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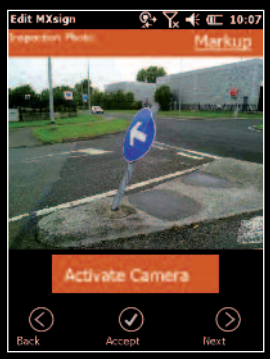

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Front cover: Web apps and 3D global mapping are changing GIS, as Adam P Spring discovered at Esri's UC 2015. ***To read more turn to page 20.***

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read on. . .

welcome

to the August 2015 issue of *GIS Professional. . .*

GIS is all about communication

As an editor and publisher working in the technology sector I am often unsure of exactly what our editorial schedule is going to be for any particular issue. Whilst we don't quite make it up as we go along and we do plan, we also adapt quickly to ever-changing circumstances. Articles promised often come in late or just fail to materialise. others we feel are too much of a commercial pitch from PR companies whose clients won't even discuss sponsorship or advertising. Others are more suited for learned peer reviewed journals.

This issue of *GiSPro* only germinated a week or two before going to press, yet it has two very clear themes which we can summarise as the language GIS and how GIS can help allay flooding. Eight years ago in 2007 floods generated over £3bn of claims. 2012 was the wettest summer in the UK in a century and as I write the incessant rain is aiming to beat that record. **Paul Drury** of Ambiental explains how the emergence of precision flood models can provide insight into the spatial pattern of flood risk, while **Simon Goodwin** of emapsite introduces an extensive range of geospatial products that cover the UK and Europe aimed at the flood risk managers. They include those from partners JBA Risk Management as well as products like Bluesky's tree cover mapping and are aimed at flood risk insurers as well as commercial property planners.

Now let's turn to the fascinating topic of language – how we describe applications of GIS; how we label GIS software features and menus; and how we relay these things to end users and clients. At first sight wording may seem trivial but there are too many examples of how we may think we have used clear unambiguous words but which others interpret differently to ourselves. There is ambiguity. They range from the apocryphal world war one message, 'Send more troops we're going to advance' and interpreted as 'send two and fourpence we're going to a dance', to words that all native English speakers on this side of the Atlantic will use with care and in the right context, words like mistress, rubber and intercourse.

Adena Schutzberg in her column (page 9) talks about tolerating ambiguity and the ability of people to 'just figure it out'. Just ponder on that wonderfully tortuous alliteration that came from **Donald Rumsfeld**: 'There are known knowns. These are things we know that we know. There are known unknowns. That is to say, there are things that we know we don't know. But there are also unknown unknowns. There are things we don't know we don't know.' It boils down to ambiguity. And that leads us to a topic with lots of ambiguity.

> ***…GIS and BIM may be different sides of the same coin but a common language is still needed…***

Described by some as a 'GIS for building', BIM is a significant development for GIS and for geospatial. GIS and BIM may be different sides of the same coin but a common language is still needed, argues **Steven Eglinton** (page 19), if the various professionals engaged in a BIM project are to be successful. They each need to be sure that what may seem simple terms like "polygon" mean exactly the same to all whether architect, surveyor, engineer or a CAD technician. We need standards for words as much as we do for interfaces and file formats.

Complex language however is inevitable in any profession or specialism argues **Chris Holcroft** (page 18) and we should accept it for what it is while making sure that those outside the circle understand what we mean. Effective communication with others is our responsibility.

Fortunately for most of us there are colleagues who we can discuss these "known and unknown" ambiguities with before we communicate them to others. Indeed the best advice I was ever given as an editor was, there is rarely a piece of writing that cannot be improved upon by sharing it with someone else. So please, share this issue of *GiSPro* with a colleague or friend – we need more readers!

Stephen Booth, Editor

Tree map finds sewer threat

An aerial map of trees is helping scientists to understand the damage caused to drains and sewers by tree roots. Using Bluesky's UK National Tree Map, which details the location, height and canopy cover of more than 280 million trees, scientists at Cranfield University are analysing how the proximity of trees can affect sewers. Working with long term data from Anglian Water, they considered the location of infrastructure assets such as pipes and manhole covers and their proximity to trees, and compared this spatial information with records of maintenance jobs.

By using the tree map data for the whole of East Anglia, scientists were able to show the likely zones of root intrusion, and the impact these trees had on the number/frequency of sewer blockages and other consequences. Interestingly, the study revealed that bigger trees had less impact than medium sized ones, and that foul sewer systems were most prone to intrusion. The study concluded that sewers located near trees are 1.4 times more likely to be intruded and are 1.8 times more likely where there are three or more trees. Dr Timothy Farewell, senior research fellow at the Cranfield Soil and Agrifood Institute, adds "tree roots are very good at exploiting weaknesses in sewer joints.

Correction: apologies to **Tim Whitomme**, author of last issue's article *Aerial Survey: bridging the gap*. He is indeed a Tim and not a Tom!

Winners in San Diego

The annual Esri user conference in San Diego (see page 20 for full report) was the venue for a number of significant awards. From 400 entries the city of Boston won the storytelling with maps contest. **Joyce John**'s Snow Journal story map incorporated data-rich maps, videos, photos and text to craft an engaging story of how the city dealt with historic amounts of snow earlier this year.

Meanwhile, Irish Water won a special Enterprise Award for its achievements in GIS. Irish Water is the new national water utility responsible for providing and developing water services throughout the Republic to bring water and wastewater services of its 31 local authorities together under one national service provider. To do so, the utility consolidated its operations onto a single GIS platform using ArcGIS.

Membership upgrade

Ordnance Survey has raised its Open Geospatial Consortium membership level to become the first strategic member outside of the USA, joining the US Department of Homeland Security, US Geological Survey, US National Geospatial Intelligence Agency and NASA as strategic members. The move will allow OS to represent Europe, at a strategic level, to improve the quality of standards globally in areas like Smart Cities, BIM (Building Information Models) and the Internet of Things.

Neil Ackroyd, Acting OS CEO, added: "Open Standards are a key part of achieving our business goals, but we also understand that they are vital to the industry as a whole. We expect the new level of strategic membership to deliver significant opportunities to OS and allow us to use our skills and expertise to influence and drive new standards. . . I am particularly keen to see greater interoperability in the smart cities space."

OSi opts for automation

Ordnance Survey Ireland (OSi) has launched a ground-breaking cartographic automation project aimed at transforming the mapping organisation's product and service production. To be delivered by Esri Ireland, the project is expected to enable OSi to realise significant annual cost savings, while improving delivery time and accuracy of its printed, online and digital map products.

"This is the most important advancement in cartographic product automation in Ireland since the introduction of digital maps over 30 years ago," said **Colin Bray**, chief executive of OSi. "By automating and standardising the processes involved in creating all of our different map products, we expect to make efficiency savings from 2016 onwards."

Under a four-year contract OSi will use Esri's ArcGIS technology to create a framework of automated cartographic processes that will enable all of OSi's map products and services to be generated and updated with minimal human intervention. At present, it takes employees a considerable amount of time to manually make amendments, and many processes are unnecessarily duplicated in the production of maps. When the new solution is live, OSi expects to be able to operate with a reduced headcount following the approaching retirement of several members of staff.

The automated cartographic processes to be developed will be the most wide-ranging of their kind, anywhere in the world. OSi will become the first national mapping organisation able to start with large-scale topographic level data at 1:1,000 scale (showing buildings, boundaries and other features) and use this single source of data to derive all products at multiple scales from 1:1,000 large scale urban maps and 1:5,000 rural maps right the way down to the smallest map scales.

Exemplar update

Following last issue's report on the GeoPlace annual conference and awards (*GiSPro* June 2015, p20), we can report that the winner of the Local Digital Award was Northumberland County Council for its delivery of a streamlined digital solution for the public to report issues to the council. The system links a number of council data sources such as street lighting, recycling points and potholes. The data is integrated with other back-office systems, using the master council address system as the source to link data together. 94% of streetlight faults and 95% of potholes were logged through the new system in first six months.

Also honoured were **Glenn Dobson**, team manager business

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and information systems operations at Hull City Council and **Pauline Clifford**, mapping & geographic information co-ordinator at Reigate & Banstead Borough Council. The pair were the joint recipients of the Peer Award for 2015. Recipients are nominated by their colleagues for those who have made a significant contribution to the address and/or streets data community.

The Exemplar Awards recognise excellence in local authority creation of address data known as a Local Land and Property Gazetteer (LLPG) and Street data, known as a Local Street Gazetteer (LSG). These gazetteers enable digital transformation by joining information together from different local authority departments to give a property or street level view of service delivery.

Just 60 secs to act

An earthquake early warning app is to be tested by US Geological Survey, CalTech and other university researchers. QuakeAlert is set to alert users with a countdown to when shaking will strike their exact location, telling the user how severe the intensity is expected in their location. The app simultaneously delivers important safety instructions to the user on how to respond if indoors, outside or in a moving vehicle. QuakeAlert will be provided to the public free of charge.

In some scenarios, such as the one depicted in the new movie *San Andreas*, warnings can be up to 60 seconds! With an early warning, people could take cover, trains could stop and oil rigs can be shut down.

Developed by Early Warning Labs, of Santa Monica, CA, an official partner of the USGS, QuakeAlert utilizes USGS's seismic sensor network data, Esri GIS backend and the Microsoft Azure cloud to deliver the earliest and most accurate earthquake early warnings.

Automated maps for property agents

An automated map generation system developed by Mapmechanics for property agent and valuer Christie & Co has reduced a task that previously took hours or even days to minutes. When a Christie agent takes an instruction on a new property the company produces a map showing the premises in relation to the surrounding area. Previously all 16 of the company's UK offices sent requests for maps to a single designated member of staff, who had to generate the map manually, then send it by email to the person requesting it. Delays and backlogs could easily build up.

With the new system, agents simply enter details of the premises on their local computer and the request is passed via the web to the company's centralised Geo-concept GIS. Within 15 minutes this sends back appropriate maps automatically in three different scales, allowing the agent to select the most suitable version for the property according to its location (urban, suburban or rural).

Bluesky aerial photography helps 3DW

Aerial photography and computer generated models of buildings and trees from Bluesky are helping specialist graphics company 3D Web Technologies (3DW) to create interactive 3D visualisations. The highly detailed models have been used to support planning applications and consultations for some of the UK's largest infrastructure projects such as wind and solar farms, power lines and power stations, as well as housing and regeneration projects. "The Bluesky data helps us to better represent the real world environment or site to its true likeness, which in turn helps our clients communicate their plans more effectively and efficiently", said Kangjie Zhao, of 3DW.

BRIEFS

This year's Intergeo, 15-17 September in Stutgart, has a major focus on unmanned aerial systems (UAS). An exhibition area and specialist forum in Hall 8 will see companies such as DroneDeploy, SenseFly, Spectair, Sitebots and FlyTech UAV be showcasing solutions along with a specialist forum presented by the professional partner UAV DACH e.V. (the German-language Association for Unmanned Aircraft Systems).

Taxi trip manager Uber has purchased Microsoft's data acquisition assets for mapping including a data centre, cameras, intellectual property and roughly 100 personnel. Uber tracks the location of drivers and passengers and uses algorithms to predict supply and demand for travel, as well as travel times. The move will almost certainly see Uber capturing more of its own mapping data.

Satellite imagery provider BlackBridge has announced that its RapidEye suite is to be acquired by Planet Labs, a provider of a dataset of satellite imagery based in San Francisco, California that designs, builds, and operates a fleet of earth imaging satellites.

XYZ Maps has been selected by Hewlett Packard to provide demonstration maps for their plotters. XYZ's Dr **Tim Rideout** commented: "It is a great reflection on both XYZ Maps and Scottish cartography that out of all the hundreds of map companies in the World, HP should have come to us."

Getmapping is reported to have won a three-year contract to host the 'All Wales Mapping Services Framework' datasets. The framework will provide a cloud-hosted base mapping service covering the whole of Wales, including a 2km buffer along the Welsh border with England. It can be accessed through desktop GIS, mobile or web mapping applications. The service will be available to all PSMA members. Source: geospatialworld.net/News

Pitney Bowes has announced an alliance to give their GeoInsight customers the opportunity to benefit from iGeolise's application TravelTime, which uses satellite data to calculate the possible locations reachable

within a specified time; for example, which store can be reached within 30 minutes. Initially aimed at consumers, iGeolise has seen an opportunity for consumer-facing businesses.

