Administration of Spatial Information in the Americas

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ABSTRACT

International economic and social development is currently facing a number of challenges that require the adoption of new schemes and paradigms associated to globalization and sustainable development. One of such challenges is to make the most and best of available statistical and geographic information.

These ideas are in the agenda of several international forums that reflect the governments' concern to provide an adequate response to problems affecting social and human development in our countries. Those forums include the World Summit on Sustainable Development (2002, South Africa), the World Summit on the Information Society (2003, Switzerland) and the Special Summit of the Americas (2004, Mexico).

Along the years, an extraordinary volume of data has developed the world over and, of course, in the Americas. Due to their characteristics, integration process or other features, these data have not become operative pieces of information for better decision making on matters related to economic and social development planning. In view of the increasing demands of society, countries need to adopt management schemes and data administration plans that would allow for data integration, characterization, enhanced availability, access and distribution.

Nowadays, there are sub-regional and regional instances dedicated to foster and develop geographic information or spatial information, such as the Pan-American Institute of Geography and History (PAIGH), and the Permanent Committee on SDI for the Americas (PC-IDEA). The sub-regional instances include the Central American Geographic Information Project (PROCIG), the Meso-American and Caribbean Geospatial Alliance (MACGA) and the recent Spatial Data Infrastructure Initiative for Andean Countries; Colombia, Venezuela, Ecuador, Peru and Bolivia (IDE ANDINA).

CP IDEA was established in compliance with Resolution number 3 issued by the Sixth United Nations Regional Cartographic Conference for the Americas (UNRCC) held in New York in June 1997. The Geospatial Data Infrastructure (GSDI) for the Americas is defined as the set of core geospatial data, the standards for its integration, the mechanisms to facilitate access and use, associated policies and the principles that ensure compatibility among member countries of the Permanent Committee.

CP IDEA is a regional organization established in March 2000. Its first meeting was held in Santa Fe de Bogotá, Colombia where the first steps to create the Permanent Committee were

taken. A first resolution was adopted and Colombia was appointed to chair the Organization through the General Direction of the Agustin Codazzi Geographic Institute (ICDE), while Mexico was appointed to vice chair through its General Direction, National Institute of Statistics, Geography and Informatics (INEGI).

Following Resolutions Nº 3, 4 & 6 from UNRCC, the main objective of CP IDEA is to design and coordinate policies and technical standards to develop the Geospatial Data Infrastructure (GSDI) for the Americas, and to foster and prioritize the building and development of national GSDI in each member country of the Permanent Committee. So far, 24 countries from the Americas are members of the Organization.

PC IDEA's Third Meeting was held in Cartagena, Colombia, in 2001, along with the V Conference of Spatial Data Global Infrastructure (GSDI5). It adopted the Bylaws and Rules of Procedure and three Working Groups were created: Legal and Economic Issues, Communications and Technical Matters. This last Working Group includes six sub-groups, Core Data, Geospatial Standards, Policies, Clearinghouse, Cadastre, Geographical Names and Institutional Strengthening.

PC IDEA's Fourth Meeting was held in San Jose, Costa Rica in 2003. Mexico was appointed to chair through INEGI and Tommy Guardia National Geographic Institute was appointed to vice chair.

Several countries within the Americas are working in the design, development and implementation of their spatial data infrastructures. The United States and Canada have made significant accomplishments both in the design and implementation phases. The initiative to integrate and develop Mexico SDI (IDEMEX) is under implementation. The most important national organizations involved in geospatial information are contributing to this initiative under the coordination of INEGI.

CP IDEA is an organization focused on articulating common interests in the field of geographic information to develop national GSDIs that will integrate into a regional and global context. There should be a response to the increasing demands imposed by globalization, sustainable economic development and growing technological progress.

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1. INTRODUCTION

International economic and social development worldwide is currently facing a number of challenges and situations that require the adoption of new schemes and paradigms associated to globalization and sustainable development. One of such challenges is making the best and maximum utilization of available statistical and geographic information, since it represents the temporal and spatial scenarios of economic, demographic and social phenomena.

These ideas are in the agenda of several international forums that reflect the governments' concern to provide an adequate response to problems affecting social and human development in our countries.

