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10th International GSDI Conference

St. Augustine, Trinidad, 25-29 February 2008

GSDI conferences are opportunities to meet and exchange views about implementing and developing spatial data concepts and practices. From national and international agency perspectives to local grassroots initiatives, the conference provides an occasion for interaction and cooperation among disciplines and practitioners that use and develop spatial technologies and databases. Policy-makers at local, regional and global levels are provided with an opportunity to interact with a global community fostering spatial data infrastructure developments in support of addressing important worldwide needs.

Trinidad and Tobago are a unique Caribbean paradise. There is no place in the world quite like this tiny twin island republic of 1.3 million ethnically diverse people. Bursting with spirit and a heady mix of cultural activities, beautiful people, eco adventure and culinary delights, Trinidad and Tobago has something for everyone. Located just off the tip of Venezuela, Trinidad, the larger and livelier of the islands, is an industrial giant boasting exciting nightlife, a robust energy sector and growing manufacturing industry

The conference program will feature opening and closing plenary sessions with keynote speakers, daily plenary sessions focused on the conference theme and related topics, technical paper sessions in several parallel tracks, pre-conference workshops freely open to all registrants, a poster exhibit and competition, an exhibition area highlighting agency initiatives and corporate product and service offerings, and numerous organized round table discussions to allow people from common regions of the globe or with common interests to present, discuss, and share issues, experiences and plans.

The selected theme of GSDI 10 is ***Small Island Perspectives on Global Challenges: The Role of Spatial Data in Supporting a Sustainable Future***. The pressing needs of small island nations are a particular emphasis of the conference and include such concerns as:

- sustainable development,
- disaster prevention, warning, management, response, and recovery,
- alleviation of poverty and crime,
- economic development,
- lessening the digital divide including access to information technologies,
- ensuring food security,
- support of transportation, health and communication systems, and facilitating land ownership

GIS, spatial data infrastructure concepts, and affiliated technologies are being utilized worldwide to help address all of these issues.

The Co-Chairs of the Local Organizing Committee are Jacob Opadeyi and Bheshem Ramlal of the University of the West Indies. For additional details, please visit <http://gsdi.org/GSDI10/>



Creative Commons Photo Credits: Tree- Debansu. Map: Plate in Samuel Augustus Mitchell's School and Family Geography (1839) published in Philadelphia, Pennsylvania

President's Message

The 9th International Conference of the Global Spatial Data Infrastructure Association was conducted in Santiago, Chile on November 6-10, 2006. The theme of the conference "Spatial information: Tool for Reducing Poverty" was addressed from many viewpoints through the presentations and in round table discussions convened during the week. The GSDI9 Conference illustrated just how strong the SDI idea is around the world. The conference attracted over 400 registrants representing 62 nations. It featured over 193 presentations and 53 posters in 58 technical sessions, 8 workshops, 6 round tables, and many business meetings.



The GSDI 9 inauguration ceremony featured welcoming presentations by the Director of the Chilean Instituto Geografic Militar, Colonel Luis Alegria M., and the Chilean Minister of National Assets, Mrs. Romy Schmit. Other keynote and

plenary sessions featured presentations by Dr. Maryvonne Plessis-Fraissard, Director of the Transportation and Urban Development Department at the World Bank, Dr. Carmelle Terborgh, Manager of Global Affairs at Environmental Systems Research Institute (ESRI), Peter Batty, Chief Technology Officer of Intergraph Corporation, Ivan DeLoatch, Director of the US Federal Geographic Data Committee (FGDC), Jorge Duran, Senior Manager of

Municipal Development and Capacity Building at the Organization of American States (OAS), and Ricardo Quiroga, Principal Economist of the Environment Division of the Sustainable Development Department at the Inter American Development Bank.

The 2006-2007 GSDI Small Grants Programme Call for Proposals raised great interest, and total of 85 proposals from around the world were received. The GSDI Regional Newsletters are still going strong.

From the GSDI9 conference we can say that SDI is an essential and necessary component in the fight against poverty and the GSDI Association urges governments to recognize this in their developing programs.

The GSDI Association continues to concentrate on raising awareness of the benefits of spatial data infrastructure. To augment our strong representation from the surveying, mapping and GIS professions we are stepping up efforts to expand GSDI membership with a particular focus on boosting membership representation from the user community.

To the members of the GSDI Association, I thank you for your unwavering support of the GSDI Association mission!

Jarmo Ratia, President
GSDI Association

What are spatial data infrastructures?

Spatial data infrastructures (SDIs) provide a basis for spatial data discovery, evaluation, and application, and include the following elements:

- Geographic data: the actual digital geographic data and information.
- Metadata: the data describing the data (content, quality, condition, and other characteristics). It permits structured searches and comparison of data in different clearinghouses and gives the user adequate information to find data and use it in an appropriate context.
- Framework: includes base layers, which will probably differ from location to location. It also includes mechanisms for identifying, describing, and sharing the data using features, attributes, and attribute values, as well as mechanisms for updating the data without complete re-collection.
- Services: to help discover and interact with data and provide direct answers to the questions of users.
- Clearinghouse: to actually obtain the data. Clearinghouses support uniform, distributed search through a single user interface; they allow the user to obtain data directly, or they direct the user to another source.
- Standards: created and accepted at local, national, and global levels.
- Partnerships: the glue that holds it together. Partnerships reduce duplication and the cost of collection and leverage local/national/global technology and skills.
- Education and Communication: allowing individual citizens, scientists, administrators, private companies, government agencies, non-government organizations, and academic institutions with local to global interests to communicate with and learn from each other.

Grant Programs

GSDI Small Grants Program

By Alan Stevens and Carmelle Terborgh

The GSDI Association along with partners and participants funds a regular small grants program to support national or sub-national activities that foster partnerships, develop in-country technical capacity, improve data compatibility and access, and increase political support for spatial data infrastructure and earth observations application development. Activities receiving support may focus on technical or institutional projects, as long as there are concrete outputs and several institutions collaborate on the effort. Priority is given to projects in developing nations and countries with economies in transition.

