Appendix to item 13

FIG Commission 3 – Spatial Information Management

Work Plan 2015–2018

1. Title

Spatial Information Management

2. Terms of Reference

- The use of Spatial Information Management (data, tools, procedures, regulations, standards);
- The support of Good governance (sustainable development, poverty reduction, social and economic growth, social security);
- Spatial data infrastructure;
- Research on the use of crowdsourced VGI data and derived information to geoscientific disciplines that make use of mapping, GIS, and Geo-SDI systems and procedures;
- The research of the methods for the sustainable development especially of mega cities and emerging countries with high index of development;
- The study and monitoring, as control of the fragility and vulnerability of the territory.

3. Mission statement

The mission of Commission 3 is to:

- Increase awareness about successful SIM approaches and achievements within the "e-Society" by showing good practice like availability, reliability, efficiency and accessibility of spatial information for better decision making and processes.
- Support the use of spatial information and SIM-tools by surveyors and by all participants in decision-making to serve the goals of good governance.
- Share good practice on managerial processes and infrastructure required for data handling, using information and distributing knowledge.
- Share good practice and develop high-level methods and techniques for merging and managing updated spatial information at various levels according to market requirements.
- Establish and maintain data - and data-quality-standards relevant to SIM, while cooperating with international spatial data standard committees.
- Encourage the use of spatial information within e-government and e-commerce.
- Cooperate and coordinate with the related United Nations Committees and other geospatial information societies and organizations active in the field based on request from the Council, they key focus will be in co-operation with ISPRS (Commission IV

on Geodatabases and Digital Mapping), ICA (commission on Geospatial Data Standards), GSDI, EUROGI.

4. General

Most of the objectives, topics and scope of the previous term will be continued. Therefore the 3 previous working groups are confirmed in the new term and a new working group is established about crowdsourcing and VGI.
Commission 3 delegates have expressed their interest in continuing organizing Commission 3 annual meetings and workshops focused on the specific and identified current topics.
Commission 3 will continue to address the phenomena of rapid urbanization and its impact focusing on identifying new solutions for the survey of spatial data and general principles.
As new projects, Commission 3 will:

- address the phenomena of Crowdsourcing and Volunteered Geographic Information. This neogeography revolution has started to fundamentally transform how geographic data are acquired, maintained, analysed, visualized and consequently used. SDI as well as SIM can benefit greatly from the use and integration of this type of data, all of which with the focus of contributing to the surveyor role;
- follow the management of the environment, monitoring and supporting the legalization process and progress of land, property registration, planning reforms;
- assist good governance, efficient operations of property markets, affordable planning, affordable housing, and appropriate environmental management - by providing innovative and reliable land tools and spatial information solutions addressing to global challenges.
- address the research of the methods for the sustainable development especially of mega cities and emerging countries with high index of development (China, India, South America).
- address the research for the reuse of the built and the savings of the territory with the incentive of specialized crops;
- study and monitor (as control of the fragility and vulnerability of the territory, for the defense from natural phenomena and from the consequences of the human intervention dangerous for the wellbeing and for the goods of properties, and for the prevention of hydrological disasters that have interested in a strong way and with severe damages e many dead different parts of the world.
- participate in the organization of an International Summerschool for Young Surveyors following the model of the International Training Courses organized by Consiglio Nazionale Geometri e Geometri Laureati in the last years.

Summarizing, the topics of general interest of Commission 3 are:

- SIM Infrastructure;
- SDI and GSDI;
- 2D/3D/4D applications of SDI;
- Web services and metadata;
- SIM application for disaster monitoring and environmental prevention;
- Urbanization;
- Mega cities and emerging countries;

- Crowdsourcing and VGI;
- Low cost methods and tools for environmental monitoring;
- 3D cadaster.

5. Working Groups

Working Group 3.1 – SIM Infrastructure

Policy Issues

SIM has the role of an integrator of components for a Spatial Information Infrastructure especially for urban areas within the information society. SIM is a facilitator for IT based services for planners, administration as well as for citizens.

Chair

Hartmut Müller (Germany), email: hartmut.mueller@hs-mainz.de

Specific topic(s)

- NSDI / GSDI: Spatial Data + Information Infrastructure.
- The "Open" trend: open source, open standards, open data.
- Volunteered and crowdsourced geospatial data and information.
- Integration of Volunteered Geographic Information VGI and geospatial authoritative government information.
- Semantic technologies.
- Public geo-participation and citizen empowerment.
- Share current experiences and technical visions of the future.
- Inform future decisions and implementations.
- Inform the big picture on drivers, trends and technologies.

Workshop(s)

Participations in FIG Working Weeks and other major Commission events with dedicated technical sessions and/or workshops as appropriate.

Beneficiaries

Surveyors, associations engaged with spatial data, local and regional municipalities and users of spatial data and spatial information.

