Section 2 Management of a national names programme

Chapter 4 Compilation and updating of the swisstopo geographic names database "swissNAMES³ᴰ"

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4.1 Glossary

swissNAMES³ᴰ is the new dataset of geographic names in Switzerland and the Principality of Liechtenstein. It is suitable for a broad variety of uses and visualisations, including updating with names. It replaces the "SwissNames" database that was updated until 2008 and was based on the names used in the set of national maps.
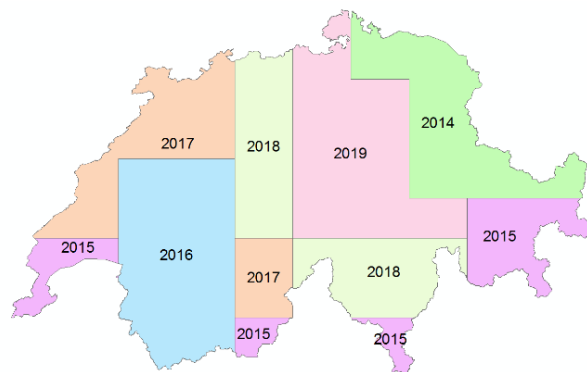

Figure 4-1: Updating cycle for Switzerland's topographic landscape model (the indicated years refer to the status of the fundamentals)

Figure 4-2 Names displayed as an orientation aid on an aerial image of Interlaken

4.2 Compilation, updating and fundamentals

The data contained in the "swissNAMES³ᴰ" database (see figure 4-1 for an example) was compiled within the scope of the production of the topographic landscape model with the aid of the "TopGIS" topographic-geographic information system. The database is to be updated every six years (cf. figure 4-2).

The content of "SwissNames" and the objects resulting from the transfer of the topographic landscape model (TLM) that replaced the former VECTOR25 landscape model into the TLM production database formed the basis for the compilation of the initial dataset. These data formed the original basis for the placement of names on the 1:25,000 national map from which they were taken. "SwissNames" was a point database. All objects that were now modelled as lines or polygons were initially defined as "standard geometry". The resulting basis facilitates the localisation of the objects to be recorded in the aerial image, which is subsequently used for carrying out the

geometric measurement. The high degree of accuracy required for the topographic landscape model calls for the exact geometric referencing of all identified objects and the applicable perimeters for all names, as well as the photogrammetric measurement of their height or allocation of their height based on the digital terrain model that also forms an integral part of the production environment. With respect to objects that cannot be identified in the aerial image, and for the verification of orthography, other principles apply as described below.

Place names in the cadastral survey: The place names defined as polygons in the cadastral survey data model specify the applicable perimeters for place names in the large-scale range. The applicable perimeter refers to the area recorded in the cadastral survey that can be used for an indicated place name. These new geometries and names are to be transferred to the new database. Around 130,000 objects included in the new database are place name polygons. Currently, only around 35 percent of the production perimeters are filled with name data from the cadastral survey. The orthography of the place names in the cadastral survey is also being transferred to other object categories of swissNAMES3D (names of regions and terrains, point objects).

Official index of towns and cities, with postcodes and perimeters from the cadastral survey: Complete existing cadastral survey dataset. Lists towns and cities with their own postcode as polygons with attributed names. This index serves as the reference work for the spelling of the names of towns and cities that have their own postcode. In densely developed areas, the geometries of towns and cities with postcodes are used for the internal delimitation of neighbouring development polygons.

geoSTAT: This is the distribution model for official federal geodata (produced by the Federal Statistical Office). Alongside datasets relating to land use and ground cover, together with data from population and business censuses, municipal boundaries and terrain data, the boundaries of suburbs, districts and residential zones in Switzerland's 17 largest towns and cities are depicted in the GEOSTAT model. The interior boundaries of towns and cities, together with the corresponding names, are used for the definition of development perimeters in swissNAMES3D.

Public transport stations and stops: The complete dataset of the Federal Office for Transport is to be transferred to swissNAMES3D.

