



National Report

Cartography in Switzerland 2019-2023

Swiss Society of Cartography SSC/SGK
www.cartography.ch

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Foreword

Mark Wigley, President Swiss Society of Cartography SSC

Dear fellow Cartographers, SSC friends and Map Enthusiasts,

Four years ago, I was invited to write my first ever foreword, it was for the 2015 - 2019 National Report Cartography in Switzerland. Four years on, here I am again wondering how to sum up all that has happened within the Swiss Cartographic scene between 2019 until 2022.

Well, to be honest it's not an easy task as it's not been an easy time, not for us and I imagine not for any of our international counterparts.

I left the 2019 International Conference and 18th General Assembly, which was held in Tokyo with many ideas and plans as well as hopes as to how I would like to see cartography grow and flourish in what we see as one of the key countries in the history of Cartography.

But then came COVID and all of our plans were changed for us. No more events, no networking, and no recruiting.

We tried to adapt and put on several virtual events, but these just were not the same. Some did indeed attract greater numbers than on-site events but there was very little in the way communication outside of the focus of the event.

The Swiss Society of Cartography at least in my opinion lives and thrives from its events where we can come together and chat about all things remotely mappy, new maps, old maps, fun maps, serious maps. We also spend time discussing the future of cartography in Switzerland and how it is taught both to our apprentices as well as to further education students. But all this went on hold as we struggled to cope with Zoom meeting and electronic voting.

One event we did manage to hold was our biannual Prix Carto competition, where Swiss-made, or related cartographic products can be submitted for one of our prestige awards. This was well received, and I strongly recommend that you read more about the event itself as well as about the winners later on in this report.

Also included within this report are articles from some of our corporate members who present what they are working on together with what they have been working on since the last National report. Our corporate members play a very important part within the SSC, sponsoring events, supplying ideas for discussions and well as giving many of the presentations which we have enjoyed. We are very proud to have so many corporate members and are extremely grateful for the continued support which they offer.

Alongside our corporate members we also have almost 300 regular members who regularly take part in our events and often offer to give presentations on the work or research they are presently doing.

So, were do we see the SSC being in four years' time when the next National Report is due?

We would like to expand our membership to embrace not only those fulltime involved in cartography but also those who perhaps only temporarily need some cartographic assistance/guidance with the present product they are working on or those who only have a focused area of interest within the wide scope of Cartography and Geo-Visualisation.

Finally, I wish you all an enjoyable experience as you scroll through our first ever fully electronic National Report. Please feel free to contact me if you have any questions regarding the SSC and I very much hope that our next report in four years' time will be able to report of many successful events and blossoming membership numbers. I would also like to take this opportunity to thank all those who have contributed to this edition and a special thanks goes to Susanne Bleisch for all the work she has put into compiling this edition.

Yours sincerely
Mark Wigley

The Swiss Cartography Award Prix Carto – Editions 2019 and 2021

Roland Schenkel, Head of Prix Carto Jury
<https://www.prixcarto.ch/>

Biannually and since many years, the Swiss Society of Cartography honours innovative and outstanding cartographic products. The eighth and ninth awards in the history of the Prix Carto took place during the period of this report. The award ceremony for the Prix Carto 2023 will not take place until after this report has gone to press.

Prix Carto 2019

As part of the anniversary event in Bern celebrating the 50th anniversary of the Swiss Society of Cartography, the renowned Swiss cartography prize "Prix Carto" was awarded in three categories. "Edu" for students and trainees as well as "print" for printed products and "digital" for digital entries.

In the "Edu" category the entry "Turbulence ahead" by Lisa Stähli won the 2019 Prix Carto. Stähli's innovative web-based product was developed as part of her master's thesis at the Institute of Cartography and Geoinformation at ETH Zurich in collaboration with the Federal Office of Meteorology and Climatology MeteoSwiss and Swiss International Airlines. It brought existing two-dimensional weather maps for pilots into the virtual three-dimensional space.



Figure 1: Lisa Stähli receiving the Prix Carto 2019 in the "Edu" Category for her work titled "Turbulence ahead".

In the "Digital" category, the jury awarded the 2019 Prix Carto to the American cartographer John Nelson for his work on digital maps and map

templates in the style of the famous Swiss cartographer Eduard Imhof. The jury was impressed by the meticulous implementation of Imhof's style, including relief shading and height-dependent colouring, as well as the aspect that Nelson made his work available to the public as templates for free use.

The Prix Carto 2019 in the "Print" category was given to the Penan Community Maps by the Bruno Manser Fund. The series of 24 map sheets covered an impassable area in the Malay Territory Sarawak inhabited by the Penan people. Besides the extensive on-site mapping using state-of-the-art technology, what impressed the jury was the involvement of the local community, who were also an important - if not the most important - user group of the maps.



Figure 2: Lukas Straumann, managing director of the Bruno Manser fund and Baptiste Laville, Project Manager Penan Community Maps proudly present their Prix Carto 2019.

The jury also recognized the original and excellently crafted Relief Furniture by Tim Boin with a special award of recognition, which was given in

this manner for the first time that year. This was due to the fact that, in the opinion of the jury, the submitted work did not fit into any of the existing categories. The unique furniture pieces allowed bringing the understanding, aesthetics, and passion for cartography and cartographic representations of outstanding quality into the everyday lives of many people.



Figure 3: Tim Boin's Relief Furniture meets with great interest.

Prix Carto 2021

As part of the autumn event of the Swiss Society of Cartography on November 1, 2021, at the Rhaetian Museum in Chur, the prestigious Swiss Cartography Award "Prix Carto" 2021 was presented for the ninth time. The following outstanding and innovative map works related to Switzerland were honoured this year.

In the "digital" category, the jury recognized the swisstopo app by the Federal Office of Topography (swisstopo). The completely redesigned swisstopo app replaced the Swiss Map Mobile app in the summer of 2020. It is available for free on iOS and Android. The jury was impressed by its intuitive user interface, useful features, and the fact that the app provided high-quality Swiss national maps to everyone, free of charge and accessible online and offline with just a few clicks. The app serves as an excellent ambassador for Swiss cartography.

The Prix Carto in the "print" category was also awarded to the Federal Office of Topography (swisstopo) for the innovative print-on-demand

product "mySwissMap." With just a few clicks on the web, an individualized paper map of the country could be created and ordered. By choosing the area, scale, and type of map (aerial view, national maps), various needs could be optimally met. The jury found the creative idea, its solid implementation, and the quality of the personalized paper map particularly deserving of recognition.

That year, the two Young Talent Promotion Awards, each endowed with CHF 500, were awarded to Andrea Hess ("start") and Nicolas Reibel ("edu").

Andrea Hess created a orienteering map as part of her graduation project at Kantonsschule Zug, depicting the Oberwil district of the city of Zug. The jury was impressed not only by the quality of the orienteering map itself but also by Andrea's meticulous and independent foundational work and her in-depth engagement with cartography as a discipline.

Nicolas Reibel, a student at the German Hochschule für Wirtschaft und Umwelt Nürtingen-Geislingen, created a map showcasing historical Swiss glaciers and geology. The map combined an artistic representation of glacier extents from 1850 and 2010 with Switzerland's geological features. Nicolas Reibel developed this fascinating combination of two themes into an artistic map through a relatively complex workflow during an industrial internship.

The jury also recognized the enlightening and technically excellent digital map animations "Land doesn't vote, people do." - Evidence from Switzerland! by David Zumbach with a special recognition award. These animations, based on an idea by Karim Douïeb, were developed using the R software and utilized open government data (OGD) from the Federal Statistical Office. The source code is also publicly available on GitHub. The successful implementation highlighted the challenges of representing, analysing, and interpreting spatially aggregated data, especially in choropleth maps.



Figure 4: From left to right: Roland Schenkel (head of the jury) Christoph Streit (swisstopo, winner Prix Carto “digital”), Andrea Hess (winner Prix Carto “start”), Urs Isenegger (swisstopo, winner Prix Carto “print”), Mark Wigley (president of the Swiss Society of Cartography, accepts the award on behalf of Nicolas Reibel, who could not be on site), and David Zumbach (winner of the recognition award).

Training, Education and Research

Swiss Federal Statistical Office

Institute of Cartography and Geoinformation, ETH Zurich

FHNW Institute Geomatics

Hydrological Atlas of Switzerland

Swiss Federal Statistical Office

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Cartography training at the Swiss Federal Statistical Office (FSO)

Introduction

Since 2012, the Federal Statistical Office (FSO) offers a training in Geomatics, with a specialisation in cartography. Until today four cartographers have successfully finished their training. The competence centre ThemaKart, where the training takes place, became a part of a new service Data Visualisation in 2022, in the course of a reorganisation of the division Communication and Publishing.



Cartography apprentices working at FSO



Cartography apprentices at FSO meeting with their instructors.

Cartography training

Four cartographers work together with in total nine data visualisation specialists. Two of them are in charge of training. The training plan specifies technical, methodological, personal and social competences. The concrete training contents are defined via generally applicable goals and company-specific goals. In addition, the apprentices gain a wide variety of experiences in the everyday work in a federal office, which enriches the training beyond the defined knowledge and capacity goals.

Today, the future of vocational training in Geomatics in the FSO is uncertain. From 2025, after a reform of the professional profile in Switzerland, only two key areas of vocational training will remain: Cadastral surveying and Geoinformatics. To avoid a lack of cartographic skills, the proportion of cartography teaching content will be higher in these two key areas as it is today. In addition, the cartography training companies can achieve an in-depth specialisation of their apprentices by defining company-specific capacity targets. In recent years the demands on the apprentices have been extended and increased.

Interdisciplinary skills such as work management, project planning and also programming skills become increasingly important. Beyond the subject-specific cartography training and the company-specific focus on thematic and statistical maps, the knowledge in GIS and HTML technologies has gained strongly in importance.

Institute of Cartography and Geoinformation, ETH Zurich

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The Institute of Cartography and Geoinformation consists of two professorships Cartography and Geoinformation Science with several research groups employs approximately 40 people. The Institute of Cartography was founded in 1925 by Professor Eduard Imhof. It is the world's oldest university institute for Cartography. Eduard Imhof is one of the founders of modern academic Cartography. In the reporting years 2019 to 2023, the following topics were taught – some of the research projects are also listed. In addition, the Institute offers a Certificate of Advanced Studies (CAS) program in Geographic Information Systems and Analysis.

Bachelor – Teaching program in Cartography

- Cartography Fundamentals
- Cartography II
- Project Work GIS and Cartography
- Cartography Lab Bsc
- Bachelor Thesis

Master – Teaching program in Cartography

- Application Development in Cartography
- Research Topics in Cartography
- Cartography Lab MSc
- Geomatics Projects MSc
- Master's Thesis (Example in Figure 1)

Research projects in Cartography

- CARTISTIC – CARTographic Illustrative STyles to Inspire Creativity: Visualising deep uncertainty in spatial planning
- Emphases: Assessing EMergent PHe-nomenA in complex Social-Ecological Systems with time series of settlement and habitat networks
- HistoRiCH: Historical river change – Planning for the future by exploring the mapped past
- Vectorization of Building Footprints from the Siegfried Map Series
- Isolines for the City of Zurich (Figure 2)
- Storytelling with Animated Interactive Objects in Real-time 3D Maps
- Auto-Adaptive Algorithm for Small-Scale Terrain Representation

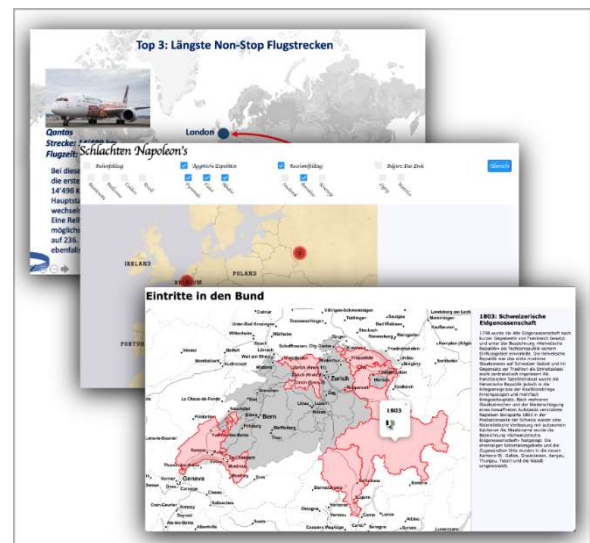


Figure 1: Master thesis by Stefan Schalcher, "Storytelling in Interactive Atlases" (2021).



