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GLOBAL MAPPING AND DISASTER MANAGEMENT: THE IMPORTANCE OF PARTICIPATION AND PARTNERSHIP IN THE CREATION OF GLOBAL MAP

Submitted by the International Steering Committee for Global Mapping (ISCGM) **

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Global Mapping and Disaster Management: The Importance of Participation and Partnership in the Creation of Global Map

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1. Introduction

Global Map is an international initiative which now involves 162 National Mapping Organizations (NMOs) and regional bodies worldwide. The initiative is coordinated by the International Steering Committee for Global Mapping (ISCGM). The main product is a 1:1 million digital map of the world with eight data layers to support environmental and sustainable development decision-making and completion is planned for the end of 2007. The Geographical Survey Institute of Japan has hosted the Secretariat of ISCGM since its inception in 1996. The current geographical coverage of Global Map is shown in Figure 1, and Figure 2 shows the extent of the area coverage of the project, which now includes 91 percent of the world's land surface. The detailed history and ongoing development of Global Map is the subject of another paper being presented to this conference (Yagunchi, Maruyama, et. al. 2006) which is an update of a paper given to the 16th United Nations Regional Cartographic Conference in 2003 (Hoshino, Maruyama, et. al. 2003). The general context of the development of Global Map and its comparison to the International Map of the World is given in an article entitled "Geopolitical Ideas and Utopian Cartography: An International Map of the World (Pearson, Taylor, et. al. 2006).

Figure 1

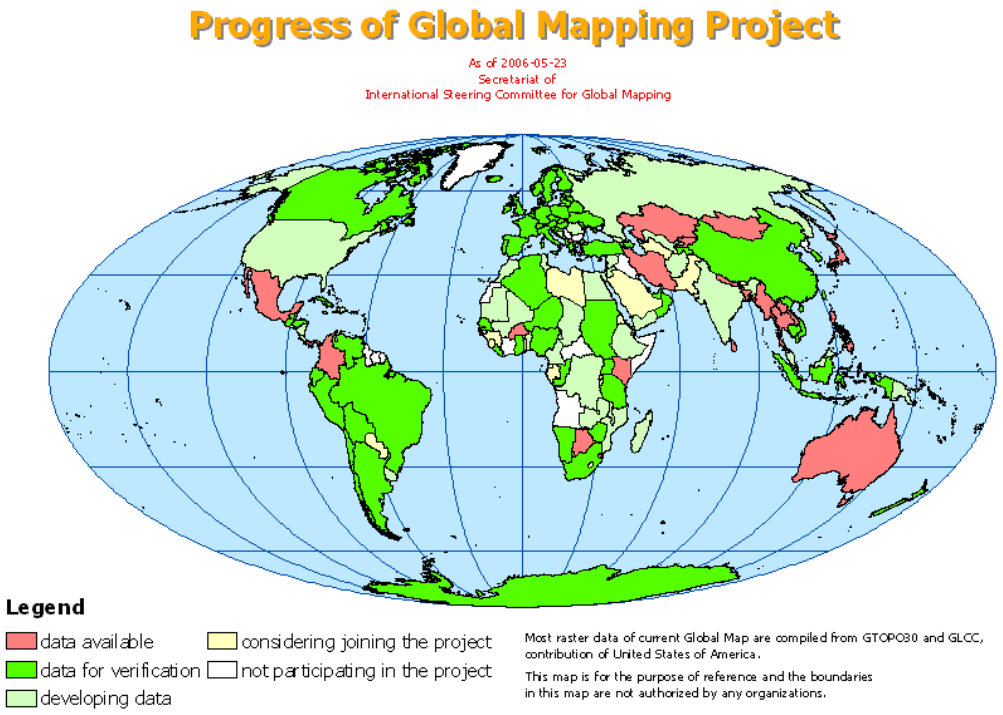
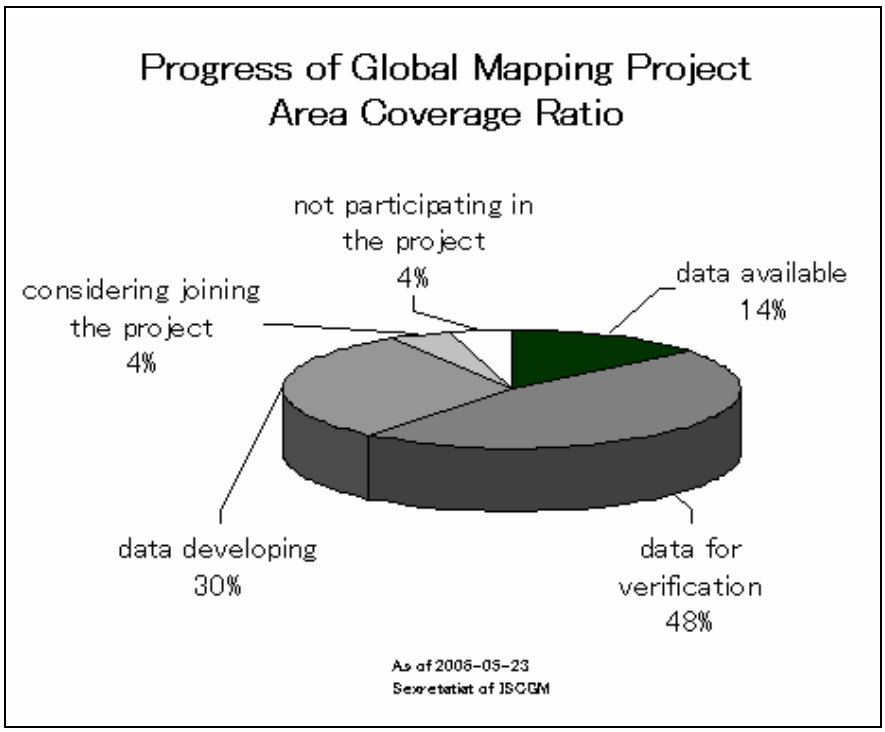