Addresses from the register of buildings and residential dwellings: These are used for determining the perimeters and names of developed areas.
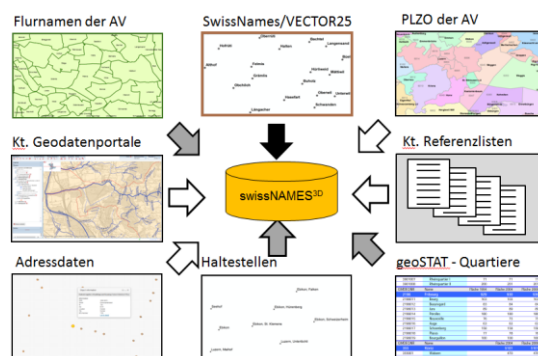

Figure 4-3 Bases for the compilation of swissNAMES3D

Cantonal geodata portals and reference lists: These provide the names of objects to be included in the database (sites, bodies of water, buildings, individual objects, etc. – cf. figure 4-3).

4.3 Example of input into the database

The example below describes the input of areas relating to object type "Place" (object category "TLM_Placename"). The basis for entering the polygon geometry is the corresponding orthophoto. The perimeter encompasses buildings that are occupied permanently or seasonally, as well as infrastructure (e.g. roads and paths). In the case of larger towns and cities, the perimeter also includes objects such as bodies of water, parks and other unoccupied zones up to a certain size. The external boundaries of development polygons are defined on the boundaries of occupied plots of land or may be defined by neighbouring objects that are not part of the development (e.g. bodies of water, forest – cf. figure 4-4).

Figure 4-4 The place names "Grueben", "Muheimere" and "Toffenholz" were transferred to the production database from the previous "SwissNames" database (points) as standard polygons and...
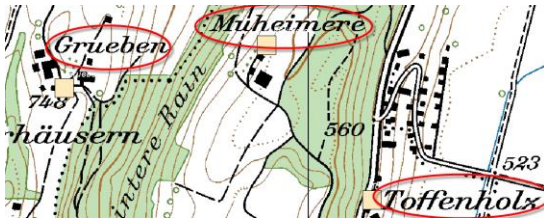
Figure 4-5 ... they correspond to the place names in the 1:25,000 national map.

Figure 4-6 The perimeters are entered on the basis of the aerial image depicting the developed area. The z values are automatically transferred during digitisation from the digital terrain model to the base points of the development contours.
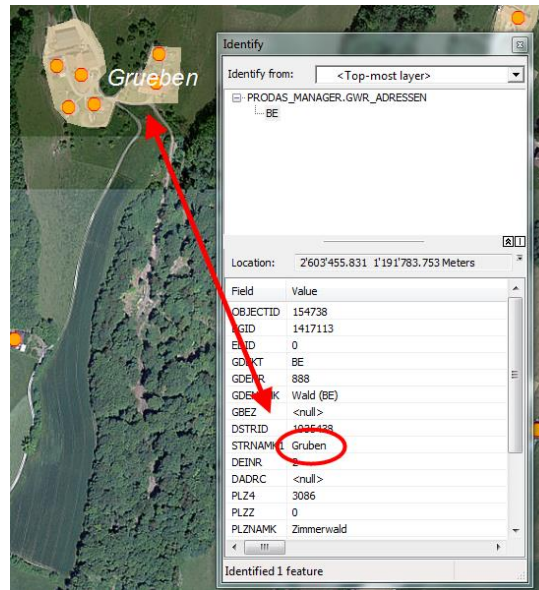

Figure 4-7 The orthography of the place names then has to be verified. This is done by consulting an addresses dataset. The corresponding datasets are the official index of towns and cities (for places with their own postcode) and the official register of buildings and residential dwellings (for smaller places without their own postcode). This means that "Grueben" and "Muheimere" have to be changed to "Gruben" and "Muheimern".

