Digital Maps in Map Collections - Presenting New Electronic Media

by JÜRG BÜHLER

1. THE SITUATION IN GENERAL

Changes in the Information World

In this day and age fast-paced changes are taking place everywhere. Initiated by highly innovative computer technology new possibilities of conveying information are opening up. Accordingly cartography itself is subject to transformation. Internet and computerized cartography set new standards and the formation of geographical information systems (GIS) adds a totally new dimension to spatial information.

Spatial data, i.e. information with geographical reference, has become important in almost every area of modern life and economy. GIS is the magic acronym that enables us to display countless statistical and numerical data through our computers, describing complex situations and processes on earth in a visual way. An important part of this visualization is the digital or electronic map.

Digital Maps in Map Collections?

As this development does not stop outside the map reading room the question is: Are electronic maps a necessity in the map library or do we leave this field of information to others and stick to traditional (analogue) maps?

A modern map collection has to offer both traditional and digital material - this is our firm belief. Only in this way may the profession of map librarianship justify its existence in the coming millennium.

Who else but the map librarian will be able to supply the public with all sorts of data from GIS? Who else will provide maps on the Internet and find

solutions for archiving digital maps? You certainly cannot expect to find electronic maps in every map library. However, a majority of collections in our university and state libraries have to face their duty and make electronic media available to their customers. Today's CD-ROM products can be looked upon as „conditioning drugs". Other sorts of digital data might be much more important though: GIS offers digital maps in multimedia surroundings and makes the accessing of a world wide supply of maps on the Internet possible.

2. Acquiring Technology for Digital Maps in the Library

With its concept to acquire „modern" maps the ETH Bibliothek Zurich faced the task of following developments in computerized cartography closely from early on. Consequently the integration of digital maps into the collection was decided in 1993. The 9th conference of the Groupe des Cartothécaires de LIBER in October 1994 in Zurich, dealing with „Map Curatorship in Transition: Computerized Maps, a New Environment", actually initiated the realization of these plans.

Choice of Cartographic Software

Through repeated visits to several fairs and producers and by studying professional literature a profile of our needs was formed. Contrary to map producing institutions the map library does not need complex multitask software. It does require, however, user-friendly tools for easy access to as many different products as possible. Thus we have chosen the following:

- Adobe Photoshop,
- Adobe Illustrator,
- ArcView GIS (ESRI).

Adobe Photoshop serves as supporting software for raster maps and for the graphic handling of scanned maps. Adobe Illustrator can be used for support of both raster and vector data. ArcView GIS is a universal support software for GIS data and more sophisticated CD products such as the GIS „Digital Chart of the World", the latter being of general importance for map collections. Additionally ArcView supports working with the standard software for cartographers, ArcInfo. The Map Department of the Library of Congress provides ArcView and even ArcInfo for its users. For this both the librarian and the user need special skills in order to be able to handle the software.

Choice of Hardware

Digital maps needing high performance software also call for high quality hardware. Otherwise a lot of problems will occur and many products simply will not work. Personal computers, in order to host graphic software and GIS, must meet certain minimum standards. In 1997 our PCs had the following technical standard:

• Processor: Pentium II 233 MHz	• 4 MB Video-RAM
• 21 inch monitor	• Good graphics card
• 4 GB hard disk	• Fast CD-ROM drive
• 64 MB RAM main memory	• Sound card

Auxiliary hardware includes one DIN A3 black & white and one colour laser printer. A central DIN A3 scanner is at the disposal of the whole library. The use of a PowerMac station is recommended.

3. SUPPLY OF DIGITAL MAPS IN THE COLLECTION

The speciality of the Map Collection of the ETH-Bibliothek lies in its diversified collection of digital maps, all simultaneously available:

- CD-ROM products available at three local PC stations,

- Geographical Information Systems (GIS),

- Internet search tool „The World of Maps",

- Richly illustrated „Virtual Library Eduard Imhof" via the Internet,

- Digital atlas of Switzerland available at a PowerMac station,

- Basic collection of electronic index sheets to map series.

This parallel build-up of the different digital areas was only made possible through the competent work of several staff members of the Map Collection.

CD-ROM Products

Some 40 CD-ROMs are available, among them: Regional and world atlases, topographic maps, city and town plans, street atlases, thematic data bases like

the World Climate Data Base, satellite images and geographical indexes. Our list of CD-ROMs can be viewed at the following Web-site: <http://www. ethbib.ethz.ch/ks/kart_cd_e.html>

GIS Products

Recently there has been a growing demand for GIS data available in databases. To meet this demand three PC stations were especially equipped. Users should have the knowledge to perform these kinds of database searches themselves. At the moment the following services can be accessed:

- World: DCW (Digital Chart of the World),

- Europe: Mountain High Maps,

- European Community: Eurostat-Regiomap,

- Switzerland: CH-Atlas,

- Switzerland: Digital general map 1:1,000,000 (Bundesamt für Landestopographie),

- Switzerland: Scenarios of population development (Bundesamt für Statistik).

