



NATIONAL REPORT

ON THE GERMAN CARTOGRAPHIC ACTIVITIES

Deutsche Gesellschaft für Kartographie DGfK
(German Society of Cartography)
Report Period 2007 – 2011



Compilation:
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1 Activities of the Deutsche Gesellschaft für Kartographie DGfK (German Society of Cartography)

1.1 Society Organisation and Activities

The *Deutsche Gesellschaft für Kartographie DGfK* is the national professional organisation of the cartographers of the Federal Republic of Germany and of those persons who have an interest in cartography.

The aims of the society are:

- to promote cartography in research, training and practice
- to support all involved in the field of cartography with apprenticeships and further training, especially for entrants
- to cultivate national and international co-operation in cartography and with other specialist fields
- to promote knowledge of cartographic science for geospatial planning and projects
- to support and nurture the cartographic culture in Germany

Executive bodies of the DGfK are the Vorstand (Executive Committee) the Vorstandsrat (Executive Council) and the Mitgliederversammlung (General Assembly). The Society is regionally organised in Regional Branches (Sections), professionally in Commissions. The Sections and Commissions organise professional and social meetings, lectures, seminars, and excursions for their members and guests. At present the Society has about 2000 members.

The DGfK holds an annual "Deutscher Kartographentag" (German Cartographic Conference). The annual general assembly of the society also takes place during this event.

Also, within this conference the "Ravenstein Förderpreis" will be awarded, a prize to honour young talented cartographic students and professionals for their qualified work.

The "Kartographischen Nachrichten", the only cartographic periodical in German, is also published by the DGfK. Six issues per year are delivered to the DGfK members free of charge. In articles, reports, reviews, and much other information, also job advertisements, this periodical mirrors cartographic news in Germany and abroad (especially Switzerland and Austria).

Apart from the "Kartographischen Nachrichten" members of the DGfK also receive, every couple of years, the "Kartographisches Taschenbuch" (Cartographic Paperback) which contains an extensive list of addresses in the field of cartography. Together with the "Staatsbibliothek Preußischer Kulturbesitz, Kartenabteilung" the "Bibliographia Cartographica" is published annually. It is the only regular documentation of international cartographic literature.

DGfK is a member of the International Cartographic Association (ICA). On a European level DGfK is, since 1999, a founding member of the European Cartographic Union (ECU). Nationally, DGfK contributes to the Deutsche Gesellschaft für Geoinformation "DDGI" (German Society for Geoinformation) and the German GeoUnion. In this way our society is engaged on an international and national level and is involved in the development of cartography.

Annual Meetings "Deutscher Kartographentag" (German Cartographic Conference)

2007 Leipzig: Joint Conference with INTERGEO, the Conference of the Gesellschaft für Geodäsie, Geoinformation und Landmanagement "DVW" (Society of Geodesy, Geoinformation and Land Management). Main Topic: "Knowledge and Activity for the Earth".

2008 Oldenburg: Joint Conference with INTERGEO, the Conference of the Gesellschaft für Geodäsie, Geoinformation und Landmanagement "DVW" (Society of Geodesy, Geoinformation and Land Management). Main Topic: "From Potato Globe to 3D Models".

2009 Karlsruhe: Joint Conference with INTERGEO, the Conference of the Gesellschaft für Geodäsie, Geoinformation und Landmanagement "DVW" (Society of Geodesy, Geoinformation and Land Management). Main Topic: "Knowledge and Actions for the Earth".

2010 Berlin and Potsdam: Joint Conference with INTERGEO, the Conference of the Gesellschaft für Geodäsie, Geoinformation und Landmanagement "DVW" (Society of Geodesy, Geoinformation and Land Management). Main Topic: "Cartography Offers Many Solutions".

2011 Nuremberg: Joint Conference with INTERGEO, the Conference of the Gesellschaft für Geodäsie, Geoinformation und Landmanagement "DVW" (Society of Geodesy, Geoinformation and Land Management). Main Topic: "Cartography all over – Ubiquitous Cartography".

1.2 Commissions

1.2.1 Applied Cartography – Geovisualisation

Terms of Reference

The Commission on Applied Cartographie – Geovisualisation has for many years in advanced cartographic dominated environment of the earth sciences involved. This core problem is it constantly through the early detection of changes in this environment needs. Shall be communicated at the same time market-leading technology and related developments by means of appropriate information services not only in the community of DGfK inside. Challenging workshops, various training events and the cross section scale and biannual symposium Königslutter also available for cross-disciplinary know-how transfer of the developed in the Commission findings. The range of actual issues and innovative approaches in cartography and related topics requires focus on a range of topics. Here in the recent past, the following key points emerged:

Use of Norms and Standards for the Creation and Distribution of Cartographic Web Products

This task area is characterised by the progressive trend to use ISO / OGC-compliant standards for the creation and dissemination of cartographic products on the Internet. In combination with such services as well as taking advantage of current web technologies (keyword Web 2.0) has opened up new possibilities for better human-computer interaction in cartographic applications characterised.

A good example of the application is "geostatistics". He is on the almost unlimited combinatorial heterogeneous spatial data sources and a uniform and portable because standardised cartographic "signature language dependent. These are increasingly used possibilities for simultaneous transfer (transmission) and the layout of the semantics of spatial data on the Internet now provides a common understanding of use cases and their cross-system Interpretations.

This approach is also the basis for building a new kind of web-enabled sales portals that connect as a service-oriented data hub in a kind of broker function sellers and buyers about the ISO / OGC-compliant data interfaces and standardised data formats.

Focus of the Commission:

- Standard conformity for the map generation on the web
Human Machine Interface
- Map Sales on the Internet
- Print on Demand

Simulation Methods for 3D-Modelled Geodata

Due to the increasing availability of 3D city and landscape models structured according to standards like CityGML, spatial simulation systems have increasingly been coming into the center of attention.

The declared target is the compliance of these systems to the specifications of ISO/OGC mainly aiming at their data interfaces and the corresponding service architectures. The final goal is the use of standardised geodata in simulations in order to drastically reduce it still required the extensive data processing for these systems.

Associated with this are new requirements for data modelling and temporal visualisation of three-dimensional spatial data. In addition, at this point, the aspect of visual accuracy based on the well-known in cartographic processes of generalisation is to be examined in greater depth, especially in light of the ever increasing amounts of data, the increased quality requirements for a real-time representation (in comparison to the 3D game consoles) and the generally scarce hardware resources.

In related disciplines similar standard developments and trends can be observed. E.g. data bases in the form of the ISO/IEC standard SEDRIS (Synthetic Environment Data Representation and Interchange Specification) (ISO/IEC 18 023 and following) for the description of simulation objects.

Focus of the Commission:

- Generalisation processes for 3D data models
- Standards in the 3D visualisation in simulation systems
- Requirements for the (carto-) graphic display quality

These topics are representative of a number of applications, which are also the focus of the Commission:

- Benefits and uses of print-on-demand,
- Technologies of 3D displays,
- Technological, economic and legal aspects of Open Street Map.

These task areas continuously characterise the work of the Commission Applied Cartography - Geovisualisation. They are at the regular meetings of the Commission of deepening and updated in the direction of new developments.

Members

The Commission on Applied Cartography – Geovisualisation is composed of members who are engaged continually in their professional life with cartographic issues (private business enterprises, public administration, self-employed).

Currently the Commission comprehends 16 members.

Events and Symposia

Inside the Commission a two-way transfer of knowledge takes place through the coordinated participation of individual members place on various trade events. This new knowledge is continuously flowing into the discussion of existing and the provision of new topics.

Knowledge transfer is also the basis for the conference program for the symposium Königsutter, which took place in 2009 and 2011 in Königsutter am Elm. "Reality - Perception - Knowledge" is the motto of this biannual event. The symposia have been keeping the tradition to identify current and future-oriented trends in cartography, topics such as INSPIRE, standardised methods of data collection and innovations in the 3D simulation of virtual worlds.

A variety of workshops complement the speeches. They give the practical use of targeted 2D/3D-Geodaten - whether to produce the charts for the Internet, the cartographic representation of geo-statistics and 3D visualisation of cities.

The intense experience- and information exchange with representatives from commercial enterprises is the proven trademark of this conference. Thus, this year the symposium was again accompanied by a professional business exhibition covering a big variety of specialised topics.

Outlook

The work of the Commission Applied Cartography - Geovisualisation is well perceived outside the DGfK. It is characterised by a variety of interesting topics related to the field cartography.

The members of the Commission have continuously been showing a high level of interest in cartographic knowledge transfer. New challenges are mainly seen in the application areas of

"technologies and data sources on the Internet" and "use of of cartographic methods in the simulation".

Through the binual Königslutter Symposium Series the Commission provides this wide range of expertise to an interested professional audience. At this conference it is clear that the terms of reference represent challenging subjects of cartography in modern, future-oriented fields.

1.2.2 Education and Further Training

No report submitted.