A total of 85 proposals were received in the 2007 competition. After review by international assessment teams, the GSDI Association is pleased to announce the following 20 recipients:

- * Africa -- Integration of Metadata in current MadMappers Web Archive
- * Africa (regional) -- Metadata for the Management of the Guinea Current Large Marine Ecosystem Region
- * Americas (regional) -- Global Map of the Americas User Application Survey
- * Belize Metadata -- Promoting the use of Metadata Standards in Belize
- * Burkina Faso -- Technical Workshop on the Production of Metadata
- * Chad -- Organization of Spatial Data at the CNAR & Implementation of a Spatial Metadata Base for Researchers
- * Egypt -- National Spatial Data Infrastructure: Policies, Regulations, and Standards
- * Jamaica -- Fostering a Culture of Metadata Production
- * Kenya -- Enhancing Capacity of Mapping Services within the International Livestock Research Institute
- * Kenya -- Mau Watershed (Sub-region) Spatial Data Infrastructure
- * Kenya -- Metadata training for Kenyan government and non-profit cooperators
- * Moldova -- Geospatial Data Standardization
- * Mongolia -- Establishing web mapping services and applications
- * Nepal -- Cadastral Metadata of Nepal
- * Niger -- Niger National SDI Plan
- * Nigeria -- Spatial Data Infrastructure Capacity Building for Nigerian Professionals
- * Pakistan -- Environmental Spatial Metadata Archive of Pakistan
- * Peru -- SDI National Workshop
- * South Africa -- Training of Data Managers in GIS
- * South Africa -- Address Standards Workshop

The following grant recipients will receive manpower contributions from URISA's GISCorp as a part of the GSDI Grant program:

- * Kenya -- GIS on Indigenous Population & Occupations in Kenya
- * Mongolia -- Establishing web mapping services and applications (In addition to the cash grant)
- * West Africa -- Web-map Services for Vulnerability Monitoring and Food Security in Sub-Sahara Counties

Congratulations to all the award recipients! This is the fourth GSDI Association offering of Small Grants in the last 5 years. We wish to thank the US Federal Geographic Data Committee for their financial and human resource contributions to make this program a reality. Additional thanks go to URISA's GISCorps for their human resource contributions both in the selection process and in the field allowing us to approve additional proposals. Summary descriptions of each of the new projects may be accessed at <http://gsdi.org/proj+progr.asp>

Intergraph/GSDI Interoperability Grants

By Mark Doherty, Intergraph Corporation

Intergraph Corporation is pleased to continue to support the development of international spatial data infrastructure projects. Through building relationships with organizations such as the Global Spatial Data Infrastructure (GSDI) Association, Intergraph is able to encourage the use and dissemination of geospatial technology. If your organization is a member of GSDI, you are eligible to apply for an Intergraph Open Interoperability Grant Program. Details of the grant and the application form can be found at www.Intergraph.com/interoperability/gsdI.asp

ESRI, GSDI and Global Map Program

By Jeanne Foust and Carmelle Terborgh, ESRI

ESRI is honored to support the missions of the International Steering Committee for Global Map (ISCGM) and the Global Spatial Data Infrastructure (GSDI) Association with a grant. Since 2001, the grant has been awarded to over 105 institutions in support of national mapping efforts and the development of spatial data infrastructures (SDIs). Most recently, the grant was awarded to a grantee in Libya.

The website for the Global Map/GSDI Grant Program was recently updated to announce the provision of the latest versions ESRI Virtual Campus training courses and ArcGIS software through the grant. For further information about this program, please refer to <http://www.esri.com/sdigrant> or contact Jeanne Foust, Global Manager for SDI at jfoust@esri.com.

Developing Nation Fund

The GSDI Association administers and solicits funds for a Developing Nation Fund to support such items as travel expenses of individuals and organizations in developing nations to allow worthy individuals to participate more fully

in GSDI meetings, workshops, and grant opportunities. Money for this fund is received from additional contributions as members pay dues and from other activities. The Developing Nation Fund Auction at GSDI 9 raised a couple thousand dollars and we are hopeful that future conference auctions will be as successful. The local organizing committee for each conference makes the decisions on how such funds from the auction at the last conference are expended for travel at their conference.

GSDI-9 Conference in Santiago

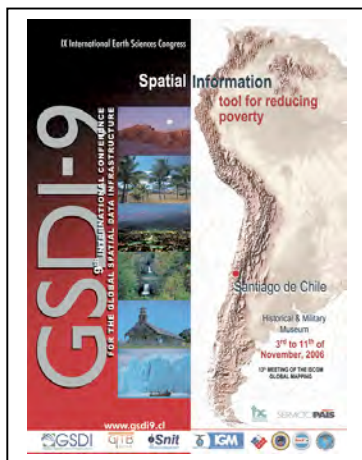
By John Moeller, Northrop Grumman

The theme for GSDI 9 was **Spatial Information: Tool for Reducing Poverty** and the conference included plenary sessions, technical sessions, workshops, regional discussions and commercial exhibits. The GSDI Association hosted the Conference in cooperation with the Military Geographic Institute of Chile, The Spatial Data Infrastructure of Chile (SNIT), ESRI, Intergraph and the US Federal Geographic Data Committee.



Three among many featured speakers at GSDI 9: Ivan Deloatch, FGDC, Peter Batty, Intergraph and Carmelle Terborgh, ESRI

The GSDI Conference was well supported by the Chilean Geospatial data community. High level Government Officials made presentations, and many political, military and government officials were part of the more than 500 attendees at the opening ceremony for the Conference. Approximately 425 persons from across the globe attended plenary presentations, technical sessions, workshops, roundtables, and business meetings.



The Conference was a great success in bringing together a wide array of countries and individuals and the resolutions of the Conference reflect the growing capability around the world of national and regional organizations to develop and implement SDIs. The key to this growth is the recognition that a solid baseline of adopted international

standards and common SDI practices now exists, enabling compatible SDIs to flourish. Further, the development of implementation profiles for different major regions of the globe is stimulating collaboration and implementation in many parts of the world. A special edition of the GSDI Regional Newsletter for Latin America and the Caribbean was published for the Conference and can be seen at: <http://www.gsd.org/newsletters/SDILACv3n11English.pdf>

In conjunction with this meeting a number of other global and globally regional organizations also held meetings to take advantage of the gathering of key geospatial policy and technical leaders:

- The United Nations Geographic Information Working Group
- International Cartographic Association (ICA) - Spatial Data Standards Commission
- Permanent Committee for the Infrastructure of Geospatial Data of the Americas (PCIDEA)
- International Steering Committee for Global Mapping (ISCGM)
- The Pan-American Institute for Geography and History (PAIGH)

As with previous GSDI conferences, the gathering of leaders from government, industry and not-for-profit organizations in the geospatial community was both stimulating and beneficial. Participants were able to share their challenges and successes in SDI development and implementation; discuss the past and future vision for GSDI; interact in both meeting and social settings and gain an appreciation for the level of GSDI activities occurring around the world.

