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MAPCURATORS'GROUPSPECIALISSUE

A Digital Map Library – Electronic Information in the Map Collection

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The ETH-Bibliothek (the Library of the Swiss Federal Institute of Technology) in Zurich has employed electronic resources to vastly enhance access to its collections. This article examines how ETH has set about the task of incorporating electronic data into the map collection, and then explores how access to hard copy map materials has been

revolutionized by electronic means.

The arrival of personal computers did not have any great influence on the traditional work of map collections. At best, a small number of such collections began to actively contribute to the online catalogues of their libraries. The fact that printed maps could now be produced by electronic means had no effect on map collections. But with increasing technological development in the fields of computer graphics and computerized cartography, the situation changed dramatically in the 1990s. Digital maps and Geographic Information Systems (GIS) made their entrance into cartographic information. These tendencies were accelerated by the triumphant advance of the Internet. For scientific map collections the existential question arose of whether they, too, should collect digital map material and make it accessible to their users.

Taking such a fundamental decision is not easy: it not only means augmenting the map collection with additional cartographic material but also investing in the necessary technology and re-orienting the profession of map curator, adding new skills in the fields of digital cartography, computer graphics, GIS and the Internet.

As early as 1992 those responsible for the Map Collection of the ETH-Bibliothek (the Library of the Swiss Federal Institute of Technology) decided to integrate digital maps into the collection wherever possible. Their reasoning was that only in this way could a scientific map collection justify its existence in our modern information society, and be recognized and used in the future.

In planning the incorporation of digital materials into the collection, it became evident that the potential fields of interest could be divided into two groups:

A. Maps on CD-ROM, GIS products, Internet material and digital images of the library's own map holdings.

B. New working and cataloguing systems such as electronic index sheets, the exploitation of geographic coordinates, spatial searches in a graphic catalogue.

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In all these fields the Map Collection of the ETHBibliothek, Zurich is able to present finished projects or projects nearing completion

A. NEW CARTOGRAPHIC PRODUCTS FROM THE MAP COLLECTION

The CD-Centre

The CD-Centre of the Map Collection consists of three powerful PCs with large-size screens (Figure 1). Some 250 CDs are available to our users in our open stack library on the premises, and another 150 CDs may be borrowed. There is great diversity among the topics: regional and world atlases, topographic maps, city maps, street atlases, thematic databases like the World Climate Database, satellite images and geographical indexes. By the middle of 2005, topographic maps of the United States at a scale of 1:24 000 on 40 CDs will be available as well.

The CD products with GIS databases form an important part of our holdings. They are, for example, the Digital Chart of the World (DCW), data about the ground cover of Germany, Mountain High Maps: Europe, the EuroRegioMap, and the digital General Map of
Switzerland at 1:1 million. The accessibility of this data is ensured by three workstations equipped with the necessary software: ArcView, Adobe Illustrator and Adobe Photoshop. Because of the complexity of these GIS products, some of them may also be borrowed.

The Library's printed holdings of old maps of Switzerland are being systematically filmed and digitized, and these are available to our users on CD. Since the beginning of 2005

these old maps have also been on sale as digitized files (Figure 2). Information can be found on the web under the URL www.ethbib.ethz.ch/ks/altekarten_e.html.

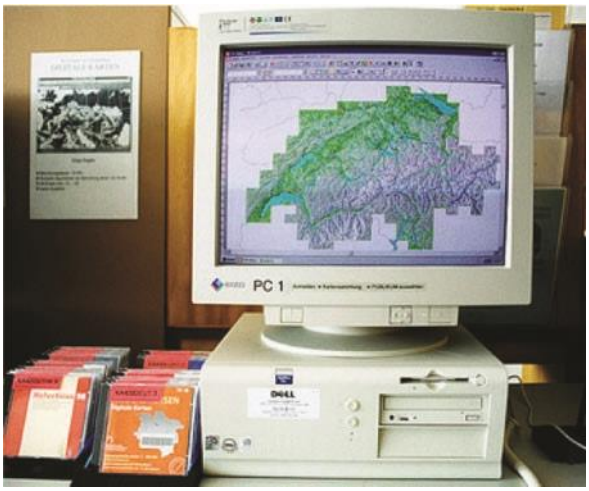


Figure 1. Workstation in the CD-Centre

The Interactive Atlas of Switzerland, a multimedia national atlas developed by the Institute of Cartography of the ETH Zurich and first published in 2000, is a very interesting product in the field of national atlases. It offers new ideas on presenting thematic maps, with three dimensional relief description and panoramic views that can be modified in terms of orientation, height and incidence of light. A prototype version attracted great attention at the 1997 International Cartographic Association (ICA) conference in Stockholm (Ba¨r and Sieber, 1997).

