HIGH LEVEL FORUM ON GLOBAL GEOSPATIAL MANAGEMENT INFORMATION

WORKING PAPER No. 1

First Forum
Seoul, Republic of Korea, 24-26 October 2011

Addressing global challenges underwritten by geospatial data management – Joint Board of Geospatial Information Societies contributions *

* Submitted by: Mr. William Cartwright, President, JB-GIS

Addressing global challenges underwritten by geospatial data management – Joint Board of Geospatial Information Societies contributions

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Seoul, Korea
October 2011

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Content

- Overview
- JBGIS
- Importance of geospatial information
- Spatially-enabled government and society
- Connected societies. Challenges are beyond individual organisations.
- Governance and interactions with society
- Capacity building (including capacity assessment and capacity development)
  - Research;
  - Knowledge transfer;
  - Education; and
  - Outreach
- The importance of a united voice

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Challenges

- Natural disasters
- Human issues

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Challenges

- Natural disasters
- Human issues

- Need for spatial enablement of government and society

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Spatial Data Infrastructure

- Governance
- Data sharing
- Discovery
- Access
- Interoperability
- Multi-sourced data integration
- Standards
- Capacity-building
- Technology transfer

United Nations Group of Experts on Geographical Names

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Benefits of Spatial Data Infrastructure

- Economic
- Environmental

- Through
  - Management of spatial assets
  - Development of spatial-enabling platforms

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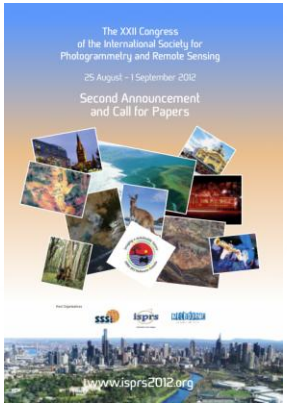
- Committed to supporting society and governments
- Through
  - Collaborative facilitation of initiatives and programmes
- To
  - Establish and grow capacity
  - Deliver timely, comprehensive and useful geospatial information



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- 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 Trade Association (IMTA)
- International Society of Photogrammetry and Remote Sensing (ISPRS)
- International Steering Committee for Global Mapping (ISCGM)

Ad hoc Committee on Capacity Building in Africa

Ad-hoc Committee on Risk and Disaster Management

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- Member organisations of JB GIS will
  - contribute to the UN GGIM initiative
  - champion the advancement of the UN GGIM initiative
- Through
  - individual and collaborative efforts

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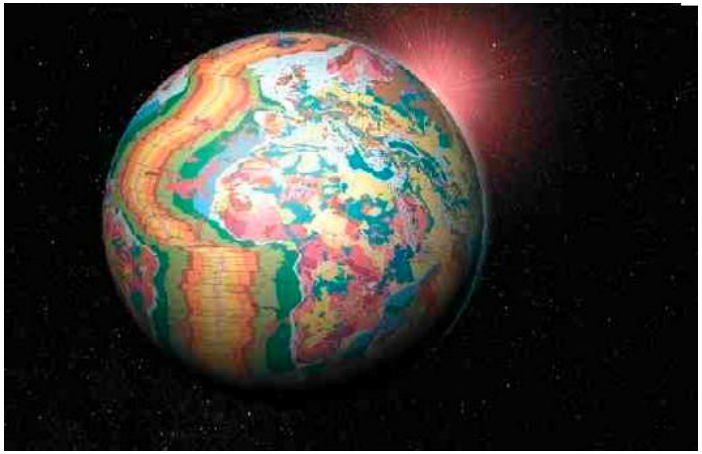
- Importance of geospatial information
  - Supports evidence-based decision making
  - An enabling technology/infrastructure for modern society
    - Remote Sensing, Photogrammeetry, GPS, Geographic Information Systems, Cartography



