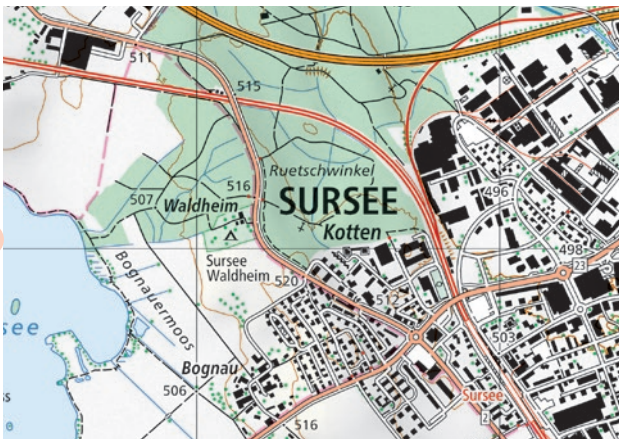
Good maps for better decisions



knowing where

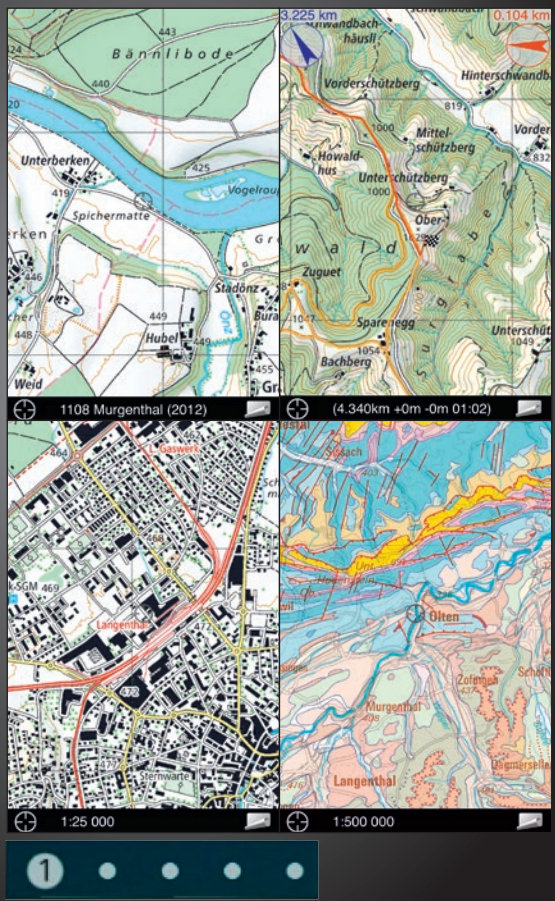
swisstopo

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Office of Topography swisstopo
www.swisstopo.ch

Maps with future



The printed map has a future and celebrates successes in digital version.

Much has changed since the publication of the first printed map of the country in 1845. Cartographic contents in digital applications have become indispensable companions in many situations, both professionally and privately, and affect our decisions. swisstopo moves with the times, so that you know, today and in the future, where to.

Index

Reliable bases for planning and development

Geographic information provides modern states with the essential foundations for planning and development. In the early days of the Confederation, maps helped to define the political structure, and to visualize the geographic area. Nowadays, they provide the geographic infrastructure to represent the spatial connections of numerous interest groups.

swisstopo ensures consistent and comprehensive coverage of Switzerland with high-quality maps, in print and digital format.

Impartial and independent

Geographic information, and maps in particular, are often used as tools to shape public opinion. Hence, the protection from any form of abuse must be a priority. The State fulfils an important duty in mandating swisstopo to provide impartial and independent foundations. The official products are the property of Switzerland. They are free of advertisements and based on the law on geoinformation, which dictates transparently and comprehensibly which services swisstopo is bound to provide. The law also establishes the requirements for accessing and using geodata.

Avers is as important as Zurich

The geography of Switzerland is very diverse. It includes a densely populated central plateau, as well as lonesome and wild mountain valleys. Some people value the timely and accurate representation of the new developments in the agglomeration. Others rely on the path given on the map to find their way in the fog. The people's demands for good maps are legitimate, and the same everywhere. swisstopo ensures the availability of uniformly high-quality maps covering the entire country, in digital and printed form.

Did you know that…

…the first Dufour map – the first official map of Switzerland – cost the equivalent of today's 80 francs? The printed national map, as its successor, presently costs 14 francs. Under **www.map.geo.admin.ch** the map clippings can even be printed for free.

