

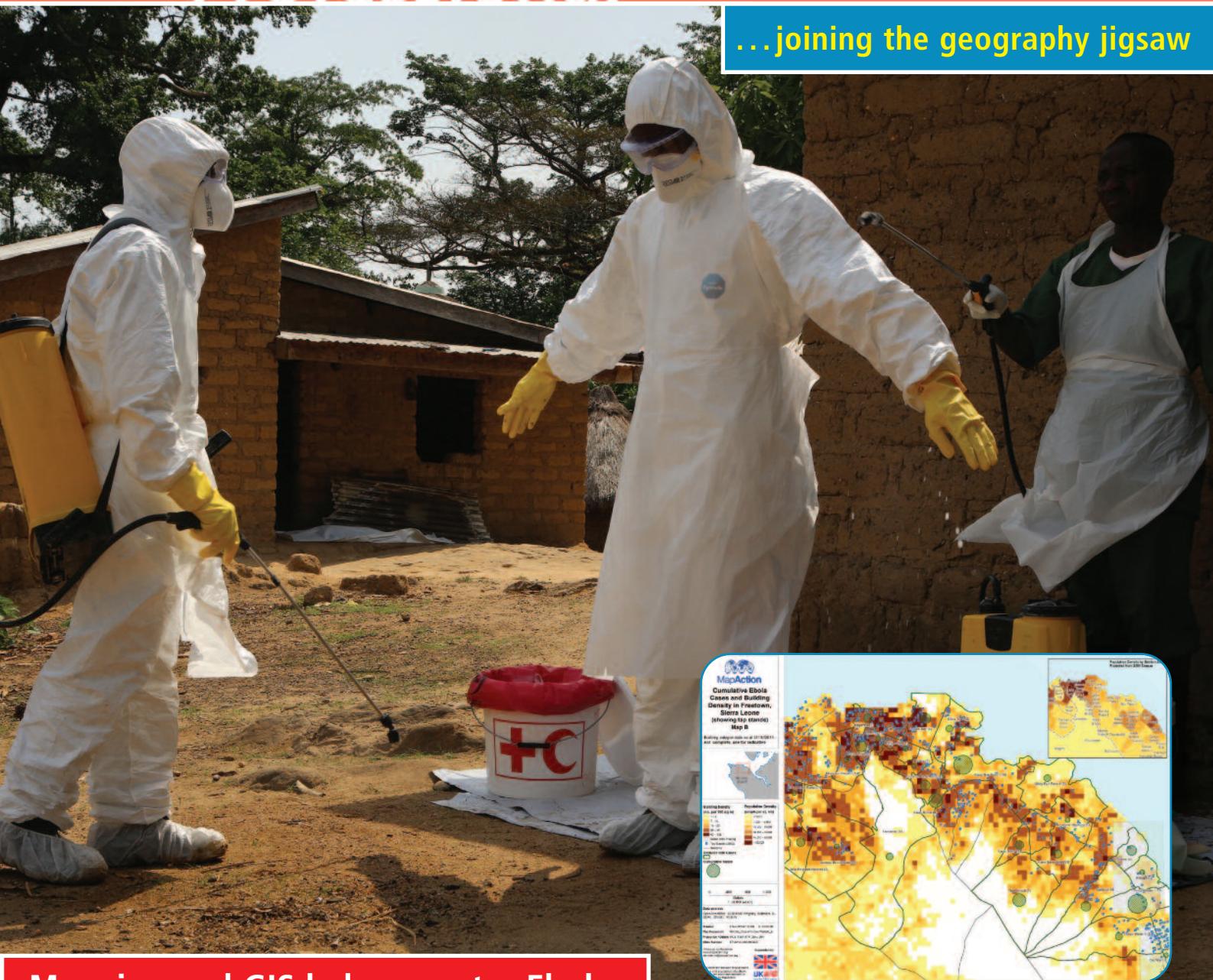
# GIS

## Professional

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issue 62 : February 2015

... joining the geography jigsaw



### Mapping and GIS helps counter Ebola

What's in a name? GIS or geospatial  
MapAction maps Ebola

Geography and the NHS: GIS for A & E  
The geography of books

Government funds open address database  
Publishing INSPIRE data for suppliers  
Reflecting on ten years of GI  
INSPIRE: the first seven years  
*and much more with*

News | People | Products & Services | GiSPro's columnists



# mobile data collection, with value added



New Pothole-Multiple

Feature Geometry

Point Required

Do any of the defects have a sharp edges  
 Yes

What is the max depth of the largest defect  
 >100mm

Are the defects impacting on the use of the road  
 Yes

What is the potential impact of the defect  
 2-Minor or low impact

What is the probability of an incident occurring  
 3-Medium probability

Risk Level - ( $I \times P$ )  
 6-8 R3 - monitor condition;

Any action required:

Cancel  Save



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## Cabinet Office funds 'free & open' address database

The government is encouraging the creation of a new 'free and open' address database. Can it repeat the success of OpenStreetMap?

## Mapping Ebola

MapAction has once again demonstrated how its volunteers with standard GI technology can make a difference fighting Ebola.

## GIS or Geospatial - does it matter and why now?

Many GIS practitioners wonder where the 'GIS' should belong in their organisation. Ralph Diment answers the questions.

## The challenges of putting books on the map

Books are spatial objects - they are written, published, printed and consumed at particular geographical locations.

## The first seven years of INSPIRE implementation

The INSPIRE Directive has had a massive impact on the provision of European GI and hence on software developers and users.

## Reflections on a decade of GI

Three of our first edition contributors reflect with thoughtful insight on the last decade of GI.

## 2014 GeoCom: the changing face of geo - Day 2

With spectacular and breathtaking plenaries, last year's AGI annual conference had a new buzz and a distinctly different feel to it.

## Publishing INSPIRE data: a supplier's perspective

Laura Williams tells us about miso's experience of helping GIS teams meet the requirements and making their data publishing simple.

## GIS for A&E – part of the answer

Ipswich Hospital NHS Trust tackles escalating demand with help from geographic information, reports Dr Ed Wallington.

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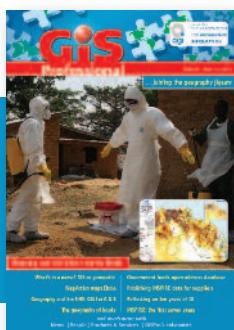
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**Next Issue: APRIL 2015**

Copy dates **Editorial:** 09 March

**Advertising:** 26 March

**Front cover:** MapAction have been deployed to help with the Ebola crisis using GIS. **To read more turn to page 12.**



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

## Company move for OS and elephants in the room

I hope I will be forgiven for putting Ordnance Survey in pride of place in my final editorial for GIS Professional. As a sometime employee, partner and customer of this British institution it has always loomed large during my professional career in the UK and, as a brand and a very highly respected national mapping agency, when working overseas. But could there be trouble ahead?

"Becoming a GovCo will not change the ownership of Ordnance Survey - it will remain 100% in public ownership." This somewhat defensive statement concluded with the announcement that "the Government and Ordnance Survey management have concluded that operating as a government-owned company (GovCo) will better place the business to act at pace in rapidly changing markets and remain at the forefront of the global geospatial industry". This change will take place at the end of the 2014/15 financial year. Customers have been informed that they can "expect to benefit from a more efficient and focused organisation, which continues to deliver for its customers and partners."

The announcement added that there would soon be more details of continuing Ordnance Survey "extensive support" for Open Data policy and some senior appointments to strengthen the management team. OS will continue to publish a statement of its public task, to subscribe to the Information Fair Trader Scheme and comply with the relevant Public Sector Information Regulations, including Freedom of Information.

Not content with selling off the publicly created Postcode Address File with Royal Mail at a knockdown price and creating Ordnance Survey's expensive AddressBase with the (free) help of local government, the government is now investing over £300k via the Cabinet Office in Open Addresses (see News page 06). This completely new and (they hope) crowd-sourced database of addresses is to be made available free of charge and under an open licence to all comers. Time will tell whether this is a good use of our money; a step too far for crowd sourcing; and/or nirvana for the advocates of open data.

GiSPro cannot help wondering how on earth the current one million addresses with which it is starting – some of which have postcodes cancelled at least ten years ago – will become anything like the 29m definitive postal addresses in PAF or the 35m in AddressBase Plus. Come to think of it there is no definition of an address on the Open Addresses website – by implication it is a postal address and the current database certainly includes a postcode. Neither the press release nor the website mentions the Royal Mail or Ordnance Survey, the 'elephants in the room'. However, they both very carefully allude to the need for any contributors to check that the data submitted does not contain 'third party IP'. Whose would that be then?

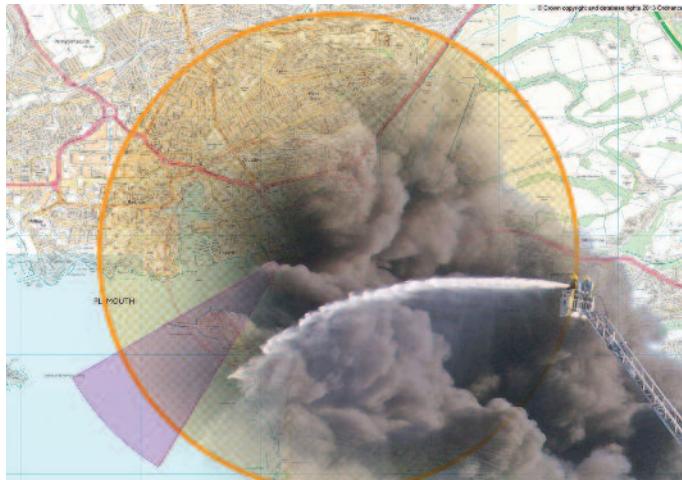
Doubtless I will be accused of navel gazing when we should perhaps be concentrating on arguably more important matters like the Ebola epidemic in West Africa, the crisis in our hospital A&E departments or even the European wide INSPIRE directive for making more public sector GI available to all. You will find them all covered in this issue along with the Geography of Books, the report of the final day at AGI's sparkling GeoCom last November and three of our first edition authors reflecting on the last decade in our industry.

So I am not sure whether to laugh or cry at the news that Ordnance Survey is now stocking a pet-tracking device. Good to know that our national mapping agency has got its priorities right in this age of austerity! To quote from the press release: 'It's been great working with the team at G-Paws to make their product available in our Leisure Shop and I'm sure customers will have fun with the results.' Oh dear!

My career in this industry began with development of what was then just digital mapping at Ordnance Survey; although I have not yet fully retired I can see that as well as all of the serious uses for geospatial information perhaps we should just accept that trivial uses may end up being the most voluminous and possibly the most profitable! It's just that when we are only just achieving some of the goals that we articulated 40 years ago (in local government and utilities for instance) it is difficult to see why the serious stuff is being squeezed to death and the trivial is promoted as if it really mattered.

Robin Waters, Editor

## Plymouth's emergency mapping



Plymouth is using the mapping technology from GGP Systems to help prepare the city for major emergencies. Plymouth City Council is using the GIS to help produce emergency planning maps for a range of exercises relating to a major incident in the city such as flooding, terrorist attacks or even a nuclear accident. Prepared for use in the event of a real life scenario, the maps are vital for staff training and inter-agency coordination, and have supported the launch of a new "warn and inform" service for residents and businesses close to locations identified as possible high risk sites.

"Although uncommon, major emergencies are inevitable fact of life", said Scott Senior, civil protection manager with the Council. "As a unitary authority with statutory emergency planning and community resilience responsibilities, we must respond in a rapid, effective, efficient and co-ordinated manner, whatever the emergency may be. The maps produced in GGP GIS are critical, not only in the planning of emergency responses but also in the training of staff and the co-ordination of agencies in both desktop and live exercises, as well as actually in an emergency, as defined in the Civil Contingencies Act 2004."

The primary function of the Civil Protection Unit is to map public information zones around sites where a major incident could occur. These sites currently include oil terminals, fuel distribution centres, munitions stores as well as the Devonport Dockyard which berths and refuels nuclear powered submarines. The sites are analysed in GGP GIS and, using the Council's centralised address database (Local Land and Property Gazetteer), individual properties that may be affected are identified. In the case of an incident these addresses will be issued with relevant information and will be the addresses the Council evacuates should the need occur.

GGP GIS is also used in live exercises, such as the multi-agency scenario of a radioactive leak from the city's Devonport Dockyard codenamed Short Sermon. "By mapping the exact area of impact of such an incident we can quickly identify affected properties and export this information to share with other authorities or agencies that would be involved in the emergency response to a major incident in Plymouth," concluded Scott Senior. "In a real life scenario this information would be essential in managing the distribution of potassium iodide (a salt of stable iodine that can help block radioactive iodine from being absorbed by the thyroid gland) to affected properties."

## Company status for OS

In an interesting move the Government has announced that Ordnance Survey, which currently operates as a trading fund, will become a government-owned company from the beginning of the financial year in April 2016. OS has been working with the Department for Business, Innovation and Skills to consider the most appropriate platform for its future operations. The government and Ordnance Survey management have concluded that operating as a government-owned company (GovCo) will better place the business to act at pace in rapidly changing markets and remain at the forefront of the global geospatial industry. GiSPro wonders if the move could facilitate a sale of OS after the Map general election.