1.2.3 High Mountain Cartography

Chair D, A, CH

Karel Kriz

Chair Germany

Manfred Buchroithner

Terms of Reference

Further define the topics of Mountain Cartography and promote the methods and knowledge of mountain cartography among scientists and professionals in cartography and related fields.

1. Provide an updated, attractive web-site with information about Commission activities, links to other events and theme-specific knowledge.
2. Provide an updated web-portal with links to related web-sites and bibliographic information.
3. Emphasise cartographic design issues and map related representations in large scale topographic mapping.
4. Continue the well-established workshop series.
5. Promote publication activities (proceedings, web-proceedings, journal articles and special issues) and common research activities.

Members

In Germany, the Commission currently only comprehends some 10 members who are active. They come from TU München, TU Dresden and the German Alpine Club (Deutscher Alpenverein).

Activities

With active participation from the group of TU Dresden, the following workshops and meetings have been attended:

9th meeting of the ICA Commission on Mountain Cartography, 13 February 2008, in Lenk, Switzerland

10th meeting of the ICA Commission on Mountain Cartography, 19 November 2009, Santiago de Chile, Chile

11th meeting of the ICA Commission on Mountain Cartography, 2 September 2010, Borsa, Romania

ICA Mountain Cartography Workshop, 11 -15 February 2008, Lenk, Switzerland,

7th ICA Mountain Cartography Workshop, 1-5 September 2010, Borsa, Romania

Publications

Maps:

Gruppo di Brenta 1:15,000. Pecial Edition on the Occasion of the 100th Anniversary of the First Edition. Arbeitsgemeinschaft für vergleichende Hochgebirgsforschung (2009).

Nrevado Chimborazo. Ecuador. Trekking/Orthophotokarte 1:20,000. Arbeitsgemeinschaft für vergleichende Hochgebirgsforschung (2009).

Llanquihue, Travel & Trekking Map. *Fundación Trekkingchile* (2010).

Papers:

Besides a series of more or less cartography-related papers with other fouses, few ones have been published with a mere high-mountain cartographic content:

- Bolch, T. & Buchroithner, M. F. (2007): *Automated Mapping of Scree-Covered Glaciers Using Space Imagery*. Proceedings of the 23rd International Cartographic Conference, Moscow, Russia, 4.-10.8.2007, CD-ROM.
- Bolch, T., Buchroithner, M. F., Kunert, A. & Kamp, U. (2007): Automated Delineation of Debris-Covered Glaciers Based on ASTER Data. In *GeoInformation in Europe = Proceedings of the 27th EARSeL-Symposium, 4-7 June 2007, Bolzano/Bozen, Italy*, Millpress, Netherlands.
- Buchroithner, M. F. (2007): *Echtdreidimensionalität in der Kartographie: gestern, heute, morgen*. Kartographische Nachrichten, 5, S. 239-248.
- Buchroithner, M. F. (2007): *Tätigkeitsbericht der DGfK-Kommission Hochgebirgskartographie 2006*. Kartographische Nachrichten, 4, S. 221-222.
- Buchroithner, M. F. & Bolch, T. (2007): *An Automated Method to Delineate the Ice Extension of the Debris-Covered Glaciers at Mt. Everest Based on ASTER Imagery*. Proceedings of the 9th International Symposium on High Mountain Remote Sensing Cartography 14-22 September 2006, Graz, Austria, Grazer Schriften der Geographie und Raumforschung, 43, S. 71-78.
- Buchroithner, M. F. & Bolch, T. (2007): *Automated Mapping of Scree-Covered Glaciers Using Space Imagery*. Proceedings of the 23rd International Cartographic Conference, Moscow, Russia, 4.-10.8.2007, CD-ROM.
- Buchroithner, M. F. & Walther, S. (2007): *Development of new Types of Glacier Dynamics Maps*. In: Petrovic, D. (Ed.): Proceedings of the 5th Mountain Cartography Workshop, Bohinj, Slovenia, 29th March – 1st April, 2006, Ljubljana, Croatia, pp. 19-26.
- Buchroithner, M. F. & Walther, S. (2007): *Multiparametric Cartographic Visualisation Of Glacier Rheology*. The Cartographic Journal, 44, 4, pp. 304-312(9)
- Vassena, G., Buchroithner, M. F., Lanzi, C., Gelmini, M., Bolch, T., Löffler, J. & Wundram, D. (2007): *A 3D Mixed Laser-Scanner and Photogrammetry Survey Approach for High-Altitude Glacier Monitoring*. Proceedings of IUGG XXIV General Assembly 2007, 2-13 July, Perugia, Italy, <http://www.iugg2007perugia.it/webbook>.
- Mikolaichuk, A. V., Buchroithner, M. F. & Dolgushev, V. G. (2008): Digital Geological Map of the Khan Tengri Massif (Central Tien Shan). In *GeoCongress 2008, Geotechnics of Waste Management and Remediation, Proceedings of Sessions of Geocongress, 9-12 March 2008, New Orleans, USA, Louisiana* (Geotechnical Special Publication), American Society of Civil Engineers, CD-ROM.
- Buchroithner, M. F., Thieme, N. & Kohler, J. (2008): Investigations into the Spatial Pattern of Annual and Interannual Snow Coverage of Brøgger Peninsula, Svalbard, 2000 – 2007. In *Proceedings of the 6th ICA Mountain Cartography Workshop, 11-15 February 2008, Lenk, Switzerland*, pages p.19-24.
- Buchroithner, M. F., Molnia, B., Muskett, R.R. & Sauber, J.M. (2008): A First-Look at ICESat Altimetry and DEMs of the Himalayas and Tibet Plateau Region for Estimates of Glacier Area-Average Elevation Changes. EGU Geophysical Research Abstracts, Vol. 10, EGU2010, CD-ROM.
- Buchroithner, M. F. & Gaisecker, T. (2009): Terrestrial Laser Scanning for the Visualisation of a Complex Dome in an Extreme Alpine Cave System. *Photogrammetrie Fernerkundung Geoinformation (PFG)*, 2009(4):329 - 339.
- Bruhm, K., Buchroithner, M. F. & Hetze, B. (2009): True-3D Visualisation of Glacier Retreat in the Dachstein Massif, Austria: Cross-Media Hard- and Softcopy Displays. *De Maeyer, P., Neutens, T., De Ryck, M. (Eds.): Online Proceedings of the 4th International Workshop on 3D Geo-Information, Ghent, Belgium*, p. 244.
- Bruhm, K., Buchroithner, M. F. & Hetze, B. (2009): True-3D Visualisation of Glacier Retreat in the Dachstein Massif, Austria: Cross-Media Hard- and Softcopy Displays. In *Developments in 3D Geo-Information Sciences*, Springer Berlin Heidelberg, p. 17-32.
- Uffmann, J. & Buchroithner, M. F. (2010): Konzept für die Nachführung des Nepal-Kartenwerkes der Arbeitsgemeinschaft für vergleichende Hochgebirgsforschung. In *Gemeinsame Tagung der ARGE und des AK Hochgebirge, Bayreuth, Germany, 3-6 Juni 2010, Abstract Book*, p.14.
- Bolch T., Kang Sh., Yao T., Buchroithner M.F., Maussion F., Scherer D., Huintjes E. & Schneider, Ch. (2010): A Glacier Inventory for Western Nyainqentanglha Mountains and Nam Co Basin, Tibet,

and Glacier Changes 1976-2009. EGU Geophysical Research Abstracts, Vol. 12, EGU2010-13126, CD-ROM.

Buchroithner, M.F. (2010): When Remote Sensing Went Alpine – The 10 International HMRSC Symposia 1990 – 2008. DGPF Proc. Volume 19/2010 – Dreiländertagung OVG, DGPF und SGPF: 146 – 155.

Buchroithner, M.F. & Himpel, T. (2010): The Centennial Edition of the 1908 Alpenverein map of the Brenta Massif, Italy. Erdkunde, 64, 2: 195 – 202 plus map supplement.

1.2.4 Law and Geodata

Chair

Dietrich Dietz

Terms of Reference

The Commission on Law and Geodata discusses and publishes legal aspects relevant for the processing and use of geodata. Of high priority are copy right issues, rights of database producers, Internet contract laws, data protection/obligation of secrecy, geodata infra-structure and surveying law.

The members of the Commission place concrete problems or projects out of their working areas or fields of interest and suggest solutions. Here, discussions of legal issues are of high importance. Obviously they are a sort of evergreen.

The Commission on Law and Geodata is a common Commission of DGfK, DGPF and DVW.

Members

Currently the Commission comprehends 10 members.

