



WUPPERVERBAND
für Wasser, Mensch und Umwelt

WaCoDiS - Identifying Element Inputs in Water Bodies relying on INSPIRE and Copernicus

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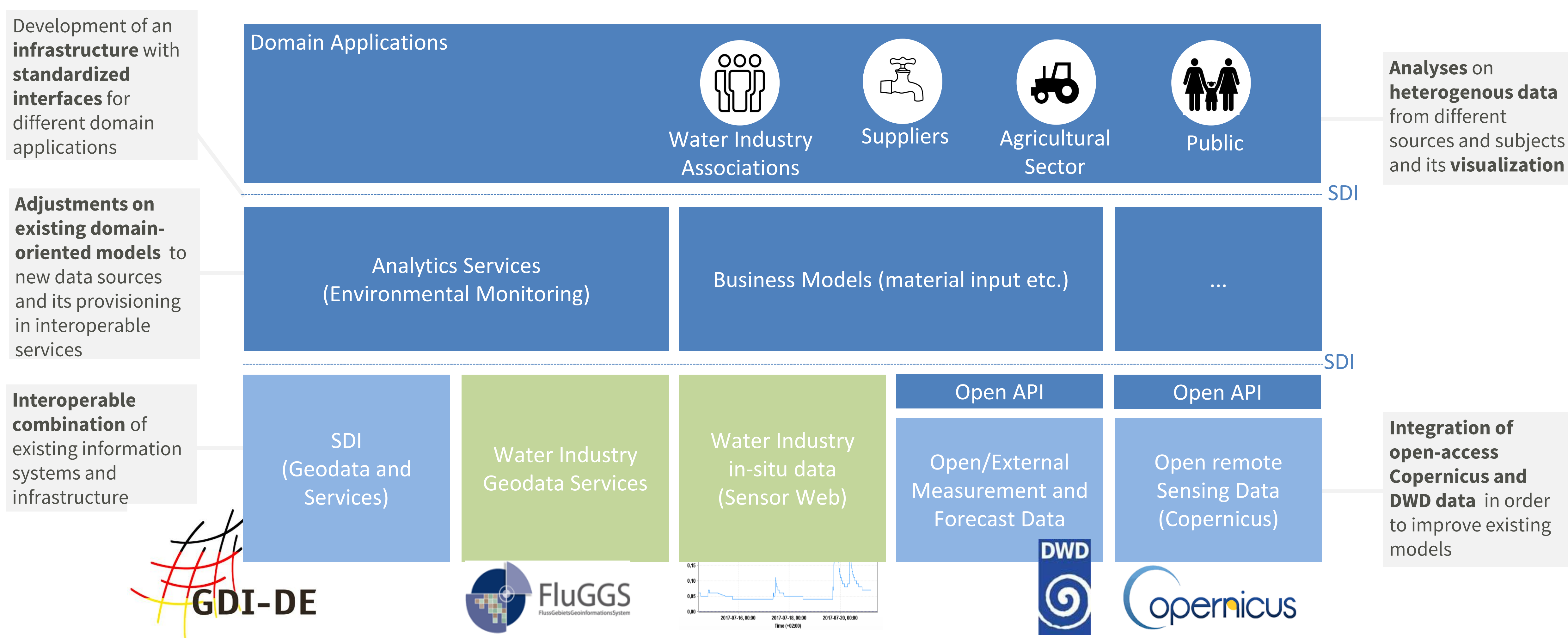
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Background and Goals

Climate changes and the ongoing intensification of agriculture effect in increased material inputs in watercourses and dams. Especially, soil erosion causes sediment inputs that pose a risk for water protection and the quality of drinking water. Thus, water industry associations, suppliers and municipalities face new challenges. To ensure an efficient and environmentally friendly water supply for the future, adjustments on changing conditions are necessary. There is a need for water management monitoring programmes in order to develop methods to reduce pollutant inputs into surface waters. Hence, the research project WaCoDiS aims to geo-locate and quantify material outputs from agricultural areas and to optimize models for sediment and material inputs (nutrient contamination) into watercourses and dams. The application will be deployed in an operative test mode within the infrastructure of the Wupperverband, a regional German water management association, in order to optimize monitoring processes for its dynamic catchment area. In addition, the project focusses on the usability of open access big data in combination with in-situ data for the purpose of analysing and predicting heavy rain events.



Technical Concept

To generate high level information products that increase the environmental monitoring efficiency, the project explores different approaches for:

- The combination of heterogeneous data sources and existing interoperable web-based information systems
- The connection to the Copernicus infrastructure and the extension of INSPIRE-compliant Sensor Web technology to deal with big raster data
- Innovative analyses of high temporal resolution Sentinel-1 and Sentinel-2 Copernicus satellite data that contributes to the exploration of heavy rain effects on agricultural areas
- An integration of in-situ and satellite data into domain-oriented models to optimize the simulation of pollutant flows

Finally, the water management analyses services and models will be provided to the different expert users by means of lightweight web applications. These can utilize the applications in order to optimize processes when dealing with domain related tasks.

Innovation

The research on the integration of satellite data and in-situ data from a variety of sources within the context of WaCoDiS will provide various benefits:

- Extracting valuable information on dynamics of land cover as well as interannual variability of soil moisture and nutrient balance by exploiting the potential of a combined analysis of Sentinel-1 and Sentinel-2 data
- Automation of analysis processes to make environmental monitoring more efficient and user-friendly
- Use of meteorological data to validate and improve analysis processes
- Analysis outputs serve as a basis for case-specific measures for water protection which can be executed in cooperation with agriculturalists and local farmers
- A modular and extensible software architecture that is prepared for the connection to the Copernicus Data and Exploitation Platform – Germany (CODE-DE)

The result of WaCoDiS is a web-based software application which can be used as a monitoring tool for various use cases in the field of water resource management.

Project Partners

Hochschule Bochum
Bochum University
of Applied Sciences



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