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V FOR WaTer

V-FOR-WaTer – a new virtual research environment for environmental research

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Motivation

Management and preprocessing of heterogeneous data pools for hydrological analyses and models often bears a big challenge. Data preprocessing for hydrological models typically involves collecting datasets from different sources, working extensively within geographic information systems (GIS), transforming data, generating computational grids and defining initial and boundary conditions.

With V-FOR-WaTer, a standardised and scalable data hub that includes compatible analysis tools packed in a web GIS **(Fig. 1)**, we will significantly reduce data preparation time and facilitate comprehensive studies.

Objectives

- Quick and simple access to hydrological data and tools with an easy-to-use web GIS.
- Run sophisticated hydrological models online.
- Save and share tools for data analysis.
- Incentive users to upload their data with the opportunity to receive a persistent identifier (e.g. DOI) for shared data.
- Centralise hydrological data of the Upper Rhine Rift from universities and state offices for a coordinated long-term monitoring.
- Security layer to assure that users can access only data for which they have access rights.
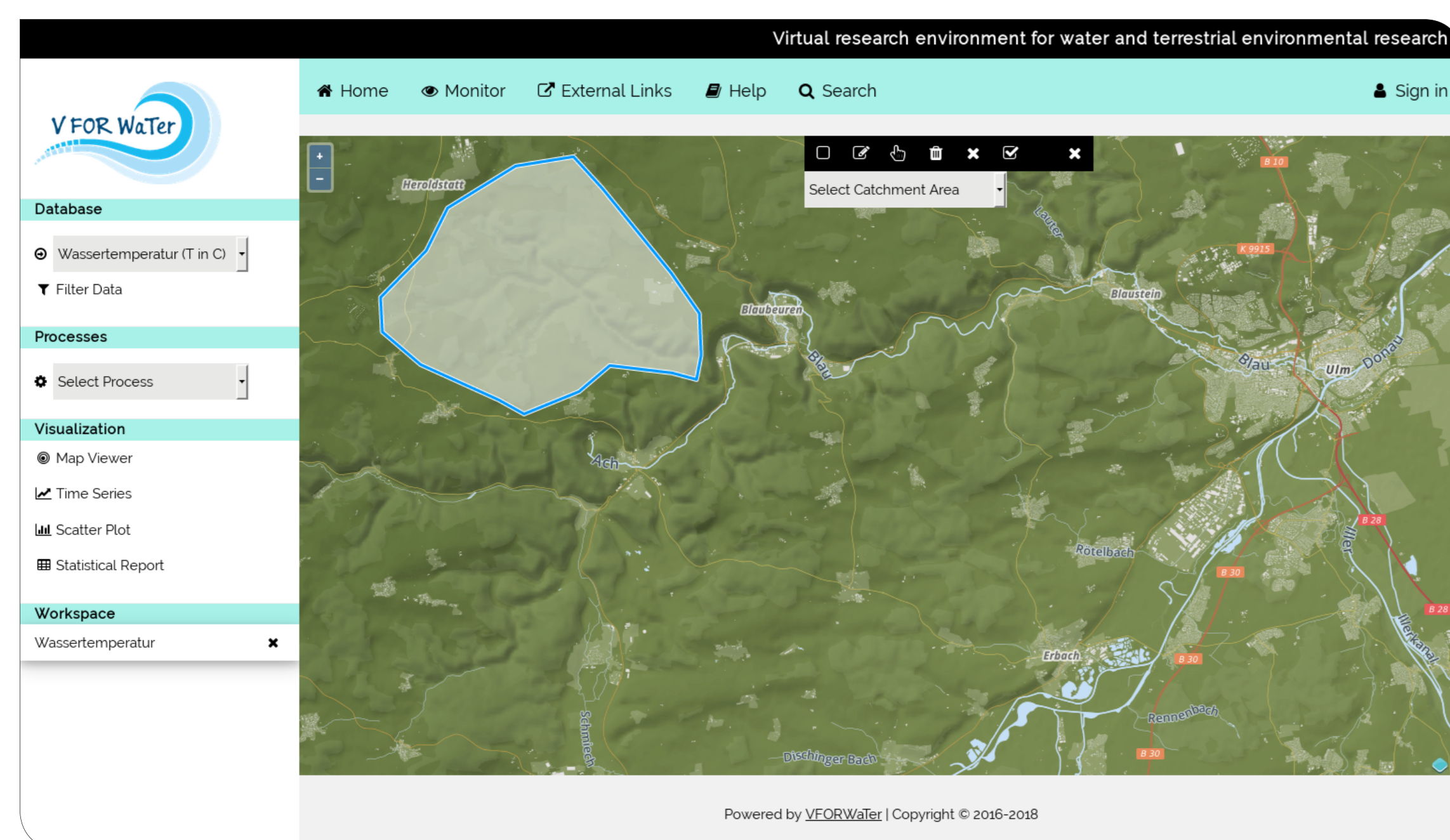

