

Visualising Complexity

The OGC, working with ISO and other standards organisations, has made geospatial interoperability possible by developing standards that OGC members and the rest of the information technology industry are now implementing in software and online services and deploying in applications.

Where to Now

I believe we are pulled by wonder and pushed by urgent necessity to embark on a new global research programme based on these interoperability capabilities. Having at our fingertips petabytes of earth data and vast, linked processing resources positions us to make tantalising new discoveries. At the same time, literally billions of lives may be lost if humanity doesn't, as soon as possible, use these resources to develop knowledge, understanding and wisdom. The telescope, calculus and other physical and conceptual scientific tools existed for decades before their benefits were widely felt in the world. We cannot wait decades to mature our use of the newly integrated geospatial technologies and content.

Continuing Boom

The Group on Earth Observation (GEO) lists ten areas of societal benefit for its Global Earth Observation System of Systems (GEOSS): Disasters, Health, Energy, Climate, Water, Weather, Ecosystems, Agriculture and Biodiversity. These are all complex knowledge domains, and each pertains to a current or emerging global crisis. Each is related to the others, so a given datum may be relevant in any or all of them. Technical interoperability is a first step toward delivering benefits in these areas through fluid intra- and interdisciplinary sharing of data. Just as significantly, it is also a first step toward equipping ourselves with a broader and deeper set of conceptual tools. We must develop new modes of understanding, new capacities for people to visualise, understand and communicate complexity. We must understand and elaborate the man/machine interface and become more adept at modelling so that we can employ our powerful geospatial technologies to their fullest. If they are to remain relevant, stewards of traditional "GIS curricula" need to step outside their habitual frames of reference and think about pattern languages, grid computing, sensor webs, and time-series visualisations. They need to consider re-purposing domain-specific applications, and imaginative exploitation of iPods, Google Earth, virtual worlds and other current manifestations of the continuing boom in processing power, storage and bandwidth.

Academia and Policy

The OGC Interoperability Institute (OGCii) was chartered in 2006 to promote and organise collaborative research projects addressing these issues and the underlying "science of spatial-temporal information interoperability". The premise of OGCii is that the field of interoperability research and development requires a disciplined academic foundation and sound public policy, even if initially motivated by the work of a commercial consortium process driven by pragmatic market requirements. Academic and other users of geospatial technologies share a responsibility for documenting the interoperability challenges they encounter. Consortia and researchers must work together to evolve the standards and advanced scientific techniques essential to informing models of our increasingly complex world with relevant geospatial information.