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10th Anniversary Edition

issue 61 : December 2014



...joining the geography jigsaw

Anniversaries for AGI and GiS Pro

astronaut stars at EUROGI's 20th anniversary!
virtual cities and 3D models ten years on
talking to Vanessa Lawrence
consumer segmentation

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- when it has to be **right**





our mission... to help grow the business for the whole GIS community by providing an effective, reliable and timely medium for news, information and comment.

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Front cover: AGI marked its 25th anniversary with the annual conference which attracted over 300 delegates. **To read more turn to page 20.**

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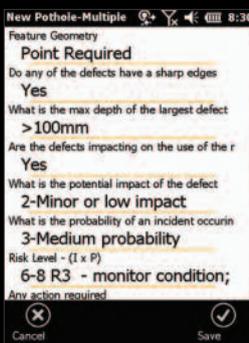
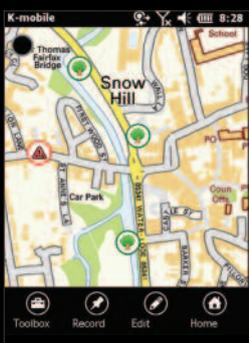
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welcome

to the December 2014 issue of *GIS Professional* . . .

Anniversaries: AGI 25, GISPro 10

We are delighted to congratulate AGI on reaching its 25th year and celebrating with a really good conference last month. 2014 GeoCom: The Changing Face of Geo celebrated the past but, more than ever, was looking forward to a bright future.

While we were in Kenilworth we took the opportunity of interviewing Dr **Vanessa Lawrence** on the occasion of her leaving Ordnance Survey after 13 years at the helm and latterly as secretary general of OS International. No-one has done more to promote our industry in that time and we wish her well in her continuing role with the UN and whatever else she will be doing. We are certain she will still be an ambassador for GI wherever she goes.

We hope that you will also congratulate GIS Professional on reaching its 10th birthday and, by way of marking this occasion we went back to the nine authors from the original edition to find that all of them are still working, five of them for the same employer as in 2004; and **Adena Schutzberg** is still writing a column for us. Professor **Mike Batty** from UCL's CASA has updated his article on 3D London and, in the next issue we will summarise comments from others on how they view the last ten years of GIS and/or their own career developments. Only **Mark Linehan** has left the industry – he was CEO of AGI at the time and is now running the Association of Ethical Restaurants! We have been unable to contact him to find out if he uses GIS to calculate food miles! We have also provided a timeline of important events in our evolution since 2004.

Our main articles this time include reports on Day One of AGI GeoCom and on the Awards Dinner. **Iain Stewart** was a brilliant host by all accounts and we congratulate all of the award winners – we are just sorry we don't have room to carry pictures of everyone.

We have majored on geodemographics now that the 2011 Census results are finally processed and available for a variety of GI related products and services. There is an overview from **Peter Sleight** and a particular example – MOSAIC – from **Richard Jenkins** at Experian. **Ian Masser** reviews the mid-term report on INSPIRE, while **Riley Marsden** explains how Barnsley uses geospatial information to great advantage for all its citizens.

There could be trouble ahead. . .

In the last two issues we have commented on OPSI's adjudication on the inability of 77M to reach a satisfactory licence deal to use the Ordnance Survey's intellectual copyright in the Land Registry index maps. This is still not resolved as we go to press, although it may be awaiting the chancellor's autumn statement, which will apparently set out a future path for Ordnance Survey and its datasets. Meanwhile, Getmapping, Bluesky and eight other British geospatial companies have filed a complaint with the European Commission alleging unfair competition from Ordnance Survey. It looks as if whoever becomes the next director general will have plenty on their plate. We just hope that these disputes will be resolved in such a way that geospatial information, from whichever organisation, public or private, will become more available and will be more widely used so that all of us can benefit in our private or commercial lives.

Robin Waters, Editor



. . . **Getmapping, Bluesky and eight other British geospatial companies have filed a complaint with the European Commission alleging unfair competition from Ordnance Survey.**



Irish campaign for Bluesky



Bluesky has announced plans to photograph the whole of the Republic of Ireland from the air to create the most up-to-date high-resolution photomap of the country. It will add 70,000 square kilometres of brand new aerial photography to Bluesky's existing archive. To be flown in 2015, nationwide coverage will be at 25 cm resolution with higher – 12.5 cm coverage for selected urban areas. Colour infrared imagery (CIR) will be simultaneously captured along with accurate 3D terrain maps. The imagery will be captured during the spring and summer months of 2015 from planes equipped with the latest Vexcel cameras operating out of multiple flying bases, including Dublin, Cork, Shannon, Knock and Donegal, to ensure maximum optimisation of all flying opportunities.

OS 'stifling competition in open data' row

Articles in Computer Weekly and The Times have reported on a complaint lodged at the European Commission in November against Ordnance Survey. GetMapping and nine other UK firms have accused OS of using £800m of government contracts to stifle competition; they claim that this amounts to illegal state

aid. Tristram Cary, founder and chairman of Getmapping, has previously taken these complaints to the UK government but got nowhere. Rachel Tidmarsh, founder and managing director of Bluesky, which is also a party to the complaint is quoted as saying "Tristram has been fighting this alone for a long time and it's time to back him up".

The complaint seeks to

make OS curtail its ambitions so private companies can prosper in its stead. Getmapping said the Department for Communities and Local Government (DCLG) let contracts wrongfully in 2010 and 2011, because it didn't put them to public tender. One is the Public Sector Mapping Agreement (PSMA), which pays Ordnance Survey about £60m a year to supply mapping data across government. The other was a ten-year deal to compensate the agency for releasing some of its assets free of charge, under the government's open data scheme. The open data was estimated to be worth £20m a year in lost sales.

Free mapping for colleges

Ordnance Survey and Jisc – the charity that offers digital services and solutions to UK education and research – have released Digimap for Colleges. This secure, free and easy to use online mapping service supports further education (FE) institutions – both staff and students. The service includes OS MasterMap as well as digital versions of the OS Landranger and OS Explorer maps. The launch follows the success of Digimap for Schools and Digimap for Higher Education and was also developed by EDINA, a Jisc designated centre at the University of Edinburgh. A series of 'How to...' guide films have been posted to YouTube. The service runs on all

up-to-date browsers and is available at: <http://digimapforcolleges.edina.ac.uk>

Cutler battles for Britain

TechMarketView has included eMapsite on its prestigious list of 'Little British Battlers'. These are small companies seen as 'punching above their weight' in tech disciplines. James Cutler, emapsite's chief executive, said: "This is a real feather in our cap acknowledging that we have battled through three recessions since we formed in 2000 and have grown our business all the way. We are thrilled that our work in B2B and B2G location content and services is being recognised by TechMarketView." The accolade means that emapsite will present to a panel of tech industry analysts and receive their expert feedback. This is a rare chance for unbiased opinion on company performance to date and market propositions. The company will also be featured on www.techmarketview.com and in a research report distributed to industry and government.

www.emapsite.com



Left: Screenshot of Digimap for Colleges.

*There is more news of companies and organisations on our website www.location-source.com
To get your company featured on these pages call Sharon Robson on +44 (0)1438 352617*

MOD win for Envitia

GEOCORE, a consortium of academic and industry partners, led by Envitia, has been awarded a further contract by the Defence Science and Technology Laboratory (Dstl), following two successful years of delivering applied research to support Ministry of Defence (MOD) policy and capability. This will enable the consortium to build on the tasks undertaken for Dstl's Advanced Geospatial Information and Intelligence Services (AGIS) research project. The research will be exploitable over the next 5-10 years and will identify opportunities for the rapid development and insertion of geospatial technology. The GEOCORE consortium includes Helyx SIS Ltd, the University of Nottingham, University College London (UCL) and QinetiQ. The research underpins and improves GEOINT capability and policy for the UK MOD, and across government.

Historical walks win

Television production company, Wildfire Television has selected Landmark Information Group to source and supply a range of data terrain images for a series commissioned by Channel 4. 'Walking Through History' is the third series of six documentaries presented by Sir Tony Robinson. The programmes focus on locations across the UK, including the Cairngorms, Sherwood Forest, Pembrokeshire, the Yorkshire Moors, and the Channel Islands.

Postcode lottery increases risk

The work of geographers at the University of Leicester has helped to identify a postcode lottery that increases your risk of developing diabetes or obesity. Professor Lex Comber, from the Department of Geography, was involved in the

study published ahead of World Diabetes Day on Friday November 14. Published in Public Health Nutrition, the research found that there was a higher number of fast-food outlets within 500 metres of inner-city neighbourhoods described as non-white as well as in socially deprived areas. The study provides a new public health understanding that could influence policies to limit the number of fast-food outlets in deprived areas. The work analysed the neighbourhood factors from an individual perspective rather than placing the individual in a set of pre-defined neighbourhoods.

BRIEFS

Following a recent deployment to Liberia, MapAction now has a highly experienced team in Sierra Leone to help coordinate the response to the Ebola outbreak. The team will provide mapping support to the Ebola Operations Centre in Freetown and is being funded primarily by the UK Department for International Development (DFID).

Geospatial veterans **Lokku** have invested in **what3words** and incorporated the technology into a number of their products including Nestoria, the property search engine, where it's a big help in markets like Brazil or India. It has also been added to the OpenCage geocoding service. www.lokku.com

1Spatial launched The Little Book of Smart Cities at the Smart City Expo World Congress in Barcelona. This features case studies and explains how spatial data are fundamental to the concept of smart cities. www.1spatial.com/smartcities

BSI Standards has published PD8101:2014, Smart Cities: Guide to the role of the

LiDAR survey for power lines



A multi-million pound contract to produce the largest ever LiDAR survey undertaken by an electricity distribution network operator in the UK has been awarded to ADAS and Bluesky International. They will conduct the 3D survey of the whole 30,000 kms of UK Power Networks' High and Extra High Voltage overhead power lines.

planning and development process, which is the latest in a series of publications on standards for Smart Cities.

Ordnance Survey has become a corporate supporter of the Open Data Institute, joining organisations such as the Met Office, Arup, Telefonica, Thomson Reuters and the University of Southampton, which are leading the way for best practice for open data usage and delivery in their particular industry or field.

Northern Ireland Water (NIW) has selected **Envitia** to provide a managed service to automatically align their asset datasets to positionally improved Ordnance Survey Northern Ireland large-scale vector maps using MapRite software.

GGP Systems has held its first new look annual user group meeting in Nuneaton. The agenda now includes an introduction to key personnel, demonstrations of new technology and an introduction to INSPIRE. The Croydon based

company is expanding with a new management team and new offices.

PEOPLE

Steven Ramage, former managing director of Ordnance Survey International, has joined global addressing start-up **what3words** as director of strategy.



Above: Steven Ramage

What3words has named every 3x3 metre square on earth with three unique words: a much more user-friendly interface for latitude and longitude. Ramage says "this is a simple system that enables absolutely everybody to communicate a precise location anywhere on earth with just three words. This is a game changing approach that

people

can help the 20 million unaddressed homes in the Brazilian's favelas, the aid agencies mapping schools in rural Africa or the numerous governments in emerging nations looking to take the next step of development that will need robust addressing and location referencing".

Rachel Tidmarsh, managing director of aerial mapping

company **Bluesky**, was named as the Leicester Mercury Business Executive of the Year in the small firm category before going on to win the overall title of Business Executive of the Year. Rachel, who co-founded the Coalville based company in 2003, commented: "These awards celebrate the hard work, dedication and innovation of every single person at Bluesky

and I am pleased to accept it on their behalf."

Giles Rhys Jones, director of digital strategy at Ogilvy & Mather UK has been appointed marketing director and **Tim Williams** becomes business development director. Tim was previously head of partnerships at Shutl, the rapid fulfilment service sold to eBay last year. www.what3words.com

Europe and beyond. George is an information systems apprentice and will develop his skills in marine GIS and the use of IT.

Jonathan Williams, an experienced street-works and highways professional, has joined **Yotta** as a product consultant. He will work with users of Mayrise street works, highways and street lighting software to ensure effective and productive use of mapping and asset management solutions. He will support councils implementing street-works permit and lane rental schemes. Jonathan was compliance team leader with Kent county council where he was responsible for coordinating street-works. His career has spanned both public and private sectors after graduation from the University of Greenwich in geography and GIS. www.yotta.co.uk



Left: Rachel Tidmarsh (middle) having won the Leicester Mercury Business Executive of the Year.

Independent marine data management, publishing and GIS specialist **OceanWise**, has welcomed **Richard Marlow** and **George Wright** to the company. Richard becomes a senior information systems developer and was previously with Fugro EMU. He will focus on further developing GIS capabilities and extend the portfolio of data products to serve customers in



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Above: The Shuttle piggybacks aboard a 747 as it passes over the Golden Gate Bridge. © NASA

THE BERLIN MESSE IS BIG, very big! The INTERGEO trade fair used less than a third of the space available and EUROGI's imaGIne conference was just tacked on the side of that. Instead of dodging the drones in the big halls, the conference delegates listened to and discussed more down-to-earth issues from the economics of geospatial information to linked data and the internet of things. Only at lunchtime did we take off in the Shuttle!

the public in the realities of economics. Good luck!

Peter ter Haar from Ordnance Survey explained that UN-GGIM for Europe was necessary because it is an intergovernmental body rather than an inter-agency body such as EuroGeographics. Not convinced? Then try explaining the difference between the European Union Location Framework (EULF) and the European Location Framework (ELF). The former is controlled and funded by the European Commission; the latter by the National Mapping & Cadastre Agencies and EuroGeographics, to which they all subscribe. We will try and clarify the roles of these (taxpayer funded) bodies and initiatives in a future Eurofile; and perhaps even how they relate to INSPIRE! But please don't hold your breath.

