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issue 64 : June 2015

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Aerial survey: medium format bridges the gap

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Map reading sedated by software

Adena Schutzberg: the churn of technology

Everything happens somewhere 10 years on

Leicester leads with Geodata for Business

Maps from big data with the neocartographers

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Printing: The Manson Group, St Albans



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The rise of mapmaking amongst those without cartographic qualifications presents a challenge, argues Nico Regnaud.



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The Royal Institution of Navigation has warned that we are becoming too dependent on satnavs and that basic navigational skills are being lost.



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A free event laid on by Leicester University showed what our industry should be doing to get our message across.



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Looking at where the value comes from

Esri UK's annual conference attracted 2500 delegates this year, up by a thousand on 2014 as many uber-cool GIS apps were on show.

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Next Issue: AUGUST 2015

Copy dates **Editorial:** 06 July

Advertising: 23 July



Front cover: Irish woodland devastated by Storm Darwin as explained by Tim Whittome, founder of Caledonian Air Surveys. **To read more turn to page 10.**

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LoRa™ Internet of Things

KCS has extended their successful TraceME product line with an advanced module, targeted for worldwide mobility in the Internet of Things era. The latest development of the TraceME GPS/GPRS Track and Trace module will combine the RF location based positioning solution with the LoRa™ technology. This combination offers 'smart objects' being even smarter, since LoRa™ enables long range, battery friendly communication in a wide variety of (M2M) applications. Supporting GPRS/SMS and optional 3G, Wi-Fi, Bluetooth LE, ANT/ANT+ and iBeacon™ provides easy integration with existing wireless networks and mobile apps. Other variants in the high/mid-range and budget-line will follow soon.

ANTI-THEFT module based on RF

KCS TraceME product line offers an intelligent location based positioning solution for indoor and anti-theft applications. The solution is based on RF with an intelligent algorithm of measuring the propagation time of transmitted (proprietary protocol) signals. Unique features are: minimum size (46x21x6.5mm), weight (7 grams for fully equipped PCB) and a standby battery lifespan of more than 10 years. 'Listen before talk' algorithm makes it practically impossible to locate the module, which secures the valuable vehicle or asset. Supporting GPRS/SMS and optional 3G, Wi-Fi, Bluetooth LE, ANT/ANT+ and iBeacon provide easy integration with existing wireless networks and mobile apps.

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welcome
to the June 2015 issue of *GIS Professional* . . .

Geodata for all is the growing reality

This year's UK Esri conference attracted an astounding 2500 attendees, up by a thousand from 2014. As always, it was an incredibly busy day with far too many sessions to try to cover. I hope we've managed to convey a flavour of the event (begins page 26) through several significant projects including the Port of Rotterdam, Transport for London, the new Irish Water authority and Sellafield. In addition, it was a chance to see some clever apps under development and to pause to understand the impact that data collected from mobile phones is likely to have (see also **Robin waters** article on maps, smartphones and declining navigation skills).

Capturing imagery for mapping and GIS has never been easier or cheaper. There are several companies in the UK and Europe who will sell you the area you want, although it may not be as up-to-date as you would like. Tasking a UAV to help with the updating may be the solution but there are other technologies available as **Tom Whittome** of Caledonian Air Surveys explains in his article advocating medium format photography (see page 10). This has been an overlooked technology, positioned mid way in cost between UAVs (quick, cheap but limited range and coverage) and high resolution aerial survey (also quick but expensive and for some tasks maybe overkill).

Big Data is set to provide GIS analysts with an exponential increase in available data. One source will come as anonymised mobile-phone tracking, timing and location. But there are risks, argues **Nicholas Regnaud**, as the so-called neocartographers get to grips with mapping (page 18). Some will be tempted by open source software but they also need to understand how both scale and generalisation works. As you drill down so you want more data. National mapping agencies are beginning to recognise the growing demand for better background mapping that can be easily manipulated. The good news is that the traditional skills of the cartographer are likely to remain in demand.

In her regular column **Adena Schutzberg** comments (page 09) on the churn of names in our sector and the regular rebranding, following takeovers and mergers. This phenomenon is not unique to the US. We are already comfortable with 1Spatial, once Laser-Scan though neither titles conveys much relevance to me (Laser-Scan never did much laser-scanning). I had rather forgotten that Nokia had acquired NavTech until I ran into a new company at Esri's 2015 UK conference. Snappy and simple, 'here' is now the name for what was once Navtech. All of this is harmless unless it's done to mask and forget a failing company or one mired in dubious business practices as we have seen in other sectors.

Continuing our open source reporting, **Suchith Anand** of Geo4All explains the philosophy behind the global partnership Open Source Geospatial Laboratories (motto, 'Geo for all'). It's all about spreading geospatial knowledge (page 14). If you're not already using open source software you're probably missing out on major emerging series of technologies that can save time and money; and possibly release you from the clutches of the big software providers and their annual licence fees.

Two further articles in this issue which we are fortunate to bring to you is a report on the annual GeoPlace Exemplar Awards day, always a great opportunity to share and discover best practice in using address data. Finally the Leicester University Geodata for all event (page 24) provided many of those 'light bulb' moments for attending local solicitors, marketers, estate agents and even tv programme makers as they began to realise the overarching significance of geospatial data in today's economy.

Stephen Booth, Editor



. . . it was a chance to see some clever apps under development and to pause to understand the impact that data collected from mobile phones is likely to have.





Satellite boost for EO data

Europe's ambitious earth observation programme, Copernicus, is already allowing the government to make environmental policy based on robust scientific evidence. The launch of a family of satellites to provide accurate, timely and easily accessible information will improve the management of our environment, help understand and mitigate the effects of climate change and ensure civil security.

The Sentinel satellites "are set to live up to their name by watching over our planet and providing us with the vital data we need to solve the climate and environmental problems facing mankind", according to Dr David Parker, chief executive of the UK Space Agency. "By hosting a Sentinel data hub and making the satellites' data readily available in the UK, we can continue our leading work in the field of Earth observation whilst opening up new business opportunities from the commercial development of space data" adds Dr Parker. The data hub will be jointly funded by the UK Space Agency and the Satellite Applications Catapult. Defra chief scientist Ian Boyd adds: "This earth observation data has the potential to allow a wide range of organisations to help our environment."

The Copernicus programme is set to bring a huge increase in the amount of EO data available. When fully operational, 8 terabytes of new data per day will be available for people to access and all of it free to download. Users can expect access to Sentinel products within a matter of hours from initial acquisition as well as a full set of archive data. The service will be further enhanced for those who require near real-time data by the addition of a European Data Relay Service (EDRS) terminal.

Pylon challenge for OS

Ordnance Survey often talks about the 10,000 changes a day their surveyors capture in the national topographic database. Amongst those changes are even electricity pylons. So when National Grid announced that the first new electricity pylon design in 90 years was going to be erected in Nottinghamshire, OS knew they would have work to do. Pylons not only feature in large scale products, such as OS MasterMap but also in smaller scale products, like the 1:25,000 scale mapping in the OS Explorer maps.

Chris Isaac at National Grid told OS that the new T-pylons are shorter than conventional lattice

ones, measuring 36m against the 50m height of some traditional high-voltage towers. Although they are shorter, they are still capable of operating at 400,000 volts. The six T-pylons being built at National Grid's training academy in Eakring will help the energy company better understand how to build and maintain the new design. And while T-pylons won't be replacing the hundreds of miles of existing lattice structures, with many proposed new low-carbon wind and nuclear power stations needing extra electricity connections across the UK, it will give National Grid another option to limit the effects of any new lines. The modern, sleek and

slender alternative to traditional designs won't be right for every landscape, but its shorter stature and ability to be routed in sweeping curves which follow land contours will offer an alternative.

OS surveyor, Mark Southwart, covers the Nottinghamshire area and went out to capture the new pylons. The changes will be added to the next OS MasterMap refresh and then, over a period of time, be added into the smaller scale products such as 1:10,000 and 1:25,000 scale mapping. As the site is still under construction, Mark will be heading back there towards the end of May to pick up the final changes.

Bluesky help for hayfever sufferers

By shedding light on the way pollen travels through the atmosphere, a new environmental dataset is helping scientists improve the lives of hay fever sufferers. Created from high-resolution aerial photography and colour infrared data, the National Tree Map database created by Bluesky details more than 280 million trees covering around 20,000 square kilometres.

A research initiative with the Met Office and University of Exeter Medical School has enabled Bluesky to develop the most detailed, species specific maps of allergenic pollen ever produced. This information will then be combined with detailed models of how pollen is likely to move and behave in the atmosphere. It will allow researchers to assess the links between pollen exposure and allergic diseases such as asthma, as well as examine other potential health implications, including links to pre-term births, strokes and mental health issues.

Dr Rachel McInnes, senior climate scientist at the Met Office Hadley Centre, commented, "Different types of pollen are released from different plants and trees at different times of the

year. These can trigger hay fever and other allergies that can have a serious impact on the health and wellbeing of sufferers. By understanding where and when allergens are produced and how they are affected by weather and climate, we can gain a better understanding of their impact on health and provide more accurate and detailed forecasts."

Light note

Research conducted by De Montfort University sponsored by blind manufacturers Hillarys, in association with the UNESCO International Year of Light, has found that satellite observed light pollution in the UK has reduced by 28% since 1992. Drawing on data from satellite images between 1992 and 2012, the research found that the brightness of the UK's night skies, caused by upwardly directed light and its refraction in the atmosphere (skyglow), has surprisingly reduced in every part of the country since the peak year of 1993 pleasing astronomers.

Professor Martin Morgan Taylor, principal lecturer at De Montfort University and former vice-president of the International Dark Sky Association, says, "We are designed for dark nights and bright days. So daylight types of light at night can disturb human and animal circadian rhythms. It's not a question of turning off all of the lights. It's about using daylight types of light carefully, and using the right amount of light where needed, when needed.

Bob Mizon MBE FRAS, coordinator at the British Astronomical Association Campaign for Dark Skies, adds: "Since the 1950s, a tide of wasted light has veiled the starry sky. Light travelling, even at low angles, above the horizontal scatters from dust and aerosols in the atmosphere and colours the night sky out to great distances. Most of us, not just astronomers, enjoy seeing a star-filled night sky,

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but even if you don't, Skyglow is an obvious symptom of the waste of money and energy.

Doing more with less

Barnsley Metropolitan Borough Council has been working with 1Spatial to improve their data management. The local authority has been using GIS systems for over 15 years with projects evolving in individual departments. Four years ago, a GIS specialist unit was formed within the IT department and they were keen to implement a "single source of the truth" and to manage all their assets in a database. Like many local authorities Barnsley has gone through many budget cuts and faced the challenge of finding more and more savings. With reduced headcount and an aging GIS that continually needed attention, the GIS team found it could not immediately allocate the time necessary for all the change-management that introducing a single, central database would require.

Riley Marsden, IT systems manager at Barnsley and his team started to look around for a solution. "The Council needed to do more with less," Marsden explained. "With fewer staff in the council we started to think about how to make life easier for people, how to create better processes and how to put more information at people's fingertips". Barnsley opted for 1Spatial's FME Desktop, together with training, technical support and consultancy.

Barnsley's GIS team has now developed automated processes. The software populates data into the online map overnight, audits data quality, manages planning applications and organises background mapping. Increased efficiency has meant a greater demand for spatial data within the council. Even challenges that are not traditional spatial problems like integrating Barnsley's master address list

(LLPG) with SAP and populating their new CRM has been undertaken using FME, proving its 'flexible' credentials.

London Hub for OS

In a move that aims to energise innovation in the UK geospatial industry, Ordnance Survey is opening a London-based Geospatial Innovation Hub to attract new players, new visions, new thinking and new markets.

In the past five years OS, through its GeoVation Challenges, has awarded almost £650,000 in funding 28 new ventures, and Britain's mapping agency believes the Hub will build on this. OS anticipates it will expose and expand industry opportunity for existing and new participants through the innovative adoption and application of its UK geospatial assets.

Win a trip to Guiana and view a satellite launch

Looking at Earth from space, the lines between desert and fertile terrain, populated and uninhabited regions, and dense rainforest and cleared land are clearly visible. Indeed, they are what give contours to the very face of our planet. Also evident, but more difficult to construe, are the human borders: between nations, ethnicities, religions, and the wealthy and impoverished.

