

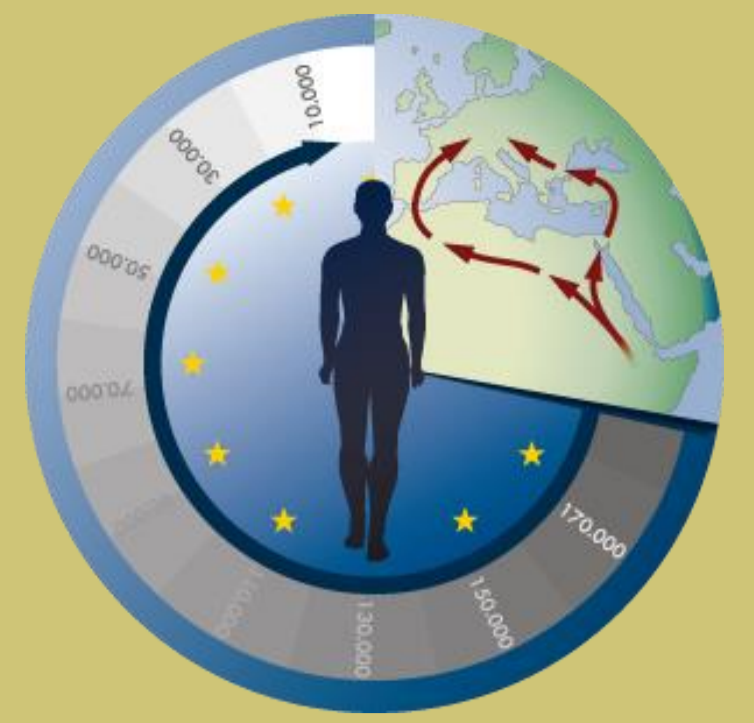


# How to exchange data between DB Systems on Early Humans?

A case study based on the CRC806-DB and the ROCEEH ROAD System

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## 1. Introduction

In the recent past database (DB) systems providing information on early humans and their environment are becoming more and more important and increase rapidly in number. However, this increase in different DB systems is concomitant with an increasing redundancy in the digital information stored in these database systems.

## 2. Aims and objectives

In this study we explore ways to reduce redundancies due to multiple storage of data and, hence, we show solutions to minimize the requirements to store and manage digital information in the prehistory and paleo-environment domains.

