GEOSPATIAL WORLD FORUM™

05-09 May 2014

Centre International de Conférences Genève (CICG)
Geneva, Switzerland

Theme
geoSMART Planet
resources + infrastructure
& You!

REPORT / 2014

www.geospatialworldforum.org

Geospatial World Forum 2014 came to an end on May 9, 2014, after five days of intense discussions on the best practices and success stories, and knowledge exchange at national, regional and global levels on the use and benefits of geospatial information and technologies across businesses.

The Forum, which had 35 collaborative partners, witnessed ministerial-level participations from Ghana, Mauritius, Malaysia, India, Azerbaijan and Philippines, and 405 technical presentations. A total of 1,002 delegates from 78 countries visited the conference, which also had 48 exhibitors from 16 countries, including two country-pavilions.

Conference Objectives

- Interactive and Collaborative Forums
- Policy and Technology Leaders Forum
- Best Practices and Success Stories
- Exchange and Knowledge at National, Regional and Global Levels
- Connecting Communities
- Converging Process and Practices
- Demonstrating Value and Utility of Geospatial Enabled Society and Economy

Achievements

- Hosted industry-specific sessions on Land, Agriculture, Building, and Energy
- Discussed global and pressing issues - Disaster Management, Humanitarian Aid, and Climate Change
- Highlighted technology trends - 3D, Sensors, Big Data, and Cloud Computing
- Policy and capacity building discussions
- Ministerial participations from Ghana, Mauritius, Malaysia, India, Azerbaijan and Philippines
- Participation by Mayors from Pakistan, Saudi Arabia, Sweden, Austria, and more

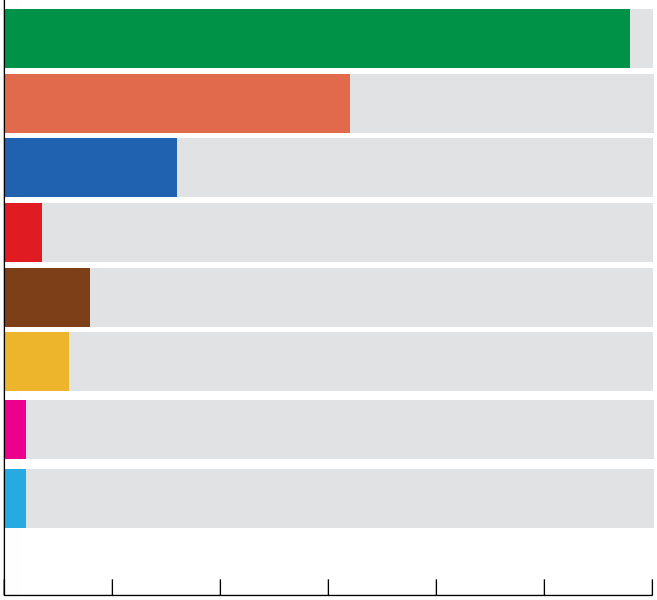
This report shall give a look back on what was discussed and the takeaways of the conference.

Conference Highlights

17
Plenary Talks

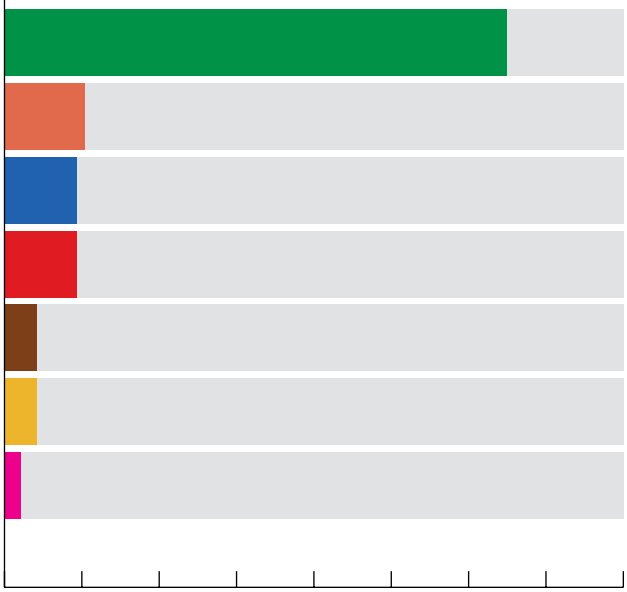
28
Thematic Sessions

Delegate Type (%)



Geospatial Industry	33
Government	28
NGOs	16
Academic/Students	3
Government Data Poviders and Policy-Makers	12
Private Sectors Users	6
Media	1
Professional Associations	1

Delegate Regional Representations (%)



Europe	62
Asia Pacific	10
North America and Canada	9
Middle East	9
Africa	4
South Asia	4
Latin America	2

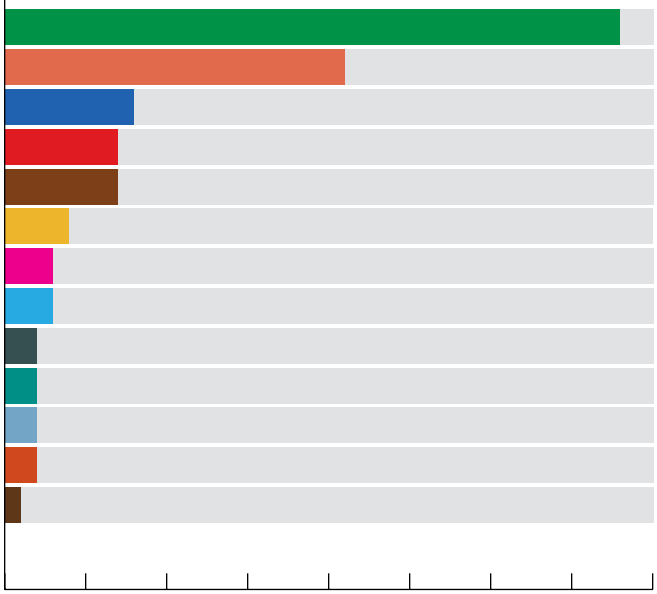
405
Technical Presentations

35
Collaborative Partners

1002
Delegates from 78 Countries

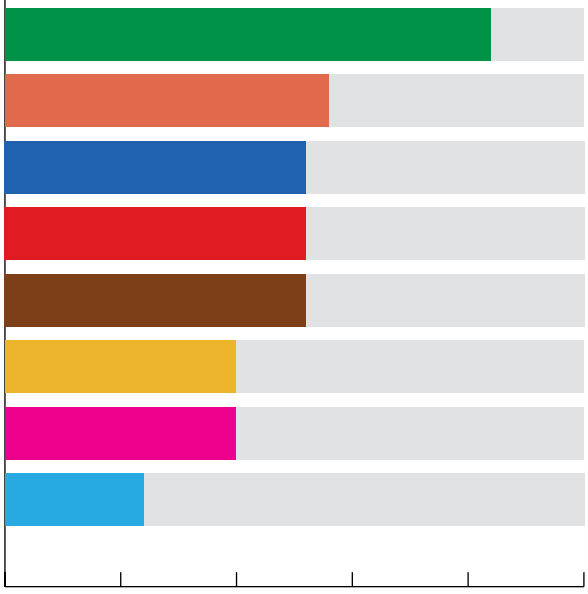
48
Exhibitors from 16 countries

End User Participation (%)



Surveying and Mapping	30
Government	21
Land Administration	16
AEC/Infrastructure	7
Environment	7
Utilities	4
Agriculture	3
Urban Planning and Development	3
Defence and Security	2
Disaster Management/Emergency Services/Public Safety	2
NGOs/Humanitarian Aid	2
Miscellaneous (Natural Resource Management, Tourism, Insurance)	2
Energy, Mining and Exploration	1

Exhibitors Profile (%)



Solutions Providers	21
Software Developers	14
Data Providers	13
Research Institutes	13
Hardware Providers	13
Government Users	10
Associations / NGOs	10
Services Companies	6

Pre-Conference

Geospatial Industry Forging Ties with GEOSS: A Value Proposition Dialogue Forum

During that day Alessandro Annoni of JRC highlighted a number of important functions of GEO that are relevant to the private sector:

→ Data collection,

→ Data dissemination (including value added services),

→ Data analysis (including value added products), and

→ Capacity building (including education).

The Group on Earth Observations (GEO), which is an inter-governmental body interested in Earth observation (EO) data, information and services organised a dialogue forum during the Geospatial World Forum to engage with the private sector of Earth observation data, services and solution providers. The dialogue forum was motivated by the decision made by the governing body of GEO to increase both the uptake of Earth observations in decisions and the value for end users of its nine key Societal Benefit Areas (SBAs) including Agriculture, Biodiversity, Climate, Disasters, Ecosystems, Energy, Health, Water and Weather by increasing its network and alliance with the private sector. After a few governments (including European Union, India and US) and GEO representatives provided their points of view on the need and relevance of GEO and its Systems of System (GEOSS), senior representatives from nine different organisations from different geographies shared their views and experiences with open data, policies surrounding EO data, the value proposition of the GEOSS platform, prospects and challenges.

The inclusion of value-added services in particular, goes beyond the more modest goal of data dissemination, but may well be what is required from GEO if it wants to maintain its relevance for the next 10 years. This more ambitious approach requires that a number of issues are solved (with the private sector), such as licencing agreements on the use of data and, possibly, litigation. Not surprisingly, the discussion of restricted and for-cost data versus open and free data received a lot of attention. The Department of Rural Development and Land Records in South Africa (Clarke) concluded that: "access to open and affordable geo-spatial information is essential in any democratic society". This is in line with US policy that "supports open data and the GEOSS Data Sharing Principles as part of an Open Data Policy" (DeLoatch) and European policy (Briggs, Jensen).