The GEO Illustration Challenge is asking participants to give our planet a new face. The theme is "Transcending Borders - and Changing the Earth's Image". From illustrators and designers to keen Photoshoppers, everyone is invited to participate. The grand prize: a VIP invitation to a 2016 ESA satellite launch at Guiana Space Centre near Kourou, French Guiana. The Challenge is part of the 2015 Copernicus Masters competition and GEO magazine is inviting interested participants to apply graphical and artistic techniques to satellite imagery and illustrate them in vivid, artistic ways that reflect the theme.

Supercomputer for aerial mappers



Bluesky is exploring the power of supercomputers to process and deliver 3D maps, comprising trillions of data points. Working with HPC Midlands and experts from the Karlsruhe Institute of Technology (KIT) in Germany, Bluesky has already been able to devise workflows to create region-wide maps of sun shadow – of particular interest to check the effectiveness of solar panel installations.

Bluesky is also exploring the use of high performance computers to scale up workflows to help create and maintain key datasets such as the National Tree Map, air pollution models and thermal heat loss surveys. "Having invested in the very latest survey equipment, we are now generating more detailed data covering larger areas than at any other time in the history of aerial surveying," comments James Eddy, technical director of Leicestershire based Bluesky International. "Our nationwide annual programme of data capture results in hundreds of terabytes of raw data every year."

"Processing this amount of data on conventional computers is simply not time or cost effective," adds Simon Schuffert, research associate at KIT. "However, by partnering with HPC Midlands and Bluesky we have proven scalable workflows through a 'divide and conquer' approach made possible by parallel programming."

The Bluesky partnership initially developed an open source shadow analysis programme that calculated the amount of shade a 3D surface structure is subject to over a day, month or year. With ground sampling distances of 25 square centimetres this level of detail would, for a country the size of Great Britain, mean processing over 3.5 trillion elevation points! The dataset created by the new shadow analysis could theoretically be used to accurately predict effectiveness of solar panels as small as those attached to parking ticket machines or monthly and annual sun exposure for agricultural areas.

Participants will receive access to free satellite image data provided by the European Space Agency (ESA) through the competition website. An expert jury will judge every complete submission based on its informative content and aesthetic value. The submission phase for the competition will run from 15 April to 13 July 2015 at www.geo.copernicus-masters.com.

BRIEFS

Hexagon Geospatial and Intergraph Security are celebrating

their 10-year anniversary of supporting the Land Survey Office of the Czech Republic. Since its inception in 2005, the ÚZK Geoportal has provided spatial data and services to the 10.5 million citizens of the Republic. The site shares all geospatial data with the various government departments, as well as the public.

MapAction, the charity that specialises in mapping natural disaster zones, has deployed a team in response to the devastating earthquake that hit Nepal in April. One of MapAction's



An occasional column where we highlight some of the weird, bizarre, quirky and downright dumb geo stuff that comes over the ether to us.

Mapping and spoken directions from a mobile phone are great for in-car navigation but can be of limited use to the pedestrian. Lost in the middle of Barcelona's old town in a maze of narrow streets and high buildings, my phone kept issuing instructions to head off in various compass points. . . without providing so much as a compass bearing. Fortunately I found my way back to the hotel and picked up our guide book!

A search for a racist word and "house" on Google apparently takes you to a map of the Whitehouse. It's not clear who's responsible for creating this obnoxious search but a Google spokesperson says the company is trying to "fix this issue quickly". Meanwhile, Google suspended its Map Maker tool recently after some of its content was vandalised. Recent pranks include an image of the Android mascot urinating on an Apple logo. Disgraceful! I would have positioned it over both!

The general election provided plenty of examples for this column. Katie Collins on wired.co.co.uk, filed a piece oddly titled "How election maps reveal the strange politics of geography". She argues that election maps either prioritise the geography or try to reshape the country, to give a more accurate representation of political support. If an election was decided on what proportion of the country your party holds the Conservatives would win hands down every time. Perhaps a better way of looking at it is *The Guardian's* cartogram, a map of UK built from 650 equally sized polygons, each in the winning party's colours.

The site <http://www.worldmapper.org> is a great source of maps depicting the world in different ways to those of Gerardus Mercator. Many are really cartograms, much beloved by Prof **Danny Dorling**. I especially like the animated Age of Death which slowly changes in increments of 5 years. It begins with infant mortality as a spidery thin US and Latin America viewed against a bulging Africa and India but gradually the shapes swap around as middle age (by Western standards) cuts in before reverting back in old age. The income map that begins at \$1 a day shows even greater distortion as the income threshold rises. Powerful visual tools.

New words heard at Esri's conference: "trilemma"; now does that mean three dilemmas or six?

news & people

volunteers was already in Kathmandu and is liaising with the UN on mapping needs. The charity is also participating in a matched funding appeal for its response to the Nepal earthquake. Donations made through the Big Give will be doubled. UK taxpayers can further boost the value of their gift by adding Gift Aid. To benefit from matched funding, please donate at www.mapaction.org/mapalerts.

Cadline, which recently launched the DynamicMaps website, is marking their 25th anniversary this year. Opening in 1990 with just three members of staff, the company has grown to nearly 100 staff in eight UK offices and two in Europe.

Open Geospatial Consortium is seeking comment on a candidate standard, WaterML2.0 - part 2: Ratings, Gaugings and Sections. The move is an initiative within the joint World Meteorological Organization (WMO) / OGC Hydrology Domain Working Group to address standards development and interoperability of hydrological information systems at an international level.

OGC has also approved "OGC Compliance Overview - Guide for Software Acquisition" as an official white paper. The white paper provides an overview of the OGC compliance process. It describes the benefits of acquiring OGC compliant products, as opposed to products that implement OGC standards but have not been certified as being OGC compliant. The document is located at: <http://docs.opengeospatial.org/wp/15-002r5/15-002r5.html>.

The latest issue of locr's newsletter highlights personalised mapping using the storytelling concept with both maps and images. More at www.locr.com

A website has highlighted the widely varying costs of the Apple

Watch with the US and Japan lowest at £368 or lower and the UK the highest at £479. In France and Germany the price is £458. Check it out at www.voucherbox.co.uk

Getmapping has partnered with PlanetObserver to offer a full range of global and regional Earth satellite imagery along with two global height datasets. The key offerings include PlanetSAT 15, 15m resolution global satellite imagery and PlanetDEM 30 and PlanetDEM 90 with resolutions of 30m and 90m respectively. The data is especially suited to energy and utilities, telecommunications and smartphone apps, visualisation and simulation, plus mapping and illustration.

Dotted Eyes and miso have officially split into two separate trading companies. The move, instigated two years ago, split the miso online mapping and data business, and Dotted Eyes, its consultancy business. The split has enabled both companies to clearly focus on developing product lines that are specifically tailored to the needs of their customers.

'How can map-based data help simplify complex business decisions?' is the topic for a short video released by Mapmechanics, which answers that deceptively simply question in just three minutes. The video takes viewers clearly and logically through a range of possible reasons for using map data, describing the opportunities it offers and suggesting some of the many ways in which it can offer benefits.

PEOPLE

It is with great sadness that we announce the recent death of former GSDI President, Prof. **Bas Kok**. Bas helped to found the initial GSDI conference series, serving as GSDI Association President from February 2008 until June 2009. **Robin Waters** in his Eurofile

column on page 13 pays tribute to a great stalwart of GI.

New VP for Topcon GeoPositioning

Francois Erceau is the new vice president of Topcon's GeoPositioning Solutions Group in Europe. Erceau brings more than 20 years of executive-level industry experience with both technical and business expertise. "Francois will be responsible for pushing forward our existing businesses and developing new vertical markets in the region, continuing the expansion strategy of the GeoPositioning Solutions Group in Europe," said **Eduardo Falcon**, executive vice president and general manager of the Group. Erceau holds an MBA with emphasis in management, strategy, finance and general administration from IAE Business School, as well as a master's degree in optics, physics and electronics from Institut d'Optique.

New chair

EuroGeographics has named cadastral surveying expert **Daniel Steudler** as the new chair of its Cadastre and Land Registry Knowledge Exchange Network (C&LR KEN). Dr Steudler, who holds a PhD degree from the University of Melbourne, Australia, is a scientific associate at the Swiss Federal Office of Topography (swisstopo), working for the Federal Directorate for Cadastral Surveying. As well as an active member of the International Federation of Surveyors (FIG), he is well known as a conference speaker whose work has been widely published. Dr Steudler also has extensive international experience consulting for land administration and cadastral projects in Saudi Arabia, Azerbaijan, Pakistan, Sri Lanka and Kosovo. He was previously vice chair of the C&LR KEN and succeeds **Julius Ernst** from Austria's Federal Office of Metrology and Surveying.



Adena Schutzberg has worked in geospatial technologies for 25 years and is principal of ABS Consulting Group, www.abs-cg.com, adena@abs-cg.com

AS I WRITE THIS IN MAY, two geo-related events are in full swing. There's the Imaging & Geospatial Technology Forum and what next year will be known as Xponential. The former is also known as the American Society for Photogrammetry and Remote Sensing (ASPRS) 2015 Annual Conference. The latter is currently known as Association for Unmanned Vehicle Systems International (AUVSI) Unmanned Systems.

The new event names are part of a rebranding of the geotechnology marketplace that has been going on for some time. Most of us in the industry can make sense of photogrammetry and remote sensing but surely "Imaging & Geospatial Technology" is easier to say. And, perhaps more

remained until today, though the organization and its events have changed significantly. In 1999 *GIS World*, at one time the only regularly published print publication I read, became *GeoWorld*. The Urban and Regional Information Systems Association (URISA) maintains its organization moniker from back in 1966, but added the tagline "The Association for GIS Professionals" in 2010. Its annual conference was rebranded as GIS-Pro that same year.

It's telling that Environmental Systems Research Institute, once known as ESRI and pronounced in a particular way, is now Esri. It no longer expands and can be pronounced as one prefers. The Esri International User Conference is now the Esri User

What's in a name? Who are we? Who are you? The constant churn and arrival of new technologies and inevitable trade and professional groupings means rebranding our industry and ourselves from time to time, says **Adena Schutzberg**. But just how important is it?

importantly, those terms may be more decipherable to our family and friends, students and potential clients.

AUVSI may be a new acronym to some in the geospatial arena, but the precursor to the current organization launched in 1972. Today, the unmanned technology is part of our quiver of platforms for what ASPRS and others call imaging technology. Why the change from acronym to made-up-term for the conference and trade show? I suspect the various acronyms related to small remotely controlled devices (UAV and UAS among others) are not as warm and fuzzy as the event organizers, who serve device vendors and supporting companies, would like. Thus, the branding team chose a name that had nothing to do with flying or remote sensing or geospatial, but rather with math. The not so subtle implication for sponsors and attendees of Xponential 2016: exponential growth in the event, the market and profit margins!

Re-branding These changes are just the latest of a steady re-branding stream in motion for last 20 years or so. In 1998, Automated Mapping/Facilities Management (AM/FM) International, which hosted an event of the same name, became the Geospatial Information and Technology Association (GITA). That name has

Conference. Other Esri industry events no longer include "user" in their names. The Esri Education User Conference is now the Esri Education GIS Conference. Today I was invited to the Esri AEC Summit.

Names do matter Earlier this year discussions yielded a name for a Canadian geospatial organization: GeoAlliance. The name and the process by which it was determined has prompted quite a bit of conversation, reinforcing the idea that organization and event names really do matter. While some find discussions of names a pointless exercise; the final selection impacts the individuals and groups the organization or event in question may engage, support, represent or from whom they may ask for funding.

The most positive takeaway from all of these event, company and organization name changes is that ultimately each of us, individually, decides how to describe what we do. In some companies each staffer determines the title on the business card in their wallet. In others, there's a corporate convention to be followed. Perhaps the best solution is the simplest: the business card with no title at all. That forces the individual to articulate a title or short statement describing what they do or have to offer.

“

... acronyms related to small remotely controlled devices (UAV and UAS among others) are not as warm and fuzzy. . .

”

Aerial survey



Cessna 172
survey aircraft.

Aerial Survey: bridging the gap

Except in academia, the development of medium format cameras have been neglected. However, they offer reasonably priced calibrated economic and calibrated imagery product, positioned between UAVs and large format cameras, argues **Tom Whittome** of Caledonian Air Surveys.

References

1. Warner, W.S., Graham, R.W. and Read, R.E. (1996) Small format aerial photography. Whittles Publishing, Caithness.

AERIAL SURVEY PHOTOGRAPHY IS CARRIED OUT either from twin-engine manned aircraft using ever larger and more expensive specialist large format cameras or from UAVs using small format consumer grade cameras. A lay person might reasonably get that impression from current magazine articles and advertisements. It reflects the remarkable technical development of large format digital survey camera systems over the last ten or fifteen years and the proliferation of UAVs more recently. But is this impression accurate, and do these two platforms adequately cover the ranges of requirements for aerial survey photography?

