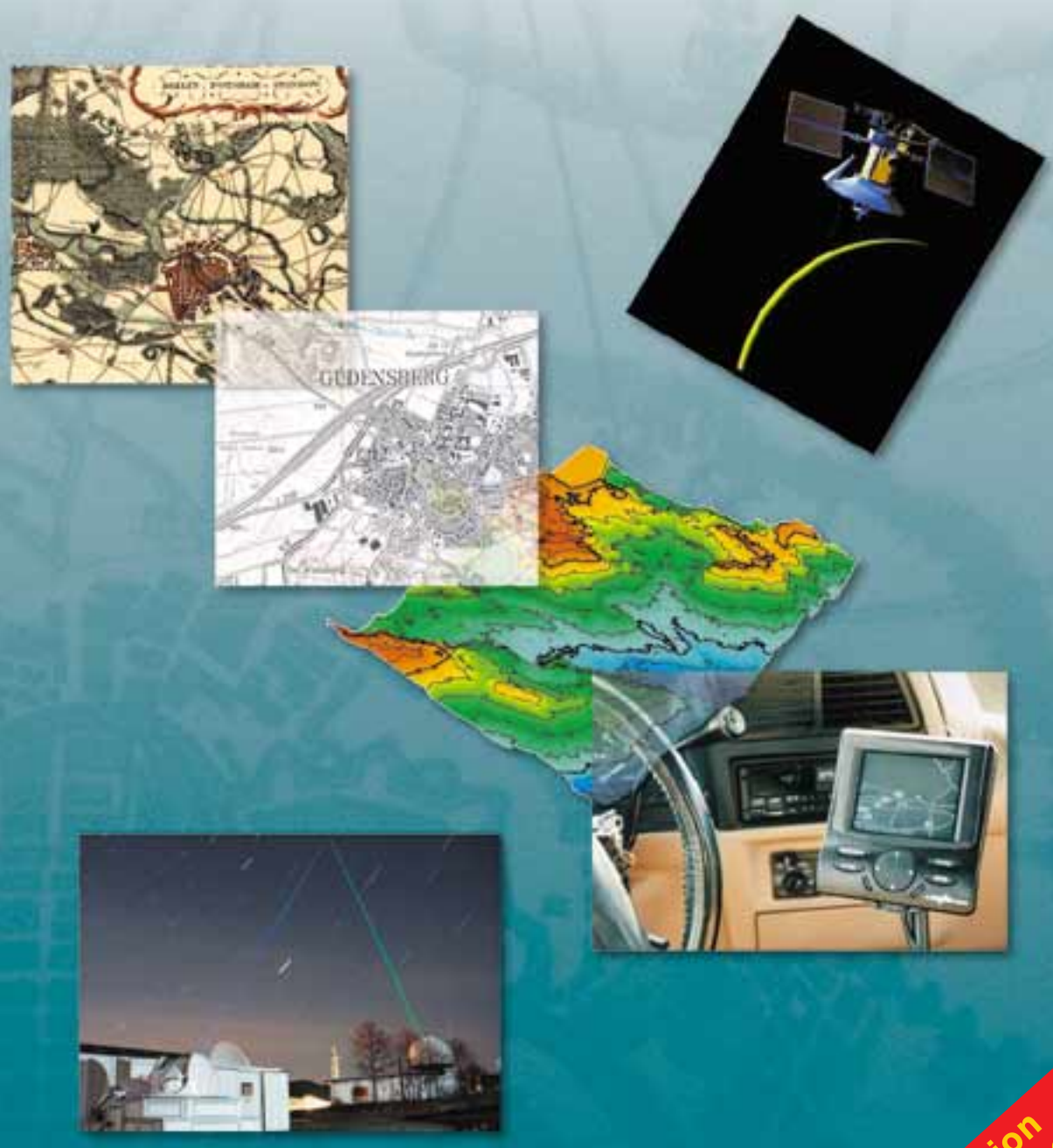
The Federal Government

IMAGI
Interministerial Committee for Geo Information

Geo Information in the modern state



bkg Federal Agency for Cartography and Geodesy

English edition with Multimedia-CD

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- Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
- Federal Ministry of Consumer Protection, Food and Agriculture
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- Federal Ministry of Defence
- Federal Ministry of Economics and Labour
- Federal Ministry for Economic Cooperation and Development

As permanent guest:

- Working Committee of the Surveying Authorities of the States of the Federal Republic of Germany (AdV)

Geo information in the modern state

An information document from
Interministerial Committee for Geo Information (IMAGI)

Written and edited by:
IMAGI Office

Publisher:
The Federal Agency for Cartography and Geodesy (BKG)

Written and edited by:
Interministerial Committee for Geo Information (IMAGI)
Frankfurt am Main 2003

Preface

I am pleased to be able to present the second edition of an extremely successful publication. The first edition from year 2002 met with a good deal of positive response. Within a few month there were more than 30,000 copies in circulation. The current revised edition has been updated because of results and experiences over the last few years. The enclosed CD-ROM gives a more visual presentation of the subject using modern multimedia methods.

The floods in 2002 have made it very clear that the preparation of up-to-date geographical data is a vital prerequisite for modern disaster management. Independently of current problems, the use of geo information has a long tradition in political action on a national and local level: in matters of spatial planning and land division, environmental and nature conservation, internal security and the national defence, and in many other areas.

The decision of the German Bundestag of 15 February 2001 regarding the use of geo information in Germany (Parliamentary Paper 14/5323) is the political guideline for the building of a geodata infrastructure in German (GDI-DE). This measure taken at a national level, serves to fulfil on the one hand the required modernisation of the economy, administration, politics and science. On the other hand it is the starting point for the value-added chain with the use and refinement of geo information.

The Federal Government is dealing successfully with this task by building up the GDI-DE and developing and putting in place geo information as a modern instrument for acting in the national interest. To coordinate these activities, in 1988, the Federal Government set up the Interministerial Committee for Geo Information (IMAGI). After extensive work in the beginning, which took into account the very heterogeneous developments in the Federal Administration, the states (“Länder”), and the EU Commission up to this point, the first concrete measure, the Internet project GeoMIS.Bund was brought to a conclusion in 2003. For the first time it will be possible to search geo databases, which are not held centrally in the administration of the Federal Government and states, from any desk. GeoMIS.Bund is at the same time the first component of the GeoPortal.Bund planned for the year 2004. This portal will provide a user-friendly platform as a central access point for the online provision of geo information in connection with extensive services for administration, economy, and citizens.

Today, digital communication and information technologies are successfully used for the creation, preparation and distribution of geo information. Municipal administrative bodies try to improve the participation of citizens in decision processes as well. Striving to optimise their business processes, companies set up geo information and market their product more and more often over the Internet. Therefore, the availability of geo information and its greater distribution are not only definitive prerequisites for tasks at a national level when it comes to site and investment decisions, but these factors also have positive repercussions for the labour market.

I sincerely hope that access to geo data will be made easier for you through the brochure and CD-ROM and I wish the new edition much success.

Dr. Göttrik Wewer
State Secretary at the Federal Ministry of the Interior

What is geo information?

Questions with a spatial aspect are as old as mankind. For example:

- Where am I?
- Where can I find…?
- Where can I find the next…?
- How do I get to…?
- How far is it to…?
- What is in…?
- Where does this road take me?

Any of these questions refers to a section of the earth of a greater or smaller size. The information that we need to respond we call geo information. Geo information describes and explains our environment using models which consist of object descriptions and object links and have as a particular feature a spatial reference to certain points, locations areas or regions. It is not the need for such information that has changed over time, but the technology to investigate and convey this information.

Since the 19th century it has been a responsibility on a state government level in Germany to work on land registry and official topographic and subject-related maps and to issue these for national, economic and scientific tasks and the general public.

In the last few years the nature of products demonstrating spatially-related contents, among others: in surveying and cartography, in the Land Registry, in environmental planning and in the environmental sector, has changed drastically from “static” to “dynamic” map products because of the new possibilities offered by modern information and communication technologies.

Geo data and geo information systems (GIS) are prerequisites for this change. With geo data there is a distinction made between topographic basic data (reference data) and geo specialist data (e.g., data regarding climate, environment, economy or population; see Figure 1). With regard to the production of geo information, linking reference data and geo specialist data in data models and the application of GIS-supported analytical methods, which are fed from data models, now replaces the use of maps. The advantage of this procedural method for the user as opposed to classic map usage is quite clear, since the use of IT-based analytical procedures allows extensive interrelated sets of data to be analysed in a short time. For example it is possible to find the best route to the nearest hospital or ascertain those areas where the construction of roads or manufacturing plants would have the least damaging effect on the environment.

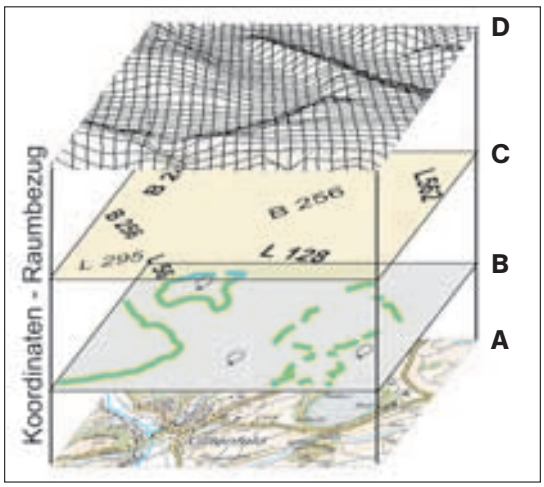


Figure 1: Linking topographic foundations (reference data) and subject-related geodata (geo specialist data) through a standardised spatial concept.

A – Topographic Reference Data
B – Conservation Area Boundaries
C – Classification of Transportation Routes
D – Digital Relief Model

Geo data are described by metadata (“data about other data”, see Tab. 1), which are managed and prepared in a metadata information system. This is where information can be gained about sources (data holders), technical specifications, scope, origin, relevance to the current situation, and the quality of available geo databases. In this way the geo databases which are allocated according to the various specialist areas of responsibility are made transparent and with easier access. This approach also ensures their value in the long term.

Geo Information *Geo information is information regarding objects and facts with a spatial reference.*

Geo Data *refers to geo information that can be read by a computer*

Reference Data *are basic official geodata that describe the landscape (topography), plots of land, and buildings within an application-neutral, standard geodetic reference system.*

Geo Specialist Data *are thematic location-referenced data, which can be given directly – by geographic co-ordinates – and indirectly – for example by postcode district or administrative unit.*

Metadata *describe (geo) data sets*

Geo Information System (GIS): *An IT-based information system with functions for recording, updating, administering and analysing geo data as well as cartographic representation of geo information.*

Digital Federal Waterways Map 1:2,000 Rhein (km 650 to 660)	
Meta data language	German
Meta data created on	DD.MM.YYYY
Abbreviation	DBWK2dek2_013
Scale range	1:2,000
Record language	German
Classification	Inland water
Key words	Hectometre points, WSV (Wasser-und Schiffahrtsverwaltung – water and shipping management) location points, levelling points, water level fixed points, order profile points, special profiles, clearance gauge profiles, trigonometric points, cadastral fixed points, GPS reference station, division lines, axes, shipping channels, profile measurement points of reference, average high water levels
Data format	MicroStation Design File (DGN)
Data providers	Catographic Office of WSD West
Function	Fulfilment of specific topic-related WSV tasks
Contact	Mario Mustermann
Postcode	D-48147
Country	Germany
Telephone number	0251/4701121
Fax number	0251/470999
West Coord.	3385102.00
South Coord.	5807994.19
East Coord.	3390955.72
North Coord.	5816532.29
Geographic name	Dortmund-Ems-Kanal; dek2; West; Rheine

Tab. 1: Example of a metadata record for describing geo data

What geo information means for society and how it can be used

The last few years have brought recognition of the meaning of geo information for almost all areas of society. It is estimated that approximately 80% of all decisions in public and private life have a spatial reference.

With the modernisation of administration (eGovernment), geo information linked with modern information and communication technologies is playing an increasingly important role, in particular with respect to an increase in citizen participation. A good example for this development is the area of spatial planning and development.

The growing interest of society in environmental monitoring, ecological business methods, in saving energy and natural raw materials as well as conserving the cultural heritage of our country and planet requires new solutions using reliable and comprehensive geo information. Furthermore, geo information allows significant savings to be made, for example in coping with large-scale catastrophes such as the Elbe flood in August 2002.

The great importance of geo information can also be recognised in geo-scientific research directed to a better understanding of the "Earth System" and to modelling of complex spatially referenced processes, such as weather and flood forecasting. Important results have been detailed in the "Deutsches Forschungsnetz für Naturkatastrophen" (DFNK) ("German Research Network for Natural Disasters") promoted by the German government. The results are to be used for population protection.

In business and economic life, geo information together with the development and creation of appropriate technologies are considered an important factor for the development of the information and scientific company. Cost-benefit analyses show that investments in geographical databases and the implementation of information technology

lead to more effective working methods and commercial decisions based on greater prior knowledge. To be able to fully utilise these advantages, the data must be up to date and easily accessible. Current work carried out by the Federal Government in co-operation with the individual states is serving the purpose of setting up a geo data infrastructure for Germany.

In the European context, some 10 billion € annually are invested for information in the public sector. Of this total, approximately 50% is allocated to geo information. It is estimated that this public sector investment will help generate a volume of approximately 65 billion € in the geo information industry. As a result, there are good prospects for high-quality jobs being created in the German geo information market and the development of geo information systems. For instance, by the year 2000, around 100,000 new jobs were created in the USA solely because of the application markets of the GPS satellite navigation system, a special segment of the geo information market. By the year 2004 an annual rate of increase of just 10 % is expected in the area of surveying and cartography in the USA.

Where can you find geo information?

a) Public Administration

Reference Data

The GeoData Center (BKG, http://www.geodaten-zentrum.de) was set up in 1996 at the Federal Agency for Cartography and Geodesy (BKG, http://www.bkg.bund.de). The Centre combines, co-ordinates and prepares geo-topographic reference data kept by the surveying establishments (http://www.adv-online.de) for the scale range of around 1:10,000 to 1:100,000 for the area of the Federal Republic of Germany together with the centrally produced small scale data models (1:200,000 and smaller) produced by the BKG. Furthermore these data can be passed on to a third party across all the federal states. The data are sold via an online shop on the Internet. The meta information System of the Geo Data Center (http://www.atkis.de) provides information on availability, quality and subscription options for reference data. A summary of addresses and Internet connections of the surveying establishments is listed in the chapter “Further Information” and contained as a link on the enclosed CD-ROM “Geo Information in the Modern State”.

A significant and extensive source of data is provided by earth observation by satellite above all with respect to monitoring the environment. A reference source for such data is the Deutsches Fernerkundungs-Datenzentrum (DFD) (German Remote Sensing Data Centre) of the Deutsches Zentrum für Luft-und Raumfahrt e.V. (German Aerospace Center e.V.) (http://www.dfd.dlr.de). The Office for Geo Information of the German armed forces (AGeoBW = Amt für Geoinformationswesen der Bundeswehr) prepares geo information about areas abroad hit by disaster and areas of deployment for the German Ministry of Defense (BMVg = Bundesministerium der Verteidigung) together with the armed forces and the federal departments involved. Further information can be found on the CD-ROM and on the IMAGI Internet site (http://www.imagi.de).

Geo Specialist Data

Within the Federal administration, geo information is used and prepared for processing specialist tasks in the following areas:

- Spatial planning,
- Transport and traffic,
- Environmental and nature conservation management,
- Internal security,
- National defence,
- Civil and disaster prevention,
- Supply and waste management,
- Water management,
- Geo-scientific protection of resources,
- Agriculture and forestry,
- Weather service,
- Climate research,
- Statistics.

Reference data are linked and combined with specialist data from the most diverse areas of application combined and task-specific geo information is then generated. An overview of the some 250 federal responsibilities which are being processed at the present time can be found on the Internet under http://www.imagi.de in the document entitled "Conception of an efficient federal geodata management system", which is available for free. A compilation of the metadata information systems within the jurisdiction of the Federal government, which can be reached on the Internet, is given on the enclosed CD-ROM in the chapter "Further Information".

b) Business

The private industry is both the partner and competitor of public administration in the area of geo information. On the one hand it provides geo data of its own making and on the other hand it records geo data as a contractor for public administration for many sectors. Furthermore, private industry acquires geo databases from public administrative bodies in order to use them commercially after their refinement. Thus modern and commercially available navigation systems have their foundations in official data, which have been enriched with a wealth of additional information by the private sector. It is anticipated that with the introduction of the communications system UMTS, the services offered based on geo information (Location Based Services [LBS]), will grow considerably.

An overview of the many firms and enterprises that are active in the area of geo information as well as their products (hardware, software and services) is provided by the German umbrella organisation for geo information in their web pages (DDGI = Deutscher Dachverband für Geoinformationswesen, DDGI, http://www.ddgi.de) and the "GIS Report" (http://www.gis-report.de). In addition the D21 initiative (http://www.initiatived21.de), set up by German industry, has the aim of accelerating the changeover of the industrial company to the Information Company in Germany. This should strengthen competitiveness towards other states and economic growth and increase employment in Germany.

c) European establishments

In the European Commission (EC), a total of 36 Directors General (DG) are dealing directly with the subject of geo information including the directives of "Environment", "Information Company", "Energy and Transport", "Farming", "Research", "Fisheries". The co-ordinating committee for geo information within the EC is the "Interservice Committee for Geographical Information within the Commission – COGI" (http://www.ec-gis.org/cogi/menu.html). It has been aimed at an initiative of the DG "Information Company" and the statistical service "EUROSTAT" of the European Union (http://europa.eu.int/comm/eurostat).

EUROSTAT prepares spatially-referenced decision aids for the EU, in the form of topographic data in the areas of hydrography, digital terrain models, the traffic network, administrative boundaries as well as other specialist data (e.g. climate, infrastructure, soil, environment). Private interested parties can also access part of this data. The Joint Research Centre (JRC, http://www.ec-gis.org) deals with remote sensing applications amongst other things to which independent research projects on the subject of geo information also belong.

The EU Commission has recognised that the availability of relevant and standardised geo information is a vital prerequisite for efficient political action by the European Union. To co-ordinate activities to improve utilisation of geo information on a European level, the initiative "Infrastructure for Spatial Information in Europe (INSPIRE)" has been set up (http://inspire.jrc.it/home.html). This initiative prepares a European legal norm, which it is envisaged will take effect by 2005, and which will regulate the structure of a European geo data infrastructure (European Spatial Data Infrastructure – ESDI) by using the national geo data infrastructures of the EU members. The measures required were started in 2001 in the "European Environment" area of responsibility and they will be extended step by step to other relevant areas such as "Transport in Europe". The approach pursued by INSPIRE for the ESDI has a marked similarity with the approach of IMAGI for the GDI-DE.

As the EC lays down in its green paper "Green Paper on Public Sector Information in the Information Society", the access to information by the central government needs to be improved generally (http://www.echo.lu; http://europa.eu.int). In order to take into account the area of geo information, the DG "Information Society" has set up the forum "European GI Policy Development" (EGIP). In this connection, not only purely GI related aspects, but also others such as the bringing together of national policies and initiatives on public-private partnerships have been included. The project "Panel GI" counts among these, in which scientific and technological co-operation is promoted between the member states of the EU and the countries of central and eastern Europe in the area of geo information. The aim of this project is the development of a perspective for a European GI community as well as the promotion and activation of the GI market.

