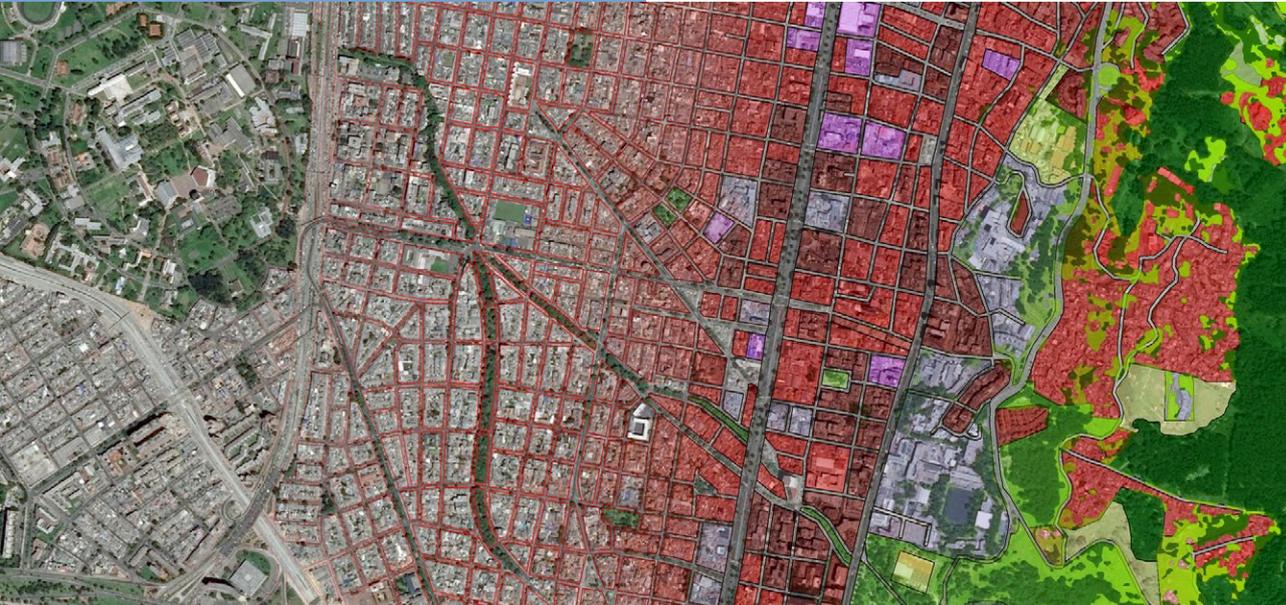


IABG. The Future.



Geodata Services

Geodata turn into solutions



Geodata Technologies

Remote Sensing

Photogrammetry

Geomatics

Environmental Services



Solutions Services



Land Cover & Land Use

Safety & Security

Natural Hazards

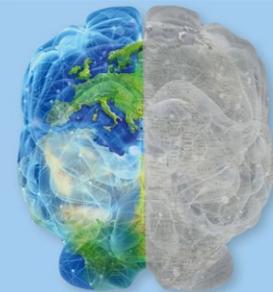
Urban Analyses

Energy Solutions

Brown Field Redevelopment
Contaminated Site
Remediation

Infrastructure Management

Forest Applications



Environmental Services

We support the turnaround in German energy policy

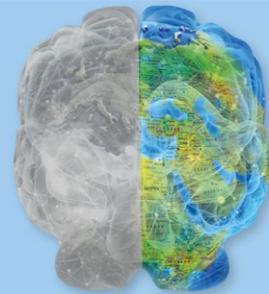
Based on our longstanding know-how, we develop sustainable and cost-oriented solutions for the exploration and assessment of waste residue for complex environmental projects. Our environmental remediation experts conceptualize and implement the revitalization of industrial brownfields and the conversion of former military and armament sites.

We support the turnaround in German energy policy by providing our technical expertise for the dismantling of nuclear power stations and the use of regenerative energy generation plants. Our focus regarding regenerative energy thereby lies on the qualification and engineering of wind energy plants and on examining the potential applicability of regenerative energy generation plants.

Our services

- Environmental engineering
- Geodata services
- Brownfield remediation
- Energy management
- Environmental risk assessment
- Renewable energies





Contaminated Site Remediation

For industrial, military, and armament sites

As an independent service company, we possess current expert knowledge from 30 years of experience in national and international projects. Even today, former industrial and commercial sites oftentimes pose a hazard to humans and the environment, due to decades of production and the use of a plethora of substances.

In addition to conventional pollutants, particularly military- and armament sites such as production plants, munitions institutes, weapons disposal sites, explosion sites and sites where bombs were dropped, etc. are burdened with explosive substance compounds and chemical warfare agents and their degradation products. In any case, waste residue poses a grave obstacle for the reuse of these areas.

