



REPORT

Future Proofing the Provision of Geoinformation: Emerging Technologies

An Exchange with the Geospatial Industry for Global Geospatial Information Management (GGIM)

3 February 2013, Qatar National Convention Centre, Doha, Qatar

PREAMBLE and BACKGROUND

Rapid advances in technology, information access, methodologies and equipment have meant that geospatial information is collected, globally, to high precision, processed using innovative software applications and made available via contemporary communications methods. This information is underpinned by accurate geodetic data from globally-distributed geodetic infrastructure, precision data collection methods, comprehensive analysis tools, the provision of global geospatial information, integrated data collection and mapping activities, formalized agreements and specifications and innovative means for information provision and visualization. It is therefore important that all stakeholders in global geospatial information collection, delivery, representation analysis and use are cognizant of current technologies, equipment and methodologies. As well, it is equally important that they are aware of emerging trends, developing technologies and future geospatial data usage and communication tools.

An Exchange Forum with the Geospatial Industry was held on the day immediately before the Second High Level Forum on GGIM, on Sunday February 3, 2013. This Exchange continued the discourse between Industry, Government, Organisations and the research community following the success of the last Exchange Forum with the Geospatial Industry, held in Seoul, Korea, in October 2011.

This pre-conference exchange facilitated the continued involvement of the geospatial industry at the most senior levels in the discussions surrounding UN-GGIM. It serves as a means for the industry to 'tie' into the GGIM agenda, while demonstrating some of the trends and directions in which the industry is heading.

FOCUS ISSUES

Four focus issues were addressed during the Exchange:

- Determining place
The session addressed the methods and technologies used to determine place. Advances in geodetic reference frames and techniques, surveying methods and technologies and the overarching concepts of geographic

information collection and classification were the themes of this focus session. The session covered how new technologies can be used to facilitate the efficient location of geographic information – from global to local applications.

- **Monitoring place**
Advances in remote sensing and imaging, and related technologies continue to make data collection, monitoring and surveillance more efficient. This is happening from local to global applications. This session provided discourse on technologies, strategies and methodologies that facilitate essential information capture to support global geospatial initiatives.
- **Connecting place**
Facilitating the accessibility and usefulness of geolocated data and collected information relies upon having systems and agreements in place that enable the efficient use of these resources. At a global level, just having information available is not enough – efficient and usable methods for management, access and dissemination are needed. This session covered the advances in research and development and current initiatives being applied to ensure that decision-makers are able to better access and use geospatial data and information.
- **Delivering [geoinformation about] place**
Once geospatial data and information is collected, analysed and represented there exists the need to have systems and standards in place to ensure efficient delivery of that data and information. Rapid advances are being made in this area, as electronic production and publishing methods are combined with contemporary communications systems for output and delivery. This session provided information regarding current and developing technologies for production and delivery of authoritative data and information for decision-makers.

SUMMARY OF OUTCOMES

Below are summaries of the outcomes of each session. Each summary includes a paragraph that summarises, in general terms the outcomes from presentations and the Question and Answer session. This is followed by a 'dot point' section, which is an encapsulation of the essential elements of the session.

- **Determining place**
IAG has developed an accurate International Terrestrial Reference System (ITRS) on which all GNSS positioning services are based. The sustainability of ITRS implementation and associated infrastructures require intergovernmental support and commitment through a UN mandate.
 - GNSS provides high accuracy for positioning applications.
 - IAG services provide an accurate global reference system under the name of International Terrestrial Reference System (ITRS) that requires further improvement for scientific applications.

- Sustainability of ITRS implementation and associated infrastructures require intergovernmental support and commitment through a UN mandate.
 - The respective roles of public and commercial positioning services should be regulated.
 - The implementations of the ITRS at the national level should continue to be progressed.
 - There is a need to develop a worldwide height system.
 - Progress is required to improve indoor positioning.
- Monitoring place

Noting the advances in number, types and capacities of platform and sensors, imageries is the main source of data and the basis for monitoring place. There remain the needs for open standards and strategies to demonstrate the underlying economic benefit of geospatial information as well as consideration to address privacy issues that are context driven. These are important considerations for the future technological development.