Figure 2



2. Global Map as a Global Spatial Data Infrastructure

Global Map is an operational geospatial data infrastructure and provides a useful framework into which other global datasets can be integrated. It has also been used as a framework on which larger scale national spatial data infrastructures can be built and there are several examples of this process such as the cases of Brazil and Kenya. The development of Global Map complements and illustrates the importance of the work of the Global Spatial Data Infrastructure Association.

3. Global Mapping and Disaster Management

Global Map is designed to aid in the process of sustainable development and environmental decision-making but the framework and the data it contains are useful for the challenge of disaster management. The utility of spatial data infrastructures at various scales for this purpose is widely recognized and there are a number of proposals on the table for the creation of such infrastructures. Effective use of geospatial information for disaster management is both a technical and an administrative challenge. Solutions to the technical challenges, such as appropriate scales, content, standards, system interoperability, currency of information, data access and quality are relatively easy to find but the major challenge is the administrative and political coordination required at both the national and international levels. This is evidenced in almost every major disaster relief effort over the last decade and, in some instances, the lack of coordination creates new problems in a situation already fraught with difficulties. In some cases lack of coordinated efforts by agencies and governments, both national and international, become an additional problem rather than a solution. Here partnership and participation at both the local and international levels are important. Several national and international efforts are underway to create geospatial databases and information systems for disaster management but effective coordination is lacking lessening the potential beneficial impact of such approaches and leading to substantial duplication of effort. The Global Map experience is not only useful as a global spatial data infrastructure which can be utilized as part of a disaster management strategy. The process by which Global Map is being created and the partnerships and participation involved are equally, if not more,

instructive and this will be the main focus of this paper.

