



Cartography in Switzerland 2003 – 2006

National Report for the ICA-Conference 2007 in Moscow

Goals of the Society

The Swiss Society of Cartography was founded in 1969. Its main goal is to support theoretical and practical cartography and the education of the corresponding professionals. The society distributes the latest knowledge in the field of map production, map use and the history of cartography. In addition it assists in the exchange of experience and knowledge with experts and institutions in Switzerland as well as abroad.

Activities

The Swiss Society of Cartography

- organises meetings for its members twice a year
- organises workshops, further education, and excursions to cartographic enterprises and exhibitions (www.kartografie.ch/veranstaltungen/veranstaltungen.html)
- publishes and distributes internal newsletter bi-monthly (www.kartografie.ch/mitteilungen/mitteilungen.html)
- publishes textbooks and national reports on cartography (www.kartografie.ch/publikationen/publications.html)
- is the official representative for Swiss cartography in the International Cartographic Association (ICA) and in the Swiss Organisation for Geoinformation (SOGI)
- takes part in commissions and working groups of the ICA (www.kartografie.ch/commissions/commissions.html)
- distributes to its members the journal *Kartographische Nachrichten* bi-monthly

Present working groups and commissions

- ICA-Commission on Mountain Cartography (chairman: Prof. Dr. Lorenz Hurni)
- ICA-Commission on Map Generalisation and Multiple Representation (Prof. Dr. Robert Weibel)
- ICA-Commission on Map Production (Prof. Dr. Lorenz Hurni)
- ICA-Commission on National and Regional Atlases (Dr. René Sieber)
- ICA-Commission on Visualization and Virtual Environments (Dr. Christian Häberling)
- ICA-Commission on Management and Economics of Map Production (Prof. Dr. Lorenz Hurni)
- ICA-Commission on Mapping from Satellite Imagery (Dr. André Streilein)
- ICA-Commission on History of Cartography (Hans-Uli Feldmann)
- ICA-Commission on Education and Training (Marion Werner)
- Permanent Committee on Geographical Names (Dipl. Ing. ETH Martin Gurtner)
- SGK-working group on Map History (chairman: Dipl. Ing. ETH Martin Rickenbacher)
- Swiss Organisation for Geographic Information SOGI (Dipl. Ing. FH Martin Probst)
- EuroGeographics (Dipl. Ing. ETH Urs Gerber)

For further details see (www.kartografie.ch/commissions/commissions.html)

Information about current activities can be found in the annual reports

For further details see (www.kartografie.ch/berichte/berichte.html).

Members

state 15.08.2007

304 individual members

34 collective members

Executive Committee

During the reporting period 2003–2006 the Swiss Society of Cartography was managed by the following executing committee:

President: Hans-Uli Feldmann (Federal Office of Topography, Wabern)

Vice-president: Lorenz Hurni (Institute of Cartography, ETH Zurich)

Secretary: Stefan Räber (Institute of Cartography, ETH Zurich)

Treasurer: Hella Marti (Bern) *untill 2005*

Member: Martin Probst (TeleAtlas AG, Neuenhof)

Member: Camillo Kohli (Kohli Cartography, Berne) *untill 2005*

Member: Stefan Arn (Federal Office of Topography, Wabern)

Member: Nicole Brönnimann (Anderhub AG, Eschenbach) *since 2006*

Present executing committee: (www.kartografie.ch/contact/contact.html)

Education

Cartographer

The Federal Office of Topography is the only institution, where the official training for the professional diploma as a cartographer can be achieved (4 trainees / year).

Educational directives for cartographers (curriculum and examinations) have been approved by the representatives of the supervising school authorities and of the employer organisations. The directives became effective on the January 01 2000.

At present there is a national commission, founded by different Swiss professional societies, which will reform the profession of cartography and geomatics. The aim is to create a new professional apprenticeship program in three directions: Geomatician official cadastral surveying, Geomatician Geoinformation, Geomatician Cartography.

The launch of the new education is planned in 2010. Cartography is represented by the Swiss Society of Cartography.

The duration of the new apprenticeship remains four years for cartographers. Once a week all trainees attend theoretical courses at the School for Graphic Design in Berne.

The entire practical training follows a common plan and is a matter of the enterprises. The directives are formulated generally, in order to allow space for later adaptation to new developments.

Practical Training:

Compared to earlier where the first 2-3 years consisted of intensive handwork exercises in drawing and film engraving, today the apprentices are quickly integrated into the production process.