The star of the show, Dr Gerhard Thiele (61) flew on the Shuttle mission which provided 30m resolution topographic data for 99.97 % of land from 56 deg south to 60 deg north. He described his training and the aims of the mission before giving a very down-to-earth story of the flight, the feelings and the camaraderie amongst the international crew. Being launched into space, he said, is like sitting in a comfortable armchair but with an elephant on your chest! When he had been asked to describe his thoughts on seeing earth from space for the first time

Astronaut stars at EUROGI's 20th anniversary!

Robin Waters reports on the Eurogi anniversary conference in Berlin, avoided the ubiquitous drones in the concurrent INTERGEO event and tried to sort out some very confusing initials.



Your data will never be as interesting as what I can merge it with!



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

There are still not that many people who have orbited the earth in the last 50 years and most of our remotely-sensed information is collected from unmanned satellites. So it was a real privilege to hear European astronaut Dr **Gerhard Thiele** talk about the Shuttle Radar Topography Mission and his role as the lead scientist. The mission has just hit the news again as it is only in the last few weeks that NASA has finally released the highest resolution terrain data for the whole of the world outside the polar regions.

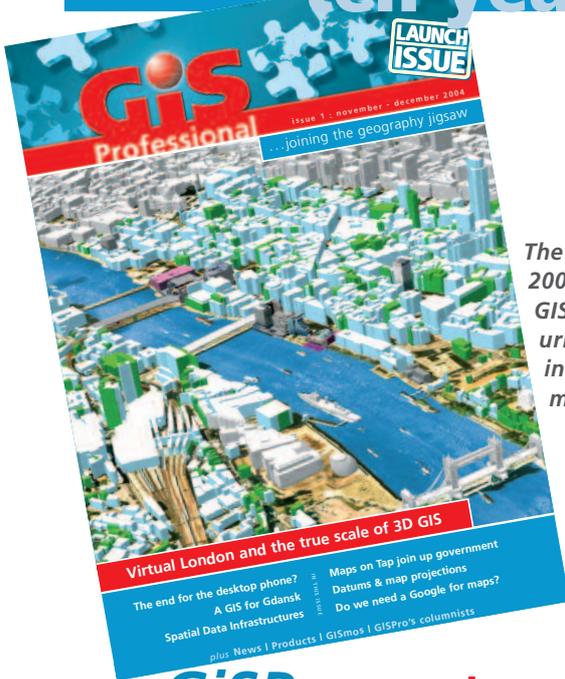
Important topics were discussed in parallel sessions which attracted speakers from the European Commission, the German government, Ordnance Survey, academics from Berlin and Hong Kong as well as representatives from Esri and Hexagon representing the commercial sector. Your reporter was particularly interested in a paper entitled 'Geo-Information and Job Creation and Economic Growth: an Economic Perspective' ably presented by **Jean-Marc Daniel**, an economist. He made it clear that economists do not have all the answers (I think we knew that!) and that in the so-called information or knowledge economy, we are still struggling to value and put a price on information based products and services. Some governments have embraced 'open data' but there is no global consensus. Daniel argued that we must educate

he said it was just like the iMax films! When he had asked before the mission 'What would constitute success?' he was told anything better than 70% of the targeted data. They got 99.97 % and therefore can be very satisfied with their achievement.

If there was one quote to take away from the Eurogi meeting it was from **Clemens Portele** who has played a prominent part in defining INSPIRE implementing rules: 'Your data will never be as interesting as what I can merge it with!'

Unfortunately my visit to Berlin was short and wet so I did not see very much of the city except that it seemed very spacious compared to London but quite drab compared to my previous fortnight sailing from Calabria to Malta via Stromboli and Sicily. No real business content there but one night my smartphone picked up an emailed press release about a new technique for measuring, in real time, the waves and hence surface winds by detecting and analysing GPS signals reflected from the sea back to a specially designed satellite. When your own navigation is dependent on those weak GPS signals received direct from their source several hundred miles up, the mind just boggles at being able to get useful information from such infinitesimally small signals reflected off the surface of the sea!

GISPro's ten-year timeline



The launch issue in November 2004 featured articles on 3D GIS, CASA's Virtual London, urban planning, spatial data infrastructures and datums & map projections.

under the pen of **Mark Linehan** and **Ed Parsons**, then with Ordnance Survey, began a short series under the banner of "GISmos". We hope to print some comments from these contributors in our February 2015 edition.

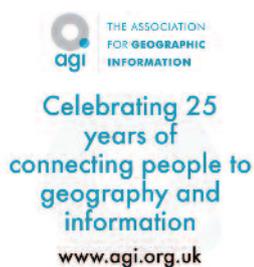
We also interviewed **Martin Daly** of Cadcorp upon his award of the Kenneth D. Gardels Medal (Gardels, who died in 1999, was one of the founders of the Open Geospatial Consortium, OGC). The award was presented by the then OGC director Dr **Mike Jackson** who now heads up the Nottingham Geospatial Institute.

In the timeline below we pick out some of the significant events over the years and the companies that have led change and innovation in geographical information, both through systems and services.

2004 GISPro is launched at AGI's inaugural

GISPro marks ten years of informing UK's GI business

GIS Professional was launched in the autumn of 2004 at the AGI's inaugural exhibition and conference at Chelsea Village in London (previously the AGI had held its annual conference in conjunction with the GeoSolutions event).



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LOOKING BACK FROM the distance of a decade those were heady days when GIS was making inroads across government, local and national, and in many commercial organisations. Ordnance Survey was working hard exploiting its topographical database under the title of MasterMap. Meanwhile the US majors – Esri, MapInfo, Autodesk, Bentley and Oracle – as well as the likes of the UK's Cadcorp, Innogistic and LaserScan were busy selling their "out-of-the-box" solutions or "seats" as they were commonly called amongst major users. Software as a service and web-based solutions were barely twinkling on the horizon and awaiting the arrival of ubiquitous fast broadband.

Under editor **John Fenn** the first edition featured articles on 3D GIS including one on Virtual London from Prof **Mike Batty**, who we are delighted to hear from again in this current issue. We looked at how mapping was spreading across government (Maps on Tap), how Gdansk Development Agency was helping urban planning using Bentley software, **Roger Longhorn** looked at the importance of spatial data infrastructures (INSPIRE was moving up government agendas), Dr **Jonathan Iliffe** explained the intricacies and pitfalls of datums and map projections and the first of what would become regular case studies looked at how Surrey Fire & Rescue was using MapInfo's FirePro to assess risks.

The issue also introduced regular columnist **Adena Schutzberg** whose sparkling insights to all things GIS has been a regular feature ever since. **Chris Holcroft** also began a series of regular columns, then working for Cadcorp; the AGI column was

exhibition and conference under editor **John Fenn**. Local Government Information House partnered with Intelligent Addressing to build the National Land and Property Gazetteer; 82% of LLPGS linked to NLPG 28,345,968 Land and Property Identifiers.

2005 John Fenn moves on to join the BBC and publisher **Stephen Booth** sits in the editorial chair before handing it to **Tamsin Fleming** in the summer. The year sees the first Eurofile penned by Robin Waters on. . . yes you guessed, INSPIRE. And the launch of Google Earth.

2006 following marriage, Tamsin Fleming leaves and Stephen Booth again assumes the editorial role. The year hears the first rumours of Irish post codes; Foot & Mouth disease hits with a vengeance but gives OS supremo **Vanessa Lawrence** the chance to show what GIS can do. A series of articles in The Guardian newspaper fires the opening shots in the "Free Our Data" campaign. Meanwhile OS launches Address Layer 2 of MasterMap; **Iain Greenway** joins OSNI, Northern Ireland's Ordnance Survey in Belfast; Bluesky launches GeoPerspectives; the next generation of airborne acquired geospatial data, which becomes the solution of choice for prestigious organisations such as Google and UK government organisations. Meanwhile **Robin McLaren**, tasked with coming up with a UK Location Strategy, was pleading for input from GIS professionals and LizardTech and ER Mapper were squabbling over patents. The year ends with the announcement that

NIMSA, the National Interest Mapping Services Agreement will end.

2007 **John Arthur**, formerly with UCL, slots into the editorial seat. **Ed Parsons** joins Google and **Chris Holcroft** joins AGI as director. For Esri, ArcGIS 9 builds on desktop success and adds a development framework and server platform. Rumours begin to circulate that one or two banks may be in difficulties. . . And Esri reaches a milestone with the release of ArcGIS Explorer, providing GIS for Everyone.

2008 The credit crunch begins to bite and GiSPro hears from **John Marchant** on just how to put together a business case to persuade the bean counters. From March publisher **Stephen Booth** again takes up the editorial pen but he is assisted by features editor **Robin Waters**. AGI holds GeoCommunity 2008 in Stratford upon Avon and attracts over 600 delegates. ConsultingWhere is founded to offer business and technical services to clients wherever location could add value to their business. *Place Matters*, the UK Location Strategy is published along with OPSI's report on re-use of Public Sector Information. **Gordon** (Brown) met **Tim** (Berners-Lee) and the first UK government datasets are released as open data.

2009 **Andy Coote** kicks off the first issue of the new year with an assessment of just how big the market is for GI in the UK following ConsultingWhere's first ever survey of the market. Ordnance Survey announces a new business strategy with more benefits for partners, "tariff rebalancing" and the first open data for "experimentation and development". Laser Scan becomes 1Spatial after 40 years.

2010 Haiti earthquake begins year. By now over 3000 public sector datasets are available for free in the UK. EuroGeographics marks its tenth anniversary. Ordnance Survey launches Digimap for Schools with free access to many OS products.

The general election sees Britain's first coalition government since the second world war. ArcGIS Ideas website launched as a forum for users to suggest new products and improvements, vote for their favourites, and discuss ideas submitted by others.

2011 GeoPlace is launched, a joint venture between Ordnance Survey and Local Government. The Public Sector Mapping Agreement is announced (PSMA) and the Cambridge Conference is held in. . . Southampton! Meanwhile people are starting to talk about something called Linked Data and AGI's GeoCommunity conference moves to the University of Nottingham's campus.

2012 Crowd sourcing becomes possible for registering third world land rights and **Adena Schutzberg** asks whether it's inevitable for mapping too. Bluesky invests in the world's first fully integrated LiDAR, thermal and imaging system and purchase a new large format digital aerial photogrammetric camera – an UltraCam Eagle from Microsoft. The UK location market is estimated at well over £1 billion. Case studies range from how handheld GPS data collectors are helping Latvian farmers to using GIS in a vineyard; grape expectations indeed.

ArcGIS Online launched, a cloud-based mapping system that offers collaboration tools for cataloguing, visualising, and sharing geospatial information. And ArcGIS 10.1 debuts, enabling users to deliver any GIS resource as a web service, putting geographic information in the hands of more people.

2013 Intergraph Geospatial 2013 arrives following acquisition by Hexagon. Esri releases CityEngine 2013, the latest version of its 3D urban design software. The AGI moves to the home of British geography, the Royal Geographical Society in Kensington Gore. People are talking about BIM and where it connects to GIS and they're also talking about UAV's for data capture. The Royal Mail is sold off and with it the PAF database. Forth Valley GIS becomes thinkWhere and the British Cartographic Society celebrates its 50th birthday.

2014 The year opens with the MapAction team still hard at work in The Philippines after super typhoon Haiyan. More than 1,500 GIS professionals attend the Esri UK annual conference, the biggest GIS event in the UK to date. In May the first GEO Business is held attracting over 1600 visitors. UNIGIS celebrates 25 years since its launch in 1990. AGI launches its "Big Five" topics for debate and the PanGeo project is enabling access to geo-hazards. There is a buzz about Smart Cities and Dr **Vanessa Lawrence** announces she is moving on from Britain's mapping agency. Bluesky's co-founder and MD **Rachel Tidmarsh** named Leicester Mercury Business Executive of Year having already scooped the title in small business category. By now GeoPlace has built the National Address Gazetteer, 100% of LLPGs are linked to NAG and there are 33,202,859 Land and Property Identifiers.

Many thanks to all the companies and organisations which have backed this timeline review of GiSPro. You will also find many of them on the 2015 Yearplanner which accompanies this issue.

So, where next for GiSPro and UK's GI sector? To be part of the community and the debate make sure you receive your copy of *GiSPro*, which is free to AGI members. www.gisprofessional.co.uk





Above: Vanessa Lawrence

AT THE END OF THIS YEAR Vanessa Lawrence formally leaves the Ordnance Survey of which she was director general and chief executive officer for 13 years. During that time she has done more than anybody else in the UK to push geospatial information up the government agenda. *GiSPro* caught up with Lawrence at the AGI's 2014 GeoCom event in November. At the same event we heard testimony to her achievements from Sir Mark Walport, the Government's chief scientific advisor, who said 'geospatial is integral to everything I do'. Lawrence herself, as we shall report, claims that GI is now used across some 3000 UK government departments.

What we did together We began by asking her about how she thinks staff at Ordnance Survey will remember her and to reflect on her achievements. 'I hope they will remember me for all the things that we did together, and the mutual passion we shared to be part of the digital revolution. When I started we were in the middle of the Dotcom bubble. Many in the press said we didn't have a role. We were also

management team' (she cannot recall an issue that divided the team).

Opportunity knocks Only months into the job and Lawrence saw a significant opportunity to show what GI could do for UK Plc. The country was faced with a serious outbreak of foot and mouth disease amongst cattle and other livestock. Back then, geospatial information was being used operationally to underpin tangible services like the Land Registry, but it was only being used extensively in about 25 parts of government.