4. Participation and Partnership in the Creation of Global Map

Although Global Map is a global enterprise it is built for the bottom up, not the top down. There are a number of 1:1 million databases in existence produced by national and international agencies but what sets Global Map apart is the fact that individual national mapping agencies are responsible for creating and monitoring their own national coverage. Where necessary capacity building help is provided to nations by ISCGM in the form of both training and appropriate software. The membership of Global Map includes 147 individual national mapping agencies at the time of writing (June 2006) with a number of others being represented by regional groupings such as Euroglobal Map. Membership is in three self identified categories designated as A, B, and C nations. Many of the nations who self identify in the C category do not initially have the resources to develop Global Map coverage. Nations in the A category volunteer to help in this respect and Japan has been the most active. Support has also been made available by grants by both ESRI and Intergraph is the form of both software, and training and travel support. International training and workshops are also an integral part of capacity building as described by Yaguchi, Maruyama et. al. in their paper to this conference.

The result is very active participation in the creation of national global map coverage and a strong source of national ownership and pride. If effective disaster management information systems are to be built a similar process is required.

5. National and International Partnerships

Given that national mapping organizations are the key players in Global Map they can also become the focus for national disaster management. A robust and functioning partnership is already in operation and can be built on and expanded. Creating new structures and actors for disaster management information systems is less likely to succeed than building on what is already there.

This will, of course, require expanded internal national partnerships among key actors as well as new efforts at the international level. Disaster management resulting from phenomena such as Tsunamis, for example, often requires cooperation among a number of countries as well as the involvement of international aid agencies. A robust and interoperable disaster management information system requires larger scale national systems to be nested inside smaller-scale regional and global systems.

One of the weaknesses of the Global Map model is the mirror image of one if its strengths. Coverage is controlled at the national level and the national tiles produced do not easily merge at national boundaries which themselves are sometimes in dispute creating political problems. In creating Global Map coverage each nation defines its own boundaries which avoids the issue of disputed territories but makes edge matching a major problem.

New regional partnerships are helping to solve this problem and in the process improving the utility of Global Map as a disaster management tool. In Europe, Eurographics has created Eurograph Map. In Latin America a new initiative is creating a Global Map of the Americas and in Asia/Pacific The Permanent Committee for Geographic Information for Asia and the Pacific (PCGCIAP) is creating a unified Global Map of the region. In Africa Mapping African for Africans has recently defined the fundamental geographic datasets required for the continent and African participation in Global Map is coordinated by CODI-GEO, an agency of the Economic Commission for Africa (ECA). The International Steering Committee for Global Mapping welcomes and seeks out partnerships with other initiatives and is an active participant in GEOSS (The Global Earth Observation System of Systems), for example, as pointed out by Yaguchi, Maruyama, et. al.

6. The Need for New Partnerships

Global Map is a useful framework on which to create a disaster management information system at both the national and the international level but it was not designed primarily for this purpose. Mention has already been made of the

need for the national mapping organizations, which are at the core of Global Map, to build new partnerships at the national level with other government agencies involved in disaster management. This will require the addition of new data layers relating to socio-economic data as well as geological information which is of great importance in disasters such as earthquakes.

There is a new proposal to create GlobalGeo-Map by the Geological Surveys of the World (Jackson, 2006) as a contribution to the International Year of the Planet Earth built on the experience of Global Map and ISCGM will participate in this initiative.

There is also a pressing need to more effectively link territorial information with oceanographic and undersea information. ISCGM has been in discussion with IHO (the International Hydrographic Organization) on this topic and although agreement on cooperation has been reached in principle, the implementation of increasing interoperability between land and sea based geospatial information is in its infancy. Coastal regions and island states are critical areas for traumatic short-term disasters caused by tidal surges and tsunamis. They are also the regions most immediately affected by longer term, but no less serious disasters caused by rising sea levels and effective partnerships are required if a more effective response and management of disasters is to be developed.

7. Conclusion

Global Map will reach its goal of complete coverage of the earth's surface by 2007. The reasons for its success lie in a clearly identified and practical goal, the existence of a well defined and funded implementation mechanism, and above all, the processes of partnerships and participation which gives prime importance to bottom up national efforts within a framework of international cooperation. Although Global Map was not developed primarily for disaster management purposes the Global Map model can be extended for this purpose both in technical and organizational terms.

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