Furthermore a directive is being prepared – initiated by the EU Commission – , that is intended to simplify control of the further use and commercial utilisation of public sector information ("Proposal for a Directive of the European Parliament and of the Council on the re-use and commercial exploitation of public sector documents").

At the present time, 35 national surveying administrations are members of the organisation "EuroGeographics" (http://www.eurogeographics.org). They work on joint projects, for example standard databases on a scale of 1:250 000 (EuroRegionalMap) and 1:1 000 000 (EuroGlobalMap), as well as a pan-European database of administration units even down to parish boundaries. (SABE). The Federal Republic of Germany will be represented as an active member by the Federal Agency for Cartography and Geodesy, as agreed within the Consortium of Surveying Administration Bodies of the states of the Federal Republic German (AdV, http://www.adv-online.de).

Co-ordination of geo information – The Interministerial Committee for Geo Information (IMAGI)

In the Federal Republic of Germany, geo information is predominantly produced and prepared by the individual states. So it is the task of the states, in accordance with the allocation of competencies as defined by the Grundgesetz (the German Constitution) to raise, carry on and prepare geo-topographic fundamental data (i.e., reference data). The Federal Government is responsible for areas of overall national significance (federal boundary issues, international programmes) or foreign representation (EU, VN). In isolated cases, responsibilities are additionally controlled by agreements between the Federal Government and individual states.

On September 1, 1999, the administrative agreement[1] between the Federal Ministry for the Interior and the individual states came into force regarding the continuous passing over of digital geo-topographic information by the surveying authorities for use in the federal area. Similar agreements between the Federal Government and the states were also made in some other specialist areas (e.g. nature conservation, farming, soil).

To improve co-ordination of geo information systems within the Federal administration the Interministerial Committee for Geo Information (IMAGI, http://www.imagi.de) was set up on September 8, 1998. The members of the IMAGI are listed on the first inner page of the cover page of this brochure. The IMAGI is in the chair of the BMI and the co-ordination office is set up in the Federal Agency for Cartography and Geodesy (BKG) in Frankfurt am Main. The contract for the IMAGI is the result of the cabinet decision by the Federal Government on June 17, 1998 (see Section "Further Information"). The committee's tasks include

- the conception of an efficient data management system for geo data at federal level as a priority (completed in October 2000),
- to organise the building and operating of a meta information system for federal geo data (GeoMIS.Bund) (completion summer 2003, http://www.geomis.bund.de),
- to realise a geo portal for federal geo data,
- to optimise the technological and organisational responsibilities for the maintenance of geo databases, e.g. by the introduction and implementation of standards,
- to work on solution proposals to harmonise and optimise administrative specifications for referencing and passing on geo data,
- to generally promote awareness of geo information by public relations work and
- to drive forward a geo data infrastructure for Germany.

[1] Work is in progress on an extension to this administrative agreement beyond year 2003.

A Geo Data Infrastructure for Germany (GDI-DE)

Geo Data Infrastructure for Germany
GDI-DE = NGDB, Network, Services, Standards

With its decision 14/5323 of February 15, 2001, the German Bundestag requested the Federal Government to take political measures to expedite the building of a national geo data infrastructure in Germany as a step towards a public infrastructure (see Section, "Further Information"). Federal Government, states, and private initiatives are called upon, in trusting and close co-operation, to use and improve further for long-term effect those opportunities that are found in geo sciences and geo information.

National Geo Database
NGDB = GBD + GFD + MD

A core component of Geo Data Infrastructure Germany (GDI-DE = Geodateninfrastruktur Deutschland) is the National Geo Database (NDGB), which consists of reference data (GBD), geo specialist data (GFD = Geo-Fachdaten), and their metadata (MD). With the help of the geo database, a geo information network together with services and standards, the GDI-DE can create the conditions required for the acquisition, analysis and application of geo information. This information is utilised by users and providers in public administration, in the commercial and non-commercial sector, in science and by citizens.

The structure of the GDI-DE is to follow a three-stage process, co-ordinated by IMAGI.

- The target of the first stage is the creation of the meta information system GeoMIS.Bund for searching federal geo data.
- The target of the second stage is the co-ordination of geo databases and the development of interfaces, conversion modules, norms, standards and procedures for data integration. The foundation database in the NGDB is to be checked by the departments by means of stock and requirement analysis. In co-ordinating the geo data and the establishing geodetic reference systems the European context will be taken into account. The new ALKIS/ATKIS data model, which conforms to ISO, provides a general basis for an object catalogue, which covers all the departments.
- The aim of the 3rd stage is the implementation step by step of the National Geo Database.

The following action areas have been identified as necessary for construction the GDI-DE:

- Taking political measures (including holding a joint conference of the Federal Government and the states on a particular topic),
- Definition of the National Geo Database, and the analysis of requirements and stock of the foundation database,
- Optimising the conditions for referencing and passing on geo data,
- Carrying out qualification initiatives,
- Co-ordination of the NGDB, conversion of norms and standards as well as semantic models and regulations,
- Building of a geo data network throughout Federal Germany with the option of being able to access geo data, metadata and services (Geo-Portal),
- Improvement of public relations work

In order to be able to develop and operate the geo data infrastructure, it is necessary to have an organisational and management structure for co-ordinating and administering business processes at a local, regional, national and international level. The geo data infrastructure will only be successful in Germany if effective political action is taken.

With its decision 15/809 of 10 April 2003 the German Bundestag acknowledges the progress made up to the present in the establishment of the Geo Data Infrastructure Germany (GDI-DE). It is requested to take advanced measures in the elimination of deficiencies that have still been detected in order to push further ahead the use of geo information in Germany (see Section "Further information").

Examples of Applications

The availability of high performance information technology with practical methodology such as Geo Information Systems (GIS) opens up new possibilities for spatially referenced analysis and processing when it comes to providing answers to concrete questions. Furthermore, GI systems are effective instruments in the context of resource planning and control. In particular, the availability of integratable and meaningful geo data is a fundamental requirement for using geo information systems. The following examples are designed to clarify the efficient implementation of geo information in different areas of application, and to show that geo information has already become an integral part of the strategic information concept in several organisations.

- Geo Information for German Environmental Planning
- Internal Security – Geographical Analysis of Criminality
- Implementation of GIS Technology in Disaster Prevention
- Precautionary Emergency Measures – Monitoring Environmental Radioactivity
- Reorganisation of the Constituencies of the Bundestag
- Geo information for the German National Meteorological Service.
- Conservation – testing for environmental sustainability when planning transportation routes
- Monitoring Air Pollution – Ozone near ground level using the Federal State of Hessen as an Example
- Atlas of Regional Statistics,
- Weapon and Explosives Clearance Service
- Geo Information in National Park Management
- Insurance – Risk Calculation and Damage Evaluation
- Fleet Management
- Forestry Applications
- Precision Farming

Geo Information for German Environmental Planning

For a comparative analysis and evaluation of spatial development trends in the federal area and Europe, the German Federal Agency for Building and Environmental Planning (BBR, http://www.bbr.bund.de) operates a spatial information system. The necessary statistical data foundations and reference data are continually being updated and prepared as indicators of the different spatial regional units (as a rule, environmental regions and districts).

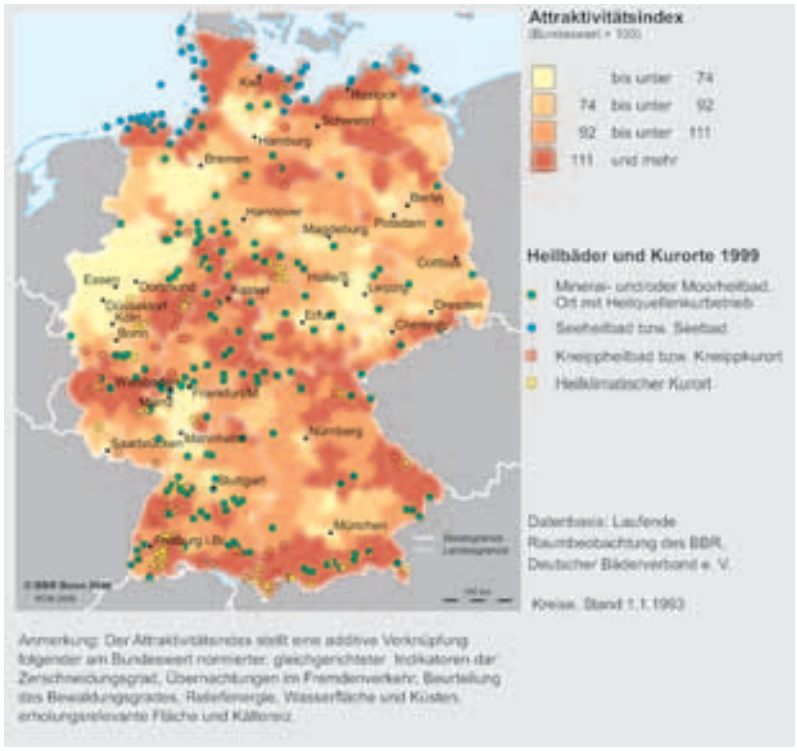
The results from the information system are regularly published by the BBR and used for political consultation by the Federal Government. The BBR produces a Federal Regional Development Report at regular intervals to provide information to the German parliament.

The two exemplary maps (Figures 2 and 3) have been taken from the last Environmental Planning Report, from the year 2000. They clarify and make concrete two important environmental objectives.

Figure 2 shows the measured accessibility of so-called “chief centres” using the BBR accessibility model. “Chief centres” are locations established by State planning departments for higher grade infrastructures and services.

Figure 2: Accessibility of Chief Centres depending on car traffic travel time (minutes) to the next chief centre.

Figure 3: Countryside Attractiveness



It is the objective of regional planning that every citizen can reach a chief centre within a reasonable time (for example, 45 minutes by private transport). The map shows in which parts of the country this target still needs to be achieved.

Figure 3 shows the connection between countryside attractiveness and tourism using which has been conveyed here using several indicators. It becomes clear that the most attractive landscapes are found on the coast, in the Alps and the foothills of the Alps, in the low mountain range regions, and in lakeland areas. At the same time a concentration of spas and health resorts can be found in these places. It is the aim of regional planning to protect, maintain, and develop nature and landscape. It is also particularly important to promote tourism in these areas.

For further information:
go to the Federal Agency for Building and Environmental Planning site at
http://www.bbr.bund.de

Internal Security – Geographical Analysis of Criminality

The analysis of crime has always been of great interest for internal security with respect to its distribution in time and location both on a regional and supra-regional level, whether it be petty theft or financial transactions crossing the frontiers into the world of organised crime.

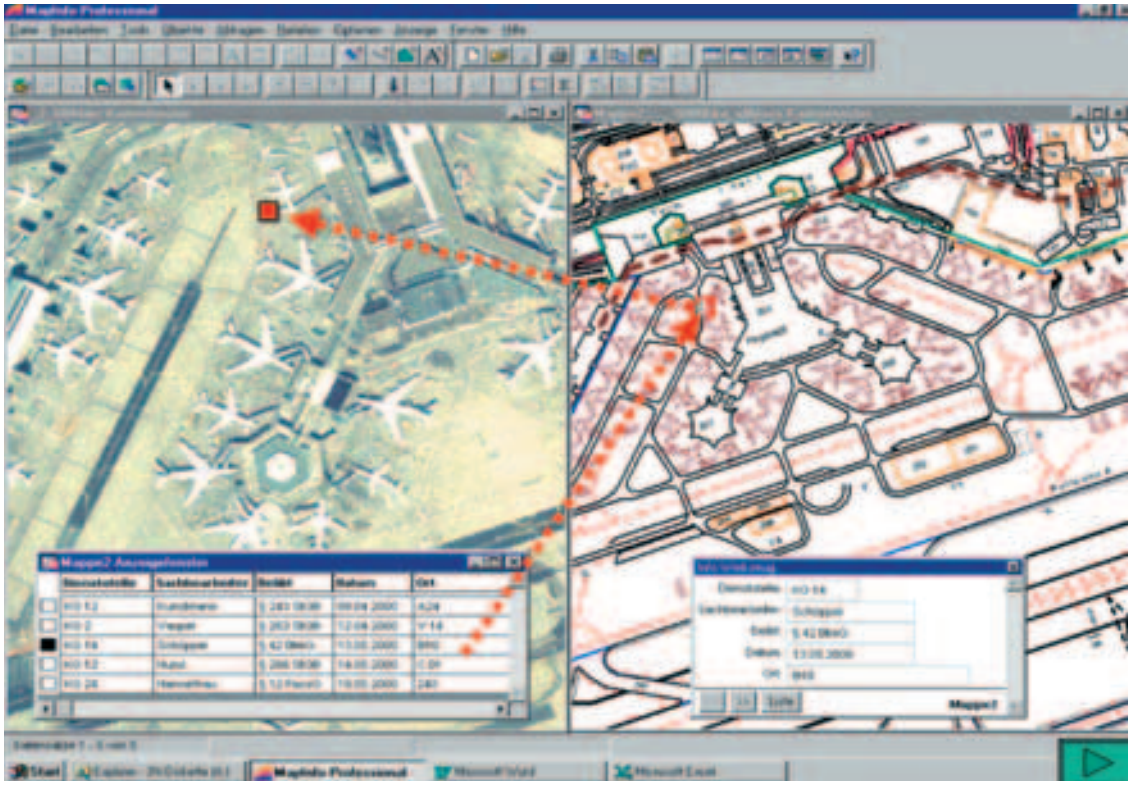
Initially, observations on criminality based on geographic data amounted to nothing more than plug-in card-shaped visual displays of criminal activities. The diagrams obtained with their help, showing distribution of crime, are today as they were then the basis for the strategy and tactics used in combating criminality. The high amount of time and work expended meant that the criminal-geographical principle was largely lost from view in science and in practice, with the exception of a few isolated criminality atlases and criminological regional analyses.

With the aim of being able to recognise and combat criminal activities more efficiently and effectively, for example here smuggling routes, methods and persons involved (Figure 4), relevant factual information including geographical references, are analysed using GIS systems. It is commonly expected that this analysis can be used to visualise and observe hot spots of criminal activity.

The results of these evaluations are intended to support future resource planning as well as strategic problem posing such as the creation of visual portrayals and to facilitate the recognition of connections within criminal organisations. The statistics and report functions of the systems used also allow for evaluation of data used.

For further information: go to the Federal Bureau of Criminal Investigation site at http://www.bka.de

Figure 4: GIS Analysis of a Crime. The diagram displays hot spots of criminal activities on an airport.



Deployment of GIS Technology in Disaster Prevention

For effective planning, implementation and control of aid action in large-scale danger zones at home and abroad, comprehensive information on the types of danger, the options for their aversion as well as the potential for providing aid with respect to personnel and materials are necessary. This information is incorporated and held in specialised information systems based on GIS technology (Figure 5).

Dangerous situations can arise from natural catastrophes or other catastrophes such as those caused by mankind, through the use of weapons or terrorist attacks. This type of situation also includes dangers to the population, the environment, animals, property or supply services from high waters or floods, extreme weather situations, earth quakes, fires or severe disturbances to the infrastructure either regionally or covering a wider area. Their essential characteristic is that the local resources are insufficient to avert danger. The intensity of the danger can be so great as to cause political and economic outcomes which affect the whole nation.

To overcome these dangers and for disaster prevention, geo information such as relief data or land utilisation information held in particular GIS systems are made ready and displayed. This information serves as a basis for action and decision by the responsible offices (Federal and State departments, municipalities, aid organisations and supra-national institutions).

Where such an event occurs, there is easy access to the information. Besides data, which are partly automatically recorded by the sensors of the various logging systems, it is also possible to integrate the latest observation reports into the information system (Fig. 6). In this way, additional information on aid or risk potential in the vicinity of the event is displayed and made available for use in damage control as well as disaster protection.

For further information:
go to the site of the Deutsches Fernerkundungsdatenzentrum (German Remote Sensing Data Centre)
http://www.dfd.dlr.de/images_hochwasser/index.html
and to Forschungsverbund und Kompetenznetzwerk Elbe (Elbe Research Association and Competency Network)
http://www.glowa-elbe.de

Figure 5: GIS-based representation of the Elbe Flood at Magdeburg in August 2002

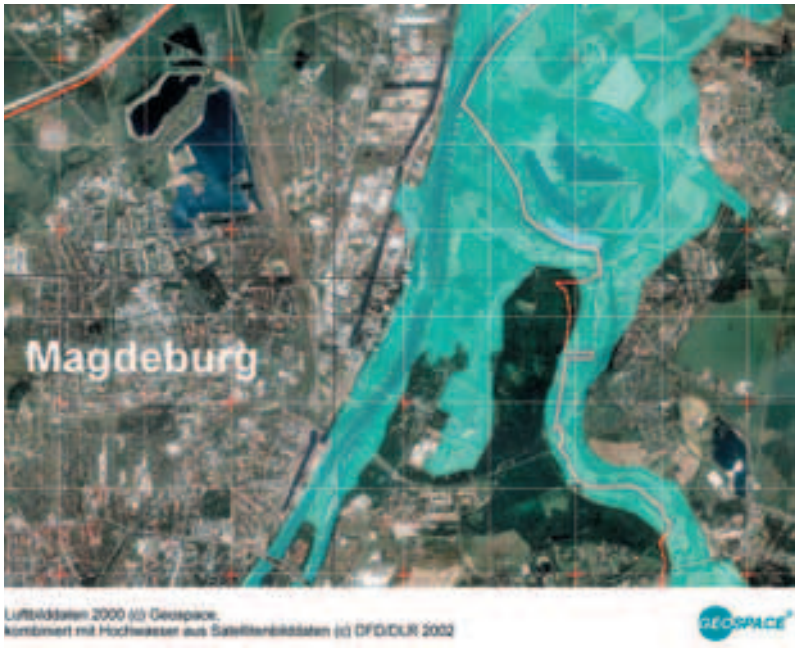


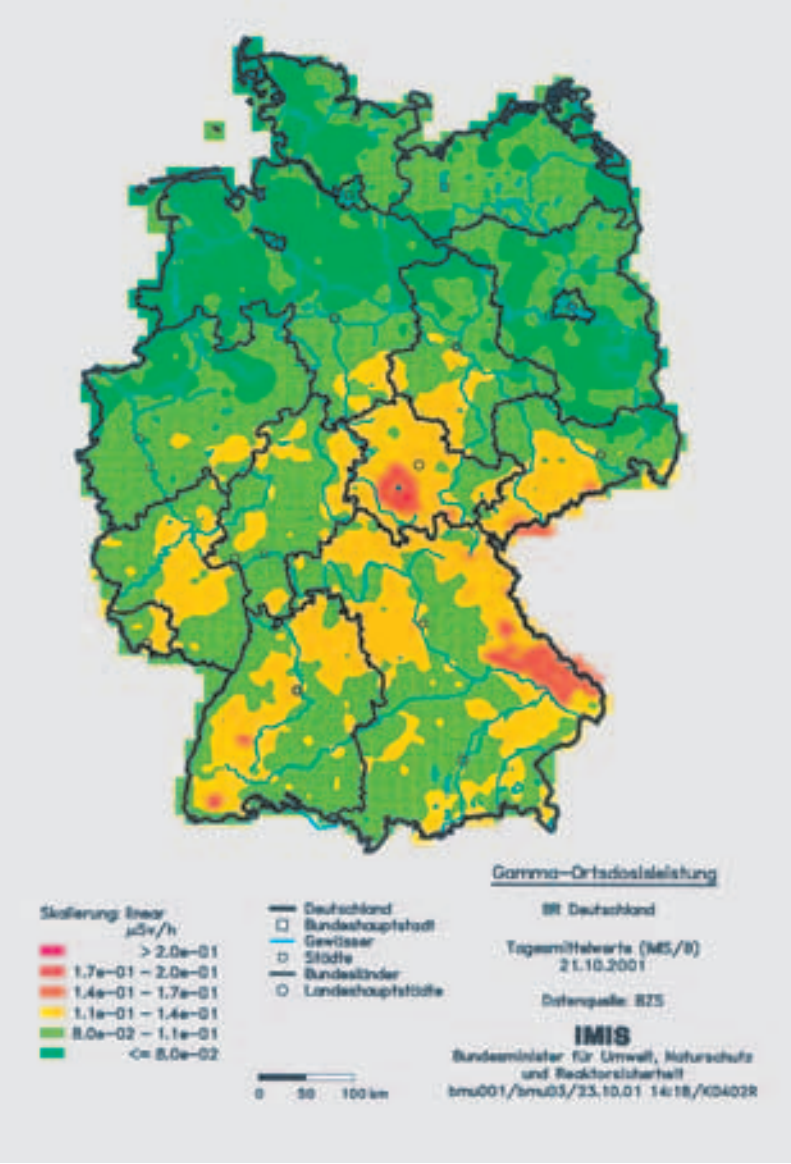
Figure 6: Flooded agricultural land

Precautionary Emergency Measures – Monitoring Environmental Radioactivity

Catastrophes, whether man-made or caused by nature, require very targeted crisis management in order to minimise the effects on man and the environment.