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- 80% of all decisions made by humans have a spatial element (Albaredes 1998)
- "…geographical information is used in making decisions that have a spatial element and consequently geographical information improves the decision making process." (Frank, Raubal and van der Vlugt 2000)

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- Spatial enablement
  - Effective management and sharing of information (across agency borders) results in more efficient and effective information use
  - Benefits
    - Reduced costs of information collection and management
    - Streamlined collection, processing and storage
    - Improved decision making
    - Enhanced government service deliver
    - Timely
    - Consistent
    - Relevant
    - Accurate
    - Transparent
    - Sharable

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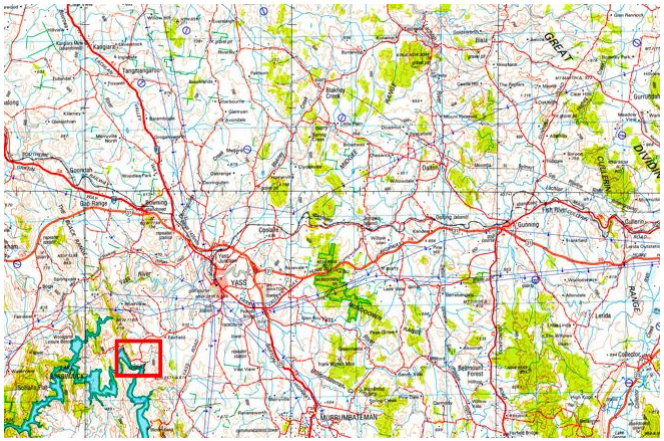

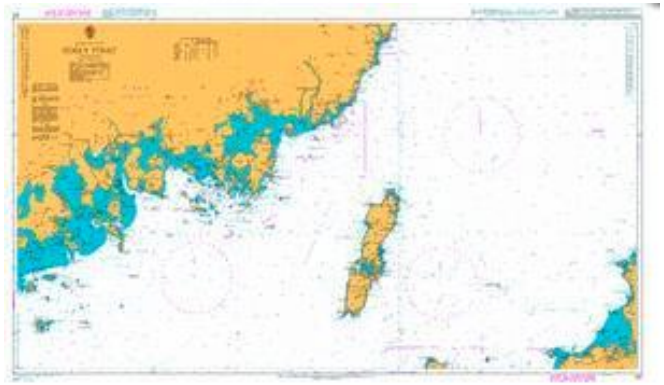

- Need
  - Terrestrial and hydrographic geospatial information
  - Underpinned by accurate positioning
  - Depicting the correct information
    - Features
    - Naming of features
  - Effectively communicated and visualised

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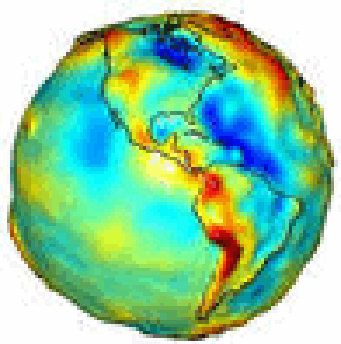
- Representing the Earth
  - Mapping
  - Charting
  - Imagery
  - …



- Critical to recognising benefits to society
  - Environment
  - Security
  - Economy
  - social