Projects

The following topics are in the centre of the Commission's activities:

- Which activities or generated data are protected by copyright or rights of database producers?
- Which actions may injure these rights?
- What happens if one's own geodata are inserted into open geodata bases (OpenStreetMap) or if OpenStreetMap data are used for one's own products?
- What are the effects of European regulations (e.g. INSPIRE) for access and/or provision of geodata and geoinformation on the national legislation? How differs the realisation in the various countries?
- Does the term „Amtliche Stadtkarte“ („Official Town Map“) stand in contrast to a map properly published by the city government and thus distort competition?
- What has to be considered when putting geodata into the Internet?
- What has to be considered when providing geodata via the Internet?
- Which geodata are individual-related thus protected by the obligation of privacy?
- In which cases may the obligation of privacy be infringed during the processing and provision of geodata?

Publications

Dietrich Diez, Michael Rösler-Goy, Wolfgang Schmid und Eckhardt Seyfert, Schutz des Persönlichkeitsrechts bei der Verarbeitung von Geodaten, zfv 6/2009 S. 357 ff. und KN 6/2009 S. 323 ff.

Dietrich Diez, OpenStreetMap – Unterwegs für eine freie Weltkarte, KN 2/2010 S. 89 f.

Dietrich Diez, Ein fremder Hund in meinem Garten auf einem Luftbild von Google – darf das sein? KN 5/2010 S. 283 f.

Events

Oral presentation at the 57th DKT in Karlsruhe entitled „OpenStreetMap – Why Still to Pay Royalties?“

Presenters: Dietrich Diez & Hubert Bischoff.

1.2.5 Geoinformation and Visualisation

This Commission concluded their activities and the members rearranged themselves in order to establish a new *Commission Cartography and Research*. See 1.2.9.

1.2.6 Cartographic Terminology

Chair

Wolf Günther Koch

This Commission dissolved in 2008. For the reporting period no activities can be reported.

1.2.7 Map Curators

Chair

Wolfgang Crom

Terms of Reference

The Commission of Map Curators (including bibliography of cartography) is a forum for the exchange of ideas between staff members in map collections of different institutions like archives, libraries, institutes, and museums. It is an open body without a rigid member structure. Its members mostly belong to these institutional professional associations; rarely are they members of the DGfK. The advantage of being part of the DGfK is above all the importance of maps and the way the association deals with cartographic material. In other associations the map would only play a subordinate role. This means that the Commission is the only professional forum for questions about cataloguing, provision and preservation of maps. The Commission holds annual meetings at various places. On the one hand, meetings are an information forum for most recent developments and current issues, on the other hand a meeting always has a main topic and according to the subject, external speakers are sometimes invited to join the conference. Thus, the meetings often are continuing professional education events.

Members

Currently the Commission comprehends 18 German members plus a number of colleagues from Austria and Switzerland.

Projects

Further development of the Bibliographia Cartographica towards a better online presentation and visibility, especially regarding electronically available publications. Strengthening of international relations with the aim to improve the data for documenting cartographical literature.

Improvement of catalogues and search capabilities in map collections. Further standardisation of procedures for the work with cartographic materials, inclusion of geographic coordinates in title information and in subject authority files as a basis for graphical search tools.

Exchange of experiences regarding digitisation projects (digitisation, storage, presentation), which frequently are joint projects.

Spreading of Results

- Publication of the results in journals of the library and archive sectors as well as in the KN (Kartographische Nachrichten).
- Participation in congresses (national and international) with oral presentations and/or posters.
- Organising of meetings and events.
- Internal working papers.

Publications

Bibliographia Cartographica online

Bibliographia Cartographica – Internationale Dokumentation des kartographischen Schrifttums. – Berlin : De Gruyter Saur. – Bd. 32, 2009 und Bd. 33, 2010. – ISSN 0340-0409

Crom, Wolfgang: Kartenkuratoren. Die DGfK-Kommission in den Jahren 2008/09. – In : Kartographische Nachrichten 59. - 2009, Heft 6, 206. - S. 336 – 337.

1.2.8 Cartography and Research

Chair

Jochen Schiewe

History

In November 2010 the Executive Board of the German Cartographic Society (DGfK) decided upon the installation of the new Commission on “Cartography and Research”. In agreement with the Board a working group developed a concept that satisfies the demand for a platform within DGfK for persons from universities, public authorities and companies, who are active in cartographic research and want to make this visible to an international community. In order to express the desired networking aspect in German speaking countries, members from Austria and Switzerland are explicitly invited to participate in this Commission.

Terms of Reference

General objective of the Commission on „Cartography and Research“ is to monitor and foster cartographic research on an international level, in particular by the following actions:

- Propagating and promoting the scientific positioning of Cartography and its self-conception to be the responsible discipline for the communication of spatial data;
- Promoting the exchange over a huge bandwidth of current research topics and initializing research co-operations;
- Developing and promoting networks with other disciplines;
- Strengthening of international networking and improving the international visibility of Cartography in German speaking countries.

Board

The activities of this Commission will be further guided by a group which consists of the initiators (Prof. Dr. Doris Dransch, Dr. Ernst Jäger, Prof. Dr. Jochen Schiewe, and Prof. Dr. Monika Sester) and also of members from Austria (Prof. Dr. Georg Gartner) and Switzerland (Prof. Dr. Sara Fabrikant), in order to express the desired networking aspect in German speaking countries. Prof. Schiewe acts as chair of the Commission.

Activities

Since its first weeks being in business the new Commission held its kickoff meeting, bringing together 24 participants at HafenCity University Hamburg. Furthermore the Commission acted as co-organiser of the ICA workshop “GeoViz_Hamburg 2011” which was hosted in close co-operation with the ICA Commission on „Geovisualisation“ and HafenCity University Hamburg.

Future activities are already planned, including the organisation of an Anglophone conference on a regular basis (of ca. two years), to promote smaller workshops covering special topics (eventually by integrating interdisciplinary competences), and the compilation of a White Paper dealing with the research agenda in Cartography (embedded into the research agenda of ICA).

Further information: <http://www.visualisierung.dgfk.net>

1.2.9 3D City Models

Chair

Ekkehard Matthias and Bettina Petzold (for DGPF)

Terms of Reference

The Commission represents the first common Commission of DGfK together with the German Society of Photogrammetry and remote Sensing (DGPF). It is devoted to the methods for acquisition, storage,

presentation and usage of three-dimensional geographic objects and the applied techniques and conveys those to interested individuals by means of workshops and lectures.

Members

Members from industry, commerce, authorities and science make sure that a wide range of topics with a relation to 3D city models is represented. Currently the Commission comprehends 19 members including one Swiss. The regional distribution of the members reflects the German „3D landscape“ very well.

Projects / Activities

On 8/8 November 2010 an international workshop held in German language dealt with exemplary cases employing different acquisition and up-dating methods for 3D objects, the retaining and description of the quality of 3D city models, application examples, clarification and advertising of the use of 3D city models, distribution models, database techniques for storage and management incl. the CityGML standard as well as existing services.

Commission Members participated in various events and spread and fostered the topic of 3D city models. Besides national meetings and conferences, also presentations at the U.S. American Ecobuild Fair in December 2010 were given.

The Commission holds a meeting at least once a year, in June 2011 e.g. at the Virtual Development and Training Centre (VDTC) of the Fraunhofer Institute in Magdeburg.

Preview

For 8/9 November 2011 currently a workshop at the University of Bonn is in preparation. It will, again, include topics concerning other Central European countries.

Further Information: www.3d-Stadtmodelle.org

1.2.10 History of Cartography

Chair

Markus Heinz

Terms of Reference

For a long time the Commission ‘History of Cartography’ has had the aim to observe all activities and developments in the field and to provide a platform for researchers. This platform is the ‘Kartographiehistorisches Colloquium’ (colloquium on the history of cartography).

Events

From 2 to 4 September 2010 the 15th „Kartographiehistorisches Colloquium“ took place in Munich. It was organised in cooperation with the „Landesamt für Vermessung und Geoinformation Bayern“. More than 100 participants from 9 countries listened to around 30 scientific reports. Inspired by the genius loci, the meeting included a comprehensive programme of guided tours and presentations.

Publications

Thanks to the help of Kurt Brunner, the publication on the Bonn conference could be dispatched in the beginning of this year. The publication on the Dresden conference has progressed well, but has not yet been finished. The same can be said regarding the publication of the Nuremberg conference. For the publications on the conferences in Munich and Nuremberg the cooperation with Mr. Kurt Brunner has already started. At the conference in Munich there has been a very intensive discussion on future strategies on how to speed up the publishing of the proceedings, some participants made radical proposals, others suggested only minor changes. Unfortunately, a unanimous solution was not found. Neither was it possible to find someone who would continuously help the head of the Commission, particularly in his work as an editor, especially for future publications.

Perspectives

Instead of the conference in Gotha in 2012, which was planned in cooperation with the Collection Perthes, there will now be a conference in Marbach, organised in cooperation with the „Tobias Mayer Museum“. In 2014 the conference will then take place in Gotha. Because of current construction work in the building in Gotha and the expected end of projects in connection with the Collection Perthes in 2014, it is now possible to better plan the conference.

