A Proposed CCGIM and OGC: How the U.N. can use its OGC membership in addressing critical issues

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Introduction

Most attendees at this Preparatory Meeting of the Proposed U.N. Committee on Global Geographic Information Management know about the Open Geospatial Consortium (OGC). Since 1994, the OGC, an international not-for-profit standards organization, has been managing a consensus process in which users and providers of geospatial technology collaboratively develop technical interoperability standards for the full range of technologies that produce and use geospatial information. When the Internet and the Web began developing into the world's dominant distributed computing platform, the OGC membership began leveraging widely used Internet and Web standards to create geoprocessing standards that make geospatial information an integral part of the overall global information and communications technology (ICT) infrastructure.

This Scoping Note by the OGC reviews the U.N.'s Critical Issues as defined in the Agenda for the 2nd Preparatory Meeting for a proposed Committee on Global Geographic Information Management from a slightly different perspective. Our Note deals more explicitly with how these issues and the formation of such a Committee might be considered in light of the U.N. being a Principal Member of the OGC. In what follows we suggest specific ideas and ways the U.N. and the proposed Committee might best leverage the OGC membership. The Note addresses the following 7 items:

- **Governance: Is global governance relevant and necessary?**
- **Emerging trends in institutional management models**
- **Interoperability of systems and data**
- **Common technical solutions and standards**
- **Data integration and layering**
- **Public rendering of geographic information by the private sector**
- **Capacity building and technology transfer**

During the period 2000-2010, the U.N. joined OGC in 2002 as a Principal Member. The U.N. remained a member in good standing until 2005. During the early period of membership, the OGC was contracted to prepare a "Geographic Information Strategic Plan for the United Nations" that provided a roadmap for using the emerging global Web-based geoprocessing framework to realize the U.N. Geographic Information vision, a vision that has changed little, and that is much closer to reality today than it was eight years ago. Now, following continuing informal discussions with U.N. organizations and in recognition of the important role the U.N. can play in developing the Global Spatial Data Infrastructure, the OGC board of directors has awarded the U.N. Principal Membership status in the OGC at a much reduced membership fee. *This membership allows any organization with the U.N. structure to fully engage in OGC related activities.* Under the present terms of the membership management and access to

OGC internal information, working groups, candidate standards, etc. is via the United Nations Geographic Information Working Group (U.N. GIWG).

To this end, the U.N.'s membership in OGC, and specific representation via the UNGIWG provide the best pathways:

> **For identifying and implementing protocols for sharing, maintaining and assuring the quality of geographic information within the United Nations System;**
>
> **To develop, maintain and make accessible common geographic information deemed crucial for capacity-building efforts, whose aim are to enhance normative, programme and operational capabilities and efficiencies within the United Nations system; and**
>
> **Thus induce more efficient and cost effective information systems evolutions that further cause closer cooperation among and between Member States, non-governmental organizations, research institutions and industry.**

1. Governance: Is global governance relevant and necessary?

Governance is identified as one of the top critical issues before this group of experts. There exist means and practices (institutional arrangements) within the operating modes of both the U.N. and OGC that can be brought together to address governance without having to re-invent process. U.N.-related approaches believed feasible and practical are laid before this group for consideration. The OGC leadership believes these ideas integrated with OGC's process will help the CGGIM address the critical issues that are before this group.

Over the years, OGC has found that institutional arrangements and governance and standardized technologies and encodings, data models, best practices can sometimes be imposed, but usually they are more effective if agreed through concertation and consensus. However, it is a fact that sometimes communities of practice or geographic or institutional communities find it difficult to come to agreement on what is necessary for data sharing and communication of critical information. This is because agreement among many parties requires a structured process, and also because both conformity and diversity have value, and organizations' views cannot always be readily reconciled. Thus these are the conditions where governance can play a beneficial role.

The Governance section of the GSDI Association's "Data Integration and Interoperability of Systems and Data" scoping note (by Abbas Rajabifard) outlines proposed governance goals and objectives of the U.N. CGGIM. We find that Note to contain some excellent statements. To achieve such goals and objectives, the U.N. and the OGC will need to work together to develop a model for U.N. CGGIM requirements development and participation in the OGC process. Specifically, the U.N. and OGC should focus on means for leveraging the OGC's expanding global membership, the global nature of OGC standards and the process by which requirements (including the requirements of U.N. organizations) become widely used standards.

