

What To Do If Your Government Is Hoarding National Geospatial Data?

Geodata is a priceless public resource, but few national governments see it that way. How can you get free and fair use of it?

If you're not based in North America, you're probably flipping through this book thinking, "Almost all these hacks are based on US data! How can I make my own maps of London/Karachi/Accra/Quito?"

This isn't regrettable cultural arrogance on the part of the authors; it is a reflection on the lack of geospatial data available in the public domain. Even the world maps and gazetteers built in this book are mostly derived from data published by US intelligence agencies, not from local sources.

National mapping agencies are in a difficult position. They provide an essential public service and are arguably part of the core machinery of government, along with roads, streetlamps and schools - the kinds of services that would not be adequately provided by 'market forces' alone. But mapping agencies are squeezed by commercial pressures; because they have a clear potential revenue model, they are liable to be privatised. Citizens who paid handsomely in taxes for the initial data collection, now pay to have it sold back to them piecemeal, without access to or means to contribute to the raw data from which the maps are generated.

Long-established national mapping agencies tend to have a military origin, like Britain's Ordnance Survey and nima.mil, formerly the Defense Mapping Agency. Visions of action-men bent over a strategic map spread out over a table, or moving tiny flags on a wall-mounted territorial display as the frontline advances and retreats. Maps were essential military instruments - a few hundred metres calculation error in the bend of a river, or the slope of a hillside, could mean death for many thousands, the fall of a city. Without the map to demarcate the territory, how could it be defended? Geospatial data is key to many other, more peaceable government functions; road building, public transport planning, pollution monitoring, political boundary (re)drawing, refuse collection, sizing school and hospital catchment areas, just-in-time route planning for emergency services. Location - it's everywhere!

Across the world, centralised, national mapping agencies are maintaining geospatial databases as government sub-departments, while under pressure to realise their commercial potential as a geodata monopoly, and having budgets cut or status changed as a result. Meanwhile local government departments and community groups are obliged to buy back the maps and filtered data from the national agency. They pay millions for proprietary software and consultancy from ESRI, and create their own data in undocumented formats. They can't share the data with each other because they don't have clear legal rights to redistribute it; they can't connect it to their other logistics systems over the web because the interfaces are closed.

The raw geodata underlying the map is not for use by ordinary citizens at all. Academic and non-profit institutions get a discount.

The European Union faces a particularly challenging set of problems, with the ten new countries and nine new official languages recently added to the current fifteen. Twenty-five 'territories', each with its different naming conventions for regions and districts and postal codes and political systems, which need to be mapped between.

There is an exciting prospect, were the underlying map data opened up to free use by those nations, that academics and enthusiasts would solve many of these problems while 'scratching their itches'; environmental scientists exchanging flooding data across borders, determined linguists translating metadata models into Welsh from Polish, hackers writing geocoders for street addresses in different forms to support locative services.

One common argument against freeing national geodata is that NMAs would lose a lot of their revenue model; anyone, a small to medium business, a local councillor with a copy of Manifold, an inspired reader of this book, could make and maintain their own maps. The mapping agency would be merely left with the task of geodata collection and maintenance. Some of this needs to stay in the public domain - remote and rural areas, for example, which a purely commercial market (such as cell tower telephony) would not have an economic incentive to cover. This is surely an argument for keeping geodata collection in the hands of elected authorities, an important source of trust for data distribution.

There are drawbacks to the US model of local free geodata. The mapping agencies, not making commercial offerings, are dependent on federal or state funding, which can fluctuate between administrations. Meanwhile huge companies like Navteq and ESRI, who can afford to rent time on earth observation satellites and send fleets of scouts out 'ground truthing' with GPS units, are augmenting the free TIGER data with more accurate data and up-to-date feature sets, with no obligation to enrich the public domain with new data.

In truth, these huge companies already have accurate thematic maps and feature databases, and they aren't going into the public domain whether or not national geodata is publically released. And for the first time, since the descrambling of the US GPS spectrum and with international offerings on the way, ordinary citizens have the affordable technology, and the free tools outlined in this book, to actively contribute to the maps that describe their world. Open geodata would be a millions-saving boon to small businesses and local government departments. The latter could have the means to collect and make sense of metadata about their communities at a local level.

A principled idealist might argue that national mapping data should be released under a GPL or ShareAlike licence - <http://www.intramap.co.nz/atlas/freeworldmaps.html> puts this case convincingly. But this might prove unacceptable to large businesses, and detrimental to smaller ones. It might also widen the gap between public domain geodata and commercial offerings, in both coverage and intent. That person who controls the map, he controls the image of the map in the world. If you would like to own your map, and the government where you live has a restrictive policy on geodata:

Formulate a project - a 'cool hack' ideally with an educational and civic aspect. Write to named members of your national mapping agency, making the exact scope of what you need clear. If they seem unreceptive, ask if you can come in for a meeting and chat anyway, offering to share your specialist knowledge.

Get together with other geohackers on the web, working on related projects or ideas. Hold a show'n'tell workshop about your projects, and invite some mapping agency representatives.

If your NMA is still unreceptive, try going upstream - write to the government department that nominally runs or funds your national mapping agency. Stress the fact that data withholding is throttling innovation in the mobile market and masking the true nature of local statistics.