The presentation of JRC concluded with the following observations:

→ GEO could benefit from the vast amount of data collected, processed and disseminated by the private sector, citizens and social media;

→ Big Data requires Government investments to modernise existing infrastructures, and outsourcing data dissemination and processing capabilities;

→ Data analysis becomes an important aspect where Governments should make major investments [in the development] towards a data intensive society;

→ Public – Private partnerships are necessary but their articulation could take different forms for fast delivery; and

→ The private sector is unpredictable; [therefore] particular attention is required to maintain control of critical infrastructures and ensure long term preservation of data and/or to define a regulatory framework.

Audience feedback (and Opportunities and Challenges):

→ We are very excited by the potential of GEOSS, both as a platform that we might use to reach relevant users worldwide, and as a source of data and products that we might be able to exploit to the benefit of both public and private sector customers globally (Pradhan, CGI);

→ We fully subscribe to the GEOSS vision of being a

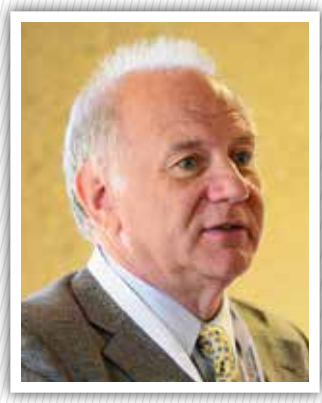
global and flexible network of content providers (Pradhan, CGI);

→ This network must be fully inclusive to commercial content providers, who are best positioned to multiply benefits via commercial exploitation opportunities, delivering growth and jobs (Pradhan, CGI);

→ We would like to see GEOSS engage directly with the Earth observation value-adding industry to build this network, and support the private sector by (a) promoting applications amongst public sector users and decision makers and (b) making the public sector needs accessible to the commercial value-adding sector (Pradhan, CGI);

→ GEO could have a role to help clarify the overlaps and improve efficiency in the whole system especially by: helping create the conditions where private investments can be made and sustained so reducing the public sector burden and ensuring that genuine public needs, especially so developing nations without their own EO capacity can benefit (Sawyer, EARSC);

→ GEOSS has value as a channel for accessing publicly available data to support societal needs (Satterlee, MDA);



→ The technology to rapidly access and mine a broad range of data combined with much greater availability, is driving the business of EO (both commercial and societal) into a whole new dimension which is no longer wholly reliant on government institutions to foster growth and utilization (Satterlee, MDA);

→ Help us where we have mutual interests, [such as] policy development, expanding needs for imagery, expanding uses for imagery, technology development, technology and capability transfer, licensing and standards (Ahlrichs, Blackbridge);

→ Focus on problems not easily addressed commercially (Ahlrichs, Blackbridge);

→ GEOSS can support [our] Seeing a better world [initiative:] make data accessible, provide consistent data, create a common understanding of our changing planet (Kodanaz, DigitalGlobe);

→ Space data infrastructure: investing in access and data exchange mechanisms (Heege, EOMAP);

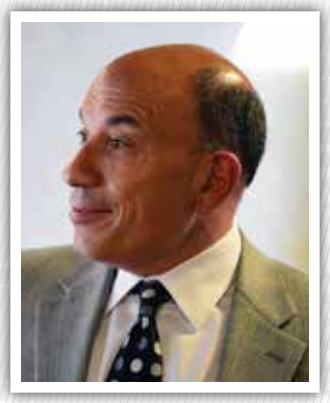
→ Opportunity to make use of the data of the Contributing Missions [i.e. Copernicus] for GEOSS activities depending on decision of the European Union and Member States (Helfritz, Airbus);

→ Umbrella organisations like EARSC are necessary to help reach the large number of SME's which constitute the sector (Sawyer, EARSC);

→ Making commercial data available through GEOSS, requires commercial agreements to be reached with the data providers. Most of these providers will be open and flexible to any arrangement which will not have detrimental impact on their business (Satterlee, MDA);

→ Access to Contributing Missions [i.e. Copernicus] is possible and even encouraged for complementary and global images resources; conditions such as pricing, licencing, and possible national law considerations (e.g. German SatDsiG) to be agreed (Helfritz, Airbus);

→ Need for national and international sponsors for scientific as well as operational use of Contributing Missions' data (e.g. 30m digital elevation model, area frame sampling with very high resolution such as for forest degradation monitoring) (Helfritz, Airbus).



Concerns and issues to solve:

→ Without clarity, there is a risk that development of GEOSS may inadvertently distort an existing or emerging commercial market (Pradhan, CGI);

→ The private sector will be reluctant to invest in new EO systems and services if there is a perceived threat that GEOSS will step in and offer alternatives at low or no cost (Pradhan, CGI);

→ Business disruption [that is] not based on market forces (Ahlrichs, Blackbridge);

→ Governments competing with commercial companies (Ahlrichs, Blackbridge);

→ Our business has to profitably survive a cycle of 15 years from planning to end-of-satellite-life (Ahlrichs, Blackbridge);

→ Need for a funding scheme such as national budget in order to provide data from national missions to GEOSS (Helfritz, Airbus).

Summary of EARSC (Geoff Sawyer) summarized the added-value that GEO/GEOSS can provide to the private sector:

→ Enable improved data access to all stakeholders;

→ Raise awareness of Earth observation capabilities; and

→ Help the private sector understand the needs of the public sector.

Geo3D

The need for 3D information has been rapidly increasing both in the public and private sectors. It is being applied in generating profiles and visibility analysis in wide range of application areas. The programme gave a good glimpse of the wide spectrum of applications and technologies in 3D geospatial modelling.

Key Outcomes:

- UAVs are very flexible data collection devices for 3D modelling but there is still much room for improvement especially on data processing methods
- Quality of elevation reference is decisive in flood and sea level rise modelling
- 3D models in urban project communication could bring optimal results if strategically planned
- 3D WebGL domain is in momentum with ongoing standardizations efforts
- 3D geospatial data combined with 3D acoustics computing can create a new dimension to explain and visualize road noise
- In a wireless coverage mapping application, 1-2m resolution maps are best resolution to use as the level of detail matches perfectly with the ranges of coverage. As the small cell is under the level of the surrounding buildings, 3D geodata is highly recommended.

GeoDevelopers

GeoDevelopers Forum was organised as part of the pre-conference program at this year's Geospatial World Forum. The programme focused on the emerging areas of cloud and mobile.

The lead speaker Mano Marks spoke on the unique opportunities cloud offers to the GIS developers, and brought before the audience the opportunities Google Maps Engine, Cloud Platform and its APIs can bring it.

The second speaker, Dino Ravnic presented on GIS Cloud's platform that enables deployment of fast and easy mobile apps and enterprise solutions. In his presentation, Dino gave examples on the flexibility the cloud can provide in sharing larger datasets.

Matthias Schenker form ESRI gave a talk on how people are consuming map data like never before and leveraging the power of location in their applications. He emphasized on the growing role of open data concept and how Esri's platforms are making this a reality.

In the second session, Cedric Moullet from swisstopo spoke on the Swiss Geoportal and how mobile first strategy was applied in creating the new version. He also spoke on how they Federal Spatial Data Infrastructure (FSDI) is deployed over Amazon Web Services (AWS).

Later in the session, was Ian Holt speaking on the efforts of Ordnance Survey in providing opendata services are enabling developers to create new and out of the box applications.

Tim Williams of what3words spoke on the challenges with geocoding engines when considered at a global scale in multiple languages.

Dr.Thomas Bahr from Exelis presented on the Interactive Data Language, and how applications can be developed for geospatial data analysis.

Key Outcomes

- The current trend is about apps and not just maps
- Cloud has a great potential in geospatial applications
- Open data is emerging and contributing to semantic web
- Mobile first strategy is the need for geospatial applications
- Engage and educate approach has proved to work well when working with developers
- Location geocoding is still challenging, at global scale

GeoCapacity

In many countries, demand for a geospatial workforce is not being met by supply. It is important to connect the stakeholders to understand each other's role in finding the answer to this shortage of geospatial expertise. The programme, co-organized by UNIGIS, in partnership with EUROGEO and AGILE, discussed the issues surrounding geospatial education and training initiatives as well as the challenges in producing competent human resources.

Key Outcomes:

- It is important to engage industry in education and training initiatives
- Making resources including software and data openly available offers an opportunity for knowledge to be shared widely so as to increase learning opportunities, especially in developing countries
- Government level initiatives could lead to better interoperability and lower capacity building costs
- Educational systems need to improve Mathematics and Science teaching strategy to produce better GI science understanding among students
- Funding support from industry could help in capacity building initiatives
- Long-term commitment from stakeholders is required to see through capacity building action plan
- Publication of geospatial sector assessment through research and information gathering with strong risk evaluation could increase public awareness of the industry
- A reliable programme/infrastructure is needed to improve cooperation between vocational education and training and the world of work. This will enhance employability and participation in the geospatial labour market
- Children should be exposed to maps from young age to familiarize them with geospatial information
- Different on-job training curricula should be defined according to different levels of skills and knowledge requirements for different job scopes
- Raising awareness and interest on sustainable development should start from school so students from young age will learn more about technologies to address the issue


Jean Philippe Amstein


Ueli Maurer


Barbara Ryan


Bryn Fosburgh


Sanjay Kumar

Inaugural Session

Geospatial World Forum 2014 opened to an enthusiastic audience on May 6, 2014. The theme, 'Geosmart Planet, Resources, Infrastructure and You', was the focal point of attention among the opening speakers.