We hope that a result of the formation of a U.N. Global Forum SDI, that there will take place a recognition on the part of the organization to consider the Global SDI as more a market or demand driven information infrastructure as opposed to a supply driven model. Outcomes and management will be less burdensome because developments are driven by operational requirements of U.N. Agencies that are responsible for addressing societal benefit areas and mission requirements.

A governance framework for CGGI then becomes not an exercise in centralized power. Rather, it has everything to do with networking, facilitation, collaboration and consensus. Solutions to the critical issues will become attractive to U.N Agencies and involve technical as well as commercial, institutional, and governmental innovations, and indeed the whole set of issues will have the room to evolve rapidly with the rapid evolution of the underlying technologies. So, from the perspective of a technical standards organization with experience in adapting to and managing such evolution, we recommend governance that is lightweight, flexible and distributed rather than heavy, bureaucratic and centralized. This kind of governance is consistent with the transition from SDIs conceived of as central databases to "SDI-2" or "ISDIs" – Interoperable SDIs – conceived of as nodes in a network and with capabilities consistent with OGC Web Services and Web 2.0 characteristics.

Open standards are not the whole answer, but they are a critical part of the answer, and the OGC standards process arguably provides the most cost-effective way for governing bodies to track and influence the evolution of geospatial technology. Internationally accepted open interface and encoding standards from standards development organizations, principally the OGC and ISO, are fundamental parts of the Global ISDI that are too important for any vendor to provide alone. With a proven process for addressing technical interoperability requirements provided by commercial, academic, research and government institutions, the OGC offers the fastest, least expensive, most effective and most scrupulous way to develop – and ensure market adoption of – the particular geospatial interface and encoding standards that serve U.N. ISDI stakeholders' needs. Semantic issues such as data models and metadata standards are part of the picture. Increasingly, information communities such as hydrology, meteorology, climate change, aviation, urban infrastructure, disaster management are discussing and resolving information model coordination issues in the OGC because those issues are related to the software interface and encoding issues relevant to their work. The OGC is also the organization most able to bring leading commercial, academic, research and governmental organizations into alignment to solve important problems related to geospatial information and technologies.

Also, as geospatial information and services become more important, innovations in GI applications, camera surveillance and sensor networks, GPS and location services raise increasingly serious questions of privacy, security, geospatial rights management, procurement regulations, and charging for government data. These are important issues for the private sector geospatial community as well as government ISDI stakeholders at every level, from local to international. And these issues present a need for governance in coherent, community identifiable manners.

The U.N. is founded on the assumption that there are policy issues that are too important for nations to address in isolation, and thus the U.N. is potentially a good forum for

addressing the above-mentioned issues as they relate to international access to geospatial information and services. In light of near unanimous written agreement in Notes (as exemplified by Taylor, Scott, Rajabifard, and Salvemini) that –

> **A United Nations consultation process is timely, led by member States, and dealing with societal issues and U.N. mission requirements that demand global geographic information management, coordination of regional efforts, promotion of global norms; and**
>
> **Member States desire that global mechanisms for consultation be in place to develop common frameworks by societal issue that tunes those tools, practices and processes for standardization, trade and commerce that best fit that issue and its associated style and mode of information sharing by community, or domain, and corresponding necessity for exchange and technology transfer specialized to regional and international organizations especially those in emerging, transitional and developing countries –**

The OGC recommends that the U.N.CGGIM consider the Centre for Trade Facilitation and Electronic Business (U.N./CEFACT) as a governance model for this global forum.

U.N./CEFACT supports activities to improve the ability of business, trade and administrative organizations from developed, developing and transitional economies to exchange products and services effectively. It facilitates national and international transactions through the simplification and harmonization of processes, procedures and information flows. CEFACT's aim is to contribute to the growth of global commerce.

While the U.N.CGGIM's aim is to help U.N. organizations and their many partner organizations, public and private, become more effective in the ways they develop, publish, discover access and use geospatial information, the U.N./CEFACT model approaches the same areas of need - process, information and technology at a global scale for global commerce. Geospatial information's role in global commerce can simply not be disputed and this model, in today's world of "exchanging (geospatial) products and services" on the Web, is highly synergistic with the work such a Forum will need to conduct. It recognizes the job at hand involves much more than "building databases".