Colonel Luis Alegria, Director of the Military Geographic Institute of Chile spoke about the importance of geo-spatial information for the development of countries and to reduce poverty. His comments stimulated attendees to each contribute to a rich exchange of knowledge using our common language of geography.



Group Photo at GSDI Association Council Meeting at GSDI 9 in Santiago

At the Santiago Conference, the GSDI Association elected Jarmo Ratia, Director General, National Land Survey of Finland as President and Bas Kok, Director International Affairs, Dutch Cadastre, as President-Elect. Professor Harlan Onsrud of the University of Maine, USA, became the immediate past-president as well as interim Executive Director. These three along with fifteen other elected representatives from organizations spread across the

globe make up the Board of Directors. New organizations admitted as full members to the GSDI Association include INPE (Brazil) and the University of Melbourne while UN-Habitat was admitted as an ex officio member. Finally, we wish to acknowledge, congratulate and thank the Military Geographic Institute of Chile, its staff, its leadership

including Colonel Luis A. Alegría Matta and Colonel Rodrigo Barriga, as well as the local organizing committee for a well run, productive and highly enjoyable conference. The quality of the speakers and the hospitality was truly outstanding.

Santiago Statement

1. Spatial Information is a public asset. Governments around the world should attempt to make freer access to it. This will better enable shared development that is interrelated and standardized for both the public and private organizations that use it. This information is an important element for our countries, becoming a basis for economic growth, encouraging public and private investment. Consequently it generates economic and social development.
2. Governments must invest in the development, implementation, application and use of spatial information, consequently making contributions to the budgets of the bodies which create territorial information, in order to produce, maintain and publish the spatial data that sustains development in these countries, oriented to a continuous improvement of the standards and lives of the people of our planet.
3. Spatial information is a technological resource that should be used by governmental authorities at all administrative levels, in order for them to know, have access to and use territorial information, thus making decisions to benefit the population and its territory, being properly informed, in order to generate the tools for reducing poverty by determining the unsatisfied needs of the people that must be resolved as soon as possible.
4. Educational authorities should ensure that future generations of the most highly educated people set to become the leaders of tomorrow understand, use and learn to manage spatial data to benefit the society they work in, also studying relevant aspects such as measures in response to disasters, environmental protection, the acquisition of awareness of the social conditions involving poverty in the area studied, generating social measures to improve the quality of life among inhabitants, and gaining a real knowledge of the legacy and assets constituted by that territory.
5. Spatial Information becomes a real tool for reducing poverty while the governments of the world create geo-referenced territorial information and statistics about the social, economic, cultural, institutional and environmental conditions of the territory and its population. Poverty is the major issue and scourge of our current society, leading in turn to other problems, for example the increase in crime, corruption, drug addiction, child abuse and so on. We will seek to find the way to continuously improve living standards in our countries.
6. It is important that nations work on the creation of a legal framework that supports the work on SDIs in every country. A national SDI legal framework aids institutional backing that brings the financial resources this task requires and provides a structure that applies across all the activities of each country. Adequate training will be necessary for it all to function well.

Outreach Summary

1. GSDI Association Website (<http://gsdi.org>)

The links for the Newsletters, News List Archive and Upcoming Conferences continue to support some of the heaviest traffic on the website. The website has been upgraded to accept on-line credit card payments for new and continuing memberships as well as for conference payments. The website also contains a “members only” section providing access to minutes of the monthly Board teleconference minutes as well as contact information for other members. We also support numerous discussion lists for those desiring to discuss regional interests and to support the work of the association’s committees. A conference paper submission, review, and management system continues. Blog and wiki capabilities are also available but have not been used substantially to date.

2. Regional Newsletters Support SDI Outreach

The GSDI develops mainly through SDI activities that occur at the local, national and regional levels. The Association's monthly electronic regional newsletters continue to be coordinated and posted on the GSDI site. They have been extremely popular in keeping people around the globe informed about SDI-related activities in

their locales. Our Association's newsletters include the *SDI-Africa Newsletter*, edited by Kate Lance; the *SDI-Latin America & Caribbean Newsletter*, edited by Nancy Aguirre on behalf of PAIGH; and the *SDI-Asia & Pacific Newsletter*, edited by Changsup Han. Current and past issues are available on our website. The GSDI Association website also contains links to other SDI-related newsletters, such as the US Federal Geographic Data Committee (FGDC) Newsletter. We also archive the EUROGI, UNGIWG SALB, and EIS-Africa Newsletters. The GSDI Association website is the world's leading aggregator of global SDI news.

3. GSDI Newslist

Our GSDI newslist continues to be very popular with several thousand subscribers. New people from across the globe join the list virtually every day to receive announcements on SDI-related topics. Feel free to join at <http://gsdi.org/newslist/gsdisubscribe.asp>

4. Discussion Lists

The GSDI Association supports 14 email lists. Some focus on thematic issues (e.g. technical list, legal and economic list), some focus on regional interests (e.g. Africa, Europe, etc.) and others focus on supporting discussions among members of the standing committees and administrative

units of the organization (e.g. Communications Committee, GSDI Council, etc.).

5. Geographic Information Knowledge Portal

Over the next year members are likely to witness the emergence of a Geographic Information Knowledge Portal supported by the GSDI Association and hopefully other major international geospatial. The goal of the portal will be to enhance communication and freely share knowledge among professionals in the geographic information global community. This is intended as a participatory user created and maintained commons. The intended users are professionals, government agencies at all levels, non-government organizations (NGO's), private companies, practitioners, scholars and students across the globe who have sincere interests in creating a geographic information "knowledge network" and advancing the practice and science of the discipline. It is not so much about maps, data and map services as it is about people. In short, none of us knows as much as all of us. This portal is intended as a facility for collective intelligence where each community member acts responsibly and makes their own decisions about what and how much to contribute. A prototype is under active development and will be demonstrated at the GSDI 10 meeting.

6. Active Engagement in International Standards Development Forums

Standards are essential to GSDI best practices. The GSDI Association has International Standards Organization (ISO) Class A liaison status, allowing member organizations to review and provide comment on ISO/TC 211 documents. (ISO/TC 211 is the ISO technical committee responsible for standardization in the field of digital geographic information.) Various GSDI members continue to participate in standards development forums such as OGC and ISO TC 211. The GSDI Association is also a Participating Organization in the Group on Earth Observations (GEO) and actively participates in its working groups and events.

