Providing WFD Reporting over SDI services

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The Water Framework Directive (WFD) [OJ, 2000] introduces a new approach to data and information collection and reporting of hydrologic data and WFD implementation state from member states to the European Commission. This work proposes to use INSPIRE [CEC, 2004] principles for fulfilling the reporting requirements imposed by the WFD, i.e. the required data and information will be directly accessed within a spatial data infrastructure.

This work has dealt with a subset of the information described in the 2005 Reporting Guidance document, which collects typology information for the different types of water bodies, as stated by the article 5. The 2005 reporting guidance document [EC-DG Environment D.2, 2004] distinguishes between 28 reporting sheets of which a subset has been implemented.

The final result of the work has been a web application that presents to the user the WFD information according to the reporting requirements. The application offers to the user the possibility of choosing a report sheet:

- typology of surface water bodies (SWB1),
- identification of surface water bodies (SWB 2),
- artificial and heavily modified surface water bodies (SWB 3),
- reference conditions (SWB 4),
- significant pressures summary (SWPI 1),
- surface water bodies at risk (SWPI 2),
- point source pollution (SWPI 3),
- diffuse source pollution (SWPI 4),
- water abstraction (SWPI 5),
- flow regulations and morphological alterations (SWPI 6),
- data gaps (SWPI 8) and
- recommendations for surveillance monitoring (SWPI 9).

Additionally, the application allows the user to customize the kind of information to be considered when showing the request trough a window (Figure 1) where restrictions to the features to be included in the report can be made. In addition, the user can specify if they want to visualize the features of the report with their real geometry (lines for river water bodies and polygons for lake, coastal and transitional water bodies) or only as centroids (points) and the legend to be applied to the features.

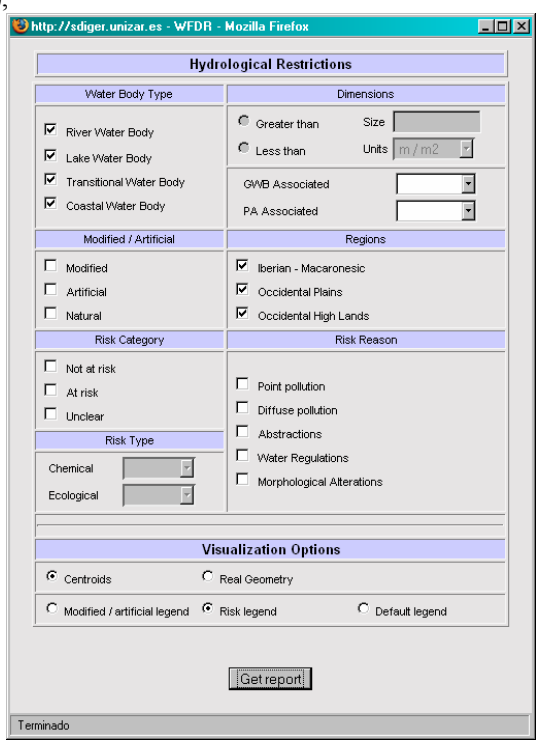

Figure 1. Restrictions window

- The reports corresponding with each selectable sheet are structured in three sections:
- geographical data, that it is provided both graphically in the form of an interactive map (Figure 2) and in tabular form (Figure 3, left));
- aggregated data (that are automatically calculated depending on the restrictions put on the features to include by the reporting sheet, the user restrictions and the geographic extent shown on the map) (Figure 3, right) and summary texts provided as part of the reports (Figure 3, right).

