New ways for improving global land tenure

Updated transformations for Britain and Ireland’s geoid
RICS response to Land Registry privatisation plans
Something for everyone at GEO Business 2016
NZ’s FIG Working Week shines in Christchurch
Leica enters GPR market with portfolio of devices

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The Chairman of the FIG Commission for Fun (!) John Brock reports on the History of Surveying Symposium and gives his impressions of a lively and entertaining working week with many distractions.

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Engineering surveying showcase 2016 ISSUE ONE

Issue No 1 of Showcase for 2016 was published on 25 April. RICS members in the UK are entitled to receive a FREE copy upon registration or request. Just drop us an email with your full postal address and we’ll pop a copy in the post to you.

If you missed Showcase No 2 for 2015 you can view the digital edition by following the link below.

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Mobile mapping and more

Copy dates for next issue: Editorial: 15 August Advertising: 23 August

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What skills should we be teaching young surveyors? Why is addressing so important? Should we really disturb the beast that is the Land Registry? And how can we raise the levels of global tenure? In this issue GW tries to provide some answers to these challenging questions.

Geoid models or tripods: which is more important?

Gordon Johnston in his Chair’s column (page 09) poses an interesting question. Will young surveyors always need to know how to level a tripod? He raises this somewhat startling question in the context of the RICS review of core competencies for the APC, the test of professional competence for chartered surveyors. Perhaps students don’t need to know that but surely they should get the education to realise that, if one far off day the batteries having all failed and someone reaches for an ancient T2 and tripod in the back of the store to send them off to survey, it needs a level platform to take readings from. Just as they should be aware of the limitations of optical instruments.

The future is one of many paths but at the root of most surveying is geodesy. It is probably more important for a newly graduated surveyor to understand the significance of transformations and geoid models and how they might affect a client’s navigation or positioning system, than the procedure for levelling a tripod. Equally important is an ability to explain geodetical transformations in relatively simple language to a client. OSTN and OSGM are the transformations that link 3D positions measured using GNSS with the national coordinate and height reference systems of Great Britain, Ireland and Northern Ireland. There are new transformations available for each territory. Surveyors should note the average change of levels of 25mm in mainland Britain, as this may have implications for anyone trying to merge legacy databases up to date. Without regular updating someone may die because they have to wait too long for a paramedic or ambulance that can’t find the given address, which is exactly what may have happened recently in London.

A multi-layered and deeply rich history

I’ve taken the liberty of publishing a fairly fulsome summary of the RICS response to the Government’s proposals to privatise the Land Registry. There are serious worries around additional risk, conflict of interest and insecurity in allowing a commercial company to grant title, which in turn may open the door to title insurers to place an additional cost burden on purchasers. Many questions in the proposals remain unanswered. Availability in future of Open Data is amongst many issues unaddressed. Readers who have any dealings with the Land Registry should study the RICS response carefully. Perhaps the most significant aspect of the Land Registry and one that politicians and civil servants focused on raising funds overlook or are unaware, is what it does. I quote from the response: “England & Wales has a multi-layered and deeply rich history of land law which can have different nuances in some regions. This is a living, highly complex beast rather than a data house.” It sounds like a beast we disturb at our peril!

Addressing global insecurity of tenure

We stay with land and Dr Robin McLaren’s magisterial review of global insecurity of tenure. Based on shaky statistics it seems that only around 30% of the world has some form of secure or registered title. To register more landholder’s rights McLaren argues that there is a growing range of new and cheap tools available to help people. Mobile phones and the Internet offer a potentially life-changing way of recording land rights and claims. But in some parts of the world we need to better understand how indigenous people regard both land use and ownership. We have much to learn. This article is abridged from a longer paper and is essential reading for all involved in international land management.

Lastly, we have reports from two attendees at the recent FIG Working Week in Christchurch New Zealand. In the next issue I hope to bring you a more detailed review of the papers presented. Enjoy the summer, we shall return in September.

The editor welcomes your comments and editorial contributions by e-mail: editor@pvpubs.demon.co.uk or by post: Geomatics World PV Publications Ltd 2B North Road Stevenage Herts SG1 4AT United Kingdom
Spectra Precision Focuses on Dam

At the Razisse dam on the Dadou River in southwest France, a Spectra Precision Focus 35 robotic total station has just completed monitoring the structural movements that occurred during recent major repairs and improvements to the dam. The instrument, which has a one arc-second accuracy, was chosen to monitor to a half-millimetre accuracy movement of the arch dam abutments during a particularly critical six-week period in the construction project.

The Razisse is an arch and gravity type dam 30m high & 300m across built in 1955 to impound water for hydroelectricity. The current engineering project to improve dam performance and ensure downstream safety included raising the dam height by 60 cm, reinforcing existing abutments and adding two new piano key spillways.

Publishers team up
PV Publications Ltd, publishers of Geomatics World, GIS Professional, Maplines and other titles are to join with Geomares, publishers of GIM, the website Geo-matching.com and other international titles.

Welcoming the move, Stephen Booth, managing director of PV Publications Ltd said, “This is an exciting move for our readers. Demand for information about all things geospatial has never been higher. By combining with Geomares we will be able to move forward and improve services to our readers worldwide”. Durk Haarsma of Geomares adds: “We are very happy to announce this step, convinced that readers of all our publications – print and online – published from The Netherlands and the United Kingdom will benefit from the synergy between the established brands of our respective companies.”

Geomares will be establishing a new company in the UK to continue publishing and servicing readers of Geomatics World, GIS Professional, Maplines and other titles of PV Publications. It is understood that the new company will commence trading from 1 July 2016. Stephen Booth will be continuing his editorial role for the titles for the present time.

GEO Business grows
London’s 2016 GEO Business show and conference at the end of May has reported another overall attendance up by 10% on last year with over 2,200 visitors from 50 countries and positioning the event as a truly international one.

The show director, Caroline Hobden, commented: ‘It was clearly evident by the buzz on the show floor that many of our new developments had a major impact. Changing the date so that the show took place outside of half term obviously had a significant effect on visitor numbers with many of the senior buyers that we had been counting for a number of years now finally being able to attend. The best testament to a good show though is whether or not your exhibitors want to come back and we are delighted that 94% have rated the show as excellent or good and are already clambering to book stands for next year.’ You can read GW’s full report on page 12.

EO in Africa
Backed by the Group on Earth Observations (GEO) the first AfriGEOSS symposium, “Earth Observations for the Africa We Want” was hosted by the Research Council of Zimbabwe (RCZ) in April at Victoria Falls, Zimbabwe. The symposium concentrated on ensuring that AfriGEOSS activities respond to broader African agendas and objectives, including the African Union’s Agenda 2063. Minister Ambassador S.K. Moyo of Zimbabwe stated that, “Earth Observation and geo-information science provide ample tools to tackle issues to do with the prediction and response to natural disasters such as droughts and floods.” Citing the Intergovernmental Panel on Climate Change (IPCC) assessments which rate Africa as most vulnerable to changes in climate, he added “Earth Observation is of critical value to the planet.”

Professional Services team
Topcon Positioning Group has formed a global team that integrates their customer support and training teams under one collaborative group. The Professional Services team will provide training, customer support, and sales support among other responsibilities related to their Construction and GeoPositioning business groups. The team is comprised of more than forty applications experts from the surveying, construction, civil engineering, networking and mapping fields.

Oceanography partnership
The UK National Oceanography Centre (NOC) has entered into a two-year Knowledge Transfer Partnership (KTP) with Marlan Maritime Technologies Ltd to develop innovative remote sensing services for the survey of inter-tidal zones.

The partnership will see NOC’s Dr Paul Bell and KTP Associate Dr Cai Bird work with Marlan over the next two years to develop and then test new techniques that will ultimately provide improvements to the quality and efficiency of delivering data services to the coastal engineering industry. These services will enable more cost-effective monitoring, design and construction of coastal and maritime infrastructure.

The technique involves using a ship’s radar to visualise the location of the ‘waterline’ between wet and dry regions. The rise and fall of the tide and consequent movement of the waterline is used to build up a three-dimensional map of the coastline covered by the tidal ebb and flow – the inter-tidal areas. This is an old idea, which dates back to World War One that uses aerial photos and radar and recently developed robust software algorithms. This allows new maps of the inter-tidal beach areas to be produced automatically every couple of weeks, more comprehensively than current beach surveying techniques.

The project is being funded through Innovate UK following a successful joint bid application from NOC and Marlan.

Apps for space data
The European Space Agency’s Space App Camp is inviting programmers to develop mobile apps that make Earth observation data accessible to a wide audience. The deadline for applications is 22 July 2016 at www.app-camp.eu. Based on the applications received, twenty developers will then be invited to participate in the free Space App Camp at ESA’s ESRIN facility in Frascati (near Rome), Italy, from 12 to 19 September 2016. The selection criteria will include the applicants’ previous programming work. Travel and accommodation will be covered by the event’s organisers.

The Space App Camp is more than just another developer competition. Its main goal is to familiarise the participants with the many ways satellite data can be used in mobile apps. Those who attend will be tasked with devising innovative apps and feasible business models in one of five subject areas: agriculture; environmental protection; smart cities; transport and logistics; or lifestyle, tourism, and health. The event will also be an excellent opportunity to make interesting contacts from all across Europe while gaining insights into how ESA operates.

NASA-UK Space Agency
Sustainability software and data company Ecometrica is spearheading an international
collaboration on the monitoring from satellites and on the ground. The International Partnership Space Program (IPSP), will be used to the UK Space Agency’s in parts of Latin America through scientists. It is expected to vastly increase the Global Ecosystem Dynamics on the International Space Station – at the University of Leicester.

Degradation and deforestation. It follows the signing of budget.”

Dr. Richard Tipper, chairman of Ecometrics, said: “With the UK alone now spending £200m a year to protect forests, it is crucial to be able to monitor their success and to target efforts at the areas that are being most at risk of degradation and deforestation.

Hydro sale at GeoBusiness Following a presentation at the current GeoBusiness 2016 exhibition in London, Survey Solutions (Scotland) has taken delivery of their first remote controlled platform for hydrographic data acquisition. The HyDrone platform will join their extensive survey equipment hire fleet and will be used in conjunction with Trimble GPS and robotic total station systems. Commenting on the addition to their hire fleet, Richard Mason said “they could see a wide range of applications for the HyDrone system for inland hydrographic surveys of canals, rivers and lochs throughout Scotland”. In response to feedback from the show Ohmex has provided Trimble with updated interface files to incorporate the SonarHive BTX and DXF echo-sounder unit seamlessly within Trimble Access data collection software Files are available to download from the Trimble Docushare website.

Commenting on the GeoBusiness exhibition and the number of overseas visitors John Tampkin, president of Seafloor Systems stated, “this show is rapidly becoming the focal point for exhibiting to the UK based survey, architectural and civil engineering markets, see you again next year”.

Smart build move Leica Geosystems parent Hexagon AB has launched HxGN SMART Build, a construction management software solution designed to alleviate cost overruns and delays. The move comes on the back of Leica’s and Hexagon’s expertise on some of the world’s most complex construction projects. SMART Build facilitates the convergence of construction planning and execution through real-time clarity, accountability and management of the project lifecycle.

Hexagon President and CEO Ola Rollén said, “General contractors face an almost impossible challenge with the number of variables they deal with every day. SMART Build will deliver cost savings, improved workflows, increased productivity and countless other benefits to an industry seeking a better way to deliver projects on time and on budget.”

In another move announced at Hexagon’s HxGN Live! event Esri and Hexagon have launched a series of imagery services to Esri users through ArcGIS Marketplace to deliver high-resolution aerial multispectral and basemap imagery through ArcGIS Online. You can read more about HxGN Live! in Adam Spring’s report in the next issue of GW.

OGC collaborates with SIBA The Open Geospatial Consortium and the Spatial Industries Business Association (SIBA) have signed a Memorandum of Understanding that will further the missions of both organizations by collaborating as partners in the development and conduct of outreach and education programme activities to advance standards-based, interoperable modelling approaches to address the needs of each organization’s membership. SIBA is the leading association representing the spatial industry in Australia and New Zealand.

Mongol Post adopts w3w Mongol Post, Mongolia’s national postal delivery service, has adopted the addressing platform from UK company what3words to address the entire country – an area nearly the size of the European Union. The partnership gives the whole of Mongolia, a rapidly emerging market, an instant addressing system to help to underpin the country’s economic development. Despite almost a third of its population living as nomads, and a vast sparsely populated landscape, Mongolians now have an address.

Trimble partners University of Cambridge Trimble has announced that it is partnering with the University of Cambridge to collaborate on research to advance technology development in the engineering and construction industry. The Trimble Sponsorship Program will support research in construction information technology. Initial focus will be on academic research that has the potential to achieve a significant impact across the construction industry to improve safety, reduce costs, and increase predictability and operational efficiency. The partnership will also focus on educational and professional development to encourage and champion construction information technology research in academia and industry and to accelerate the advantages of BIM as well as the use of computer vision and augmented reality technologies to simplify a wide variety of common construction problems in practical applications.