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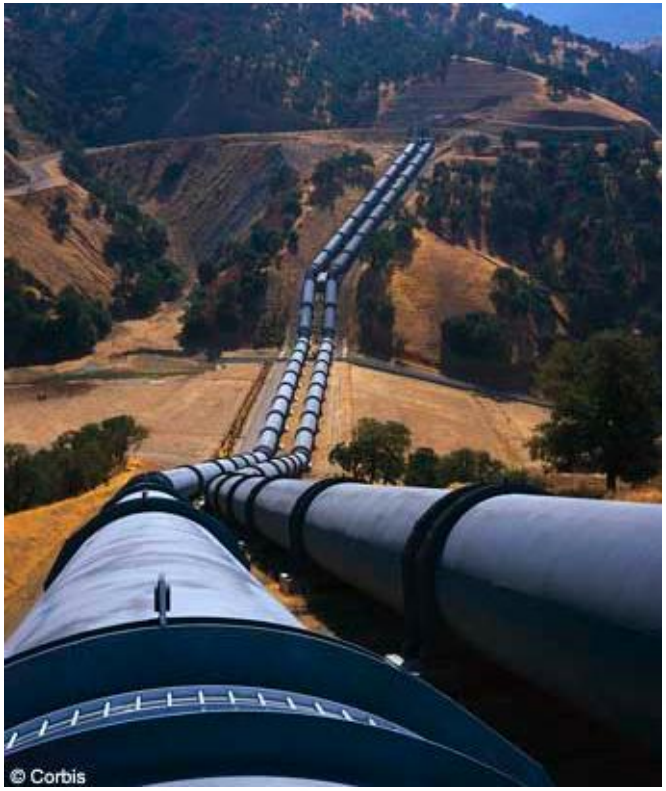
Terrestrial global geospatial information

- Almost all social and economic human activity depends on location
- Global geographic information an essential tool for understanding regional and global issues
- eg
  - *Global Map* created to solve global environmental challenges identified in AGENDA21
  - Global Earth System of Systems (GEOSS) Data Sharing Action Plan for full and open exchange of data, metadata and products



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Hydrographic global geospatial information

- 90% of world trade transported by sea

- Access to hydrographic information
  - Knowledge of the physical nature of the seafloor
  - Hazards to safe navigation
  - Safety at sea
  - Efficient maritime trade
  - Efficient maritime communications
  - Protection of marine environment

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Hydrographic global geospatial information

- Issues
  - Much geographic information in areas of regular trade
  - Little or no data in many parts of the world
  - Many measurements obtained centuries ago
  - Initiatives
    - International Hydrographic Organization encouraged Regio Hydrographic Commissions to v at the regional level
      - Coordination
      - Production
      - Documentation
      - Training
      - …

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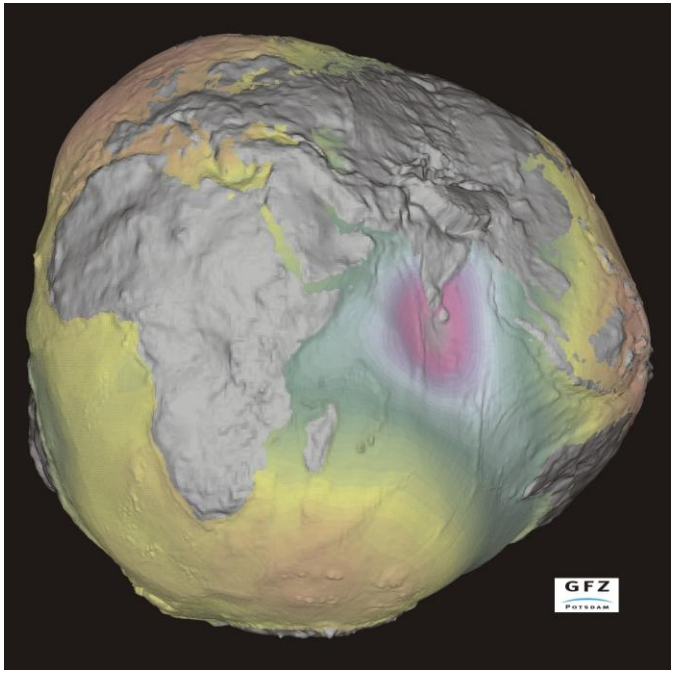
Accurate positioning

- Geodesy
  - Accurate surface mapping
  - Earth observation techniques
  - Measuring and mapping the geometry, orientation and gravity field of the Earth
- Geodetic practice
  - Foundation for geographic information
  - Serves
    - Surveying, geomatics, mapping and navigation
- Modern geodesy
  - Relies on space technology
  - Global navigation Satellite Systems (GNSS)



http://www.gfz-potsdam.de/news/foto/images/GFZ-Potsdam-PR-20030122-Geoid-Undulation-1250x1250.jpg