Giving the inaugural talk, **Jean Philippe Amstein,** Director, Swisstopo, Switzerland, the co-organisers of the Forum, said geospatial data and information have become integral to our everyday functioning now. As professionals, we need to make this information more accessible and simple so that they can be widely used in the world of political and economic world for developmental activities.

> Geospatial data and information have become integral to our everyday functioning now. As professionals, we need to make this information more accessible and simple so that they can be widely

Jean Philippe Amstein
Director, Swisstopo
Switzerland

Drawing on the importance of Geneva as a city of conventions on any new development, whether in terms of politics, economics or science, **Ueli Maurer,** Member of the Swiss Federal Council, Head of the Department of Defence Civil Protection and Sports, said it is apt that the Geospatial World Forum has travelled to Geneva with such an innovative theme. Underlining the importance of geospatial information and technology in decision making, Maurer said, "I am told 80% of government decisions are based on geoinformation. I quite believe it when I look at the working of my department."

Barbara Ryan, Director, Group on Earth Observations (GEO) Secretariat, opened her presentation with a question: "The planet is quite smart [to survive] but are we?" Drawing up on some of the pressing problems of global warming and climate change, sustainability issues, increasing natural disasters, impending food and water crisis, Ryan said the planet will be there even after we disappear. "We as human beings have to make use of all available technology to ensure that we remain part of this existence." She also said to seamlessly incorporate geospatial data in government and developmental activities involvement of the private sector is essential.

As speakers talked about the importance of geospatial information and technologies in making a smarter and better world, **Bryn Fosburgh,** Vice President, Trimble, hit the nail right on its head first by raising the question "Is geospatial today an industry, a profession or ability?" and then answering it with: "Geospatial is a combination of all three. Converging forces have placed geospatial information at the centre of an evolving ecosystem."Making an interesting point as to how consumer devices and innovations are moving into the professional world, which is a completely new trend, Fosburgh said the declining cost of geospatial technology is opening up new uses for high-accuracy geospatial data.

Earlier, declaring the conference open, **Sanjay Kumar,** CEO, Geospatial Media & Communications, gave a rundown of the geospatial industry from its evolution to ecosystem, while listing out the trends in the industry and in which direction it is heading. He said that the industry is moving towards solutions, and data is driving these solutions. Another interesting trend highlighted by Kumar was how mainstream IT and engineering firms like IBM, Oracle, Google, Microsoft, Facebook, GE have in the last few years acquired companies with geospatial component. "This is not because they want to serve the geospatial industry but because they have discovered that the geospatial component helps them deliver their solutions better".


Dr. Vanessa Lawrence


Jay Freeland


Ewout Korpershoek


Amar Hanspal


Juergen Dold

Visualisation to Industrialisation

The first plenary of Geospatial World Forum discussed how geospatial industry is evolving from visualisation to industrialisation. Key industry players enumerated their perspective and their solutions to drive the geospatial industry to industrialisation. The session was chaired by Dr. Vanessa Lawrence, Secretary General, Ordnance Survey International, United Kingdom.

> The presentations were followed by an interactive question and answer session, where-in pertinent questions about the use and effectiveness of geospatial technology have been raised and discussed in detail.

Describing FARO's solutions, **Jay Freeland,** President and CEO pointed out that everything in the world has three dimensions and the need to capture and visualise the same is growing by leaps. This is necessitating even more detailed and accurate information. He cited several examples of successful data capture in 3D across the world demonstrating FARO's laser scanners' capabilities serving umpteen application sectors including heritage, forestry and AEC.

Presenting the case of Topcon Positioning Group, **EwoutKorpershoek,** Chief Marketing Officer and Senior Vice President, discussed the evolution of surveying and said technology has been a major enabler in this evolution. Technologies like GNSS, laser scanning, Cloud, telematics, 3D design and increased computing power are enormously supporting this evolution, he said. The productivity of manufacturing sector grew two-times in size than what it was in 1960s. On the contrary, the productivity of construction sector has gone down in the last 50 years. To increase this, it is important that construction sector adopts automation. Underscoring that BIM will be a major driver for automation, Ewout pointed out that this enables elimination of waste, increases efficiency and improves time management.

Making a powerful presentation on how geospatial technology can integrate into the future of infrastructure technology, **Amar Hanspal,** Senior Vice President – Information Modelling & Platform Group of Autodesk, said that humanity is living in interesting yet challenging times with increased infrastructure, food and energy needs and clearly technology is part of the solution. However, he opined that technology is part of the problem itself, because projects are massive and there is a huge backlog of refurbishment of existing infrastructure in developed countries and construction of new infrastructure in developing countries. He summed up saying that as geospatial comes together in infrastructure space with all other information creates a new experience which is immersive and allows the visualisation of the infrastructure before one builds.

JuergenDold, President, Hexagon Geosystems informed that geospatial technology has evolved into an engine for smart enterprises, driving productivity in decision-making processes by integrating solutions from data capture to creating information. He then went on detailing Hexagon's solutions for manufacturing, infrastructure, safety and mining.


Dorine Burmanje


Steven Hagan


Actuary Ronaldo Ocampo-Alcantar


Prashant Shukle


Michael T Jones


Shannon Ulmer

geoSMART + You

Geo-enabling citizens across the world with innovative technologies was the theme as the second plenary at the Geospatial World Forum 2014 witnessed high-value presentations from speakers as well as enthusiastic participation from the audience.

Introducing the session, Chair and moderator Prashant Shukle, Director General, Canada Centre for Mapping and Earth Observation (CCMEO), Earth Sciences Sector, Natural Resources Canada, highlighted that information has become ubiquitous and is changing every aspect of how people live. It is not only reshaping the economies and societies but is having a great impact on the citizens.

DorineBurmanje, Chairman Executive Board, Cadastre, Land Registry and Mapping Agency, The Netherlands, first speaker from the panel, kick-started the session in an innovative way as she connected Van Gogh's paintings with mapmaking and navigation. Highlighting how Dan RooseGaarde, a Dutch artist and innovator, was inspired to apply the glowing lines on highways from paintings, Burmanje also stated that new geospatial technologies are inherent to citizen-centric concepts like smart and connected cities, intelligent transport, real-time traffic systems, energy efficiency etc.

Steven Hagan, Vice President Development for Server Technologies, Oracle Corporation, said that geosmart technologies empower each one of us as a citizen. Explaining how this can be done, he said the Internet of Things and Cloud help governments to check the pulse of things — from weather to pollution, radiation levels in a city, waste management, roads and traffic conditions, sustainability, and urbanisation. In addition to speed and efficiency in governance, Hagan felt that this would also ensure transparency and inclusiveness.

Actuary Ronaldo Ocampo-Alcantar, Vice President, National Institute of Statistics Geography and Informatics (INEGI), explained how the UNGGIM in Latin America and Caribbean countries are working towards enabling and empowering citizens. He also drew up on INEGI's work in Mexico towards this.

> New geospatial technologies are inherent to citizen-centric concepts like smart and connected cities, intelligent transport, real-time traffic systems, energy efficiency etc.
>
> **DorineBurmanje**
> **Chairman Executive Board, Cadastre, Land Registry and Mapping Agency, The Netherlands**

Michael T Jones, Chief Technology Advocate, Google, grabbed immediate attention of the audience as he started his presentation with The Beer Hunter, an interactive map which tells you about where all one could get beer at Toronto in Canada at any particular time! Stating that it was one of the innovative ways of geospatial technology empowering citizens, Jones quickly switched to more serious topics such as worldwide sensor web and connectivity. "Maps are just pictures. But maps also must make the picture come alive to communicate with people," he said, adding, "If we process some of these data in these interactive maps we can build up a nervous system of the planet in the next 10 years."

Shannon Ulmer, Chief Technology Officer, Tax & Accounting, Thomson Reuters, described how geospatial information and technology can be used in the financial sector such as in commodities trading or taxation. Ulmer also showed a Reuters version of the ship movements across the earth which he claimed helps commodity traders in tracking cargo ships and possible factors that could affect commodity prices at a particular market -- the path, time taken to reach destination, possible disruption en route etc.


Hugo de Groof


Dr. Wendy Watson-Wright


Christopher Cappelli


Dr.Reinhard Schulte-Braucks


Maher Khoury

GeoSMART + Resource Management

Opening the session, chair and moderator Hugo de Groof, Chief Scientist, Research and Innovation Unit, European Commission — DG Environment-D-4, Governance, Information & Reporting Unit, talked about resource management in an economic as well as environment point of view; something he called the circular economy – use and reuse.

Resources are essential to the economy of a nation. Smart, sustainable and inclusive growth can only come from efficient resource management. Accordingly, the third plenary focused on the role of geospatial technology for the utilisation of resources in an effective and efficient manner and how informative data and information could be used to make sound decisions.

Dr. Wendy Watson-Wright, Assistant Director General & Executive Secretary, Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO), the first speaker of the day spoke about IOC's work in the area of ocean science, observations, data and information exchange and services, including global tsunami warning systems. The objectives of IOCare summarised by its Main Lines of Action – healthy ocean ecosystems and sustained ecosystem services; effective preparedness for ocean-related hazards; increased resiliency of society to climate change through scientifically founded services; and Enhanced knowledge of emerging ocean science issues. All of these call for Actionable knowledge about the ocean to aid people who depend upon the ocean for sustainable services.

> Resource sustainability can only be addressed if you have the information about what and where those resources are. Collecting and extracting information from the pixel is only part of the story, decision makers also need to access the relevant information
>
> **Maher Khoury, Senior Director, Channel EMEAR, Digital Globe**

Outlining the efforts of geospatial industry in creating awareness among business and customers alike, **Christopher Cappelli,** Director of Sales, Esri, said that maps promote awareness, discovery and action. He added that seamless integration of maps with geographic data across business processes leads to resource management.