Thus, while we support the general purposes outlined in the U.N. Secretariat's "Scoping Paper on Global Coordination of Geographic Information Management", we advise caution regarding the goals about building a U.N. geographic database and establishing a U.N. commission on geographic information.

As geospatial information becomes an integrated part of the larger Information and Communication Technology (ICT) infrastructure and the commerce created from it, old business models become obsolete. The information in a database quickly becomes outdated and better information may become available at less cost from other sources. The workflows and knowledge necessary to provide geospatial information to U.N. organizations and its stakeholders will almost certainly be quite different five or ten years from now, and thus one must be cautious about building governance around current geospatial data management practices. Tomorrow's management issues will likely involve brokering multiple independent data sources, understanding pricing and

access models, understanding different levels of veracity and trust, and combining historical and current-day/real-time data. New kinds of information practices and information companies are emerging, and these will operate in and be shaped by an environment of open standards. It is believed that the U.N./CEFACT approach provides the kinds of structures where these issues and the fact that change is continuous can be most effectively governed.

2. Emerging trends in institutional management models

Sixty years after the birth of the computer industry, information technologies continue to transform institutions. Increasingly efficient information workflows – in planning, organizing, leading, controlling, and development -- induce changes in business processes and relationships among entities in both public and private sectors.

Trends include:

- **Growing transparency and accountability**
- **Closer links between industry, public sector agencies and NGOs**
- **Increased diversification**
- **Increased opportunity for individual initiatives**
- **Restructuring of departments into cost centers**
- **Small organizing units involving or influencing many external participants**
- **Contests between centralized planning and self regulation**
- **Merging of institutions for economy of scale and avoidance of duplication**
- **Networking of institutions**
- **More regional and international co-operation**

These trends affect all institutions, including institutions that use geospatial information like statistical agencies and institutions that develop and manage geospatial information like National Mapping Agencies, but also Peacekeepers, Relief and Food and Agriculture.

The "Emerging trends" section of the GSDI Association's and others Notes) compile a most complete list of benefits and features from information being used more efficiently and effectively through effective management and sharing of information across agency boundaries:

- **reduced costs of information collection and management through streamlined collection, processing and storage;**

- **improved decision making for policy and business processes, resulting in more integrated planning and enhanced government service delivery;**

- **improved timeliness, consistency and quality of government responses – information will be easily accessible, relevant, accurate, and complete;**

- **improved accountability and transparency for citizens;**

- **reduced costs and added value for government through reusing existing information, sharing infrastructure and designing integrated, collaborative methods of delivering services;**

- **improved national and jurisdictional competitiveness; and**
- **improved national jurisdictional security.**

All of these features and benefits require the use of a common, standards-based infrastructure. Yet that infrastructure is not fully developed and not yet deployed sufficiently to enable these features and benefits to accrue to reasonable levels. Policies and programs that aim to deliver these benefits cannot succeed without a strong emphasis on helping organizations redevelop management philosophies and build out interoperable information architectures that articulate how particular standards will meet their particular requirements taking into account culture, semantics, policy and legal mandates, commercial/free data limitations, service level agreements, etc.

One of the most effective things the U.N. CGGIM could do would be to instruct organizations and national agencies in the use of procurement language that requires vendors to provide products with interfaces and encodings that comply with standards from OGC and ISO, standards that match the interoperability requirements of the organizations' and agencies' information architectures.

The U.N. has two main ways to take advantage of its OGC membership:

First, the U.N. needs to recognize that the evolution of geospatial interoperability proceeds largely through users' introduction of requirements into the OGC process, where requirements are vetted, solutions proposed, interfaces and encodings developed and tested, and where standards are finally approved by the membership. The U.N. can funnel their requirements from across its various organizations into this process to ensure and accelerate the delivery of coordinated interoperability solutions.

Second, in network theory terms, the U.N. and the OGC are both hubs, that is, they are common connection points connecting many nodes. Connecting two hubs provides a wealth of easily-made connections and positive "network effects". In other words, the OGC has brought together a community of experts and leaders, a consortium of companies, agencies, universities and research organizations, a body of knowledge, a "necklace" of activities that constitute a rich resource for the U.N. to fully leverage.