GeoPlace has again achieved re-certification to ISO9001 and ISO27001 international standards, for Quality Management and Information Security respectively. These management systems both apply to the 'provision to the public and private sectors of information management and consultancy services, relating to address location information and street information' says GeoPlace's MD Richard Mason.

The General Directorate of Land Registry and Cadastre, Turkey is the latest organisation to become a full member of EuroGeographics, which represents the interests of 61 organisations from 46 countries in Europe for national mapping, land registry and cadastral authorities – the whole of geographical Europe.

The independent crime-fighting charity Crimestoppers and Esri UK have renewed their partnership. The organisations first began working together in 2011 when ArcGIS was first installed into the Crimestoppers' call bureau. The software enables calls and online information to be mapped in relation to where crimes reported to the anonymous 0800 555 111 number took place, enabling hot-spot analysis and further evaluation. Using Esri Storymaps, the location of cannabis cultivation has been tracked as well as the whereabouts of fugitives hiding out in Spain.

A new book from Esri explores how GIS tools can help to manage and protect the oceans. *Ocean Solutions, Earth Solutions* includes 16 peer-reviewed papers from 50 ocean and coastal science researchers using GIS tools showcases the latest and best ocean and coastal science using spatial analysis and GIS. "The mantra of the book is essentially that if the ocean is in crisis, the earth is in crisis," said Esri Chief Scientist **Dawn J. Wright**, the book's editor. "The solutions that we devise to help the ocean will be important in helping the entire earth."

OGC's Point Cloud DWG is being established to address a gap in standards. The group will examine interoperability issues related to sharing and processing point cloud data. The group will not create new standards but will provide a collaborative discussion forum to define and understand issues, requirements, uses or barriers to interoperability. The OGC feels that point cloud data has often been overlooked or treated in the same buckets as images or terrain models. The use of point clouds is growing at a rapid rate in a variety of domains including utilities, mining, 3D modelling, etc.

Europa Technologies has won a Global Innovation Award from geodata supplier MB-International. The award recognises the innovation shown in the redevelopment of Europa's Global CRESTA Plus product to meet the latest standard of CRESTA (Catastrophe Risk Evaluating and Standardizing Target Accumulations). The standard defines a global zoning system used by insurers and re-insurers for modelling and risk management. The latest iteration of the standard uses postcode boundaries as the primary building blocks for the zones. Europa Technologies selected postcode boundary data from MB-International in order to build the new CRESTA HiRes and LowRes zones for Global CRESTA Plus.

Esri is joining the Global Partnership for Sustainable Development Data. The move was announced at the third International Conference on Financing for Development in Addis Ababa, Ethiopia, the first of several conferences focused on financing Sustainable Development Goals which the Sustainable Development Solutions Network (SDSN) organizes through a partnership with the World Bank, the UN, the ONE campaign, the Bill & Melinda Gates Foundation, the Center for International Earth Science Information Network (CIESIN) and others to provide financial, political, and technical support for data creation that supports the Sustainable Development Goals.

PEOPLE

Gardels winner for 2015

Paul Scarponcini is the recipient of this year's Open Geospatial Consortium Kenneth D. Gardels Award. Over almost two decades, Paul Scarponcini, a senior information architect at Bentley Systems, has been an important OGC Technical Committee contributor. He has also done much to help OGC advance spatial information technology standards in collaboration with other standards organizations. He helped develop some of the OGC's foundational geospatial standards and also played a pioneering role in bridging the critical gap between geospatial standards and information technology standards for the built environment. His years of technical leadership and liaison work in this area are now beginning to benefit information sharing in activities such as civil engineering, urban planning, facilities management and indoor location services.

The award memorialises **Kenneth Gardels**, a founding director of OGC who coined the term "Open GIS" and devoted his life to the humane and democratic uses of geographic information systems. He died at the age of 44 in 1999.

Headcount rises at Bluesky

Bluesky has completed a significant recruitment programme, expanding its Leicestershire based workforce by more than 20%. Key appointments include **David Findlay** who joins as business development manager with responsibility for the insurance and financial sectors, and **Trevor Barnes** who joins the team as production manager. Boosting research and development is **Christopher Aschuaer**, who takes on the role of GIS specialist while **Agnes Kowalczyk** and **Ignacio Magallon** join as GIS analysts in the production department, along with **Ryan Krisch**, image analyst, and **Tom Newis**, software developer.

New head at Landmark

Landmark Information Group has appointed **William Kirk** as head of asset management. This new section is tasked with the development, innovation and delivery of consulting and bespoke solutions to meet client needs in managing the lifecycle of their land, property and infrastructure assets. Kirk joins with a wealth of experience having worked as land management development director at SKM Enviros and associate director at Eden Nuclear and Environment. With over 25 years of experience, he has worked on environmental risk and liability consultancy specialising in the development of environmental solutions land, property and infrastructure.

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

Tolerating ambiguity in geospatial

There is ambiguity all around, says **Adena Schutzberg**. The trick is recognizing it, choosing a way forward and not being frightened to fail.

JEFF SELINGO, WHO WRITES ABOUT EDUCATION, shared a terrific article on LinkedIn titled Wanted in College Graduates: Tolerance for Ambiguity. He argues that the "killer app" in today's workplace is the ability to tolerate ambiguity. Said another way, it's unlikely a new employee will get a clear set of expectations from a supervisor for a specific project, nor a recipe for how to get the work done. Instead, the employee will need to figure it out. That's a valuable insight for students, job seekers and hiring managers in the geospatial marketplace.

Students are unsure whether to major in forestry and take a few GIS classes or the other way around. They are unsure which programming language to learn. They are unsure where to move to, to start their careers. They are unsure about taking an unpaid internship. The best news about this group is that they know they are unsure! I see their questions regularly on social media and in sessions devoted to GIS careers at conferences.

Employers might have one task they know a new employee will do, but the rest of the job "depends." If the position is in government, it depends on if the budget is available to purchase the new server or software license. If the position is in consulting, it depends on if the company wins the big (or small) contract and if the scope of work changes. If the position is in software development, it depends on the speed of development and if the selected development platform will still exist or be supported next week or next year. I suspect all this ambiguity pushes hiring managers to list every possible skill (GIS or otherwise) in each new job description.

The biggest players in our industry, the ones everyone has heard of that "do mapping," also live in a world of uncertainty and ambiguity. These companies' executives are watching the unpredictable hardware, software and services markets rise and fall even as they launch new products and services, acquire companies and shut down efforts that don't pan out. Just this year Google announced that Google Maps Enterprise would be phased out and Microsoft agreed to sell its imagery collection assets to Uber. Those decisions in turn cascade down to business and consumer customers, creating even more ambiguity and uncertainty.

Dealing with ambiguity and uncertainty I like to think GIS education provides students with at least a taste of the ambiguity they will face. The quintessential example is "the GIS project." It might be the first independent effort in a GIS 101 course or it might be a capstone project for a degree. Students sometimes panic as they take responsibility for selecting the topic, defining the final product and creating the workflow.

How do we as professionals deal with this uncertainty? How do we mentor less experienced colleagues? How do we calm students? Taking a step back and gaining perspective can help.

First off, everyone involved in a project is unsure of at least some aspects of it, what **Donald Rumsfeld** would call "the unknown unknowns." Realizing that there is ambiguity, and that others are in the same boat, can bolster one's confidence.

Second, tackling a project completely on your own is the exception, not the rule. The students crafting a GIS project who look for input from classmates and instructors or on social media are reaching out to help deal with ambiguity. Colleagues asking one another or other experts are doing the same thing. Gathering input (data or opinion) can lessen ambiguity.

Finally, at some point, despite the ambiguity, a student or staffer must choose a path forward. Some paths will be more successful than others. Diving in and "going for it," even if it turns out to be a disappointment in the end, is always better than being paralyzed and doing nothing. The student or employee who tries and succeeds is lauded. The one who tries and fails should be lauded, too. The one who fails to try is unlikely to pass the course, get the job or keep the job.

> ***"Diving in and "going for it," even if it turns out to be a disappointment in the end, is always better than being paralyzed and doing nothing."***

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GEOBusiness 2015: attendance up at busy bustling show

A busy two days found your reporters struggling to cover everything at the industry's annual show. A conference with two streams is always a challenge but we think that below we have covered the most relevant aspect for GIS professionals. We've published the session titles in full so you should be able to track them down.

WITH VISITORS QUEUING IN DROVES to get in on the first day and attendance up 25% , the second GEO Business event attracted over 2000 people from 47 countries. With an improved layout and over 180 companies represented the organisers were clearly delighted. Event director **Caroline Hobden** commented, "We have had so much positive feedback following the show and are thrilled to see such an increase in attendance in just a year since we launched the first show". Her comments are echoed by industry players: "GEO Business is now the established show for everyone involved or interested in geospatial activities" and "The conference perfectly represented the energy of the geospatial industry. . . with inspiring presentations to reflect all the opportunities of a growing community."

The exhibition was certainly spectacular and the show floor was always bustling with activity. The absence of Esri can perhaps be explained by their own conference in the previous week. One seasoned commentator pointed out that conference attendees seemed lower than last year and several presentations were too oriented towards their presenters' companies.

The keynote on the opening day was an enthusiastic presentation on HS2, given by **Kate Hall**. Being an HS2 sceptic does not help your reporter relate to the content of Hall's talk. It was full of enthusiasm and justification for the scheme, including a rather bizarre diagram demonstrating that faster trains have greater capacity than slower trains. Not so Kate! Eight carriage trains leaving Euston at fifteen minute intervals with the same number of stops have the same capacity, whatever their speed. If however, half the carriages are first class and empty, the capacity is dramatically reduced.

Geospatial data management and big data techniques **Andy Wells** from Sterling Geo believes we are still only starting to use remote sensing and that 'We ain't seen nothing yet!' His presentation, "Future developments in remote sensing – more than just a pretty picture" mentioned how higher resolution images, real time video, and much higher frequency of standard optical or radar sensors will transform the market. Change detection will become much more effective and will be very important for local authorities, for example. But 'information from the internet' he argues, 'is like trying to drink from a fire hydrant'!

> ***. . . information from the internet. . . is like trying to drink from a fire hydrant!***

Wells believes that data will become a service rather than a discrete deliverable and so interpretation and labelling will become much more important. Users currently spend a lot of time 'not finding things'. That will change as searches become automated. He doesn't think that our industry understands what users want and we will be overtaken by those that do – or those who will just create a new 'need' – like Google Earth.

OS overtaken by open On the subject of being overtaken, **John Carpenter**, director of strategy & planning for Ordnance Survey, was quite honest about having been overtaken by 'open'. His session, titled "Open data is more than just putting it out

there!", heard him state that OS are now following the trend with collaborative data such as Open Rivers, Open Roads, Locate, Open Gazetteer. He thinks that the Environment Agency has led the way on open data and that future cities must be 'open'. However, he pointed out that more OS data was downloaded for the game Minecraft than for all other applications put together.

OS is now recruiting rather differently than in the past, and doing its best to embrace cultural change. They have had talks with OpenStreetMap – which can use all of OS's open data – and they are now taking steps to get users of all their open products to voluntarily register so that they can find out how data is being used and why. A final question about Linked Data elicited the response that there was not much demand yet! How did they really know?

Case for a UK cadastre **Julia Stolle** from Technics did her best to make a case for a UK cadastre, perhaps starting with new developments but did not, in my view, manage to join all the dots ("Boundary Demarcation in the UK and Europe. Is there a case for a UK cadastre?").

It is all very well pointing out the obvious flaws in our property registration system; it is quite another to put a business case for changing to a continental system. And she admitted that many of the boundary disputes are not about the geometry but about people unable to get on with their neighbours. She did however make a good case for only allowing full registration with 'as built' surveys and believes that although developers now have to produce as-built plans, conveyancers don't have to use them and with many sales now made 'off plan' this could become a growing problem. Someone pointed out that there are only 27 'fixed' boundaries in all of England and Wales. No vote was taken but, even in an audience with many surveyors I doubt the motion would have been carried!

