

The British Cartographic Society Annual Symposium 2010

Talking with Maps

Presentation Summaries 1: Thematic Mapping

Death's Designs. Mapping explosive remnants of war

Chris Going, Managing Director, GeoInformation Historic

Abstract

'Explosive remnants of war' (EROW): mainly unexploded air dropped bombs, and 'area denial' weapons such as cluster munitions and landmines are legacies of 20th century conflict with which construction industries must grapple as the world expands onto former battlefields, manufacturing sites, and old targets. All can remain viable for decades.

While unexploded and residual weapons can be a problem in the developed world their most baleful effects are felt by third world societies with agricultural and subsistence economies. There the bill is paid in lost limbs and lives – particularly of children.

In the developed world, mainly in Europe and East Asia, it is routine to search for unexploded ordnance before building projects. In 2009 the UK building sector has rather belatedly published its own first guide to UXO hazard (CIRIA Report C681).

Often UXO hazard is mapped at site-specific level, but where major infrastructure projects –such as motorway construction - are being undertaken, a more broad-brush approach is necessary. These draw on a wide variety of documentary and photographic evidence is needed. In damaged agricultural regions (for example, Laos and Mozambique), where land mines and cluster bombs have been used, yet larger scale surveys are necessary – up to province and even regional level.

This paper looks at how war damage has been mapped from Napoleonic times, at site level, area, region, to entire country level. It explores the classification of damage to the French landscape in the wake of the First World War, at ways Second World War bombing campaigns were assessed, to the recovery of 'lost' computerised data for the

groundbreaking 'UXO Laos' project, and to examples of UXO risk map today using examples from Asia (Laos), North Africa, the UK, and Continental Europe.

Biography

Chris Going has been involved with the creation and dissemination of aerial photography for over thirty years, initially as an archaeologist (assisting in the foundation of the first journal dedicated to aerial archaeology) and latterly as a risk analyst working internationally in the field of explosive remnants of war (EROW).

A past chair of the UK National Association of Air Photo Libraries (NAPLIB) Chris has acted as consultant to some of the world's largest aerial imagery archives advising them on the curation of their holdings.

Currently he is Managing Director of the Historic Division of The GeoInformation Group, which aims to make historic aerial imagery currently kept in public and private repositories in the UK and USA as widely available as possible, using the most up to date technology.

Recent projects include advising on a Bafta nominated and Emmy winning television series using aerial imagery as part of their format.

Representing large multivariate datasets in a single choropleth map: the use of multidimensional scaling to inform colour allocations

James Cheshire, PhD Researcher, Centre for Advanced Spatial Analysis,
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Abstract

Choropleth maps are often ineffective when representing data with very many variables because they are limited to a single colour for each spatial unit. One popular solution to this problem involves the aggregation of multiple variables to a single variable prior to mapping. This may take the form of simple averaging or more complex clustering. Another potential solution applies to full colour maps; by treating the spatial units' colour

allocations as a combination of red, green and blue (RGB) intensities three variables (one for each RGB component), not one, can be represented.

This presentation will demonstrate the effectiveness of prior aggregation on multivariate data to create three variables that inform a map's colour allocations. First the variables are reduced to a set of three coordinates using multidimensional scaling (MDS). When plotted in three dimensions, the data points that are closer together in the MDS data space have characteristics (based on the values of their variables) that are more similar than those further apart. This characteristic means that when the coordinates are rescaled to RGB values (0-255) the data (spatial units) with similar characteristics (and therefore similar MDS coordinates) are allocated similar colours in the resulting choropleth.

Example maps produced using this method can be viewed at spatialanalysis.co.uk/surnames. This methodology appears especially effective when visualising variables that vary gradually over space, such as linguistic characteristics. The method effectively highlights anomalies by allocating colours that reflect the significant difference between an exceptional spatial unit and its surroundings. In short, the use of MDS to inform the resulting RGB colours in a choropleth provides one potential solution to the common problem of representing data with very many variables.

Biography

James is a PhD student at the Department of Geography and the Centre for Advanced Spatial Analysis, University College. His research is sponsored by the Economic and Social Research Council and ESRI (UK) and his interests lie in the spatial analysis of surnames. In addition to undertaking PhD research, James is the GIS Specialist for UCL's ESRI Developer Centre and Postgraduate Representative for the Royal Geographical Society's GIScience Research Group. More information on James's research and broader GIS interests can be found at spatialanalysis.co.uk.