2 Cartographic Activities of Authorities

2.1 Topographic Cartography of Germany

The creation and management of topographic map series in Germany is traditionally the responsibility of the 16 Federal States and is part of official surveying and mapping. The authorities provide the government, industry and private users with the topographic geobasis data for the State territory based on an official spatial reference system in a standardised and platform-neutral way. While the State surveying authorities / agencies are responsible for managing the topographic geobasis data in the Federal States, the provision of corresponding analogue and digital topographic data at the federal level is within the responsibilities of the Federal Agency for Cartography and Geodesy (BKG) under the Federal Ministry of the Interior.

Printed topographic maps have been the primary product of official topographic cartography until recently. Nowadays the demands of the information society have changed almost totally to spatial data in digital formats as a component of a national spatial database. The Working Committee of the Surveying Authorities of the States of the Federal Republic of Germany (AdV) has reacted in good time to this development with the setting up and management of the **Amtliches Topographisch-Kartographisches Informationssystem** (Authoritative Topographic-Cartographic Information System) (ATKIS®) (Figure 1) and is providing standardised topographic geobasis data nationally for establishing the national spatial database in the German Spatial Data Infrastructure.

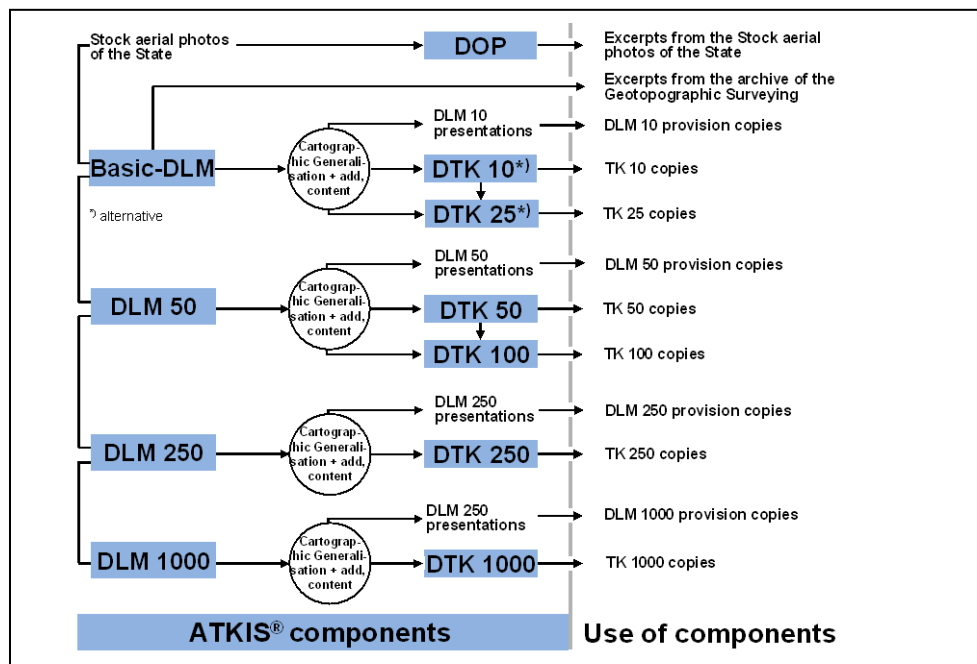


Figure 1 : “ATKIS® components”

2.1.1 Spatial Data Infrastructure in Germany

The Spatial Data Infrastructure Germany (GDI-DE) is a joint project of the Federal government, Federal States and local authorities.

Decisions in administration, economy and politics are more efficient using the network of spatial data conveyed by the GDI-DE. Tasks of the GDI-DE are the inspection of national developments as well as integrating the developments in a European (INSPIRE) and global scope (GSDI, GEOSS).

In order to ensure the collaboration of the Federal government, the Federal States and the local authorities, a Steering Committee (LG), composed of representatives from the Federal government, Federal States and local authorities, has been set up as a strategic decision committee. The activities of GDI-DE are supported by a permanent coordination office (KSt). The LG GDI-DE reports to the IT Planning Council (*IT-Planungsrat*), the joint decision body of Federal administration and States for the information technology.

The tasks of the GDI-DE include taking care of the national spatial database (NGDB) with content provided by the public administrations of the Federal government, the Federal States and the local authorities. The national spatial database allows for access to spatial reference data, thematic data and the corresponding metadata. Topographic maps are included in the georeference data and are provided in conformance with the ATKIS® specifications.

2.1.2 ATKIS® Digital Landscape Models Components (DLM)

The basic DLM is the geotopographical basis for the derivation of the DLM50, DLM250 and DLM1000 small scale digital landscape models and for the derivation of the digital topographic maps to be created with new map graphics. The basic DLM has been introduced gradually. In 2010 it was finalised for the entire country with more than 120 topographic feature types. Now frequent update cycles are established for important topographic data such as transport network and administrative units in particular, to ensure provision of up-to-date information.

In the course of the “ATKIS® Generalisation” project, under the control of yet 12 State surveying authorities supporting the project, the prerequisites have been created for being able to derive the DLM50.1 in an automated way from the basic DLM using model generalisation. With this geotopographical database a widely available digital landscape model standardised for Germany is ready which shows a more simple structure and a lower amount of data as compared with the basic DLM so that it is particularly suitable as basis for computer supported analyses and for location based services (LBS) or for the calculation of routes and for applications at the federal administrations level. Over the recent years major progress has been achieved with the introduction of automated map generalisation procedures for the production of a DLM50.2, to serve as data source for the DTK50 with minimised manual interaction. Further improvement in efficiency is aimed at.

The DLM250 and the DLM1000 processed in the BKG are available for the entire country and updated annually. They serve as a data source for the EuroGeographics products EuroRegionalMap and EuroGlobalMap. The contents are continually extended to allow for linking the DLM with other data such as gazetteer and hydrological data.

The digital landscape models can only meet the requirements if a high up-to-dateness of information can be ensured. The state survey authorities and the BKG constantly endeavour to improve the currency of the topographic data. In doing so, they are primarily setting up a close co-operation with the parties responsible for the topographical changes using advanced methods of information technology and also using photogrammetric and computer-controlled terrestrial reconnaissance systems.

2.1.3 Digital Terrain Model (DTM)

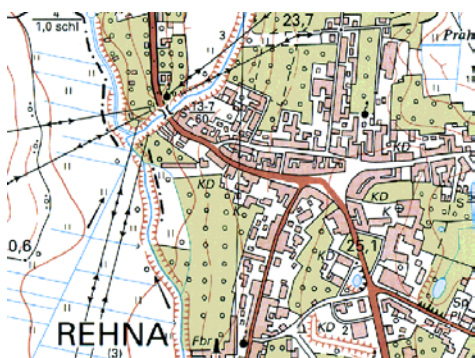
The Federal States are establishing DTMs in parallel with the DLMs and are providing these with different degrees of accuracy and abstraction. As well as regularly distributed geodetic points, the DTMs usually contain vector structure elements in the form of terrain form lines and particular terrain points. As a result of the automated harmonisation of the currently available DTMs in the Federal States with the BKG, a homogeneous DTM with a terrain-type dependant height accuracy of at least 2 m and a grid width of 10 m is available for the Federal Republic of Germany which is distributed by the geodata centre at BKG. The Federal States intend to improve the accuracy of this dataset until 2013. Furthermore most States have already achieved a coverage with DTM at grid width of 5, 2 or even 1 m with equivalent height accuracy by means of laserscanning, or are about to finalise the product.

2.1.4 Digital Topographic Maps (DTK)

On the basis of the already available digital landscape and terrain models, the State survey authorities produce the official topographic map series with new map graphics, documented in the ATKIS® portrayal catalogues. Digital topographic maps (DTK) at scales of 1:10 000 and 1:25 000 are already achieving a high profile in the product range of the State surveying authorities. The DTK at scale 1:50 000 is designed as a joint civil-military map series which is also available in most Federal States. Processes for an as much as possible automation supported generalisation of the DTK50 still have to be further developed so that a significantly more efficient derivation from the digital landscape and terrain models can be achieved in the future.

The map graphics have been developed and published in the corresponding ATKIS® portrayal catalogues for the DTK100, DTK250 and DTK1000. It has been agreed to also produce the DTK100 as a joint civil / military topographic map series and to publish this by the end of 2011 for the entire territory of the Federal Republic of Germany.