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Global measurements

- Global sea level change
- Determination of glacio-isostatic adjustments due to deglaciation
- Pre- co- and post-seismic displacement fields associated with large earthquakes
- Early warnings for tsunamis, landslides, earthquakes, and volcanic eruptions
- Deformation and structural monitoring

- Development and coordination by JB GIS member association, the International Association of Geodesy (IAG)

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Comprehensive mapping and charting is paramount

It is complex and demanding

Complex undertaking across international borders

Access important

How to market and deliver information?

Security and privacy

Integrity

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Global Geospatial Information capture, measurement, management and depiction is important

JB GIS member organisations have been involved for many years

Can assist by establishing accurate positioning, data collection, management, representations, dissemenation and services

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Spatially-enabled government and society

- Uses and benefits from wide array of geographic information
- Adds location to existing information
- Shared, integrated and analysed
- Provides the basis for value-added services

http://fineartamerica.com/featured/mapping-boundaries-anthony-harris.html

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Good governance

- Making better decisions with geographic information
- Reducing costs associated with data duplication
  - Australia
    - APS200-Location Project - supports government reform and location enables all of government.
    - United States White House Office of Management and Budget - requires place based information to support any budget requests.
    - The Geospatial Platform identified by US agencies as critical to the US National Spatial Data Infrastructure (NSDI).
    - Indonesia - NSDI to enable better governance in environment management and land administration.
- Society expects geographic information from their governments

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Responding to natural disasters

- Requires geographic information
- Rapid response
- Availability
- Geographic analysis
- Specifying relief logistics
- Planning for reconstruction

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Potential of shared data

Need for international coordination on global geospatial information management

Best practice

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Issues to address

- Data sharing enabled by policy agreements and technology;
- Adoption of the highly stable International Terrestrial Reference Frame (ITRF) as the datum for all geospatial information;
- Integration of location data in solutions for environmental, security, economic and social issues;
- Utilization of location GIS analysis in evidence-based decision making;
- Use of visualization and cartographic representation to clearly communicate issues and solutions; and
- Access to data and answers via web and mobile applications (Apps)

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Considerations for spatially enabling society

- educational framework
- technical and institutional development of spatial data management
- development of awareness at all levels of society (citizens institutions and decision-makers)
- development and applicability of land management tools in order to make best use of spatial data

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In support of this, the role of JB GIS member organisations is to facilitate better global outcomes through utilisation of SDIs and delivery of spatially enabled societies.

This role directly complements the objectives of UN GGIM initiative.

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Connected societies

- Interoperability
- Multi-sourced spatial data integration

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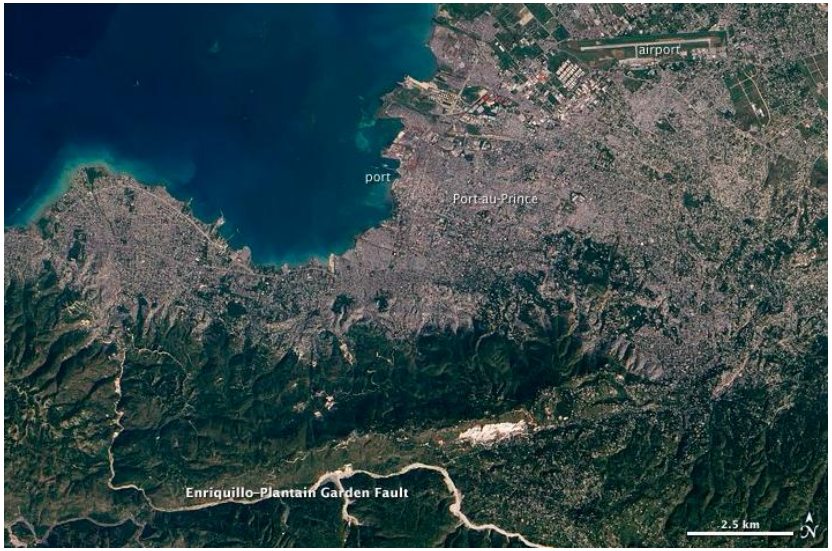
Interoperability