IABG specialists possess the required precise skills and the specialist knowledge regarding the construction of facilities, technological procedures, and the diverse chemical degradation processes of highly toxic environmental pollutants that are related to various sources of waste residue.

Our services

- Determining the pollutant burden using load profiles
- Remedial investigations and risk assessment
- Remediation planning and technical supervision
- Implementation and management of remedial measures
- Waste disposal management
- Monitoring
- Conversion and environmental management
- Conducting expert training
- Aftercare and recultivation



Natural Hazards

Global climate change and its ramifications

Global climate change and its ramifications are posing new challenges for today's society: Rising sea levels, earthquakes, or extreme weather events like heavy rainfall or storms are increasingly common. Consequences like flooding, coastal erosion, landslides, or tsunamis oftentimes claim a large number of human lives and cause substantial economic damage.

Using remote sensing methods, and imagery, radar, and laser data acquired by satellites, airplanes, or RPAS, IABG generates the geodata necessary for analyzing the resilience of rural and urban areas.

In the topic of „Disaster Risk Reduction (DRR)“, potential risk areas are identified, and the efficacy of structural and planning measures are verified using a modeling approach.

These analyses provide important information regarding a region's vulnerability, to be able to implement targeted measures and to improve the sustainable protection against natural disasters.

Our services

- Construction of high resolution terrain models
- Land use mapping
- Soil sealing assessment
- Determining retention surfaces
- Flood mapping
- Flood simulation
- Determining potential landslide areas
- Monitoring ground motion using radar interferometry
- Monitoring coastal erosion
- Aiding the implementation of the EU flood directive
- Population density



Urban Analyses

Risk management and monitoring in urban areas

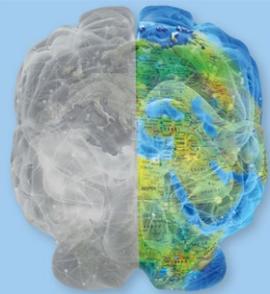
The first decade of the 21st century marked the first time that more than 50% of the world's population resided in cities, which led to a soaring increase in the areal as well as vertical expansion of urban areas. The process of increasing urbanization is accompanied by increasing climatic change.

Frequent flooding or marked heat waves, partly accompanied by extreme droughts, are affecting an increasing number of people. In future, planners and administrations face the challenge of making urban spaces resistant towards climatic change, and cities and conglomerate cities increasingly need to be developed into "Resilient Cities".

IABG supports this process through targeted analyses of city structure, based on high resolution remote sensing data. In the context of crisis management, weaknesses like extensive soil sealing, poor distribution of green areas and waterbodies, or areas threatened by flooding and heavy rainfall events are identified.

Our services

- Construction of high-precision terrain models
- Classification according to the European Urban Atlas Classification or other international standards
- Acquisition of single buildings for cadastral applications
- Simulation of flooding scenarios for the designation of threatened areas
- 3D building and city models with derivation of population density
- Retrospective multi-temporal analysis of urban development and future growth scenarios
- Monitoring of critical infrastructure



Land Cover and Land Use

Multi-temporal evaluations and analyses

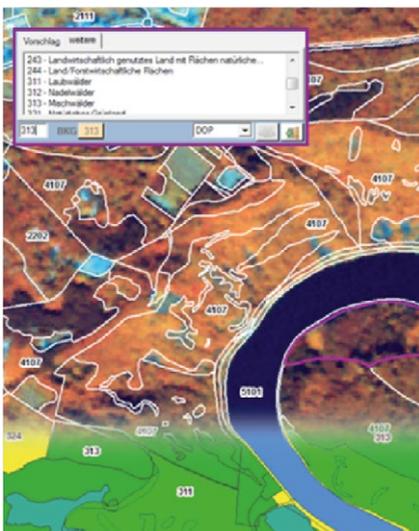
Capturing and taking inventory of the land surface are crucial for various planning, monitoring, and modeling purposes. IABG has longstanding expertise in the evaluation and analysis of multi-spectral, multi-sensorial, and multi-temporal landcover data.