## 4. ROAD System Architecture

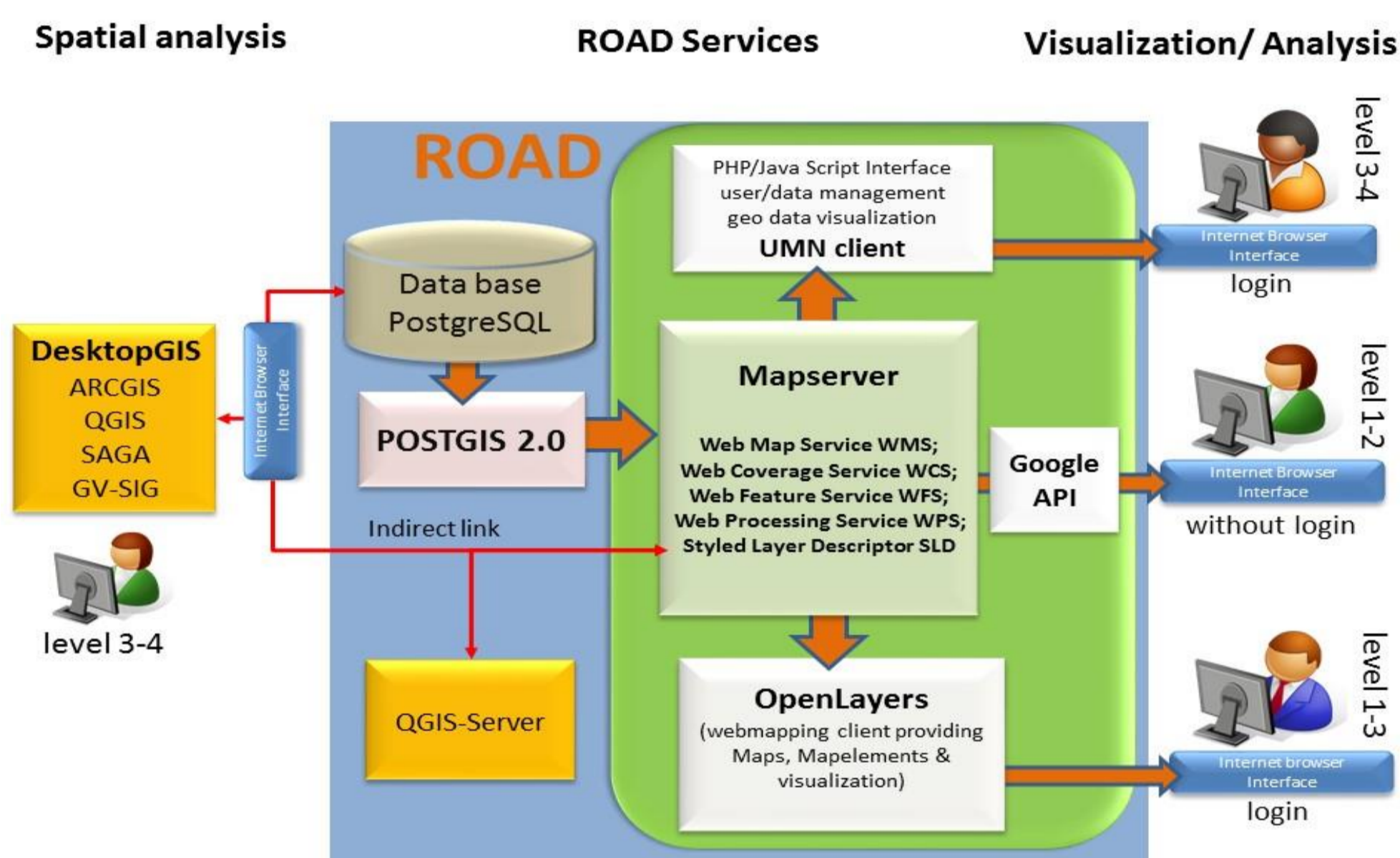


Fig. 1 : The ROAD-System at the backend and its user interfaces (Hochschild & Märker 2014)

Fig. 1 and Fig. 2 show the ROAD and CRC806-DB architecture. The easiest way to utilize and exchange spatial data between the two systems is to connect to the OGC services as illustrated in Fig. 3. Fig. 4 and Fig. 5 demonstrate how the data can be directly retrieved via a Desktop GIS. Here the connection with ArcGIS (Fig. 4) and QGIS (Fig. 5) is shown. OGC services also allow to visualize the data of the partners SDI directly in their own WebGIS interfaces.