Names of places with an own postcode are binding. However, smaller places do not have an own postcode and therefore do not have a place name with postcode (according to the abbreviated name of the town with a postcode, "Gruben" belongs to "Zimmerwald" [attribute, "PLZNAMEK"]).
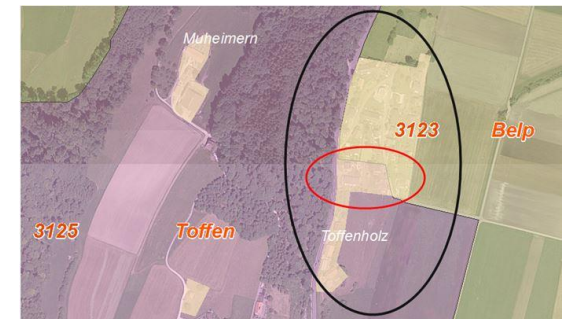

Figure 4-8 Nonetheless, the postcodes dataset still has to be consulted. According to the input guidelines, the boundaries of the town with an own postcode have to be used for the interior delimitation of the development polygons. This now also applies to small places. In the example presented here, "Toffenholz" has to be divided because the northern zone belongs to "Belp" (which has its own postcode) and the southern zone belongs to "Toffen" (which also has its own postcode).

The result is shown in figure 4-9.

Figure 4-9 Example of input

4.4 Geometric characteristics and special features

swissNAMES³ᴰ is based on the topographic landscape model. This is Switzerland's new official geodata set and it corresponds approximately to a degree of abstraction of 1:10,000. The data are three-dimensional. The recording of heights is carried out through the automatic adoption of height data during the digitisation of the location base points. Certain object heights are measured photogrammetically. The targeted degree of geometric accuracy is one metre (location and height).

With very few exceptions, all objects in the topographic landscape model that have a specified name are to be transferred to swissNAMES³ᴰ. The name is the decisive criterion for the input of an object. While in developed areas there are no neighbouring objects with the same name and same object category, this is not the case when it comes to the network of bodies of water. Neighbouring objects with the same name are merged to form a single object. Figure 4-10 shows a comparison between the development of the topographic landscape model and the swissNAMES³ᴰ database. Each colour represents an object with a single name and is thus taken from the topographic landscape model for swissNAMES³ᴰ. The topology is not transferred to swissNAMES³ᴰ, which means, for example, that for estuaries of the "Fildrich" and "Goldbach" streams into the "Kirel", the latter is not divided. So the
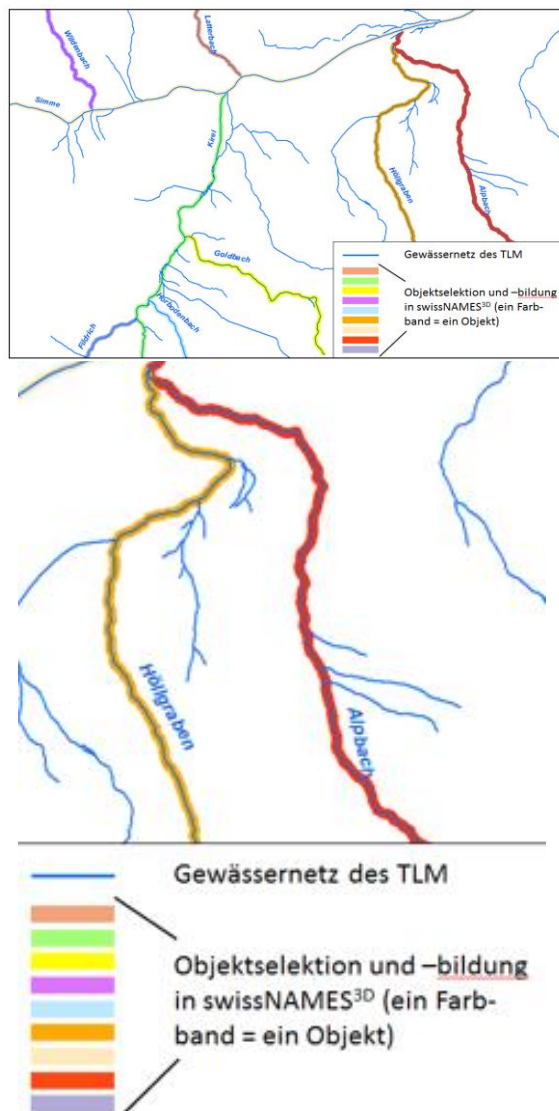

Figure 4-10 Comparison between the development of swissNAMES³ᴰ and the topographic landscape model

green line depicts a single object with the name "Kirel" (and no longer several objects, as would have been expected in a topological dataset). And of course, the same applies with respect to the "Simme" and the "Alpbach".