Figure 2: The research project "Isolines for the City of Zurich" primarily encompasses the development of a GIS-based workflow that allows to generate such a dataset in an automatic manner.

Atlas of Switzerland – online (Figure 3)

The Atlas of Switzerland (AoS) has been the official Swiss national atlas since the Federal Council decision of 1961. In recent years, the atlas has been further developed into a contemporary interactive online version. The atlas shows phenomena and structures, as well as processes and changes, relating to all the various aspects and allows readers to experience topics such as society, economy, history, nature, and environment. It offers a completely new view of Switzerland and a good overview of an area that is constantly evolving in terms of landscape, demographics, and economy. The map inventory of the AoS also expanded by the end of 2022: A total of 422 maps are now offered in ten categories. The atlas also contains interesting new maps on renewable energy, the bedrock of Switzerland, on manufacturers of skis and snowboards, and also on tax revenues and burdens.

Swiss World Atlas (Figure 4)

The Swiss World Atlas is the most widely used school atlas in Switzerland. It has been used in geography lessons for over 100 years. The newly designed introductory section of the Swiss World Atlas explains the various types of maps, making them easier to use. Following an extensive section on Switzerland, the atlas contains maps of Europe, other continents, and the world. Using standardised overview maps and themed special maps, the Swiss World Atlas offers a comprehensive image of our earth, covering topics like settlement, economic geography, and global processes such as climate change. The printed atlas is supplemented by content and thematic indexes, a name and subject index and country statistics, making it easier to use in school lessons. In the last few years, at the Institute several papers have been published on the Swiss World Atlas. For example, in a case study, an Augmented Reality Android application was prototypically implemented and evaluated, which visualizes georeferenced augmented 2D and 3D elements on maps from the Swiss World Atlas. (Figure 5)

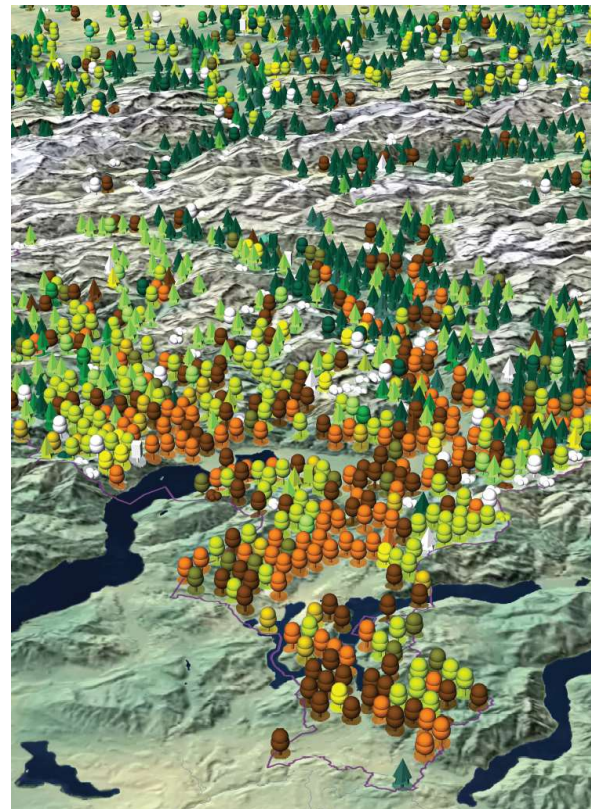


Figure 3: Atlas of Switzerland – State of the Swiss Forest. Screenshot atlasderschweiz.ch



Figure 4: Swiss World Atlas – Geology Switzerland. Screenshot schweizerweltatlas.ch

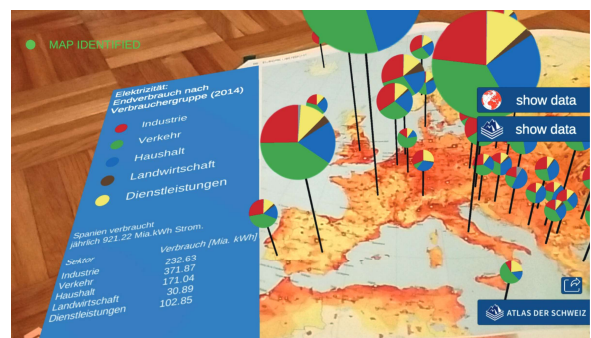


Figure 5: Augmented reality view of the population density map of Europe with pie charts. Case study "Augmenting Printed School Atlases with Thematic 3D Maps" by Raimund Schnürer, Cédric Dind, Stefan Schalcher, Pascal Tschudi and Lorenz Hurni (2020).

FHNW Institute Geomatics

Susanne Bleisch, Pia Bereuter

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Education and Research

The FHNW Institute Geomatics (IGEO) offers two academic degree courses, a BSc in Geomatics (German, <https://www.fhnw.ch/geomatik-studieren>) and a MSc in Engineering, Profile Geomatics (English, <https://www.fhnw.ch/master-geomatics>) and is active in applied research and development projects and collaborations. Additionally, the IGEO offers further education courses, i.e., the in 2022 newly established CAS in Spatial Data Analytics (<https://www.fhnw.ch/spatial-data-analytics>) and the CAS in GeoBIM, as well as selected services.

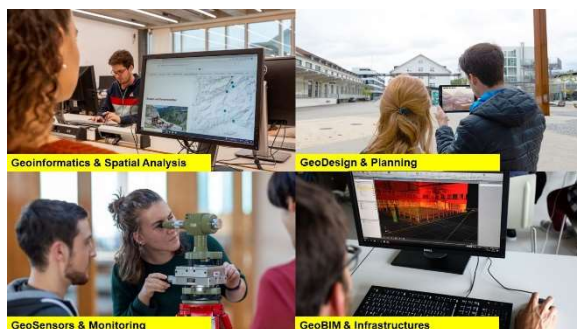


Figure 1: The four specializations of the redesigned BSc in Geomatics

The Bachelor of Science in Geomatics was redesigned and started in the autumn semester 2022 with four specializations – GeoDesign & Planning, GeoInformatics & Spatial Analysis, GeoBIM & Infrastructures, GeoSensors & Monitoring (Figure 1) - from which the students choose a major and a minor specialization area.

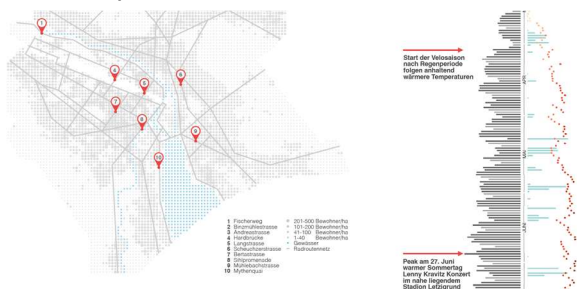


Figure 2: Part of a MSc InfVis student project result (Müller 2020)

The two main courses regarding cartography and geovisualization are the BSc module Geovisualization and the MSc module Information Visualization. In addition to theory, the students do practical visualization projects (e.g., Figure 2).

The following sections give insights in selected applied research projects of the past four years. More information on all projects can be found at <https://www.fhnw.ch/geomatik-forschung>.

ThermoPlaner3D

The ThermoPlaner3D project (Figure 3, <https://www.thermoplaner3d.ch/>) aims at extracting and visualizing detailed building energy information from large-area 3D thermography. The IGEO works together with the partners ZHAW, BSF Swissphoto and Considerate to design analysis processes and suitable visualizations to support energy companies and homeowners in making informed energy decisions.

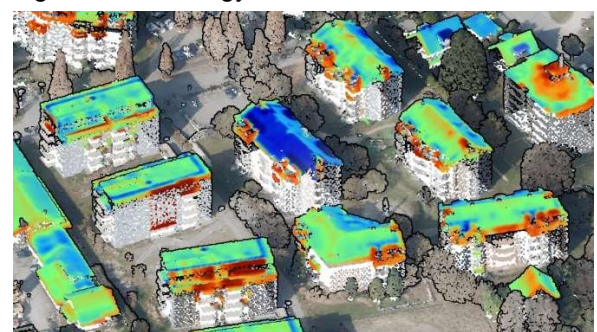


Figure 3: Visualization of raw thermal imagery data used to analyse building roof heat loss.

REDULO

A template-based App framework REDULO was developed to support location-based learning. In collaboration with the FHNW Institute of Architecture, a first application of REDULO offers archi-

tectural walks in Basel in the App “Baukultur Schweiz” (Figure 4, on GooglePlay / AppleStore).

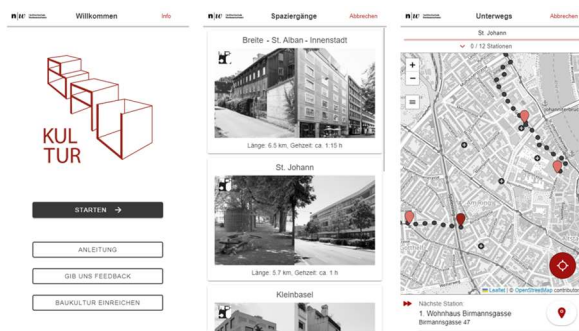


Figure 4: Three App “Baukultur Schweiz” screenshots using two different REDULO framework templates.

EVAC - Employing Video Analytics for Crisis Management

When extraordinary incidents take place, like a flooding after much rain, people record the event with smartphones. Such eyewitness videos may contain interesting information for incident management. This project developed processes to identifying relevant videos and visualizing extracted content for use by crisis managers (Figure 5, <https://www.nfp75.ch/en/ZJjLVBZ18ygSB9zw/project/project-bleisch>).



Figure 5: Examples of street centre line cues for linking multiple perspectives in spatial video analysis (Hollenstein & Bleisch 2022)

Building aggregation for shared heat pump energy generation

The project MicroHeat investigates the potential of thermal micro-grids for residential buildings with gas heating in the Canton of Basel-Stadt. A method was developed that estimates the potential of thermal micro-grids for small building groups considering factors such location,

neighbouring buildings, construction year, energy reference area, and building type to cluster buildings efficiently (Figure 6).



Heat load limit 100 kW, residential buildings with gas supply considered
Data source: Federal Statistical Office Switzerland, Geoportal Kanton Basel-Stadt, 2022

Figure 6: Visualising building topologies with potential thermal micro-grids (Bereuter & Hall 2023).

Digital Cities 4 Us

In the research project DigitalCities4Us, IGEO collaborates with Hexagon and the City of Basel to analyse and visualize dense city point clouds to support different stakeholder requirements.

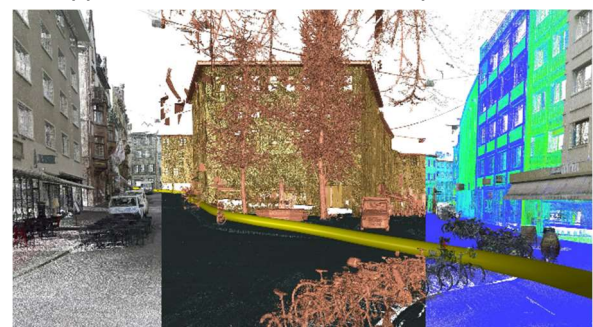


Figure 7: Analysis of dense city points clouds to evaluate accessibility (Cadotsch & Karabasoglu 2023).

