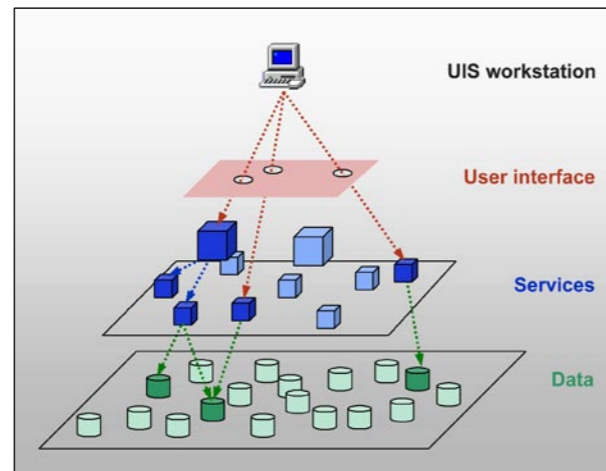## Technological Background

Modern information technology is required to meet the various demands facing the UIS Baden-Wuerttemberg. Therefore, during several years of research and development a comprehensive service concept has been established and implemented, which fulfils the current and future demands. The guidelines of the service concept are documented in the framework concept of the UIS.

The service concept includes a large number of diverse services, providing access to the required data, according to the users´ demands. Instead of uniform and self-contained applications for large user groups, the UIS provides options to set up customized user interfaces, matching the specific information demands. The multiple use of several UIS components considerably increases the economic efficiency.
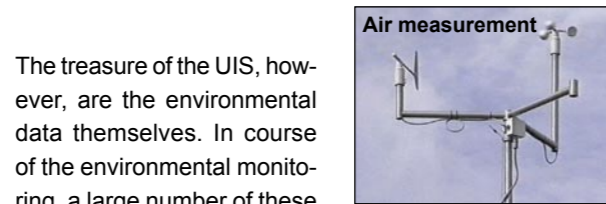
High-performance data management systems (lower level) provide the basis for the service-oriented UIS, as illustrated in the figure to the right. Thereby, open data interfaces facilitate easy data exchange. A common data model, used in most thematic areas, allows a large number of users to work with these data. The further components of the UIS are based on this data model.

The UIS offers a rich variety of services (middle level), which include navigation and data access as well as the integration of standard office applications. With descriptive metadata the particular services, which are increasingly realized in a web-based manner, can be combined to complex applications. A main focus is laid on the advancement of public e-services.

Together with the environmental data, the services represent the resources of the UIS. Based on customized user interfaces, the user may access the resources from his personal workstation (top level), without specialized knowledge of the system. According to the personal settings, the relevant resources are selected and subsequently allocated through a user-friendly interface, thereby improving the workflow within the authorities sustainably.

The UIS workstation in terms of the service concept: customized user interfaces for individual requirements