A buyer of aerial survey photography has a number of primary considerations – what area needs to be covered; what detail and hence what resolution is required; are there any special conditions such as season, time of day, etc; how up-to-date does the photography need to be; and how much will it cost?

If the resolution on offer (typically 25 cm, 10 cm or 5 cm for limited areas) is acceptable, and up-to-date photography and/or special conditions are not required, then the library photography offered by the companies using large format systems to cover the whole country will almost certainly be the cheapest option. If very high resolution (less than 5 cm) is required for a small area, then small format UAV photography can be commissioned.

But what about the situation where the photography has to be up-to-date or taken under special conditions, or where the area required is too large for a UAV to cover within a reasonable time, or

where there are a number of widely scattered sites? Suitable library photography may not be available, and the cost of commissioning a large format survey of a few tens or even hundreds of square kilometres is likely to be prohibitive for most buyers.

This gap has attracted little attention from equipment developers and suppliers. A few have concentrated on the high end of the market, developing large format systems for small numbers of customers who are willing to pay very large sums for the ability to acquire and process vast quantities of imagery. Greater numbers have jumped onto the UAV band-wagon at the other end of the market, with many more potential customers and an “affordable” product even for an individual operator.

Neglected medium format But for the operator who wants to bridge the gap and respond to the need for reasonably-priced high-quality bespoke aerial survey photography covering more than a few hectares, little is on the market. Twenty years or so ago, well before UAVs became available, interest in small format aerial photography (which included what would now be termed medium format) using mostly single-engine light aircraft was growing. At that time the authors of one book wrote (**Ref.1**): “For small blocks (in the region of a few square kilometres) small format aerial photography has already been very successful using light aircraft and calibrated [medium format] cameras.”

However, technical development in this area was largely the province of university departments,



CASL's philosophy is to make use of the best available off-the-shelf equipment. . .



adapting and making use of off-the-shelf small and medium format film cameras, rather than commercial companies.

Developing a medium format capability By 2004 the sensors in high quality small format digital cameras were reaching sizes at which their commercial use for aerial survey work was looking viable. At the same time, photogrammetric software suites, including facilities for calibrating cameras and lenses, were becoming available for use on relatively low-cost PCs. These developments significantly improved the economics of small format aerial survey photography, and Caledonian Air Surveys Ltd (CASL) was set up early in 2005 to develop and exploit the new technology.

Initially using a 14-mpx camera, CASL acquired its first medium format digital camera, the 39-mpx Hasselblad H3D-39, soon after it was introduced in late 2006, and in 2009 moved up to a 50-mpx Hasselblad H4D-50, again shortly after it was introduced.

The H4D-50 can be adapted for full colour or false colour infrared photography by using different filters. It provides an image comparable with a scanned 23 cm × 23 cm photograph from a traditional large format aerial survey camera, and the 86-mpx frames from one of the first large format digital cameras, the Vexcel UltraCam D, were not so much larger. Now, of course, the largest of the UltraCam range provides a truly massive 260 mpx.

CASL's philosophy is to make use of the best available off-the-shelf equipment, be it cameras, computers, software or other items such as GPS units, with minimum use of specially developed items. This ensures that new equipment and technical developments can be adopted as early as possible.

Where items have not been available commercially, the company has designed and built its own equipment, notably a camera mount (with adaptors for different cameras) for use in our Cessna 172 light aircraft and a GPS-based controller for firing the camera at the correct intervals.

CASL has resisted the trend towards system integration apparent in both large format and UAV systems today. Integration may be essential for dealing efficiently with the very large volumes of data acquired by large format systems and can certainly make things easier for UAV operators. However, it would lock the company into particular ways of operating and reduce the company's flexibility to introduce new equipment and software as they become available.

From the outset, it was clear that customers were not just interested in sets of photographs with a rough indication of where and when they had been taken. They needed the photography to be orthorectified and mosaiced and supplied in a form which could be loaded straight into their GIS systems. Further processing using image



Above: Hasselblad camera with mount and controller.

classification methods might also be required. More recently, there has been increased interest in deriving DTMs from the photography. CASL started out using a traditional suite of photogrammetry software, but has recently moved on to one of the leading programs based on "computer vision" techniques, which is now used by many UAV operators.

Formats compared So how does CASL's medium format capability compare with "conventional" large format and UAV small format aerial photography?

Medium format photography can be acquired at resolutions from 5 cm up to 25 cm and beyond. UAVs in the UK are subject to stringent height restrictions and are effectively limited to resolutions smaller than 5 cm, so medium format photography complements small format UAV photography rather than being in competition with it. The range of resolutions from large format cameras is similar to that from medium format.

A typical UAV flies at around 15 m/s and can capture at most a few square kilometres in a day. CASL with its medium format equipment, flying at 50 m/s, can capture up to a few hundred square kilometres in a single flight, with two or three flights possible in a day, while a large format system carried in a twin-engine aircraft will fly somewhat faster and can capture a thousand or more square kilometres in a day.

The cost and weight of cameras has a significant impact on the price of photography. Cameras in UAVs typically cost a few hundreds of pounds and weigh less than 1 kg, while specialist large format camera systems cost hundreds of thousands of pounds and weigh upwards of 35 kg, needing twin-engine aircraft to carry them. A professional grade medium format camera now costs less than twenty thousand pounds and weighs less than 5 kg. It can easily be carried in a single-engine light aircraft, but would be too heavy for the current generation of UAVs.

Finally, much has been made of the flexibility of UAVs and their rapid response times. This of course is only true if they operate close to home, otherwise overland transport times to site become excessive. With a light aircraft the crew travel with the camera



The cost and weight of cameras has a significant impact on the price of photography.



Aerial survey



About the author

In 2005, after a career in engineering consultancy and ski area management, Tim Whittome founded Caledonian Air Surveys Ltd, which brought together long-term interests in photography, mapping, navigation and flying light aircraft. He remains managing director of the company and is a Member of the Royal Institute of Navigation.

and it is easily possible to fly the length of the country, carry out a survey and return the same day. And if weather conditions turn out not to be suitable at one site, rapid positioning to another site where conditions are better is possible.

An example In February 2014 forestry on the west coast of Ireland suffered severe damage from Storm Darwin. CASL was commissioned by insurers and forest managers to survey a total of 54 privately-owned properties at 25 cm resolution.

The properties were mostly small, from 10 ha to 30 ha in area. Each individual property would have been well within the capabilities of a UAV, but they were spread out over the whole of the west coast of Ireland. CASL arrived in Ireland shortly after noon one day, and the survey was started later that day and completed the following day.

The damage caused by Storm Darwin was so extensive that its impact on the Irish national forest resource raised concerns. Coillte, the Irish national forest agency, commissioned satellite photography of the whole of Ireland to assess its overall extent. The satellite photography was acquired at 5m resolution, which would not have shown the detail required by the insurers, while to fly the whole country at 25 cm with a large format camera would



Above: Irish woodland devastated by Storm Darwin.

have been a lengthy undertaking and unnecessarily detailed for Coillte's purposes.

For both Coillte and the insurers and forest managers, up-to-date photography of the forest resource was required after the storm. For Coillte, full and rapid coverage of the whole area was of first importance, but high resolution was not necessary. For the insurers and forest managers, cost was the primary concern and medium resolution was adequate, while speed of response was also important. The approaches chosen by the different organisations, satellite photography and medium format aerial photography, were each appropriate in the circumstances, and in neither case would large format or UAV photography have best met the requirements.



Caledonian Air Surveys Limited

Bespoke medium format aerial photography throughout the UK and Republic of Ireland

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Digital terrain models

Image classification

Environmental monitoring & assessment

Powerline routes, pipeline surveys

Rivers, estuaries, coastal surveys

Golf courses, archaeology

Forestry, estate mapping

Quarries & windfarms

Towns & settlements



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• **Robin Waters is Features Editor of GISPro and an independent consultant who has worked extensively in several European countries and has a keen interest in EU's INSPIRE Directive and its implementation.**

I DOUBT THAT MANY AGI MEMBERS now remember that we played a leading role in EUROGI from its foundation in 1994 until we withdrew 15 years later. If we don't leave will we become two nations within Europe instead of one? If we do leave will Scotland secede from the UK and take our place in the EU? Will any of these shenanigans affect our industry? Answers on a postcard to Eurofile in time for our next edition please.

Someone who did a lot for European GI was Professor **Bas Kok** who died recently of cancer. Bas was a co-founder of the European Umbrella Organisation for Geographic Information (EUROGI) and was vice-President from 1994 to 1998. He worked on the European Commission's GI 2000 initiative as an expert on its advisory group and which led to the INSPIRE Directive to develop a pan-European Spatial Data Infrastructure. From 2002, Bas was a member of the INSPIRE data policy and legal issues working group. Bas was also president of the Global SDI Association in 2008/9 and remained a member of the Board of Directors and the GSDI Executive Committee for several years thereafter.

professionally and on a personal basis will mourn the loss of a strong SDI proponent and friend.

What would leaving the EU mean for us? A possible effect of leaving Europe might be to make it more difficult for British companies to bid on work in other EU countries such as Ireland. Bluesky, has just opened an Irish office in Cork which will provide a local base for sales, marketing and customer support. This announcement comes at the start of the 2015 flying season which has already seen the capture of significant amounts of data. Bluesky has committed to the capture of 70,000 square kilometres of brand new aerial photography as well as colour infrared (CIR) imagery, and the creation of 3D maps providing accurate elevations of land and buildings for the Republic of Ireland.

Robert Loughran, International Sales Manager at Bluesky said that "We have already been able to start the 2015 flying programme due to early weather windows and have captured much of Wexford and Waterford." Bluesky plans to capture high resolution, leaf on, aerial photography and colour

Shame? Sorrow. Success

Europe was one of the main issues in our recent general election and is likely to dominate British politics for another 12 or 18 months at least. Will we vote to leave and follow the example of the AGI?

In the Netherlands Prof. Kok was Director of the Netherlands Council for Geoinformation (Ravi), responsible for the development and implementation of a Dutch national geospatial information infrastructure. Bas was appointed as Associate Professor at Delft University of Technology in the Netherlands in 1998. Our readers who knew Bas

infrared imagery for the whole of The Republic of Ireland during the Spring and Summer months of 2015. In order to maximise all flying opportunities and complete data capture as soon as possible, planes equipped with the latest Vexcel cameras will operate out of multiple flying bases, including Dublin, Cork, Shannon, Knock and Donegal.

The resulting products will include 25 cm resolution coverage for the whole country with 12.5 cm resolution data for selected urban areas. In addition to the aerial photography and CIR imagery, digital terrain and surface models (DTM / DSM) will be created. The first datasets, available in a variety of GIS ready formats as well as online at Bluesky's Mapshop, are expected to be launched to market in the third quarter of 2015, and Bluesky has already committed to a three-year update cycle for core data products.

Unfortunately Eurofile will not have a direct presence at the forthcoming INSPIRE Geospatial World Forum in Lisbon. The theme of Convergence of all the 'Ps' – policies, practices, processes, public, private and partnership seems able to cover almost any aspect of GI and we would be interested in any reports on the conference from the most technical to the best gossip! If you are there and would like a platform to reach a wide audience in the UK then please let us know.



Right: Bas Kok, co-founder of the European Umbrella Organisation for Geographic Information (EUROGI).



Left: OSGeo shake hands with ICA on their collaboration.

technology. The widespread application of e-learning tools and open source GIS will help enable greater access to geospatial education.

Open Source collaboration worldwide In September 2011, the Open Source Geospatial Foundation (OSGeo) and the International Cartographic Association (ICA) signed a memorandum of understanding with the aim of developing collaborative opportunities for academia, industry and government using open source GIS software and data on a global basis. The MoU will provide expertise and support for the establishment of open source geospatial laboratories and research centres across the world to enhance local development of these technologies, training and expertise. In 2014 the International Society for Photogrammetry and Remote Sensing (ISPRS) formally joined the initiative.

Geo For All: Open is the word!

Suchith Anand explains the philosophy and organisation behind Open Source Geospatial Laboratories – motto 'Geo For All' – a global partnership aiming to spread the use of geospatial technologies to any application where they may be useful. The essential ingredient is 'open' - open software, open data and open standards together with open, online 'e-learning'. The partnership involves the open source movement, international cartographic and photogrammetric organisations, and educational establishments in every continent.