## Esri aims high for 2015

With plans to attract some 3000 delegates, Esri UK's 2015 Conference is aiming high. In January GiSPro met with PR & corporate communications manager Sarah Webb, marketing analyst Chetna Bhavan and other senior Esri UK personnel to hear plans for the conference. In addition to plenary sessions, the event will run several parallel sessions highlighting how GIS is being used across a range of industry sectors and saving money for users. Delegates can also expect to hear details of the latest releases of Esri GIS software including an entirely new desktop offering, ArcGISPro. Although this follows a 'ground up' development, users can be assured it will work 'tightly with ArcGIS Online' says Pete Wilkinson, Esri UK's head of customer success. ArcGISPro is expected to include integration with Esri's CityEngine enabling 3D analysis, modelling and editing for projects that use BIM. GiSPro also heard news of

recent changes in Esri's personnel line-up including the appointment of Stuart Bonthrone, recently sales and marketing director for Esri UK, as its new managing director. Stuart takes over from Richard Waite who takes on the role of chairman with immediate effect. In addition, Pete Wilkinson told us that he'd added nine new graduates to his team. The company has also appointed James Millner as development evangelist.

The venue for the 2015 conference is again the QEII Conference Centre in London's Westminster and the date to note is 19 May. Reserve your place at:

<http://www.esriuk.com/events/annual-conference-2015>

## OS Ireland opts for 1Spatial

1Spatial has deployed its 1Spatial Management Suite (1SMS) at Ordnance Survey Ireland (OSI) to populate and manage its new real-world object database, PRIME2. OSI has seen a steady increase in demand for reliable spatial data, in particular to inform decision-making within government bodies. 1SMS was used to move from managing cartographic content to running a real-world, object-oriented data model; a digital representation of the landscape made-up of over 50 million individual objects, each with its own Globally Unique Identifier (GUID).

## Bluesky for Pink Floyd!

Aerial photography from Bluesky is helping to promote Pink Floyd's latest album. A sixty-second television advert, promoting Endless River, the fifteenth and final studio album by the band, features high-resolution aerial photography of the River Cam in Cambridgeshire. The commercial was created by London based Glassworks, a post production company supplying high-end

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digital animation and visual effects.

## EC backs existing legal frameworks for UAVs

A report for the European Commission recommends that existing legal frameworks around UAVs are adequate provided that EC support the Remotely Piloted Aircraft Systems (RPAS) industry to take privacy and data protection issues seriously. It believes that experience in the RFID and 'smart-meter' markets is directly applicable.

## BRIEFS

Envitia has been awarded the Investors in People Gold standard, joining the top 7% of accredited organisations across the UK who believe in realising the potential of their people. Established in 1989, Envitia is a geospatial software and solutions provider serving defence, government and industry customers all around the world.

In future Mobile GIS Services wishes to be known as MGISS and have branded a range of products from TopoGrafi to PhotoGrafi with a new design.

GeoPlace has achieved re-certification to ISO9001 for Quality Management, and ISO/IEC27001 for Information Security.

The Open Geospatial Consortium (OGC) has approved the IndoorGML Encoding Standard. This specifies an open abstract data model and XML schema for indoor spatial information particularly relevant for navigation.

Trimble is now a Principal Member of the Open Geospatial Consortium (OGC) and will participate in OGC's planning committee to explore relevant market and technology trends.

TerraQuest has been named as the preferred bidder to take over the running of the Planning Portal. Over 85 per cent of applications in England and Wales now go through the Planning Portal system.

The new website for the Association for Geographic Information (AGI) is now live. It looks good and member's log in information is being emailed as we write!

## PEOPLE

Three well known figures from the industry have been appointed non-executive directors of Open Address Limited – see 'Cabinet Office' article, page 10.



**Steven Feldman** (above), an economist by training, formerly of GDC and head of professional services at whereonearth.com before joining MapInfo when it bought GDC. He has more recently set up his own consultancy, KnowWhere, and is chairman of geo.me and Exprodat Consulting.



**Andy Hird** (above) is

## Airborne system detects air quality

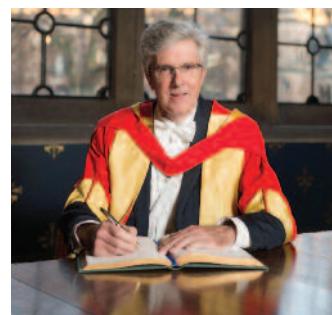


The University of Leicester and Bluesky are aiming to improve the monitoring of dangerous gases in urban environments. Using an airborne mapping system developed at the university, integrated with ground based sensors, a Bluesky sponsored PhD student, Jordan White (above), is providing a quantitative understanding of the levels of nitrogen dioxide around any given city. Dr Roland Leigh, academic supervisor adds, "Air quality continues to be a critical issue in our society, requiring innovative solutions to measure and reduce pollutant concentrations. The project builds on academic expertise in instrument design and data manipulation, and benefits from a strong industrial partnership with Bluesky." The project funded by the Natural Environment Research Council (NERC).

managing director of Aligned Assets Ltd, a leading address management and gazetteer solution provider.



**Mike Sanderson** (above) is the director of strategy at 1Spatial, the company that he joined as Laser Scan and where he led a management buy-out before the name change. Mike is a visiting research fellow at Leeds Business School and is also an industrial advisory board member there and at the School of Computing.



**Robin McLaren**, has received an Honorary Doctor of Science Degree from the University of Glasgow in acknowledgment of his contribution to Geomatics. The citation recognises Robin as a national and international pioneer and outstanding practitioner and adviser on spatial data infrastructure design and implementation. He graduated from the University in 1975 with a BSc in Topographic Science. He founded Know Edge Ltd as an independent management

# news&people

## Newham's school admissions app



Incorrect allocation of school places can lead to an increase in appeals, substantial administrative and legal costs, damaging negative publicity and a loss of trust in the community. Newham Council has to process over 10,000 applications for school places every year. The 'School Locator' app integrates with Newham's existing admissions system and uses the council's definitive index of addresses, each with co-ordinates giving a precise location and a Unique Property Reference Number (UPRN) coordinated nationally by GeoPlace. The app enables the rapid calculation of accurate catchment and distance information for each pupil and school preference. It also serves as a public-facing website, where anyone can see catchment areas, parishes, closest schools, interactive maps and the all-important home-to-school distances tie-breakers.

consulting company in 1986 to support organisations to innovate and generate business benefits from their geospatial information. This work has included leading the formulation of the UK Location Strategy and similar initiatives in Canada, Kenya, Hungary, Iraq and Western Australia. He helped implement the EU INSPIRE Directive in the UK and was a founder member of the UK Location Council.

[www.KnowEdge.co.uk](http://www.KnowEdge.co.uk)

business transformation, growth, strategy & finance. He has over 30 years commercial experience at Reuters and QinetiQ, and as a successful investor / entrepreneur. Stephen is an experienced non-executive director in both the USA and UK.

Esri UK has appointed **Stuart Bonthrone** as its new managing director. He takes over from **Richard Waite** who becomes chairman with immediate effect. Stuart has been with the company since July 2012 as its sales and marketing director, before which he was vice president of Pitney Bowes Europe and managing director of Pitney Bowes UK and Ireland. Richard said, "My new role will be focused on strategic development while Stuart takes over operational issues and the day-to-day running of the company."

**Anne Jessopp** and **Stephen Lake** have been appointed as non-executive directors to the board of Ordnance Survey. Anne has been Director of Business Services at the Royal Mint since 2008 and also has experience of working in HR at Rolls Royce, Procter and Gamble, Radio Rentals, RAC and Remploy.

Stephen is a specialist in

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# 50 iconic years getting it **right** in the UK



## The Shard

London's skyline is changing dramatically. From 1710 to 1962 St Paul's Cathedral was London's tallest building standing at 365ft high. Canary Wharf, the Gherkin and the Shard are all new buildings on London's skyline and dominate St Paul's Cathedral significantly. Leica Geosystems has played a major part in changing London's landscape over the past 5 decades including the construction of the Shard.



Leica Geosystems proposed a system of TPS total stations, four GNSS receivers and four dual-axis inclinometers located on the rig. The system offered verifiable data from more than one system. The GNSS antennas were co-located with 360° prisms to give a constant check on GNSS positions against total station readings. The combined systems fed data into GeoMoS, Leica's monitoring software which can be installed offsite or over the web and provide early warning of any departure from design tolerances.

**Great British moments, we were there.**

To follow our iconic journey,  
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# Addresses open & free

ANYONE WHO HAS FOLLOWED what Prof **Bob Barr** has called the 'UK address wars' will now be able to join in themselves! We have all – individuals and businesses alike – been called on to donate information to a 'free and open' address list. Open Addresses Limited's ([openaddressesuk.org](http://openaddressesuk.org)) new database will, 'In time, become the first UK address list published as open data and available for everyone to use without restriction'. The list will combine information from existing open data sources with material provided directly by individuals and organisations via the website.

The press release heralding this development admits that 'there are existing address files but they tend to charge a fee, require a licence or are incomplete. Open Addresses' fundamental commitment is to produce a free, open list that will enable people to focus on using the data, rather than having to think about whether they can afford, or are allowed, to do what they want. The data collected and maintained by Open Addresses

Dear people,  
[openaddressesuk.org](http://openaddressesuk.org)

The link above to Open Addresses allows you to submit any number of addresses to help build an Open National Address Dataset. Please contribute, even if only to add your own address and please forward this email to your contacts too.

Here's the background..... Open Addresses has been set up after a two year debate led by the Open Data User Group (ODUG) asking the Government to make a single set of national address data open and available for use by everyone. Addresses and location co-ordinates are a crucial part of our National Information Infrastructure. We need to know where things are! This (non-personal) data can also be used to link other open data together for analysis across sectors like health, transport and education, so that better public services can be designed for the future, based on actual evidence about how things work now, rather than sentiment and assumption. Address

## Cabinet Office funds 'free and open' address database

Having sold off the Postcode Address File with Royal Mail and commercialised the GeoPlace maintained AddressBases marketed by Ordnance Survey, the government is now encouraging the creation of a completely new 'free and open' address database. Can it repeat the success of OpenStreetMap? Even if it does, will it become the authoritative source of addresses? Will it include non-postal addresses? And if so, will they be the same as those in AddressBase or will we have a choice of addresses?

UK will always be available in full, without restrictions, as open data. In addition to submitting new addresses, users will be able to validate and correct existing addresses and look up address locations'.

The need for a free, open address database has been well documented within Open Data User Group business cases and in the recent report on an Open Address Gazetteer, written for the UK Department of Business, Innovation and Skills. Open Addresses Director, **Jeni Tennison** said, "Addresses are an essential part of our national infrastructure. They connect us to wider society and help us to access services. Everyone needs to be able to use addresses freely, which means they need to be open. We want to make UK addresses easier for people to find and combine with other data. We want as many people as possible to collaborate with us to create what we hope will be the definitive open database of addresses in the United Kingdom. Our aim is to ensure address data is both accurate and openly available."

**We have all...  
been called on  
to donate  
information to a  
'free and open'  
address list.**



**Heather Savory**, Chair of the Open Data User Group, wrote the following letter in support of the Open Addresses initiative. She acts as 'ODUG Observer' for the Open Addresses board.

*data is important for all types of businesses to help them build and deliver products and services, so this data has a direct impact on the economy too.*

*At the moment there are several different 'national' address datasets, not a single accurate central repository - which I found unbelievable when I started working in this area! The main one - AddressBase is controlled and sold by GeoPlace (a joint venture between the Ordnance Survey and the Local Government Association). The use of AddressBase is restricted by the Ordnance Survey (OS, a publicly owned body). The OS sells our address data and also other mapping data back to the government/public sector and to the private sector. Our national address data is also restricted from mainstream use because the bulk postcode data, the Postcode Address File (PAF), was sold into private ownership with the privatisation of the Royal Mail last year. This was a huge mistake with the result that the Royal Mail now has lightly regulated control over all public and private sector use of the main address dataset for the nation as it charges the government and other organisations to use postcodes. Because of the importance of address and location data the beneficial use of almost all our public data is controlled by the Ordnance*

# Addresses open & free

Survey and/or the Royal Mail.

This incredible, economically inefficient, mess has been allowed to persist for many years by successive governments. Aside from the argument of principle that the public should have access to this data as a 'public good' which is funded through taxation, this hasn't been such a big problem in the past. Now, in an increasingly digital society/economy, it is a massive problem/issue. Other countries like The Netherlands and Denmark have solved this problem and made their address data open and free to use, and have reaped the benefits, sadly we have not.

Hence this project where Open Addresses is stepping up to the challenge of building an alternate national address dataset from scratch. The goal is that this address data will be open for use by anyone without third party intellectual property restrictions.

Please give Open Addresses your support by clicking on the link above and helping them crowd-source the address data. They will do the rest!

Please help make this happen.

Many thanks,  
Heather Savory, Chair ODUG, [@SaturnSA4](#)

Open Addresses Ltd is an independent company set up following the award of a grant from the Cabinet

Office's Release of Data Fund. Following an initial project to investigate the feasibility of creating the address list, run by the Open Data Institute (ODI), £383k was awarded to develop the Open Addresses UK platform as an open alternative to other address databases available in the UK. Three of the non-executive directors will be instantly recognisable to GiSPro readers – **Stephen Feldman** who is now an independent consultant under the trade name KnowWhere, Dr **Mike Sanderson**, director of strategy at 1Spatial, and **Andy Hird**, managing director of Aligned Assets. (See also the editorial and people news on this item.)



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restrictions.



**Alice in Addressland** While GiSPro fully understands the need for an 'open' address database with geocodes, we have yet to be convinced that this publicly funded initiative will produce one. With the exception of those companies with a vested interest in maintaining their businesses by hiding behind Royal Mail and Ordnance Survey licensing terms, who gains from this almost surreal situation? How will any contributor be able to prove that they did not infringe RM or OS IPR when they supply a substantial number of addresses to the new database? So we could end up with the Cabinet Office and BIS fighting it out in the courts at public expense. Alice would feel at home!