Architect certified ‘BIM Ready’ AHR is the first architecture led practice to be certified by BSI to deliver construction projects at BIM Level 2 for Design & Construction. This verification, which took place in March 2016, covers all aspects of the business, including Architecture, Building Surveying, Geomatics and Landscape Design. The BSI system independently assesses businesses against the PAS 1192-2 standard, which sets out how to share information on BIM projects and lists the requirements for BIM Level 2.

Intergeo and the Smart City The theme for this year’s Intergeo conference in Hamburg will be Smart Cities. As the host city for INTERGEO 2016 (11-13 October), Hamburg is leading the way in
Germany when it comes to the Smart City and has been quick to position itself with “Hamburg’s Strategy for the Digital City”, which aims to develop a standardised smart city strategy that aims to make cities places which offer a good standard of living and that can fully harness their economic potential. Key areas include mobility, energy, business and work, accommodation and city life.

IN BRIEF

Topcon Positioning and Volvo CE have announced that the companies are working together to establish a Topcon 3D machine control (3D-MC) solution. The technology is designed to seamlessly integrate with Volvo Dig Assist (machine control 2D) on Volvo excavators and with Topcon workflow solutions for design and as-built data. Also announced is the formation of the Topcon Agriculture Group, a global organization to incorporate its precision agriculture business with recently acquired companies to create connected field and farm management solutions for aftermarket and OEM customers. Global headquarters of the group is Turin, Italy, with regional headquarters in Fort Atkinson, Wisconsin, U. and regional APAC headquarters in Adelaide, Australia.

Proteus, a provider of satellite derived mapping and geospatial services, has delivered satellite derived bathymetry to Royal Haskoning DHV as part of a port design project in Saudi Arabia and to identify suitable and cost effective approaches to the port. The 8,000 sq km area of interest was surveyed and delivered within 6 weeks and depths up to 20 m were successfully reached.

Survey equipment suppliers SCCS recently supported Jackson Civil Engineering to set up an Automated Total Station (ATS) monitoring system at Coventry mainline railway station. The system will be providing real-time deformation monitoring data during construction of a new footpath and pedestrian tunnel adjacent to the mainline railway station.

The Commercial UAV Show is set for ExCel London from 19-20th October. It brings together UAV pioneers and technology experts to examine new operational efficiencies and opportunities across the industry. More at www.terrapinn.com

Septentrio has announced a partnership with Innovolec, a UK based company as an authorised partner for GNSS positioning solutions in the UK and Europe. The move enables Septentrio’s GNSS products to meet the needs of unmanned aerial systems customers in the European market.

PEOPLE

Bluesky expands
Investing in internal support, Bluesky has appointed Andrew Kociolek to the role of IT Engineer, while Suzanna Baynard joins as management accountant.

Charlotte Ballard, previously a key member of the Bluesky production team, joins the sales team, and Marco De Stavola joins the company on an ERASMUS scholarship as GIS Intern.

“We have recently been involved in a number of large, high profile contracts both in the UK and abroad,” commented Rachel Tidmarsh, MD of Bluesky, “and it was crucial to our continued success that we underpin our frontline sales and production teams with the support they, the company and our expanding client based require. These appointments will allow us to build on recent success and will provide the foundation for future growth.”

New MD for OS
Ordnance Survey International has appointed Peter Hedlund as its MD. Peter has previously held senior director positions, and has over 15 years’ experience in developing and delivering international business strategies to support business objectives of both start-ups and global corporations. Peter joins from Trimble where he was regional director of Middle East and Africa. During his time with Trimble, Peter produced and implemented growth strategies for international markets that grew Trimble’s business across several regions.

Professor Terry Moore of The University of Nottingham has now received more top medals from the Royal Institute of Navigation (RIN) in its near 70-year history, than anyone else. Professor Moore receives his latest accolade, the J E D Williams Medal, for his significant and varied contributions to the RIN, in particular his leading role in staging its major conferences. His Royal Highness, The Prince Philip, Duke of Edinburgh, who is patron of the Royal Institute of Navigation, will present the award to Professor Moore at the RIN Annual General Meeting on Tuesday July 19 at the Royal Geographical Society in London.

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Subscribers to GW can call +44 (0)1438 352617 or email: jason@pvpubs.demon.co.uk
The recent FIG working week in New Zealand and GEO Business in London all highlight the growing influence of geospatial. But will our core skills change? asks Gordon Johnston, chair of the Geomatics Professional Group, ahead of an RICS review.

Following the mantra of KISS (“Keep it Simple Stupid”) often takes considerable will power. In a profession too often buried in its own complexities, taking this approach can be as big a challenge as the decision itself being considered, due I think to our association with detail. It means making a decision can be difficult but the debates and discussions are over, the votes are cast and we have a result. No, not the UK’s separation from the EU or Brexit, but this May’s FIG Working Week General Assembly election for new vice presidents to join our own vice president, Diane Dumashe, at FIG and to help steer it forwards.

The new vice presidents are Mikael Lilje (Sweden) and Orhan Ercan (Turkey). It is no coincidence that they are from north western hemisphere countries, due to the current trend of many developments in standards and guidance notes being strongly supported from these regions. That is not to say that the other candidates (who lost out by only a very small margin) or their regions are not contributing: they are, across many of the Commissions. In fact, the Christchurch hosted FIG event was one of the best FIG working weeks in recent years and the New Zealand Institute of Surveyors did a fantastic job. See the articles on pages 28-31 for more details.

Now in its third year, GEO Business in the UK proved to be a hugely entertaining and engaging event with over 2200 delegates from many countries attending. The plenary speakers, including RICS president elect, Amanda Clack, were from across the geospatial sector, which helped the panel discussion. The themes of innovation, sustainability and the value and impact of geospatial data ran through much of the two days. Various new innovations had been introduced as part of the ongoing commitment to develop and sustain a strong industry event for the UK. The “Ale trail” around the exhibition being one such popular addition! Again, elsewhere in this edition of GW, you will find a comprehensive report on GEO Business 2016.

The growing influence of geospatial

The general interest and awareness in geospatial data is on the increase. In part through the socializing and wider use of location based tools and apps, which we hope have had their design influenced and supported by experts from our profession. The development of digital and visualization based technologies and the real need to manage and sustain the environment around us have also been influential. A widening user community is good, although we must ensure that the competencies we represent are not diluted to render areas of our expertise redundant. We need to continue to promote our values, engage and demonstrate that we have the relevant skills. There are important initiatives to embrace and support both here and around the world.

Core skills: are they changing?

Perhaps the core skills which our profession requires are changing. The RICS review, of the current APC (Assessment of Professional Competence) pathways, highlights the difficulty of assessing our profession and where the core and rather traditional competencies need to be for the future young surveyors. To use, an admittedly very simplistic but illustrative, example: in this digital age a surveyor, who uses GNSS with an unmanned aerial system to acquire point cloud data for analysis in a GIS and deliver results to a client, may never have to level a tripod. Surely they do need to know how to do this survey task, don’t they, or do they? The massive construction projects that the Olympics represent or survey work for the Gotthard tunnel might offer a clue. I would certainly welcome your thoughts and comments on this topic, noting that the Olympics, currently being hosted in Rio De Janeiro, demonstrate that accurate measurement skills are perhaps still required for the competitive field sports results.

Finally as the summer makes an appearance in the northern hemisphere many of us will find time for some holidays, visiting and experiencing new places, and hopefully not getting lost. It used to be product centric (maps), but it is now much more data centric (satnav) and now moving towards the user centric experience (interactive “smart” apps). They all require the input and expertise of professionals with geospatial competencies during their creation. If we’re smart this will sustain us into the future. Okay, so someday a stay-at-home interactive immersive experience (no not the swimming pool!) might just be a common occurrence. Until then let’s hope the journey still involves some fun and the visits are both smart and safe. Keep it Spatial Stupid!

... we must ensure that the competencies we represent are not diluted to render areas of our expertise redundant.”

Gordon Johnston welcomes your comments and thoughts so please email to the following address geochair.rics@gmail.com

July / August 2016 Geomatics World 09
When I go to exhibitions and other events that require registration I’m never quite sure how to title myself these days since I am in the process reorganising my trading company. I settled for a catch-all term, as you can see, when I registered at GeoBusiness.

What a brilliant show it was. An incredibly busy exhibition floor with far too many companies I’d never heard of (!) and a fantastic Gala Evening – good food, good wine, good company and dancing girls; what else can a man of advancing years ask for?

There were of course plenty of companies at the exhibition I did know and many old friends and acquaintances to catch up with. It was good to meet with Mikes McKay and Roller as well as Chris Little and Chris Gray. As ever, I enjoyed the company of the “Massed Maltbys”. It was also excellent to talk to former RICS Geomatics Chair Rob Mahoney (now Hon Sec of RICS and surely a heartbeat away from the presidency). Also there was Peter Merrett, who never forgets the very first World of Surveying back in 1997 at the Motorcycle Museum when somebody stole his car; he came in from the car park holding the lock (“It’s all I’ve got left of my car!”) and James Kavanagh, Dave Haddon, Derry Long and my old chum Neil Vancans.

The first day of the exhibition ended with an “Ale Trail” and, once armed with our Beer Passport, the opportunity to sample eight different beers on different stands. It was difficult to find a favourite. Some I definitely didn’t like (sorry AGI, ICES, TSA and RICS) but then wheat beer is not normally a favourite of mine. The Salopian Brewery’s Darwin’s Origin on the Severn Partnership’s stand was tasty with a nice hoppy flavour and attractive copper colour. Timothy Taylor’s Landlord Pale Ale on Trimble’s stand is definitely an old favourite. I also enjoyed something called Amarillo Gold from the Saltaire Brewery on Sokkia’s stand but by that time I may have tried too many and my judgement was a tad impeded. Great fun and well done to who ever came up with that idea.

**a big ‘Thank You’**

Finally, a really big “Thank you” to Caroline Hobden, the event director of GEO Business and her boss at Diversified, Versha Carter. How they manage to stand all day walking around the busy exhibition floor of a very successful show and still scrub up so elegantly in the evening for the Gala Dinner is a mystery to me.

Talking of standing all day at GeoBusiness, there were a few who managed to grab some downtime. Can anyone guess whose feet those are (below left)? If the owner quickly sends enough for a couple of good beers we’ll close the competition to save his blushes).

**The Davis Cup Trophy**

Readers who know me know that in addition to Rugby I am a big fan of Tennis. I therefore couldn’t believe my eyes when I saw a tent in Kingston and something called the Davis Cup Tour emblazoned on it. As the pic shows, I managed to get a selfie with me and the eponymous cup (that’s a long word the Editor insisted on putting in!).

For the anorak’s and unenlightened amongst us here is a brief history of the cup, which came from Wikipaedia.

“The tournament was conceived in 1899 by four members of the Harvard University tennis team who wished to challenge the British to a tennis competition. Once their respective lawn tennis associations agreed,
one of the four Harvard players, Dwight F. Davis, designed a tournament format and ordered an appropriate sterling silver trophy, purchasing it from his own funds for about $1,000. They in turn commissioned a classically styled design from William B. Durgin’s of Concord, New Hampshire, crafted by the Englishman Rowland Rhodes. Davis went on to become a prominent politician in the United States in the 1920s, serving as US Secretary of War from 1925 to 1929 (why did every nation have a minister for war in those days?) and as Governor-General of the Philippines from 1929 to 1932.”

Sunken cities appear at British Museum

London as ever offers so many events during the summer. The Editor and I visited the British Museum’s “Sunken cities – Egypt’s lost worlds” exhibition. This is a startling display of artefacts recovered from the seabed off the Nile Delta. Two great cities of ancient times, Thonis-Heracleion and Canopus disappeared beneath the waves more than 1200 years ago, following a series of earthquakes and the liquefaction of the sandy ground on which they stood.

The remains of the cities were first noticed in aerial photography back in the 1930s. They lie in shallow water and to date, divers have retrieved thousands of objects - from giant statues to tiny gold coins and everyday personal objects of the citizens.

This is an amazing exhibition. Not just for the objects but for the way it traces the ancient Egyptian and Greek religions. The cities were great trading posts between the two ancient civilizations and many Greeks lived and flourished in Egypt from around 300 BC, their religion gradually changing and merging with some of the various cults of ancient Egypt. One such was that of The Mystery of Osiris, the god of the underworld who married his sister and whose honour was celebrated annually in a festival over 18 days with boats parading up and down the Nile. Must have been quite a sight. This was all part of a powerful belief system that survived not only the Greeks but into the Roman era too.

One tiny exhibit, part of bowl, came from London a few years after the Roman conquest, suggesting that there might have been a temple to the worship of Osiris in Roman Londinium.

Band for the March

I was delighted to take part with my band The Hangovers in the 2016 Marsden March. This year over 5000 people marched for 14 miles or took a 5-mile sponsored walk between The Royal Marsden’s hospitals in Chelsea and Sutton. The hospitals are dedicated to cancer diagnosis, treatment and research. Over the last six years the March has raised over £7.5 million with £1.7 million raised this year to help build a future beyond cancer.
GeoBusiness returned to the Islington Business Design Centre for its third year with a larger exhibition, more visitors and, if anything, an even buzzier atmosphere. GW’s team at the event report.