Up in the air In "Small Unmanned Aircraft (SUA) data capture operations in congested areas" **Peter McConnell**, of Skycap, reviewed the regulatory requirements – or lack of them. There are now 600+ Permissions for Aerial Work (PAW) authorised by the Civil Aviation Authority for individuals (not companies). CAA has been overwhelmed by the demand and does not even have dedicated staff. Practical issues include the novelty factor which means that the use of SUAs can attract many spectators. It was suggested that the fees for PAWs should increased several fold to pay for the necessary staff. McConnell thought that we are in a 'wild west' phase with very cheap drones operating as little more than 'toys' and the distinction between these and the professional versions, is not well enough defined. He thinks that there will probably be some sort of incident that will challenge the safety and/or security aspects of SUA use before any legislation is brought in.

Above: With over 180 companies the show floor was nearly always busy.

Smart GIS In an otherwise rather disappointing series of sessions, **Adam Iwaniak**, from the Wroclaw Institute for Spatial Information and Artificial Intelligence, spoke on "Geo Media semantics toolkit for linked geospatial data". He articulated the main reason for the slow take up of linked geospatial data – the rather simplistic assumption that we can all agree on what we mean when we talk about Wroclaw, Islington, or the High Street. Yet just look at how difficult it is to get agreement on the new roads database being prepared by Ordnance Survey and GeoPlace with the aid of the Dept of Transport. Highway engineers, utility asset managers, satnav suppliers and the Royal Mail can all mean completely different things when they refer to Long Lane in Little Snoring! And why shouldn't they? Personally I am not even convinced that each world view can necessarily be constructed from a set of atomistic building blocks which are themselves never used by anyone except the IT experts behind the scenes.

Emerging and developing technologies In "The evolution of geospatial technology – from data to knowledge" Trimble's **Lee Braybrooke** articulated the company's message that the 'value chain' for capturing and delivering geospatial data needs to be extended by geospatial professionals into interpretation, analysis and visualisation. The data must be turned into knowledge brokered by people and software that understand the inputs but also understand the end user's requirements for outputs.

Meanwhile, **Gary Gale** posed the question, "What does the future of maps look like?" Gary, in his usual quirky style, set out ten predictions for the future of maps – having defined maps as already

> ***. . . we are in a 'wild west' phase with very cheap drones operating as little more than 'toys'. . .***

> ***. . . crowded slums in various large cities being ignored because they don't have navigable roads is now unacceptable. . .***

being nearly always digital or derived from digital information. His predictions were mostly supported by other presentations and/or the exhibition and taken together they auger well for anyone pursuing a career with geospatial information. They will move towards being in real time; they should be able to move from inside to outside and vice versa – seamlessly - and will become 'less closed and more open'. Accuracy should improve with the ever decreasing cost of GPS (at least to the end user) and the potential of so called (QPS) Quantum Positioning Systems – very accurate inertial systems – now just being trialled in submarines where current inertial systems quickly drift off position.

Sharing of locations – whether we like it or not. The classic case is the anonymised (so we are told) use of mobile phone positions to 'crowd source' traffic flows – of vehicles or pedestrians. However, the personalised delivery of maps, which is already with us, will increase. This will not necessarily be controllable. We are familiar with our web experience being different from our friends – based on our individual browsing habits and any other information that various layers of the supply chain know about us. We are familiar with maps popping up already centred on our current location. Personally, I am very annoyed that some sites – e.g. my local planning authority – cannot remember where I am for a map but does send me location-based 'alerts'. In contrast my county council always remembers where I was looking at last time I logged in and goes straight there.

Gary pointed out that the delivery of maps by Google, for example, in disputed areas of the world is already personalised based on the provider's assumptions about your location. Different views of the border between India and China will appear if you are assumed to be Chinese, Indian or 'other' – presumably based on your perceived IP address. The same applies to the 'border' between Crimea and (the rest of?) Ukraine.

There will be a proliferation of stylised 'maps' able to show, very effectively, spatially variable datasets in a variety of different ways to illustrate very diverse continuous or discrete datasets. Maps will continue to be printed – on a variety of media – and will have to accept that 'white spaces' are not really acceptable. Gayle's examples of the crowded slums in various large cities being ignored because they don't have navigable roads is now unacceptable for administrators and can be 'filled in' by imagery or 'volunteered' geospatial information. Finally he emphasises the simple fact than any visible map is only ever the tip of the huge data iceberg which forms its foundations. We are still only scratching the surface of this iceberg and drilling deeper will present us not only with more information but with different ways of presenting it.

Wear your GIS with pride Nutiteq's **Jaak Laineste** delved into the world of wearable GIS tools – from huge helmets to rather heavy spectacles and single eye displays. However, the most interesting part of his presentation was on the improvements of indoor positioning highlighted at Microsoft's Indoor Localization Competition in April this year in Seattle. The winner was the EU's Joint Research Centre team (remember INSPIRE?) with an infrastructure free experimental STeAM system – Sensor Tracking and Mapping. It will not win a fashion prize but was shown to be better than any of the competing systems using local transmitters with an accuracy of 0.2m during the trial. By comparison the majority of the 23 competitors were worse than 1m but only five were actually from industry as distinct from research institutions.

International issues **Matt Pennell**'s description of MapAction's work in Nepal was fascinating. In "Taking the web out of web-mapping: a different approach in a disaster" he emphasised the difficulties of operating in 'disaster' environments with non-existent or intermittent power and communication channels. He also made the point that they were at their most useful when compiling simple maps to help coordinate the aid effort in an emergency – they have to use any information available and turn it into easily understood maps on paper (the supply of which may be limited) or on local networks. They now promote their 'kiosks' in the field which service their clients on a local network and enable their own staff to concentrate on collating and presenting the relevant data.

Airborne optical remote sensing can be used under the Comprehensive Nuclear-Test-Ban Treaty (CTBT) during an On-Site Inspection (OSI) searching for evidence of an underground nuclear explosion. In "Using airborne remote sensing to search for illicit nuclear explosions" Dr **James Palmer** from AWE described the development and testing of an instrument suite to be deployed in helicopters if required. The treaty has not yet come into force but would impose many constraints (e.g. maximum flying height of 1500m). The sensors include a hyperspectral imager; thermal camera; RGB/CIR camera; LiDAR; and HD video. These have all been tested during a recent large field exercise in Jordan.

750 million need it **Fred Mills** ("Encouraging mass BIM adoption: the role of Scan-to-BIM") talked up BIM for the masses! He said that over 750 million people need to be using BIM worldwide if its potential is to be realised. That represents a huge market for his 'theB1Mmail' (sic) promoted as the world's first BIM newspaper. His illustrations of the progress being made by scanning technology and BIM software were impressive. Apparently Finland is

Above: Taking the web out of web-mapping.

the most advance country in Europe for BIM take up followed by the UK – which has government mandated targets. Elsewhere he claimed that Australia is way ahead with South Korea and Brazil catching up fast. Even Antarctica has one research station using BIM and proving that it is ubiquitous and useful everywhere.

Standards, risks and communication In sessions aimed more at surveyors **James Kavanagh** introduced the RICS's the IPMS, the International property measurement standards, which defines exactly what areas are to be included so that land and buildings can be valued in exactly the same way worldwide. He also emphasised that measurement standards are vital for the delivery of BIM while acknowledging that a BIM model of RICS's London headquarters was too large for any computer they owned to handle!

Meanwhile **Chris Preston**, chair of the RICS Geomatics faculty who works for Network Rail asked his audience if they like taking risks before pointing out that we all take risks with our professional work but must always take steps to minimise and mitigate them. Cheap surveys can lead to costly litigation and great damage to a practitioner's reputation. He agreed with a questioner that many users simply don't understand geospatial data. He suggested that if we are to get better and become more efficient there must be a 'wash up' at the end of every project to learn lessons and promulgate them through the organisation – or through professional bodies. We have to get better at communicating including to our clients.

• *Reporting by **Robin Waters** and **Richard Groom** with additional material by **Stephen Booth**.*

• *Copies of all the papers presented at the GEO Business Conference are available from Diversified Communications, The Pike House, George Street, Nailsworth, Gloucestershire, GL6 0AG, United Kingdom. Email:* **cotswolds@divcom.co.uk**
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Precision flood models and spatial analysis of flood risk

This article explains how modelling is a vital tool in understanding flood risk and in mitigating the effects of flooding in Great Britain. **Paul Drury** explains how recent research undertaken by flood risk specialists at Ambiental has enabled the development of precision flood models and explores how data generated through flood modelling can provide some interesting insights into the spatial pattern of flood risk.

• This article is based on a paper presented by the author at the GEO Business 2015 conference in May this year.

FLOOD MODELLING DEPENDS ON accurate topographic data. The resulting outputs, combined in a GIS with accurate spatial representations of our built environment, enable insurance companies, public authorities and the general public to understand flood risk and to take the precautions necessary to reduce the effects and the costs of flooding.

Flooding is a recurring phenomenon. In comparison to other environmental hazards floods in the UK generate the biggest financial losses to insurers and the wider economy. The effects of flooding have been recorded since the beginning of time and we have seen several major flooding events within recent memory. In reaction to these events, and through an appreciation of how risk may potentially increase in the future, insurance companies and other organisations are in need of tools which help them manage and better understand flood risk.

Understanding flooding in our past Britain's floods of 2007 generated insurance losses of over £3 billion – the biggest loss since records began. Thereafter we have seen significant flooding almost every year. In 2012 we experienced the wettest summer in 100 years. And more recently in 2013/14, following the wettest December and January in well over 100 years, we encountered major flooding which cost the insurance industry £1 billion and resulted in the loss of 17 lives.

Clearly the frequent occurrence of record-breaking weather and flooding events is something we should all be concerned about, and with increasing pressure to build on flood prone land this presents one of the biggest challenges we face as a nation. In light of this challenge, how do we go about trying to understand flooding?

Firstly we must understand that flooding can happen in a number of ways. Flood types can be divided into primary and secondary sources. Primary sources are driven by weather and natural cycles. Through the study of historic records we are able to assign a probability of occurrence for fluvial, pluvial and tidal flooding. From this we can predict the occurrence of frequent minor floods and of the much less frequent severe floods.

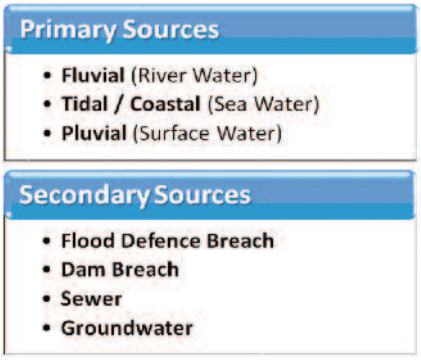


Figure 1: Primary and secondary sources of flooding (©Ambiental 2015).

It is much more difficult to assign a probability to secondary flooding sources, which are therefore harder to predict. There is often an inter-linkage between different flooding sources. For example, a sewer flood will depend on localised drainage conditions, which will exacerbate the effect of a surface water flood. Readers may also recall that the flooding in the winter of 2013/14 was made much worse through the emergence of 'groundwater' which caused flooding in areas supposedly protected by defences.

Historical sources such as written accounts, illustrations and flood height markers all serve as evidence from which it is possible to infer where flooding may occur in the future. However, when we attempt to make precise predictions the accuracy and completeness of historic records is an issue. To gain a fuller understanding we need detailed scientific measurements from flow gauges and depth gauges, and this type of data only exists for the last hundred years or so.

Predicting the future Now let us consider the probability of flooding happening. To describe the magnitude of a specific flood event we use the terminology 'return period'. This describes the likelihood of a flood of a certain scale happening in any given year. So we can say that a 100-year flood

> ***Britain's floods of 2007 generated insurance losses of over £3 billion – the biggest loss since records began.***

event has a 1% or a one in one hundred chance of happening this year. That is determined through a statistical analysis of historic records which consider all of the past events on record and rank them in order of magnitude.

It is important not to assume that a hundred year return period means that the same flood will occur every hundred years. In reality it could occur much later or earlier than that. Furthermore, it is possible that a one-in-a-hundred year event could occur next year and again the following year. However, if two flood events of one hundred year magnitude were actually to happen back to back then this will clearly change the probability of that event for the future. This is a limitation of using a deterministic approach which analyses the past to predict the future.

Flood risk in Great Britain gives rise to several headline grabbing statements. The Environment Agency state that one in six homes in England are at risk of flooding. Studies by Willis Research Network state that half a million homes are at 'high' risk. But what do we mean by risk, and what do we consider to be high risk? These are subjective terms. Later in this article we will explore what we mean by risk and we will discuss how factors such as flood depth are important in establishing our view of what we define as high risk.