Outcome of GSDI 9: A New Book

Research and Theory in Advancing Spatial Data Infrastructure Concepts

Spatial data infrastructures (SDIs) have come a long way in the last two decades. In this timely scholarly volume, peer-reviewed submissions to the GSDI 9 conference present the latest research by renowned international experts and offers insights into possible directions in which SDIs may be headed. Firmly rooted in a broad societal context, the studies take technical, legal, economic, and



institutional challenges head-on, with a strong emphasis on the needs of developing nations. The research analyzes models for planning, financing, and implementing SDI initiatives and assesses the extent to which established SDI projects in Australia, India, and the European Union are contributing to national economic competitiveness and social well-being. The book includes examples of how instrumental SDIs can be in disaster preparedness and poverty management, and it examines the integration of intellectual property rights within the framework of international SDI collaboration.

The book is the first known open-access licensed book published within the GIScience and SDI scholarly communities. Nicely bound printed books are available from ESRI Press at <http://gis.esri.com/esripress/>

Committee Progress

Technical Working Group

By Douglas Nebert, Technical Committee Co-Chair, US FGDC Staff

The GSDI Technical Working Group members met at the GSDI-9 Conference in Santiago to discuss activities and plans. The maintenance of the SDI Cookbook implementation document was highlighted as a key need and possible work item for the 2007 calendar year. A request for contributions and editorship on specific chapters is needed to refresh the Cookbook content. Greg Yetman from CIESIN was nominated and selected as a co-chair of the Technical WG at the GSDI-9 meeting and is working to revive efforts to update the SDI Cookbook document during 2007.

The continued operation and development of a GSDI Gateway capability was discussed by the membership. The GSDI Gateway is intended to provide a catalog search capability and visualization of spatial data that would traverse individual national SDI offerings to provide a virtual global view. There was interest on the part of several providers in offering a free capability to the GSDI Association. Because of the implicit competition between the offers, the proposal was forwarded to the GSDI Board for further consideration as to how or if such a common portal capability will be deployed.

On a related note, the development of a global "yellow pages" service registry for maps and data was discussed. Such a directory would allow for the registration of catalogs and map services and provide portal or application developers with information about what Web services would exist over a given geography and allow programmers to connect to the services for more information. The requirement for this global geospatial service registry was initially suggested by the OGC and more recently the Group on Earth Observation (GEO) as the basis for their GEO System-of-Systems (GEOSS). The GSDI TWG members are invited to collaborate on the

promotion and development of this capability with the GEOSS that could be used to document catalogs and web services from both the SDI and earth observation domains: <http://www.earthobservations.org>

"SDI 1.0" was discussed as a means to identify a group of ready-to-apply geospatial standards that are commonly applied in Spatial Data Infrastructures at the local, national, and regional level. The packaging would be most helpful to new adopters of SDI technology as a checklist of available and reliable standards that should be anticipated in the deployment of SDI. This packaging proposal was presented in a paper at the GSDI-9 conference for consideration by the GSDI members. A question remains as to what role that the GSDI should take in promoting, supporting, or maintaining such a list of standards in concert with the originating standards organizations (ISO TC 211, OGC, OASIS).

Legal and Socioeconomic Working Group

By Roger Longhorn and Kate Lance, LSWG Co-Chairs

The Legal and Socioeconomic Working Group continues to be engaged in a range of activities including support of an active discussion list and creation of on-line resources <see <http://gsdi.org/standingcomm.asp>>.

At the GSDI Legal and Economic Working Group open meeting at the GSDI-9 Conference in Santiago, a detailed work plan was developed based on inputs from participants at the meeting. Among the items in the task list include: Establish a Legal and Socioeconomic Working Group Blog and schedule authored contributions; Experiment with the WebEx capability for virtual presentations and question/answer sessions; Organize a Legal/Policy workshop in conjunction with PCGIAP meeting in 2007 in Korea; Include links to existing compilations of relevant SDI Legal and Economic documentation/reference material; Add abstracts to the existing Working Group Website; Facilitate joint research among Legal and Economic Working Group members. Work continues on some of the tasks while other tasks have been subsumed by the Geographic Information Knowledge Network and Portal project.

The Legal and Economic Committee continues to maintain a web page providing examples of courses that introduce SDI concepts and components. It is useful to see how these courses are structured, which SDI elements they include, and how the concepts are conveyed. The Committee invites GSDI Association members and others to offer news of courses as they become available. Further, the committee supports a Legal and Economic Discussion list that has been active since December 2004. See http://www.gsdi.org/lewg/SDI_education.htm and <http://lists.gsdi.org/pipermail/legal-econ/>.

Sponsored Project Committee

By Al Stevens and Carmelle Terborgh

The Sponsored Projects Committee is soliciting sponsors willing to fund programs in support of SDI. The essential capacity building and outreach activities of the GSDI Association are needed in order for organizations to realize the benefits of building and maintaining an SDI. The following items are in need of funding or in-kind donations:

- Regional SDI newsletters (Africa, Asia and the Pacific, and Latin American and the Caribbean) - need funding and translation services
- Workshops and training events - need funding and hosting
- The Developing Nation Fund (see article on page 3)
- General administration of the GSDI Association

Individual Grant Programs, such as those by two of our corporate members, Integraph and ESRI, are another great opportunity to provide targeted sponsorship in support of SDI.

Please see the article on page 3 related to the GSDI Small Grant Program. Our thanks to the US FGDC for sponsoring this program and to GIS Corps for serving as a partner to this effort! We hope to have others join them in providing needed resources to foster SDI.

Conference Planning Committee

The Conference Planning Committee has been actively working with the Local and Regional Organizing Committee in Trinidad to arrange the GSDI10 technical sessions. While the web site for the conference is already up featuring items such as conference topics and theme, registration information, social activities, accommodation information and related data, the detailed technical program will not be posted until after the paper review process is completed. See <http://gsdi.org/gsd10>. The call for papers was distributed widely. Any full paper submitted to the conference will be refereed by an academic peer review panel and a subset of articles will be invited to appear in a special issue of the *International Journal of Spatial Data Infrastructures Research* upon appropriate revision. See <http://ijsdir.jrc.it/>

Preparations are already underway for GSDI-11. It is scheduled tentatively for Rotterdam, The Netherlands in June 2009.

