Sheetlines

The journal of
THE CHARLES CLOSE SOCIETY
for the Study of Ordnance Survey Maps

The Charles Close Society was founded in 1980 to bring together all those with an interest in the maps and history of the Ordnance Survey of Great Britain and its counterparts in the island of Ireland. The Society takes its name from Colonel Sir Charles Arden-Close, OS Director General from 1911 to 1922, and initiator of many of the maps now sought after by collectors.

The Society publishes a wide range of books and booklets on historic OS map series and its journal, *Sheetlines*, is recognised internationally for its specialist articles on Ordnance Survey-related topics.

Ordnance Survey and OpenStreetMap: UK mapping is getting crowded
Steve Chilton [1]

Introduction

Following a mention of working on the OpenStreetMap project (OSM) at the talk given at the CCS AGM in May, the editor suggested *Sheetlines* readers might be interested in some background to the project, what it is and why it exists. Initial thoughts were along the lines of 'what relevance does this have for OS aficionados'? Hopefully, by considering how OSM is similar to OS, and also, importantly, how it differs, some understanding will be gained. In this short article it is hoped to address those issues, and along the way illustrate how the geodata landscape is rapidly changing just now.

Background

To address the question above a trawl was undertaken of the volumes of *Sheetlines* since joining CCS (consisting of the last seven issues) to see how much material was included that would be considered tangential to Ordnance Survey specific matters. The initial impression – that there would be none – was actually changed on looking at the summary. There were a significant number of mentions of peripheral subject matter, such as some new map products from non-OS publishers, and some visit reports. There are a couple of more significant pieces of non-OS content, such as those on Irish postcodes [2] and Loc8 [3] by Paul Ferguson and Gary Delaney respectively, and perhaps Alex Kent's two-part article on cartographic styles.[4] Also noted were how few pieces there were about contemporary OS work. CCS is the society for the 'study of Ordnance Survey maps' after all, and not specifically the 'study of the history of OS maps'. In these two years of output there were only two significant articles – one by Anthony Cartmell [5] and one by David Archer.[6] Hopefully the content of this piece will redress that balance in some small way.

OpenStreetMap

So, what is OpenStreetMap? According to the project wiki 'OpenStreetMap creates and provides free geographic data such as street maps to anyone who wants them. The project was started because most maps you think of as free actually have legal or technical restrictions on their use, holding back people from using them in creative, productive, or unexpected ways.'[7] The back-story to that is that

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[2] *Sheetlines* 89, 16-18.

[3] *Sheetlines* 90, 38-40.

[4] *Sheetlines* 87,19-28 and 88, 11-16.

[5] *Sheetlines* 87, 39-43.

[6] *Sheetlines* 89, 33-35.

[7] *http://wiki.openstreetmap.org/wiki/Main_Page*

it was the frustration of the restrictive license of the Ordnance Survey at the time (2004) that made the OSM founder Steve Coast decide that there should be an alternative. He was a postgraduate student at UCL at the time and just wanted to send a map of a party to some friends. He had this wild idea that by using a consumer-grade GPS unit he could survey the area he was interested in and produce his own map. His next leap of faith was to think 'why not get others to do the same for their immediate area and then we could map the world'. Oh, yes, and 'we could release the data with a Creative Commons licence to allow them to use the data in interesting ways' – as noted above. That is the bare bones of the gestation of the project. Coast (2006), in a presentation on the project at the Society of Cartographers conference in the early days predicted global take-up – and many thought there was no chance of this happening. How wrong was it possible to have been? There are now over 400,000 registered contributors in the project, and in well-mapped areas it provides a fantastically detailed and accurate map and geodatabase. However, this is not the time and place to give a detailed history of OpenStreetMap. Actually, there is a job for someone to do just that, as it hasn't been documented – to the best of the author's knowledge – although some history (and much other detail) is covered in Ramm et al (2011).

Rivals to OS

These are changing times for Ordnance Survey. There have been other startups trying to take on the monopolistic position that the OS have been in as far as providing detailed map data in the UK is concerned. As well as OpenStreetMap there have been the efforts of both UK Map and the People's Map. UK Map is 'a modern, highly detailed and feature rich mapping database created independently of Ordnance Survey'.[8] The layered data is very detailed and has been digitised from original aerial photography of the Geoinformation Group. Unfortunately, it is currently only available for London. The People's Map is 'an exciting new mapping concept which enables any individual or organisation to create and maintain maps of Britain by 'drawing' features like roads, land use and point of interests over aerial photography, using simple online editing tools'.[9] So, the difference from UK Map is that it crowd-sourced data, although seeded by information by its 'backers' – Getmapping (aerial photography) and XYZ Maps (reference data sets). It seems, however, that the project is now moribund. The latest news entry on the website is dated 18 March 2010, and the forum has very few entries, mostly from 2009. Lastly the map, as displayed in the web browser on the website, has an alarmingly poor level of detail, with even the main road network incomplete.

