

**SDI DEVELOPMENT IN POLAND –
First Results from a National Survey**

INFRASTRUKTURA DANYCH PRZESTRZENNYCH
W POLSCE –
wstępne wyniki ogólnopolskiej ankiety

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Poland's next generation SDI

The SDI currently under development in Poland belongs to the third generation; at the same time Poland is also developing the first and second generation SDI components—a great challenge. First and second generation SDI focus on the provision of data collected from multiple national agencies (National Research Council 1993; National Research Council 1994; Federal Geographic Data Committee 1997). The first generation follows a library model and bases its organization of data on the concept that certain common data layers, known as reference or framework data, are necessary for most governmental activities (National Academy of Science 1999). An SDI of the first generation serves as the common point for all participating agencies and was aimed at avoiding the expensive duplication of data collection for all types of government agencies (Harvey 2001). The second generation introduced the concept of clearinghouses. A clearinghouse is the provision of the data collection on the internet. It has successively evolved into a metadata enabled access point (called a gateway) and multiple repositories (the clearinghouses) (Minnesota Governor's Council on Geographic Information 1997; Nebert 2001). Third generation build on these principles, experiences, and technologies to support a more heterogeneous SDI capable of supporting multiple governmental, private, and other public geographic information needs (Cromptoets, Bregt et al. 2004).

The key distinction for third generation SDI is following client-server architect principles and enterprise-computing concepts (Levinsohn 2000). GI is understood in this model to be a critical value-adding component to any activity, regardless whether government or private.

Examples for this model are the proposed INSPIRE SDI for the European Commission and the National Map of the United States Geological Survey (USGS).

Poland's SDI faces a number of challenges. This is not due to situation or circumstances unique to Poland, but is commonplace understanding developed in the years of developing SDI here and elsewhere. Most studies highlight institutional challenges (Craig 1995; Obermeyer 1995; Rhind 1997; Harvey, Bittenfield et al. 1999; Tosta 1999; Salgé 2004; Nedovic-Budic, Pinto et al. In press). Poland, given its rich and complex history is no stranger to difficult administrative arrangements and undoubtedly faces challenges specific to its history, but much can be gained by thoroughly engaging the experiences of others.

Poland has great opportunities to develop an SDI. Our study aims to contribute to the activities of all groups involved in the development of the Polish SDI. While most people are prone to believe that centralized and decentralized approaches need to find a balance in any successful SDI, this research offers support for the importance of harmonizing centralized and decentralized approaches.

Background

A brief history of SDI's should go back to the Multipurpose Land Information System (MPLIS) concept. This concept, introduced in the 1970s, sought to define an arrangement of geographic information that would support all needs of local government. While it has antecedents in previous projects that created regional GIS, it had both organizational and technological emphasis and the goal of sustainability (National Research Council 1980; Chrisman and Niemann 1985; Tulloch, Niemann Jr. et al. 1996). It later became a vehicle for developing government GIS which used cadastral parcels as the base unit for associating all other government information. It became the direct basis for the organization of GIS data in parts of the United States and Australia. Its broader impact was on the conception of the SDI as a collection of geographic information from multiple sources and placed in a common reference system to reduce duplication of data collection and maintenance activities and improve availability to government and non-government agencies and individuals.

The US NSDI consolidated many of the concepts of the MPLIS, which are still central to any SDI, including INSPIRE, to which the Polish SDI should be closely related. Introduced in 1993 and 1994, it became the basic model in the United States for coordinating geographic information. The NSDI consists of framework data, a principle of free data sharing, and clearinghouses. The framework data in the NSDI consists of seven most-used types of geographic information:

- Elevation and bathymetry
- Hydrography
- Geodetic control
- Cadastre
- Transportation
- Governmental units
- Orthoimagery

The principle of free data sharing makes all framework data available for free and suggests that all other data in the NSDI be free of charges. This is to support government and

private activities that add value by increasing efficiency, reducing costs, or creating new services, regardless of any charges added by the value-adding group. Principally, most government data is understood to be a powerful stimulant for economic activity and hence considered to be a public good that benefits all whether through better services or increased tax revenues. Of course, substantial divergences exist and cost-recovery continues to be a conflict-laden issue. Clearinghouses, as described above, are points, now almost completely on the internet, for organizing the collection of government geographic information and providing access to other government agencies and private companies and individuals. Metadata plays a crucial role for clearinghouses. Through metadata people and computers have the capability to determine which geographic information is best suited for their needs.