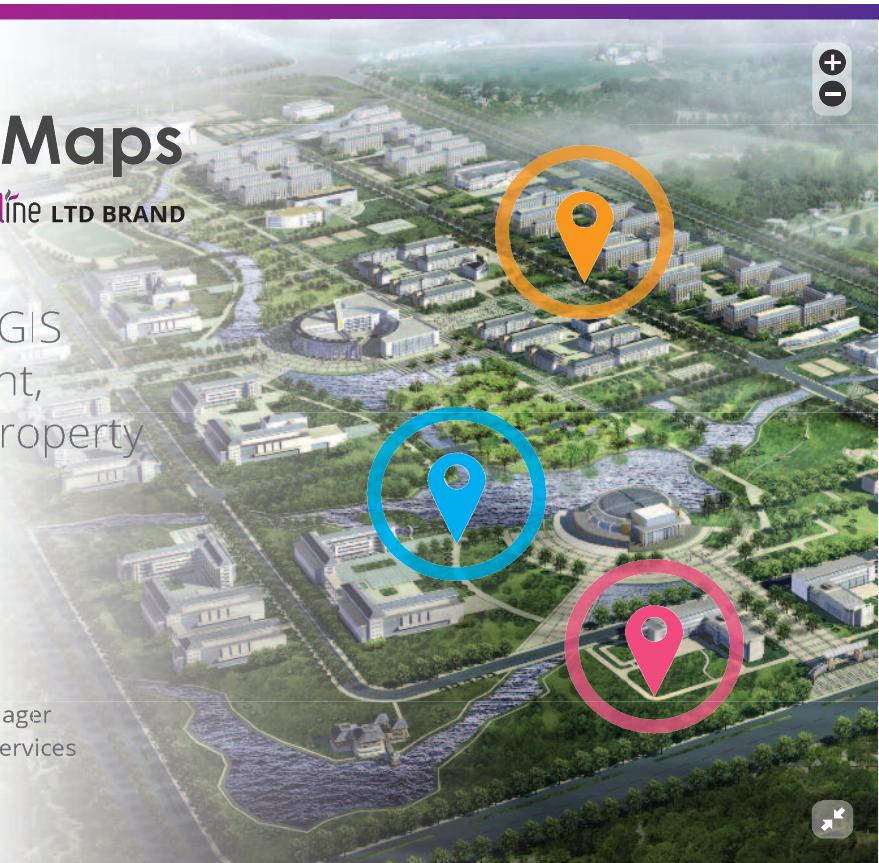


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# MapAction deployed



**John Snow's map from 1854 mapping a Cholera outbreak.**

THE EBOLA OUTBREAK in a village called Meliandou in Southeast Guinea in December 2013 was not, of itself, a new phenomenon in Africa. The disease had first been described 37 years earlier, deep in what is now the Democratic Republic of Congo. Likewise, the employment of maps to fight killer diseases is hardly new: **John Snow** is venerated by epidemiologists and cartographers alike for his street

mapping in the 1854 London cholera outbreak. Maps and more recently GIS have become routine tools in tackling epidemics.

Yet in the middle of 2014 the world was realising that the West African Ebola outbreak was 'different', and it had somehow not responded to the efforts that had controlled previous outbreaks. The international GIS community was deliberating how

regional level. Here again, MapAction sent its team members to provide a 'surge' of GIS expertise to support this regional layer of response. Then, after a handful of Ebola cases were reported in Mali, a UN emergency response team with embedded MapAction support flew into Bamako in an effort to get ahead of the spread of the virus.

MapAction had never before responded to a disease crisis of similar proportions. But in fact there was no shortage of available knowledge about the principles of using geospatial methods to help to contain the Ebola outbreak. Epidemiologists already at work in the affected countries, and international expert bodies like the London School of Hygiene and Tropical Medicine, explained clearly the priority needs: firstly to trace people who had been exposed to the virus, then to get communities on board with basic public health measures and to ensure dignified

## Mapping Ebola

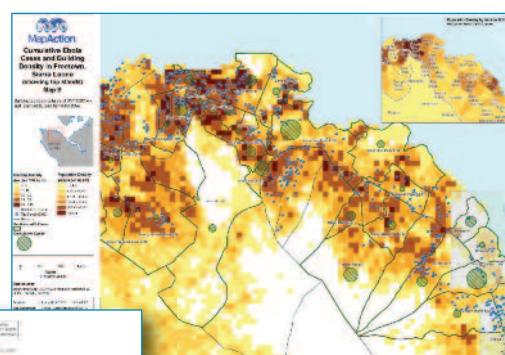
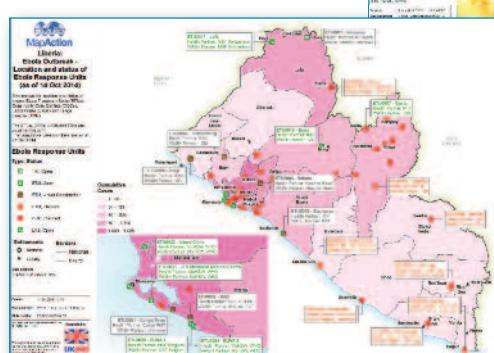
MapAction has once again demonstrated how its volunteers with standard geographic information technology can make a difference. Working with the UN or other NGOs the volunteers have worked since last September in Liberia, Guinea, Sierra Leone, Mali and Ghana, reports **Nigel Woof**, to support the international response to Ebola.

to bring into play its technology and methods against the spectre of what one British newspaper dubbed "The world's deadliest plague".

What made the West African outbreak different from previous ones was that, rather than being contained by tried-and-tested public health contingencies within a single rural village, the disease gained a hold in urban communities, and crossed borders into Liberia and then Sierra Leone.

**UN request** At the request of the UN, a team of experienced volunteers was sent to Liberia in September to support its Disaster and Assessment Coordination team on the ground. A further mission quickly followed to Sierra Leone where

volunteers provided mapping expertise for the government's National Ebola Response Center. Meanwhile, the UN's Security Council responded to the enormity of the evolving crisis by setting up from scratch a new mission, the UN's Mission for Ebola Emergency Response (UNMEER), to coordinate response to the emergency at a



**MapAction's Ebola maps detailing the treatment areas and most effected areas.**

and safe burials. It was anticipated, and later demonstrated, that the disease would spread along road corridors. Ebola treatment units (ETUs) would need to be positioned in the right places, anticipating the transmission of the virus. The role of GIS would be, above all, to create a common operational picture for national and international agencies to ensure that the crucial care facilities were put in the areas of current and likely future need, as a tool for managing implementation of public health

“

**... providing the necessary geospatial services and map products in Liberia and Sierra Leone was a huge challenge.**

”



*Liberia Ebola disinfecting a volunteer in a village.*

measures district by district, and to support the massive logistical challenge involved in the response.

**Meeting the practical obstacles** Although the goals and information needs to support them were well understood, actually providing the necessary geospatial services and map products in Liberia and Sierra Leone was a huge challenge. Many of the practical obstacles were familiar to MapAction's humanitarian mappers used to working in natural disasters or conflict zones around the world. These included limited national government capacities, international responders trying to work together in an unfamiliar context, as well as routine headaches like power cuts and unreliable Internet access. But another pervasive dimension of this crisis was fear: this affected willingness by communities to report Ebola cases and sometimes distorted information flows in other ways.

Fear also had an impact on the international capacity to mobilise a response. Unlike the medical staff on the front line, many of whom tackled the early cases in the Ebola outbreak without benefit of proper protective gear, the MapAction teams at work in the region were not at high risk from the virus. But the charity still faced some of the same challenges as other international agencies in finding volunteers who had the backing of their friends, families and (crucially) employers to travel to the region and slot back into their everyday lives on their return.

The shortage of experienced humanitarian staff available to support the response within Liberia and Sierra Leone meant that the charity's teams there could not rely on a stream of GIS-ready data to map. In fact, on their arrival in Sierra Leone there was no comprehensive list of Ebola care facilities, so MapAction took on the task of creating one, which became a key information resource for the newly established National Ebola Response Centre (NERC). As in other humanitarian crises, the imperative was not to exploit the most sophisticated analytical capabilities of advanced GIS, but rather to capture,

process and map basic figures on needs – here represented by daily figures on new Ebola cases – and of the response capacity, both operational and planned. And again as a commonplace of MapAction's experience in fifty humanitarian missions, even base map data was less than ideal; the lack of an adequate dataset of villages often prevented the geolocation of case reports, which rarely included coordinate tags (few public health staff working in the rural districts would have a GPS-equipped smartphone, nor an awareness of the value of such geo-located data).

**Standardising the geo data** Working to support the newly-mandated UNMEER, headquartered in Accra, Ghana, two MapAction team members strove to address the need for standardised geo data across the Ebola-affected region. They also advised on the establishment of a common data repository framework, which resulted in the linking of two platforms: the Humanitarian Data Exchange (HDX) and Ebola Geonode. Still, they also encountered many of the problems familiar from other emergencies, including the re-publishing of out-of-date datasets without metadata. On the other hand, several organisations around the world made extremely valuable contributions of relevant and high quality data, including the US-based Nethope organisation which obtained mobile phone coverage data for northern Sierra Leone, and the Humanitarian OpenStreetMap Team (HOT) which as usual responded rapidly to the need to fill gaps in map data for the affected region.

As the international response in West Africa gained capacity and traction, by Christmas the MapAction team had handed over most of its work in the region. A volunteer flew back to Mali to help with precautions in case of another outbreak there. Meanwhile, on a wintry January weekend the other eleven staff and volunteers who had deployed to four countries in the 2014 response gathered at the charity's base in the Chilterns to review the missions and to capture lessons learnt. The tone was surprisingly upbeat and, despite the practical challenges, the positive contribution of GIS in supporting coordinated response to the crisis became clear. One volunteer who had spent a month working with the NGO Médecins Sans Frontières (MSF) in the field in Sierra Leone reported how important the map visualisation of both Ebola cases and the care facility plans of other agencies had been to MSF's ongoing response to the outbreak. Reports from other users of MapAction's information products, including senior decision makers, had spoken of the value of timely and relevant information geared to their needs to make sense of the dynamics of the crisis, and to allocate resources to get ahead of the virus.

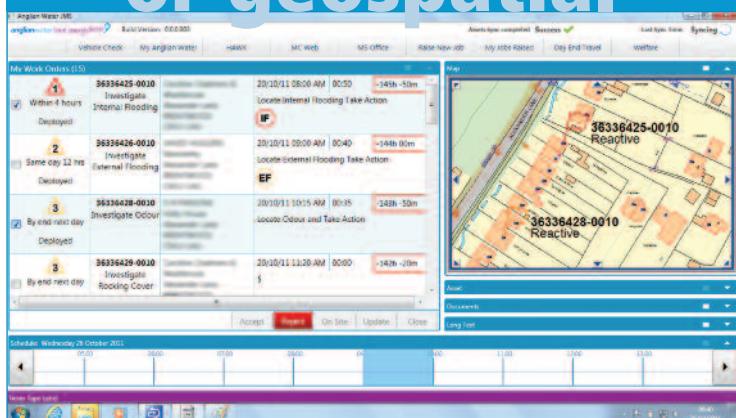
MapAction ([www.mapaction.org](http://www.mapaction.org)) is the only non-governmental organisation in the world with the capacity to deploy a fully trained and equipped humanitarian mapping team anywhere on any continent within hours of an alert. As well as its work on the Ebola crisis in West Africa, the past year has seen teams on the ground in humanitarian crises in Iraq, South Sudan, Serbia, Paraguay and Malawi. The charity is part-funded by the UK's Department for International Development (DFID) but also relies heavily on business and individual supporters to make its work possible. In particular MapAction would like to thank Arup, Astun Technology, Calesurvey, Environment Agency, Landmark Information Group, Maersk and UWARC for releasing staff to volunteer for its Ebola response.



*... team members strove to address the need for standardised geo data across the Ebola-affected region.*



# GIS or geospatial



Above: A hybrid mobile app for Anglian Water that integrates elements of SAP, GIS, CRM, HR and other operational systems.

THREADS ON THE RELATIONSHIP between GIS and the wider world of ICT are common on social media. While posts like "is GIS splitting?" appear contrived to stir debate, others seem genuinely confused over

with technical platforms that can be harder to integrate due to specialised data or processing requirements. As David Morenz of XchangeCore (a US initiative enhancing interoperability between public safety systems) observed "technical software packages are serving their [immediate] users very well, but not the wider organisation".

**GIS ROI – or not** With respect to GIS, financial profiles vary by sector but studies of utility operations suggest a well-planned and properly executed conventional GIS can deliver ROI of around 2:1. Adding enterprise access increases the benefit, but the combined return still peaks at around 4:1. However, if the underlying spatial data and processes can be integrated within existing operations, such as outage management, network automation, and customer services, the ratio jumps to 20:1 and higher. The route to achieving greater ROI does not

## GIS or Geospatial - does it matter and why now?

Many GIS practitioners wonder where the 'GIS' should belong in their organisation. **Ralph Diment's** answer is that 'geospatial' – data and functionality – belong nearly everywhere and cannot produce a satisfactory return on investment as isolated 'GIS' applications.

the distinction between the concept of a geographic information system and geospatial technology in general. Such distinctions can be dismissed as semantic, but the focus on 'GIS' can reflect an implicit assumption that spatial is somehow apart from general ICT. Should we be concerned by posts like "where should a GIS unit belong in an organisation" or "is it important to keep GIS out of the IT department"? If so, why especially now?