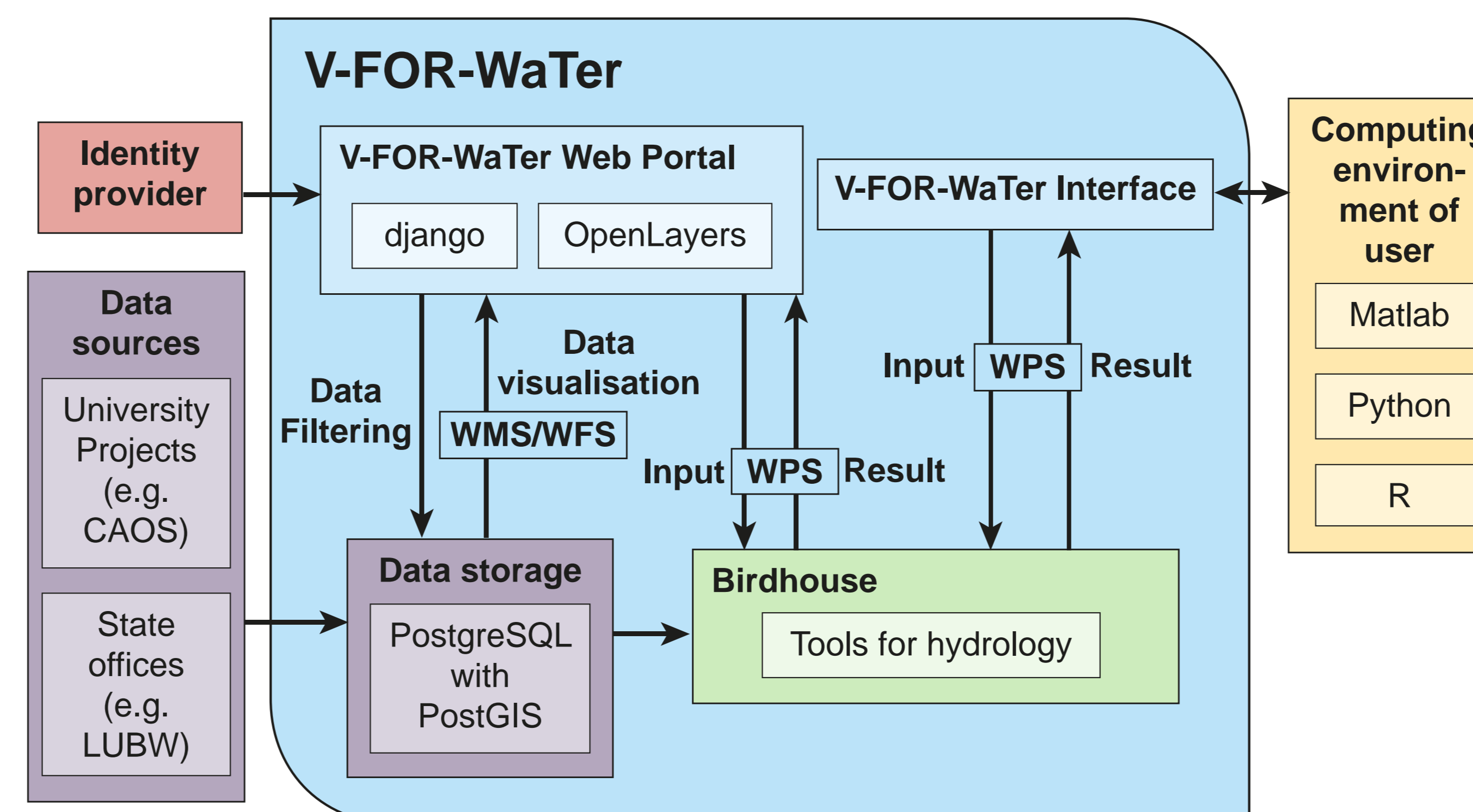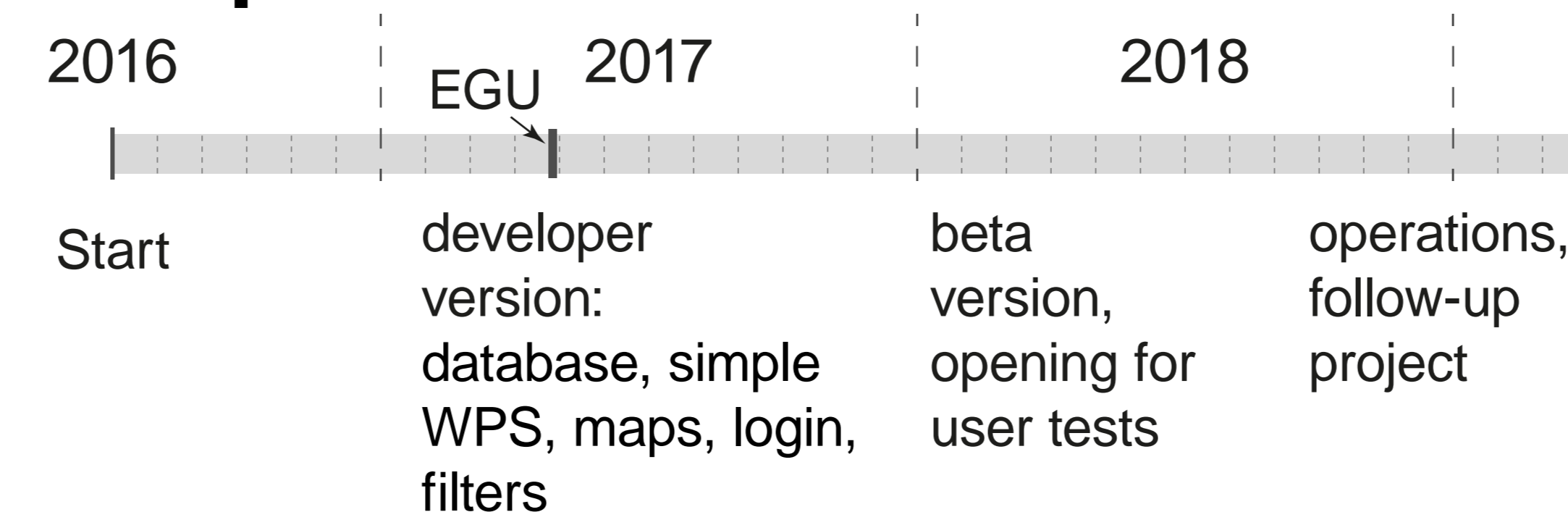**Fig. 1:** Screenshot of the preliminary V-FOR-WaTer Web Portal.