DIY! Focus on a small area around you, and start making your own shapefiles from GPS traces, annotating local sites of interest in an OpenGuide, map the local community wireless network.

If you're in the US

You have nothing to worry about! Under US law, all information published by the federal government must be copyright-free, and must be made available at the nominal cost of copying it. In 1997, Bruce Perens purchased the US Census Bureau's TIGER dataset on CDROM, and made the data freely available on his FTPsite. This prompted the Census Bureau to publish all its data for free download over the web. Now the US government is running a 'one-stop shop' initiative which includes free data from the National Imagery and Mapping Agency and the US Geological Survey - <http://www.geodata.gov/>. The latter provide the excellent 'seamless' system featured in [Seamless Data Download from the USGS]. <http://seamless.usgs.gov/>

If you're in Canada

Your luck is improving! Partly as a result of grassroots lobbying by GIS industry experts, a government policy study recommended that "Digital geospatial data that are collected or created by any level of government should be made as readily available electronically to the public as possible". Canada now publishes increasing amounts of free data through its 'geoconnections' website, <http://cgdi.gc.ca/english/index.html>

If you're in Australia or New Zealand

You have ANZLIC, The Spatial Information Council which covers Australia and New Zealand and publishes metadata standards based on ISO 19115, which in turn is converging with the OGC standards. The ASDD is a one-stop data directory service for Australia. There are free topo and DEM models available, and a selection of feature and geoscience data sets which are deemed "fundamental". There's not much in the way of demographic data. <http://www.anzlic.org.au/http://www.ga.gov.au/>

The Australian government geodata policy states that "Fundamental spatial data will be provided free of charge over the Internet, and at no more than the marginal cost of transfer for packaged products" - <http://www.osdm.gov.au/osdm/policy.html>

If you are in Denmark

You are lucky! The Danish government has the most liberal data policy in the EU. <http://www.geodata-info.dk/> is a central portal service. <http://dk.space.frot.org/> is an interesting semantic web service based on the complete, public-domain set of Danish addresses.

If you're in the rest of the EU

You need deep pockets. Most EU National Mapping Agencies operate on a partial cost-recovery by user payment model. As of writing, there is a European Commission funded initiative aiming to establish a common European Spatial Data Infrastructure which covers intellectual property and licensing policy.

At <http://www.ec-gis.org/inspire/> are a series of enlightening documents assessing the 'state of play' in GIS infrastructure in the then 15 EU and ten accession countries. Included are URLs and contact details for the individual national mapping agencies. Most are part-government, part-privately funded and are under pressure to 'pay for' the costs of their activities, even though many of the licensing fees will be 'false profits', coming from other branches of publically funded activity like local government and city planning.

The INSPIRE initiative has held public consultations and is likely to do so again. The needs of 'citizen-oriented society as a whole' are far down their priority list of vested interests in geodata availability.

If you're in India

The Geological Survey of India was founded in 1851. They publish hardcopy maps, carry out geological surveys and have digitisation of their databases in hand. Their web presence is a bit scattershot, but there must be an amazing amount of potential data and depth in there. There is currently no available geodata or digital mapping provided by the Indian NMA. It seems ironic that the UK's Ordnance Survey now outsources its digital map drawing to Delhi. <http://www.gsi.gov.in/aboutgsi.htm>

If you're in Japan

Oddly for a country so renowned for its obsession with mobile devices, the mapping agency seems very old-fashioned. However the Japanese mapping agency is working hard to organise data-sharing efforts throughout Asia and indeed the rest of the world. But as of writing no raw geodata is available for Japan itself. <http://www.gsi.go.jp/>

If you are in Asia/Pacific

<http://www.pcgiap.org> - Permanent Committee on GIS Infrastructure for Asia and the Pacific. This inter-mapping-agency institution, hosted on the web by the Japanese national mapping agency, seems more concerned with the social and organisational aspects of mapping than the very technical. It encompasses almost all of central and eastern asia and the pacific. Their problem set is even more complicated than Europe; many countries use obscure or outdated ellipsoid projections, and have different character sets.

<http://www.gsi.go.jp/PCGIAP/maps/memmap.htm>

If you are in South America

The Mexico-hosted *Instituto Panamericano de Geografa e Historia* has existed in some form since 1928 and has a dense organizational structure. On its list of activities you can find conferences on remote sensing alongside "*Estudios de Filosofia Practica e Histoa de las Ideas*"

Interestingly, many South American national mapping agencies are still overtly military concerns. Others integrate national mapping with national statistics. Brazil's NMA has a lot of arbitrary census data and some maps files free for download at <http://www.ibge.gov.br/>.

Otherwise map offerings are mostly conventional, paper-based cartographic products. Chile and Argentina both offer proprietary digital GIS packages at high cost.

UNESCO maintains an excellent current index of world mapping agencies, with website and contact email where available, and phone and street address in most cases, at <http://whc.unesco.org/map-agencies.htm>

If you're in Africa

National mapping coverage of Africa is patchy. Though most countries have a geological survey or government cartographical body, most in in sub-saharan africa don't have an online presence at all. Sadly most data is to be found in the hands of uncoordinated relief agencies and NGOs. South Africa runs a modern, commercial NMA with topo data for sale and look best positioned to lead intracontinental efforts. Try the UNESCO list at <http://whc.unesco.org/map-agencies.htm> to obtain national mapping agency contact information.

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