The industry’s biggest players seemed to have bigger stands and there were more new exhibitors. Perhaps more importantly, the event is attracting interest from surveyors’ clients as well as surveyors. No longer are we talking to ourselves!

The first session of the first day started with inspiration in spades. Tom Cheesewright, an ‘Applied Futurist’ gave the audience his vision of the geospatial future. The future, according to Cheesewright, is a mix of human and machine, where the machine does more thinking than it does today. It was interesting, but perhaps somehow obvious and perhaps a little spooky, that he predicts that machines will have the same sense organs as humans. They will be able to see and hear and react according to their senses as well as analyse what they see to determine what to do next. The future, he says, is a synthesis of the physical and digital organic living built environment which can develop and evolve, populated by autonomous organisms… and ‘us’. Unfortunately nearly every ‘autonomous organism’ in sci-fi is of the competitive rather than the collaborative kind. Clearly they will need to get on board with BIM!

Setting aside concerns about world peace, this brave new world is good news for ‘geospatial’, because, as we know, everything happens somewhere, so the autonomous organisms… and us, will need map data to find our way around.

**Clumsy cars, toothbrushes and hats**

The euphoria brought by this thought was however short-lived, as Ed Parsons, from Google, said that navigating is actually the easy bit. The bigger concern for the Google car is bumping into objects that have not been mapped, such as other road users. He introduced us to the ‘toothbrush test’. The toothbrush is a necessary part of our lives and we buy one regularly. The aim of Google is to deliver products that pass the toothbrush test. He suggested that Google Maps, with a billion users has passed the test. Arguably, Google Glasses did not pass but Cheesewright suggested that augmented reality is yet to have its day, so perhaps the glasses will eventually pass the ‘old toothbrush test’.

Parsons structured his talk around hats. We started off with a construction hard hat – no stereotyping there then. This is worn by ‘traditional’ geospatial people with a reverence for precision and care, and a reputation (deserved or otherwise) for protectionism. Then along comes the ‘hipster hat’, worn by people who hide complexity behind APIs and make our precious geospatial data available to everyone. They give access, just as Uber gives access to taxis, without owning any vehicles and without the user having to master the intricacies of GIS.

**Clever tractors**

Professor Gianvito Lanzolla from the Cass Business School asked ‘what triggers digital transformation’? His answer was converging technologies, like the connected tractor with technology to ensure that it delivers fertiliser in the right quantity to the right part of fields, so it is using GNSS, remote sensing and communications. Similarly, Rolls Royce monitors its aero engines throughout their working life to target maintenance.

**Addressing the world**

Gary Gale from what3words said that maps on their own are not enough and that the distribution of geospatial data is not uniform around the globe: London is bathed in it whilst in other places it is sparse. He claimed that 75% of the world has inadequate, poor or no addressing system. Even in Britain he was able to quote negative house numbers, the same house number and street name four miles apart amongst a dozen similar examples. His company’s solution is to divide the world into three metre tiles and assign three words to each tile. Three words are easier to communicate than latitude and longitude.

**Technoology and society**

Parsons, Lanzolla and Gale then joined chairman Andy Cooté on stage for a panel discussion on the subject “Emerging technology and applications – how to examine the societal benefits of what we do”. Like the opening pages of ‘A Tale of Two Cities’, discussion centred around opposites and contradictions: freedom v regulation, privacy v accessibility, society v technology.

Regulation, the panel pleaded should be informed and should not stifle. Privacy is viewed differently by different cultures and indeed age groups, with younger people more willing to be open. The problem is not so much the handing over the data as ensuring that it is used for the purpose it was intended and nothing else. Rigor and freedom were also debated, with a consensus that it is the product that is important and should be subject to appropriate standards and regulation, not processes and certainly not process for process sake. Other discussion points concerned the ‘democratisation’ of data and the pros and cons of large monopolies against SMEs. In Silicon Valley monopolies are seen as ‘good’ because they are able to sustain innovation, whilst in Europe we put greater value on the competitiveness generated by SMEs. But are we
happy, said Lanzalla, to see the monopolies take all, whilst everyone else fights over the scraps?

**Survey4BIM**

There were associated meetings at GeoBusiness, one of which was a call to action from Survey4BIM. A capacity audience on both days heard a presentation on the aims of the group and its progress so far, together with a panel discussion. Survey4BIM was formed to ensure that surveying does not get bypassed by the BIM revolution. It is one of 37 BIM4 committees in the UK. The group has a webpage: www.bimtaskgroup.org/survey4bim/. Under the resources tab there are white papers on the big 5 challenges that the committee has identified. They are looking for as much participation as possible, which Barry Gleeson illustrated with the help of a TED talk: www.ted.com/talks/derek_sivers_how_to_start_a_movement?language=en. This is well worth watching and fun to boot. BIM is still something of an enigma for many, including this writer. It is very difficult to translate from high-level concept to footprint on the ground. Not least because we have all been following its concepts for years. For surveyors the single point of truth is obvious; collaboration is obvious; and standardisation of data is obvious. But should BIM be a standard procedure? It feels like this is what it has to be, but to what extent is this a good thing?

**The Infrastructure debate**

The second day of the conference heard from a panel of speakers, moderated by former New Civil Engineer editor Anthony Oliver, around the topic of infrastructure and how the geospatial sector should embrace the opportunities presented by the government’s recent commitment to invest in large infrastructure projects. These were exciting times, thought Oliver, with the UK government committed to a ‘pipeline of projects’ at a time when the focus had shifted from hardware to customers.

The panel discussion was preceded by RICS president-elect Amanda Clack, who has the challenging task of preparing two speeches for her investment day on 27 June as president: one if the UK decides to leave the EU and one for remain.

**Standards and professionalism**

Clack, who confesses to being a ‘techno geek’ thought geospatial data was incredibly exciting.

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**Workshop snippets**

**GeoRiver**

The workshops attracted good crowds. In one, Storm Geomatics announced that they are in a 50:50 partnership with JBA Consulting to develop their software to improve the interface between their river channel survey software GeoRiver and river modelling. The new platform will consolidate the tools that JBA uses to process survey data and the result is expected to be a 90% reduction in errors, which will save modelling time. The format will make use of the EA’s EACSD data. Mike Hopkins, Storm’s MD floated the idea as to whether we still need fully formatted drawings. He reckons that reducing this current requirement could reduce the cost of surveys by 15%.

**Big data**

Externix Ltd showed off their new server solution for big data – Blaze Hub. The server handles big-data with ease which means once you’ve captured the data, you can instantly view a 3D model using their Blaze Terra software. It does this by storing the data in a simple way to allow quick and easy access. You can then back up the data onto their servers and access it anywhere you need it. This saves time both on-site and back at the office as you can get a rough idea of the data you’ve captured and know there and then whether you have what you need.

**Vexcel**

Vexcel Imaging unveiled the UltraCam Condor, due for release autumn 2016. The camera is designed for high-altitude mapping and boasts being able to capture large regions in record time thanks to a fast frame rate and being able to operate at high aircraft speeds. It can capture hi-res RGB, panchromatic and NIR data in a single pass.

We then got introduced to their fully integrated UltraMap workflow solution which can support unlimited project sizes and also has an automatic colour-balance and de-haze feature when merging 3D models together. To show the power of UltraMap, we had a quick demonstration of different datasets, taken by different methods, being merged into one. They took us from the sky to ground level, then moved along the ground and finally went inside a structure in one fluid movement with a 3D model.

**ZEB-REVO**

GeoSLAM gave a detailed and close-up view of their latest scanner, the ZEB-REVO, which is distributed in the UK by Opti-cal. The scanner is extremely mobile, rugged, cost effective in the field and boasts a scanner speed of 100 Hz, 2.5 times faster than its predecessor, the ZEB1. Other key features include a 270° field of view with 360° rotation and a range of 30m at low-res or 15m for hi-res imagery. It can also be handheld, deployed on a pole or mounted onto a backpack and has a 55Gb hard drive. To give an idea of what that means in practical terms, a scan of the Geo Business hall absorbed 100Mb.

**Drones**

With the hustle and bustle of Geo Business in the background, Aerial Tonics talked about their new sleek UAV, the Altura Zenith. It comes in two models, the ATX4 which is the basic version, and their flagship model the ATX8, which is made of carbon fibre, has a maximum payload of 2.9kg, a flight time of 35min, can travel in wind speeds of 14 m/s and can operate in light rain and snowfall.

The ground-based pilot uses a GPS assisted control system to fly the drone. Pre-installed is ‘sense and avoid’ technology, meaning the drone will keep a safe distance from objects to prevent crashing. The default safe distance is 15m, but this can be adjusted. It also comes with a neat ‘return to home’ safety feature where with a click of a button, the drone can be told to land at the exact point it took off from in case something happens to the pilot. But as they pointed out, if it takes off from a moving ship, you may have to fish it out of the water!

**Underground utilities**

Many utilities survey companies took stands in the exhibition and outside, (with combined mobile mapping and utilities detection systems). In the workshops, the guys at Technics gave a passionate speech about GPR (ground penetrating radar). They used the example of mapping beneath a road to discuss the pros and cons and where the technology needs to head towards in the future. But to look ahead, you must understand where you’ve come from. When the technology was first introduced, the biggest problem with GPR surveys was the time it took to do the survey and the disruption it caused as nine times out of ten, the road would have to be closed to protect the surveyors. Nowadays, a camera can be mounted on the back of a vehicle and driven down a road without this disruption. However, this causes its own problems as the equipment is vulnerable to weather and other cars along with the age-old problem of transferring the data from site securely.
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She reviewed the future possibilities and implications for land and the built environment at a time when the pace of change was increasing, but we were still not learning lessons from the past: standards and professionalism are key, like the RICS’s International Land Measurement Standard, now rapidly being adopted internationally. She urged the audience to read a document recently published by the RICS entitled “Changing World – let’s be ready”: visit www.rics.org.uk/knowledge/research/insights/futuresour-changing-world/.

According to Clack, major projects in the UK continue to go over budget by 75% although it’s even worse in the US where only 13% are reported to stay within budget. She believes that we are reaching a tipping point in the use of technology. The GEO Business exhibition was a reflection of the era of mass geospatial data.

**Think global**

Clack painted a picture of a world where we will use space differently: where urbanisation is the biggest challenge. To illustrate the scale of the problem she cited China, where there will be 13 megacities of over ten million people by 2030. Investment will be global and to achieve the investment there will have to be confidence; and that means minimising uncertainty. Geospatial information will be crucial for evaluating and minimising risk at all scales of development from individual buildings up to smart cities.

She turned to the role of modern surveyors. Clack is a QS, now a partner and head of infrastructure advisory at Ernst & Young. Technology, she argues, must underpin the next generation of surveyors to unlock innovation and influence thinking. ‘My focus is on cities and infrastructure’, citing BIM and GIS as key technologies that can deliver 20% savings over the whole life of a project. However, she conceded that the cost of BIM is at the front end where the capital spend occurs, which makes it difficult to persuade clients to invest. Nevertheless ‘BIM can bind professionals together’.

**Is BIM transforming projects?**

Following Clack’s address there was a panel discussion around the question: “How will the geospatial sector embrace the opportunity presented by the UK’s commitment to invest in large infrastructure projects?” She was joined by Alex Bywaters from Highways England, Peter Vale from Thames Tideway and Jon Kerbey from HS2 to debate the question, ably and incisively facilitated by Oliver who constantly challenged speakers, including those from the floor.

He began by asking them if Level 2 BIM really would transform projects. Bywaters bears the title Head of Business Improvement, Smart Motorways Programme at Highways England, a new government owned company set up to manage England’s core road network. ‘We have aspirations to be an intelligent client’ was his view. Vale suggested that BIM is actually a ‘brand’ – a view that will make a lot of sense to those of us who struggle to see the novelty in it.

Kerbey said that HS2 had been designed from the passenger experience backwards. This reflected a presentation from hospital design & build company Circle at a BIM conference, where the company made a point of gaining input from medical staff when designing new hospitals. Consultation is the key to unity, but one wonders if HS2 forgot to involve those who will run the railway and Circle forgot the patients!

**Future surveyors**

Asked about the future for the modern professional surveyor, Bywaters recounted standing on a hill in Jubail forty years ago with his survey instruments. He reckons that data gathering is now completely different and that the challenge is data management. Clack thought that BIM and data management ‘should be at the heart of our day jobs’ and that the RICS reflected this by offering a new pathway to membership called ‘data analytics’. She also mentioned that there is an annual turnover in the built environment sector of 400,000 people. Clearly more needs to be done about retention and making career paths more attractive.

**Value of survey**

Speaking from the audience, former Geomatics Professional Group Chair Chris Preston, who works for Network Rail, made the point that many in our industry understand cost but not value. He thought there was a ‘lack of an informed client base’. Responding, Clack explained that RICS had developed a series of informed client guidance notes and was running a series of seminars.

**It’s about people**

Another member of the audience, Steven Eglinton of the AGI, argued that BIM was about ‘people change’. Oliver challenged that surely it was about ‘whole life value’ and only by focusing on this do we get the benefits. Eglinton argued that one of the problems in gaining these benefits was that of ‘clunky topologies and the lack of common semantics. ‘So the government needs to bang heads together but how can they do this in the private sector?’ Oliver asked Peter Vale, who responded that they were members of various industry panels aimed developing and sharing practice in this area.