OS OpenData

It is possible that these two developments were, in effect, sidelined by the announcement by the UK Government that Ordnance Survey was to release some of its data freely under the OpenData proposal on 1 April 2010. The

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[8] *www.geoinformationgroup.co.uk/products/mapping*
[9] *http://peoplesmap.com*

announcement of this eventuality was made by Vanessa Lawrence during her keynote speech at the International Cartographic Association conference in Santiago, Chile the previous November. Your correspondent was there to witness this momentous announcement and readers might be interested in a personal take on it. The following is a slightly amended version of a piece published in the SoC Bulletin (Chilton, 2009):

> 'Vanessa Lawrence (CEO of OS) was giving a keynote presentation. Blow me down if Gordon Brown doesn't make the announcement that very day about proposed changes at the OS, and freeing-up some OS data maps and data.
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> So Vanessa is halfway round the world and frantically re-writing her keynote presentation. But the amusing thing to me was that a couple of people who had been in my presentation [where I had predicted OS having to make significant changes] came up to me and said things on the lines of 'I see what you were inferring in your presentation yesterday', and making me out to be some kind of seer or person with inside information – neither of which is remotely true.
>
> Vanessa gave a consummate performance in the keynote, underlining the point that the government had certainly better back the theory with appropriate funding if the OS was to retain its position as supplier of high quality geo-data. By the simple expedient of offering to carry her suitcase I was invited to lunch by Vanessa that day. Whilst OS are obviously trying to keep abreast of technologically-led developments I suspect she herself has a slightly old-fashioned outlook. She was particularly surprised that No.10 had actually released the information about proposed changes at OS via Twitter, rather than by a traditional press release (which admittedly came later). She also impressed on me that our lunch conversation was strictly 'off the record', and that under no circumstances was I to be off tweeting it directly afterwards. I can honestly say that, tempting as it might have been, I respected her enough to not do anything of the sort. There were indeed some fascinating insights on possible ways forward for OS, funding, future of paper products, staff issues etc within our conversation. An indication of the global nature of communications was Vanessa's view that there was actually no problem with her being in South America when the news broke, and she was not dashing home on the next plane. She was in constant contact with her managers at OS, and able to record video messages for her staff to be availed of her views on their future, etc. So not THAT old-fashioned then.'

Changes at OS

So, what effect did all this have on OS? Between that announcement in November 2009 and the making available of some data on 1 April 2010 there was a consultation on the way forward, which has already been commented on significantly in this publication. Much credit to OS for getting the portal in place to release the agreed data in a timely fashion in April, although those of a cynical nature (myself included) suggested that they had inside information well before the closing date of the consultation in order to make those arrangements in

advance. As well as the OpenData provision that OS had to encompass, the whole situation seemed to act as catalyst to other changes at the organization that started bringing it well into the new era. One of these was the OpenSpace initiative. The OS OpenSpace API is free to access and lets developers create web applications and online projects with OS maps. Initially the tile access limits were hugely restrictive and caused all sorts of issues. These have been relaxed, but are still in place, unless you opt for the 'charged utility pricing model' – i.e. the Pro version. The initial service has morphed into web-map builder,[10] and now you can pick up ready-made code to embed an OpenSpace instance in a web page or popular blogs such as Wordpress or Blogger. Next came Geovation, which is 'about helping communities address their unmet needs through the application of geographic data, skills and expertise' – i.e. using OS data.[11] Geovation, along with OpenSpace and OpenData, all have their own blogs and use twitter to disseminate information about developments.

OS OpenData and OSM

Some pundits were predicting that the release of OS OpenData would sound the death knell for OpenStreetMap, or that the project would just incorporate all the OS OpenData and have nothing else to do in the UK. In fact neither of those scenarios came to pass. The fact that MasterMap is not included in the OpenData package, and that therefore large scale data is still costly to licence, meant that the existing excellent provision of large scale data within OSM would be expanded on by the micromappers in the project. It is worth noting that whilst much of the original data collection for OSM was with commercial grade GPS units (and still is to a considerable extent) there has been the possibility of using high-resolution aerial imagery from Bing as a source more recently. This has been rectified and tiled as backdrop in the editing software and has enabled mapping as detailed as the area of Sutton Coldfield illustrated (*figure 1*),[12] and level of detail of the OpenStreetMap data compares very favourably with other available mapping sources (e.g. Google and OS OpenData StreetView).[13]