THE TREMENDOUS GROWTH IN THE POWER and use of geospatial technologies over the last few decades has not been matched by the number of universities offering courses in geospatial science. Universities, as well as private and public sector organisations, are in search of alternative means of educating a new generation of geospatial professionals. Free and open source geospatial software applications have now made it possible for a large number of private and government agencies and academics in both developed and developing countries to make use of geospatial software that could not previously be justified. Applications for GIS, spatial database management, and remote sensing abound for environmental protection, transportation, alleviating urban poverty, town planning, waste management, rural development, public policy, public administration and education. By combining the potential of e-learning tools and open source geospatial software, the academic community can strengthen education in GI science providing students with holistic education covering open source, open standards, and open data in the context of geospatial

http://wiki.osgeo.org/wiki/Geoforall_criteria

The motto of the ICA-OSGeo-ISPRS Lab initiative is "Geo For All". Having free and open source GI software is the key to enabling students worldwide from disadvantaged backgrounds to learn geospatial skills. Geo4All will also start work on a "Train the Trainer" programme for school teachers all over the world. It is therefore vital to have open source GIS and open standards (e.g. OGC) based solutions to achieve widespread application of geospatial tools at grassroots level, especially in developing countries. The open source software provides accessibility, reduces costs, and lowers the barriers to entry for the use of geospatial technologies. Over 90 Open Source Geospatial Labs have already been established in universities on every continent as a part of this initiative. We thank our colleagues everywhere for their strong support for this initiative. It is very gratifying that the initiative has now grown rapidly from very humble beginnings and is helping to widen the benefits of geospatial education opportunities to thousands of students worldwide.

The creativity, dynamism and high-profile success



Geo4All will also start work on a "Train the Trainer" programme for school teachers all over the world.





Above: OSGeo workshop at University of Nottingham during OSGIS 2014.

stories of the free and open source movement are attracting increasing attention from end users, developers, businesses, governments, educators and researchers around the world. The goal of the initiative is to promote and enhance education, research and service activities carried out by these stakeholders. By combining the potential of FOSS geospatial software, open data, open standards, open access to research publications and educational resources the initiative will enable the creation of a sustainable innovation ecosystem to advance the discipline. This is vital to encourage wider geospatial education opportunities, to accelerate new discoveries and to help solve global cross disciplinary societal challenges – from climate change mitigation to sustainable cities.

Spreading geospatial knowledge FOSS geospatial technologies are critical for both developed and developing countries because they lower access costs for education, government and industry applications and enhance research and teaching in geospatial science and technology. They also enable more research and development into spatial data infrastructures and help improve the transparency, accessibility and long term sustainability of the applications. There is little doubt that the healthy competition with proprietary software will also be to the long term benefit of the industry. Government organisations, universities and private companies are all turning to FOSS to carry out their missions. For universities and educational institutions, open geospatial science and applications are especially important because they help to empower students and help with capacity building. FOSS also helps to create openness in geospatial education which in turn develops students' creative and open thinking. This is critical for building open innovation and contributes to increasing open knowledge for the benefit of society future generations.

Geo4All can claim to have achieved several objectives since the signing of the MoU in 2011 thanks to the efforts of our colleagues:

Right: The Open Source Geo Lab founding meeting at University of Nottingham (June 2010).

- Established Open Geospatial Science as a discipline (academic journals, journal special issues, conferences, proceedings, etc.)
- Enabled Openness in Geospatial Education (university programmes, MOOCs (massive open online courses), summer schools, training programmes, etc.)
- Establish Open Source Geospatial Labs in universities worldwide to build firm foundations and expand the discipline.

As part of our next stage of expansion of Geo4All, we want to focus on using the Open Geospatial Labs in universities worldwide to expand research by bringing together colleagues from other departments in the universities. We will address three particular areas where the focus is on 'big data' research and development (urban data science, transport science, environment and climate science). This will help expand our established research labs and establish new labs internationally specialising in these themes and building on 'open' principles (open data, open software, open standards, open access to research publications, etc.). For new universities that wish to establish Open Geospatial Labs, details can be found at <http://www.geoforall.org/>

Geo4All participants believe in empowering people with spatial decision making tools to help build a better society for all of humanity. Combining the potential of free and open source software, open standards, open data and open education resources, we are now offering opportunities to nurture and develop open minds for students everywhere to help achieve a better planet and a better future for all. We look forward to working with colleagues – both present and future – to make geospatial education, software and opportunities accessible to all.

Acknowledgements

"Geo for All" started from very humble beginnings and my sincere thanks to all our colleagues in the "Geo for All" initiative for their help and dedication for this mission. I especially thank Professor **Georg Gartner** (ICA President) and **Arnulf Christl** (former OSGeo President) for taking the initiative of ICA-OSGeo MoU on which we build the Geo for All initiative.



Geo4All participants believe in empowering people with spatial decision making tools to help build a better society. . .



About the author

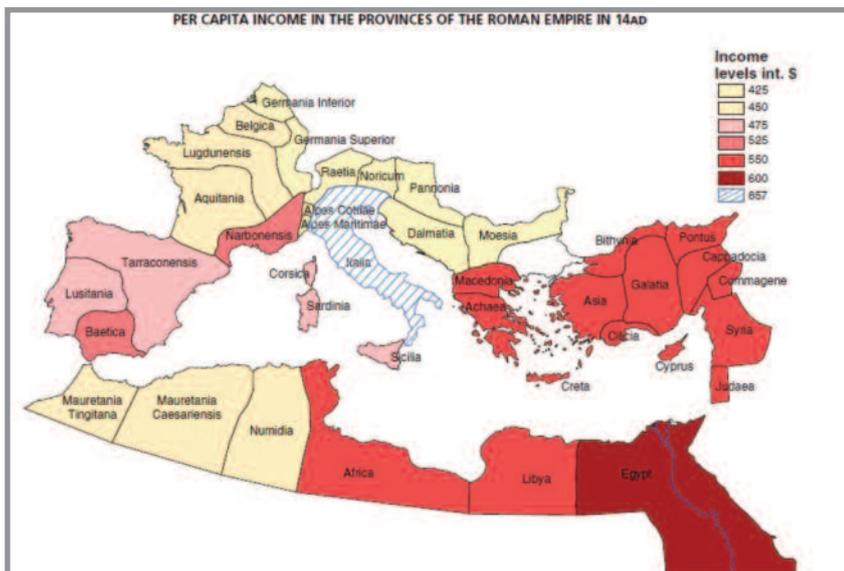
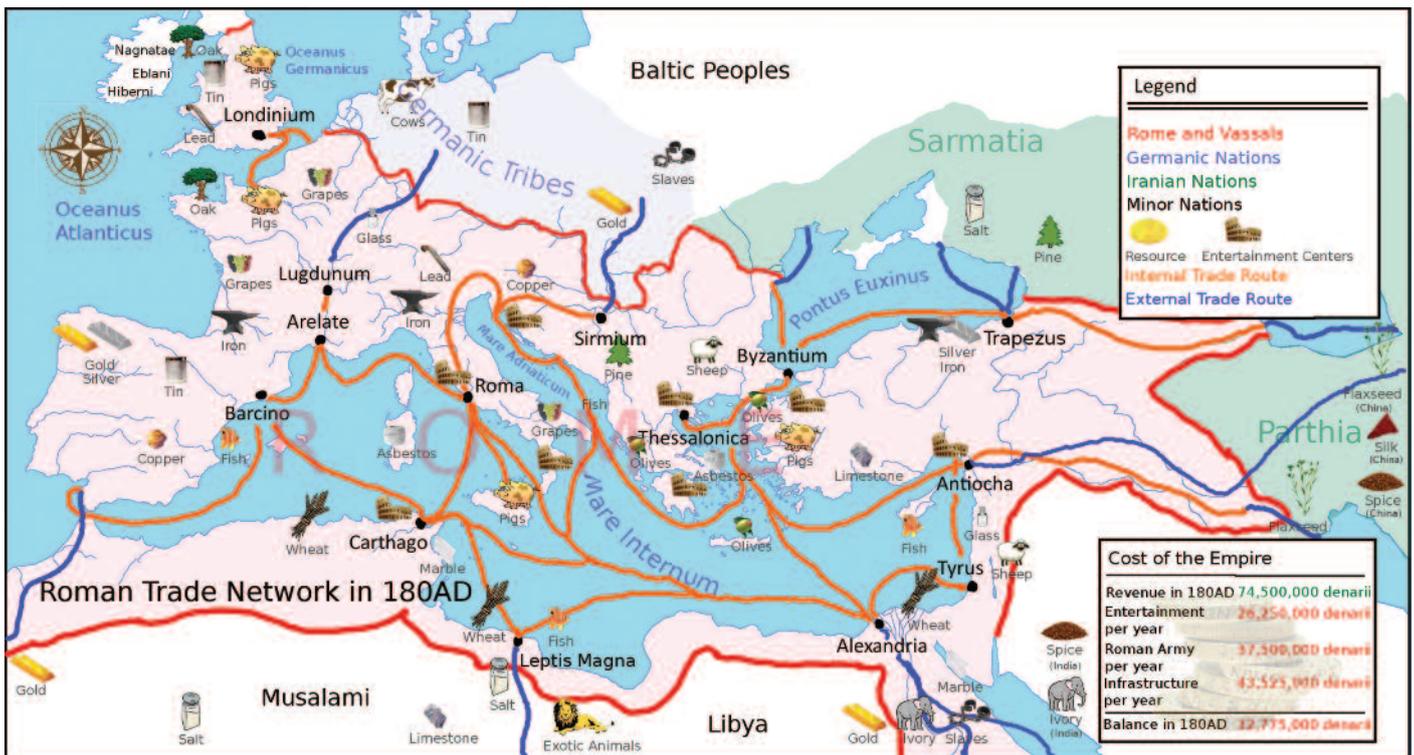
Dr Suchith Anand is the founder of "Geo for All" initiative and working for establishing Open Source Geospatial Labs/Research Centres in key universities worldwide as part of the Open Source Geospatial Foundation- International Cartographic Association MoU. He is charter member of the Open Source Geospatial Foundation and chair of ICA's Commission on Open Source Geospatial Technologies. His mission is to build up open source, open standards, open data research for bridging the digital divide.

GISPro's big map feature

Roman trade routes and the Roman economy in 14 AD

The map below looks at the various trade routes within the Roman Empire in 180 AD to give you a better idea about the types of goods and resources each part of the Empire

produced and perhaps help explain why some were richer than others.
Map created by *Adhavo* via *Wikimedia*



Even the Romans were poorer than the poorest today

The map on the left shows the estimated GDP per head in the year AD14. Whilst the Romans were better off than their subject tribes and races, they were still poorer than the world's current poorest nation, the Democratic Republic of the Congo.

You may wonder how you can calculate and compare GDP per capita figures from 2,000 years ago. The numbers for the map come from historian **Angus Maddison** who uses Sestertius (a small silver coin) records to find wheat equivalent figures for national disposable income and makes comparisons based off that.

It also assumes the population of the Empire in 14AD was 44 m (other estimates have it as high as 60 m). The Roman Economy Wikipedia page has more on this.

• These maps are reproduced with the permission of **BrilliantMaps.com**



David Henderson is a geospatial professional with a geographer's heart. He is the Head of Product Management & Development at Ordnance Survey and is serving as AGI's Chair in 2015.



THE EARLY SPRING IS TRADITIONALLY a busy time in the UK's geospatial scene with several events taking place - some dates proving so popular that geospatial professionals have had to decide where valuable time out of the office should be most profitably spent. In addition to a range of AGI Geo: Big 5 events and meetings of various special interest groups, we've also had great events from Esri (UK), GeoData, Ordnance Survey and GeoPlace to name but a few and by the time this magazine is distributed AGI will have enjoyed two great days of geo-collaboration with our GEO Business conference partners – RICS, TSA, ICES and ICE.

During April and May, the AGI's Geo: Big 5 have focused on two themes that have proven to have significant overlap. I've been hugely impressed by the quality of the presentations and subsequent discussions that have taken place at these events; the

conference, Resilient Futures, at Chesford Grange Hotel in Warwickshire will provide a great platform to bring this year's conversation together and early bird registration details were launched this month along with a call for papers. After the huge success of last year's conference I'd encourage early registration and a personal commitment to be part of the conversation about how our industry develops over the next few years. Mark the dates, 23-25 November.

Changing world This month I was particularly interested to hear about the Royal Institution of Chartered Surveyors Futures programme – RICS's response to the challenges posed by a changing world. It's certainly worth a read online and highlights many parallels with the geospatial industry. More locally the AGI

Quality presentations and discussions as we head for GeoCom 2015

A busy spring has meant hard choices for geospatial professionals faced with a plethora of events. From the Geo: Big 5 to BIM and Smartcities, the industry is busy, says AGI chair **David Henderson**. And looming this autumn is the AGI's own annual conference, GeoCom.