As long as the topographic map series are not fully available at the map graphics defined by the ATKIS® portrayal catalogues, the previous scanned maps may remain at offer. The update of the traditional maps will be discontinued with the introduction of the new DTK. Figure 2 shows a direct comparison of the previous and current topographic map series.



topographic map at scale 1:10 000



digital topographic map at scale 1:10 000



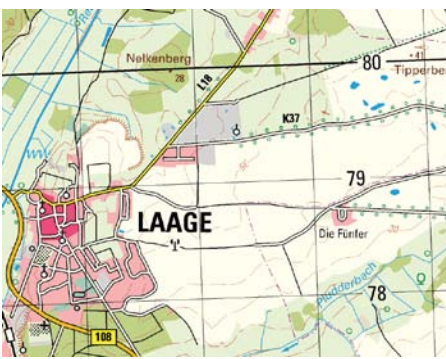
topographic map at scale 1:25 000



digital topographic map at scale 1:25 000



topographic map at scale 1:50 000



digital topographic map at scale 1:50 000

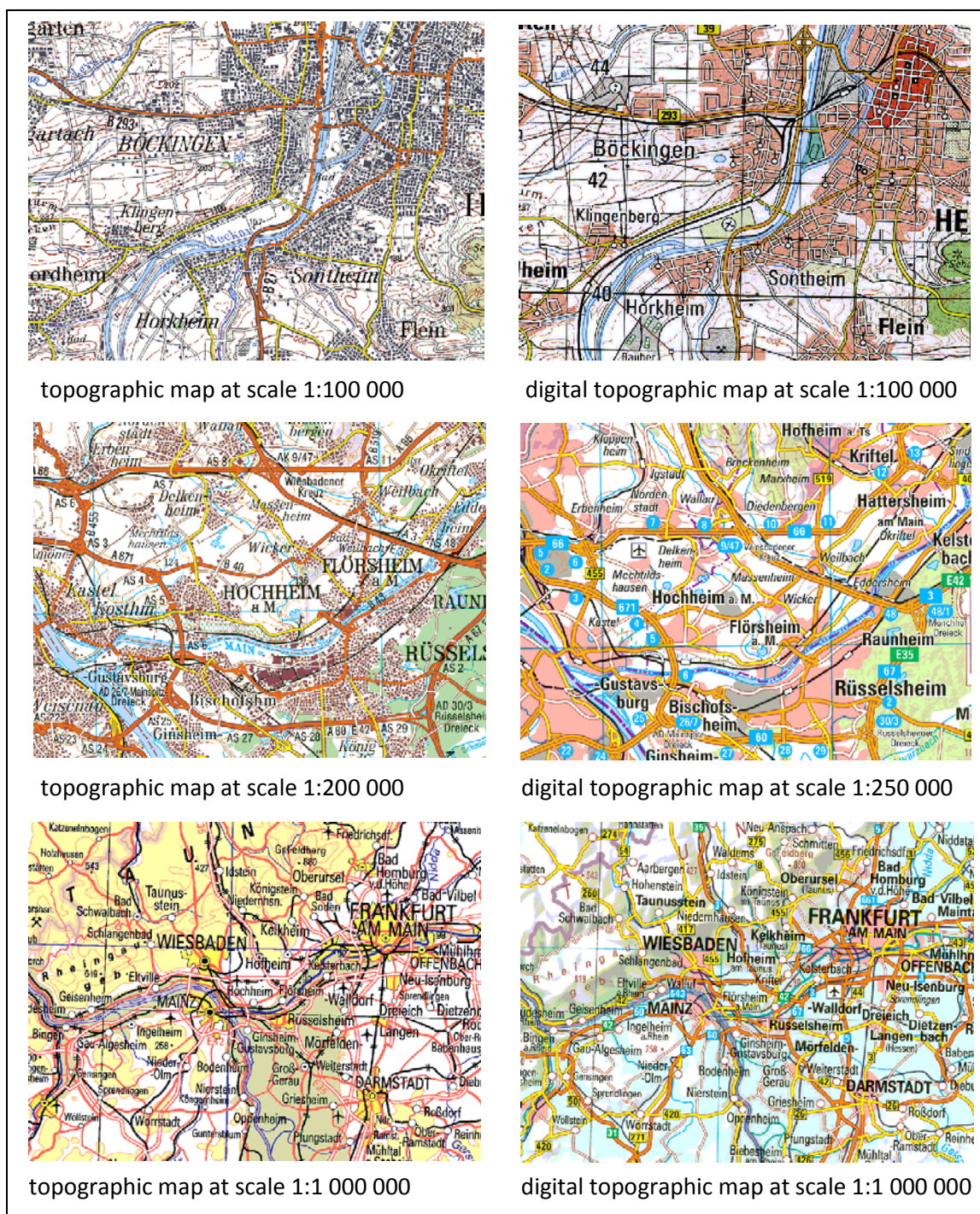


Figure 2: “Map graphics of the previous and future topographic map series”

2.1.5 AFIS®-ALKIS®-ATKIS® Project

Starting from an analysis of the developments on the geodata market and the future requirements for official spatial databases resulting from this, the Adv has achieved a standardised modelling of its real estate cadastres' databases, the geodetic spatial reference and the geotopography. It has developed the common AFIS®-ALKIS®-ATKIS® (AAA-)data model for this. AFIS® stands for **A**mtliches **F**estpunkt**i**nformations**s**ystem (Authoritative Fixed Point Information System) and ALKIS® for **A**mtliches **L**iegenschaftskataster**i**nformations**s**ystem (Authoritative Real Estate Cadastre Information System). The complete project is documented in GeoInfoDok and is available at www.adv-online.de. The migration of the available databases to the AAA data model has been started, and is already

completed in some Federal States. For the ATKIS®-DLM full coverage is expected by the end of 2012. The implementation of the ETRS89 location reference system in combination with the UTM mapping is intended in direct connection with the implementation of the AAA data model.

2.1.6 Interactive Topographic Maps on CD-ROM

Based on the topographic map series, the AdV has developed a CD ROM series which presents the raster formatted “Top50” 1:50 000 topographic map and “Top200” 1:200 000 topographic overview map for the whole of Germany (Figure 3). This very successful CD ROM series is available for all States at version 5.0 and for some States at version 6.0 The functionalities have been enhanced, for instance to allow for a virtual flight over Germany.

The product may not be developed further despite its commercial success, because the AdV will adapt its range of products to user requirements as the trend goes to web-based viewing services and applications.

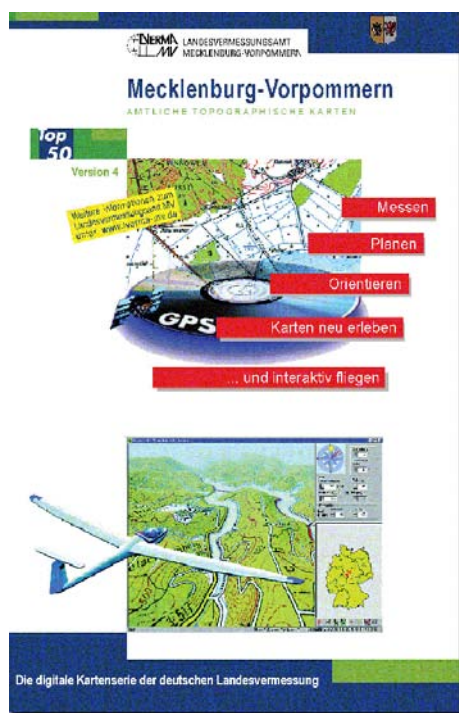


Figure 3: “Cover of the Top50 CD ROM”

2.1.7 Toponymy

The „Ständiger Ausschuss für geographische Namen“ (StAGN) (Permanent Committee on Geographical Names) is the independent scientific body responsible for the standardisation of geographical names in the German-speaking area. The office of the StAGN is located at the Federal Agency for Cartography and Geodesy (BKG) in Frankfurt am Main. Of great importance is international cooperation, especially with the United Nations Group of Experts on Geographical Names (UNGEGN), which comprises a Dutch- and German-speaking Division (DGSD). Information about the StAGN and a link to UNGEGN are available at www.stagn.de.

To enable cartographers especially of other countries to treat correctly all problems of cartographic toponymy in Germany the StAGN produced Toponymic Guidelines for Germany. In 2010 these Guidelines have been comprehensively revised and were published as 5th edition. This new edition is extended by some required amendments regarding contents as well as editorial updates. Particularly a chapter has been added dealing with the principles of the approval of geographical names of the Federal Republic of Germany. Furthermore explanations on those regions in Germany where multilingualism appears (German - Danish, German - Frisian, German - Upper Sorbian and German -

Lower Sorbian, resp.) (Figure 4) as well as on German dialects were revised and supplemented by maps of the dispersal areas (Figure 5). The Toponymic Guidelines Germany are downloadable from the StAGN homepage www.stagn.de, click: Publikationen/Downloads.

2.2 The Bundeswehr Geoinformation Office (Federal Armed Forces Geoinformation Office)

No report submitted.

2.3 Bundesanstalt für Geowissenschaften und Rohstoffe (Federal Institute for Geosciences and Natural Resources)

No report submitted.

2.4 Bundesamt für Seeschifffahrt und Hydrographie (BSH, Federal Maritime and Hydrographic Agency)

2.4.1 Cartographic Responsibilities and Activities of BSH

BSH is responsible for the production and issuing of official nautical charts. It presently produces about 212 charts covering the European waters of main interest to German merchant vessels, Navy and pleasure boating. The production is based on the cooperation of national hydrographic services under the umbrella of the International Hydrographic Organisation (IHO) and takes advantage of the system of International Charts coordinated by IHO.