1. Apprenticeship year

- Simple drawing exercises
- Introduction to Macintosh (Programs: Freehand, Photoshop, Power Point, NT, Word, Excel)
- Data capture in raster and vector format
- Digital Maps 1:25 000
- Screen / Internet-maps

2. Apprenticeship year
 - Basics of computer science
 - Introduction to Macintosh (Programs: Quark XPress, Filemaker)
 - Basics of topography
 - Locality and city maps
 - Composition of thematic maps
 - Generalisation exercises (maps 1:25 000, 1:50 000 and 1:100 000)
 - Relief representation
 - Production: Updating a map sheet 1:25 000
 - Introduction to the software program Dry/Nuages
 - Introduction to Intergraph (Microstation, I/RAS B)
3. Apprenticeship year:
 - Rock representation
 - Topographic base data collection in the field
 - Production: Updating a map sheet 1:50 000
 - Generalisation exercises and map editing for small scales 1: 50 000 – 1:200 000
 - Production: GIS, updating vector maps 1:25 000
4. Apprenticeship year:
 - Topography and image integration
 - Map sample 1:200 000
 - Production: updating a map sheet 1:100 000.
 - Work preparation and production control
 - Internet, Web paging

For more details see (www.kartografieausbildung.ch)

Further education possibilities

In the area of pre-press/printing as well as geomatics there are many possibilities for further education for cartographers. These are primarily concentrated in the general graphic industries:

Professional examination with federal certificate

(Preparation at vocational schools and private institutions): Proof-reader, Topographic-designer, Technopolygraph, Multimedia-coordinator and Print sales.

Higher subject examination with federal diploma

(Preparation at vocational schools and private institutions):

Specialist with a diploma in the graphic arts industry.

Technician TS: Education is offered by the schools for design in Basel and Bern, ERAG in Lausanne as well as the TGZ Zurich.

Engineer FH: The Fachhochschule Nordwestschweiz (FHNW) offers a study course as an engineer for Geomatic.

Engineer FH: The École d'Ingenieurs du Canton de Vaud (eivd) offers specialised university education as an engineer for communication management (2 directions: printing engineer and communication engineer).

Geomatic study: In Switzerland almost all universities within the scope of geographic study offer at least basic lectures in cartography. However extensive sessions with specialist themes such as thematic cartography, digital cartography and multimedia cartography are almost never available. A fundamental in-dept study in cartography can only be taken at the ETH Zurich as part of the five year Geomatics course. This specialisation can also be taken by geography students of other universities as a minor

subject. Geomatic-engineers and geographers have most career opportunities in the areas of GIS within public offices, private engineering offices and research establishments.

Review on the present situation of cartography in Switzerland

Cartography in Switzerland continues to follow its traditional path. The official topographical map series are periodically up-dated (www.swisstopo.ch/en/).

The major company's are Hallwag Kümmerly + Frey AG (Schönbühl) and Orell Füssli Kartographie AG (Zurich). There are several other companies (with one or more employees) and institutions which produce printed maps and digital geodata products. Most of them are listed (with an illustration of one of their products) in this National Report. (www.kartografie.ch/national_report/)

The following major atlases are produced:

- Geological map series of Switzerland 1:25 000
- Atlas of Switzerland - interactive
- Hydrological Atlas of Switzerland
- Climate Atlas of Switzerland
- Swiss World Atlas for Schools

A wide range of inventories and suitability maps for local, regional and national planning purposes and scientific research have been published or are updated frequently (selection):

- Inventory of sites to be protected 1:5000 / 1:10 000 / 1:300 000
- Inventory of landscapes and natural monuments of national importance 1:25 000
- Inventory of amphibians 1:25 000
- Inventory of flora (wet/dry locations) 1:25 000
- Inventory of bird reserves 1:25 000
- Inventory of historical trails 1:25 000
- Inventory of fauna species 1:25 000
- Water protection maps 1:25 000
- Water supply atlas 1:25 000
- Inventory of natural dangers and hazards 1:100 000
- Inventory of aerial photographs and satellite images 1:50 000 / 1:300 000
- Geotechnical map 1:200 000

National Mapping

Since 1.1.2000 the Federal Office of Topography has consolidated with the Federal Directorate of Cadastral Surveying. In 2006 the Federal Office of Topography integrated the geology division which was part of the Federal Office of Environment. COGIS has been upgraded as a division as well.

The Federal Office of Topography is a part of the Ministry of Defence and Sports and consists of six different divisions and the support:

- Geodesy
- Federal Directorate of Cadastral Surveying
- Topography
- Cartography
- Geology
- COGIS
- Support

Founded: 1838

Staff: 251 and 23 apprentices

Expenditure (2006): CHF 48.4 Mio

Revenue (2006): CHF 31.7 Mio.

Vision:

As a Swiss Federal competence centre, it supplies high quality spatial reference data and derives products and enhances their economic benefit.