4.5 Multilingual aspect

Multilingualism is one of Switzerland's main identification characteristics: In the Federal Constitution, German, French and Italian are defined as official languages, together with Romansh. According to a 2013 survey conducted by the Federal Statistical Office, German is the main language for 63.5 percent of the population, French for 22.5 percent, Italian for 8.1 percent and Romansh for 0.5 percent. There are three bilingual cantons (Valais, Bern and Fribourg: French & German), and one trilingual canton (Grisons: German, Italian and Romansh). See figure 4-11.
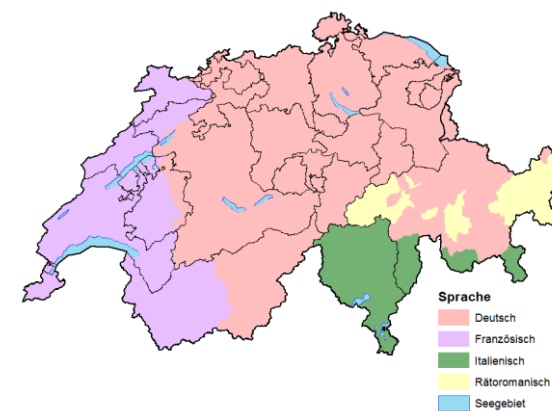

Figure 4-11 Switzerland's language regions

In the current set of national maps, some objects (primarily housing developments, but also the names of some regions) located in the vicinity of the borders of language regions have more than one name (see figure 4-12).
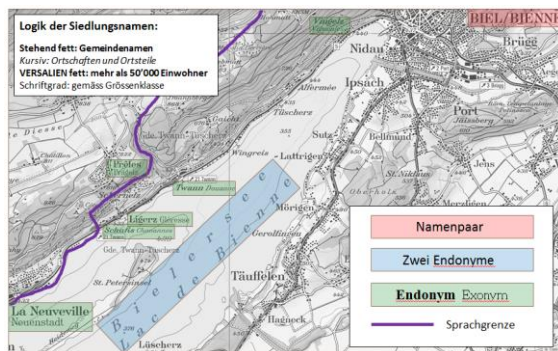

Figure 4-12 Extract from the 1:100,000 national map showing names in more than one language

The following terms that are used in connection with multilingual nomenclature are defined below.

Endonym: The name used in a region within which the designated object is located

Exonym: The name used in another region than that within which the designated object is located

In the context of Switzerland's geographic nomenclature, the term "region" refers to "language region".

Pairs of names are also used exclusively for municipalities and/or their districts, zones, etc., that are officially declared as bilingual. The names in the respective languages are separated by a forward slash (e.g. Biel / Bienne).

swissNAMES³D supports the use of multiple languages by attributing each name with a "language code" (GER, FRA, ITA and ROH, see figure 4-13) based on ISO 639-2. The language code incorporates both the respective standard language and its dialects, i.e. a name in a dialect is attributed the same language code as a name written in the respective standard language.

In swissNAMES³D, the processing of objects for which more than one name exists in the official languages is extended to include major objects of national importance. In other words, it is not only objects in the vicinity of language region borders that may be given more than one name. This may concern several names in the same language as well as names in different official languages. Similarly, in the case of composite names, endonyms and exonyms are explicitly indicated. The data are listed in a separate table as name components. Under "NAME_TECHNICAL", all names of a given object are listed together with their respective language codes and the indication whether they are endonyms or exonyms (cf. figure 4-13).
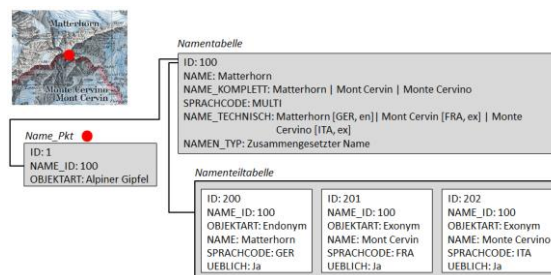

Figure 4-13 Depiction of objects with several names in the production database

4.6 Data model / content and scope of data

The structure of the data model is very simple. For each geometric type (point, line, area) there is one object category which comprises all the named objects in the same geometric category. The names take the form of attributes (Shapefile or CSV format), or are listed in a separate table referenced to the geometric tables (geodatabase). The content of swissNAMES³D is presented in table 4-1.