Facing obstacles of institutional politics, under-funding, and federal-centric authority, the NSDI has had lasting impacts on the geographic information landscape of the United States, particularly among civilian federal agencies and state governments (Harvey, Buttenfield et al. 1999; Masser 1999; Craig 2001; Johnson, Nedovic-Budic et al. 2001). Its impacts among local government have been much more variable (Tosta 1999; Sperry 2000; Harvey 2003; Sietzen Jr. 2003).

INSPIRE is creating an infrastructure for a pan-European SDI, created first to support EU commission activities. It bears similarities in its reliance on concepts drawn on the American NSDI and other SDIs, but appears to be functionally limited to supporting activities of the European Commission, the executive body at the head of the European Union (Albin 2003; Salgé 2004; Vanderhaegen and De Groof 2004). As it works its way through committees, its final shape and objectives will become clearer.

A number of Polish activities in the last 15 years also help with the creation of a Polish SDI.

The legal foundation of the Polish SDI is found in the decree (*rozporządzenie*) – from 2001 which lays out the basic outline for a Polish LIS including the responsibility of building a metadata repository. Parts of the framework data are coming together. The basic general geographic data (baza danych ogólnogeograficznych (BDO)) at the scales of 1:250,000, 1:1,000,000. VMAP2 will be available at the scale of 1:50,000. Free data sharing has yet to become common. Sharing in any format seems to encounter exceptionally stiff boundaries that policy and politics have not yet been able to resolve. The free availability of BDO may constitute a watershed event and mark the beginning of new policy. The lack of clearinghouses and policy for creating clearinghouses is perhaps the most significant issue impeding the development of the Polish NSDI.

Survey Methodology

The study we discuss here used a multi-part questionnaire which was mailed or emailed to prospective recipients and their voivodeship survey directorates. Each survey directorate was asked to distribute the questionnaire to all powiats in that voivodeship.

We received more than 126 completed surveys, mainly from powiats (Fig. 2).

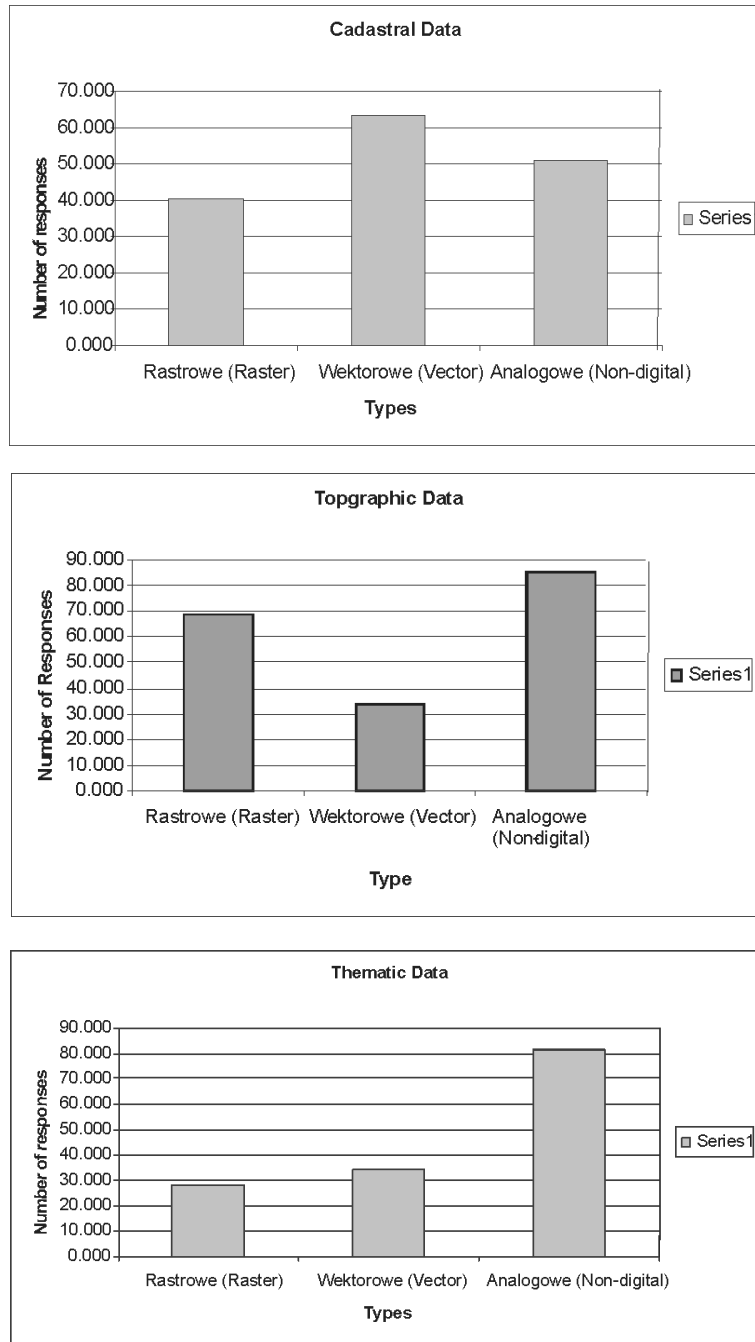


Figure 1. Types of materials used for cadastral, topographic and thematic data

Selected Results

We focus on results, which on first analysis appear significant for helping gain insights into the status of GI in Poland with resulting opportunities and risks. This selection is just a glimpse into the questions asked in the survey.