The distribution channels are becoming more diverse. Online services are rapidly growing in significance along with trade.

Quality has its price

If the existent geodata were lost, their replacement would cost over 5 billion francs. This is a tremendous value. swisstopo maps are part of this "treasure", since many products and applications depend on these bases, and those responsible rely upon them. The debate over whether the users of geographic information and infrastructure should be charged – and if so, how much – is on-going. Politics will decide whether in the future the offer shall be freely available, or whether some uses shall continue to be paid for. Surely, appropriate founding must be secured, in order to maintain the value and quality of our geographic infrastructure.

Official information centralized

Times are changing. While in the past swisstopo itself collected many map data, today the network of official data is paramount. Efficiency requires that data are collected only once, by the most competent body. They are then integrated over interfaces into the swisstopo products. This saves time and resources, and ensures high quality. Via geo-services and standardized interfaces, swisstopo maps are now easily integrated into websites and geographic information systems.

Competition spurs!

Not every public interest is equated with a public duty. swisstopo maps often serve as a basis to fulfil the needs of the private sector. swisstopo exerts restraint whenever tasks beyond the official services are already adequately met by private institutions.

Innovation is part of the business: motivated and competent employees make sure that swisstopo is represented on the market with innovative and successful solutions, which become standard. Through swisstopo participation in the competition, products are continuously questioned, customers' needs are taken into account, and trends are identified.

HINT: Free geodata!

Even today, many swisstopo geodata are digitally available for free under **www.swisstopo.ch/freegeodata.**

Navigation on all paths – and off them

When it matters, compromises are out of the question. swisstopo maps are unique in their richness of detail. The new landscape model and high-precision elevation models ensure that the maps' precision keeps pace with technological progress (e.g. satellite navigation for everyone). Thus, maps are not only beautiful and detailed, but also accurate.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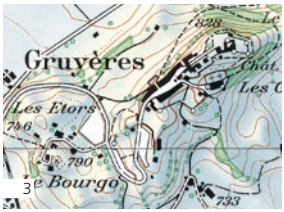

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The better the bases, the better the maps

The aerial images SWISSIMAGE, which are flown and rectified by swisstopo itself, have a ground resolution of 0.25–0.5 meters. They were used to create the elevation model swissALTI^{3D} and the landscape model swissTLM^{3D}, with a precision and content comparable to that of a 1:5 000 map. It covers the whole of Switzerland and have, for well-defined objects such as roads and buildings, a position and elevation accuracy of 0.2–1.5 meters. Around eight million objects are included, with their location and shape, the associated object type, and many other attributes.

The maps of the latest generation are directly derived from the model, and contain much information for digital use. This ensures that data are captured only once and used repeatedly. The production of the map is automated where possible. The cartographer focuses on the matters that are not solved by the systems. The graphic eye is still essential to ensure that the unique quality of the maps is preserved.

To generalize is an art

Different scales cover individual needs. Maps are interpreted and simplified representations of reality – in the branch jargon: generalized. They help us to gain an improved understanding of spatial relationships – simply put, to handle topography in handy entities.

The continuous sequence of scales and the consistent representation, regardless of the scale, are quality characteristics that set swisstopo maps apart, and will continue to do so in the future.

Product development process:
1 Aerial view SWISSIMAGE
2 Landscape model swissTLM^{3D}
3 National map 1:25 000
4 National map 1:50 000
5 National map 1:100 000

HINT: Report improvements online!

swisstopo cannot immediately take into account all changes. Report changes and improvements, so that they can be incorporated into the products. It is easily done online under **www.swisstopo.ch/revision.**

Digital applications add value to printed maps – map sheet-independent use, and additional information such as 3D views with mountain names.

Hiking is officially a popular sport

Switzerland is arguably the only country in the world, in which hiking is laid down in the Constitution (Art. 88), and governed by a law (Federal Act on Footpaths and Hiking Trails). 30 per cent of the resident population enjoys hiking. 75 per cent uses the hiking trail network for further activities. 90 per cent of the hikers are satisfied or very satisfied with the quality of the trail network, according to a survey by the Federal Roads Office. Maps in digital and printed form are an important component of planning and executing a hike.

Swiss hiking trails and swisstopo: partners for over thirty years

In 1982, Swiss hiking trails and swisstopo entered a partnership for the publication of products with maps. The lasting co-operation ensures that the products are developed further and continuously adjusted to the needs of hikers. For the first time, the national maps 1:25 000 of the newest generation fulfil the users' wish for a distinct representation of trails with and without hard-surface pavement. Thus, thanks to swisstopo maps, hikers always find the right way.