Since the early 90s, evangelists have touted GIS as the next big thing in IT, but the visibility and ROI of the traditional GIS model – even single supplier corporate GIS – remain stubbornly low. The reason has not been misplaced belief in the utility of spatial capabilities – witness the explosion in 'neo-geo' apps – but rather how spatial information and processes need to be delivered in today's highly heterogeneous ICT environments.

Every organisation is multidisciplinary, comprising a set of functions or departments. Each of these often deal with the same events or entities, but for different purposes and with each using their own specialised software tools. As a result, elements of the work are highly automated, but the overall operation is fragmented. Process disconnects, manual hand-offs and data duplicated between functions, result in inefficiency, errors and delays that limit the utility of each system and ultimately their value to the enterprise. This is particularly the case

lie in making everyone use a 'GIS', but rather planning an enterprise information architecture that enables the wider organisation to integrate spatial data and capabilities with its existing work processes and tools.

**IC-ITE – pronounced 'eyesight'!** The desire to better match technology to use can be clearly seen in the Intelligence Community, Information Technology Enterprise (IC-ITE) strategy published by the US Office of the Director of National Intelligence (ODNI). This highlights the critical need for access to broader and more current sources of data and to deliver task-oriented tools that enable more staff to apply the combined information picture to their work. "It is imperative that information technology provides [staff], wherever they are, with the ability to efficiently and effectively discover, access, and exploit data," the document states.

The ODNI's goal is not only to provide staff with enhanced information and tools, but also to extend the capabilities of core systems to a far wider audience – making staff more effective, but also more self-sufficient. Providing greater autonomy enables more users to execute complete 'end-to-end' tasks without manual hand-offs or reliance on others to process elements of their workflow. As well as speeding-up processes by pushing decision making further out through the organisation, autonomy

**... the visibility and ROI of the traditional GIS model – even single supplier 'corporate GIS' – remain stubbornly low.**

through connected apps also improves efficiency and helps maintain the currency and accuracy of enterprise data. It also releases specialist staff from processing volumes of low-level tasks for other business functions.

The ODNI says the changes will be achieved by moving from the "current state of duplicative [function]-centric infrastructure to one characterised by common, secure enterprise capabilities and services". Focusing on enterprise needs, rather than individual technologies, will not only enhance capabilities but also the organisation's ability to adapt: "Missions will benefit from improved agility, scalability and security while realising lower operating costs". This win-win scenario seems almost too good to be true, so why might this be possible now?

ICT has changed radically over the preceding five years and the rate of change continues to accelerate. The maturing of what were previously regarded as disruptive technologies – cloud, mobility, the Internet of things, actionable analytics, and others – is transforming the industry. Indeed, Gartner predicts these 'nexus forces' will drive and dominate change in enterprise software over the coming decade. This revolution is transforming IT in many ways, but of particular interest to geospatial is the softening of ties between the interface experienced by an end-user and a defining back-office system. This is allowing a new generation of app to emerge that is far more task- and user-oriented, one that is not limited to or, perhaps more importantly, defined by a single software product. The back-end systems are themselves becoming platforms, decoupling their data and capabilities from the packaged product, enabling them to be consumed within other packages and apps via web services, functional components, APIs and other means.

**Below:** New Zealand Police using the map app.



**Hybrid IT** This new 'hybrid IT' can harness data and functionality from multiple sources to fulfil an entire workflow rather than being restricted to a specific aspect such as engineering, finance, even geospatial. A mobile solution deployed by UK water company, Anglian Water, provides a good illustration of this trend and its benefits. What looks like a conventional mobile GIS is in fact a hybrid app whose workflows exploit the data and processes of multiple office systems, including SAP, Intergraph's G/Technology asset GIS, CRM, scheduling and others. These resources combine to give a single, logical, task-oriented tool that not only delivers everything field engineers need to fulfil their work but also, crucially, keeps multiple enterprise systems and operations updated.

Next generation apps give users greater autonomy and immediacy in executing their work while also feeding back operational data directly to the enterprise. This highlights another powerful characteristic of hybrid IT – the processing logic is no longer linear. In conventional clients, the user accesses information, performs some action and gets a result or outcome. Now, the user is no longer an end user, but a connected part of the enterprise information architecture. They are both a consumer and source of dynamic operational data with their actions directly affecting data and processes in multiple operational platforms. For example, tracking and dynamic analysis combining the position of field units on stand-by with historical event data, can enable units to be positioned for optimal response times to calls.

Other benefits of hybrid IT identified in the ODNI strategy are increased agility and greater sustainability. Wider use of standards supports a more modular approach to development that allows greater re-use of components, including commercial off-the-shelf capabilities. This cuts development time and cost by reducing the need for custom-developed capabilities which, in turn, enables organisations to respond to changing requirements in more timely and affordable ways. The ability to exploit mainstream consumer platforms and development environments can dramatically change cost models, enabling capabilities to be deployed to a far wider user base. Not surprisingly, enterprise use of smartphones and tablets is firmly established even in the most demanding contexts, including defence and public safety.

Looking to capitalise on shorter development cycles and lower costs, the US Defense Information Systems Agency has deployed an App Store for its Defense Department Mobile Unclassified Capability. The agency "expects user numbers to exceed 100,000 in fiscal 2014 and be well beyond that number after 2014". The significantly lower cost of consumer mobile has also enabled New Zealand Police to connect 10,000 devices to operational systems, including real-time exchange with I/CAD command and control. According to Anne Speden,



**What looks like a conventional mobile GIS is in fact a hybrid app whose workflows exploit the data and processes of multiple office systems. . .**



# GIS or geospatial

the force's manager for innovation and alignment, the new apps are "saving at least half an hour per-day, per-officer... this equates to 520,000 hours annually." The increased productivity effectively equates to 345 additional officers in the field. As well as providing greatly enhanced public service the force predicts £150m in savings over 12 years.

databases and neo-geo apps are less existential threats than enablers. In order to realise the benefits of hybrid IT, capabilities need to be driven by an organisation's information and process needs rather than the idiosyncrasies of individual software products, hence the imperative to break out from the introspection of GIS.

**The challenge for geospatial is to ensure it engages with the new hybrid landscape and does not remain isolated, technically or conceptually.**

**The end of GIS?** Does this new era herald the end of GIS? Gartner's nexus forces are indeed dominating the focus of developments, both in commercial product and organisations' projects. The cloud, mobility, harnessing real-time information from devices, sensors and society and others are providing enhanced insight and more effective and efficient services. However, these efforts tend to add complementary capabilities and workflows by working with existing systems rather than replacing them.

As outlined by the ODNI, the approach promises solutions that are both better (being more complete and closely aligned to the needs of the wider community – not just specialist users) and more sustainable. The challenge for geospatial is to ensure it engages with the new hybrid landscape and does not remain isolated, technically or conceptually. As such, OGC interfaces, native spatial data types in

## About the author

A graduate of the University of London, Ralph Diment has more than 25 years' experience in geospatial technology. During 20 years with Intergraph, his roles have spanned implementation in the government, transportation and defence sectors, regional business development in telecommunications and technical marketing. He is currently a member of Intergraph's global marketing function, responsible for developing content and programmes. Prior to joining Intergraph, he worked in the GIS unit of CH2MHill, supporting major infrastructure and environmental projects around the world.



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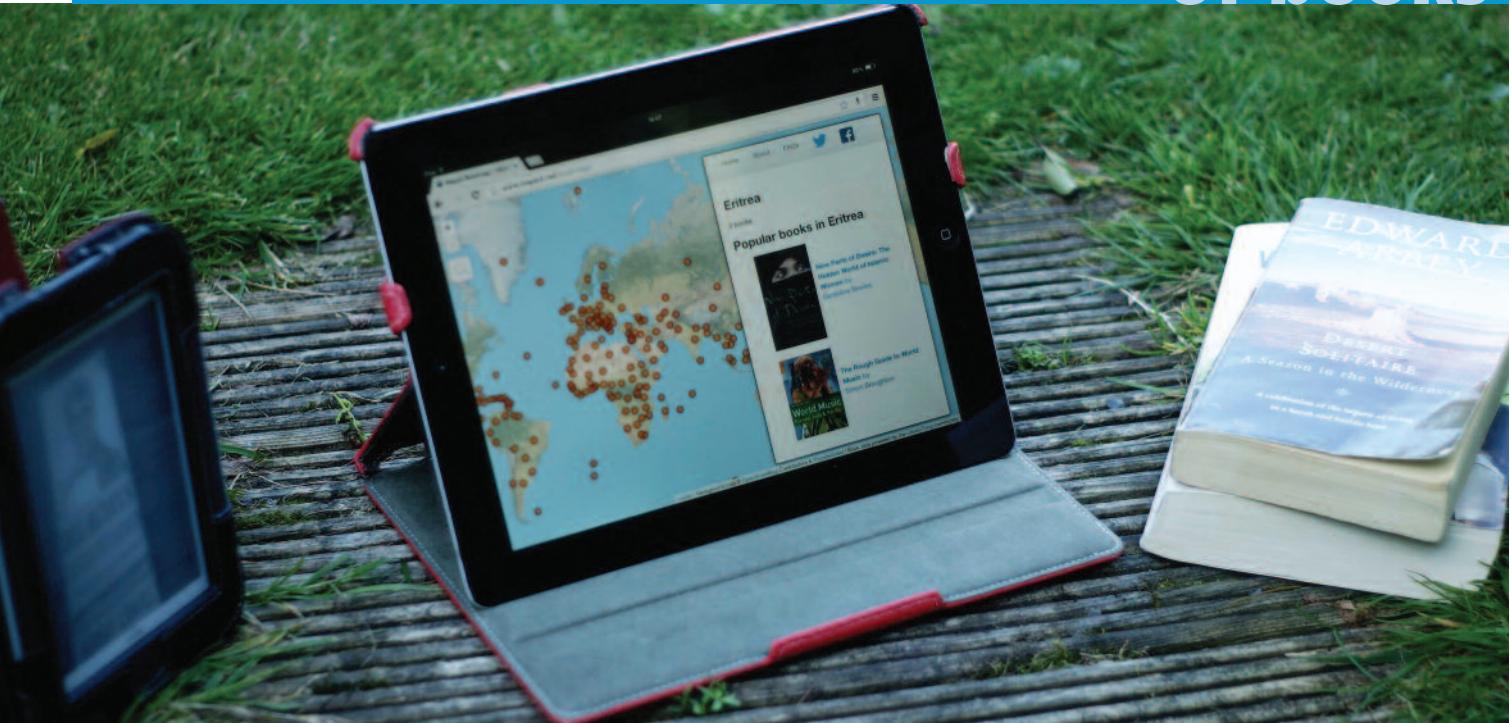
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## Once upon a somewhere: the challenges of putting books on the map

Books are spatial objects - they are written, published, printed and consumed at particular geographical locations. Most importantly they feature places as their subjects or within their storyline. Thus it is perhaps surprising that there have been relatively few attempts to exploit their spatial location, whether as a means of promotion or a way of connecting people to place.

Place Name	Mentions	Person Name	Mentions
BALTIC	12	CHRISTIANSEN	11
BALTIC PROVINCES	1	DUKE OF COURLAND	1
BALTIC REGION	1	EASTERN	4
BALTIC SEA	1	ERIC CHRISTIANSEN	1
ESTONIA	1	HANSEATIC	1
EUROPE	8	LATIN	4
FINLAND	2	NORTH-WESTERN	1
GERMANY	1	NORTHERN	20
LITHUANIA	4	NOVGORODIAN	1
LIVONIA	5	ORTHODOX	2
NOVGOROD	3	ROMAN CHURCH	1
PALESTINE	3	SOUTHERN	2
POLAND	4	TEUTONIC	17
PRUSSIA	6	TEUTONIC KNIGHTS	10
RUSSIA	10		
SLAV	2		
STALINGRAD	1	Number of Reviews	Words
TANNENBERG	1		
THE MIDDLE EAST	1	12	2902

FOR HIS GIS MASTERS DISSERTATION at the University of Edinburgh, **Alex Mackie** chose to mix two subjects close to his heart: books and maps. There is undoubtedly commercial value to mapping books but this has been largely ignored by the industry. If books are properly georeferenced then location-aware e-readers and tablets can use their user's location to recommend locally relevant books or provide the option to search for books relating to intended holiday destinations or places of interest. This extends the principle that physical bookstores already recognise a demand for locally relevant books, with Waterstones and other retailers stocking shop windows with books linked to the shop's location. In addition to the commercial value there is also a humanistic argument that the best way to really get a feel for a place is via its literature.

*Left:: Figure 1, Example data generated by Unlock Text for the book 'The Northern Crusades' by Eric Christiansen.*

# The geography of books

Screenshots from [www.mappit.net/bookmap](http://www.mappit.net/bookmap) of zoomed results for books by countries, individual places and regions.



**How: part I** Rather than having to source, store and manage the text of thousands of books, the initial method involved extracting place names from on-line book reviews, totalling around 80 million words, on the basis that reviewers tend to discuss the places books are about or set in. Reviews tend to represent the book in a highly condensed form, but despite the reduction in size, this is still an example of a 'Big Data' problem and this represents much of the challenge of this work. It may seem strange to be mining metadata for further, more specific metadata but the vast amount of review text is a potentially rich source of information and book catalogue data is sparse when it comes to the settings of fiction.

The Unlock Text Geoparser was used to do this. A geoparser is a tool which attempts to find words that are related to specific places and, using a gazetteer, assigns geographical coordinates to these place names. The particular challenge is the disambiguation of place names, for example distinguishing the London which is capital of the

UK, from the smaller city located in south-western Ontario (Canada). The Unlock Geoparser was developed by the Language and Technology Group within the School of Informatics in Edinburgh and has been successfully used for geoparsing historical texts. It therefore seemed an appropriate tool to use for this application. Figure 1 shows an example of the types of location data generated from book reviews. This data is typically richer and more specific than the places included under the 'subject' headings of official book metadata.