One speaker from the floor asked whether the client representatives on the panel employ any chartered land surveyors on their projects. Vale said that Tideway leaves ‘all that to the
Topcon’s Matt Kellet demonstrates the finer points of the Falcon 8 UAV.

supply chain’. Bywaters didn’t, but thought they should and Kerbey gave a resounding ‘yes’.

What about maintenance
Another audience speaker wondered if the 20% claimed savings from BIM could all be lost through poor maintenance during a project’s lifecycle. It seemed to him that there was always excitement (and votes) from government around new projects but never the money for local government for paint and maintenance. Amanda Clack said the use of apps in citizen hands can force local councils to act on maintenance.

Modelling, remote building and monitoring
The second conference session of the day concerned geo-infrastructure. Ioannis Brilakis, director of the Construction Information Technology Laboratory at Cambridge University, described work on point cloud to vector modelling and basic object recognition. The method is to recognise horizontal and vertical objects and then deduce whether they are, for example, a bridge deck or a pier. One could be forgiven for thinking that this research had already been done by numerous other innovators. The technique has been adapted for modelling buildings whilst MEP is the next challenge. Brilakis believes that augmented reality will be in use in buildings within four to five years and that ‘live BIM’ will be with us within twenty years.

Mark Lawton from Skanska foresees the day when machine-controlled plant can be operated from anywhere. So the operative can sit in an office and drive the plant on one or more sites around the world. . . .

During a two-week period before construction work commenced they were able to record changes to the tunnel caused by diurnal effects and then monitor it during construction. Data was transmitted out of the tunnel via a mobile comms link – yes, there was a signal inside the tunnel!

Meanwhile in the exhibition...
Outside the conference and workshop sessions there was plenty of activity on the exhibition floor. Indeed, the level of interest even held up well on Day 2, which bodes well for the future. Scanning systems on trolleys have been around for a few years, but one wondered why they should be attractive when their accuracy is very similar to the ZEB-Revo – which can negotiate stairs. This year Trimble was exhibiting its TiMMS system and a company new to GeoBusiness, Surphaser, exhibited its 105HSX scanner which, when mounted on a trolley with an IMU would, the supplier claimed, deliver accuracies of an order of magnitude better than competitors when operating over closed routes. Faro has developed something similar by mounting a second scanner under its Faro Focus and putting the whole system on a trolley. The lower scanner scans ahead over a 45 degree arc and uses this data to determine the movement of the scanner and thereby create a single point cloud covering the whole trajectory.

Backpacks
3D Laser Mapping has developed a backpack LiDAR system called the Robin to compete with Leica’s Backpack and the ZEB Revo. The system has two GNSS antennas and an IMU for outdoor use, and will be equipped to process using SLAM for indoor use. Heading back to Trimble, I saw a demonstration of their RealWorks software with some impressive surface and edge detection. Pointfuse were demonstrating software that can convert point clouds to vector models automatically as was Clearedge.

UAVs
There were plenty of UAVs in evidence. French company Delair-tech made their first appearance at GeoBusiness with two fixed-wing aircraft able to carry LiDAR and hyperspectral sensors or cameras, as well as GNSS and inertial sensors to observe the aircraft trajectory. Topcon’s Falcon 8 is a multicopter UAV which is offered with a thermal infrared camera.

Self-learning GNSS
Leica had recently launched the GS16 GNSS receiver using the same concept as that in its self-learning total station, so it can deselect satellites with poor signals on-the-fly. There is also a new series of digital levels, and GeoMOS can now accept any data, including scans from the MS60.

Viewing GeoBusiness a few days after the event, it was certainly a success for all concerned, as the exhibition enlarges and Diversified Communications discovers what does and what does not work. For this reviewer the highlight was the panel discussion on the first day. The exhibition had a friendly atmosphere and nothing seemed to be missing: whoever you needed to see was there.
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KOREC
OSGM15 and OSTN15:
Updated transformations for UK and Ireland


OSM15 and OSTN15: the transform -
ations that link 3D positions measured using GNSS with the
national coordinate and height reference systems of Great
Britain, Ireland and Northern Ireland. This article explains
the background to the changes and presents OSM15 and
OSM15, the latest transform -
ations that
incorporate new
gravity data and
iron-out
discrepancies –
mostly at the outer
edges of the models.

The Ordnance Surveys of Great Britain
(OS), Ireland (OSi) and Land & Property
Services (LPS, formally Ordnance Survey
Northern Ireland) have collaborated to improve
the OSM02 geoid model covering the UK
and Ireland. The new model is OSM15. OS
has also updated the horizontal transforma-
tion grid for GB, OSM02, to OSTN15. The
horizontal transformation polynomial for
Ireland and Northern Ireland is unchanged.

Coordinate systems and transformations
There are several coordinate systems in use
across the UK and Ireland. The primary system
for use with satellite positioning is ETRS89
(European Terrestrial Reference System 1989).
As the name suggests, ETRS89 is for use over
the whole of Europe and facilitates a standard
coordinate system across the entire region.

ETRS89 is realised and accessed through
continuously operating reference station
(CORS) networks – ‘OS Net’ in GB and ‘Active
GNSS stations’ in Ireland and Northern Ireland.

Mapping data is on more “traditional”
datums – OSGB36 National Grid in GB and Irish
National Grid in Ireland and Northern Ireland.
Similarly height data is related to mean sea level
based datums – ODN (Ordnance Datum Newlyn)
plus island specific datums in GB, Belfast datum
in Northern Ireland and Malin Head datum in
Ireland. So, to get from/to ETRS89 and the
mapping datums a coordinate transformation is
required and a geoid model is required to
transform heights.

In GB the mapping transformation is a grid
look-up model. OSTN15 covers the whole of GB
at 1km resolution with a set of transformation
shifts (Δeastings, Δnorthings) at each inter-
section. Bi-linear interpolation of the values from
each corner of a km square is used to compute
the transformation shifts at a specific point.

In Ireland and Northern Ireland the
mapping transformation is expressed as
νtitude and λongitude via a third order
polynomial.

The geoid model OSM15 is common across
the whole region. In Ireland and Northern Ireland
there are two separate files, based on a
latitude/longitude graticule, one for Malin datum
and the other for Belfast. In GB the OSM15
offsets are incorporated into the OSTN15 1km
grid with an additional flag parameter to
indicate the height datum they relate to.

Strictly speaking OSM15 is not a true
goid model, but is rather a ‘height corrector
surface’ since the gravimetric geoid surface
has been fitted to the local sea level based
datums. However, it is common practice for
such models to be referred to as “geoid
models” so the “GM” is retained.

Reasons for the updates
There were two main drivers for the change in
the models – an improvement to the
realisation of ETRS89 across the region and an
improvement to the gravity data and fitting of
the OSM geoid model.

There is now, for the first time, a
homogeneous, “zero order”, realisation of
ETRS89 across the whole region. This is from the
“EUREF IE/UK 2009” GNSS campaign,
which has been ratified (by “EUREF” a sub-
commission of the International Association of
Geodesy) as the official extension of ETRS89
across the UK and Ireland. The reason for
EUREF IE/UK 2009 was that in GB a number of
the original ETRS89 stations from the earlier
EUREF GB 2001 definition had been lost, so,
whilst some of the original stations still
remained for continuity, it was decided to build
a purpose designed zero order network of 12
new points. In Ireland and Northern Ireland the
ETRS89 realisation had not been submitted to
EUREF for ratification. So, it made sense to
combine the campaign for the whole region.

The update to ETRS89 required an update to
the OSTN transformation to minimise the
change in OSGB36 coordinates. This by itself,
would have also required a small update to the
OSM geoid model, but in GB the OSM02
model also required improvement in its fitting to
the height datum in the Scilly Isles, north-west
Scotland and also on the Scottish islands
especially the Outer Hebrides. The data in the
west of Ireland required improvement post
OSM02. Also, additional gravity data from the
GRACE (Gravity Recovery And Climate
Experiment) satellite mission was available to be
incorporated into the gravimetric model.

Update to ETRS89 realisation
The EUREF IE/UK 2009 campaign realised a
new ETRS89 across the whole region resulting
in 12 zero order stations in GB, 10 in Ireland
and 6 in Northern Ireland. The stations in the
campaign are shown in Figure 1. The final
accuracy of the new stations is 2mm
horizontal and 6mm vertical.

In GB the updated coordinates have been
used as fiducial stations for a complete
recomputation of the OS Net stations. This is
the first time that OS Net has been computed as a
whole network since 2001 (when it was simply
the “Active GPS Network”). The re-computation
The format of the OSTN15/OSGM15 transformation parameter file is unchanged from OSTN02/OSGM02. The main difference between the two files, apart from the updated parameters, is that the inbuilt 10km offshore cut-off in OSTN02/OSGM02 has been removed from OSTN15/OSGM15. In OSTN02/OSGM02 transformation parameters beyond 10km offshore were set to zero. The OSTN15/OSGM15 transformation grid is fully populated.

The on-shore parameters are computed from the OSTN dataset of over 4,200 points with an observed difference between OSGB36 and ETRS89. A Triangulated Irregular Network (TIN) is fitted to the dataset to express the datum shifts as “surfaces” (one for east shift and another for north). The 1km transformation grid is overlaid onto the surfaces and the transformation parameters at each km intersection are interpolated.

Since the ratification of the EUREF IE/UK 2009 coordinates, LPS has installed four new reference stations, which were not included in the campaign: Queen’s University (QUB1), Thomastown (THMS), Ballypatrick (BPTK) and Bangor (BNGR). Unfortunately the original Belfast station (BELF) has since been destroyed. All the new stations have been processed against the original fiducials so are aligned to the EUREF IE/UK 2009 realisation of ETRS89.

### OSTN upgrade

OSTN02 was aligned to the older EUREF GB 2001 realisation of ETRS89. OSTN15 has been aligned to the EUREF IE/UK 2009 realisation of ETRS89 by applying a transformation to the OSTN transformation data set ETRS89 coordinates to shift them to the new ETRS89 realisation. The transformation was computed from common points in both EUREF campaigns.

Table 3 shows the expected differences between OSTN02 and OSTN15. These were computed by passing the same OS Net station coordinates through each transformation. Table 4 shows the expected final impact on user generated OSGB36 coordinates by comparing the old OS Net coordinates passed through OSTN02 with the new ones passed through OSTN15.

The removal of the 10km cut-off means a transformation is now available across the whole area within a single application. Previously, users would have to switch to the seven parameter transformation at the 10km boundary. Of course having the transformation available across the whole area does not mean it should be used everywhere. So, there is now an inbuilt transformation “boundary” based on

<table>
<thead>
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<th>2D coordinate change</th>
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<tbody>
<tr>
<td>BELF</td>
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<tr>
<td>ENIS</td>
<td>0.009</td>
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<td>FOYL</td>
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<td>KLRE</td>
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<td>MRKT</td>
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<tr>
<td>OMGH</td>
<td>0.014</td>
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</table>

### Table 1. Differences (in m) between old and new OS Net coordinates.

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<th>North</th>
<th>Up</th>
<th>2D</th>
</tr>
</thead>
<tbody>
<tr>
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<td>-0.010</td>
<td>-0.050</td>
</tr>
<tr>
<td>Max</td>
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<td>0.021</td>
<td>0.053</td>
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<tr>
<td>RMS</td>
<td>0.015</td>
<td>0.008</td>
<td>0.018</td>
</tr>
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</table>

The 2D differences between old and new coordinates for Active stations in Northern Ireland are shown in Table 2.

### Table 2. 2D coordinate changes (in m) for Northern Ireland stations.

<table>
<thead>
<tr>
<th>Station</th>
<th>2D coordinate change</th>
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<tr>
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<table>
<thead>
<tr>
<th>East</th>
<th>North</th>
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<tbody>
<tr>
<td>Min</td>
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</tr>
<tr>
<td>Max</td>
<td>-0.006</td>
</tr>
<tr>
<td>RMS</td>
<td>0.012</td>
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</tbody>
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### Table 3. Differences (in m) between OSTN02 and OSTN15.

<table>
<thead>
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<th>North</th>
</tr>
</thead>
<tbody>
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<td>Min</td>
<td>-0.037</td>
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<td>Max</td>
<td>0.019</td>
</tr>
<tr>
<td>RMS</td>
<td>0.009</td>
</tr>
</tbody>
</table>

### Table 4. Differences (in m) old OS Net + OSTN02 and new OS Net + OSTN15.
New Geoid model for UK & Ireland

the UK EEZ line ([https://en.wikipedia.org/wiki/Exclusive_economic_zone#United_Kingdom](https://en.wikipedia.org/wiki/Exclusive_economic_zone#United_Kingdom)), see Figure 2. Parameters beyond this line are flagged as datum number 16, “Outside transformation area” as a warning to users that they have passed the “sensible” boundary beyond which the transformation should not be used.

**OSi/LPS Polynomial Transformation**

In Ireland and Northern Ireland analysis of the changes to the ETRS89 realisation following the EUREF IE/UK 2009 campaign showed that a recomputation of the OSi/LPS Polynomial Transformation was not necessary. The changes observed were not significant enough to warrant adjusting the transformation and so it remains the same.

