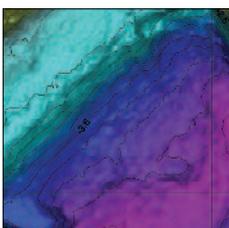


Surveying for geographical and spatial information in the 21st century

Capturing bathymetry for inland reservoirs



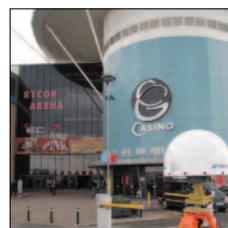
High resolution compact SAR arrives



Visitors and vessels head to Excel for Oceanology



Seminars and technology draw visitors to GEO-10



Golden State chooses high-speed rail solution



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COVER STORY
 This image of the eruption of Iceland's Eyjafjallajökull Volcano was captured on 15th April by NASA. A brown-grey plume of ash streams across the North Atlantic clipping the northern British Isles. Image courtesy of NASA/GSFC, MODIS Rapid Response.

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 The biennial offshore exhibition took place in the London Docklands' exhibition centre. Richard Groom and others were there for GW.
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 The annual showcase event for laser scanning and 3D took place in Houston, Texas in February. GW's Patrick Collins was there.
- p.18 Compact SAR arrives**
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- p.22 Inland shallow water surveys**
 Mobilising a boat and equipment can be a major challenge for inland hydro surveys. A team report from recent experiences in Italy.
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- p.28 Future for OSGB after crowd-sourced consulting**
 HMG has published its response to the OS consultation exercise. Richard Groom looks at what's new and some worrying implications.
- p.30 FIG 2010: History in the making**
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- p.33 Scottish Land Reform: Britain's first cadastre?**
 A weighty report and a draft Bill could see a major change in land registration in Scotland, reports Richard Groom.

Regulars

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Next issue

The next issue of GW will be that for July/August 2010.
 Copy dates are: Editorial: 07 June Advertising: 18 June



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The election is over but will it have brought change? For us in geomatics, we have to adapt and respond to it constantly.

Volcanic wisdom and hindsight

Our previous issue's front cover of a gently smoking volcano in Papua New Guinea proved portentous. The Icelandic volcano on this issue's cover is a much starker reminder of the fragile skin of rock and earth that we all live on. The volcano shutdown European airspace for over a week yet our cover image, courtesy of NASA, shows the volcanic plume only just touching the farthestmost tip of the British Isles. The image was captured on 15 April, the day all flights were suspended. Maybe the meteorologists knew more than the image suggests but it does leave you wondering whether the decision was on the outer edges of extreme caution. For those who worry about these things or don't scare too easily, I recommend a read of **Simon Winchester's** article in *The Guardian* on 21 April (<http://www.guardian.co.uk/world/2010/apr/21/iceland-volcano-ash-extinction-human-race>). His account of the eight-month eruption of Iceland's Laki volcano in 1783 makes (literally) chilling reading.

For me, in an odd way the volcano underpinned the wisdom of a decision I took not to go to the FIG Congress in Sydney, which I had been looking forward to since the Munich Congress in 2006. The organisers refused to give me a press registration so it tipped the balance in my budgeting against the trip. It proved fortuitous: I might have been stuck down under for a couple of extra expensive weeks (John Brock's kind invitation notwithstanding).

All change?

By the time you read this issue of *GW*, the UK may possibly have a new government. As I write, the country is in a febrile state of anticipation of change, if you believe the media pundits; or in a slough of disinterested lethargy if you actually go out there on the streets. What cannot be denied is that geomatics endures a constant churn of change, the latest heralded by the release of a range of datasets from Ordnance Survey that will be free on demand (see page 28). Scotland, long overlooked as having, not only its own distinctive culture but its own legal system, is also anticipating change in its land registration system (see page 33).

It's not just the political order that's changing. Technology over the last decade has seen improvements in data capture rates, accuracy, downward pricing and miniaturisation. The latter is highlighted in two articles in this issue. Capturing bathymetry at remote and inaccessible shallow inland reservoirs, where dams need careful monitoring for safety, can be difficult. The problem is addressed by **Carlo Peris** and **Tom Hiller** in connection with a number of remote sites in Italy, on page 22.

Airborne and spaceborne data capture is also

getting cheaper thanks to the emergence of systems like that from MetaSensing, which now offers a lightweight SAR system that can be deployed in a single-engined aircraft. Developer **Dr Adriano Meta** explains the potential and the quality of data that can be expected on page 18.

These are all exciting developments that will sustain and in time, as the recession retreats, be the catalyst for new businesses and applications. But for us in the media, times are likely to remain worrying. *GW*, like other business and professional titles, was sustained until recently by advertising, and especially recruitment advertising. Even if the economic buoyancy of three years ago returns, the Internet will have further strengthened its grip against printed titles.

We believe that there remains a strong demand amongst readers of all ages for printed material. But we recognise that they want the option of timely online editions between printed ones as well as the convenience. We are developing a new strategy for our website that will see new issues of *GW* appearing on the web as soon as we have gone to press and ahead of the printed edition arriving in letterboxes. This will be of enormous benefit to overseas readers who have to wait far too long to receive printed copies. Our searchable archive facility will remain and will only be accessible to RICS or IIS members and subscribers.

Stephen Booth, Editor

Ten years ago

The May/June issue of *Surveying World* in 2000, like this issue, focused on hydrography, driven by the previous month's Oceanology event, the last to be held in Brighton before the move to Excel. But perhaps the most far-reaching and incisive words in the issue came from the then president Professor **Michael Cooper**. Welcoming the changes in the structure of RICS that came from the Agenda for Change initiative, Cooper argued that they would "remove the boundaries between hitherto disparate practice areas which should bring greater understanding of clients' needs". He went on to argue that, "the greatest contribution that Geomatics members can bring to members of other faculties in the RICS is a critical acceptance and ready use of changing technology".

The surveyor's acceptance of changing technology was clearly demonstrated through a report of the previous month's World of Surveying exhibition, which had taken place at Donington. The previous year saw the debut of the Cyrax laser scanner; one year on and there were two more with offerings from Callidus (now owned by Trimble) and UK Robotics, now Z+F UK Ltd.

The editor welcomes your comments and editorial contributions by e-mail: editor@pvpubs.demon.co.uk or by post:
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Getting the measure of a Welsh mountain



Ever since detailed maps of Snowdonia were first produced, the 3,002-foot Tryfan has been a member of the 14 peaks, the list of 3,000-foot Welsh mountains. But recently some experts have asked – does Tryfan really measure up? The matter will be settled in June when three amateur mountain surveyors haul professional GPS equipment and computers to the summit to resurvey the mountain. John Barnard, Graham Jackson and Myrddyn Phillips have a serious track record in surveying mountains and their measurements are accepted by Ordnance Survey. Mark Greaves, Ordnance Survey geodetics analyst, has been working closely with the expedition: 'Once their survey is complete we will verify the accuracy of their data and, providing it meets our standards – which I'm sure it will, the revision will be made to the relevant maps and mapping data'.

Renewables need Supergrid



On 8 March, a group of ten companies active in the offshore renewables industry formed a new organisation called "Friends of the Supergrid" (FOSG). The organisation aims to lobby European governments to solve a looming energy problem. With conventional power networks, the transmission line grid has to

transmit power from generators that produce power in a steady predictable way to consumers with varying rates of consumption. In the past there have been ingenious responses to the problem of uneven load on the network. For example, the Dinorwic pumped storage scheme power plant in North Wales, which was built in 1984, "stores" power. The plant works by building up a head of water during periods when there is surplus power and then releasing it when there is a spike in the load – usually at critical points in the TV schedules.

A frequently-quoted objection to renewables is their reliance on natural energy sources that are far from steady and predictable. The Supergrid is intended to

revolutionise the transmission of power from source to receptor. It will be a network of high voltage DC underwater cables connecting renewable energy sources, such as wind farms, with the countries bordering the North Sea, Irish Sea and Mediterranean. We reported in *GW* (May/June 2008) on the 1000MW DC interconnector between Britain and the Netherlands. FOSG say that a lot more is necessary to build in flexibility between supply and demand.

There will clearly be demand for hydrographic surveying to support projects like this, but rapid development sometimes means that corners get cut and already there are voices of concern within the industry that health and safety is being compromised by ill thought-out design and project management. For more on the Supergrid see: www.friendsofthesupergrid.eu/

AssocRICS for project managers

Project management has become the fifth specialism for RICS' new grade of associate membership, launched last year. With AssocRICS, those with relevant experience or qualifications working within project management can now achieve an internationally recognised professional qualification. It is an entry-level qualification that offers an alternative to the RICS graduate route for those without a degree. AssocRICS can also offer a progressive route to chartered project management surveyor status for highly skilled professionals by enabling project managers with vocational competence to undertake study modules to work towards a final assessment of professional competence. The assessment

process is online and is competency based with the qualification is achieved by demonstrating that RICS standards have been met through relevant work experience and/or qualifications.

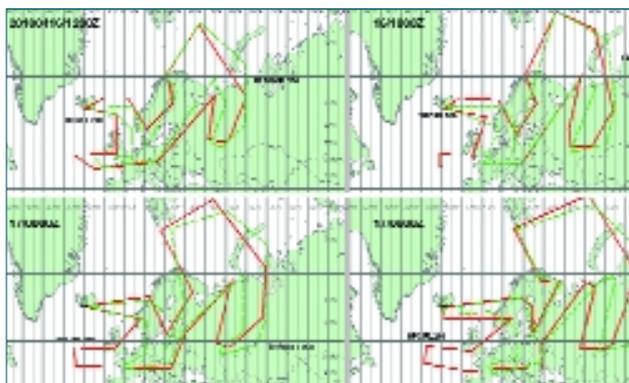
LR revises closure plans

The Land Registry has published the outcome of its consultation over office closures announced last October. LR has made changes to its original proposals to try to mitigate the impact on staff, reducing the number of staff potentially facing compulsory redundancy by a third. The revised programme retains an LR presence in the south-east. It will mean only two offices will be closed completely in 2011. Land Registry will be keeping open the Croydon and Peterborough offices and intends to retain a reduced presence in Portsmouth until 31 March 2013. As a result of office closures and voluntary redundancy, staff numbers will reduce to just over 5,000 by the end of 2011 and to around 4,200 by the end of 2014. A new non-executive chairman and more non-executive directors will be appointed as a result of a recent review of the organisation's governance arrangements. For more information on decisions regarding LR offices and staff, visit www.landreg.gov.uk. Source: www.landreg.gov.uk/about_us/pressoffice/notices/?article_id=20548

CONTRACTS & PROJECTS

Plotting plants with GPS

Mapping technology is helping the National Trust with a plant-recording project covering more than eighty of its gardens. Currently 60% of the way through a three-year survey, the trust has recorded details of over 120,000 plants covering some 13,000 different species. The equipment supplied by Ormston Technology allows staff to accurately plot and record each plant using the new Ashtech handheld data collection device with GPS receiver and mapping software. Franklyn Tancock, plants collection curator, says: 'We have recently purchased more Ashtech MMCX GPS receivers since our initial order of two years ago as they have proven to be highly suitable to our requirements.'



ESRI helps chart ash risk

ESRI UK has been busy helping the UK Met Office map the areas at risk from the "zero tolerance" level of volcanic ash. The area enclosed by the red line shows the area at risk from the surface to 20,000 feet and the area enclosed by the green dotted line shows the area at risk between 20,000 feet and 35,000 feet. At the time there was no significant ash risk above 35,000 feet.



Scanning for gold

Riegl's VZ-400 laser scanner is to help monitor the construction of a new gold mine in the Dominican Republic. Selected by the Pueblo Viejo Dominicana Corporation, the laser scanner will be used to record construction in the process plant, calculate volumes of material displaced during land clearance and monitor civil structures for subsidence and deformation. Once the facility is operational, the scanner is expected to be used for high precision monitoring of slopes and mining activity to optimise site safety. Supplied by 3D Laser Mapping, the scanner is part of the Riegl V-Line range and will initially be used to collect as-built surveys to record construction progress on the process plant and at other civil structures at the site in the Sanchez Ramirez province north east of the capital Santo Domingo.

We have also purchased the half licence dongle, which allows our surveyors to continue to use the GPS software whilst the unit is in use at another property'.

Promoting shared space

The official opening of a shared data centre took place on 3 March with IT directors from Ordnance Survey and Land Registry cutting the ribbon. The opening reflects the two organisations' support for the Government Information and Communication Technology (ICT) strategy, which aims to reduce IT infrastructure costs by up to £300 million a year

and to support the achievement of environmental and sustainability targets. The agreement for Land Registry to lease OS 219 square metres of serviced and managed space, meets industry best practice for the mapping agency. **Bob Goodrich**, director of information systems at OS, says: 'Now that we have completed fitting out the area we will begin migrating our infrastructure and aim to have completed this by late summer 2010.'

Landmark deal

Following a reseller agreement with Landmark, Bluesky's

collection of commercial aerial photographs are being made available through the Envirocheck website. The photographs from the Old Aerial Photos archive date back as far as 1917 and include some of the earliest commercial survey images and military photography. The images will be offered on the website as a value-added service and registered users can select images from detailed search results, including the age and ground coverage of every image that matches the search criteria, with the file supplied as a digital image.

Subsurface survey for Spurs stadium

Subsurface utility engineering company, Cardno TBE UK, has completed a project at Tottenham Hotspur Football Club in line with plans to redevelop the stadium. The contractor carried out preliminary subsurface utility mapping and detection in accordance with the American Standard of Civil Engineers, ASCE 38-02 standard guidelines. Initially, Cardno conducted a quality level B survey, which uses subsurface geophysical prospecting technologies. Ground penetrating radar (GPR) and a range of high

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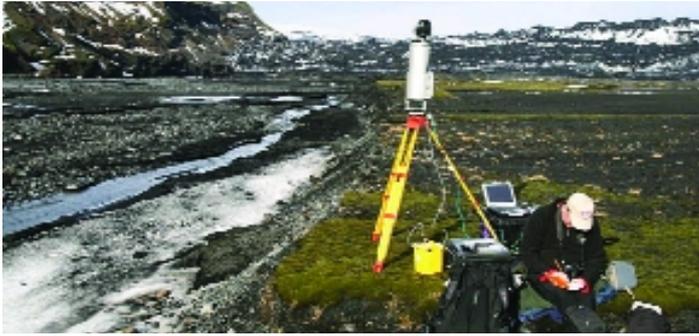
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Predicting rock fall hazards



Laser scanning and remote controlled aircraft technology are to be used to monitor glaciers where unstable slopes and rock falls are a continual threat. A long-range scanner, capable of measuring tiny movements over a 2km range, is being supplied by 3D Laser Mapping for the research by the University of Northumbria. Scan data will be used to help create 3D maps using low-level aerial photographs captured by an unmanned aerial vehicle (UAV). The Riegl LMS-Z620 can obtain 10mm accuracies at distances of up to 2km and will support the monitoring of retreating glaciers in the European Alps and the investigation of rock falls in the Southern Alps of New Zealand. *Photo: Stuart Dunning*

and low frequency detection systems were used to determine the existence and horizontal position of underground utilities. To verify the survey and accurately determine the precise depth and horizontal position of the utilities detected, quality level A surveys were then conducted using a non-intrusive vacuum excavation mobile unit. The use of quality levels allows the stadium engineers, Buro Happold, to confirm their plans that a certain level of accuracy and comprehensiveness was provided.

Advancing marine information

All of the equity of SeaZone Solutions Ltd has been sold following a competitive process. Based in Oxfordshire, UK, HR

Wallingford acquired the company from the United Kingdom Hydrographic Office (UKHO). SeaZone joined the UKHO group in 2005 and since then has grown with a projected turnover of £1.5m for this financial year. The company, with its existing team, will operate as a separate entity within HR Wallingford Group.

BLAST aims for N Sea

A three-year European funded project is working to improve marine reference information for the North Sea. SeaZone is collaborating with hydrographic offices and other organisations from Norway, Denmark, Germany, Belgium, Sweden and United Kingdom on the Bringing Land and Sea Together (BLAST) project, which aims to harmonise

and integrate terrestrial and marine geographic datasets to create a consistent reference base suitable for integrated coastal zone management (ICZM) and other purposes. In addition, BLAST has a transnational challenge to incorporate maritime information from the sea areas of the different countries making up the North Sea region to ensure this information can be readily combined to improve coordination and maritime safety.

Veripos has been awarded an extension to its existing master services contract with seismic survey contractors, Bergen Oilfield Services (BOS). The contract covers continuing supply of a range of positioning services and equipment for BOS' three seismic exploration vessels.

The Rural Payments Agency (RPA) has taken delivery of 194 Trimble Juno SC handhelds with FastMap iCapture software on-board. The agency will use the units acquired from Korec to equip its team of land inspectors in a move away from using the more traditional land wheel.

BRIEFS

The *Magnificent Maps: Power, Propaganda and Art* exhibition at the PACCAR Gallery, British Library opened in April and showcases the library's collection of large-scale display maps, many of which have never been exhibited before. The exhibition demonstrates why maps are about far more than geography and will close on 19 September 2010. To coincide with this

exhibition, BBC4 has also been running a series of documentaries on the history of maps. For more information, visit www.bl.uk/whatson.

Navegocom is now the official Erdas distributor to customers in Russia. Supporting the full portfolio of the company's products, the distributor provides local sales and support, including technical support, individual training and software customisation in Russia. The previous distributor in the region, Data+, is now a sub-dealer, reporting to Navegocom.

Artech House has announced the publication of *Navigation Signal Processing for GNSS Software Receivers* by Thomas Pany (ISBN: 978-1-60807-027-5, £86). This book offers an in-depth understanding of navigation signal detection and estimation algorithms and their implementation in a software radio. Also now available is *Inertial Navigation Systems Analysis* by Kenneth Britting (ISBN: 978-1-60807-078-7, £55). Out-of-print for years, this volume, focuses on terrestrial navigation but is also useful for air and sea applications.

The UK's Marine Management Organisation (MMO) was established at midnight on 1 April. The new executive non-departmental public body has been created under the Marine and Coastal Access Act 2009. For more information, turn to RICS Policy Watch, page 27.

