

Flood Risk Management Services

Geo-Information Supporting Flood Prevention and Mitigation

Floods are among the most frequent types of natural disasters in Europe: More than 100 major floods were recorded in the past decade alone, each causing severe social, ecological and economic damage.

The overall objective of an effective flood risk management is to reduce the likelihood as well as the impact of floods. Infoterra's geo-information services are a fundamental source of information for all phases of risk management; they reliably support the responsible authorities and relief units in their decision-making.



All across Europe, floods frequently cause major damages

Infoterra's services are based on Earth observation and ancillary data as well as sound modelling techniques. The service package consists of four complementary services.

Mapping of Flood Events:

Based on Earth observation data acquired by satellites or airborne sensors and – if available – historical maps, this service provides maps of historical or recent flood events in support of existing data bases. Combining information on flood extent and progression with further knowledge such as landcover and infrastructure information supports flood risk management during post-crisis and preparedness phases of the risk management cycle.

Flood Risk Maps:

A multitude of information is displayed in Infoterra's flood risk maps: flood areas, floodprone areas, damage potentials, and specific parameters such as water depth, flow velocity, flow direction. These maps are based on simulations using hydrologic models coupled with GIS software. The precise calculation parameters are defined in cooperation with the users; usually, 100-year or larger return intervals as well as dam failure scenarios are simulated.

Damage Assessment Maps:

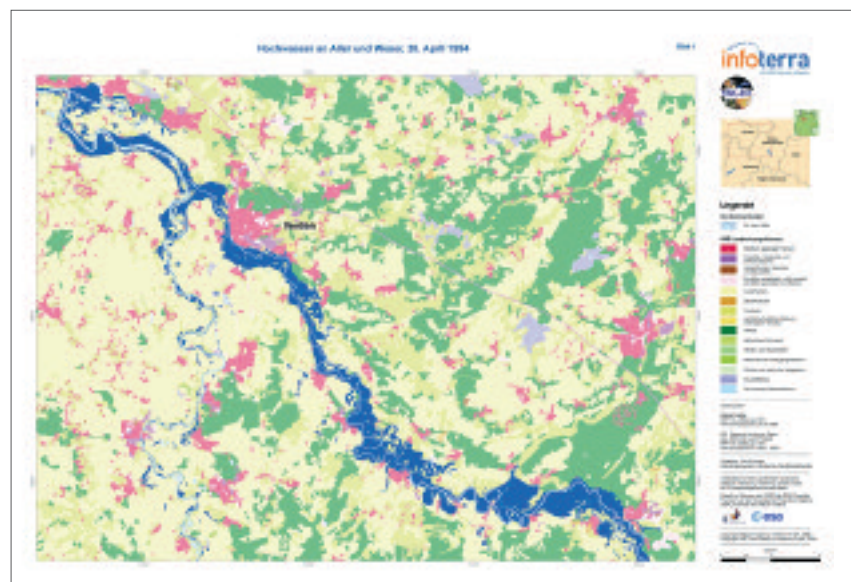
Economic losses caused by floods and the spatial distribution of damage



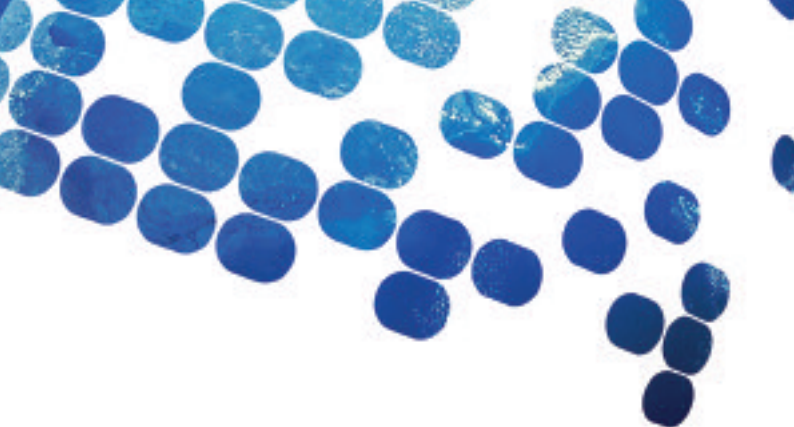
potentials are displayed in maps that can be provided for actual or potential damages. Damage calculation is performed using well-established damage functions based on information about water depth and/or flow velocity as well as land use and socio-economic statistics.

Flood Information System:

This internet-based system bundles a multitude of information levels, such as historical maps, satellite maps of past or current floods, flood risk and damage potential maps. It is configured according to the individual client's definitions and can then be made available online – either publicly or to a restricted group of users selected by the client. A first implementation is available via www.floodrisk.eu.



1994 flood event at rivers Aller / Weser (Germany), mapped for Schwarmstedt region



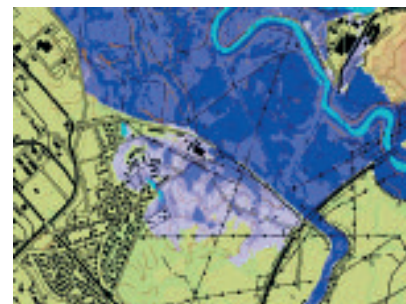
Infoterra's flood risk management services **support decision-making on all administrative levels**: from local rescue and emergency units and communal bodies to European institutions active in flood management, civil protection or spatial planning; respectively in charge of implementing the European Floods Directive.

The assessment of former flood events is a valuable knowledge base for environmental and urban planning issues. Flood risk maps provide essential information for flood risk preparedness and environmental planning. Damage estimation serves as basis for spatial planning and disaster control and can validate the effects of preventive measures as well as clarify the residual risk. The flood information system permits fast and reliable access for decision makers to crucial information.

Infoterra's Flood Risk Management services have been **developed in close cooperation with user organisations across Europe** – they are specifically designed to fit user-defined requirements and have been validated and approved. This user-driven development approach ensures that customers are provided with reliable and efficient geo-information services that can be acquired as standardised products or may of course be adapted to the specific requirements of individual applications.



Flood risk scenario simulation:
flood extent before a dam failure



Flood risk scenario simulation:
flood extent after a dam failure

Technical Specifications:

Themes	Flood Extent Maps * Flood risk maps depicting water depth, steps/classes defined together with users Flood damage maps depicting economic values
Thematic accuracy	>80% *
Geometric resolution/scale	2.5 – 20 m *
Typical working scales	1:10,000 – 1:20,000 *
Update frequency	Depending on user demand
Format of delivery	GIS formats e.g. .grid, .tiff, .img, .shp
Type of data delivered	Maps (print outs and digital), statistics, GIS files
Data sources used	EO data of different sensors, satellite and airborne images, digital elevation models, historical maps, socio-economic data

* for "Mapping of Flood Events" all available Earth observation data acquired during flooding time is used for production. As the sensor entails all product specifications, only approximate figures given.

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