Milestones

1982 The first hiking map 266 T Valle Leventina 1:50 000 is published
2005 The hiking routes in digital form appear in the Swiss Map
2007 The maps cover the whole of Switzerland
2008 The SwitzerlandMobility routes are integrated
2009 The hiking routes become mobile with Swiss Map Mobile
2010 To mark the 75th anniversary of Swiss hiking trails, "Plan & go" introduces a combination of hiking map and CD of a region
2010 Swiss Map Mobile introduces the voice-supported navigation along hiking trails
2013 The first hiking maps are printed on waterproof, tear-resistant paper in a scale of 1:33 333
2014 On the new National Maps 1:25 000, routes are labelled according to surface – asphalt or natural surface

Exploitation and protection do not contradict each other

Switzerland is a densely populated small country: 8 million inhabitants occupy an area of approximately 40 000 square kilometres. Conflicts of interest easily arise in confined spaces. Maps provide an important contribution to transparent planning and decision-making, to the control of measures, and the implementation of legal requirements.

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1 Clipping portal wildlife quiet zone on the internet
2 Clipping snowshoe and ski tour map 1: 50 000

Winter sports in Switzerland are booming. This has advantages and disadvantages

We are not alone in the mountains: the winter landscape is claimed by both wildlife and sportsmen. With the advent and diffusion of trendy disciplines such as snowshoeing, animals are increasingly put under pressure, since they depend on undisturbed refuges. It becomes thus increasingly important to reconcile exploitation and protection. To that purpose, the cantons, in collaboration with the Federal Office for the Environment, set aside wildlife quiet zones and wildlife protection areas. They are marked on the swisstopo winter sports maps and on the wildlife quiet zones portal on the internet.

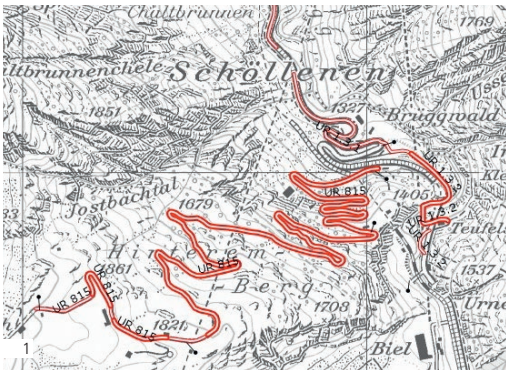
Committed to winter sports: SwissSki, SAC and swisstopo

For 60 years SwissSki, SAC and swisstopo have been pledging their common support for safe and environmentally sustainable winter sports. Off-piste tours require not only a high degree of personal responsibility and adequate equipment, but also reliable maps, when markings and trails are buried under the snow, and avalanches threaten the safety.

The routes on swisstopo maps are provided by experienced local mountain guides. All the routes are tested with respect to their environmental sustainability. Fine-tuned interactions between the involved partners ensure that the current maps provide the inspiration for winter activities in time for the start of the season.

Milestones

1950 The first ski route map 283 S Arolla 1: 50 000 is published
2000 The slopes are integrated into the ski route map
2000 The “Ski route map” becomes the “Ski tour map”
2005 The first ski tour map with protected areas is published
2008 The ski tours are published digitally on Swiss Map online
2012 The maps are published as “Snowshoe and ski tour maps”, newly including snowshoe routes
2015 Maps are printed on waterproof paper



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1 Clipping inventory of historical traffic routes of Switzerland
2 Clipping earthquake preparedness

No maps, no planning

swisstopo maps are used by other public institutions as a reference on which to build further data. It is essential that swisstopo ensures the long-term provision of these bases, in dependable quality and consistent representation. Citizens can easily obtain freely available information about topics of interest from the federal geoportal and other specialized portals of various federal institutions, and generate map displays accordingly.

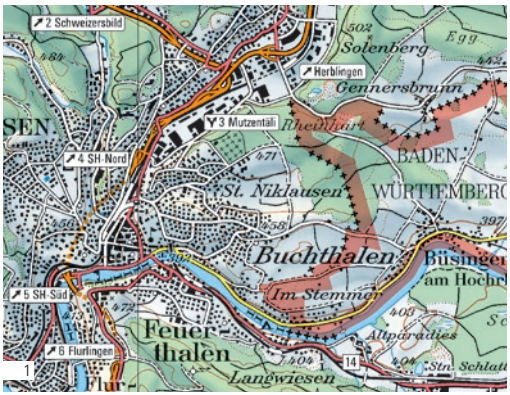
Thus, any user of the territory can easily and rapidly gain first insights into planning. The offer is diverse, ranging from risk representation (e.g. earthquake preparedness), to the protection of animals and plants, to information about historical heritage and traffic routes.