Dr.Reinhard Schulte-Braucks, Head of Unit, Copernicus Infrastructure, DG Enterprise & Industry, European Commission, during his presentation gave an overview of the ambitious Copernicus programme, while underlining it as EU's efforts for efficient resource management. Highlighting the progress made in the past one year, Dr Schulte-Braucks said the programme has secured a dedicated funding of 4.3 billion euro for 2014–2020.

Maher Khoury, Senior Director, Channel EMEAR, Digital Globe, spoke on the value of accurate satellite data and Big Data analytics. Speaking on the topic 'Turning Pixels into Actionable Insight', Khoury said, "Resource sustainability can only be addressed if you have the information about what and where those resources are. Collecting and extracting information from the pixel is only part of the story, decision makers also need to access the relevant information and turn this into actionable insight to help them save time, resources and even lives."


Peter Hansford


Georg Gartner


Chris Gibson


Carlo des Dorides


Pascal Berteaud

GeoSMART + Infrastructure Development

The infrastructural needs are increasing day-by-day; and it is a challenge to meet them. While there is a need to manage a broad spectrum of diverse information, there is also a need to encourage multi-disciplinary teams to collaborate and implement best practice tools in their projects. As highlighted by Chair and Moderator Georg Gartner, President of the International Cartography Association, the fourth and last plenary focused on the seamless environment across lifecycle phases for maximum efficiency in infrastructure development.

Carlo des Dorides, Executive Director, European GNSS Agency (GSA), spoke on the growing need for GNSS services across businesses and explained how the agency, which is responsible for laying down and regulating the GNSS services in Europe, is managing the ambitious Galileo project. The agency is also involved in developing the market for adoption of GNSS services across Europe and has been working in getting market intelligence in this regard. The main sectors identified by the agency where it thinks GNSS has great potential are civil aviation (a sector GSA already serves with its EGNOSS programme), road transport, tolling, railways (GNSS penetration in railways installed base is still below 4%), surveying and mapping, and utility infrastructure among others.

Chris Gibson, Vice President, Trimble said geospatial data management is a key not only in the plan and build phases now, but also play significant role in the maintain and operate phases. Elaborating, Gibson said all the data collected during the first through phases is made accessible to all stakeholders opens up great arena of benefits for everyone. In the later phases of a project, stakeholders like asset and equipment managers, machine operators, sub-contractors, design engineers, surveyors, site engineers and general contractors have access to the data, thus reducing costs and ensuring data integrity and accuracy.

Speaking on UK's vision of smart infrastructure, **Peter Hansford,** Chief Construction Adviser, the London Government, explained how the government is betting on smart construction to reduce costs of public construction projects by 15-20% by the end of the current Parliament term. The vision, which promotes use of smart technology like BIM in all construction projects, amounts to a target of reducing costs worth 2 billion pounds over four years. It includes a faster delivery time of 50% and seeks to lower emissions by half. "Smart construction is central to transformation of the construction sector in UK and for this a solid partnership between the government and industry is essential," he added.

Pascal Berteaud, Director General, IGN, the national mapping authority of France, also spoke on the extensive use of geoinformation and innovative technologies like BIM for development activities in France. Geospatial information is the basis for optimisation of mobility and transport, real-time information, on assets, intelligence road reference systems, automation process for detecting road components, maintenance of transport infrastructure etc. He underlined that highly accurate measurements must be undertaken according to geospatial geodetic frames for managing underground infrastructure. Berteaud said that France is working on developing a 3D model for its underground infrastructure and is employing highly advanced technologies in the project.


Alhaji AB Inusah Fuseini


Dr Abu Twalib Kasenally


Dr Shailesh Nayak


Prashant Shukle


DatoSri James DawosMamit

Evolving Geospatial Policy for National and Regional Development


Karam Hasanov


Sally Fegan-Wyles


Representative of Florence Modupeola Oguntuase

Enumerating the several initiatives in Ghana, Alhaji AB Inusah Fuseini, Minister for Lands and Natural Resources informed that Ghana is actively working on developing an integrated LIS programme, which will integrate all spatial data through time, remove duplication and improve service delivery. It is also actively working on establishing a national spatial data agency and is taking all measures to bring in legislation in the near future.

Dr Abu Twalib Kasenally, Minister of Housing and Lands, Mauritius stressed the importance of up-to-date information in fostering economic and social development and informed that his government is aware of the significance and is working through several initiatives.

Highlighting India's biggest project "National GIS', **Dr Shailesh Nayak,** Secretary, Ministry of Earth Sciences, India noted that policy makers should keep three aspects while formulating policies – the earth system, the social system and the human system. He enumerated how the scientific aspects of the earth system should link with the economic, political and industrial system (social system) to improve the quality of people (human system).

DatoSri James Dawos Mamit, Deputy Minister, Ministry of Natural Resources, Malaysia outlined the geospatial activities in Malaysia and informed that Malaysia has been using geospatial technology for long but as technology progresses, Malaysia is finding its way forward by implementing the same for national development.

Prashant Shukle, Director General, Canada Centre for Mapping and Earth Observation informed the audience that data/information is viewed as a natural resource and as a global currency in Canada. Saying that the true value of geospatial data can be realised by its liberation and use, Prashant informed that the open data initiatives taken by Canadian government in the recent past underscoring that geoinformation contributes to Canadian economy to the tune of billions.

Enumerating the activities of United Nations Institute for Training and Research (UNITAR), **Sally Fegan-Wyles,** Assistant Secretary General-UN and Director-UNITAR underscored that if the ambitious goals of UN towards reducing poverty are to be materialised, geoinformation and a policy that best guides the use of geoinformation is key.

The **representative of Florence ModupeolaOguntuase,** Commissioner of Establishments, Training and Pensions, Lagos State government, Nigeria described the earth observation capabilities of Nigeria and enumerated all the geospatial activities happening in Nigeria. **KaramHasanov,** State Committee on Property Issues, Azerbaijan, presented the case of the East European country.

Land Information System for Smart Cities

Smart City, as a concept, is adopted in the United Nations Economic Commission for Europe (UNECE) Strategy for Sustainable Housing and Land Management 2014-2020. UNECE organized together with Geospatial Media and Communications an exclusive two-day programme on Land Information Systems for Smart Cities. The goals of the workshop include: to showcase examples of land administration systems which form a strong foundation for smart cities; present success stories from authorities who successfully implemented smart city approaches; share information on the wide range of software, services and technologies available for developing sound information systems for smart cities; and brainstorm on possible future steps to promote effective and modern land administration and the implementation of smart city approaches. Representatives of governments, academia and companies from 20 addressed topics such as information systems to support urban planning and management, land administration, housing, energy, environment and disaster risk reduction. The workshop highlighted, furthermore, several approaches to the use of Land Information Systems for improving city services and increasing the participation of citizens in cities' decision-making processes.

Key Outcomes:

→ Intelligent land administration sets the basis for efficient development;

→ Attractive and fast developing cities are engaged in innovative and sustainable urban management solutions;

→ Decision making is more effective and aware when based on spatial data and on transparent information;

→ The Smart City concept is inclusive, and addresses both developed country's urban dynamics, and countries in transition or developing countries;

→ Technologies for smart city development are available and can be integrated within the current management of the city;

→ There is motivation for municipalities to embrace the smart cities concept - application of those technologies can bring additional revenues to cities while improving transparency and the participation of citizens in the decision-making process;

→ The smart cities concept is well developed in Western Europe and USA and not easily applicable in transition countries;

→ There is a need to narrow the digital divide between economically developed countries and countries in transition, between large and smaller cities, which can be supported by a major availability, openness and security of data and by an improved governance, political commitment and cooperation among different stakeholders;

→ Energy efficiency and energy supply are key sectors in the planning process to achieve more sustainable built environments;

→ Access to information, made easy in Smart Cities, is fundamental to raise the awareness on disaster preparedness.

Smart Cities can rely on a set of indicators to showcase achievements:

- UNECE initiative includes the selection of eight cities in the UNECE region, Middle East and Northern Africa as pilot areas;
- Prepare city profiles – conduct analysis, make recommendations;
- Establish organizational structures with representatives of the cities, governments and with the involvement of stakeholders (private sector, academia, NGOs).

Develop action plans for implementing recommendations:

- Identify priorities for actions;
- Support to the implementation of priority actions;
- Identifying and sharing best practices;
- Networking and exchange of best practices.

The workshop efficiently addressed some challenges too:

- Need of new models for sustainable urban development;
- Ensuring improved living standards and efficient environments as well as opportunities;
- Engage in a cross-sectorial policy field to implement innovative projects;
- Use technology to support decision making and planning processes;
- Integrate land registration, spatial planning, transport and disaster risk reduction to make future-proof cities.

GeoAgri - the new wave of Farming

The GeoAgri session started with a brief introductory presentation by the Chairperson Mark Noort (Editor – Agriculture, Geospatial Media and Communications) giving the overview of the agriculture scenario in the world. He focused on the major Geospatial market trends and challenges in Agriculture sector for different regions. It was followed by the presentations from the eminent speakers highlighting the use of geospatial technologies for different agricultural activities.