Working Group 3.2 – Technical aspects of SIM

Policy issues

The on-going development of tools, techniques and policies for spatial management of urban areas, in particular cities/megacities but also rural, forest and coastal areas leads to the need for collection, management and integration of various spatial data, such as: optical and SAR satellite and aerial images, images derived from various kinds of UAV, images derived from the Internet, orthophotos, point clouds derived from LiDAR and terrestrial laser scanners, global DTMs, etc. These data and the need for their management in real time or in a short time, in order to monitor growth and change across the urban environment and to forecast areas of risk, leads to the development of specific techniques for Big Data management. The on-going development of 3D and 4D spatial or city models, using photogrammetric or computer vision techniques, demands the development of interoperable formats and tools for the exchange of geometric and semantic 2D/3D data and information. The improvement and enrichment of data and spatial product quality control methods and techniques is an important issue as the variety of data collection sources and information management and integration procedures become wider.

Chair

Ioannidis Charalabos (Greece), email: cioannid@survey.ntua.gr

Specific topic(s)

- Data collection, recording and updating,
- Low-cost methods and tools for environmental monitoring,
- Standardization of information and metadata,
- 3D and 4D spatial data recording and management,
- Visualization of information in 2D/3D/4D,
- Big data management,
- Integration and update of spatial data-bases, 3D GIS and BIM,
- Content and 2D/3D semantic modelling,
- Quality control.

These technical aspects will be dealt in relation to legal, social, economic, educational, and policy implications.

Workshop(s)

Participations in FIG Working Weeks and other major Commission events with dedicated technical sessions and/or workshops as appropriate.

Publication(s)

FIG-publication on “Management of big data” by the end of the 4-years period –to be published for the FIG Congress 2018.

Timetable

Special sessions on Technical Aspects of SIM at the Annual Meetings of Commission 3 and FIG Working Weeks.

Beneficiaries

Surveyors, private and public firms and associations engaged with spatial data, and users of spatial data and spatial information.

Working Group 3.3 – 3D Cadastre (Joint Working Group with Commission 7)

Policy issues

The results of the previous term (2010-2014) of the working group provide a solid basis for the next 4-year phase of the working group. The concept of 3D Cadastres is here to stay and the number of implementations is increasing, quite often with ambition to become LADM (ISO 19152:2012) compliant.
In 3D, it is even more important to connect land administration to other registrations via SDI: buildings, tunnels, cables/pipelines, terrain elevation, etc. (physical and legal 3D objects should be aligned). The main objective of the working group is to establish an operational framework for 3D-Cadastres. The operational aspect addresses the following issues:

- A common understanding of the terms and issues involved.
- Concepts should be refined and agreed based on the ISO 19152 Land Administration Domain Model.

A description of issues that have to be considered (and to what level) before whatever form of 3D-cadastres can be implemented. These will provide 'best practices' for the legal, institutional and technical aspects.

Chair

Peter van Oosterom (The Netherlands), email: P.J.M.vanOosterom@tudelft.nl

Special topic(s)

Topics to be dealt within the activity of the working group are:

- 3D-Cadastre: models, SDI and time
- 3D-Cadastre and the usability

Options for realization of a 3D cadastre model will include:

- Minimalistic 3D cadastre (no cables, pipelines etc.)
- Topographic 3D cadastre
- Polyhedral vs. Non-polyhedral Legal 3D cadastre
- Topological Legal 3D cadastre

Additional emphasis on the following topics:
1. Collect and exchange experiences of operational 3D Cadastral systems (law, organization, technology)
2. 3D Cadastre in mega-cities, often in Latin-America (Brazil, Mexico), Asia (China, Malaysia, Korea, Singapore) and Africa (Nigeria)

3. 3D Cadastre usability studies, web-dissemination and 3D cartography
4. 3D Cadastre as part the full life cycle of spatial development in 3D: spatial plan, zoning, register restrictions, design solutions, acquire space/land, request/provide permits, obtain financing, realize/develop, survey/ measure results, submit final RRRs/SUs, check/validate submitted RRRs/SUs, store/ analyse data, disseminate, visualize and use the 3D (cadastral) objects
5. Contribute to the upcoming revision of ISO19152:2017 or 2018 (LADM) by further developing the 3D aspects in this international standard; e.g. provide a more formal taxonomy of different types of 3D parcels (spatial units).

Workshop(s)

Participations in FIG Working Weeks with 3D Cadastre sessions and other major Commission events above all with Commission 7.