The treasure of the UIS, however, are the environmental data themselves. In course of the environmental monitoring, a large number of these data is continuously collected by self-operating instruments, automatically evaluated and uploaded to the UIS databases. The high degree of automation allows realtime data access for decision makers e.g. in case of floods.
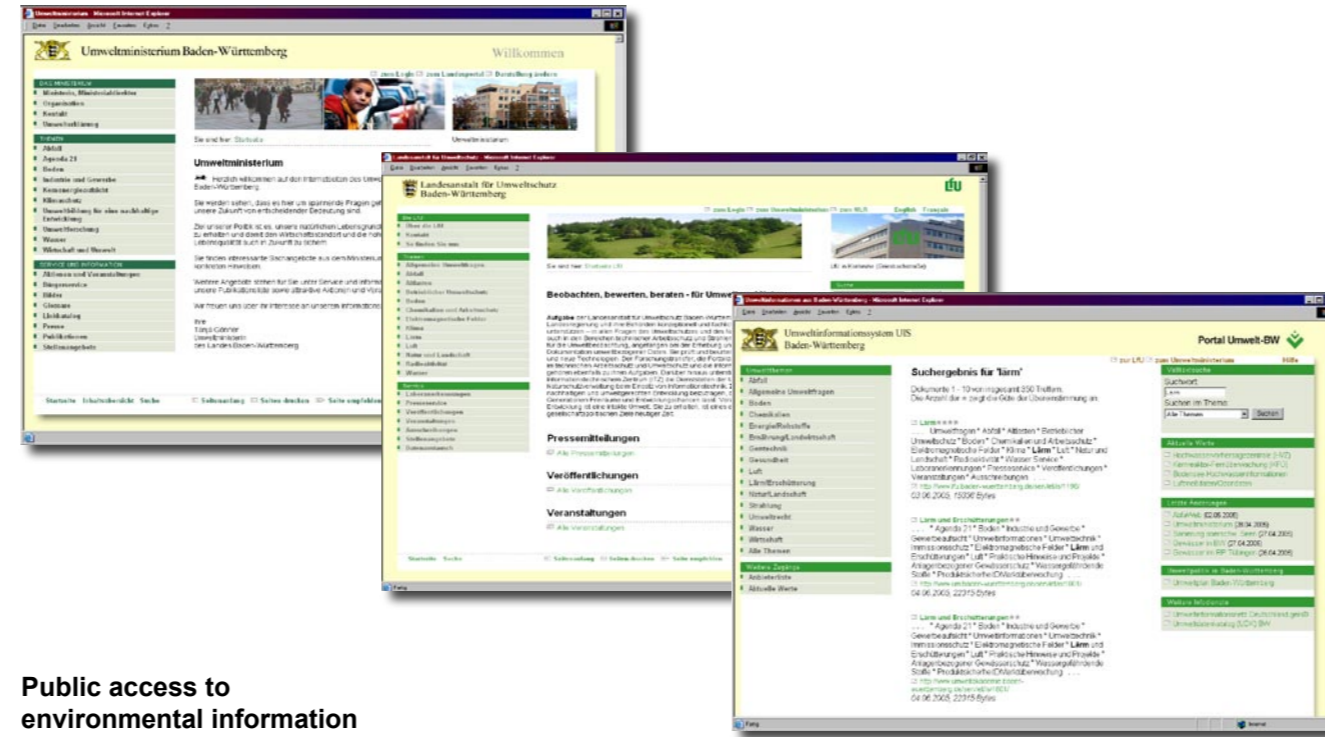
Air measurement

Discharge measurement

Noise measurement

Monitoring networks provide continuously realtime data

Information on the Internet

Public access to environmental information

The website

www.umwelt.baden-wuerttemberg.de

provides public access to high-quality information on the environment in Baden-Wuerttemberg. All relevant information of the environmental Land authorities can easily be retrieved through this environmental portal. The variety of information includes data, which usually cannot be found using commercial search engines, such as press releases, environmental reports and data from monitoring networks and the statistic database. Public environmental information from Baden-Wuerttemberg is also available via the German Environmental Information Network gein®, the Land Administration Portal of Baden-Wuerttemberg at the URL *www.service-bw.de* and the Land Portal at the URL *www.baden-wuerttemberg.de*. All these information sources help to fulfil the obligation to publish environmental information according to the future Baden-Wuerttemberg environmental information act (LUIG) and the corresponding EU directive respectively.

An overview of the current environmental situation in Baden-Wuerttemberg is given in the printed report "Umweltdaten", which is regularly released by the Ministry for the Environment Baden-Wuerttemberg. It is available at the delivery service of the State Institute for Environmental Protection at the JVA at Mannheim, Herzogenriedstraße 111, D-68169 Mannheim, Germany or online at the URL *www.lfu.baden-wuerttemberg.de*.