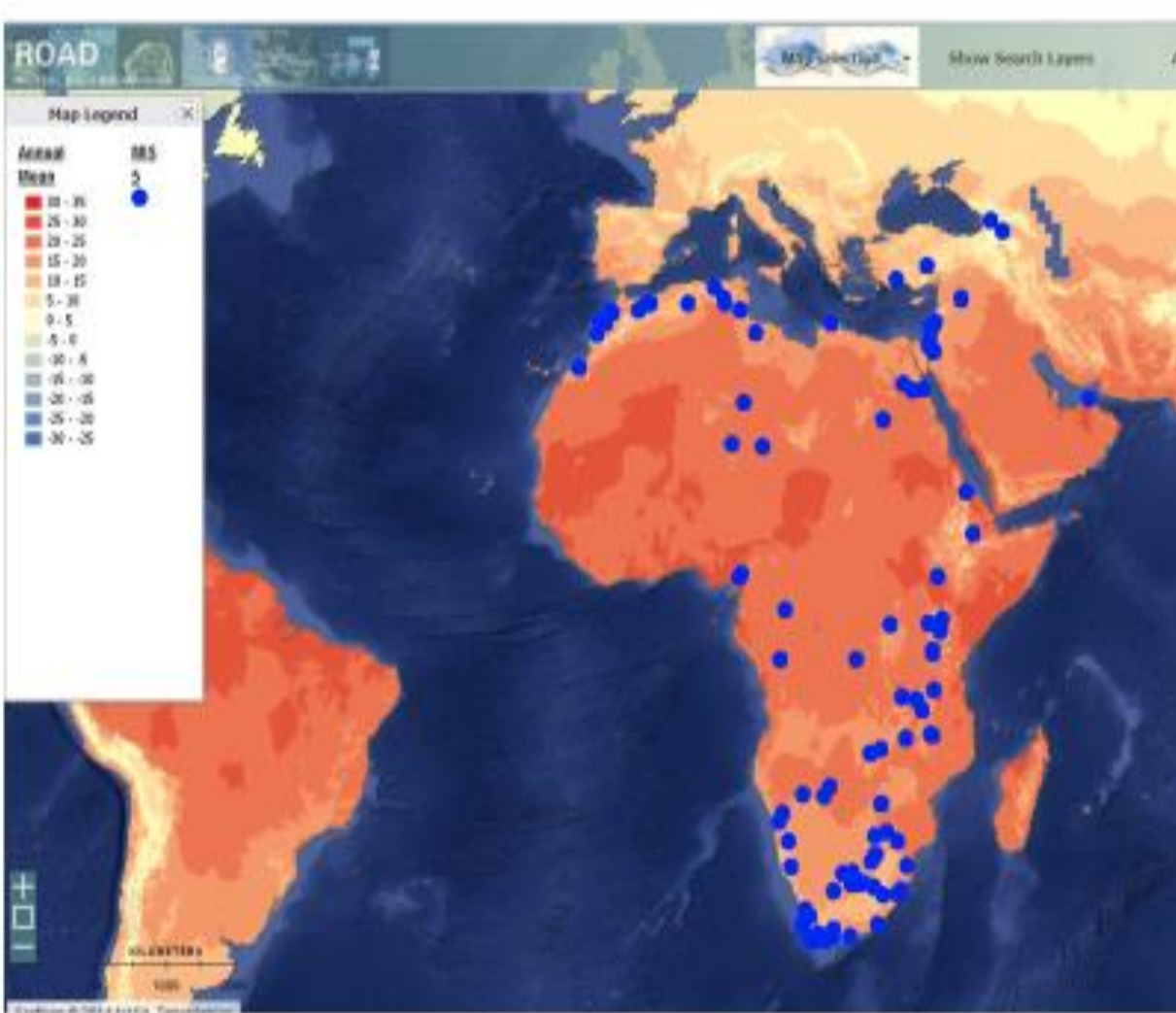


Fig. 3: WebGIS front-end showing archaeological sites and mean annual temperature for MIS 5

## 6. Results

We illustrate currently implemented interfaces of both data base systems that allow especially the exchange of spatial environmental data. However, as shown in Fig. 4 also archaeological data can be exchanged and visualized in the context of the partners' WebGIS-system.