Forget how do you get two whales in a mini; how do you fit millions of people into an event - safely?

Ralph Diment, EMEA Marketing Lead, Government & Transportation, Intergraph, UK

Abstract

Their sheer scale combined with the need to coordinate such a diverse range of organisations makes delivering major events one of the most complex and challenging undertakings. In the lead-up to the London Olympics, much coverage has been given to the use of mapping in functions such as visualisation or analysis to support planning. However, far less is known about the geospatial systems that underpin the actual delivery of major events. In contrast with stand-alone GIS applications, these systems are tightly integrated with a diverse set of ICT (information and communication technology) and rely on map data and geospatial processes to bring order and control to what are some of the most complex and demanding operational environments.

Examples including Euro 2008, the Rio Pan-American Games and the Obama Presidential Inauguration will illustrate how mapping is used to build and maintain a real time operating picture (situational awareness), integrate and interact with critical ICT such as digital radio, CCTV and sensors, manage and communicate with mobile resources and exploit embedded spatial processes to simplify and automate responses that help ensure swift and effective response.

Biography

A Geography graduate of the University of London, Ralph's 20 year career in GIS has enabled him to work with some of the most exciting and innovative geospatial projects. Key among these have been the National River Authority's Shoreline Management System (the UK government's first application of GI to develop a regional, information-driven, integrated management strategy), the Dubai seafront redevelopment, map production workflows and asset management for London Underground.

A recurring theme has been the integration of geospatial information and processes with wider IT, ranging from specific applications (such as numerical models) to enterprise ICT encompassing ERP, CRM and asset management applications. For the past five years,

he has been responsible for marketing and is Intergraph's lead for the Government and Transportation sectors in EMEA.

Topological trail mapping for winter sports

Dr Kenneth Field, Kingston University London, Centre for GIS (ESRI Development Center), United Kingdom

Abstract

Trail maps for winter sports often take the form of highly illustrative landscape paintings overprinted with trails and lifts to allow skiers and snowboarders a mechanism for on-mountain navigation. The character of mountain environments lends itself particularly well suited to the traditional form of representation which creates visually pleasing maps (often referred to as panoramas).

However, navigating is not always easy since conditions, map perspective, orientation and the illustrative form often make reading the map awkward. Landscape artists have more often than not sought to replicate the beauty of the landscape rather than create a backdrop that promotes on-mountain navigation through judicious application of cartographic design principles. More recently, highly illustrative and detailed paintings have been replaced in many resorts by digitally derived versions which amount to little more than draping low resolution satellite data over a poorly tilted Digital Elevation Model.

The work presented here sought to develop an alternative to the traditional ski resort map by reducing a mountain and its trails to topological primitives. As a series of interconnected routes, the navigation on mountain is similar in principle to that of a metro system so the map has been developed in that style allowing the network of trails and lifts to become visible. The map illustrates the 176 trails in Breckenridge, Colorado derived from GPS track logs and incorporates a range of other contextual datasets. This paper explores a little of the history of panorama painting and recent developments in mapping mountain regions for ski resorts. It further describes the philosophy, design and approach taken in creating the topological map as well as describing the way in which GIS has been used as a production tool to create high quality cartographic output. The

map won the 'best software integration' and 'best overall' categories at the 2008 ESRI EMEA conference.

Biography

Dr Kenneth Field is Principal Lecturer at Kingston University London and Course Director for undergraduate and postgraduate courses at the Centre for GIS. A graduate of Oxford Polytechnic's cartography degree programme, he has spent the 20 years since graduating enthusing successive groups of students at Northampton and Kingston Universities on cartographic design and production, increasingly through the use of GIS technologies. He has presented at over 50 conferences worldwide, published a similar number of papers and book chapters and is the current Editor of The Cartographic Journal. He continues to practice cartography and has authored a number of large format special purpose maps, some of which have received international awards. He is Nottingham born and bred and has promised to deliver his presentation in his Nottingham Forest football shirt (and stick to time).