Lawrence wrote letters setting out what OS could do but got little response until a permanent secretary said, 'If you definitely think you can do something come along; you've got a ten-minute slot'. Those ten minutes were vital to the industry because everybody suddenly got it, she says. Accurate location would assist in making sure that the vets, who were coming from all over Europe, would be able to accurately locate the farms and at the same time there would be a better understanding of the spread of the

Talking to Vanessa

As Vanessa Lawrence leaves Ordnance Survey, *GiSPro* found her undaunted by setbacks and enthusiastic to bring the geospatial message to the rest of the world.

at the very beginning of making OS profitable, which we did very quickly but we also had to increase our relevance. I asked all the staff to work together to solve this problem. One of the results was the launch of OS MasterMap. When I arrived it was in the research phase but I asked the staff to finish it within 14 months – we did it in 13.'

An infectious enthusiasm When you talk to Lawrence it isn't long before her infectious enthusiasm for all things geospatial shines through. 'We made sure that we became part of the community of our industry and I hoped they would support us and our aspirations for GI. We tried to create a symbiotic ecosystem – a strong OS could only be successful if we also had strong links to the private and academic sectors. Today, for instance, all students can get free OS data'.

'We progressed quickly but kept all our staff engaged and when inevitable disrupting events occurred 'the management team worked together to deal with them so that staff could get on with their operational jobs. When Google Maps came along in 2005, our people wondered what this meant for OS. I said to them, "'What you do is world class. Get on with it and we'll deal with Google Maps!'"

'To sum up, I hope I created a happy cohesive work environment. The landmarks during my time included OS MasterMap, the new building, free maps for schools, GeoVation, unlocking some of our data into the open data space and a unified

disease. 'We bought well over 1000 handheld GPS kits and we engineered a plate to go over the top so that there was only one button to press and a read-out for the vet to read off the number rather than an OS grid reference. This was transformational, and it was also about using up-to-date data in an age when people still had map chests and were getting out their paper maps combined with lots of local knowledge required. But mapping for a strategic common operating picture was new, whereas today we see with the Olympics, last winter's floods, etc., that it is an essential part of the underpinning framework of the infrastructure of our country, a complete change'.

We questioned her on whether she'd had disappointments. 'I actually said to someone recently that I believed I loved every day as director general. I cannot recall a disappointment. I can recall things going slower. We were doing some world-leading things which occasionally led us into cul-de-sacs and we had to come back out, but I never saw them as disappointments, only as setbacks which I had to lead us out of in order to move on because, like landing on the moon, it was the destination – we had to do it. We were driven by those mantras about collecting once and using many times, even though we were trying to do it with the most complex data in the world'.

Surely she must have had some frustrations over the years? 'I will always be frustrated that there aren't 62 million people out there thinking that geospatial underpins every decision they make.



Those ten minutes were vital to the industry because everybody suddenly got it.



Whether they got their water and phone signal this morning, or whether the traffic lights changed in the right sequence for the school crossing, those 62 million people depend on it. Geospatial is now inside every decision. Now I want to continue to get the whole globe to understand its importance!

Now for the rest of the globe Since 2011 Lawrence has been co-chair of the UN-GGIM, the UN's initiative on global geospatial information management. What attracted her to this position? 'I have always been passionate about geospatial, inspired by a geography teacher. I was very lucky when I was in my 20s I won a scholarship from the Worshipful Company of Stationers that was worth £5000 to investigate a project that would, I told them, change their lives and that GIS would underpin every business within ten years. I went around the world and met some of the leaders from every continent. I was away for six months, even though I was disabled from a skiing accident at the time. Some of those people still remember those meetings including the surveyor general of Hong Kong, who is a good friend'.

We fast forward to 2011 when some people from the UN came to visit Lawrence at Ordnance Survey and to tell her about UN-GGIM and how they had a mandate for the next five years and wanted a co-chair. 'I was surprised to discover that the British Government and some 90 other countries had suggested I become the first co-chair. Since then we have developed a good understanding that authoritative and maintained geospatial data is an essential requirement for underpinning the infrastructure of nations and is essential for good governance along with sound fiscal measures, authoritative statistics etc. We report to the Economic & Social Council and I've been lucky

enough to be re-elected four times'.

She is proud of being presented recently with a large book filled with statements from ministers and governments from around the world saying how much mapping means to them. One of the fruits is a resolution to the UN General Assembly about the Global Geospatial Reference Frame and how it will make a difference for accurate positioning.

The elevator pitch We finally asked about the elevator pitch: you have a few minutes in the lift at the UN building in New York and the ambassador for a newly elected government intent on making savings asks why he should support UN-GGIM. 'I would convince him of the economic benefits. If they want to make savings they must have good geospatial data. I would also emphasise the economic stimulus. 72% of the world doesn't have good land registration systems; as a result they can't get loans, they can't start businesses or stimulate growth. A geographical base is vital for good land tenure. It's about optimally using the loans you could get, to build infrastructure. Powerful arguments to developing and transitional countries.'

So how many world leaders really get it we asked? She thought for a few moments. 'Probably about 70, there may be more, even 100 who understand the importance of geospatial across the board from developed to developing countries. They do see land as socially and strategic importance'.

From January, Vanessa will be able to concentrate fully on UN GGIM but this is an expensive only position and it would be unprecedented for her to be elected again next August. *GIS Professional* will be very interested to see where she will deploy her talents next. We are certain that she will continue to encourage the use of geospatial information wherever she goes and we wish her all the very best.



If they want to make savings they must have good geospatial data.





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Database marketing



Above: Acxiom's Personix segmentation showing likely digital access for different 'Lifestages' and 'Affluence'.

EVERY CENSUS IS NOW FOLLOWED – two to three years later – by the launch of a new wave of geodemographic segmentation systems. In 2013/14 there are eight systems aimed at various parts of the market including much more emphasis on the internet as well as conventional direct marketing.

systems in March 2013. John Rae said 'we didn't use census data for segmentation, but we waited until we could check our results against census data before launching'. He explained that, with uncertainty over the future of the census, it was prudent to seek an alternative solution and particularly one that could be regularly updated much more frequently.

CACI has used a wide range of datasets, from commercial and public sector open data sources including land registries, commercial sources on age of residents, ethnicity profiles, lifestyle surveys, population density, benefits, social housing and other rental property data. CACI has created proprietary databases including prisons, traveller sites, age-restricted housing, care homes, high-rise buildings and student accommodation.

Acorn classifies postcodes into 6 categories, 18 groups and 62 types. John Rae says that, 'We put more effort into Acorn than our competitors. We use more Open Data and make many 'freedom of information' requests. We buy in more data from

How your neighbourhood is classified for targeted marketing

The main users of geodemographic segmentation systems have traditionally been commercial direct marketing companies, academics, and large retailers. Latterly they have been accepted by public sector organisations as being very relevant to planning and implementing more efficient services.

Peter Sleight explains how eight systems were produced and how they differ.

The most notable innovations relate to two key factors; the ability to update, (present in most systems this time), and the heightened importance of digital. These are on top of the real growth in their use since the turn of the century.

The census of population is taken by the Office for National Statistics for England & Wales, by what is now the National Records of Scotland (previously the General Register Office) and by the Northern Ireland Statistics and Research Agency. The production of the output statistics took place on different timescales for the three agencies, so the data has arrived in waves, with the most detailed, 'small area' data coming towards the end. Geodemographics systems providers need these small area statistics unless they decide not to use census data at all.

What follows is a summary of the eight systems in order of their appearance from March 2013 through to the near future.

Systems reviewed CACI produced the first UK geodemographic classification, **Acorn**, in 1979 and had apparently been wedded to the census data. This time CACI did not use any census data in their new system – enabling them to launch before other

commercial sources and tread the streets to collect key information. This makes Acorn more up to date and accurate'. www.acorn.caci.co.uk

Censation, from **AFD Software** was built by **Tim Drye** from Data Talk, and launched in May 2013. This system uses 600 variables from the Census, plus data

According to Wikipedia, geodemographic segmentation is based on two simple principles:

- People who live in the same neighbourhood are more likely to have similar characteristics than are people chosen at random.
- Neighbourhoods can be categorised in terms of the characteristics of the population which they contain. Any two neighbourhoods can be placed in the same category, i.e., they contain similar types of people, even though they are widely separated geographically.

However Peter Sleight prefers his snappier descriptions: 'the analysis of people by where they live', or just 'locality marketing'.



CACI did not use any census data in their new system.



from the Land Registry and from 80,000 face-to-face interviews every year. It is referenced to residential and transactional data and provides a neighbourhood classification at unit postcode level. The methodology treats the census data as 'undulating terrain' rather than as discrete 'islands'. The product is free with AFD name & address management software. www.afd.co.uk

TRAC Consultancy's 'Sonar' classification was launched in January 2014 and uses census data as well as council tax bands, Land Registry property prices, police crime data, and DWP claimant data. The resultant clusters were grouped by life-stage and affluence. **David Griffiths**, proprietor of TRAC, said 'Sonar is the result of using a wide variety of different statistical techniques and combinations of variables to find the most powerful and predictive classification. Testing is key and we always recommend that potential clients try the product for themselves.' www.tracconsultancy.co.uk

Axiom's Personix avoids census data because testing showed no significant improvement over the use of the other data sources. Personix works across all levels of geography – postcode, household, and individual, and incorporates a code that denotes 'digital sophistication'. Personix is apparently being used within online environments for ad targeting not least in partnerships with Facebook and eBay. This is key to the company's cross-platform global Audience Operating System.

The prime data source is Axiom's own on/offline lifestyle survey data for which the company claims responses for over 20 million consumers at their current address. This means that the segmentation performs particularly well at an individual/household level, specifically behavioural variables. Personix has 55 clusters, driven by behaviour and structured with a five digit code combining lifestage, affluence, digital activity and age. This is visualised with the Personix 'Eye', which can be seen on their website and which enables an intuitive overview of the clusters, segmented by age bands, with life-stage numbers in coloured circles – then click for a pen-portrait of that cluster code.

Clare Woodvine, product manager, said 'Personix links the off- and online worlds and can become the common language between traditional CRM-based marketers and digital (agency and publisher) marketers. One segmentation that works across all sectors and all geographic levels simplifies the product, which will also be more accurate by using up-to-date survey data'. www.personix.co.uk

Experian's latest version of **Mosaic** was launched with illustrations of notable changes in UK society since 2001, including the forced move to renting or house sharing as the only affordable option for a large section of the population. The list of data inputs can

be seen from Experian's impressive visualisation tool at www.SegmentationPortal.com

Mosaic is built on the 'ConsumerView' picture of all UK adults, using hundreds of millions of input records with actual data at individual and household levels. It aims to optimise the balance of geodemographics and individual/household data, so that the segmentation will be an accurate and reliable classification of households and postcodes.

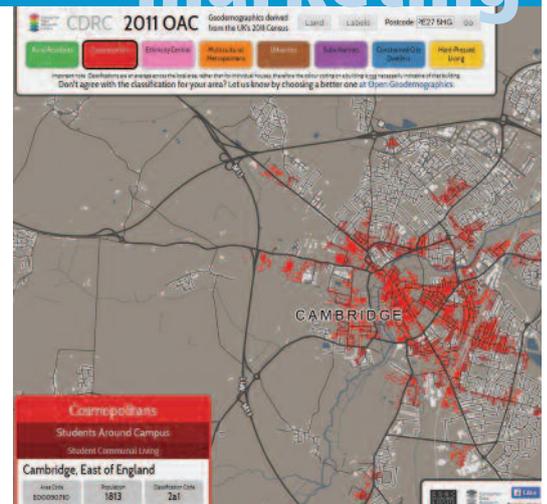
The visualisation shows the Mosaic build process in detail and also enables viewing of details of all Mosaic types, maps of areas of chosen types, characteristics of people and families within each type. It enables customisation, with client-specific segmentation being built from underlying Mosaic 'DNA' building blocks, which can then be viewed – privately of course! **Paul Cresswell**, VP of product management, said 'Using advanced analytical techniques and relevant new data, new Mosaic optimises geodemographic and individual data, delivering a stable, robust solution for clients across all marketing channels'.

CAMEO, from **Callcredit Information Group**, uses census data and Open Data, and is built with dynamic links to its consumer database, Define, which holds details on over 60 million UK residents with actual lifestyle, survey and transactional data. CAMEO is updated dynamically to reflect key life-changes of individuals and Define provides a breadth of consumer insights across ten vertical sectors, and multi-channel behavioural insights from online and offline transaction data. CAMEO therefore claims to accurately reflect changing consumer characteristics as their affluence varies or as they go through key life events from setting up home, having children, and retiring.

Callcredit have a new microsite where visitors can explore CAMEO; each segmentation type can be explored using detailed sector-specific descriptors and visualisations. It is built in three tiers; individual, household and postcode. All are built from individual-level granularity. www.cameodynamic.com/uk

Zoe Palethorpe, head of products & propositions, said 'With ever-expanding availability of data types, we have kept CAMEO flexible enough to incorporate data from new sources. We can add fresh datasets as they become available to provide increasing width for consumer targeting.

The 2011 Area Classification of Output Areas, or OAC, has been produced by **University College**



Above: Output Area Classification for 'Cosmopolitans' in Cambridge using UCL CASA Mapping.



Experian. . . client-specific segmentation being built from underlying Mosaic 'DNA' building blocks.



Database marketing



About the author

After spending ten years in FMCG Marketing, Peter Sleight became professionally interested in geodemo-graphics. He left ABM to join CACI as head of consultancy, subsequently jointly setting up PinPoint Analysis. Since 1991 he has run Target Market Consultancy, providing independent advice on targeting and geodemographic analysis)

London (UCL) in collaboration with **ONS** and is now complete for the whole of the UK.