- Communicate
- Execute programs
- Transfer data



- Successful SDI
  - Interoperability of systems and information

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Interoperability

- Issues
  - Technical
  - Non-technical
  - eg
    - Legal, policy, institutional, social

Legal interoperability addressed by GEOSS Data Sharing Task Force

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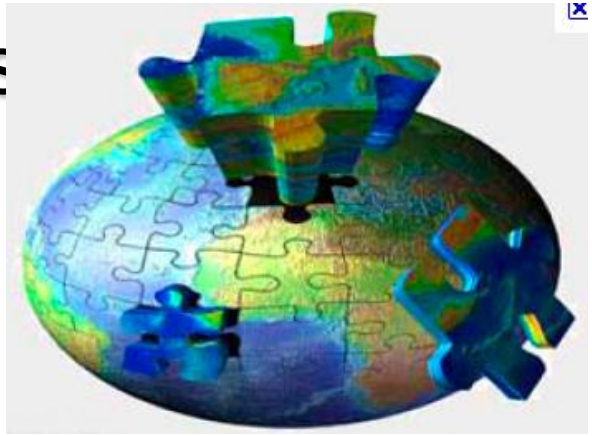
Multi-sourced spatial data integration

- Technical inconsistencies
  - From
    - Non-technical aspects
    - Fragmentation of arrangements
      - Social
      - Legal
      - political



Development of integrated datasets is a cultural and institutional challenge (more than scientific)

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Governance and interaction with society

- Information management
- Visualisation and representation
- Understanding geographic information representations

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Information management

- Requires good governance
- Policy networks transcend territorial boundaries
- Vertical and horizontal interactions

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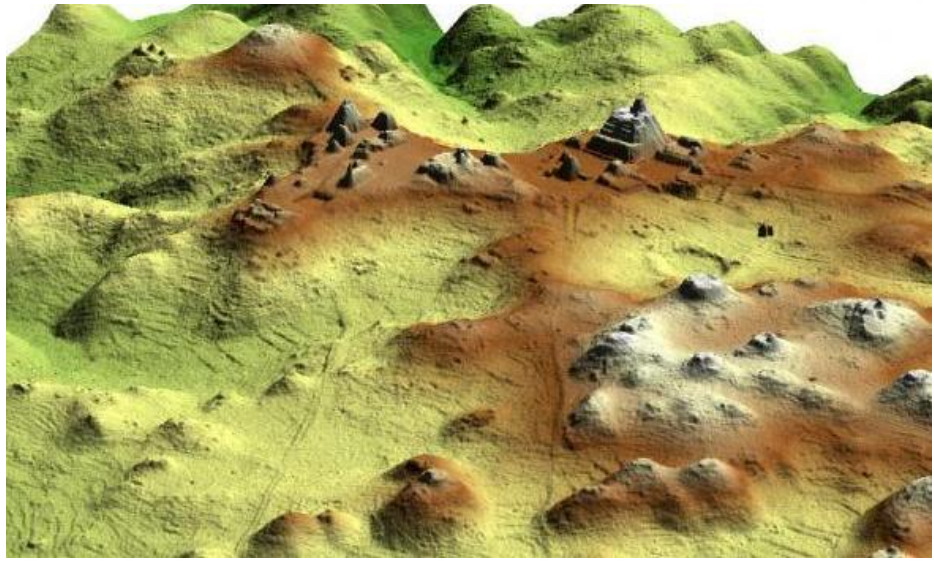
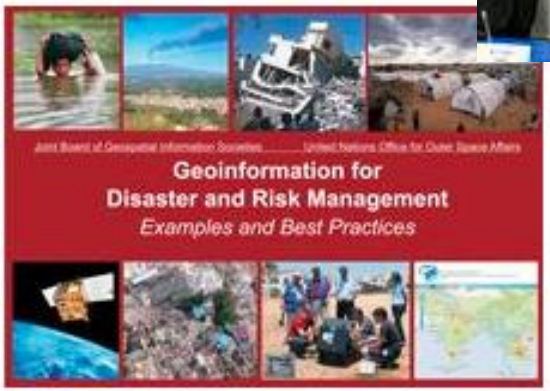
Visualising and representing geospatial information