The CD products are offered locally in the reading room of our Map Collection. After several trials it was decided not to use a server to search these CDs, as the complex graphic products often interact with each other, the result being changes in the software used by the clients which would subsequently block searching in other products.

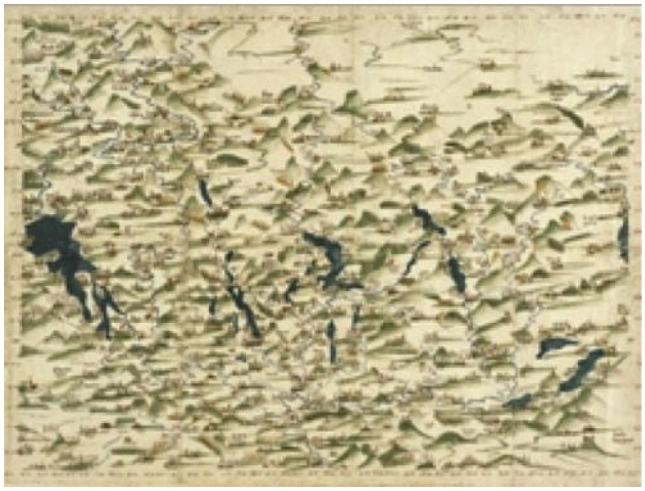
The complete list of CD-ROMs can be viewed at the web site of our Map Collection, the address being: www.ethbib. ethz.ch/ks/cd-rom_e.html.

The Internet Portal 'The World of Maps – Die Welt der Karten'

The Internet site The World of Maps – Die Welt der Karten (Figure 3; www.maps.ethz.ch), set up by our Map Collection, is an efficient tool for searching for digital maps worldwide on the Internet. It consists of several thousand

Figure 3. The World of Maps Internet site

Figure 2. For sale: Digital facsimile of the oldest map of Switzerland



links to digital maps and spatial data, and also contains links to other Internet portals of cartographic interest.

Numerous special topics covering other areas of cartography can also be found: search tools for maps on the Internet, map collections, map archives, map librarianship, map institutions, references to events, cartography and map history.

Of particular interest to those working in the field of map curatorship might be the links to the website of the Working Group for Education of the Groupe des Cartothe´caires de LIBER, the European group of specialist map curators:

- Literature: An extensive multilingual list of literature about map librarianship, map history and GIS/cartography (www.maps.ethz.ch/gdc-education2.html);
- Tutorials and Courses: a collection of links to free online courses, learning programs and reference works of interest to map curators and including the new fields in map librarianship (www.maps.ethz.ch/gdc-education4. html);
- Who is Who in Map Librarianship: giving information on which colleague you might turn to for advice in which special area (www.maps.ethz.ch/gdc-education6.html).

Another home-made product of our Map Collection is the Virtual Library Eduard Imhof, found under the URL www.maps.ethz.ch/imhof_engl.html. The scientific support of Mrs Viola Imhof made it possible to produce this impressive documentation of the famous cartographer's works. It consists of eleven chapters, enhanced with more than one hundred digital images of original documents and complemented with a biography and bibliography of the cartographer, formerly non-existent in such completeness.