UIS BW
Environmental Information System Baden-Wuerttemberg

Comprehensive Information in the Service of Environmental Precaution

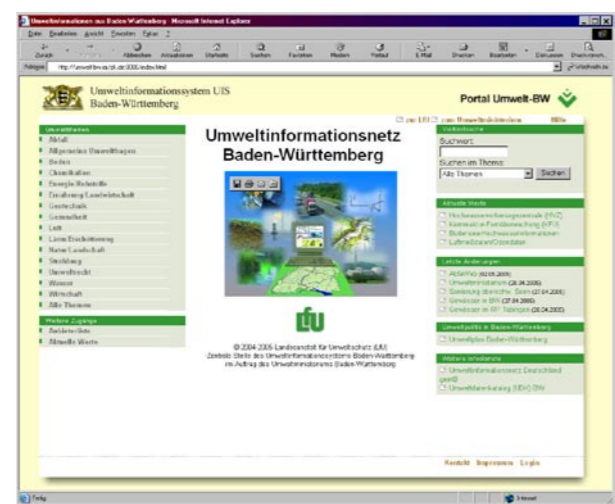## Modern information technology serving the environment

Within the Environmental Information System of Baden-Wuerttemberg (UIS BW) the Ministry for the Environment (UM) coordinates cross-departmentally the entire processing of environmental information. Data on different environmental topics such as water, air, waste or nature and landscape are collected and administered by many departments. The UIS assists in making these varied data available. Unified standards and formats guarantee the accessibility and the usability of the data for different divisions. This facilitates data exchange with other areas like road engineering and traffic, with the Federation, the Laender and the local authorities in Baden-Wuerttemberg.

Measured values alone are not very meaningful, however. For their adequate use additional information on aspects such as sampling conditions, measuring procedures as well as threshold and standard values are required. Then measured values can be regarded in their correct context. Here the UIS provides substantial aid to understanding.

Another task of the UIS is to collate data from the different environmental departments. Within the work field of the environmental protection authorities, measured values have to be assessed frequently, e.g. in connection with remediation or conservation plans. Therefore the UIS supplies additional information as well as measured data, law texts, methodical descriptions or abstracts of environmental reports. Thus the process of environmental planning is supported efficiently.

Apart from the UM, which is responsible for the entire Environmental Information System of Baden-Wuerttemberg and its cross-departmental coordination, the other Land ministries with environmental tasks are involved in the UIS, as well as the intermediate Land authorities and rural and urban districts. The UIS components are mainly developed by the State Institute for Environmental Protection (LfU), the operational headquarters of the UIS. Furthermore the "Datenzentrale Baden-Wuerttemberg", the "Forschungszentrum Karlsruhe" and other partners in the research and development project "Kooperative Entwicklung wirtschaftlicher Anwendung für Umwelt und Verkehr in neuen Verwaltungsstrukturen" (KEWA – Cooperative development of economical applications for environment and traffic within new administrative structures) cooperate in the development.

The Environmental Information Network of Baden-Wuerttemberg and its Environmental Portal

A main requirement for the use of environmental information is the knowledge about which information is provided and how it can be accessed. Important assistance is given by the Environmental Information Network of Baden-Wuerttemberg (UINBW). Its central point of access, the so called "Umweltportal Baden-Wuerttemberg", offers thematic access and search options, which also cover large information services (German Environmental Information Network gein®, Environmental Data Catalog UDK).
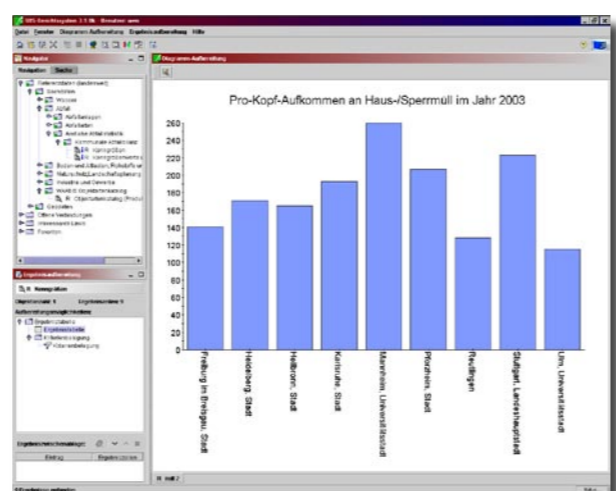
On the one hand, the Land authorities as well as the local authorities receive efficient execution support. On the other hand, it is a convenient way for interested citizens to get an overview of the environmental data existing in the UIS BW, provided by the websites of the authorities involved in the Environmental Portal.