2. INTERNATIONAL FORUMS

The first agreement on the urgent need to act upon the environmental decline was achieved 32 years ago, in Stockholm. The World Summit held in Rio de Janeiro in 1992 agreed that protecting the environment and achieving economic and social development were key to sustainable development. To such end, Agenda 21 and the Declaration of Rio de Janeiro were signed.

The World Summit on Sustainable Development (WSSD) convened in Johannesburg, South Africa in September 2002 made a statement on the collective responsibility to foster and strengthen the separate and synergic pillars of sustainable development at local, national, regional and international levels.

This Summit confirmed the significant progress made towards achieving an international consensus and a worldwide alliance in a context of continued environment decline; desertification; loss of biodiversity; extended contamination; climate change; more frequent occurrence of natural disasters and higher levels of exposure in developing countries, just to mention some of the factors that impact the most and that produce the biggest concerns. The overall conclusion drawn by the Summit is that a commitment towards sustainable development must be made.

The World Summit on the Information Society held in Geneva, Switzerland in December 2003 to discuss the *Building of the Information Society* adopted a joint vision on development. A challenge outlined by the Summit involved ensuring environment sustainability and fostering world partnerships that may bring a more peaceful, fair and prosperous world.

It was stated that communication is a fundamental social process that is grounds for every social organization. Special emphasis was given to the role that Information and

Communication Technologies (ICT) play today, since they have a huge impact on practically every aspect of daily life. Discussion was intended to achieve the primary goal of reducing the digital gap and turn it into an opportunity for everybody.

To such end, the Summit set several key principles, including those relative to the functions that governments and every party interested in the promotion of ICT should perform. Those principles include implementing the information and communications infrastructure as grounds for an information society that should be inclusive in nature; access to information and knowledge; capacity building, fostering reliable and secure use of ICT since their applications are potentially important for government's activities and services, education, economic activities, agriculture, transportation, environment protection, natural resources management, disaster prevention and management among other agreed goals.

A third significant event was the Special Summit of the Americas held in the city of Monterrey, Mexico, in January this year, where Heads of State and of Government from the Americas participated, and the main result of which was the signing of the *Declaration of Nuevo Leon*. The Summit's objective was to discuss issues related to the progress in the implementation of measures to fight poverty, foster social development, achieve economic growth with equality and strengthen governance in democracies in the Americas.

The Declaration stated that each country is responsible for its own development and subscribed to the fact that security of tenure is a key element towards economic growth. This idea is a main component in land administration policies, the focus of this Special Forum for the Development of Land Information Policies in the Americas.

Besides, the Summit also debated issues related to education, culture, emerging technologies and to the role that computer systems play for development, health issues, rural development, disaster occurrence, public security, etc.

3. OVERVIEW

Throughout the years, an extraordinary volume of data has developed the world over and, of course, in the Americas. Due to their characteristics, integration process or other features, these data have not become operative pieces of information for better decision making on matters related to economic and social development planning.

In view of the increasing demands of society, countries need to adopt management schemes and data administration plans that would allow data integration, characterization, enhanced availability, access and distribution. In short, make the most out of them.

4. THE AMERICAS

Nowadays, there are sub-regional and regional instances dedicated to foster and develop geographic or spatial information, such as the Pan-American Institute of Geography and History (PAIGH), and the Permanent Committee on SDI for the Americas (PC-IDEA).

The sub-regional instances include the Central American Geographic Information Project (PROCIG), the Meso-American and Caribbean Geospatial Alliance (MACGA) and the recent Spatial Data Infrastructure Initiative for Andean Countries; Colombia, Venezuela, Ecuador, Peru and Bolivia (IDE ANDINA).

Besides, the PAIGH is a specialized body within the Organization of American States (OAS) and is highly esteemed since it has been working in the Continent since 1929. The PAIGH has fostered and assisted the development of regional geographic information through its Cartography, Geography and Geophysics Commissions and also through its History Commission. Accomplishments have been very significant, especially in the field of training and in inter-regional projects for development.