Reports from Around the World

Asia-Pacific: GSDI/ PCGIAP Workshop held in Seoul Korea on June 12th 2007

By Bas Kok and Abbas Rajabifard

The development of a spatially enabled government was a key focus of the 17th United Nations Cartographic

Conference for Asia and the Pacific (UNRCC-AP) and 12th meeting of the UN supported Permanent Committee for GIS Infrastructure for Asia and the Pacific (PCGIAP) in September 2006 in Bangkok, Thailand. This focus led to Working Group 3 (formerly Cadastre) of the PCGIAP to realign its activities on Spatially Enabled Government as part of developing national Spatial Data Infrastructures (SDI). In conjunction with the GSDI Association, WG3 (Spatially Enabled Government) of the PCGIAP held a dedicated workshop on “Spatial enablement of government and NSDI – policy implications” during the 13th PCGIAP meeting in Seoul, Korea on 12th June 2007.



The major aims of the workshop were:

- To communicate and refine the draft PCGIAP WG3 workplan
- Commence dialogue in PCGIAP and better understand and describe spatial enablement of government
- Gather preliminary data and refine understanding of data requirements for PCGIAP WG3 data gathering task
- Better understand and describe the legal and economic issues and policies on a global level in the development and implementation of SDIs

The workshop reviewed the national use of spatial enablement by governments and society including:

- how is spatial information being used nationally?
- who uses it – particularly in non traditional areas such as taxation, health services, human services?
- how widely is it used?
- is the concept of “place” or “location” such as street address used as an organizing entity in government processes?
- do countries have a geocoded national street address file?
- is the use of spatial information linked to whole-of-government policies (such as e-government and information and communication technology (ICT) strategies)?
- what can be done to improve the use of spatial information?

The workshop focused also on capacity building and policy initiatives in other parts of the globe such as the data

policy initiatives in Europe in relation to the development of SDIs including: data sharing and collaboration developments; drivers for SDI investment; SDI benefit/cost studies; and data access policies.

Presentations were made by 125 delegates from thirteen countries. Ian Williamson of the Melbourne University presented a position paper on Spatially Enabled Government. Abbas Rajabifard of the Melbourne University presented an overview of PCGIAP-WG3’s vision and workplan on Spatial Enabled Government. Ms Liz Marchant, of Service Delivery Policy Department of the Australian Government, Mr Ahmad Fauzi Nordin of the Department of Survey and Mapping of Malaysia, Victor Khoo of the Singapore Land Authority, prof Sang-Ki Hong of the Department of Urban Information Engineering and Akeno Kazuhiko of the Department of Transport of Japan presented invited presentations on Spatial Enabled Government in their countries. Bas Kok of the GSDI Association presented an overview of GSDI capacity building on spatial enabled government initiatives in Europe and gave an overview of the activities of the Legal and Economic Working Group. He invited all to join the Legal and Economic Working Group.



The main outcomes of the Spatially Enabled Government (SEG) workshop included:

1. The Workshop endorses the concept of Spatial Enabled Government as an important activity of government for improving effectiveness, efficiency, better decisionmaking, business processes and policy implementation, nationally, regionally and globally.
2. SEG builds on National SDI initiatives (NSDI) that are an important and integral part of a country’s infrastructure by developing an enabling platform, including institutional, legal, governance and political arrangements that facilitates the integration of natural resource environmental data (particularly topographic and geographic information) with large scale built environmental data (and particularly cadastral data), together with all related non spatial data such as demographic and census data, to support the objectives of sustainable development.
3. The workshop recognizes SEG as an important part of countries’ ICT, e-government and information sharing strategies as a key activity that fosters innovation.
4. The workshop recognizes that the key to SEG is the integration of a spatially enabled cadastral

layer within an NSDI that provides information about properties land parcels, land use, land value, roads, buildings and other built environmental data.

5. While the focus of SEG is government, it is equally important for promoting private sector activities and business outcomes.
6. The workshop recognizes that SEG is an evolving concept that requires ongoing research and development by PCGIAP, the GSDI Association and by member countries to clarify and expand the principles and applications associated with the concept that involves policy, social, institutional, legal and technical dimensions.
7. A toolbox for implementation of SEG is necessary, such as an enabling platform, making use of NSDI initiatives in the past, the use of essential data sets and the development of tools for data integration, and the use of legal frameworks.

Europe: The European Spatial Data Infrastructure Scene – Historically and Today *by Roger Longhorn, Co-Chair of the GSDI Association Legal & Economic Working Group and Member of the EUROGI International Affairs Working & Advisory Group*

Many initiatives for implementing national Spatial Data Infrastructures (NSDI) now exist across Europe and, as one would expect, some are more advanced than others. The European leaders in implementing fully fledged NSDIs, based on current definitions of what constitutes an SDI, include pioneering work carried out since the late 1990s in countries such as Finland, Portugal, Spain, the Netherlands, Germany and Hungary. Information on the current state of play of 32 European countries can be found on the INSPIRE web site at http://inspire.jrc.it/state_of_play.cfm.

However, rules on data accessibility issues, such as pricing and charging policies, still vary widely across Europe, as do data harmonisation and interoperability solutions. The new INSPIRE Directive of the European Union (Infrastructure for Spatial Information in Europe), which came into force in May 2007, proposed to create a level playing field across 27 EU member states. INSPIRE dictates legally binding implementation rules for data sharing principles, harmonisation of geospatial data sets to common data and metadata specifications based mainly on ISO standards, interoperability solutions based on ISO and Open Geospatial Consortium compliance, and a range of network services for discovery, viewing, downloading, and transformation between formats and coordinate systems.

Work on the pan-European SDI began in April 1995 with the European Commission's GI2000 initiative, originally proposed within the pan-European Information Market development programme of the European Union (EU). This work, inspired by NSDI development in the USA in

1994, stalled in 1999 for political reasons. It was replaced by a series of EU-funded projects, such as ETeMII – European Territorial Management Information Infrastructure and GINIE – Geographic Information Network in Europe. In parallel, related European initiatives focusing on re-use of public sector information (PSI) and access to environmental information led to two new EU Directives in 1998 and 2000 respectively. Since most environmental information is geospatial and 80% of PSI is claimed to have a spatial attribute, much groundwork on access, use and exploitation of geospatial information was already in place by the time the Environmental-European SDI (E-ESDI) concept was proposed in December 2001 by the EC's DG Environment. The E-ESDI later expanded into the INSPIRE initiative in 2002, now with full high-level political support from within the European Commission. Even with such support, it took five years for the current INSPIRE legal Directive to reach fruition. The Directive sets out a timetable under which metadata and geospatial data in 34 major themes will be harmonised and made accessible across Europe between 2008 and 2014, based on different priorities for implementation per theme.