HINT: Geodata and protected areas!

The federal geodata portal under **www.map.geo.admin.ch** contains a wealth of information. Current information about the wildlife quiet zones are found under **www.wildruhezonen.ch.**

Safety requires clarity

The Dufour map, published between 1845 and 1865, first made the geographic and political territory of Switzerland tangible. With its homogeneous representation, it became a symbol of the modern state founded in 1848. Today, swisstopo maps characterize sovereign duties of the federal government, and at the same time include elements that fall within the responsibility of the cantons.



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Safety on the ground
Boundaries define the national territory. Public institutions, the private industry and the public must be clear about the position and the course of boundaries – even in complex situations. swisstopo is responsible for surveying the national borders, and makes sure that they are unambiguously marked in the maps. Coordinates define the boundary points and enable the determination of unique points in a map. This ensures that everyone knows where to, not only in emergencies.

Safety in the air
The airspace over Switzerland is heavily trafficked, and thus requires a clear regulatory framework, which coordinates private, commercial and military flight plans. The official air traffic maps are produced, updated and published by swisstopo in co-operation with the Federal Office of Civil Aviation.

1 Clipping national map 1:100 000
2 Clipping national map 1:500 000

HINT: New coordinates for Switzerland
Information about the new coordinates is given under **www.swisstopo.ch/lv95.**

1 Clipping from the "Topographic Map of Switzerland" 1:100 000 (Dufour map) sheet Monte Rosa
2 Clipping national map 1:100 000

Names are where the home is – and a lot more besides!

Geographical names are important parts of a map. They are often key when it comes to orientating oneself in the landscape. On a map, they are divided into place names, area names, names of bodies of water, etc. and their importance is indicated in different fonts. In this digital age, people usually search using a known place name. The orthography, on the other hand, is determined by the cantonal nomenclature commissions.

swisstopo coordinates the task to ensure unambiguous place names. Recommendations are submitted to the commissions, in order that existing names are changed only in well-grounded cases. If, for example, the name of a municipality is changed as the result of an amalgamation, this requires approval from the municipal, cantonal and federal authorities. Following publication in the Swiss Federal Gazette, the map is amended by swisstopo.

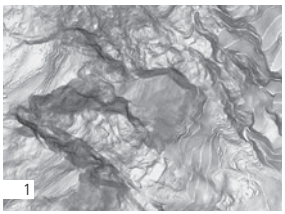
Did you know that…

… Switzerland's "highest peak" was renamed "Dufourspitze" in 1863, as the Federal Council decided to honour the contribution of general Guillaume-Henri Dufour to the creation of the "Topographic Map of Switzerland" in the scale 1:100 000.

… In 2014, the "Ostspitze" was renamed the "Dunantspitze" by the Swiss Federal Council to commemorate the 150th anniversary of the Red Cross and to honour its founder, Henry Dunant.

The knowledge under our feet

Geological principles are increasingly important for the exploitation, planning, and design of our environment. Anyone familiar with the geological past can better plan the future. Information in map form makes geological findings comprehensible on a visual level and is also always at hand when out and about.



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1 Clipping from the digital terrain model (DTM) of Montana
2 Clipping from the geological map of Montana with potential landslide areas
3 Clipping from the hydrogeological map

Foundations as a contribution to safety

As an alpine country, Switzerland is exposed to numerous natural hazards. swisstopo's maps help to assess these hazards and ensure sustainable spatial development. Risk areas such as slated layers of rock can be integrated with slopes extracted from the Digital Terrain Model to identify potential slide areas. In this way, geological knowledge helps to protect human lives and properties.

Sustainable drinking water supply

In Switzerland, every year nearly 1 billion cubic meter of drinking water are used. Basic geological information is an important basis for the sustainable supply of the country with qualitatively flawless drinking water. The hydro-geological and geological maps, data and models provide professionals with important information on the spatial extent of groundwater resources, as well as on their quality. They support the establishment of catchments and protected areas that are to ensure long-lasting exploitation.