5. PC IDEA

PC IDEA was established in compliance with Resolution number 3 issued by the Sixth United Nations Regional Cartographic Conference for the Americas (UNRCC) held in New York in June 1997. Resolution number 3 recommended the creation of a Permanent Committee on Spatial Data Infrastructures for the Americas, following similar guidelines established for the Permanent Committee for Asia and the Pacific.

Along with Resolution number 3, Resolution number 4 was adopted. Resolution number 4 recommended considering the creation of National Spatial Data Infrastructures (NSDI) and that every member country participate in the Committee set forth by Resolution number 3.

Second to an initiative from the National Institute of Statistics, Geography and Informatics (INEGI), Mexico, both resolutions were countersigned at the Meeting of Delegates and Experts from the United Nations Regional Cartographic Conferences in Aguascalientes, Mexico, in March 1998. The Meeting in Aguascalientes arrived at the initial consensus and set forth the basic concepts that would govern the Infrastructure based on an agreement between nations in the Americas to integrate and develop geographic information across the continent as well as to manage and administer such information.

The Geospatial Data Infrastructure (GSDI) for the Americas is defined as the set of core geospatial data, the standards for its integration, the mechanisms to facilitate access and use, associated policies and the principles that ensure compatibility among member countries of the Permanent Committee. This definition was written in PC IDEA's Bylaws, adopted in its Third Meeting.

PC IDEA is a regional organization established in March 2000. Its first meeting was held in Santa Fe de Bogotá, Colombia where the first steps to create the Permanent Committee were taken. A first resolution was adopted and Colombia was appointed to chair the Organization through the General Direction of the Agustin Codazzi Geographic Institute (ICDE), while Mexico was appointed to vice chair through its General Direction, National Institute of Statistics, Geography and Informatics (INEGI).

6. PC IDEA OBJECTIVES

Following Resolutions Nº 3, 4 from the Sixth UNRCC, the main objective of PC IDEA is to design and coordinate policies and technical standards to develop the Geospatial Data Infrastructure (GSDI) for the Americas, and to foster and prioritize the building and development of national GSDI in each member country of the Permanent Committee.

PC IDEA specific objectives are:

> Promoting the sharing of geospatial information among all members of the community in the Americas while respecting autonomy and in accordance with national policies and regulations.
>
> Encourage cooperation, research, complementariness and experience exchange in fields related to geospatial issues.
>
> Defining guidelines and strategies to develop cadastral information in support of member countries of the Committee that will allow for each country needs.

6.1 Second Meeting and Membership

The Second Meeting was held together with the Seventh UNRCC in New York, in January 2001. The original ideas and principles on the building of regional and national spatial data infrastructures were reaffirmed. Emphasis was given to the need of national settings where the infrastructure to develop geographic information will be supported as a strategic policy. Likewise, a recommendation was made to all member countries to adopt the concept of GDI and to design strategies for its implementation in support of regional and global initiatives while considering national goals.

So far, 24 countries from the Americas are members of the Organization.

Member countries of PC IDEA

Argentina	**Belize**	**Bolivia**
Brazil	**Canada**	**Chile**
Colombia	**Costa Rica**	**Cuba**
Dominican Republic	**El Salvador**	**Ecuador**
Guatemala	**Guyana**	**Honduras**
Jamaica	**Mexico**	**Nicaragua**
Panama	**Paraguay**	**Peru**
United States of America	**Uruguay**	**Venezuela**

6.2 Third Meeting. Working Teams

CP IDEA's Third Meeting was held in Cartagena, Colombia, in 2001, along with the V Conference of Spatial Data Global Infrastructure (GSDI5). It was the first time that such a meeting was held in a Latin American country. The number of initial members increased in this Meeting and the Bylaws and Rules of Procedure were adopted. Also, three working works were created:

Legal and Economic Matters
Communications
Technical Matters

This last working group involves seven sub-groups to discuss issues related to:

Core Data
Geospatial Standards
Policies
Clearinghouse
Cadastre
Geographical Names
Institutional Strengthening

Each group is coordinated by a representative from a member country and is formed by technical and professional people appointed by the geographic institutes. Below, a brief explanation of the objectives defined for the different Working Groups:

6.3 Legal and Economic Matters

Review and amend PC IDEA's Bylaws, giving consideration to technical and legal issues in order to adopt a legal framework that will support the implementation of a Geospatial Data Infrastructure.