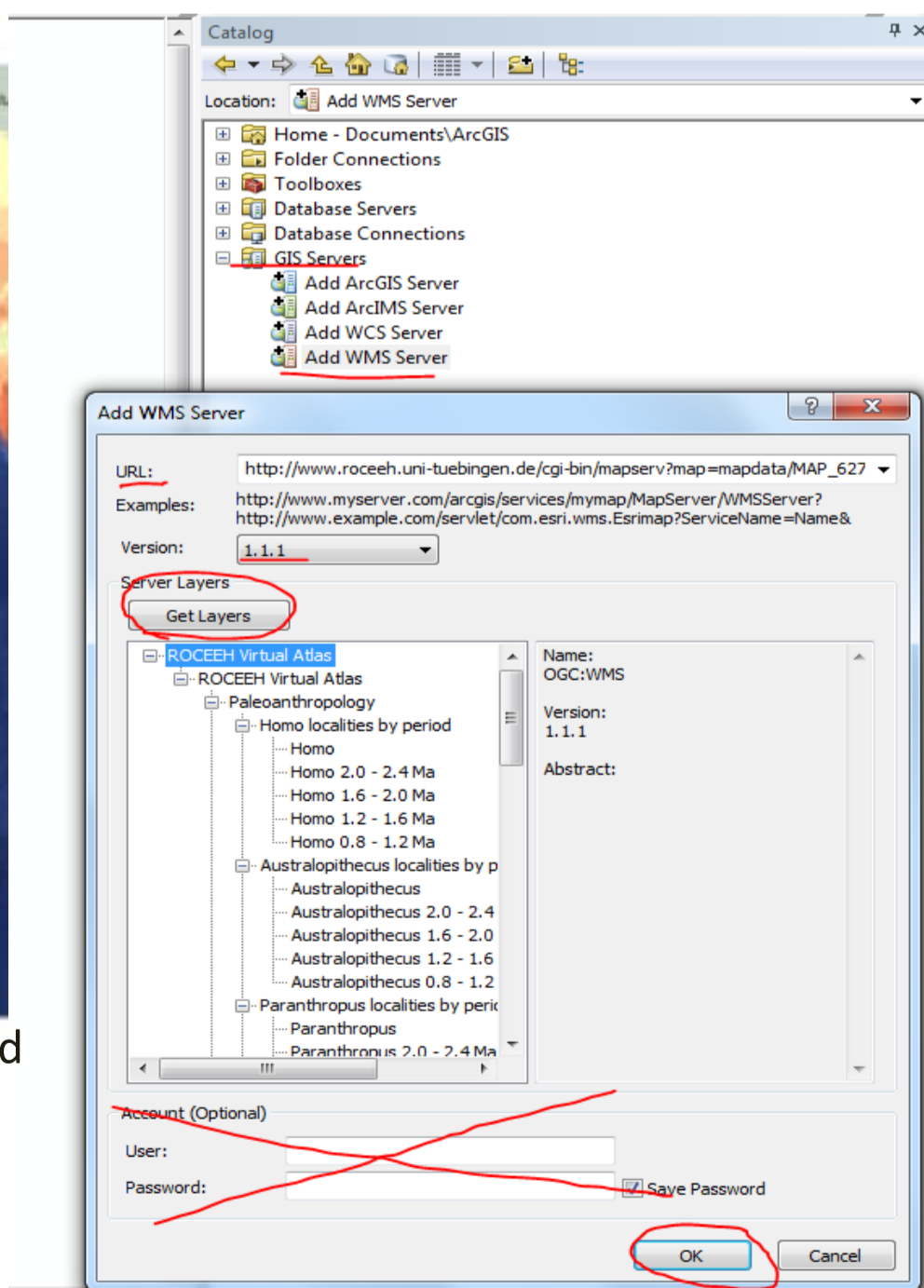


Fig. 4: Adding WMS server information to ArcGIS

## 3. Methodology

The two DB systems were set up for: i) the DFG financed CRC806: "Our Way to Europe" and ii) the Heidelberg Academy of Sciences and Humanities project entitled: "The Role Of Culture in Early Expansion of Humans (ROCEEH). The ROCEEH Out of Africa DB (ROAD) and the CRC806-DB provide archaeological, palaeontological and particularly, spatial environmental information. We examine and test exchange interfaces based on Spatial Data Infrastructure technology (OGC Standards). Data can be exchanged via Web Mapping Service, or directly link to the other DB systems. Moreover, SQL queries on the meta data of the DB-systems can be carried out providing valuable information for the corresponding partners.