Flood risk is increasing in various ways. The study of natural cycles suggests that Great Britain is likely to experience a 'flood rich' period over the next decade or so. Furthermore, climate change may cause flood risk to increase in the future through sea level rise and more extreme rainfall events. Compounding these factors is a decrease in public spending on flood defences. With the imminent launch of the FloodRE initiative to control insurance premiums in flood prone areas, it is clear that there is a need for geo-data products that enable a greater understanding of flood risk for all concerned.

Flood modelling techniques GIS can be used to produce flood maps to help improve our understanding of where and when flooding will occur. Fig 2 shows the key spatial data inputs used to build a flood model.

One of the main datasets used in flood modelling is topography, which has the single biggest influence on where flooding is likely to occur. A detailed digital terrain model is required to accurately show the height of the ground surface and, for flood modelling it is always best to use LiDAR data whenever possible.

Post-processed bare earth terrain models are used which have had surface features such as vegetation and buildings removed. This allows for free movement of water and simulation of flooding within buildings. Ambiental also undertake additional terrain processing to remove flow obstructions such as bridges which otherwise will act like barriers and impede the flow of water. An understanding of the effect of structures and the relative speed with which water flows across various surfaces are also important factors in achieving predictive precision.

The other main flood model inputs all relate to hydrology. This includes flow gauges, and rainfall gauges, which are crucial to determining where water should be input to the model and how water flow should be simulated. In Great Britain reliable flow data can be sourced from the Centre of Ecology and Hydrology. Flood hydrographs are generated from this data which represent a time sequence growth curve as flow volumes increase towards a peak flood level and then decrease as a flood subsides.

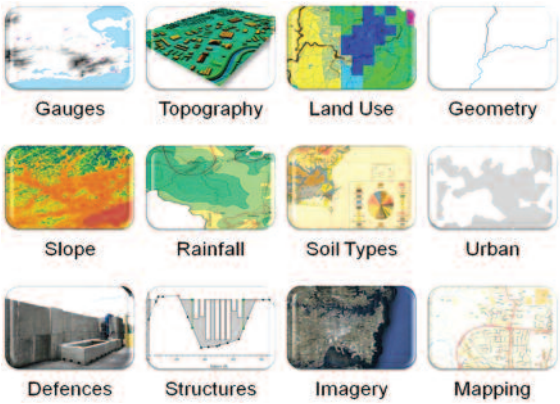


Figure 2: The key spatial data inputs used to build a flood model (©Ambiental 2015).

When all the data has been loaded it is time to run simulations to generate flood maps. There are a variety of flood modelling techniques available which vary in their sophistication and processing effort. Ambiental use proprietary software called FlowRoute which uses the 'shallow water wave equation' to simulate water movement in two dimensions. Various other simulation tools are available commercially and non-commercially.

2D flood modelling differs from 1D in that it represents differing flow conditions across a floodplain. A 2D hydrodynamic model divides the floodplain into a gridded domain where obstacles can be taken into account. Water flow between grid cells is dependent on roughness and water levels between iterative time steps.

Modelling hydraulics is the most computationally demanding stage of the process requiring high performance computers. Modelled areas are broken into small domains and the software runs each simulation in turn. The raw raster model outputs are finally merged together to form a continuous flood map for each modelled return period to simulate different flood severities.

The map image of Kingston upon Thames (Fig 3 (see next page)) shows the end products of flood simulations. It shows fluvial flooding in blue and pluvial flooding in pink. This map shows not only the areas likely to flood but also the depth of flood water at every location.

Once simulations are complete it is necessary to evaluate whether the results are accurate. The first indicators come through the quality assurance process. Every model output is visually checked by technical analysts to identify and correct any errors in the data. Terrain models provide a top down view of the world, which means that simulated water flow under obstructions like bridges or through culverts is not

> ***. . . what do we mean by risk, and what do we consider to be high risk? These are subjective terms.***

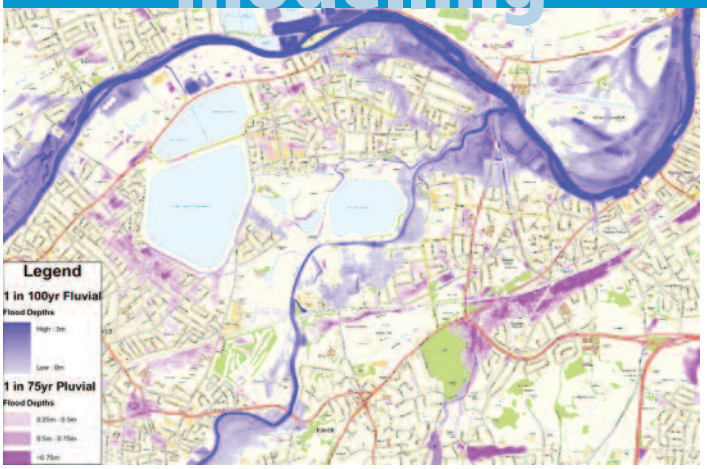


Figure 3: Fluvial and pluvial (surface water) flood map for Kingston upon Thames (©Ambiental 2015).

enabled. Manual correction is required to remove flow impediments that cause water to dam up behind them.

Accuracy is also ensured by data validation – establishing if the flood map results correspond with the actual locations of historic flood events. Ambiental have undertaken numerous validation studies throughout Great Britain to ensure that any known risk areas are accurately represented in their models. When there is a strong correlation between reality and the model output it serves to confirm that the modelling method is accurate and reliable.

> **Ideally the OS MasterMap building outlines would be used but they are too expensive for customers requiring an affordable flood screening tool.**

Flood maps for insurance For the insurance industry knowing where and when flooding might occur is only part of the puzzle. Flooding in the middle of nowhere, away from human settlements and infrastructure is of little consequence. Floods in an urban centre put lives, property and possessions under threat. Flood models are now detailed and accurate enough to determine flood risk at property level. So it is now possible to use GIS to produce products that deliver fresh insight to the insurance industry.

Risk is a function of hazard, vulnerability and exposure. (Fig 4) Flood hazard is largely outside of our control; it is inevitable that flooding will happen. But as we have seen so far analysing and interpreting the best available flood data does mean that the nature of the hazard can be well understood.

'Vulnerability' in this context describes the amount of damage occurring to structures whilst interacting with flood hazard. Some buildings will be more vulnerable as a consequence of their design and specific usage. Conversely some buildings are much more resistant to the effects of floods, or they have been specifically designed to cope with flood hazard. The vulnerability of buildings has been studied academically and graphs can describe the ratio of damage occurring to various property types at increasing flood depths.

'Exposure' refers to the insurance policy, how much an asset is insured for and what policy conditions and excess have been agreed. It measures the potential losses an insurer faces in the event of the insured asset being flooded. From these three factors we form our holistic view of risk.

A flood hazard map (Fig 5) has red areas where the hazard is greatest and at-risk properties within the flood hazard area are shown as black points. The map shows that not all properties are receiving the same intensity of hazard. Intensity will vary depending on flood return period with buildings in the red zone hit much more frequently than those in the light blue areas.

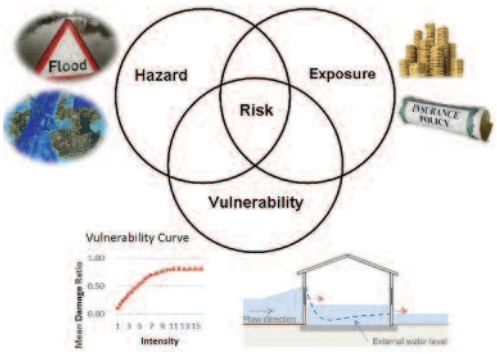
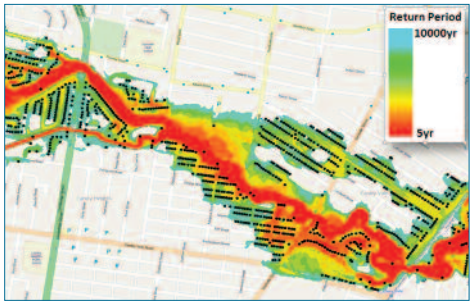


Figure 4: Understanding risk through consideration of Hazard, Exposure and Vulnerability (©Ambiental 2015).

Figure 5: A flood hazard map showing properties affected at a range of return periods (©Ambiental 2015).

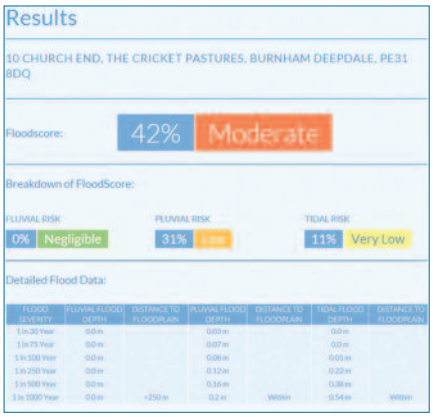


To analyse flood risk throughout Great Britain Ambiental extracted property level hazard values on a national scale. We used Ordnance Survey's AddressBase which contains property locations, addresses and a variety of other attributes. The locations are very accurate but the data is simply a set of points which does not immediately enable detection of partial flooding. Ambiental has therefore applied a variable search buffer distance to each property type in order to extract maximum flood depth within the buffer. We found that our buffer approach brings locational uncertainty down to an acceptable level, so this approach was used to produce the FloodScore database. Ideally the OS MasterMap building outlines would be used but they are too expensive for customers requiring an affordable flood screening tool.

The FloodScore database was initially developed to deliver an online flood screening service to insurance brokers. Users of the online system enter a postcode, select a property and receive an instant result describing flood risk for their chosen property (Fig 6 (see next page)). Insurance customers are generally less in need of GIS flood maps with return period and

flood depth information, but the insurance industry are very keen on having a simple and consistent measure of flood risk for one building relative to another. To tackle this market Ambiental developed a scoring system which utilises an algorithm to formulate a summary risk score out of a hundred. The resultant FloodScore is driven by the flood hazard and a calculation of an average annualised loss prediction.

Figure 6: An extract from the FloodScore online service showing property level flood risk scores out of 100 (©Ambiental 2015).



Analysing flood risk across Great Britain

Through the FloodScore project Ambiental created a detailed database of flood risk for every property in Great Britain. This data can provide some interesting insights into the pattern of flood risk and highlight how it varies regionally (Fig 7). Overall it shows that 20% of properties had some level of flood risk and that 2.6 million properties have a high risk. These results are broadly consistent with figures published by the EA for England and Wales.

Combined FloodScore is the aggregated risk posed by all three flood types: fluvial; pluvial; and tidal. The

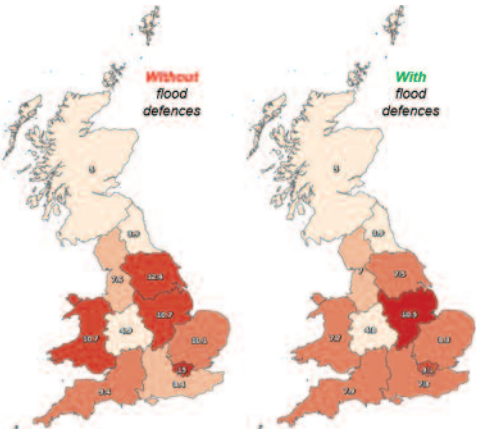


Figure 7: A regional view of combined flood risk within Great Britain – showing mean property level risk scores out of 100 (©Ambiental 2015).

Top ten towns with highest flood risk	Mean FloodScore
1 Boston	95.6
2 Spalding	93.4
3 March	89
4 Skegness	87
5 Wisbech	74.2
6 Grimsby	49.7
7 Bridgewater	40.8
8 Cleethorpes	39.4
9 Edmonton	39
10 Chertsey	37

Fig 9 (Right): The top ten towns of over 10,000 properties without flood defences which have the lowest flood risk (©Ambiental 2015).

Fig 8 (Left): The top ten towns of over 10,000 properties without flood defences which have the highest flood risk (©Ambiental 2015).

Top ten towns with lowest flood risk	Mean FloodScore
1 Larkhall	0.9
2 Livingstone	0.9
3 Motherwell	0.9
4 Hamilton	1
5 Wishaw	1
6 Cumbernauld	1
7 Glenrothes	1.2
8 Bellshill	1.4
9 Morley	1.5
10 Felling	1.6

North East has the lowest risk overall and, when flood defences are assumed to be operational, the East Midlands has the highest flood risk. A comparison of areas with and without operational flood defences shows the risk to London increases considerably. These results show the critical role of the Thames Barrier.

