

ISPRS Congress Daily

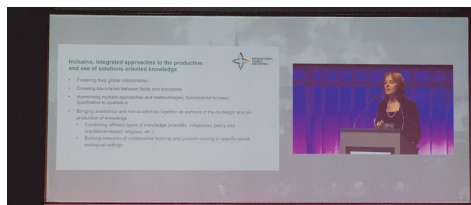
HIGHLIGHTS

CAPACITY BUILDING | EDUCATION | 3D MODELLING | CADASTRE

Open Science Matters!

The second day of the ISPRS Congress in Prague kicked off with a highly relevant keynote presentation by Ms Heide Hackmann of the International Council for Science (ICSU). She told the audience passionately about the urgency of open science. The world faces great challenges and the society expects science to solve these problems. On the other hand, science itself is under pressure to reinvent itself and to re-energize its contact with the society. Hackmann calls for a global response and a significantly enriched collaboration within and between the scientific community. And beyond that, as the world of policy and business, and the public at large are also involved. This necessitates the scientists' engage-

ment with the open science imperative. Hackmann signals that the scientific community is responding to this imperative. A difficult job is waiting for those who determine policy of science – including international bodies like ICSU – to create the conditions of possibility that will allow the science to better support and strengthen that response. Open access and open data are key elements in increasing and having an impact on the influence of science on policy and practice. Hackmann envisions a shifting of the ethos of how we practice and value science, moving from competition towards collaboration. Not surprisingly, capacity building is vital in achieving this shift – scientific capacity building will be



Heide Hackmann delivering her keynote presentation.

the route to follow in the decade(s) to come. Are we walking the talk? At least there are some excellent international examples such as Future Earth and Science International. Multi-stakeholder approaches it is! Heide Hackmann faced the audience with a reality check and observed that there are still many burdens to overcome: budgets for international collaborations are often not global in scope, fre-

quently the first to be cut in times of constraint, excellence is still largely measured in numbers, metrics and institutional rankings and national policy for science is primarily about national economic growth and competitiveness. We need to transform science and the success of this process will determine whether and what kind of role science plays in shaping the future of humanity on planet Earth.



COLUMN

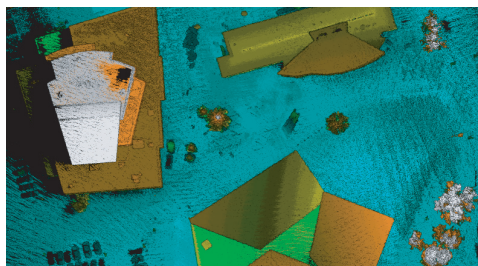
10 years from now, a semantic-rich 3D virtual model of our environment will be available and continuously updated by citizens, companies and governments as well as by sensors that monitor air quality, temperature, noise, etc. With the up-to-date 3D virtual model, governments will be well-informed on the current state of our environment and will be able to accurately predict the impact on flooding, energy, safety, etc. in the case of an intervention (whether planned or not). In addition, citizens will be able to experience the impact of new infrastructures or a windmill using serious gaming. 3D building permits can automatically be checked against the 3D zoning plans and 3D city models, and the submitted 3D design data can be used to keep the virtual model up-to-date. This scenario seems feasible with the current techniques for collecting, updating, maintaining and disseminating 3D data. However, there are a few challenges to overcome. First of all the scenario is only feasible if 3D data can flow between different domains. In many domains 3D has been common technology for many years (e.g. water, noise, air quality, energy, building & construction). But it is still very difficult to share 3D geo-information along the stages of urban and environmental processes (from plan and design to maintenance). Another challenge is keeping the level of detail of 3D data in balance with the needs. When talking about 3D, people often assume highly accurate, virtual reality models are needed, while for many applications less accurate models (but with clean data) suffice. Starting with requirements for the finest level of detail will not automatically give the integrated 3D virtual model. Instead experience on how the integration of 3D data between domains work is needed first, starting with 3D data that is already at hand like the Digital Terrain Models and block models of buildings. Also relevant for 3D developments is the integration between geo and BIM. Although often named as the solution for 3D, in practice reuse of BIM data in geo-applications and vice versa hardly happens. One overarching model does not seem realistic because of the fundamental differences between geometry, semantics and level of detail. Because very few people are experts in both domains, attempts to achieve integration using assumptions about each other's domain leads to solutions that may work on paper but not in practice. Instead, the integration can take shape by starting small and specific. Through actual data exchange, one can understand the data restrictions from the other domain and construct a BIM-friendly geo model or a geo-friendly BIM model. And from there, small steps can be taken towards further integration. The vision of an integrated, up-to-date 3D virtual model of reality dynamically integrating 3D data across domains comes within reach if we think small and make this fit in larger ambitions like Smart Cities, Internet of Things and Big Data. Only then will this vision, which looks straightforward on paper, become feasible.