> Agriculture is to become one of the largest markets for UAS on the medium term. A new tool to acquire "big data", a new field of innovations for dedicated sensors

Emmanuel de Maistre
Co-Founder & CEO, RedBird, France

Key Outcomes

- Geospatial technologies are of significant importance in transforming Africa's agriculture with respect to combating poverty and food insecurity.
- Remote sensing technologies coupled with GIS tools play a crucial role in management of agricultural risks related to disasters, productivity, climate change, food security and social protection.
- The data acquired using UAV can be easily analyzed and managed using GIS tools.
- The incorporation of various technologies such as GPS, Geographic Information System (GIS), Business Intelligence (BI), production monitoring, Variable Rate Technology and Remote Sensing can help in achieving accuracy and efficiency in precision farming techniques.
- Agriculture is to become one of the largest markets for UAS on the medium term. A new tool to acquire "big data", a new field of innovations for dedicated sensors (other indexes than NDVI) and data analysis.
- There is need to leverage our current and future capabilities to generate the most complete data platform that produces near term benefits of data driven decisions and long term sustainable agriculture through modeling, management and monitoring.
- UAS are an appropriate solution to analyze the cultures at the intra-plot level (cm resolution) due to their high spatial resolution, and accuracy.
- Radar sensors in addition to optical sensors are very efficient in Flood Monitoring.

GeoBuild - GeoSmart Construction through Geospatial + BIM

The programmebrought in expertise and best practices from around the world in construction and infrastructure domain through its technology oriented sessions and panel discussions.

> Converging imagery + geospatial + BIM + 3D enables planning, right-of-way, sustainable design, construction monitoring and accurate as-builts.

Geoff Zeiss
Editor, Building & Energy, Geospatial Media and Communications, Canada

Key Outcomes

- 3D GIS database of infrastructure objects could support management, maintenance, precise localization of elements and plans production
- Geospatial + BIM integration needs strong standardization initiatives and commitments
- The development of standard taxonomies and ontologies for CAD and GIS is a pressing need in order for BIM to work
- Geospatial + BIM progress relies on integrating geospatial skills and technologies into BIM solutions. Key issues include common language, data schema and specifications, system integration, and progression to integrated work and information flow
- A successful BIM-enabled collaborative project team will plan, design and deliver a project with all teams looking at a single shared 3D version of the truth which is fully coordinated and updated as the project progresses
- Mobile laser scanning is a perfect complement to airborne laser scanning especially in modelling narrow infrastructure such as tunnels and bridges
- Converging imagery + geospatial + BIM + 3D enables planning, right-of-way, sustainable design, construction monitoring and accurate as-builts
- Private investment will be the key driver to geospatial + BIM + 3D
- Digital engineering should be encouraged at universities so as to produce industry leaders in this regard
- In future, geospatial + BIM will allow resilience assessment of infrastructure networks

GeoEnergy

The GeoEnergy symposium at Geospatial World Forum 2014 turned out to be a great platform for demonstrating the huge potential that geospatial technologies possess for the electricity sector, as to point to the critical, as well as inevitable, role that it is going to play in the near future. Visionary speakers with wide variety of backgrounds came together at GeoEnergy to present their views and body of work in these regards to the audience. The Presentations covered areas related to exploiting renewable energy, effective distribution management, smart grid, automation etc. Going by the range of topics and the sheer number of projects underway, it would be safe to say that we are making great strides towards unleashing the true power of geospatial for the world of energy, and GeoEnergy is sure to play the role of a resolute advocate and a strategic harbinger.

> The electricity distribution and transmission utilities around the world have realised the promises of geospatial technologies. They have started putting ever-stronger emphasis of these applications.

Theo Laughner
Transmission/Power Quality, Tennessee Valley Authority, USA

Key Outcomes

- Geospatial technologies are being used greatly in mapping the renewable energy potential in various regions, especially for solar power generation. As the world moves away from fossil fuels, and toward the renewable sources, the geospatial industry's foothold will only get larger with time.
- This factor is all the more powerful in Europe with hundreds of GW of nuclear generation capacity slated to be replaced with cleaner options. The electricity players would need to deploy every tool at their disposal to spot and spin alternate sources. The EnerGEO project (for identifying priority regions) is a step in the same direction. There are a number of similar initiatives launched that make use of geospatial tools to identify renewable generation potential in different geographic regions.
- The electricity distribution and transmission utilities around the world have realised the promises of geospatial technologies. They have started putting ever-stronger emphasis of these applications of these technologies. Resultantly, the henceforth one-way push from the geospatial industry into electricity sector is gradually transforming into mutual interest based collaborations.
- Despite there being no quantitative study of this matter, distribution utilities believe that investments in GIS mapping have very quick RoIs. And as its features enable the system to show real-time changes on the ground vis-a-vis operation and maintenance, the results are quick to come by. It starts immediately starts adding to the topline of the firm, which further helps the GIS professional in making the case for further investment, expansion and integration with the operations of the firm.
- Even though adoption of GIS among the utilities in Europe started way back in the late 80s or early 90s, the level of integration has left much to be desired. Looking at GIS mapping of assets and consumers as standalone projects does not do justice to the true scope of such technologies. For optimal realization of its benefits, it must be integrated into the tactical as well as the strategic decision making modules of an organization.
- The advent of smart grid appliances and applications becoming more and more common, geospatial technologies are no longer a matter of choice for electric utilities. It would become absolutely essential to the system. Smart grid is about real-time awareness of the system, its assets and the consumers, and that can not happen without geospatial means.

Collaborative Approach Fostering Global Peace and Prosperity

This special programme organized by UNOSAT/UNITAR featured speakers from UN agencies and their peacekeepers and humanitarian response partners discussing the potential of geospatial technology to increase the effectiveness and transparency of development assistance and humanitarian aid activities.

> Geospatial technology is required to provide long-term risk assessment to determine priority countries for humanitarian assistance.
>
> **Syed T. Ahmed, UN-ESCAP**

Key Outcomes

- Demand for the utility of modern geospatial technologies for groundwater exploration and management services is continuously increasing as evidenced by the several requests from Field Missions and inquiries from UN Agencies and NGOs
- Lack of a 'one-stop-shop' to address stability/security issues is the key challenge to multilateral approaches to space security
- It is necessary to engage all actors across stakeholder communities, especially the industry, to discuss space technologies benefits in UN operations
- Despite significant improvement in geospatial technology and in its availability and affordability, it is still insufficiently used in humanitarian planning. Need to continue reinforcing links between agencies specialising in geospatial analysis and field-based humanitarian actors
- Humanitarian demining programmes may benefit from adopting and using GIS technologies, toolsand data by leveraging their ability to account for a wide range of geographic factors
- Geospatial technology is required to provide long-term risk assessment to determine priority countries for humanitarian assistance
- Satellite imagery is a good tool for damage assessment from natural disasters

photo with 2694d

GeoDisaster

GIS and earth observation systems have long been used in managing disaster, from preparedness, to response and relief efforts. The programme detailed on the latest innovative technology that could increase the effectiveness and efficiency of disaster management strategy.

> Remote sensing technologies offer huge number of information sources but the key issue is providing fast and easy access and usability of the data and information.

Dr. Horst Harbauer
Hexagon Solutions

Key Outcomes

- The use of LiDAR data from aerial/terrestrial laser scanning for measuring land deformations is gaining interest, as they obtain point clouds of high density and positional quality
- Photogrammetric techniques allow landslide multi-temporal analysis by analysing inventory movements of 3D digital stereo-plotagainst time
- The major challenge in landslides mapping is determining its vulnerability in a given period (return period). Such parameter can be estimated by applying different remote sensing techniques such as aerial and UAV photogrammetry, terrestrial laser scanning and wireless sensor network
- Geospatial technologies contributed to landslides management system through sensor networks and crowdsourcing for early warning and process monitoring;and UAV for process monitoring and victims rescue
- Committee on Earth Observation Satellites (CEOS) has created three thematic teams to develop three thematic pilots (one each relating to floods, seismic hazards and volcanoes) as part of its Disaster Risk Management Observation Strategy
- There is a need to identify specific satellite-based products that can be used for disaster mitigation and response on a regional level
- Pooling satellite imagery and terrestrial in-situ data onlinefor the public could bridge science and society in risk mitigation exercise
- A system that provides targeted information from local to global scales could integrate individual efforts into fire management and fire danger rating
- Challenges identified:
  - Uncertainty over continuity of observations
  - Large spatial and temporal gaps in specific data sets
  - Eroding or little technical infrastructure in many parts of the world
  - Lack of relevant processing systems to transform data into useful information
  - Limited access to data and associated benefits in developing world
  - Inadequate data integration and interoperability
  - Inadequate user involvement
- High-resolution DEMs contain significant information on floodplain-related physical phenomena used in terrain analysis to generate floodplain topography
- Integrated flood risk management and territorial planning should considerhy-drogeomorphic flood footprint rather than event-base standard flood mapping
- Remote sensing technologies offer huge number of information sources but the key issue is providing fast and easy access and usability of the data and information
- Predictive analysis to statistically identify similar places where similar disaster could occur in the future can be done by combining data from past occurrence andpresent environmental and social features on the ground using high-resolution satellite imageries
- A volcanic disaster response system with comprehensive GIS database could estimate damages and generate response plan quicker
- In remote areas where no structural measures are practicable, the implementation of an automatic Early Warning System based on satellite remote sensing and terrestrial observation stations has proved to be efficient and could significantly reduce damage in disaster-strike area
- Climate Change is a global issueinter-related to disaster management, therefore requires a close cooperation on international level
- Continuous research and development activities must be pursued and supported to further generate accurate, consistent and reliable geo-information products

Climate Change

Climate change is now widely recognized as the major environmental problem faced by the planet. It has become a pressing need for geospatial community to identifythe right mechanisms, sectors and regions, how and where geospatial technology can contribute in addressing it. The Climate Change programme at Geospatial World Forum has raised awareness of the completed, current and future work being done on this front and the international experts deliberated on developing a new vision to createa comprehensive and systematic gap analysis in climate impacts research.

