

# GeoWeb 2.0 and Volunteered GI

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The GeoWeb has developed rapidly in the last few years and it is now commonplace for geographic data and applications to be used over the web. This has opened up new and innovative ways to use geography both in traditional professional GIS application domains and in the new areas of mainstream web use (e.g. mashups, neogeography, and volunteered GI).

GeoWeb developments are very much tied to the general, fast-paced advancement of the web itself. Tim O'Reilly popularized the evolving nature of the web by introducing the term 'Web 2.0' in a white paper (O'Reilly 2005). O'Reilly's central proposition is that the web is becoming more interactive, more integrated and consequently more useful. It is evolving from being a network of one to many (one web site, many users) applications to a network of many to many (many connected web sites accessed by many users) applications. The real significance of this is that applications can now be created that integrate many smaller application services to create quite sophisticated and useful mainstream solutions to a range of business problems at both personal and enterprise levels.

GeoWeb 2.0 is the geographic embodiment of O'Reilly's ideas for the general web. It is the next generation of geographic information publishing, discovery and use. The GeoWeb is a system of systems bound together by a common interest in, and reliance upon, geography. Table 1 shows some of the key differences between the GeoWeb 1.0 and GeoWeb 2.0.

GeoWeb 1.0	GeoWeb 2.0
Static 2D map sites	Dynamic 2D maps, globes and earths (e.g. Google Earth, ArcGIS Explorer)
File transfer (ftp)	Direct use web services
Clearinghouse nodes	Catalog portals (e.g. geodata.gov)
Individual web sites	Web service mashups
Proprietary protocols (e.g. AXL)	Standard protocols (e.g. W3C SOAP/XML, OGC W*S)
User hosted services	Remotely hosted services (e.g. ArcWeb Services)

Table 1: Comparison of the GeoWeb 1.0 and 2.0 experiences.

Although these web and GeoWeb trends are presented separately here for explanatory purposes it will be obvious that many of these trends are not independent and, indeed, are mutually reinforcing. For example, third party hosted SaaS (Software as a Service)

applications are often funded using an advertising revenue model. In the SaaS model data and functionality are packaged together and made accessible over a web connection to distributed users. Large centralized server farms can be used to deliver even the most sophisticated applications and the largest databases (for example, Google Maps and Microsoft Virtual Earth). SaaS works best for simple, well-defined workflows that need to be performed repeatedly. This type of ‘utility’, or ‘cloud computing’ GIS will become increasingly popular for delivering geographic applications, especially where consistency of workflow and service is important across the enterprise.

### **Mashups, Neogeography and Volunteered Geographic Information**

The term ‘neogeography’ was coined by one of the founders of platial.com, Di-Ann Eisner. She used neogeography to describe the ‘new’ geography of overlaying or mashing up two or more sources of geographic information (for example webcams from Caltrans [California Department of Transportation] on top of a Yahoo basemap). Subsequently, it has been adopted by those keen to advance modern web-based approaches for working with geographic information. Turner (2007) provides a useful introduction to neogeography and he defines the term with reference to traditional GIS:

*Neogeography means “new geography” and consists of a set of techniques and tools that fall outside the realm of traditional GIS, Geographic Information Systems. Where historically a professional cartographer might use ArcGIS, talk of Mercator versus Mollweide projections, and resolve land area disputes, a neogeographer uses a mapping API like Google Maps, talks about GPX versus KML, and geotags his photos to make a map of his summer vacation. Essentially, Neogeography is about people using and creating their own maps, on their own terms and by combining elements of an existing toolset.*

The equally new field of ‘volunteered GIS’ popularized by Michael Goodchild and others is in a similar vein. Goodchild (2007) argues that humans are acting as sensors and are building and publishing content from the ground up. The non-authoritative and sometimes transient and dynamic nature of this information provides new geographic challenges and opportunities. Google’s MyMaps (<http://maps.google.com/>) initiative provides a good window on to the world of mashups and neogeography (although the latter is not a term they use to describe their work), as does the site <http://www.programmableweb.com> which lists over 1400 map mashups.

The GeoWeb 2.0 is here and now in many ways (mashups, geoportals, dynamic 2D / 3D clients), but in other ways it is many years away (widespread acceptance of on-demand or hosted GIS data and application services). Table 2 summarizes some of the differences between the GeoWeb 1.0 and GeoWeb 2.0 from the user perspective.

GeoWeb 1.0	GeoWeb 2.0
Static	Dynamic
Publishing	Participation
Producer-centric	User-centric
Centralized	Distributed
Close-coupling	Loose-coupling (mashups, hacking)
Basic	Rich

Table 2: Some differences between the GeoWeb 1.0 and GeoWeb 2.0 from the user perspective.

Just as we are coming to terms with Web 2.0, there is a certain inevitability that the Web 3.0 will be born. This term was first introduced in 2006 by Jeffery Zeldman in his blog to describe the advance of the web along several fronts including transformation into a database, the 3D web, the Semantic web, leveraging of artificial intelligence technologies, and a move towards making content accessible by multiple non-browser (Wikipedia 2007).

Goodchild, M F (2007) *Citizens as sensors: the world of volunteered geography*. Unpublished Paper. NCGIA, UCSB

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