Geo: Big 5 series continues to command a respected position as a premier source of geo thought leadership.

What is very apparent is the increasingly overlapping nature of the opportunities afforded by the 'internet of (spatially enabled) things', spatial data analytics, 'big (spatial) data', open (spatial) data and application domains such as Building Information Models (BIM) and Smart Cities. What has been equally apparent has been the cry for a greater need to advance our collective adaption of new technologies, business models, collaboration opportunities and skills such that our traditional industry is equipped to benefit from the opportunities that are being afforded to us. The familiar quote, attributed to Darwin seems very applicable - It is not the strongest of the species that survives, but rather, that which is most adaptable to change.

GeoCom 2015 This year's annual GeoCom

launched its Early Career Network (ECN) in May with a fantastic webinar involving guest speaker Jon Graham from Triad Group who talked about trends and skills in the GI jobs market. The ECN has been widely welcomed and it's been great to see so many of AGI's members sign up to be involved. Under **Andy Murdoch's** leadership I'm really looking forward to seeing how this develops.

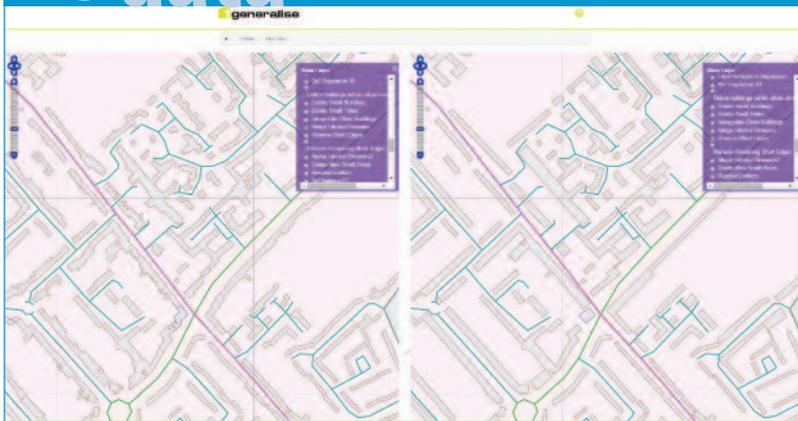
Finally, whilst it's great to meet up at events, AGI continues to host a number of active LinkedIn groups and posts regularly on twitter **@geocommunity**. Don't keep those post-event thoughts to yourself – post online and keep the conversation going!!

AGI exists to "maximise the use of geographic information (GI) for the benefit of the citizen, good governance and commerce". Membership details are available from info@agi.org.uk or by calling: +44 (0)207 591 3190.

“
What is very apparent is the increasingly overlapping nature of the opportunities afforded by the 'internet of (spatially enabled) things'”



Big data



Left: 1Generalise dual viewer, allowing the user to compare any pair of intermediate states in the process. This is useful for tuning parameters.

they need, and then derive multiple map products from it.

Some of these are made available for general use and are widely distributed. For example, topographic maps which are used for outdoor leisure can also be used for a wide range of analytical tasks. Others target a very specific usage, like flying an aeroplane to the right destination or presenting geology.

We are now, however, seeing another kind of map-maker, often referred to as the neocartographer, with little, if any, expertise in cartography. The rise of available data and the ease of access to it enables them to make a map, often just for personal use, using the information they need when they need it. It's still not easy, as it requires tracking down the datasets, often from multiple sources, integrating them, and styling them

FOR CENTURIES MAPS HAVE BEEN an effective way to display location information; how things relate to one another geographically. This information can be represented in many forms: geo-referenced coordinates, addresses, place names, relative position (5 miles south of the Angel of the North) etc. The most useful maps however, are those which combine several types of information, so that the reader can quickly spot correlations.

More maps from big data?

The rise of mapmaking amongst those without cartographic qualifications presents a challenge, argues **Nico Regnaud**. Big data and the ever expanding demand for mapping on a variety of devices means generalisation of datasets and integration of skills. The arrival of new software tools can speed up this work for both neo and traditional cartographers.

In the digital age, it's this ability to combine datasets which makes a map a powerful information and decision-making tool; be it planning teams working out how to widen a road through a valley, environmental departments planning flood defences or simply getting from A to B in the car. However there are technical challenges to creating these new maps.

As data becomes more readily available and more voluminous, it becomes big data, and the technology needs to keep pace. The potential for maps is enormous – as big as big data! Perhaps we can now have all the maps and combinations of data we need. Or are there still some limitations to what can be done with the data and software available today?

Making maps today Traditionally map-making has involved specialists - professional cartographers skilled in the art of representing the world around us. These cartographers usually make maps for an organisation specialised in a particular domain; perhaps topography, roads, charts for navigation at sea or in the air, etc. The organisations usually capture and maintain large amounts of data at the highest level of detail

before publishing a map. General purpose GIS software, such as the open source QGIS, will help them, but anything more complicated than overlaying layers on top of each other and styling them is non trivial.

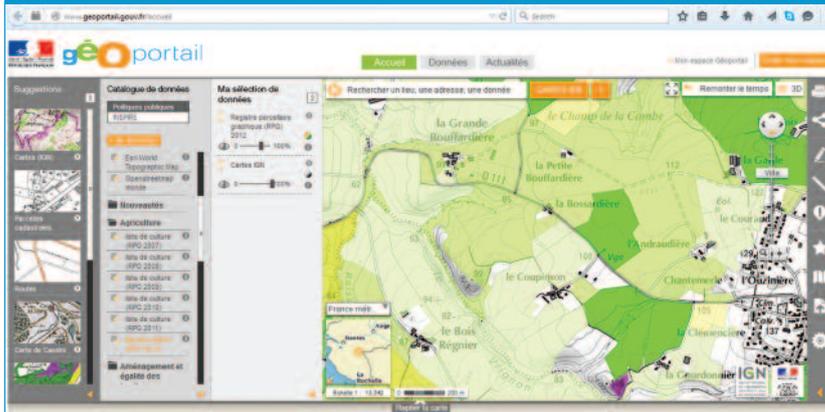
New challenges for map makers If professional map-makers have the experience to make easy-to-understand maps, they are now facing a new challenge: how to make more of them, more quickly and at lower cost.

The process of generalising data, so that the information can be displayed and understood at larger scale (more detailed) and smaller scales (to facilitate, for example, zooming in and out of a map on your phone), is still expensive and involves manual processes. Consumer demand for location-based information has also created demand for more maps, more information on existing ones and maps for specific uses. So speeding up the map-making process is important for national mapping and cadastre agencies (NMCAs), which cover large territories. Automated generalisation can help these organisations increase their responsiveness to market needs, but creating niche maps will rarely be sustainable.



From the neo-cartographer's point of view, speed is not so important. . .





Above: Example of Geoportail from IGN, it allows users to make custom maps by combining existing layers, here the coloured layer represents types of cultivation, with a topographic map in grey scale in the background.

From the neocartographer's point of view, speed is not so important. The challenge is to find the datasets, integrate them, and style them. The most complex and difficult stage is integration.

Fortunately the NMCAs are developing ways to make their data available to users through geoportals. This will enable neocartographers to make their own maps using trusted and reliable datasets. These can be delivered as a set of base maps at several scales, often in raster format and sometimes also in vector. So the mapping industry is moving to provide neocartographers with better background data to make their maps and reduce the challenges all round. What about the tools?

Data integration and generalisation To effectively integrate datasets and carry out some generalisation processes, neocartographers often still need programming skills and time, even though

some software is available to help. They cannot access the automatic generalisation systems created by the NMCAs.

1Spatial has recognised the need to combine these approaches and bring more of the expertise of cartographers into the

software. This will speed up the work of traditional cartographers, reducing costs and improving update rates. For the neocartographer, the software will mean easier integration and generalisation processes; and a wider range of possible maps.

1Integrate has been designed to help the user clean datasets from multiple sources and integrate them. It uses a rule editor that gives users the flexibility to create rules to detect correspondences between features from multiple sources and perform actions to integrate them as needed. This leads on to 1Generalise, designed to provide a ready-to-use, potentially on-demand, generalisation service to both NMCAs and neocartographers.

The generalisation issue is not a new one, but these new technologies could have a significant impact on the work of both traditional and 'neo' cartographers. The more automated generalisation processes can be used to re-engineer legacy data for internal use, or to publish data products to customers. Either way the automation will save huge amounts of manual effort and make previously impossible tasks possible – for both sides of the map-making community.



About the author

Nicolas Regnauld has many years of experience in researching solutions for automating the generalisation process. After doing a PhD on the subject at the Institut Geographique National (Paris), followed by a post doctorate at the University of Edinburgh, he led the research team on automated generalisation at Ordnance Survey for 11 years. During this time, he and his team successfully developed a fully automated generalisation process that was used for the creation of OS VectorMap District. Nicolas joined 1Spatial in June 2013, as product manager for 1Generalise and 1Publish. www.1spatial.com



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GeoPlace awards



Below: Cakes – celebrating the 10th annual GeoPlace conference.



Above: Heads down for a busy day.

bold, to be proud and to be change agents! Someone has got the message!

There were over 300 in the audience who were welcomed as usual by **Richard Mason**, GeoPlace managing director, who reminded us that the first meeting in Manchester in 2005 had only 75 attendees. Of course the nitty-gritty of gazetteer creation and maintenance took centre stage but Richard drew our attention to the almost complete transition that has now taken place from Ordnance Survey's original address datasets to the AddressBase products derived from the national land and property gazetteer compiled by GeoPlace from local authority inputs.

He emphasised the recent 'opening' of access to UPRNs, which are now free to use in any way and which he called a 'golden thread'. This linkage is

Everything Happens Somewhere: 10 years on

The day's play at Edgbaston might be summarised as Addresses comfortably coasting to victory while Streets are just beginning to get to grips with a sticky wicket! **Robin Waters**, who is one of the Exemplar Award judges, reports from a rain affected match being played in front of a smaller crowd than the GeoPlace 'Everything Happens Somewhere' event in Birmingham.

EDGBASTON CRICKET GROUND. 19th May 2015. Third day of a county match between Warwickshire and Durham. The home side's first innings 450. Durham finally skittled out for 185 in front of our very eyes (well a few of us) and forced to follow on.

No, I have not quite retired – and I won't be watching much cricket when I do. In the Edgbaston conference centre this was day one of the one day, once a year, gazetteer fest laid on by GeoPlace for all those hard-working people who cooperate to provide the National Gazetteers for Land and Property, and for Streets. In fact it is the 10th anniversary of the GeoPlace annual conference, exhibition and presentation of the Exemplar Awards. Your reporter was also on the jury for those awards which go some way to make up for the low regard in which gazetteer custodians are often held by the press and many ignorant politicians.

Green councillor 'gets it' Not so councillor **Jason Kitcat**, immediate past leader of Brighton and Hove City Council who spoke very enthusiastically and very succinctly about the need for well co-ordinated information sharing across and between councils. He specifically challenged us and our elected representatives to treat legal advice as advice and not as absolute instruction when questions are raised about the legalities of sharing data. He closed a very short speech (no slides) with an exhortation to be

already being used in the majority of authorities to enable exchange of information between their many databases. Four councils – North Somerset, Huntingdonshire, Camden and Newport already claim to link more than 20 different databases through their gazetteers and only 26 (out of 400+) are linking less than five sets of information.

How long is that road? **Paul Baden**, who glories in the title of GIS manager, road length statistics & network geography at the Department for Transport (DfT), is looking forward to the improvement of the first version of the as yet unnamed 'new highways mapping product'. This is combining Ordnance Survey's MasterMap Integrated Transport Layer (ITN) with the National Street Gazetteer maintained by GeoPlace from highway authority data. There will be additional information to be added from DfT itself and its agencies. The current version has approximately 70% match between ITN and NSG but is having to reconcile two different views of the network which overlap but neither of which provides complete coverage.

DfT are putting up £3m to fund the creation of this database which will provide them with their first ever complete dataset for England and Wales – presumably Scotland will come later if they haven't left us in the meantime! Given that our roads represent an asset with a replacement cost of around £400bn perhaps this is not before time. It is



*... to be bold,
to be proud and
to be change
agents!*





Above: Delegates enjoyed a busy day of inspirational presentations, round table discussions and the award ceremony.

envisaged that the product will be made available under PSMA and that it will be commercially available in Autumn 2015. Amongst the 'drivers' (!) for this project Paul mentioned intelligent transportation systems and the EU INSPIRE directive, though he suggested that its spec was much broader than the basic European requirement.