The GSDI 12 World Conference will take place in Singapore from 19-22 October 2010 with the theme "realising spatially enabled societies". The conference will explore the complementary roles of government, private industry and the academic community in realising better means for sharing geographic data and technologies and developing improved location-based services for meeting real world needs. For more information, visit www.gsdi.org/gsdiconf/gsdi12



New reseller for GPS range

The Juno and Nomad ranges of GPS hand-helds will now be supplied for use across a range of conservation and country management applications by environmental and IT consultancy, exeGesIS Spatial Data Management. Following a reseller agreement with Trimble distributor, Korec, the products will also be used by the in-house exeGesIS survey team to undertake public access and other countryside asset surveys. 'In particular, these units offer the power for rapid map handling, a robust build, long battery life and excellent screen visibility. The Juno SB is a cost-effective option whilst the water resistant rugged Nomad is ideal for when our clients want us to survey through the wet British winters,' says Jon Young, exeGesIS director.

RICS names new CEO

RICS chief operating officer, **Sean Tompkins**, has been named chief executive officer of the organisation in a decision made by the institution's governing council. He will assume his new role later this year following the retirement of Louis Armstrong. In 2002, Tompkins joined RICS as its first executive director responsible for developing its brand and marketing and was then named as chief operating officer (COO) in 2006.

Mahoney is Hon Sec

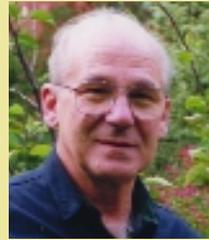


Geomatics Surveyor **Rob Mahoney** has been elected Honorary Secretary of the RICS. The four-year post is seen as one of the most influential member elected positions in the Institution.

New CEO announced



Dr **Jürgen Dold** has assumed the position of president and CEO of Leica Geosystems AG. Dold has been with the company since 1995, beginning as a product manager and general manager for several business areas of the metrology and surveying divisions, and was previously president of the geospatial solutions division. Before he joined the company, Dold acted as an academic counsel and a lecturer at the Technical University of Braunschweig, Germany. He holds a university degree in surveying from the University of Bonn, Germany and received his doctor's degree from the University of Munich.



Richard Witrzens (1928–2009)

Richard was born in Rosanov, Poland. During the latter years of the Second World War he served in the Polish underground, carrying supplies during the Warsaw uprising and later received a number of awards for this service. He became a German POW and after the war

he joined the British army and served with the Royal Artillery in Malaya. On one operation he was shot while parachuting.

He studied Land Surveying at South West Essex Technical College at the time when his compatriot Z M Michalski was the main tutor. Dick, as many of us knew him, was one of several ex SWETC students who worked for the Jamaica Survey Dept and the Public Works Dept. He became a member of the RICS in 1963. After four years in the Survey Dept he moved to five years service in Sarawak. He then obtained a post with the National Mapping Service of Australia where he spent twenty years and sometimes undertook hydrographic assignments. After many years in retirement, Richard died among his family in Canberra. Those of us who were privileged to study and work with Richard admired his commitment to work and his unflinching geniality. Richard is survived by his wife Barbara, children Ilona and Tomek and grandchildren.

Alan Teulon MBE

Bell for KOREC

Christina Bell has been appointed survey sales consultant for Korec's east of England area. Responsible for the sales and hire of the full

Trimble range of survey instruments, Bell has experience in coastal process and monitoring projects and has had extensive hands-on use of surveying instruments.

William Kenneth Kilford, MA, C.Eng, MICE

31st August 1916 to
28th February 2010



It is with a huge amount of sadness that I write this obituary for Ken Kilford. When I visited him in September last year, I reported how well he looked for a man of 93 years and how alert and interested he was in my career. But then that was Ken. He always showed and practised a huge interest in all his students. Our daily student lives, our backgrounds, our ethnic traditions (more than 50% of his students were foreign), our diets and our lifestyles. Ken was more than a lecturer to us all, he was more our surrogate father.

In 1953 he joined the cadre of lecturers, at the South West Essex Technical College, who comprised

the embryo staff of the newly formed Land Surveying courses under the leadership of Zenon Michalski. In those early days of Land Surveying at SWETC, Ken was a unique lecturer, attempting to teach photogrammetry to groups of young men who had no previous knowledge of the subject, nor what the science really entailed. Ken's job was made all the more difficult by the lack of equipment and practical opportunity. I remember that we had a mirror stereoscope and a parallax bar and must have had some stereo pairs of photos. In those days the subject was generally known as "Air Survey" and my course notes of so long ago refer to "The Arundel Assumption" and slotted template adjustments. Of course we had no opportunity to practice such applications. Our standard textbooks, Clarke and Middleton & Chadwick made little or no reference to air survey, so Ken wrote one. Elementary Air Survey (Pitman), which in fact ran for four editions between 1963 and 1979. After a spell of 18 years in London (SWETC, Barking Regional College of

Technology and North East London Polytechnic now the University of East London), he moved to the University of Sheffield in 1971, where he remained until he retired in 1981.

Ken was born in Ilkeston, Derbyshire. He attended Kimbolton School, Huntingdonshire (now Cambridgeshire) from which he went up, in 1935, to St. John's College, University of Cambridge, reading Economics/Geography. His early career was in local government, interrupted by wartime service in the Royal Engineers. Ken volunteered and enlisted in the Army in August 1939 and attained the rank of Captain. He landed on "Gold Beach" on D-Day +4. Following the invasion of France, Ken was engaged in bridge building as his contribution to the Allied advance, ending up at the Kiel Canal. He was demobbed in December 1945. Either the events of his war were too traumatic for him or had no impact, but he never mentioned his war experiences.

Ken, with his film star looks, was a genial, very modest and kind man with a very keen sense of humour.

He was certainly their "hero" for many of his students, giving not only technical advice but advice on life skills. I remember the advice and useful comments he gave to me regarding whomsoever was to be my date at a college ball! His identification with our student pastimes and particularly enjoying a pint with us at The Lord Brook pub, will be remembered by all.

The photogrammetry that Ken taught us has been totally overtaken by technological advances, however, what we really learned from him, has stayed with us for the rest of our lives. Recently, following the publication of "Parallax Pages", to his great delight, he made contact with many ex students and staff. He died at Nyton House, Westergate, near Chichester, West Sussex. He is survived by his wife Joan, his son John and daughter Jane, to whom thousands of his erstwhile students will wish to offer their collective and individual condolences. Roger Wilson, very capably, represented all Ken's ex London students at his funeral.

Keith Syrett

• SEMINARS CONFERENCES EXHIBITIONS COURSES EVENTS

We welcome advance details of conferences, seminars, exhibitions and other events which are likely to be of interest to the Geomatics community. Please mention the name of the event, venue, date and point of contact for further information by readers. Please send to:

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2010

Magnificent Maps: Power, Propaganda and Art Finishes 19 September, PACCAR Gallery, British Library.
Contact: www.bl.uk/whatson/exhibitions/magnificentmaps/index.html

ESRI (UK) Annual Conference 2010 10-11 May, Hilton London Metropole, London.
Contact: www.shapingyourvision.co.uk

GeoDATA 2010 Seminar 11 May, Angel Hotel, Cardiff.
Contact: www.training4gis.com

Leica High Definition Surveying Training Courses 11-14 May, Milton Keynes.
Contact: Email, uk.training@leica-geosystems.com or www.leica-geosystems.co.uk

GeoDATA 2010 Seminar 13 May, Aintree Racecourse, Liverpool.
Contact: www.training4gis.com

GeoCAD'2010 Geodesy, Topography, Cadastre and Land Registry 14-15 May, Alba Iulia, Romania.
Contact: www.fig.net

Developments in GPS, GNSS & SmartNet Training Course 18 May, Northern England.
Contact: Email, uk.training@leica-geosystems.com or www.leica-geosystems.co.uk

Combining GPS & TPS Training Course 19 May, Northern England.

Contact: www.leica-geosystems.co.uk

GeoDATA 2010 Seminar 20 May, Emirates Stadium, London.
Contact: www.training4gis.com

Leica Geosystems & Applications in CADD Training 2 June, Northern England.
Contact: www.leica-geosystems.co.uk

Leica Geosystems & McCarthy Taylor Systems LSS Training 3 June, Northern England.
Contact: www.leica-geosystems.co.uk

MBS Survey Software Ltd Training Courses 7 June, Northern England.
Contact: www.leica-geosystems.co.uk

5th International Terrestrial Laser Scanning User Meeting 8-9 June, Prague, Czech Republic.
Contact: www.optech.ca/i3dugm

Combining GPS & TPS Training Course 9 June, Southern England.
Contact: www.leica-geosystems.co.uk

The British Cartographic Society Annual Symposium – Talking with Maps 9-11 June, Nottingham VILLAGE Hotel, Nottingham, UK.
Contact: www.cartography.org.uk

Smart Utility 2010 14-16 June, Chelsea FC, London.
Contact: Tel, +44 (0)207 368 9300 or Email, enquire@iqpc.co.uk or www.SmartUtilityEvent.com

Canadian Geomatics Conference 2010: Convergence in Geomatics – Shaping Canada's Competitive Landscape 14-18 June, Calgary Telus Convention Centre, Calgary, Canada. *Contact:* Email, exdircig@magma.ca or www.geoconf.ca

The International Society for Photogrammetry and Remote Sensing (ISPRS) Commission V Symposium – Close range image measurement techniques 22-24 June, Newcastle upon Tyne, UK.
Contact: Dr David Barber, Email, isprs_sec@hotmail.com or www.isprs-newcastle2010.org

2010 Survey & Engineering GIS Summit 10-13 July, San Diego, CA, USA.
Contact: Email, segsummit@esri.com or www.esri.com/events/survey/index.html

ESRI International User Conference 12-16 July, San Diego, CA, USA.
Contact: Email, uc@esri.com or www.esri.com/events/uc/index.html

International Federation of Surveyors Workshop – Trends in Surveying Education and Training 26-28 August, University of East London, UK.
Contact: Email, Sharon Brown s.g.brown@uel.ac.uk or www.uel.ac.uk/fig

RSPSoc 2010 – The Remote Sensing and Photogrammetry Society annual conference with Irish Earth Observation Symposium

1-3 September, University College Cork, Ireland.
Contact: Email, Dr. Fiona Cawkwell rpsoc2010@ucc.ie or www.rpsoc2010.org

International Conference on Spatial Data Infrastructures 2010. Co-sponsored by FIG. 15-17 September, Skopje, Republic of Macedonia.
Contact: Email, sdiconf2010@agisee.org or www.agisee.org/sdiconf2010.htm

XIV International Congress for Mine Surveying 20-24 September, Sun City, South Africa.
Contact: Email, ism2010@globalconf.co.za or www.ism2010.co.za

AGI GeoCommunity'10 - Opportunities in a Changing World 28-30 September, Stratford-Upon-Avon, UK.
Contact: www.agigeocommunity.com

Geospatial Defence & Intelligence APAC 2010 28-30 September, Millenium Hotel, Kuala Lumpur, Malaysia.
Contact: www.geospatialdefenceasia.com

Intergeo 2010 5-7 October, Cologne, Germany.
Contact: www.intergeo.de

GeoDATA 2010 Seminar 10 November, Trades Hall, Glasgow.
Contact: www.training4gis.com

GeoDATA 2010 Seminar 16 November, Hastings Stormont Hotel, Belfast.
Contact: www.training4gis.com

New Year, New Board and an apology

Oceanology and FIG in Sydney are to the fore this time, with the RICS stand proving popular with students at the global marine event and a strong institution team at the four-yearly surveying congress. But in the meantime, why not hug a triggy?

Firstly, apologies to both Michael Hannaway and Martin Smith, who I missed off the board listing in my last column. The full listing is below in its complete form.

Ruth Adams (UK and Chair until Sept 2010)
Horst Borgmann (Europe)
Colin Bray (Europe)
Brian Coutts (Oceania)
Paul Cruddace (UK)
Peter Dare (Americas)
Stuart Edwards (UK and Chair Desig)
Mark Griffin (Middle East and Africa)
Ken Hall (UK)
Michael Hannaway (UK)
Gwyn Jones (UK)
Moira Knight (UK)
Simon Kraeter (UK)
Simon Kwok (Asia)
Duncan Moss (UK)
Chris Preston (UK)
Martin Smith (UK)

Geomatics Makes it Big!

Many congratulations to Rob Mahoney, a previous chair of Geomatics, who has been elected Honorary Secretary of RICS. He takes over from Jim Allen in July 2010. Rob is known to many of us for his unending commitment to all things surveying and is a nice chap to boot. It's great to have some geo input up in the high echelons of the RICS.

Oceanology International 2010

RICS attended Oceanology International in March and had a great time. Oceanology is a

massive biennial exhibition and this year was attended by nearly 7000 people from 75 countries. As ever, we were welcomed in the marine arena particularly as hydrography is such an international discipline. The global standing of the RICS qualification makes a lot of sense. Our biggest day was the Thursday, student day, and we signed many up. Thanks to RICS staff James Kavanagh and Chrissie Mallett for manning the stand.

In between the RICS stand I was able to explore some of the fascinating exhibits. There are lots of big geeky toys here notwithstanding five vessels berthed alongside. I spent a happy 90 minutes on HMS Cattistock, an RN minehunter, learning about mine countermeasures, how their SeaFox works and, of course, the vital cup of coffee with Ops! I also spent some time on Gardline's vessel, MV Confidante chatting about multibeam etc. On the exhibition floor I learnt all about oceanographic profilers, including XBTs, CTDs and ADCPs – ask me about them one day!

FIG Sydney

The 14th International Conference of FIG (Fédération Internationale des Géomètres) has just finished in Sydney. The RICS was represented by many members from around the world and you can read all about the conference at <http://www.fig2010.com/>. I expect the papers will be available for download very soon from either this site or the main FIG one, <http://www.fig.net/>. I will be keeping an eye out for the Commission 4 (Hydrography) papers but, of course, there will be a wide and varied selection offered across the whole genre of geomatics.

Teo CheeHai, from the Association of Authorised Land Surveyors Malaysia, has just been elected president for 2011-2014. Teo is a Fellow of RICS and currently Chairman of RICS Asia. He will be FIG's first non-European president since 2002, and the first non-western president for many more years than that. The RICS Geomatics Professional Group extends our warmest congratulations to him.

The obsession continues

I have an obsession with lumps of concrete. I doubt that, in the realms of this magazine, I am alone. My poor mother had to suffer this recently on a mum/daughter break to Dorchester where I espied a target sitting on the hill and had to go hug it. Despite being a geography teacher, she doesn't seem to feel the need as I do. From viewing the UK website <http://www.trigpointinguk.com/> I seem to be in good company.



The obsession to hug remote lumps of concrete continues.



Should old acquaintance be forgot. . !

By Malcolm Draper

Almost a night out in Las Vegas, Chinese puzzles and a decisive way to settle a boundary dispute come to our columnist's attention this issue.

Despite there being little work around in the survey business I seem to be as busy as ever! In March I went to the GEO-10 and met many old friends and acquaintances. It was great catching up with **Mike McKay** and **Robin Waters** plus **Richard Maltby**, **Paul MacArthur**, **Tim Brennan** and from the newly regurgitated PCA, **Andy Molloy** and **Dave Norris**. I was also delighted to see the Severn Partnership well represented including **Nigel Atkinson**, now busy doing boundary surveys and being a magistrate! Other old friends there were **John Tomlinson**, **Bill Dearling** and **Alan Thunhurst**. I think that's the lot but apologies to anyone I've missed especially if they bought me a drink!

The GEO-10 evening event followed a very different format to the usual sit-down dinner but worked extremely well. The gorgeous Las Vegas Showgirls greeted us as we entered the Casino and for a moment I was almost in the famous Nevada gambling resort until one of the girls whispered in my ear in a very rich Brummy accent, 'Now yo' 'ave a loo-vely eveninggg!'

I was almost in the famous Nevada gambling resort until one of the girls whispered. . .

Chinese puzzle

There have been several excellent lectures at the Royal Geographical Society this year. There was a really great one by Commander **Gavin**

Menzies who talked about his latest book, "1434" which argues that a Chinese fleet sailed to Italy in that year and ignited the Renaissance. According to Menzies the Europeans discovered very little, if any part of the world while the Chinese had traversed the whole planet and charted it by 1421! (the year and title of Menzies' earlier book on the global travels of the Chinese Treasure ships). He goes on to suggest that Columbus carried the Chinese charts to "re-discover" The Americas. An amazing tale that must leave conventional academic historians scratching their

heads and wondering if they've been wasting their careers by looking in the wrong places.

A nice aspect of the RGS evening lectures is that you run into so many people you know. I met up there recently with **Ron Craven** who gave me news of **Ray King** who used to work for PCA. He has been working in HK for well over 20 years where Ron saw him there 14 years ago. He originally worked for a Hong Kong based survey company, but for the past few years he has been working for himself, forming a company called Digital Image Surveys (CDIS). Ray says that it is worth his membership of the RICS to read Undercurrents in Geomatics World - thanks Ray, all bouquets welcome! If any of his old surveying friends are passing through HK he would be pleased to see them, he can be contacted on rayking@netvigator.com

Just before we leave news from the RGS, the Editor drew my attention to a brilliant exchange in the House of Lords involving **Lord Selbourne**, former president of the RGS whose wit always enlivened RGS meetings. He spoke in a debate about the future of Ordnance Survey towards the end of March (see also Richard Groom's article on page 28), questioning the minister on the outcome of the Government's consultation which called for the OS to be ready with any of three or more trading models to go into operation on 1st April. He asked whether the minister knew where the next week's funding for OS was to come from!

I was in touch recently with **Brian Hart**, a surveyor from Barbados who knew the late **Alan Rhodes** when he worked on the island. Brian was naturally very upset to learn of Alan's untimely death. We also chatted about business with Brian telling me that his workload had begun to slow although he was more concerned about the lack of rain for shaddock tree that produces those wonderful Caribbean citrus fruits.

Settling a boundary dispute

International boundary disputes can lead to wars. Undercurrents is therefore delighted to report that one long-running dispute has been settled without a shot being fired. The ownership of an uninhabited island in the Bay of Bengal has been disputed for years by India and Bangladesh. Although there was never a permanent settlement on the island, there



were visits by Indian naval vessels and temporary occupation to assert ownership. But today that's all over. If you want to visit New Moore Island or South Talpatti Island, as it was known to the Bangladeshis, you will need to go by submarine because it has sunk beneath the waves. Professor Sugata Hazra of the School of Oceanographic Studies Jadavpur University says that sea levels in this part of the Bay of Bengal have risen much faster over the last decade than they had done in the previous 15 years. He predicts other islands in the Bay are likely to follow suit in the coming decade.