Research revealed that the reviews do indeed contain sufficient place-names to effectively geolocate books, however this particular use case of mapping books requires a very high level of accuracy in toponym identification and disambiguation. Despite considerable efforts, it was felt that this level of accuracy could not quite be achieved. This demand for near-perfect accuracy is higher than in typical applications of geoparsing, for example identifying trends and the gist of texts. Errors such as misidentified mentions of things like author names, Dundee cakes and Yorkshire terriers meant the data was not ideal for powering location-based book recommendations and would lead to the application being rejected by potential users.

**How: part II** Thus an alternative approach was taken, searching existing metadata for less fine-grained but more accurate locations. By taking subject metadata from existing book catalogues (the Open Library and Library Thing) and using a custom algorithm to disambiguate these toponyms to real-world coordinates, an interactive "global book map" of 60,000 books has been built at <http://www.mappit.net/bookmap>. The algorithm works by examining the names and determining if they can be reliably disambiguated. Using third-party APIs like GeoNames, the algorithm takes the place name that is top-most in the administrative hierarchy (e.g. United Kingdom) and checks other place-names for containment within it and continues down the place hierarchy as far as necessary. If it can be confident that it has found a unique and definite place name match then the book is added to the map. This algorithm is simpler than the Unlock Geoparser, but has the great advantage of running quickly, vital to be able to effectively process the data volumes involved. The map is growing as fast as allowed by the rate-limited APIs it uses – rate limited by the third-party provider to prevent abuse.

**The algorithm  
works by  
examining the  
names and  
determining if  
they can be  
reliably  
disambiguated.**

# The geography of books



**Mapping the output** As the data grows, displaying tens of thousands of points elegantly and speedily becomes a significant challenge. Large numbers of features clutter web maps to the point of being unusable and also cripple browser performance. A major goal of this work was to be able to aggregate points in a meaningful way on the map – research indicated that users wanted books aggregated by regions and therefore a scalable way to do this had to be found.

After reviewing the technologies available, we were unimpressed with the near-ubiquitous proximity-based, client-side clustering used in most web mapping applications. Thus the book map takes a new approach to intelligently clustering these large point fields for web mapping. The PostGIS spatial extension to PostgreSQL was used to aggregate points by country and region, depending on the zoom level of the map. Zoomed out users see books by countries, zoomed in they see books by individual towns and cities, and in between they see counties and states. This was made possible by lightning-fast point-in-polygon operations in PostGIS and the ease with which it can be used to support web feature services. This approach gives a much more useful map for this application than simpler client-side clustering alternatives. It performs well with tens of thousands of points and it demonstrates that it is possible to have very synoptic but nonetheless informative data at small zoom levels in web maps by investing time in the server-side technology.

There are challenges remaining. Not the least of these is that the density of data varies enormously by region (there are far more books per square mile of England than Western Australia) so that the level of detail appropriate for one part of the map at a given zoom is not an appropriate one for another area. This is a tricky problem to solve while also keeping meaningful regional aggregation.

**Results** Although it is still early days for the book map, with only around 10% of published books

*Left: Mappit's logo emphasising their brand.*

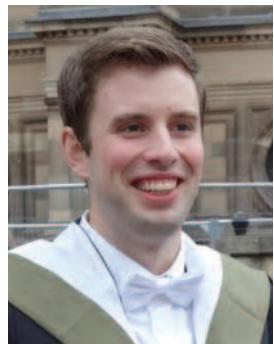
so far processed, it is proving popular on social media and has been picked up by the literary press. This extra work in aggregating by areas means that the application – now named mappit – has thousands of unique, search-engine friendly pages about books set in specific regions and countries as well as discrete places. Tuning a website to respond well to search engines is somewhat of a black art yet, despite its newness, mappit is often the first Google result when searching for books set in very niche locations such as 'Auchterarder' or 'Bougainville Island'. There may not be many searches for each one but altogether they attract significant traffic to the map.

As part of the work, a geographical book search API has been implemented that can be used to find books set within a given radius of a geographical coordinate. This unique API has numerous possible applications, for example it can be used to implement local book recommendations as part of a location-aware e-reader or smartphone app or it can be integrated into a gazetteer or travel guide to further enrich the associated information about a place with literary suggestions.

**What is next** Inspired by his success, Alex has taken the next step and commercialised his work, founding his own company mappit.net. He has already built on his book map to add participatory mapping to the portfolio. He is creating a simple environment that enables users to quickly and easily create their own custom map layer, to which others can contribute. The goal is to make building and using participatory maps as easy as posting on social media or composing a text message.

The intended application is for one-off consultation projects and niche interests with a spatial element such as local community and local advocacy groups. Participatory maps can benefit these groups and their stakeholders by helping to inform people about what exactly is being proposed and gives people a chance to contribute and unambiguously communicate their own views and concerns via the map. He is currently looking for beta-testers and potential case studies with interests in community mapping so if you have a project that could benefit from map-based public discussion please contact him via his web site, [mappit.net](http://mappit.net), or by email to [info@mappit.net](mailto:info@mappit.net).

## About the authors

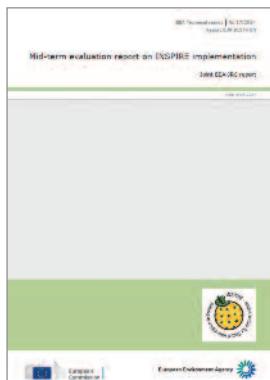


**Alex Mackie** has recently completed his MSc in GIS at the University of Edinburgh and has commercialised his dissertation project on mapping book locations. Building on his academic background in philosophy, Alex has been able to gain skills in natural language processing, handling 'big data', spatial database design, creating dynamic web apps with a spatial component and geovisualisation.



**Bruce Gittings** runs the GIS programmes at the University of Edinburgh, having joined the staff there in 1987. He has interests in distributed and web-based GIS, database management, gazetteers, terrain modelling and UAVs, together with his work on the encyclopaedic Gazetteer for Scotland.

# INSPIRE Directive



Above: Cover of 'Mid-term evaluation report on INSPIRE implementation'.

THE 'MID-TERM EVALUATION REPORT ON INSPIRE implementation' (<http://inspire.ec.europa.eu>) is, arguably, an 'autobiography' written by a team of officials from the European Environment Agency and the Joint Research Centre led by **Christian Ansorge** and **Massimo Craglia**, who have been closely involved in its development. It also draws heavily on the reports on implementation from each EU member state; an independent assessment by KU Leuven; and a public consultation that had some 700 responses.

The report is a requirement of the Directive at the halfway stage to full implementation and, as such, is aimed at the European Parliament and Council. It evaluates progress towards achieving the original objectives and considers the need for policy action to align existing approaches better to changing circumstances. The first three short chapters explain the rationale for the report, identify the key elements of INSPIRE and outline the methodology for the assessment.

and activities. The final chapter is a synthesis of the findings of the assessment and this article describes highlights of the state of implementation and the synthesis of findings.

**The state of implementation** The first section of chapter 4 shows that the Directive has been successfully transposed into the legislation of all 27 states, which formed the EU in 2007. Croatia, which became a full member in July 2013, had already enacted the necessary legislation in May of that year. However, it should be noted that only one state met the original transposition deadline, and the European Commission had to threaten 'infringement' procedures against the others.

At the EU level there were questions of issues relating to coordination and communication, the development of implementing rules as well as maintenance and implementation. The report concludes that the participatory model that was first developed for the general coordination of INSPIRE

## An autobiography? The first seven years of INSPIRE implementation

The INSPIRE Directive has had a massive impact on the provision of European GI and hence on software developers and users. We now have a 94-page 'autobiography' of the first seven years of INSPIRE which makes fascinating reading. It complements the insiders' view from the EU and Member State data providers with the perspectives of over 700 responses from an international consultation and an independent academic review, says **Ian Masser**.

Chapter 4, on the state of implementation, is the heart of the report. It considers legal transposition by Member States (MSs) and the coordinating structures that have emerged within each country. It also considers the development of the implementing rules, the use of the emerging infrastructure, and the estimated costs and benefits of its implementation. There are two chapters on INSPIRE's links to environmental legislation and policies, as well as to other policies

activities, and the formulation of implementing rules, are successes that need to be maintained and further developed. At the same time more effort is needed to embed INSPIRE fully into other related environmental activities.

Coordination at the national level is discussed with respect to the advantages of centralised and decentralised coordination structures, the role of the lead organisation, the stakeholder board membership and the effectiveness of

coordination. Main features of centralised and decentralised structures are shown in Figure 1 (Overleaf). It can be seen that a federal structure, as emerging in France, Germany and Spain has the advantage of involving far more stakeholders at the subnational level than is the case with centralised coordination structures. In countries where the latter is in place, the need for local government agencies to operate through national organisations can

**... the use of the emerging infrastructure, and the estimated costs and benefits of its implementation.**

This report reflects on what has happened during the last seven years during implementation of INSPIRE and also on the changes that have taken place in the external environment in that time. It complements Ian Masser's book, '*Building European Spatial Data Infrastructures*', which explains INSPIRE implementation to a non-technical audience. The first edition in 2007 covered developments leading up to the legislation. The second in 2010 described 'transposition' and the first round of implementing rules. The latest edition, written with **Joep Crompvoets** for publication in early 2015, also considers the implementation of the Directive at the national level and draws upon similar sources to this report. These books are available from <http://esripress.esri.com>.

have a negative impact on their motivation to participate actively in implementation.

An important factor is the role of the lead organisation – usually the national mapping and cadastral organisation or the environment ministry. These large organisations have the necessary human, financial and technical resources to shape the form and nature of national implementation. Typical stakeholder boards for coordination contain only the main stakeholders and, in many cases, the freedom of action of these bodies is constrained by a national spatial data infrastructure (NSDI), open data requirements and/or eGovernment policy.

The section on implementing rules considers their impacts on six key components of the Directive: metadata, network services, the INSPIRE geo-portal, interoperability, sharing of spatial data/ services, and monitoring/reporting.

## 1. Metadata

Table 1 shows the status of metadata reported by each MS in 2013. This shows considerable progress with the creation of Annex I and II metadata, although not all of the metadata is INSPIRE compliant. A third of countries, including the UK, reported more than 90% compliant metadata but some of the others lagged far behind, frequently citing lack of resources and complexity of specifications as reasons for the delay.

## 2. Network services

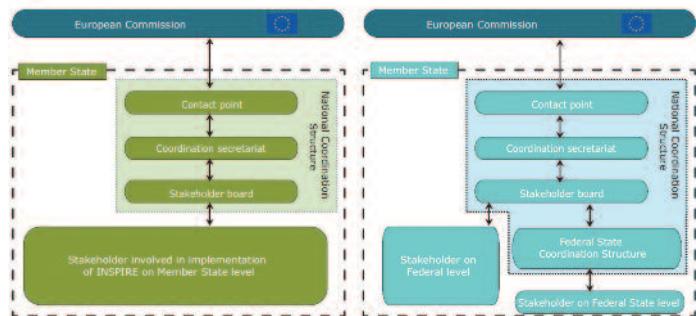
There are clear parallels with metadata and, on average, 63% of the required metadata spatial

*Below: Table 1 showing Data with compliant metadata.*

Table 4.1 Status of metadata as reported by the Member States in 2013 (refers to 2012)

	% data sets with compliant MD			% services with compliant MD
	Annex I	Annex II	Annex III	
Austria	99	97	11	91
Belgium	73	71	61	25
Bulgaria	2	5	4	25
Cyprus	0	0	0	0
Czech Republic	81	100	75	62
Denmark	100	0	0	81
Estonia	100	100	7	71
Finland	99	100	80	72
France	90	91	74	77
Germany	70	92	49	83
Greece	41	20	27	18
Hungary	78	41	10	13
Ireland	65	69	19	54
Italy	78	77	74	65
Latvia	85	87	70	78
Lithuania	93	91	83	100
Luxembourg	100	100	99	94
Malta	88	0	0	67
Netherlands	100	100	1	89
Poland	82	21	33	18
Portugal	100	100	86	92
Romania	58	65	28	4
Slovakia	80	99	17	89
Slovenia	68	43	24	0
Spain	63	46	26	66
Sweden	100	100	62	84
United Kingdom	100	100	87	100

Figure 4.1 Generic models of coordinating structures in federal and centralised Member States



Above: Fig 1 showing Central vs Federal models.

datasets and services is available through discovery services and 27% of the data is available to view and download. Again, there are marked variations between countries.

## 3. The INSPIRE geo-portal

Usage of the pilot INSPIRE geo-portal mirrors the content of the national discovery services. Only Bulgaria, Cyprus, Hungary, Italy, Lithuania and Malta had not connected at least one discovery service to the geo-portal. The public consultation suggests that relatively few respondents used the EU wide geo-portal: national and regional geo-portals were much more popular because most users were only looking for national data (Figure 2, see next page).

## 4. Data interoperability for Annex I

The current timetable requires MS to comply with the implementing rules for data interoperability only for newly collected and extensively restructured Annex I spatial datasets. So far the implementation of INSPIRE is not consistent across all MS due to differences in the effectiveness and communication of the national coordinating organisations. Nevertheless, implementation in several countries has enabled stocktaking of who is responsible for what data, and has created opportunities for reorganising data holdings to reduce duplication.