Postman and valuer Last year, at Old Trafford cricket ground with no match to watch, the conference pioneered the knowledge exchange sessions with eight to ten people discussing specific issues on 30 tables with a facilitator on each. I listened to a really heartfelt plea to ensure that non-domestic rating information from the Valuation Office Agency used a compatible set of attributes to those required for the NLPG. It must be very frustrating to find that all your hard work has been nullified by a system that cannot cope with a particular set of attributes. Richard Mason's table encouraged participants to say 'what they wanted from GeoPlace' and the overwhelming answer was more support in convincing their employers – officers and elected councillors – that gazetteers were necessary if not sufficient for the effective digital transformation of any council. There was also a call for a better set of processes for dealing with Royal Mail which currently seems to vary widely across the country. The privatisation seems not to have made much difference to addressing processes and the Address Management Unit continues as before. Now they have settled down it is GeoPlace's intention to tackle some of the outstanding issues relating to the allocation of addresses and postcodes.

Attentive GISPro readers will know that the Land Registry has now been mandated to take over responsibility for the land charge searches required for all conveyancing. This required local authorities to provide their current land charge databases from several different systems and formats and also to codify much 'local knowledge'. On one table I saw an advocate for the new system run into some very sceptical questioning from current local authority

practitioners and I can certainly see many hurdles to be overcome before Land Registry will be able to deliver a 100% service. Issues arise from the use of addresses (presumably with an AddressBase point coordinate) in some places but the use of Basic Land and Property Unit (BLPU) polygons in others. What I had not fully realised was that we are actually moving full circle – some of the land charge information was previously provided (in a pre-digital age) by HMLR. The main reason for the change championed by the government is to provide a consistent and cost-effective service across England and Wales. We will see!

Exemplar Awards And so to the Awards which were presented by **Claire Holloway**, chair of the Local Government Association, which co-owns GeoPlace with Ordnance Survey.

The main Exemplar Award was won by Bromley Borough Council which demonstrated impressive savings by creating a street gazetteer based schedule of streets and paths for tendering their street cleansing contract. They were thereby able to visualise and model different frequencies and projected potential savings by re-engineering schedules of work. This resulted in substantial annual – sustainable – savings of £800k.

The local digital award went to Northumberland County Council but no single winner could be found for the Peer Award. In fact it was awarded to both **Glenn Dobson** of Hull City Council and **Pauline Clifford** from Reigate and Banstead Borough Council for their work in their own councils but also for their contribution to the national scene. Most improved address data was in South Lakeland DC and most improved Street data was in Hampshire.

So, with the mention of another first class cricket team, we leave Edgbaston with the feeling that this event is very well focused. It is also well supported by several companies which provide software to help the custodians; provide some of the raw data that meshes with the gazetteers; or build on top of the GeoPlace products. There is no doubting the dedication of most local authority employees – one might wish that they were better supported by their bosses – elected or otherwise.

STOP PRESS (the next day) Warwickshire beat Durham by 8 wickets!

All photos © Nick Beadle



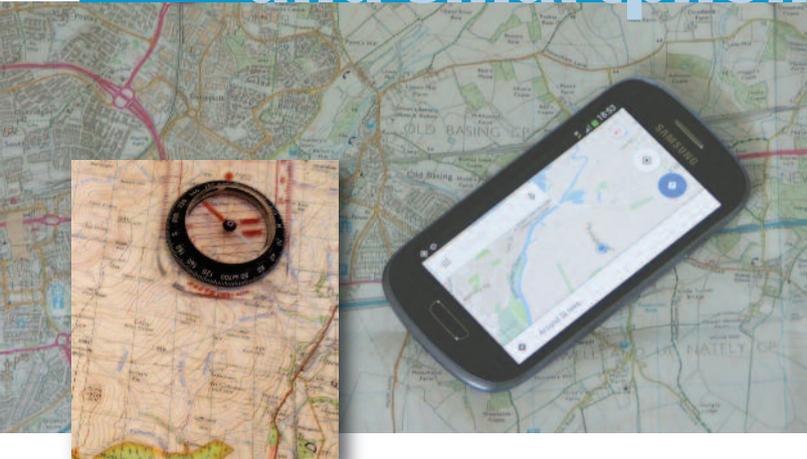
... the first version of the as yet unnamed 'new highways mapping product'.



Below: Simon Park, Electronic Business Systems Officer and Gillian Gribble, Property Gazetteer receiving the Award for Most Improved Address Data from Claire Holloway, Head of Corporate Governance, LGA and Chair of the GeoPlace Board, Neil Silley, Senior National Address Data Manager, GeoPlace.



Maps and smartphones



Above: The simple compass is unlikely to fail due to lack of power (unless it's part of a mobile phone).

MAPS ARE ONE WAY in which geospatial information can be presented to a user. To those of us that enjoy using or have at least been trained to use maps they are often the best way of understanding geography – where physical features exist or how statistical information relates to space and how people or things are distributed across a town, a country, or the world. But often they are only a means to an end – how to

has warned that “Growing dependence on smartphones and satellite navigation systems to find our way threatens the future for basic map reading and compass knowledge”. Apparently “society is becoming “sedated by software” as it loses both a practical skill and a spur to self reliance”. Doubtless most cartophiles will agree but most cartophobes will just press the directions button again.

The RIN was set up in 1947 when airliners still carried navigators able to take star shots and when every man was still called up for national service and learnt at least basic map reading in their first weeks of training. By the same token most car drivers would have been able to change a spark plug (in cars where they were at least visible!) and copies of documents were by carbon paper or spirit duplicator. Can you still get carbons for A4 paper?

Blessed relief or King Canute? Press response to the warning from RIN was instant and varied. The BBC's **Tom Heap** suggested that not having to get to grips

Map reading sedated by software

The Royal Institution of Navigation has warned that we are becoming too dependent on satnavs and smartphones. It believes that traditional navigation skills encourage independent thought based on calculation and self-reliance. It wants UK schools to encourage the teaching of basic navigation as a way to develop character, independence and an appreciation of maths and science. **Robin Waters** looks at the warning and the press reaction.

get there; what can we see; what's the density, or some other attribute, of population varies in an area. The information content of most modern maps is stored digitally – whether as relatively sparse attributed points, polygons or line strings or as continuous images captured from sensors on satellites and aircraft or scanned from existing maps.

Cartophiles and cartophobes The difference, I would submit, between cartographers and many geospatial specialists is that the former, by definition, produce maps; the latter may do so (and probably not so well!) but must also produce other outputs to answer users' expectations. These outputs might include descriptive routes, whether or not some condition is met at a particular point or in some particular area, and tables or textual representations that may be more useful, or just more familiar, to a complete range of end users. One mobile phone company carried out a survey in the early noughties to establish how smartphone users would react to mapped information. It turned out that while 30% of the population are 'cartophiles', there are at least another 30% who are 'cartophobes' and who really don't like maps and cannot understand them.

Recently the Royal Institute of Navigation (RIN)

with maps would be greeted by some as a “blessed relief from flappy paper, navigation anxiety and marital trauma”. He also quotes the Geographical Association: “digital navigation helps you to get somewhere but fails to tell you anything about your surroundings”. Map skills are compulsory in GCSE geography which is still taken by 30% of our children.

A headline above **Harry de Quetterville's** piece in the Telegraph suggests that ‘Maps are beautiful things, but GPS is far more practical – especially if you've got no sense of direction! He writes about the “Canute-like attitude of **Roger McKinley**” (president of RIN) and sees him “from his throne on the beach, issuing a decree that the tide of technology should come to a halt”! He goes on “Map-reading may be a skill in decline, but a great many of us have been rubbish at it for many years. Much as I'd like to, it's a bit much to blame Apple for our long-standing incompetence”.

The Guardian devoted a leader to this announcement which includes:

“For as far back as records go, it has been a powerful human instinct to try to describe the relationship between the physical world up to and beyond the horizon, and the world visualised in the imagination. Maps may have been among the earliest



... 30% of the population are 'cartophiles'. . . another 30% are 'cartophobes' who really don't like maps and cannot understand them.



form of written communication. Sometimes it was an attempt to apply mathematical understanding to create a truly scientific account of the world. Sometimes a map was intended to order it according to ecclesiastical priorities, like the Mappa Mundi in Hereford Cathedral. Copies of maps allegedly made by **Marco Polo** of the coast of Alaska have surfaced in the US. Maps became the tool of merchants and administrators. In some places the cartographers represented a kind of cultural oppression, a phenomenon captured by **Brian Friel** in his play about mapmaking in 19th-century Ireland, *Translations*, where the villages and mountains are robbed of their Gaelic identity in a brutal outburst of Anglicisation by a detachment of soldiers. The Ordnance Survey maps that most walkers still use are direct descendants of the maps drawn up in the great expansion of cartography ordered to assess the state of Britain's coastal fortifications against the French in the Napoleonic wars, and later the maps on which the great engineers sketched their plans for canals and railways."

"To lose a familiarity with these maps would be like giving up learning a second language. Being able to look at a map and turn the contour lines and the symbols into the lie of the land, to see the march of pylons and the wooded hilltop and to be able to work out how to reach the nearest village with a pub: this is both a practical skill and a voyage of the imagination."

Techno-Nostalgia Comments on these articles are even more varied and seem to bear out the proportion of cartophiles to cartophobes. One points out that paper maps don't need batteries or phone or satellite signals. Another describes the whole RIN warning as "a bunch of techno-nostalgia tosh" (sic) and that the digital technology enables us all to carry much more detailed maps for much greater areas than we could with paper.

Another suggests that "But for all of this technology, a map is still a map. If you could bring the people who made the first OS map forward 214 years, they would (after the shock wore off) recognise it as a magical evolution of the maps they know. The 'ancient skills of mapping' aren't threatened, we just live in a world where the modern skills of mapping are in more demand. Those skills are built upon the old skills. This is the way the world changes over time. Moaning about 'millennials who can't use a compass' is as profoundly unhelpful as me moaning about oldies who can't use a computer. Embrace, adapt, evolve. By all means, preserve the past, but also recognise that the real 'voyage of the imagination' isn't behind you."

Personally, as a convinced cartophile I can appreciate the usefulness of both maps and satnavs. Smartphones do however have one real problem – try reading anything on a phone in bright sunlight. And why would you want to walk in the hills when it is dull and grey!



To lose a familiarity with these maps would be like giving up learning a second language.



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Geodata for business

From left to right: Phil Cooper, Sterling GEO; Theresa Smith, IRSA; Gerry Wildman, BGS.



Leicester leads the way: Geodata event for business

A free event laid on by Leicester University showed what our industry should be doing to get our message across to those not yet positioned or located. **Robin Waters** reports on how to get people interested; show them what can be done and then show them how to do it! As an industry we should take note and put on more events like this.

WHY IS WHERE NOT WANTED? Ever since I started working on digital mapping for the Ordnance Survey in the 1970s I have heard our industry bemoaning its lack of success in persuading government and business to take up our 'offerings'. Why don't they use this? Why can't they see the 'obvious' benefit of that? Why on earth can't they put that data in its geospatial context?

Of course we have got better at demonstrating value for money and showing how useful spatial data can be. But arguably we have still not got to the core of a lot of potential applications for a variety of reasons.

So it was very refreshing to attend the Geodata for Business event in Leicester in March. Over 100 attendees from 40 SMEs from the area, including solicitors, marketing services, TV programme makers, estate agents and health companies were treated to really enthusiastic presentations of actual applications and benefits. And not just SMEs but also local and central government, the health service and some bigger businesses sent representatives to listen and learn. They did! I saw several 'light bulb' moments when people with no previous knowledge of digital maps or satellite imagery suddenly saw how they might be able to benefit.

FREE as in beer! The event, fully entitled GeoData: New Business; New Markets; New Customers was set

up by the University of Leicester partnering with Google, the University of Aberdeen and the EU. The latter are collaborating with the University through IRSA, Innovation through the Research Support Accelerator, which is part supported by European Regional Development Funds. The event was FREE to participants, including a very good lunch, and I think everyone enjoyed and profited from the day.

GeoData was a really useful contribution to our industry and very different from the average 'geo' event. This was aimed at people with little or no understanding of how geospatial technology works or how it could help them with their existing processes or customers and how it could bring in new business. Although some of the speakers were well known in our industry I don't think I knew a single member of the one hundred strong audience – mainly small and medium sized businesses from the East Midlands.