GI is for respondents at times not the most important type of data. This suggests that people are still choosing or must rely on printed maps for important activities. Of course, this is also the result of Poland being at the beginning of a process of building SDI. The range of available data is very limited. Further, the available data in digital format is very expensive. At the same time, respondents point out the considerable duplication of data.

The distinctions we can draw between different data types suggest that a large amount of cadastral data is available in vector format compared to topographic and thematic data (Fig. 1).

The survey respondents underscore that framework data is widely used. At the same time, it is clear that the internet is not widely used for data distribution and comments suggest that the lack of a common identifier scheme for reference data at scale 1:10 000 and 1:50 000 is an important impediment (Fig. 3).

The responses also indicate that both national and EU programs are not well known. Clearly many opportunities exist to help Polish government agencies obtain support (Fig. 4).

Finally, the study results that the development of the Polish SDI needs to consider financial and policy issues above others, especially in conjunction with each other (Fig. 5).

Conclusion and Outlook

The study results gives credence to widely perceived comments that Poland needs clear guidance, laws, and regulations, and financial support in this area. At this point in time, two interpretative observations from the study should be emphasized

- For a third generation SDI to be successful, standards and commonly used data descriptions are needed. Local governments see the need for harmonizing data models and data.
- Clearly, harmonization needs to occur under central agency (agencies) leadership and coordination. The involvement of local governments will be critical to success among decentralized governmental agencies. The powiaty are in need of financial support to tackle this complex problem.
- At the base of SDI and GIS are data, which need to be provided at low costs for the public who benefit from more efficient government and better decision making

Guidance, law, regulations, education, and financial support all must be coordinated for the development of the Polish SDI. This can commence with a user-orientated provision of framework data which leads to an impetus for the central government agencies to maintain and standardize this geographic information which is critically needed for governance and private economic activities. Metadata is not just important for clearinghouses in an SDI, but also for helping to create a network of trust.

Finally, we need to point out survey respondents comments that education, at all levels, is also important in conjunction with policy issues. For the long-term development and sustainability of the Polish SDI, this seems to be of great importance.

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Streszczenie

W związku z INSPIRE, w Polsce prowadzone są prace mające na celu rozwój infrastruktury danych przestrzennych (SDI) nowej generacji. W artykule przedstawiono wyniki ogólnopolskiej ankiety dotyczącej stosowania geoinformacji w urzędach i instytucjach administracji publicznej. Wstępne wyniki ujawniają istnienie wielu przeszkód dla rozwoju SDI, ale respondenci również wskazują, w jaki sposób przeszkody te mogą być przezwyciężone. Za największe przeszkody rozwoju SDI uznano:

- wykorzystywanie w wielu dziedzinach geoinformacji (GI) nadal w formie analogowej, a nie cyfrowej,*
- prowadzoną w tym zakresie politykę oraz przyjęte standardy, jak też problemy wiążące się ze stosowaniem danych referencyjnych,*
- różnorodność stosowanych formatów danych, które powinny być ujednoczone,*
- brak dostatecznej świadomości w zakresie zarówno programów krajowych jak i Unii Europejskiej,*
- brak środków na finansowanie prac na szczeblu samorządowym,*
- brak młodych, dobrze wykształconych kadr, szczególnie dotkliwie odczuwany przez samorządy lokalne.*

Ankieta była upowszechniona wiosną 2005 r. i jest ciągle analizowana, przedstawione wyniki mają więc charakter wstępny i mogą być skorygowane.