6.4 Communications

Disseminate GDI basic principles on wide coverage and higher detail supported by themes that are specific to one country (case study).

6.5 Technical Matters

6.5.1 Core Data

Define, establish and create a set of very useful core geographic data which are reasonably needed at national and regional levels to foster sustainable development and the implementation of projects that involve geographic information.

6.5.2 Geospatial Standards

Developing and fostering standards to be effectively applied in the collection, use and management of regional geographic data in benefit of its members.

6.5.3 Inter-Institution Agreements and Policies

Present resolutions and recommendations with a focus on disseminating quality standards and guidelines to share and exchange geospatial data at regional, national and local level, giving consideration to legal, technical, social and economic aspects of member countries.

6.5.4 Clearinghouse

Install a Clearinghouse node in each member country to set up a metadata consultation system, supported by technology transferred from the U.S. and Colombia, to facilitate on-line geographic data access and use.

6.5.5 Cadastre

Promote initiatives and action plans among member countries of PC IDEA aimed at outlining the significant role that cadastre plays in the development of SDI and for nations to adopt a common language that may guide the enhancement of cadastral systems under an SDI perspective.

6.5.6 Geographical Names

Support and strengthen initiatives put forth by UN, PAIGH Groups of Experts as well as by national authorities or committees to standardize and provide precise and consistent use of geographical names, as key elements of global, regional and national SDI's. This common language is required for appropriate communication, sustainable development and regional infrastructure purposes.

6.5.7 Institutional Strengthening

Build PC IDEA's and its members' management capacities by entering into agreements for technical and financial cooperation with different players in the international community, so as to ensure technological transfer and sustainable development.

During this Meeting, Colombia completed its presidency and Venezuela was appointed to chair through the General Direction of the Venezuela Geographic Institute *Simon Bolivar* and *Tommy Guardia* National Geographic Institute was appointed to vice chair.

6.6 Fourth Meeting

PC IDEA's Fourth Meeting was held in San Jose, Costa Rica in June, 2003 along with a Technical Meeting of the PAIGH Cartographic Committee. Mexico was appointed to chair this Meeting through INEGI and Tommy Guardia National Geographic Institute continued to vice chair.

This Meeting defined some conceptual guidelines and lines of action. It also outlined that there is need to face strong challenges to develop the Regional Infrastructure and to promote national initiatives. This requires the strengthening of PC IDEA.

Furthermore, a statement was made on the need to develop new paradigms in the Americas and to open up to the world. Clearly, this will bring new challenges associated with mutual understanding, cooperation, the promotion for the development of knowledge and the opening of new opportunities in the context of global information and communications.

On the other hand, emphasis was made upon the need for the development of new ideas and concepts linked to geospatial data that may support appropriate decision making towards sustainable development in the Americas. It was also concluded that we all have something to learn from our peers.

7. MAIN ACCOMPLISHMENTS

PC IDEA has made significant accomplishments thanks to the dedication, interest and efforts of many countries and to the cooperation provided by those already well advanced in the implementation of their own SDI, mentioned below.

Following resolutions adopted in the above mentioned Resolution number 4 from the Sixth UNRCC, several countries in Latin America are working in the design, development and implementation of spatial data infrastructures, some of them, even from before the celebration of the Sixth Conference. A few of them are currently going through their conceptual stage; a few others are clearly progressing towards implementation, and showing various degrees of improvement at this time. Other countries, such as the United States and Canada have made significant accomplishments both in the design and implementation phases. The following twenty-two countries already have their initiatives to develop their SDI's:

Latin American Countries with SDI Initiatives in place

Argentina	**Canada**	**Bermuda**
Bolivia	**Chile**	**Colombia**
Costa Rica	**Cuba**	**Dominican Republic**
El Salvador	**Ecuador**	**Guatemala**
Honduras	**Jamaica**	**Mexico**
Nicaragua	**Panama**	**Peru**
Trinidad & Tobago	**United States of America**	**Uruguay**
Venezuela		

The initiative to integrate and develop Mexico SDI (IDEMEX) is under implementation. The most important national organizations involved in the development of geospatial information are contributing to this initiative, which is under the coordination of INEGI and pursuant to the capacities granted by the Law on Statistical and Geographic Information (*Ley de Información Estadística y Geográfica*). It is the operational instance for the management and development of the National System of Geographic Information (*Sistema Nacional de Información Geográfica*, (SNIG) towards the provision of the best Public Service of Geographic Information.