In conclusion, creating a legally binding pan-European SDI has involved thousands of experts from government and industry, at local, regional, national and trans-national levels, spanning a planning and consultation period of 12 years, with initial implementation scheduled to take another 7 years. The end result of this two decade process should be an interoperable set of NSDIs across all 27 European Union Member States, supporting a population of more than 495 million citizens, in the first such truly international initiative at creating a legally binding regional SDI on such a vast scale. Numerous challenges have been faced in reaching this stage and more lie ahead, but the political will now exists to make this unique experiment work, as do the information and communication technologies and geospatial data and metadata standards needed to underpin the infrastructure.

South America

*By Rodrigo V. Barriga
Member, GSDI Board of Directors*

As the South American regional representative to the GSDI Association Board of Directors, I would like to reflect on SDI activities in our part of the world, and share my thoughts on the future of GSDI.

A successful GSDI-9 conference was held in Santiago, Chile last November, together with the GSDI Association Board and Council meetings. The conference preparation in Chile required a substantial effort on the part of the Local Organizing Committee, which included significant support from my organization, IGM. Despite a setback early in the year when the venue intended for the conference (the Diego Portales Convention Center) was damaged by fire, the Local Organizing Committee succeeded in transferring the conference to another facility, the Military and Historical Museum. I applaud the

efforts of the Local Organizing Committee, which undertook a substantial to deal with the venue change and conference preparations despite the limited budgetary and human resources available. On behalf of the Local Organizing Committee, I wish to thank the GSDI Board, IGM staff, other local contributors, the paper and poster authors and especially the sponsors and participants for making this event possible.



Gathering after the GSDI 9 Inauguration Ceremony
 Peter Holland - PCGIAP, Ignacio Guerrero - Intergraph, Santiago Borrero - IPGH/PAIGH, Luis Alegria Matta - IGM, Jorge Matus - Chilean Army High Command, Romy Schmit - Chilean Govt Minister & head of NSDI, Harian Onsrud - GSDI, Jarmo Ratia - GSDI, Vanessa Lawrence - Ordnance Survey, Peter Batty - Intergraph

In concert with GSDI-9 meetings several organizations that liaise with GSDI convened meetings in Santiago including CP-IDEA, ISCGM and PAIGH. The following are a few highlights from those meetings:

Panel Meeting of the Americas – On November 8 a special regional panel session was held in which leading figures in the Americas spoke about SDI issues in the region. The panel included speeches from leading figures in GSDI, PAIGH and CP-IDEA.

Panel Meeting of the Geo-Cartographic Agencies - Leading figures from agencies and public institutions that create or maintain spatial data met discuss common issues and challenges. A collective decision was made to establish a “Geo-Portal” as a collective resource for development, coordination and exchange.

CP IDEA - The workshop entitled “Spatial Data Infrastructure in terms of the needs of Latin America” was held in Santiago, Chile from the 30th of October and the 3rd of November, with instructors from Canada, Mexico and Cuba, with participation from representatives from Colombia, Ecuador, Uruguay, Brazil, Panama, Belize, Paraguay, Cuba, Venezuela and Chile.

I'd also like to take the opportunity to summarize some of the SDI related activities making progress in the region during 2006:

1. Pan American Institute of Geography and History (PAIGH)

During 2006, PAIGH sustained its continuing cooperation with GSDI, mainly through the interaction with one of its four constituent Commissions, the PAIGH Cartography Commission which is based in Chile through 2009. The Cartography Commission in turn manages a series of Committees, Working Groups and Technical Cooperation Projects, many of which are relevant to SDI. These include:

Name	Type of Unit	Country hosting the central coordination
Geospatial Data Infrastructure	Policy Committee	Colombia
Institutional Strengthening and Technical Cooperation	Policy Committee	USA
Aeronautical Charting	Technical Committee	Chile
Fundamental Data	Working Group	Colombia
Geocentric Reference System for the Americas – SIRGAS	Working Group & Tech. Cooperation Project	Argentina (Brazil up to 2006)
Americas Global Map – MGA	Working Group & Tech. Cooperation Project	Chile
Thematic Cartography	Working Group	Argentina
Catalogue of Cartography of the Americas	institutional program of the Cartography Commission	Chile

The Geospatial Data Infrastructure Committee held a course in SDI in conjunction with the IGAC agency (Bogota, Colombia) and with the Fundamental Data WG in the period 28th August – 8th September, with participants from many Latin American countries.

The GDI Committee continued to cooperate with other SDI-related networks, in particular the GSDI Association, CP-IDEA and the IDECAN project. The IDECAN project is the “Spatial Data Infrastructure of the Andean Community”, an initiative backed by the “Andean Community” (a treaty structure between several South American nations) which held a successful meeting in February, 2006 (Lima Peru).

The Fundamental Data WG is concerned with basic or fundamental cartographic data and has been researching issues of standardization for digital cartography, basic spatial data entities and Metadata.

The period of greatest convergence between GSDI and PAIGH was in the month of November 2006 when many leaders of both institutions came to Chile to attend successively GSDI-9 (6th – 10th November) and then the PAIGH Council meeting (13th -16th November). At the GSDI Council meeting on the 5th of November in Santiago PAIGH represented by the PAIGH Cartography Commission President and by the President of the PAIGH National Section in Chile. On the 8th of November the Regional Panels in the GSDI-9 conference program included an enlarged session for the Americas, led by a panel of speakers who were mostly leading figures of PAIGH, GSDI and CP-IDEA. Two members of the GSDI Board, including the former GSDI President, were invited as guests to observe and briefly speak at the first day of the PAIGH Council meeting on the 13th of November.