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Hydrological Atlas of Switzerland

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The “Hydrological Atlas of Switzerland” HADES is the result of a collaborative effort by Swiss hydrologists and has provided basic hydrological information, specialist knowledge and didactic materials to a wide range of users for over 30 years, on behalf of the Federal Office for the Environment FOEN.

Data and Analyses (since 2018)

The data and analysis platform provides analysis and aggregation options for viewing and downloading in over 4500 catchments (see Figure 1). The topics are divided into the following eight chapters: A) Fundamentals, B) Water in the Atmosphere, C) Water on the Earth's surface, D) Water in the Lithosphere, E) Synthesis, and F) Water and Humans.

Printed Issue (1992–2010)

The printed issue provides reliable and comprehensive information about water in Switzerland by means of maps, diagrams, and texts. Digital tables, grid and vector data corresponding to the Atlas, as well as all explanatory texts, are available for viewing and for downloading. In addition, all printed plates are at your disposal in pdf format.

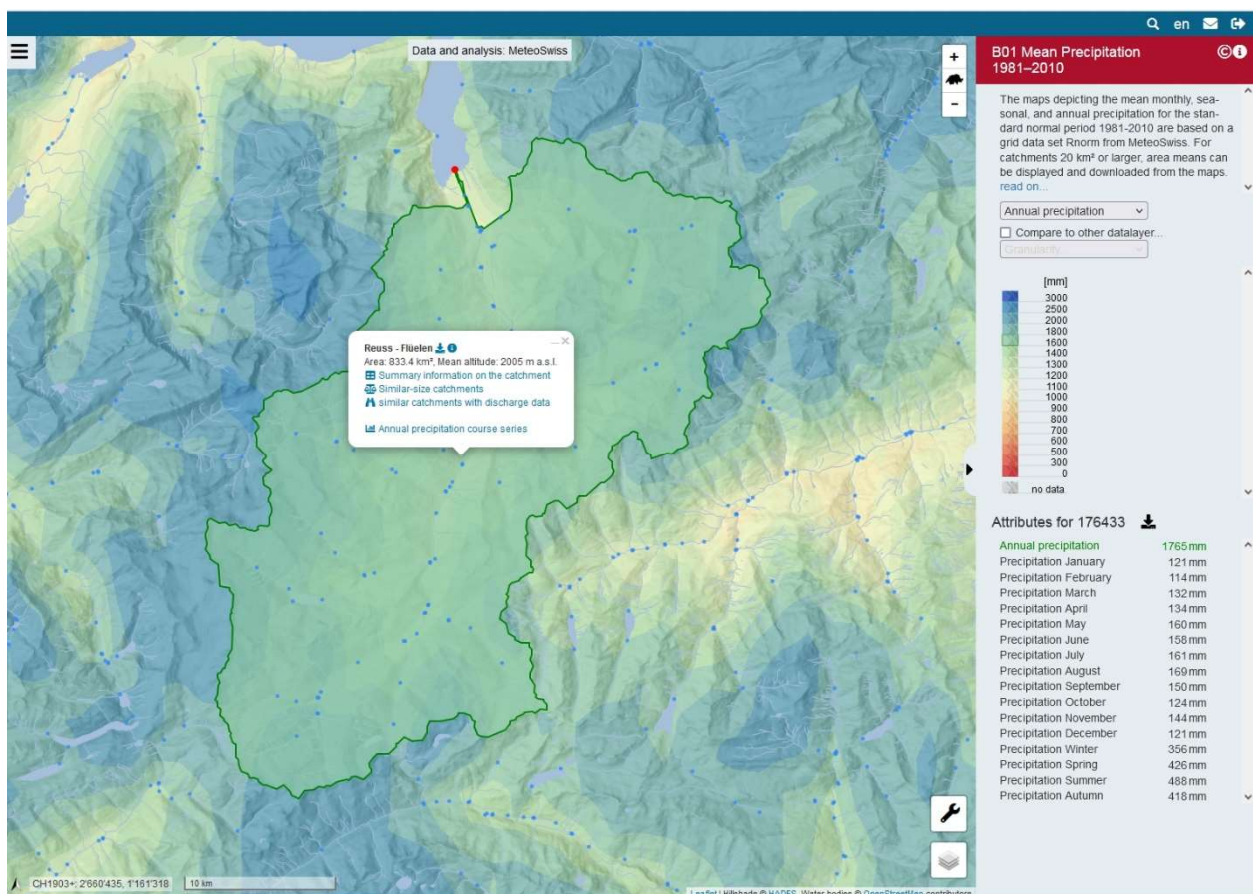


Figure 1: Map B01 Mean Precipitation 1981–2010 with the analysis options for a catchment.

Excursions (since 2004)

With its series of excursions under the heading “Tracks along the Water World”, the Atlas aims to create public awareness about hydrological topics. Since 2004, 31 excursions in nine regions of Switzerland have been published (see Figure 2).



Figure 2: Excursion guides to hydrological topics

Hydro-CH2018 (since 2021)

The present platform, “Hydro-CH2018: Scenarios till 2100”, presents hydro-climatic and hydrological scenarios for the 21st century. The platform currently includes precipitation and temperature scenarios, estimates of glacier development, and the resulting runoff scenarios for selected catchments (see Figure 3). The hydrological scenarios show possible ways in which the water balance

and waterbodies in Switzerland could, under certain assumptions, change as a result of climate change. They include important hydrological components such as discharge, groundwater recharge, proportion of meltwater, evapotranspiration, or waterbody temperatures. At the end of the model chain are impact models that simulate the effects on water management or agriculture.

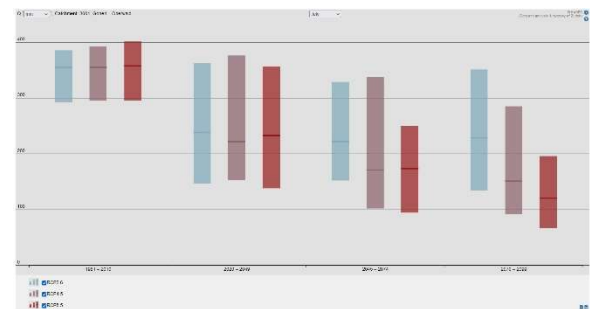


Figure 3: Goneri–Oberwald (influenced by glacier retreat): Changes in discharge in July up to the end of the 21st century for RCP2.6 (blue), RCP4.5 (purple), and RCP8.5 (red)

Teaching Material (since 2015)

The modern teaching material “WASSER verstehen” (“Understanding water”) for high schools is available in both print and digital formats. The printed and digital materials complement each other in the modularly structured learning environment and support a deep examination of hydrological topics (see Figure 4).

Distribution de l'eau

Même en 2100, la Suisse enregistrera encore assez de précipitations pour ne pas manquer d'eau, grâce aux Alpes. Les **changements climatiques** en modifieront cependant la répartition saisonnière. En outre, du fait de la disparition des glaciers d'ici 2100 et de la diminution des quantités de neige, il s'écoulera bien moins d'eau de fonte en été. Sans ces réservoirs, les pénuries s'aggraveront, surtout lors des canicules.

La **distribution optimale de l'eau** dans ce type de situation n'est pas le seul défi auquel font face les services chargés de la **gestion des eaux**. Ils se débattent aussi contre la répartition des tâches compliquée entre la



Fig. 1 : Le lac de barrage de Tseuzier stocke l'eau pour la production d'électricité. (photo: Tom Reist)



Fig. 2 : Le Grand Bisse de Lens conduit l'eau du torrent Ertenze vers les prairies et terres agricoles à irriguer. (photo: Flurina Schneider)



Figure 4: Teaching material for high schools (extract)

SSC Corporate Members

Matthias Beilstein Kartographie

Esri Switzerland

evoq communications AG

Hallwag Kümmerly+Frey AG

MapTiler

OCAD

Orell Füssli Kartographie AG

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Since 2007, “Matthias Beilstein Kartographie” has been specialised in visualising a wide range of topics with reference to geographic locations. Special emphasis is given to an aesthetically appealing presentation and intuitive readability. Customers and business partners come from the private sector as well as administration and NGOs.

Philosophy

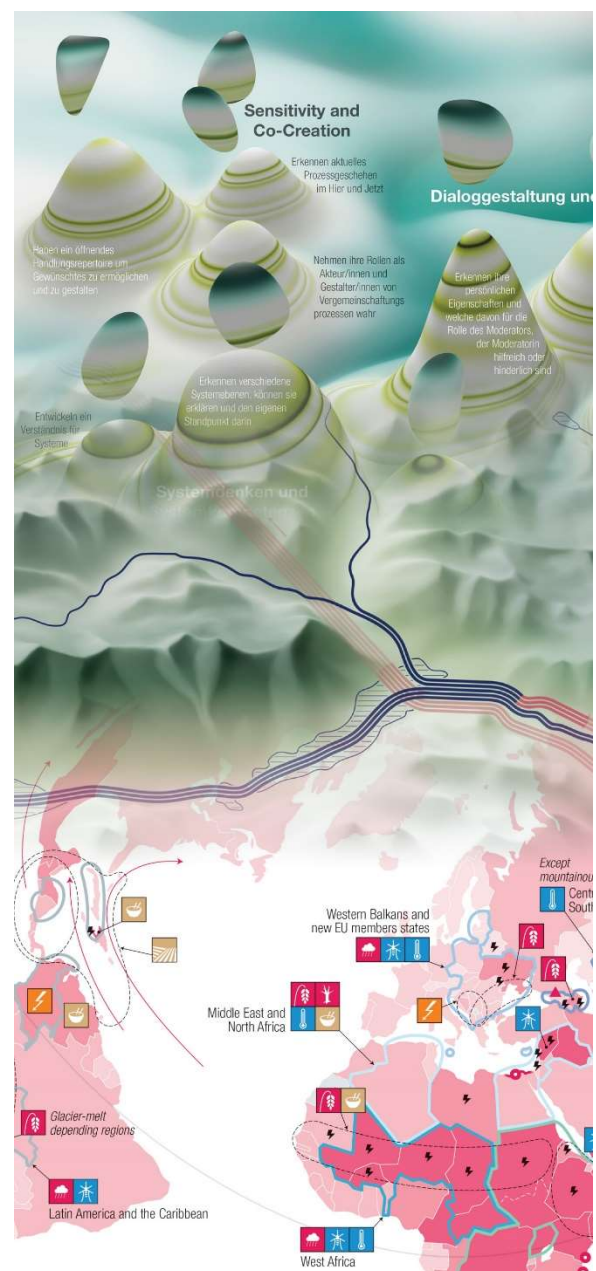
Cartography is an art,
that gives us the world on paper.
We see mountains, rivers, and coasts,
that fill our hearts with longing.

The map is a treasure chest,
full of knowledge and secrets.
It shows us paths and trails,
that lead us to new destinations.

It gives us orientation,
in a world full of change,
it's like a compass,
that guides us to our destiny.

But the map alone,
is just a piece of paper,
it takes the spirit of exploration
to bring it to life.

So cartography remains,
an art full of magic,
that shows us the world in miniature,
and inspires us.



Esri Switzerland

Esri is the world's leading provider of geographic information systems and location intelligence as well as map-based digital solutions. Esri's ArcGIS geo-platform helps organizations in the private and public sectors transform big data, real-time data, and geodata into information that can generate added value. More than 300,000 customers around the world put their trust in the flexible solution and service portfolio offered by the GIS provider, which was established in 1969. Customers that use the ArcGIS geo-platform include 90 percent of Fortune 100 companies, numerous governments, 30,000 cities, and more than 12,000 universities.