Billions in return from mineral raw materials

Knowledge about the historically exploited earth's treasures, which have accumulated underground through geological processes that occurred over millions of years, spurred the development of the first geological maps. Professionals use geological maps, drill cores and rock analyses to spatially delimit potential mining sites in the search for abundant occurrences of resources. This information also allows Switzerland to meet its needs for rock and clay, primarily through domestic quarries.

HINT: Geology portal

Further information on many geological topics is provided under **www.geologyportal.ch.**

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1 Clipping from the map of the Last Glacial Maximum
2 Clipping from the hiking and geology map 5080 T of the Tectonic Arena Sardona

Raising awareness of geology

With unusual maps, a wide audience can be reached and made aware of specific geological topics. For example, the ice age map shows Switzerland during the last glacial maximum about 24 000 years ago.

The topic is timely – for how long glaciers will persist is a much debated issue both among specialists and the public. Glaciers are not disappearing overnight – but on the map the changes documented by the tracking systems look impressive.

Thematic maps are of interest to laymen as well

Geological maps are primarily intended for experts. In order to make them accessible to non-specialists, they need to be simplified and explained, best by using practical application examples, and by incorporating geological information into Leisure Maps. The first hiking and geology map 5080 "Tectonic Arena Sardona" draws attention to interesting geological phenomena along hiking trails using vivid examples.

Thanks to the trans-disciplinary cooperation within swisstopo, the geological and the thematic maps continuously evolve.

Did you know that …

… the Emmental was not completely covered with ice during the last ice age around 24 000 years ago?

In maps we read the time

So far, historical maps ended up in archives. Accessing and using these printed cultural goods cost effort. Nowadays, maps are digitized and available online as a landscape memory in the form of time series. Hence, it is much easier for everyone to learn from the past for the future, and make the right decisions.

HINT: Time series online
Have a look at the landscape memory of Switzerland under
www.swisstopo.ch/zeitreise

Entrance into the fourth dimension
swisstopo faces a variety of challenges. On the one hand, swisstopo as administration must provide information about what has been produced; on the other hand, what has been produced needs to be made available in up-to-date form, and allow for answering questions on a scientific level. Demanded is thus a new perspective, since the entire production must be perceived and divulged as a product.

With the new time series service, swisstopo provides data and bases for a broad view of the territorial development of Switzerland. The management of historical resources thus becomes part of the core business for the future – kind of entering a new, fourth dimension: time.

Photo of the Dufour map 1:25 000, 1838–1843

Siegfried map 1:25 000, 1877–1880

National map 1:25 000, 1955

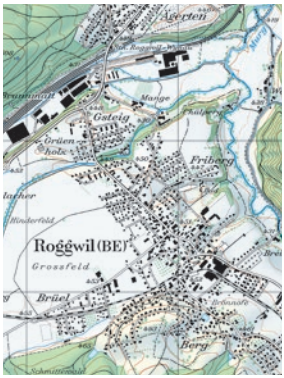
History happens all the time

Dating back to 1840, maps and their bases cover a very long time period. The geometric bases are known, and founded on well-defined nationwide reference systems for position and elevation. From the beginning, they were edited according to consistent monitoring guidelines, and regularly updated.

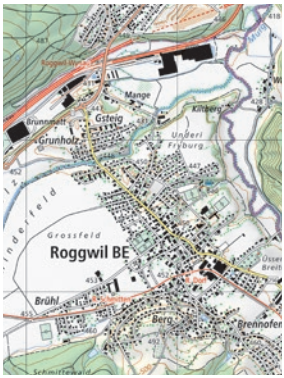
The time-series maps were generated over a long time period, with different means, and by using different bases. Hence, not all maps in a series look the same. For example, in the Dufour map the terrain is hatched, while the national map shows contour lines. The state of the art has evolved since the beginning of the national cartography. For consistent maps throughout, they would need to be laboriously "back-cartographed" …

History happens all the time – not only yesterday, but also today and tomorrow. Therefore, swisstopo further invests into good maps, old ones and new ones.

National map 1:25 000, 1982



National map 1:25 000, 2006



National map 1:25 000, 2014

Maps for all occasions – you decide!

National maps

Topographical maps, hiking maps, snowshoe and ski tour maps

Special maps

Historical maps, geological maps, aeronautical maps, road maps

National maps mobile online and offline

iPhone/iPad, Android

National maps interlinked

application programming interface (API), geoservices (WMS, WMTS), iFrame

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