The Geodata Service – a service for the community of the ETH

According to specialists, 75%–80% of all data has a spatial relationship to our living space and can therefore be called spatial data or geodata. In the same issue of GeoBit (11, 2004) we read: 'The significance of spatial information will infiltrate all spheres

Figure 4. Pixel map 1:25 000

Figure 5. Digital aerial view (50 cm)

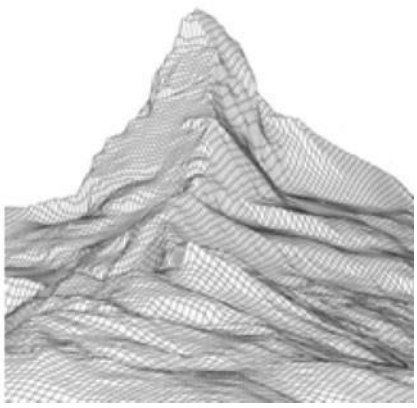


Figure 6. Height model (25 m)

The ETH soon became aware of the value of geodata information, and has used geodata from Swisstopo (Swiss Federal Office of Topography) extensively for a long time – first as printed maps and orthophoto images, and in the last decade increasingly as digital geodata. In order to reduce the cost of this expensive service the acquisition and administration of the data was centralized two years ago, when the Map Collection of the ETH-Bibliothek was asked by the ETH Zurich Executive Board to establish a centralized service for the Swisstopo geodata to be used free of charge by all members of the ETH community.

The Map Collection had been slowly but surely evolving into an effective and competent information centre for geodata and so the request fitted perfectly with our future plans. It also provided a rare opportunity for a special collection within a large university to strengthen its position within the organization.

In our Special Collections reading room two geodata stations are available to members of the ETH, on which almost all Swisstopo geodata can be accessed. Among other things (Figures 4–6) pixel maps at 1:25 000 to 1:1 million, vector maps at 1:25 000, 1:200 000 and 1:1 million, digital height models (25 m and 200 m net grids), landscape models and Swissimage digital aerial images with an accuracy of 50 cm can be accessed, selected, edited and exported to one's own server. Some of the products (vector maps, height models) require some experience with GIS. The Institute of Cartography is presently developing the GeoVite project, which will provide an easy-to-use navigation system plus a tutorial for working with geodata. Information about this new geodata service is available on the web site: www.ethbib.ethz.ch/ks/geodaten/geodaten_e.html.

B. TOPORAMA IMS (INTERNET MAP SERVER) – THE NEW SEARCH INSTRUMENT FOR MAPS

Digital possibilities in the area of maps do not exhaust themselves in new digital maps and geodata. They can also lead to new and spectacular working and search tools.

Identifying map sheets and the holdings of map series has traditionally required the consultation of hand-drawn index sheets in the library. This in spite of the proliferation from the 1980s onwards of online library catalogues accessible worldwide, and the consequent urgent need for intelligent, online, index sheets.

The Toporama software, developed by Joachim Lamatsch in Freiburg im Breisgau, Germany, in cooperation with the Map Collection of the ETH-Bibliothek, offers electronic index sheets plus a database for conducting searches and a map series control facility. It was developed using ArcView GIS software (Figures 7–8).

Figure 7. Toporama index sheet: Carta d'Italia 1:50 000

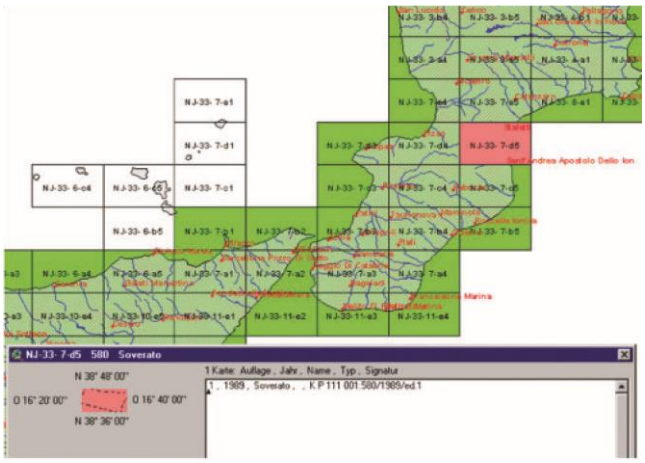


Figure 8. Zoom function, selection of map sheet, call number

Electronic index sheets for map series are linked to a database which contains the coordinates, and other details, of the maps. By means of an editing function, newly purchased map sheets can be pasted to an index sheet with a mouse click. This automatically feeds details of the new map holding into the database. Searches can be made not just for sheet names and sheet numbers, but also coordinates.