Esri Switzerland is a distributor and part of this global network. With its approximately 50 employees and more than 800 customers, Esri Switzerland, which has locations in Zurich and Nyon, employs its complete ArcGIS expertise to provide GIS services throughout Switzerland.

Digital Twins driven by GIS

Digital twins have become crucial across industries, offering valuable insights into the systems and operations that sustain processes. Governments, at both local and national levels, recognize the benefits of accurate digital twins for their cities, states, and countries. They enable smarter planning, increased efficiency, and the advancement of sustainability initiatives. Businesses also rely on digital twins for enhanced understanding, which leads to informed decision-making.

The evolution of the concept of "digital twins" is intriguing. Originating from the aircraft and automotive manufacturing sector as a means to assess performance in specific scenarios, it has now been commercialized for use by architects and engineers in construction.

For digital twins to be effective, they rely on precise and up-to-date maps and 3D models derived from imagery. These requirements align with the crucial aspects of geographic information systems (GIS) technology.

Esri technology serves as a logical foundation for digital twins, offering rich data models and enabling data integration from various sources. It provides tools for exploring the digital twin and applying it to different missions, including critical

applications such as infrastructure projects, disaster response, and natural resource conservation.

A digital twin driven by GIS is a foundational element for diverse operational activities. It becomes an integral part of a city's infrastructure, offering a 3D representation that can be continuously updated in real time through GIS technology.



Figure 1: Digital Twins represent a replica of our real-world.

A geoinformation system transforms data from different systems into digital twins, which are continuously updated through various transactions. There is a growing trend of digital submissions, such as building information management (BIM) models for cities, and reality capture through imagery from drones, aircraft, or satellites.

In essence, GIS serves as the cornerstone for a dynamic digital twin, representing a replica of our real-world environment. The concept of GIS originally aimed to abstract and construct a "digital twin" containing geographic information about cities, landscapes, and environmental conditions.

This opens up fascinating possibilities

By using a GIS digital twin as a foundation, you can create visualizations, simulations, and physics models within an immersive, game-like environment. This allows for collaboration and sharing with both colleagues and the public.

This innovative approach gives rise to a new type of business system that requires immersive connectivity and offers an immersive view. By employing an open GIS approach, federating

datasets within a virtual environment, we can explore relationships, processes, and forecasting.

The concept of a digital twin extends beyond local geographies and the natural world. It also encompasses the entirety of social science, offering insights into interconnectedness and relationships. Esri technology itself has always served as a digital twin of our reality, integrating the natural and built environments.

As we continue to leverage GIS and digital twins, with each new generation of technology and leadership, we have the potential to achieve extraordinary outcomes.

Zürich

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Figure 2: Digital Twins create visualizations and simulations – this allows to collaborate and share with stakeholders, colleagues, and the public.

evoq communications AG, Zürich

Christian Sutter

Managing Partner, Head of mapsteam, evoq communications AG, Zurich

evoq.ch / mail@evoq.ch | +41 44 262 99 33

SBB Trafimage represents the most comprehensive range of map products for public transportation services in Switzerland. For all travellers and public transport operators, Trafimage combines data from various sources and provides suitable databases as well as ready-to-use map products for public transportation needs. Our products range from both interactive and printed maps to floorplans for train stations throughout the country.

Trafimage is a system owned by the Swiss Federal Railways SBB. It is a longstanding successful collaboration between evoq, responsible for the development, design, and updates of Trafimage products, and geOps, who is in charge of the technical development and operation of the IT systems.

Public transportation map system

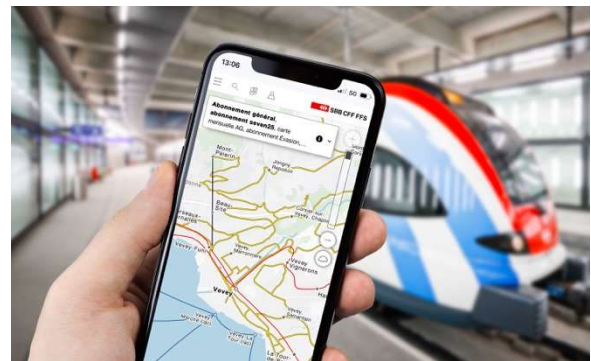
Trafimage maps are created on the basis of various data sources, such as OpenStreetMap or Swisstopo. They do not only cover Switzerland, but also a major part of Europe. The system offers continuous scales, from the bus stop in the neighbourhood to the generalized international rail network. Trafimage maps are characterized by high design standards, easy usability, and a focus on public transport. In recent years, the system has not only been expanded geographically, but has also been technically and visually adapted to meet the needs of today's railway passengers.



Printed map for infopoints in trains and stations

Our map system allows a wide range of applications for print and online usage. Trafimage provides a complete series of interactive maps, which are used in all important GIS systems of

SBB. Our maps are a key feature of SBB Mobile, the leading Swiss travel app, as well as for online timetable inquiries and in-train board information systems. Finally, the system represents the data source for numerous classic maps.



Online map showing area of validity for GA travelcard

Floorplans for major SBB railway stations

Besides maps, Trafimage offers floorplans for all major railway stations in Switzerland. The floorplans present all offers and public services available at SBB railway stations, both in print and online. The data for more than 600 stations is being managed in the INSA database, allowing central data management for all online and offline applications – from GIS data to logos for all shops, opening hours, available services, and POIs in close proximity around the stations. Travellers can access all information, offers and services of a railway station on their mobile device as well as on their PC.

The INSA system also allows data export for printed media. Station floorplan posters are still an essential part of local customer information. The posters with the iconic 3D design are an essential part of the SBB brand and its wayfinding

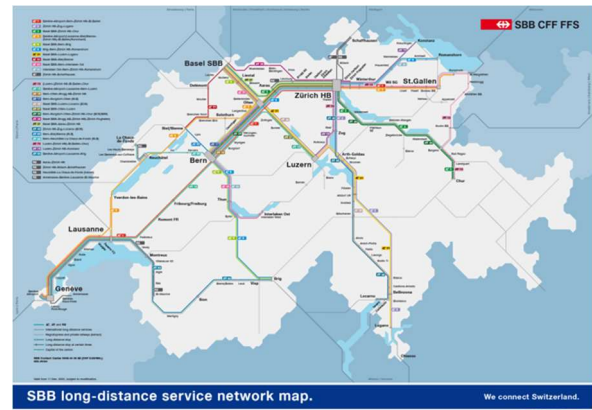
systems, providing customers with spatial information and orientation in complex building situations.



Interactive floorplan for Basel SBB

Railway network maps

The Trafimage system is completed by evoq's network maps that provide customers with a systematic and easy-to-understand view of public transport networks. The standardized graphic map design is being used to represent entire transportation networks, fare associations or local zones. These maps are based on the specifications of the Alliance SwissPass organization and thus guarantee consistency of all over the country. They also take the specific needs for people with visual impairments into account.



Network map for SBB long-distance services

A nationwide information system

Trafimage maps and floorplans are intended as a comprehensive information system not only for SBB, but for the whole Swiss public transport system. As the system owner, SBB sets the framework and standards for design, data, and content of the whole map system. Trafimage is open to all transport providers and is used especially by other public transport companies. Clients such as Switzerland Tourism, BLS Railways or Zurich Public Transport (VBZ) profit from our expertise and the data provided by Trafimage.

The Trafimage system: maps and floorplans, online and printed.



Hallwag Kümmerly+Frey AG

Marianne Saner and Rahel Eggimann

Hallwag Kümmerly+Frey AG, Grubenstrasse 109, CH-3322 Schönbühl, Phone: +41 31 850 31 31,

E-mail: info@swisstravelcenter.ch, URL: www.swisstravelcenter.ch

Publishing House for Tourism

Hallwag Kümmerly+Frey is the leading publisher of travel information in Switzerland. From road maps and city maps to hiking maps and bicycle maps, we offer Swiss quality products to ensure optimal planning and travel experiences for our readers. Our extensive international range of maps is impressive with its up-to-date information, precise cartography, clear layout, and detailed depiction of landmarks, national parks, and more. Thanks to their multilingual labelling, our maps are distributed worldwide and enjoy an excellent reputation.

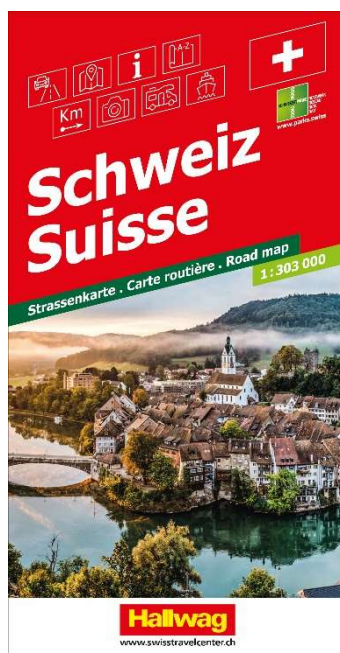


Figure 1: Cover Switzerland road map 1:303,000

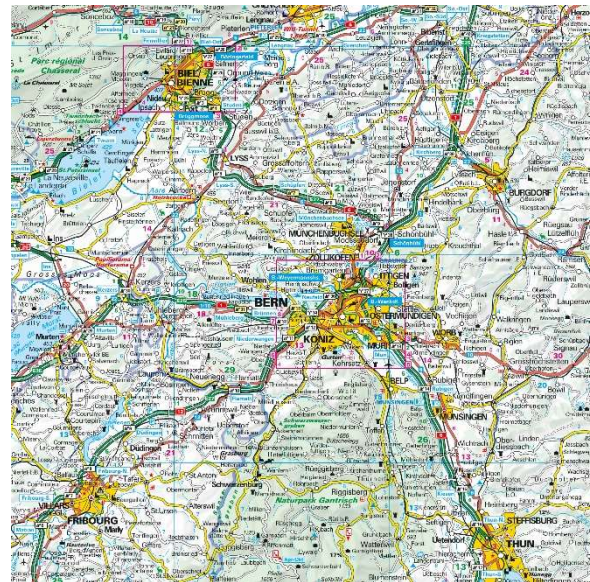


Figure 2: Map view Switzerland road map 1:303,000

To round off its tourist package, Hallwag Kümmerly+Frey AG is also the exclusive Swiss supplier of many famous travel guide series including Baedeker, Busche, Conbook, Dorling Kindersley, DuMont, Falk, Kompass, Kunth, and Lonely Planet.

Product Range

- road and regional maps
- city maps
- guides and atlases
- continent and world maps
- panoramic maps
- leisure books
- hiking and cycling maps
- hiking guides
- hotel and travel guides
- cartographic products as promotional gifts for all sorts of businesses (customised products).