Shortening days

Meanwhile, despite the apparently lengthening days of approaching summer, do not be deceived. Days are actually a little shorter than they were last year. According to scientists, the earthquake that hit Chile in February was so powerful it actually shook the Earth on its axis causing it to accelerate slightly. A day is now 1.26 microseconds shorter than before the quake. A microsecond is one millionth of a second. Amazing the things we can measure; now does this mean we've all got to work that little bit harder?

And talking of things we can measure, I was interested to see the unit of measurement applied by the writer of an article about the gold our prime minister (by now possibly

former prime minister) sold off in 1999 when he was chancellor of the exchequer. It totalled 395 tonnes or just over 20 cubic metres.

"About the same as a small caravan", the newspaper helpfully informed readers, unable to visualise 20 m³. And just in case we were unable to visualise small caravans they swapped to a different unit to measure the total amount of gold that has ever been mined: a stack of Routemaster buses four deep, four high and four wide. Interesting units but how many Routemasters are still running and how many people under 30 can visualise one?

Miscellany

We managed to raise £2500 for kidney research when my band, The Hangovers played at Sandown Park recently. It was a great evening but it nearly came to grief what with many guests stuck in far-off places due to the volcano and a few ructions in the band that nearly left us as "The Leftovers". It was ever thus in Rock 'n' Roll bands!

When **Gordon Brown** invited Sir **Tim Berners Lee**, who incidentally I was at school with, last year to lecture the cabinet on what freeing up public datasets could do, **Jack Straw** was heard to say - 'This is like having the inventor of the wheel to talk to us'. **David Milliband** was heard to say, 'and what was that like Jack?'

Got a tale to tell?

Please send letters for publication by e-mail to the Editor: editor@pvpubs.demon.co.uk or contact Undercurrents, in strictest confidence if you wish (we promise to change names, places, etc to protect the guilty!), via e-mail: rentamal@aol.com

Letters

The Editor welcomes letters from readers on relevant topics. Please endeavour to keep them brief and to the point. We reserve the right to edit for clarity and brevity. email: editor@pvpubs.demon.co.uk

John Taylor has written to the Editor from South Africa enquiring after old friends and acquaintances:

"Many years have passed since I began Survey work with an A+B vernier theodolites, Indian clinometer and alidade. I read the articles in the magazine with much interest and decreasing comprehension but I found myself in familiar territory in the current edition whilst reading the notes on scale factor etc.

I joined the pre-war Survey Battalion Royal Engineers in 1935 when it was part of the O.S. I would like to know if many of the former members are still on the planet. I write to ask if you or your readers would advise where I might apply to obtain this information."

Editor's note: I contacted Alan Gordon of the Defence Surveyors Association who informs me that there was a dinner at Hermitage in 1997 attended by some 15 members of the Battalion and all surviving director generals of Ordnance Survey. I have written to Mr Taylor with this information but if there are any members who knew him please get in touch and we will forward your contact details to him.

From Richard Benson

I read with interest Andy Roberts' views on trade or profession (GW Nov/Dec 2009). The status of land surveyors has been an ongoing debate for at least as long as I have worked in this field, some 37 years and probably goes back to the mists of time.

The essential problem is that we are site workers. All professionals can't wait to get away from site work, into the suit and tie, and out of the worn reflective jacket etc. At a site meeting you can always spot the professionals: their reflective jacket is new as is the hat and wellingtons. They look at a site but don't see it.

We work on a tender basis not a fee structure. In this respect we

are just like a builder. A builder gets work largely by word of mouth and I would imagine that in a lot of instances this applies to Land Surveying. The problem comes in a tender. Building work comes with a set of drawings etc. With survey this is replaced by the spec. Andy is correct; the specification is often old, out of date and irrelevant - it's just picked out of a hat or taken from the RICS booklet with the relevant bits filled in.

Does anyone ever check the final product and whether it matches the specification? My experience would say no. There has rarely been the time or the money to divert from the final design to checking the base survey. It is accepted as correct. Similarly, a tradesman produces the goods, building erected. It takes some scrutiny to tell the good from the bad and in the end you don't pull it down, you live with it. You perhaps try suing the tradesman, but to what effect? Similarly, our data is presented as a final product either on disk or paper. The data is accepted and for the most part goes unverified. How many readers have seen OS information used as the base with levels and detail surveyed in? This is not a lot of use for some projects but why not use this in certain conditions, if it is "fit for purpose"?

My feelings are that we are a trade and should be proud to be so. As a trade we should encourage everyone to be included just like master builders. Not every builder is in this association and clients must beware the person who is not. More especially, bids should be a matter of past experience and the quality of previous jobs; not the adherence to a specification that is at best poorly understood. Like all tradesmen, it is our attention to detail and close liaison with the client that really counts. We must accept what we are, tradesmen. There is nothing wrong with pursuing a trade and if you wish to be a professional then there are other areas of work to move into.

Oceanology consumes Excel

By Richard Groom, Richard Wylde and Gordon Johnston

The biennial offshore exhibition attracts visitors as well as vessels to London's riverside Excel centre.

Richard Groom reports with additional material from **Richard Wylde** and **Gordon Johnston**.

London's Excel Conference Centre might have been built for Oceanology International (OI). This free biennial event took place in March and, despite the recession, consumed every inch of the exhibition space with five hundred exhibitors and then spilt over onto the quayside where there was a flotilla of vessels on hand to display the latest marine technology in action. Over the three days, 6921 people from 75 countries attended. Over 38% of visitors came from overseas.

Five stream conference

The event also included a conference, or more precisely five one-day streams: Navigation and Positioning; Ocean Observation and Forecasting; Hydrography and Geophysics; Geotechnics; and the Marine Environment. The range of topics demonstrates the reach and pulling-power of this event. I attended some of the sessions on hydrography. Inevitably, when they are free, most of the talks are from suppliers eager to promote their wares and so the conference presents the exhibitors with an opportunity to extend their reach beyond their stands. That said the quality across the various sessions was of a high order, such as the underwater and above water elements of the Navigation & Positioning stream and the Hydrography and Geophysics papers.

Underwater flying

The mainstream hydrographic survey companies and their suppliers were on show. Several supplier companies now offer multibeam and interferometric bathymetry systems. These are operating at ever higher frequencies and benefiting from improved position fixing through advances in GNSS and inertial navigation systems (INS). The result is higher resolution data that makes the technology useful for detailed inspection work.

As well as being mounted on conventional surface vessels these systems can also be installed on remotely operated vehicles (ROVs). Like their airborne cousins, there are safety issues with this technology but it is certainly developing fast. Take this a stage further and sensors can be fitted to autonomous underwater vehicles (AUVs). Whilst on the surface, AUVs gain their position using GNSS and initialise their INS. Then, when they dive, they navigate on the INS alone. The submarine environment is ideal for INS because it is possible to pre-define trajectories that minimise drift. It does however offer an interesting challenge for the surveyors who are accustomed to a slow accumulation of data but now receive the whole survey at the end of the flight in one large dataset. The required access to the detailed data for QC purposes and the need for intensive processing put pressures on the offshore personnel to find ways to minimise delays but maintain data quality.

In days gone by, the survey companies were the ones vying for the biggest stand, introducing new technologies and offering prospects to the young students of the day. However, the impression at this Oceanology was that the underwater sensor and acoustic systems manufacturers had increased their presence.

Back on the surface, **Applanix** has developed its LANDMark Marine product to combine point clouds from bathymetry and



Oceanology (right) filled the London Dockland's Excel facility with over 500 exhibitors. The dockside location provided the ideal spot to moor survey vessels (above), old and new.



laser scanned data above the water line. This is seen as useful for offshore rig and harbour wall inspections.

Designing in the clouds

For point cloud data processing in the marine environment, **Fledermaus** software from IVS 3D is now at version 7.0. The software is available in five bundles, one of which has a 4D component and another has functions for interactive planning and design of seabed pipeline and cable routes. What better way to get point cloud data accepted than to write design software within the data manipulation, management and production packages?

Similarly, **CARIS** were demonstrating their latest package for processing high density multibeam sonar data, HIPS & SIPS 7.0. Further modules of **CARIS** demonstrated their data management solution, Bathymetry Database 3.0, highlighting its support for true 3D bathymetric point clouds.

Blue Marble Geographics has developed from the geographic calculator into a powerhouse of data conversion software that is useful on land and at sea, and particularly in that world of multiple datums and projections – the oil industry. As well as transforming and converting between different datums and map projections, Blue Marble also offers translations between many

Survey vessels moored along side the Excel Centre.



CAD and GIS data formats.

Finally, my attention was caught by the NPL stand. The **National Physical Laboratory** offers a calibration service for underwater acoustic systems including ROVs, AUVs, transducers and sonars using facilities at one of the reservoirs near London and their Teddington laboratories.

Speaking to a long standing OI visitor, I got the impression that this year's event was every bit as busy as previous ones, but there was a noticeable shift towards marine environmental science marked by the large stand from the Global Ocean Observing System (GOOS) – the marine equivalent of GGOS (for geodesy).

“What better way to get point cloud data accepted than to write design software within the data manipulation, management and production packages?”

SURVEY REVIEW

Survey Review is a leading and prestigious journal published quarterly by Maney Publishing on behalf of Survey Review Ltd. The journal brings together an unrivalled body of knowledge in the land and engineering survey profession, with papers on research, theory, practice and management.

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www.surveymagazine.org



SPAR 2010: change in size, scale and solutions demoed

By Patrick Collins

GW editorial board member **Patrick Collins** reports on SPAR, which he attended earlier this year. Run by Spar Point Research LLC, the annual event aims to showcase 3D laser scanning, dynamic survey/LiDAR, new data capture and processing technologies used for 3D surveying and dimensional control.

SPAR, the annual conference specialising in the use of laser scanning and related 3D technology, took place in Houston at the beginning of February. This was the seventh year of SPAR with attendance at over 750, up 23% on the previous year and 19% of attendees from overseas. This year the conference was based at the Marriott Hotel in The Woodlands, a master-planned community north of Houston, with shops, cinemas & other amenities all within walking distance of the hotel. Anyone familiar with Houston will know that the ability to walk somewhere is highly unusual!

The conference is spread over three days with presentations divided into different tracks covering Industrial Plant, Mobile Surveying, Security Planning & Forensic, Civil Infrastructure, New 3D Imaging Technologies, Data Management, Geotechnical and Mining, Historic Preservation and, new this year, Scan to BIM (Building Information Modelling).

With four different tracks running concurrently alongside vendor presentations it is not physically possible to cover all of the conference. The comprehensive documentation goes a long way to help select the most relevant presentations but of course it's often the unexpected presentations that can reveal something new, useful or interesting. In this context, **Allan Carswell** of Optech talking about the use of Lidar for measuring atmosphere conditions was both fascinating and volcanically timely! Many of

the presentations are placed on-line after the conference so one can at least get an overview of what was missed.

Real working projects

The presentations are a mixture of software and hardware manufacturers, academics, service providers and client/end users giving a wide and diverse selection of projects and views. From a commercial practitioner point-of-view, the demonstration of real working projects and discussions on problems and success is invaluable in understanding the current benefits and limits of the technology. This was illustrated by the new track on Scan to BIM, a process gaining a lot of interest due in no small measure to the US General Services Administration having adopted a National 3D-4D BIM Program. (*GSA describe themselves as the world's largest landlord with some 1600 buildings under their control – similar to our former PSA*).

The GSA see laser scanning as part of this process and are actively funding projects as proof-of-concept for enhancing the accuracy and efficiency of documenting existing conditions of their assets. One of the case studies presented under this program was by **Pat Carmichael** of HKS, an 1,100 employee multi-disciplined practice, for the 50 United National Plaza building in San Francisco. This is a Beaux-Arts structure from 1936 and the project is funded by the American Recovery and Reinvestment Act, an economic stimulus package enacted by Congress in February 2009. At over 360,000 gross square feet with 1,200 rooms on seven floors the building proved too complex to complete solely by scanning. Just the outside elevations and internal circulation routes were scanned with the remainder of the building measured by hand. The resulting survey was then modelled in Revit.

Whilst this was a large project by any standards there seemed little additional data to suggest what benefits were gained by the Scan to BIM route. With no case studies or experience of similar structures using more traditional techniques, it was difficult to know



Mobile scanning solutions are now available from the major hardware developers.

the real gains. This appeared to be a common issue with many of the presentations, where participants had little past experience of the type of projects being shown and no comparative metrics. As the speed of data acquisition increases innovation is certainly required but without proper comparative studies it is hard to quantify what the gains are over the true cost of producing such information.

Whilst there is no doubt that benefits exist from following an "all-digital" process, some of these benefits are only quantifiable through the duration of the project. This can be difficult to account for in additional survey costs charged at the start of the project. Given the fragmented nature of the UK construction process, these additional costs will not be accepted without further rigorous analysis.

Maturity of mobile surveying

My last visit to SPAR was in 2008 and in there has been a definite change in the types solutions on offer and the size and scale of projects demonstrated. Presentations by small-scale niche developers using their skills and expertise seemed to be replaced by larger organisations and developers defining new markets. As an example the Mobile Surveying solutions on offer two years ago were from independent developers, whereas this year all the major hardware manufacturers had their own integrated solutions on show, costing hundreds of thousands of dollars. Mobile Surveying is a good example of a defined solution to an existing problem where scale of economy can revolutionise working practice. These solutions show an increasing maturity when compared to some of the laser scanning markets.

The sense that the market was starting to mature was underlined by both AutoDesk and Bentley Systems announcing point-cloud integration directly within their CAD software. The ability for the wider AEC community to manipulate and view point-clouds as part of their common toolset will have a positive demand for such data. Certainly, this year many of the presentations from large corporations showed solutions that used point-clouds as a direct deliverable – Rajeev Kalamdani of the Ford Motor Company described this as "field checks" – allowing design and integration with such features as clash detection without the costly overhead of modelling the data.

Incremental change now

Laser scanning hardware, as a generalisation, has reached a stable platform and changes will now be incremental. On software issues there remains both the problem of handling large amounts of data and the ability to convert point-cloud data into some form of recognisable deliverable. Many of the issues highlighted and discussed at the conference

With a choice of four tracks there was still plenty of time to network and study manufacturer's offerings.



were about data management issues (terabytes of data, file formats between different software, etc.) or about surveying issues (survey control, point cloud registration, image calibration, etc.). The managing, co-ordinating and analysis of large datasets has always been part of the skill base of the land surveying profession. Given the problems discussed at the conference, the laser scanning community seems to be adopting the technology often without the underlying principals of survey processes and data management.

As **Dan Beardslee** said "Land Surveyors are paid not to drive stakes in the ground but to know where to drive the stakes". The same principal applies to all types of data collection – we are not paid for the number of points we collect but for collecting the right points. As new tools are developed to take advantage of this disruptive technology the analysis of data and its transformation into information will move from the site collection process to the desktop, but for now quantity doesn't equate to quality. Laser-scanning technology is being used on some exciting projects but the gap remains between specialised applications and the wider general market. Better tools for manipulating and analysing the data will close this gap and, from some of the technologies on show at SPAR, we do not have long to wait.

"... we are not paid for the number of points we collect but for collecting the right points."

• All images copyright Spar Point Group and Hixson Photography.

Time for that one-to-one demo.



High Resolution, compact SAR arrives

By Dr Adriano Meta

Dutch company MetaSensing has developed synthetic aperture radar for airborne platforms.

Adriano Meta describes how affordable, high resolution SAR will open up new markets for this technology.

For certain airborne mapping applications like change detection, deformation monitoring, imaging in cloudy areas or detection under foliage, radar is often the only viable solution. Yet the commercial use of airborne radar has been limited to just a few companies in the world. They use it for large and very expensive projects because of the very high cost associated with the mobilisation and operation of the radar instrument. That was until a few months ago. . .

By combining a new radar technology and advanced Synthetic Aperture Radar (SAR) techniques, MetaSensing has developed very high resolution, cost-effective airborne mapping sensors and services. High-resolution mapping is desirable for homeland security, environmental assessment and infrastructure monitoring, but it has hitherto usually been too expensive or difficult to realise.

Compact technology for lower operating costs

MetaSensing is starting to provide a cost effective mapping solution that meets the needs of governments and private companies who face daily the increasing demand for accurate monitoring. The mapping technique is based on SAR and interferometric SAR, a technology for producing 2D and 3D imaging employing a radar sensor [1].

Big and expensive sensors and aircraft are not needed for mapping campaigns using MetaSensing's technology. Accurate mapping measurements can be carried out by employing small, readily available and cost effective aircraft, cutting the high operational costs of such campaigns.

One of the main advantages of MetaSensing's sensors is the very low irradiated power, which results in a low power consumption for the whole sensor whilst it is still able to image areas of several kilometres. This feature is of great importance when considering the use of high resolution SAR sensors on board small Unmanned Aerial Vehicles (UAVs).

The reduced operational cost of the airborne mapping radar services directly translates into benefits for commercial and scientific airborne radar mapping applications.

SAR and Interferometric SAR

Synthetic Aperture Radar is a remote sensing imaging technology. Like lidar, radar is an active sensor that transmits electromagnetic energy and records the reflection of this energy from objects on the earth's surface.

SAR is a digital signal processing technique that combines several radar signals coming back from the imaged area as the sensor moves forward in the flying direction. The end result is that range and azimuth resolution are constant and independent of the distance.

The radar's unique ability to operate in any weather condition (at night, with fog or clouds) and its particular interaction with vegetation, soil and water, make it an extremely useful tool for studies embracing many natural resource applications.

Depending on the radar frequency, different penetration is achieved in vegetated areas, with lower frequencies penetrating deeper.

The commercial use of radar in topographic mapping applications has expanded greatly in



Fig. 1: The MetaSensing radar is a compact sensor that can be mounted on small unmanned aircraft or on single-engine aircraft such as the Cessna 172, shown here. It is, therefore, easy to image any item or area of land at a much lower cost than traditional surveys.

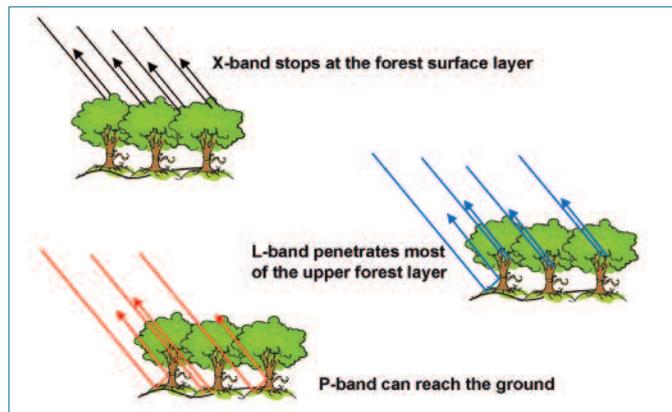


Fig. 2: By using different radar frequencies, different penetration in vegetation areas can be achieved. Lower frequency radar, such as P-band, can potentially penetrate 15 metres in sandy regions, enabling mine detection, water network mapping and heritage studies.