OAC is a 'classic' product using census data only and is free to use. It is a hierarchical classification that assigns each Output Area to 1 of 6 supergroups, 24 groups, and 68 subgroups. Although it is 'general purpose', the methodology is flexible, so specialised versions could be produced in future. The product is supported by the renowned UCL CASA mapping.

The ESRC funded Retail Research Data website offers interactive maps of 2011 OAC for England and Wales – the rest of the UK will follow. The Open methodology and use of open source programs means that expert users can either replicate the classification or modify it.

www.retailresearchdata.org/2011oac.aspx

The latest product, expected in early 2015, is P2 (P-squared – People & Places) from **Beacon Dodsworth**. This version will incorporate economic factors, with the ability to update as regional economies change. The company is working with the **University of Liverpool**, using research carried out by the 'Centre for Cities' urban policy research unit.

This team is looking at the 64 Primary Urban Areas in Britain, which are aggregations of local authorities. By relating 11 census variables (e.g. area

density, population 65+, qualification level, and economically inactive rate) they have analysed the factors that lead to 'success or struggle'. The subsequent cluster analysis produces 6 different clusters of local authorities, 'Urban Clusters'.

Cluster 5, for example, is labelled 'Regional Growth Centres' – such as Cambridge with positive variables such as Business Churn, Population Density, High Level Qualification Rate, and Knowledge-Intensive Services. This type of area is well-positioned to benefit from economic recovery. The remainder of the UK is made up of three Rural clusters – 9 clusters in all.

P-squared is built inside the economic clusters and is a hierarchical system with three tiers in order of affluence; 14 'Trees', 41 'Branches', and 157 'Leaves'. In addition to census data, P-squared will use insight from the British Population Survey to provide extra descriptive variables, such as lifestyle and income measures. **Simon Whalley**, data manager, said 'the aim is to create a classification based on an economic picture of the UK that allows for regular updating from an economic perspective'.

www.beacon-dodsworth.co.uk

So, a rich mixture of approaches to a common theme – how best to classify and target consumers in the second decade of the second millennium. Geodemographics reinvents itself yet again!

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For more information visit: www.abdn.ac.uk/gis

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Adena Schutzberg is
Principal of ABS Consulting
Group Inc.
and Executive Editor of
Directions Magazine,
www.directionsmag.com

THERE ARE TWO WELL ACCEPTED IDEAS in today's educational thinking. One is that active learning typically outshines passive learning. The second is that reflection on learning is valuable in increasing retention and making content meaningful. While researchers and some administrators attempt to inject active learning into educational systems for young and old all over the world, our industry conferences - one of our key educational opportunities - remain stagnant, dull and uninspiring. Similarly, attendees rarely take the time, or have any incentive or requirement to reflect on their learning at conferences.

Before I get ahead of myself, let me briefly explain active learning and reflection. Active learning is learning by doing, usually directed in some part by the student. Reflection refers to thinking back over a learning experience. Typically a student would ask:

proposal requiring not only an abstract but also an active lesson plan?

Lack of reflection Once a conference is over the suitcases are packed and attendees pile into cars and onto planes for the trip home. Once back at work we re-engage with the workflow without a moment to reflect on what we might have learned. I find it the exception rather than the rule that a company requires a "write up," blog post, or presentation to the staff on what the attendee learned. I'm dismayed to share that my published conference recaps are sometimes "borrowed" in whole or in part, to fulfill such requirements.

What can we do? Conference organizers should be looking for "non-PowerPoint" keynote and other sessions. They should market such

How and why GIS conferences fail as educational opportunities

Conferences are the focal point for many GIS practitioners when we share experiences, find out what is new and learn what works or what doesn't. But do we really? **Adena Schutzberg** asks some pertinent questions and suggests some ideas for making conferences more interesting and useful for all concerned.

What did I learn? How? What were the important ideas or skills? How do they relate to my life and work?

Consider the last few conferences or training courses you attended in person. Did you do anything in the educational sessions or mostly sit watching PowerPoint? Did you take some time, alone or with someone else to think back on what was learned? I hope you answered yes to both questions but fear, like me, you answered in the negative.

Why PowerPoint reigns Speakers are good at PowerPoint. We've used it for years and it's the way we know to teach or brief one another. And, of course, we can put together the slides on the plane.

Attendees expect to be passive and "not work". Attendees expect to sit back and have their heads filled with knowledge.

Conference organizers can easily fill five tracks of five 45 minute papers rather than insist on alternatives. Can you imagine a presentation

experiences as a key distinguisher of the event! It might be worth selecting respected educators who have active learning skills to provide a session or pair them up with a presenter as a coach to turn PowerPoint content into one or more activities.

Attendees should evaluate conferences on engagement. They should use feedback surveys to identify speakers who showed slides as well as those who went beyond and created engaging active learning opportunities.

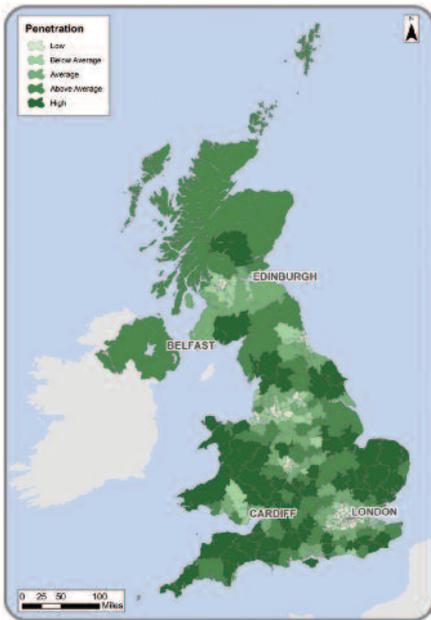
Employers (and others footing the bill for conference attendance) should insist on some reflective exercise. It might be an internal, or better yet, public blog post. It might be a lunchtime talk to the staff or a short video recapping the big ideas from the event.

As an industry we spend lots of money on these conferences. Some of the investment is aimed at marketing our organizations, products and services. Another part is aimed at educating our staff; we should be tapping into what's known about teaching and learning.



Can you imagine a presentation proposal requiring not only an abstract but also an active lesson plan?





Above: Map shows the 'Penetration of village retirement classification across UK'.

DATA IS GROWING – everyone knows that. Big Data has been a buzz term for years, and whilst many marketing folk talk about how much new data is being created, and how the variety of types of data is expanding, more still are wondering, "What do we do with it?"

For marketing in particular, this is golden data for consumer segmentation which is used to categorise customers into groups that have similar traits. Segments can be based on almost anything - age, gender, email behaviour or spending habits.

Using segmentation enables more focused targeting and consequently more relevant marketing for any particular customer, improving the customer's experience with a brand or company.

The What: selecting data sources The more data a segmentation tool can access, the more accurate and detailed it can be. We have over 800 million data input sources, and over 600 variables in order to fully understand UK consumer characteristics and lifestyles. Large volumes of

target audiences and customers and who they really are.

Creating a robust and stable solution is vitally important, but building an understanding of consumers that sit within each segment is also critical if the data is going to be used to best effect. Segmentation tools should contain a broad and in-depth range of interpretative data to help organisations know more about their target audiences and customers. This data can include:

- Digital insights based on online activity data helping organisations understand how their target audiences behave online.
- Partnerships with global market research brands giving rich insights into how people live their lives and spend their money.

The How: technology With such enormous volumes of data, and so many different varieties, any segmentation tool needs to be very sophisticated in order to be able to deal with the data properly. New techniques to fully exploit the depth of available consumer data are continuously being explored. Optimising the balance between geo-demographics and individual data delivering a stable and robust segmentation is essential for a detailed and accurate

Consumer segmentation: New data means new insight

One of the geodemographic segmentation systems profiled in **Peter Sleight's** review is Experian's Mosaic. **Richard Jenkins** takes us into some of the more technical details of Mosaic and how it is derived. So if you want to know why you are a Parish Guardian rather than a Stressed Borrower or a Footloose Manager then read on!

actual data with tried and tested models means that information for each consumer can deliver a robust and stable segmentation that generates superior understanding and insight on consumer demographics. The typical data used includes person level variables such as age and financial status; family variables such as household composition, home ownership and presence of children; property information such as type, size, value, number of storeys.

Sources include the Census, specialist third parties such as RightMove, open source data, public sector data, the land registry, and tenure data on home ownership and rental properties.

Quantitative data alone is not enough however; we are rather more than walking talking ones and zeros! What brings the data to life and enables brands to make meaningful connections with people is the qualitative, interpretive data. This needs to be included to paint a detailed picture of

product. It's important to fully exploit the valuable information that can be gained from understanding a consumer's neighbourhood, but combining this with accurate, specific characteristics make the classification tool relevant and reliable.

Clustering is one of the key techniques used. It is a statistical technique that finds the natural groupings of data points while looking at multiple dimensions in a set of data. In the case of consumer segmentation, this means finding the key socio-economic groups within the UK in terms of their demographics, purchasing power and general attitude and behaviour; defining them mathematically; and assigning every household to one of these groups.

The Why: keeping pace with consumers Accurate marketing is important because customers are increasingly expecting, even demanding, that businesses put them, rather than products, at the



Segments can be based on almost anything - age, gender, email behaviour or spending habits.



heart of their marketing and sales structure. In order to do this successfully a well informed, targeted approach is essential. Experian surveyed 2,000 UK consumers and found that 84% would take their custom elsewhere if an organisation doesn't get 'the basics' right.

Three quarters of consumers said they would respond positively to a brand that they believe "understood them" and that connected with them on an individual basis. 29% of respondents agreed that they would make additional purchases from a brand that communicated with them on a highly personalised level.

Being able to accurately segment their customers enables organisations to communicate in a personalised, relevant way, delivering the right product or message to the right person. Customers will vote with their feet and it has never been more important to understand targeted consumers.

Aside from ensuring delivery of the right service, a thorough segmentation tool could also highlight shifts in behaviour for a population that could have an enormous effect on marketing, and in some cases, business decisions. For example, the latest Census from 2011 has revealed a shift in property trends, with a huge increase in the number of people renting properties, with distinct sub-types. This may

indicate that the UK population is moving towards a more transient pattern of habitation, which could have a large impact on efficient targeting.

Data is essential for modern businesses that want to understand consumers and ensure that they remain useful for a customer base that demands the highest levels of service, with a distinctly personal relevance. The population has undergone enormous changes over the past few years, with living patterns and consumer habits changing drastically – ignorance of these changes will become obvious in any communications and a customer could easily be 'turned off' a brand.



About the author

Richard Jenkins has over 20 years in location planning and analysis. This includes a decade working for CACI applying geo-demographic targeting data and another decade as a consultant on predicting sales. Richard has degrees in Geography, Town Planning and Computer Science.



... the UK population is moving towards a more transient pattern of habitation, which could have a large impact on efficient targeting.



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AGI 25th anniversary



Above: Anne Kemp addressing the conference.

PROFESSOR **TIM BROYD** KICK-STARTED THE CONFERENCE with some horrifying statistics about the state of the world's built infrastructure and the amount of money that will be needed to fix it. As if that was not bad enough he quoted a government report that claims that the construction industry has had no = zero = zilch increase in productivity compared to other industries which have improved by 25% or more in the same period.

He argued that BIM and GI could play an important role in improving these statistics. Apparently there has been a saving in capital expenditure of 20% due to the introduction of BIM level 2 with more to come as we implement levels 3 and 4 which is being mandated by government. However he said that introducing BIM required collaboration whereas the industry was used to competition and/or working in silos. 'People don't like collaborating'.

Construction 2025 Interestingly he believes that government must be involved in the creation and adoption of standards. So there is a clear opportunity for geospatial input that could help the construction

geospatial data and has been instrumental in setting up the United Nations Committee of Global Geospatial Information Management (UN-GGIM). She gave an overview of this work.

The committee is a formal mechanism to discuss and coordinate geospatial data at the highest level of government. 'We brief UN ambassadors' explains Lawrence. The committee is part of a statistical group, the Economic & Social Council, which sits within the UN's labyrinthine maze of committees, commissions and groups. There already is a cartographic section that provides support to all UN activities. Nevertheless, Lawrence has successfully argued that there is a significant gap in UN geospatial information. The establishment of GGIM follows a report on global geographic data management.

While studying UN organisation can be a tad yawn inducing, there really is need for reliable GI around the world. It can help Africa feed itself. It can help stabilize political regimes through reliable land tenure records. Yet only 28% of the world has proper land registration – a fundamental prerequisite for development and investment; banks won't lend against unknown title. Lawrence has certainly pushed the issue up the agenda for many governments.

2014 GeoCom: The changing face of geo – Day 1

AGI marked its 25th anniversary with the annual conference Chesford Grange Hotel near Kenilworth which attracted over 300 delegates for two days of intensive conference sessions and mild celebrations! We will cover Day 2 in our next edition.

industry improve its performance and efficiency. **Richard Waite**, MD of Esri UK agrees. He used an interesting metaphor to describe the progress of GI to date – the exploration and settlement of America by Britain. He thought that we had established our east coast colonies (initial applications?); broken free from our home governments (CAD?); but have yet to cross the Mississippi or do the deals with France and Spain to annex Louisiana or Florida. There was no mention of the aboriginal inhabitants!

Waite sees many GI applications maturing in different industries but worries that, with our present mindsets, we are not selling our undoubted competitive advantages and that the 'traditional' GI companies are in danger of losing out to start-up companies that are often reinventing the wheel but using new tools to serve end users better or more efficiently.