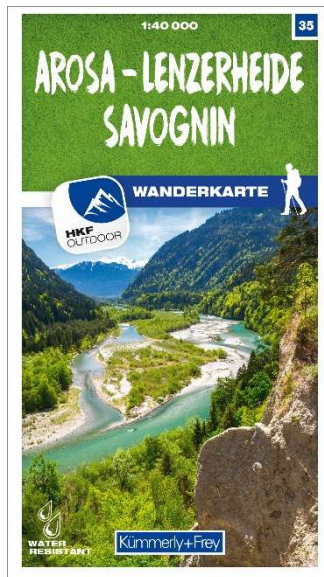


Figure 3: Cover of a hiking map 1:40,000

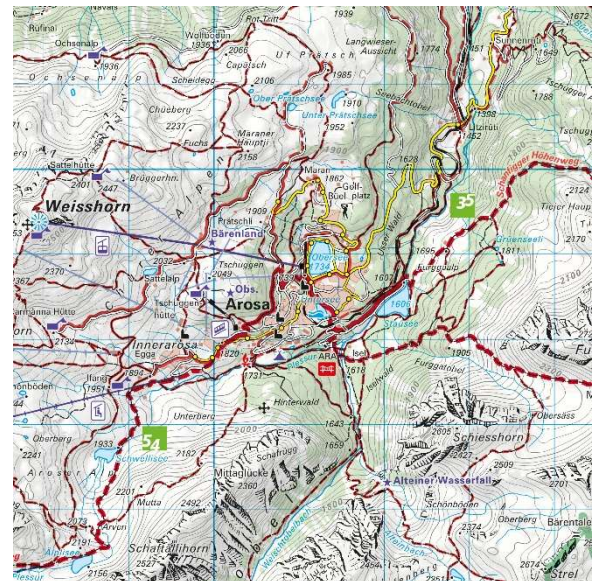


Figure 4: Map view of a hiking map 1:40,000



Figure 5: Cover of a GuideMe Travelbook

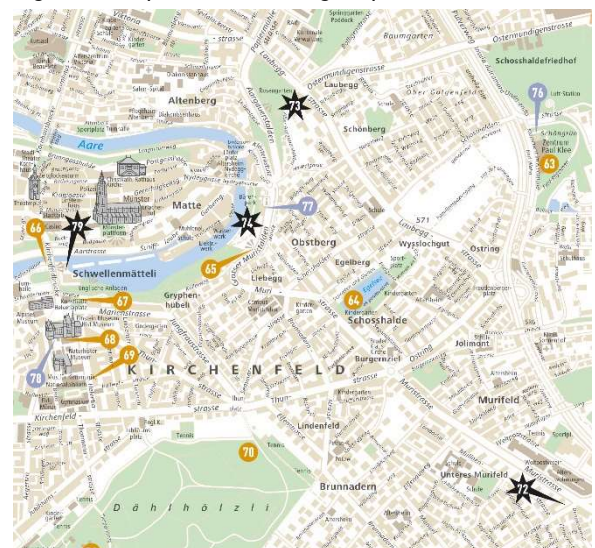


Figure 6: Map view of a GuideMe Travelbook



Figure 7: Cover of the Grand Tour of Switzerland Touring Map 1:275,000

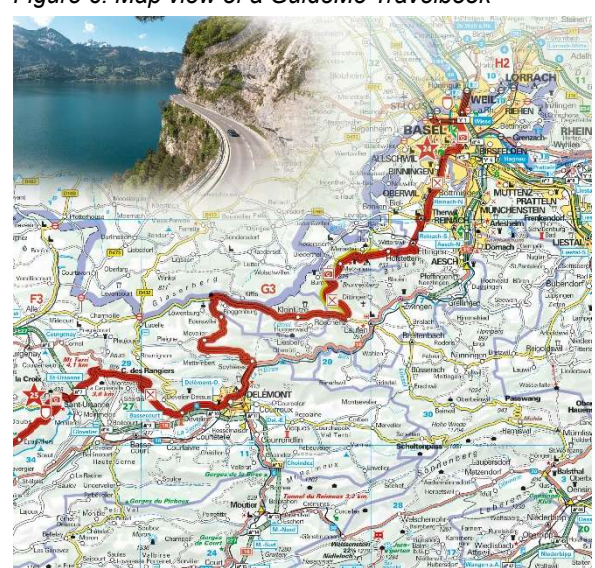


Figure 8: Map view of the Grand Tour of Switzerland Touring Map 1:275,000

MapTiler

Petr PRIDAL, PhD, Chief Executive Officer.

MapTiler A.G, Höfnerstrasse 98, 6314 Unterägeri, Switzerland - +41 41 511 26 12 - sales@maptiler.com

More information available at <https://www.maptiler.com>



MapTiler is an online platform and software that specializes in the creation and customization of maps. It offers a range of services and features related to map generation, hosting, and integration. MapTiler has brought a number of innovations to the field of digital cartography in recent years (2019-2023), which result in interoperable maps that are viewed monthly by millions.

MapTiler Streets and Satellite maps

MapTiler Streets is a visually appealing and highly detailed global base map, designed for a variety of use-cases. It offers a comprehensive view of streets, roads, and points of interest, making it ideal for navigation, route and delivery planning, or any kind of mobility applications. The map design employs a vibrant color scheme that enhances legibility and helps users to understand their itinerary or surroundings.



Figure 1: Streets style with global coverage

Since 2019, MapTiler has also been creating and serving MapTiler Satellite, a cloudless satellite map of the world. It is composed of a vast collection of open satellite imagery and orthophotography. The imagery is carefully processed and stitched together to create a seamless and accurate representation of the Earth's surface. MapTiler's unique color-toning technology enables the balancing of the imagery colors and ensures the best rendering at every scale. The MapTiler Satellite map is continuously improved and updated with new data sources.



Figure 2: High-resolution MapTiler Satellite for the entire world

MapTiler Streets and Satellite maps combine accurate geospatial data, visual aesthetics, and interactive capabilities. They provide a versatile and user-friendly mapping solution suitable for web and mobile applications, geographic information systems, and other location-based services.

An Innovative map customization tool

MapTiler maps can be modified with MapTiler Customize, an intuitive online map design editor. Users can easily adapt the map to their use-case by adjusting language, colors, labels, or icons.

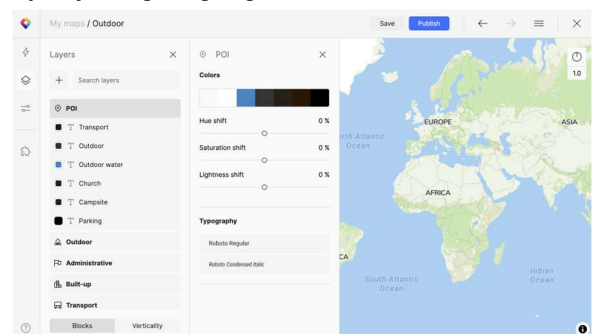


Figure 3: New design tool for cartographers

Completely redesigned in 2022/2023, the latest version of Customize disrupts the vector map design process, allowing both non-cartographers to create professional maps in a few simple steps, and experienced users to leverage advanced functionalities and modify every style detail. Custom vector or raster geospatial data can also be overlaid and integrated into the map, offering infinite possibilities to the cartographer.

MapLibre and the MapTiler SDK

It's in MapTiler DNA to contribute and leverage open-source geospatial technology for building innovative mapping products. One of the most recent contributions is MapLibre, an open-source mapping library that MapTiler helped to create back in 2021.

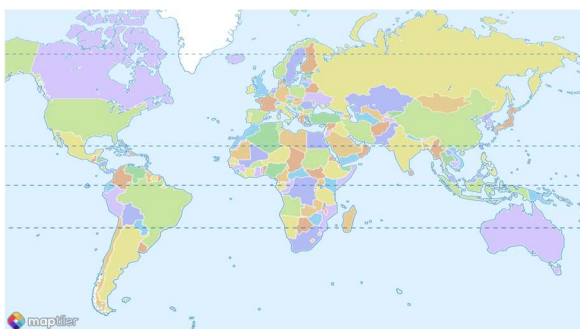


Figure 4: The MapLibre default map style by MapTiler

Initiated in late 2022, the MapTiler software development kit (SDK) leverages the MapLibre functionalities and extends them for the MapTiler Cloud platform. It simplifies the implementation of maps and geospatial functionality into applications, providing developers with powerful tools for creating location-aware experiences.

As an example, The MapTiler SDK can be used to create a map-based data visualization of earthquake occurrences with clustered icons on top of a dark base map in only a few lines of JavaScript/TypeScript.



Figure 5: Earthquakes map powered by MapTiler SDK

MapTiler Weather

The MapTiler Weather technology is another significant innovation developed by MapTiler since 2021. It is based on a cutting-edge approach for weather data visualization based on OpenGL Shading Language (GLSL) and a modular TypeScript library, allowing to build animated and interactive weather maps. Scientific weather data such as wind, temperature, precipitation, pressure, or radar usually comes in complex formats, like GRIB or NetCDF, which can't easily be rendered in the web browser or mobile applications. MapTiler Weather now makes it possible to visualize raster data across space and time, with minute-to-minute interpolation between timeframes. Particle rendering and visualization parameters can be customized to build efficient weather forecast maps.



Figure 6: Animated wind map powered by MapTiler Weather

OCAD

Andreas Kyburz

OCAD Inc., Mühlegasse 36, CH-6340 Baar, +41-41-763 18 60, info@ocad.com, www.ocad.com

OCAD is the result of more than 30 years of software engineering. During this time, OCAD has evolved from an orienteering map drawing software to a powerful mapping solution that covers the entire map production workflow. In OCAD you draw maps that are georeferenced to a specific scale.



Cartographic workflow

- Use Existing Geo Data

Import geospatial data such as shapefiles, Geo-Packages and OSM or connect to Web Map Services. Organize and edit the vector data attributes using database tools.

- Capture Your Own Data

Enhance your map by capturing map features directly in the field with our OCAD Sketch App for mobile devices.

- Analyse LiDAR data

Derive hill shadings, contour lines, vegetation height maps, slope gradient and feature extraction within a single run.

- Create Your Own Map Symbols

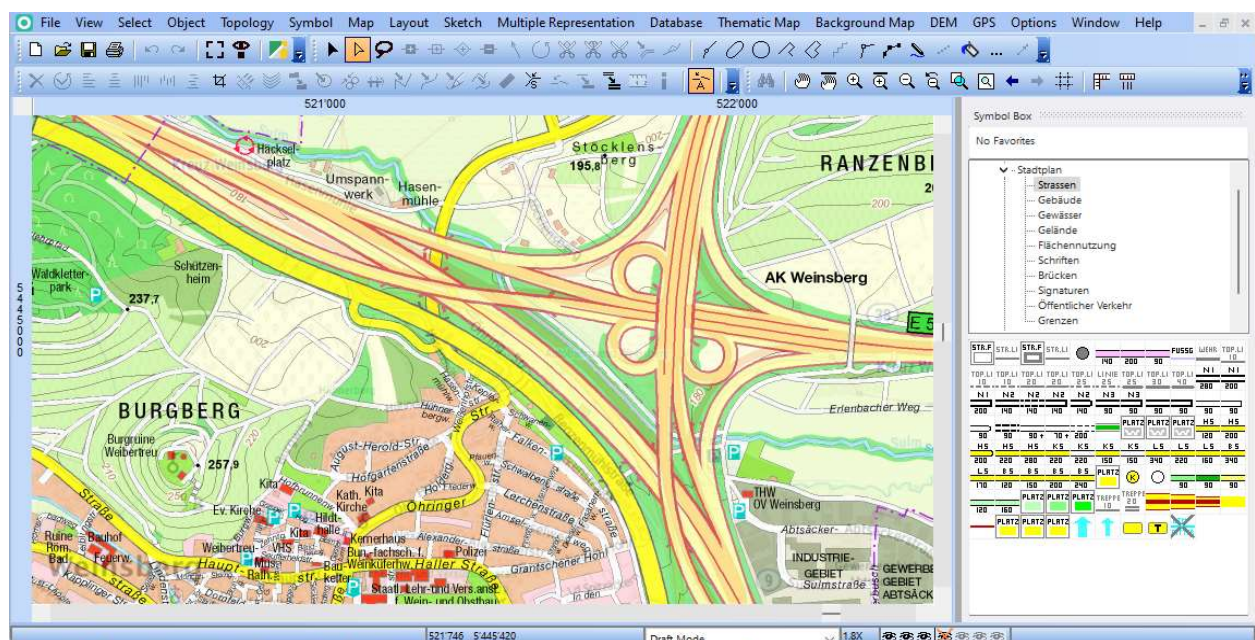
Assign your data to own created maps symbols. Use the unique drawing, editing and generalization tools to produce maps for the most demanding cartographic requirements.