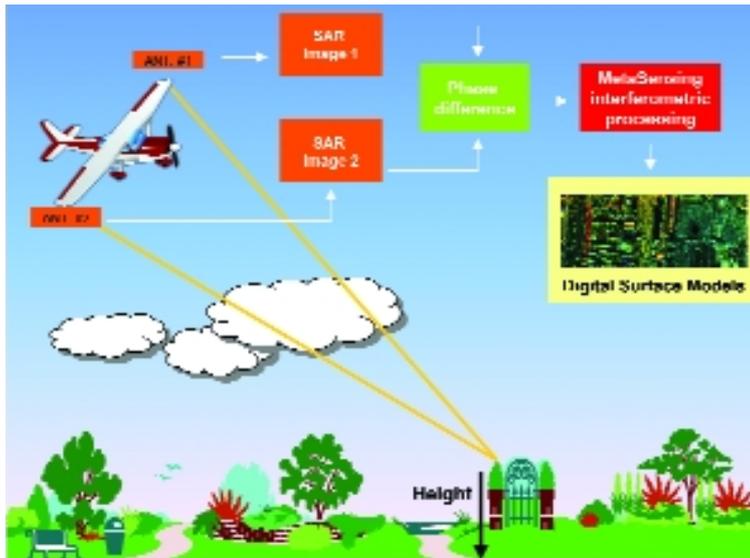


Fig. 3 (left): MetaSensing’s proprietary airborne interferometric SAR processing generates digital surface map products from radar data collected by small and readily available airborne systems. Height information is obtained by using the interferograms – the phase difference between two coherent SAR images acquired simultaneously by two radar antennae looking at the same ground area from different positions.

the past decade; however, the number of available commercial systems is quite low, compared to aerial cameras and lidar. This is attributable to the high cost of development and operation of a conventional SAR platform-sensor system. MetaSensing has changed this by drastically reducing the operational costs of SAR airborne campaigns.

Interferometric SAR is to radar what stereo pairs are to photogrammetry. Different images of the same area taken from different angles are combined together to retrieve three dimensional information. In the case of radar, the phase differences between two radar images form what is called an interferogram and carries the 3D information.

Recent system testing

In 2009, MetaSensing performed flight campaigns for interferometric SAR acquisitions. For the first time in the world, such images have been acquired with a compact radar sensor and using small aircraft.

All the images presented in this paper have been processed with a spatial resolution of 40 cm and a pixel spacing of 25cm. MetaSensing’s X-band sensor is, however, able to acquire images with a maximum resolution reaching 15 cm; this high-resolution mode being currently under test.

The first campaigns for acquiring 2D images were performed in April 2009 on different areas in The Netherlands and in Portugal. Then, in September further flights were made for testing 3D applications.

Figures 5 and 6 show some examples of images acquired during the two campaigns. More pictures and updated information can be found at [2]. Figure 5 demonstrates the post-processing applied to a single look 2D radar image in order to remove speckle noise (the typical salt and pepper noise in radar images) and to highlight human structures by colour coding the direction of arrival of the radar backscatter energy.

Figure 6 (over page) shows interferograms

Fig. 4: (below) MetaSensing radar images can be directly displayed using standard geographical software such as Google Earth.



Fig. 5 (right): A 2D radar picture acquired in The Netherlands. In a) the single look radar image; in b) the multilooked image; in c) a colour coded images where colours are related to the direction of scattering. Therefore, colour indicates the orientation of the surface toward the aircraft carrying the radar. This image highlights the sensitivity of radar sensors to human structures.



Fig 5a

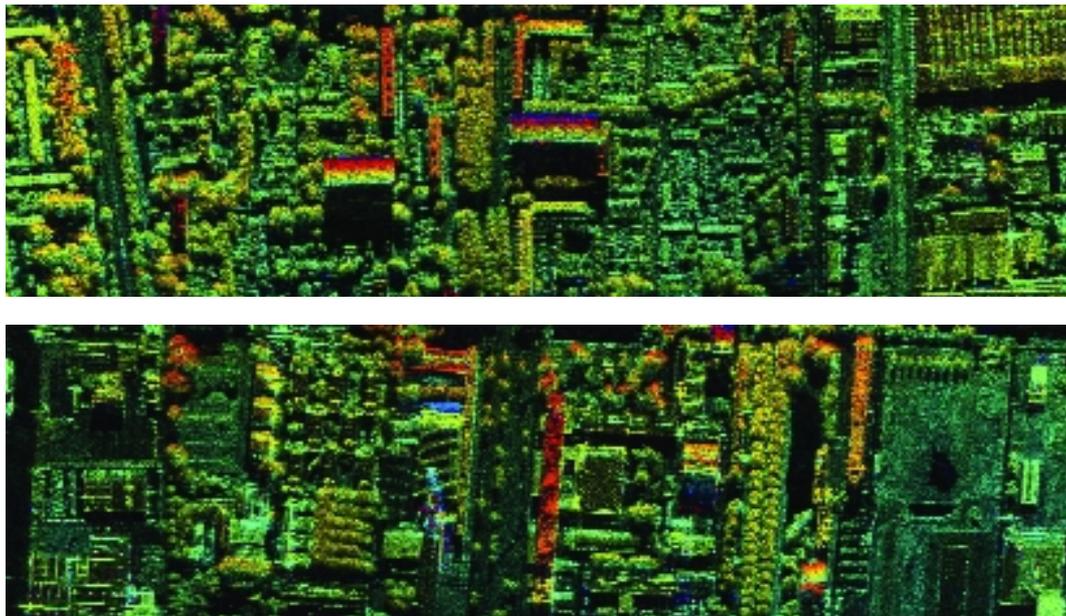


Fig 5b



Fig 5c

Fig 6: Radar interferograms acquired by MetaSensing X-band sensor. Colours (going from blue through green, yellow to red) indicate the height of the area imaged, while the intensity of the picture is related to the radar backscatter level. These digital surface model images are the first in the world to be acquired by a compact radar technology and feature a resolution improvement of more than 10 times when compared to conventional commercial radar images.



for 3D information retrieval. Colours (going from blue through green, yellow to red) indicate the height of the area imaged, while the intensity of the picture is related to the radar backscatter level. These digital surface model images are the first in the world to be acquired by a compact radar technology and feature an improvement in resolution of more than 10 times when compared to conventional commercial radar images produced using older technology.

MetaSensing's proprietary processing chain is able to produce radar images in different formats, such as;

- the traditional radar range-azimuth coordinates in single look or detected format;
- geolocated images in latitude/longitude or UTM coordinates over different geoids (standard is WGS84);

Data can be output in other specific formats on request.

Looking ahead

MetaSensing currently operates an X-band sensor. An L-band version is under test and will be available for the third quarter of 2010. The L-band sensor will allow the company to complement its current X-band capability in order to cover several other applications for vegetation monitoring, like forest mapping, biomass estimation and soil moisture measurements.

For the fourth quarter of 2010, a P-band version of the new MetaSensing technology will also be available for addressing digital surface mapping of forested areas and sand penetration for water networks, national security, and heritage management. Very low-frequency sensors, such as P-band radar, can indeed penetrate depths of fifteen metres or more depending on soil composition, radar incidence angles, and soil moisture.

Partnership opportunity

The new radar technology is based on several years of advanced research in prominent European research institutes and is supported by the European Space Agency through its Business programme.

MetaSensing is interested in partnerships with enabling mapping companies for the best and most efficient use of the new radar mapping technology.

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- [1] J. C. Curlander, R. N. McDonough, Synthetic Aperture Radar Systems and Signal Processing, John Wiley & Sons, Inc., 1991
- [2] www.metasensing.com

About the author

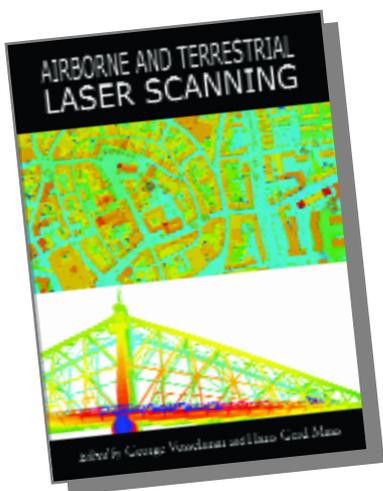


Dr Adriano Meta is director of MetaSensing, the company he founded to commercialise the new compact, high-resolution radar mapping technology. With a decade of advanced radar research and management in prominent European universities, research institutes and space agencies (TU Delft, University of Rome Aerospace School, TNO Defense Security and Safety, German Aerospace Center, ESA incubation), he is a recognised expert in radar mapping and SAR technology.

- For more information visit www.metasensing.com or email info@metasensing.com

“ P-band radar, can indeed penetrate depths of fifteen metres or more. . . ”

Airborne and Terrestrial Laser Scanning



Edited by George Vosselman and Hans-Gerd Maas. Whittles Publishing, Caithness, Scotland, 2010. ISBN 978-1904445-87-6. xviii + 318 pages. Illustrated, full colour, hardback.

The ongoing development and commercialisation of laser scanning as a geomatics technique has been accompanied by a diverse avalanche of literature. Despite this, the emergence of definitive reference texts has been notably lacking, most likely due to the dynamic evolution of laser scanning technology. However, *Airborne and Terrestrial Laser Scanning* is a comprehensive work which appears to go some way to plugging this gap. Although often treated separately, airborne and terrestrial laser scanning (ALS and TLS respectively) are presented side-by-side in this text, which highlights fundamental parallels, whilst effectively detailing system- and application-specific differences. This generously-illustrated, full-colour text is edited by George Vosselman and Hans-

a comprehensive core text expected to retain longer term relevancy

Gerd Maas, two leading authorities in laser scanning research, and individual chapter contributions from a host of respected experts lends further credence.

The book is structured around nine chapters, which progress from fundamental concepts through to increasingly focused application examples. Chapter One reviews Laser Scanning Technology, introducing the principles of laser distance measurement and scanning mechanisms. This is followed by ALS-specific considerations, examining operational aspects such as the integration of GPS-IMU data and imagery. The chapter is particularly well illustrated with numerous full-colour figures and fundamental equations. Chapter Two introduces Visualisation and Structuring of Point Clouds. Addressing oft-overlooked aspects, such as the visualisation of data for quality control purposes, this chapter also considers point cloud structuring, including octrees and k-D trees.

Chapter Three tackles Registration and Calibration, elaborating on the mathematical principles of laser scanning system geometry, including the complexities of ALS, and relationship with the GPS-IMU reference frame. A useful discussion on determination of the aircraft trajectory and systematic errors is also provided, which is then extended into TLS through a detailed examination of systematic errors and common data artefacts. This provides the background for a detailed section on registration principles, including conventional target-based registration, point cloud matching approaches, and

feature-based registration.

The final part of the chapter considers the important concept of TLS and ALS system calibration. Chapter Four considers a process intrinsically related to laser scanning – Extraction of Digital Terrain Models. This commences with a comprehensive overview of point cloud filtering. Somewhat surprisingly, this chapter lacks the mathematical elaborations of earlier chapters, but is nevertheless equally effective in educating the reader. The potential of full waveform information for enhancing the overall performance of DTM filtering is highlighted. Building Extraction is reviewed in Chapter Five, with an in-depth discussion of building detection methods, extraction of building footprints, and building reconstruction and modelling. This field is highly research-driven, and is effectively illustrated with examples from the literature throughout.

Chapter Five concludes with a short section on data exchange formats for building models, identifying the growing demand for improved interoperability of building model data.

Whilst Chapters Four and Five are application focused, Chapters Six, Seven and Eight can be considered even more so, focusing on Forestry, Engineering, and Cultural Heritage respectively. This acknowledges the notable impact of laser scanning technology on these respective fields. The emerging technique of full waveform digitisation perhaps holds greatest promise for forestry applications, as elaborated on in Chapter Six, which highlights the value of dense ALS information for a

range of forest studies and the specific benefits of TLS for detailed localised and single tree structural modelling. Chapter Seven reviews Engineering Applications, from the use of TLS for modelling of engineering works and morphological monitoring of landslides, through to ALS for powerline and transport corridor monitoring.

Chapter Eight presents the well-established application of laser scanning for cultural heritage through a series of selected and well-illustrated examples. Although primarily focusing on TLS, an example of the use of ALS for archaeological analysis of forested terrain is also presented. Finally, Chapter Nine somewhat draws together the terrestrial and airborne strands through the rapidly developing technique of Mobile Mapping. Data collection, registration and processing are considered, and application examples are provided. Issues of calibration and data accuracy and precision are also briefly discussed.

This text provides a comprehensive account of airborne and terrestrial laser scanning. By avoiding manufacturer-specific content and instead focusing on fundamental concepts and applications, the book can be expected to retain longer-term relevancy. This will likely become a core text for undergraduate students, but will doubtlessly also appeal to a broader range of readers, including those engaged in academic research and commercial practice.

*Reviewer, Pauline E. Miller
School of Civil Engineering and Geosciences
Newcastle University*



To buy a copy of Airborne and Terrestrial Laser Scanning or other essential reference titles on geomatics, go to:

**<http://www.pvpubs.com/books.php>
or call 01438 352617**

Shallow water surveys for small hydro electric

By Carlo Peris, Pangea srl and Tom Hiller, GeoAcoustics Ltd

Small inland reservoirs with dams can present a serious challenge to the hydrographic surveyor. Mobilising a boat and equipment plus running survey lines in shallow water are but two. **Carlo Peris** and **Tom Hiller** relate the challenges of using swathe bathymetry to survey small reservoirs in northern Italy.

Small hydroelectric generation stations can provide local, environmentally friendly power wherever a suitable head of water exists. By the end of 2008 'small-hydro' was generating over 85 gigawatts of power from installations with capacities of a few hundred kW up to a few tens of mW (compared to the Hoover dam at over 2000mW).

These installations often use existing dams or are developed alongside new dams whose primary purpose is river water-level control or irrigation. There are many thousands of these small dams worldwide (over 95,000 in the US alone) and maintaining this infrastructure requires accurate mapping and monitoring. But this can present some novel challenges to the hydrographic surveyor. This article describes the experiences of one company providing hydrographic surveys of dams in the Apennine Mountains of Italy.

Many small sites

In 2007 Pangea Srl was contracted by Enel SPA to perform bathymetric and topographic surveys around hydroelectric plants located in the Lazio and Abruzzo regions of central Italy, including installations on rivers such as the Liri (province of Frosinone) and the Tiber (upstream of Rome). The project covered

many sites but each individual survey project was fairly limited in area, including some dams only a few tens of metres across.

The accuracy requirements for monitoring the sedimentation and shape of a dam floor are comparable to a ship navigation channel or dredge works. Knowledge of the water depth and total volume is required for dam maintenance and to maximise the renewable energy output. Detailed bathymetry allows improved irrigation planning and flood control, and survey images show the status of the dam infrastructure (such as the threshold and sluice gates). Accurate depth maps can also be critical to the safe operation of the hydroelectric facility and to inform the risk assessment of the dam structure.

Getting the boat to water

The difficulties posed by this kind of survey are in two main areas. Firstly, survey sites may be remote and there may be limited access to the bank, and no piers. The dam may be some distance from the nearest road, requiring all the equipment to be carried over rough land. This can make it difficult to mobilise the survey. Second, running the survey lines is difficult because of the limited depth of water (sometimes less than a metre over much of the dam periphery) along with the presence of hazards to navigation such as trees or submerged structures.

Often during the survey the boat will need to navigate close to a shore covered by dense vegetation and around the hydroelectric plant structures. These difficulties exclude the possibility of using a standard survey launch; something much lighter and man-launchable is required, but it still has to carry a fully capable hydrographic survey rig.

For this contract, Pangea chose two vessels: a 3.7 m long aluminium boat and a 4.3 m inflatable boat. The advantages of the aluminium boat are its lightness and strength; it is easily transportable, is straightforward to launch and robust around obstacles. However

it was found to be fairly unstable especially when loaded with crew and numerous instruments that raised the centre of gravity. The advantage of the inflatable boat was the stability, allowing good mobility when the boat was fully loaded and operating. However, it was heavier and less resilient, leading to transport

GeoSwath 250kHz transducer head on the inflatable's customised mount.



Right: Access to the waterside is sometimes difficult!



Far right: Surveying a small dam near Volci, Italy.



difficulties where waterside access was limited and the greater likelihood of damage during launching or around obstacles. In order to limit the weight and the quantity of equipment to be carried to the site, a small 2 hp outboard engine was often used, or even oars in the smallest sites. In the larger surveys and in the rivers a 15 hp outboard engine was used.

Interferometric sonar selected

Choice of a suitable integrated hydrographic package was key to successful completion of the contracts. The requirements were for wide swath bathymetric mapping to better than IHO special order specifications, along with co-registered side-scan images for structure inspection, with reasonable productivity in water depths often less than 1m and data collection up to the waterline. The GeoSwath Plus (GS+) interferometric sonar from GeoAcoustics Ltd, a Kongsberg company was chosen. One of the great advantages of the GS+ for this type of small boat work is its compactness. Most of the ancillary sensors are integrated into the transducer V-Plate, which saves space, saves time during installation and allows pre-calibration of the offsets between the sensors. Full calibration on-site would often have been difficult because of the small extent of the survey areas. Another advantage of the GeoSwath is the robustness of the V-Plate and transducers; more than once an accidental grounding left the system undamaged.

The equipment sometimes had to be hand carried over rough terrain to the waterside, which is only feasible for a compact system like the GS+. The boat was separately craned in or manhandled to the water. At each survey site the transit to the waterside, installation of equipment on the vessel and system tests took about two hours in total. Data acquisition usually lasted 1-2 hours (sometimes much less on the smaller dams) and dismantling took about 1 hour. The biggest problem usually encountered was how to get the equipment from the van to the waterside and back.