## 5. Spatial data and service sharing

Agreements for sharing, access and use are among the main components of an infrastructure for spatial information and MSs are adopting a variety of measures for spatial data and service sharing between public authorities. The main focus has been on sharing and providing access to the basic (reference) spatial datasets such



**A third of countries, including the UK, reported more than 90% compliant metadata...**



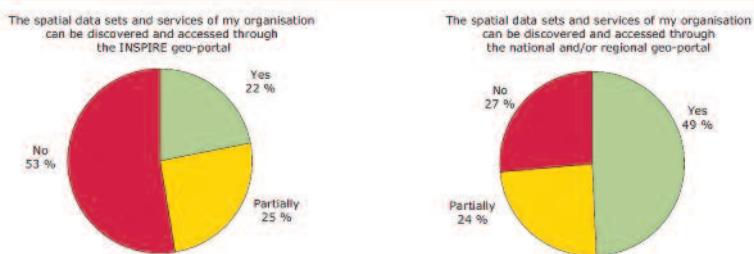
# INSPIRE Directive



## About the author

Emeritus Professor Ian Masser has held professorial positions in Utrecht, Sheffield and Enschede. He was Founder Chairman of AGILE, and President of EUROGI and the GSDI Association. His publications include more than 300 papers and 18 books.

**Figure 4.5 Discoverability and accessibility of spatial data sets in national geoportals and in the INSPIRE geo-portal**



*Above: Fig 2 showing discoverability and accessibility of spatial data.*

as topographic maps, geographical names, addresses, and orthoimagery. The public consultation suggests that INSPIRE has contributed to a more open policy for the public sector but that there are still a number of organisational, technical and legal barriers to sharing.

## 6. Monitoring and reporting

Annual quantitative monitoring and the three-yearly country reports are the main sources for evaluating the progress of INSPIRE. However, there are concerns about the relevance and reliability of some indicators and the country reports vary considerably in quality. There is also a tendency to focus on technical implementation at the expense of issues such as data sharing and the extent to which INSPIRE is supporting national environmental policies.

The last two sections of chapter 4 deal with the use of the infrastructure and the costs and benefits. With respect to the use of the infrastructure, the report concludes that this is particularly difficult to measure and that further work on this topic is needed. The key finding of the 2013 country reports

is that costs so far are in line with initial expectations but that most of the benefits in terms of improved data access, better cooperation in the public sector, and better services to citizens and business, have yet to be fully realised.

Chapter 4 concludes with a summary of the state of implementation.

**The results of the assessment** Chapter 7 describes the results of the assessment. These suggest that implementation has reached its half way stage with generally positive outcomes. Three of the five original objectives have undergone a positive evolution. Increased availability of metadata has led to improved documentation, and considerable progress has also been made with establishing internet based network services. Interoperability is improving, even though most of the measures required have yet to be implemented. Organisational, legal and cultural barriers still restrict data sharing and the arrangements that have already been made for coordination need strengthening at the EU, national and local levels.

The evidence presented in the report clearly shows the uneven implementation of the INSPIRE Directive across the EU and points up markedly different progress between Member States. The report concludes that some form of additional support is likely to be needed to help Member States that are lagging behind.

We look forward to INSPIRE Part II in 2020 – with perfect hindsight!



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Adena Schutzberg has worked in geospatial technologies for 25 years and is principal of ABS Consulting Group, [www.abs-cg.com](http://www.abs-cg.com), [adenas@abs-cg.com](mailto:adena@abs-cg.com)

AS I WRITE THIS COLUMN IN JANUARY, Esri is getting ready to ship the first release of ArcGIS Pro. The company has been talking about and showing the new product for a few years, so I'm confident readers have heard of it, if not seen or touched it. How will users learn the new software?

Those new to ArcGIS of any flavour have far more options for learning than I did when I took a face-to-face ARC/INFO course in 1992. In 2015, Esri hosts its own virtual campus, publishes tutorials, offers live online training and teaches face to face. There have been two iterations of the company's Massive Open Online Course (MOOC), Going Places with Spatial Analysis, with more planned for this year. Writers and educators outside of the company also offer online and face-to-face courses, books, videos, tutorials, and MOOCs.

training materials come to market more rapidly, I think those of us in the field need to do far more of the task focused learning and less of the broader learning.

There are simply too many tools to bother learning any one in too much depth unless or until it is part of your regular workflow. If you work with a software product regularly you will master it and find its quirks. I did that with AutoCAD 25 years ago and ArcCAD 20 years ago. I can't say I've learned a software product of any kind in that kind of depth since. But I've been successful nonetheless.

There are times, to be sure, where we need the broad overview type of learning. These are opportunities to learn; what the new product or technique is, how it works and if it helps address a

## It's time for just-in-time learning

It is 20 years since **Adena Schutzberg** last learnt any GIS software - in depth. She has since had a very successful career and argues that we, and course providers, need to tailor our learning to our immediate requirements.



**Bosses want to hire, and keep, those who keep learning.**



**Simplifying the learning process** The fact that all of these different products even exist suggests significant demand to learn the software. The products are appealing because they simplify the learning process. Students who choose one of these options push the burden of teaching (both selecting which material to teach and how) to the authors. Ideally, students learn what they need to learn.

Now and again, they do not. In those situations the first question to ask is: Did the learner know exactly what he or she hoped to learn? Was it narrowed down to "learn how to use kriging in ArcGIS to determine the most likely location for a specific mineral"? Or was it vague like "I want to learn Python"? As geospatial technology and

need or problem. A product or technique's marketing team or outreach community should offer that information.

**Task-based learning** Once a user determines that an offering can potentially solve a problem, it's time for more focused, task-based learning. This type of learning is what's going on in many US and other schools via project-based learning. The idea, in part, is that students learn skills specifically to solve a problem. Middle schoolers might need to learn just enough ArcGIS Online to produce a map of where crossing guards are posted as they explore safety around their school. They might use that map to help convince town administrators to add more guards. Will the students become experts in GIS or the specific software? No. Will they get a feel for it? Yes. Will they solve a problem with it? Yes. Will they learn how to learn technology? Yes.

We professionals need to do just that sort of "just in time" learning. Unlike school students, we won't have an instructor guiding us in finding a tool and how to learn it. We will need to do it ourselves. This sort of learning is good for one's career. In that document where you track your work accomplishments (my Dad called it a "hornblower") are the details you needed to learn, how you learned it and how you applied the tool on a project. Bosses want to hire, and keep, those who keep learning.



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Dreamstime.com - people learning about social media.

# Reflecting GI



Chris Holcroft

AFTER A LONG SPELL as the executive director of AGI, has joined Ordnance Survey International.

From a personal perspective the decade has been less about 'surprises', more about seeing trends and technologies develop and the growth of the geospatial market.

For example, Web-based GIS was well established in 2004, but has become even more widespread and fundamental to geospatial solutions. Connecting these applications to new channels, such as social networking, has been very innovative.

Open standards have continued to develop and grow with more understanding of their importance,

concept to delivery in less than a year. Globally we have seen the massive use of digital mapping in smart phone applications, which has put maps, imagery, positioning and geo-referenced data collection, literally, into the hands of millions.



Jonathan Iliffe

Jonathan Iliffe is still lecturing at the Dept of Civil, Environmental & Geomatic Engineering at UCL.

Looking at my articles I wrote ten years ago, the most striking feature is my casual reference to the issues affecting data in the marine environment: "integrating data in the coastal zone, combining bathymetry with land data and perhaps GPS and LIDAR, is indeed a challenge". This was written

## Reflections on a decade of GI

In our December 2014 10th anniversary edition we published an update on the article from our first edition by Prof **Mike Batty**. That highlighted the progress in the collection, processing and presentation of 3D geographic information since 2004. In this issue we are pleased to present three more of our first edition contributors who reflect with thoughtful insight on the intervening decade.

particularly in an international context. Citizen/stakeholder participation in collective projects is not new but the term 'Crowd Sourcing' wasn't coined until 2006. OpenStreetMap started, in the UK, in 2004 and has been a remarkable international collaborative project. The advent of Google Earth/Maps in 2005 has also been very significant, not least in raising consumer awareness. We should not ignore the emergence of Open Source GIS and its growth.

Authoritative national mapping retains its vital importance for good governance and is now more heavily used. This has enabled considerable efficiency savings and much better returns on investment. The Olympics and the Commonwealth Games relied on geospatial information for much of the planning, delivery and overall security with excellent collaboration between all the organisations involved.

But, when change comes, it can come very quickly! From my current perspective an example would be the emergence of OS Opendata – from a

without any fore-knowledge that the challenge would land on my own plate soon after. Now the Vertical Offshore Reference Frames project – and similar initiatives around the world – have advanced our understanding of marine coordinate systems, and are affecting day-to-day professional working practices.

A similar "pre-echo" was my comment about coordinate transformations being derived for limited areas leading to a patchwork approach and subsequent confusion and inconsistency. Similar concerns for very large engineering projects led to my involvement in the development of the SnakeGrid system that is now the de facto standard across Britain's railways.

So I'm very happy that there has been real progress in the handling of some of the issues that I highlighted ten years ago. I'm also happy to say that there is still enough confusion and misunderstanding of geospatial issues to keep me busy for a while yet!

“

**OpenStreetMap... has been a remarkable international collaborative project.**

”



Ed Parsons

Ed Parsons was then the Chief Technology Officer at Ordnance Survey and is now Geospatial Technologist at Google Inc.

How do we judge the significance of a rather arbitrary period of time representing the life of this august journal? Perhaps only with personal observations – not reflecting the views of current or past employers, organisations or groups.

The last ten years have been the most dynamic in the long and illustrious history of map making and geographic knowledge. Not because we have made any notable discoveries or gained new fundamental understanding but because we have brought what we do and what we care about into the mainstream.

That mapping has become part of peoples' daily lives is great for our industry. By knocking a few minutes off the daily commute, by enticing customers to bars

and restaurants they might never have discovered and, most fundamentally, by making sure that people don't get lost, we are improving billions of peoples' daily lives.

The same platforms now provide a channel for new communities to contribute and create their own maps – often both geographical and societal landmarks. The location of the nearest Starbucks may be useful; the mapping of informal settlements such as Kibera in Nairobi can be totally transformative.

As the "professionals", we had failed to reach this mass audience because we had not adopted both the new technologies and new business models to make geography accessible. The narrative of the last decade, which will surely continue, is of rapid technology change with success for those organisations able adapt their policies and business models. Think UAV's and the Internet of Things.

The legal and economic implications of high resolution imagery, volunteered geographic information, and changing roles of national mapping agencies are now discussed in broader debates on the size and role of government. Geography now matters in the corridors of power and, inevitably, this brings greater scrutiny and maybe some unpredictable consequences.

For many of us the most important development in the last ten years is simply to be able more easily to explain what we do. At last!



*... the mapping of informal settlements such as Kibera in Nairobi can be totally transformative.*



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# AGI GeoCom 2014



**Sir Mark Walport:**  
*'geospatial is integral to everything I do.'*

THE SECOND DAY'S OPENING plenary session heard two outstanding and at times breathtaking presentations that showed us just how important geospatial data has become. Sir Mark Walport is the Government Chief Scientific Advisor and head of the Government Office for Science. In a presentation that spectacularly underlined how geospatial data now underpins everything government does (a tribute surely to outgoing

Ordnance Survey DG **Vanessa Lawrence**, whose missionary work over 14 years saw the rise of GI across the public sector), he ranged from wearable GPS in fitness bracelets to mapping Napoleon's march on Moscow and the ignominious retreat.

Like many speakers to our events Sir Mark has always been fascinated by maps. His insight for once was rather more interesting. He attributes this to the

worlds of augmented reality. We are vulnerable though when IT fails like when a satnav leads someone into a river. More positively, who would have thought that government was willing to back an institute for research into algorithms? The Alan Turing Institute is to receive £42m from government. There are exciting opportunities ahead but we shall need pace and agility. Responding to a question on how one makes money in the age of open data Sir Mark concluded that you had to combine data openness with smartness.

There remain issues of anonymised data. The challenge is how to use the data and protect privacy. We tend to talk about privacy and personal data as though it's a binary thing. But its use should be proportionate. Sir Mark invited us to view it through three sliders. The first was Obfuscation and ranged from "open" to "anonymised". The second was Access & Environment: from "free on the web" to "locked in a steel room". And the last covered Governance & Accountability, ranging from "little" to "highly legislated and regulated".

## 2014 GeoCom: the changing face of geo - Day 2

With spectacular and breathtaking plenaries, last year's AGI annual conference had a new buzz and a distinctly different feel to it. The *GiSPro* team report from Day 2 that opened with the government's chief scientific advisor Sir **Mark Walport**.

way humans and animals navigate their worlds with maps in their brains using specialist cells, a neuron for place and another that enables us to create a mental grid or map. The discovery of this remarkable human attribute earned UCL Professor Sir **John O'Keefe** a Nobel Prize which he shared with Professors **May-Britt Moser** and **Edvard Moser** of the Norwegian University of Science and Technology (<http://www.ucl.ac.uk/news/news-articles/1014/061014-john-okeefe>).

The Government cares about three things on our behalf: wellbeing, health and resilience. Sir Mark explained that he advises government in emergency situations like flooding or the Ebola crisis. To date, he has twice been summoned to the Downing Street bunker where the cabinet emergency committee COBRA meets.

Emphasising that 'geospatial is integral to everything I do', he argued that there is nothing new about additional map layers. Dr Snow's pioneering work in finding the water pump from which typhoid was being dispensed to London's population was just the beginning. He contrasted Sir **Charles Booth**'s London poverty maps with today's open data mapping. Wearable GPS enabled bracelets like Strava can track routes and log where people have been.

