Implementation Specification Version 1.1.0 serving to describe the feature and features, respectively.

2.6 GetFeature

When calling GetFeature the height on the coordinate specified in the filter is provided. As an OGC conformal filter the operation "ogc:Equals" with the operand "gml:Point" is loaded.

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Here is a sample inquiry via GET, which for reasons of better legibility has been noted in several lines and without URL encoding:

```
http://sg.geodatenzentrum.de/wfs_altimeter?
SERVICE=WFS&
VERSION=1.1.0&
REQUEST=GetFeature&
TYPENAME=gdz:Altitude&
SRSNAME=EPSG:25832&
FILTER=<Filter xmlns="http://www.opengis.net/ogc"
xmlns:gml="http://www.opengis.net/gml"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:gdz="http://www.geodatenzentrum.de/altimeter"
xsi:schemaLocation="http://www.opengis.net/ogc">
<Equals><PropertyName>gdz:location</PropertyName>
<gml:Point srsName="EPSG:31467"><gml:pos>3651650.00
5971150.00</gml:pos></gml:Point>
</Equals></Filter>
```

The **target coordinate system** EPSG:25832 (UTM 32) indicated here constitutes the standard, in which also the relevant data form the basis of the service. Therefore, the parameter SRSNAME may also be omitted. For further supported coordinate systems please refer to the Capabilities of the service, see 3.2.

The same request via POST has the following layout:

```
<?xml version="1.0" ?>
<wfs:GetFeature service="wfs" version="1.1.0" outputFormat="text/xml; subtype=gml/3.1.1"
xmlns:gdz="http://www.geodatenzentrum.de/altimeter"
xmlns:wfs="http://www.opengis.net/wfs"
xmlns:ogc="http://www.opengis.net/ogc"
xmlns:gml="http://www.opengis.net/gml"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://www.opengis.net/wfs
http://schemas.opengis.net/wfs/1.1.0/wfs.xsd">
<wfs:Query typeName="gdz:Altitude" srsName="EPSG:25832">
<ogc:Filter>
<ogc:Equals>
<ogc:PropertyName>gdz:location</ogc:PropertyName>
<gml:Point srsName="EPSG:31467"><gml:pos>3651650.0 5971150.0</gml:pos></gml:Point>
</ogc:Equals>
</ogc:Filter>
</wfs:Query>
</wfs:GetFeature>
```

The XML element <wfs:Query> can occur several times. This way, it is possible to simultaneously carry out several requests. Indication of the **target coordinate system** is effected according to the WFS specification as attribute srsName in the XML element <wfs:Query>.

The parameter gml:Point expects an x-coordinate and a y-coordinate, which are separated by a space. The coordinates describe in this case a georeferencing according to GK3 (EPSG:31467, see GetCapabilities → <wfs:FeatureTypeList>).

GetFeature supplies the requested feature in a GML structure. The response to the example given above looks as follows:

```
<?xml version="1.0" encoding="UTF-8"?>
<wfs:FeatureCollection numberOfFeatures="1" xmlns:wfs="http://www.opengis.net/wfs"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://www.opengis.net/wfs ../wfs/1.1.0/WFS.xsd">
<gml:featureMember xmlns:gml="http://www.opengis.net/gml">
```

```
<gdz:Altitude xmlns:gdz="http://www.geodatenzentrum.de/altimeter">
  <gdz:location>
    <gml:Point srsName="EPSG:25832">
      <gml:pos>651518.68797224 5969199.77191301</gml:pos>
    </gml:Point>
  </gdz:location>
  <gdz:height>44.96</gdz:height>
</gdz:Altitude>
</gml:featureMember>
</wfs:FeatureCollection>
```

2.7 GET requests

Survey on key-value pairs besides "service", "version" and "request" with GET requests:

Schlüssel	Default	Methode	Beschreibung
outputFormat	„text/xml; subtype=gml/3.1.1“	DescribeFeatureType, GetFeature	Content-Type as response. Presently only the standard value is supported
typeName	gdz:Altitude	DescribeFeatureType, GetFeature	Feature-Type requested
namespace	-	DescribeFeatureType, GetFeatures	Indication of the Namespaces and its prefix. The format must meet the following scheme: xmlns(prefix=escaped_url). If the prefix is omitted, this is used as Default-Namespace.
filter	-	GetFeature	URL encoded XML structure for the request
srsName	EPSG:25832	GetFeature	Indication of the target coordinate system

2.8 Data acquisition

2.8.1 Test data

Test data can be downloaded from our website under the heading „Test data“. In terms of content and structure, they correspond to the data supplied later and can therefore be used for very concrete application testing purposes.

2.9 Testdienste

If you are interested, we can set up a two-month access to a test service for you. Please contact the Service Center for further information.

3 Terms of use

Provision to federal institutions and beneficiaries according to V GeoBund

The data are protected by copyright. In accordance with the Contract on the Continuous Transfer of Authoritative Digital Geodata of the Länder for use within the German Federal Administration as published on July 1, 2019 (V GeoBund), the data are made available free of charge to federal institutions and beneficiaries within the meaning of § 4 V GeoBund. The source note must be observed.

[Musterlizenzvereinbarung für Bundesbehörden und Nutzungsberechtigte nach V GeoBund](#)
(PDF, 2 MB)

[Vertrag über die kontinuierliche Übermittlung amtlicher digitaler Geobasisdaten der Länder zur Nutzung im Bundesbereich \(V GeoBund\)](#) (PDF, 1 MB)

4 Copyright

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Provision to federal institutions and beneficiaries according to V GeoBund

Geobasisdaten: © GeoBasis-DE / [BKG](#) (year of last data acquisition)

Nutzungsbedingungen: https://sg.geodatenzentrum.de/web_public/nutzungsbedingungen.pdf

5 Contact

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