Publication(s)

Maintain the website and FIG publication on 3D-Cadastre

Timetable

2015-2018: Maintain website and interest-group www.gdmc.nl/3DCadastres (inc. literature)
2015: Analyse and complete second questionnaire status 3D Cadastres 2014-2018
2015-2017: 3D Cadastres session at FIG working weeks
2016: Organize 5th workshop on 3D-Cadastres
2017-18: FIG-publication on 3D-Cadastres
2018: Conduct third questionnaire status 3D Cadastres 2018-2022
2018: Presentation of the results FIG-congress

Beneficiaries

Surveyors, land developers, national cadastral agencies, land registry administrations, local and regional municipalities.

Working Group 3.4 – Crowdsourcing and VGI supporting SDI

Policy issues

As of 2010, 90% of the data that existed in the world were created within the previous two years, while personal location data has been singled out as one of the five primary 'big data' streams in the 2011 McKinsey report. By 2020, the volume of existing data will increase by fifty-fold, where a large percentage of this volume will be associated with geospatial data. The term Volunteered Geographic Information (VGI) encapsulates the idea of using the internet to create, share, visualize, and analyse geographic information and knowledge, envisioned via the use of numerous computing devices and platforms. This neogeography revolution has started to fundamentally transform how geographic data are acquired, maintained, analysed, visualized, and consequently – used. Thus, it has the potential to influence common practices, since it captures a broad knowledge of the environment we live

in, in all aspects of life, encompassing new services to take place, applications and processes to be developed – all of which are location based. Spatial Data Infrastructure (SDI), as well as Spatial Information Management (SIM) can benefit greatly from the use and integration of this type of data. The diversity of research disciplines that explore the potential of VGI – data and working methodologies - arguments its current usability relevance: ranging from transportation network analysis, to air pollution and air quality and to natural disaster decision-making systems.
VGI is becoming more and more a legitimate and reliable spatial, environmental and sustainable infrastructure on local, as well as on global scales, thus it encompasses vast geospatial potential that can contribute significantly, and is highly relevant to various geoscience research areas.
Consequently, it transforms and changes the surveyor's role, as well as the established working methodologies and protocols; new ideas, concepts and practices are to be developed and envisioned.
The emphasis of Working Group 4 will be on the investigation and identification of processes and protocols aimed at handling 'big geodata', crowdsourced and contributed by the public, on collection, processing, interpretation, administrative, and analysis levels, all of which with the focus of contributing to the surveyors role. Working Group 4 will search and learn new means and technologies on how to exploit and make use of crowdsourced VG data and derived information to geoscientific disciplines that make use of mapping, GIS, and Geo-SDI systems and procedures.
Since VG data is relatively easy to acquire, and consequently simple to access and make use of, Working Group 4 will aspire to motivate and work with scholars and professionals from developing countries, where it is believed that this working methodology can contribute utmost. Also, Working Group 4 will aim to have joined and mutual interests with other FIG Commissions, specifically Commission 2 (on Professional Education) and Commission 8 (on Spatial Planning and Development), where it is believed that this neogeography revolution can bring new ideas and

Chair

Sagi Daylot (Israel), e-mail: dalyot@technion.ac.il

Specific topic(s)

- Utilization of VGI and crowdsourcing with SDI, SIM and environmental knowledge
- Working methodologies of VGI in developing countries
- VGI collection, dissemination, analysis, maintenance, and visualization
- Crowdsourced land management tools and innovative spatial information solutions addressing global and national challenges
- The significance of open source SDIs for managing authorities' services
- VGI interoperability standards, uncertainty, authenticity, validity
- Applications of VGI in managing the built environment, legalization monitoring, property registration, planning reforms
- Participatory mapping and citizens science – case studies and processes

Workshops

Participations in FIG Working Weeks and other major Commission events with dedicated technical sessions and/or workshops as appropriate.

6. Co-operation with Other Commissions and organisations

- Commission 2;
- Commission 7;
- Commission 8;
- Young Surveyors Network.

7. Co-operation with United Nation Organisations, Sister Associations and other Partners

- FAO;
- UN-HABITAT;
- UNESCO;
- ISPRS Commission IV on Spatial Information Systems and Digital Mapping;
- ICA – International Cartographical Association;
- International Geographical Union, Commission on geographical Information Science;
- GSDI – Global Spatial Data Infrastructure Association.

8. Calendar of Events

May 2015 – Sofia (in conjunction with FIG WW 2015);
November 2015 – Malta (annual workshop in conjunction with Commission 7);
April – June 2016 – Christchurch, New Zealand (in conjunction with FIG WW 2016);
November 2016 – Hungary or Greece (annual workshop);
May/June 2017 – Finland, Helsinki (in conjunction with FIG WW 2017);
November 2017 – location TBD (annual workshop);
April/May 2018 – Istanbul, Turkey (in conjunction with FIG Congress 2018);
November 2018 – location TBD (annual workshop).

9. Workshops

Commission 3 is planning to organize, in addition to its activity during the annual FIG Working Weeks or Congress, also four annual Workshops during the 2015-2018 term.

10. Commission Officers

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