The UN-GGIM: no money but key to global development Most readers of *GIS Professional* will by now be aware that **Vanessa Lawrence** is moving on from Ordnance Survey. Indeed, for some time she has taken a close interest in the international role of

Sustainable development is predicated on geography and data. She says "In Namibia where the cabinet once talked about water scarcity, today they talk about geospatial data management. In Ruanda over 11 million plots of land are now registered thanks to using crowd-sourcing technology".

Nevertheless, despite spending \$100 billion a year the World Bank hasn't looked at geospatial data strategically, argues Lawrence. Recent initiatives such as the release by the Obama administration of 30-metre Space Shuttle data will assist worldwide development. Yet perhaps the most startling statistic revealed by Lawrence is that the committee which she co-chairs is unfunded! Her position, which is elected annually, is funded by the British Government year by year. She has managed to persuade the Chinese to set up a trust fund to help but until the committee moves up the UN hierarchy to become a commission it remains a home for volunteers.

Trains – HS2 HS2 is Britain's mega infrastructure project, which has yet to see a single spade or machine start work. It awaits a hybrid Bill to go



We are not selling our undoubted competitive advantages



through Parliament which will require considering many objections. But Atkins are already working on the detailed route design for stage 1, known as Country South, or London to Birmingham, to you and me. This has already required some half a million man-hours and **Ian Walker**, senior GIS consultant, explained their role to date under the title "HS2 – a contractor's perspective". They have generated 76 map books with over 1200 maps and numerous standards, including no less than eight dealing with geographical information geometry. Now they have a very large GIS that has been created with outline design work in MicroStation and then converted to Esri shapefiles for the geo database.

Marech Suchocki of Autodesk presented "Achieving true integration of engineering and geospatial information for HS2". He focused on the design and build once the project was given the go-ahead and reeled off some gob-smacking statistics for the 230 kilometre route: 53kms will be tunnelled; 74kms in cuttings; 152 underbridges, 145 overbridges. Client led BIM is integral to the project and should save a lot of money. It will deliver an operation and management asset model for a project that will have a long legacy - the current London to Birmingham railway opened in 1838. The BIM is expected to hold some 3 terabytes of spatially located data, will be software agnostic, and will be future proofed. It is also expected to highlight innovation in UK design.

Opening up government data Defra and the Land Registry are two sources of geospatial datasets that are rapidly being made available as open data in various ways. **Savania Chinamaringa** presented the methodology that Defra uses to determine which of its 4500 datasets should be released and in what order of priority. He detailed the cost-benefit analysis that has to be taken into account, for example, estimated benefits of data that is released free of charge as well as potential loss of income from datasets currently priced for commercial use. They must also take into account the costs of making data available if it has to be reformatted, anonymised, aggregated or otherwise manipulated from Defra's internal databases. His worked example for the National Flood Risk Areas dataset concludes that it is worth £4.4m to the UK economy. This assumes that opening data increases the demand by 3.4 times – a figure from a Deloitte study on public sector data in general.

The cost of preparation – and in particular quality improvement – of Land Registry open data also has to be balanced against the internal value; not just the value to external users. **Lynne Nicholson** said that publishing the INSPIRE Index Polygon dataset had required ten full-time staff for four months but that this was only what she described as the 'Bronze' product and is free of charge to download. The

'Silver' is now available as their MapSearch web-mapping service that also includes title numbers and addresses but requires users to register and pay.

The Gold service is coming in 2015 as a web feature service with a working title of the national spatial database. Several questions to Nicholson showed how well valued this data is but also exposed some of its limitations and how there are many misunderstandings about Land Registry information in England and Wales. Nicholson described the Index Map dataset as a 'washing line' on which a lot of other information is and will be 'hung out'. Both presenters in this session made it clear that many of their datasets required licences from Ordnance Survey and/or the privatised Royal Mail for onward commercial use.

Yes minister Many of us are sceptical of the policy-making process in government at all levels. 'Don't confuse me with the facts' and 'Yes minister' are phrases that come to mind! So **Clare Hadley's** presentation on 'The Value of Geospatial Information in the Policy Making Process' was awaited with some interest. Jointly prepared with **Katherine Beard** – also from the Ordnance Survey – this paper was a real dose of reality GI.

Hadley described the theoretical and actual policy cycles (see Fig 2) and the need to engage at the right points of that cycle. The policy processes differ at different levels of government and anyone trying to introduce information for 'evidence based policy making' must establish well in advance where and when it is best delivered. She cited the 'Flood Re' (flood reinsurance) scheme as a good example of the use of geospatial data along with other examples from Defra, the Welsh Government, Resilience Direct, and the deputy prime minister's announcement of 'accessible green space'.

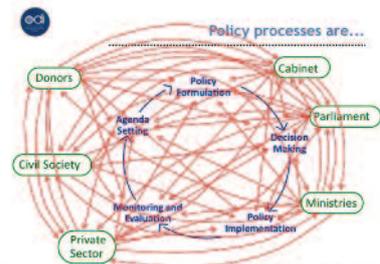
Policy makers are generalists and rely on recognised experts. However, although the government recognises economists, statisticians, social scientists and operational researchers as distinct professions, there is no such recognition of geographers. Hence a lack of geographical input in many policy making areas, although there are moves

Benefits to Publishers

Strategic Impact	Operational Impact
<ul style="list-style-type: none"> • How opening data will support strategic aims [statutory task] • Impact on major projects, programs and initiatives • Stakeholder engagement & collaboration 	<ul style="list-style-type: none"> • Improved data management <ul style="list-style-type: none"> ▪ Maintenance ▪ Quality ▪ Metadata • Cost savings <ul style="list-style-type: none"> ▪ Re-use ▪ Avoid FOI costs ▪ Technical and admin costs • Skills and Capability

Above: Fig 1 - Chinamaringa's methodology.

Policy Making Cycle



NB. "Virtually every interviewee dismissed policy cycles like ROAMEF as being divorced from reality." Policy Making in the Real World; Institute for Government; 2011.

Above: Fig 2 - Hadley's Policy making cycle.

“
...a washing line on which a lot of other information is ...hung out.
 ”

AGI 25th anniversary



afoot to achieve such recognition. One related initiative is the formation of an AGI policy forum, which was agreed at a subsequent meeting at the conference. Watch this space!

Drones – the hype and the law The next session took us firmly into data gathering and from a new platform for many attendees. **Robin Higgons** works for Qi3 Ltd., a specialist consultancy providing sales, marketing and business development support to technology companies, enterprises and government. To hear him say that these drones are ‘rapidly exploding’ was somewhat alarming but fortunately Higgons was referring to the Gartner hype curve which, for drones (or unmanned aerial vehicles – UAVs) has not yet reached its peak though that will be followed by the trough of despair! Some countries have been using UAVs for years. Japan for instance has been using them for over 30 years for agricultural and crop-spraying applications. The question is whether there is money to be made in the UK.

Higgon’s colleague **Peter Lee**, a lawyer, discussed not only the legal issues surrounding UAVs but the ethics of their use. Citing the great 19th century explorer Sir **Richard Burton**, Lee explained that in order to gain access to Mecca and the Holy places of Islam, Burton dressed as a Turkish Dervish. He knew the ethics. The legal issues however are draconian for UK operators. Larger drones are governed by EU legislation. Nevertheless, there has been an 80% increase in applications for pilot’s licences in the last six months.

A third contributor to this slightly eccentric session was **Jerry Connolly** who spoke as an aviator. He explained that for a UAV there is no certificate of airworthiness available for the current 600 or so different types of machine on the market. ‘There’s no safety ethos’ says Connolly, ‘and with maintenance a big issue they do go wrong’, he added before advising would-be users of UAV services to check the CAA’s website for licensed individuals (<http://www.caa.co.uk>).

But the little things still count Harrow Council has often won prizes for its innovative and effective use of GI – particularly gazetteers from what is now Geobase. **Matt Pennell** presented another application that is saving the council tax payers money while arguably delivering a better service. They pioneered

the use of GIS for asset management in the ‘80s but this became obsolescent and they reverted to paper based systems for awhile albeit with mobile phone communications. Now they have an up-to-date integrated system working both on and off line with tablets and smartphones in the field connected back to the office in real time. The council has been able to reduce staff numbers but with the backing of the unions because the changes were fully evidence based and were negotiated from the outset. Although currently the work is entirely handled in house, the system would enable contracting out, of grounds maintenance for example, with total confidence that all areas of grass, flowerbeds, paths, etc are described accurately and up to the minute. One questioner from Ordnance Survey asked if they used MasterMap change only updates. Matt replied that they actually use UKMap!

The new disruptors: evolution or revolution

Acting Ordnance Survey director general **Neil Ackroyd** wound up the first day by tracing the current demand for mapping through enabling technologies like satnavs and what he sees as a game-changer: UAVs. For OS, ‘It’s about solving customer problems’ says Ackroyd. While OS is ‘leveraged around detail’ the mapping is routinely 6-9 months out of date: ‘rapid update has still to be solved’. Change detection software is now used on a day-to-day basis to update the topographical database and already it can automatically extract detail like roof shapes.

Turning to a more philosophical issue, Ackroyd posed the question, ‘Is there a future for the geospatial professional?’ His context was what he called ‘the new cartography of visualisation’, vividly shown in the demand for OS data from Minecraft enthusiasts which far outstrips demand for all other OS OpenData products put together! ‘Spatial skills are thereby instilled in teenagers’, declares Ackroyd, ‘they get it’. While he didn’t answer his opening question, the consequences are not difficult to deduce; tomorrow’s geospatial professionals are more likely to specialise in other disciplines for which geospatial skills are necessary but not sufficient.

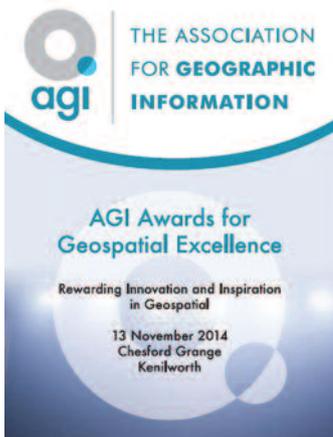
He moved on to “Resilience Direct” and the government’s common operating platform. Ackroyd cited the Glasgow Commonwealth Games as an example, arguing that, ‘there is a greater eagerness to collaborate even though government doesn’t do it very well – the tide is rising’. He listed a range of Ordnance Survey initiatives that included growing partnership approaches, managing content, unlocking new value from OS core capabilities, delivering greater value through open data and embedding new data capture methods. He was very keen to have partners but very clear that OS would continue to expand its own products and services – with or without them.

• To read *GiS Pro’s* report of Day 2 of GeoCom 2014 you’ll need to wait for the February 2015 issue.



... ‘the new cartography of visualisation’, vividly shown in the demand for OS data from Minecraft enthusiasts. . .





ON 13TH NOVEMBER at the Chesford Grange Hotel in Warwickshire, AGI hosted a new look awards ceremony for 2014 after their annual GeoCommunity Conference. The event brought together leaders from across the geospatial sector to celebrate the best of the year's GI activity. **Emma Bee** (AGI Council) said "We wanted to re-vitalise the AGI awards for 2014 and beyond to be bigger and more inclusive, but also provide better insight into progress across the industry. So this year sees both new awards and entries open to all sectors to encourage an element of friendly competition". **Anne Kemp** (Chair of AGI 2014) said "This is about supporting the development of professionals throughout their careers and recognising the invaluable relationships members form beyond our immediate community".

such a clear manner, why geology is important to the Future Cities agenda".



Left: **Diarmid Campbell** having won his award.

Excellence in Education - Luke Burns, School of Geography, University of Leeds for his GIS and Spatial Analysis module and particularly impressed the judges: "This nomination fizzles with the energy and commitment that was doubtless deployed in the teaching of a large undergraduate intake".

2014 AGI Awards for Geospatial Excellence – a celebration of cutting edge geospatial projects, teaching and research.

The new look AGI Awards have attracted a high standard of entries and some ground breaking work on the visualisation and application of GI.



Above: **Iain Stewart** making his speech.

The compère for the evening was Professor **Iain Stewart**, popular TV scientist and geologist who delivered a humorous speech describing his TV work and the vital role that geospatial is playing within his research and in our understanding of geology.

The awards presented were:

Best Paper at Conference
- Sponsored by **Informed Solutions**
Delegates at GeoCom 2014 voted for this and it went to **Doug Specht**, from Voz for his talk "Securing Human and Environmental Rights through PGIS". The research, supported by the University of Amsterdam, Universidad del Valle, and the University of Westminster drew upon case studies from Colombia and Syria and sought to explain how locally generated geospatial information can be used to promote human rights.

Best Paper within the Event Programme The best paper from AGI's GeoBig5 event series was awarded to "Glasgow, setting the standard for Europe" by **Diarmid Campbell**, British Geological Survey and **David Hay**, Glasgow City Council. Judges said that: "It was a pleasure to watch someone articulate in



Above: **Luke Burns** alongside **Paul Longley** holding his award.

Best Geospatial Data Visualisation Ordnance Survey with GB Minecraft by for their "refreshing and outstanding application of geographic visualisation" in building a model of Great Britain within this popular children's game. Judges remarked on its value as a teaching aid and as a novel way to engage young people with geography. The model has some 83 billion blocks for the 220,000 square kilometres of mainland Great Britain and surrounding islands.

Excellence in Research & Development
- sponsored by **GI Standards**
Acknowledging those projects that have advanced best practice, technology or tools to the benefit of



AGI awards



Above: Anne Kemp, AGI Chair, addresses the Awards Dinner.

the geospatial industry this award went to Proteus FZC for their project Terrestrial and marine ecological classification and land-use land-cover mapping from satellite imagery for Abu Dhabi emirate. AGI Judges commented that "The scale of this project and the integration of land based / maritime satellite imagery to influence planning decisions and to track carbon is ground breaking".

