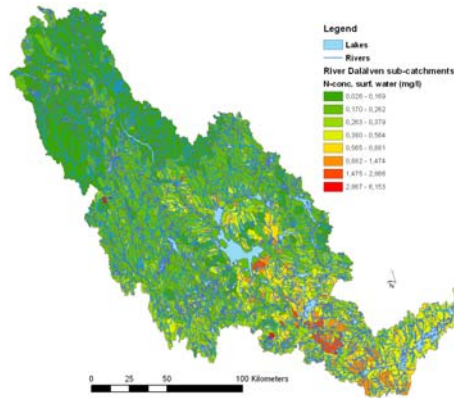


Water quality and quantity

The topics addressed by the water group within the Observatory Water & Soil are water quality and quantity. The overriding policy for the observatory is the European Water Framework Directive (WFD) but water management in general at regional and national level is addressed.

An important objective of the Observatory Water & Soil – Water is to develop and establish pre-operational capabilities of an efficient use of spatial information related to land management and irrigation practices within European river basins. This is done in close co-operation with key user organisations, such as national and regional environmental authorities and river basin authorities, responsible for the implementation of European policies, directives and standardisation initiatives.

The demand for a wall-to-wall system for monitoring spatial and temporal variations and the follow-up of environmental trends, quality objectives and policy measures calls for a new conceptual framework. The Observatory will address this by developing stable, repetitive and quality-assured methods that integrate and optimise the



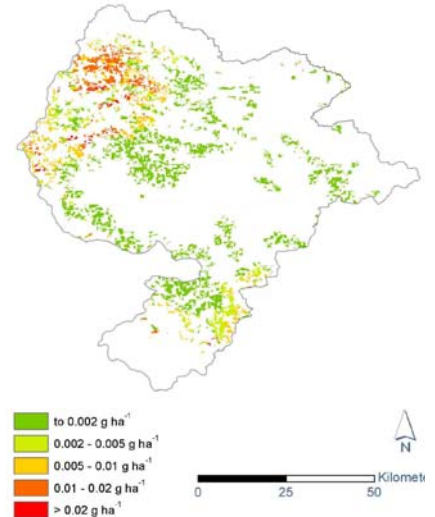
Product examples – Water quality

1. Sweden: Source apportionment of nitrogen in surface waters in the Dalälven river basin.

use of earth observation derived information, i.e. land use / land cover data with customized thematic, spatial and temporal resolution, and ancillary geospatial data as input to catchment and surface water modelling.

The Observatory addresses the WFD as a key policy covering a broad range of implications, where information derived from Earth observation satellites can contribute to a high extent, providing spatial information on environmental pressure and state, which can be translated to pollution risks and environmental indicators required from decision makers.

Isoproturon (April) High resolution (SAGE class 55)



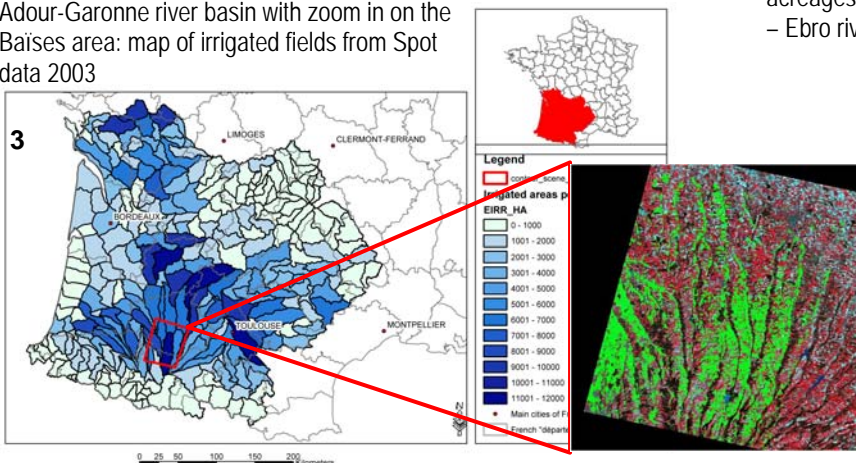
2. Germany: Plant Protection Agents modelled using the DRIPS model (Drainage, Runoff & Spraydrift Input of Pesticides into River Systems) for the Unstrut river basin

An integrated and innovative approach, based on different observation systems available, ancillary data, statistical methods, catchment based source apportionment models will contribute to improved monitoring programmes and to WFD reporting obligations.