An example of how these connections work can be seen in the rapid OGC-based response to the recent Haiti earthquake. This is one of the first events where we saw a number of SDI-related resources stood up within hours of the event, most of which were interoperable through interfaces and encodings that implemented OGC standards. The OGC quickly hosted a Web page (http://www.ogcnetwork.net/networks/haiti) that provides links to Earth images, maps and other geospatial data for use in earthquake disaster rescue, relief and reconstruction. Also, officials at the U.S. National Institute of Building Sciences who work with OGC on interoperable building information asked the OGC to host a web portal so committees who are working on a major Haiti reconstruction project could share information and documents quickly and efficiently.

3. Interoperability of systems and data

Interoperability is, of course, OGC's main objective. The collection of Notes for this meeting provides a quite thorough overview of technical interoperability objectives, but we would add four additional and important points:

1. **Standards are necessary to achieve the objectives.**

2. **One must look beyond "geospatial." Consider, for example, the value in being able to move easily between spatial representations of the natural environment and spatial representations of the built environment. Considerable work needs to be done to weave geospatial standards together with the standards for computer aided design (CAD) used in the architecture, engineering and construction (AEC) world, and the standards used in the worlds of facilities management, real estate, insurance, utilities and emergency response. Information about "where" involves much more than GIS and remote sensing, and in many domains of activity spatial information needs to accompany other kinds of information. The number of Smart Grid things that need to be located, for example, is about to expand exponentially as alternative electricity generation moves to the edge of the grid and as metering functions become two-way and the associated transactions become information we can use in our homes, businesses, cars, and mobile devices. And the electric power grid overlaps with neighboring worlds; first responders, civil engineers, street crews, and many others will ask "where" questions that can only be answered through inter-process communication between the Smart Grid and systems created for other purposes.**

3. **We also must understand what role particular U.N. geospatial products address and to what degree there are requirements embedded in those products that require an interoperable solution. Simply considering the differences in use patterns for Global Map and products with different scale will suggest the kind of sharing required and thus what types of interoperability services might be offered.**

4. **It is important to pay attention to the ways in which semantic interoperability activities are converging with technical interoperability activities. The example below (excerpted from "Ocean Science, OneGeology, and GEOSS: Building 'SDI Bridges'" (http://www.gsdi.org/gsdi11/papers/pdf/293.pdf), a paper presented by Mark Reichardt, President & CEO, OGC at the GSDI 11 Conference in 2009) shows how systems interoperability relates to data interoperability in the OGC context.**

In the Open Geospatial Consortium context, an "information community" is a "collection of people (a government agency or group of agencies, a profession, a group of researchers in the same discipline, corporate partners cooperating on a project, etc.) who, at least part of the time, share a common digital geographic information language and common spatial feature definitions." (OGC, 2006). In the global geology community, there is increasing agreement on community information models and geospatial standards that enable data sharing within and between different communities of interest.

Geoprocessing standards play a key role in OneGeology (http://www.onegeology.org), a global project that has produced the first on-line digital geological map of the world.

OneGeology was the flagship project for the U.N. International Year of Planet Earth 2008. OneGeology depends on standards such as the OGC Web Map Service Interface and GeoSciML (http://www.geosciml.org/). GeoSciML is a geoscience encoding standard developed by the International Union of Geological Sciences (IUGS http://www.iugs.org/). GeoSciML is an "application schema" of the OpenGIS® Geography Markup Language Encoding Standard (GML). Without such standards, geology data clients and servers around the world would not be able to interoperate across the Web as OneGeology nodes.

To develop GeoSciML, representatives from the world's major geology organizations used the Universal Modeling Language (UML) to develop a common conceptual data model, to which data held in existing databases can be mapped. It identifies the objects being described (e.g. 'faults'), their properties (e.g. 'displacement') and the relations between objects (e.g. 'faults are a type of Geologic Structure').

The GeoSciML model was converted to an interchange format following the rules provided in the GML standard. Because geology depends on geography and on observations and measurements, GeoSciML is based on GML for representation of features and geometry, and the OGC's Observations and Measurements standard for observational data. Geoscience-specific aspects of the schema are based on a conceptual model for geoscience concepts and include geologic unit, geologic structure, and Earth material from the North America Data Model (NADMC1, 2004), and borehole information from the eXploration and Mining Markup Language (XMML).

UNESCO and six other international organizations support the OneGeology activity.