- Print and Export Your Map

Finalize your map with a layout for printing or export for further digital use.

- Multiple Representation

Alter your map features in different representations without affecting your original map. However, if you change the original, the different representations will adopt these changes.



OCAD GUI.

Products and Services

The OCAD Mapping Solution combines all the functions to create city maps and topographic maps in one software. In addition to developing its software, OCAD Inc. offers its services for data migration and customization projects.



OCAD migrates and georeferences city maps.

OCAD Sketch App

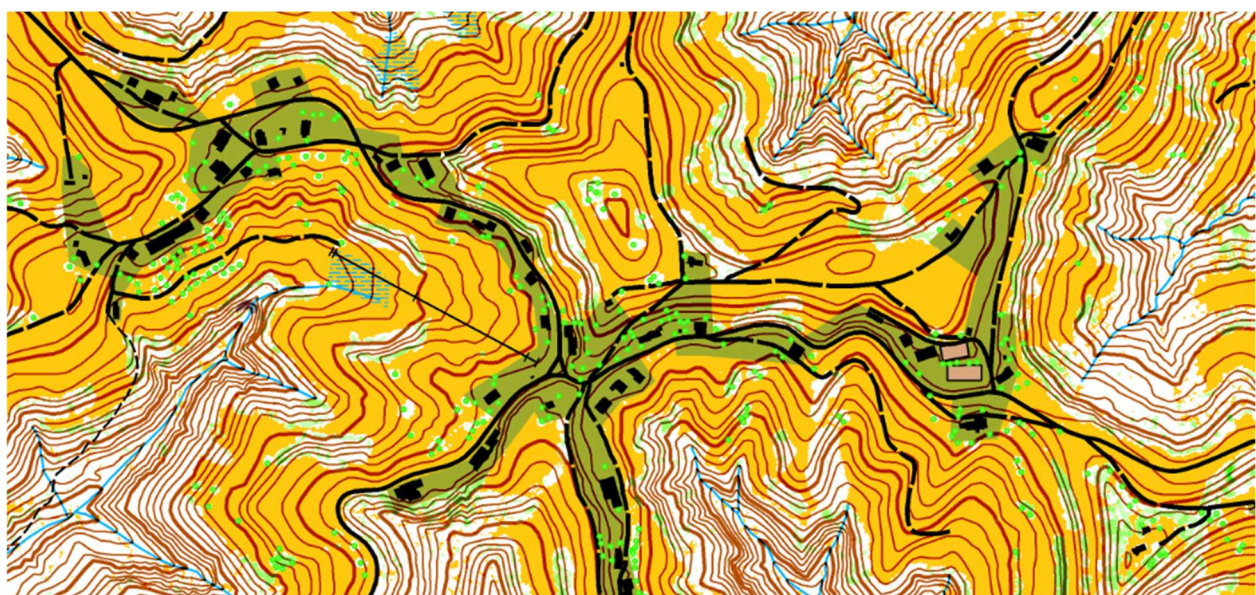
The newly developed OCAD Sketch App complements the desktop version of OCAD. It is designed for mapping in the field – both for new mapping and for revisions or feedback from map reviewers.



The OCAD Sketch App enables ergonomic and efficient mapping in the field.

MapAnt.ch

In order to show that OCAD can handle large amount of data volume, MapAnt.ch was created. It is an automatically generated map of Switzerland from free available geodata, such as swissALT13D, swissSURFACE3D and swissTLM3D and is the most accurate topographic map of Switzerland. Furthermore, it also shows vegetation. The elevation curves are automatically smoothed to account for the roughness of the terrain.



Map extract from <https://www.mapant.ch>

Orell Füssli Kartographie AG

Giuliano Beccarelli

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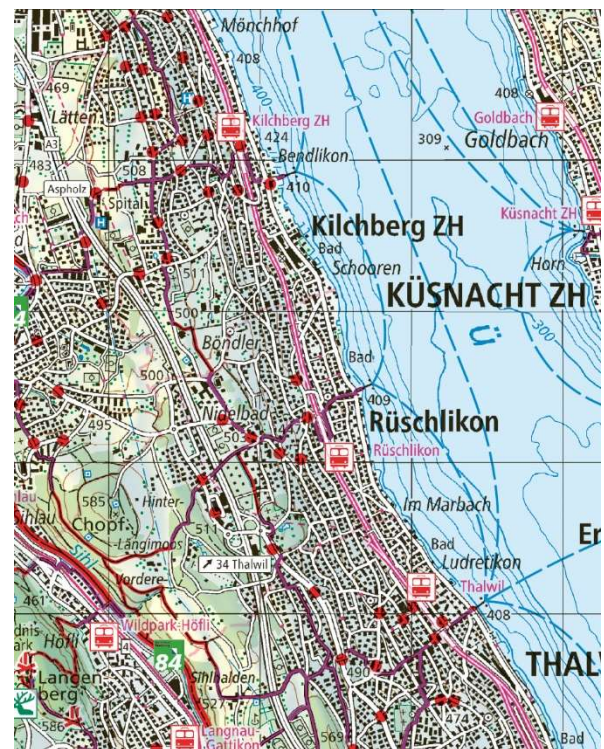
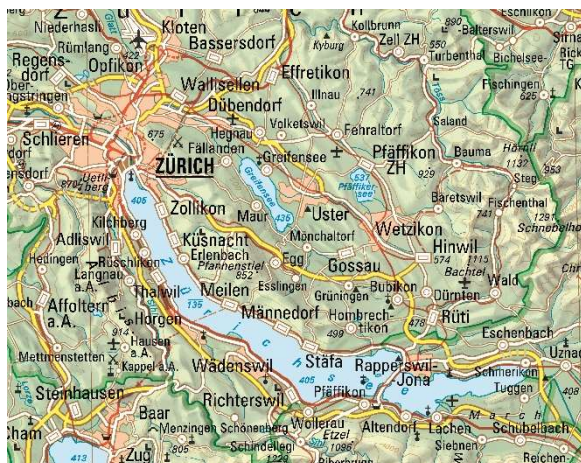
More than 500 years of company history. In 1519, the Zurich City Council commissioned Christoph Froschauer for printing jobs. Orell Füssli began manufacturing maps in 1924 when acquired the company Kartographia Winterthur. From then on important map works such as the Schweizerischer Mittelschulatlant, and later the follow-up work, Schweizer Weltatlas were produced and printed in-house. In 1992 the Orell Füssli cartography division became largely independent through a management buyout. The company positioned itself as a prominent publisher in the fields of hiking, tourism, city plans and other special services.

Services and Products

Orell Füssli Kartographie AG offers planning, consultation, and development of all cartographic products, from the concept stage, through to designing and editing of the basics, right up to the modelling of your data according to cartographic principles and corresponding graphics. Own publications include different products like city maps and atlases, school maps, holiday maps and hiking maps. We offer also special services in cartographic pre-press, check your map products using colour management system, create reliable authoritative digital proofs and generate your CTP print data.

Schulkarte der Schweiz

The 1:500,000 official school map of Switzerland has been published regularly since the 1930s. The map is available in German, Italian and French and is printed using eight spot colours with a CMYK title page.



Wanderkarte Kanton Zürich

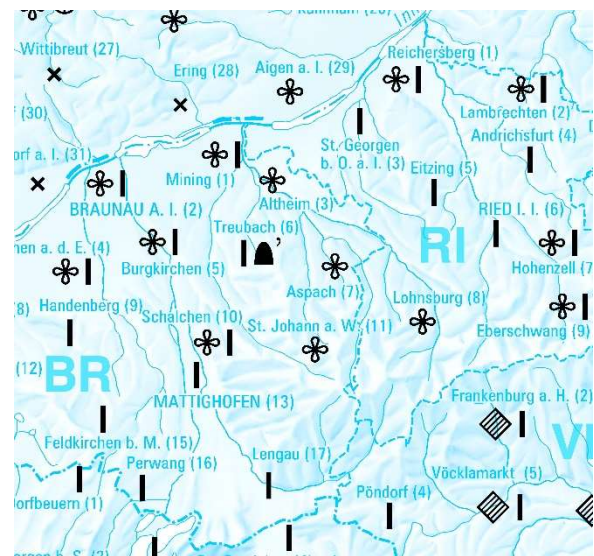
In collaboration with the "Zürcher Wanderwege" association (Zurich Hiking Trails), the new 1:50,000 scale hiking map was produced to mark their 90th anniversary. The whole canton of Zurich shown on a single map including signalled hiking and mountain trails, railway and boat lines, places of interest and the Hiking in Switzerland routes (SwitzerlandMobility) such as the "Zürcher Weinland Weg", the "Hüttchopfweg" and the "Küsnachter Tobelweg". In addition, almost 600 fireplaces are marked.

Sprachatlas Oberösterreich

The Language Atlas of Upper Austria (SAO) is the centrepiece of the Upper Austrian Linguistic Research Department. It documents the dialects of Upper Austria and its direct neighbouring areas. The SAO presents the - linguistically geographically varying - linguistic forms in 223 places in and around Upper Austria in form of maps and accompanying explanations. In the years from 1988 onwards, the dialect survey of the province of

Upper Austria yielded a total of 170 place records in Upper Austria and in the neighbouring areas of Lower and Upper Bavaria, Salzburg, Styria, Lower Austria and Southern Bohemia, plus villages in Romania (Transylvania) and Ukraine (Carpatho-Ukraine) settled from Upper Austria. This results in a network of 223 places whose dialects are presented in the Language Atlas of Upper Austria.

	<i>Keks</i> <i>ghɛks̥, k̥hɛks̥, k̥xɛks̥</i>
ı	<i>Keksl</i> <i>k̥hɛks̥l̥</i>
ı	<i>Keksei</i> (GM 10) <i>k̥xɛks̥aj</i>
▲	<i>Gutel</i> <i>gʊtl̥</i>
▲	<i>Gutsel</i> <i>gʊnds̥l̥</i>
◌	<i>Zelten</i> (NB 12) <i>ds̥ɔ̃n, ds̥ɔ̃l̥t̥ɪ</i>
◌	<i>Zeltl</i> <i>t̥ʂeid̥l̥, t̥ʂɔ̃id̥l̥, t̥ʂɔ̃d̥l̥, d̥ʂɛit̥l̥</i>
◌	<i>Zeltei</i> (NB 7) <i>t̥ʂɔ̃ɛd̥aj</i>
◌	<i>Bacht</i> <i>bâxd, bax̥d̥</i>
◌	<i>Zuckerbacht</i> (B 1) <i>t̥ʂʊkʊb̥ax̥t̥</i>
◌	<i>Bacherei</i> (FR 1) <i>b̥ɔx̥v̥r̥æ</i>
◌	<i>Bäckerei</i> <i>b̥ɛkʊ'r̥äj; b̥ɛkʊR̥ɛ</i> (L 2)
✱	<i>Leckerl</i> <i>lɛknl̥</i>
⌣	<i>Platzerl</i> <i>blat̥ʂnl̥, blādsnl̥</i>
⌣	<i>Plätzl, -erl</i> <i>bl̥et̥ʂl̥, bl̥et̥ʂnl̥</i>



Der Jura Weg - L'Échappée Jurassienne

The hiking guide "L'Échappée Jurassienne" describes a hike that starts in Dole, France, then runs for 350 km in the Jura Mountains and ends in Nyon on Lake Geneva in Switzerland. The last three stages of this hike will make you discover Switzerland as you have never seen it before. From La Coudre, you will climb to the top of "La Dôle" (1677 m) and admire one of the most beautiful panoramas over Lake Geneva to Mont Blanc. You will then reach the village of St-Cergue for a well-deserved rest in one of the accommodations provided. The next day, you will discover the "Toblerone Trail" on a remarkable stage in the forest that will lead you to the lake. From there, the trail leads to the magnificent "Château de Prangins" (Swiss National Museum).