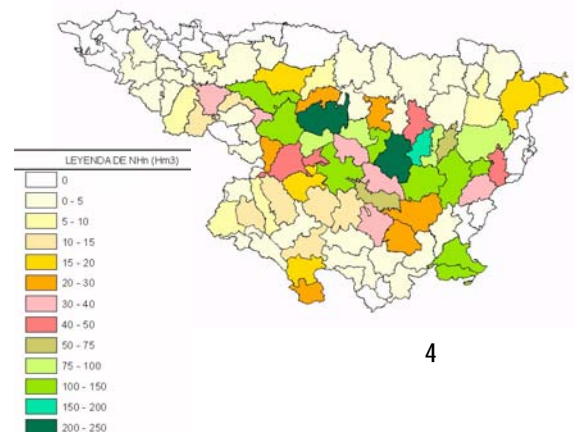
The close co-operation between end-users, service providers and frontline scientific expertise will ensure that the development will be based on user requirements and that the results will be adopted and disseminated to a wider user community.

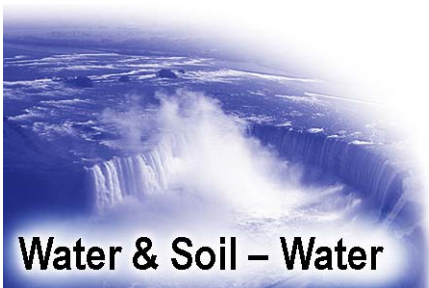
Product examples – Water quantity

3. France: areas of irrigated summer crops per hydrographic unit, Adour-Garonne river basin with zoom in on the Baises area: map of irrigated fields from Spot data 2003



4. Spain: GIS information per hydrological unit, of irrigated acreages for various crops and irrigated volumes (see map below) – Ebro river basin





The environmental issues related to water differ between the various geographical regions of Europe. Southern Europe is affected by water shortage situations due to imbalance between irrigation and resources. The boreal regions are affected by intense forestry. Finally, as water pollution by fertilizers and pesticides is a common concern in Europe, it affects with higher intensity regions of stock-farming and the Western and Central Europe, where intensive cereal agriculture is practiced. This shows the importance of carrying out the work at a European level with a segmentation approach for different eco-regions.

The partners of the Observatory are all involved in national as well as international research, development and implementation activities of relevance to the WFD. Their insight into other relevant projects, such as the ESA GSE projects SAGE and GSE Land addressing mature geo-information services to serve WFD related issues (see: <http://www.gmes-sage.info>), will secure that account will be taken to these activities. Especially for GSE Land the geoland project will act as a platform where further

validation will be done for promising services or service components.

Land cover and land use classification

High to medium spatial resolution satellite data are used, individually and/or in combination to derive the specific land cover / land use products required as input to water quality and quantity modeling. In the former case the land cover classes forest, peatland and arable land are further refined, in the latter case arable land is the main focus. These refined high resolution land cover / land use products are mainly based on the geoland Core Service Land Cover and national land cover / land use data sets.

Water quality

The refined land use products are used together with ancillary data as input to water quality modeling, with focus on nutrient and pesticide leakage to surface waters. The test sites are situated in Germany (State of Thuringia), France (Adour-Garonne Basin), Spain (Ebro river basin) and Sweden (Dalälven river basin).

Water quantity

The product consists of a set of GIS compatible maps reporting on the water abstraction pressure by irrigation. The test sites for water shortage are situated in Spain (Ebro basin) and France (Adour-Garonne Basin).

User involvement

Apart from the user organizations that are actively involved in the project (see below) strong support has been expressed by e.g. *Agence de l'Eau Adour-Garonne*, *Confederación Hidrográfica del Ebro*, *Spanish Ministry of Agriculture* and *Umweltbundesamt Germany*.



OWS-W Test Sites

Dalälven river basin (Sweden), 29.000 km²; Ebro basin (Spain), 85.000 km²; Adour-Garonne basin (France), 120.000 km²; Unstrut river basin (Germany), 6.500 km².

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User organisations



Service providers and scientific experts