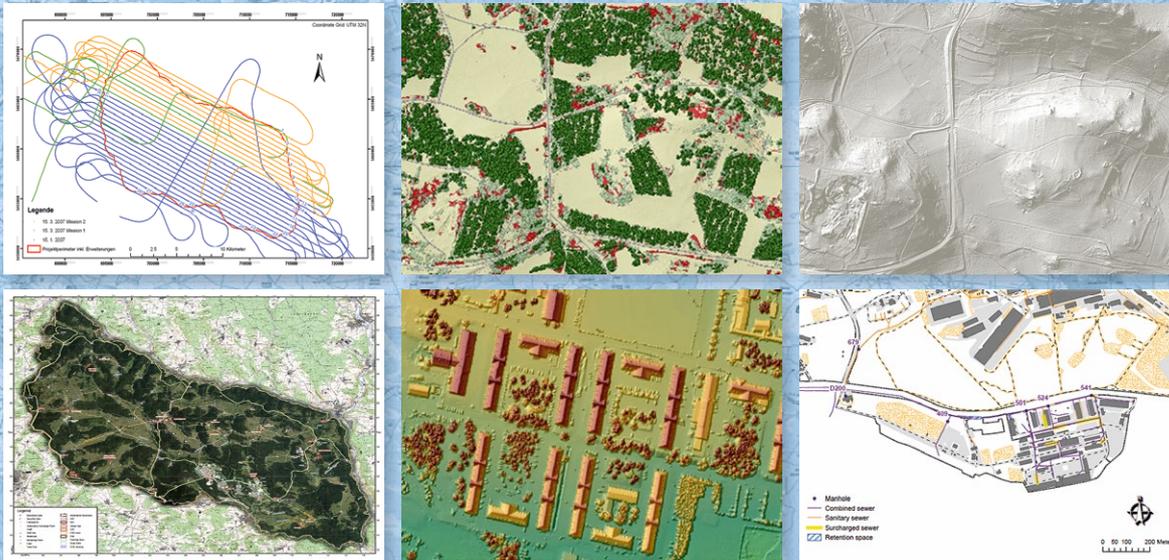
Our services are characterized by highest-quality standards, and comprise national nomenclatures (ATKIS®, LBM-DE, cadastre), European standards (Corine Land Cover), and international mapping provisions (DFDD, FAO, LCCS).

We support our forestry clients in forest inventorying by providing remote sensing and situational analyses and GIS-technical data handling.

Our services

- Land use mapping
- Land use classification using optical radar satellites
- Change analyses
- Data migration
- Storm damages assessment
- Biomass determination





Land Cover and Land Use • Current Frame Work Contract

US Army Corps of Engineers, Europe District

Support of Surveying and Photogrammetric Mapping Services, EUCOM

The US Army Corps Engineers awarded IABG with the Architect-Engineer Contract *Architect-Engineer (A-E) Indefinite Delivery Contract (IDC) in Support of Surveying and Photogrammetric Mapping Services, EUCOM (W912GB-16-D-0002)* with the duration from February 2016 until February 2021. The contract covers a wide range of geospatial services and tasks throughout the EUCOM Area of Responsibility (see map below).

IABG has a long-time experience and expertise in conducting all kind of geospatial related projects for the US Army Corps of Engineers and the various departments of the US Garrisons in Europe and is familiar with US Army regulations.

Together with specialized partners and experts IABG covers all the geospatial needs of the Garrisons and support and counsel them to achieve their objectives – to get the best training conditions and sustain the environment.

Our services

- Remote Sensing Services
- Aerial Imagery & LiDAR Survey Flights
- Aerialtriangulation & Orthophotography
- Photogrammetry & Stereo Mapping
- Land use/Land cover Interpretation
- Topographic Mapping
- Geographic Information System (GIS) Services & Technologies
- Database Technologies
- Detailed Planimetric, Cadastral, Utility & other Infrastructure Surveys
- Natural Resources Surveys & Management (e.g. Threatened Species)
- Cultural Resources Surveys & Management
- CAD Data Management