In addition, BSH is responsible for producing the so called Electronic Navigational Charts (ENCs) for German waters (147 cells), using the IHO Transfer Standard for Digital Hydrographic Data, referred to as S-57. These official ENCs, and their regular electronic updates, are for the onboard use on an Electronic Chart Display and Information System (ECDIS). They are Germany's contribution to the World-wide ENC Database (WEND) coordinated by IHO and distributed by Service Providers appointed to the International Centre for ENCs (IC-ENC) based in United Kingdom. Printed nautical charts and ENCs are produced by BSH and other hydrographic services worldwide to satisfy the carriage requirement for ships according to the International Convention "Safety of Life at Sea" (SOLAS) of the International Maritime Organisation (IMO) and are part of a comprehensive nautical information system comprising charts, nautical books and the regular update services "Notice to Mariners".

Furthermore, BSH produces about 925 topographic maps of the sea floor covering the about 57.000 km² of the German waters which are to be regularly surveyed by BSH's five own wreck search and survey vessels. These maps present high-resolution topographic sea bottom information as the result of state of technology sea surveys.

BSH licenses its cartographic products for commercial reuse by private companies.

2.4.2 Important cartographic products and projects

Products (see above):

- Official nautical charts for professional shipping and small craft
- Notice to mariners, a printed weekly bulletin for keeping nautical charts and publications up-to-date
- Official Electronic Navigational Charts (ENCs) including weekly electronic up-dates
- Vessel Traffic Services Guide North Sea and Baltic Sea
- Topographic maps of the sea floor
- WMS chart services based on ENCs as part of the national geodata infrastructure (GDI) accessible via www.geoseaportal.de

Projects:

- Nautical Hydrographic Information System (NAUTHIS)

- Electronic Sailing Directions
- Development of three fully new charts of Antarctic waters according the commitment of Germany within the framework of the international Antarctic Treaty.

2.4.3 New Developments

A new cartographic GIS-based software, the “Hydrographic Production Database” (HPD) has been developed by the Canadian company CARIS in a joint venture project with BSH. HPD is based on the IHO S-57/S-100 standard (see below) and forms the core element of a fully integrated digital work flow from processing of survey data and other relevant sources down to final cartographic products in either printed or digital form. The HPD, which is also commercially available now, is currently being introduced into the BSH production environment.

2.4.4 International Cooperation

All hydrographic services cooperate under the International Hydrographic Organisation and its Regional Hydrographic Commissions (RHCs). Relevant for BSH are the North Sea Hydrographic Commission and the Baltic Sea Hydrographic Commission. BSH has also observer status in other RHCs, depending on varying requirements, such as bilateral projects. BSH cooperates also, within the framework of IHO, in the development of standards related to hydrography. A particularly important one is the development of the IHO Universal Hydrographic Data Model, referred to as S-100. S-100 came into force on 1 January 2010. S-100 is the document that explains how the IHO will use and extend the ISO 1900 series of geographic standards for hydrographic, maritime and related issues. S-100 extends the scope of the existing S-57 Hydrographic Transfer standard. Unlike S-57, S-100 is inherently more flexible and makes provision for such things as the use of imagery and gridded data types, enhanced metadata and multiple encoding formats. It also provides a more flexible and dynamic maintenance regime via a dedicated on-line registry.

S-100 provides the data framework for the development of the next generation of ENC products, as well as other related digital products required by the hydrographic, maritime and GIS communities. This is already beginning to occur (2011) with various would-be data providers preparing themselves for the advent of the E-Navigation concept currently under active discussion in the UN International Maritime Organisation (IMO).

2.5 Bundesamt für Bauwesen und Raumordnung (Federal Office for Building and Regional Planning)

No report submitted.

3 Cartographic Activities of Private Enterprises

The private cartographic industry is undergoing a phase of massive reorganisation. Whereas navigation systems pull away customers from town maps the interest in medium and small scale maps is staying stable. This affects all suppliers of mapping, whether big or small. The market for mapping products is down some 30% from 2007, which is 90 Mio. EUR p.a. in revenues.

The production now is mostly organized with database driven software, being aware that the new market demands such data or hoping to build up a market with these data respectively. Nonetheless a lot of suppliers still use desktop publishing software for their business, since converting the acquired data from dtp to database is not always ensured.

Google and OpenStreetMap give a boost various cartographic demands - the private sector happily acknowledges this fact and encourages all members of the cartographic branch to participate and build new products.

The free usage of public-sector cartographic products is in the view of the government bodies limited to their internal use. Therefore, they strictly prosecute private companies whenever they have the impression public-sector data has been used to compile maps by private companies. In the view of the private sector tax paid data is public domain and to be used by all under the same regulations. In the perspective of the private sector German cartographic government bodies violate laws like the German freedom of information act.

4 Cartographic Training and Research at Institutions of Higher Education

4.1 Beuth Hochschule für Technik Berlin (Berlin University of Applied Sciences)

Research

Research activities mainly focus on applied tasks, e.g. the use of Geoinformation Sciences (GIS), the advanced analysis of remote sensing data, the perception and the compilation of cartographic representations and geovisualisation including internet cartography, health mapping, atlas research and 3D landscapes.

One study area is the use of GIS methods in health services research. This includes studies in Germany as well as in countries located in East Africa. The focus are monitoring systems for decision makers to assist them making optimal use of available healthcare resources. Internet-based, mobile WebGIS are currently developed for an integrated management approach for public buildings in Berlin districts. Those will be used for a real time snow check in winter.

Since Beuth faculty traditionally keeps close connections to various partners in African countries, GIS techniques and methods were used for mapping purposes on different scale levels and spatial resolutions in these regions. In 2008 the first edition of an official Addis Ababa city map was produced by the geo3-Institute; geo3 is a dedicated Geo Research facility at the University of Applied Sciences. These projects were carried out with funding of the German Development Organisation GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit).

Education

Starting fall 2011/2012, the University of Applied Sciences Berlin offers the consecutive two-step study program in cartography for six years now. We have succeeded in this period; we doubled the student numbers in the bachelor program to 40 places. These places are well demanded. The thematic focus of the course was underlined by a change in the name to "Cartography and Geomedia" and in 2007 all study programs passed the accreditation procedures successfully.

In May 2011 the department of Civil Engineering and Geoinformation celebrated its 75th anniversary of cartographic education at a university level with more than 180 former students.

The international networking the University of Applied Sciences Berlin has been significantly extended within the past few years. University of Bahir Dar, Ethiopia, El Neelain University, Khartoum, Juba University, Sudan, Université Evangélique en Afrique, Bukavu / Democratic Republic of Congo (DRC), and National University of Rwanda (NUR) represented by the Center for Geoinformation Systems & Remote Sensing (CGIS-NUR), Butare / Rwanda are sharing our expertise in geospatial sciences.

4.2 Hochschule für Technik und Wirtschaft Dresden (HTW Dresden, Dresden University of Applied Science)

Research

During the report period, the research projects of the degree program Geoinformation und Kartographie (Spatial Information and Cartography) focused on the key topics of atlas cartography, geoinformation systems, digital cartography, web mapping, 3D cartography, topographic and thematic cartography, and applied (practice-oriented) projects.

Actual Researches and Projects:

- Atlas of History and regional Geography of Saxony (Atlas zur Geschichte und Landeskunde von Sachsen) in Cooperation with Saxon Academy of Sciences (Sächsische Akademie der Wissenschaften).
- Archaeological Maps in Cooperation with Saxon Department of Archaeology (Sächsisches Landesamt für Archäologie).
- Education Portal of Saxony (Bildungsportal Sachsen), e-learning Course in Cartography.
- Maps of Via Regia in cooperation with the European Culture- and Information Center (Europäisches Kultur- und Informationszentrum Via Regia e.V.).
- Compilation of regional atlases of applied geography in collaboration with local institutions and authorities.
- An analysis of the demand for geodata in Saxony and the development of means of consultancy on the management of geodata on the internet.

Education

The bachelor program *Geoinformation und Kartographie (Spatial Information and Cartography)* established in 2007 is in its fourth cycle, the first batch of students graduated successfully in the spring of 2011. The curriculum has been adapted to current demands since the beginning of the academic year 2009.

The MBA program *Master of Geoinformation and Management* started in 2009 and is held as a four- or three-semester Master's course. For the cartographers of the year of 2011 the proportion of cartography in choice modules was increased to provide an adequate field of study to Bachelor alumni.