An interesting aspect of IDEMEX is that it integrates objectives and action plans linked to the participation and consultation processes defined by the Law on SNIG integration and development. This is achieved through Technical Committees that focus on programming, regulatory and operation issues of geospatial data in different government levels and jurisdictions. Those Committees are part of the National Program for the Development of Statistical and Geographic Information (*Programa Nacional de Desarrollo de Estadística y de Información Geográfica* (PRONADEIG)), that fully supports IDEMEX. Besides, INEGI has already created the internal infrastructure to support and operate the development of this SDI.

In response to the objective put forth by the Working Group on Clearinghouses, several member countries already have at least one website that provides this service to users. This was achieved with the assistance and cooperation of the United States Geology Service (USGS) and the Federal Geographic Data Committee (FGDC). So far, 24 countries from the Americas can provide this service that is expanding its coverage and thematic scope in relation with requested geospatial information.

Latin American Countries with Clearinghouse

Argentina	**Barbados**	**Bolivia**
Canada	**Chile**	**Colombia**
Costa Rica	**Dominica**	**Dominican Republic**
El Salvador	**Guatemala**	**Honduras**
Mexico	**Nicaragua**	**Peru**
Trinidad & Tobago	**United States of America**	**Uruguay**
Venezuela		

PC IDEA already has a Class A link with Technical Committee 211, Geographic and Geomatic Information from the International Standards Organization, ISO TC/211, responsible for the development of standards worldwide. ISO TC/211 is providing valuable information that is being organized to make it available to member countries. Besides PC IDEA has a website mainly aimed at contacts with foreign countries and at enhancing communication among members.

8. PC IDEA PLANS

PC IDEA immediate plans include the creation and the strengthening of links and relationships with geospatial organizations that are global and regional leaders, including, the Global Geospatial Data Infrastructure (GSDI), the Permanent Committee on GIS Infrastructure for Asia and the Pacific (PCGIAP), the emerging African initiative, the European Organization for Geographic Information (EUROGI), the Open Geospatial Consortium (OCG), the IPGH, the FGDC, ISO TC/211, the International Cartographic Association (ICA), the International Committee for Global Mapping (ISCGM) and, most especially, the United Nations.

The plan also intends to redefine and strengthen working groups and to support above mentioned sub-regional initiatives such as the Meso-American and Caribbean Geospatial Alliance (MACGA), the Central American Geographic Information Project (PROCIG), and the recent IDE ANDINA.

There will be attempts to increase membership. PC IDEA is organizing Regional Seminars and Workshops, the Fifth Meeting of the Committee in Aguascalientes, Mexico, convened for the 29th, this current month, and the Sixth Meeting to be held in New York, probably in May 2005 along with the 8th UNRCC. An example of the efforts in progress is the ISO Metadata Standard Workshop to be delivered here, on the 28th. This Workshop is supported by PAIGH and ISO/TC 211 will participate.

One of the primary lines of work focuses on promoting better communication with and among member countries by fostering participation. This is done using the new information and communication technologies that allow to disseminate information on SDI projects formulated in different countries and to set up discussion forums at PC IDEA website.

9. FINAL REMARKS

AS conclusion, we may say that PC IDEA is a young organization aimed at bringing together joint interests in the field of geographic information. The goal is to develop national geospatial data infrastructures that can be integrated into the regional and global context. There should be a response to the increasing demands imposed by globalization, sustainable economic development and growing technological progress.

Thanks to the efforts of PC IDEA, the Regional SDI is on line but it will take some time before all objectives are formally met. However, we are confident that mutual understanding, cooperation and willingness to make things happen in the Americas will allow the accomplishment of our goals, in due time.

Hopefully, this presentation has contributed to the establishment of a useful framework for debate and discussions on the development of land information policies in the context of Spatial Data Infrastructures.

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