The Chernobyl disaster in 1986 and experiences gained in crisis management at that time led the German Federal Government to take a series of steps which would serve to achieve future standard evaluation and procedures for overcoming similar exceptional circumstances involving events of a radiological nature in Germany.

Figure 7: Radiation effects (localised gamma dose rate)



In the very same year, the German Federal Government passed a law to provide protection against harmful radiation ("Act on the Precautionary Protection of the Population against Radiation Exposure"), which includes the requirement for continuous monitoring of radioactivity in the environment and the bringing together of all created data in one standard Federal information system.

During the course of the following years and supported by electronic data processing, the "Integrated Measurement and Information System for Monitoring Environmental Radioactivity (IMIS)" was established.

Radioactivity is recorded on an ongoing basis within this information system in all relevant environmental areas. In so doing, the permanent German national measurement networks continuously work to monitor media carrying radioactive substances (such as air and flowing waters), whereas the measurement agencies of the Federal States use sampling to monitor the media in which radioactive substances become enriched and finally reach organisms which could affect man (such as food, feed stuffs, and drinking water). Furthermore, monitoring ground-level radiation is carried out using over 2,000 stationary units for measuring local dose rates.

All data ascertained by IMIS are transferred with IT support to a central database at the German Federal Agency for Radiation Protection, are stored, prepared, and visualised geographically with the help of an information system. The map opposite shows the localised gamma dose rates (see Figure 7) of October 21, 2001, interpolated on the basis of measurements from some 2,000 gauging stations. The observed differences are essentially due to the different contents of naturally radioactive substances (for example, uranium) in the ground and rocks.

The system continually works to ensure that even if an event has considerable radiological effects, the necessary data and information for determining and evaluating the situation are available and complete in good time in order to guarantee targeted and co-ordinated actions by those responsible for protecting the population.

For further information:
go to the site of the Bundesamt für Strahlenschutz (Federal Office for Radiation Protection),
http://www.bfs.de

Reorganisation of the Constituencies of the Bundestag (German Parliament)

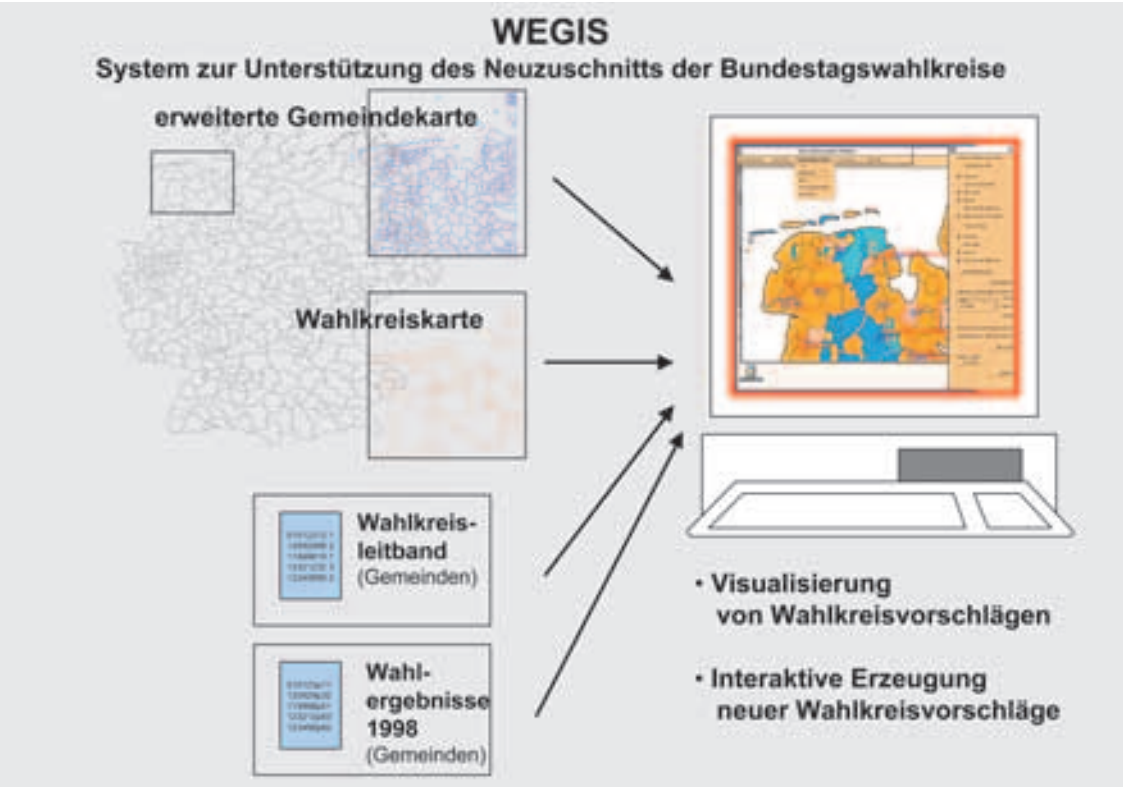
The Federal Republic of Germany is divided into a total of 299 constituencies, subject to any variations arising from the Federal Election Law. The areas of constituencies for the election to the 15th German Bundestag is described in the Sixteenth Law on the Amendment of the Federal Election Law (BWG) of April 27, 2001 (German Federal Law Gazette I, page 701). Compared to the organisation of constituencies for the 1998 election, considerable legislative changes were made after the election of the 15th German Bundestag, in particular by reducing the number of members (598 instead of the previous 656) and, hand in hand with this, the number of constituencies (299 instead of the previous 328).

The reorganisation of constituencies was supported by a data processing system based on modern GIS technology (Figure 8). This system was developed in the Federal Statistical Office of Germany (StBA) using the GIS software package ARC/INFO. The system contains a component for generating constituency maps from predefined constituency cut-out segments in the form of sequential data, a visualisation component for showing constituency information in the form of maps up to municipal level, a component for interactive production of new constituency segments, as well as components for issuing tables and large format maps.

The GIS constituency division (WEGIS) was first used to support the work of the Reform Commission of the German Bundestag and the Constituency Commission for the organisation of constituencies for the 2002 Bundestag election. It is planned to use this system for future elections in order to make any necessary adjustments to the respective constituencies.

For further information:
go to the site of the Statistisches Bundesamt Deutschland, (Federal Statistical Office of Germany)
http://www.destatis.de

Figure 8: Diagrammatic Representation of the Organisation of Constituencies (WEGIS)



Geo Information for the German National Meteorological Service

The weather is of public interest to man and the environment – from disaster prevention to private planning – in particular when it comes to weather warnings and forecasting. The measurement and observation of weather phenomena form the essential basis for all meteorological services. These services include the continuous obtaining and preparation of meteorological data for the most varied areas of application such as air and sea travel, farming, supply management during disasters and disaster prevention, advisory services regarding climate and the environment, medical meteorology, and hydrometeorology.

Figure 9: Weather satellites

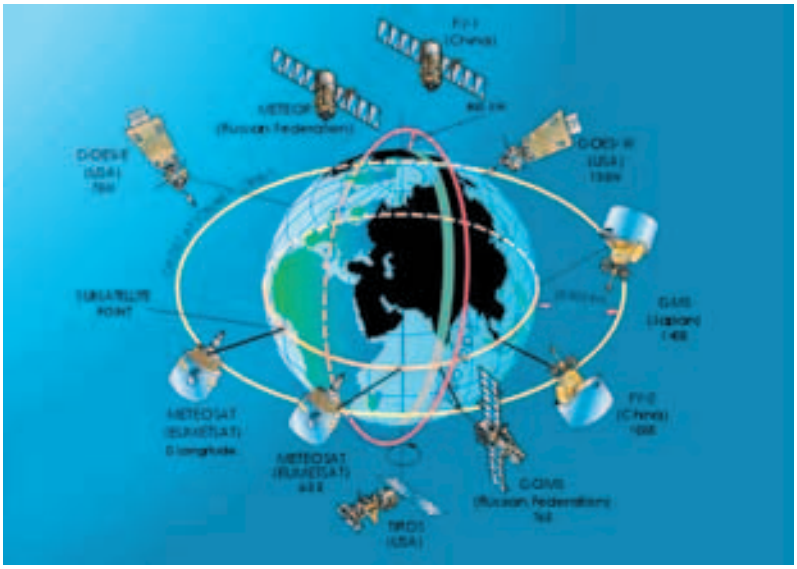


Figure 10: Satellite image

Since the 1950s, remote sensing systems have been used for data acquisition. These include weather radar systems, lightning detection systems, Light Detection And Ranging (LIDAR – determining key atmospheric parameters, for the biosphere or hydrosphere by means of laser) Sonic Detection And Ranging (SODAR – measuring equipment for wind field measurement of the lower layers of the atmosphere) Wind-profiler (a type of vertical radar) which initially was restricted to specific locations but for some years now has been increasingly used as part of a network for acquiring meteorological data.

The building of a world-encompassing system of weather satellites (Figure 9) has meant that meteorological data acquisition has gained both in quality and homogeneity in the last decades. The possibilities for utilising satellite image data and satellite location systems (GPS) for meteorological purposes have been far from exhausted (Figure 10). Altogether, satellites provide one of the most important sources of data today, with a considerable potential for development.

For further information:
go to the site of the Deutscher Wetterdienst (German National Meterological Service), on http://www.dwd.de

Conservation – environmental viability when planning transportation routes

Geo information is used in the realisation and documentation of building projects to ensure compliance with legal and technical requirements. It is precisely in the area of land management where the effects on our environment from building projects are very serious (Figure 11). This is why it is only possible through the interaction of many specialist disciplines to treat natural resources carefully and with forethought to meet the needs of the population.

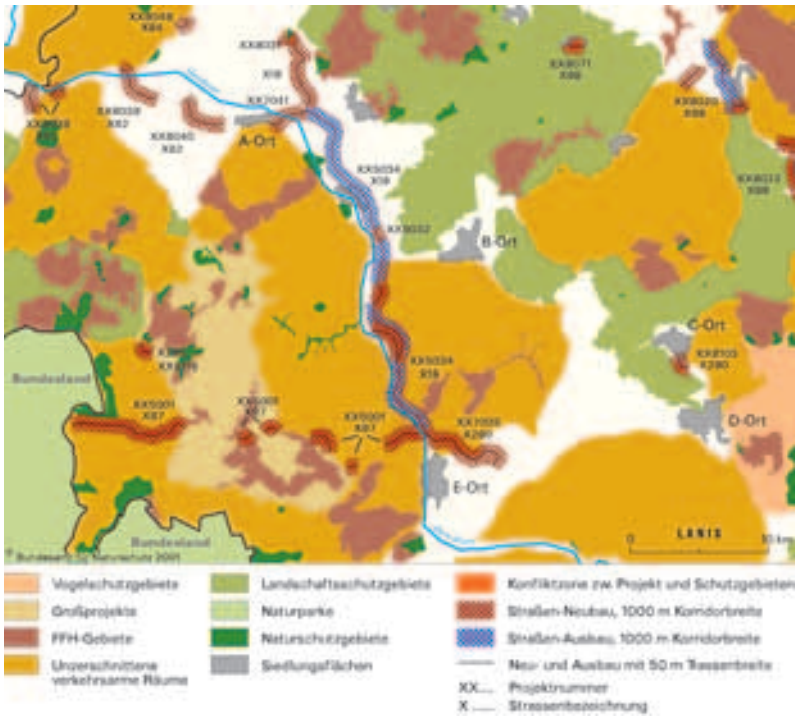
When building new transportation routes, any negative aspects need to be ascertained and allowances made as early as possible during the planning stage. Risks to the environment connected with individual projects are determined already in the German National Transport Infrastructure Plan (Bundesverkehrswegeplan). By means of what is known as an early detection system and using GIS technology, the possible effects of highway projects on different conservation areas (for example, nature and countryside conservation areas, FFH – Flora Fauna Habitat – areas, and bird sanctuaries) can be determined and evaluated (cf. Figure 12). Furthermore, a differentiating environmental risk evaluation is carried out for very controversial projects in which the effects on different conservation resources (for example, biotopes) are also evaluated outside conservation areas.

This process should enable timely detection of any negative effects of transportation infrastructure on the environment and minimise these as much as possible.

For further information:
go to the site of the Bundesamt für Naturschutz (Federal Nature Conservation Agency),
http://www.bfn.de

Figure 11 Road works construction site

Figure 12 Conservation areas, conflict zones



Monitoring Air Pollution – Ozone near Ground Level Using the Federal State of Hessen as an Example

Figure 13: Air gauging stations in Hessen

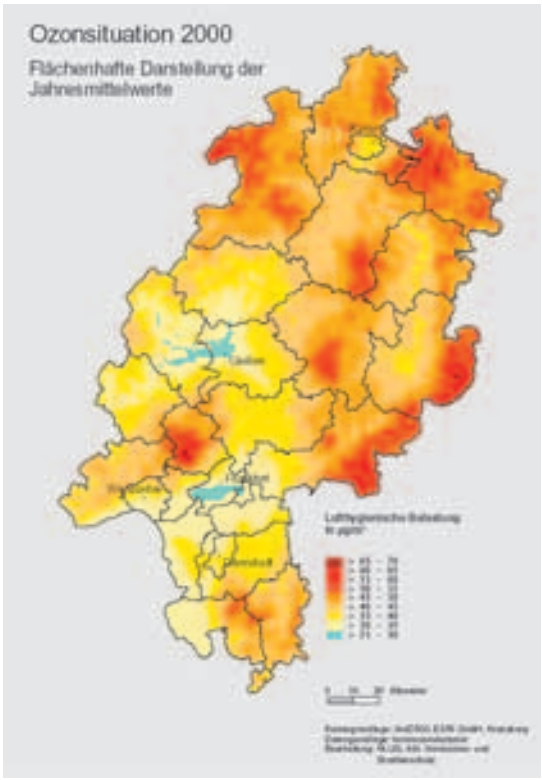
Ozone is a constituent of the earth's atmosphere. For man and the environment, this gas has positive and negative properties. In the stratosphere, 15 to 35 km above the earth's surface, it protects man and animals from harmful UV rays and so makes life on earth possible. However, this layer is endangered by emissions of ozone-destroying substances, for example CFC.

Near the ground, however, ozone acts as a harmful or irritant gas on humans. In high concentrations, primarily children are harmed. More generally, anyone moving in the open air and carrying out physical activities will be affected.

A network of air gauging stations determines the concentration of ozone in the individual federal states in Germany. For example in Hessen, there are 31 (Figure 13). Measured data and prognoses are continuously made available to the public as maps (Figure 14) on the Internet and through videotext. This information provides the population with timely warning if ozone levels are high, allowing steps to be taken nationally, for example the enforcement of speed limits and/or prohibition of vehicles producing harmful emissions.

For further information:
go to the site of the Hessisches Landesamt für Umwelt und Geologie (State Office for the Environment and Geology, Hessen),
http://www.hlug.de

Figure 14: Ozone situation in Hessen in 2000 (areas with annual means)



Atlas of Regional Statistics

Citizens interested in regional policies will find easily accessible information, for example on regional concentrations of unemployment, availability of health services to the population, and income differences according to districts, in the Atlas of Regional Statistics. Statistical data have been graphically mapped according to administrative units with the aid of a geo information system. Different cartographic forms of representation such as degrees of surface shading bar and pie charts as well as symbolic representation proportional to the size of area allow a quick comparison between states, cities and districts (Figure 15).

The Atlas of Regional Statistics, as a joint product developed by the Federal and State Offices of Statistics, covers key focal areas in the provision of information using 80 clearly represented diagrams and maps.