4.3 Hochschule Karlsruhe – Technik und Wirtschaft (Karlsruhe University of Applied Sciences), Faculty of Geomatics

Research

The BIOTA East Africa project ended in 2010 after 9 years of funding by BMBF. Following cartography-related products were generated:

- BIOTA East African Atlas. Rainforest Change over Time.
- Kakamega Forest Tourist map (1:20.000).
- BIOTA east geodata catalogue with more than 500 geodatasets and 55 ready-to-use maps.
- 3rd place on the Int. ESRI User conference (2009), category Multimedia maps: "Biodiversity research in Eastern Africa".
- Capacity building with workshops in Africa and supervision of Kenyan students in the Geomatics Master programme in Karlsruhe.

In the BfN-project (Federal Agency of Nature Conservation) "Balancing of floodplain areas in Germany" a wide range of spatial data of floodplains along more than 10.000 km river in Germany were edited and analysed. Next to a WebGIS-System different overview maps of Germany (1:1.000.000) were published (2009), to complement the series of the well-known national German water quality maps.

Education

The study programme "Cartography and Geomatics" has been continually developed for integration of recent technical progress, like WebGIS, 3D-Geovisualisation, dynamic and mobile cartographic applications. Caused on this extension the successful examined students have working possibilities in a wide range of geoinformation technology companies.

With the fall term 2009/2010 a new study program was set up at the Faculty for Geomatics. Next to the two Bachelor study programmes "Surveying and Geomatics" and "Cartography and Geomatics" a third Bachelor study programme, called "Geoinformation Management" has been started. All three Bachelor programmes start every year in fall term with 30 study places for beginners. The main focus of the new study programme is related to the geoinformation technology with an emphasis on three different specializations: geomarketing, environmental applications and facilities.

Since the fall term 2010/2011 a programme called BACHELOR PLUS is running: the program duration of the Bachelor study programmes will be extended by one semester. Students can obtain a DAAD (German Academic Exchange Service) scholarship to spend a year at one of the following partner universities: University of Szeged (Hungary), Universidad Politécnica de Valencia (Spain), University of Nebraska in Omaha and University of Colorado in Boulder (both USA).

The Master course Geomatics (lectures in English) can be attended by consecutive students from the Bachelor study programs (2 study terms and one term for the master thesis) as well as by non-consecutive students in 4 terms, with a preliminary basic term. More than 50% of the enrolled Master students are international students.

4.4 Fachhochschule München (Munich University of Applied Sciences)

No report submitted.

4.5 Dresden University of Technology (TU Dresden)

Research

Like within the previous reporting period, Theoretical Cartography (i.a. Cartosemiotics), High-Mountain Cartography (primarily Multitemporal Glacier Cartography), Mobile Cartography, True-3D Cartography and – nor additionally – Generalisation were the strongholds of research. Here, a series of national and international cooperation projects funded by various funding entities – mainly the German Research Council (DFG) and the Federal Ministry of Education and Research (BMBF) – have been carried out and are still ongoing for several years.

Geographically, the mapping activities are covering parts of Antarctica, the whole Andes, Western Greenland, the Austrian Alps, Tian Shan, the Himalayan Range, Tibet as well as the Malaysian Peninsula and Borneo.

Education

The well-established educational system leading to the globally well-known degree of a *Diplomingenieur* of Cartography has been abandoned and substitutes by the Bachelor-Master system.

As from the study-year 2008/09 on the first Bachelors in Cartography have been educated. Beginning with 2011/12 the first batch of Master students in Geo-Information Technology will pursue their studies. Currently the preparatory activities for this Master Course are going on.

In addition, in fall 2011 the globally unique *International Master Course Cartography*, together with the Munich University of Technology and the Vienna University of Technology, will start. Currently the preparatory activities are entering their final phase, after the dispelling of all legal difficulties (which took some three years).

Organised Symposia

- 27 – 28 September 2010: 47. Tagung der Arbeitsgruppe Automation in Kartographie, Photogrammetrie und GIS (AgA), in collaboration with BKG (Federal Agency for Cartography and Geodesy) and Leibniz University Hannover
- 26 – 30 September 2010: "Color cartographicae" - Ausstellung zu Farbanwendung in der Kartographie
- 24 – 28 August 2009: True-3D in Cartography – International ICA Symposium
- 07 April 2008: Ehrenkolloquium Prof. Koch
- 09 – 10 November 2007: 50 Years of Cartographic Education at TU Dresden.

4.6 University Bonn

No report submitted.

4.7 Leibniz University Hannover

Research

The research projects at the Institute of Cartography and Geoinformatics (ikg), generally deal with questions of automation of spatial data processing. Major focus lies on the automation of generalisation, nowadays also in 3D, data integration, interpretation of landscape models, navigation and positioning, analysis of spatio-temporal data, VGI, geosensor networks, visualisation of data in the internet, 3D-visualisation, Augmented Reality, as well as location based services.

3D-data acquisition and interpretation is investigated with respect 3D-city modelling and navigation using laserscanning. Dr. Brenner, who is head of this research group recently has been assigned the title of an apl. Prof. (Associate Professor). Current research projects are funded by German Science Foundation, VolkswagenStiftung, German Ministry of Science, as well as by cooperations with federal authorities in Germany.

At the institute software products for cartographic generalisation have been developed, namely for building simplification, aggregation and typification (CHANGE, TYPIFY), and for object displacement (PUSH). These products are being used by several National Mapping Agencies in Germany and in Europe.

On-going research projects (selection):

- Interpretation and quality analysis of trajectory data (DFG)
- Using cars as moving rain gauges for precise estimation of rainfall (DFG)
- Generalisation and update of land cover data (Federal Agency of Cartography and Geodesy)
- Landmark based positioning for driver assistance using Lidar data (Volkswagen Nutzfahrzeuge and Leibniz Universität Hannover).

Education

The ikg is responsible for the education in *Geoinformatics and Cartography* at Leibniz University Hannover. Basic, as well as advanced courses in GIS are communicated to students both from Geodesy and Geoinformatics, and to students from Geography, Computer Science and landscape architecture. In 2011 a new master course is introduced, entitled "Navigation and Field Robotics".

Service for Scientific Organisations

The ikg is active in ISPRS by chairing a Working group on Multiple Representation of Spatial Data. This working group has organised several workshops, in 2011 also together with an ICA Commission, and contributed to ISPRS symposia and congress. The ikg organised the AGILE conference in 2009 in Hannover.

4.8 Munich University of Technology (TU Minich)

Research

Research fields of the Department of Cartography are spatial data integration with emphasis of road networks, development of multimodal routing algorithms and map-based web services, non-photorealistic visualisation, visual analytics of mass data, application-driven generalisation and spatio-temporal data modeling for visualisation and queries. Main collaboration partners and sponsors are: German Natural Science Foundation (DFG), German Ministry of Education and Research (BMBF), Federal Agency of Cartography and Geodesy, Graduate School of TU Munich.

On-going research projects:

- Generalisation of road network for navigation purposes
- Non-photorealistic 3D virtual environments for mobile devices
- Event detection from Volunteered Geographic Information
- Conflation of road databases for different traffic modes
- Distributed Web Services for post-earthquake rescue work

Research projects finished in the recent two years:

- Methods and implementations of road-network matching
- Integration of time-dependent features within 3D city model
- Driver behaviors on different presentation styles of traffic information
- Data model and algorithms for multimodal route planning with transportation networks

Education

Cartography is one of the essential components in the bachelor / master program of “Geodesy and Geoinformation” at TU Munich. The Department of Cartography is also involved in the following international master courses:

- (1) Cartography (a joint program with TU Vienna and TU Dresden)
- (2) Land tenure and land management
- (3) Earth-oriented space science and technology
- (4) Transportation systems
- (5) Environmental engineering

Organised Academic Event

The 3rd international conference on “Earth observation for global changes”, 13 – 15 April 2011.

4.9 University of Trier

No report submitted.

4.9 Ruhr University Bochum

Cartography is part of the Geomatics Group within the Institute of Geography at the Ruhr-University Bochum. The Geomatics Group teaches in the various geography study programmes (more than 1400 students) available in Bochum. In all those programmes cartography, remote sensing, GIS and modelling are an integral part for the students. Within a M.Sc. programme students can specialise in geomatics (www.geographie.ruhr-uni-bochum.de/ag/geomatik/).

Research

During the report period the research topics included digital cartography, geo-information systems, web mapping, 3D cartography, satellite cartography and user oriented cartography. Besides research topics also relevant aspects of practical cartography were considered. The main topics in cartographic research are summarised as follows:

- efficiency analysis of thematic maps (empiric cartography)
- 3D-Geovisualisation / photorealistic 3D-modelling of buildings
- multimedia representation and communication
- web mapping
- thermal mapping
- lenticular foil techniques for thematic cartography
- cognitive mapping.

Education

In addition to the regular teaching the geomatics group offers courses for professionals to update and supplement their professional skills. These courses focus on the following topics:

- geographic information systems
- 3D-data capture from aerial photographs
- map updating techniques from aerial photographs
- cartographic presentation with GIS.