2. CP IDEA

The Vice-president of the CP IDEA, participated in the 12th meeting of PC GIAP (Permanent Committee for the Geo-spatial Infrastructure of Asia and the Pacific) and in

the 17th Cartographic Conference of the United Nations, at which he presented the speech titled "Regional and National Spatial Data Infrastructure in the Americas: institutional and capacity building issues". He also participated, together with the representative of the Caribbean region, in the GEOTEC where the situation of the national SDI was covered, also about the coming GSDI9 and CP IDEA workshop events, obtaining economic assistance for holding the latter in Santiago, Chile. On the 7th of November, in Santiago, Chile, a meeting of the Directing Council of the CP IDEA was held in which the Vice-president and Executive Secretary stood down to be replaced; moreover the Work Plan for 2007 was discussed.

3. Project IDEDES

"Evaluation and Strengthening of Spatial Data Infrastructures in Sustainable Development for Latin America and the Caribbean". A survey of countries in the Americas and the Caribbean was completed, and is included in the book "Spatial Data Infrastructures in the Iberian-American and Caribbean Region." Please visit: <http://redgeomatrica.rediris.es/idedes>

4. Project GEOSUR

Project GEOSUR has established an effective, regional and decentralized mechanism for outreaching and applying geospatial data in South America. With the participation of geographic institutes and the ministries of the region, as well as the Pan American Institute of Geography and History (IPGH in Spanish) and the Inter-American Biodiversity Information Network (IABIN), and the under the coordination of the Andean Development Corporation (CAF in Spanish), it is foreseen the implementation of (i) a decentralized network of map servers; (ii) a mechanism (geointegrator) that will allow regional visualization of national data in these servers, (iii) regional maps related to integration infrastructure and (iv) regional maps derived from elevation (source data from SRTM, resolution 30 meters)

Moving into 2007, we are glad to report from Chile an increasing contribution to the International Cartographic Association (ICA), which recently elected a new set of Vice-Presidents to its Executive Committee, among them Engineer Pablo Gran L., former Director of the IGM in Chile. His new role in the ICA can be considered roughly analogous to my own on the GSDI Board as South America representative. P. Gran was the immediate predecessor of Luis Alegria as Director of IGM.

In closing, I believe the work of the GSDI Association, its members and alliance partners continues to be critical for the advancement of compatible SDI's worldwide. The concluding statements from the GSDI-9 Conference in Santiago echo listed in this newsletter illustrate the urgency and value of a global SDI to address poverty and critical need for improved information sharing to address a range of local, national and regional challenges.



UNGIWG participants meeting in affiliation with GSDI 9 Conference

Asia: NSDI Initiatives in Nepal 2006

Raja Ram Chhatkuli

Programme In-Charge NGIIP, Nepal

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The National Geographic Information Infrastructure Programme (NGIIP) in Nepal was initiated in 2002 with the primary aim of avoiding duplication in spatial data creation and developing an environment for data sharing and thereby strengthening planning and resource management in the country. NGIIP could utilize part of the European Commission assistance in the initial three years till 2005. This period was crucial for conceptual design of the future NGII and also in developing the Metadata Clearinghouse. NGIIP obtained Founder Membership of GSDI Association in early 2004. This relationship with GSDI Association was very helpful in planning the course of NGII in Nepal. The experts and top management of NGII could interact with GSDI board members, experts and other SDI gurus through emails, and by retrieving necessary information from the GSDI Association website and SDI Newsletters. The interactions held with many experts and especially with the SDI Cookbook editors during GSDI7 and GSDI8 Conferences were particularly helpful.

The year 2006 saw the termination of external funding. But due to the sound infrastructure and the conceptual foundation built over the last three years the Government of Nepal has sustained the Programme though with limited funding. A wider networking and interaction between data producers and data users was realized and a Consultative Meeting on Metadata Clearinghouse and National Geoinformation Infrastructure Networking was organized in Kathmandu, Nepal on March 31, 2006. A total of 74 top executives of Government of Nepal from 13 Ministries and 28 Governmental Departments participated. This Meeting was very important in raising NSDI awareness among top government executives and also in acquiring commitment for cooperation in its development. All organizations agreed in principle to donate their metadata. In addition to the Survey Department, two other organizations namely the Department of Mines and Geology and the Department of Urban Planning and Building Construction committed to upload their metadata in the Metadata Clearinghouse with a clearly defined timeline. The Index of Geographical Names covering the whole country was posted in the Clearinghouse website.

In 2006, NGIIP was restricted to interactions with the GSDI Association and its board members and other experts

through the web and emails only. Programme In-Charge Raja Ram Chhatkuli attended bgis@India International Conference in Trivandrum, India in December 2006 and delivered keynote on the topic "Towards a Spatial Data Infrastructure at the National Level: Lessons and Experiences Focusing on Organizational and Institutional Aspects of SDI". He is also on the Board of the Trans Asiatic GIS Society.

NGIIP recognizes that the GSDI Association has helped propagate the idea of SDI at the national level in Nepal and also at the regional level in Asia.

Africa: Current NSDI Small Grant Projects

Of the small grant awards made through the recent competition sponsored by the GSDI Association, 12 of the 23 grants focus on projects in Africa. Following is an illustrative project supported through the program. Descriptions of all of the recent awards may be accessed at <http://gdi.org/proj+progr.asp>

Title of Project: Organization of Spatial Data at the CNAR (TCHAD) and Implementation of a Spatial Metadatabase for Researchers

Sponsor: Centre National d'Appui d la Recherche (CNAR)

According to recent 2006 Human Development UNDP reports, Chad is among the poorest countries in the world lacking communication facilities with limited access to the Internet. As a result, exchanges between national research institutions are extremely difficult. Despite these difficulties, research programs continue, particularly in the fields of agriculture, animal husbandry, and natural resources.

Created in 1991, the Centre National d'Appui d la Recherche (CNAR) established the Earth Observation and GIS Laboratory. The lab's functions include:

- Collection, storage, and dissemination of all scientific and technical documentation related to Chad
- Organization of seminars and debates
- Publication of research results
- Production of supporting map products

CNAR is by far the largest owner of spatial data in Chad. Hardcopy spatial data products are stored under good conditions in the documentation centre. Unfortunately, digital data is disseminated from different computers in the lab, in no logical manner, due, in part, to the lack of large storage facilities. Access to this data is difficult not only for CNAR employees but also for other researchers as well. Spatial data is also available in other research facilities, such as the Laboratoire de Recherches Vdttrinaire et Zootechnique (LRVZ), the Institut National de la Statistique et des Etudes Ddmographiques (INSEED) and the Direction de L'Urbanisme but again without inventory.

CNAR aims to take the first steps in building a spatial data infrastructure in Chad by creating a comprehensive database and metadata of its own information, organized

and stored in a single place within the lab. This metadata catalogue will also include data available from other partner institutions. The catalogue will be freely accessible both domestically and internationally.