4.7 Downloading the data

swissNAMES³D will be published annually with effect from 2015 and may be downloaded free of charge from the swisstopo online shop. It may only be used for the purposes that are specified in the licence for obtaining geodata free of charge from swisstopo. With each order, the entire dataset will be delivered in three formats (ESRI Filegeodatabase / ESRI Shapefile, CSV text file) and two coordinate systems (CH1903 and CH1903+).

4.8 Options for use

swissNAMES³D can be used for a broad variety of purposes, especially in combination with other geodata. Because the dataset contains data in the large-scale range as well as for overview purposes, swissNAMES³D is suitable for use at various degrees of abstraction. Examples for the use of the database include:

- As a nomenclature database for Internet solutions (geographic searches)
- As an orientation aid on aerial images and other geodata sets
- For the compilation of catalogues of geographic names (gazetteers)

TLM_NAME_LIN¶ 10'000·Objekte¤	• → Namen·wichtiger·Verkehrsbauwerke· (Brücken,·Tunnel)¶ • → Seilbahnen¶ • → Skilifte¶ • → Namen·von·Sportanlagen· (Rodelbahn,· Bobbahn,·Sprungschanze)¶ • → Gewässernamen¤
TLM_NAME_PKT¶ 225'000·Objekte¤	• → Gipfel¶ • → Pässe¶ • → Points·of·Interest· (Bildstock,·Brunnen,·Denkmal,·Aussichtspunkt·u.·a.)¶ • → Einzelobjekte· ¶ • → Flur-·und·Lokalnamen¶ • → Haltestellen· des·öffentlichen· Verkehrs· ¶ • → Gebäudenamen¶ • → Namen·von·Infrastrukturanlagen· (Ein-·und·Ausfahrten,· Zollstellen)¤
TLM_NAME_PLY¶ 76'000·Objekte¤	• → Siedlungsnamen· (Orte·und·Quartiere)¶ • → Gewässernamen· (Seen·und·Seeteile)¶ • → Naturräumliche·Gliederung· (Grossregionen,· Haupttäler,· Landschaften)¶ • → Geländenamen· (Täler,·Gräben,·Gletscher,· Grate,· Massive)¶ • → Nutzungsareale· (Abwasserreinigung,· Deponien,· Friedhöfe,· Klöster,·Kraftwerke,· Schulen,·Spitäler,·Messeareale,· Pärke,·Zoos)¶ • → Verkehrsareale· (Flugplätze,·Heliports,·Parkplätze,· Rastplätze)¶ • → Freizeitareale· (Camping-·und·Golfplätze,· Sportanlagen)¶ • → Infrastrukturanlagen· (Staumauern· und·—dämme,·Wehre)¤

Table 4-1: swissNAMES³ᴰ contains more than 300,000 objects, of which 180,000 have place names or local names.

- As a basis product for publications (e.g. maps, plans), including for all names in the set of national maps
- As an orientation aid in 3D visualisations

4.9 swissNAMES3D in the federal geodata infrastructure

Search tool

swissNAMES³ᴰ is used within the federal geodata infrastructure. Together with addresses, the new geographic nomenclature database functions as the main source of data for the SwissSearch geo-coding service, which can be used for carrying out searches based on the geographic names in the federal geoportal (see figure 414; http://map.geo.admin.ch). The "Geographic Names" section of the federal geoportal is also available for use. With this function, users can display names as an orientation aid, for example on an aerial image (see figure 4-1).
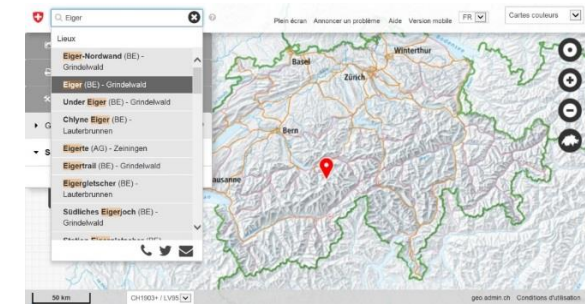