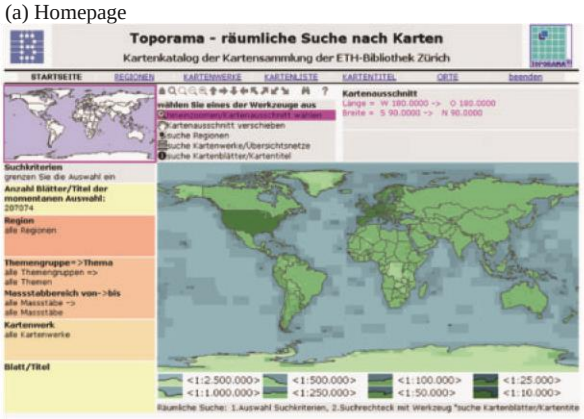
It is now possible for a customer to mark his desired map area with a mouse click. From this marked rectangle the computer then defines the coordinates, compares them to the coordinates of the documents in the database and indicates the hits scored. In a second step the title record in the library catalogue or the digitized map image can be shown. The big advantage of such a graphic search lies in the fact that in one single process all suitable maps will be shown. Such a graphic-spatial search is not only suitable for maps, but can also be used for all information and documents related to geospace.

Toporama IMS is already available locally but we hope soon to be able to make the information available over the Internet and then to develop it into an online record of map holdings in Switzerland.

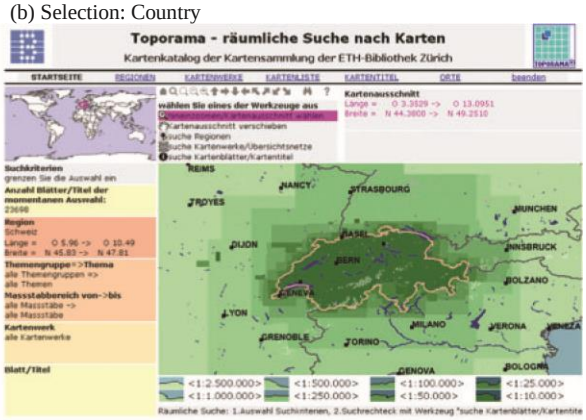
To us this instrument seems to be of extreme interest to map librarianship. Therefore the functions and search steps shall be presented in a few images (Figure 9). Further information can also be found at: www.ethbib.ethz.ch/ks/ proj-toporama_e.html.