EUCOM Area of Responsibility



Brownfield Remediation

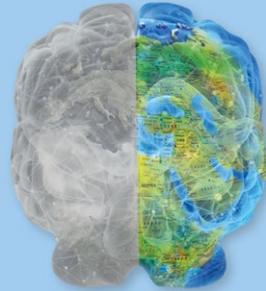
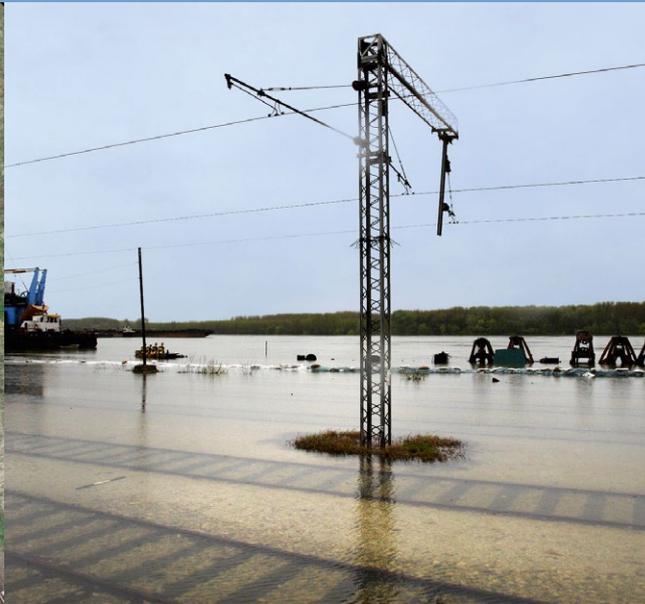
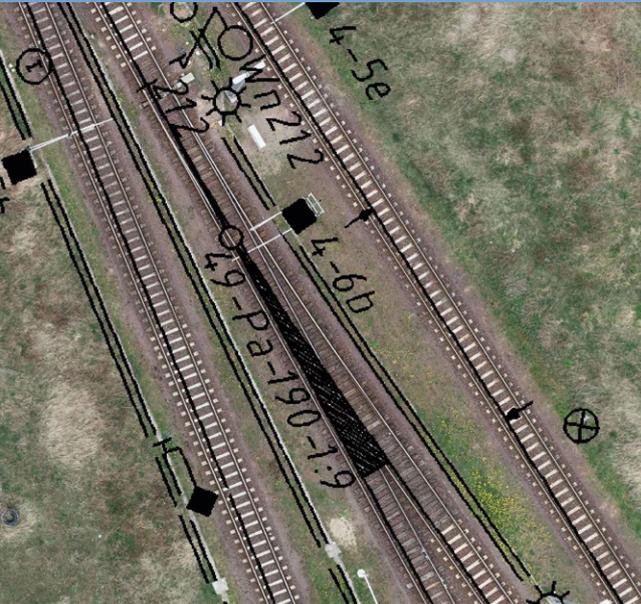
Experience and specialized knowledge in environmental consulting

As an independent service company, we possess current expert knowledge from 30 years of experience in national and international projects. As such, we pride ourselves in environmental consulting from an engineering perspective, which is particularly valued by our regular clients of the public and private sectors alike. Our longstanding experience and our specialized knowledge are the basis on which our clients entrust us with technically demanding cases.

Our thematic focus includes consulting in plant-related water protection and incident management, flood risk management planning, the remediation and aftercare of military and armament waste residue, the conversion of civil and military properties, technical project management, the preparation of manuals and study guides in the context of research programs, securing old waste deposits, and renaturation including land development.

Our consulting services are complemented with practically-oriented project management:

- Consultancy services in the field of civil and military waste residue, conversion, and environmental management for ministries, administrations, and the corporate sector
- Conducting expert training
- Technical support services
- Conducting ground, groundwater, and water analyses
- Site investigations for renewable energies



Survey and Monitoring of Railway Infrastructure

Services

Remote sensing and photogrammetry

- Processing of satellite and aerial imagery
- Generation of high resolution terrain and surface models
- Production of orthophotos
- Interferometric Synthetic Aperture Radar

Mapping

- Vector data acquisition
- Automated image analysis
- Topographic mapping
- Land-use mapping
- Emergency mapping and risk evaluation

3D stereo analyses

- 3D city models
- Cadastral surveying

Geoinformatics

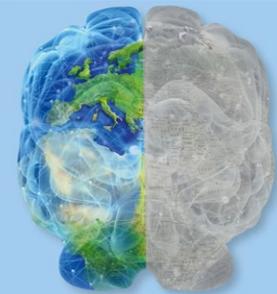
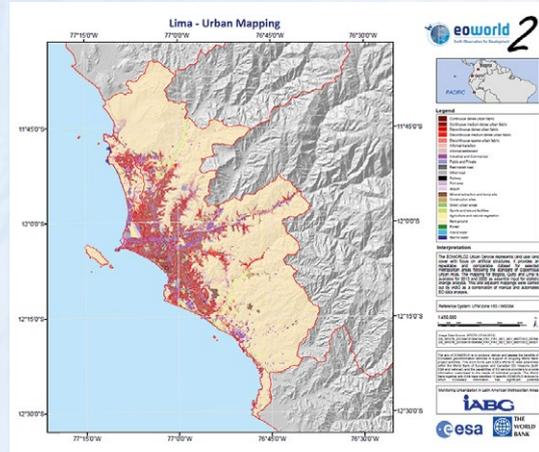
- GIS analysis
- Application development
- Database management
- Quality Assurance of Geodata

Land monitoring

- Ground movement
- Change detection

Projects

- Monitoring of track-geometry after heavy rainfall or landslides
- Semi-automatic acquisition of the railway infrastructure
- Management and quality assurance of infrastructure data
- Mapping and evaluation of forest areas as well as green at and in the railway track
- Ecological management of power lines aisles



Remote Sensing

A view from above

Satellite technology and remote sensing have a decades-long tradition at the IABG. During this time, we not only tested numerous satellites regarding their suitability for space travel in our Space Test Center but also extracted information from images captured by a wide range of sensors.