Key Outcomes

- IS-ENES climate4impact portal is now fully operational, oriented towards climate change impact modellers, impact and adaptation consultants, as well as other experts using climate change data
- Cross domain integration is vital, i.e. integrating weather and climate information into hydrology domain for flood forecasting
- 3D city models can also be used to compute alternative energy production potential, and the associated reduction in CO_2 emissions associated with alternative technologies
- Global Forest Observations Initiative (GFOI) ensures the acquisition of core satellite data for 11 countries in 2013 rising to global coverage in 2016
- Requirements for Essential Climate Variables (ECVs) need to be revised in order to better address mitigation & adaptation needs at national & local scales
- Requirements for in-situ climate data records to be better specified
- More national climate adaptation activities should be contributed
- Accelerated implementation of Global Climate Observing System (GCOS) hasenhanced capabilities to access, develop, implement and use integrated and interoperable Earth- and space-based observation systems for weather, climate and hydrological observations
- Middleware applications to interrogate models; and practical guidance, use cases and specific requirements for and from users that are not necessarily climate or computer scientists are lacking
- Practical guidance is needed for the use of Climate data for stakeholders
- Cloud Sensor Service integrated with Nanosensor and Wireless GIS could produce effective real-time monitoring system
- Gravity Recovery And Climate Experiment (GRACE) is enhancing knowledge of climate change impacts through groundwater and soil moisture monitoring capability
- Conservation water budgets are built using geospatial data and tools such as ortho-imagery and land cover data
- Accurate long-term weather forecasts based on geospatial data promise to allow dynamic, real-time operations in reservoir reserved for flood

> 3D city models can also be used to compute alternative energy production potential, and the associated reduction in CO2 emissions associated with alternative technologies.

Carl Reed
Chief Technology Officer, Open Geospatial Consortium

Emerging and Disruptive Technologies Shaping the Future

The session on Emerging and Disruptive Technologies Shaping the Future was organised along with Joint Research Centre European Commission (JRC), to look at technologies that will define the industry in the future, beyond the next 5-10 years period.

Key Outcomes

- It is important to be able to model and understand earth and its complex systems and interactions between this environment and the society
- Serious gaming as a concept to understand complex behaviors of the society, able to predict them especially by police for peace keeping
- Need for computing power growing at roughly the same pace as data volume and complexity and the need for smarter models and analytical techniques
- Need for a new perspective to understand earth
- The notion of Social Machines, where people be creative, machines does administration

Chaired by **Massimo Craglia**, JRC, European Commission the session saw scintillating talks and discussions that are part of the current research across various domains that will define the future of technology and research.
The lead speaker **Bob Bishop**, CEO of International Centre for Earth Simulation gave the talk on Building a Virtual Earth to better understand the real world, where the key message was to understand and communicate effectively the complex interactions between society and the environment.
Followed by this was **Ed Fennema**, CEO of Sightes where he brought out how we live more and more in both physical and virtual worlds, and how gaming is a serious strategy to engage the audience, and retain attention in such a generation.
The third speaker, **WimBroer,** Commissioner of Police from Netherlands added to Ed's presentation by exemplifying on serious gaming as a concept to deliver training to police and how National Dutch Police is experimenting with it.
Later Didier Schmitt of Bureau of European Policy Advisors (BEPA) gave an impromptu talk on the need to envision the future where we want to develop policies and strategies to get there. He further said the need therefore to model not just data but also policies to understand in advance the effects on later date.
Another key topic discussed was on how computing power is growing at roughly the same pace as data volume and complexity and the need for smarter models and analytical techniques – through a presentation by Thomas Ludwig, Director of the German Climate Computing Centre.
An out of the industry example was discussed through the Blue Brian project presentation by Dr. Felix Schürmann, a great example of multi disciplinary project based on modeling and simulation as the challenge to map the brain empirically is not possible to achieve.
Well within from the Earth Observation was the Urthecast project discussed by its CTO George Tyc on the overview effect and getting new perspective of the planet.
The last speaker, David de Roure - Director - Oxford e-Research Centre spoke on the concept of Social Machines where people be creative, machines does administration, and how crowdsourcing holds good in this concept.
Followed up by this was a panel discussion on all the topics brought before the audience.

> The need is to envision the future where we want to develop policies and strategies to get there. The need is to therefore to model not just data but also policies to understand in advance the effects on later date.

Didier Schmitt, Bureau of European Policy Advisors (BEPA)

Sensors - Innovative Remote Sensing & ROI

Key Outcomes

- In sensors design, engineers able to rationalise their requirements can realise huge reductions in mission cost, with limited reduction in capability
- Current operational missions for VHR imagers can have 50kg mass or lower with good performance
- UAS will not replace the traditional large format sensors, but will be advantageous for local area applications ("hot spots")
- Harmonized flight regulations throughout Europe will be the requirement for further use of UAS in National Mapping Agencies
- RADAR is well suited to provide Near Real Time service for oil & gas, disaster management, natural resources and defence & security due to its weather-independency, and data processing automation
- A global network of receiving stations could minimize data latencies
- Atmospheric Sensor (CAVIS) on a satellite will improve measurement and removal of atmospheric effects
- Short Wave Infrared (SWIR) bands will detect chemistry-based absorption features and improve ability to identify man-materials, soils and minerals
- Global Sensor Network facilitates the deployment and programming of sensornetworks but interoperability with GIS had to be additionallyimplemented (via GML) and maintained
- OGC web services could help convert existing legacy databases into standard web services to handle different types of data produced by real-time sensors
- Airborne bathymetric LiDARprovides good information for critical coastal management decisions in a variety of water conditions and depths
- Digital map and map-aiding technology could assist in generating reliable results out of mobile phones positioning technology

The programme on Sensors, organized in partnership with EuroSDR and ISPRS discussed different types of satellites and airborne sensors, their integrations, applications and latest innovations, chaired by Prof.Ian Dowman of University College London, who is also the First Vice President of ISPRS.

The programme Innovative RS and ROIfeatured various case studies of innovative remote sensing technology usage and its return on investment, chaired by Dan Shannon, Senior Program Manager, TELUS, Canada.

> Global Sensor Network facilitates the deployment and programming of sensor networks but interoperability with GIS had to be additionally implemented (via GML) and maintained.

Ionut Iosifescu
Institute of Cartography and Geoinformation, ETH Zurich, Switzerland

Big Data

The programme discussed how to turn big data into a competitive business asset and start making profitable use of it, especially through effective management and analytics.

Key Outcomes

- Data providers (e.g. mapping agencies) are evolving from being providers of traditional mapping products to being the providers of rich, intelligent data
- With the overflowing geodata, it is important to get a comprehensive, up-to-date and shared catalogthat conform to standards and promotes public transparency
- Through the creation of NSDI, there is a marked increase of socio-economic use of geodatafor the administrations on the federal, cantonal and municipal levels, for private businesses and the scientific community as well as for private citizens
- Big data can be transformed into actionable knowledge through combination of computer vision, machine learning and crowdsourcing

Cloud Computing

The programme discussed the entire spectrum of cloud services, and its utilization to support the enablement of geospatial sciences.

Key Outcomes

- Geospatial Cloud Computing is an interesting perspectives for Startups and Open Source projects
- Integrating sensor data and modeling results into the Cloud could create an intelligent spatial decision support platform
- Geodata Cloud hosting and streaming will reduce infrastructure costs and maintenance for location information, resulting in more efficient utilization of funding across the government
- Advanced geoprocessing in the Cloud can take away the need to store, host or manage products locally

Business Intelligence

The programme discussed Business Intelligence data and analysis as an increasingly important tool for businesses.

Key Outcomes

- Since the majority of corporate data has a spatial connotation, decision support systems and business intelligence platforms need to take into account the geographical dimension
- Business Intelligence data and analysis is an increasingly important tool for executives and financial managers but few businesses take full advantage of spatial and location analysis
- Enterprise mobile work management solution could drive greater transparency, performance and accountability within organisation
- Google and Bing maps present advanced options for utility companies to improve customer care and operational efficiencies
- Incubation process is an efficient way to let a company grow into GeoICT technology without completely overthrowing its initial business model
- A location-based business intelligence (LBBI) system will enable organization to make better decisions and get reliable answers to key questions
- Creation of an integrated database is a challenging undertaking due to technicality but organization should also pay attention to institutional difficulties (cooperation between different units within the organization)
- In a world full of invisible infostructures with millions of connected devices and sensors, huge amounts of time-stamped information become available, creating the need for 'fuzzy logic' analysis in optimising such information for business
- There are many examples of mash-ups at a frontend level that integrate maps visualisations and traditional Business Intelligence, but spatial data usually resides on separate GIS. This leads to features and performances serious limitations.
- A centralised Geo-Data Warehouse is the core of the infrastructure to integrate both business and geographic data with external data like Open Data (demographics, geographic borders, etc.) and represents an essential component managed as Big Data.

National Initiatives & Community Engagement

The programme featured projects undertaken at national level and a few applications developed through community engagement.

Key Outcomes

- Location-based technology could bridge the gap between local authorities and the public through mobile applications
- Government needs to create massive public-private partnerships (PPPs) run by the private sector in areas which require urgent attention
- Environmental analysis should engage the local communities in order to fully assess the impacts of a project on the environment
- An up-to-date geodatabase is an important tool in producing a city master plan; and by publishing it online, thelocal communitycan easily share their ideas and suggestions to participate in design process
- Geo-information public platforms could support decision-making information systems for emergency response, environment monitoring and protection, e-government and others

Open Data

The programme is part of a broader effort to expand and produce knowledge about public information shared in open formats, accessible and structured to substantially increase transparency and accountability in public policy design and implementation, chaired by Prof Robert Barr, Open Data User Group, Manchester Geomatics, United Kingdom.