Jantien Stoter

Dubai at Forefront of Geospatial Technologies

The XXIII ISPRS Congress is underway in Prague and witnessing the participation of a large number of photogrammetry, remote sensing and GIS enthusiasts from around the globe. Organised once every four years, the ISPRS Congress is an important event for members of the global geospatial community, and strengthens the bond between researchers, professionals and representatives of government and private organisations, thus ensuring much needed cooperation within the field. Dubai Municipality has always been at the forefront of utilising and propagating the use of geospatial technologies for the enhanced functioning of various organisations in the Emirate of Dubai and across other countries in the Middle East. The Municipality also organises its annual conference known as GRASF (GIS and Remote Sensing Annual Scientific Forum), which is aimed at showcas-

ing the extent of usage of geospatial technologies by various government and private sector organisations from across the Middle East region. Taking this initiative one step forward and to ensure that its activities are spread on a global scale, Dubai Municipality has decided to participate as a sponsor and exhibitor at the XXIII ISPRS Congress in Prague. The participation is aimed not only at supporting ISPRS in its wonderful initiative but also at bringing forth to the world the extensive and highly impressive work being done by Dubai Municipality and other organisations in the region, in the field of geospatial science. A visit to the Dubai Municipality booth would be an opportunity to learn about some of the ongoing projects in the field of geospatial technologies as well as to experience traditional Middle Eastern hospitality. We look forward to welcoming you to booth number 69.



What are the differences in suitability between the two main types of UAS platforms – fixed-wing systems and rotorcraft – and what is the current state of the art in UAS-compatible laser scanning systems? Find it out at www.gim-international.com/lidar

Technology in Focus: Dense Image Matching

Point clouds are increasingly a prime data source for 3D information. For many years, Lidar systems have been the main way to create point clouds. More recently, advances in the field of computer vision have allowed for the generation of detailed and reliable point clouds from images – not

only from traditional aerial photographs but also from uncalibrated photos from consumer-grade cameras. Read on at <http://tinyurl.com/zuyapla> to learn more about dense image matching, the powerful technology underpinning this development.

CLASSICAL CONCERT

Take the opportunity to attend a classical concert and enjoy the great Bohemian composers Bedřich Smetana, Antonín Dvořák and Josef Suk.

14 July, 8 PM
Bethlehem Chapel, Betlémské náměstí

Price: 25 EUR
Welcome drink included
Tickets available at the registration desk



Phase One Industrial: Medium format, metric cameras for aerial photography

PHASE ONE INDUSTRIAL



Phase One cameras are known for their image quality, accuracy and easy integration with leading flight management systems, IMU/GNSS receivers and all popular Lidar systems. Phase One is dedicated to research, development and manufacturing of these solutions for the surveying industry.

Phase One's flagship camera series, (iXU 1000), incorporates a 100 MP CMOS sensor and offers large format coverage at medium format size and price. These cameras are distinguished by their high resolution, wide ISO range and fast capture rate.

With a wide choice of lenses, Phase One offers solutions for everything from small UAVs up to large manned aircraft.

Come and see us at stand no. 36 for a chat and view our winning digital medium format cameras.

Education is Key

Our society is facing many complex challenges. Climate change is related to many issues today's governments are having to deal with. Think of food security, migration, social justice, urban planning and water supply – all topics that are under increasing pressure due to the effects of global warming. The growing world population is another important hazard that is pushing policymakers to the edge. The combination of these two major threats demands cost-efficient, innovative and smart solutions. The geomatics industry can deliver many of these solutions but, although there are some parties that are doing great work, the real transfer of knowledge still has to take shape.

According to current projections by the United Nations, the global population will reach eight billion by 2024 and will likely reach around nine billion by 2037. Various scenarios for 2050 range from a low of 7.4 billion to a high of more than 10.6 billion. The lion's share of this growth will

take place in Africa and Asia, in developing countries. Migration to cities poses challenges for urban planners, who already have more than enough on their plate. And what about the agricultural sector and the food industry, with so many mouths to feed? A recent World Bank report explores the impact of climate change in Latin America and the Caribbean, the Middle East and North Africa, and Eastern Europe and Central Asia. It finds that warming of close to 1.5°C above pre-industrial times is already locked into Earth's atmospheric system by past and predicted future greenhouse gas emissions. Without concerted action to reduce emissions, our planet is heading for 2°C warming by the middle of this century and 4°C by 2100.