The UK is leading Europe in the Internet of things, according to Sir Mark, and it will lead us into the

This is an interesting approach and helps people think through a complex issue that is not black and white, nevertheless 'my privacy trumps data' said Sir Mark. In responding to a question on whether geographic data today would identify the medical mass murderer Dr Shipman before he's strayed too far, he assured us the tools were in place but it's still no guarantee that bad things won't happen.

**From Stevenage to Mars** From the complexity of human life on earth we moved to the red planet and its next visitor, ExoMars set for 2018. Prof **Sanjeev Gupta**

**Prof Sanjeev Gupta: 'It's no more than the cost of a latte for every American citizen!'**



of Imperial College is part of the team designing an autonomous lander that amongst many things will be able to drill up to 2 metres into the planet's rocky surface. This remarkable vehicle is being built by a joint European team and this reporter was delighted to hear it is being built in his home town. Stevenage is not only the home of GIS Professional, it is also the home town of F1 champion **Louis Hamilton**; and now we're off to Mars courtesy of Airbus who designed the lander!

But what has this got to do with GI? 'We live and breath geospatial data' said Prof Gupta, 'we even have someone on the team called the keeper of maps. We already have imagery of the planet at 25cms'. The lander is expected to be able to image down to microns, 'a single grain of sand'. Prof Gupta is a geologist and has had considerable influence in choosing the landing site; somewhere near an exposed strata so that ExoMars can investigate close up to confirm the intriguing data sent back by NASA's earlier Rover that suggests a watery past.

Planetary science is very important for the UK, according to Prof Gupta. 'We spend \$5m a day on this project'. A sum that prompted a questioner to ask about the business case. 'It's no more than the cost of a latte for every American citizen!' declared the professor, 'a gateway drug into education'. To inspire us further he showed an image from Mars of the tiny bright dot that is Earth in the Martian sky. 'By 2050 I would like my grandchildren to be camping out on Mars'. Good luck with that.

**Widening focus brings understanding of GIS, CAD and BIM** "3D or not 3D" was all about building a business case for a 3D GIS for Crossrail. **Dan Irwin** is the GIS manager for this £15bn project which burrows under the capital and is expected to increase London's passenger capacity by 10%. Citing **Harry Beck**'s map of the London Underground, Irwin said that whilst most software can now cope with 3D animation, not everything needs to be in 3D; it's

**Emma Whitehead: Put us in a room with no stimulating tales for an hour... and we'll begin to self harm!**



about realism versus symbolism. Nevertheless, the aim is a 3D virtual model of the finished project that will serve as a BIM gateway to the master geometry. To achieve this, Irwin said political buy-in through inclusivity was essential. He argues that the benefits of 3D are speedy decision making, reduction of risks and heightening public awareness.

This introduced the following session that posed "Will BIM provide a platform to finally integrate CAD and GIS for holistic asset management?" **James Colclough** of AECOM believes that the current divide is between the CAD-centric engineer who sees GIS only as a strategic tool and database. While CAD and GIS may overlap with some things possible in either, BIM is about the flow of information through the project lifecycle. BIM is, Colclough argued, 'a single source of truth'. Barriers to integration are currently discrete processes and skills that put a brake on the handover from CAD to GIS. Key is a common data environment.

**Telling an old story** In the closing plenary **Emma Whitehead** and her colleague **Tobias Sturt** are part of Graphic Foresight, a creative design agency that has spun out of *The Guardian* newspaper's Digital Agency. 'Humans always look for patterns' she argues. As an example she cites the Pixar films approach which follows an age old way of telling a story: Once upon a time... Every day... One day... Because of that... Until finally... Whitehead believes that's the pattern we look for in a story. Put us in a room with no such stimulating tales for an hour or more and we'll begin to self harm!

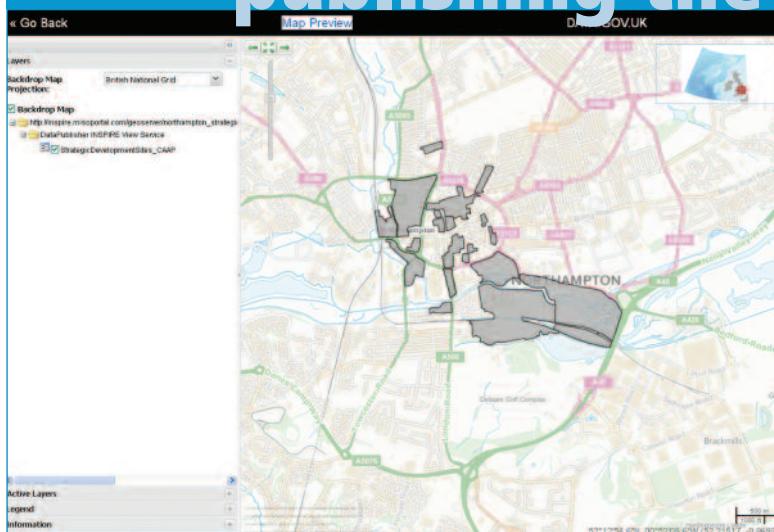
She spoke of the 'ethical challenge of data' (do we always trust digital data?) and commended **Susan Greenfield**'s latest book "Mind Change" on how digital technologies are leaving their mark on our brains.

The session brought to a close one of the most stimulating GeoCommunity conferences. It was wide ranging, plenty of speakers demonstrating a sure grasp of their topics that left many of us keen for more. Once again however delegates had the too hard choice of selecting which of six simultaneous sessions to attend. This reporter tried (mostly) to avoid headline speakers in favour of those with interesting subject matter. It worked, I hope you will agree.

**The hard choice of selecting which of six simultaneous sessions to attend.**

**"By 2050 I would like my grandchildren to be camping out on Mars."**

# INSPIRE publishing the data



Above: Northampton Strategic Development Areas in [data.gov](#).

## Publishing INSPIRE data: a supplier's perspective

Tackling the EU INSPIRE Directive has been a challenge for local authorities across the UK. **Laura Williams** tells us about mapping company miso's experience of helping GIS teams meet the requirements and making their data publishing simple.

**The EU INSPIRE Directive, and associated UK Regulations, place legal obligations on public authorities which hold geographical data about the environment and things that affect the environment. The definition of environment is broad and INSPIRE includes data about: species and habitats, population demographics, utility services, energy resources, marine features, metrological features and human health.**

**The geographical information held by European countries does not currently join up - but the environment does. Environmental issues such as flooding, forest fires and climate change do not respect national borders.**

**In the beginning. . .** The INSPIRE directive had been in force for a number of years when miso became involved in 2013. At the time, local authorities had to publish Annex III data by the end of that year and there were four major issues preventing them from publishing:

1. Knowledge of what needed to be achieved was scarce. The complex nature of the documentation surrounding the INSPIRE directive proved difficult to digest and caused a lot of confusion for local authorities.
2. Lack of skills and capable IT infrastructure in-house added to the strain.
3. Funding was yet to be released that would ease the burden.
4. There weren't many readily available publishing solutions, and these involved lengthy processes and a lot of investment.

**... developing a sophisticated online service was the easy part. . .**

Given all these challenges, the GIS teams we were working with turned to us for something that would help them manage their new responsibilities as data owners. We saw a real need for a service that was easily accessible and usable by these teams, but also one that didn't place too much of a burden on their already stretched budgets.

As a SME in the GIS industry, miso was ideally placed to fulfil this need particularly with our fast service development capabilities and experience. Keeping the INSPIRE directive in mind and basing our service on what local authorities needed to achieve, DataPublisher was created to provide view and download services for all datasets as well as to deliver additional functionality geared to making publishing easier to manage.

**Creating a supportive service** In many ways, developing a sophisticated online service was the

easy part. Before that could happen we spent a lot of time going over the EU directive behind INSPIRE and breaking it down into parts that could be communicated easily to our customers. We discovered that many found it hard to commit to publishing data when so many aspects were not clear to them. We really wanted to contribute an understanding of what was required of local authorities. We could then present these requirements as clear instruction and best practice guidance though, for example, webinars, digital guides, and an INSPIRE email newsletter.

As a supplier we also needed to fully understand and be able to use and advise on tools such as the UK Location Metadata Editor. Then we could help councils streamline their metadata creation and spend less time preparing it for publishing. During this process miso became a beta tester for the July 2014 version of UK Location Metadata tool so that we could anticipate changes and help our community's transition to the new version.

From our own learning we were able to pass information and tips onto our INSPIRE community via PDF guides and a set of videos for the metadata tool. The idea was to find a way through the difficult tasks and, wherever possible, to simplify them.

Our biggest driver as an organisation is to use our knowledge of data processing and spatial data to

# INSPIRE publishing the data

make everyday tasks a bit less tedious. So to create something like DataPublisher was very satisfying because it meant that our local authority customers could get their datasets published very quickly without adding to their workloads. One example is Stroud District Council which managed to publish 10 datasets to data.gov in 3.5 hours. We approached the GIS Officer for Stroud, **Vince Warwick**, to take on the challenge to prove that once you have the data and metadata it really doesn't take very long to publish.

"Once we set up the template it was easy and we could start creating and publishing the metadata every few minutes. We started at 9 and with no pre-preparation we were done by lunch and the next 10 datasets will only take a few minutes to complete" – Vincent Warwick, Stroud District Council.

**A different perspective** As a solution supplier we have an interesting window onto the activity around INSPIRE. We've developed an acute awareness of all the trends and issues that arise for local authorities through processing their data. On a daily basis we see what organisations struggle with, whether that's a technical issue or not knowing what to publish and when.

There are now over 115 local authorities using our service and we are therefore now in a unique position to help our INSPIRE community by sharing both their problems and successes. We can then provide as many solutions as possible through our blogs or mailing list.

We also maintain relationships with data.gov and the LGA in order to act as a bridge passing on information to and from our community. It's a great way of distributing this collective knowledge and means our role isn't just that of a supplier but one of

support too. As a result our journey as a supplier has been a really interesting experience for us - we are able to see the INSPIRE initiative from a number of perspectives and contribute to the UK's open data catalogue.

**What next for data publishing in the public sector?** The next big thing is INSPIRE Phase 2. The challenge by the end of this year is for local authorities to have published their existing data in the prescribed INSPIRE schema. It's specifically designed to make all data published across the EU easier for people and organisations to understand and use. A number of councils have already been using our phase 2 solution which is developed using Safe Software's FME to convert data to the correct new schema. The package is designed to cut down significantly on the number of hours it would take to manually manipulate the datasets.

Another task for local authorities this year is to publish data in accordance with the Transparency Code released in October 2014. As with INSPIRE we've been developing a platform for publishing this data. But now it is not just GI datasets that are needed but also many other types of data from areas like finance and procurement.

Co-ordinating several departments presents new challenges for local authorities. For example there must be a way to track when data was late or due, as well as the need to get to grips with yet another set of complex support documentation. In response to this miso's new service CompliancyView will make this coordination easier as well as continuing to providing a way of hosting and publishing data.

For more information or queries visit [www.misoportal.com/services](http://www.misoportal.com/services).



## About the author

Laura Williams is head of miso – Dotted Eyes' online portal dedicated to online GIS based services and data automation. She has more than 15 years of experience in helping SMEs from many sectors to run and grow their business. Laura has also recently been elected an AGI council member.

**Left:**  
Screenshot of  
miso's web  
portal for  
publishing  
data.

**... customers  
could get their  
datasets  
published very  
quickly without  
adding to their  
workloads.**



According to Paul Scott "Our existing information solutions rely on extensive use of spreadsheets. They are therefore simply unable to provide us with the level of insight into patterns of behaviour in core populations that we urgently need. So we decided to find a solution that would give us greater understanding of the geography of demand within our catchment area, as well as what form that demand will take."

The escalating demand now being faced by the A&E department continues to increase financial pressures on the IHT. It is also making it all but impossible to efficiently manage patient flows. There are increasingly urgent knock-on effects on inpatients and outpatients' departments and the wider 'care flow' pathway.

These challenges are made even more difficult by the need to meet tough key performance indicators (KPIs), including keeping waiting times below four hours. IHT has therefore set itself the following priorities:

## GIS for A&E – part of the answer

Ipswich Hospital NHS Trust tackles escalating demand with help from geographic information, reports Dr **Ed Wallington**, Health & Social Care Lead, Esri UK.

REFERRING TO THEIR NEW GIS, **Paul Scott**, Director of finance and performance at the Ipswich Hospital Trust, said "it has given us a whole new platform for discussion and changed the conversation at board level to focus on moving to a more sophisticated way of visualising and reporting data. The IHT board has requested that geographic information and location is included within its business intelligence strategy"

Ipswich Hospital NHS Trust (IHT) provides healthcare services to more than 356,000 people. One of the hospital's key objectives is to become the centre of a network of co-located and integrated services, delivered to meet demand for healthcare in the region as well as driving education and research. It's an ambitious goal and to meet it IHT needs to map the demand – from where, and by what means, do patients come to the hospital?

- Improving clinical outcomes;
- Overcoming financial challenges and making savings, critical in light of potentially failing to meet KPIs;
- Making systems more efficient.

### Integrated locational and actuarial analysis

Not only did IHT need an objective understanding of current demand, but it also needed to know how to intervene more effectively in the future. It decided to implement a feasibility programme to assess how location analysis and actuarial analysis, working together, could provide insight into demand management that could shape future services for the better.

Esri UK worked with an actuarial services provider, for analysis of financial trends and risk, and delivered the location analysis solution to turn this vision into reality.

This combination of GIS and location analytics with high-quality clinical and financial data analysis, feeds into a long-term financial modelling system provided by the actuarial service provider.