For further information:
go to the site of the Statistisches Bundesamt Deutschland, (Federal Statistical Office of Germany)
http://www.destatis.de

Figure 15: Foreign Population according to Citizenship in 1997

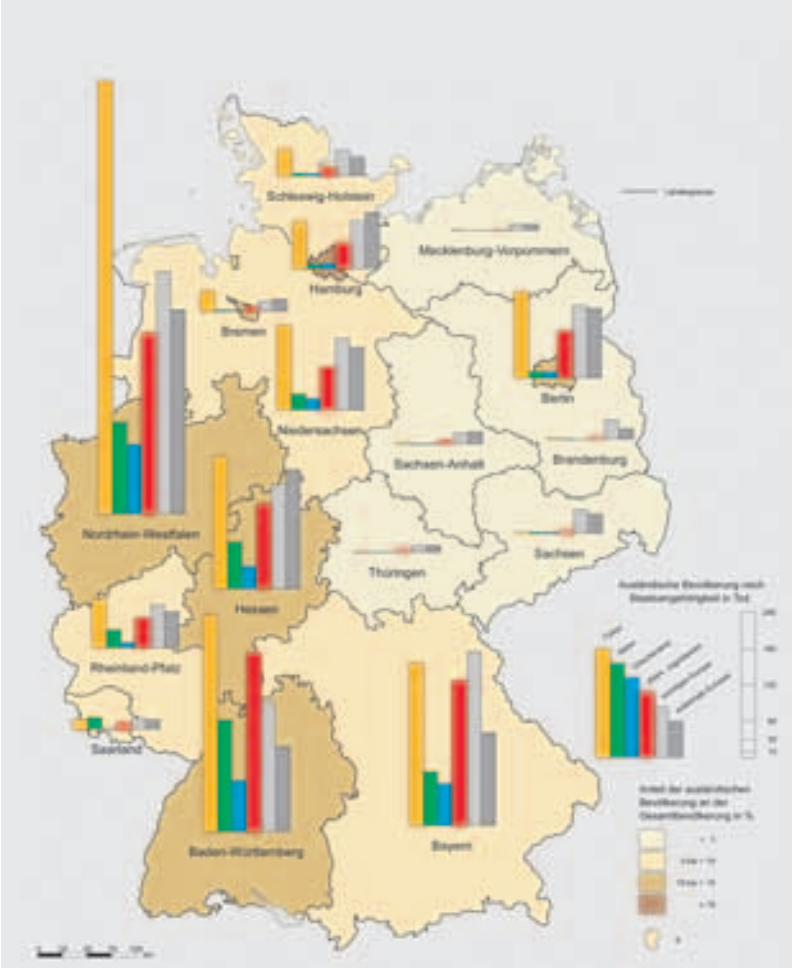
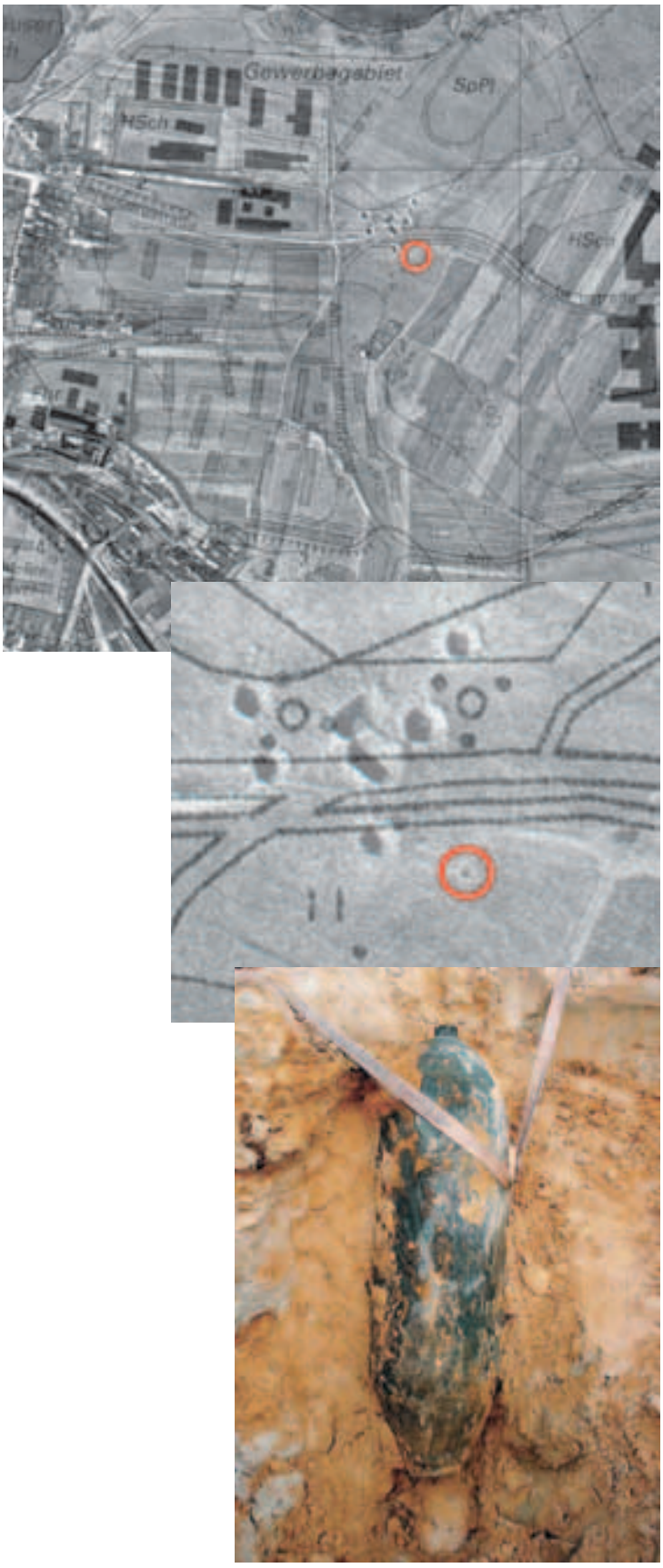


Figure 16 Locating weapons



Weapon and Explosives Clearance Service

Even after more than half a century since the end of the Second World War, ammunition from the war era is still being found. Approximately 45,000 tons of bombs fell on Berlin alone during 363 attacks. Empirical statistics imply that approximately a fifth of the bombs dropped are duds.

Excavations and targeted searches have recovered large quantities of ammunition remains – between 50 and 80 metric tonnes a year in the last few years. For example, on September 16, 1994, during building works in Berlin-Friedrichshain, a ten hundredweight bomb was detonated, which besides causing a great deal of damage to property also took three lives.

To be able to carry out a systematic search, aerial photographs taken by the Allies from the time of the Second World War are being analysed in order to ascertain and avert potential danger spots. With the help of these analyses as well as witness reports and archive material, this information is being transferred into up-to-date map material. Later checking will then take place on location. Approximately 30% of the duds are located by means of aerial photograph analysis (Diagram 16).

For further information:
go to the site of the Aufsichts-und Dienstleistungsdirektion (Supervisory and Services Management) Rheinland-Pfalz,
http://www.add.rlp.de/23_kmrd.html

Geo Information in National Park Management

Besides important basic research in a National Park, there is an emphasis on applied research. Existing environmental problems and their complex interrelations are investigated, in order to be able to find regional, supra-regional and even global solutions in order to avoid environmental problems. A vital aim is to support nature conservation management and to check the success of measurements taken towards nature conservation.

Since 1984, the Berchtesgaden National Park Administration has been working with a Geographical Information System within the framework of the project “Man’s influence on Mountainous Eco-Systems”. The German Federal Republic’s contribution to the UNESCO programme “Man and the Biosphere” (MaB) was financed between the years 1984 and 1991 by the Federal Agency for the Environment in Berlin and by the Bavarian State Ministry for State Development and Environmental Affairs.

To this end, location-specific data were created over a wide area and processed, as well as colour-infra red aerial photos on a scale of 1:10,000, which were analysed and digitised extensively. Initial models were created showing the distribution of selected animal and plant life (for example, Figure 17 shows the distribution of Primula Auricula). Digital relief models (Figure 18), ground and vegetation maps, inshore water catchment areas, flowing waters, the road network, zoological and botanical point data have been included for the whole area of the National Park and its immediate surroundings. After the data collection project had been concluded, the data for the national park plan were processed based on the recorded GIS data. These make up the basis for long-term environmental observation and provide a future focal point for work by National Park management.

For further information:
go to the site of the Berchtesgaden National Park,
http://www.nationalpark-berchtesgaden.de

Figure 17: 3D-Representation showing the Distribution of Primula auricula

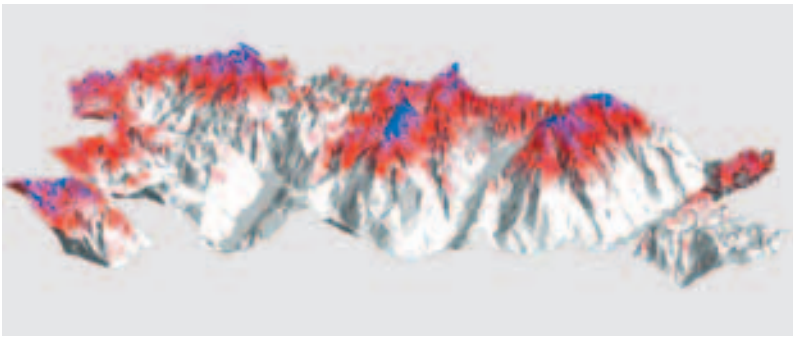
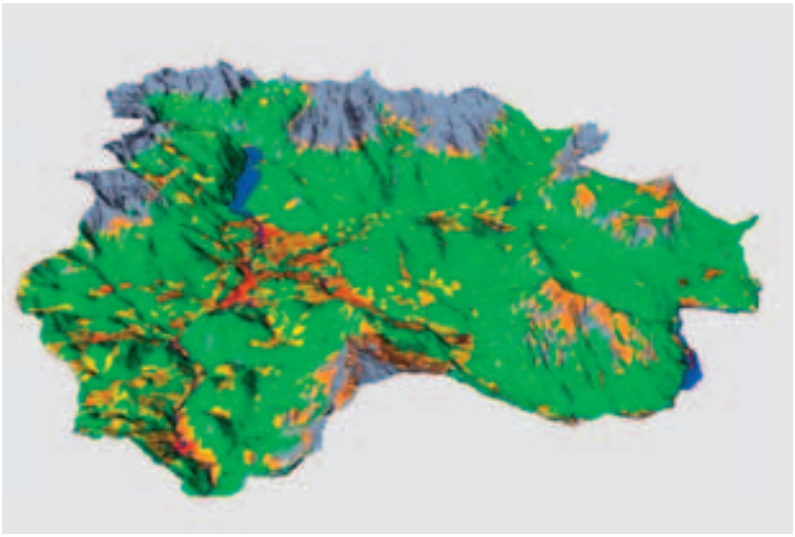


Figure 18: 3D Representation of the National Park



Insurance – Risk Calculation and Damage Evaluation

Figure 19: A maize field completely destroyed by a hailstorm

Figure 20: Representation of damage by the elements in agriculture (here drought in Sachsen)

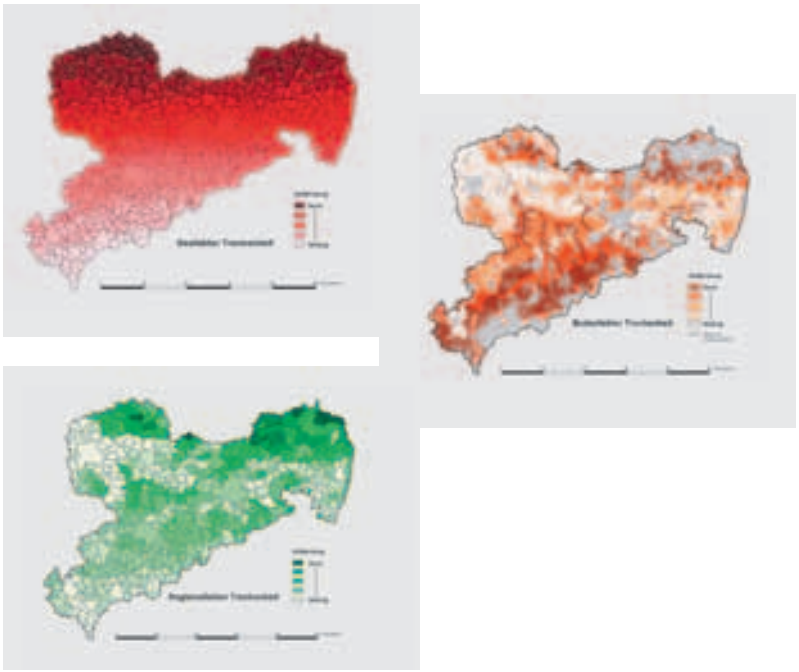
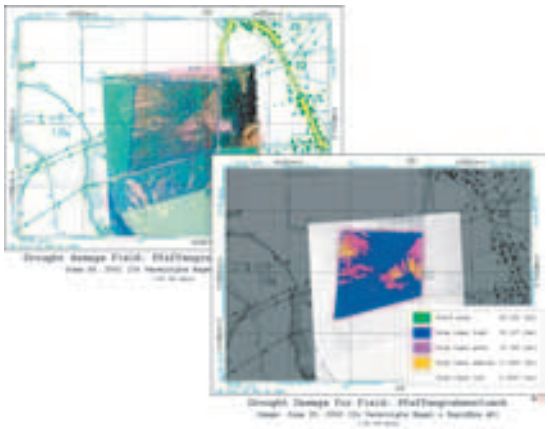


Figure 21: Loss adjustment due to damage caused by drought with the aid of geo information



Natural hazards such as storms, drought, floods and hail (Figure 19) cause a great deal of damage every year. It is noticeable that there has been an increase in such events. Therefore, more than ever, economic and political planning and decisions require information that allows statements on type, intensity and frequency of these natural hazards.

Geo information systems are used in risk calculation. Insurers are able to evaluate the risk of natural disasters with regard to a specific location. So, for instance, using the GIS-supported risk model as a basis for crop and multiple danger insurance – a product for insuring agricultural cultivation against damage done by the elements – the risks of all significant natural hazards as well as their loss ratios can be calculated. Geo information such as regional weather data, ground characteristics, relief data, and land utilisation information are integrated into this risk model (Figure 20). The GIS-supported model links this geo information with agricultural and insurance-specific factual data and in so doing provides a precise statement on the insurance risk at community level. The quality, availability, and relevance of the geo and factual data will determine to a great extent how accurate the statement will be.

Geo information is also used widely in the settlement of losses. German hail insurers use aerial and satellite pictures in order to support their specialist staff on location during the settlement process. With the aid of aerial and satellite pictures objective information can be obtained on the degree and extent of damage (Figure 21).

Fleet Management

In the year 2000, German forwarding services completed 360 billion kilometres of service, 30% of which were without load. By using satellite technology (GPS) and communication services, these transport services can be made more flexible and efficient equally for freight suppliers and haulers. The amount of freight, the respective locations and routes the vehicles take are accordingly shown and processed further with the support of GIS systems (Figure 22). These systems are used for the transportation of hazardous loads, for personal security, transport of goods, passenger services, etc.

The advantages for freight providers and haulers are reduced shipping costs, flexible shipping management and the avoidance of empty runs. By using such fleet management systems, the search for suitable freight tenders, as well controlling and checking of the same can be improved and so be processed more cost effectively. Optimising routes and at the same time the more efficient use of vehicles reduces environmental pollution.

Figure 22: Representation of transport routes

Applications in Forestry

Since the 1980s, extensive investigations using remote sensing equipment have been carried out for the classification of forested areas, as well as types and conditions of forest. Topographic and terrain data can only be systematically included for the first time using GIS technology. In so doing the division into coniferous, deciduous and mixed woodland or into different categories of damage and age in purely forested areas is possible. The experiences gained when creating forestry information systems in several federal states are now being put to good use.

From 1992 to 1996 the German Aerospace Center (DLR,http://www.dlr.de), in co-operation with the State Institution for Forests in Saxony and the Bavarian State Institution for Woodland and Forestry has created of an extensive map showing the condition of forests of the Erzgebirge in Saxony and the Bavarian Fichtelgebirge. By using remote sensing systems it has been possible to differentiate in spruce forests five categories of needle loss and three categories of tree top conditions.

Satellite-supported remote sensing analyses (Figure 23) made it possible to record the pattern of damage distributed over a wide area compared to the inventories of damage in woodland compiled by random terrestrial sampling supported by aerial photographs. The extent and development of damage to forested areas as well as appropriate measures in forestry could thus be documented for a wide area (Figure 24).

For example, in Nordrhein-Westfalen, an analytical process developed in Finland was commissioned by the State Ministry for the Environment, Environmental Planning and Agriculture and used for statistical linking random sample values with satellite pictures. This approach improved the quality of information provided by satellite pictures with respect to types of trees and supplies of wood. Statistical data can therefore be shown on maps in relation to an area of land.

After other positive experiences abroad therefore, remote sensing technology will also be tried out at a federal level with respect to their applicability to future forestry inventories in Germany.

Sources:
M. Schlüter: Continuation of Geo Information Systems by means of directly recorded digital picture data, communications from the Federal Agency for Cartography and Geodesy, Volume 14, published by the Federal Agency for Cartography and Geodesy, Frankfurt am Main 2002.
W. Steinborn: "Remote Sensing in Agriculture and Forestry – an Overview of Status with Perspectives", Geo Information Systems, Herbert-Wichmann Verlag Hüthig GmbH & Co. KG, Heidelberg, Issue 6 (1999), pages 4-12

Classification of tree types
(Example from the Frankfurt am Main area)
Figure 23: Types of trees

blue – coniferous woodland
green – deciduous woodland
yellow – mixed woodland

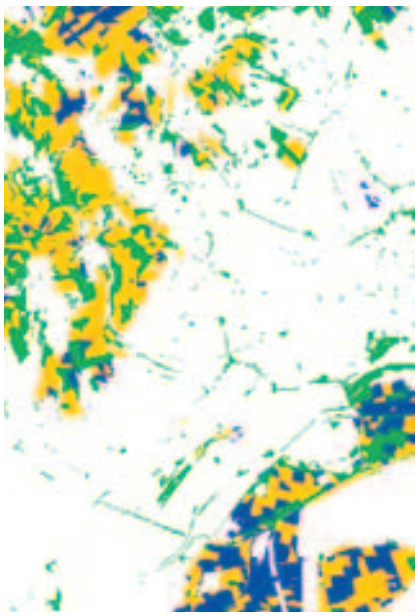
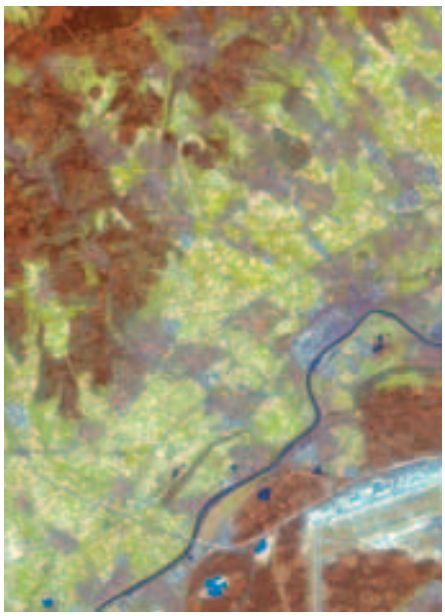


Figure 24: Satellite image



Precision Farming

Farmers today can optimise the cultivation of their arable land by using satellite technology (GPS) and GIS technology (Figure 25). In most cases, plant feed is unevenly distributed on agricultural areas. With GIS support the condition of the fertiliser and the supply of water to plants can be assessed and the distribution of fertiliser onto specific areas controlled by GPS. To do this, land borders, geographic data, and the size of the currently farmed tract of land are recorded. A mixed soil sample is taken from each tract. After precise laboratory analysis, the results are used for the fertilisation of tracts of land as needed (Diagram 26/27).

This system, which can also be used to control cultivation, plant protection as well as measuring harvest yields, represents technological progress in agriculture. It allows savings on production resources, ensures profit and the quality of agricultural products and makes possible sustained farming, which makes little demands on resources.

Environmentally flexible farming of land, therefore, makes an important contribution to economically successful and ecologically acceptable farming. Farmers need to fulfil their obligation to provide evidence that they are complying with the Fertiliser Ordinance as well as regulations governing land cultivation. Here new satellite and remote sensing technology offers sufficient help and opportunities for farmers to comply with statutory regulations.