Key Outcomes

- The move to Open Data is inexorable at global, national and organisational level, therefore public sector bodies need to adapt rapidly
- Users need to be able to browse through open geodata without any specific knowledge or GI-upbringing
- Another way of working for making open data accessible and meaningful is to address businesses and sectors where geodata might be of interest through a targeted campaign.
- Open data gives way to the community to be more open to IT solutions from other sectors than GI
- A tight framework is required to reach interoperability in quality description, web services and data models

SDI, Urban Planning

The programme featured presentations of Spatial Data Infrastructure and urban planning initiatives from various countries.

Key Outcomes

- A web-service based approach is the only path to meet the growing demand for more accuracy and greater frequency of geodata, and greater rates of maintenance that comes with it
- High quality geocoded address remains an important information asset for any digital economy
- Clear guidelines for preparing geodatabase should be prepared and circulated by the department to avoid duplicity of work
- Data collection licensing could be a good practice, especially if the collection involves forbidden area, and it has the potential danger to guarantee the safety of both data collector and the surrounding community

Governance

The programme discussed deployment of geospatial technology in municipal governance including urban planning, land administration, infrastructure management, and others.

Key Outcomes

- International Property Measurement Standards Coalition (IPMSC) will develop and implement a common international standard for measuring property to create a standard property measurement worldwide
- Human mobility data could help transportation planners, policy makers, human geographers, social scientists and other geospatial information users to understand travel behavior and social interactions from spatial perspective
- All e-government initiatives should be publicized in mainstream media for greater uptake
- Spatial data analysis in civil defense could improve emergency response time

Swiss Day

The programme, organized by Swisstopo, featured presentations from various Swiss public and private agencies highlighting the usage of geospatial data in their everyday operations.

Key Outcomes

- The Swiss cadastral system helps to secure land ownership mortgages in the order of CHF 700 billion
- Swiss Digital Cartographic Modelsand the New National Maps of Switzerland meets the new demands by map users with new 3D base data and vector data and databases as basis for quicker actualisation
- The three-dimensional Topographic Landscape Model of Switzerland (swissTLM3D) is used as reference for a variety of thematic data sets, including meteorology, navigation, real estate, hydrography, many others
- All data managed by Survey Department of the Canton of Genevaare time-enabled (4D)
- Swiss National Map series allows visualisation of older versions of (analog) maps using new state-of-the-art technologies
- The Swiss federal geoportal offers 340 datasets with 2.5 billion tiles. Delivery rate at peak hours is at 2800 tiles/sec
- Every CHF invested by Swiss government into geodata creates 4-5 CHF in GDP
- Spatial Data Infrastructure of the Swiss Parks has increased the parks geoinformation community
- SITG owns a 3D database of Geneva since 2010 with buildings, bridges and tunnels, trees' inventory, digital elevation model and orthophotos
- The new SITG's data catalogue, allowing free download, will open in June 2014




Space Technologies Empowering Geosmart Applications in Switzerland

The programme presented a number of applications and services utilizing space technologies, currently under development in Switzerland.

Key Outcomes

- Radar application is promising to meet high demand for information on avalanche activity and snow surface information (height change, wetness, snow type); however SAR satellites data availability and temporal resolution are still insufficient today
- High accuracy navigation sensors (GPS/INS) with Airborne Laser Scanner (LiDAR) and high-resolution digital cameraare used for accurate mapping of ski resorts
- Space Assets For Enhanced DEMining (SAFEDEM), a demo project co-financed by ESA, produced hazard and risk assessment maps by using geospatial reasoning andmultivariate analysis combining satellite images (Optical, SAR), RPAS data/ products, thematic maps and BHMAC delivered minefield records

Geospatial World Forum 2015

The Way Forward

At a heavily attended closing panel on the last day of the conference, chair and moderator Christopher Barlow, Director, Strategic Relations and Communications, Thompson Reuters, summed up four days' takeaways and invited the closing panellists to put their views forward.


Christopher Barlow


Geoff Zeiss


Barbara Ryan


Prashant Shukle


Ronald van Coevorden

Geoff Zeiss, Editor – Building and Energy, Geospatial Media & Communications, said the strategy to get into verticals such as building & construction, agriculture, energy etc. was an excellent move as it connects the geospatial industry with the mainstream industry and builds awareness about the evolving technologies.

Barbara Ryan, Director, Group on Earth Observations (GEO) Secretariat, Switzerland, said the conference was a perfect way for her organisation, which is pioneering the task of spreading awareness about the use of earth observation data for global benefits, to connect with the private industry, including geospatial and mainstream businesses. GEO also used the forum to launch their pet project GEO Appathon — an app-building contest using EO data.

Prashant Shukle, Director General, Canada Centre for Mapping and Earth Observation, earth Sciences Sector, Natural Resources, Canada, said the conferences like this was essential is increasing the outreach of geotechnologies. He also called for strong interaction of the public sector with the private players to create conducive policies and market while optimising the use of these innovative technologies. Shukle, however, had a word of warning regarding too fast and too enthusiastic a focus on vertical industries, saying timing is critical and the industry must carefully learn from experiences.

Ronald van Coevorden, Worldwide Segment Marketing Manager – Geospatial Division, Trimble, said his company had been a strong supporter of such events since that creates a platform to interact with a wide variety of people from various public sectors. He also welcomed the trend of vertical focus of the industry.

GEO Appathon

The global App development competition hosted by Group on Earth Observations kicked off at a special live and free event on 7thMay. The event featured inspirational talks from GEO Appathon partners unleashing the power of Earth observation data, as well as a unique App 'design and spec' session.

India Geospatial Summit

Association of Geospatial Industries (AGI), a non-profit body representing the collective voice of Indian Geospatial Industry, for the first time, has led a delegation of Indian Geospatial Companies to Geospatial World Forum. In recognition of the increasing collaboration and partnering between global and Indian companies as well as the need for building long-term, sustainable relationships, AGI has organized an India Geospatial Summit for delegates to the Geospatial World Forum 2014, on 7th May. In this forum, AGI presented India and Indian industry capabilities, competencies and capacity in the geospatial technology arena as well as showcase some leading Indian services companies






GENEVA, SWITZERLAND
Recognizing

GEOSPATIAL WORLD AWARDS

JURIES

Prof. Fraser Taylor	Aida Opoku Mensah	Matt O'Connell	Prof. HenkScholten	David Schell
Distinguished Research Professor at Carleton University	Director, ICT, Science and Technology Division at the United Nations	President of MOC Partners	CEO of Geodan and Scientific Director of the SPINlab at the Vrije Universiteit Amsterdam	Chairman of the Open Geospatial Consortium

GEOSPATIAL WORLD LEADERSHIP AWARDS

Lifetime Achievement
Dr. Carl Reed
CTO, OGC

Geospatial Ambassador
Geoff Zeiss
Former Director Autodesk and Founder of Between the Poles

Geospatial Entrepreneur
Steve Coast
Founder OSM & CloudMade

Geospatial Business Leader
Bryn Fosburgh
Vice President, Trimble Navigation Ltd.

National Geospatial Information Agency
Singapore Land Authority

Geospatial Business Hub
Gavle and Gavleborg Region
Sweden

Geospatial Strategic Merger
Telenav– Skobbler

Geospatial Solutions Company
eLEAF

Geospatial Content Company
Planet Labs Inc.

Geospatial Technology Company
Snowflake Software

GEOSPATIAL WORLD INNOVATION AWARDS

Category	Project	Recipients
Cartography	Automatic Generalisation of Topographic Maps	Kadaster, The Netherlands
Mobile Mapping	Georeferenced 360o Video	Horus View & Explore BV, The Netherlands
LiDAR Mapping Systems	RIEGL LMS-Q780	RIEGL LMS Gmbh, Austria
Big Data	Dutch Satellite Data Portal	Netherlands Space Office Astrium Services, GEO-Information Division i-cubed
Meteorology	MetEye	Australian Government Bureau of Meteorology
Coastal Zone Mapping and Imaging	CZMIL: Coastal Zone Mapping and Imaging LiDAR	US Army Corps of Engineers Optech, Inc, USA
Interoperability	GEOSS Brokering Framework	National Research Council, Italy
3D Terrestrial LiDAR Scanner	Laser Scanner Focus3D X 330	FARO Technologies Inc, Germany

GEOSPATIAL WORLD EXCELLENCE AWARDS

Category	Project	Recipients
Agriculture	e-Pest Surveillance and Advisory System	Stesalit Systems Ltd, India Bidhan Chandra KrishiViswaVidyalaya, India
Reinsurance	NATHAN Risk Suite	Munich Re, Germany
Governance	COMCOL Platform: ICT for Social Accountability in Ghana	World Bank Glonedho Local Authorities, Ghana
Public Safety	Safe City Monitoring System	Federal Department Town and Country Planning, Peninsular Malaysia Royal Malaysian Police Ministry of Home Affairs, Malaysia
Disaster Monitoring	Incident Command GIS System for Improved Disaster Relief and Emergency Rescue	Supergeo Technologies Inc., Taiwan Taipei City Fire Department, Taiwan
Environment Monitoring	Rural Environmental Cadastre - CAR	Brazilian Institute of Environment (IBAMA) Ministry of Environment, Brazil
Law Enforcement	Green Wave Operation - Indicator of future deforestation in the Amazon	Remote Sensing Center, Brazilian Institute of Environment (IBAMA)
Transportation	Person Trip Data Browser and Space-Time visualiser	Division of Spatial Information Science, Faculty of Life and Environmental Sciences, University of Tsukuba, Japan
Environment Monitoring	Noise Watch Mobile App	European Environment Agency
Business Intelligence	GNAF	PSMA Australia Ltd
Infrastructure Management	3D Modelisation for the Transports Publics Genevois	Transports Publics Genevois(TPG), Switzerland Service de la Mensuration Officielle du canton de Genève (SEMO), Switzerland HKD Geomatique SA, Switzerland
Infrastructure Planning	LINZ - Data Service	Land Information New Zealand
Cadastral Survey	eKadaster	Department of Survey and Mapping, Malaysia
Mapping	Western China Mapping	Chinese Academy of Surveying and Mapping (CASM) National Administration of Surveying, Mapping and Geoinformation of China (NASG)