The most important data of the UIS are supplied by the State Institute for Environmental Protection (LfU) and the Centre for Environmental Measures, Environmental Data Collection and Equipment Security (UMEG) at Karlsruhe. In addition to the Land authorities and the local authorities in Baden-Wuerttemberg, other Laender, the Federation, neighbouring countries, the European Union, research organisations as well as the public are among the users of the UIS.
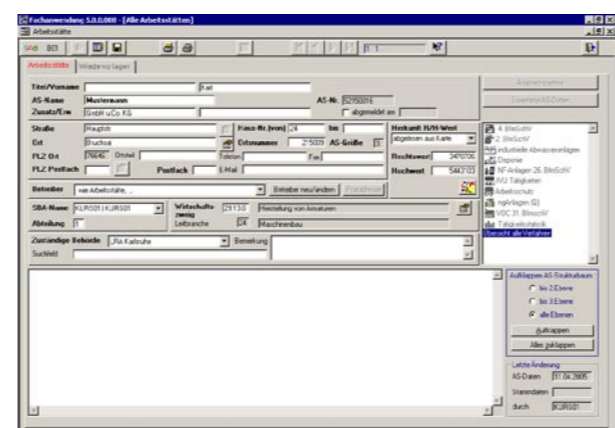
Specialized applications for the environmental authorities

The majority of data within the UIS are of technical nature, produced during the execution of environmental tasks. In the specialized application of the Industrial Inspection Authority (FA-GWA), for example, the data of approx. 400.000 working places and their environmentally relevant industrial plants are documented. The technical data primarily support the users at service agencies performing their executive tasks, but also are used by comprehensive reporting systems.
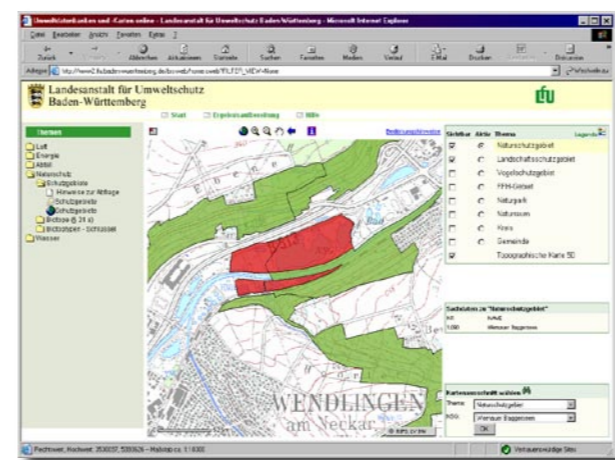
Reporting data for the overview