Authorities and Institutions

Swiss Federal Statistical Office

Geoinformation Kanton Luzern

Federal Office of Topography swisstopo

Zentralbibliothek Zürich

Swiss Federal Statistical Office

Olaf König, Joël Gasche
www.statistik.admin.ch
info@bfs.admin.ch

Portrait

The Federal Statistical Office (FSO) is Switzerland's national competence centre for official statistics and constitutes the hub of the Swiss statistical system. It produces and publishes statistical information on the status and development of the population, economy, society, education, research, territory, and the environment. This information is used for opinion building among the population and for the planning and management of key policy areas. It provides insight into society's development and its complexity and helps make it transparent for democratic debate.

Through innovative approaches, the FSO analyses, interprets and publishes statistical information. It edits around 150 publications annually for print and digital media, publishes more than 400 statistical data releases and has a widely used website portal with about 15 million page views every year.

As the largest national provider of regional statistics for more than 150 years, the FSO also has a long tradition in the field of data visualisation, especially in the use of thematic maps.

Since 1989, the FSO has had its own cartographic service – ThemaKart – that offers a competent and fast cartographic information service for institutional customers and is the centralised production unit for all FSO's map and atlas products.



The FSO is situated in Neuchâtel and attached to the Federal Department of Home Affairs.

Services and products

Maps are a key element of the FSO's publications and are widely used to disseminate data in a visual form. The cartographic production covers the whole range of topics of socio-economic data that are collected in the Swiss statistical system. Whether in static form or in interactive form, our maps are always multilingual (up to five languages) and made accessible for all devices.

The main platform to publish new maps is the online statistical atlas interface that provides a full dissemination tool and is very popular with our customers. Users can explore atlas content, find thematic maps, download ready-to-print exports of these, extract the underlying data and find some additional information (various metadata). All our interactive atlases are freely available and are published in German and French.

Statistical Atlas of Switzerland

The standard reference work contains maps from almost every topic covered by the FSO's activity and in which regional data are available. Continuously updated during the year with new data, this atlas provides more than 5000 interactive maps at various geographical levels.

Political Atlas of Switzerland

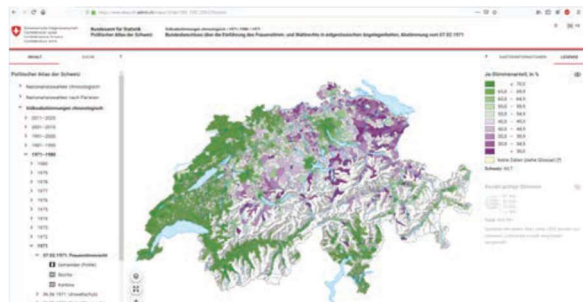
The specialised atlas contains all current and historical Swiss election and vote results. On the days of national elections and popular votes, the FSO offers live maps with continuously updated results.

Statistical Atlas of Swiss Cities

The specialised atlas covers statistical data that presents various aspects of the living conditions in eight Swiss cities.

Historical Atlas of the Federal Population Census

The specialised atlas covers a selection of statistical maps produced from federal population census data taken from the federal censuses carried out from 1850 until 2000.

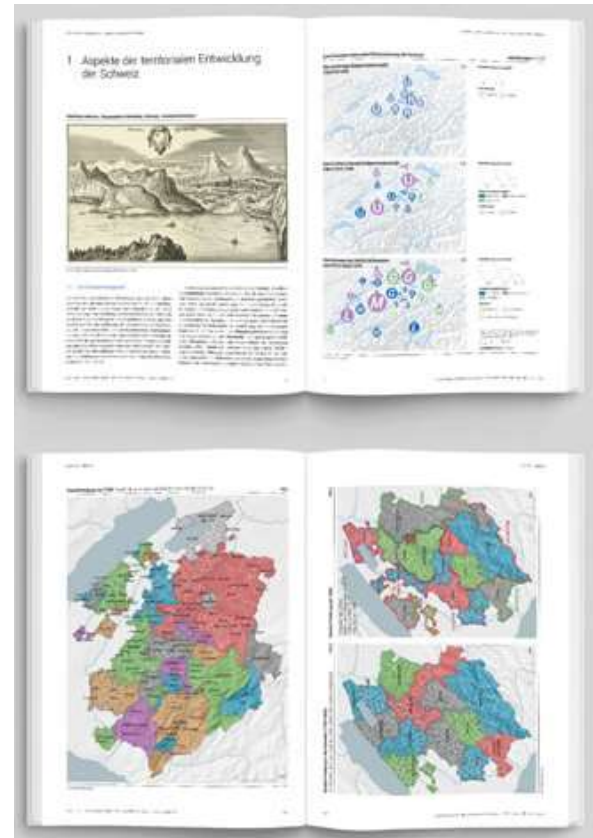


The web interface of the Political Atlas of Switzerland: map of the accepted historic popular vote for "Women's suffrage" (1971).

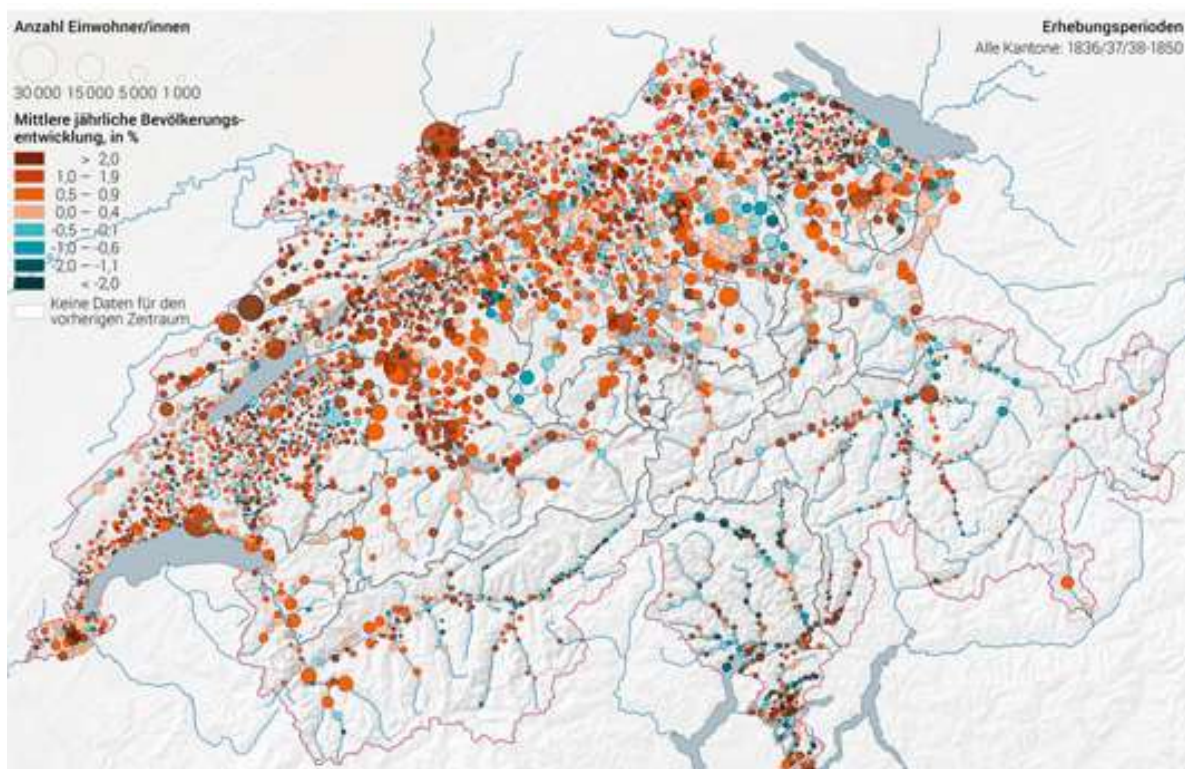
Population censuses in Switzerland before 1850: population numbers at local level

This publication from the Federal Statistical Office (FSO) provides an overview of all population censuses in Switzerland from the period before the first federal census of 1850. It includes the Helvetic Republic population census of 1798/99 at commune level and also all spatially complete surveys during the Ancien Régime and the first

half of the 19th century. The author of the work, Martin Schuler, researched in all of Switzerland's cantonal and episcopal archives as well as in some neighbouring territories.



Population censuses in Switzerland before 1850: population numbers at local level



Geoinformation Kanton Luzern

Jonas Thalmann, André von Wartburg

What we do

Geoinformation Kanton Luzern is the responsible authority for collecting, processing, managing, and publishing spatial data. Furthermore, Geoinformation manages, coordinates, and monitors the work of cadastral surveying.

The coordination of spatial data across the cantonal administration is vital. We ensure optimal usage of data and resources while minimizing redundancies.

Providing an efficient geodata infrastructure, developing data standards, as well as offering GIS training and consulting are other central duties and responsibilities.

Due to the visual nature of geographic data we aim to maintain high cartographic standards rooted in the Swiss traditions of cartography.

Here are three examples to illustrate this:

Basemaps with vector-tiles

Starting in summer 2023 Geoinformation is migrating daily updated base maps such as the plan for the land register (*Grundbuchplan*) to a vector-based format across all platforms (desktop and

web). Vector-tile basemaps offer a number of advantages:

- Dramatically faster generation times for daily updating
- A better user experience, including smooth zooming on mobile and tablet devices
- Fulfilling user expectations as vector-tiled base maps are now a de-facto standard (i.e., Google Maps, Apple Maps)
- Smaller data size and therefore lower disk space requirement
- Easier customisation and maintenance of map content

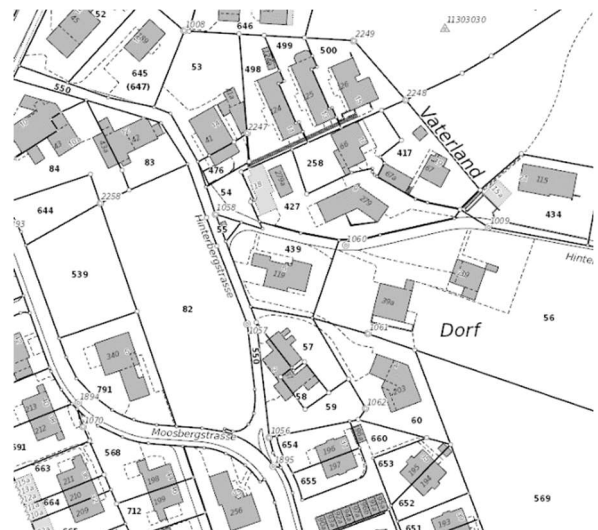


Figure 1: Basemap with vector-tile

General Plan 1:10'000

In the last 10 years, all other Swiss cantons have stopped to produce a cantonal general plan in favour of using the National Map 1:10'000. The canton of Lucerne still sees clear value in maintaining

such a product as long as the following goals are met:

- More up to date than comparable national products.
- Map production is fully automated
- Based on cantonal data
- Dynamic, vector-based product, which can be used in a variety of contexts and for specific cantonal needs

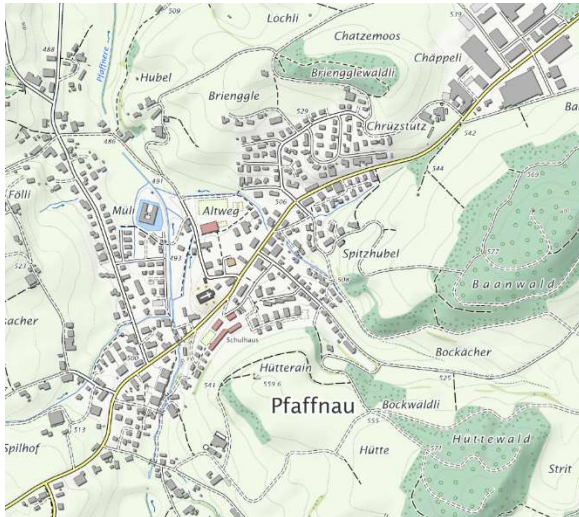


Figure 2: General Plan 1:10'000

3D-Landscape Model (3D-Landschaftsmodell)

There are a lot of emerging topics and initiatives in the field of 3D. The 3D-Landscape Model allows users to visualize and analyze in a 3D landscape, including 3D objects like trees and buildings as well as planned, strategically relevant construction projects.