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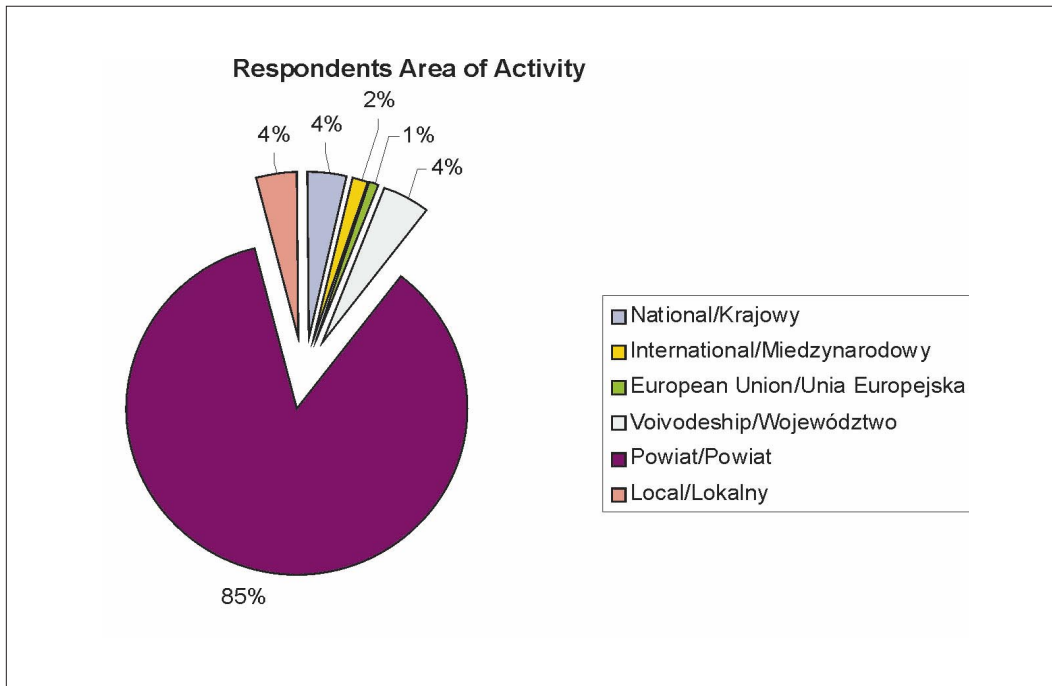