Figure 9. Interactive Search in Toporama IMS

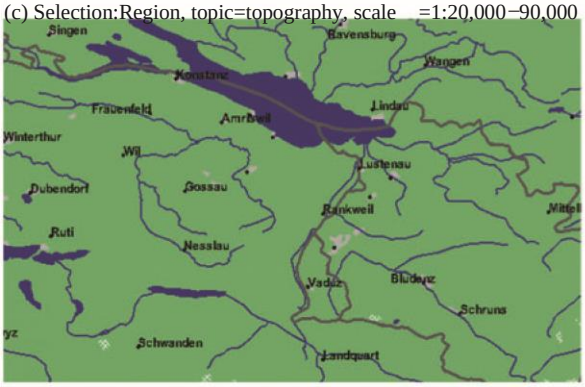
(a) Homepage



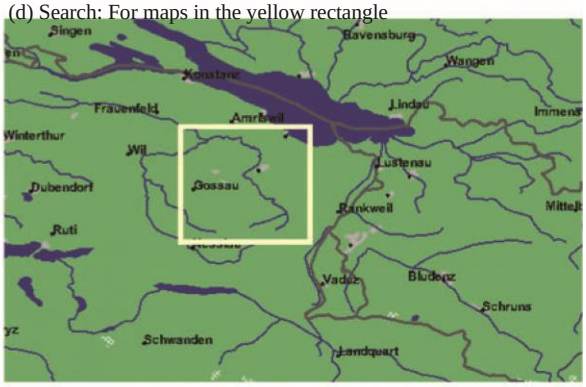
(b) Selection: Country



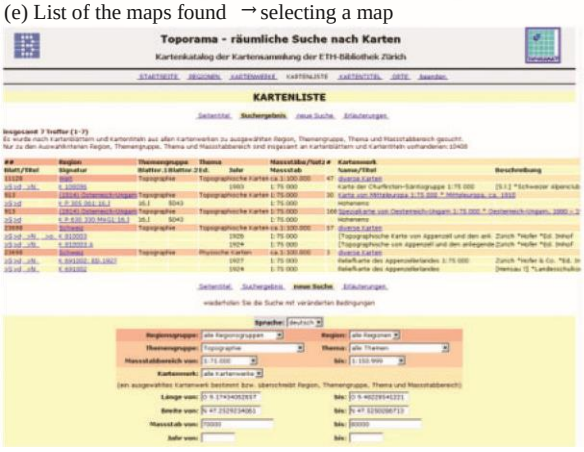
(c) Selection:Region, topic=topography, scale =1:20,000−90,000



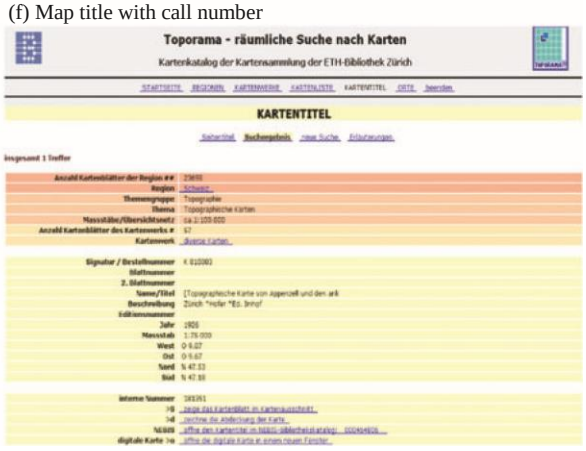
(d) Search: For maps in the yellow rectangle



(e) List of the maps found →selecting a map

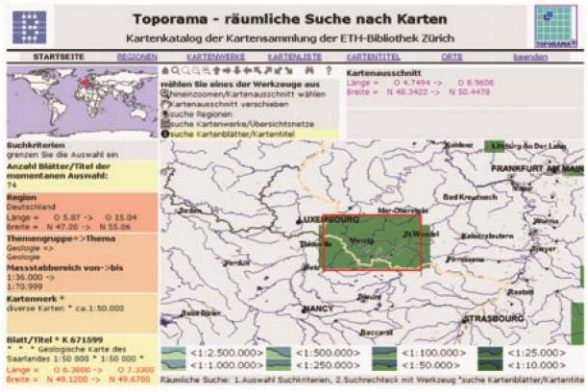


(f) Map title with call number

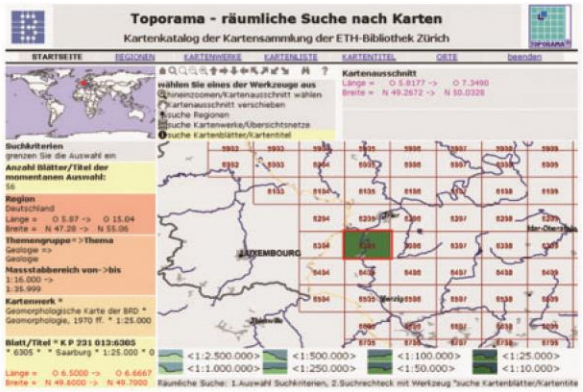


(g) Section of the selected single map

(h) Selecting a sheet from a map series on the index sheet



(i) Title record in the library catalogue



(j) Display of digital map

CONCLUSION

In a time when a modern scientific map collection considers itself an information centre not just for printed maps but also for geodata, digital maps, geographic information systems and the Internet, such sources are indispensable in its planning. Printed map holdings are still an important and often irreplaceable source of information, but they can be offered in scanned or digitized versions as the need arises. Electronic index sheets and text-free spatial searches in a graphic catalogue offer new and important possibilities for working and searching in the map collection. They also allow cross-linking of the map catalogues of many different collections.

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