Fig. 2: Component diagram for the V-FOR-WaTer Portal. The components in the blue box are implemented on the servers at KIT. V-FOR-WaTer Web Portal and V-FOR-WaTer Interface will give access to data and tools. Data storage and tools interact with the django front end directly and via WFS, WMS and WPS.

Components of Web Portal

- Data for visualisation is provided as Web Map Service (WMS) and Web Feature Service (WFS) with GeoServer **(Fig. 2)**.
- Sophisticated filtering of data for all relevant attributes through PostgreSQL with PostGIS extension **(Fig. 3)**.
- Background map based on Open Street Map (OSM) and digital elevation models (SRTM) **(Fig. 1)**.
- Comprehensive documentation and Helpdesk will maximise usability of the portal.

Roadmap

2016 — Start
EGU 2017 — developer version: database, simple WPS, maps, login, filters
2018 — beta version, opening for user tests
operations, follow-up project

Processing

- Tools and data available through web portal and interfaces for common computing environments (Matlab, Python and R).
- Tools for hydrological analyses provided as Web Processing Services (WPS) in an instance of birdhouse **(Fig. 2)**.
- Monitoring of processes.
- Results will come with references to enable users to cite data owners appropriately.

Data

- Hydrological data holds extensive meta data to ensure usability **(Fig. 3)**.
- Initial data will come from the CAOS research unit (Catchments as organised systems) and LUBW (Landesanstalt für Umwelt, Messungen und Naturschutz Baden-Württemberg).
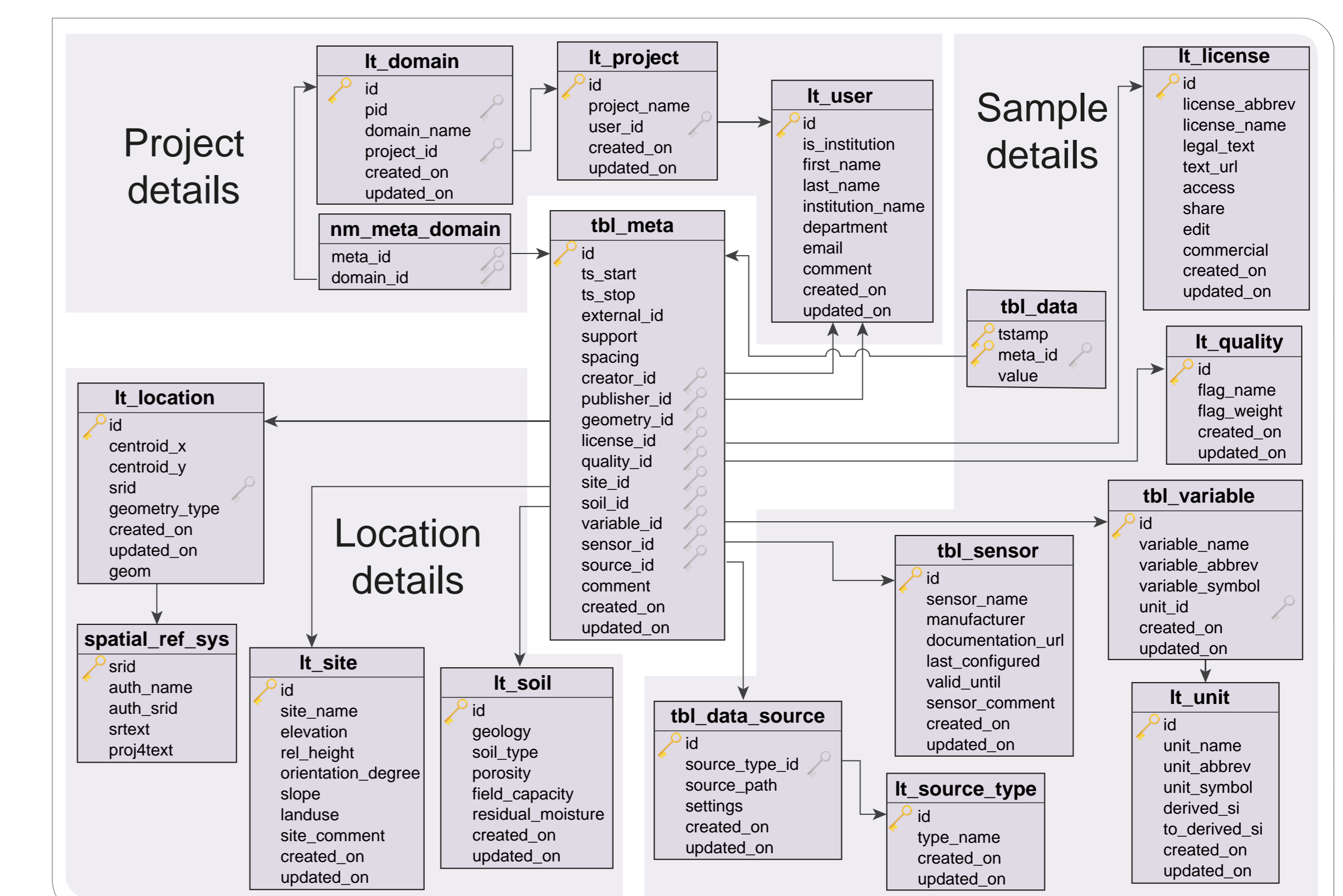

Fig. 3: Entity-relationship model of the database for the V-FOR-WaTer Portal. Content of the extensive metadata is divided in the three main components project, sample and location details.

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