 - How do we create a knowledge base?
 - Government working with Industry in a collaborative way
 - Advances in number and types of platform and sensors
 - Imagery as source of data and monitoring tool
 - Need for standard and strategies
 - Data for archive and simulation for future
 - Policy relevant information
 - Cloud, consumer, crowd, communication
 - Public-Private Partnership (PPP)
 - Precision and technology scale (large/small scale)
 - Return on investment (ROI) vs. immediacy
 - Privacy
 - Personal place
 - Big data
 - Need to consider linkage with other sectors
- Connecting place

Collaborating and communicating across disciplines using the value of place to facilitate informed decision making to improve societies. This could be achieved by integrating authoritative and crowd-sourced information and place-based analysis using the Cloud platform.

 - Big data, hardware and software, and Cloud
 - Data value, volume, variety, and velocity
 - Detect, filter and business analysis
 - Beyond spatial enablement
 - Multi-disciplinary collaboration
 - Response to societal challenges and improvement (population and sustainable development)
 - Return of investment value on place based information

- Geographic information is pervasive
- Story maps and simplicity in communication
- Geoinformation is integral to statistical data
- Quality control of data dependent on the use of the data
- Use of both authoritative and crowd-sourced information (Haiti disaster management is an example)
- Spatial -> Placial (Spatial being 3-space + time and Placial being a more personalized location, where adjunct data is used to provide affective information)
- Need to reassess business models based on availability of data vs. scarcity of data and new uses
- Predictive analytics leverages place based information
- Delivering [geoinformation about] place

Contemporary GIS offers flexible platforms for managing and integrating data under the context of location. Electronic production and publishing methods are combined with contemporary communications systems for output and delivery. There remain the needs for effective communication of geospatial information through context-dependent contemporary cartographic presentation techniques to ensure efficient dissemination of geospatial information to decision makers as well as the public.

 - GIS is now a platform that is the result of the convergence of new architecture
 - Now possible to integrate of all types of information, including 3D.
 - Available for non-experienced users.
 - The map is an engineered model that provides information under the context of design for perception.
 - In the future, the map will be real-time, ubiquitous, media adopted, personalized geospatial information communication medium.
 - Major issues on SDI have moved from being an institutional, overarching, strategic document to one that now supports inter-sector business integration.
 - Advances in SDI will lead deliver the means of supporting governmental decision making and offer the means to include society in the communication of this information.
 - Mapping key risks to society on flooding, earthquake, volcano and fire support government decision-making related to society and industry.

CONCLUSIONS

The JBGIS, through the various individual and collaborative efforts of member organizations, supports the endeavours of the United Nations Global Geospatial Information Management initiatives, in association with the United Nations Statistics Division.

The Exchange was a collaborative effort, developed and moderated by members of the organizations that comprise JBGIS and facilitated by the UN Cartographic

Section, Strategic Support Service, Department of Field Support, with support from the UN Statistics Division.

The JBGIS and the geospatial industry are committed to continually exchange ideas and practices to further the objectives of UNGGIM.

This activity contributes to the advancement of the Global Geospatial Information Management (GGIM) initiative. The JBGIS thanks presenters and attendees for their support of this activity and their enthusiastic participation.

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Also, the JBGIS acknowledges the support of the United Nations Statistics Division.

Note:

The JBGIS is a coalition of leading international geospatial organizations that speaks on behalf of the geospatial profession at the international level, especially to the United Nations and other global stakeholders. It coordinates activities within the geospatial society and organizations, internationally.

Membership of the Joint Board comprises:

- Global Spatial Data Infrastructure (GSDI) Association
- IEEE Geoscience and Remote Sensing Society (IEEE-GRSS)
- International Association of Geodesy (IAG)
- International Cartographic Association (ICA)
- International Federation of Surveyors (FIG)
- International Geographical Union (IGU)
- International Hydrographic Organization (IHO)
- International Map Industry Association (IMIA)
- International Society of Photogrammetry and Remote Sensing (ISPRS)
- International Steering Committee for Global Mapping (ISCGM)

For further information see: <http://www.fig.net/jbgis/>