For further information:
go to the site of the Kuratorium für Technik und Bauwesen in der Landwirtschaft (Association for Technology and Structures in Agriculture), http://www.ktbl.de

Figure 25: Satellite supported control of agricultural machinery

Figure 26: Map showing soil quality

Figure 27: Map of open fields with soil evaluation results

Further Information

List of Abbreviations

AdV	Arbeitsgemeinschaft der Vermessungsverwaltungen der Länder der Bundesrepublik Deutschland (*Working Committee of the Surveying Authorities of the States of the Federal Republic of Germany*)
AFIS	Amtliches Festpunkt-Informationssystem (*Official Fixed Point Information System*)
AG	Arbeitsgruppe (*Team or Working Group*)
AgeoBW	Bundeswehr Geoinformation Office (BGIO)
AK GT	Arbeitskreis für Geotopographie (der AdV) (*Working Group for Geotopography (of the AV)*)
ALB	Automatisiertes Liegenschaftsbuch (*Automated Land Register*)
ALK	Automatisierte Liegenschaftskarte (*Automated Real Estate Map*)
ALKIS	Amtliches Liegenschaftskataster-Informationssystem (*Authoritative Topographic Cartographic Information System*)
ARC/INFO	A GIS product
ATKIS	Amtliches Topographisch-Kartographisches Informationssystem (*Official Topographic and Cartographic Information System*)
BfG	Bundesanstalt für Gewässerkunde (*German Federal Institute of Hydrology*)
BGBl	Bundesgesetzblatt (*Federal Law Gazette*)
BfN	Bundesamt für Naturschutz (*Federal Nature Conservation Agency*)
BfS	Bundesamt für Strahlenschutz (*Federal Agency for Radiation Protection*)
BGR	Bundesanstalt für Geowissenschaften und Rohstoffe (*Federal Institution for Geo Sciences and Raw Materials*)
BISStra	Bundesinformationssystem Straße (*Federal Information System for Highways*)
BK	Bundeskanzleramt (*Federal Chancellery*)
BKA	Bundeskriminalamt (*Federal Bureau of Criminal Investigation*)
BKG	Bundesamt für Kartographie und Geodäsie (*Federal Agency for Cartography and Geodesy*)
BMBF	Bundesministerium für Bildung und Forschung (*Federal Ministry for Education and Research*)
BMF	Bundesministerium der Finanzen (*Federal Ministry of Finance*)
BMI	Bundesministerium des Innern (*Federal Ministry of the Interior*)
BMU	Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit (*Federal Ministry for the Environment, Nature Conservation and Reactor Safety*)
BMVBW	Bundesministerium für Verkehr, Bau- und Wohnungswesen (*Federal Ministry for Transport, Construction and Housing*)
BMVEL	Bundesministerium für Verbraucherschutz, Ernährung und Landwirtschaft (*Federal Ministry for Consumer Protection, Food and Agriculture*)
BMVg	Bundesministerium der Verteidigung (*Federal Ministry of Defence*)
BMWA	Bundesministerium für Wirtschaft und Arbeit (*Federal Ministry for Industry and Commerce and Employment*)
BMZ	Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung (*Federal Ministry for Economic Co-operation and Development*)
BSH	Bundesamt für Seeschifffahrt und Hydrographie (*Federal Office for Maritime Shipping and Hydrography*)
BWG	Bundeswahlgesetz (*Federal Election Law*)
CERA	Climate and Environmental Data Retrieval and Archive
CERCO	Comite Europeen des Responsables de la Cartographie Officielle (jetzt EuroGeographics) (European Committee Responsible for Official Cartography) (now EuroGeographics)
CFC	Chlorofluorocarbon
COGI	Interservice Committee for Geographical Information within the Commission
DB	Database
DDGI	Deutscher Dachverband für Geoinformation (*German Umbrella Organisation for Geo Information*)
DFD	Deutsches Fernerkundungsdatenzentrum (*German Remote Sensing Data Centre*)
DG	Generaldirektion (*Head Office*)
DHM	Digitales Höhenmodell (*Digital Relief Model*)
DLM	Digital Landscape Model
DLR	Deutsches Zentrum für Luft- und Raumfahrt e.V. (*German Centre for Aviation and Space e.V.*)
DTK25/.../1000	Digital Topographic Map 1:25.000/... /1:1.000,000
DV	Datenverarbeitung (*Data Processing = DP*)
DWD	Deutscher Wetterdienst (*German National Meteorological Service*)
EC	European Commission
ECU	European Currency Unit
eEurope	EU-Programm zur Förderung der Informationstechnik (*EU Programme to Promote Information Technology*)
EG	Europäische Gemeinschaft (*European Community*)
EGIP	European GI (*Geoinformation*) Policy Development
ESA	European Space Agency
ESDI	European Spatial Data Infrastructure
EU	European Union
EUMETSAT	European Organisation for the Exploitation of Meteorological Satellites
EUROGI	European Umbrella Organization for Geographical Information
EUROSTAT	Office of Statistics of the European Union
FFH	Flora Fauna Habitat
FGDC	Federal Geographie Data Committee (USA)
FIS	Digitales Fachinformationssystem (*Digital Specialist Information System*)
FMIS	Fach-Metainformationssystem (*Specialist Meta Information System*)
FOI	Freedom Of Information
FOWIS	Forstwirtschaftliches Informationssystem (*Forestry Information System*)
GB	Gigabyte
GBD	Geobasisdaten (*Geo Basic Data*)
GDI-DE	Geodateninfrastruktur Deutschland (*Geo Data Infrastructure Gemany*)
GDZ	GeoDatenZentrum (beim BKG) (*Geo Data Centre (at the BKG*)
GeoMIS.Bund	Metainformationssystem für Geodaten des Bundes (*Federal Government Meta Information System for Geodata*)
GeoPortal.Bund	Internet-Portal für Geodaten des Bundes (*Internet Portal for Geodata of the Federal Government*)
GFD	Geofachdaten (*Geo Specialist Data*)

GFZ	GeoForschungsZentrum Potsdam (*Geo Research Centre Potsdam*)
GI	Geo Information
GIS	Geo Information System
GISU	Geographisches Informationssystem Umwelt (*Geographical Information System for the Environment*)
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
GSDI	Global Spatial Data Infrastructure
GTZ	Gesellschaft für Technische Zusammenarbeit (*Society for Technological Co-operation*)
HGF	Hermann von Helmholtz-Gemeinschaft Deutscher Forschungszentren (*Hermann von Helmholtz Group of German Research Centres*)
IES	Institute for Environment and Sustainability
IMAGI	Interministerieller Ausschuss für Geoinformationswesen des Bundes (*Interministerial Committee for Geo Information of the Federal Government*)
IMIS	Integriertes Mess- und Informationssystem zur Überwachung der Umweltradioaktivität (*Integrated Metrology and Information System for Monitoring Environmental Radioactivity*)
INFO 2000	EU-Programm zur Förderung der Informationstechnik (*EU Programme to Promote Information Technology*)
INPOL	Information System of the German Police
INSPIRE	Infrastructure for Spatial Information in Europe
InVeKoS	Integriertes Verwaltungs- und Kontrollsystem (*Integrated Administration and Control System*)
IRS	Indian Remote Sensing Satellite
ISIS	Intelligent Satellite Data Information System
Isite	Database Programme for Free Text Search
ISO	International Organisation for Standard ization
IST	Information Society Technologies
IT	Information Technology
IVBB	Informationsverbund Berlin-Bonn (*Information Co-operative for Berlin and Bonn*)
JRC	Joint Research Centre (EU)
KB	Kilobyte
KBA	Kraftfahrt-Bundesamt (*Federal Office for Transport*)
KBSt	Koordinierungs- und Beratungsstelle der Bundesregierung für Informationstechnik in der Bundesverwaltung (*Federal Government Co-ordination and Advice Centre for Information Technology within the Federal Government*)
KERIS	Kiel Ecosystem Research Information System
KLIS	Klimainformationssystem (*Climatic Information Centre*)
KMK	Ständige Konferenz der Kultusminister der Länder in der Bundesrepublik Deutschland (*Standing Conference of the State Ministers for Education in the Federal Republic of Germany*)
KTBL	Kuratorium für Technik und Bauwesen in der Landwirtschaft (*Committee for Technology and Building and Construction Industry*)
LANIS-Bund	Landschafts- und Naturschutz-Informationssystem des Bundes (*Federal Countryside and Nature Conservation Information System*)
LBA	Luftfahrt-Bundesamt (*Federal Office of Aviation*)
LBS	Location Based Services
LEPIDAT	Datenbank gefährdeter Schmetterlinge (*Database for Endangered Butterflies*)
LINUX	Open Source (UNIX) operating system
LOTSE	Land Ocean Thematic Search Engine
M745	Military Edition of the Topographic Map 1:50,000, now released for civilian use
MaB	Man and Biosphere (UNESCO programme)
MB	Megabyte
MD	Metadata
MDF	Metadata Format
MDK	Metadaten-Katalog (*Metadata Catalogue*)
MEGRIN	Multipurpose European Ground Related Information Network
METEOSAT	System of geo-stationary weather satellites
MIS	Metadata Information System
NAUTHIS	Nautisch-hydrographisches Informationssystem (*Nautical-hydrographic Information System*)
NGDB	National Geo Database
NWR-DAT	Naturwaldreservat-Datenbank (*Primal Forest Reserve Database*)
OGC	Open GIS Consortium
SABE	Seamless Administrative Boundaries of Europe
SAPOS	Satellitenpositionierungsdienst des amtlichen Vermessungswesens in Deutschland (*Satellite Positioning Service of the Official Surveying Agencies in Germany*)
STABIS	Statistisches Informationssystem zur Bodennutzung (*Statistical Information System for Land Use*)
StBA	Statistisches Bundesamt (*Federal Statistical Office*)
StrVG	Strahlen-Vorsorge-Gesetz (*Law on Precautionary Measures against Radiation*)
TB	Terabyte
TC	Technical Committee
UBA	Umweltbundesamt (*Federal Environmental Agency*)
UDK	Umweltdatenkatalog (*Catalogue of Environmental Data*)
UFIS	Umweltforschungsinformationssystem (*Environmental Research Information*)
UIS	Umweltinformationssystem (*Environmental Information System*)
UMTS	Universal Mobile Telecommunications System
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UTM	Universal Transversal Mercator Projektion
UV	Ultraviolet
VN	Vereinte Nationen (*United Nations*)
WaGIS	Wasserstraßeninformationssystem (*Waterways Information System*)
WATIS	Wattenmeerinformationssystem (*Mud Flats Information System*)
WEGIS	Wahleinteilungs-Geoinformationssystem (*Geo Information System for Electoral Organisation*)
WKNeuG	Wahlkreisneueinteilungsgesetz (*Law on the Reorganisation of Constituencies*)
WMO	World Meteorological Organization
ZADI	Zentralstelle für Agrardokumentation und -Information (*Central Office for Agricultural Documentation and Information*)
ZALF	Zentrum für Agrarlandschafts- und Landnutzungsforschung e.V. (*Centre for Agricultural Countryside and Land Utilisation Research e.V.*)
ZUDIS	Zentrales Umwelt- und Klimadaten-Metadaten-Informationssystem (*Central Environmental and Climatic Data and Metadata Information System*)

Glossary

Geo information	Information on objects and facts with reference to space.
Geo data	Computer-readable geo information (overall concept for reference data and geo specialist data)
Geo basic data (GBD) (reference data)	Fundamental official geo data ,which describe the landscape (topography), plots of land and buildings and is application-neutral. Reference Data are created operated and made available by the Surveying authorities of the Länder (federal states). They fulfil the function of basic data for geo specialist data.
Geo specialist data (GFD) (thematic data)	Thematic data with reference to location, which can be given both directly by geographic co-ordinates and indirectly for example by postcode district or administrative unit. Geo specialist data are operated on the basis of professional regulations (for statistics, soil, nature conservation etc.) by the administrative authorities of the Länder (federal states) and the Federal Government.
Remote sensing data	Data from the earth' surface which are recorded with the help of satellites or aircraft. Thematic interpretation and geo-referencing acquire geo information.
Geo data record	Identifiable collection of logically connected geo data
Geo Information System (GIS)	A spatially-referenced information system with functions for recording data, updating, manipulation, management and analysis of geo databases as well as cartographic representation of spatial information.
Geo Data Infrastructure (GDI)	A Geo Data Infrastructure consists of a geo database, a geo data network, services and standards. In this way the conditions are created for the acquisition, evaluation and application of geo information in public administration, in the commercial and non-commercial sector, in science and for the citizen.
National Geo Database (NGDB)	Core constituent of a geo data infrastructure consisting of reference data, geo specialist data and meta data.
Specialist Information System (FIS = Fachinformationsystem)	Information system which serves to process specific specialist tasks. For processing geo specialist data, the FIS (Specialist Information System) must include a geo information system.
Meta Data (MD)	Description of documented details on (geo) data records ("Data about data")
Meta Data Record	Meta data which describe in a standardised format, a data record.
Meta Data Information System (MIS)	Information system about available databases
Meta information system for geo specialist data (FMIS)	Information system about available geo data orientated to special subjects (e.g environment, geo statistics, climate,….)
direct spatial reference (geo referencing)	Allocation to a location on the earth's surface by giving coordinates, e.g. geographical co-ordinates or UTM co-ordinates
indirect spatial reference	Allocation to a place on the earth's surface by stating for example address, district, region or similar
IMAGI	Interministerial Committee for Geo Information of the Federal Government (Interministerieller Ausschuss für Geoinformationswesen des Bundes)

Cabinet Decision of the Federal Government of 17th June 1998 for the Co-ordination of Geo information in the Federal Administration

The Federal Cabinet on 17 June 1998 approved the report presented by the Federal Ministry for Internal Affairs for an improvement on co-ordination of geo information and the proposal in the report to set up an "Inter-ministerial Committee for Geo Information".

A translation of the report is given below:

Foreword

1. Initial Situation

Geo information (location and spatially-referenced data for describing the concrete features of a country) forms an essential part of the knowledge available in the modern information and communications society. It is needed at all levels by administration, economy, science and the citizen; it is the basis of action planning and its availability and is an essential requirement for decisions relating to location and investment decisions. Important areas are development planning, telematics/traffic guidance systems, environmental and nature conservation, national defence, internal security, civil protection, insurance, the provision of health care, agriculture and forestry, land planning, supply and waste management as well as citizen participation in administrative decisions.

Geo information is an economic product worldwide of the highest quality, which is increasing in importance all the time. Furthermore the manufacture and development of the technology invested for processing geo information is an important area of growth for the employment market.

Political and administrative handling of geo information is especially in need of improvement against a background of increased data-technological options and the globalisation of markets. The German geo information system must not get out of touch with world-wide development.

2. Call for Action

At the present time, there is no guarantee that using geo information will save resources. The reason, on the one hand, is a multitude of data sources which cannot be monitored: Geo data because of lack of co-ordination are often created more than once; on the other hand the data sources available remain very much under-utilised. The knowledge of data users with respect to scope, quality, how up to date the available geo data are, and availability is insufficient. On the other hand, different remuneration policies make using data difficult from the point of view of the Federal Government, since there are no standard federal or state prices in Germany.

Because of the federal structures in Germany, standard data recording is made more difficult. In addition the understanding of the importance and possibilities of utilising geo data in Germany has not been sufficiently developed. Finally there is a lack of standard representation to the outside world of German geo information.

It is therefore the aim to make access to geo data considerably easier by improving co-ordination and exploitation of the options of modern information technology for administrative bodies, businesses, science, and citizens.

3. Task

To improve the co-ordination of geo information a standing "Inter-ministerial Committed for Geo Information" under the overall guidance of the BMI is being set up. Other members are the BK, BMWI[1], BMF, BMVg, BMBF, BMV[2], BMU, BML[3] and BMBau[4].

Above all, the inter-ministerial committee shall undertake the conception of an efficient data management system for geo data, whereby strict responsibilities, the use of geo data across all departments, the creation of an improved information system for geo data, improved access for industry to such data, and the export of data needed for research are stated as an essential task. In discussions between the Government and the federal states, the problems of non-standardisation of geo data, differences in remuneration when purchasing such data and similar questions are being dealt with. Finally, public relations work by the Federal Government with respect to the importance of geo information should be strengthened.

In addition, standard representation must be created at federal level regarding geo information questions for outside parties and in particular with respect to the EU.

Improved co-ordination of geo information in Germany will also result in positive effects in the areas of science, business and economic growth. Strengthening Germany as a location will have the effect above all of creating new jobs.

[1] now BMWA, [2] now BMVBW, [3] now BMVEL, [4] now BMVBW

Report regarding the Improvement of Co-ordination in the area of geo information in Germany which should work towards handling geo information without taking too much from public resources, which at the same time will benefit the economy.

I.
Foreword

Geo information is an essential part of the knowledge in existence in the modern information and communications society. Geo information is required at all levels in administration, economy, and society as well as by the citizen and is a condition for establishing new fields of business. It is precisely in the German federal administration that geo data are needed on a larger scale with new data being produced on an ongoing basis. An overview of the geo data recorded by the individual federal departments is included in the enclosed compilation of data (see Appendix to this report).

Germany is traditionally a classic country of precise maps and infrastructure data, based on an excellent surveying system. The performance capability and specialised competency must remain intact even in an era of unlimited access to information. Otherwise, the german geo information system will find itself in danger of losing touch with world-wide developments. The increasing need for geo information, the rise in technological options when it comes to data and the globalisation of markets are making new demands on activities using geo data. The Federal Republic of Germany must ensure by overall national co-ordination that national needs and those extending beyond frontiers, and the overall economic opportunities which these offer, are given full consideration. This consideration is also necessary in order to show to full advantage internationally the high standard of technology achieved in Germany. At the same time this brings innovative and market promotional repercussions for Germany.

Geo data records form an economic product of the first order. They can contribute considerably to economic growth if official data management is tightly co-ordinated, and so to the creation of new jobs, as experiences abroad and investigative studies show. The USA as an important industrial country, has been working for some years on achieving a suitable data management system. Attempts to introduce controls are particularly recognisable on a European level.

This report is a record of the problems of the German geo information system and aims to set up an instrument of co-ordination, which is designed to work towards handling geo information without taking too much from public resources, which at the same time will benefit the economy.

II.
The Significance of Geo Information

In the majority of decisions made in the areas of politics, administration and the economy, geo information plays a deciding role. Through the modern options offered by digitisation, geo information is growing in significance when it comes to planning and implementation measures.

The areas of application listed in the Federal Government‘s “Info 2000” report – telematics, traffic guidance, citizen participation in administrative decisions, environmental management, disaster handling and insurance, the provision of health care as well as agriculture and forestry production – are directly based on geo information. The potential of digital geo information for instance becomes clear from the increase in navigation systems in vehicles. “Precision farming” in agriculture, which is based on the utilisation of spatially-referenced geo data, has achieved a considerable reduction in the use of fertilisers and pest control by means of more precise farming methods. Other areas of application are found in decision-making regarding supply and waste management, land planning, and location and investment.