4.10 HafenCity University Hamburg

Research

Cartography at the HafenCity University Hamburg is conducted at the Lab for Geoinformatics and Geovisualisation (g²lab), headed by Prof. Dr. Jochen Schiewe. The lab focuses on the development of

methods and applications which are positioned at the interface between Geovisualisation, Remote Sensing and Geoinformatics. Main projects in the report period were concerned with

- developing Visual Analytics methods and workflows for improving the interpretation of remotely sensed scenes;
- designing and applying graphic variables for representing acoustic parameters in a structured and comprehensive manner;
- improving noise maps for presentation and public participation purposes by enhancing cartographic design and interactive tools;
- developing and evaluating the multimedia combination of animated maps and sounds for representing quantitative data;
- applying and evaluating different methods for visualizing thematic uncertainties for specific user groups.

Besides this research work g²lab was responsible for organizing the two successful international workshops *GeoViz_Hamburg* in 2009 and 2011 in close co-operation with the ICA Commission on “Geovisualisation”. Furthermore it hosted the kickoff meeting of the new Commission on “Cartography and Research” of the German Cartographic Society (DGfK; headed by Prof. Schiewe).

Education

Education in Cartography at HafenCity University Hamburg is embedded in the study programs on “Geomatics”. While there is only little consideration in the Bachelor of Science course (with only one larger unit on Cartography, besides other lectures in GIS, Remote Sensing, etc.), the Master of Science program offers a specialisation area in “geoinformation technologies” with a strong emphasis on (geo-)visualisation topics.

Further information: www.g2lab.net

4.11 Helmholtz Centre Potsdam GFZ German Research Centre for Geosciences

Current research activities of Section Geoinformatics at GFZ focus on the two main topics geoinformation management and interactive geovisualisation for data exploration. In close cooperation with geoscientists, the goal is to develop new concepts and methods to support the geoscientific research process. In the field of geoinformation management, one major topic is the development of internet based geoinformation systems to make scientific results available to a larger public. Examples are the RiskExplorer, which provides risk information concerning earthquakes, storms and floods, and a web based information brochure for flood damage precaution measures that links scientific results with local information.

A second topic is the extraction and integration of heterogeneous data from various data sources. One successful realisation is the flood damage database HOWAS21, the largest scientific data collection for flood damages in Germany. Research in interactive geovisualisation focuses on the visual exploration and analysis of large heterogeneous data set with spatiotemporal context and the linkage of automated analysis methods with interactive visualisation. Examples for current projects are the visual assessment of simulation models, the interactive analysis of high dimensional data and the exploration of massive time series data on multiple abstraction levels.

4.12 Sächsische Akademie der Wissenschaften zu Leipzig (SAW, Saxon Academy of Sciences)

The Saxon Academy of Sciences in Leipzig is responsible for more than 20 research projects especially in the humanities but also in the natural sciences and in engineering.

During the report period a project has been established that produced maps: the “Historical Atlas of Saxony”. Between 2007 and end of 2010, the dead-line for the project, 17 maps for 13 different themes about the Saxon history could be published, from archaeology via the organisation of the church in the middle ages to military locations in the 18th and 19th century and the wood

development in Saxony between 1800 and 2000 as examples. The project was running in co-operation with the Saxon land surveying office “Staatsbetrieb Geobasisinformation und Vermessung Sachsen” and the “Hochschule für Technik und Wirtschaft Dresden”.

Beside this, there are some projects at the Academy that uses maps for different research interests such as applied geography, for the regional provenance of names or the distribution of mediaeval lawbooks such as the “Sachsenspiegel”.

4.13 Leibniz Institut für Länderkunde (IfL, Leibniz Institute for Regional Geography Leipzig)

The Leibniz Institute for Regional Geography (IfL) is the only non-university research institute for geography in Germany and focuses in two departments on cartography and atlas production.

Research

The IfL research on cartography has focused on the design of graphical user interfaces, on interactivity, animation and the visualisation of mass flow data e.g. for commuters or migration. This connects the visualizing research with the main research objectives of the institute.

Products

In addition to maps produced for in-house publications and journals the institute is specialised in atlas production. In continuation with the National Atlas of Germany (NAD) – published between 2000 and 2007 – the institute has prepared the following products either as print atlases or as CD-, DVD- and online products:

- **Deutschlandatlas** (2010, print), a concise and partly updated one volume edition based on NAD,
- **Wissenschaftsatlas Heidelberg** (2011, print), as a new form of a jubilee book that presents the universities history and status with the spatial perspective and is produced in co-operation with the Geographical Institute of the University of Heidelberg,
- **Elbe Atlas des Globalen Wandels** (2011, print) as a cartographic result of the research project “Global Change Impacts on the Hydrological Cycle in the Elbe River Basin” co-ordinated by the Potsdam Institute for Climate Impact Research (PIK).
- **www.nationalatlas.de** (started in 2011) is a new atlas portal, an information platform and archive on regional, national and thematic atlases. The portal also provides the user the opportunity to connect with other IfL products.
- **GIM** (Germany in Maps, 2008) – an extract of NAD with new and updated themes,
- **Nationalatlas aktuell** (launched in 2007) is an online journal that brings a new theme of current interest every month such as natural hazards, the education situation, health or demographic development in continuation of NAD. In 2010 a selection of about 20 themes of the first three years of “NAD-aktuell” was published as a printed edition.

5 Major Map Collections in Libraries

5.1 State Library Berlin, Map Department

In 2009 the map department of the Berlin State Library celebrated its 150th anniversary with an exhibiton in Schloss Bellevue, the official residence of the President of the Federal Republic of Germany. The map department holds the largest map collection in the German speaking area. With around 1.100,000 maps, 155,000 views, 33,000 atlases, 35,000 volumes of cartographic literature, 2,700 CD-ROMs / DVDs and 530 globes the collection covers a very broad spectrum. In the framework of the system of supraregional literature supply the department takes care of two special subject collections (SSG) of the German Research Foundation (DFG): SSG 14.1 Cartographic literature and SSG 28.1 Topographic maps. New publications of these special subjects are automatically listed in Acquisitions list.

In the last two years – and particularly in the subject field Topographic maps – it was possible to complement our collections by numerous additions, as the selection of large scale map series clearly shows:

Ethiopia 1:50,000 (started)
Bahrain 1:50,000 (nearly complete)
Bangladesh 1:25,000 (started)
Bangladesh 1:50,000 (complete)
Belise 1:50,000 (digital)
China: Taiwan 1:25,000 (complete)
El Salvador 1:50,000 (digital)
France: Ile de la Réunion 1:25,000 (complete)
Gambia 1:50,000 (digital)
Guatemala 1:50,000 (digital)
Jamaika 1:50,000 (digital)
Israel 1:50,000 (complete)
Laos 1:25,000 (started)
Latvia 1:50,000 (complete)
Lesotho 1:50,000 (nearly complete)
Malaysia: Sabah; Sarawak 1:25,000 (started)
Malaysia: Semenanjung 1:25,000 (started)
Newsealand 1:50,000 (complete)
Netherlands 1:25,000 (started)
Pakistan 1:50,000 (started)
Portugal 1:50,000 (new edition, started)
Ruanda 1:50,000 (complete)
Spain 1:50,000 (new edition, started)
Swaziland 1:50,000 (complete)
Timor-Leste 1:50,000 (complete)
Turkey 1:50,000 (supplemented)
Uganda = East Africa 1:50,000 (started)
Vanuatu 1:50,000 (complete)

A survey of modern topographic map series in the holdings of the map department is accessible online, countries are arranged in an alphabetical list. The listing contains nearly 1,500 map series. A number of entries provide additional information like, e.g., index sheets.

The acquired cartographic literature is systematically catalogued in the *Bibliographia Cartographica*. There is a print edition of this bibliography and publications published from 1989 onwards are accessible online free of charge. The international journal exchange of the journal *Kartographische Nachrichten* which is organised on behalf of the German Cartographic Society (DGfK) provides a major support for the collection of data for this international bibliography.

Bibliographic details for all titles (maps, atlases, cartographic literature) published from 1940 onwards are searchable online in the electronic catalogue (StaBiKat) of the Staatsbibliothek zu Berlin. Old printed maps and atlases published before 1851 are listed in the IKAR-Database of old maps. It is an online database free of charge which records the holdings of twelve map collections.

The map department closely cooperates with various partners; one partner for example which is supported by the Federal government of Germany, is the Excellence Cluster Topoi. The department is also partner in various digitisation projects, which develop new ways of presenting historic map material. Outstanding projects are the Digital Wenker Atlas (DiWA), a project on the digital use of Georg Wenker's language atlas of the German Reich (at the end of the 19th century) and the presentation of the Sächsische Meilenblätter (Saxon mile sheets), the early survey of Saxony, dating

from the 18th century, in a seamless version. The department also provides exhibits for the World Digital Library and other similar projects.

5.2 State and University Library Goettingen, Map Collection

No report submitted.