**OSGM upgrade – OSGM15 in GB**

OSGM02 was fitted to the height datums in GB via observed geoid separations at benchmarks. The majority of these observations on the GB mainland for fitting to ODN were from a single campaign (“The FBM Project”) and were aligned to a different realisation of ETRS89 than the one used for OS Net coordinates. OSGM15 is now aligned to the same realisation as OS Net (from the EUREF IE/UK 2009 campaign) via transformations based on common points in the FBM Project campaign and old OS Net coordinate set. The realignment has resulted in approximately a 0.025m shift in the vertical.

Table 5 shows the expected differences between OSGM02 and OSGM15 and also the accuracies of the OSGM15 datum realisations. The variation of the differences across Great Britain are shown spatially in Figure 3.

A much better fit to ODN has been achieved in north-west Scotland and to the local height datums of the Islands by researching and surveying new benchmarks. A great contribution to the selection of suitable new points came from extensive research carried out by the late John Hallam, formerly of BGS.

On the Stornoway datum for the Outer Hebrides, OSGM15 now achieves a smoother and consistent fit along the whole island chain and is more closely aligned to the datum mark in Stornoway. However, this has resulted in a bigger jump from OSGM02 heights in the southern part of the island chain.

On the Scilly Isles, St Mary’s datum the previous fit of OSGM02 was to just one point which was not on St Mary’s island. OSGM15 is fitted to two new points on St Mary’s island and is therefore more closely aligned to the local datum. This has resulted in a height change of approximately 0.35m.

In OSGM02 the Newlyn (ODN) datum extended up to the 10km offshore boundary imposed in the file. In OSGM15 ODN extends to 2km offshore. Since the gravimetric geoid is computed for the whole 700km × 1250km OSTN15/OSGM15 area, but is of course just extrapolated Newlyn datum. So, beyond the 2km line this datum is now flagged as “Ordnance Datum Newlyn (Offshore)” to indicate the extrapolated Newlyn datum. Figure 2 shows the transformation extents.

OSGM02 contained some datums for small islands off the north and west of Scotland – Fair Isle, Flannan Isles, North Rona, Sule Skerry and Foula. All these island datums were fitted using single points and testing against OSGM15, which showed that their historic datums were poorly defined so they have been removed from the model. The St Kilda datum has also been removed for the same reason. In OSGM02 the fit on St Kilda was based on three points of varying quality fitting to an assumed mean sea level of unknown origin. OSGM15 highlighted a large discrepancy between the fitted St Kilda surface and both the gravimetric geoid and the fitted ODN surface. In OSGM15 heights in these areas now come from the ODN fitted geoid and are flagged as “Ordnance Datum Newlyn (Offshore)”. To avoid steps in the model where an island datum meets Newlyn (Offshore) each island had a 15km buffer placed around it in addition to the 2km cut off for the island’s datum. In the zone between the two buffers a custom surface was fitted between the island datum at 2km and Newlyn (Offshore) at 15km – this achieves a gentle transition from one datum to the other. The transitions were checked by sampling cross-sectional profiles for both the island datum, the underlying Newlyn (Offshore) datum and the interpolated sections.

As a consequence of the loss of some datums and the addition of new ones, the OSGM15 datum flags in the file are changed from OSGM02. Where a datum flag was used in OSGM02 the flag value is the same in OSGM15. Flags in OSGM15 are:

1 = Ordnance Datum Newlyn, UK mainland.
2 = St Marys datum, Scilly Isles.
3 = Ordnance Datum Newlyn (Offshore).
3 = Douglas02 datum, Isle of Man.
4 = Stornoway15 datum, Outer Hebrides.
6 = Lerwick datum, Shetland Isles.
7 = Newlyn (Orkney), Orkney Isles.
15 = Ordnance Datum Newlyn (Offshore) – new flag in OSGM15.
16 = Outside transformation area – new flag in OSGM15.
The following flags from OSGM02 are no longer used:
0, Outside model boundary.
5, St Kilda.
8, Fair Isle.
9, Flannan Isles.
10, North Rona.
11, Sule Skerry.
12, Foula.

OSGM upgrade – OSGM15 in Ireland and Northern Ireland

Table 6 shows the differences between OSGM02 and OSGM15 in Ireland and Northern Ireland.

Table 6. Differences (in m) between OSGM02 and OSGM15 in Ireland and also accuracy values of OSGM15.

<table>
<thead>
<tr>
<th>Datum</th>
<th>Malin Head</th>
<th>Belfast</th>
</tr>
</thead>
<tbody>
<tr>
<td>RMS difference</td>
<td>0.093</td>
<td>0.018</td>
</tr>
<tr>
<td>Accuracy</td>
<td>0.023</td>
<td>0.014</td>
</tr>
</tbody>
</table>

The differences between OSGM02 and OSGM15 on the Malin datum can be largely attributed to improvements in the extreme West of Ireland. The difference between the OSGM02 model and the OSGM15 model in Ireland is, on average, at the least than the 2cm level. However, the new model in some places contains significant variations. An area around Leitrim/Cavan/Monaghan contains differences around the 20cm level, while the most pronounced differences occur in the most Westerly parts of Galway and Mayo. These differences are higher than expected given the accuracy of the models and to give further assurance of the validity of these changes OsI observed some further test points targeted specifically in these areas.

There is a correlation between these areas and the density of the terrestrial gravity data that was used in the OSGM02 model. The improvement to the gravitational geoid model in these areas can be attributed in part to the new gravity field data now available from the GRACE mission.

In addition much of the available orthometric height data in the extreme West is of a lower standard having been derived from a transformation from Poolbeg datum to Malin datum rather than by spirit levelling. These effects combine to produce significant deviations between the 2002 and the 2010 models.

The raw OSGM15 data for Ireland is released as two files – one for Belfast datum and the other for Malin datum. Within the updated transformation software limits have been placed on the extents of the datums. Belfast extends 10km offshore and into Ireland and Malin
extends 20km offshore and into Northern Ireland. See Figure 2.

Availability
All the transformations have been coded into a software application – “Grid InQuest II”, which allows for individual coordinate input and output via a GUI and also batch input/output via text files. A command line interface and dll, along with examples of their use in a variety of programming languages, are also included. Users wishing to incorporate the pre-prepared dll into other applications should refer to the Grid InQuest II user guide. Grid InQuest II download packages for Windows (32 bit and 64 bit), Linux (32 bit and 64 bit) and OSX are available from https://bitbucket.org/PaulFMichell/gridinquuestii

The raw data files have been released to software and equipment vendors. Any developer wishing to request the raw data files should contact:

Ordnance Survey (GB):
GeodeticEnquiries@osi.ie

LPS: peter.downie@finance-ni.gov.uk

OSI: control@osi.ie

The new models and updated coordinates of the national CORS networks will be available by August 26th 2016 and website transformation tools will also be updated at this time. A tool will also be available to allow coordinates and heights from the OSTN02/OSGM02 models to be converted to OSTN15/OSGM15 values by first back transforming to ETRS89, via OSTN02/OSGM02, and then forward transform through OSTN15/OSGM15.

The EPSG Geodetic Parameter Dataset maintained by the International Association of Oil & Gas Producers (IOGP) has been updated to give new EPSG codes to the OSTN15 and OSGM15 models. EPSG codes are commonly used to uniquely identify datums, projections, transformations etc especially within GIS systems. E.g. OSGB36 datum can be referenced as EPSG::27700.

Concluding remarks
The coordinate, transformation and geoid model updates bring improved accuracy and homogeneity of the ETRS89 realisation and mapping coordinates and height datums to users across the whole region. Increased compatibility of data is also a benefit for initiatives such as INSPIRE.

Table 5. Differences (in m) between OSGM02 and OSGM15 in GB and also accuracy values of OSGM15.

<table>
<thead>
<tr>
<th>Datum</th>
<th>Newlyn</th>
<th>St Marys</th>
<th>Douglas02</th>
<th>Stornoway15</th>
<th>Lerwick</th>
<th>Newlyn (Orkney)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RMS difference</td>
<td>0.026</td>
<td>0.365</td>
<td>0.000</td>
<td>0.175</td>
<td>0.013</td>
<td>0.021</td>
</tr>
<tr>
<td>Accuracy</td>
<td>0.008</td>
<td>N/A</td>
<td>single offset</td>
<td>0.030</td>
<td>0.011</td>
<td>0.018 0.017</td>
</tr>
</tbody>
</table>

Figure 3: Differences (in m), in Great Britain, between OSGM15 derived heights and OSGM02 derived heights (OSGM15 minus OSGM02).
How big is global insecurity of tenure?

Current sources of Global Land Indicators are limited with only 30% of the globe covered. Robin McLaren believes that new, innovative sources of land information can strengthen our understanding of the size of the global insecurity of tenure gap.

The land sector has not been good at monitoring progress of global initiatives in fighting insecurity of land governance and tenure. But now there is no hiding. Solving land issues is on the radar of the G8 and is reflected in the adopted Voluntary Guidelines on the Responsible Governance of Tenure, Forests and Fisheries (VGGTs). After a successful lobbying campaign, land is integrated into the post 2015 Sustainable Development Goals (SDGs). The tenuous nature of our often quoted 70% insecurity of tenure statistic highlights the challenge for the land sector to design and implement global land indicators and monitoring frameworks associated with land governance and land tenure security that are based on feasible data sources and data collection strategies.

Traditional sources of data are currently limited, expensive and do not normally have the outreach to the most vulnerable. New, innovative sources of data need to be explored to create a much more comprehensive and meaningful set of statistics that are technically feasible, politically acceptable and obtain stakeholder ownership. Smart phones, satellite imagery, social media, and the ‘Internet of Things’ continuously generate data everywhere faster and more detailed than ever before. These technologies offer new measurement opportunities and challenges for the land sector. However, their success is dependent upon convincing citizens to trust these solutions and understand the benefits of participation.

Need for core set of land indicators

Over the past decade the global land community has seen a growth in consensus that land tenure security for all and equitable land governance are foundations for sustainable economic development and the elimination of poverty. This consensus is reflected in the VGGTs (FAO 2012) and in other related regional and global instruments such as the Framework and Guidelines on land policy in Africa (LPI 2011). The international donor community has also paid renewed attention to land governance in response to the new wave of private land acquisition and land-based investment in the global south (GLTN 2015). To date, development agencies and programmes for land related interventions have established their own systems for monitoring outcomes; there is no overall comparability of progress in different countries or the effectiveness of different approaches. Monitoring has also tended to focus on land policy and legislative processes and on performance of individual projects rather than on people’s perceptions of tenure security and the development outcomes of land governance systems as a whole. In addition, there are large gaps in available data, including baseline conditions, and coverage of national land information systems. However, an initial Conceptual Framework for the Development of Global Land Indicators has been formulated (GLTN 2015).

Traditional sources of land indicators

The current, principle data sources available (UN Habitat / GLTN 2014) to support comparable global reporting, include:

- Administrative data, in particular that derived from national land information systems although in many countries these datasets are incomplete (only 30% of the world’s population is included) and not up to date, or gender-disaggregated, and therefore requiring supplementation from other data sources;
- National censuses and household surveys, for which there is considerable scope for expansion by introduction of specific land-related modules into existing national surveys, designed and adapted so as to elicit consistent data across different countries;
- Purpose designed global polls, comprehensive sample surveys managed on a global basis to supplement data available nationally on questions not easily integrated into demographic and household surveys, for example, perceptions of tenure security for which a “perception module” is under development by the World Bank; and
- Expert assessment panels and expert surveys, which provide important ways of assessing the quality of legal frameworks, qualitative improvements and changes, and of making sense of institutional processes and complex and incomplete datasets from different sources.

Data collection of globally comparable data will require significant investment in additional datasets and capacity.

Innovative new approaches

A number of new, innovative approaches to land administration are appearing that will accelerate the coverage of security of tenure and extend the formal data sources available to support global indicators. New approaches have recently been tested in countries such as Rwanda, Ethiopia, in the Europe and Central Asia region, in the South East Asia region, and in the 1990s in many Eastern European Countries. Experiences in these countries have helped form the fit-for-purpose (FFP) approach to land administration. Rwanda provides one of the best examples, where a nationwide systematic land registration started after piloting in 2009 and was completed in only four years.
The FFP approach to land administration has emerged as an enabler, accelerator and game changer. It offers a promising, practical solution to provide security of tenure for all and to control the use of all land. UN-HABITAT Global Land Tool Network (GLTN) has recently released a reference document “Fit-For-Purpose Land Administration Guiding Principles,” (Enemark et al, 2015).

A good example of innovative use of new technology to accelerate security of tenure is the USAID Mobile Applications to Secure Tenure (MAST) project in Tanzania (USAID 2015). USAID has completed an innovative pilot that utilised an easy-to-use, open-source mobile application that can capture information to issue formal documentation of land rights. Coupled with a cloud-based data management system, the project is designed to lower costs and time involved in registering land rights and, importantly, to make the process more transparent and accessible to local people – see figure 1.

The project was implemented in rural Tanzania working directly with villagers (trusted intermediaries) to map and record individual land rights, strengthen local governance institutions, and build government capacity. The Ministry of Lands then had the information necessary to issue MAST beneficiaries with official Certificates of Customary Right of Occupancy.