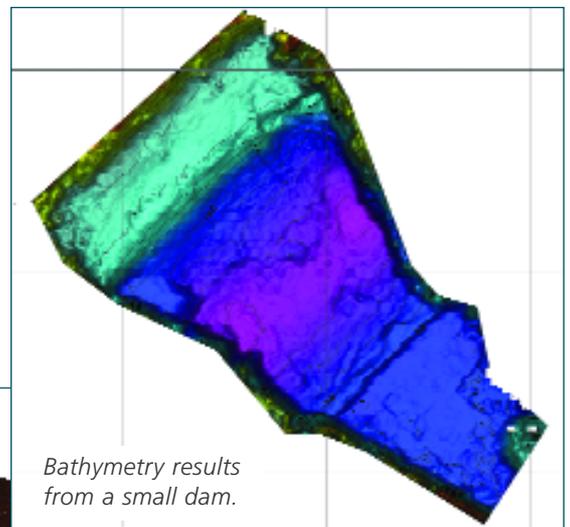
Not just bathymetry

The data deliverables were bathymetry and side-scan data processed by GS+ as well as depth profiles exported directly from the real-time data collection windows. The real-time side-scan data displays also proved to be very useful for data interpretation on-site. The images accompanying this article show a few of the installations used and bathymetric survey results. After carrying out successful survey seasons in 2008 and 2009, Pangea can report that the compact GS+ is ideal for this type of small boat hydrography in harsh environments.

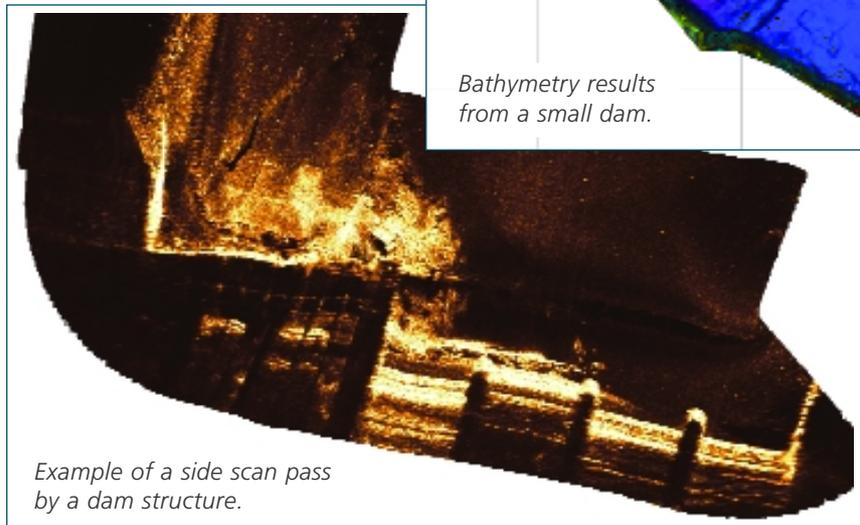
This project has shown that modern highly accurate wide swath hydrographic survey equipment can be economically deployed for restricted area surveys, with rapid mobilisation and limited time on-site. Even the smallest hydropower dam can be fully mapped quickly and efficiently. This type of mapping capability can be used to increase the safety and efficient operation of small-hydro projects worldwide.

- For more information visit www.pangeamare.it and www.geoacoustics.com

“The dam may be some distance from the nearest road, requiring all the equipment to be carried over rough land.”



Bathymetry results from a small dam.



Example of a side scan pass by a dam structure.

Multibeam or phase measuring bathymetry

In contrast to single beam echo-sounding, where a single depth value is recorded at a time below the survey vessel to deliver a depth profile in the direction of travel of the ship, with multibeam echo-sounding numerous beams are formed electronically across the direction of travel, to acquire a swath of depth values along the survey direction. This makes it possible to map the seafloor in great detail. The swathe covered is typically five times the depth of the water.

Interferometric or phase measuring bathymetric sonar (PMBS) do not form individual beams to acquire depth measurements. Only two beams are transmitted, port and starboard from the direction of travel, which cover a swath, narrow along the direction of travel and

very wide across. Depth values are obtained by comparing the phases of the signal backscattered from the seafloor and recorded at receiver elements in the transducer head. Additionally, the amplitude of the backscattered signal is recorded.

What's the difference? Both technologies deliver the same data result: a high resolution bathymetry map of the seafloor. In addition the recorded backscatter amplitudes in the PMBS can be used to produce a side-scan image of the survey area. The PMBS are limited to shallow water (up to 200 m), where they are very productive with a swath width of up to 12 times the water depth.

GEO-10

– busy two days



This year's GEO event – GEO-10 – was again held at Ricoh Arena, Coventry. Supported by 35 exhibitors and attended by nearly 600 people over the two days. **Richard Groom and Hayley Tear** report.

This is the third "GEO" event at Ricoh Arena. This year's show included two seminar streams spread over the two-day event (with 29 individual sessions); and attracted two leading sponsors in ESRI UK and SCCS, representing respectively the GIS and Geomatics side of geospatial. Surveyed evidence afterwards found positive feedback from visitors. One visitor stated "I attended the first two seminars and they were really what made the day" and another "I regret not spending more time there really. . ."

The exhibition showcased two high-speed laser-scanning vehicles on the showfloor and another outside. Despite the major suppliers leaving it to their dealers, following the failure last year to reach agreement for a joint show with CICES (which staged its own event ahead of GEO-10) attendance was only marginally down by 5% from last year. Overall the show was judged ". . . well organised, informative and interesting" by a typical visitor and from an exhibitor, "a zillion times better than another event" that had taken place three weeks earlier.

Organiser **Stephen Booth** commented, 'Although the big three weren't there (Trimble, Leica, Topcon) we felt they were well represented through their dealers. What impressed us, was the way companies like SCCS, KOREC, Opti-cal and Phoenix all stepped up to take a strong presence. For the future, the industry must avoid this date clashing and we have already invited CICES to meet with us.'

Seminars

Navigating the day-to-day world of work is arguably an exercise in dead reckoning. We seek out work to determine the path forward, concentrate on the current job to keep the ship stable and try to avoid leaving anything unpleasant in our wake. The trouble with



Phoenix had a rather stylish mini for scanning.

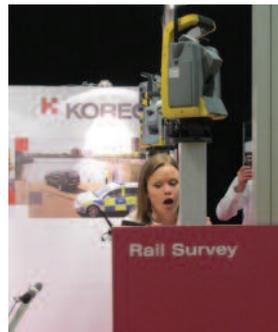
dead reckoning is that, however accurate the navigation system, it will cause you to drift off course gradually. Resetting position and course requires absolute position fixing and for that we have GEO-10.

As well as staging the exhibitor's show-floor seminars, a second seminar stream was on offer that began with "3D scanning comes of age". **Timothy Beach** from Multi-Limn has been using high definition scanning (HDS) since January 2003 and currently uses a Leica ScanStation 2. There is huge potential in laser scanning, argues Beach. It can be used with a vehicle; allows a "one person" methodology in the field - and it will never turn up late! Early projects found that it worked well for GIS data collection and was perfect for building elevations and road marking work. It also provided the opportunity to provide information to bigger companies who perhaps don't want to invest in a scanner. So why scan everything? Simply because we can, because the equipment is available and it takes nothing to set up and because scan data might be useful for the future, answered Beach. Our company motto is "we've got a scanner, so let's use it!"

Alan Barrow, ABA Surveying Ltd, explained how his firm had pioneered 3D scanning for railway surveys in 2000 and kinematic 3D scanning was introduced in 2004. Although we have seen many technological advances, 'what is important is finding uses for this technology. Surveying is moving on', he argues, 'we always push the boundaries' but now must aim to 'broaden our horizons on uses - the beauty of scanning is that it's blind. It does the same job whoever uses it'.

Mapping from horseback

The British Horse Society has a project to map Britain on horseback using crowd sourcing. The results are going into a GIS for equestrians called EMAGIN. **Heather Clatworthy** and **Ceri**



Rail was to the fore. SCCS (above left) and BRSSOS (centre) showed rail surveying solutions along with KOREC, whose offering was clearly jaw-dropping for one visitor!

Watkins explained the reasoning behind the project, which is needed to help riders find trails and to improve safety. BHS is an affiliation of riding clubs and bridleyway groups. The total membership is around 114,000, which makes it a similar size to the RICS. There are rather more equestrians than horses - 4.3 million of the former and 1.3 million of the latter.

Volunteer mappers receive a welcome pack with instructions and when they return their results to HQ they are verified with local councils and landowners and then published on EMAGIN. BHS used 1:25,000 scale raster data from the OS but why do they not extract bridleyways from OS data? It's the usual response - licensing or more accurately, licensing costs. BHS does not want to sell the data. They just make it freely available on their website, but the funding for this comes from advertising.

The objective with this and with other crowd-sourced products is to avoid paying for base data - or is it? Dr **Muki Hacklay**, in a presentation on Open Street Map said that **Steve Coast's** motivation for setting up OSM was frustration with OS licensing models. The recent OS policy consultation document states that people expect not to have to pay for map data. Licensing and charging are related topics but certainly not the same. Indeed, those who are hoping that 'Ordnance Survey Free' will mean an end to OS licences could be in for disappointment as Carl Calvert pointed out, Crown Copyright regulations will still oblige the OS to licence its data.

Trust, the seven C's and carrots!

Did anyone say 'trust'? Yes, **Graham Vowles** did. He was speaking with **Carl Calvert** in a session titled "Navigating the 7 c's - Crown Copyright, Creative Commons, Computing in the Cloud and Co-operation". Graham looked for a show of hands from the audience. Who was a producer and who was a consumer of data? All hands went up. Human nature is such that we want to consume free data but make money out of the data we produce. Perhaps the solution is to share on equal terms. Licences don't just involve money, they nearly always restrict the use of the data. They can be used to prevent the data from being used in connection with a product that might damage the copyright holder's reputation or prevent it from being used to produce a high value product - unless more money is handed over. In other areas of life this cannot happen. Imagine, for example, buying carrots in a supermarket with the restriction that they cannot be used in a casserole with beef because the carrot producer is a vegetarian. Clearly a nonsense, but Carl made the point that there is no point in specifying a restriction that you cannot enforce. That, of course, is the reason there are no restrictions on the use of carrots. But does that not assume that the

"Las Vegas" party format is big success

A feature of the show this year, supported by 160 guests, was a party style gala evening held in Ricoh's Casino. With a welcoming drink courtesy of sponsors SCCS, buffet supper and live entertainment from "Elvis" and the Las Vegas Showgirls, the evening had an exhilarating buzz with guests expressing delight at the different format. One even told us it was 'the best corporate event I've been to'. Before the "show" guests raised £400 for charity MapAction. Once the formal proceedings were over, many settled themselves either at the bar or down at the Casino's tables with fortunes won and lost into the early hours.



licensee's primary objective is to find a way around the rules? Trust may be too altruistic a concept for the world of business!

Open source changes business models

Creative Commons is a concept at the very centre of the open source revolution. Dr **Suchith Anand** from the Centre for Geospatial Science at the University of Nottingham spoke on "Open Source Geospatial technologies - opportunities and challenges". The principle behind open source software is that developers share code to develop software collaboratively. There are significant benefits to this approach, over development of proprietary software. Software is inevitably peer reviewed and therefore quality is higher; open, so that anyone can use it and adapt it for their purposes; licence free, so there is no paperwork; and there is no lock-in to a particular vendor with the consequent support costs. Open source has been embraced by some influential institutions - even NASA. Suchith left us with two thoughts, "recurring licence fees will be outdated soon" and that we need to realise that business models are changing. To make money we will have to understand them.

In the same session, Dr Muki Hacklay from the Department of Civil, Environmental and Geomatic Engineering at UCL told us about his research into the quality of data sources, such as OpenStreetMap (OSM). The 250,000 registered users don't share the workload equally. Muki had looked at 1000 contributors and discovered that 25 of them contributed 50% of the content, 67% had never mapped and 20% had started but subsequently stopped.

How accurate is OSM?

OSM is well known for its mapping parties that turn the business of data collection into a social occasion but in fact most of OSM's mapping has been carried out by people

"...buying carrots. . . with the restriction that they cannot be used in a casserole with beef because the carrot producer is a vegetarian."



Above: ESRI's stand was a popular destination for visitors eager to see and try out the new Océ Colorwave600 plotter.

working alone or in pairs. He tested the positional accuracy of roads by comparing them with the OS Integrated Transport Network (ITN). The ITN roads were buffered according to their width and then tested to see if the OSM roads fell within the buffer. In 70% of cases they did. For more on this visit Muki's blog:

<http://povesham.wordpress.com>.

We reported on the use of OSM during the Haiti earthquake emergency in the March/April issue of *GW*. Luckily for Muki, **Nigel Woof** and **James Steel** from MapAction were all at GEO-10, giving a chance for some collaboration. They related their experiences of the Haiti disaster. In particular the problems of dealing with information overload. Multiple reporting of missing people and unsolicited spatial data arriving too late to be of use were particular problems. Similar problems were reported for defence geo-intelligence (*GW* Mar/Apr 2010). We need a means of sorting through the dross to find that nugget of gold that could be inside.

Camera exposes more from scanner

Z+F's UK office is a select band of 22 employees who specialise in developing the company's scanner processing software. **Tony Purslow** and **Rob Greenhaugh** gave an interesting talk focusing on their LFM software. On the hardware side, they offer an option to use the Spheron camera for imagery in place of a standard digital camera. The Spheron camera is able to capture imagery at multiple F-stops, which means it can 'see' underexposed dark areas as well as overexposed parts of an image. A combination of laser scanner and Spheron camera must have attractions for forensic investigations.

Z+F recommend registering scans whenever possible using surveyed targets within the scan. They believe that this method gives stronger QA documentation than cloud-to-cloud registration. Before scanning, the operator places standard targets within the scene, surveys them and then conducts the scan. Back in the office, LFM identifies the targets in the scanner-centred 'bubble' view of the scan and finds the centre of the target. After you have found two, the software will find the others for you.

Finding a route through

Integrated Skills is an environmental management consultancy and reseller of RouteSmart software. Many products can calculate optimum routes for low density delivery where there

may be few delivery points, but RouteSmart focuses on high density problems where there are many possibilities to optimise. The software finds the optimum route and timing taking into account any requirements to balance workload between teams and other factors.

Simon Canning from Halcrow Group described his work to test position-fixing of mobile scanners. He tested base and rover post-processed RTK for this purpose, using OS Net stations as base stations ranging from 25km to 80km from the site. He found, surprisingly, that there was no significant degradation of quality over the longer baselines. In the same session, **Abby Hunt** and **Trevor Pearson** of English Heritage explained how they are using GPS, lidar, GIS and remote sensing in archaeology. This is the oldest branch of the discipline and involves surveying the lumps and bumps in our ancient landscape. Traditionally, hachures have been used to depict these features and, until recently, they were surveyed using chain and offset and plane table techniques. They entered the GPS age with Trimble. Surveyors use base and rover RTK, recently completing a project at Stonehenge (see *Engineering Surveying Showcase* Spring 2010 issue).

Ireland shows the way for survey specs

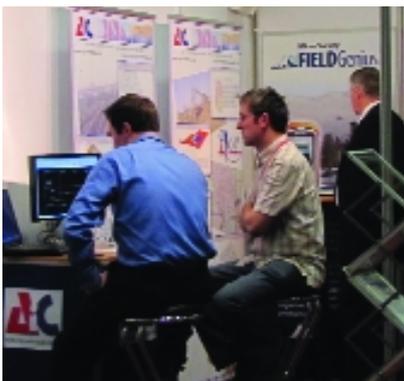
Shane MacLaughlin from Atlas Computers chairs the Dublin Quality Bus Network topographic specification working group (see *GW* Mar/Apr 2010). The working group's major achievement is in transforming the quality of surveys carried out by contractors for the Council. Specifications are enforceable and enforced to drive quality and tender prices up to a sustainable level. Check surveys are carried out and the main contractor is not paid if work is substandard - straightforward and effective.

The RICS 1:500 specification is out of date but still in widespread use. RICS wants to coordinate its revision with the UK Highways Agency (HA). **Chris Mills** has been working on the SD12 spec and reports that HA intends to produce a specification that can be used to specify surveys for a range of end product - not just highways - and has a wider consultation group with representatives from other government organisations and the professional bodies.

The HA spec classifies the standard of survey on a system ranging from AA+ for the most accurate to K for the least accurate. The intention is to tag surveys with the accuracy classification. Where clients require some parts of a survey to a higher standard because they are critical to design but others to a lower standard, the spec will classify the latter as out-line data. The use of GML as a transfer format is being considered (see *GW* Nov/Dec 2008).

• **More information on the companies at GEO-10 together with their products and services can be found at www.pvpubs.com where you can download the GEO-10 Showguide & Catalogue.**

The GEO event is always useful to get up close for a personal demo.





RICS Update and Policy Watch

By James Kavanagh, Director of RICS Land Group

All change at the Land Registry, the Government's response to the OS's policy options consultation and the launch of the new Marine Management Organisation are among several key initiatives the Institution has contributed to, reports Land Group Director **James Kavanagh**.

“Land Registry has been affected worse than most by the latest recession . . .”

Spring and election time in the UK, and several geo-related issues of policy have been put onto the agenda just before the UK government enters 'purdah'. Members can, as always, keep up to date with the Land e-brief and through the website

www.rics.org/geomatics and www.rics.org/land

On celebratory note, RICS Geomatics was delighted to see former geomatics professional group chair **Rob Mahoney** FRICS, a GIS specialist, elected to the position of Honorary Secretary within RICS. The position of HonSec is a four-year post and is one of the most influential member positions within the global RICS organisation. Rob is the first chartered land surveyor in 140 years to hold the position.

RICS geomatics was also delighted to see **Teo CheeHai** FRICS be elected to the position of FIG president at the FIG Congress in Sydney April 2010.

Land Registry – Accelerated Transformation Programme (ATP)

RICS recently responded to the consultation on the possible effects of the proposals outlined within the ATP initiative. Land Registry has been affected worse than most by the latest recession and has seen a severe fall in income due to the recessionary effects on the property transaction market. The ATP outlined a programme of office closures, estate and property rationalisation, staff cuts and an increase in online services. Nothing has been spared, even Land Registry's famous Lincolns Inn Fields offices are under the hammer.