Products and services:

- Reference systems and map projections
- National survey
- Positioning and information service
- General management of cadastral surveying
- Digital national maps 1:25 000 – 1:1 Mio. (raster data)
- Digital topographic bases (vector data)
- Landscape models, Height models
- Boundaries, Toponymy
- Aerial and satellite images and orthophotos
- Archive for historical maps and aerial photos
- Aerial photography
- Topographic maps
- Thematic maps
- Geological maps
- Interactive map applications (CD-ROM/DVD)
- Atlases
- Cartographic services
- Inter-departmental coordination centre COGIS
- Competence centre (Institute of Military Geography)

Topographic maps:

Revision cycle: 6 years for approx. 350 maps:

1:25 000	247 sheets
1:50 000	78 sheets
1:100 000	22.5 sheets
1:200 000	4 sheets
1:300 000	1 sheet
1:500 000	1 sheet
1:1 mio	1 sheet

Map assemblies:

1:25 000	17 sheets
1:50 000	24 sheets
1:100 000	10 sheets

For further details see (www.swisstopo.ch/en/)

Future map production

The National Map Series is about to take a huge technological leap from using graphic image data to flexible useable geo-information. This technological leap will be facilitated through the use of associated data and networked systems. This reorganisation will allow the modernisation of the circa 70 year old National Map graphics.

Project OPTINA-LK

The project goal of „optimising the updating of map data“ leads to the decision to recreate the National Map Series. Concepts have been elaborated for the development, management and editing of Digital Cartographic Models (DCM) and the necessary geoinformation system. For this purpose the project team designed a specification rich in requirements for a system for interactive editing, management and representation (called Genius-Database) as well as for a second system for the automatic generalisation of map data (called SysDab). Tendering and evaluation procedures carried out according to rules for public procurement were successfully completed by the beginning of 2006. In the year of this report, the system design for the Genius-DB and SysDab systems was in the forefront. By using the existing

software as a basis from which to build, it was possible to design concrete enhancements in order to fulfill the requirements which were based on the specification.

Map content, map graphics

The reorganisation of the National Maps can be seen as an historic event. Since 1938 the content and graphics of the New National Maps has not changed significantly. The previous changes in the production methods, from copper engraving to negative scribing on glass plates and from glass plates to CAD, were based on the existing map representation and these changes in the production methods did not have any significant visible impact on map users. This reorganisation of the National Maps is being used as an opportunity to adapt the National Maps to the needs of the times. The new graphics will use more colour and intuitively more understandable symbols as well as easily readable text. However not all traditions will be broken: the rock representation which in mountainous sheets preserves the unmistakable character of the maps will be taken from the existing maps.

For further details see (www.swisstopo.ch/en/)

COGIS

The national and political dimension of this infrastructure calls for controlled and high quality communication with all partners.

One important component of NSDI is the definition of a general charging and distribution strategy, facilitating access to geodata. Proposals by the Federal administration and an analysis of the Swiss market in connection with geodata context have been worked out by COGIS. Within the Federal administration, COGIS is in permanent contact with the departments (UVEK, EVD, VBS) through standing coordination groups.

A smoothly functioning direct democracy would be inconceivable without geographic information. This is a prerequisite for the transparent and traceable implementation of decisions and to enable the population to participate in the main political decisions and social trends.

Transport, energy, environment and nature conservation, agriculture and forestry, regional planning, real estate regulations, information technology and telecommunications, education, culture, insurance services, public health, national defence, internal security, civil protection and disaster relief, supplies and disposal – in practically every walk of life, geographic information is becoming increasingly important. As a central element of the national infrastructure it is of comparable importance to the transport or communication network, or the nationwide energy and water supply of a modern state. In the European Union, governments spend around 10 billion euros every year on public information, more than half of it involving geographic data. This represents a GDP volume estimated at 60 to 70 billion euros.

To eliminate existing difficulties associated with geodata management (in particular because of the lack of uniform standards and technologies, inadequate coordination during the compilation of new data and the lack of standard prices and distribution arrangements), and in order to guarantee in the long run the extensive use of high quality geographic information, a national spatial data infrastructure (NSDI) is essential. This is a generally available system of procedures, institutions, technologies, data and persons which permit the mutual exchange and efficient use of geographical data.

In Switzerland, this framework is provided by the e-geo.ch contact network which coordinates and controls all the relevant performance factors:

- Political support at the highest level
- Definition of basic geographic information and services which are to be provided and updated by the agencies
- Definition of the necessary meta-information and supervision of updates
- Identification and creation of the necessary technical infrastructure
- Definition and / or adaptation of the legal basis COGIS
- Development and implementation of binding standards for metadata, modelling and data exchange
- Promotion of basic and advanced training and research
- Development and introduction of a common charging and sales strategy

Because up to 80% of all political and economic decisions have spatial references, the Swiss authorities, using e-government, wish to promote the development of a national spatial data infrastructure, to network all kinds of data, facilitate access to them and promote their use. The activities and measures needed for this purpose are being combined and promoted under the lead management of COGIS with the egeo.ch incentive program.

All the Federal agencies, as well as the cantons and local authorities, economic enterprises and research establishments which collect, manage and work with geodata, are invited to work towards these common goals. They are all expected to play an active part in the development of the NSDI by creating the prerequisites, further development of electronic cooperation and services, together with benefit orientated networking. This willingness can be unambiguously documented by signing the e-geo.ch charter.

For further details see

(www.e-geo.ch)

(www.kogis.ch)