Furthermore, around half of all branches of industry are indirectly affected by geo information. The possession of geo data that can be processed and analysed is becoming ever more the key to industrial success and so also an issue with respect to site security and safeguarding German industrial interests.

The geo data characteristic of interlinking location-related information sets of every kind with each other opens up considerable utilisation possibilities, in particular in research, practice, and administration.

Geo information also provide an economic product, which can provide statistical information whose significance up to now has been considerably underestimated. The turnover of qualitative high-grade geo information throughout Europe was given in the EU Commission‘s “GI 2000” Paper for 1996 as 550 million ECU with a 14% annual rate of increase. In addition, expenditures on systems for hardware and software must be included, which make up another third of the costs given.

III.
Identified Fields of Activity

An efficient utilisation of geo data, which is not too

heavy on resources, is severely handicapped due to serious differences in the collection, recording, and distribution of data in the individual administrative and business areas. These differences can in essence can be traced back to the historically determined, decentralised, and federal structure, legal and technological boundaries as well as the immense unclassified growth in data sources, data producers and databases. These factors give rise in particular to problems of data availability and data access, data exchange and compatibility. The causes and problems are increased above all because of the lack of transparency of the available geo data and their description (metadata). Essential difficulties and restrictions of data utilisation are explained in more detail below.

1. Federal Data Recording and Standardisation

Raising geo information usually takes place when public service projects are executed. Due to the federal structures in Germany, initial recording of data occurs to a large degree through state and municipal authorities as well as national research establishments. Data recording and presentation is orientated primarily to one's own needs and area of competence. How much is recorded and how up to date the data are, object differentiation and definition, recording scales, time periods and priorities, exchange formats and in particular the spatial references are therefore to a great degree different and incompatible. As a result, the data can only be pooled for general specialised utilisation across all the states by a technologically expensive process requiring a lot of staff.

This concerns above all users who are dependent on data already recorded by somebody else, due to a deficit in their own competence and resources for raising data. The Federal Government is affected by this to a certain degree. In the context of its national tasks and international duties, the Government has responsibility for the creation, presentation and utilisation of standard geo information throughout all departments and beyond frontiers, and for the integration of this information into relevant and in particular European activities. Commercial specialist users in the areas of industry and public services (e.g. supply and waste management) require more and more extensive useable data, in particular because of the stronger pressure from competition.

Non-standardisation and incompatibility are encouraged in particular because of insufficient standardisation. It is true that in official geo information on a national and international level, subject-related norms are in use. These norms hardly take account of a thematic approach on a broader basis.

Linking only topic-related standardised databases requires avoidable cost-intensive work. Even within the Federal Administration, all the offices recording and using data still have no understanding of the idea of general standardisation. Too often, thoughts on standardisation are geared towards a limited data circle (e.g. geo basic data or only environmental data), and all too little to a universal usefulness for areas of application in administration and business. Germany is under-represented on the appropriate committees dealing with standardisation in comparison with other states.

2. Multiple sources, multiple data acquisition and under-utilisation of data

The direct relation of geo data to concrete tasks necessitates a multitude of data sources, which are barely manageable, as well as constant new production of databases. In addition, certain segments of databases, which are already available, find their way into other information systems and form additional sources of data on their part.

This situation favours increasingly uneconomical procedures even in the Federal Administration. If available data sources are not utilised, there will be unnecessary multiple data acquisition geared towards specific departmental needs. In other offices of the Federal Administration, data that have already been recorded at great expense and for use by the states and across the departments remain unused. The potential for reuse is disregarded. This happens above all if technically difficult linking and exchange procedures together with elaborate cross-co-ordination processes with other federal authorities get in the way.

Geo information also goes to waste as unused data where they have not been acquired with external reuse in mind. It is estimated that, in the field of research alone, each year geodata worth 400 to 450 Million Euros are produced in projects, which if properly co-ordinated could also be used elsewhere. There are no options for sending data to a central data pool after an application project has finished or even to central cataloguing section, for instance data for the catastrophic Oder river flood in 1997.

3. Data information

Knowledge about potential manufacturers and users of data with respect to scope, quality, relevance to the current situation and availability of recorded geo basic and specialist data (meta data) is insufficient. Using such information, it will be possible to avoid unnecessary work being carried out twice and to achieve economic handling of geo information which meets user requirements.

As a rule, the meta data descriptions and structures being designed are written only within defined specialist and basic data areas and represent thus far purely non-networked, isolated solutions. In addition, they are not uniformly constructed or managed according to established norms.

4. Reimbursement policy for data suppliers

The possibilities of supplying data to a third party come up against legal and economic boundaries when it comes to costing. The reimbursement policy for data suppliers and the outcome of negotiations as a consequence produce a non-uniform picture in the geo data landscape. Pricing for the provision of geo data very often causes a conflict of interest between customer-friendly payment that is in line with the market on the one hand, and on the other the pressure from public funds and the expectation to be able to reinvest.

Whilst in the area of geo specialist data, joint thematic interests often lead to a reciprocal solution without any payment, the relation of reference data to the administrative sections responsible for surveying is often associated with considerable expense and utilisation restrictions (protective rights), which make it more difficult to pass on data. Negotiations on matters of cost must at the present time be conducted for each country by each federal authority on an individual case basis and related to a specific situation and to specifications which are continually being changed.

Differing billing costs between the departments, the considerable costs arising as a result of utilisation, and utilisation restrictions also make particularly difficult the use and passing on of data across departments within the Federal administration.

5. Transparency of Utilisation Potentials

For all those involved, there is still a lack of understanding for the fact that geo information in a modern society – similar to keeping the time and the weather service – is a national and innovation-promoting resource with a key function for administration and business. This lack is still accompanied by a lack of understanding and lack of transparency with respect to the manifold utilisation options and the necessary organisational, technological and structural requirements. There is also too little recognition of the opportunities arising from the combined action of the government and commercial users for reciprocal and overall business use (principle of public-private partnership).

Without such awareness it is impossible to create the general framework conditions which would be jointly borne by all involved and which would benefit utilisation of data.

6. Standardisation for the outside world

The current situation in German geo information does not sufficiently meet European needs nor future world-wide requirements. The problems exposed make it difficult to provide utilisation of data across frontiers. This is especially the case because German requirements of Europe when it comes to planning, or European requirements of the German data infrastructure, cannot be negotiated from the German side with the required commitment and force. The weight of Germany's involvement and input in many specialist European projects – for example within CERCO and EUROGI – suffers considerably because there is no central contact. The accomplishment of national interests on a European level requires, while preserving existing competencies, standardised representation to the outside world.

IV.
Objectives

Access to geo information or geo data which is predominantly managed in public sector administration needs to be made considerably easier through improved co-ordination, organisational and data infrastructure, while taking into account sustained exploitation of modern information technology for all user requirements in administration, business, science and the public.

1. Preconditions

The likelihood of the necessary measures by the Federal government being successful, however, are considerably affected because the responsibility of the decentralised authorities of the states for data recording – above all of reference data – will give rise to internal developments within each state because of the nature of the federal structure. All co-ordination and reconciliation activities on the part of the Federal Government, which cross the boundaries of the states and specialist areas, must be fine-tuned with the comparable efforts made by the states and certain specialist services. Even with the best data alignment by the states and specialist services amongst themselves, there still remains the need for a pooling of data in standardised databases common to each Land.

Because the difficulties stated cannot be fully overcome, co-ordination efforts will be an ongoing task.

2. Special Responsibilities of the Federal Government

Because of its duties in the public sector as well as its national and worldwide obligation, the Federal Government is one of the most important and needy carriers and multipliers of geo information. In this respect, the Government has a special responsibility for co-ordination, but also a far-reaching opportunity for structuring geo information. The Federal Government has a particular interest in the optimum organisation, acquisition, holding, and reapplication of geo data to fulfil its own needs anyway. At the same time, the Government also improves the framework conditions for businesses to access central government geo data for the stimulation of new services and the development of new technologies.

The help of a co-ordination programme which covers each department is necessary if the problems outlined in the previous section are to be solved. Essentially, it should be the aim to fulfil the objectives detailed below.

3. More effective fulfilment of requirements by the Federal Government

If the Federal Government is going to more effectively meet requirements, data organisation needs to be tightened up throughout all departments influencing data preparation and the way external data producers are paid. In more detail the following should be achieved:

Tracing any incompatibilities

To overcome heterogeneous data recording and exchange structures, there is a need to develop concepts of standardisation to cover all departments. Furthermore, exchange and co-ordination of planning data is necessary for manufacturing and continuation programmes and the alignment of hardware and software used.

Rationalising the variety of sources

The great variety of sources producing data encourages multiple uneconomical data recording. This needs to be addressed at an early stage by obtaining information on the reasons for data recording together with the co-ordination of these reasons by the different departments, together with optimum development in other places by the Federal administration of data which are already available. A stronger duty and self obligation by the departments towards the principle “re-utilisation before new creation of data” is necessary.

Data acquisition should as far as possible be centralised. In this regard, the policy adopted the BMI – setting up the Federal Agency for Cartography and Geodesy (BKG) as the head office of the Federal Government for the procurement of necessary geo basic data for the states – signals a strong commitment.

Fair regulation of costs for users

With respect to data acquisition and forwarding, there is a need to work towards a standardised payment of data suppliers – instead of costly individual settlements – as well as a more practicable and user friendly price structure. In so doing, it is especially important to slacken the licence-type restrictions with respect to utilisation and forwarding of data. This should considerably facilitate, and ideally at no cost, the forwarding and re-use of data throughout all departments within the Federal Administration. From the point of view of the Federal Government, the focus should be on the overall economic use of data, not on attempts to recover costs due to excessive expectations of cost-effectiveness and refinancing by the departments. Reimbursement of costs and limitations on utilisation within public administration for services which are already financed by the state should be reconsidered.

Bundled data management

Engineers and technical administrators responsible for data recording and maintenance should be concentrated and grouped in central offices within the Federal administration according to specialities. Central data producers in this sense would for example be the BMWi[1] for subsoil data, the BMBF for remote sensing data and the BMI – as before – for basic data (BKG). Broad-spectrum users on the federal side, such as BMU or BMBau[2], should commit themselves to give these central offices priority when requiring external data segments . This would also be a contribution towards an increase in data quality and relevance to the current situation.

More comprehensive data information (meta data)

An indispensable precondition for improving data management and transmission as well as access to available geo data is a complete and easily understandable documentation of all relevant data for Germany.

Therefore it is an urgent requirement to set up and continue in a standard format an information system about type, extent, quality and availability of geo data (meta data), spanning all departments, and accessible without restrictions. Such a system should also include decentralised information which is already available.

[1] now BMWA, [2] now BMVBW

For the area of reference data, the BKG is the central agency responsible for constructing a meta data information system of this type. It still needs to be investigated whether a comparable system for geo specialist data could also be realised.

Representational competency on an international and in particular EU level.

In view of the national and international duties of the Federal Government and corresponding requirements across frontiers, there must be a guarantee of uniform representation of geo interests to the outside world. In this respect, the obstacles resulting from the federal structure must be solved wherever possible. Therefore, it is important that Germany – like other states – is presented as a strong partner with a high ranking and competent contact centre in the area of geo information. This would be in the German national interest.

4. Improved access for business

By taking appropriate measures the Federal Government, with regard to the general economic significance of geo information, should enable the highest availability possible of available data to the advantage of commercial applications. All previously mentioned measures towards improvement will make a contribution to this end. Of considerable importance in this regard is a user-friendly price structure, in which charges can only be made for the general costs of data recording if these constitute a share which can be tolerated by the market.

It is important that in this way the overall value of geo information to the economy can unfold, which – if used as a national resource – will allow the development of new and technically demanding projects and markets on an ongoing basis. Numerous commercial applications only possible with geo information, for example in the areas of transport or public utilities, lead to immense private economic net products. On the other side, this has positive effects on tasks which are to be financed publicly.

5. Public relations

Public relations work by the Federal Government in the area of geo information needs to be improved.

In particular, the added value of geo information for the whole national economy needs to be conveyed to policy makers, administrators, business, and citizens. For this purpose, there guides to geo information on the Internet should exist. The Federal Government should demonstrate the diverse options for use of and the different links to geo information for commercial and private users through brochures and information in the media to encourage the application of geo information.

V.
Recommendations for action

To improve co-ordination in the area of geo information in the Federal Republic of Germany, with a view towards implementing the previous part of this report, a standing “Inter-ministerial Committee for Geo Information” (“IMAGI”) is to be set up at federal level under the overall guidance of the BMI. Other members are: BK, BMWi[1], BMF, BMVg, BMBF, BMV[2], BMU, BML[3] and BMBau[4].

The interministerial committee is to take on, for the long-term, all the objectives specified and addressed in Section IV of this report, acting in combination with business and science. In particular it should

- develop, as a priority, the conception of an efficient data management system for geo data on a national level (tightening up of responsibilities, utilisation throughout all departments, metadata information system, improved access for business, transmission of data needed by research and for new developments).
- intensify coordination between the Federal Government and the states as regards compatibility, questions of payment and similar issues.
- implement new ideas with respect to norms and standards.
- improve public relations work (awaken understanding and awareness with respect to the meaning of geo information and its scope of use) as well as testing of marketing elements for marketing public data.

A top ranking representative should be appointed at national level for better representation of German interests abroad, and in particular with respect to the EU in matters of geo information.

[1] now BMWA, [2] now BMVBW, [3] now BMVEL, [4] now BMVBW

Departmental Activities with respect to Geo Information

Appendix to the Cabinet Resolution of 17th June 1998

Departmental recording of geo Information is subdivided as follows.

The BMI records:

Reference Data

- for transportation routes, waterways network, vegetation, settlements, relief, administrative areas/boundaries, geographic names/descriptions of landscape.
- for purposes of direct specialist applications, for example, resource planning, internal security and disaster prevention, determining location, radio direction finding, navigation etc. and for standardised geo referencing of specialist information for all federal departments, for example in the areas of statistics, defence, transport, telecommunications, agriculture and forestry as well as the environment and regional planning
- for basic information systems: Official topographic and cartographic information system ATKIS, digital relief model as well as digital topographic maps

Statistical data (geo)

- for the areas of soil coverage and utilisation, natural types of location, relief, soil, climate, hydrography, geology, administrative boundaries, general regional statistical data etc.
- for purposes of documenting the current situation and change in framework structures in the areas of soil utilisation and the environment (overall environmental economic calculations), for the conception of new divisions of constituencies, for cartographic presentation of statistical results etc.
- Information systems: Statistical information system for soil utilisation STABIS, constituency geo information system

The BMF records:

Land utilisation data (forestry)

- for the areas of forestry stock, tree types and development, subsoil, (for ascertaining wooded locations) forest biotope mapping
- for purposes of forestry maintenance by federal real estate agencies
- Specialist information systems: Forestry information system “FOWIS-Bundesforst” (inventory and planning)

The BMWi[1] records:

Subsoil data

- for the areas of soil, raw materials, geology, hydrogeology/ground water, geo chemistry, geophysics, seismics
- for purposes of advising the Federal Government in geo-scientific matters, applied geo-scientific research and their use for measures towards development aids at the request of the BMZ and preparation for other federal departments
- Specialist information systems: Soil information system with added info systems, for example “FIS-Boden”, international raw materials databases and other geo-scientific databases of different kinds arising from TZ projects.

The BMWi[2] records:

Stock and utilisation data

- for the areas of animal parks, fisheries, land development
- for purposes of land utilisation documentation during production planning, control and checking, risk assessment and fighting disease in livestock, fleet management of agricultural machinery and the management of fishing quotas

[1] now BMWA
[2] now BMVEL

- Thematic information systems: enquiries into damaged areas of woodland, diverse information systems on individual thematic topics

The BMVg records:

Geo information of all kinds

- for the areas of topography, geology, geomorphology, regional studies, meteorology, hydrology, high-resolution remote sensing, environmental protection, transportation routes,, airspace including obstacles in aviation, seas and coastal waters including underwater obstacles
- for purposes of computer-supported planning, management, reconnaissance, navigation, education, simulation of actions and weapon development
- Thematic information systems: MilGeo database with three levels of detail as well as approximately 150 integrated information systems purely for military application

The BMV[1] records:

Traffic infrastructure data

- for the areas of topography, hydrography, hydrology, statistics, meteorology as well as utilisation/capacity and the traffic density on transport routes, including seas and air space
- for purposes of telematics (navigation, traffic guidance systems, optimising transportation), planning, extending and making transportation routes safe as well as weather information for traffic safety
- Thematic information systems: Federal information system for the roads BISStra, nautical-hydrographic information system NAUTHIS, waterways geo information system WAGIS

The BMU records:

Environmental data

- for the areas of nature conservation, land utilisation, conservation areas, types of conversation, environmental data on air, water, soil, hydrology, meteorology and geology
- for purposes of environmental, nature and radiation protection
- Specialist information systems: Central referencing and communication system for the environment (VKS-U), countryside and nature conservation information system for radioactivity in the environment (IMIS), environmental information network

The BMBau[2] records:

Spatial Planning and Land Utilisation Data

- for the areas of topography, administrative and area boundaries, remote sensing, space indicator, traffic and supply networks, soil utilisation climate, natural spatial information, topological networks for major highways, rail and air traffic, accessibility/distances etc.
- for purposes of continually observing spatial development
- Specialist information systems: Spatial information system for the area of the Federal Republic

The BMBF records:

Geo specialist data of all kinds relevant for development

- for the areas of mobility and transport, air travel, renewable energy, environment and marine studies, polar studies and geo-sciences: in particular data relating to climate, eco systems, agrarian and other land utilisation, as well as subsoil data, using modern remote sensing procedures and satellite data
- for purposes of environmental research and geo-scientific foundation research
- Specialist information systems: Intelligent satellite picture information system ISIS, Climate and Environmental Data Retrieval and Archive CERA, mud flat information system for research and administration WATIS, environmental research information system UFIS as well as Central Environmental and Climate Data meta information system ZUDIS.

[1] now BMVBW
[2] now BMVBW

Resolution of the German Bundestag of 15 February 2001 regarding the use of geo information in the Federal Republic of Germany

German Bundestag Parliamentary Paper 14/5323,
14th Period in Office 14.02.2001

Resolution Proposal

by the elected representatives Dr. Margrit Wetzel, Klaus Barthel (Starnberg), Dr. Axel Berg, Hans-Werner Berti, Willi Brase, Ursula Burchardt, Dr. Peter Eckardt, Lothar Fischer (Homburg), Rolf Hempelmann, Hubertus Heil, Jelena Hoffmann (Chemnitz), Dr. Uwe Jens, Volker Jung (Düsseldorf), Ulrich Kasparick, Siegrun Klemmer, Ernst Küchler, Werner Labsch, Christian Lange (Backnang), Christian Müller (Zittau), Michael Müller (Düsseldorf), Dietmar Nietan, Dr. Edelbert Richter, Rene Röspel, Dr. Ernst Dieter Rossmann, Birgit Roth (Speyer), Thomas Sauer, Siegfried Scheffler, Wilhelm Schmidt (Salzgitter), Heinz Schmitt (Berg), Bodo Seidenthal, Dr. Sigrid Skarpelis-Sperk, Dr. Ditmar Staffelt, Jörg Tauss, Wolfgang Weiermann, Dr. Rainer Wend, Klaus Wiesehügel, Brigitte Wimmer (Karlsruhe), Engelbert Wistuba, Dr. Peter Struck and the coalition party SPD as well as the elected representatives Hans-Josef Fell, Kerstin Müller (Köln), Rezzo Schlauch and the coalition BÜNDNIS 90/DIE GRÜNEN (THE GREENS)

on the Parliamentary question dealt with at a meeting of the Lower House by the elected representatives Dr. Ing. Rainer Jork, Ilse Aigner, Günter Baumann, and other representatives and the coalition of the CDU/CSU – Parliamentary Papers 14/3214, 14/4139 -

Utilisation of geo information in the Federal Republic of Germany

The Bundestag wishes to resolve: The German Bundestag establishes:

The acquisition, processing, distribution and utilisation of geo information are a core element of the modern information society.