Excellence with Impact sponsored by 1Spatial



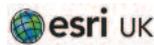
This award recognises projects which have achieved outstanding success or impact whether this be within an organisation or at a local, regional, national or international scale. The winning entry was UK Soil Observatory by the UK Soil Observatory Partners for what judges described as "An ambitious project with huge potential as a spatial research resource for a range of fields including agriculture and geotechnical engineering".

Best Use of Geospatial for Business Benefit - Sponsored by Ordnance Survey



This highlights outstanding achievement in the use of geospatial technology, particularly those that have had positive impact on business processes or practices and can demonstrate significant return on investment relative to the project scale. The winner was "Knowledge Based Mobile Asset Management for Walsall Council" by Kaarbon Technology which focused on their GullySmart system for managing drainage assets. The judging panel felt the project had "all the elements of using geospatial information, operating at scale, making better decisions, and delivering business benefits".

AGI Student of the Year - sponsored by Esri UK



The award for best dissertation project from geospatial disciplines within UK universities went to **Richard Thomas**, University of Leeds for his work on "Determining Cycle Mode Choice for Commuting using New Route Analysis Methods". The judges comments were: "well presented research with clear aims and objectives".

The AGI Award for Exceptional Service This goes to someone who volunteers to help AGI fulfil its mission. **Peter Kohler** won for his considerable research to help formulate a skills framework for the AGI's CPD programme. In addition, the judges also recognised significant contributions from **Abi Page, John Marshall, Laura Kinley, Matt White** and **Rollo Home**.

Career Achievement in GI The final and most prestigious award of the evening recognises an individual who has made a significant long-term

contribution to geospatial within their professional career.

Keith Adlam, formerly worked at the British Geological Survey, in Keyworth, near Nottingham. Originally from Maybole in Ayrshire and with a BSc Hons. in Applied Geology, Keith was appointed to the Industrial Minerals Assessment Unit of the Institute of Geological Sciences (now BGS) in 1977 as a Scientific Officer. Keith was a champion and pioneer of GIS at BGS and his many achievements over the years included being the original author and manager of the Geoscience Data Index (GDI), making BGS's vast spatial data assets accessible to a huge audience from both within and outside BGS. He was also a lead player in many other large corporate GIS systems including SIGMA, GeoReports, UKDEAL and GHASP. AGI Judges remarked that "It is difficult to overstate the contribution Keith made to the application of GIS to solve real world business problems both within BGS and externally. Indeed, Esri UK held Keith in such high esteem that they paid tribute to his 'Life in GIS' in their *ThinkGIS* magazine earlier this year". Keith's colleagues said of him that "he had an unrivalled determination and ability to solve just about any technical issue and did so with such a calm and cooperative manner that he was always a pleasure to work alongside". Many congratulations to Keith who is a worthy winner and joins a distinguished company of previous recipients of this award.



Above: Keith Adlam, formerly British Geological Survey, receives Career Achievement Award.

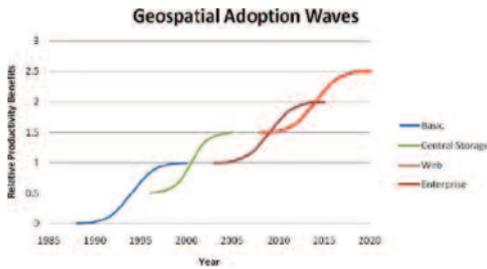
Attendees remarked on the success of the event with one commenting "now that really was an awards ceremony!"

AGI Awards for Geospatial Excellence 2015

AGI is now seeking to build on the success of the 2014 awards. Emma Bee AGI said "We intend for next year's awards to be bigger and better again and we hope that this year's winning entries will inspire the GI community to start thinking about possible projects, teaching and research to submit for the 2015 Awards".

Further details at www.geobig5.com/events/agi-awards-geospatial-excellence/

“ . . . he had an unrivalled determination and ability to solve just about any technical issue. . . with such a calm and cooperative manner. . . ”



Above: Fig 1 - LGA Geospatial adoption waves.

DEVELOPMENT, SUPPORT AND MAINTENANCE of web mapping systems is a key function of GIS teams within UK local authorities, and the vast majority of public sector organisations provide some kind of internet or intranet GIS capability. Yet there is little in the way of

documented rationale or joined-up thinking in approaches between organisations, which are all seeking to deliver similar outputs.

These systems are no longer 'new' or 'evolving' technologies: they are business-critical applications which - deployed effectively - deliver value to both the organisation and the citizen. Where once local authorities created solutions to meet statutory requirements (e-government and beyond), now the objective is to promote self-service, improve the customer experience, create efficient or automated

Using the LGA's 'geospatial adoption waves' (see figure 1) as a framework, Barnsley remained at the 'central storage' stage until the procurement of a web solution in 2010. Subsequent work has focused on developing a true enterprise capability which is based upon the web solutions procured, rather than simply providing a web presence as an end in itself.

Whilst the objective of creating an enterprise level 'location intelligence' capability has always been at the forefront of strategic thinking, the approach at BMBC has been to develop incrementally, at each stage demonstrating the value added by each new component or project. Whilst many organisations define a strategy, identify the building blocks required, and then procure those components, we did not think this approach would succeed in the current budgetary climate. It would have been too great a leap of faith for management to invest for a return that – however well-articulated – was too risky.

Barnsley takes to the clouds for better services

Every local authority uses geographical or spatial information for a variety of purposes but, for optimum effectiveness and efficiency an authority wide strategy and implementation is essential. **Riley Marsden** describes how Barnsley has implemented a cloud based system to improve existing services, which has in turn led to increased demand for other applications.



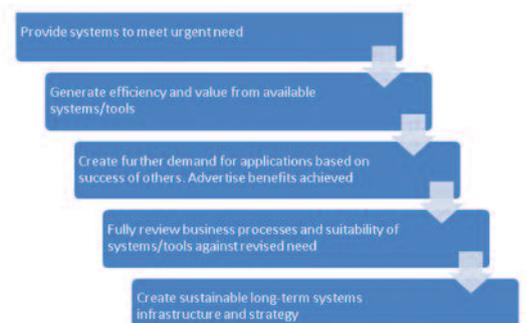
These systems are no longer 'new' or 'evolving' technologies: they are business-critical applications which - deployed effectively - deliver value to both the organisation and the citizen.



end-to-end business processes, generate business insight, promote transparency, reduce cost of ownership, and a lot more besides. For many, GIS applications are a key building block within a wider IT strategy.

The well-documented budget pressures within the sector should, in theory, offer an opportunity to those who are able to demonstrate the value that effective use of spatial technology can add. However, in many cases internal capacity to develop or customise solutions, initiate projects or review technology and systems infrastructures has been stripped, leaving little option but to battle just to "keep the lights on." Where once the challenge was to 'sell' the technology and the rationale for invest-to-save projects, now many must justify continuing the existing provision at all.

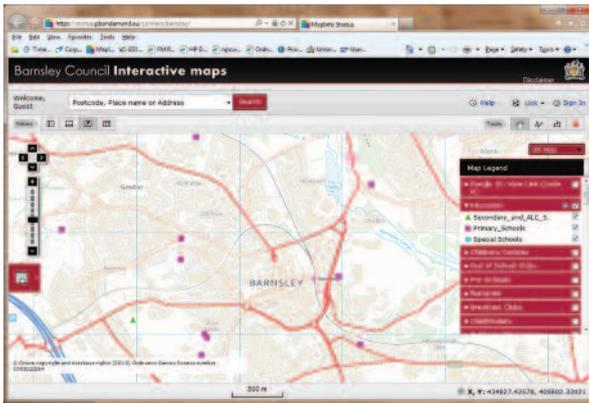
Experiences in Barnsley: Structured development of GIS capability at Barnsley Metropolitan Borough Council (BMC) has been a relatively recent transition, achieved over the last five years. Previously, silos of usage had built up in different departments with little strategic oversight and little thought given to competing requirements – a familiar story for many public sector organisations.



Above: Fig 2 - BMBC approach to enterprise GIS development.

At the outset, the focus was on improving data management procedures to feed the web GIS system, and then configuring the system to make information available to as many staff as possible. The more data that was opened up, the greater the demand for 'new' data within the system, as staff who had limited or no previous exposure to GIS identified opportunities to improve their own ways of working. This was supported by the 'corporate' team (within the IT service) pro-actively engaging with users. In 2011, for example, there was a series of workshops supported by Ordnance Survey aimed

Web mapping



Above: Fig 3 - Views of BMBC mapping capability.

at identifying opportunities for improved use of geospatial information.

Having created an additional demand for GIS and 'sold' the benefits through such events, the team engaged with high profile projects within the organisation, such as a review of all

council and community buildings, a review of library provision, and route optimisation projects for various services. In each case, cashable savings are attributable to the use (to a greater or lesser extent) of geospatial information, and these were reported back to senior management as outcomes of the initial investment made. Important lessons learned were:

- 1) It is as important to record the benefits of minor projects or process improvements as it is to 'sell' the role of geospatial data in major projects. For example, an officer who saves ½ hour per day by having information at their fingertips can do 15% more in their core role. Replicated across many staff this benefit will be very significant but is not often quantified.
- 2) It is important to consider benefits arising from the end-to-end practice of managing geospatial data, not just the end result. For example, time and money is spent managing the Local Land and Property Gazetteer (LLPG), not primarily to fulfil contractual obligations, but to provide an enterprise-level geo-referencing capability. So, significant benefits have been identified from data-matching projects using LLPG (for example identification of businesses missing from the NDR register). Geospatial data is not the 'main event,' but without it the matching could not have taken place. The benefits derived from such projects must also be linked to the initial investment in geo-enabling the service.

Ultimately, it is important that when (not if!) senior management asks "why do we do this?" an answer is available which shows that benefits achieved are greater than costs incurred.

Present and Future: The web-mapping system is widely used and generally popular with staff, and has created a level of interest in use of geospatial data that exceeds the ability of the central team to support it. We have at least a five-year backlog of projects! The implementation of the web-mapping system has met its aims, and a return on investment can be demonstrated.

The current implementation provides about 100 data layers to the public, a further 500 to internal staff across 50 different map 'configurations,' and is accessed from a range of end points including a public web map, an 'intranet', a 'find my nearest' web page and it enables embedded location maps in context on the public website.

We have therefore achieved some degree of success and there is evidence of channel shift. However, the current method of creating, maintaining and publishing layers needs radical overhaul. The 'incremental' approach to development relied initially on a flat (proprietary) file structure, and remains in place, so the next major project is to move all of this content to a database environment. This will remove the reliance on the specific web-mapping system and allow greater freedom and flexibility in the future.

Secondly, the recent addition of ETL tools has significantly increased the capability to automate frequent processing and geocoding tasks, enabling the central team to hand over the role of managing datasets back to departments which don't necessarily have any GIS expertise. For example, spreadsheets with asset identifiers, linked to UPRN's from the LLPG, can now have their geocoding, styling and publication completed automatically – the end user simply maintains a spreadsheet.

Experiences in the Cloud: The web-mapping system and database are entirely hosted by Pitney Bowes software via the Stratus system – delivered as SaaS (Software as a Service) – with BMBC taking an 'early adopter' role in 2010. Once again, the primary factor in this approach is cost with the overall implementation costs approximately 25% cheaper than the in house alternative.

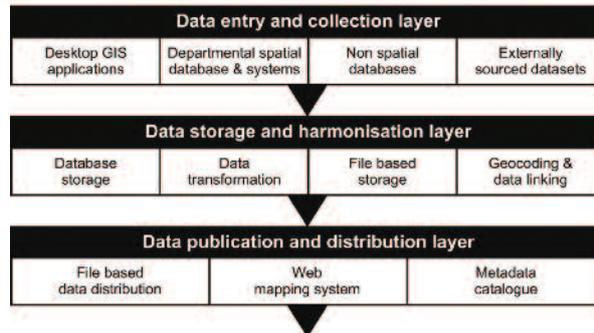
In the specific context of the BMBC implementation, key benefits of a service in the cloud are:

- As an early adopter, we were able to influence the product road map. In the early stages, the ability to receive new releases automatically with no installation requirements was a massive advantage. Implementation of new releases (although less frequent) remains a significant benefit.
- After some initial difficulties, the tools available for uploading data to the hosted database are simple to use and allow relative flexibility. Data can be uploaded from a range of sources (files and databases) and can be scheduled. Recent development of capability to utilise WMS/WMTS/WFS services have massively improved capability.
- Configuration and administration of the system is relatively simple and is achieved through a browser-based application.

“
The web mapping system is widely used and generally popular with staff.... and a return on investment can be demonstrated.
 ”

However, drawbacks include:

- Lack of control over performance – where problems are encountered, debugging is difficult to achieve and the end user perception remains that the IT team are responsible for the problems.
- Competing with other organisations (often with highly diverse requirements) to prioritise required developments on the product road map.
- Limited ability to customise and develop applications.



Above: Fig 4 - Target operating model

Summary: Implementation of a web-mapping system at Barnsley has assisted the central team to enable the organisation to make a step-change in use of geospatial information, moving incrementally towards the objective of providing enterprise level capability to analyse information spatially. Rather than seek to implement a 'strategic ideal' from the outset, small steps have been made and reviewed in order to demonstrate value and increase confidence that there is a return to be made on such investment.

