

## Designing an user-centric academic SDI

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### Extended Abstract

The Action Plan for the Brazilian NSDI defined the role of universities in the infrastructure primarily as capacity building actors (CONCAR 2010). However, universities, in their activities of research, teaching and public services are important geospatial data users and producers. Research data are often spread among several academic units and recover this data is an effort that demands time and resources (Davis Jr et al., 2009). Additionally, federal universities in Brazil are public and are required to follow federal-level Open Data Policy and the NSDI rules and standards. At this point, no Brazilian university has joined the official Brazilian NSDI initiative (Brito et al 2014). Universities have their autonomy, therefore the project of a SDI to accomplish both the internal needs for data re-use and external needs of data publicity must be address carefully the uses and needs of each institution.

There are an increasing number of data sharing studies and SDI initiatives among the academic and research communities, both in Brazil and around the world (Arzberger et al. 2004, Campbell et al 2003, Davis Jr 2009, Hill et al. 2012, Kethers et al 2010, Oliveira & Ramos 2013 and Painho 2010). This ongoing project aims to assess the requirements of the community in the Earth Sciences Sector of Federal University of Paraná (UFPR) in order to design and implement an SDI to accomplish these objectives. This project is also connected with a network of other Brazilian universities that are together exchange experiences in SDI implementation on the academic sector (Brito et al. 2014).

Today, geospatial data produced in research at UFPR is stored in non-standardized way among several research labs and seldom distributed for society and other researchers. This project aims to assess the need of the academic users, their requirements and legal constraints, including those regarding privacy and legal rights. The concept in this SDI is of an inverse infrastruc-

ture: user-driven, self-organizing infrastructures with decentralized governance where development is influenced from the bottom-up (Coetzee & Wolff-Piggott 2015).

In the requirements elicitation phase, the chiefs of the four graduate programmes in the Earth Sciences Sector (Geography, Geology, Geodetic Sciences and Ocean and Coastal Systems) were interviewed. The objective was to assess the programmes current policies on data management, and their views about data sharing. They expressed some concerns regarding data misuse or misinterpretation, and commercial use of data. This phase also presented the main project ideas in order to build synergy between programmes, and other departments of the university, such as the library, in this subject.

Additionally, an online questionnaire was addressed to researchers, both staff and students, in the programmes. There were 30 respondents, most of them willing to share their research data under a creative commons license. The survey was divided in Data Acquisition, Storage and Management, and Sharing. There was also an additional topic asking their opinion on the most needed features on a research geoportal.

In the Data Acquisition section, 87% of the researchers stated that it is not easy to acquire data for their projects, describing the process as bureaucratic, time-consuming, and sometimes expensive. Among them, 43% create their own data in field surveys and other primary sources. Only 7% uses data from geoservices such as WMS and WFS, which shows how little SDI architecture is being actually integrated in the research routine.

Regarding Storage and Management, most of the users store data in their own computer, with only a few storing it in a database system, or a data server, or in the cloud. Another question was about the geospatial software: 80% uses proprietary software, although the most popular open source software (QGIS) is also chosen by over 53% of them.

The third group of questions were about Data Sharing. Most of the users (80%) did not see problems in sharing their data, although 84% of them would feel safer if this sharing would occur under a license. Finally, about the geoportal, the main features the users considered essential were an efficient search engine, including map based search, geospatial data download, geoservices such as WMS and WFS, and bibliographic related information.

Next steps in this project involve the creation of an open source and open standards based geoportal, integrated with the NSDI. The start point is to publish metadata from thesis and dissertations on Earth Sciences graduate programmes. This first metadata geoportal will use ISO 19115 profile that was created for use in Brazilian NSDI, with academic-related additional metadata. After that, the last phase proposes the creation of a geographic data

repository, where the researchers will be able store and share geospatial data within the university and with community in general. The lessons learned in this project will be shared with other Brazilian universities in order to promote open source, open data and open standards to facilitate both the research process and the outreach of the academic data for a wider audience.

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