We should not be surprised at this initiative in Leicester – it is the home of the British National Space Centre and close to Blue Sky International, one of the UK's most innovative aerial imagery companies. The University has a geography department that was a centre of pioneering GIS activity and now promotes the use of space-based technology through the EU funded G-STEP



GeoData was a really useful contribution to our industry and very different from the average 'geo' event.



partnership. Forget horseless Plantagenet kings and docudramas about pioneering DNA profiling; Leicester should have been in the news for this meeting in the City Rooms.

Teresa Smith, IRSA project manager, was a very welcoming host and it was no fault of hers that **Ed Parsons** (big brother from Google!) had problems with his technology in Barcelona and could not present as planned. It didn't matter at all. Google's mission is 'to organise the world's information using geography' and his fellow speakers amply illustrated how various representations of geography can do that job for everywhere from the local street to the whole globe.

MBA's to wedding photos Dr **Ian Heywood** was well known as a GIS lecturer and author when he was at Manchester Metropolitan University. He is now the MBA programme director for the Aberdeen University's Business School and was able to show how geographic information can provide a company with a new business angle or enhance its value proposition. He took us through several examples of start-ups that rely on location information – via geo-tagging (shutterbug), geo-connections (songkick), geo-social networks (banjo), geo-navigation (viewranger), tracking (zest:trak), geo-memory (Placeme) and the key finder (Tile) story. Not forgetting to consider possible ethical issues and the pace of innovation. He also suggested that our children might soon be asking their parents 'What does 'lost' mean?'

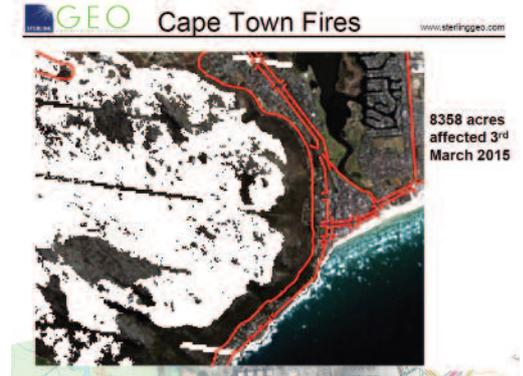
More familiar to our industry was **Gerry Wildman's** presentation from the British Geological Survey (not far from Leicester) on their digital products and value added services. She was complemented by **Andy O'Keefe** who works for Virtualis, which provides 3D visualisation tools for BGS and many other applications. Geological 'big data'; the power of modern computers and the connectivity of the internet all come together to provide visualisation and analysis that simply could not have been achieved even ten years ago.

Below: A variety of business models using GI as presented by Dr Ian Heywood, Uni of Aberdeen.



Satellite data was introduced by Prof. **John Remedios** from the National Centre for Earth Observation with examples from bespoke weather forecasting (with or without pollution); topographical measurements in South America; and agriculture and food security applications in south east Asia.

Sterling Geo are based in Loughborough and specialise in 'getting dirty with data' according to **Phil Cooper**, director and a Leicester graduate. Although they collect data from the ground, the air and from space, most of their business is in manipulating and managing the data as well as developing tools and proving services and training. A typical example was their ability to deliver processed satellite data to a client in Cape Town, affected by extensive bush fires, within an hour of the request coming through. The company has now moved into using UAVs for aerial imagery and subsequently found a very lucrative niche market taking photos of wedding parties at nearby stately homes!



Above: Interpreted Landsat imagery delivered to Cape Town in less than one hour from the order coming in to Sterling GEO.

Interactive workshop The afternoon workshop had a team of Google trained facilitators on hand to show how 'Scrappy GIS – Google My Maps' can be used by anyone for their own purposes and be customised accordingly. We had all been asked to bring our own devices and to have signed up for an active Google+ account. This was for many their first experience of doing anything 'interactive' with a geospatial application and showed just how easy it can be. The workshop covered basic cartographic tools, projections, database management, map layers and basic styling as well as sharing and embedding the final result.

Conclusion The event suggested many ways of exploiting geodata and the associated tools:

- Finding where your existing customers are and what is close to them
- Finding where similar demographics live and how best to reach them
- Monitoring trends in delivery data
- Expanding into new markets
- Developing new services

The importance and potential of geodata were thoroughly examined at this event – everyone could relate to some of the examples and the enthusiasm of the presenters was a joy to behold. With 'big data' becoming increasingly critical to businesses across the UK, we know more and more about WHAT our product is and WHO we target, but can we really afford to ignore the WHERE?



The importance and potential of geodata were thoroughly examined. . .



user conference



Eyes up for a busy day at Esri's 2015 user conference. Far left: the printed programme proved a reliable backstop when the app failed.

HOW DO YOU GO ABOUT organising a conference for 2500 people? How do you control it on the day, when you've got five tracks and two sub-conferences running simultaneously, as well as plenaries? The caterers gave up early and just put the milk for tea & coffee out in bottles! Your reporter had forgotten what a milk bottle looked like. Putting the empties out each night along with the cat must have all but

his colleagues was, what do you do if you have to double your throughput by 2030 but have no space left in which to expand?

The answer of course is to apply geospatial information management in the form of ArcGIS, integrated and available to all across 35 departments. A Smart Port data object model of 1500 layers, developed over many years, was reduced to ten core objects and a

Looking at where the value comes from

Esri UK's annual conference attracted 2500 delegates this year, up by a thousand on 2014. The QEII centre was creaking and struggling to cope in a day when the caterers had clearly remembered to put the milk bottles out! But there was much to entertain and excite your reporter in a day of many uber-cool GIS apps.

disappeared as a national habit. I came over quite nostalgic. . . But not for long, as this sparkling day was all about what we're doing today with GIS technology and what we may be doing with it tomorrow.

Opening events, **Pete Wilkinson**, Esri's head of customer success, urged us to use the downloadable event app. Alas, he later had to apologise for some of its shortcomings within the rambling floors and halls of Westminster's QE II centre.

Handing over to Esri CEO **Stuart Bonthron**, the day began in earnest. In a wide ranging introduction to the day, he argued that business needs to transform rapidly in the face of climate change; and GIS has a role to play. Ahead of us was learning about topics as diverse as air pollution, story mapping for Crimestoppers, endangered biodiversity, Ireland's new water authority, how Westminster was using GIS to work out the best location for building new primary schools, Network Rail's National Aerial Survey (which was to win a prize later in the day), how Scottish Power is using augmented reality on mobile devices and how the NHS can better manage A&E admissions if they knew where they came from.

Expand but how, where? By way of an entrée to all these geo stories **Erwin Rademaker** from the Port of Rotterdam told us about how GIS was being applied across the board to a mini city covering 105 square kilometres that accepts a container ship on average every six minutes. The challenge for Rademaker and

brief to make access to all information no more than three clicks away. The system contains a vast range of information from lease details of warehouses and other infrastructure, to bathymetry, environmental data ('smell emissions') and even a key-wall modelling element.

Rademaker assured us that the system was so simple that even a child could use it. Hmm. . . he's obviously not met some of the children I have who seem effortlessly to master technology much better than most adults. Nevertheless, to prove his point Rademaker and his colleagues unleashed their own children on the system one Saturday morning to test it. It came through with flying colours.

Working with the wounded There followed a presentation from **Victoria Nicholson** on behalf of the Esri sponsored charity Walking with the Wounded (patron HRH Prince Harry), whose work is about getting exservice men and women back into the workplace.

It may come as a surprise to learn that there are currently some 72,000 veterans in the UK needing support in one form or another, the damaged survivors of Britain's various wars over the last 40 years or so. They range from amputees to the mentally scarred. Alas, many have ended up in the criminal justice system (8 – 10% according to Nicholson). They are supported by some 2,200 military charities in addition to Walking with the Wounded. The latter's skill-sets include people as diverse as an equine therapist.



...to prove his point Rademaker and his colleagues unleashed their own children on the system...



The charity raises awareness of its activities through high profile events like trekking across Antarctica or the latest venture, a 1000 mile walk across Britain. Nicholson was at pains to stress that these events are paid for through sponsorship and all money donated by the public goes directly to the charity's day-to-day work.

It's where the value comes from Charles Kennelly is Esri's chief technology guru and his presentation along with colleagues looked at how smart mapping driven by ArcGIS Online was providing some very rapid analytics. Starting from a map of the world Kennelly was only two or three clicks away from locating all the capital's docking stations for Boris bikes by linking the map data to a simple csv file. But as he reminded us, "spatial analysis is where the value comes from" in GIS.

ArcGIS Online now has over 120,000 accounts and nearly 400,000 users. Esri also hosts the biggest repository of maps in human history. Requests for base mapping is currently running at 1.25 million a week; that's a lot of people around the world getting the geospatial message. Kennelly assured desktop users that ArcMap and ArcGIS would continue, though ArcGISPro is where the development will occur, a core part of which is apps. Recent improvements focus around open source, templates for the Builder app and better APIs.

GPS for those indoors GIS analytical tools can now deal with extreme granularity of data, even inside buildings yet the data we use is just the tip of the iceberg. Sensors like mobile phones can help fill in that missing chunk below the surface.

Tracking people indoors has been quite a challenge and a number of companies have been devoting much cash and energy to it. GPS is of course not the answer, even if "GPS for indoors" is a simple way of explaining the technology to Joe public. Sarah Lewin, technical research manager, demoed an indoor tracking app developed using compass and mobile phone technology. Her Harry Potter-inspired Marauders' Map of the QEII centre tracked four colleagues around the building successfully, including the creation of a geofence as a "danger zone". She was enthusiastic about it supporting BIM. Not so sure about that. Whilst possible for facility owners, take-up of that feature is a long way off. Let's get them used to using and maintaining BIM first.

A much more relevant application came from her colleague Alice Duff who showed how it could be applied to a hospital, in this case an imaginary one, where nurses were tracked during their day to see whether the pharmacy was in the best location. It was not too difficult to see that it wasn't and by referring to hot-spot mapping a better location could easily be seen, reducing journey times.

A giant clock just ticking away Next, Esri's Tim Welch promised "80 minutes of GIS magic". His first offering came from Vodafone's Fraser King, who argues that a mobile phone network is basically a giant clock as everything is time-stamped. He spoke about how real-time mobile location and anonymised data enhances spatial analytics. Getting it in the right place for a new retail store development can make $\pm 15\%$ on the return but getting it in exactly the right location is the bigger opportunity for analytics, he thinks.

Turning to the topic of Big Data, King showed the problem through a map circle drawn around the Holborn area of London in which in the space of a week there are 74 million "events" involving 1.4 million identities. Unsurprisingly, a heat map showed a hot cluster of activity around the underground station. Only mobile phone technology can track the myriad journeys and occupancy of buildings within that circle to enable analysis.

London calling London is arguably the most dynamic and iconic of cities. It is growing at the rate of an equivalent of a tube train full of people every week (I had to let six such trains go by at King's Cross that morning before I managed to squeeze into a tiny spot). The city constantly draws them in from all over the world and every generation or so reinvents itself. Managing traffic flows around the capital is a major headache but one Alan Bristow, director of road space management for TfL, is well up to. Driven by the Olympics in 2012, GIS and Esri's ArcServer platform has been an enabler to transform the management of London's roads. But in addition to traffic management, TfL has the target of reducing fatalities and accidents by 40%.

Bristow and a colleague demonstrated Playbook, a real-time traffic management app, taking an example of the congested area around the Elephant & Castle junction in south London. Traffic cameras are sited on every approach road so operators can assess volumes and change signal timings to improve flows. Bristow assured us that some 500 users are looking at this sort of information across the capital and he can call in a further 400 if needs be. He concluded that a "surface intelligent transport system" is the future for TfL's GIS. I hope it includes installing motion sensors at crossings so road users don't have to wait aimlessly while no traffic passes in the opposite direction.

Water, water everywhere but. . . From one of the world's busiest cities we moved to Ireland, a land of rivers, lakes and rain. Except no one's done very much for years to harvest and conserve this bounty. The republic was the only country in the EC where citizens got their water for free from their local authority, a policy doubtless driven by my opening lines. But with Ireland enjoying boom times through



...a "surface intelligent transport system" is the future for TfL's GIS...



user conference



Bluesky was positioned to grab delegates as they emerged from the plenary room.

the noughties to the crash in 2008, the politicians didn't think too much about where the water was going to come from for all those new estates. With the network crumbling - up to 40% was being lost through leakage from a system of which 50% was 80 years old or more - by 2012 there was a full blown crisis with many areas having to boil water and Dublin consuming 99% of the water available to it.