Similarly, a partnership of 124 governments and international organizations is developing the Global Earth Observation System of Systems (GEOSS), (www.earthobservations.org/about_geo.shtml), a set of agreements and online data and processing resources based on a shared, open, standards-based architecture that enables continuous monitoring of the Earth and access to a vast shared set of information resources. Also, marine research organizations from many countries have been actively working to implement and influence the evolution of metadata, semantics, geospatial, and sensor standards that help ocean scientists discover, access and apply a wide range of sensors, sensor networks and sensor data.

OGC plays an important role in all three initiatives, which could be seen exemplars for similar initiatives undertaken by the U.N. or by information communities in which the U.N. is a member.

4. Common technical solutions and standards

One new emphasis regarding OGC policies should be mentioned in this discussion of how OGC membership can serve the U.N. going forward: *The OGC invites companies and others to contribute their geospatial interface and encoding specifications as candidate OGC standards. Such contributed specifications do not need to be "harmonized" with the OGC Baseline of adopted standards.*

This policy reflects industry realities. As mentioned in the Governance section of this Note, conformity has value, but so does diversity, and these are often competing values. Geospatial data and technology administrators in the U.N., Europe and most other places are aware that standardization sometimes faces difficult obstacles, and harmonization is the best that can be accomplished. However, one might say that there is "weak harmonization" and "strong harmonization." The OGC provides a strong harmonization option in the world of geospatial standards.

The OGC remains committed to standardization, but it now actively invites submitted interfaces and encodings, with a commitment to bring them into an open, consensus process for maintenance and evolution. Some contributed specifications will become OGC standards that are not consistent with the OGC Baseline. Others may, through revisions, eventually become consistent with the Baseline, but this is *not* a requirement. There is general agreement among thought leaders in the OGC that a non-OGC-compliant defacto standard is less problematic if it is open, fully visible within the OGC, and if changes to it are subject to the OGC's informed consensus process that involves both vendors and users.

Indeed, there are solid precedents. Google's 2008 transfer of KML to the OGC was the first instance of a contributed OGC standard. KML is the application programming interface for Google Maps and Google Earth. It is now an OGC standard, which means it is an open standard that anyone can use and whose evolution will be managed by the OGC. Also, in 2009 the atmospheric science community introduced another outside specification into the OGC: NetCDF (network Common Data Form) is a data model and set of access libraries for array-oriented scientific data, widely used in the climate and meteorological communities. The OGC NetCDF Standards Working Group aims to move a version of the netCDF specification through the OGC consensus process so it can become an adopted OGC standard.

It happens that KML is largely complementary to the OGC Geography Markup Language (GML) Encoding Standard, and the proposed OGC NetCDF standard will be integrated with the OGC Baseline of adopted standards. But, though OGC-developed standards will continue to be consistent with each other, such consistency with the OGC Baseline is *not* a requirement for other specifications that companies or organizations might want to introduce into the OGC as proposed OGC standards.

The OGC membership wants to adopt outside standards to provide user organizations such as the U.N. with more predictability. When interface and encoding standards evolve in an open consensus process, vendors and users can influence the evolution, see what's coming, and reduce their technology market risks. The main implication for the U.N. is that, through this accommodation to a complex and dynamic marketplace, the OGC has become an even more important force for openness and interoperability. And if the U.N. is spending resources maintaining geospatial standards, they might choose to contribute the standards to the OGC so that others could share in the cost of maintaining these standards.

5. Data integration and layering

Data integration and layering is a broad topic referring in a general way to very many applications of geospatial data and geoprocessing.

Section 3, Interoperability of systems and data, describes how OGC interface and encoding standards are being used by information communities to help them solve their data integration problems, where data integration refers largely to integration of data created using different data models.

OGC standards also enable different vendors' geoprocessing systems, and different types of geoprocessing systems (GIS, Earth imaging, navigation etc.) to communicate regarding coordinate reference systems, presentation styles, and other programming considerations involved in combining different data layers for analysis or display.

These are some of the basic issues that have been, to a large degree, resolved by vendors' implementation of OGC standards. Institutional users of geoprocessing systems around the world are learning to structure their procurements so that purchased products and upgraded legacy systems belonging to the institution and the institution's trading partners have matching interfaces and encodings that enable these systems and components to communicate across networks or while running on the same computer.