As such, our geodata experts process image data from optical sensors and radar images, as well as from LiDAR point clouds. Depending on the desired level of detail, images captured by satellites, aircrafts, or drones (RPAS) are used. 70 highly qualified employees use this Earth observation technology to solve a variety of issues that can affect a whole continent or even just a single land parcel. Thereby, the images are not only evaluated visually but are also semi-automatically classified using methods of object-based image analysis (OBIA).

Due to the increasing availability of satellite images with a high spatial and temporal resolution, remote sensing is becoming ever more important for Earth observation.

Our expertise, proven within the framework of Copernicus services, makes the IABG a reliable and sought-after partner for European institutions.

Areas of application

- Land cover/land use mapping
- Monitoring of critical infrastructures
- Risk and damage analysis
- Monitoring border security
- Urban development
- E-government

Our services

- Advice on the appropriate procedures
- Procurement of the image material
- Image processing/georeferencing
- Image interpretation/image analysis
- Presentation of the results



Digital Photogrammetry

From image to information

Highly accurate, current spatial information (geodata) is the basis of many planning and decision-making processes. Using individually captured or readily available aerial and satellite images, our experts carry out digital photogrammetry (image surveying) using state-of-the-art processing stations as an efficient method of obtaining accurate 2D/3D-data. Project-relevant visible objects and structures are thereby systematically and uniformly captured and stored in a database. The spatial resolution of the used images ranges from a few meters up to 3 cm and can thus be adapted to the requirements of our customers with regard to subject matter and accuracy.

Whenever geodata is used to realistically depict or model our complex world, the photogrammetric approach is the method of choice.

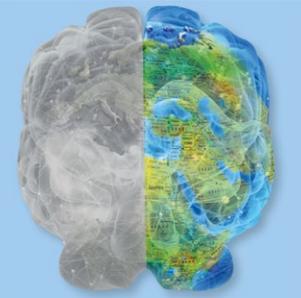
In close cooperation with our customers, we develop tailored solutions and implement them in sophisticated, cost-efficient projects. Our many years of experience and ISO 9001 certified quality management thereby ensure the highest quality standards.

Areas of application

- Land cover / land use mapping
- Terrain and surface models
- 3D city models
- Explosive ordnance exploration
- Solar registry
- Municipal cadastre
- E-government
- Natural hazards analysis

Our services

- Advice on the appropriate procedures
- Procurement of the imagery
- Image processing / georeferencing
- Photogrammetric evaluation
- Further processing in Geographical Information Systems (GIS)



Green Space Cadastre for Municipalities

Tree cadastre – cemetery cadastre – playground cadastre

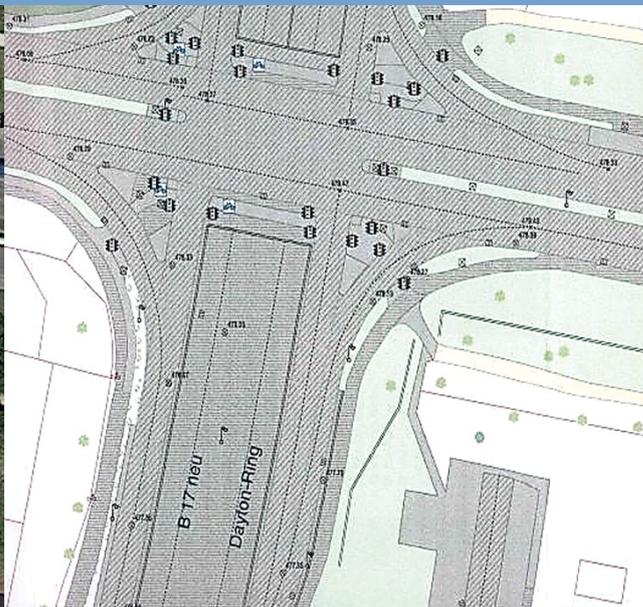
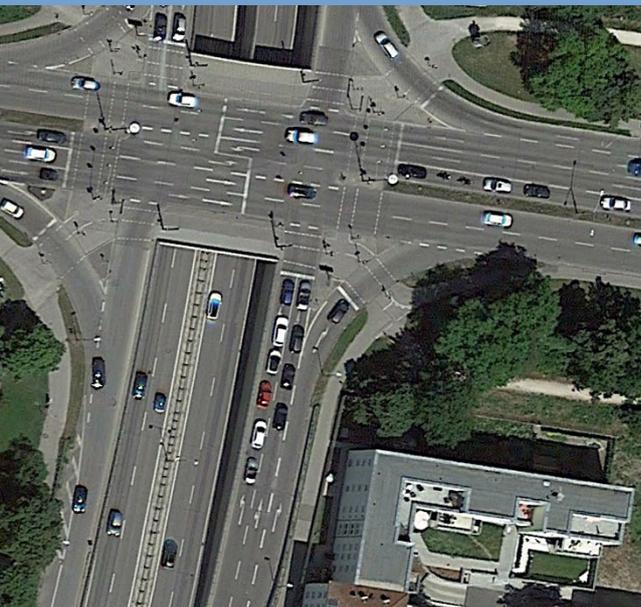
Urban green spaces in parks, tree-lined avenues, school sport facilities, are valuable elements of a well-rounded and high-quality city or municipality image. Digital green space cadastres enable the efficient management and maintenance of green space facilities, parks, playgrounds, and cemeteries, as well as center strip and roadside greenery. They support the operations of personnel and machinery and are used for the planning and fulfillment of the statutory traffic safety requirements.

