

The TR32 project database - TR32DB

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Introduction

The TR32DB system is developed following the guidelines of the DFG to enable a centralized, sustainable storage and exchange of the TR32 data for all project participants. Due to the interdisciplinary background, the TR32DB has to handle a huge amount of heterogeneous data. These are collected research data (including measured and modelled data), reports, presentations, publications, and pictures provided by the TR32 participants, as well as purchased geodata from various institutions.

Project Description

The Transregional Collaborative Research Center 32: 'Patterns in Soil-Vegetation-Atmosphere Systems: monitoring, modelling, and data assimilation' (TR32) is an interdisciplinary research project funded by the DFG. The TR32 (www.tr32.de) is a joint project of the Universities of Aachen, Bonn, Cologne, and the Research Centre Jülich. The research partners cover the fields of soil and plant science, geography, hydrology, meteorology, remote sensing, geophysics, and mathematics. They work on exchange processes between the soil, vegetation, and adjacent atmospheric boundary layer (SVA). The TR32 study area is defined by the catchment of the river Rur situated in western Germany, parts of the Netherlands, and Belgium.

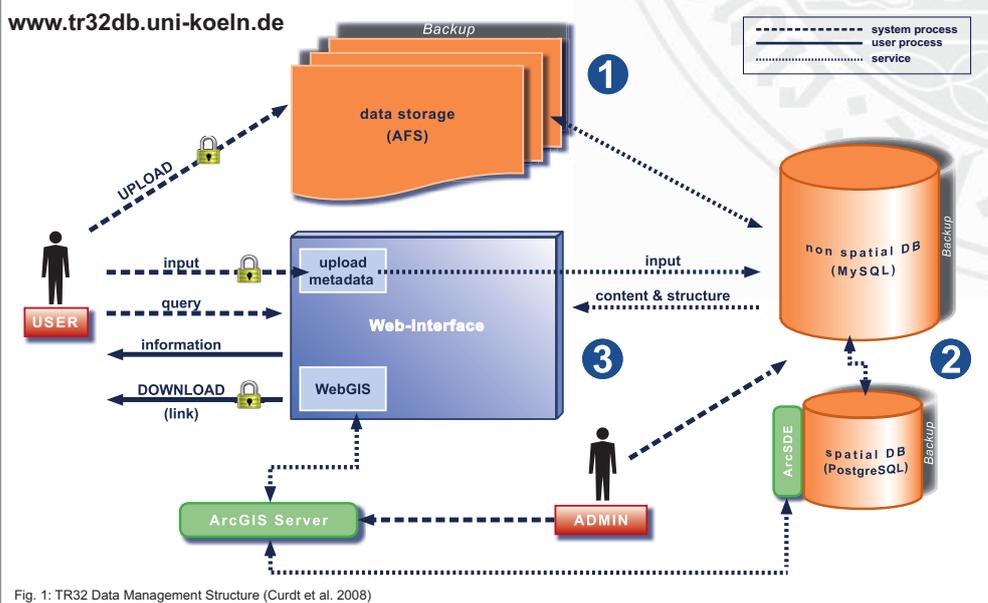


Fig. 1: TR32 Data Management Structure (Curdt et al. 2008)

Metadata - Profile

- implementation of core elements of recent standards and principles (Dublin Core, INSPIRE, ISO 19115)
- amount and kind of metadata elements depending on dataset type
- mandatory and optional metadata elements
- TR32 specific elements, for example:
 - topic (e.g. soil, vegetation, atmosphere, land use)
 - measurement/model region and location

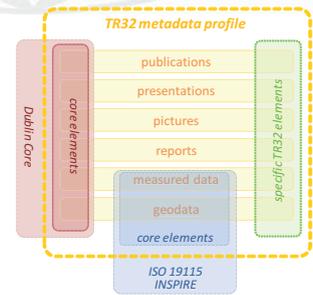


Fig. 2: TR32 Metadata - Profile

TR32DB Data Storage 1

- located at Regional Computing Center Cologne
- physically storage of project data organized by different project sections and data types
- implemented by the Andrew File System (AFS), a distributed networked file management system
- main reasons: security, scalability, location independence, cross platform access, simple archive and data backup

TR32DB Databases 2

- spatial database**
- storage of purchased geodata (only vector data) and spatial-related project data of the TR32
- non-spatial database**
- management of non-spatial project data, e.g. administrative data of TR32DB users
 - storage of references to uploaded project data

TR32DB Web-Interface with integrated web mapping application 3

- representation, search (via metadata), and download of non-spatial data
- input and modification of metadata
- application of TR32-DOIs
- temporary exchange of project data
- visualisation and temporary download of purchased and processed geodata

Conclusion

Central data management systems for large interdisciplinary research projects experience different problems. Therefore, heterogeneous data should be for example stored in an ordered and explicit structure including their metadata (Mückschel et al. 2007). Unfortunately, as an experience of many research projects, participation and time for the development and utilization of the management system are not appropriate (Bryn 2009).

With regard to different scales of data (SVA) and an estimated huge amount of large data files, the TR32DB is developed in a persistent, secure, stable, and well organized structure in cooperation with and also situated within the environment of the Regional Computing Center of the University of Cologne. This will ensure the availability of data beyond the project funding.



Fig. 3: TR32DB web-interface: metadata - input form for measured data



Fig. 4: TR32DB web-interface: web mapping application

References

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