Geospatial fusion is a related topic that has been the subject of considerable work in the OGC in the last few years. In the context of the 2009 OGC "Fusion Standards Study Engineering Report," (http://www.opengeospatial.org/standards/per) "Fusion is the act or process of combining two or more pieces of data or information regarding one or more entities in order to improve the capability for detection, identification, or characterization of that entity". This Engineering Report includes discussions and recommendations for fusion standards in three categories: sensor fusion, object/feature fusion, and decision fusion. Elements of this study are being implemented in the current OGC Web Services, Phase 7 (OWS-7) Testbed.

This ongoing fusion work is driven mainly by defense and intelligence requirements, but it is applicable in many other domains, and the work is being done in testbeds structured around scenarios that address fusion in the context of use cases that mix fusion and other technical capabilities.

The OGC Interoperability Program manages many interoperability experiments, pilot projects and testbeds each year. The OWS-*n* testbed is the main OGC interoperability initiative in a given year, with multiple sponsors defining and funding multiple technology threads, each executed by a variety of large and small companies as well as universities. These testbeds provide a cost-effective way for organizations like the U.N. to submit requirements and share the costs of developing technical specifications that can be brought into the OGC consensus process as candidate standards. The testbeds are also a rich source of best practices for coding managing geoprocessing systems.

The U.N. and the OGC should work on building a bridge between the activities of the Interoperability Program and the needs and activities of the U.N.CGGIM.

6. Public rendering of geographic information by the private sector

This issue suggests a need for liaison and coordination to resolve a variety of difficult policy issues mentioned in Section 1 Governance – issues such as privacy, security, geospatial rights management, procurement regulations, and charging for government data. Corporations that provide geographic information (including map browsers), national defense and security agencies, the U.N. and other stakeholders will need to address these issues in a collaborative way.

The OGC has several groups that can help the U.N. work together with others to solve these problems.

The Spatial Law and Policy Committee (SLPC) of the OGC board was formed to address these issues. It provides an open forum for OGC members' legal and policy advisors to discuss the unique legal and policy issues associated with spatial data and technology. The Committee will also work with relevant legal groups, such as the American Bar Association, to raise awareness of these issues within the broader legal community. The SLPC will not provide legal advice to the OGC or its Members and will not take a position on any legal or policy matter on behalf of the OGC or its membership. It will rather focus on clarification of the legal and policy environment of the Consortium and work to ensure that Consortium standards reflect related best practices and the societal requirements that shape institutional uptake of interoperable geoprocessing.

Also, the OGC's Geo Rights Management (GeoRM) Domain Working Group is developing a framework of geospatial rights management standards. Organizations want to be able to specify, manage, control and track geodata distribution within secure and trusted environments that are also "open" in the sense that the Web is open. The goal is to develop a policy neutral standards framework that would support the full range of data sharing arrangements and business models.

Other opportunities for liaison and coordination include OGC events, such as the GeoRM Summit, SWE Summit, 3D Fusion Summit, and Spatial Law & Policy Summit; and also Alliance Partnerships, OGC's formal relationships with standards organizations and membership organizations in the broader technology community.

7. Capacity building and technology transfer

Capacity building and technology transfer are topics of great interest to the OGC and its membership. Both vendors and users benefit from global expansion of the network of interoperating geospatial systems and the people and organizations who use them.

The OGC has worked diligently and successfully to develop international membership that in large part is all about capacity building and technology transfer. This has involved speaking engagements at conferences around the world, recruitment of an international board of directors, visits with national mapping agency directors and other leaders in countries around the world, liaisons with ISO and many other international standards development organizations, active recruitment of international members, active support of the Global Spatial Data Infrastructure organization, international interoperability

initiatives (including "plugfests), a global marketing communications campaign, and hiring of staff from different countries.

Also, the OGC board of directors recently adopted the charter for a Global Advisory Council (GAC), which is formally a committee of the OGC board. It is comprised of OGC directors and select leaders of the global geospatial community chosen to represent the requirements of regions or communities currently underserved by the Consortium's consensus process. The GAC will be a forum for development of outreach and participation strategies to ensure the continued growth and development of the consortium process and to support critical Global Spatial Data Infrastructure (GSDI) initiatives around the world.

7. Conclusions

The OGC is an international organization, like the U.N., with an international mission: "To serve as a global forum for the collaboration of developers and users of spatial data products and services, and to advance the development of international standards for geospatial interoperability." (http://www.opengeospatial.org/ogc/vision) This mission positions the OGC as a key partner with the Proposed U.N. Committee on Global Geographic Information Management.