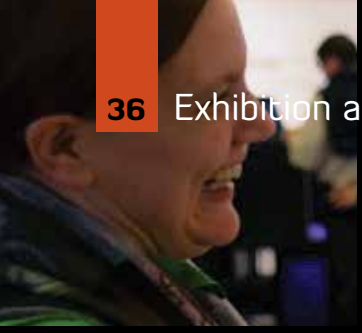
THE GEOSPATIAL WORLD POLICY AWARDS

Project	Recipients
4th Rwanda Population & Housing Census	National Institute of Statistics, Rwanda
Land Administration, Valuation and InformationManagement System (LAVIMS)	Ministry of Housing and Lands, Mauritius Astrium
3D Ethics Charter	3D Ethics Charter Committee, Switzerland
Disaster Risk and Exposure Assessment for Mitigation (DREAM)	Department of Science and Technology, Philippines National Engineering Center, University of the Philippines
digital-earth.eu:Network and Centres of Excellence for Geomedia in Education and Training	European Commission European Centre of Excellence, Salzburg European Association of Geographers

BEST PAPER AWARD

Using Geographic Information System (GIS) Pedagogy as a Catalyst for Community Engagement

Author: Nicholas Pinfold, Lecturer, Cape Peninsula University of Technology, South Africa









APART FROM THE EXHIBITION SERVING AS NETWORKING HUB TO DELEGATES DURING THE CONFERENCE, GEOSPATIAL WORLD FORUM ALSO HOSTED VARIOUS SOCIAL EVENTS IN THE EVENING OF THE CONFERENCE THROUGHOUT THE WEEK, PROVIDING DELEGATES WITH AMPLE OPPORTUNITIES TO CONVERSE IN A MORE LEISURE ENVIRONMENT







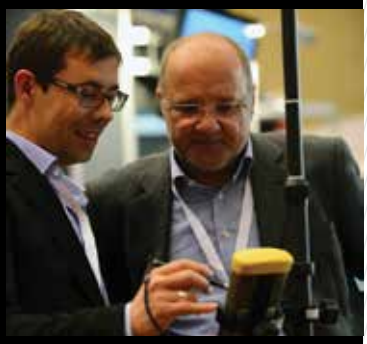


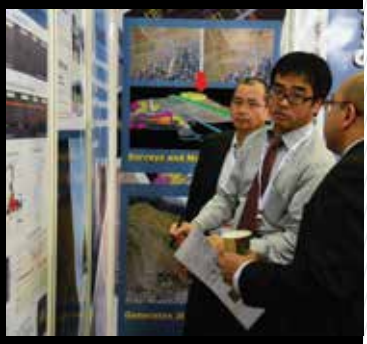












GeospatialM
Ministerial Panel at #GWF2014 Rep by Canada, Swiss, Malaysia, India, Ghana, Mauritius, Nigeria & Azerbaijan

Steven_Ramage
Refreshingly short presentation and no preaching, just some ideas for thought from Barb Ryan @geosec2025 #GWF2014

jenevanderheide
More and more apps with maps inside. Let's call these mapps. It's all about location! #gis #geo #GWF2014 #geonl #apps

geospatialgenie
75 countries and 250 speakers participating in #GWF2014 ! Undisputedly, it's gonna be a great show!

rooevans
Seamless, @amarhanspal discussing „interesting" and „challenging" times. How can we rise to the challenge? #GWF2014

karldonert
Ideas and issues from #GWF2014 Capacity building session

UNOSAT
We are excited to be a strategic partner of the ongoing #GWF2014. Theme is #geoSmart planet, resources + infrastructure & YOU @geoworldmedia

AidaOpokuMensah
„Geospatial tech entered all our lives" says Juergen @HexagonAB @geospatialgenie #GWF2014

rollohome
Currently listening to UK Land Registry: using „the technology we have to the maximum practical use" to free value of core data #GWF2014

digitalurban
‚BIM does not relate to Reality' ‚Esp.. in Renovation and Renewal' interesting session at #GWF2014

stefanjensendk
Amazing talks about advancing computing power and the human brain (yes, there are spatial aspects!) #GWF2014

DrBobBarr
Enormously impressive presentation on Chicago's Smart City LIS #GWF2014

UNOSAT
#GWF2014: @UNOCHA´s Craig Williams addresses the topic of humanitarian assistance @geoworldmedia #geoSmart

sandolinic
People from all around the world at the gala dinner Geospatial World Forum #GWF2014 @IconsultingBI @marco_vignoli

"The conference was well organized and everything went according to the planned schedule. The program was full with prominent experts and leaders from the field of Geo-Information and Mapping. It was truly business with pleasure conference. We learned about the developments in the field and we enjoyed meeting peers in the pleasant facility"

Prof.Yaron A. Felus
Chief Scientist, Survey of Israel

"An excellent opportunity to present [our work] and to meet a number of very useful and helpful contacts for the future. It was a wonderful opportunity to learn and engage with others. Thank you indeed"

Iain Langlands
GIS Manager, Glasgow City Council, United Kingdom

"We're very happy to participate in this conference as it gave us substantial presence felt by the earth observation community"

Dr. Rao Ramanayanam, Vice President Sales, Middle East, Africa and South Asia, UrtheCast, Canada

"There were many sessions that talked about the main subjects that we were looking for; the exhibition and overall atmosphere were fantastic"

Ahmed Humaid Alzaabi, Head of Maps Section, Boundary Affairs Council General Secretariat, UAE

"For me personally, GWF 2014 has been a great experience opening my mind to the way geospatial technologies can help observe, measure, analyse and sometimes solve global problems. Receiving a world excellence award for our work was the icing on the cake!"

Jérôme Henry, Ing. GéomètreTopographe ESGT/SIA, Directeur, HKD Géomatique SA, Switzerland

"The third GWF [in Europe] provided again an excellent opportunity to meet with high level government officials from around the globe and to meet up with many of our users"

Frank Holsmuller, Regional Marketing manager, EMEA, Esri

"I found the event very successful. All halls running technical sessions were full. There were a lot of interactions among the delegates and excellent demonstrations at the exhibition area"

SwarnaSubba Rao
Surveyor General of India

"It was great to experience GWF in Switzerland after the past two years it was held in Netherlands. Compared to previous two years, [this year] we can see clear development especially at the national level in developing spatial data infrastructures"

Kees de Zeeuw
Director, Kadaster International Netherlands

"For us in the middle-income countries, particularly Ghana, the Geneva Forum convinced me, beyond any reasonable doubt, on the need for fit-for-purpose panaceas for the development, application and use of geospatial technologies for our developing countries"

Dr. Isaac Karikari
Consultant, Ghana

"The technical sessions helped me to be aware of what is being develop and what we are going to face, and also how we can manage the situations that come ahead. This kind of sessions helped to understand where we want to be and how we can achieve it"

Geog. Adriana Enríquez, Projects and Spatial Analysis , SEDATU, Mexico

"We were really happy to see the discussions that took place in a couple areas that are particularly aligned with four of our societal benefit areas - agriculture, climate, disasters and energy - so we found the entire week to be very productive"

Barbara Ryan
Director, GEO Secretariat Switzerland

"During the conference I had good discussions with important geospatial players to identify opportunities that we can have in our country"

Rolando Ocampo
Vice President INEGI, Mexico

"Geospatial World Forum 2014 was a unique opportunity to understand the industry as a whole and gather information about how the different sectors are working to achieve the best results. The venue, Geneva, is an impressive display of what can be achieved when geospatial technology successfully supports government policies"

Coronel Roberto Penido Duque Estrada, Brazilian Army Geographic Service

"The organization was impeccable along with the choice of location, with high accessibility and comfort; the sequence of topics provided was of great interest, offering a broad overview of the worldwide panorama with state of the art geotechnologies; the level of the lectures and plenary sessions were excellent"

Prof.Mirna Lobo, Special Advisor to the Presidency, Urban and Architectural Council of Brazil

"As a new player in the industry, it was great for us to connect with the traditional players and the clients of geospatial"

Dino Ravnic, CEO
GIS Cloud, Croatia

"As a whole, Geospatial World Forum 2014, as it aims to be, was a great opportunity to gather with experts, service and equipment providers from all around the world to exchange knowledge in Geotechnologies"

Felipe Cerbella Mandarino, Instituto Pereira Passos, Rio de Janeiro City Hall, Brazil

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UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE

JRC EUROPEAN COMMISSION

kadaster Cadastre, Land Registry and Mapping Agency The Netherlands

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OGC Making location count.

ICA ACI

agi

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GEOSPATIAL WORLD FORUM™

24 – 29 MAY 2015, LISBON, PORTUGAL

CO-ORGANIZERS

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THEME

CONVERGENCE

POLICIES | PRACTICES | PEOPLE

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