RICS was delighted to note that since the consultation ended, several of the more draconian proposals have been shelved. Only three offices will now be closed with Peterborough and Croydon being spared but Lincolns Inn Fields will close and move to Croydon by 2011. The policy response can be sourced at <http://www.landregistry.gov.uk/>

Ordnance Survey

The high profile consultation 'Policy options for geographic information from Ordnance Survey' has resulted in a full response from HM Gov. RICS sent in its response like numerous other organisations and was only moderately surprised by the government response. The full text of the response can be found @ <http://www.communities.gov.uk/documents/corporate/pdf/1528263.pdf>

As expected, the OS Free Data proposals formed the main message of the response

with addressing datasets (Code-Point Open) and even a vector medium scale mapping dataset being released along with a raft of other medium and small scale products. All of the newly available products can be found @ <http://opendata.ordnancesurvey.co.uk/>

The response will no doubt be dealt with in more detail in this and other journals but RICS does believe that the lack of a strong Public Sector Mapping Agreement until April 2011 could be a potential Achilles heel for this brave new world of UK mapping. The addition of INSPIRE into the mix was unexpected and the thoughts on OS licensing structures, particularly in relation to 'derived data', are to be welcomed.

As outlined in the RICS response and the consultation itself, the free data option comes with financial strings attached. However, the current minister responsible for OS, **John Denham**, stated at the launch of OS OpenData in Southampton that the government had agreed to foot the bill for the loss of income that comes from the new free data business model. It will take a new UK government time to bed down but expect more news on OS in the near future.

Marine

The new executive non-departmental public body has been created under the Marine and Coastal Access Act 2009, bringing together key marine decision-making powers and delivery mechanisms to provide an integrated method of planning, regulating and licensing activity in the marine area.

The Marine Management Organisation has incorporated the work of the Marine and Fisheries Agency (MFA) and has acquired several important new roles, principally marine-related powers and specific functions previously associated with the Department of Energy and Climate Change (DECC) and the Department for Transport (DfT). The MMO will:

- be the national champion of sustainable development in our marine and coastal area
- implement a new marine planning system
- implement a new marine licensing regime that is easier for everyone to use
- streamline the management and regulation of England's fisheries
- work with Natural England and the Joint Nature Conservation Committee (JNCC) to create and manage a network of protected

continued on page 29

Crowd-sourced consultancy helps out CLG

By Richard Groom

GW comments on the Government's response to the Department of Communities and Local Government consultation: Policy options for geographic information from Ordnance Survey.

The beauty of crowd sourcing is that it's free and the OS consultation document produced plenty of free advice for the government. Our overall impression of the OS consultation process is of a pretty dreadful consultation document put right by people power. We love to express our opinions but nothing galvanises us into action like the need to put a wrong right.

OpenData is here

It is clear that the government has taken some notice of the responses, although the statistical interpretation of the results looks questionable. 216 organisations and 225 individuals responded but all responses seem to have been treated with equal weight and used to produce some questionable statistics.

As announced by the prime minister before the consultation started, Ordnance Survey will be providing some data free of charge from April 1st 2010, although the list of datasets has been modified slightly from that presented in the consultation document. The service is called OS OpenData and can be accessed from the OS website:

www.ordnancesurvey.co.uk/oswebsite/opendata

Free TOIDs

What is the effect for geomatics? Given that most of us work at the large scale end of the spectrum, our main interest must be MasterMap and high resolution terrain data. MasterMap will continue to be supplied under licence and charged for,

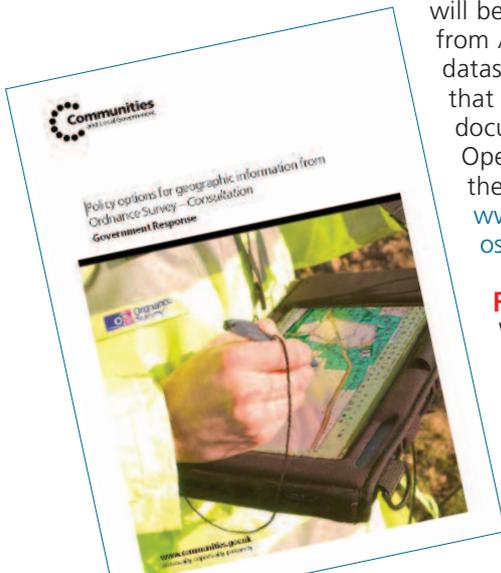
although there is a paragraph in the response suggesting that TOIDs – those topographic identifiers for real world features – will be made available for download, but not when. The TOIDs will be georeferenced but the attributes to be supplied with them are not specified. Perhaps the objective is to supply a 'lite' version of MasterMap. For those of us that use MasterMap to produce location maps, that could be very useful.

Derived data policy under review

Many consultees commented upon the treatment of data 'derived' from OS maps. There are references to this throughout the response document. Under current rules, in simple terms, any spatial or attribute data that a surveyor adds to OS mapping, i.e. it is located by reference to the 'drawn' OS topographic detail (so it includes sketched additions), is derived data and must be licensed. The response restates that OS will be proposing changes to the derived data policy for the commercial sector. This appears to be a subject on which there will be no detailed consultation because the response continues: "Further details of when these changes will be implemented will be communicated later in the year." Let's hope they address the problems once and for all. The licence bureaucracy that accompanies transfer of data from the public sector to its contractors and consultants is not mentioned but has hopefully not been forgotten.

Towards One England and Wales

The Government's aim is to remove barriers to transfer of data between public sector departments by introducing a single public sector mapping agreement to replace the PGA, MSA and other agreements. This would be similar to the existing 'One Scotland' agreement and a concept that OS had been promoting for England and Wales long before the present consultation. It is intended that the agreement will include supply of "underlying core, national geography data and mapping services". The government response is light on detail in several areas and here again it is not clear what the Government considers to be core national geography data. This makes assessment of the impact rather difficult. The proposal seems to exclude competing commercial



What will be for free? Key points in the Government's response

A suite of OS products, under the brand name OS OpenData™, are to be released immediately with others to follow. They will be free including for commercial re-use. They include:

- OS Street View®
- 1:50 000 Gazetteer
- 1:250 000 Scale Colour Raster
- OS Locator™Locator™
- Boundary-Line™TM
- Code-Point® Open
- Meridian™ 2
- Strategi®
- MiniScale®

- OS VectorMap™ District (available 1 May 2010)
- Land-Form PANORAMA®

There will be a new "centrally funded Public Sector Mapping Agreement" for the use of OS products.

OS "will take on the technical delivery role of the services that are required to meet Britain's obligations under INSPIRE. . ."

OS OpenData products will be available in hard media and as an on-line service at

www.ordnancesurvey.co.uk/opendata

datasets from the public sector mapping agreement, although individual bodies will be able to purchase additional data from the private sector as necessary.

The government has chosen to provide OS Panorama free of charge. This is only useful for the crudest of visualisation purposes but the danger, as with other 'free' products, is that people will think it will do – when really it won't.

Inspiration but from where?

There is also the Government's surprise decision to make OS responsible for the "technical delivery" of the EU's INSPIRE initiative. This will give OS a huge advantage over commercial companies and consultants

who have been working on INSPIRE. It undermines, at a stroke, several years of investment work by software and service consultants and businesses. It is in the words of one observer, 'akin to handing the burglar the key of the house'. The Government is silent on how this work will be funded and may yet add further opaqueness to OS's accounts. The view of Defra and those charged with delivering the UK Location Strategy on this move, unheralded in the original consultation, would be interesting.

- The response document can be downloaded from: www.communities.gov.uk/publications/corporate/ordnancesurveyconresponse

“Perhaps the objective is to supply a ‘lite’ version of MasterMap.”

RICS Policywatch continued from page 27.

areas, marine conservation zones (MCZs), designed to preserve vulnerable habitats and species

- respond to marine emergencies with other agencies.

Chief Executive Officer of the MMO, **Steven Gant**, said 'This is an important day for the sustainable development of our seas. We aim to provide exemplary levels of delivery and public service in the marine area through a truly integrated approach to marine management.'

The MMO consists of a headquarters in Newcastle and an integrated chain of 18 coastal offices around the coast of England. One of the first issues that the new MMO will have to deal with is the ongoing consultation on the Marine Policy Statement (MPS). The MPS asks consultees to respond on a number of issues, the major one being if the MPS is needed in the first place

<http://www.defra.gov.uk/environment/marine/>

The general RICS stance is that doing nothing is not an option. Marine planning will be of primary importance to the MMO and with this in mind DEFRA has launched a Marine Planning newsletter, which can also be accessed from the url above. Interested marine orientated members can avail themselves of a marine specific online virtual community of like-minded professionals. This new virtual community contains members active in marine conservation, hydrographic survey, oil and gas, aggregates, academia and offshore construction activities. If you would like to join this community please contact cmallett@rics.org

Latest releases

RICS members should watch out for the

following new guidance title releases from RICS Geomatics.

- *The use of GNSS in surveying and mapping*, 2nd Ed 2010, RICS Guidance Note. This new edition is fully updated to take account of recent advances in GNSS technologies and the emergence of national RTK networks and systems.
- *Vertical Aerial Photography and Derived Digital Imagery*, 5th Ed 2010, RICS Guidance Note. This new edition has been completely redesigned, formatted and updated to take account of the digital aerial camera revolution and now comes with a completely separate client specification and updated guidance section.
- *Geospatial information and the surveying profession*, 1st Ed 2010 RICS Information Paper. This new information paper sheds some light on the fast moving world of geospatial information and its myriad uses within the property industry. Designed as an update for property surveyors but is also a useful touchstone for geomatics members and GIS practitioners.

The extensive RICS geomatics portfolio also includes such industry standards as *Boundaries – procedures for boundary identification, demarcation and dispute resolution in England and Wales* 2nd edition 2009 and *Terms and Conditions of Contract for Land Surveying Services* 3rd edition 2009. This edition features a new quick specification, an updating of intellectual property issues and a fully edited and revamped format.

All of the above are or will be available free of charge from www.rics.org/guidance and www.rics.org/geomatics

“This new virtual community contains members active in marine conservation, hydrographic survey, oil and gas, aggregates, academia and offshore construction...”



FIG Sydney 2010: Surveying History and Congress

By John Brock

GW is indebted to **John Brock** for this report from the FIG Congress that took place in Sydney in April and particularly the special workshop on the History of Surveying. Readers, including the Editor, will be envious to have missed this fantastic event.

Having just had over 2000 guests in Sydney from over 100 countries attending the XXIV FIG Congress in Sydney, we are feeling much more relaxed that we have hosted a fine event for the enjoyment of the participants. Some "poor" visitors have been forced to stay in our great city for an indefinite period due to the Iceland volcano eruption. They are so upset!

However, I am very proud to announce that the two-day Workshop conducted on behalf of the FIG International Institution for the History of Surveying and Measurement was most well attended with 108 on Friday 9 April at Parramatta Old Government House and 133 at the Dixson Room of the Mitchell Library on Saturday 10 April. Seeing that the slogan of the Congress was "Facing the Challenges – Building the Capacity" we went "beyond the capacity" of 130 at the second day of the event!

Chairman of the History Institution, Professor **Jan De Graeve** from Belgium, led the delegation with inspirational introductions on each day along with a brilliant presentation on Gerhard Mercator, Surveyor and Map Maker (1512-1594) on the second day. On the first day he was joined by our impressive New South Wales Surveyor-General **Warwick Watkins**, who told us about our most famous S-G Sir **Thomas Mitchell** in stirring style.

Surveyor-Generals day

Day one was the reserve of the Australian Surveyors-General with all the S-G's from each mainland State and territory giving a presentation about their own first or most renowned predecessor, apart from the Tasmanian S-G **Peter Murphy**, prevented by a funeral on his island state.

On arrival guests were greeted with early morning coffee as well as the poster display featuring the first Surveyor-General of New South Wales **Augustus Alt**. Our second speaker was **John Tulloch** the Victorian S-G who gave us a colourful account of his state's first surveying leader **Robert Hoddle** followed by the S-G from the west **Mike Bradford** passionately extolling the tale of his own first S-G of Western Australia, **John Septimus Roe**, before we feasted on scones with jam and cream in true English tea style.

Session two saw the current S-G from South Australia, **Peter Kentish**, introduce another former SA S-G, **John Porter**, whose authoritative narrative on the first S-G from their state Colonel **William Light**, was enough to pump up the pride of any raw blooded

surveyor. SA historian **Kelly Henderson's** enduring campaign to have Light's design for the City of Adelaide enshrined on the UNESCO World Heritage List garnered much support from the crowd.

Our northernmost S-G from the Northern Territory, **Garry West**, related the hardships and determination displayed by the SA S-G **George Woodroffe Goyder**, who was the intrepid explorer who succeeded in settling the Northern Territory after others had failed.

Session three saw a most rousing joint presentation by the S-G of the Australian Capital Territory **Bill Hirst** and Dr **David Headon** on the design and survey of our national capital Canberra, which was an exhilarating eye-opener to all present.

It would not be a true blue Australian surveying history seminar without the pre-eminent individual on the subject, **Bill Kitson**. He gave us a glowing testimonial of his state's first S-G, **Augustus Gregory** and was introduced by his state's incumbent Chief Surveyor Dr **Russell Priebbenow**, who provided an insight into the early surveyors of Queensland.

Homage to Augustus Alt

With the completion of our final speaker, it was time to take 108 guests to the grave site of the first Surveyor-General of Australia (New South Wales at the time) Augustus Alt, who was buried in St John's Cemetery in 1815, to raise a toast to him and all Surveyors-General who have been an essential element in the formation and development of our great country. Wine was generously donated by one of our own legendary surveyors **Bob Linke** from his own family winery.

On the return to Old Government House we viewed the only remaining artifact from Governor **Brisbane's** Astronomical Observatory. This is the telescope mount, bearing in its upper base the broad arrow placed by S-G Thomas Mitchell during his conduct of the Trigometrical Survey of NSW in 1828.

It was now time for a magnificent cocktail party sponsored by the NSW Surveyor-General **Warwick Watkins** – a special welcome to Australia, in advance of the official FIG Welcome Reception held at the exquisite Sydney Town Hall on Sunday evening for about 1800 guests.

International day

On Saturday it was the turn of the international surveying leaders to treat the audience to a day of presentations about the

"... campaign to have Light's design for the City of Adelaide enshrined on the UNESCO World Heritage List..."

prominent surveyors from their parts of the world. Immersed within the ambience of the historic Mitchell Library the visitors were captivated by the floor mosaic tile map of Tasman's epic 1642 voyage to Australia, sold to the curators by the granddaughter of **Napoleon Bonaparte**, as well as the large door at the entry depicting many surveyors and explorers of Australia in relief.

The Dixson Room is adorned with beautiful oil paintings of early Australia and some of its most prominent settlers. Again opened by Professor Jan De Graeve, our first speaker was **Richard Hucker** from the UK who highlighted the advanced skill of the ancient Roman surveyors in setting out their many aqueducts all over the world. This was followed by presentations on two of the most famous surveyors the world has ever seen – **Leonardo da Vinci** by **Brian Blevins** from the USA, and **Gerhard Mercator** by Jan De Graeve from Belgium.

Morning tea at the opposite side of the premises allowed everyone to gaze upon the elegant internal fixtures of this nineteenth century landmark. Next came the former Chief Surveyor of Hong Kong, **Gordon Andreassend** to detail the work of the colonial surveyors of the Asian nation before its repossession by the Republic of China, followed by the Chief Surveyor of the Bureau of Land Management of the USA, **Don Buhler** who give us a fascinating biography of America's first President, Surveyor **George Washington**. I then provided some comic relief with a ten-minute edited excerpt from the satirical series "The Games" about the setting out of the Sydney 2000 Olympic track along with the real story of the precise work which I supervised.

After lunch we heard about **Albert Einstein's** theories, which were essential for the development of accurate modern surveying equipment by Brian Blevins followed by an entertaining account of the surveyors of New Zealand by former Surveyor-General from that nation, **Bill Robertson**. Head of the National Geodetic Survey of the USA, **Dave Doyle** gave an hilarious history of the US Geodetic Service before afternoon tea.

Our final session for the day started with a dual paper by **Ken Leighton** from Western Australia and **James Canning** (Victoria) about his great uncle **Albert Canning's** Stock Route through the north west of our big country followed by the President of the Nigerian Institution of Surveyors, Dr **Olusola Atilola** who went through the history of Nigerian surveying.

To wind up the session it was left to me to give a super-quick presentation of the "Five Surveyors of the Gods" in 20 minutes so that everyone could slip in a drink or two before security closed the building. All participants left with an immense feeling of pride and exhilaration in their profession, while non-surveyors were left spellbound about our rich tapestry of world history.

Doing the Sydney walk

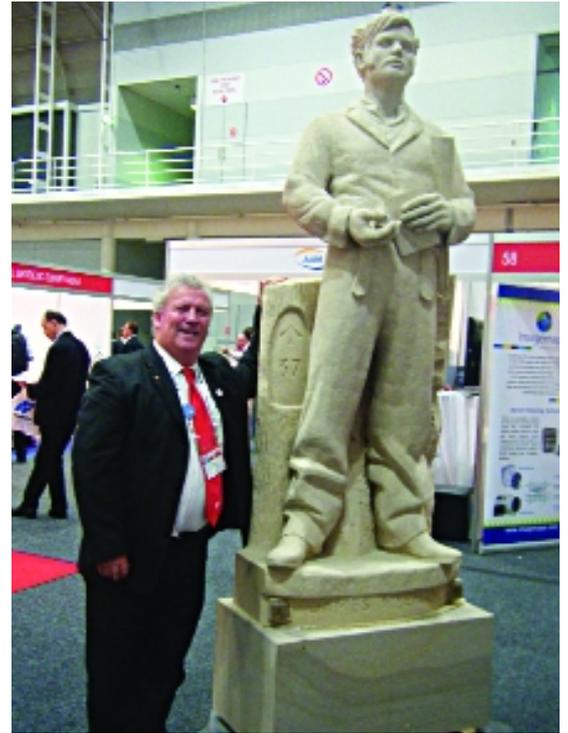
On Sunday 11 April I took 27 visitors on a walking tour of Sydney, which started with a monorail ride from the Convention Centre to the city centre. Walking along Pitt Street I highlighted many historic buildings and sites including Australia Square and the Old Lands Department building in Bridge Street on our way to the Museum of Sydney, erected on the site of the first Government House. Within this relatively recent repository, a brand new exhibit had been set up only the day before to commemorate the 200th Anniversary of the governorship of the Scotsman **Lachlan Macquarie**, which features a special display dedicated to the Irish convict **James Meehan**

who rose to the ranks of Deputy Surveyor-General in New South Wales. In honour of this "most excellent surveyor" (in the words of Macquarie himself!) our incumbent S-G Warwick Watkins commissioned a sculptor to carve a statue of him which is to be erected into one of the vacant niches on the façade of the Old Lands Department building upon which many statues of other surveyors and explorers also stand. This is the first such statue in over 120 years to be so affixed.