The mean combined FloodScore in Great Britain is nine out of a hundred. However, for individual towns the numbers vary wildly from the mean. The table (Fig 8) shows the ten towns (over 10,000 properties) with the highest combined FloodScore. Boston is actually awaiting a massive flood defence scheme in the next few years. A close second is Spalding, located on the fen wetlands. All towns on this list have had flooding in the recent past which helps validation of the predictive accuracy of the database.

At the other extreme, Fig 9 shows the top ten towns with the lowest flood risk. Places such as Larkhall, Livingstone, and Motherwell tend to be in quite hilly areas with properties typically located on sloping ground away from any flood hazards.

Be prepared

Flooding is a complex phenomenon and Great Britain has particularly high exposure to flood risk as compared to many other countries. Research suggests that flood risk will continue to increase presenting many challenges to government, business and the population at large.

Flood modelling can help to predict, prevent and protect against the risk of flooding by using spatial analysis to identify locations at risk. This article has demonstrated how a flood model can be built and has introduced the key datasets and GIS processes involved in creating flood hazard and flood risk data products. We have also provided insight through the analysis of the FloodScore database which has demonstrated that 1 in 5 properties in GB have at least some degree of flood risk. This analysis also identified risk hotspots, which can be of great benefit to insurance companies and other organisations trying to understand the extent of their exposure to flooding related losses.

About the Author

GIS data manager Paul Drury oversees the production of spatial data products relating to flooding. This includes project management of production operations and reporting to stakeholders as well as the preparation, integration and quality assurance of data assets. Paul's experience includes managing technical computing and data build projects in the UK. He is an expert in GIS and data analysis with an understanding of the environmental data industry. He has a BSc (hons) in Environmental Sciences from the University of Brighton.

Chris Holcroft is an experienced geospatial professional and Chartered Geographer. He has contributed to GISPro since its first issue in 2004.

Stop navel-gazing about the language

argues **Chris Holcroft**, it's the communication we have to get right.

I'VE BEEN RECENTLY FLICKING BACK through the last year's worth of issues of *GISPro*. A thing that struck me was the appearance of a hardy perennial in our profession, or is it a thorn in our side? These botanical metaphors are being used for another I have in mind, namely 'navel gazing'. Something that can happen a lot in the geo business.

Now, before I mention what we are navel gazing into, what does it actually mean? Delving into dictionaries is amusing. The Miriam-Webster online dictionary uses a lovely definition which is: "useless or excessive self-contemplation". Wikipedia states it originates from the Greek word omphaloskepsis, combines the respective words 'navel ' and 'gazing' to describe the act on inward looking to one's navel to aid meditation. It then adds that the term is also now used in "jocular fashion".

Have we really failed? I've been involved in GI for many years and in several guises. It never ceases to amaze me how persistent the introspection into the apparent failure in GIS there is in some circles. This failure, it seems, is built around the future of GIS having been heavily evangelised over the final decade of the last century and, in some eyes, it never reached its potential mythical proportions. For this apparent failure, there are other related factors, including our geospatial lexicon. In other words, our specialist terms. There are too many. They are incomprehensible to the non specialist. Some say that is bad.

There are also those who would say that the profession has failed to grasp new technologies and business models to reach the mass consumer market, or keep pace with innovative 'disrupters' moving into the geospatial business. These aren't the only factors, in the great "why has Geospatial not turned out like the soothsayers said it would?" debate, but they are enough to be getting on with.

Critical introspection is always fodder for geospatial event debates. It's a catalyst to encouraging opinion from all angles. But I think there's a number misconceptions underlying this desire for some to beat up on GIS. The great expectations of GIS a couple of decades back were based on the factors and thinking of the day.

I also suspect that a good dose of wishful and parochial thinking was shovelled into forecasting the future of GIS. Like any industry or interest, it is great to be seen to be on the crest of a big new wave of change. There's a vested interest in growth and a lot of the early market analysis drew from future projections of the solutions vendors themselves.

The words 'forecast' and 'evangelism' mean exactly what they say they are. They aren't absolutes!

In my view the 'too much complex terminology' argument is false. The real issue is ensuring effective communication with customers and users. This industry is like all others. Do accountants have a professional lexicon? Do Doctors? Lawyers? Soldiers? Systems Architects? Yes, all of them. Sports and hobbies are the same. I was once a school governor. Meetings actually required the use of a glossary for the inexperienced. For me that was the defining moment in the geospatial specialist vocabulary debate.

What makes the difference? Effective communication is key. It's that which makes the difference. The doctor will talk to patients about their 'chest' not their 'respiratory system', likewise a professional weather forecaster on TV keeps weather terms within generally common understanding rather than use the scientific language they would amongst peers.

So, going back to my perusal of the last 12 months issues of *GISPro* and getting away from industry self-reflection, what actually strikes me is the vibrancy and diversity of geospatial business and activity today. It's a big business with many diverse players. It does not stand still.

Some things haven't changed, but other things have. In just the last decade we've seen significant developments in national and supra-national SDI; crowd sourced activity; the arrival of Google Earth/Maps, and increasingly Apple Maps; Open data is here; there is the growing use, validity (and controversy) of drones; BIM and geospatial is a key topic area; consumers use mapping and location intelligence massively on electronic devices; there are many cases of GIS being used effectively for a myriad of solutions in utilities, health, good governance and many others, enabled in part in this country by collective data supply agreements (like OneScotland and the PSMA), as well as growing standards-based technology.

I think we need to think less about "GIS saving the world" and more "GIS helping to *save* the world". Our specialism is equally valid as other professions. We should be proud of that. Self contemplation has its place, but we need to look less at what 'potential' proclaimed in the long distant past and focus on the reality that has been achieved. Geospatial has come a long way. It is in the mass market, but equally it maintains its professionalism. Rightly so.

We also need to recognise, accept and celebrate our professional language, but improve as well our communication with non specialists. The attack on the 'GIS Dictionary' is misguided.

> ***. . . the 'too much complex terminology' argument is false. . .***

Geospatial Convergence - but are we all talking the same language?

A recent talk by **Steven Eglinton** during the RICS evening lecture series took a distinctive view of BIM, says **Richard Groom**.

WHAT IS BIM? Like most of his predecessors on the BIM podium, **Steven Eglinton** argues that it depends who you ask. Indeed, he threw a new interpretation – 'Better Information Management' – into the ring for good measure. He believes that data is a commodity and that the essence of BIM is cross-discipline and cross-organisation co-operation.

Eglinton regards himself as an IT professional, having once upon a time been a GIS person and before that a cartographer. His point is that BIM is a collection of concepts that can be employed in different ways to suit different applications. It is a collaborative integrated digital process which brings together all the disciplines involved in an infrastructure project to produce a digital product for the whole lifecycle of the development. Although the focus of BIM has been on buildings, it is applicable to all forms of construction activity, with each project following a different path, governed by its needs and the nature of the spatial data.

A digital plan of works So each project should be preceded by systems analysis to clarify what digital data is needed. Eglinton advocates a "Digital Plan of Works" at the outset. This will involve an analyst speaking with all those involved in the project, including those who will run the facility after it has been completed. This was a refreshing take on BIM. So what is it? It's like any other IT development so don't let the term BIM restrict your thinking.

However, one of the key problems is that the various stakeholders do not speak the same language. Eglinton showed a slide with numerous words that BIM creators have to get to grips with. He illustrated this point by describing his difficulty in getting a clear understanding of the term 'polygon' as variously understood by GIS people, CAD people and those with a maths GCSE.

It takes some skill for the analyst to get people to explain what they do and need in an environment where they may be wary of the prospect of 'change'. As with all data collection exercises, there is a point where the cost of collecting ever more detail outweighs the benefit. A point that can be addressed at project scale but which is likely to result in mismatches between different BIMs.

Common data at the core A common data environment is at the core of BIM and should be enshrined in the Digital Plan of Works. Not only must people understand each other but computer systems and data must do so as well. BS1192:2007, PAS1192-2 and PAS1192-3 are the standards for this purpose. There are others and Eglinton used UNICLASS as an example. A new version of this feature coding standard is about to appear, so how about using it to help break down that language barrier between disciplines and promote the common understanding that is essential for BIM to work? The problem with most standards is that they are necessarily complicated in order to be universally applicable. But, as Eglinton said, the benefits of common understanding outweigh the costs.

The problem is frequently that the client is not able to articulate their 'wants'. For the analyst it's a question of combining the high level BIM vision with detail from the people at the coalface to make an economic and effective solution.

> ***. . . the notion of location as a common language for all disciplines is blindingly obvious, but to others it is not.***

Can 3D visualisation help? Eglinton also discussed the opportunities for geospatial people and some of the challenges that we face. Perhaps the greatest challenge is in how we sell the overall concept of BIM. Because we deal with geospatial data every day, we tend to take it for granted. To us the notion of location as a common language for all disciplines is blindingly obvious, but to others it is not. There is a need for clear simple presentation of ideas to the decision-makers. 3D visualisation is an important adjunct of BIM that can aid this process.

In a point raised from the audience, **Anne Kemp** mentioned the ultimate goal of Digital Built Britain, to which Eglinton added smart cities, for which models are currently produced independently, but is it practical to derive smart cities from models produced for BIM? Perhaps this is a topic for another day.

This was a talk that might have disappointed those who look for good hard certainty in BIM. 'BIM's vague, get over it!' seemed to be the message. If the intention was to get the audience thinking, then it was certainly successful. There were several questions in the hall and lively discussions followed in the Westminster Arms.

The Esri UC 2015 party was an outdoor affair with the Star of India as its flag ship.

Esri User Conference 2015: applying geography everywhere

Over 16,000 people attended the Esri User Conference in 2015 (UC 2015). Mobile sensing in all shapes and sizes played an important role at the event with crowd-sourced mapping and spatial information systems strongly promoted, reports **Adam P Spring**.

DISTRIBUTED OR CLOUD COMPUTING has changed the way companies like Esri develop geospatial services and solutions. This was very much exemplified at their user conference in San Diego, California, July 20th - 24th, 2015. For example, mapping via ArcGIS has become a connected process – one precisely shaped by its users and their intended application. Developments geared toward connected multi sensor technologies, such as tablets and smartphones, are now an integral part of Esri based workflows. Its user community is enthused by what is best described as GeoICT.

GeoICT Geographical information and communication technologies (GeoICT) started to emerge in the first decade of the 21st century. Affordable and accurate location-aware devices like smartphones had, for example, started to be included in EU initiatives like the Internet of Things (IoT) in Europe as early as 2009. Sensors and sensing are now about a connected network of users, who have the ability to communicate their experiences via numerous devices. For companies like Esri, smartphone data is as important as information collected from professional grade survey tools like laser scanners. Analytical workflows via R & ArcGIS were a prime example at the UC 2015.

R & ArcGIS R is freely available statistical software that came out of the University of Auckland, New Zealand. The announcement of an R-ArcGIS bridge platform was a smart move by Esri. Working with R enables both Esri and its user community to immediately hit the ground running in terms of information handling. It also enables Esri to better integrate itself into pre-existing user communities, which are growing beyond academic and research environments.

Overall the announcement of the R-ArcGIS community page on Github feeds into broader changes taking place within geospatial communities. This is particularly the case from within large companies. For example, Autodesk announced their commitment to open source platforms at Autodesk University 2014. The R-ArcGIS community page (**https://r-arcgis.github.io/**) provided three tools upon its launch: r-bridge-install, r-bridge and r-sample-tools. It also provides a way in which data from multiple sensors of varying quality can be integrated into ArcGIS.

Keynote Esri President and GIS evangelist **Jack Dangermond** opened the keynote by emphasising the value of networking within the Esri user community. In fact, it is seen to be at the heart of the community and its 36-year history. The multidisciplinary nature of maps is now being reflected through what Esri sees as stories. Fundamentals pertain to what maps are used for, and how this is communicated across industries and applications. Dangermond used the broad concept of geography in order to communicate his message to the audience: "GIS in its digital manifestation of geography goes beyond just the science. It provides us with a framework and a process for applying geography."

The increase in location-aware devices is considered to be part of a "geoenlightenment". In other words, Esri users now live in a connected world where information capture and flow can be instantaneous. For example, mapping can be done in real time and on the move. This was something Dangermond sees as reshaping what it means to be a GIS professional. WebGIS was a term used to explain trends linked to the industrial web. It is seen to be a transformational architecture that makes GIS more accessible and engaging to the user. Esri is benefiting greatly from smart devices and the apps that can be made for them.