A key feature of these citizen centric approaches is the use of a network of locally trained land officers acting as trusted intermediaries and working with communities to support the identification and adjudication process. This approach builds trust with the communities and allows the process to be highly scalable. The training, support and supervision of these local land officers requires new strong partnerships to be forged with land profession associations, NGOs, CSOs and the private sector. Over time, the trusted intermediaries will most likely self-organize into collaborating networks and resources may be shared with other information services, e.g. health and agriculture.

The UN Secretary General has proposed that the framework for monitoring progress towards the SDGs should take full advantage of the data revolution.

Crowd-sourcing evidence of land and resource rights
The range of devices in the mobile ecosystem, such as tablets, cameras, GNSS, mobile remote sensing / photogrammetry and mobile power, are enabling citizens or trusted intermediaries to directly capture evidence of land rights (McLaren 2011). An increasing number of crowd-sourcing initiatives are emerging to provide increased security of tenure to vulnerable communities.

- Rights Resources Initiative (RRI) – RRI’s forest tenure database is an interactive tool to compare changes in legal forest ownership from 2002 to 2013 between countries, regions, and lower- and middle-income countries. The quantitative approach monitors spatial forest tenure data. This statutory forest dataset currently covers 52 countries containing nearly 90% of the world’s forests. Much of the information is crowd-sourced (www.rightsandresources.org/en/resources/tenure-data/tenure-data-tool/).

- Rainforest Foundation UK - The “Mapping for Rights” programme has been active in the Democratic Republic of Congo. It trains forest people to map their land using GPS devices. The information captured is used to create a definitive map of the land used by semi-nomadic communities, which can be used to challenge decisions that see them excluded from areas of forest (http://ictupdate.cta.int/en/Feature-Articles/Crowdsourced-land-rights/%2869%29/1353928539).


- Landmapp – Landmapp is a mobile platform that provides smallholder farmer families with documentation of their land. They also provide them with a profile which they can access technical and financial services that are precisely tailored to their circumstances (www.landmapp.net).

- Cadasta Foundation – Implementing a global platform to manage crowd-sourced land rights information is due for release in 2016 and could provide a common platform for all the currently discrete land rights initiatives to manage evidence of land rights and create transparency and publicity (http://cadasta.org).

- STDM - A pro-poor, gender responsive and participatory land information model recognising the need for legal pluralism and a broader set of person-land relationships found in legitimate tenure types. GLTN have also produced a STDM solution, based on QGIS, that manages land rights data in the STDM model (www.stdm.gltn.net/).

Potential new innovative sources of land information
A number of innovative approaches are emerging to remotely derive land information such as crowd-sourcing information from...
About the Author
Robin McLaren is director of Know Edge Ltd an independent about the Author.

N ations agencies on land policy / land reform / NSDI programs and is on a mission to ensure that Land Professionals are delivering appropriate land administration services to the citizen.

The location of mobile phones carried by members of a community can be passively monitored over a period of time to track movements across their territory. Overtime, the extent of these recorded tracks will define the boundaries of their land and resource rights.

The increasingly pervasive mobile phone in developing countries provides opportunities for obtaining data on citizens’ / communities’ perception of tenure insecurity. The results would then be used to plan and target security of tenure programmes globally.

Extending community mapping initiatives could increase engagement with communities. A significant number of such initiatives are being activated across the globe. Examples include:

- The Extreme Citizen Science (ExCiteS) research group at UCL are recording community resources with forest villages (described at www.scidev.net/global/indigenous/multimedia/mapping-the-congo.html). This could be extended to ask the anthropologists who are working in the field to talk about perceptions of ownership and land use.
- The OpenDRI initiative of the World Bank involves extensive OSM mapping with a focus on disaster preparedness. A good example is in Kathmandu, Nepal (www.youtube.com/watch?v=L2IfYJigcQs). Specific mapping sessions with OSM could include collection of perception data.

Another source could be local radio communication campaigns designed with facilities for citizens to leave voice messages or SMS responses. The deciphering and geo-referencing of the messages could be crowd-sourced.

The evolving capabilities of Big Data and big analyses may prove to be another effective way of deriving perceptions of insecurity of tenure across communities and regions. The use of datasets such as property valuations, micro-financing, mortgages, addresses, business registers, school registers, census, marketing campaigns, social security payments, property tax, agricultural grants, mobile phone users. . . could all be used to model, analyse and derive perceptions of insecurity of tenure, especially when many of the datasets are georeferenced.

Another option might include an approach similar to the UNICEF uReport outreach to youth.

satellite imagery. DigitalGlobe’s Tomnod platform (www.tomnod.com) uses Artificial Intelligence (AI) powered by crowd-sourcing to automatically identify features of interest in satellite and aerial imagery. Tomnod runs crowd-sourcing campaigns that attract thousands of volunteers around the globe. One campaign is mapping populations across Ethiopia.

Facebook has recently used its AI tools to identify human-made structures in 20 countries across Africa. This involved analysing 14.6 billion satellite images and has resulted in 350Tb of data with a spatial resolution of 5m. This informs Facebook’s Internet.org initiative.

The increasing use of social-media (Facebook, Twitter, LinkedIn, WhatsApp…) across the globe (Facebook has over 1.6 billion users) provides excellent opportunities to tap into these communication channels and forums to derive information on perception of insecurity of tenure.

Conclusions
Many of these new sources and channels for capturing evidence of land rights and indicators, such as perceptions of insecurity of tenure, are already delivering successful projects. However, there are several key issues to be investigated, understood and resolved before the approaches can be widely accepted and can go to scale:

- What are the technological limits and opportunities?
- How and where is this crowd-sourced data stored, quality assured and accessed to allow communities to police their data collection efforts?
- How can engagement be maximised and can campaigns be promoted across communities? What motivates communities to participate? What is required to make crowd-sourcing go to scale?
- How is this information used in decision making? Where are those decisions made, and how do such projects improve the quality of decision-making and community participation? More broadly, what are the socio technical issues and how does the technology disrupt power relationships within and outside the community?
- How will citizens be convinced to trust these solutions and understand the benefits of participation? How will privacy and security of information be managed effectively to provide the necessary security of these sensitive sources of land rights information?

These new innovative sources of data need to be explored to quickly create a much more comprehensive and meaningful set of statistics that can provide an insight into the size of the security of tenure gap and help plan priorities for its reduction.
RICS responds to Land Registry privatisation proposals

In May the Government published proposals to privatise the Land Registry, even though a similar consultation only two years ago had resoundingly rejected such a move. Below we summarise the RICS’s response to the latest scheme.

The land and property transfer market in England & Wales adds approximately £8 billion to the Treasury's coffers every year, one of the highest in the world and accounts for 4.2% of UK GDP. Understandably any change to how this important market operates needs to be thought through very carefully. Can privatisation really prove a better option than the status quo? What's wrong with the present system? What are the risks in privatising such a traditionally core function of government?

The Government’s preferred proposal is to have a separate private company (NewCo) responsible for all of the Land Registry’s services but with a few individuals experienced in Land Registry matters remaining in Government for oversight. The state will act as guarantor, keeping of register/statutory data and basic fee setting.

Land Registry fees are charged on a not for profit basis and have remained broadly stable at a relatively low level within the context of the overall cost of a property transaction. To make privatisation attractive for a private investor they will want to be satisfied that the Land Registry can be run at a profit. "It seems inevitable", says the RICS in its response to the proposals, “that fees will rise.”

The consultation highlights that its proposals will enable “best in class” knowledge to be brought into the Land Registry. RICS response is that the skills within Ordnance Survey, VOA and Land Registry are already best in class. They believe any private company would be very hard pushed (or find it impossible) to match those skills, although RICS observes that “it might be possible that another National Cadastre Agency such as the world renowned Dutch Kadastre might bid for and win the role of NewCo. This might be a good solution to this privatisation issue.”

The UK is built on individual private property rights as a basis for wealth creation and prosperity. RICS questions “the philosophy behind allowing a NewCo and private interest access to a process with such potential for fraud and corruption.” They add that “Land and Property is listed as the third most corrupt sector in the world by Transparency International and was again highlighted at the recent HM Gov sponsored anti-corruption conference in London.”

Historic link

The Institution has stressed that it has a real link to the Land Registry, going right back to the founding of RICS in 1868, during the Victorian period of formalising, legalising and creating standards for the operation of the property sector. “We continue to have members working in Land Registry, members utilising Land Registry’s services and a role in providing the standards which are based on clear and transparent ownership and transference of property.”

Following responses from across the Institution’s various panels, forums and boards the “response was overwhelmingly against the concept of moving Land Registry into the private sector, based on the value of its work underpinning the whole property sector, as well as a registry that is driven by public duty and professional standards, rather than commercial opportunity and market advantage.”

There is considerable concern over details of the proposals and that a major opportunity for “agency integration” may be being missed. RICS points out that “integration has been taken on by several nations (the latest being Ireland with the formation of Tailte Eireann).” In the UK it would involve the integration of “Land Registry with Ordnance Survey and the Valuation Office to form one single point for all land and property transactions, registration, rating, mapping and taxation in England and Wales.” In this regard the UK is a “global anomaly” although Northern Ireland has already combined all three agencies into one Land and Property service.

Commenting that “the survey services of Land Registry (and staff) have already been transferred to Ordnance Survey” RICS concludes that “the UK has three of the best agencies of their kind in the world, and together they would be ground-breaking. This is also the model that is proposed within numerous DfID International Development aid projects (Legend), it is bizarre that the UK would instigate an initiative at home so at odds with its international knowledge projection.”

Inadvertent risk

RICS believes “that the Government’s proposals may inadvertently add a
previously non-existing element of ‘risk’ to the land and property transfer market and thereby undermine investor confidence. We would like clearer guarantees that the privatisation of the Land Registry (whilst providing short term revenue to Government) will not impact on long term viability of one of the world’s most active land and property markets.”

The key requirements repeated in the consultation are customer satisfaction levels and speed of service delivery. RICS acknowledges their importance, “but surely the imperative of ensuring that there is quality in legal terms in the service provided by the Land Registry is paramount. A private owner may not have the depth of expertise on technical points or properly support critical but non-profit making areas. England & Wales has a multi-layered and deeply rich history of land law which can have different nuances in some regions. This is a living, highly complex beast rather than a data house. As a consequence, trust and confidence in the operation of the Land Registry may be undermined and this will affect the trust and confidence that investors and homebuyers have in the land & property system in this country.”

Title insurance?
Although unmentioned in the consultation, “an introduction of a certain level of insecurity and risk may open the door to land & property ‘title’ insurance companies (such exist in some states in the USA) increasing the costs of transfer on land & property owners. This is surely not in the ‘public interest’ even if professional surveyors may stand to gain (title insurance pays the costs of surveyor’s fees in many states). Title insurance only occurs when an existing registry system is so inherently weak. . .”

Adjudication & dispute resolution
“Is it crucial to appreciate the adjudicatory nature of the Land Registry’s work on registering title and guaranteeing land rights and the often complex issues that have to be dealt with”, says RICS. Land Registry’s experienced and professional staff (many legally trained) are key to this work.

Although the “consultation seeks to give some assurance about governmental interaction with the private owner of the Land Registry during dispute, very little detail is provided on the protections and contingency plans if the Government needs to step in.” RICS observes that “the ‘buck’ will always stop with the public purse in cases of title dispute and compensation.”

RICS concludes that the proposed NewCo is an “inadequate resource for what is a critically important role. Greater thought should be given to how the Government oversees the private company (NewCo) and more formalised structures and stringent arrangements (along with penalties) should be put in place in case of direct costs being transferred to land & property owners.”

Open data
The consultation suggests that the current Land Registry is not a suitable environment for the future. RICS agrees that it “should embrace the benefits of technology” but says that much has already been done like the electronic document registration system and open-data initiatives on house price information. This ‘price paid’ open data has enabled numerous downstream services such as Zoopla. Will a private company be equally willing to provide open data to a rapidly expanding market? If not, it could stymie a burgeoning UK property data start-up investment.

RICS concludes that, “Land Registry is much more of a strategic national asset than just a data house and even though we fully agree with the opening of freely available datasets, which may run counter to the commercial wishes of NewCo.”

Link to Law Commission consultation
RICS queries how the consultation “connects with the Law Commission’s consultation on changes to the Land Registration Act. The Law Commission has produced an in-depth analysis of the problems with the statutory regime. Any private owner would be obliged to adopt these findings and any legislative changes even if they do not suit the commercial imperative.”

An area of great concern not touched upon within the consultation is how will the professions work with any NewCo? What will happen to the Rules Committee? And as legislative changes will be required, just what process of consultation will be used to ensure that professional institutions will be engaged?

RICS concludes that “the timetable for change is inadequate and should be reviewed. This is an important issue and a major change to the land & property market, 2017 is much too soon to be able to develop a coherent strategy for change.”