A fuller analysis of the data released by the OS OpenData initiative and the reasons for it not being imported into the OSM dataset is given in a recent paper in the Cartographic Journal. In this, Chilton (2011) concludes 'OS OpenData gives access to places one cannot otherwise go, such as docks, but so does aerial photography. It provides features such as power lines and some waterways that cross land that one does not have access to. It gives access to the official, up-to-date boundary data that are just not available in any other form that can be used. It is much more up-to-date than some of the aerial imagery and some of the

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[10] *http://openspace.ordnancesurvey.co.uk/openspace*

[11] *www.geovation.org.uk*

[12] *http://mappa-mercia.org/?zoom=16&lat=52.56047&lon=-1.82078&layers=B*

[13] Google comparison:
http://tools.geofabrik.de/mc/?mt0=mapnik&mt1=googlemap&lon=1.82075&lat=52.56039&zoom=17
OS StreetView:
http://tools.geofabrik.de/mc/?mt0=mapnik&mt1=ossv&lon=1.82075&lat=52.56039&zoom=17

datasets have names in them (StreetView and Locator), though that does have some small level of errors. There is also the postcode dataset which is a valuable source of data that would be very difficult to gather exhaustively otherwise. However, despite all, this there has not been, and there is very little likelihood of there being, large-scale import of OS data into OSM. It will, however, continue to be used in various ways as a check mechanism for locally surveyed data.'

Figure 1. Detailed OSM mapping of Sutton Coldfield, from ground survey and aerial imagery. (OpenStreetMap data licensed under Creative Commons Attribution-ShareAlike 2.0)

Uses of OS OpenData with OSM

One of the reasons for the conclusion above is that the project has always aimed at being a new and up-to-date map, and not just a repository of other's geodata. However, if existing data can be used to compile features difficult to survey in the field then consideration has been given to using it in some cases. For instance, water features are difficult to survey in the field with a GPS device. These are distinguishable on early Ordnance Survey maps that are now out of copyright and are unlikely to have changed significantly since then. Members of the project who have accumulated full sets of OS New Popular Edition one-inch maps, and also those from the OS 7th Series, have had them scanned, and then geo-rectified and then made available via a web server as backdrops in the two standard OSM editors. These scanned maps are available for others to trace or derive data from, under a Creative Commons licence.[14] Significant amounts of rivers and streams have been added to OSM from the New Popular Edition sources (*figure 2*), and more recently water features such as the lochans on the Isle of Lewis from the 7th Series maps (*figure 3*).

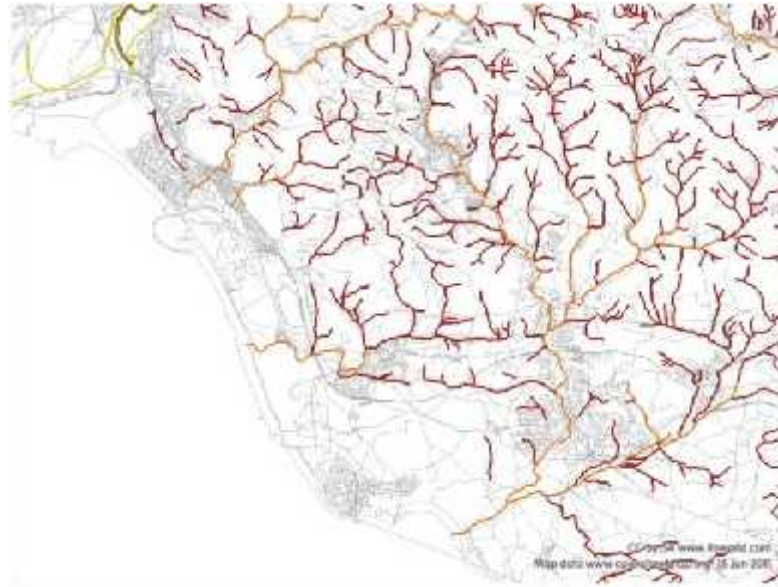[14] *www.npemap.org.uk/* and *http://steve8.dev.openstreetmap.org/os7.htm*