Figure 4-14 swissNAMES³ᴰ as the basis for a search tool in http://map.geo.admin.ch

Raster-based data layer

swissNAMES³ᴰ is integrated into the federal geodata infrastructure as a data layer. The dataset can be displayed as an orientation aid for other data layers, especially aerial images. The federal geoportal enables the visualisation of data layers at 14 zoom levels or scales ranging from 1:500 to approximately 1:2,000,000. Visualisation of texts (annotations) is raster-based. For each zoom level, the swissNAMES³ᴰ annotations to be displayed were initially defined in ArcMap and graphically structured, then exported as a raster image. For the larger scales / higher zoom levels, the raster image has to be tiled due to the higher data density.

swissNAMES³ᴰ as a data layer in the federal geodata infrastructure - Data layer visualisation of object geometry

For each zoom level, precisely those object geometries are visualised that are foreseen for annotation. A data layer is required for each geometry type, in which the content

and annotations vary according to the zoom level. Basic icons are used for graphic presentation.

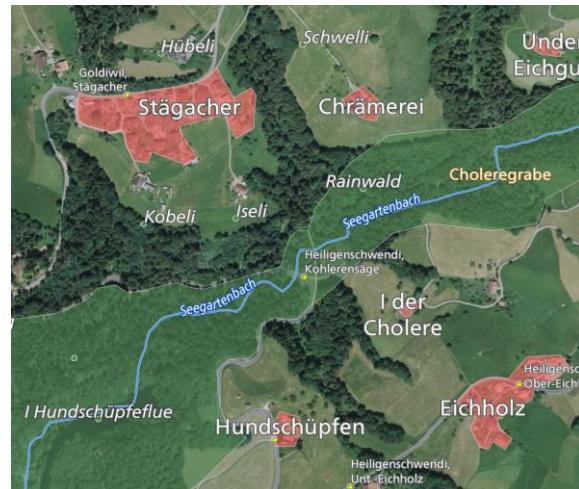*Figure 4-15 Presentation of swissNAMES at the lowest federal geodata infrastructure zoom level*

Figure 4-16 Presentation of swissNAMES at the scale of approx. 1:200,000

Figure 4-17 Presentation of swissNAMES in the large scale range

Data layer feature information

Tool tips provide object data (feature information) when a swissNAMES³D object is activated in the raster image. The selected object is highlighted and the most important attributes stored in the vector layers are displayed.

Figure 4-18 swissNAMES³D object information in the federal geodata infrastructure

4.10 Development of the geographic names database: required time and personnel

The names database was developed over a period of six years (2009 to 2014, cf. "Development, updating and fundamentals"). An annual total of around 6,500 hours was required, which corresponds to approximately 4 full-time equivalent jobs.

4.11 Links to other sources

http://map.geo.admin.ch: federal geodata portal map
viewer

http://www.swisstopo.admin.ch/internet/swisstopo/en/h
ome/products/landscape/swissTLM3D.html - swissTLM3D -
the topographic landscape model

http://www.swisstopo.admin.ch/internet/swisstopo/de/h
ome/products/landscape/swissNAMES3D.html:
swissNAMES3D

http://www.bfs.admin.ch/bfs/portal/de/index/dienstleist
ungen/geostat.html: GEOSTAT

http://www.bfs.admin.ch/bfs/portal/de/index/themen/00
/05/blank/01.html: Federal register of buildings and
dwellings

http://www.cadastre.ch/internet/kataster/de/home/servi
ces/service/plz.html: Official index of towns and cities

http://www.cadastre.ch/internet/kataster/de/home/av/n
ames.html: Geographic names

http://www.geo.admin.ch/internet/geoportal/de/home/s
ervices/geoservices/display_services.html: Description of
the presentation services in the federal geodata
infrastructure