- Geographical visualisation
- Understanding content of databases
  - eg ICA Commission on Visual Analytics
    - Development of tools to interrogate, visualise and understand data



Understanding spatial information representations

- Experts
- Public



- Best practice
  - eg booklet published by t Joint Board of Geospatial Information Societies and the United Nations Office for Outer Space Affairs

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Capacity building

- Research
- Knowledge transfer
- Education
- Outreach

Summary of JB GIS capacity building activities:

www.fig.net/jbgis/adhoc/index.htm

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Research

- Provision, use and exploitation of geographic information
- Ensuring
  - Quality, timeliness, appropriateness

JB GIS member organisations offer to undertake research to support GGIM initiatives

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Knowledge transfer

- By JB GIS member associations
- In collaboration with national member organisations, affiliates and industry
- Via
  - Courses, publications, workshops

FIG Africa Task Force Workshop on Proactive Planning for Infrastructure in Peri-Urban Settlements , Mombassa, Kenya 2010

Geographic Information Knowledge network (GSDI Association initiative):

www.giknetwork.org

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Education

- JB GIS member associations champion education
- From children gaining map reading skills to experts better producing and using geographic information tools

International Hydrographic Organisation CAT 'B' course, at national Institute of Hydrography, Goa, India

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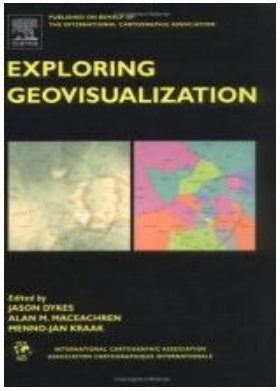
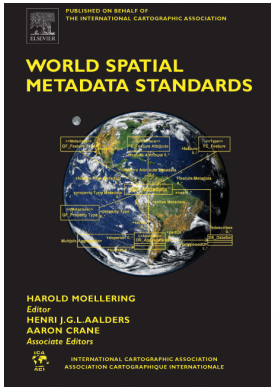
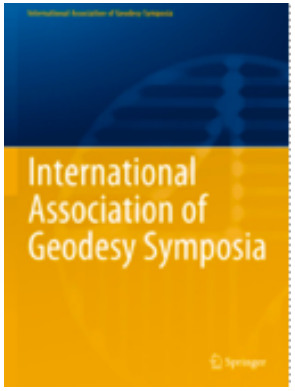
Outreach

- Outreach and technology transfer
- Workshops
- Publications







- JB GIS community
  - provide outreach programmes and resources on a volunteer basis, supported by national member organisations and national mapping agencies

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Importance of one voice

- ‘Collective’ voice
- JB GIS
  - Foster collaboration
  - Engagement
  - Multidisciplinary skills
  - Knowledge
  - Support to UN GGIM via coordinated JBGIS activities

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Summary

- Importance of geospatial information
- Spatially-enabled government and society
- Connected societies. Challenges are beyond individual organisations.
- Governance and interactions with society
- Capacity building (including capacity assessment and capacity development)
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- The importance of a united voice

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Potential of shared data

Need for international coordination on global geospatial information management

Best practice

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The JB GIS, through its member associations offers to contribute actively to the work of the UN GGIM and to take action as necessary as a result of the Committee's deliberations.