HAVE YOU THOUGHT RECENTLY ABOUT YOUR RESPONSIBILITY FOR THE CONSEQUENCES OF YOUR ACTIONS?

RESPONSIBLE USE OF GEOSPATIAL DATA

What do the accidental destruction of a Chinese embassy in Belgrade in 1999, the illegal logging of a protected forest in Tasmania in 2005, and the crash of an airplane in Kentucky, USA, in 2006, have in common? They all result, like many other accidents, from the use of inaccurate maps or geospatial data produced and distributed by geospatial experts like us... and likely you. If you were involved directly or indirectly in the production of geospatial data or imagery, your actions and potentially mistakes may have led to such undesired consequences. If you are involved in geospatial data distribution, such as Spatial Data Infrastructures (SDI) initiatives, or if you are mashing up spatial data from different sources and provide web services, you also have your share of responsibility.

Is it really there?
All maps and geospatial datasets are imperfect representations of the real world and are produced for specific purposes as well as within given budgets and timeframes. Examples of practical problems include roads misplaced or not connected at intersections, buildings missing or mistakenly identified (e.g. school labelled as hospital), etc. To see an example of inconsistencies, simply open Google Earth, overlay vector data (e.g. roads) on the top of the imagery and look at the differences. If this fact seems obvious to us experts, it is not for the lay users who expect data to be a reliable representation of the world... “Such data must be correct; they are produced by scientists with satellite technology!”
To control and then document the quality of the dataset they produce, national mapping agencies and many other mapping organisations rely on technical specifications and other good professional practices.

Specifications are technical guidelines that describe the way datasets should be produced. Such specifications ensure that datasets reach a certain level of quality, but can't make them perfect, due to the nature of the data collected, the data acquisition techniques used, and problems that can emerge from the production process. For instance, data collected by a typical handheld GPS can't give you centimetre accuracy, nor can it give you precisely the centreline of a road, and delineation of objects from a GPS can't give you centimetre accuracy, for instance, data collected by a typical handheld GPS.

The issue of Fitness for Purpose

Also, good quality maps made for usage at a given scale may not be suitable for a use at another scale. This would not be an issue if maps were only a piece of art one looks at, but they are often used to support a variety of decision-making processes by people that are often unaware of these technical considerations. From the point of view of the lay user, maps are usually considered as being accurate, up-to-date, complete, etc. From the point of view of experts, each map is made according to different specifications, with different levels of accuracy, up-to-dateness, completeness, etc. The decisions taken by people can range from trivial day-to-day decisions, such as looking at the place where we are to spend our next holidays, to decisions that can lead to more severe consequences, such as identifying the best neighbourhood for a commercial activity, finding our way back to camp during a snow storm, finding the shortest path a fire truck has to follow to reach the burning residence, or locating a new school in a region at risk of flooding.

Those pesky legal issues

Because geospatial data are important assets and because they are increasingly used to support various types of decisions, a number of legal questions have emerged in recent decades.

The oldest one is probably copyright, which should protect data producers from people that would copy their work without their permission to usually generate revenue. Using other people's maps has a longstanding tradition in cartography as cartographers have for centuries produced maps that typically attempted to improve maps from other cartographers. This resulted in propagating errors, such as California being mapped as an island on maps from the XVIIth to the XVIIIth centuries, or the representation of the island of Friesland which never existed but was on almost all maps of the North Atlantic from the 1560s to the 1660s.

Nowadays, it is still not rare to see geospatial producers including deliberate mistakes on their maps in order to be able to demonstrate copyright infringement in court. Copyright questions in the digital age are, however, much more complex and less clearly regulated than it was for paper documents. The legal framework for geospatial data is still largely incomplete and misunderstood, for both digital maps and aerial photos. The fact that geospatial data production processes are now more complex and sometimes involve different organisations contributing to different elements of a dataset also increases the complexity of copyright issues. This is particularly evident in spatial data mashups and collaborative (crowdsourced) maps.

Privacy is a two-way street

Another legal consideration that becomes increasingly important nowadays in our digital society is privacy. Privacy separates what is public from what is private, constituting what can be seen as 'the right to be left alone'. In practice, this separation is not always clear and is more a transition zone than a crisp line. The increasing availability of digital data from the Internet and volunteered geographic information (VGI), and developments of geospatial tools such as Google Maps or Street View that show private properties and at times people and their belongings, make some expectations for privacy harder to fulfil. It is now easier to collect through the combination of different sources a variety of personal data which would not be an issue if taken individually, but can become a problem when combined. Privacy with geospatial data is for instance a recurrent issue with a number of Google products, including Google Street View, where images acquired from the public space can be problematic when made available to all Internet users. Several countries (e.g. Canada and New Zealand) requested that Google blurs people faces and cars' license plates on street views to preserve some level of
privacy. This system is now applied on Google Street View images across the world. Some places like the European Union still have privacy concerns that may jeopardise the ability of organisations to communicate an increasing amount of information.

Who is liable?
A third legal issue relates to liability. A specific type is product liability, which is the responsibility held by people or organisations providing products in case those products lead to injuries. Liability issues in our field mostly emerged in the past decade when accidents resulting from the use of maps or geospatial systems multiplied. Accidents led to court decisions opposing data or map producers and distributors and their users, and frequently held the producer liable. Nevertheless, users also have their responsibilities, especially if the data they get are well documented in a language that is accessible to lay users, with clear warnings or limitations. Data integrators and distributors also have duties to properly inform their clients and to provide advice, as their role is that of link between the source of data and the users. Roles and responsibilities exist for every player in the data production-dissemination-usage workflow.

Geospatial ethics
For a number of years, some people from the professional and scientific communities have explored ways in which ethics can take a more important place in geospatial professional practices. Ethics is the study of morality, and translates into what can be identified as good or bad practices. While legal issues, copyright, privacy, and liability are tied to specific legal systems that are normally defined by geographic entities (e.g. countries), ethics is a more universal value as morality crosses languages and political boundaries. One may then wonder if professional practices in the geospatial field are good and moral. The fact that we as experts know that data are imperfect, that we know that lay users don’t clearly understand this, but that we don’t always take the necessary steps to help them, suggests that most data are not currently distributed in the most ethical manner. Similar practices can be defined in other fields as “professional misconduct” as it relates to the failure to report or remedy a known danger and to protect people. There is currently a need for better ethical professional practices for the geospatial community which could better protect geospatial data users.

Introducing the GEOIDE Project
In Canada, these legal and ethical questions are explored as part of a GEOIDE (GEOmatics for Informed DEcisions) Network project which started in 2008. The project’s Web site (http://dataquality.scg.ulaval.ca/) gives among other things access to a database of cases where the use of maps or geospatial data led to accidents, including an increasing number of cases that involved GPS navigation systems. The list on this site is the first of its kind, resulting from a compilation of cases found in legal databases and in the news. This project seeks to find new ways to protect geospatial data users and improving professional ethics in the geospatial field, and welcomes your input.

As this article is meant to be rather short and provocative, and as you will soon go back to your occupations, we encourage you to think about improving your own geospatial data production and dissemination activities to better inform and protect end-users of geospatial data. Share this concern with your colleagues and your supervisors, raise the issue in a meeting, think about existing consumer protection mechanisms, think about your profession’s guide of good practices, then try to integrate such questions into your business so you can contribute to making the use of geospatial data safer for everyone.

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