Multidimensional workflows Content and information generation is now of prime importance to companies like Esri, Hexagon and Autodesk. There has never been an easier time for users of their products

> ***"GIS. . . provides us with a framework and a process for applying geography."***

to generate useable information. For example, a partnership between Esri and Hexagon was announced in June. The Hexagon Imaging Programme (HxIP) is all about high quality and precise aerial data collection and its application. For Esri, there continues to be a move away from traditional 2D ideas of what defines geographical information systems – especially within associated user communities. Various technologies on display at UC 2015 reinforced this.

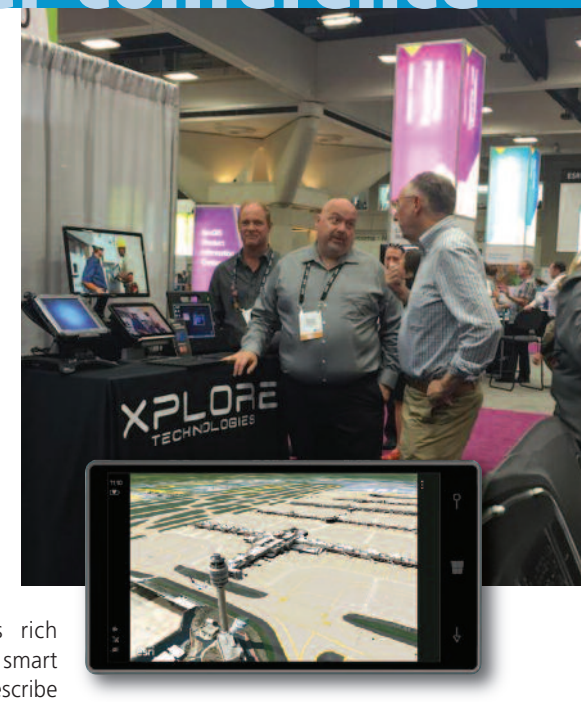
The big topics were all about mobile mapping, story maps and ArcGIS Pro. Reigl's VUX -1 RiCOPTER is finally bringing a comprehensive laser-scanning based solution to UAV based markets – albeit with a hefty price tag. The relationship between Esri and Leica Geosystems was also on show via the Pegasus backpack and its sister road vehicle-based mobile mapping solution. There were also some very interesting developments from an exhibitor called Paracosm in ArcGIS Pro.

Paracosm Consumer driven 3D imaging solutions were championed by Paracosm at UC 2015. The Florida-based company combines their understanding of computer vision and robotic navigation with developments taking place in smartphone and tablet markets. Handheld devices continue to become more powerful in terms of processing capabilities, fusing numerous sensors in one solution and are instantaneously connected to the internet. Simultaneous and localised mapping (SLAM) continues to improve this consumer-driven 3D space. It is also the bridge to mobile mapping solutions offered up for professional sectors.

ArcGIS 2D to 3D ArcGIS Pro and ArcGIS Earth provide useful solutions for sharing and publishing 3D information. For example, Google Earth has been fused with Pictometry and ArcGIS in order to provide optimal 2D to 3D map translations on a global scale. **Craig McCabe**, 3D product engineer at Esri, even told a 3D story. He demonstrated how 3D GIS is changing the way in which we analyse infrastructure and manage assets.

Continuing beyond desktop The way in which users interact with information in a digital age was openly questioned by **Amber Case** back at Esri UC 2013. Her presentation Location and the Future of the Interface raised a number of points that were more about people rather than technology. In fact, it appeared Case had closely studied the work of sociologists like **Sherry Turkle**, at that time – an MIT professor who has extensively discussed what she calls the digital self. That being, the way in which humans use technologies, such as smartphones or laser scanners, to project their views of the world.

User interfaces continue to evolve. The move away from the touch button days of the mainframe and desktop era of computing are being replaced by a touch-screen evolution. Computers are now wearable or handheld. Users are no longer tethered to a desk or fixed location which, for Esri means that data logging has never been easier. Smartphones and tablets have changed the way humans are using computers in the 21st century. Apps and WebGIS are transforming geospatial data use on an organisational scale.



Right: Jack Dangermond surprises the XPLORE Technologies team. It's not everyday a founder member of Esri visits your booth!

Insert: The ArcGIS Runtime SDK for .NET is starting to make 3D global mapping in real time more accessible.

WebGIS Distributed computing and websites as portals are at the heart of WebGIS. For **Bern Szukalsk**, the ability to process rich datasets in "the cloud" has created smart mapping. This is a term used to describe real-time enabled or reactionary mapping. Where a story could be told through the information used and the storyteller did not necessarily have to be a GIS professional. It would appear data fusion – the use of qualitative information like videos alongside map data – has become of great significance to Esri in 2015.

Gaslamp Quarter San Diego's Gaslamp Quarter is located near the Convention Center, the venue for UC 2015. It is a 16-and-a-half block neighbourhood which contains numerous restaurants and entertainment venues. Urban regeneration started to take hold in the area in the 1980s. Gaslamp Quarter is on the National Register of Historic Places in the US. It contains 94 buildings from the Victorian Era.

Summary Incresingly Esri is driven by crowd-sourced content, mobile computing and connectivity in 2015. It is started to fall more in line with the likes of Apple and Google - technology giants reshaping their business models around sensor and information fusion. For example, narratives linked to big data handling via Android and iOS apps like Collector for ArcGIS continued to unfold at ESRI UC 2015.

Below: Web implementations of GIS are changing the face of companies like Esri. Distributed processing has made it possible for anyone to use its products.

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

INSPIRE GWF

The annual European INSPIRE conference was held in collaboration with the Geospatial World Forum in Lisbon at the end of May. By many accounts it was a success, attracting over 1700 participants from over 100 countries although, unsurprisingly at least 75% came from Europe. It seems strange then that next year INSPIRE and GWF will separate again to Barcelona and Rotterdam respectively.

THE CONFERENCE THEME WAS CONVERGENCE: Policies + Practices + Processes via Public Private Partnership. The first plenary session started with this theme and had mainly public sector speakers; geospatial technology trends featured Hexagon, Esri and Topcon as well as DG Connect and Italian and Dutch environment organisations; geospatial platform enabling workflows was entirely commercial – Oracle, Bentley, SiRF and TomTom; while the final session entitled 'Geospatial practices driving policies' was all public sector including Vanessa Lawrence on behalf of UN GGIM.

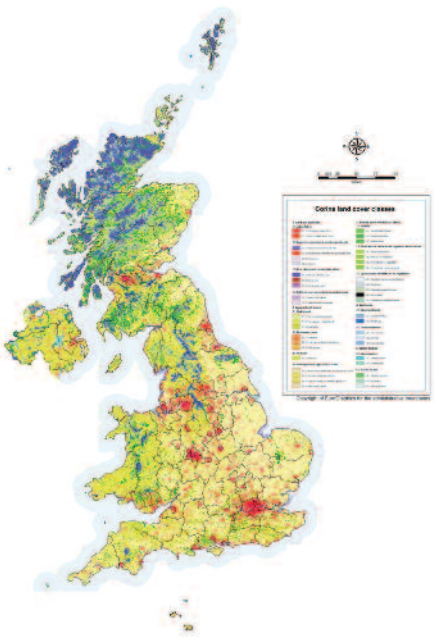
Thematic sessions came under three headings – Policy and Technology; User Segments; and Special Sessions. Five out of seven special sessions were devoted to INSPIRE including the latest 'State of Play', progress in implementation, interoperability in practice, from the INSPIRE engine room, and European SDI success stories. One of the latter, from **Savania Chinamaringa** of Defra, was Assessing the Value, Impacts and Benefits of INSPIRE: The UK Framework & Approach. There were no other UK based contributions to these sessions.

In contrast the Smart Cities session featured six UK contributors including **Lynne Nicholson** from Land Registry; **Carsten Roensdorf** of OS International and **Iain Langland** from Glasgow City Council. **Tony Mulhall** from RICS described the need to consider both smart cities and smart buildings – two rather different scales. I picked out the final recommendation of a report to the Leeds City Council executive board: 'Support the direction to all managers and services to commit to make all non-person sensitive data open and published on the Leeds Data Mill'. Will the Yorkshire mills come to life again? And in Carsten's presentation there is a map of OS International's projects worldwide with most being in the Middle East, Africa and south east Asia.

More than 20 years ago I attended the forerunner of the INSPIRE conference which was a European GIS meeting in a single small office in Brussels – about 30 delegates around a single table! When I started Eurofile in 2005 I opened with a report on the INSPIRE meeting in Alghero in Sardinia where there were perhaps two or three hundred participants all waiting for the INSPIRE Directive. Compared to many EU programmes INSPIRE has been a very open and transparent process with contributions from all countries and sectors. No one can say they had no chance to influence the outcomes and many erstwhile sceptics have had to admit that publishing their data has led to improvements in its quality and much greater use for applications that were completely unforeseen.

Eircodes Last year I visited Dublin and reported on the preparations for the introduction of Irish 'postcodes'. They were launched in July this year and are now known as Eircodes. Unlike UK postcodes, which group an average of 20 addresses into each unit postcode, there is a unique Eircode for every individual address in Ireland. An Eircode has a 3 character 'routing key' which appears to be the equivalent of the 2, 3 or 4 digit 'post town' codes in the UK and there are just 139 of these for the whole of Ireland. The remaining four characters identify each unique address but have no structure and are completely arbitrary. This means that there is no built in 'hierarchy' to compare with the areas, districts and sectors of the UK postcodes. Each flat in a block has a unique code.

One instant reaction is that it 'Works great for property tax, water charges & TV licence but doesn't make any sense for deliveries, navigation, or the emergency services!' The system has been created and is managed by Capita and was said to have been set up to 'level the playing field' for competitors to An Post which has never needed to create postcodes because its 'posties' local knowledge was thought sufficient for all deliveries despite the many duplicate addresses in the country. Ireland is the last EU country to implement a postcode system.



CORINE One of the EUs earliest geographic projects was Coordination of Information on the Environment (CORINE) which dates back to the 1980s. It set out to monitor European land use and land cover through time and the latest iteration has recently been published. The UK partner is currently Leicester University and they have just released the Land Cover map (shown on the left) for 2012 and one showing the changes since 2006. Not surprisingly the land cover showing most change was the forestry areas that have been harvested – over 100,000 hectares over the six years – and the change of use from forestry to mineral extraction and wind farming – particularly in Scotland. But still only 8% of the nation is covered with 'artificial surfaces' a.k.a. urban settlement.

The ongoing project, which is making extensive use of the most advanced satellite remote sensing and new high-resolution (layers HRLs), will be launched this October with commercial partners.

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

Busy autumn ahead. Can you help?

Once summer is over and we're back to work there's plenty to do as AGI Chair **David Henderson** relates.

AS I WRITE, the summer holiday season is approaching and it seems a good time to take stock of the year so far and to look ahead to a busy autumn. We've passed an important milestone with the formal launch of AGI's Early Career Network, which has seen a fantastic response from across the membership and been met with widespread enthusiasm - not least amongst significant employers of GI professionals. If you have been working in the industry for less than ten years follow the links on the AGI website to find out how you can get involved!

So far we've hosted four of this year's Geo: Big 5 events with the Future Cities: Security event in London held in early July. We've also been making great progress on the 2015 AGI Foresight Report, which will be published in late autumn with an inspiring set of contributions coming together under the leadership of our former chair **Anne Kemp**.

In keeping with other Geo:Big 5 events, the Future Cities: Security event brought together a really great speaker line up. Chaired by **Doug Specht** of Voz, the workshop style atmosphere of the event provided a really good opportunity to explore emerging issues and the wider role of the GI profession. High impact statistics like London's population growing by the equivalent of a full tube train every three days certainly focused the mind!

Speakers such as former MP **Dan Byles** (Living PlanIT) discussed the potential to address issues we're already facing in cities around the globe (utilities, transportation, housing) and to improve the quality of life. Where is the role for geographers? Liane Hartley (Urbanistas UK) made the case that the role of the community as "client and commissioner" in the Future City was vital but often missed. As geographers, we bring to the debate an understanding of place and more importantly the ability to communicate this effectively to society. There is an increasing need to bridge the gap between technology and communities, which fits well with AGI's mission to further the use of GI for the benefit of citizens, good governance and commerce.