## 5. The CRC806-DB System Architecture

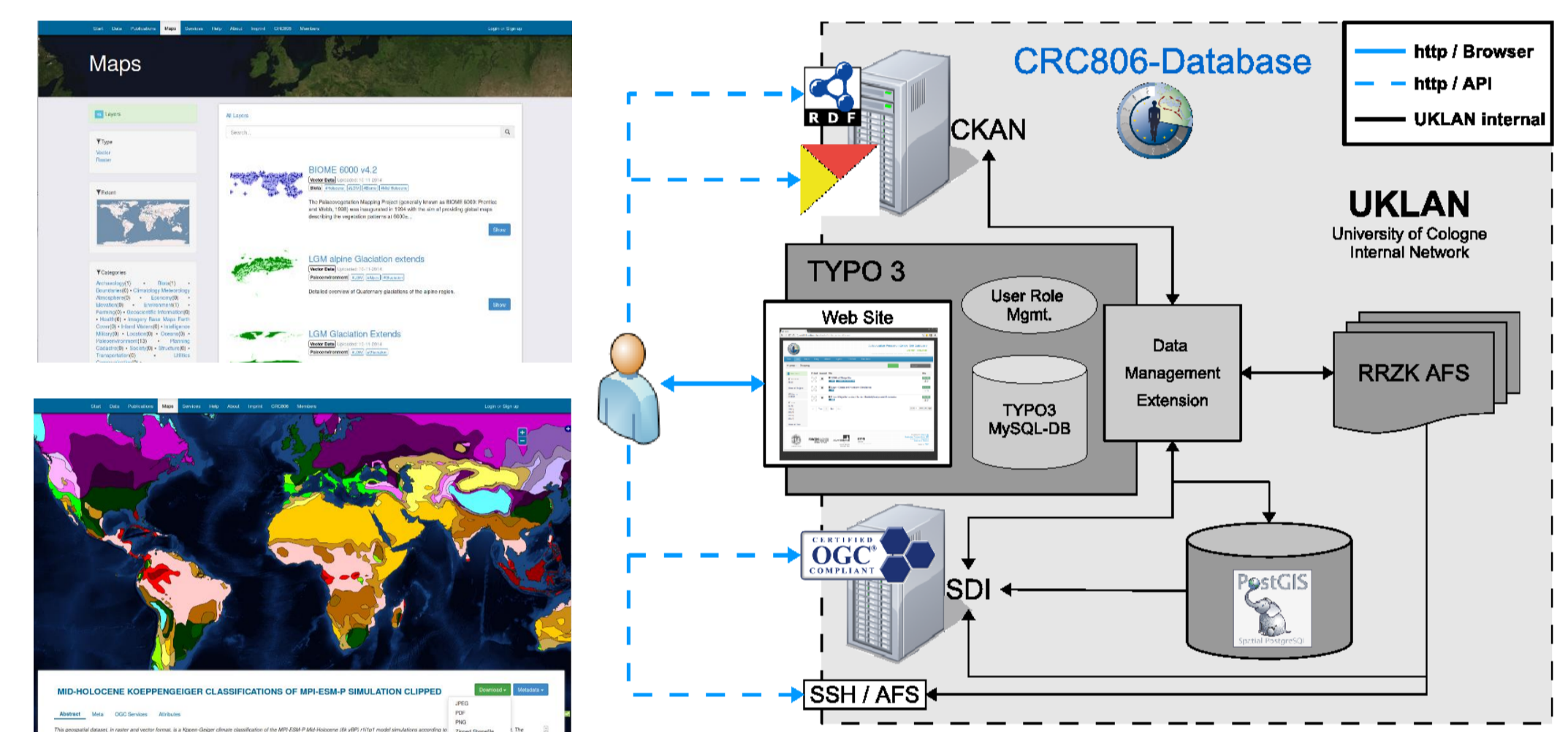


Fig. 2 : The SFB 806 Database System. (Willmes et al. 2014)

