

# Chapter XXXIX

## Digital Libraries as a Foundation of Spatial Data Infrastructures

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### ABSTRACT

*This chapter introduces Spatial Data Infrastructures (SDI) and establishes their strong conceptual and technical relationships with geographic digital libraries (geolibraries). The authors describe the origin of SDIs and highlight their role as geographic resources providers. Then, they give several examples of the use of techniques and tools taken from the digital libraries world in the development of SDIs. The purpose of this chapter is establishing a solid foundation for those aspects of SDIs that can make profit from the knowledge and tools provided by the digital library community. It will also point the key differences between SDIs and geolibraries in order to provide a broader view of these infrastructures.*

## INTRODUCTION

According to the Global Spatial Data Infrastructure (GSDI) Association (<http://www.gsdi.org>), “The term ‘Spatial Data Infrastructure’ (SDI) is often used to denote the relevant base collection of technologies, policies, and institutional arrangements that facilitate the availability of and access to spatial data.” These data are those related to positions on the Earth’s surface, and are the central component of any Geographic Information System (GIS). GISs, as defined by the United Kingdom Association for Geographic Information (AGI) (<http://www.agi.org.uk>), allow to capture, store, check, integrate, manipulate, analyse, and display spatial data.

On the one hand, the fact that most data, including spatial data, is nowadays digital, and the growth of the telecommunication networks, specially the Internet, and the existence of GIS have provided the technical foundations to develop this kind of infrastructures. On the other hand, this dependency on digital data and networks, the emphasis on discovery, evaluation and access to data, and the fact that metadata and catalogs are needed, show that a conceptual foundation on the field of digital libraries (DL) is required.

In the next sections, the evolution and current state of SDIs is described, emphasizing the fact that DLs provide several of the conceptual pillars that support them. As SDIs also include components that go beyond those in the field of DLs, they are presented and discussed before the conclusions.

## BACKGROUND

The concept of National Spatial Data Infrastructure (NSDI) was first defined, for the United States, by the Mapping Science Committee of the National Research Council (1993). In April 1994, Bill Clinton signed an Executive Order (nr. 12906, April 11, 1994) for the establishment of

the NSDI, forcing the cooperation among federal and local agencies in collecting, spreading, and using geographic information.

In 1996, the GSDI was created to promote global access to geographic information. Also in 1996, the Australian and New Zealand Information Council (ANZLIC) (<http://www.anzlic.org.au>) defined the Australian Spatial Data Infrastructure (ASDI). In 1999, the Government of Canada sponsored a national partnership initiative, Geo-Connections, to improve access to geospatial information and to accelerate the development of a Canadian Geospatial Data Infrastructure (CGDI) (<http://cgdi.gc.ca>).

In November 2001, the European Commission launched INSPIRE (INfrastructure for SPatial InfoRMation in Europe) (<http://inspire.jrc.it>), an initiative to create a European directive to guide national and regional SDI development. The directive entered into force on May 15<sup>th</sup>, 2007 (European Parliament and The European Council, 2007).

Nowadays, the GSDI Web site lists several dozens of SDI initiatives, local, regional, and national. Generally speaking, most of these initiatives have common views and objectives for SDI, as first defined by the USA NSDI, though of course they are adapted to the different realities (economical, political) of the geographic areas for what they have been established.

In parallel to the birth of the NSDI concept in the USA in 1994, the Alexandria Digital Library (ADL) Project began. This project intended to address some of the problems detected in map libraries. ADL project created the term geolibrary, defining it as “[...] a library containing georeferenced objects and with a search mechanism based on geographic location as the primary search key” (Goodchild, 2004, pp. 2–3). In 1998, a panel under the aegis of the USA Mapping Science Committee conducted a workshop on distributed geolibraries, which conclusions were published as a report by a panel on Distributed Geolibraries of the National Research Council (National

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