> ***. . . we bring to the debate an understanding of place and more importantly the ability to communicate this effectively to all corners of society.***

Volunteers make the difference During the first week of June, Ordnance Survey with AGI's Standards Group hosted the 40th plenary of ISO TC211. During that week I had the pleasure of meeting and discussing the role of AGI with a delegation from the Indonesian National Mapping Agency. They were very interested in the work we do, to understand our commitment to professional skills development, to explore what AGI has achieved and especially to understand the level of work undertaken by our volunteers. I was reminded that we should be very proud of the work volunteers do and the range of new initiatives and events we facilitate for members. We sometimes forget that many other countries do not have this level of community and connection.

August sees the 5th meeting of the United Nations Committee of Experts on Global Geospatial Information Management (or UN-GGIM for short). The UK is represented by OSGB and ONS, and works with member states to improve policy, institutional and legal frameworks for member states. The AGI was asked to collectively comment on the reports, which fed into UN-GGIM last year, and has been invited to do so again this year. All AGI members were invited to comment on the papers this year with our Policy SIG seeking to do collaboratively across our membership. Is this something you are interested in being involved with? Consider joining the Policy SIG by emailing **policy@agi.org.uk**. Recommendations from UN-GGIM is expected to point the direction of future member state spending so it's worth keeping an eye on this.

Big Data, anonymisation and GeoComm Early October sees the last Geo:Big 5 event for 2015 - "Big Data and You" hosted by AGI Cymru in Cardiff. Big Data last year was a really thought provoking event, and raised important questions around privacy and big data. In particular geospatial is recognised as being an important key to ensuring anonymisation of personal data. This is a theme which the event will explore further. The call for papers closes on August 13th.

Our events volunteers have also been working hard on organising the "GeoCom Resilient Future" annual conference to be held in Warwick from 23rd-25th November. The speaker line-up looks great and it's super to see so many of the SIGs taking a lead on hosting the various sessions. For those of you who attended last year, I think you'll agree that it was a superb event. The Icebreaker dinner kicks off the conference, followed by two days of conference. Once again, we are rounding off GeoCom with the AGI Awards for GeoSpatial Excellence on the evening of 25th November. Last year the AWG rebranded the event to give the evening and the awards the prominence they deserve. Many of our 2014 Award winners remarked about the high regard both they, and also clients have given to not only gaining an award, but also being shortlisted. In 2014 we expanded the range of entries to ensure there were opportunities for all to enter. I would highly recommend you take a look at the award entries and submit an entry. Once again, we have put together a range of early-bird packages for GeoCom and the Awards and these are available until the end of September.

Have a great summer however you choose to spend it and once again, keep an eye on the new AGI site, our LinkedIn pages and the **@GeoCommunity** twitter feed to find out more about what AGI is doing and how you can get involved!!

FLOODED OUT – A submerged road sign by the River Ouse in York. Picture by Ron Hudson.

Insurers chart course to location data for perils management

Millions of households and businesses across the UK are affected by the risk of flooding. Understanding the locations of these properties is an essential precursor to assessing exposure, underwriting risk, setting insurance premiums and managing claims. The arrival of new data and delivery platforms also supports the analysis of perils such as crime, subsidence and even the impact of revaluation on debt payments, says **Simon Goodwin**.

FAST, EASY ACCESS to accurate and up-to-date location data for insurance purposes is the cornerstone of a partnership between the hazard modelling specialist JBA Risk Management and the geospatial services provider **emapsite**.

Building on an initial collaboration, emapsite has launched an enhanced customer offering. It enables insurers to receive newly available JBA data seamlessly through a 'Data-as-a-Service' (DaaS) on-demand location content platform.

> ***Embracing customer expectations and the opportunities afforded by cloud services, is indicative of strong demand for cost-effective, place-based solutions.***

Mature platform The platform began delivering web mapping and address search web services in 2006. Since then, the development of demand-driven, problem-solving location content and associated delivery models has enriched the platform. At the same time, there has been both market and technical innovation by customers such as insurance provider Flood Excess Insurance. Embracing customer expectations and the opportunities afforded by cloud services, is indicative of strong demand for cost-effective, place-based solutions. Typically these include risk analysis, optimal risk selection and point-of-sale pricing.

Recently added JBA datasets include Annual Damage Ratio (ADR) data, which quantifies a measure of risk for pricing purposes. Also included are the Europe Flood Map (EFM) and the Global Flood Map (GFM), both incorporating the most consistent elevation models available to identify locations at risk.

Chris Netherton, CEO of Flood Excess, explains: "We have successfully applied the new ADR data to the pricing and operational processes behind our risk analysis proposition for households. We will shortly be launching a commercial version, extending the benefits to offices, small factories, retailers and other business premises. We've outsourced supply to emapsite who provide a valuable liaison function between ourselves and JBA, together with online access to the ADR data via our XML web services."

With ADR, the annual flood damage expected at a particular location is quantified on the basis of a given risk type and property structure. Annualised losses are expressed as a proportion of the unit value insured.

ADR data can be developed for any location, including at property level, where JBA has hazard maps. In the UK, ADR data are provided for river, coastal and surface water flooding and combine well with other property-level datasets on emapsite's platform including address data from Ordnance Survey.

Global and European solutions The GFM is designed to give a comprehensive view of flood hazard at an international scale. It includes all the world's watercourses and provides flood extents and depths for river and surface water flooding over multiple return periods. The consistency of the GFM simplifies the assessment of exposure across multi-national portfolios.

The EFM meanwhile provides consistent mapping across 13 European countries. It allows hazards to be easily compared between any or all of the countries covered and provides undefended river flood hazard mapping at up to 10m resolution.

Emapsite is currently exploring additional tools that can be used to aid risk assessment. They include data cleansing, normalisation and 'mash-ups' of market and customer-specific content for accumulations, visualisation and dashboards. Users who will benefit include insurers, underwriters, loss adjusters, claims managers and other property or asset managers.

Place-based insight will be offered at different

granularities to reflect customer sentiment and the resolution of the data. Customers will be able to select sector or customer-specific 'risk' features from the data enrichment portfolio on emapsite's platform. This will include features from JBA datasets and their own data sources. Visualisation controls enable alternative, additional insights that can amplify the raw data. A simple example for flood risk assessment would be to illustrate the proximity of a stream to a property in the context of the surrounding terrain. Emapsite's platform hosts a variety of terrain and risk content including the National Tree Map, indicating tree proximity as well as height and canopy cover, and property hazard data. All such factors can be relevant in assessing the potential risk of subsidence and other natural perils.

Emapsite continues to add perils data to its platform from licensed, open and proprietary sources with both interrogation and visualisation available to inform risk assessment whether for insurance, property development or asset management purposes.

Perils of property indebtedness Specifically on the commercial side, the risk of retail property indebtedness can also be assessed. A consequence of falling property values, this is where landlords may be unable to invest in shops or shopping centres yet remain unwilling to sell or write off their debts. They can also be slow to cut rents as they have to earn a minimum rental income to keep up with loan or debt payments. The result is often run-down, shuttered-up or empty shops, so-called 'distressed' properties. Identifying hot-spots of retail property distress can, as with other risks, impact on insurance.

Emapsite's PlansAhead platform has been a stalwart of the Planning Portal since 2008 with tools for viewing and marking up documents for use in the planning application process. These tools are integral to emapsite's new Screens portfolio and form part of the toolset available when assessing risk. Users can create on-screen mark-ups, annotate shapes and make other notes relating to the specific property view. They can output views and information as PDFs and JPGs showing the JBA risk outline and any other overlay or mark-up what they want to see. This capability particularly supports non-standard and case underwriting but, as the roll call of PlansAhead users illustrates, use cases can be found across road traffic accidents, loss adjustment, retail development and sales.

Both JBA and emapsite are confident that users will see a return on investment as ever more detailed location data becomes embedded in and integral to insurance domains such as risk management, claims management, counter-fraud and marketing.

Jill Boulton, Director of JBA Risk Management, comments: "Our partnership with emapsite already offers insurers swift, high-performance access to essential data to inform their analysis and decisions. The additions that emapsite is making to its on-demand content delivery platform will enable more insurers to realise business value immediately by no longer having to deal with costly IT deployments, training and maintenance."

James Cutler, emapsite CEO, adds: "JBA's recognised leadership in hazard modelling and commitment to helping insurers manage and mitigate risk make them an ideal partner. We are proud of what we have achieved to date with JBA and are excited to add the ADR and other data to our location content platform. This work complements other partnerships we have with organisations whose data is widely used in the insurance sector such as Ordnance Survey and the British Geological Survey."

As well as the definitive addressing of residential and commercial properties in the UK, emapsite's location data portfolio includes topographic base mapping, aerial imagery, 3D terrain data and the age, construction type and footprint of buildings.

About the author

Simon Goodwin has extensive experience in building and maintaining customer relationships in the insurance sector. Since 2003, he has worked with a range of UK and global insurance organisations including primary insurers, reinsurers and brokers. He works for emapsite as business development manager for the banking, finance and insurance sectors. In this role, he ensures key partners bring complementary, best-in-class capabilities to emapsite clients.

www.emapsite.com

Above: A typical village green that parish councils seek to protect and manage.

Online GIS and a perfect storm for local government

The author thinks we have been using the wrong metaphors. We shouldn't allude to aircraft taking off but to storms and perfect ones at that, argues **Chris Mewse**. Getmapping has been in the forefront of providing aerial imagery and other services for many years, as well as promoting the benefits of collaborative on-line mapping.

THE POTENTIAL FOR THE USE OF DIGITAL MAPPING and GIS in local government has taken a long time to take off amongst the lower tiers like parish and town councils. There have been several delaying factors including the cost of software, cost and licence restrictions on data, and very fragmented council structures with many different silos 'doing their own thing'.

There's a perfect storm raging in local government at the moment, but not one of those bad ones that ruins fishing boats. This is a much more positive storm and it revolves around communities and innovative GIS tools. It's really about three separate storms that have been brewing offshore for several years and have now coalesced into one. It is now making a landfall to stir up greater community engagement and leave a trail of efficiency savings wherever it goes.

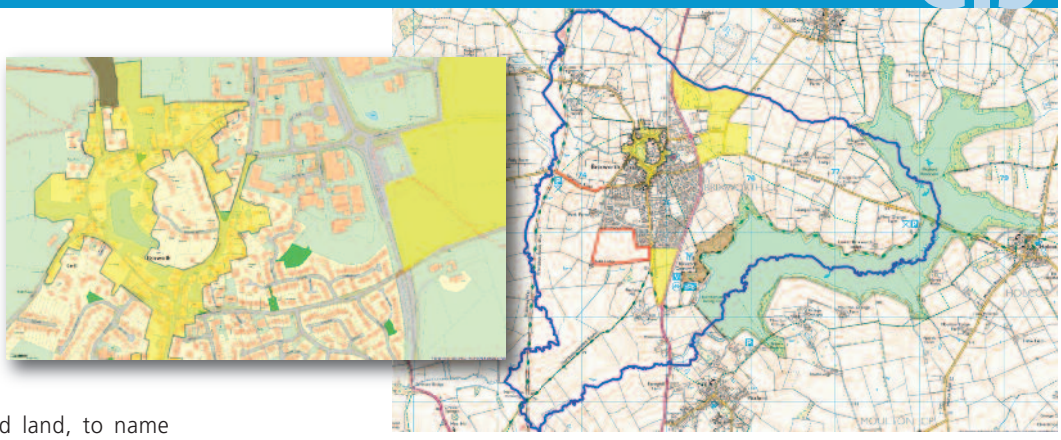
> ***It is now making a landfall to stir up greater community engagement and leave a trail of efficiency savings wherever it goes.***

The GIS Storm The first storm comes from local councils. Whether towns, parishes or communities, these organisations are the front line in local government and are charged with protecting and improving our environment and way of life at the most local level. Since the 2011 Localism Act these councils have been stirred and are now offered greater powers and responsibilities in an effort to find new, efficient and professional ways of managing their local area. By reducing the amount of legislation and control placed upon them they are freer to do what's right for their corner of Great Britain.