The web-mapping system has played an important role in promoting geospatial capability, and has fuelled demand for projects that further

derive value. By delivering the system as SaaS, BMBC has achieved this progression at relatively low cost. To progress to the next stage however, a more fundamental change is required to methods of data management and distribution, which in turn will require a re-evaluation of the systems deployed.

Acknowledgement A more detailed exploration of this topic is the subject of an article written for the journal 'Applied Spatial Analysis and Policy,' published by the Centre for Spatial Analysis and Policy (CSAP) at the University of Leeds. Publication date to be confirmed early in 2015.



About the author

Riley Marsden is an IT systems manager at Barnsley MBC with strategic responsibility for corporate data, including a team with a specific focus on spatial data. He has previous experience as a GIS officer in the authority, supporting staff across the organisation to improve business processes and create operational efficiencies.



DynamicMaps

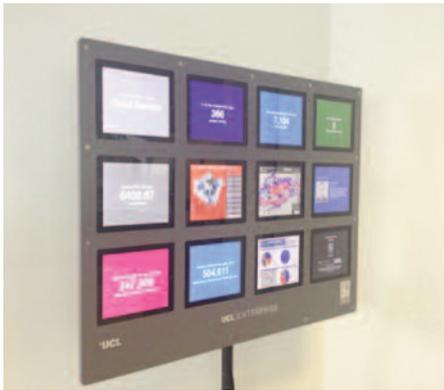
A cadline LTD BRAND

DynamicMaps Suite of GIS solutions for Government, Infrastructure, Land & Property and Gazetteers:

- Powerful Web GIS
- Mobile, Capture and Report It
- INSPIRE accredited module
- GML Translator
- GeoCoder
- BS7666 compliant Address & Street Manager
- QGIS, OL3 and GeoServer Consultancy Services



Virtual cities



Above: The iPad wall - Selected feeds from the city dashboard are shown in separate windows, on separate iPads.

THE FIRST DIGITAL 3D MODELS OF CITIES were built a very long time ago. Simple 3D wire frame line drawings of buildings in the 1950s and 1960s, which were computed on mainframes and visualised offline on vector plotters. Suddenly they became easy to generate on personal computers in the late 1970s. Mainframes and early minicomputers were largely computational boxes and their memories were not used to store computer images. If this was done at all, it was done offline but as soon as the PC exploded onto the scene, such memories were directly accessible to their users and thus immediate visualisation became routine. It is no accident that CAD company Autodesk grew up on such developments but it was not until the early 2000s that whole cities could be easily simulated in 3D. In the intervening years, GIS

our Virtual London model and the drama of flying through it never lessens despite the fact that there are now many much better rendered visualisations than we could produce a decade ago. But the real changes have come from actually using such models and from the development of different sources of media based on new technologies that were not available then.

Let me give you three examples from the cornucopia of possibilities pertaining to new modes of visualisation. First the idea of actually interacting with such digital models – but in the real world – has come of age. Ten years ago, we could import such models into virtual worlds, appear as avatars from remote sites, and see ourselves on the web interacting with others around such models. In the first issue of the magazine, we showed how this was possible for our Virtual London model but this kind of virtuality has become almost passé. It still exists on social media sites but the real action has been on

Virtual cities and 3D models ten years on

Mike Batty explains how CASA's Virtual London Model has been revolutionised by new technologies in the last decade. It can now be used to visualise the dynamics in the big data produced from sensors and hand held devices as our cities become smarter.

had been invented while CAD was coming of age, and by the late 1990s these technologies were converging. It was all of this that enabled us in the Centre for Advanced Spatial Analysis (CASA) to build the 3D model of London which adorned the cover of the first issue of *GIS Professional* in November 2004. All the elements had been put in place to be able to build such a model.

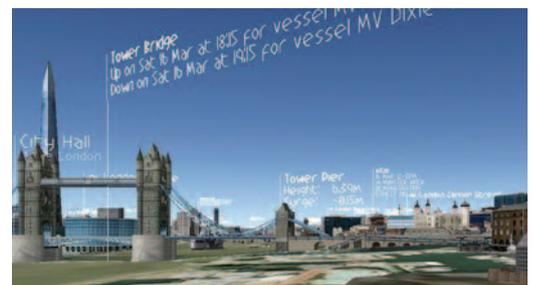
Data is critical In fact this was not just a matter of software. Data was critical. By 2004, digital terrain models (data), street and land parcel data from agencies such as OS, and 3D data obtained by LIDAR was at last available and this enabled us to take the terrain, the building plots and the streets and from the point cloud generated by the LIDAR, we could extrude the building blocks to produce the model. We first did this just before we presented the model that was reported in *GIS Professional*, notwithstanding the difficulties in making sure that we had the correct permissions to use the software and the data.

In the last ten years this has all become routine. Our Virtual London model has been replicated many times by many groups, all putting a different spin on the visualisations that can be developed for different purposes. Data has become easier to get and the Open Data movement has enabled us to acquire data for such models from the public domain, notwithstanding the fact that there are still important IPR limits on usage. In fact we still demo

linking such virtual city models to the wider real world environments in which users can interact with the model. At CASA we have such an interaction which we call PigeonSim (Fig 1). A user sits or stands

Below: Fig 1 - Courtesy George MacKerron (<http://vimeo.com/41552761>).

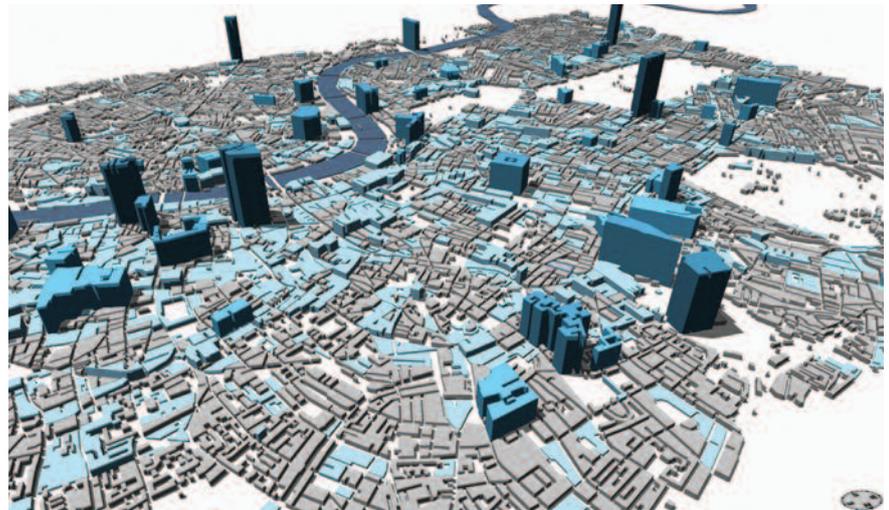
Moving back to reality: Flying through virtual London as a pigeon.



... not just a matter of software. Data was critical.



preferably in front of a large screen which is running the virtual 3D model. The user is then able to navigate through it by waving his or her arms in an obvious fashion, simulating the way a pigeon might fly through the scene. The interaction is made possible by a low cost 'Kinect' box produced by Microsoft for a couple of hundred pounds. This is games industry technology that lets the user interact with the scene. We also have a sand table where we project the imagery from the digital model of the 3D scene re-sculpting the landscape but altering the model as it runs on the fly, so to speak. The whole notion of adding the real world back into the visual produces much greater realism while enabling users to interact much more effectively with the digital models.



Embedding reality A second feature of the last decade is the emergence of real time data streams. As devices have scaled down, smart phones have appeared as well as various other sensors which can be embedded into the reality. These not only provide us with web access as we move around, but also capture our movements and a variety of other tasks and functions in which we engage. These data streams represent the digital exhaust of our interactions but the data they contain can be captured, and we are now deeply involved in mapping telephone calls, data from smart cards used for a variety of tasks particularly like paying for transport, and social media such as the tweets we make. All these can be geo-referenced in space and now time and GIS is now widely used to produce animated maps of their form. We also have new ways of modelling 3D and can now tag building with rules that enable them to be generalised and rendered in clever ways. City Engine 'plugs in' to Esri's ArcGIS and this lets users build quite sophisticated 3D models where general features are introduced making their construction fast and easy.

In Fig 2 we show how we have built our Virtual London model in City Engine but tagged the buildings with the number of Tweets generated at all those locations through a 24-hour day. The building heights are not produced from LIDAR here but are proportional to the number of tweets and the animation that can be constructed shows the kind of dynamics that a living breathing city can generate.

This is big data. Many cities are now hard at work collecting such data that is streamed from sensors and gathering it together into portals that are being called City Dashboards. These provide an instant picture of what is happening in a city. They may include maps of the data such as local weather but also images from webcams of the state of traffic

on the various transport systems. Our own city dashboard for London (see fig 3) organises such data in an easy-to-read interface. Here we show the state of the tube, congestion on the road network, disruptions on heavy rail, the value of the FTSE 100, what is trending on Twitter, how happy the population of the city is from the Mappiness site, and many other features that provide a glimpse of the city in real time. This kind of portal can be embedded into many situations. As yet we have not visualised this kind of data as maps, graphs, or 3D models but it is only a matter of time before the software generated by GIS and CAD becomes sufficiently automated to provide a truly graphical interface in 2D and 3D to state of our city in real time. In the next ten years, this kind of extension to GIS could become routine as long as spatial data becomes ever more open.

Below: Fig 3 - Courtesy Oliver O'Brien (www.citydashboard.org). The London City Dashboard, a version of which has been installed in the London Mayor's office as an iPad wall.



Above: Fig 2 - Courtesy Stephan Hugel and Flora Roumpani (http://www.youtube.com/watch?v=3fk_qxGZWFQ) A snapshot from 24 hours worth of tweets In Virtual London where the tweets are proportional to building heights.

... as long as spatial data becomes ever more open.



How can there be too many jobs and not enough at the same time? A recent GIS Lounge article by **Matt Sheehan** writes that "The demand for maps and location intelligence has been increasing exponentially. There has been a huge groundswell in interest from non-GIS users. GIS is moving from a niche sector to the centre of many software stacks". Other evidence indicates that the GIS industry is growing – but is it growing in directions for which the 'industry' is not structured or prepared?

1: Across the industry very few people currently have a good understanding of where the technology is heading. A few years ago who was seriously talking about 'the cloud', 'the Internet of Things' (IoT) and 'big data'? It certainly appears that there are shortages of skills in 'new' areas/aspects of GIS. Understanding these new areas is critical for

GIS Jobs: too many or not enough?

Nathan Heazlewood works in New Zealand where the industry also has similar skills shortages to those here. He shares some thoughts on how we define our jobs and how we might better encourage the supply of skilled people and better match them to the jobs available. Many people who use GIS in 'mainstream' jobs get paid much more than those who have GIS in their job title!

IN THE PAST FEW WEEKS I have had discussions with some recent graduates who said that there is a lot of competition for GIS jobs. At the same time some employers are saying that they can't attract the right job candidates. Do these two statements make sense?

If the statements are both true then there is an imbalance of 'employer demand' against 'employee supply'. This is particularly surprising given that there is plenty of evidence that the geospatial industry is growing, so I had thought that there should be more than enough jobs to go around. A related consideration is that, if there is a skills shortage is it reasonable to seek 'special immigration' regulations to fill the gap?

I manage projects for a wide range of clients across all sectors, so I have an understanding of what is happening right across the industry. This perspective may be unusual as most people are busy doing their own jobs and don't have time to consider how important these issues are for our future.

- Do we understand, at a detailed enough level, where there are skills shortages now and where they will be in the future?
- Do we understand the current skills and demographics of our own industry?
- How can we encourage the current and future workforce (including you and me) to adapt to a changing employment environment and target training to meet those requirements?

planning the future workforce and for planning one's own personal development.

2: If the industry struggles to keep pace with its own technology and trends, then it is much more difficult for academia to plan. There is some useful material from companies in the industry to guide educators, students and re-trainees through the skills likely to be in high demand in the future. Esri's videos on "the top 5 important skills for a GIS career" come to mind.

The private sector must continue to engage, as an adviser, with academia and other training channels. For example: If 'Big Data' is currently 'hot' and is, arguably, being driven primarily for marketing, shouldn't GIS students consider doing a marketing or statistics course to complement their GIS studies? Are messages like this being passed adequately from industry to academia and on to the future workforce?

3: Do too many people just want to do the 'fun' GIS stuff, and not put some of their time into the 'boring bits'? Most geospatial people LOVE being assigned a complex problem and having to find a solution using nice free datasets they found on the net. They plan a sequence of buffers and spatial joins, etc. to get to a clever result. Who doesn't love completing a jigsaw puzzle? Creating a beautiful map can feel satisfyingly artistic!

But isn't it worrying that these exciting applications generate competition for some niche jobs while leaving the more 'boring' roles to struggle for



Do we understand the current skills and demographics of our own industry?



attention? Long term projects can be very rewarding as well – particularly when reaching fruition after several months of real teamwork. Developers can also feel great satisfaction when completing a complex programming task. Shouldn't these facts be better communicated to students and trainees?

4: GIS is, arguably, much easier than it used to be! I started out writing command lines in UNIX and AML (if you don't know you don't need to ask!) and now it is all drag-and-drop on a touch screen. This applies to data capture as well: photogrammetry used to involve huge opto-mechanical machines, equipped latterly with digital encoders. Now it is carried out on a standard PC, perhaps with 3D goggles and is also being significantly impacted by other technologies such as LIDAR.

5: "GIS" is a broad term that penetrates many different industries but also has many different jobs, which may be so specialised that even another GIS person would need retraining to cope. Petroleum GIS analysts won't know much about water supply networks. Remote sensing specialists would struggle to step into a geodesist's job (even if they have done geodesy 101). This means that although there might be jobs available in some specialisms there may be few in some others. The transition from a GIS analyst in one organisation to a GIS analyst in another is often far from straightforward.