Climate change is affecting agriculture in multiple ways, such as changes in rainfall, fluctuations in temperatures, climate excesses (heatwaves, extreme storms and floods). In other words, a cocktail of challenges is endangering our

future. But let us stay optimistic and think in terms of solutions. Technological advances can play a vital role in tackling the effects of climate change and geomatics is definitely a key tool in this mission. I am not the first person to advocate this. However, it is one thing to be aware of the power of geomatics, but how can this power be used if so many people are still unaware of it?

There are some other obstacles too: it is great that the world's brightest brains have brought us so much advanced technology, but how can it be best utilised when funds are limited and there is a shortage of well-skilled professionals? To zoom in on a geospatial case: policymakers will probably all agree about the need for an efficient and well-functioning cadastral system, but they are often hindered by a lack of knowledge and the financial means to set up a good land administration system. It would be an oversimplification to think that the industrialised Western

countries, with all their know-how, can help less-developed countries move forward merely by providing them with access to the latest geospatial innovations. Technology certainly helps, but technology alone is not the whole solution. Local knowledge and the will to make things better are also fundamental. Geomatics is indeed a tool for overcoming the societal challenges of modern times, but not only in the sense of hardware and software products. It is also necessary to have knowledge of geomatics applications – preferably affordable ones. To stimulate the rise of geomatics in resolving the difficulties many countries face, the key lies in education.

So is education and geomatics the magic formula? Rather than speaking in superlatives, let's describe the situation in a more down-to-earth manner: there are still many opportunities left unutilised. *GIM International* is currently searching for methods to boost the transfer of geomatics know-



Wim van Wegen

ledge. We will of course keep you updated. But I also welcome your suggestions on how geomatics and education can be deployed effectively. What are the biggest needs?

Monitoring Floodplains

Why would you monitor floodplains? This is a question you don't have to ask a Dutchman. The Dutch have been living in their delta for centuries and are champions when it comes to flood water levels. Hydraulically rough vegetation types can lead to higher flood water levels during peak discharges, so that's a good reason to monitor; but to measure the ecological value is another one.

On Wednesday 13 July, Wimala van Iersel from the University of Utrecht presented the findings of her study, showing the performance of multi-temporal, high-resolution Unmanned Aerial Vehicles (UAV) imagery for analysing tem-

poral height profiles of grassland and herbaceous vegetation in river floodplains.

Six surveys were carried out over a period of 12 months, consisting of 27 field plots (vegetation heights of grasslands, herbaceous and reed plants) and the capture of UAV imagery (primary data: NIR and RGB photographs, derived data: NDVI and DSM). The results revealed the high potential of using UAV imagery for increasing grassland and herbaceous vegetation classification accuracy.

The presentation by Van Iersel and her colleagues Straatsma, Addink, and Middelkoop was lively and humorous. The study is ac-



cessible via the ISPRS Congress website.

UN-GGIM Mapping Agencies Forum

National mapping and cadastre agencies provide geospatial data of various levels of detail, types, and scales, which form the basis of today's geospatial data infrastructure – an indispensable national asset for sustainable development of the country and many other applications. The Forum sessions will be comprised of invited and presented papers. One session will be a shared session of the National Mapping and Cadastre Agencies and Space Agencies. It will be dedicated to two important questions:

- How do National Mapping and

Cadastre Agencies use satellite remote sensing data?; What they would like to see improved, etc.

- What are the plans of Space Agencies and Earth Observation Companies in the sphere of data for National Mapping and Cadastre Agencies?; How to strengthen this cooperation?

You will have the opportunity, among others, to talk to geospatial semantics and data modelling specialists from USGC, or meet the renowned photogrammetrist Gottfried Konecny or chair of the Czech national land survey office Karel Brázdil.



Aibotix performed an indoor demonstration of their Aibot X6 UAV.

IAA Space Agency Forum

The sessions of the IAA Space Agency Forum will be comprised of invited and presented papers. One Forum session will be a joint session between the National Mapping and Cadastral Agencies and the Space Agencies. It will focus on two questions:

- How do National Mapping and Cadastral Agencies currently use, or could potentially use, Earth Observation data, and what would they like to see improved?

- What are the plans of Space Agencies in the sphere of providing support to Mapping Agencies, and how can this cooperation be strengthened?

Present, among others, will be Jan Kolar, vice president of the International Astronautical Federation, and Volker Liebig, director of ESA EO programmes and head of ESA-ESRIN, and Pascale Ehrenfreund, chair of the DLR executive board.