Germany takes up a leading international position with respect to the quality and status of its geo data, which are acquired within the remit of the states, and made available by the Federal government and the states. This position is however being exposed worldwide to fierce competition, due to the dynamic development of information technology and the nature of commercialisation.

The application possibilities of geo information for business, administration and science, with effects on almost all segments of society, are giving rise to important markets which have well above average rates of growth and are providing new jobs for qualified staff. The increased use of multimedia information technology has given geo information a key position when planning and administrative decisions must be made simpler, more manageable and more transparent, in order to strengthen citizen participation in such processes and at the same time to be able to enter into a better communication process. Geo information is also needed as an indispensable decision and working aid, for example for conservation of natural resources, to protect consumer supplies and for sustained land management.

Federal Government, states, and private initiative are therefore called upon to utilise and further improve those opportunities offered by geo science and geo information in trusting and close co-operation and for lasting effect.

These opportunities are given extensive portrayal in the Cabinet Resolution of June 17, 1998 and in the answer of the Federal Government to the parliamentary question dealt with at a meeting of the Lower House on “Utilisation of Geo Information in the Federal Republic of Germany” – Parliamentary Paper 14/4139. Over and above this, there is a great opportunity to clear a deserved place for geo information within the framework of the “Year of the Geo Sciences” in 2002.

1. The German Bundestag welcomes the fact that the Federal Government has so definitely promoted co-ordination in this field by setting up the Interministerial Committee for Geo Information (IMAGI). The IMAGI has worked on the “Conception of an efficient Geo Data Management by the Federation” and is presently occupied with putting this into effect. It would be desirable that this initiative by the Federal Government does not simply remain restricted to government offices, but should contribute to the strengthening the field of geo information as a whole, and in the states in particular.

2. The German Bundestag wants to increase public awareness of the ever increasing significance of geo information for modernising business, science, administration and politics and that the potential for net product is better recognised. To achieve this objective, a far-reaching strategy by the Federal Government and the states is also necessary, which will improve data collection and allow standardisation as well as a permanent central deposit for reference data by the Federal Government and the states.

3. The basic data relating to geo information are being acquired and will continue to be acquired using mostly public resources. They represent a public infrastructure, which alone can guarantee a continuous and extensive supply of up-to-date and reliable data of a consistent quality.

In accordance with the EU Green Paper "Public Sector Information in our Information Society" and the drafts on the Law of Freedom of Access to Information, this national geo data infrastructure is already freely available for use by all public institutions as well as private and business enterprises.

Not least to defend Germany's leading position, the extension of the geo data infrastructure requires sustained investments. One supportive step in this direction is the passing of the research programme "Geo Technologies" by the Federal Government. Over and above this, the Federal Government is requested:

- on the one hand, to strengthen its efforts particularly with regard to application-orientated research and development of geo information, as well as to support further development of a national geo data infrastructure,

- on the other hand, to offer unequivocal support for applications for existing and new enterprises, and even for smaller and medium-sized companies, for example in the areas of transport, agriculture, environmental or town and regional planning. Here above all measures need to be supported which are aimed at simplified access to official geo databases.

4. The German Bundestag assumes that the Federal Government will continue to create the conditions to enable the widespread and continuous use of geo specialist data recorded in the Federal administration. In so doing, the data raised and managed by the states should also be included, in the interest of both parties. The concept for efficient geo data management by the Federal Government developed by lMAGI should be implemented as soon as possible.

5. There should be work towards making official geo data clearly more user friendly and access considerably easier. In addition, the relevant offices of the states and the Federal Government concerned are called upon to develop further and without delay an efficient management system within their remit that sufficiently fulfils modern requirements. In particular, there should be the assurance that by clarifying and providing information, knowledge on the value and utilisation of geo information will generally improve, and in particular also for efficient administrative action within a modern administration. Any deficits still in existence when pursuing the aim of a future-orientated utilisation of geo information by the state, business and science are to be systematically erased.

6. The Federal Government should work towards checking compatibility of standardised federal geo data holding and processing facilities, in the context of international and European initiatives with the joint aim of building a global or European geo-data infrastructure, for instance along the lines of the USA prototype (FOI).

7. The Federal Government is called upon to safeguard and extend Germany's leading position in the areas of Geodesy and geo information. In this context, competent political representation of Germany is also necessary on a European and international level. In this connection, the German Bundestag requests the Federal Government:

- to ensure the promotion of German interests in Europe and internationally in agreement with the federal states and

- to use the lead Germany already has and also politically to expedite the process for the adoption of the idea of the Information Society Technology (IST) by the EU.

8. The Federal Government, in the interests of sustainable development of rural and urban areas in Germany, should expedite the use of efficient technology by the consistent use of geo information in all areas of society and areas of application, such as nature conservation and environmental protection, nature and environmentally sustainable agriculture and forestry, protection of consumer supplies, transport and communication or town and regional planning.

9. The Federal Government is called upon to provide the German Bundestag in the third year of each legislative period with a progress report on the development of the different fields of geo information in the national, European and international context.

Berlin, the 14th February 2001 Dr. Peter Struck and faction, Kerstin Müller (Köln), Rezzo Schlauch and faction

Accepted as a resolution by the German Bundestag on 15 February 2001.

Decision of the German Bundestag of 10 April 2003 to drive forward the use of geo information in Germany

German Bundestag Parliamentary Paper 15/809
15th Period in Office 08. 04. 2003

Resolution Proposal

by the elected representatives Dr. Margrit Wetzel, Klaus Brandner, Doris Barnett, Dr. Axel Berg, Hans-Werner Bertl, Wolfgang Grotthaus, Hubertus Heil, Rolf Hempelmann, Walter Hoffmann (Darmstadt), Anette Kramme, Angelika Krüger-Leißner, Christian Lange (Backnang), Lothar Mark, Christian Müller (Zittau), Gerold Reichenbach, Dr. Ernst Dieter Rossmann, Karin Roth (Esslingen), Thomas Sauer, Wilhelm Schmidt (Salzgitter), Wilfried Schreck, Dr. Sigrid Skarpelis-Sperk, Dr. Rainer Wend, Engelbert Wistuba, Franz Müntefering, and the parliamentary group of the SPD (Social-democratic party of Germany) as well as the members Dr. Thea Dückert, Volker Beck (Köln), Hans-Josef Fell, Michaele Hustedt, Fritz Kuhn, Werner Schulz (Berlin), Katrin Dagmar Göring-Eckhardt, Krista Sager, and the coalition BÜNDNIS 90/DIE GRÜNEN (ALLIANCE 90/THE GREENS)

Drive forward the use of geo information in Germany

The Bundestag wishes to resolve:
The German Bundestag establishes:

the gathering, processing, dissemination, and use of geo information constitute a key element of the modern information society. The importance of geo data is summarised in the study commissioned by the Bundesministerium für Wirtschaft und Arbeit (BMWA) (Federal Ministery for Industry and Commerce and Employment) entitled “The market for geo information: Potentials for employment, innovation and net product“) as follows: “The economic use of geo information contains a high market potential and may develop into a market segment offering a considerable rise of the net product, qualified jobs, and highly innovative products that give important stimulus to the overall economy“. The provision of public geo data is not only a component of an active economic policy but also a substantial impetus to the safeguarding of the industrial location Germany.

Evident progress has been made in the implementation of the decision of the German Bundestag of 15 February 2001.
The Interministerial Committee for Geo Information (IMAGI) has

- developed further the conception already existing of the geo data management of the Federal Government to the conception of the Geo Data Infrastructure for Germany (GDI-DE),
- decided on a strategy for its implementation involving also the Länder (states) and the economy,
- made considerable progress with regard to the transparency of the geo databases maintained at Federal institutions,
- standardised the reimbursement guidelines on the federal level,
- accompanied the establishment of the German Emergency Provision Information System (de-NIS) as basis of a federally uniform emergency service, and
- started the setup of the GDI-DE by some pilot projects.

Considering that the GDI-DE constitutes a public infrastructural service co-operation with the Länder in this field is in the forefront of interest. It is essential that the Federal Government takes responsibility for co-ordinating the highly complex activities necessary for the setup of the ‘GDI-DE’.

The German Bundestag also welcomes the dedicated co-operation of German experts in the development of a “European Spatial Data Infrastructure – ESDI“, which in this context means above all in the initiative “Infrastructure for Spatial Information in Europe – INSPIRE“, which is preparing a legislative process that will probably lead in 2004/2005 to a legal norm for the setup and operation of the ESDI on the basis of the respective national geo data infrastructures of the EU Members.

The German Bundestag welcomes the obvious progress that has been made with the implementation of the geo data management of the Federal Government, which includes the

- **Setup of a metadata information system for geo databases of the Federal Government (GeoMIS.Bund):**

Testing of a prototype was completed in the summer of 2002, the order for the development of the final procuct GeoMIS.Bund has been placed and active operation with the meta information systems of the Federal Government on the internet shall start as from August 2003. In view of the fact that the GeoMIS.Bund system will be standardised for the whole of Germany, it is offered to the Länder free of charge since the Federal Government (BKG) has acquired a pertinent right of use. Presently, in co-operation with some Länder linkage of

the meta information systems already existing on the Land and local government levels with GeoMIS.Bund is being developed and tested.

- **Optimisation of the technical-organisational jurisdictions for the holding of geo databases:**

The GDI-DE conception starts from a central management of reference data (geodetic reference systems and topography) as well as a decentralized management of the geo specialist data on the federal level. An implementation concept is being prepared by way of pilot projects. The German Bundestag does not consider a mere IT networking of the geo databases of the Länder as a sufficient solution. BKG has already made considerable expenditure on the quality test and harmonisation of these data in order to secure their uniformity on the federal level.
For reasons of a reliable supply with reference data for the Federal Armed Forces, the public safety as well as for the purpose of disaster protection and defence the Federal Government has to maintain permanently a standardized database.

- **Harmonisation and optimisation of the administrative guidelines for the purchase and distribution of geo data:**

The general guideline of IMAGI concerning "Reimbursement Principles and Conditions of Sale for Geo Data" was adopted in October 2002 and has been valid for the Federal authorities since January 2003.
The presently applicable Agreement between the Federal and Länder Governments on the permanent distribution of digital geo topographic data of the Land survey authorities for use in the Federal sector will expire by the end of 2003. The follow-up agreement 2004 to 2008 has been submitted to the Länder for signature.
The German Bundestag welcomes the involvement of the Länder in the work of IMAGI.
The chairman of the "Arbeitsgemeinschaft der Vermessungsverwaltungen (AdV)" (Working Committee of the State Survey Offices) acts as permanent representative at the IMAGI, where he reports on the activities of the "Surveying State Agencies".
Moreover, AdV representatives co-operate within the IMAGI Working Group Geo data Infrastructure for Germany (GDI-DE) and also in its different expert panels. In addition, there exist various pilot projects initiated by the Federal and Länder Governments to ensure a co-ordinated setup of the GDI-DE.

- **Integration and centrally organised distribution of geo data have been improved:**

The introduction of a federally uniform ISO-based data model at the "GeoDatenZentrum (GDZ)" (Geo Data Centre), which also constitutes the basis of the GDI-DE, will be finished by 2004 and thus ensure at the same time compatibility with the standards of the European Spatial Data Infrastructure (ESDI). With the strong support of BKG the Länder continue their efforts to realize throughout Germany the satellite-supported positioning service (SAPOS) of the AdV for the purpose of navigation and surveying.

- **The user-friendliness of the GDI-DE is promoted and developed further:**

As a consequence of the new AdV Reimbursement Principles adopted on 1 January 2002, reference data can now be obtained from GDZ at considerably lower prices, which will be of particular benefit to the economy.
Easily managable internet-based services for using the GDI-DE in "KMUs" (small and medium-sized enterprises) and by the citizen are established in the form of the internet portals GeoPortal.Bund and GeoMIS.Bund accessible as from 2003.
Also, in summer 2003 the online ordering system of the "GeoDatenZentrum"of BKG is made available. Distribution of data is performed by the Geo Data Centre in all marketable data formats.

- **The IMAGI and BKG have taken a number of initiatives in the fields of information and education as well as in the public relations sector:**

These measures comprise brochures and a multimedia CD as well as informational events, presentations and info stands at numerous fairs, congresses, GIS forums, and conferences.

- **Promotion of the particular innovation capabilities of geo information by the BMBF (Federal Ministry of Education and Research) within the framework of the research and development program GEOTECHNOLOGIES. The German Bundestag requests the Federal Government:**

Taking into account experiences gained by the IMAGI and the recommendations for action formulated in the study commissioned by the BMWA as well the progress that has already been made with the setup of the 'GDI-DE', and the deficiencies detected in this context, the German Bundestag still considers necessary the following supportive steps:

a) Clear improvement of co-ordination in the German geo information sector

In order to make rapid progress now with the setup of the GDI-DE on the basis of the geo databases received from the Federation and the Länder, and to ensure their sustainable maintenance and availability in the sense of a public infrastructural service, the Federal Government is requested to

report on what problems do exist with the co-ordination of geo information both on the Federal and the Länder levels. Moreover, the effects of the INSPIRE Initiative (see above) on the 'GDI-DE' must be regulated in an unambiguous and efficient manner.

b) Standardised and simplified dissemination of geo data

The German Bundestag welcomes the initiatives taken by the Federal Government with the IMAGI, which aim at achieving transparency concerning the available geo databases of the Federation and the Länder and facilitating dissemination of the relevant data to other authorities and third parties. Rapid implementation of the following measures may even improve decisively the dissemination and use of public data:

1) Speedy adoption of the national freedom of information law presently being worked out.

2) Immediate implementation of the IMAGI General Guideline "Reimbursement Principles and Conditions of Sale for Geo Data" applying to all Federal authorities keeping geo data and providing them to other users. Within the scope of the user-oriented distribution of data via the internet e-pricing models will have to be established, in order to reduce the barriers of access to the geo information market. The general IMAGI Guideline should be transferred to the Länder in order to ensure a uniform and clear regulation on data distribution to third parties, independently of databases existing on the Länder and Federal levels.

3) It should be checked in what cases a free basic data supply with geo data, e.g. via the internet, can be made possible.

c) Improvement of the German Emergency Provision Information System ('deNIS')

The Emergency Provision Information System ('deNIS') established by the Federal Government on a cross-departmental level will constitute an important support for decision makers in the case of widespread emergencies. The geo specialist data to be represented in this system are collected for a large part by the Länder and shall be provided to the relevant authorities of both the Länder and the Federation.
In order to press ahead the further extension of this system the Federal Government is requested to report on measures by means of which contribution of the required data can be improved.

d) Convocation of a Bund-Länder Conference

Up to the present the Bund-Länder Conference requested already by the German Bundestag in the Resolution Parliamentary Paper 14/5323 was held in 2001 and 2002. Beyond that, the Federal Government is requested to invite the Länder to a GDI-DE strategy conference.

e) Involvement of the economy

The Federal Government is requested to establish a board of trustees whose task shall consist in conveying, as an additional component of the current work done by the IMAGI, the results useful for promoting the economic sector as well as in receiving demands and impulses from the economy suitable to be incorporated into the work of the IMAGI.

Furthermore, the Federal Government is asked to nominate a so-called G2B moderator who shall act as the central contact in all important matters related to the utilisation of geo data for the administrative, scientific and economic sectors, and safeguard Germany's interests in the field of geo information economy on the global level. Rapid realisation of the data supply stage may probably be enhanced by co-operation on a partnership basis with the "KMUs" in the task of setting up appropriate marketing structures. Relevant experiences gained by the Länder should be included in the overall concept.
With the progressive setting up of the GDI-DE central data distribution centers shall be created within the technical authorities of the Federation after the model of the geo data centre of BKG.

Berlin, the 8th April 2003
Franz Müntefering and faction
Katrin Dagmar Göring-Eckardt, Krista Sager and faction

Accepted as a resolution by the German Bundestag on 10 April 2003

Important IMAGI Resolutions

2. Meeting of 15 July 1999, Resolution 2 on Item 3: Working group "Geo data Management Conception"

The IMAGI has decided to set up a working group "Geo data Management Conception" under the direction of the BKG. Until Spring 2000 the working group is to work out a concept for geo data management by the Federal Government. A rough draft will be presented by December 1999.

3. Meeting of 14 December 1999, Resolution 1 on Item 5.7: Internet page

The IMAGI decides that as an immediate measure to improve access to geo information an Internet web page for general access will be set up at the Federal Agency for Cartography and Geodesy (BKG), providing an overview of available geo databases of the federal departments and subordinate authorities which can be accessed by the public.

Using a list of hit words of superordinate spatially-referenced specialist terms, this Internet page should make reference to the Internet pages of the departments which offer geo databases.

The results of the questionnaire form the basis for the compilation of the hit word list. Additional details such as the necessary INTERNET address are to be delivered by the departments.

4. Meeting of 16 May 2000, Resolution on Item 4.4: Meta Data Information System

To simplify access to geo data a meta data information system of the Federal Government for geo data (MIS-Bund) is to be created.
The BMI is requested to nominate the Federal Agency for Cartography and Geodesy (BKG) as the awarding authority for the development and later operation of MIS-Bund.

According to the opinion of the IMAGI, a search tool (Broker System) is most suitable to meet this end. This tool accesses the planned and decentralised available meta data information systems in the remit of the Federal Government.
The awarding authority should in agreement with the geo data management working group implement as a first step a hearing with scientific, business and administrative experts.

4. Meeting of 16 May 2000, Resolution on Item 4.6: Reference Data

As a contribution to the co-ordination of the spatial referencing of geo specialist data, the Federal Government, in executing its public duties, should use forthwith the reference data (topographic foundation data) of the Geo data Centre (GDZ) at the Federal agency for Cartography and Geodesy (BKG) for all new geo databases which are to be created and reorganised.

5. Meeting of 6 October 2000, Resolution on Item 4.2: Geo data Management Conception

The IMAGI acknowledges and agrees to the "Conception of efficient Geo data Management by the Federal Government" with the amendments put forward (version of September 19, 2000).

The conception is being made available immediately to all the Federal establishments and will be on the Internet by October 10, 2000.