Figure 2. Rivers and streams traced from out-of-copyright OS New Popular Edition scans
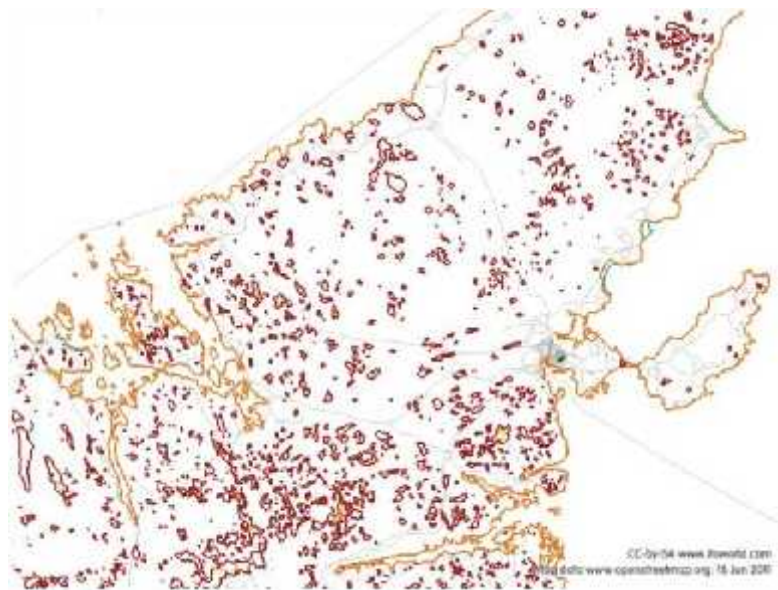

Figure 3. Lochans traced from out-of-copyright OS 7th Series scans

One strange manifestation of the availability of OS OpenData has been the move by OSM data users to emulate the printed OS output form, but enhanced with other data that is not in the OpenData set. One example takes VectorMapDistrict, Landform Panorama and 'mashes' it with footpath data from OSM to produce a resulting map that emulates the *Landranger* style of mapping,[15] by applying OS-style colours and lettering as it renders the tiles to the web server. The developer (OSM, 2011) notes that 'the end result is reasonable

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[15] *www.free-map.org.uk/expts/vmdlfp200*

though it is a shame that the VMD data does not include service roads; the result is often that footpaths disappear in thin air close to a road due to a missing service road'. On a more commercial basis, a company in Yorkshire has been putting a map together using a mixture of OS StreetView (buildings), OS VectorMap District (roads, forests, water, crags), OS Landform Panorama (contours, relief), OS BoundaryLine (civil parish names), OS Strategic (national park boundaries, mountain range names) and OpenStreetMap (point names, footpaths, parks, schools, etc.).[16] Similarly, apps for mobile phones are now proliferating. One such is the UK Map app[17] – for iPhone, iPad and Android – which combines many of the OS OpenData sets with footpath data from OSM (*fig 4*), and also has a separate 3D version for the Lake District.

Figure 4. Screenshot of the iPad version of UK Map app
(contains Ordnance Survey data © Crown Copyright and database right 2010, and OpenStreetMap data licensed under Creative Commons Attribution-ShareAlike 2.0)

Research

Ordnance Survey clearly identifies its research strands as: Usability, Automatic change detection, Data improvement, 3D data modelling, Linked data web, Mobile devices[18]. The OpenStreetMap project is grappling with similar topics, in its own way. Members are looking at the usability of both the map[19] and the underlying data. Change detection and data improvement are a function of community building. Areas that are well mapped and kept up-to-date are usually those that have individuals or groups of people out surveying and checking

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[16] *www.grough.co.uk/lib/documents/tmp/lss/nn17.jpg*
[17] see story on page 59 of this issue.
[18] *www.ordnancesurvey.co.uk/oswebsite/education-and-research/research/index.html*
[19] *www.gravitystorm.co.uk/shine/archives/2010/10/04/quick-and-dirty-usability-testing-of-osm/*

constantly, and monitoring the RSS feeds of changes being made to the data. The value of the availability of OSM data has been demonstrated by the numbers of people working in 3D developments with that data. The project wiki currently lists 22 such developments.[20] The market for mobile services based on the data seems insatiable. Again, the wiki lists many such add-on projects in fields such as: routing, 3D, editing, transport, etc.[21]

Finally, one of the questions often asked is whether data collected by such disparate methods, such as consumer GPS devices, can be accurate enough to use for real. Findings from several different OSM accuracy studies have concluded that it most certainly is. Haklay (2008), when commenting on a quality analysis of OSM data against OS Meridian data, stated that 'this preliminary study has shown that VGI [volunteered geographic information] can reach very good spatial data quality'. Further research by Amer (2010) concluded 'these results proved that in terms of positional accuracy, OSM has the potential to deliver highly accurate results which can be achieved purely from the use of handheld GPS receivers'. Details of all the extensive, and global, research on and into OpenStreetMap can be obtained via links on the project wiki.[22]

Conclusion

The foregoing gives some insight into the gestation, scope and influence of the OpenStreetMap crowd-sourcing geodata and map project. It remains to be seen whether OSM will establish itself as a viable alternative to Ordnance Survey for large scale map data users. What is evident is that it is already in many different ways a wide-ranging, and influential, player in this changing geodata world.

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[20] *http://wiki.openstreetmap.org/wiki/3D_Development*
[21] *http://wiki.openstreetmap.org/wiki/List_of_OSM_based_Services*
[22] *http://wiki.openstreetmap.org/wiki/Research#Activities*