- Geoinformation opts for a user-centric, web-first approach with emphasis on usability.
- Geoinformation owns and controls all data aspects of the model.
- 3D Landscape can be used for specific applications (e.g., visualization of different variants of bypasses etc)



Figure 3: 3D-Landscape Model

Federal Office of Topography swisstopo

Christoph Streit, Urs Isenegger

The Federal Office of Topography, swisstopo, plays a central role as Switzerland's geoinformation centre. It is responsible for the collection, management, and provision of official geodata and the provision of spatial services.

Seftigenstrasse 264, CH-3084 Wabern, www.swisstopo.ch

Free Basic Geodata

Since 1 March 2021, swisstopo has provided its official data and products online, free of charge, and for open access use. This step was taken within the framework of the Open Government Data (OGD) strategy. All swisstopo's standard digital products, such as digital maps, aerial photographs, and landscape models, are available as OGD and are freely usable.

Web: <http://www.swisstopo.ch/ogd>

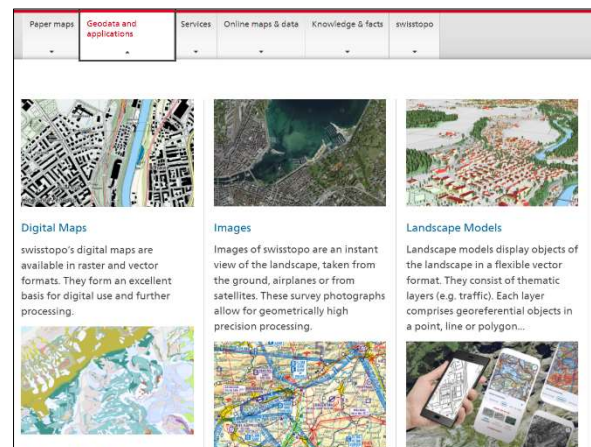
swisstopo-App

Discover even the remotest places in Switzerland with high quality-maps. The free map app from swisstopo, launched in summer 2020 and downloaded two million times since then, lets you combine the National Maps of Switzerland with many other topics such as hiking, cycling, snow sports and aviation on your smartphone and tablet. Ease of use and functionalities for planning and recording tours or experiencing the landscape in panorama mode, are some of the highlights of the award-winning app. Web: www.swisstopo.ch/app

mySwissMap

With mySwissMap, users can design their own personal map without having to worry about the classic sheet cut. Orders are printed and folded at swisstopo's own printing shop and delivered by post within a few days. Choose the desired region from the National Maps to a scale of 1:10,000, 1:25,000 or 1:50,000, the official hiking map or the newly developed orthophoto map – a combination of aerial view and classic map elements. For each map, choose text and the image on the cover yourself.

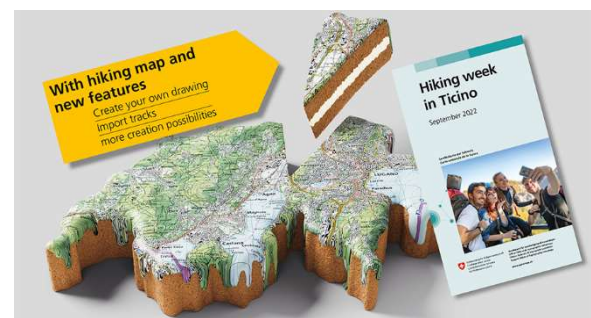
Web: www.swisstopo.ch/myswissmap



Download area for swisstopo data and applications



Award-winning swisstopo-App



Virtual Range

The series of maps of cantonal capitals is offered as a so-called virtual range. This means that the maps are predefined but that they are only produced on-demand when ordered. Based on the production infrastructure of mySwissMap and automated extraction from the production databases, maps can be extracted at any time. This makes it possible to produce publisher maps from the standard range on-demand and to continue to offer printed products even with shorter runs. Additions to the range are planned.

National Maps

Like the 1:25,000 and 1:50,000 National Maps, the 1:100,000, 1:200,000, 1:500,000 and 1:1 million scales are now set up as digital map models and represented with adapted and modernised map graphics.

Federal Geoportal geo.admin.ch

geo.admin.ch is the Swiss Confederation's geographical information platform within the Federal Administration. It provides direct access to federal geographical information, data, services, and metadata. All maps and over 900 other datasets can be represented in the viewer map.geo.admin.ch

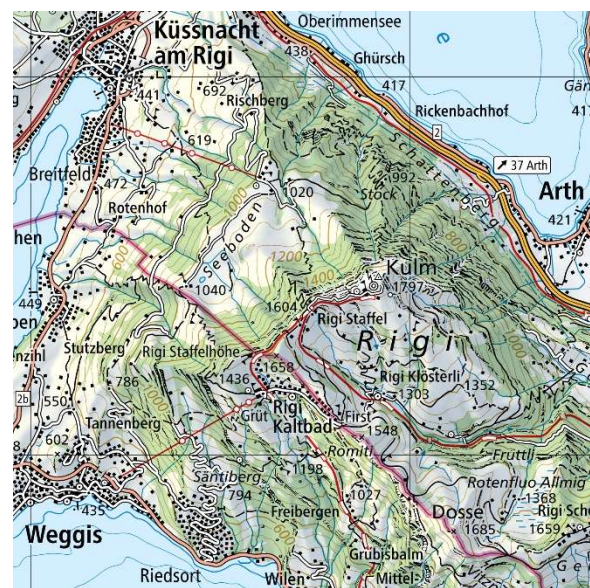
Swiss Map Web

The Swiss Map Web product line offers web-based map views based on vector tiles. The presentation of the maps can quickly and easily be adapted to individual requirements by experts. The *Light Base Map* is a background map. The graphic design of this web map is therefore unobtrusive with reduced content. The *Imagery Base Map* provides a good overview of the current landscape thanks to a combination of orthoimages and cartographic elements. The overlaid cartographic vector information on the orthophoto improves the orientation and interpretability of the content.

Web: <https://www.swisstopo.ch/smw>



On-demand production on the large format printer with inline cutting



Extract from National Map 1:100,000; map sheet 32



Light Base Map (top) Imagery Base Map

Zentralbibliothek Zürich

Jost Schmid-Lanter

The Zentralbibliothek Zürich (ZB) is the public and university library of Zurich (www.zb.uzh.ch). With more than six million documents and more than half a million visitors per year, the ZB is one of the largest Swiss libraries. The map collection is the most comprehensive in Switzerland (karten@zb.uzh.ch).

The map department of the Zentralbibliothek Zürich is consulted by both the public and scholars. Since 2019, its staff have organized conferences, workshops, and a big exhibition. In addition to collecting traditional paper maps from around the world, the team is also involved in various innovation projects such as a nationwide map query tool, knowledge visualization and citizen science projects.

Collecting activities

The map department of the Zentralbibliothek pursues an active purchasing policy. It collects topographic maps, map series and maps of all countries. As a service provider regarding map history, it also acquires literature on this subject area (incl. bibliographies, gazetteers, and journals).

Researchers, teachers, and students at the University of Zurich are the main patrons of the map collection. As part of a public library, the department staff are helping other patrons, too.

Regarding printed maps, the collection holds the biggest number of map sheets in Switzerland, i.e., more than 330,000 items. It consists mainly of topographic maps from the 15th to the 21st century. Moreover, the collection contains about 4,000 atlases of which 530 date from before 1900 (notably 2 from the 15th century and 18 from the 16th century).

In 2022, the map department was able to acquire the South America documentation of the cartographer and mountaineer Robert Helbling (1874-1954). Helbling, honorary doctor of the University of Zurich, is relevant to the history of cartography because he was instrumental in promoting stereophotogrammetry as a surveying technique in Switzerland. The approximately 200 objects (incl. photos, sketches, original cartographic drawings, hand-coloured map prints and correspondence) document the Aconcagua region on the Chile-Argentina border in various decades and therefore also offer glaciologists a unique source. About ten years ago, the Swiss Alpine Museum held an exhibition on these very objects, followed by an

article in the journal *Cartographica Helvetica* (49/2014).

The ZB map department raises the public awareness of the collection by repeatedly conducting own exhibition projects.



Figure 1: Map reading room in the Zentralbibliothek Zürich, Zaehringplatz 6.

Science outreach

In 2019, numerous collaborations enabled the ZB exhibition «Cosmos in the chamber», which attracted an above-average number of visitors within three months (1,560). Specific fields of research at the University of Zurich were considered. In collaboration with the ETH Institute for Photogrammetry and Geodesy, a handicraft sheet on the St Gallen Globe and an interactive application of this famous globe via touchscreen were developed. The exhibition space was reminiscent of a 16th century art chamber («Kunst-kammer»). Not only the well-known cosmographers of the early modern period were honoured, but also a dozen or so Swiss scholars whose cosmographic undertakings had hitherto been little

known. Many of them were discussed in depth during the supporting programme, e.g., at the conference "Cosmos in Zurich Chambers" in co-operation with the University of Zurich. Seven lectures formed the scientific part of the programme, which attracted not only young academics but also numerous listeners from the non-academic public. Part of the didactic preparation were 42 guided tours and an accompanying publication, issued by the publishing house Cartographica Helvetica.

In the same year, Stanford scholar Chet van Duzer conducted the Workshop «Reading Medieval and Early Modern Maps» in the map department reading room (Figure 1). Eleven patrons from the public and the University attended.

The 14th International Globe Studies Symposium in October 2019 was organised by the map department staff in collaboration with the Swiss National Museum and the Abbey Library of St Gallen. In Zurich, 67 participants from 13 nations (including Australia and the U.S.) discussed 16 presentations.

Innovation projects

In addition to its traditional service, the map department is increasingly involved in innovative projects for the indexing and exploitation of the ZB map stock:

The St. Gallen Globe online project (Figure 2) was developed after several years of preliminary work in collaboration with the Knowledge Visualization research group of the Zurich University of the Arts

(ZHdK). A consortium led by the ZB map department represents the commissioning body, which also includes the Swiss National Museum and the Abbey Library of St Gallen. A basic model of the online globe has been accessible to the public since 2022. Further developments are underway to explain special points of interest. The visualization of population growth and the history of trade routes are planned. Furthermore, the online globe will be able to serve citizen science projects, such as tagging and georeferencing of place names: <https://3dglobe.ch>.

Kartenportal.CH is an online research tool for maps in Swiss library holdings, which has been developed in the last decade under the management of the ZB map department. Various Swiss libraries and archives are collaborating for the purpose of this central map reference. The innovative platform is internationally renowned for its stable and cost-effective technology, which provides a national scientific map catalogue with spatial search and easy-to-use filter options: <https://www.kartenportal.ch/>.

The map department has also conducted two citizen science georeferencing projects: Eminent holdings such as the manuscript maps, old Swiss maps and old atlases were digitised and georeferenced through a crowdsourcing approach (2509 maps in 2020 and 2919 maps in 2023). More than 30 citizen scientists registered for each project (the results have been uploaded on <https://www.oldmapsonline.org>).



Figure 2: Knowledge visualization through St Gallen Globe – online, <https://3dglobe.ch>.