Questions, questions. . .
The government’s consultation document concludes by posing a series of questions to those responding to the consultation. The first is whether ownership of the Registers should remain in government, which RICS backs, observing that “This is critical for transparency, security and stability of the Register” adding that “The
Land Registry is a ‘live’ entity and thousands of changes to title are recorded, be they major or minor, how will the NewCo operate on this basis when numerous elements will have to be done in conjunction with the Government Land Registry function?“

What steps should the government take and what safeguards should it put in place to ensure continued and improved access to high-quality and reliable Land Registry data? How could the government use this opportunity to improve the quality and accessibility of data produced by Land Registry for all sectors of the economy?

On what basis should the government manage the relationship with a privately owned Land Registry to ensure Land Registry meets, as far as is reasonable, the data quality and availability requirements of all stakeholders?

RICS believes that the questions are “overtly focused on ‘data’ issues rather than the true issues of security, transparency, impartiality and recourse during dispute. Data is much more freely available than perhaps the authors of the consultation realise. It does read like something from 2006 rather than 2016.”

RICS says that “Impartiality and the potential for conflict of interest arise within these questions. How will the NewCo ensure that its staff are properly trained and impartial? What professional staff focusing on exercising judgement on technical land registration issues where [are?] required. The exercise of judgement requires a high degree of impartiality as well as the necessary technical skills. Since the Land Registry will be owned by a private company, there may be circumstances where a conflict of interest may arise. For example, a decision may have to be made affecting land registration in relation to property owned by a company connected to the company owner of the Land Registry.”

On open data RICS poses the question, “will a private company be equally willing to provide Open Data to a rapidly expanding market? Probably not which again would introduce an element of risk, run completely counter the current HM Gov Open Data policy. . . There would need to be very strong safeguards to ensure Land Registry data remains Open.”

RICS also believes that “NewCo may underestimate the technical nature of land registration. It is multifaceted and deals with the complexity of citizens and their relations with private property rights it is not merely an administrative exercise that can be improved by the better use of technology.”

RICS is also “concerned about adequate safeguards on data protection and the protection of individual rights either of access or of not having their data sold to third parties.”

The potential for international involvement by Land Registry is also touched on in RICS’s response pointing out that they have already worked with the Land Registry in other jurisdictions. “Land Registry International has a strong reputation and is much sought after for advice and expertise. This attractiveness from other jurisdictions is based on the reputation of Land Registry itself and its current processes. . . we are not sure that a NewCo would be welcomed in the same manner.”

RICS also has concerns about possible abuse of a monopoly position. “We have concerns that an expansion of services on a commercial basis by the private company could adversely affect the focus on the core services of registration.”

“The interaction between the Government’s ownership of the registers and the private company’s operation of the Land Registry as a whole needs to better thought through.”

- Do you agree with the preferred option?
- What are your reasons for your answer to question 7?
- Do you think an alternative model would be better and why?
- Are there other key costs and benefits that you think we have missed?

“The emphasis on customer satisfaction levels and speed of delivery of core functions is misplaced.”

“We were very surprised to read that the private company may be paid less over time to deliver core statutory functions. Surely this would be a disincentive to improve service and delivery with a potential for any commercial loss to be passed directly onto the private property holder.”

**Conclusions**

“We are concerned about the implications of privatising the Land Registry in numerous terms as already stated. The lack of detail about how any NewCo would operate, in a commercial, judicial, legislative and dispute resolution, capacity only heightens that concern. We would again highlight that the NewCo will operate in a ‘monopoly’ position and in light of this and the above we would strongly suggest that the timetable for change is inadequate and should be reviewed. This is an important issue and a major change to the land & property market, 2017 is much too soon to be able to develop a coherent strategy for change” adding that “proposals insufficiently emphasise the integrity of the register, confidentiality, stability and the reputation of land registration.”
The privilege of staging the 2016 working week conference was given to the New Zealand Institute of Surveyors (NZIS) several years ago. At that time Christchurch was still reeling under the impact of a series of earthquakes in 2010 and 2011, with the tragic 6.3 Richter Scale shake of February 22, 2011, resulting in heavy loss of life and extensive damage to the city centre and a number of suburbs.

New Zealand’s second largest city, Christchurch, was chosen as the venue, and the theme for the congress, Recovery from Disaster, was adopted by the NZIS conference organisers. This was indeed appropriate, and delegates were able to see that recovery was progressing every day, as they travelled to the conference venue. The congress organisers provided a free shuttle service of buses to and from the venue, running from city centre hotels, at regular intervals.

Veteran land surveyor Gordon Andreassend, provides a half century overview of FIG in Hong Kong, and his visit to the FIG Working Week in Christchurch, New Zealand. (See also John Brock’s report on pages 30-31)

There were once about 3,000 houses in the area we visited that had to be abandoned, with all structures totally removed due to liquefaction of the terrain.”

Delegates
Christchurch hosted approximately 600 delegates from 65 counties during the working week, and there were another 250 attendees from New Zealand. These numbers included 78 international Young Surveyors, and 29 from New Zealand. There were special sessions during the event where the Young Surveyors could meet and discuss matters relevant to the profession.

Technical sessions
The all important presentation of technical papers, related to the various commissions, were held in parallel sessions over the three main days of the conference. Some 250 papers were presented in the course of 86 sessions. During the course of the week there were also workshops and other working group meetings and presentations.

Technical tours
Several technical tours were arranged to enable delegates to understand the role played by the NZ government surveyors, Christchurch local surveyors, and the several firms of professional surveyors engaged in the reconstruction of the city.

I was fortunate enough to be taken on a tour of some of the earthquake-damaged areas by an old surveyor friend who has lived in Christchurch for about 20 years. He told me that he would show me the ‘Christchurch Serengeti’. There were once about 3,000 houses in the area we visited that had to be abandoned, with all structures totally removed due to liquefaction of the terrain. The roads are still there, and many trees, including fruit trees that had been growing in the suburban gardens are flourishing. ‘Serengeti’ indeed!

I was reminded of the words of the speaker in one of the WW historical sessions, where he spoke of a large tract of land in South America that had experienced liquefaction following an earthquake. He said that the process was the exact opposite of the usual development of open space for housing construction. In this case, fully developed areas were cleared completely, leaving large tracts of land covered only by vegetation. This is identical to the Christchurch situation today, and it leaves the NZ authorities in a quandary as exactly how to deal with the land, which predominantly consisted of registered, guaranteed title allotments. Compensation and conversion to a parkland would probably be best.
Plenary sessions
There were three plenary sessions. The first was held after the opening ceremony, with speakers from the host city discussing the impact of the earthquakes on the city and its citizens. On the theme of Recovery from Disaster other speakers detailed the steps that had been taken to effect recovery.

The second plenary included speeches from overseas experts who provided an international perspective of the requirements needed to deal with natural disasters. The third had several speakers with a professional background in surveying, discussing topics related to disaster response and the role of the surveying profession.

The final General Assembly
On Friday May 5, the General Assembly was held to announce developments that had taken place during the conference, and to give details of changes in the FIG organization, such as the election of two new vice presidents, Messrs Michael Lilje and Orhan Ercah.

It was also the time to announce the results of the country to host the 2020 working week. There had been a tight contest between Switzerland and the Netherlands, and it was won by the Dutch. See you in Amsterdam in 2020 then!

Early days
As a land surveyor working in Hong Kong, Gordon Andreassend (right) was first introduced to FIG (International Federation of Surveyors) in 1967, when he became the Land Surveying Division representative in the RICS. The RICS was the only surveying professional organization in Hong Kong at that time. In the 1970s the Hong Kong Branch of the RICS, felt that the funds allocated to them from the UK, were being largely consumed by the annual fees paid to the FIG, based on a large total membership. This appeared to be unreasonable to branch members, as at that time FIG catered mainly for Land Surveyors, and the LS Division was the smallest in the HK Branch.

By the early 70s the HK Institute of Land Surveyors (HKILS), had been formed, and it was arranged with the FIG secretariat that the HKIS would take over membership of FIG for Hong Kong. As an office bearer in the HKILS, Gordon became the FIG correspondent, and attended FIG congresses for several years. About the time the HKILS merged with the HK Institute of Surveyors, (HKIS) in the 1980s, the four-yearly circuit of FIG congresses, was amended to accommodate interim annual working week conferences, a format which continues today.

Gordon decided to visit Christchurch New Zealand in May 2016, mainly for family reasons, as he grew up there in the 1940s, and an opportunity to attend the 2016 FIG working week was too good to miss. His overview of FIGww 2016 is published above.
Below: from left to right, Prof Rudolf Staiger, John Brock, Claudia Stormoen Pedersen and Haydn Smith.

FIG 2016 in Christchurch NZ: – working week with a Haka!

The Chairman of the FIG Fun Commission, John Brock, is here to report on this year’s major FIG activity: the FIG2016 Working Week down under in Christchurch, New Zealand.

Some 700+ visitors from around 70 countries attended and sincere thanks are extended to the LOC for pulling off a brilliant week of lectures and tours plus a wonderful snap of un-seasonally warm weather.

My first assignment at FIG2016 was to chair the two-day Surveying History Symposium held at the Cashel Hotel at which we were staying. The first floor room had a dynamic vision of the devastation which had struck down 78% of buildings in the Christchurch Business District in 2011 but there were also many glimmers of hope with reconstruction and monuments to the fallen showing the resilience and determination of the locals to rebuild.

We were most privileged to have our debonair Vice President Prof. Rudolf Staiger officially open our activity accompanied by our tireless FIG staff member Claudia Stormoen Pedersen. With three Pacific islander presenters no-shows, it was up to me to entertain the small but keen audience with two of my ancient history of surveying talks about the “Four Surveyors of Caesar and Surveying: Shaper of World History” showing the broad spectrum of achievements of the Mesopotamians, Egyptians, Greeks, Romans and other colourful characters such as George Washington, Thomas Jefferson, Abraham Lincoln, Jesus Christ, Joshua, Daniel Boone, Thomas Mitchell, James Cook and many others achieving Hall of Surveying Fame mentions.

Finally, with two of the Pacific islanders now with us we had amazing talks by the Director of Surveying from Tonga, Viliami Folau detailing the cadastral land system and its hierarchy of male inheritance which does not allow any foreign ownership of Tongan land! I wish we had this in operation in Australia where each male inheritance which does not allow any foreign ownership of Tongan land! I wish we had this in operation in Australia where each foreign owner has to sell off the farm to the biggest bidder to the downfall of our autonomy and home control.

Next we had Andrick Lal from Fiji detailing the complex international boundaries of Papua New Guinea greatly influenced by the many treaties and agreements struck with the adjoining nations over many years of negotiations and compromises. Lastly on the first day we had a really fantastic presentation about the State boundaries of Australia by the Surveyor-General of the Northern Territory of our nation Craig Sandy, who revealed an unbelievable level of dispute still broiling over every boundary of our great brown land.

Social scene
Drinks and nibbles were a perfect pre-runner for the reception put on by the Small Island Developing States closely followed by the Young Surveyors Network cocktail party. Seeing the enthusiasm and quality of the young surveyors attending the WW gives me glowing hope for the future of our profession.

Day two of the history event had a full complement of speakers as well as double the crowd with 20 coming along. Our first presenter was the Surveyor-General of Belgium Marc Vanduschenen who is also President of the French speaking delegation giving an enlightening history of surveying in Belgium demonstrating not only its regal lineage but the major contribution this small in size but giant in achievement country had in the formation of the Fédération Internationale des Géomètres.

Next we had Kelly Henderson with revelations of our first Surveyor-General of South Australia William Light’s mapping exploits during the Peninsular Wars, particularly in Belgium thus giving the session the name, the Belgian Quarter. Not to miss the local flavour, Session Two was called the Kiwi Quarter as former Surveyor-General and NZ’s most distinguished international ambassador Bill Robertson told us of the life of NZ’s first S-G, Felton Mathew who had been in the employment of the S-G’s Department in NSW under Thomas Mitchell before going east to further his career. I gave a tailored account of James Cook, Surveyor with specific attention given to his obvious attraction to NZ having visited this south land on all of his three world explorations.

Our third session after a great lunch was the South African Quarter. There were fascinating presentations by the Surveyor-General of Eastern Cape, Chris Williams-Wynn and Professor Jenny Whittal from Capetown University, who gave an insight into the intricate difficulties in redefining historic boundaries in regions like the Natal Zulu land and a farm in Boscheuwel, where historic monuments consisting of giant boulders and hedges were identified using archaic survey plans from the 1600s and 1700s.

Not to be left out, the final period was the Aussie Quarter during which I gave the attendees
some light relief with my DVD show of "Superstar Surveyors of Silent Cinema: 1908-1930". To end the day Kerima-Gae gave the roaring crowd much to laugh at with her Brocky roast: "Surveyors Through the Eyes of a Non-Surveyor" which she supplemented with her recently compiled "History of Canterbury Surveyors", after hearing the historic commentary on the Trans-Alpine train journey to Greyouth on the west coast the previous day. She told us of many landmarks named after pioneer surveyors such as Arthurs Pass in addition to the townships of Dodson and Kass and some of the adventures carried out by these men.

To conclude a perfect weekend of surveying history we made our way to the magnificently catered Home Hosting at our sensational host Amanda Cockcroft’s home in central Christchurch at which we enjoyed the company of Kiwi’s, Aussies, a couple from LA, an Irishman and an Englishman.

