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Realizing spatial intelligence on the GeoWeb

From a presentation by Jack Dangermond at the "Where 2.0 Conference" in San Jose, California



Using geographic knowledge can make a huge difference; it impacts business and government, but also helps create a more sustainable world. So what is "geographic knowledge"? According to Jack Dangermond, ESRI president, geographic knowledge is much more than just data. He defines it in terms of six components:

- 1) Data models that structure the data;
- 2) The data itself;
- 3) Models and analytic environments that show predictions, or suitability; where different layers of information are combined and interpreted;
- 4) Encapsulation of cartographic expression—the "that thing that cartographers do," such as color ramps, symbology sets, etc.;
- 5) Geospatial workflows; and
- 6) Metadata which describe the first five components and are key to sharing, discovery, and access.

"Geographic knowledge is changing how we abstract and how we reason, both in the professional world and in broader society, by introducing spatially integrated thinking," said Dangermond. "People are beginning to think about relationships between, for instance, disease and environmental situations that may support it. Or they may ask, 'If I locate Starbucks here, will it get enough business?' The good work of Google and others in getting people spatially aware has consequences beyond simply looking at maps. It's causing people to do more spatially integrated thinking, and we're right in the midst of that today."

Shared geographic databases in concert with the Web 2.0 environment are also changing how we organize and communicate between different agencies and organizations. According to Dangermond, "this is actually introducing a new approach for problem solving and thinking. And I would say it's just the beginning. It's going to go way beyond simple visualization and mapping; it's going to embrace all types of knowledge and ultimately become kind of a societal infrastructure for human behavior and human action."

At the heart of this evolving infrastructure is Web 2.0 GIS servers or "geoservers" that make geographic knowledge directly available for mashing up and integration. "People author the knowledge, they drag and drop it onto a server, and then it's accessible on other desktops or in browsers or on cell phones or virtually anything," said Dangermond.

"The fundamental difference between this Web 2.0 world and the worlds I've experienced in GIS before is that the web is the platform that's transforming access to this knowledge base and making it much more available and usable and collaborative," said Dangermond. The GIS user community is supporting this notion of transforming their data sets into services, and those published services can be mashed up with other web services in all sorts of forms and made available for new communities to leverage.

Referring to the State of Maryland's "StateStat" web application as an

example, Dangermond commented: "This is a very powerful idea about having government open up not just their GIS data, but all their data, using web mapping as a framework to make government more transparent and more accessible; a new chapter of democracy is opening up,

Dangermond believes the opportunity is there to engage in building geoservers so as to help open up government, to look at "the financial dimension of where we're making investments, and where we need to make investments. "When I show this to political people, well, they get nervous," said Dangermond, "but they also get very excited... because suddenly they can look at government transparency and accountability."

GIS servers are integrating geographic knowledge—data models, data, cartography, workflows, and metadata—with the GeoWeb. They are easy to use, standards-based, collaborative, and will leverage the billions of dollars already invested by the GIS community in developing base maps, thematic data sets, and other geographic information.

Web GIS also promises to extend the vision of e-government. "Sometimes I like to call it g-government," said Dangermond, "because it's all about a geographic or map framework for making more transparent government policies. And this is a good and healthy thing."