Figure 2. Eighty-five per cent of respondents work for powiat governments

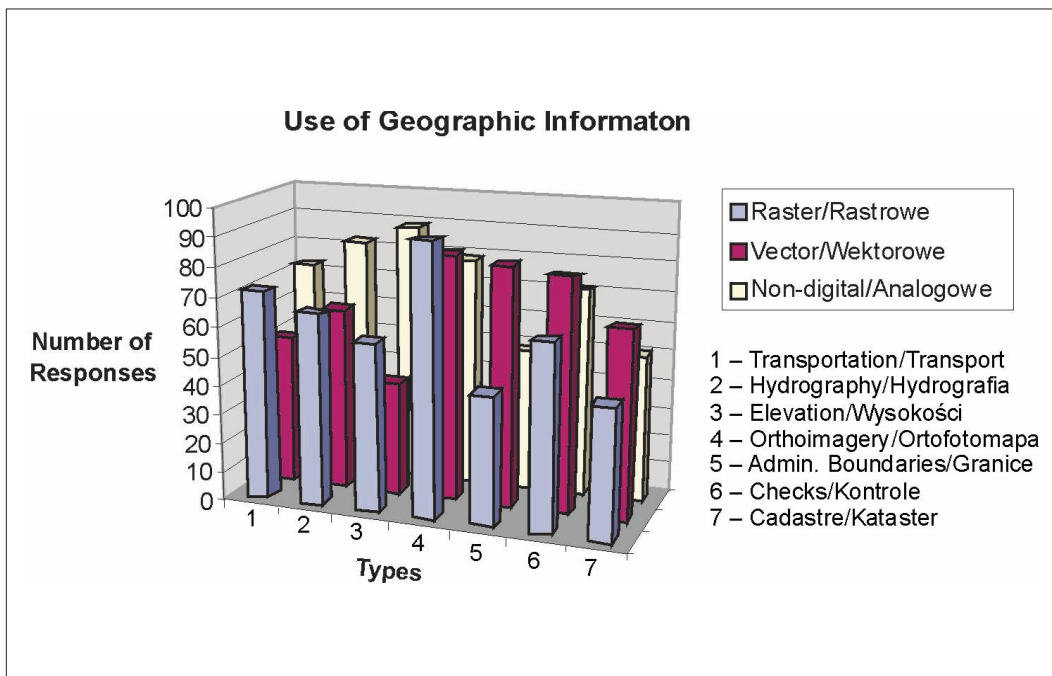


Figure 3. Use of framework data

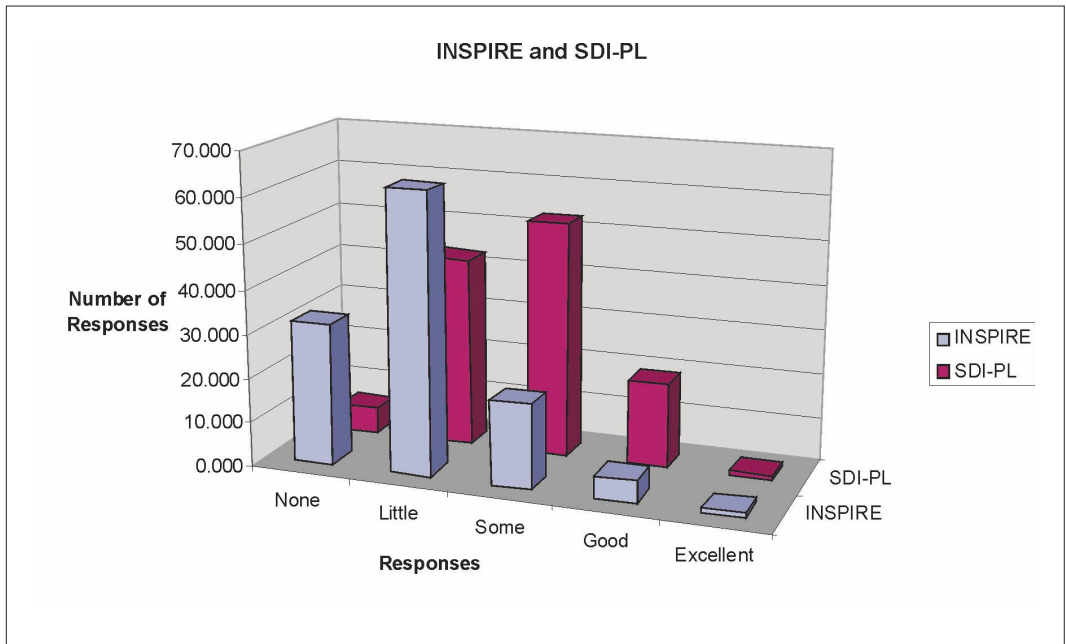


Figure 4. Knowledge of INSPIRE and Polish SDI related activities

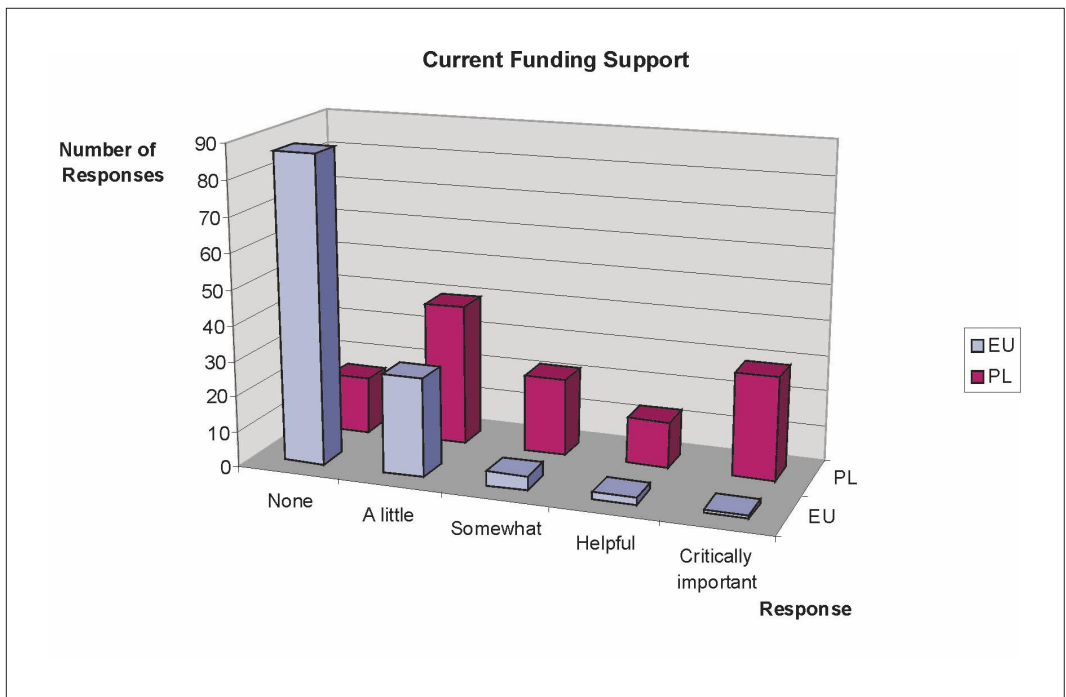


Figure 5