6. Meeting of 31 May 2001, Resolution on Item 4.2: Expert Group "Costs and Payments for Geo data"

To standardise the framework conditions for the forwarding of data by the federal authorities, the IMAGI has decided to commission an expert group to work intensely on the problems of "Costs and Payments for Geo data" at a national level and in co-operation with the federal departments which forward geo data in line with the AdV Draft Payment Guideline. IMAGI will present an interim report on the first draft of a "Federal Payment Guideline for Geo data".

7. Meeting of 10 October 2001, Resolution 1 on Item 4: Geo data Infrastructure in Germany

The IMAGI decides in accordance with the resolution of the German Bundestag of February 15, 2001 regarding the "Use of Geo Information in Germany" to expedite for a long-term effect the building of the geo data infrastructure in Germany (GDI-DE) as a step towards a public infrastructure. The building of the infrastructure will be concentrated in the first instance on the jurisdiction of the Federal Government. This will be done in a three-stage process co-ordinated by the IMAGI.

The aim of the first stage is the co-ordination of the access to the evidence (meta information systems) on geo data by the Federal Government through GeoMIS.Bund.

The aim of the second stage is co-ordination of specialist object catalogues and the development of interfaces, conversion modules, norms, standards and procedures for data integration. The European context is taken into account in the co-ordination of the object catalogues and the establishment of geodetic reference systems. The need and preparation of the foundation database in the National Geo Database (NGDB) is to be validated through the departments. The new ALKIS/ATKIS data model, which conforms to ISO-191x, provides a general basis for an object catalogue, which covers all departments.

The aim of the third stage is the gradual implementation of the National Geo Database (NGDB) on the basis of the integration concept worked out in the second stage.

The following areas of action are identified as necessary for constructing the GDI-DE. Taking the necessary political measures; analysing the database and requirements of a national Geo Database from the Federal point of view; co-ordinating of the National Geo Database, norms, standards and semantics; constructing a geo data network throughout the nation, optimising purchasing conditions for geo data; qualification initiatives; public relations work.

7. Meeting of 10 October 2001, Resolution 2 on Item 4: Joint Conference of the Federal Government and the States

Through the resolution of the German Bundestag of February 15, 2001, the Federal Government, states and private initiatives are requested, in close and trusting co-operation, to continue to further improve and utilise the opportunities which the geo sciences and geo information provide.

The IMAGI decides that the states should soon be invited to an initial joint conference of the Federal Government and its states on a "Joint Strategy for the Implementation of the Resolution of the German Bundestag".

In preparation for the conference of the Federal Government and its states, an IMAGI working group "Geo data Infrastructure" will be set up. This group will work out a resolution proposal for the order of importance of the areas of action for constructing the GDI-DE.

7. Meeting of 10 October 2001, Resolution 3 on Item 4: Co-operation with Business and Science

The IMAGI agrees that for a sustained and improved utilisation of geo information in accordance with the resolution of the German Bundestag of February 15, 2001, the building of the geo data infrastructure should occur in the different action areas in close co-operation with the business world and science.

The IMAGI decides to this end to set in motion as soon as possible a series of talks in the areas of business and science.

8. Meeting of 17 April 2002, Item 4, Resolution 4.2: Contact Parer GeoMis.Bund

In order make GeoMis.Bund available to the Federal administration without delay in the targeted expansion phase, the IMAGI expressly points out that the following measures be taken by the specialist authorities during the installation phase and the subsequent continuous operation of the GeoMis.Bund interface:

- Nomination of a standing contact for project management,
- Nomination of standing experts for IT (network, security, database, etc.).

8. Meeting of 17 April 2002, Item 4, Resolution 4.3: NGDB Validation

In accordance with resolution 4.1 of the 7th IMAGI meeting, the foundation database of a national geo database (NGDB) is to be established which is department-referenced.
The IMAGI decides to carry out the establishment of the foundation database of an NGDB in pilot projects using models. Over and above this, the establishment of the database is to be extended to services typical for the project, processes and interactions in the projects. The task is to be carried out by the IMAGI offices in co-operation with the appropriate representatives of the departments involved and the IMAGI working group for geo data infrastructure.

8. Meeting of 17 April 2002, Item 4, Resolution 4.4: Concept Task GeoPortal.Bund

The IMAGI is commissioning the IMAGI offices together with the IMAGI geo data infrastructure working group to work out the broad concept for GeoPortal.Bund.

The BMI is requested to commission the BKG with the subsequent development of the GeoPortal.Bund.

8. Meeting of 17 April 2002, Item 5, Resolution 5.2: Report on Payments and Conditions for Forwarding Data

The IMAGI acknowledges and agrees with the report of the "Expert Group for Payments and Conditions for Fowarding Data" (version of March 22, 2002) within the "Framework Guideline for the Forwarding of Geo data by the Federal Authorities".

In order to make the reciprocal exchange of geo data among the federal authorities easier, the IMAGI states it will enable the passing on of the said data at no charge by means of a general budgetary entry.

9. IMAGI Meeting of 9 October 2002, Resolution Item 4.2 – Pilot Projects:

The IMAGI notes the report by the BKG on pilot projects and ask the GDI-DE working group to carry the results over to other projects in order to build up the GDI-DE step by step.

The business and co-ordination offices of the IMAGI are requested to implement a project-related validation for nature reserves.

9. IMAGI Meeting of 9 October 2002, Resolution Item 6 – Payments and Conditions for Forwarding Data:

The IMAGI notes the draft of the framework guideline "Payments and Conditions for Forwarding Geo data". It asks the BMI and BMWA to clarify bilaterally without delay any open questions. A decision should be made regarding the resolution during proceedings.

The IMAGI requests the business offices of the IMAGI at the BKG for the autumn meeting to produce an experiential report from the federal authorities involved. These reports are to be incorporated into the report to be presented to the German Bundestag during the third year of a parliamentary term.

9. IMAGI Meeting of 9 October 2002, Resolution Item 7 – Public Relations Work:

The IMAGI requests the BKG to publish an extended and updated edition of the brochure "Geo Information and the Modern State" and to make much more use of the advantages of new multimedia and internet-based media.

9. IMAGI Meeting of 9 October 2002, Resolution Item 8 – Geo Thesaurus:

The IMAGI asks the BMI to have the BKG check the acceptance of maintenance and further development of the Geo Thesaurus, which is being dealt with at the present time in the Federal Office for the Environment.

Metadata-Information systems within Federal Jurisdiction

(accessible via the Internet)

Name	Abbr.	Authority	Internet address
Meta information system of the AdV on ATKIS Data		Federal Agency for Cartography and Geodesy, Leipzig	http://www.atkis.de http://www.geodatenzentrum.de
Geographic data description directory	GDDD	Federal Agency for Cartography and Geodesy, Leipzig	http://www.eurogeographics.org
Statistical Information system for Soil utilisation	STABIS	Federal Statistical Office, Wiesbaden	http://www.destatis.de
Police information	INPOL new	Federal Bureau of criminal Investigation, Wiesbaden	http://www.inpol.de/
Meta data catalogue	MDK	Federal Institution for Geo Sciences and Raw Materials, Hannover	http://www.bgr.de/
DAINet	DAINet	Central Office for Agricultural Documentation and Information, Bonn	http://www.dainet.de
Information system Genetic Resources and	GENRES	Central Office for Agricultural Documentation and Information, Bonn	http://www.genres.de
Central Index of Traffic Offenders	VZR	Federal Office for Transport, Flensburg, Dresden	http://www.kba.de/
Central Index of Registered Vehicles	VZR	Federal Office for Transport, Flensburg, Dresden	http://www.kba.de/
Marine Environment Database	MUDAB	Federal Office for Maritime Shipping and Hydrography, Hamburg	http://www.bsh.de
Climate Database	KLIDABA	German National Meterological Service, Offenbach	http://www.dwd.de/research/klis/daten/kollektive/Sklidaba.htm
Climate Information system	KLIDABA	German National Meterological Service, Offenbach	http://www.dwd.de/research/klis/daten/kollektive/Sklidaba.htm
Environmental data catalogue	UDK	Federal Ministry for the Environment, Nature Conservation and Reactor Safety, Berlin, Bonn	http://www.umweltdatenkatalog.de
Geographical Informa tion System for the Environment	GISU	Federal Environmental Agency, Berlin	http://193.174.169.36/gisu/gisu.htm
German Environmental Information Network	GEIN	Federal Environmental Agency, Berlin	http://www.gein.de
Botanic Specialist Database	Flora-Web	Federal Nature Conservation Agency, Bonn	http://www.floraweb.de

Name	Abbr.	Authority	Internet address
Satellite Data Information	ISIS	German Remote Sensing Data Centre, Oberpfaffenhofen	http://isis.dlr.de/
Central Environmental and Climatic Meta-Climate Research	ZUDIS	Institute of Meteorology and Information System Centre for Research Ltd, Karlsruhe	www.imkhp7.physik.uni-karlsruhe.de/ZUDIS/zudis.html
Information system for Climate and Environmental Research	PANGAEA Network	Alfred Wegener Institution for Polar and Marine Research, Bremerhaven	http://www.pangaea.de/
Land Ocean Thematic Search Engine	Lotse	GKSS Research Centre Geesthacht GmbH	http://www.gkss.de
Climate Database	CERA-DKRZ	German Climatic Processing Centre Ltd	http://www.dkrz.de/DKRZ_index.html
Challenging Mini-Satellite Payload	Champ-ISDC	Geo Research Centre, Potsdam	http://www.gfz-potsdam.de/welcome en.html
ICDP Clearinghouse	ICDP Clearinghouse	Geo Research Centre, Potsdam	http://icdp.gfz-potsdam.de/
German Research Network Natural Disasters	DFNK	Geo Research Centre, Potsdam	http://dfnk.gfz-potsdam.de/
Landscape Picture Database	Visiothek	Centre for Agricultural Countryside and Land Utilisation Research e.V., Müncheberg	http://www.zalf.de/
Database of the Institute for Baltic Sea Research	IOWDB	Baltic Sea Research Institute, Warnemünde	http://www.io-warnemuende.de/en_index.htm
Urbanet		Society for Technological Co-operation	http://www.gtz.de/urbanet/
Continuous Area and Urban Observation	LRB	Federal Agency for Building and Regional/Environmental Planning, Bonn	http://www.bbr.bund.de

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Establishments within Federal Jurisdiction

and other holders of geo data known to the IMAGI

Name	Organisation	Description
AdV*	Working Committee of the Surveying Authorities of the States of the Federal Republic of Germany (AdV)	Reference Data, Official Topographic and Cartographic Information System ATKIS. *The AdV a working group of the standing conference of the ministers of the interior and senators of the Länder. Besides the surveying agencies of the states, the Federal Ministries, BMI, BMVBW and BMVg are represented as members in the AdV.
AGeoBw	Bundeswehr GeoInformation Office (BGIO)	Geo information for National Defence/Defence of the Alliance, Disaster Areas and Deployment Abroad
AWI	Alfred Wegener Institute for Polar and Marine Research	Bathymetry, Geology, Glaciology, Climatology, Oceanography, Polar Research, Environmental Protection
BA	Federal Office for Labour	Employment market data
BAFI	Federal Office for the Recognition of Foreign Refugees	Asylum Procedures
BASt	Federal Highway Research Institute	Highway construction and traffic
BAW	Federal Waterways Engineering and Research Institute	Inland waters, hydrology, real estate administration, water level, waterways
BBA	Federal Biological Research Centre for Agriculture and Forestry	Agriculture, Ecology
BBR	Federal Office for Building and Regional Planning/Environmental Planning	Regional planning/ land use planning
BFAFi	Federal Research Centre for Fisheries	Fisheries, Marine research, Ecology, Environmental Protection
BFAV	Federal Research Centre for Virus Diseases of Animals	Epidemiology
BfG	Federal Institute for Hydrology	River Basin Catchment Areas, Inland Waterways, Hydrology, Emission protection, Ecology, Level, Radiation Protection (Radioactivity), Environmental protection
BFH	Federal Research Centre for Forestry and Forest Products	Development aid (Forestry), Forestry, Land Utilisation, Ecology, Environmental Protection
BfN	Federal Office for Nature Conservation	Biotopes, Soil Utilisation, Land use, Nature conservation, Ecology

Name	Organisation	Description
BfS	Federal Office for Radiation Protection	Permanent Waste Disposal, Disaster Protection, Radiation Protection (Radioactivity), Environmental Protection
BGR	Federal Office for Geo-Sciences and Raw Materials	Soil Science, Permanent Waste Disposal, Energy, Development Raw Materials aid (Raw Mat.), Remote Sensing Data, Geo-chemistry, Geology, Geophysics, Hydrology, Engineering Geology, Disaster Protection, Marine Research, Polar Research, resource management, Raw Materials, Tectonics (earthquakes)
BGS	Federal Border Police	Internal Security
BKA	Federal Criminal Police Office	Internal Security, Criminology
BKG	Federal Agency for Cartography and Geodesy	ATKIS, Basic geo data, Geodesy, Geographical Names, Elevation Model (DHM, DGM), Topography, Administrative boundaries
BMF	Federal Ministry of Finance (Federal Forests Administration)	Forestry
BMJ	Federal Ministry of Justice	Justice
BSH	Federal Maritime and Hydrographic Agency of Germany Marine Research	Bathymetry, Geology, Geophysics, Hydrology, Disaster Protection, Oceanography, Shipping, Environmental Protection, Waterways
DBIB	Deutsche Bibliothek (German Library)	Literature Development
DJI	German Youth Institute	Sociology
DKRZ	German Climate Researching Centre	Climatology
DLR-DFD	German Aerospace Center, German Remote Sensing Data Center	Remote Sensing Data, Land Use
DWD	German National Meteorological Service	Remote Sensing Data, Climatology, Meteorology
DZA	German Centre of Gerontology	Gerontology
FHG-IFU	Fraunhofer Institute for Atmospheric Environmental Research	Climatology, Ecology, Environmental Protection
FHG-IGD	Fraunhofer Institute for Graphical Data Processing – Ingeo Forum	Information Technology
FZJ	Research Centre Jülich	Geology, Disaster Prevention, RadiationProtection (radioactivity), Environmental Protection
FZK-IMK	Institute for Meteorology and Climate Research, Research Centre Karlsruhe GmbH Remote Sensing Data, Meteorology	Remote Sensing Data, Meteorology

Name	Organisation	Description
GDZ	Geo Data Centre at the Federal Agency for Cartography and Geodesy, Leipzig Branch	ATKIS, Reference Data, Relief Model (DHM, DGM), Topography, Administrative Boundaries
GFZ	Geo Research Centre	Energy, Remote Sensing Data, Geodetics, Geology, Geophysics, Climatology, Polar Research, Tectonics (Earthquakes)
GGA	Institute for Common Geo-scientific Projects	Soil Science, Energy, Geology, Geophysics
GKSS	Research Centre Geesthacht GmbH, Institute for Hydrographic Physics	Coastal Protection
IAB	Institute of Employment Market and Professional Research of the BfA (Federal Institute for Employment)	Employment Market Data
IO-Warnemünde	Institute for Baltic Research Warnemünde	Geology, Marine Research
LBA	Federal Office for Air Travel	Air Traffic Control
NLfB	State Office of Niedersachsen for Soil Research (Joint Data Server with BGR and GGA)	Soil Science, Energy, Geochemistry, Geology, Geophysics, Hydrology, Engineering Geology, Resource Management, Raw Materials
PIK	Potsdam Institute for Research into the Consequences of Climate Change	Climatology
PTB	Federal Institute of Physical Technology	Disaster Prevention, Radiation Protection (Radioactivity)
RKI	Robert Koch Institute	Epidemiology, Medicine
StBA	Federal Statistical Office	Soil utilisation, Land utilisation, Ecology, Statistics, Constituencies
THW	Technological Relief Organisation	Disaster Prevention
UBA	Federal Office for the Environment	Biotope, Inland Waters, Hydrology, Land Utilisation, Literature Development, Ecology, Environmental Protection
WSV	Federal Water and Shipping Administration	Geodetics, Inland Waters, Hydrology, Coastal Protection, Routing Register (in the area of WSV), Property Management, Water Depth Gauge, Shipping, Waterways
ZADI	Central Office for Agrarian Documentation and Information	Agriculture, Resource Management
ZALF	Centre for Agricultural Landscape and Land Utilisation Research	Biotopes, Soil Science, Hydrology, Land Utilisation, Countryside Research, Agriculture
ZfZ	Central Office for Civil Protection at the Federal Administrative Office	Disaster Prevention

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Alt-Moabit 101 D, 10559 Berlin
http://www.bmi.bund.de

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Federal State	Address		Internet address
Baden-Württemberg	Landesvermessungsamt Baden-Württemberg	Büchsenstraße 54 70174 Stuttgart	http://www.lv-bw.de/LVShop2/
Bayern	Bayrisches Landesvermessungsamt	Alexandrastraße 4 80538 München	http://geodaten.bayern.de
Berlin	Senatsverwaltung für Stadtentwicklung	Hohenzollerndamm 177 10713 Berlin	http://www.stadtentwicklung.berlin.de/
Brandenburg	Landesvermessung und Geobasisinformation Brandenburg (LGB)	Heinrich-Mann-Allee 103 14473 Potsdam	http://www.geobasis-bb.de
Bremen	Geoinformation Bremen	Wilhelm-Kaisen-Brücke 4 28199 Bremen	http://www.bremen.de
Hamburg	Landesbetrieb Geoinformation und Vermessung	Sachsenkamp 4 20097 Hamburg	http://www.hamburg.de/Behoerden/Vermessungsamt/
Hessen	Hessisches Landesvermessungsamt	65195 Wiesbaden Schaperstraße 16	http://www.hkvv.hessen.de/
Mecklenburg-Vorpommern	Landesvermessungsamt Mecklenburg-Vorpommern	Lübecker Straße 289 19059 Schwerin	http://www.lverma-mv.de/
Niedersachsen	Landesbetrieb Landesvermessung + Geobasisinformation Niedersachsen (LGN)	Podbielskistraße 331 30659 Hannover	http://www.lgn.de/
Nordrhein-Westfalen	Landesvermessungsamt Nordrhein-Westfalen	Muffendorfer Straße 19-21 53177 Bonn	http://www.lverma.nrw.de/
Rheinland-Pfalz	Landesamt für Vermessung und Geobasisinformation Rheinland-Pfalz	Ferdinand-Sauerbruch-Staße 15 56073 Koblenz	http://www.lvermgeo.rlp.de/

Federal State	Address		Internet address
Saarland	Landesamt für Kataster-, Vermessungs- und Kartenwesen (LKVK)	Von der Heydt 22 66115 Saarbrücken	http://www.lkvk.saarland.de/
Sachsen	Landesvermessungsamt Sachsen	Olbrichtplatz 3 01099 Dresden	http://www.lverma.smi.sachsen.de/
Sachsen-Anhalt	Landesamt für Landesvermessung und Geoinformation Sachsen-Anhalt	Barbarastraße 2 06110 Halle/Saale	http://www.geobasis.sachsen-anhalt.de
Schleswig-Holstein	Landesvermessungsamt Schleswig-Holstein	Mercatorstraße 1 24106 Kiel	http://www.lverma.schleswig-holstein.de
Thüringen	Thüringer Landesvermessungsamt	Hohenwindenstraße 13a 99086 Erfurt	http://www.thueringen.de/vermessung

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