Anonymized reporting data arise from selecting and compressing technical data. With systems such as the UIS Reporting System (UIS-BRS) technical and management personnel of the environmental Land authorities and the local authorities, for example, are able to receive these reporting data directly from the thematic databases. The service "Environmental Databases and Maps online" provides easy access for the public. Selected reporting data from the UIS are also available at the State Information System (LIS), which is operated by the Statistical Office of Baden-Wuerttemberg.
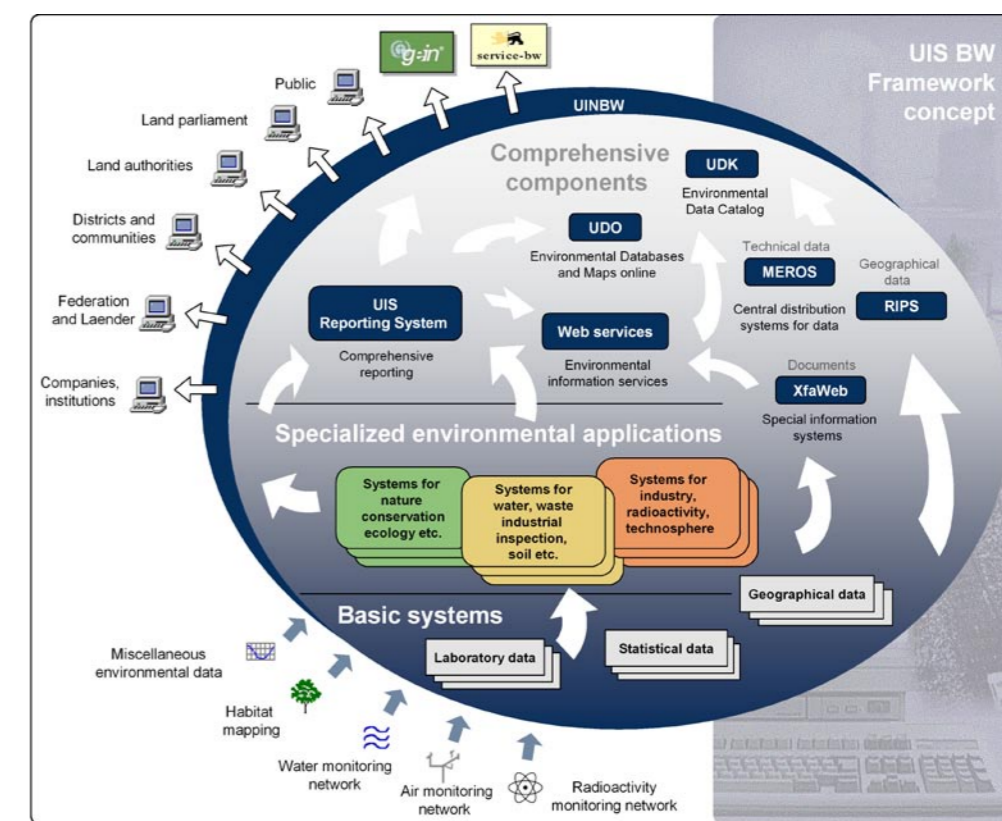
Geographical data as information basis

For a multidisciplinary linkage of environmental data as well as for the creation of spatial overviews and thematic maps, spatial base data are required. The Spatial Information and Planning System (RIPS) provides spatial base data - primarily originating from the Land Surveying and Mapping Agency of Baden-Wuerttemberg – combined with geo-referenced environmental data (e.g. protected areas, river network) for the users of the UIS at the Land service agencies and the municipalities.

In order to offer intuitive access to the contents of the UIS and a better illustration of spatial relations, more and more interactive mapping services are made available on the internal intranet and the public internet, e.g. in the context of the service "Environmental Databases and Maps online (UDO)".

An economic development and extension of complex information systems, such as the UIS Baden-Wuerttemberg with its numerous components, requires central guidelines and control. For this reason the development of the UIS has been based from the beginning on a conceptual framework (RK UIS), which is updated periodically. The advancement of this framework concept takes into account the current guidelines of the e-government concept of Baden-Wuerttemberg und the German Conference of Environment Ministers.

As seen in the figure above, the framework concept distinguishes from the user´s point of view between three system categories: basic systems, specialized applications and comprehensive components. The basic systems do not specifically serve the processing of environmental information, but parts of their data, methods or tools are used in the UIS. The public sector networks of the Land (LVN) and the communities (KVN) are examples of basic systems, which allow data transfer between the authorities of Baden-Wuerttemberg. Furthermore the State Information System of Baden-Wuerttemberg (LIS) provides statistical environmental data.

The main part of the UIS is composed of specialized applications for the different environmental topics, such as water, soil, air, radioactivity, waste etc. For example, the Information System for Water, Waste, Contaminated Sites and Soil (WAABIS), the Information System of the Industrial Inspection Authority (IS-GAA) and the Nature Conservation Information System (NaIS) belong to this category of applications. The WAABIS and the IS-GAA are currently merged into the Information System for Water, Waste, Industrial Inspection, Contaminated Sites and Soil.

Finally, comprehensive components bring together information from different environmental topics and provide access to these data. Among them are the UIS Reporting System (UIS-BRS), the Spatial Information and Planning System (RIPS) and the Measuring Series Operation System (MEROS), which allows uniform data management for all fields of environmental monitoring data and data series.