Objects such as single trees, lawns, shrubs, bushes, and many more are precisely recorded using current aerial images of a suitable resolution and are organized in a database together with the necessary describing data and corresponding orthophotos. The tree cadastre provides the basis for the further attribution of the trees with regard to tree species, maintenance measures, checks.

Additional elements such as buildings, park benches, playground equipment, paths, access roads, and fountains complete the data inventory.

Our services

- Procurement of aerial images
- Development of mapping keys
- Interpretation of aerial images
- Generation of single tree cadastres
- Mapping of green spaces
- Creation of maps and databases
- Generation of orthophotos



Road Cadastres for Municipalities

Traffic areas and their infrastructure are among the most important assets of any municipality. A road cadastre depicts the road network in terms of type, location, and features in a GIS-executable manner, which means that the cadastre can be linked to many other types of geodata. This ensures that every road section is attributed with the necessary specialized information for care and maintenance measures, valuation.

The data is usually acquired by digitally mapping current aerial images of high spatial resolution. In doing so, transport areas are recorded and individually distinguished according to their function and surface type. In addition, road inventory objects such as traffic lights, street lighting, and drains, as well as center strip and roadside greenery are obtained. In a similar manner, the transport areas can also be linearly captured and linked with the desired properties in a node-edge model.

Our services

- Advice on selecting a suitable method
- Procurement of the basic data
- Digitization of the road network
- Generation of a node-edge model
- Attribution of the road network

Anhörungshogen
Grundstücksabflussbeiwert

planting
Stadtwerke
Simon-Cohen-Straße 1
54447 Pfaffing

Flurstücksdaten:
Gemarkung: Parkstein
Lage: Parkstein-Deufelstr. 64
Flurstückskennmer: 6933-3/5
Eigentümer: Fabian, Stephan
Gesamtfäche: 9585 m²

Legende:
Dachfläche: 782 m²
Versiegelt/Imhof: 871 m²
Unversiegelt

Die Angaben der Angaben sind bestätigt:
Ortsdatum: _____
Unterschrift: _____
Telefon Nr.: _____
E-Mail: _____

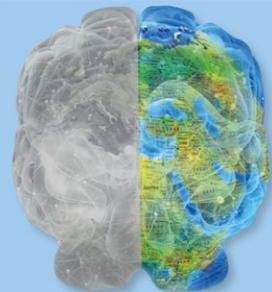
Sie Amberg-Weiden der Stadtwerke Pfaffing:
Herr Michael Schredde
+49 (0) 9621916032
michael.schredde@stadtwerke-pfaffing.de

Lageplan: Maßstab 1:800
Datum: 05.07.2013

Expansions bei Bedarf hier einzeichnen.
(Flächen in Plan und in der Tabelle sind eindeutig kennzeichnen)

Nach der Auswertung der bebauten und befestigten Flächen auf Ihrem Grundstück ergibt sich ein mittlerer Grundstücksabflussbeiwert von 0,17. Als Ergebnis wird eine reduzierte Grundsteuerklasse von 1438 m² zur Berechnung der Niederschlagswassergebühr für Ihr Grundstück herangezogen.
→ Informationen zur Berechnung der Werte entnehmen Sie bitte dem Hinweisblatt

ANKUNFTSZEITEN 9932 310 5488 81



Introduction of the Split Wastewater Charge For municipalities

Based on highest court rulings, many cities and municipalities are obliged to separate their wastewater charges according to the share of wastewater and rainwater, respectively. Over the past thirteen years, the IABG has accompanied 43 cities and municipalities in southern Germany on their way to introducing split wastewater charges.