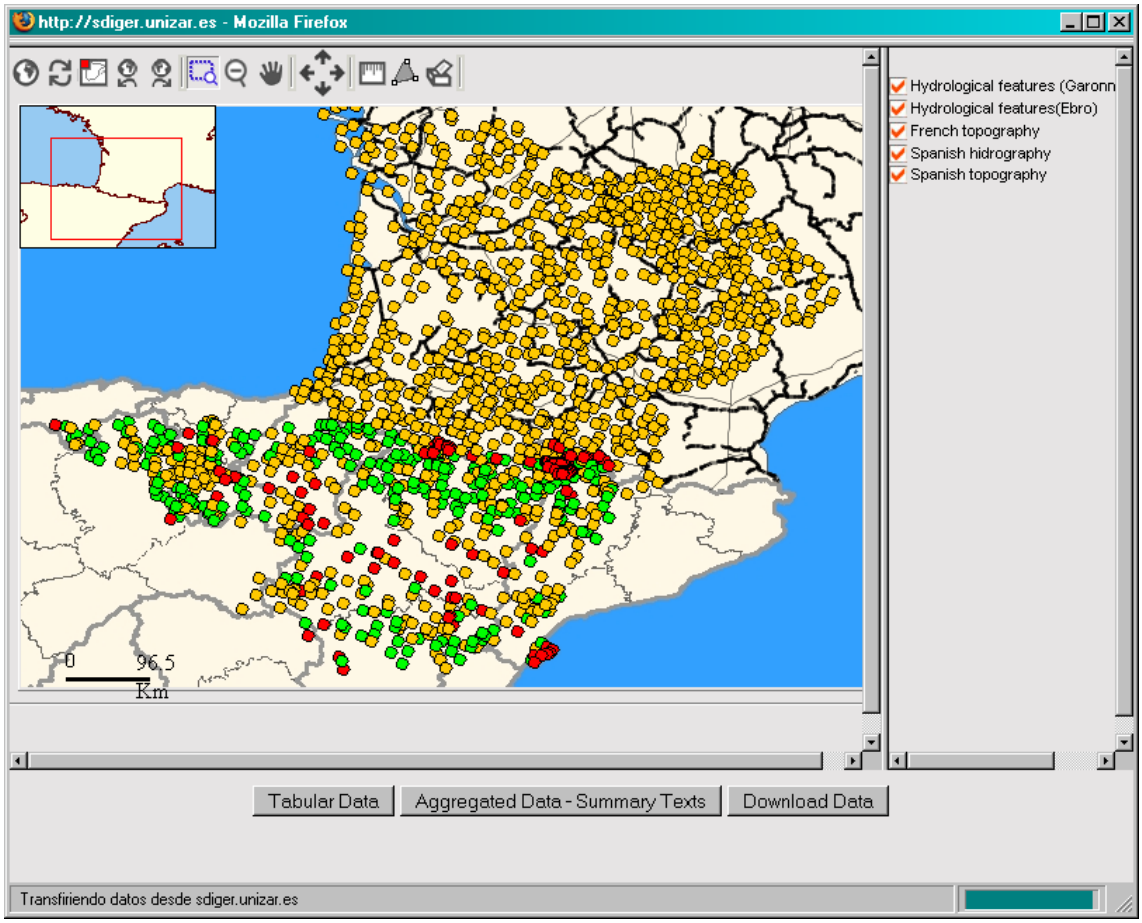

Figure 2. Geographical data of the report visualized as a map

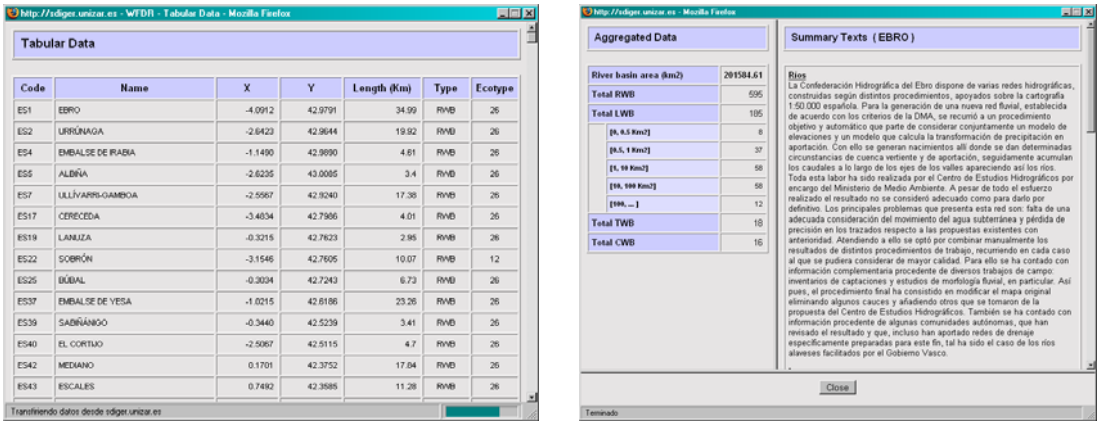

Figure 3. Tabular data of a report (left); aggregated data and summary texts (right)

The application obtains its data from a set of OGC standard, web interoperable services that form part of different SDIs. In particular, WFD data is obtained from Web Feature Services belonging to the WFD Competent Authorities, and it is served mainly according to the data model proposed by the WFD CIS GIS Working Group in their guidance document [Vogt 2002]. It is visualized through a WMS with Style Layer Descriptor capabilities where visualization options are included, together with the restrictions provided by the reporting sheet and the user, which are set in filter encoding when querying the WFS. Additional data needed for the sake of visualization is provided by Web Map Services provided by National Mapping Agencies.

This application has been developed as part of the SDIGER (A Cross-Border Inter-Administration SDI to support WFD Information Access for Adour-Garonne and Ebro river basins) pilot project on INSPIRE [Latre, 2005].

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