These services are to be extended rapidly, first with data from the GEOSTAT data base of the Swiss Federal Bureau of Statistics (e.g. digital geological and geotectonic maps, data of soil cover, indexes to nature and land reserves, population statistics) and then with world wide GIS data.

Digital Atlas of Switzerland

The „Digital Atlas of Switzerland" produced by the Institute of Cartography, ETH Zurich, is one of the most interesting projects in the field of national maps. It offers new ideas on presenting thematic maps, like three-dimensional portrayal of relief and panoramic views that can be modified in terms of orientation, height and incidence of light. The project was well received at the International Conference on Cartography in Stockholm. The ETH Map Department is proud as one of the first institutions to present this atlas to its customers.

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Finding Maps on the Internet

The Swiss Internet site „The World of Maps – Die Welt der Karten" is an efficient tool for searching maps and spatial data on the World Wide Web. Comprehensively covering other areas of cartography such as map collections, map archives, map librarianship and map producers, and having links to numerous important Web sites makes the site one of the most interesting in the field of maps. The ETH Map Library is responsible for the maintenance and improvement of both the German and English versions. (German version: <http://www.maps.ethz.ch> English version: <http://www.maps.ethz.ch/maps3.html>)

Digitizing our Holdings and the Internet Project „Virtual Library Eduard Imhof"

A further interesting possibility is the digitization of printed maps from the library's own holdings in order to obtain:

- Security copies of printed map documents,

- Maps as thematic CD-ROMs,

- Maps for the image data base of the library,

- Documents as Web pages on the Internet,

- Images as visual information accompanying the textual catalogue entries.

The first project of digitization to be conducted was the registration of original documents of the well-known cartographer Eduard Imhof. Filming and digitizing these documents made it possible to present these works as a virtual library on the Internet. In cooperation with Mrs Viola Imhof, widow of the cartographer, this unique site „Virtual Library Eduard Imhof - Cartographer and Artist" was produced. More than 100 impressive images present the complete works of Imhof, complemented with biographical information, bibliographical references and an inventory of the originals. (<http://www.maps.ethz.ch/imhof.html>)

Electronic Index Sheets to Map Series

Digital maps can also be used for map librarianship.

Locating a map sheet of a map series has required consulting an index sheet. The computer technology has made it possible to find the sheets via a

graphical catalogue on the screen. A first step is the implementation of electronic index sheets to map series, as for example Mr Joachim Lamatsch from Freiburg is developing. The Map Collection of ETH Zurich covers the whole area of Europe by these electronic index sheets. Not only do these index sheets offer valuable information to the users, but they can also be used for acquisition control. Newly purchased map sheets can easily be pasted to an index sheet by a mouse click. There are plans to link the index sheets with corresponding catalogue entries in the new cataloguing system of the ETH Bibliothek.

Image Information in Catalogues

Textual catalogue information of map documents is often not satisfactory. A map image would certainly be of great help to the user and reduce the descriptive part of the catalogue entry. Agnes Kovacs, in her thesis submitted for the diploma „Bildinformation in Bibliothekskatalogen – gezeigt am Spezialkatalog einer Kartensammlung“, tried to gain some experience in finding strategies about incorporating visual information into future library catalogues. The resulting „Kartenkatalog mit Bildinformation“ shows 40 examples of how attractive and useful catalogue entries can be with digital images. (<http://www.maps.ethz.ch/kovacs.html>)

SUMMARY

Spatial data, information about the earth, our living space, has become essential for today's world. With geographical information systems, it is possible to visualize vast amounts of geographically related data thanks to advanced computer technologies, the latter offering a powerful tool for analysis and practical work. The electronic or digital map is an important tool for visualization.

The Map Collection of the ETH Bibliothek Zurich decided in 1993 to offer digital maps as well as traditional ones.

Extensive research lead to technical solutions for hardware and software. The following was chosen:

- PC: 233 MHz processor, 21 inch monitor, 4 GB HD, 64 MB RAM main memory, good graphics card, 12x CD-ROM drive,

- peripheral hardware: Colour printer DIN A3, Scanner DIN A3, Connection to the Internet,

- software: Adobe Photoshop, Adobe Illustrator, ArcView (ESRI).

The users of the Map Collection have a broad variety of digital maps at their disposal:

- Approx. 40 CD-ROMs: Regional and world atlases, topographic maps, city plans, road atlases, satellite images and geographical name indexes.

- Geographical information systems: Digital Chart of the World (DCW), the Swiss topographic map 1:1,000,000, etc.

- „The World of Maps - Die Welt der Karten": <http://www.maps.ethz.ch/maps3.html>.

- „Virtual Library Eduard Imhof" including more than 100 digital images of original documents: <http://www.maps.ethz.ch/imhof.html>.

- „Atlas der Schweiz" (Atlas of Switzerland), an electronic atlas by the Institute of Cartography of the ETH.

- Data inventory SIK-GIS: Comprehensive information about Swiss federal and cantonal digital spatial data and geographical information systems.

Jürg Bühler
Eidgenössische Technische Hochschule
ETH-Bibliothek, Kartensammlung
Ramistraße 101
8092 Zürich, Switzerland
juerg.buehler@library.ethz.ch