Esri UK's input was vitally important in delivering data visualisation to provide the required insight. An ArcGIS platform has been implemented on IHT's in-house infrastructure behind a secure firewall. ArcGIS for Server and ArcGIS for Desktop have been deployed to provide services to a management dashboard. IHT management now gain additional insight by being able to map out the number of cases

... **GIS and location analytics with high-quality clinical and financial data analysis.** . .



going to A&E by a range of variables visualised as 'hotspots' highlighting, for example, the sources of demand. The dashboard also provides a set of KPI reporting tools, giving managers a dramatically improved understanding of the status of demand in the hospital. It enables them to break down A&E attendees by number of cases, average waiting time or mode of travel, and then split the figures down by timeframes.

**Visualising the geography of demand** The Trust now recognises the huge potential of the system to provide relevant insight much more quickly than before. Visualising data on a map helps IHT understand where there are hotspots for certain diseases, admission methods, and average time-to-treatment. Understanding the geography of demand for emergency admissions, and the type and level of that demand, has enabled IHT to pinpoint interventions that can mitigate it. The Trust believes this will enable it to improve its resourcing processes. It will, for example, be able to bring in more clinical

support staff to meet increased demand on certain days of the week and therefore alleviate resource pressure. This should help minimise costs while maintaining performance and clinical standards.

According to Scott, "While this remains an R&D project it has highlighted a different way of looking at our organisation, and the demand pressures we face. In addition, it has demonstrated the huge potential of looking at demand across the whole population rather than just on the basis of individual attendance. It also allows us to try out 'what if' scenarios. In short, it has given us a whole new platform for discussion and changed the conversation at board level to focus on moving to a more sophisticated way of visualising and reporting data. The IHT board has even requested that geographic information and location is included within its business intelligence strategy."

Moving forward, the analysis of patient demand and the mapping of various insights and possible interventions could provide a basis for reconfiguration of services and therefore reductions of wastage. The use of geographic information, in particular in conjunction with actuarial data, could position the Ipswich Hospital Trust as a leader in

the innovative use of IT in healthcare provision. This exciting, groundbreaking project has the potential to revolutionise the future of healthcare demand management, not just in Ipswich, but across the whole of the UK.



#### About the author

Dr Ed Wallington is the Health & Social Care Lead at Esri UK. Ed utilises geospatial technology and location analytics to support improving clinical outcomes and more effective spend. Ed works with a range of health professionals in public health, primary and secondary care, and social care, including hospital trusts, clinical commissioning groups, commissioning support units and national public health agencies.

“

*... it has highlighted a different way of looking at our organisation, and the demand pressures we face.*

”

# AGI column



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



THE ASSOCIATION  
FOR GEOGRAPHIC  
INFORMATION

THERE IS NO DOUBTING that we are living through a period of political, economic, social and technological disruption, the likes of which the traditional geographic information marketplace has arguably not seen before. This is particularly evident when you consider the pace of the changes that are all around us! Avid readers of *GIS Professional* will have noted a similar sentiment expressed by **Anne Kemp** in her final column as AGI Chair in 2014. It was also a consistent message delivered by many of the keynote speakers at GeoCom 2014 in Warwick last November.

Now, I am generally an optimist. Whilst we don't have all the answers today, what we do have in these times of change is an enormous opportunity. It's a chance to ensure that we reinforce our undisputed position as one of the most innovative and progressive geographic information industries in the world and demonstrate the value that we can enable. The demand for AGI members to speak at conferences all over the world underpins the respect in which we are held. This is true whether we are presenting the quality, richness, diversity and availability of our national geospatial data; the systems and services that enable ever easier access; our professional experience and expertise; the policy, business and societal applications that we underpin; and believe it or not,

the same format in 2015. We are kicking off at the end of February in collaboration with the Edinburgh Centre for Carbon Innovation with a focus on the relevance of geographic information to the security of future energy demands. Events later in the year will look towards BIM Level 3, the advent of a new generation of geospatially aware sensors and mobile devices and a focus on the sustainability and resilience of our future cities.

**New audiences help GI message** I was really encouraged by the participation of new audiences at AGI's 2014 event programme – those who were keen to learn how they could embrace GI to help them develop their organisations. Feedback from sponsors and delegates alike highlighted the quality of the insight provided by the speakers. The 2015 Geo: The Big 5 programme will build on this practical approach and I would encourage delegates and sponsors to register early for these events to make the most of these exciting new opportunities.

As I take up the Chair of AGI in 2015 I am delighted to welcome four new members to AGI Council. **Andy Wells, Duncan Hill, Laura Williams** and **Mike Saunt** will be well known to many in the industry. Together with the rest of the Council team they will ensure that AGI continues to be effective

## Opportunity and Change - moving forward together in 2015

Get involved! is the message from new AGI chair **David Henderson** in his first column for *GiSPro*.

the business models that enable us to promote innovation and sustain all of the above.

**Increase business recognition** Together we are capable of discovering the answers to many of the challenges that face our industry. We will do this as we seek to support government's policy agenda, increase business recognition of the value of geographic information, develop our skills, and discover new collaborations, partnerships and business models. The relevance of geographical thinking, the recognition of the value of geographic information and the associated opportunities for growth have never been greater.

and representative of the whole industry – whether that's policy or business; data or software; open source or proprietary; free or paid for. I'll talk more of our outreach activities and influencing strategy for 2015 next time, in the meantime you will soon be able to see our plans take shape via our new website.

Of course, the best way to make a difference is to be involved. I encourage all of my colleagues across the industry to consider how they might best do that. I'd welcome an approach from any organisation who would like to explore greater partnership with AGI and I'd like to encourage all professionals in our industry to engage with our special interest groups and local, regional and national groups. There you will find a wealth of experience, supportive professional networks and the opportunity to collaborate and ensure that the geographic industry in UK continues to go from strength to strength.

Have a great start to the year and I look forward to seeing you out there in 2015.

*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](mailto:info@agi.org.uk) or by calling: +44 (0)207 591 3190*

“

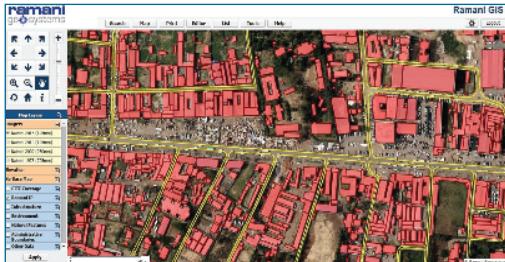
**... the best way to make a difference is to be involved.**

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To get your company featured on this page call Sharon Robson on +44 (0)1438 352617*

## Into the cloud for Getmapping



Just released is version 6 of Getmapping's Online GIS, enhanced with support for worldwide projections, INSPIRE-compliant WMS/WFS publishing and a new Street Layer module for panoramic imagery. Together with its associated 'Cloud' storage and built-in national mapping layers, this will enable users to share information between any number of in-house or external clients anywhere in the world.

The software has already been exported to Uganda, Kenya and South Africa and can be 'white labelled' opening significant partnering opportunities.

## New Web Map Layers

Cadcorp has unveiled Web Map Layers 8.0, a complete redesign of their web mapping application for sharing geographic information with the public. It features a simpler and responsive user interface, provides more functionality and creates a tighter binding to the data it serves. The interface now responds automatically to the type of device being used to access the application. When a mobile device or tablet is detected, a much simplified mobile interface is launched featuring finger-tap data interrogation and navigation, a Quick Search facility and geolocation detection.

Central to the application is a standalone web service called Local Knowledge. It provides answers to questions commonly asked about a locality such as: What is near? How many are near? How far are they? It also provides summary statistics. A new dialogue feature allows maps to be shared using Twitter, Facebook and Google+.

## Launch aims at BIM

Safe Software has launched FME 2015, available for both desktop and server, and supporting more BIM formats

such as Autodesk Revit and Trimble SketchUp. The new version features point cloud formats and updated Esri ArcGIS support to Version 10.3.

In a completely different direction FME2015 will also support Minecraft to enable users to make their GIS and other data available through its interactively discoverable gaming platform. This should be very useful for any organisation involved in city planning.

## Flood risk scenarios

Landmark Information Group has released onto the Landmark Labs portal a sample dataset of JBA Risk Management's latest Comprehensive Flood Map of Great Britain, to enable land, property and environmental professionals to preview JBA's extensive flood risk data and give feedback on its potential applications and suitability. Users can view JBA's extensive flood datasets, showing the highly detailed flooding extents and associated flooding depth information. A variety of different flood scenarios are presented, including pluvial flooding; undefended fluvial and undefended coastal flooding risk hazards.

## Improving interoperability and integration

The W3C and the Open Geospatial Consortium (OGC) are collaborating to improve interoperability and integration of spatial data on the Web.

Spatial data is integral to many human endeavours and so there is a high value in simplifying data into web based datasets and services. Backed by large organisations such as Google and the BBC, the collaboration is the result of a March 2014 Workshop on Linking Geospatial Data with over 100 participants in partnership with UK Government Linked Data Working Group, Google, and Ordnance Survey.

Participants will evaluate the use of Linked Data for managing the complex evolution and integration of spatial data. The approach enables people to produce data independently, and to then easily integrate heterogeneous data from diverse sources.

[www.w3.org/2015/spatial/](http://www.w3.org/2015/spatial/) and [www.opengeospatial.org/projects/groups/sdwwg](http://www.opengeospatial.org/projects/groups/sdwwg).

## MapFinder app for Kindle

Ordnance Survey has announced that its OS MapFinder app is now available for free download on the Kindle Fire HDX. The app provides free overview mapping for the whole of Great Britain as well as a tile download facility, to enable users to choose the maps they want. All maps are cached on the device and can be searched for locations by place name, postcode or OS Grid reference.

## Cloud update

Trimble TerraFlex Advanced is an enhanced edition of TerraFlex field data capture software designed to work with Trimble's InSphere cloud-based platform and developed to manage asset collection and update activities for everyday geospatial requirements.

Aimed at GIS professionals, the software allows users to import existing assets or GIS data into their projects and make real-time updates in the field. The information can be shared across the project to all project members.



## Solar energy assessment online

Bluesky has led the technical development of the EC funded EAGLE Platform. A website enables homeowners, solar energy companies, and governments to assess the suitability of individual properties for solar energy. It employs high-resolution geographic information and address records to accurately identify and assess a building's suitability. This can then be combined with details of energy tariffs, expected consumption, cost of installation and available subsidies. [www.eaglesolar.eu](http://www.eaglesolar.eu).

There were four other UK partners, including Leicester University and the chartered Institute of Plumbing and Heating Engineers. The other nine partners came from Germany, Turkey and Sweden.

## | 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](mailto:jason@pvpubs.demon.co.uk).

### FEBRUARY 2015

**An evening of 3D GIS**  
2nd February 2015, BCS London, UK  
[www.agi.org.uk/events/calender](http://www.agi.org.uk/events/calender)

**International LiDAR Mapping Forum**  
23-25th February 2015, Denver, Colorado, USA  
[www.international.org/international](http://www.international.org/international)

**Geo:Big 5 - Smart Energy**  
26th February 2015, High School Yards, Edinburgh, UK  
[www.agi.org.uk/events/calender](http://www.agi.org.uk/events/calender)

### APRIL 2015

**Offshore Survey 2015 Conference**  
15-16th April 2015, Southampton, UK  
[www.offshoresurvey.co.uk](http://www.offshoresurvey.co.uk)

**World Cadastre Summit**  
20-25th April 2015, Istanbul, Turkey  
<http://wcadastre.org>

**Geo:Big 5 - BIM: The Next Level**  
23rd April 2015, Murray Edwards College, Cambridge, UK  
[www.agi.org.uk/events/calender](http://www.agi.org.uk/events/calender)

### MARCH 2015

**SPAR International 2015**  
30th March - 2nd April 2015, Houston, Texas, USA  
[www.sparpointgroup.com/international](http://www.sparpointgroup.com/international)

### MAY 2015

**RIEGL LIDAR 2015**  
5-8th May 2015, Hong Kong and Guangzhou, China  
[www.riegl.com/media-events/events](http://www.riegl.com/media-events/events)



#### Smart Energy - 26 February - Edinburgh

In partnership with the Edinburgh Centre for Carbon Innovation, we will focus on the security of future energy demands. Sustainable supply requires a new approach. The grid itself needs to become smart, in addition to new technology managing demand. Understanding the needs of the citizen alongside environmental and policy challenges are key. All are highly dependent on a detailed geospatial understanding.

#### BIM: The Next Level - 23 April - Cambridge

We move beyond the discussions in our 2014 event on Building Information Modelling (BIM) & Asset Management. With the implementation for BIM Level 2 (2016) well progressed, the focus has shifted to preparing for Level 3 (2018) and beyond. We look at the real benefits in social performance where even modest improvements translate into mind blowing financial savings.

#### Sensors and Mobile - 14 May - 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. Advances in high altitude sensors, the supply of data and point clouds provide vast opportunities. There is a continuing challenge - how to extract meaningful information. We will focus on the use and applications of mobile/remote platforms and the solutions being applied to the ever growing volumes of data.

#### 2015 Geo: The Big 5 event programme

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

#### Future Cities: Security - 9 July - London

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

#### Big Data & You - 8 October - Cardiff

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

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

This annual flagship event will provide a climax for the 2015 event programme, bringing together the year's themes. Chesford Grange Hotel in Warwickshire will again be the residential format to maximise the opportunities for debate, engagement and collaboration. Our annual awards celebrate best practice from across the UK in the application of Geographic Information, providing an opportunity to meet with innovators from across the UK in a variety of sectors.

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