We then went to History House around the corner via the Palace Gates on the opposite side of the road. **Wal Knowles** gave the tragic story of surveyor **Edmund Besley Court Kennedy** who was eventually speared by Aborigines near the top of Cape York in 1848. Following a tour of the historic premises, which are the head office of the Royal Australian Historical Society by Executive Officer **Marie Metzke**, we strolled along the oldest precinct of buildings still remaining in Macquarie Street, Sydney until we reached St. James Church (c.1824) in which a stunning marble wall memorial can be viewed to this intrepid surveyor who died while carrying out his duty. Anyone still able came along with the group to enjoy a wonderful lunch in the city's highest restaurant where 360-degree views can be seen from the revolving floor of Sydney Tower.

Sensational reception

This great lunch was just a warm-up for the



Brocky stands by the newly commissioned sculpture of Irish convict James Meehan who rose to the ranks of Deputy Surveyor-General in New South Wales.

“ . . . sold to the curators by the granddaughter of Napoleon Bonaparte. . . ”



Governor Professor Marie Bashir and her husband, Sir Nick Shehadie (right), former Lord Mayor of Sydney and former Captain of the Australian Wallabies Rugby Union team.

sensational Welcome Reception held in the opulent Sydney Town Hall with its monolithic organ and renaissance ornamentation built around the end of the nineteenth century. Non-stop food and drinks kept the massive crowd of around 1800 going till the end of the event. Monday saw the Opening Ceremony commence with some indigenous singing and dancing before the Governor formally opened the Congress as well as unveiling the sandstone statue of surveyor James Meehan to the delighted audience. Her excellency was presented with her own bronze miniature of this statue at which she remarked that he was so good looking and she would now have a surveyor with her always! Later that night there was a capacity roll up for the FIG Foundation Dinner Cruise around Sydney Harbour.

Many technical sessions were held with refreshments being provided in the Exhibition Hall where many interesting exhibits were on display for the duration of the Congress especially the imposing sandstone statue of surveyor James Meehan. On Tuesday night about 100 invited guests were treated to a reception in NSW Government House hosted by the Governor Professor **Marie Bashir** and her husband, Sir **Nick Shehadie**, former Lord Mayor of Sydney and former Captain of the Australian Wallabies Rugby Union team.

The only Surveying History Session during the week of the Congress was chaired by me with **Kerima-Gae** as rapporteur. In a room with 100 seats there were 156 attending to experience excellent presentations about early surveying history in Australia. The Technical Tour of Surveying History on Wednesday afternoon of 14 April started with a ferry ride passing under the Sydney Harbour Bridge to Circular Quay. After disembarkation, a visit to Customs House to view the replica Union Jack flag hoisted on the exact spot where **Arthur Phillip** had put up the first one on 26th January 1788 as well as the scale model of the harbour inside the premises.

Then we had a stroll around the foreshore line with its indicator plaques of past (1788 and 1844) and present tide-lines to the Sydney Opera House where selected areas were pointed out and described by the original surveyor, **Michael Elfick**, as to the difficulties of the survey and complex spherical calculations to set it

out enhanced by original photography of the survey work.

From here a short walk along historic Macquarie Street to view the various nineteenth century buildings which adorn this streetscape in preparation for the brilliant Old Lands Department building in Bridge Street, which has its outside walls embellished with statues of explorers and surveyors. A short visit to the third floor to inspect the Old Plan Room with curator **Col King** showed some prized pieces to the guests then back to the ground floor to examine the standard measuring tape baseline. Next we crossed the road to view the 1818 Macquarie Obelisk from which all the distances to and from Sydney are measured and also to see the HMS Sirius anchor and cannon.

A leisurely walk through the picturesque colonial area known as The Rocks took us up to the Bridge Discovery Centre within which can be seen the unique Sydney Harbour Bridge theodolite solely commissioned for this survey by the designer of the icon J.J.C. Bradfield. Archival photography was distributed about the selection of the bridge design tender and its survey by **Edward Albin Amphlett**. On the way back to the hotels a visit to Sydney Observatory revealed some polished brass geodetic and astronomical instruments as well as the early Trig Point as a finale to an invigorating afternoon. Wednesday night was set aside for home visits which were enjoyed by all who participated.

A select group of us went on a Topp Tour of the Blue Mountains which was greatly appreciated by all before the Gala Banquet for over 600 at Dockside Darling Harbour which was well enjoyed by everyone present.

Tight voting

The FIG General Assembly on Friday saw the tightest vote of all decide the next FIG President when **Teo Chee Hai** from Malaysia snatched the prize from the Australian candidate **Matt Higgins** by 33 to 32 votes. **Iain Greenway** from the UK finished up third in the contest. Three vice presidents were elected: Dr **Chryssy Potsiou** from Greece, Prof. **Rudolf Staiger** from Germany and Dr **Dalal Alnaggar** from Egypt.

Then there was another close competition for the 2014 FIG Congress, which was won by Malaysia 35-31 from Istanbul in Turkey. International and interstate visitors were sent off with the Farewell Reception at the Sydney Exhibition Centre, the same place that the main event had begun earlier that week. The Moroccan entourage who will be hosting the 2011 FIG Working Week in Marrakesh were encouraging as many people as possible to attend their event next year with a special piece of Morocco set up serving tea and biscuits to any willing recipient. See you next year in the north of Africa for this exotic excursion!

Kuala Lumpur is next in 2014.



Scottish Land Registration: the UK's first cadastre?

By Richard Groom

The Scottish Law Commission published its Report on Land Registration on February 26th. The report looks at the current operation of the Land Register and makes recommendations for improvements. **Richard Groom** investigates.

The basis of the current law is the Land Registration (Scotland) Act 1979 which introduced registration of title. Following the Act, title registrations were recorded in a new register, the Land Register. Today about 60% of titles in Scotland are in the Land Register; but this only covers 20% of Scotland's land area. The new system has been a great improvement over the old Register of Sasines (a register of deeds dating back to 1617), but unsurprisingly the legislation was not free from shortcomings. The experience of more than a quarter of a century has shown where the problem areas lie.

In a weighty report – 452 pages plus a further 240 for a draft bill – the authors recommend:

- Acceleration of the process of getting all land in Scotland into the new Register. The objective is 100% coverage.
- The law should be changed to allow all conveyancing documents to be in electronic form.
 - New rules to minimise delays in the registration process.

- The current law often places obstacles in the way of rectifying the Register even though it can be demonstrated that there is an inaccuracy. The recommendations would remove those obstacles.

- Better protection (by the use of "advance notices") for buyers against last-minute adverse entries affecting the title.

- A new system for ensuring that buyers get a good title to common areas in new housing developments.

- New rules about the law of "prescriptive possession" to ensure that long-standing registered rights are not capable of being challenged.

- New rules about the registering of claims to seemingly ownerless land.

The report makes the point that for all intents and purposes, the register's index map is in fact a cadastral map because title plans are now produced from the index map rather than vice versa, as envisaged in the 1979 Act.

Alternatives

Regarding the registry base map, the report recommends that the Land Register is likely to be based upon the "Ordnance Map" for the foreseeable future but suggests that there are alternatives, for example aerial photography and satellite imagery. The OS mapping does not entirely satisfy the requirements of Registers for Scotland because the map may contain errors and not be fully up to date.

The report's recommendation for mapping is that "it should be up to the Keeper to replace the OS map with a different base map provided it is made according to standards prescribed by Scottish Ministers". A replacement standard would be needed if a different base map were to be used. The authors point out that this would set the standard of the official guarantee in respect of boundaries and the requirements for data submitted to the registry. The practical question of how the Keeper will reconcile existing registrations, which rely on OS mapping with any alternative reference framework, still needs to be worked through.

Deeds to take precedence?

The report also mentions a particular problem that arises on new housing estates where the development as constructed frequently differs from the design plans that are used to convey the properties before they are built. Up to now, it has been the practice within the registry, largely at the request of the legal profession, to delay registration until the OS map has been produced and to provide greater certainty of legal title using the as-built boundaries surveyed by the OS. However, the report recommends that the deeds take precedence over the subsequently constructed physical boundaries. This perhaps will place greater emphasis on the developers to better control the completion of new sites, utilising widely available new technologies.

• The report can be downloaded from: www.scotlawcom.gov.uk



“... a weighty report – 452 pages plus a further 240 for a draft bill...”



Crown Copyright, Mashups and Licences

By Carl Calvert

In March **Carl Calvert** spoke at a seminar during the GEO-10 event held to examine the "Seven C's" – Crown Copyright, Creative Commons, Computing in the Cloud and Co-operation. This article is based on his presentation.

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In March 1999 a government White Paper, Future Management of Crown Copyright², was published in which it was declared that there should be: coherence, transparency, access, simplification and liberalization. In 2005 a Statutory Instrument, The Re-use of Public Sector Information Regulations 2005 was published³ in which it is stated at section 16, that:

16. - (1) A public sector body shall ensure that the following information is made available to the public –

- (a) any applicable conditions for re-use;
- (b) any standard charges for re-use established under regulation 15(5);
- (c) a list of main documents available for re-use; and
- (d) details of the means of redress available to an applicant relating to any decision or practice affecting him under these Regulations.

(2) A public sector body shall, where possible and appropriate, make the information specified in paragraph (1) available to the public by electronic means.

(3) In relation to paragraph (1)(c), so far as is reasonably practicable, a public sector body shall ensure that potential applicants are able to search the list of documents by electronic means.

My understanding of this is that public sector bodies should make information available on the information which they hold and that the underlying terms are transparent.

In 2009, ten years after the white paper on Crown Copyright, 'Sir Tim Berners-Lee, the inventor of the world wide web, led the formal launch of data.gov.uk, a new British government website offering free access to a huge amount of public-sector data for private or commercial reuse.

The aim is to encourage British web developers and companies to create websites and information feeds that combine the data with other information such as time, maps or other datasets – and potentially to discover hidden patterns that may not be obvious from the raw information⁴. So, what happened?

Well, in December 2009 the OS published a consultation document⁵ regarding policy options with the consultation period ending on 17 March 2010. My view on that of the three options proposed the third is the least worse and there is a need for OS to be within a department headed by a minister of cabinet rank and who has more than a subsidiary interest in one aspect of mapping.

The reasoning, without going into an academic dissertation is as follows:

1. Intellectual Property Rights were considered by the EU in Directive 2001/29/EC and three sections of the preamble, 8, 18 and 31⁶ are directly relevant. Therefore the review is entirely proper and sits well with the EU Directive.

2. The main problem that I foresee is that if small scales data is released royalty free then the finances required to provide the survey data needs to be recovered from somewhere. The charges for the use of large scale or data other than that provided for free, cannot meet the shortfall and the Intellectual Property Office (IPO) provide guidance on valuing IPR⁷. However, the axiom of "the user pays" may prove problematic in that:

- a. To charge too much may lead commercial users to go to commercial providers, which can afford to cherry pick areas and not bother to survey rural and moorland areas;
- b. To charge other government departments more does not increase revenue to HMG, it only passes the costs onto another government department;
- c. If Land Registry (LR) are charged more, and LR need OS large scale mapping for their activities, then the costs may not all be transferable to the registrant and LR may consider using other suppliers of large scale data in large urban areas thereby losing the homogeneity of the Register's mapping.

3. The strength of OS, in my opinion, is the homogeneity of data quality and quantity. There are examples such as in the USA where both suffer as the probable result of the IPR regime for mapping.

4. An option which has not been voiced is that large scale survey should be done by LR as they use the large scale data as a basis for the Register. Of course the counter argument is that land registration is not survey and GIS, and GIS is far bigger than LR alone. Since OS departed from Board of Ordnance control in the 19th century it has been trailed around various departments with a subsidiary interest in mapping. Despite the Serpell Committee (1982) and the Chorley Report (1987) the ball which is GIS has been passed around more hurriedly than in any Six Nations rugby match.

At the same time the concept of "Mashups" has been developed to the point where APIs (Application Programming

Interfaces) from different sources are used to create a new result from the component sources. In other words, data is amalgamated to form a new service or product. The content can be amalgamated at the client whereas with the previous portal concept the amalgamation took place at the server.

In copyright law⁸, the result of a mashup may be construed as an original product, in that it has not been produced before. Therefore if government data is provided with a free-to-use licence and the user then incorporates this data and API in a mashup, the creator may then be able to claim a licence fee for the work created. The conundrum then is, should the government get something in return from providing the data and API? The government say that⁹:

You are free to: a) copy, distribute and transmit the information; b) adapt the information; and c) exploit commercially the applications you develop if you choose that route. There is section within that web page which states that *“rights other people may have either in the information itself or how the information is used, such as publicity or privacy rights”* are unaffected by the licence.

This may prove to be a difficulty where, say, a private individual or company A, have based their data on government data and later the whole is included in a mash up by another company, B. The question arises: ‘Can A demand a licence fee for the data which has been subsumed in the mashup by B?’

The Open Public Sector Information project (OpenPSI) is a joint project of the University of Southampton and the UK government which aspires to stimulate the interaction between three categories of user: a) data publishers, b) researchers and c) mashup creators. There are currently nine datasets available and all require a licence of some sort.

So, we end up with government data being made available under licence¹⁰ where at section 1 the licence states:

“This Licence does not cover computer programs, software, personal identity documents, and Crown Value Added products or services that have been developed by government. These works will continue to require separate licensing arrangements. Please contact the relevant copyright owner for further details.”

In other words, it is still necessary to contact

the supplying department for a licence, which may or may not be free of charge¹¹.

The fundamentals have not changed as far as the law is concerned. Ownership of copyright remains with the creator (or employer if that is prescribed in the terms of employment) and the moral rights of the author cannot be transferred. However, the licence to use the data, if required, may be free of charge. There are some exceptions in CDPA 1988 where no licence is required in any event and the move to make more government data available freely and free of charge does not affect these exceptions.

In conclusion it seems that what started out in 1999 as a way of enabling more government data to be more freely available and for free, is coming to fulfilment; but it does not mean the end of licences for government data.

References

2. <http://www.opsi.gov.uk/advice/crown-copyright/future-management-of-crown-copyright.pdf>
3. Statutory Instrument 2005 No. 1515
4. <http://www.guardian.co.uk/technology/2010/jan/20/tim-berners-lee-free-data>
5. <http://www.communities.gov.uk/publications/corporate/ordnancesurveyconsultation>
6. 8) *The various social, societal and cultural implications of the information society require that account be taken of the specific features of the content of products and services.*
(18) *This Directive is without prejudice to the arrangements in the Member States concerning the management of rights such as extended collective licences.*
31) *A fair balance of rights and interests between the different categories of rightholders, as well as between the different categories of rightholders and users of protected subject-matter must be safeguarded. The existing exceptions and limitations to the rights as set out by the Member States have to be reassessed in the light of the new electronic environment*
7. <http://www.ipso.gov.uk/iprpricebooklet.pdf>
8. Copyright Designs and Patent Act 1988 (CDPA 1988)
9. <http://data.gov.uk/terms-conditions>
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“The conundrum then is, should the government get something in return from providing the data and API?”

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California's high speed rail plans

By Nick Day

At long last America seems ready to bite the bullet of high-speed rail and challenge the car's hegemony. But it's unlikely to be done without a great deal of wailing, screaming and squaring of vested interests, as **Nick Day** explains.

I have heard that no workaholic really wants a tombstone that reads "I wish I'd spent more time at the office!" That thought came to mind as I swayed back and forth on the 22nd floor of my company's San Francisco high-rise during the Loma Prieta earthquake that hit at 5:04pm on October 17, 1989. Normally I'd have been on the bus that just cleared the gaping hole that appeared in the San Francisco-Oakland Bay Bridge (SFOBB), but decided to stay late and finish a route feasibility study. That traumatic experience instantly cured me of staying late again, or spending too much time in skyscrapers!

So, why on (an unstable) earth could I be found, March 24, 2010, on the 44th floor of CBRE's offices in San Francisco? Answer: an insatiable curiosity to find out about the feasibility study for California's first high speed rail (HSR) project. Seismically retrofitting the West span of the SFOBB, and building a completely new East span at a cost of over \$7 billion, is the most expensive project in Californian history. But, the proposed HSR link from Los Angeles (LA) to San Francisco (SF) will dwarf that with a preliminary guesstimate of \$42 billion.

The RICS "brown bag" lunch presentation, organised by **Michelle Smee**, FRICS, my successor as chair of the Northern California chapter of RICS Americas, was well attended by ex-pat and American chartered surveyors and guests, all eager to hear about the status of this somewhat controversial project. Guest speaker was **Gabriel Metcalf** of SPUR, the San Francisco Planning & Urban Research Association.

The Story So Far

In February 2009, as part of the American

Recovery and Reinvestment Act (ARRA), Congress allocated \$8 billion to states for intercity rail projects. To date, ten rail corridors have been identified for potential HSR, with \$2.5 billion set aside in the 2010 budget. California Proposition 1A, passed in Nov 2008, authorised a \$9.95 billion bond issue to fund the first phase of a planned multi-phase HSR network. When complete, high-speed trains will cross California at up to 220 mph (350 km/h), linking SF and LA in just under 2hrs 40mins.

The idea of a "bullet train" has been kicking around for some time. One initial concept was a route from LA to Las Vegas using German-type magnetic levitation. A wasteful idea if ever I saw one, speeding more and more morons to financial oblivion in gambling casinos! Round trips unnecessary – one-way only! However, the tried and true French TGV, standard gauge system, won out for this project.

Our guest speaker opened by outlining the three project phases: the HSR link; the extension of the current Caltrain route into Downtown SF; and rebuild of the old Transbay bus terminal into a futuristic four-level Transbay Terminal Centre for trains and buses. The current Caltrain, which starts in San Jose, at the south end of the SF Bay, brings commuters into a terminal at 4th Street & Townsend, still leaving an awkward trip into Downtown.