Program steps include:

- Building awareness among potential partners (in process),
- Conducting an inventory of available spatial data (in process),
- Selecting suitable metadata catalogue software (done: MDweb - www.mdwebproject.org),
- Purchasing a computer with large storage capacity (this grant),
- Accumulation of the CNAR digital spatial data,
- Dedicating one computer for metadata catalogue storage and consultation (CNAR),
- Selection and organization of the data for preservation at CNAR,
- Metadata creation for the selected data by CNAR and metadata solicited from partners.

Happenings with Board and Staff

1. Relations with other Geospatial Organizations

Cooperation with other international geospatial organizations is important to advancing the goals of the organization. UN-Habitat was welcomed as an ex-officio member of the GSDI Association Council at the recent GSDI 9 conference. Additional members include ISCGM, ISPRS, ICA, PCGIAP, and FIG. These organizations are invited to fully participate as ex officio members in full member Council Meetings during our next major global conferences. GSDI also participates with several of these organizations and others through the Joint Board of Geospatial Information Societies.

2. Daily Operations

We greatly appreciate the strong support provided by several independent consultants who work closely with the Executive Director in achieving many of the day-to-day tasks required to run the Association. We gratefully acknowledge Marilyn Gallant, Business manager and Accountant, who handles business coordination for the organization including the handling of correspondence, processing invoices, sending dues notices, completion of government and insurance forms, dealing with banks, drafting and tracking budgets, accounting and tax preparation work, and similar tasks. Richard Campbell supports our web hosting, coding and troubleshooting while we hire graduate students and others on an ad hoc hourly rate basis to accomplish well-defined specific tasks. Thanks to all of them!

2. GSDI Participation in Other Geospatial Forums

Following is a partial listing of recent forums in which the GSDI Association participated as an official delegate or

made a presentation as a representative of the GSDI Association.

- CEOSS WG Information Systems and Services (WGISS) Meeting -21, Budapest, Hungary, May 2006, G. Remetey-Fülöpp
- Ihlet Tisza Development Programme International Workshop, Brussels, Belgium, 20-24 June 2006, G. Remetey-Fülöpp
- CEOSS WG Information Systems and Services (WGISS) Meeting-22, Annapolis, USA, 10-15 September 2006, G. Remetey-Fülöpp
- Seventeenth United Nations Regional Cartographic Conference for Asia & the Pacific, Bangkok Thailand, 19-23 September 2006, B. C. Kok
- FIG XXIII Congress, München, Germany, 8-13 October 2006, J. Ratia
- United Nations Geographic Information Working Group (UNGIWG) Seventh International Meeting, Santiago, Chile, 3 Nov 2006, H. Onsrud, C. Terborgh
- Executive Committee Meeting of PCGIAP, Hyderabad India, 21 January 2007, B. C. Kok
- Map Forum India, Hyderabad India, 22-25 January 2007, B. C. Kok
- IHO Marine SDI Workshop / Geomatica Conference, La Habana, Cuba, 12-16 February 2007, J. Ratia
- United Nations Spatial Data Infrastructure (UNSDI) Global Partners Meeting, ESA-ESRIN, Frascati, Italy, 1-2 March 2007, B.C. Kok, H. Onsrud, J. Ratia, G. Remetey-Fülöpp, C. Terborgh
- EUROGI Members Meeting and General Board Meeting 29-30 March 2007, B. C. Kok
- Launch Meeting of UN Global Alliance for ICT and Development (UN GAID) Community of Expertise: Education and Global Alliance for Enhancing Access to and Application of Scientific Data in Developing Countries (e-SDDC), Atibaia (Sao Paulo), Brazil, 7 May 2007, H. Onsrud
- UNECE WPLA-FIG Workshop on Illegal Settlements. Cap Sounio, Greece, 28-31 March 2007 G.Remetey-Fülöpp
- UNECA Committee on Development (CODI) – Subcommittee on Geoinformation, Addis Ababa, Ethiopia, 1-2 May 2007, C. Terborgh
- Promoting Access to and Use of Digital Knowledge Resources in Countries with Developing and Transitional Economies: Focus on the Role of Science Academies in Latin America, Atibaia (Sao Paulo) Brazil, 8 May 2007, H. Onsrud
- Geotech Conference, Calgary, Canada, 14-17 May 2007, J. Ratia
- Workshop on Multi-view Framework to Assess National Spatial Data Infrastructures (NSDIs), Wageningen University, The Netherlands 25 May 2007, H. Onsrud

- 5th Int'l Symposium on Digital Earth. Berkeley, USA, 4-9 June 2007, G. Remetey-Fülöpp
- PCGIAP/GSDI Workshop on Spatial Enabling Government, Seoul, South Korea, 12 June 2007, B.C. Kok
- 13th PCGIAP Meeting, Seoul, South Korea, 13-16 June 2007, B.C. Kok
- ESRI International Users Conference, Tuesday 19 June 2007, San Diego, CA, H. Onsrud
- International Workshop in Good Land Administration, Ulaanbaatar, Mongolia, 27 June 2007, J.Ratia
- ISCGM (Global Map), Cambridge, England, 14 July 2007, H. Onsrud, A. Stevens
- Cambridge Conference, Cambridge, England, 15-20 July 2007, B. C. Kok, H. Onsrud, J. Ratia, A. Stevens
- IPY GeoNorth Conference and ASDI meeting, Yellowknife, NWT, Canada, 19-24 August 2007, J. Ratia
- Annual Meeting of the Heads of the Nordic National Mapping and Cadaste Agencies, Visby, Sweden, 26-29 August 2007, J. Ratia

Overall Objectives

The GSDI Association staff and Board is focusing in the coming year on continuing and enhancing the level of support we've described and will dedicate more effort to membership recruitment at the organizational and individual levels. Conference attendance numbers and country distribution, newsletter readership, and our successful grant program show that there is significant interest in the idea of GSDI. We have shown that our association can deliver increasing value from year to year, and we are optimistic about being able to recruit new members to help us not only fund our progress, but also to attract new viewpoints and ideas.

Postscript: A hearty thanks to Mark Reichardt of the Open Geospatial Consortium (OGC) for coordinating the creation of this GSDI Newsletter and to the numerous volunteers that contributed content!

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Group photo after last session at GSDI 9 Conference in Santiago