These devolved powers mean that a parish or town council's task now includes managing assets, developing Neighbourhood Plans, installing new infrastructure, ensuring local resilience, reviewing planning applications and protecting and defining an area's character, among many others. All these activities have geography at their core; whether it's a postcode, a political boundary or the exact position of an asset. At this point, those in the geospatial-know would immediately employ some GIS tools to manage, view and analyse this information. But local councils, many of which have a skeleton crew of a part time clerk and a few volunteer councillors, have never heard of GIS and how it could make their lives so much easier. This leads this one storm into the path of another: online GIS.

This second storm has been on the horizon for many years now. There are many online GIS / web GIS / hosted platform / SaaS / cloud-based (whatever you want to call it) solutions out there, all with their own specialities, USPs and quirks but none catering specifically for the parish or town council sector. So in 2009 Getmapping created Parish Online, a GIS web portal that councils can subscribe to, providing key GIS functions required to manage their increased responsibilities. It has a wide range of mapping datasets including Ordnance Survey's PSMA stack, aerial photography, EA flood data as well as a large collection of other public sector layers. Combined with asset management, neighbourhood planning and route analysis tools to build up their own GIS layers, Parish Online brings them into the 21st century and helps the decision making to become a 'smart parish'.

With nearly 1,000 town and parish councils subscribed to the service to date, each paying an average of £74 per annum, it's proven to be an essential tool for both large and small councils. The range of uses now far exceeds the product's original remit of simply providing digital mapping over the web. A key example is for creating Neighbourhood Plans for which local councils are compiling large amounts of information to help design the future of their towns and villages. This activity can substantially increase their income, as a completed Neighbourhood Plan entitles them to 25% of Community Infrastructure Levy (CIL) payments from developers instead of the current 15%. This gives them an incentive to strengthen their position when considering development projects over which they



Above: A developing/draft neighbourhood plan for Brixworth Parish Council.

have been given many more powers. In an exercise that needs to be so evidence-driven, having access to definitive digital mapping from a range of sources is absolutely paramount. Much of this data comes from the district and county councils which hold spatial information such as drainage, highways assets, public rights of way, council-owned land, to name but a few. And this leads us to the third storm. But this storm was largely distant, at sea, uninterested.

Since the economic downturn in 2009, local authorities have been put under immense pressure to improve public services as well as save money. This initially began as a whipping up of internal processes, streamlining and cutting the fat from operations. But today in the second big wave of cuts with most of the fat already trimmed, it's the public services that are in the firing line - libraries, waste collection and heaven-forbid, middle management (in jest)! But with the rumblings in the distance of local councils awakening, the upper tier local authorities have seen an opportunity to tackle a task that saves money and promotes localism: engage more with the towns and parishes.

A few years ago, with the exception of a few forward-thinking examples, you could have asked any county or district what support they provided to towns and parishes. The answer would have been 'we don't get involved with parishes', or 'not a lot, we supply some paper maps occasionally and that seems to keep them off our back'. But with this opportunity to engage a willing audience (and with a nudge of high pressure from above) that attitude is changing fast. Now you'll hear 'how do we go about providing these layers for our parishes?' and 'I hear this online thing is really good value as a group subscription, I'd like to do that for our parishes.'

And with that the third storm joins the party and a supercell is created! Local authorities want to save money and deliver services more efficiently. Local councils want more data, tools and power to do those jobs. Online GIS is the right tool, the data sharing platform that allows this all to happen easily and cost-effectively. Ultimately the solution is for both the authority and the local council to use the online GIS and the cost savings and efficiencies follow with ease.

Local authorities such as Bath & North East Somerset work in partnership with Getmapping and were heavily involved in pioneering the concept and developing Parish Online. All 50 parish councils within B&NES use the system, with 77% using it on a regular basis, and with the unitary authority feeding daily information into the system, clerks and councillors know that they can rely on the mapping information to make informed decisions for their community. For **Martin Laker**, GIS officer at B&NES it started off as an efficiency drive. "It began as a simple way of providing digital maps to my parishes so that we spent less time creating, printing and emailing maps. Six years later and with Parish Online as a mature online product and with a dedicated annual mapping event for clerks it's brought the authority and parishes closer together so that we can work in a more coherent and unified way. All the clerks think it's a big improvement from the siloed ways of working that we had before. The cost savings are easy to find through reduction in local authority time and resources, but the main benefits are much larger in the positive effect it has on each community". B&NES now use their own version of Getmapping's Online GIS, acting as their primary source for web mapping within the authority. This compounds the benefit as the mapping is within one ecosystem and easy to share with all interested parties.

Online GIS Getmapping has invested heavily in online GIS for Parishes for over six years, with importance placed on the infrastructure that the software is hosted from, the ease of use and the end-use applications to help the local councils. Including unlimited access to high-resolution mapping and aerial photography was the first easy step and since then tools such as AddressBase search, editing, printing to PDF, INSPIRE-compliant layers, spatial search and Street Layer have been added. Panoramic street-level imagery captured specifically for local authorities and local councils is just another innovative feature that gives users compelling ROI cases as well as quick decision-making capabilities.

Below: Two of Getmapping's survey vehicles; Rockwell aircraft and Street Layer car.

About the author
Chris Mewse manages the Business Innovation team at Getmapping responsible for the creation of new geospatial web services to benefit customers and partners. Working in the UK and Africa he has experience in a range of disciplines including survey equipment design, project management, web platform design and GIS consultancy.

West Sussex County Council also uses Parish Online. It wanted to demonstrate that it took the Localism Act seriously and to show their commitment and support to the work of local councils. In 2014 they took out a three-year subscription to Parish Online, loaded essential mapping layers into it and tasked their team of principal community officers (PCOs) to help promote its benefits, provide tutorials and engage with the town and parish councils on projects that were important to them such as devolved responsibilities. Services such as grass cutting and asset maintenance were high on the agenda and the use of mapping has led to a more accurate and consistent view. Local councils can now accurately mark out the areas that need maintenance, send out accurate tender documents, choose their own supplier and see the results. The benefits are reduced reliance on the county council, better value for money, a greater use of local businesses and a better service to the public.

Elaine Munns from the strategic planning division of West Sussex County Council explains the importance of a partnership with Parish Online and her local councils in achieving the county's goals: "It's important that these councils have the right tools for the job. Digital mapping is a powerful aid and can assist them by providing location intelligence and a unified view from the county council right down to the towns and parishes. By using Getmapping's cloud-based technology, access to this information is easy, consistent and cost-effective. All this enables informed decision-making which is in line with our ultimate aim to make the towns and villages in West Sussex great places to live and work".

Above: Map showing location of assets and proposed new homes in a Parish Online account.

At Getmapping we believe that the storm is still growing stronger but relies on forward-thinking and proactive GIS officers at district and county level to kick-start initiatives. The workflows for making this happen are now mature and easy to adopt, the Parish Online team are well-versed in implementation, and the ROI business case is a no-brainer when it comes to presenting to the chief exec.

Weather-based analogies aside, the combination of people, processes and data sharing can only lead to a more joined-up local government structure, better working communities and a vision of reducing costs AND improving public services.

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Flood mapping online

Following an agreement between aerial mapping company Bluesky and hazard mapping specialists JBA Risk Management, visitors to Bluesky's online mapshop can now view and download a high resolution flood map for the whole of the UK. Detailing peril from six different types of flooding, the Comprehensive Flood Map (CFM) is a leading tool for flood insurance underwriters and is used by over 70% of the UK insurance industry.

Rachel Tidmarsh, Bluesky's MD adds, "The winter of 2013-14 was the wettest winter on record, and it is estimated that insurers paid out over £446 million in claims to customers whose homes, businesses and vehicles were flooded – the equivalent of £6.7 million per day!"

Easy GNSS for GIS

GNSS receiver manufacturer Septentrio has announced a new software suite called PinPoint-GIS to make GIS data collection and visualization straightforward. PinPoint-GIS provides several methods of data collection, based on a standard web browser hosted on the Altus APS-NR2 and a mobile app integrated with Esri's ArcGIS or other GIS mapping system.

Any user of PinPoint-GIS benefits from bringing the data collection process into their familiar GIS environment. Data collected with Altus and Septentrio receivers is directly available in the user's GIS application to be processed into the database without any intermediary steps, greatly reducing the time and complexity of the collection process.

Pegasus:Backpack

Leica Geosystems has announced a mobile mapping system in a backpack. It consists of five highdynamic range cameras, which work in a variety of light conditions, and a LiDAR profiler with an ultra-light and ergonomic carbon-fibre chassis. The system creates a 3D view indoors or outdoors. GNSS, inertial measurement and Simultaneous Localisation and Mapping (SLAM) technologies are used to position the sensors.

Unity manages water utility networks

Trimble has announced a new version of its smart water mapping and work management cloud software, Trimble Unity. The version 2.0 adds new capabilities to support complex water, wastewater and stormwater industry asset maintenance planning and work execution workflows, support for "bring your own device" GNSS mapping receivers for smart devices and cloud-based single sign-on integration with Esri ArcGIS Online. Mobile workers can now connect their mobile devices via Bluetooth to the Trimble R1 GNSS receiver, a GNSS receiver with sub-metre accuracy or the Spectra Precision MobileMapper 300 receiver that supports up to centimetre-level accuracy.

Unity version 2.0 also features asset maintenance capabilities to allow utility customers to quickly search and group various types of utility assets, including meters, pipelines, valves and hydrants, into prioritized collections of work that can be easily assigned to crews for completion. The new features enable utilities to reduce the time and cost associated with water asset repair and installation work.

PocketGIS for Android

Positioning Resources has announced an Android based version of their PocketGIS software. Technical director **Neil Sutherland** explains "with the revolution in Android phone and tablet technology, PocketGIS is now poised to take advantage of Android's capabilities, releasing the customer to utilise the technology they may already have in their pocket."

PocketGIS Evolution on Android can capture uniform data, enhancing the efficiency of any workforce, and providing an intuitive mobile data collection system. On screen, mapping is viewed and manipulated via a customisable interface. For attributing, data fields can be set up with multiple choice, standard or cascading pick list tables, with quick remember of commonly used entries. To make the process on site more efficient, automatic update will insert content based on default or last entry options. Photos, bar codes, RFID and cable locators can all be directly linked to capture data. Data management is achieved via the cloud, email or manual transfer, utilising WiFi, Bluetooth, and mobile comms, providing a direct link to the office. Import and export is by common data formats.

Zeno Collector for ArcGIS

A new solution that enables users to capture, manage and share their data, regardless if they're in the office or the field, without sacrificing precision or interoperability has been announced by Leica Geosystems. The Leica Zeno 20 rugged, an Android-based handheld, has combined with Esri's Collector for ArcGIS, one of the most powerful and configurable field data collection apps in the world. ZenoCollector with an ArcGIS Online organisational subscription for one year connects users to the ArcGIS platform, automatically synching field changes to information and giving everyone access to the latest data gathered in the field. Collector for ArcGIS also supports offline data collection. Any updates will be synchronised with the map once the user is reconnected.

"Esri and Leica Geosystems recognise that enterprises may have particular field data collection challenges that smartphones can't ideally meet," said Esri president Jack Dangermond. "We're excited to combine Collector for ArcGIS with Leica Geosystems' industry-standard surveying units to create a more rugged and accurate solution for the more exacting needs of organisations."

calendar

| 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*.

SEPTEMBER 2015

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

IMMERSION 2015
7-10th September 2015, Paris-Sorbonne University, France
http://summit.immersiveeducation.org

InterDrone
9-11th September 2015, Las Vegas, USA
http://www.geoconnexion.com/events/interdrone/

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

AGI: The changing face of data within the water industry
29th September, 2015, Exeter University, Exeter, UK
http://www.agi.org.uk/events/calendar

OCTOBER 2015

Blue Marble User Conference 2015
6th October 2015, Arlington, USA
http://www.geoconnexion.com/events/annual-user-conference/

Geo:Big 5 - Big Data & You
8th October 2015, SWALEC Stadium, Cardiff, UK
http://www.agi.org.uk/events/calendar

Esri European User Conference 2015
14-16th October 2015, Salzburg, Germany
http://www.geoconnexion.com/events/esri-european-user-conference-2016/

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

NOVEMBER 2015

GeoCom: Resilient Futures
23-25th November 2015, Warwick, UK
http://www.agi.org.uk/events/calendar

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- The ease of use of the Zeno 20 software means you don't have to be a GIS or surveying professional to use it

Interested in finding out more?

To find out more information about Leica Zeno 20,
please contact Nathan Ward at **Nathan.ward@leica-geosystems.com**
or visit **http://www.leica-geosystems.com/zeno20**

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