General Assembly

Monday saw me as the sole representative of the International Institution for the History of Surveying & Measurement (IIHSM) at the General Assembly. Important matters of the election of two vice presidents and the venue for the 2020 Working Week were the main concern apart from recognition and development of joint projects and initiatives with international bodies like the UN.

Taking the opportunity of visiting the Willowbank Wildlife Park we were super lucky to see the endangered kiwi at close quarters as well as the tuatara lizard and really cheeky kaka parrots sitting on our shoulders eating food off a spoon and very gently kissing us. We also sat in on the Ko Tane traditional Maori show with delicious hangi, where the meat and vegetables are cooked in the ground. I was elected the Chief of our group and touched noses with the distinguished elder in customary style while honing my skills doing the Haka with the intimidating young warriors.

The next day had the Opening Ceremony with Sir Tipane O’Regan giving a well humoured account of life dealing with the bureaucracy of NZ followed by Margareta Wallstrom telling us of the many areas into which surveyors should delve with their expertise, especially in areas recovering from disaster like Christchurch. Mark Allan, the President of NZIS gave the response. The evening was NZ Cultural Night and had some of us on show with our newly acquired skills in doing the Haka with our tongues well stuck out as required, while the ladies swung the balls on a string with great coordination.

On Wednesday I skipped the morning sessions to tour the exceptional Botanic Gardens with many giant trees such as sequoias and other huge specimens of planting from all over the world, clearly thriving in the Christchurch climate. They have also preserved the building within which instruments were calibrated for the Antarctic expeditions of Scott and Shackleton as well as housing the experiments made by the American scientist Richter after whom the earthquake intensity scale is named.

In the afternoon history session talks were given by Kelly Henderson, Chris Williams-Wynn, Jenny Whittal and Francis Roy from Canada, which had a good attendance of around 35. Later I attended the Commission 4/6 dinner, generously sponsored by Leica and always the best value of the week. The next day’s Gala Dinner was at the Airforce Museum of NZ. The food and entertainment were sensational and they had a camera booth to give us some fond memories of a phenomenal night.

At the closing day of FIGWW2016 the two new vice presidents voted in were Mikael Lilje from Sweden and Orhan Erkan from the FIG2018 Congress Host Nation Turkey while the Dutch upstaged the favoured Swiss to win the FIGWW2020 for Amsterdam. To finish off a wonderful week of festivities and education the Farewell Reception hosted by next year’s FIGWW nation Finland was most congenial and conducted in a bipartisan mood. Afterwards the more hardy went to the Rugby Union game on the other side of the car park from the session venues to witness local team The Crusaders crush the visiting Australian side from Queensland, which did not really worry me as I come from NSW and they are our mortal enemies in Rugby League!

Next day we spent most of it in the exhilarating International Antarctic Centre where we patted huskies, endured a minus 18 degree Celsius simulated Antarctic blizzard, rode the all-terrain Hagglund vehicle up hill and down dale, saw penguins being fed and experienced all things icy. If in Christchurch this place is a must. There is even a plaque listing and showing the things icy. If in Christchurch this place is a must.

The Local Organising Committee were also a fantastic bunch of indefatigable toilers especially Warren Haynes, Hadyn Smith, Amanda Cockcroft, Mark Allan and Melissa O’Brien et al. Our tireless FIG Secretariat Louise, Hanne and Claudia must be applauded once again for a tremendous effort of organisation led by the Executive Committee of President Chrissy Potsiou, Prof. Rudolf Staiger and Dianne Dumashie. Also a warm welcome and thanks to new kids on the FIG block, Maria and Tian.

Above: From left to right, Diane Dumashie, Rudolf Staiger, and new Vice Presidents Mikael Lilje and Orhan Erkan at the final day’s General Assembly.

Below: a spoon-fed cheeky kaka parrot.
Celebrations mark 125th anniversary of Institution of Surveyors NSW

During the last couple of months my grandson Dylan has turned seven and Topp Tours has taken us to see what remains of the old little Zig Zag railway at Lapstone at the start of the Blue Mountains west of Sydney and to see some amazing “Ancient Egyptian” hieroglyphs (discovered by a surveyor named Alan Dash in the 1960s) carved into stone at an almost inaccessible secret location on the Central Coast just north of Sydney. Following this we went to the Walkabout Wildlife Park nearby to view some incredible Aboriginal rock carvings of emus, wallabies and hand blowings onto cave walls.

Dinner with Eels legends
As a sponsor of the newly formed Eels Old Players Union I was invited to the game against the Canberra Raiders at Parramatta Park as well as a “Meet the Legends” after party at the club. There I met up with my old mate and Eels icon Geoff Gerard along with the McMartin twins, John and Mal, Mick Vella, Ed Sulkowicz, Nathan Cayless and Nathan Hindmarsh. Festivities and reminiscing descended into the wee hours of the next morning.

125th anniversary meet
As this is the 125th year since the Institution of Surveyors NSW was incorporated an excellent half-day History Symposium was held at the ISNSW office in Sydney with nearly 50 in attendance. Talks were given by former President John Minehan on the facts behind the purchase of the IS office. Former Royal Australian Historical Society President Prof. Ian Jack gave startling new information about Blue Mountains surveyor George Evans with never-before-seen artwork by this prolific explorer, while author of the Sails to Satellites book on the NSW Surveyors-General Dr Terry Kass exposed two naughty surveyors from history who had provided emphasis to our colourful colonial image.

Our charismatic Deputy Surveyor-General Paul Harcombe highlighted the broad and valuable contribution of Australian and world surveyors to the whole community while I told the group of the First Fleet surveyor William Dawes whose exploits and attitude saw him banned from NSW by our first Governor, Arthur Phillip. Our immediate past president Phil Hayward told a fascinating tale of the surveyor from the Douglas Mawson expedition to Antarctica in 1911. Hayward had only visited this mysterious white seventh continent earlier this year, much to my envy. Completing a brilliant array of presenters was my old UNSW lecturer Prof. Bill Kearsley putting forward the case for renaming Lake Burley Griffin after the ACT Surveyor Charles Scrivener, whose plans for this artificial lake in Australia’s capital city Canberra far more closely resemble what was actually constructed than architect Walter Burley Griffin’s artistic fantasy.

In the evening a celebratory dinner was enjoyed by over seventy guests at the Sheraton on the Park in Sydney at which celebrity guest speaker/author and former Rugby Union Wallaby Peter Fitzsimons enthused the crowd with his enthusiastic style of story telling.

Brock family reunion
Last weekend at Cessnock I joined with my many cousins for a family get-together arranged by my south coast relation James Regan from Kiama and his wife Linda at which two of my daughters, Jaime and Alexandria, met some of the cousins they never knew they had. Due to the widespread of the family some members travelled many thousands of kilometres from Mackay and South Colan in Queensland as well as Yamba in far NSW. Leaving the clan after lunch on Sunday I picked up Kerima-Gae and drove to the heritage icon The Hydro Majestic Hotel just past Katoomba in the Blue Mountains to spend the night in a Jamieson Valley view room at a super saver rate due to the winter chilliness. It has been one of my most cherished desires to do this in this 1904 treasure of mountain heritage and the sublime view from our window combined with a superb breakfast more than satisfied a life-long vision.

John Brock is a Registered Surveyor in Australia and is a stalwart of FIG and its Permanent Institution for the Art and History of Surveying.
IoT security scanner
An internet security vendor is claiming a world first with the launch of BullGuard IoT Scanner – a powerful free tool for consumers that reveals connected devices that could be vulnerable to hackers. The scanner allows anyone to scan quickly to see if their smart devices or network are accessible to hackers. If a user’s smart device is flagged as being vulnerable, details about the specific security issues are provided.

A real-time sub-metre GNSS receiver from Juniper Systems was launched at May’s GeoBusiness show. The Geode provides precise GNSS data and combines versatility with one-button simplicity and can be used with Juniper Systems’ rugged handhelds or any Windows, Windows Mobile, or Android device.

MAGNET and ProjectWise
Topcon Positioning Group and Bentley Systems have announced a new level of direct communication between Bentley’s design applications and Topcon mobile work force products with an upcoming software release. With direct communication from Topcon’s MAGNET Enterprise to Bentley’s ProjectWise, users of MAGNET and 3D-MC software solutions can now, while working in the field, access or receive i-models created by Bentley’s OpenRoads design modelling technology, Survey data and as-built information captured by Topcon’s field devices can be brought back into Bentley’s design applications using the same MAGNET to ProjectWise direct connection.

OS and Cadline link for Infraworks
Cadline and the Ordnance Survey launched OS Model Builder at a workshop at the GEO Business event in May. Over 30 attendees heard about an application that will allow them to build 3D Models for Infraworks using Ordnance Survey data. OS Model Builder is a visualisation tool that can support projects, including Level 2 BIM activities, and could save the construction industry and its clients’ time and money when planning future projects. The tool is the result of a collaboration between Cadline and OS to provide Autodesk Infraworks 360 customers with a single source of Great Britain’s most accurate and up-to-date collection of geographic data.

Topcon scan data to ReCap
Increased integration in the Autodesk and Topcon reality data workflow recently announced will see increased project efficiency. Raw scan data from the Topcon GLS-2000 laser scanner can now be taken directly into Autodesk ReCap 360 and ReCap 360 Pro with no intermediate software conversion steps. The move is designed to streamline point cloud analysis to quickly identify conflicts, measure variations and make adjustments at various stages of a construction project.

PointSense and VirtuSurv
FARO Technologies has announced the release of PointSense and VirtuSurv 17.0, laser scanning plug-ins for the Autodesk environment to ensure seamless integration with the recently released Autodesk 2017 product line. The programs provide BIM-CIM CAD designers with comprehensive tool kits for solving the challenge of converting massive point cloud datasets into intelligent 3D models. Customers can choose software modules that match their specific workflows and plug-ins are available for both AutoCAD and Revit.

Intrinsically safe Handheld
Handheld today announced its first certified intrinsically safe model, a special version of the Nautiz X1 compact handheld. The product is a collaboration between Handheld Group and MCS (Mining Consultancy Services Pty Ltd), with offices in South Africa, Australia and Russia. The special intrinsically safe version of the Nautiz X1 ultra-rugged handheld will first be introduced to the market in South Africa, where Ex ia (Zone 0) and Ex ib (Zone 1) certifications have been issued. The international equivalent certifications, IECEx for Zone 0 and Zone 1, are in progress and are expected to be approved later this summer.

Surphaser scanner
Basis Software has launched the Surphaser Ultra Short Range model 75 (USR) laser scanner. Model 75 shares the form factor with recently released Surphaser 10, joining the family of smallest and lightest of Surphaser scanners to date. Driven by user demand for high precision scanning at short distances, Surphaser 75 gives users the ability to quickly collect high accuracy, high-resolution data starting as close as 25cm (< 1ft). A unique combination of small-sized hemispherical scanner, low noise, and close range allows users to scan with high precision in close proximity and in tight spaces. Its low weight (less than 5 kg with battery), built-in camera with automated colour mapping, built-in PC and internal battery make it a very portable, highly versatile device.

Streaming smart cities
CartoConsult, provider of smart 3D building and city models, can now deliver 3D city and building models via the web to any internet connected device, on subscription. With live web streaming, CyberCity 3D models can be instantly viewed anywhere on tablets, smartphones, interactive screens and traditional PCs. The streamed models can also include real-time data from sensors across cities, such as transport and air-quality monitoring.
GNSS signals and stay connected with or without reference links.

Also announced is Leica CalMaster, the industry’s only calibration system issuing ISO certifications for rotating lasers.

Ubisense has launched AngleID, a powerful sensor that offers ten times the range of most passive systems. It detects ultra-wideband pulses from Ubisense tags to precisely determine the angle between the tag and sensor and locates the tag in up to five different 3D zones simultaneously, reporting entry and exit events to each zone.

Seafloor Systems has released drivers for Trimble Access Field software for its SonarMite series of echo sounders. The SonarMite-MILSpec and SonarMite DFX singlebeam echosounders now work seamlessly with the Trimble Access survey system.

Murphy Surveys have introduced UAV technology to their inspection and survey services range.

Leica Geosystems has established a georadar portfolio with three releases to provide applications in utility mapping, asset detection and mapping, and monitoring.

The Leica DS2000 utility detection radar identifies all potential underground threats, including plastic, all non-conductive pipes and fibre optics. Data is collected with dual-frequency antennae that locate deep and shallow targets simultaneously. With or without GPS, utility location can be accomplished onsite without post processing.

The new radar technology has also been added to Leica’s GeoMoS monitoring software. By combining GeoMoS with IDS Guardian software, the gaps between prisms on monitoring projects of landslides, mines or infrastructure are now also detected for fast movement. Risk managers can carry out their tasks with complete confidence, knowing all movement of surfaces is monitored by the two technologies.

The Leica Pegasus:Stream combines laser scanning and images above with ground penetrating radar below to accurately capture the complete view of a targeted area. This mass digitisation of infrastructure assets, such as telephone cabinets above and cable conduits below, are collected in less time without needing to stop traffic, increasing the safety of users. The Pegasus:Stream has the potential to collect up to 100 km per day at 15 km/hr, providing digital documentation for GIS and CAD modelling.

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