The contributory share of the rainwater results from the sealed areas in the land parcels. The degree of ground sealing can be measured or estimated using different methods. Both are based on aerial imagery, which can either be analyzed photogrammetrically for separate land parcels or used to define areas of comparable surface runoff. To involve the citizens in this process, information sheets are automatically generated from the database and sent to the landowners for inspection and approval. The documents returned by the citizens are reviewed and incorporated into the database, which is delivered to our customers for the contribution calculation.

Our services

- Advice on the appropriate procedures
- Public relations work
- Conducting the imaging flight
- Capturing the sealed surfaces
- Creating personalized information sheets
- Organization of citizens' participation
- Dispatch of the information sheets
- Incorporation of citizens' responses



3D City Models for Municipalities

Cities and municipalities are increasingly providing their citizens and administrators with 3D city models. The level of detail ranges from simple block models (LoD 1) to complex building models (LoD 3).

City models serve many purposes:

- City and urban development planning
- Noise and pollution forecasts
- Urban climate
- Solar cadastre
- Assessing heat requirements
- Heavy rainfall management
- Applications planning

These models are also used to illustratively present the municipalities in the areas of tourism and marketing.

High-precision building landscapes are modeled by photogrammetric analysis. Simpler city models are produced using the partly automatic Semi-Global-Matching Process, which creates a surface model of the urban area. Both techniques use aerial images that have a resolution of 8 cm to 20 cm.

Our services

- Advice on the appropriate procedures
- Procurement of the basic data
- Site and building extraction
- Modeling



Solar Cadastres for Municipalities

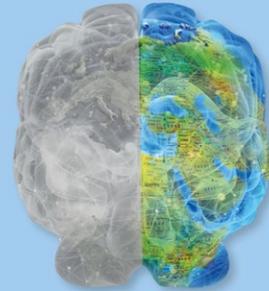
Government funding measures have led to local authorities increasingly publishing a solar cadastre in their portals. This provides neutral information about the suitability of roofs and open spaces for solar thermal energy and photovoltaics. In addition to the solar potential, information about vendors, service providers, funding opportunities can be integrated. The planning of solar parks in open spaces is also supported by this cadastre.

Decisive factors for determining the solar potential of buildings are, on the one hand, global radiation, roof area, roof pitch, and roof orientation, and, on the other hand, the shading caused by other buildings, roofs, and trees, and the relief. Based on this information, the solar potential of the roof and ground surfaces is calculated using current aerial images. For a more detailed assessment of the potential, dormers and interference objects such as chimneys, roof lights, and aerials can be recorded and included in the modeling process.

The level of accuracy desired by our clients determines the choice of modeling method.

Our services

- Advice on the appropriate procedures
- Procurement of the basic data
- Site and building extraction
- Modeling
- Determination of the solar potential
- Integration into a city portal



Explosive Ordnance Exploration for Municipalities

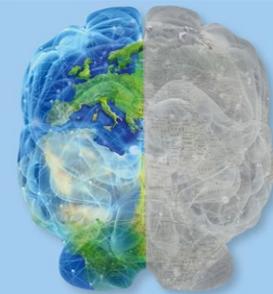
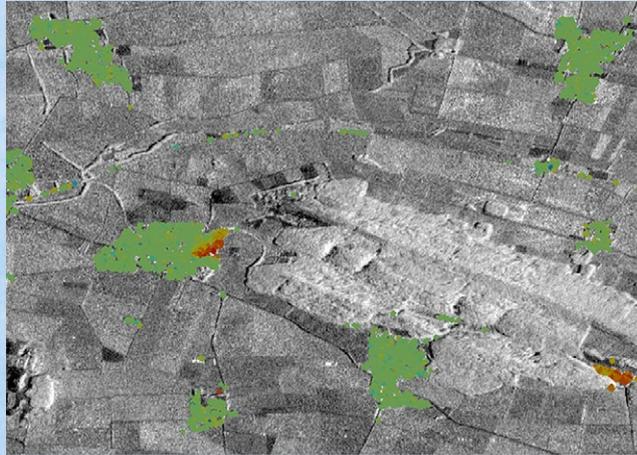
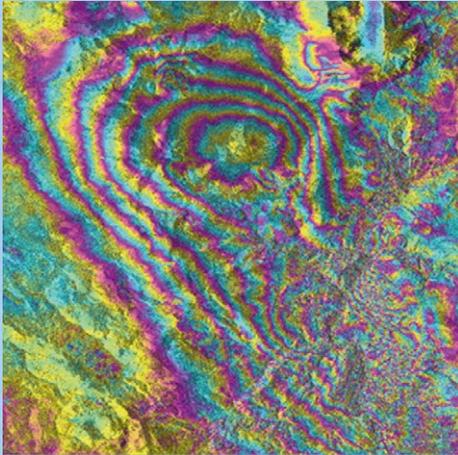
News of bomb discoveries always causes a stir among the population, in a reminder of the dangerous remnants of the Second World War that are still slumbering in the soil of our cities, oftentimes only to be discovered during earthworks. To minimize the danger to local residents and site personnel, our specialists investigate the local effects of war before groundbreaking.