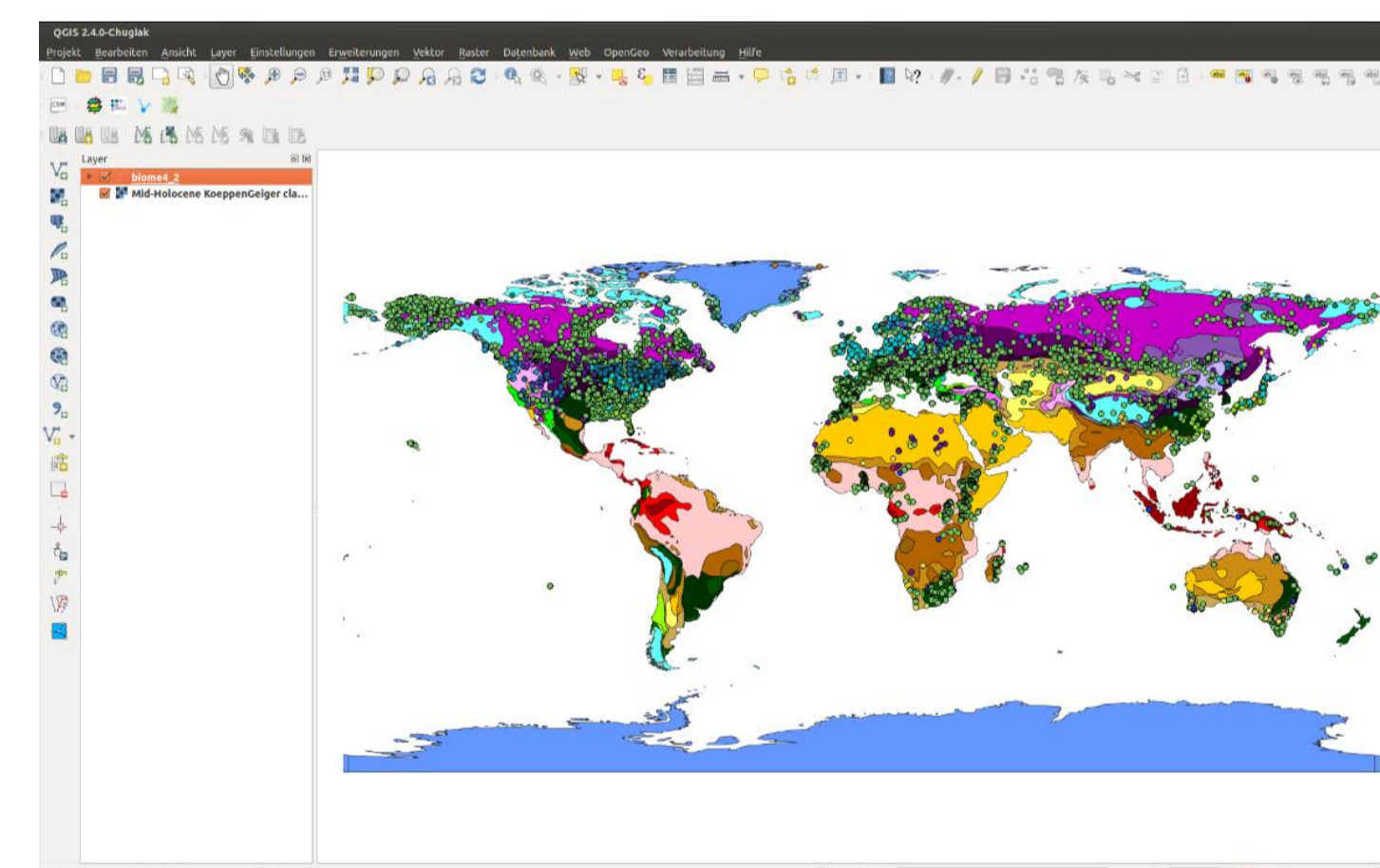


Fig. 5 : Using the GIS data via OGC services in a desktop GIS.

## 7. Outlook

The poster illustrates, that the spatial integration of environmental data is already possible through OGC standards are provided by both systems: The **CRC806-DB** and the **ROAD System**.

The next step will be the integration of non spatial data on database query level. Therefore, we are developing a data model mapping and exchange interfaces. Fig. 6 shows the Semantic Mediawiki based query interface of the CRC806-DB, which can also be queried through an API endpoint. A functionally similar query endpoint will be developed for the ROAD system. This allows to perform queries on both databases and use the results in integrated applications and data analysis.

Problems like proper citation and attribution of the databases will be addressed by developing an automated citation summary of the data delivered in a query result. In a further development step a common web interface including a WebGIS is projected and discussed.

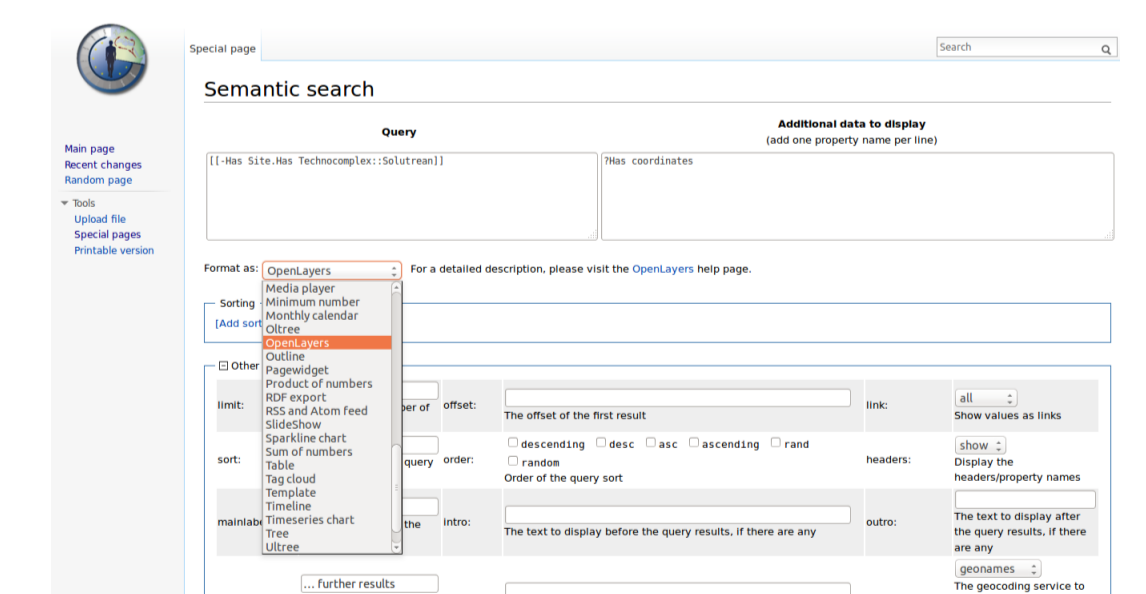


Fig. 6 : Semantic search in the CRC806 DB system