The answer was to create a brand new water authority for the country to manage and relieve the local authorities which had hitherto been responsible for both supply and the network. But alas time was up for the free-booting water consumers. They're now all getting water meters and bills.

Paul Ahern from Irish Water explained how in less than a year they had created an enterprise GIS built around a single data model to include not only the assets but the country's four million domestic customers. Although much of the data came from the existing local authority suppliers it was in 11 different formats just for water; waste water added a further 10.

The system is also driving the crews responsible for maintaining the network. Mobile devices tell crews where they will work that day instead of calling them to report for duty at the office to receive their work schedule. Meanwhile, 400 call agents are available to deal with all those new customers receiving their first bill in a country which has only very recently begun to adopt postcodes and where only 40% of addresses are not unique.

Security drives GIS at Sellafield Sometimes it can be easier to start afresh from scratch as Irish Water has had to do, than try to graft a new system on pre-existing ones. **Ian Wildig** is responsible for a GIS to manage assets at the nuclear plant of Sellafield. Dating back to the 1940s when it was a munitions factory, Sellafield is a site with several other headline names attached to it. Until just over a decade ago it was commonly known as Windscale on which site Calder Hall, the world's first commercial nuclear power station, began contributing to the national grid.

The site is two miles wide by a mile deep and some 14,000 people work there. Each unit within the site manages its own data, consequently said Wildig, "finding historical data is very difficult". GIS has only been used since 2006 when it was first applied to land parcel management. Since then security has become a major driver following Japan's Fukushima nuclear power station catastrophe of 2011.

Last round up The final plenary session of this informative day saw awards made in various categories including one for the best presentation of the day. Alas, GiSPro was not present for that but we shall try and bring you something in a future issue on **Marko Sala's** GIS – creating our future for Network Rail.

The day ended with a presentation from MapAction volunteer **Vickie White** on the charity's work to date this year: the Vanuatu typhoon, the Ebola crisis and now the earthquake-prone Nepal. A busy few months but as Vicky concluded, "We don't know how many lives we saved but we made a difference".

The final series of presentations came from Charles Kennelly and his team; this time on the theme of "ArcGIS – the road ahead". The big news is that 3D is going to be rolled out across the entire platform very soon and the integration of big data analytics is also expected soon (2015/16).

Sweet spot There are some pretty clever things being done with GIS these days and the conference is always a showcase for them. For me, Kennelly's SWEET project (developed independently by Esri UK) is right up near the top. Although only in beta, his team have been driven by the Pareto principle (or the 80 – 20 rule) and the laws of simplicity which begins by saying, subtract the obvious. Kennelly demonstrated through a simple interface uncluttered by icons, menus and windows, how much smoother, quicker and scalable vector map tiles are on mobile devices – just 2Gb for the whole of the US compared to the terabytes of data needed for raster maps. Meanwhile his colleague **Daniel**, a freshly-minted graduate, demonstrated "100 great geosites", which he has created for the British Geological Society. This is a glorious celebration of the human and natural world's creations in the UK and Ireland. Go to it: <https://www.geolsoc.org.uk/GeositesHuman>

Exhibition Amongst the exhibitors. It was good to see faithful GiSPro supporters Leica Geosystems. Their GIS expert **Nathan Ward** was busy demonstrating the latest data capture Xeno technology. Another good supporter of ours is Blue Sky with a prominent spot to grab delegates as they emerged from the plenary room. Old acquaintance **John Allan** has recently joined GeoSpock, a cloud based scalable app for location describing itself as, "The search engine for the physical world".

NavTech of course is no more, having been bought by Nokia but now rebranded as "here". I chatted to **Tuni Baraka**, a lovely bubbly young lady whose heritage is Tanzanian but who grew up in Sweden! Their mapping is several orders of magnitude better than Google's and high resolution imagery captured by their survey vehicles is good enough to calculate dimensions of features like doorways and openings. Good for planners and developers.

“

...time was up for the free-booting water consumers. They're now all getting water meters. . .

”

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New scanners from Leica

Leica Geosystems has released the 8th generation of its 3D laser scanners, the Leica ScanStations P40, P30, and P16. Three different models meet different user needs: the P40 and P30 add increasing, long range capabilities (to 270m) and advanced scanner controls for additional versatility, while the ScanStation P16 is a short range, entry model. All share the same physical characteristics: class 1 lasers, unit weight, hard drive (256Gb), temperature operating range, batteries and even scan rate (1 million points per second). Close range accuracy is also the same (1.2mm + 10ppm). They differ only in overall range, performance and therefore application.

African boost for Mapmechanics

Mapmechanics has boosted the number of African countries for which it offers HERE vector (scalable) map data. HERE mapping consists of street-level vector map and includes major highways, main roads and also some minor roads and city streets. The mapping can be used with other data such as traffic speed and density, and can be used for techniques such as reverse geocoding (finding a location by its coordinates). It also enables users to add a sense of place to activities such as geodemographic studies, store location analysis, leaflet distribution territories or depot management, and ensures that users can overlay the features they need on shaded maps.

Mobile phone tracking

Movements of populations in and out of town centres and suburbs can be tracked using mobile phone usage data with a new offering from Mapmechanics. Such data can analyse the "pull" factor of town centres and other

places where people gather, helping to plan transport and other amenities, or to develop retail and entertainment facilities. The data monitors people's location at hourly intervals throughout the day, broken down into relatively small grid squares available in both urban and rural areas. If combined with other demographic and lifestyle data, it can provide an even richer and more informative picture of where different populations and social groups work and spend their leisure time.

Windows move for handheld

The Handheld Group is now offering its ultra-rugged handheld and enterprise smartphone NAUTIZ X1 with Windows embedded handheld 6.5, Microsoft's operating system optimised for use in handheld devices. The Nautiz X1 is slim and lightweight yet incredibly tough with an IP67 ingress protection rating which means that it is fully dustproof and waterproof. It has been tested according to MIL-STD-810G military test standards to endure humidity, vibration, shock and extreme high and low temperatures.

Previously only available with the Android 4.0 operating system, the Handheld device will have broader appeal. Commenting on the Windows move, Jerker Hellström, CEO of Handheld Group said "This OS is the operating system of choice for many enterprise users of ultra-rugged computers. We're now also shipping all units with a spare extended battery as part of the standard package."

The Nautiz X1 weighs 180 grams and is sized 125 mm (4.9") x 65 mm (2.6") x 15 mm (0.6"). It has a 4-inch special sunlight-readable display with capacitive touchscreen and ultra-durable Gorilla Glass. It

Better visualization and analytics



The release of Esri's CityEngine 2015 allows GIS professionals, architects, planners, and urban designers to create 3D city models faster and share them easily via ArcGIS Online. New features open the use of 3D models for real-world simulation, emergency response, urban planning, and entertainment scenarios. Pascal Mueller, director of the Esri R&D Center, Zurich AG says that the new release "is faster, sports higher-quality visuals, and introduces an innovative and unique 3D design experience." The latter is possible with Procedural Handles, a novel user interface for the intuitive editing of 3D models.

Companies like Esri partner SmarterBetterCities use CityEngine to help clients view and investigate building development proposals in a true 3D environment. "CityEngine provides decision makers with the opportunity to do more advanced planning than when they are using a typical CAD or spreadsheet system," adds Antje Kunze, CEO, SmarterBetterCities. "We are now able to help our clients better visualize rules and regulations and perform analytics that no one has been able to address in the past." CityEngine 2015 is available for Windows, Mac, and Linux platforms. See <http://www.esri.com/software/cityengine>

runs on a 1GHz dual-core processor and has 1Gb of RAM. It features BT, Wi-Fi, compass, professional u-blox GPS, and 5Mpx camera.

BRIEFS

XYZ Maps' 2-metre wide Huge World Maps have now been released in their 2015 editions. They include changes such the occupied Crimea and the embryonic Kurdistan. In addition to the UK Postcode District and Postcode Sector map series, XYZ has added a rapidly expanding series of individual Postcode Area sector maps. Each one covers a particular Postcode

Area, for example S for Sheffield, BS for Bristol, or LE for Leicester.

Emapsite customers are among the first to take advantage of the most detailed Ordnance Survey open data product so far. Data managers at the location content provider have loaded, styled and enriched OS Open Map – Local as a dedicated layer of emapsite's web mapping service (WMS). The vector dataset, released in beta form in March 2015, has an enhanced level of building detail compared with any other OS OpenData product and is designed as a backdrop for visualising location data and integrating third-party information.

| seminars | conferences | exhibitions | courses | events | workshops | symposiums |

We welcome advance details of conferences, seminars, exhibitions and other events which are likely to be of interest to the GIS community. Please mention the name of the event, venue, date and point of contact for further information and send to Jason Poole *GISPro*, 2B North Road, Stevenage, Herts SG1 4AT or e-mail: jason@pvpubs.demon.co.uk.

JUNE 2015

Unravelling the Mystery: UAV's
 25th June 2015, London, UK
www.geoaware.info

Early-Career Scholars Institute in GIScience
 29th June – 3rd July 2015, College of the Atlantic, Bar Harbor, Maine
<http://giscienceconferences.org/vespucci2015week2/>

SEPTEMBER 2015

BCS-SoC Mapping Together
 8-10th September 2015, York, UK
www.cartography.org.uk

Intergeo
 15-17th September 2015, Stuttgart, Germany
www.intergeo.de

JULY 2015

Esri User Conference 2015
 20-24th July, San Diego, California, USA
www.esri.com/events/user-conference

OCTOBER 2015

Commercial UAV Show
 20-21st October 2015, ExCel, London, UK
www.terrapinn.com

AUGUST 2015

Geomatics Indaba 2015
 11-13th August, Emperors Palace, Ekurhuleni, South Africa
<http://geomatics.org.za/>

NOVEMBER 2015

HxGN Live 2015
 18-20th November 2015, Hong Kong
<http://hxgnlive.com>



2015 Geo: The Big 5 event programme

Following incredible success in 2014, the Geo: The Big 5 event programme is back, focussing on five developing sectors that will be central to the GI industry over the next few years.

Future Cities: Security - 9 July - London

Future cities used to be sustainable and resilient to change. But triggers for change are increasing: energy and food prices, severe weather events, and aging infrastructure. Cities face a myriad of potential future shocks and stresses. To meet these challenges they must work to identify risks and mitigate against them with location as a key component.

Big Data & You - 8 October - Cardiff

This event will look at the applications of Big Data and the ethics of Big Data and privacy. A major theme raised at last year's Big Data event, was the identification of geospatial information as a 'key' to the deanonymization of personal data. With the benefits offered by Big Data come potential issues around securing personal rights and the role of geolocation in this arena.



GeoCom: Resilient Futures and AGI Awards for Geospatial Excellence - 23-25 November - Warwick

This annual flagship event will provide a climax for the 2015 event programme, bringing together the year's themes. Chesford Grange Hotel in Warwickshire will again be the residential format to maximise the opportunities for debate, engagement and collaboration.

Our annual awards celebrate best practice from across the UK in the application of Geographic Information, providing an opportunity to meet with innovators from across the UK in a variety of sectors.

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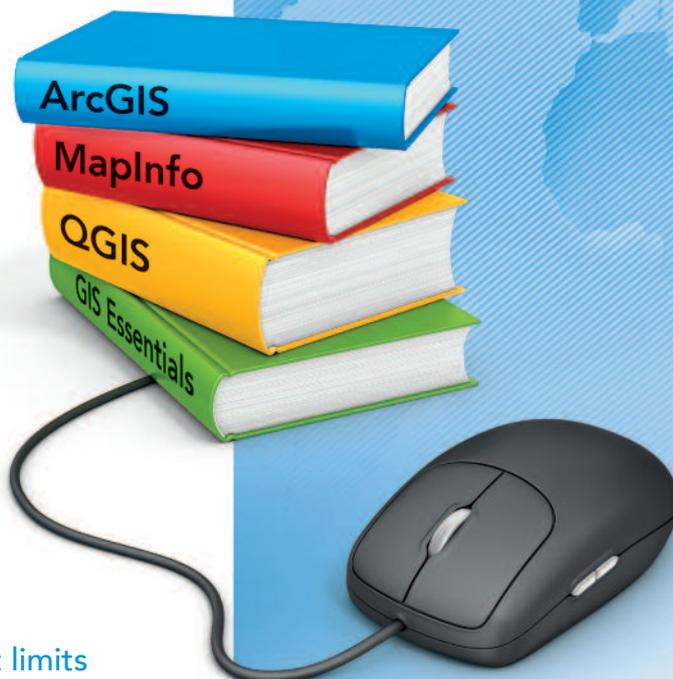
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