Important point 6: So we are already admitting that there are no easy and consistent terms for different GIS roles. My organisation's GIS consultants also cover database administration and software development; other organisations may have GIS consultants with no knowledge of these tasks but much more emphasis on the content or the data quality. Looking at my list of contacts I would have great difficulty in deciding exactly what they do for a living: GIS analyst, geospatial analyst, spatial analyst, GIS specialist, ArcGIS analyst, GIS officer, geomatics analyst, geodata administrator, geographer, GIS technician, environmental analyst, GIS engineer, land information analyst, GIS advisor, mapping advisor, GIS researcher etc. etc. etc.

Whether these job titles indicate similar or very different job descriptions is impossible to determine without much more information about the required experience; the organisation's remit; and, perhaps the types of data being used. In other professions there is more consistency with the names and grades of particular roles. There have been some attempts to standardise GIS position titles, which is something that, as an industry, we should perhaps encourage. Some international, national or commercial certifications such as GIS-P and Esri's Technical Certifications can help.

This vagueness/inconsistency makes it more difficult to match job openings to job candidates. It also makes it difficult to identify trends for the

specific subsets of geospatial skills. Do we understand the demographics, available skills, and the required skills for our own industry well enough?

Some industry organisations have undertaken some useful initiatives to understand the structure and composition of the GIS industry (at least within their jurisdiction) and I think that continued effort is required, particularly in New Zealand where I work.

The URISA Salary Survey contains many useful hints about CURRENT skills requirements. Employers, educators and students would do well to look for these hints including, for example, what software is most commonly used, and what combination of GIS and non-GIS skills are demanded most often.

New Zealand Geospatial Office and SIBA NZ's report *The geospatial skills shortage in New Zealand* explores the important "dimensions" of the problem with some of the considerations that I am trying to highlight: that there are areas of distinction within geospatial (down to a detailed level). I would certainly recommend that future studies should refine these levels even further with more exact specialities, software and functional knowledge.

I am also concerned that, although individuals, organisations and the media within the industry are starting to examine the demographics with small voluntary sample surveys, there doesn't seem to be a 'combined overview'. I think we need a comprehensive review of the structure of the industry which would attempt to determine where there are shortages and exactly what skills are in demand. On the supply side we should determine the numbers of students from GIS courses and others that come into the industry, which courses they have favoured and where they get their jobs.

Geospatial skills shortages and special immigration allowances

The NZ report has been used to argue for easier immigration pathways for skilled professionals. Immigration is a contentious subject and the report has been the subject of a vigorous debate. Personally, I was fortunate to spend some time working in the UK under a similar arrangement and I like to think that I made a valuable contribution. But how can we 'prove' a shortage of suitable people if we cannot agree amongst ourselves on how to describe the industry itself or the specialities within it?

Some would argue that, rather than encouraging skilled immigration, the answer might be to increase relevant salaries. There are some interesting articles in the *Washington Post* and payscale.com indicating the salary rates available for different professions in the USA, in which 'Geographic Information Systems' is disappointingly ranked 120th. However there are many professions in which GIS is used that rank much higher - geography at 106th, environmental studies at 90th, geology at 41st or possibly even petroleum engineering at number 1!



About the author

Nathan Heazlewood has more than 20 years experience working in GIS. He started his career as a technical advisor for the New Zealand government agency, then worked in the private sector for aerial photography and surveying firms, before taking up a senior project management role in the British Ministry of Defence. Currently he works for a software vendor in New Zealand.



... we need a comprehensive review of the structure of the industry. . .





Dr Anne Kemp is a geographer who has worked in the infrastructure industry for 25 years. She is currently serving as Chair for AGI and is also Director at Atkins and Vice Chair of BIM4I, and of ICE's BIM Action Group.



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OUR INDUSTRY IS FACING challenging but exciting times in a period, which as said many times at GeoCom 2014, is an age of unprecedented digital disruption. A combination of IT developments, such as cloud based solutions; changes in patterns of Government spending; the growth of all pervasive mobile data; and the rise of the internet of things will inevitably prove attractive to other sectors of the IT community. This activity will drive the emergence of new business models and new forms of customer engagement, creating growth opportunities and encouraging change across many aspects of our industry.

Against this background, you will be seeing AGI take a more pro-active role to define and advance the use of GI in a new commercial and government

approach which serves the needs of industry and government stakeholders.

Equally as important will be sustained engagement with new communities, for example to ensure GI is an integral part of the skill set developed during professional training, for a number of industry bodies. At the same time, work to broaden awareness of how GI can be used to deliver efficiency gains, such as through automating workflows, analysing data or predicting outcomes, will be critical to demonstrate that a geographical approach adds value.

The GI community has come a long way over the last 25 years. We now have a vibrant community which is well poised to respond to new challenges. Raising awareness of the issues and

25 years of AGI This has been a great celebratory 25th year for AGI, and I count myself incredibly lucky to have been Chair during these times. I would like to express my thanks for the hard work that so many people have contributed – certainly during the two years of my time as Chair. Not just the team and council, but the much wider voluntary network which is so vital for AGI's success and vibrancy. With a fair wind, this means that AGI can really assert its position as the GI's leading industry organisation to provide leadership, advocacy and support.

environment. Our focus will span content creation, systems and the delivery of services designed to extend the use of GI in the workplace across industries and to meet the needs of new users.

The uniqueness of the geographical approach has the potential to add value to a wide range of organisations and activities, but I feel strongly that we must pull together as an industry and figure out just how to respond to these challenges in an inclusive fashion, which benefits all of our broad church of members.

Recent deliberations regarding potential changes in the trading status of Ordnance Survey are a case in point. At present there is very little concrete information available to inform the discussion. The AGI will work to ensure that all parties have access to the available information. The AGI will also work to facilitate discussion, and will endeavour to ensure that engagement and consultation, if necessary with senior industry decision makers, creates an agreed

opportunities which GI can create has already broadened participation in the GeoBig5 conference series, which has been but the first task on this journey.

The role of the AGI is changing Collectively we can control our destiny, but it is going to require energy and focus to deliver sales and profit growth. I would urge you get involved with the many opportunities that exist to guide and structure our industry.

For the AGI, the next five years promise to be as eventful as the first 25! Please do share in our journey.

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



Equally as important will be sustained engagement with new communities



There is more news of products and services on our website at www.location-source.com
To get your company featured on this page call Sharon Robson on +44 (0)1438 352617

Upgrade for InSite Vision
CACI have upgraded **InSite Vision**, its location planning and customer analysis tool. The move provides users with an enhanced user experience and access to the software from any web-enabled device. The software has integrated the latest developments in GIS and combines CACI's Acorn demographics and consumer information with each business' existing consumer data. CACI is Europe's largest location planning consultancy and their strategic expertise is used by a range of businesses and organisations, including Debenhams, the British Heart Foundation and British Land.

Map of trees

Aerial mapping company **Bluesky** has published the first ever nationwide map of trees revealing the true extent of our 'green and pleasant land'. Topping the charts are Surrey

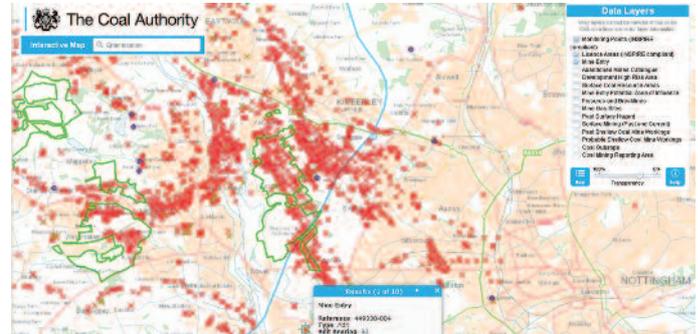
Heath and Waverly both with over 40% tree cover. Leafy Surrey, with some of the highest house prices in the UK, is also home to five other districts ranked in the top ten for tree cover. Neath Port Talbot flies the Welsh flag with a chart-topping 32%, while aptly named Bracknell Forest and New Forest District Councils hold the remaining top ten places.

At the other end of the spectrum, and ranked at the bottom of the table with just over 2% tree cover are Lincolnshire based districts Boston and South Holland. Neighbouring Fenland and East Cambridgeshire also fall within the bottom ten districts for tree cover as, possibly less surprisingly, does the City of London.

Configurable tools

Envitia has launched Discovery 3.0, a suite of tools enabling organisations to automate the

Mining data goes mobile



Above: Mine entries and high risk areas near Nottingham.

The Coal Authority has launched a mobile friendly version of its Interactive Map Viewer, enabling anyone to view selected coal-mining information on a smart phone or tablet. It includes INSPIRE compliant data for professional GIS users to stream data directly to their own systems. It can be seen at www.gov.uk/coalauthority and shows coal mining features such as known mine entries, monitoring points and areas likely to require a detailed coal-mining report. Low and high-risk development areas such as Nottingham shown above, have been defined using extensive mining records. The viewer uses data from the national coal mining database.

Mobile spatial imaging



The Trimble MX2 is now available for purchase or hire from KOREC. The MX2 is an easy to use vehicle-mounted spatial imaging system combining high-resolution laser scanning and precise positioning to collect geo-referenced point clouds and 360° images for multiple applications. It is available with one or two laser heads with the latter using a 'butterfly' LiDAR configuration to minimise shadowing. There is an option for a 360° camera and the system can be operated by a single user. The simple workflow comprises installation, initialisation, data collection and completion. Survey results are processed with Trimble Trident software to extract and analyse useful geospatial intelligence. The MX2 is suitable for use on trains and boats as well as all sizes of on- and off-road vehicles.

management, processing and distribution of geospatial intelligence and data to their users. The suite includes highly configurable tools that take the pain out of repetitive data management tasks, such as cataloguing, conversion, transformation, packaging, publication and visualisation. It also introduces a new set of workflow-oriented data management features, including powerful new data filters, making it easy to define dynamically updated 'smart collections' of geospatial data, enabling users to rapidly identify the 'right' data in a sea of information.

Discovery supports geospatial data from all standard GIS formats through to specialist formats such as CADRG, DTED and S-57. This latest release adds additional source data formats, including MrSID, JPEG200, ECRG, DBDB-

V 6, WVS and DVOF, as well as high-quality preconfigured product visualisations for many complex geospatial data formats such as ENC.

www.envitia.com/discovery

BRIEFS

Landmark Information Group, has introduced new licence management functionality to its **Promap** digital mapping platform. This will make it easier to renew export data licences in accordance with Ordnance Survey regulations, as well as viewing and managing licences online. www.promap.co.uk

Cadcorp has unveiled SIS 8.0 including a new, free-to-use desktop GIS, Map Express. This supports the same comprehensive set of data formats as the Cadcorp SIS product family including all Ordnance Survey formats.

| 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.

DECEMBER 2014**HDS Symposium 2014**

4th December 2014, Bedfordshire, UK

www.leica-geosystems.co.uk/en/Events_73707.htm?id=10146

**SPAR Europe 3D Measurement & Imaging Conference
8-10th December 2014, Amsterdam, The Netherlands**

www.SPARPointGroup.com/Europe

European LiDAR Mapping Forum 2014

8-10th December 2014, Passenger Terminal Amsterdam, The Netherlands

www.lidarmap.org/europe

JANUARY 2015**Annual UK Geoforum Lecture**

15th January 2015, RICS hq London, UK

MARCH 2015**SPAR International 2015**

30th March - 2nd April 2015, Houston, Texas, USA

www.sparpointgroup.com/international

Offshore Survey 2015 Conference

15-16th April 2015, Southampton, UK

www.offshoresurvey.co.uk

MAY 2015**RIEGL LIDAR 2015**

5-8th May 2015, Hong Kong and Guangzhou, China

www.riegl.com/media-events/events

FIG Working Week

17-21st May 2015, Sophia, Bulgaria

www.fig.net/fig2015



Join the AGI as we continue the Geo: The Big 5 into 2015

February - Smart Energy - Edinburgh

In partnership with the Edinburgh Centre for Carbon Innovation, we will focus on the security of future energy demands.

April - BIM: The Next Level - Cambridge

We move beyond the discussions in our 2014 event on, with the implementation for BIM Level 2 (2016) well progressed, the focus has shifted to preparing for Level 3 (2018) and beyond.

May - Sensors and Mobile - Belfast

There has been consistent progress in remote platforms for capturing ever higher yields of data. The current explosion of UAV providers within our sector illustrates the appetite.

July - Future Cities: Security - London

A key component to a future city is that it is sustainable and resilient to change. But triggers for change are increasing. To meet these challenges cities must work to identify these risks and mitigate against them with location as a key component.

October - Big Data & You - Cardiff

This event looks at the applications of Big Data and will include the ethics of Big Data and privacy. A key theme raised in the 2014 Big Data event, was the identification of GI as a 'key' to the deanonymization of personal data.

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

This annual flagship event will provide a climax for the 2015 event programme. Our annual awards celebrate best practice from across the UK in the application of Geographic Information.



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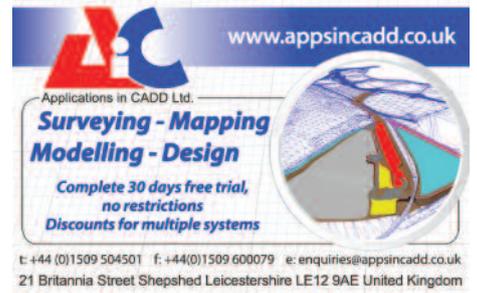


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