Since 1991, our experienced aerial image interpreters have been analyzing images that were captured from the air by the allied forces during the war. In doing so, they record former military facilities, ruins, filled pits, bomb craters, and suspected unexploded ordnance sites, which they subsequently document in reports and depict in maps. If abnormalities are detected in the investigation area, technical weapons investigations can be carried out on-site as a further measure.

The IABG is listed as a specialist company of aerial imagery evaluation in the directories of the Bavarian Interior Ministry and the bomb-disposal services Rhineland-Palatinate and is a member of the Güteschutzgemeinschaft Kampfmittelräumung Deutschland e.V.

Our services

- Provision of wartime aerial images
- Evaluation of archives
- Image Interpretation
- Mapping effects of war
- Report Generation
- Recommendations for action
- Historico-genetic evaluation



Radar Remote Sensing and Interferometry

In radar remote sensing, electromagnetic pulses are emitted from aircraft- or satellite-mounted sensors, which then record and process the radiation backscattered from the earth's surface. In doing so, various frequencies (X-band, C-band or L-band) are used for different application areas. This active process allows for Earth observation at any time of the day and in all weather conditions.

The recorded signals represent a complex combination of backscatter intensity and wave phases. These not only allow conclusions to be drawn about the properties of the earth's surface (roughness, humidity) but also enable the recording of the terrain height. Radar interferometry includes various measuring methods for the comparative analysis of image pairs and time series.

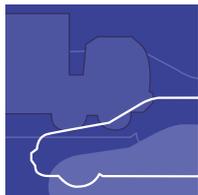
Classic differential SAR interferometry uses recordings of two points in time to detect changes in the height of the earth's surface. With the advanced methods of interferometric stacking, monitoring tasks can also be accomplished by analyzing data of entire time series. After the reduction of interferences, it is possible to identify ground movements in the cm to mm range.

Areas of application

- Land cover / land use mapping
- Soil moisture mapping
- Flood areas
- Risk and damage analysis
- Geotectonic crustal movements
- Natural resource / groundwater extraction
- Subterranean work
- Landslides
- Marine pollution

Our services

- Multitemporal land cover analysis
- Measurement of surface deformations
- Damage detection after environmental events
- Monitoring of ground movements



AUTOMOTIVE



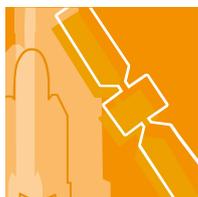
INFOCOM



MOBILITY, ENERGY & ENVIRONMENT



AERONAUTICS



SPACE



DEFENCE & SECURITY

Areas of application

Typical geodata applications include land-use planning, surveying and mapping, flood and disaster control, environmental monitoring, mobile telephony planning, contaminated site management or market research. As a result, consumers increasingly benefit from geodata-based products such as navigation systems and online services, e.g. route planners, Google Earth or Bing Maps 3D. High-resolution geodata is also an important resource for military and border control staff, given the growing number of missions in an extended area of operations.

IAGB Geodata Factory

At our ultramodern geodata production site in Dresden we have the human and infrastructural resources to handle even extensive geodata projects. At present, we are helping the German Federal Armed Forces evaluate satellite images and the Federal Agency for Cartography and Geodesy update the Digital Landscape Model DLM-DE.

About IABG

IABG is a leading European technology enterprise. We focus on trend-setting high technology and science applications. We plan, implement and operate. With approx. 1,000 experienced and committed employees we provide our customers with solutions in the sectors Automotive • InfoCom • Mobility, Energy & Environment • Aeronautics • Space • Defence & Security.

About IABG Environmental Services

We are a preferred partner for complex projects in the environmental sector, e.g. for the remediation of contaminated sites. Our areas of expertise are environmental engineering and geodata. At the IAGB Geodata Factory we capture and interpret geographical data, for example for surveying flood risk areas, planning mobile telephone networks, designating sites for wind and photovoltaic power plants and for municipal cadastres (e.g. for soil sealing, split wastewater fees).

- Environmental engineering
- Geodata service
- Remediation
- Power management
- Environmental risk assessment
- Renewable energies

For more information please contact:

Phone +49 89 6088-2823
geodaten@iabg.de



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