The Route

The route starts in LA and heads inland through Palmdale (of mythical "bulge" fame, where scientists recorded rising ground believing it heralded an earthquake - instead the surveyors had failed to take account of refraction!) and Tejon Pass in the Tehachapi Mtns to Bakersfield. An old oil town once known as the "murder capital" of the US, and where the legendary Wyatt Earp owned a well, Bakersfield has a population of over 800,000 and is California's third largest inland city, after Fresno and Sacramento. Its climate is semi-arid dry steppe, defined by long, hot, dry summers and brief, cool, sometimes rainy winters. From there, it's up the Central Valley to Fresno, home to one of the country's top Geomatics' programme universities. Any east/west route in California will always come up against the almost insurmountable crossing of the inland and coastal mountain ranges, and the next section from Fresno to Gilroy is no exception, requiring a lengthy tunnel under the Pacheco Pass. It's relatively plain sailing after that up to San Jose, and then on into San Francisco. There are long stretches of

Right: the proposed route and below, an artist's impression of a new interchange station.



existing railroad tracks and rights-of-way (ROW) that will ease the land acquisition process, but in a country obsessed with private rights over the common good, a big chequebook will still be needed during the eminent domain process. And, before you start to feel sorry for the poor, put-upon small farmers, I should mention that vast portions of the land throughout much of the route are owned by very large corporations whose extreme wealth puts many small countries to shame, yet are heavily subsidised by taxpayers.

Extensions are planned in the north up to the capital, Sacramento, and in the south down to San Diego. One attendee asked why a coastal route hadn't been considered. 'Mostly political', answered Gabe: the Central Valley towns of Fresno, Modesto, Merced, and Stockton have seen some of the greatest growth in the entire USA over the past 10-20 years. Unfortunately, the house-of-cards growth was totally unrealistic and unsustainable. House prices were bid to ridiculous heights, but the Great Recession changed all that; they've now dropped up to 70%, with many foreclosures. Unemployment is over 20%, with little chance of going lower for some time. It's hoped that the HSR will help these communities recover, a sentiment one might question. Figures from 2006 showed that more than half of Americans live within 50 miles of the Atlantic, Pacific, Gulf and Great Lakes coasts on just a fifth of the country's land area. This will surely increase dramatically over the next 20 years or so. Despite the amazing Central Valley Project – the California Aqueduct and Delta-Mendota Canals, which extend throughout much of the state – we should not forget that inland California is basically a desert climate, and water will be the prime currency, not oil.

A little history: cultural & political problems

Getting Americans out of their cars will be very difficult unless petrol goes north of \$8 a gallon (currently around \$3 in California), which it should like most other industrialised countries, but which it won't. Interestingly, one assumption for the HSR, scheduled for a 2020 opening, but realistically closer to 2023, is \$8 per gallon. So far, Americans' answer to saving energy is not to drive less, but to buy hybrid cars, and then drive more because they're so pleased to be getting a few more mpg!

Amtrak operates passenger service on 21,000 miles of track, primarily privately owned by freight railroads, connecting 500 destinations in 46 states and three Canadian provinces. In 2008, it served nearly 29 million passengers, a figure that is rising every year. It's a government owned corporation, and like so many, is poorly supported by Congress in the hope that it will fail. Such is the paranoid suspicion of government run entities in this country. Freight trains always have priority, so it's not uncommon for passengers to be held on sidings for hours. Ex: Amtrak's *Pacific Surfliner* and *Coast Starlight*,

RICS California members enjoy a brown bag lunch with Brit biscuits while Michelle Smee introduces guest speaker Gabe Metcalf.



that run from Emeryville (nr San Francisco) to Santa Barbara, about 330 miles, takes over 9 hours if on time (5½ hrs to drive). It's frequently 3 hours late, and can take 24 hours. The regular schedule to LA is just under 13 hours. That said, with dedicated tracks, their tilting *Acela Express* trains, between Washington, New York and Boston, are capable of speeds up to 165mph and achieve 150mph over certain stretches. However, they're no French TGV, as average speeds are well below 80mph.

California had some excellent public transportation systems in the past. I'm told that LA had one of the best in the country, and the Key Route in the San Francisco Bay Area was a marvel. So what happened? Well, it wasn't just the advent of more modern cars and the Interstate road system, but a concerted effort by the auto and tyre companies to ruin public transportation. How ironic that in a classic case of "what goes around comes around" American auto and tyre companies have either gone out of business or frequently been bailed out by taxpayers, yet still fail to be profitable and make reliable cars. In a similar fashion, railroads, especially those carrying coal, tried to stop pipeline companies carrying coal slurry, or gas, by refusing to allow them ROWs under their tracks. However, there were many cases where railroads did not own the fee rights, as first thought, but for many years nobody researched the original documents or bothered to challenge them.

I believe dealing with private landowners and getting EIRs (Environmental Impact Report) approved will be far tougher than any engineering or surveying challenge.

Costs, Revenues & Benefits

As we all know, project estimates are often unrealistic, usually ending massively on the upside. If true estimates were proposed, federal/state/local governments would never approve projects! However, cynicism apart, projected costs are:

- *HSR total construction costs – phase 1 (LA to SF)* \$42.5 billion
 - *Transbay Terminal – phase 1* \$1.6 billion
 - *Caltrain to downtown SF* \$2.5 billion
- So far, funding is expected from these sources:
- *Federal grants* \$19 billion
 - *State grants* \$9 billion

“... dealing with private landowners and getting EIRs (Environmental Impact Report) approved will be far tougher than any engineering or surveying challenge.”

- *Local funding* \$5 billion
- *Private funding* \$12 billion

auto and pedestrian traffic crossings, and the system will be fenced to prevent intrusion.

Naturally this is an inexact science, especially going out over 20 years, but passenger forecasts estimate growth from observed 2005 use of the existing Caltrain to 2030, and include HSR. Proximity to jobs has also been factored in. Perhaps they'll need the services of RICS Quantity Surveyors to keep them on track (pardon the pun!).

Here are some of the expected benefits from high-speed trains:

- Remove millions of passenger trips from highways every year and attract millions of airline passengers to reduce airport delays.
- Reduce freeway traffic by creating high-speed options for long-distance travellers, separated freight movement, and enhanced local commuter transit.
- High-speed trains use a third of the energy of air travel and a fifth of the energy of auto travel.
- Eliminate over 12 billion pounds of greenhouse gas emissions, equivalent to removing more than one million vehicles from our roads annually.
- Reduce dependence on foreign oil by up to 13 million barrels per year.
- Trains will not share tracks with freight services, but will be immediately adjacent to existing tracks. They will be separated from all

I find no mention of anticipated fares, but they'll have to be reasonably competitive with the airlines or driving, although I, and many others, would be prepared to pay a premium to avoid the hassles of flying today.

Contracts

Seven contractors have been identified for the various stretches, most with offices in many states and worldwide:

AECOM – one of the world's largest engineering and architectural design firms, HQ in LA.

HNTB Corp – HQ in Kansas City, Missouri.

HMM – Hatch Mott MacDonald, HQ in Millburn, New Jersey.

URS – also one of the largest engineering design services firms worldwide, HQ in SF.

Arup – London, UK

Parsons – Pasadena, CA

Wrap-Up

The Q&A session at the end brought up some excellent points from an inquisitive, yet savvy audience. Michelle's brilliant inclusion of imported chocolate digestive biscuits to complement the wide selection of sandwiches, and soft drinks, went a long way to making this a memorable event. For a nominal \$10 charge for RICS members, it was hard to beat.

Nick Day, FRICS, FRGS, PLS, is retired from the California Department of Transportation (Caltrans). He can be reached at feasibility.nick@gmail.com

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Need a theodolite? No problem, just make one with a bit of gaffer tape!

By John Brock

A four-day Topp Tour of the Riverina area in southern New South Wales at the end of March was brilliant especially seeing the room in which Sir Donald Bradman was born at Cootamundra as well as his early family slab hut home now re-erected at Temora.

Cook and Omai plus Sydney Harbour

At a lecture at the Australian National Maritime Museum in January we heard the fascinating tale of how **James Cook** took a Pacific Islander named Omai on his second world voyage from 1772-75. Omai was an invaluable intermediary when the explorers went ashore at the many islands they came across during their momentous travels.

The offer of two cruises around the Middle Harbour of Sydney being a less water-trafficked zone of Port Jackson, then a trip around Cronulla and Kurnell where James Cook landed on 28 April 1770, could not be resisted. We even had a large goanna (large Aussie land lizard) come out to greet us at one mooring near the coast which had some evidence of Aboriginal inhabitation from many years before.

Washington Surveyors put on great show

Considering their state is named after the most famous US surveyor and first President, George Washington, it would not be unexpected for the surveyors of this north-western state to stage a conference containing some memorable history presentations. As their invited international guest, I teamed up with their resident dedicated survey historian, **Brian Blevins**, to give the Land Surveyors Association of Washington and their visitors the "greatest show in surveying history". I showed my three DVD compilation titled "From Moses to MGM: Silver Screen Surveyor Heroes!"

However, to add a little bit of a special extra to this show I was able to purchase Season Two of MacGyver, about which I had been alerted by my German scout, **Mario Heuts**, who reported that episode 5 involved a light plane crash during which the front tyre was shredded. MacGyver carved a wooden ski boot to attach to this damaged assembly then constructed what he called a "theodolite" from a t-shaped stick, held together with his legendary gaffer tape, with earrings at each end as a sighting line to set out a perfectly straight trench which would be filled with mud to provide a virtually friction-free run for the remodelled "ski plane." When the young passenger remarked that the device was from

caveman times, actor Richard Dean Anderson replied that it was actually from George Washington's times, so either he or his screen writer had done their homework about surveying history. This surveying scene is real gold! You will be happy to know that after this excellent bit of rudimentary surveying the plane took off successfully with Mac as pilot and his injured passenger in need of medical attention.

I also made presentations about "Five Surveyors of the Gods" from about 1400 BC in ancient Egypt, told the story of how the Greek mathematicians Thales and Pythagoras devised geometry from observing the Egyptian Scribe surveyors from around the fifth century BC then let the Americans know how the Sydney 2000 Olympic Track was set out and certified by me.

Seattle surveyor makes history

Seattle surveyor **Brian Blevins** was the one who got me to cross the ocean to show his colleagues my series of presentations, as mentioned above. However it was the workshops on surveying history created by Brian that were amazing! The surveying exploits of the world's most famous artist and inventor, **Leonardo da Vinci**, are enough to make any surveyor puff up with pride and then to discover the contributions made by Albert Einstein to modern measuring instrumentation, makes you want to cry out "Eureka!" After witnessing an incredible array of surveyors of renown from the earliest eras of our past, the enthusiasm was only exceeded by excited pride in the Surveying Profession.

Chilling out with the ice woman

The four-day LSAW annual conference was non-stop with some fantastic social events. Lunch with comedian John Keister speaks for itself while the Gala Dinner hosted an amazing lady named **Helen Thayer**. Originally from New Zealand, she now lives in Washington State with her husband. When she was fifty years old she walked to the magnetic North Pole over the Arctic ice with only a husky dog to help protect her from the marauding polar bears who saw her as a tasty post-hibernation snack. It took her 27 days to get to her destination. All the details are in her book, "Polar Dream", an exhilarating account of her intrepid adventure. Not content with this unique feat Helen thought that it wouldn't be too bad to walk across the Sahara and Gobi Deserts, about which she has also penned her experiences. What a fascinating woman!

In the tracks of Captain Cook and Sir Donald Bradman, our intrepid surveying historian found time to cross the great Pacific pond to visit Washington State's Land Surveyors Association conference.

"... discover the contributions made by Albert Einstein to modern measuring instrumentation, makes you want to cry out "Eureka!"



Targeting data collection
 Last autumn, Leica Geosystems launched the Viva range of survey and data collection products, including the Zeno GIS series. The new Zeno Field software is an OEM (original equipment manufacturer) version of ESRI ArcPad 8 .It provides functions to control the Zeno's integrated GNSS receiver and to manage data collection such as GNSS raw data logging, handling of GNSS real-time configurations, feature accuracy management and an automated workflow between the field and office.

Rapid registration

The latest version of LFM Register software allows data to be registered automatically. Z+F UK's software features various ways of achieving a rapid registration process for laser scan data, such as providing visual metrics that immediately indicate quality of registration. Also, with target prediction the user need only identify the approximate location of two targets manually, Register is then capable of locating the additional targets. Automatic registration builds on the existing target prediction facility. By combining the technology in Z+F AutoTargets and Register 3.92.1, target identification becomes a fully automatic process, which can remove the need for an operator and the requirement for manual target selection. In certain circumstances, typically for small projects, the need to conduct a control survey is no longer mandatory. Bundle adjustment, the process by which the location of a target is considered from every scan position, is also now possible.

New measuring stations



The MS05A and MS1A measuring stations are high-precision automatic total stations from Topcon Europe Positioning. Released in the European market, the MS05A features 0.5" angle accuracy. A sub-millimetre EDM measures up to 3,500m range with a single standard prism with 0.8mm + 1ppm precision and the typical measurement speed is 2.4 seconds. The EDM and angle accuracy of the instrument make it ideal for monitoring in 3D even when

targets are not available. The MS1A is suitable for high-precision construction applications, providing 1" angle accuracy with 1mm distance precision. The accuracy and range of the 1A is: reflective sheets – 1mm + 1ppm, up to 300m; standard prism – 1mm + 1ppm, up to 3,500m; and reflectorless – 3mm + 1ppm, up to 200m. In addition, the measuring stations provide automatic functionality with auto-tracking and auto-pointing.

Wideband antenna released

Leica Geosystems' AR10 wideband GNSS antenna with integrated radome and large ground plane uses new wideband antenna technology to provide superior low elevation tracking, multipath suppression and antenna phase centre accuracy across all frequency bands. A new low noise amplifier (LNA) is also included for enhanced measurement quality. The antenna is aimed at reference station, monitoring and campaign applications. The aerodynamic shape of the antenna reduces wind loading and, together with the low weight, helps to ensure that the it can be used with various antenna masts or as a field or campaign base on a tripod. The antenna has been designed for all existing and currently planned signals of the GPS, GLONASS, Galileo and Compass global navigation satellite systems and the SBAS, QZSS, Gagan, OmniSTAR and other L-band augmentation systems.

Faster data capture

The GLS-1500 laser scanner is designed to speed up data collection, offering 30,000 points per second and a maximum range of 330m. The scanner from Topcon Europe Positioning also provides on-board control, PC control, and high-quality co-axially aligned images and scan data. Other features include: lens array optics technology to maintain distance accuracy from 1-150 metres; on-board scan control software stores scan data and images to a standard SD card for easy download; and eye-safe and invisible Class 1 laser classification, so users can scan near airports, busy traffic areas and populated areas.

Scanning in safety



The CMS V400 cavity monitoring system is aimed at scanning for dangerous and inaccessible cavities, offering improved safety in standard mining operations. The CMS measuring head is extended into hazardous or inaccessible areas while the user stands clear. Optech's system is designed to be easy to transport and set up and is fully programmable, allowing the user to define scan parameters such as elevation step, azimuth step and scan limits.



Extended range with 50X

The new 50X series of total stations from Sokkia extends measurement range to 4,000m with a single prism and up to 5,000m with three prisms. The series incorporates five measurement signals with the highest modulation frequency of 75MHz. The unit's new dual-axis tilt sensor also increases the compensation range to ±6', facilitating instrument settings such as levelling and centring. The 2" model is equipped with an independent angle calibration system (IACS) to further increase measurement stability. Other features include: Class 1 safe laser output; built-in laser plummet option for quick instrument setting; SD or SDHC card slot and USB flash memory slot; built-in Bluetooth module option for wireless communication with a data collector; password protection; and IP66 protection to keep out powder dust, sand, mud, snow, dripping water or driving rain. The series includes models with four angle accuracy grades: SET250X (2"), 350X (3"), 550X (5") and 650X (6").



A wave and read option

Topcon's new DL-500 series of digital levels feature "wave-and-read" technology. This provides an additional survey style option that allows a rod person to wave the staff back and forth, instead of keeping it plumb. The staff reading becomes the minimum when it stands vertically. The DL-500 tracks the waved staff and automatically reads the least value. Two models are available in different height measurement accuracy: DL-502 – 0.6mm (invar staff), 1.0mm (fibreglass staff) and DL-503 – 0.8mm (invar staff), 1.5mm (fibreglass staff). Other features include: pendulum compensator with magnetic damping system; 2,000 points internal memory; and onboard measurement programs such as elevation, height difference, ceiling height, cut/fill and stakeout of horizontal distance.

BRIEFS

A new version of Leica Geosystems' IPAS GNSS-IMU processing software is designed to improve flight economy and simplify GNSS-IMU processing. IPAS Freebird no longer requires a continuous lock of satellites and frees up mission planning by allowing much tighter turns between flight lines.

Topcon Europe Positioning is to offer Pointools products throughout Europe to complement and showcase the

data quality produced by its range of GLS laser scanners. Pointools Edit offers data visualisation and cloud editing software featuring effects like: lighting effects, data colouring and re-colouring options, data mark-up and tagging, effective data cleaning tools and fly-through creation.

Applanix has introduced its LANDMark Marine mobile mapping system, which enables the creation of seamless models of near-shore environments by providing an accurate

georeferenced point cloud that integrates with equivalent multibeam sonar data.

Optech's Lidar Mapping Suite v1.0 is a new software package for its airborne laser

terrain mapper (ALTM) clients. A new lidar optical rectification capability enables users to maximise lidar accuracies over large project areas in a production environment.

Engineering surveyingshowcase2010 ISSUE ONE

There were a number of errors in the Laser Scanners table published in the latest issue of Showcase, particularly affecting Leica and Z+F entries. To download an updated version please go to: <http://www.pvpubs.com/magazine.php?id=3>

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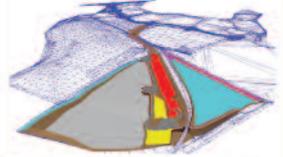
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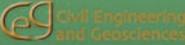



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COURSES & EVENTS





ISPRS Commission V Mid-Term Symposium
Close Range Image Measurement Techniques
21st - 24th June 2010; St. James' Park, Newcastle, UK

- Symposium registration now open
 - Full / concessionary early-bird registration £300 / £150 until 19th April 2010
 - Includes all refreshments, lunches and social events
 - Provisional programme now available on-line
 - Confirmed keynote speakers: Clive Fraser, Angelo Beraldin
 - Confirmed social events (included in registration fee)
 - Welcome reception: Newcastle Civic Centre (21st June)
 - Conference dinner: Great North Museum (23rd June)
 - One-day pre-symposium tutorials (21st June; registration £90 / £45)
 - "Heritage 3D" and "Close-range sensors and technologies"
 - Bronze sponsorship still available (£750 + VAT, inc. one free registration)
- Affordable, simple and direct travel options to / from Newcastle
 - Direct daily flights from / to Dubai and numerous European destinations
 - www.newcastleairport.com
 - 20% discount on East Coast rail for conference delegates
 - www.eastcoast.co.uk/photogrammetry
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