The International Steering Committee on Global Mapping's Progress and Process in Aligning Global Cooperation

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Abstract – The Global Mapping initiative aims to build a fundamental geographic data product covering the globe and to provide open access to the product by the global community in the year 2000. The International Steering Committee for Global Mapping (ISCGM) is managing this process. This paper introduces the concept of, and the need for, a Global Map; describes the history, purpose, structure and activities of the ISCGM; describes the structure of, and the progress in building, the Global Map product; and presents some views on the ISCGM and its contribution to global cooperation.

I. INTRODUCTION

A. What is Global Mapping?

The objective of Global Mapping is to build and maintain a fundamental geographic data product covering the globe and to provide open access to the product by the global community.

The Global Map product will initially contain the following thematic data layers: elevation, vegetation, land-use, drainage systems, transportation and administrative boundaries. Each data layer will be represented in a globally consistent manner and will be referenced to a common geodetic datum, thus allowing data layers to be overlaid and integrated with other datasets. The data will have a nominal ground resolution of 1 kilometre (equivalent to conventional maps at scales of 1:1,000,000). Current plans are that these data will be updated at approximately five-year intervals to facilitate the monitoring of changes in the global environment.

B. Why is Global Mapping needed?

It is only in the last few decades of the 21st century that the global community has become broadly aware of the stresses being placed on the environment around them. Satellite imagery, geographic information systems, and global positioning technologies have all contributed to this increased awareness. These are now essential tools for scientists, policy-makers, and administrators involved in environmental management.

Since the United Nations Conference on Environment and Development (UNCED) held in Brazil there has been an increased understanding in the community that global environmental problems require action at a global level and this in turn requires cooperation between countries and sharing of information. The UNCED Agenda 21 plan identified the need for geographic information and the need to decrease the gap in availability, quality, standardisation and accessibility of data between countries.

The importance of geographic information was reinforced during the Special Session of the United Nations General Assembly on the Implementation of Agenda 21 held in New York in June 1997. The report of this session states that "a supportive environment needs to be established to enhance national capacities and capabilities for information collection, processing and dissemination, especially in developing countries, to facilitate public access to information on global environmental issues through appropriate means including high-tech information and communication infrastructure related to the global environment, in the light of country-specific conditions, using, where available, such tools as geographic information systems and video transmission technology, including ***global mapping*** (author's highlight)**.** In this regard, international cooperation is essential".

A major factor currently hindering research and applications oriented studies attempting to provide an improved understanding of these issues is that adequate maps do not exist for many areas of the world. In terms of map scale, content, and timeliness, this is equally true for both the developed and the developing world.

At present a map of the entire globe must be compiled from material from different sources, material that has been produced to different standards of accuracy and content, material that is generally out of date and incomplete, and material that is in many cases inaccessible.

II. THE ISCGM

A. History

The concept of Global Mapping, and the establishment of an international body for Global Mapping, was first

proposed by the Ministry of Construction (MOC) of Japan in 1992, in the same year as the landmark UNCED. The MOC concept was to build global scale geographic information through international cooperation. In the last seven years many countries have embraced the Global Mapping concept.

Today the Global Mapping initiative is coordinated by the International Steering Committee for Global Mapping (ISCGM). The Geographical Survey Institute of Japan (GSI) provides the secretariat for the ISCGM. The ISCGM comprises heads of National Mapping Agencies (NMA's), international organisations, and academic institutions. A key to the future success of ISCGM lies in its ability to continue to engage NMA's.

B. Purpose

The primary purpose of the ISCGM is to examine measures that concerned national, regional and international organisations can take to foster the development of Global Mapping. Such action is designed to facilitate the implementation of global agreements and conventions for environmental protection as well as the mitigation of natural disasters and to encourage economic growth within the context of sustainable development.

The ISCGM is a mechanism to advocate the importance of Global Mapping, exchange views, facilitate coordination and make recommendations on a periodic basis. The Committee also conducts various studies and research, when necessary, and makes public the results of its activities.

C. Structure

ISCGM members are generally heads of NMA's and related international organisations. Members also include those who can make a special contribution to the attainment of the Global Map.

Professor John E. Estes[1] has chaired the ISCGM since its inception. Current members of ISCGM represent Malaysia, Antarctica, Australia, Bangladesh, Canada, China, France, Iran, Japan, Kenya, Korea, Megrin[2], New Zealand, Niger, United Kingdom and the USA. Advisers to the ISCGM include the United Nations Statistics Division, the United Nations Environment Program, the United Nations University, the Central Environment Council of Japan, the National Geographic Society and the International Cartographic Association.

[1] Director of Remote Sensing Research Unit, Department of Geography, University of California at Santa Barbara

[2] The organisation established by CERCO (Heads of European National Mapping Agencies) to create pan-European data products.

ISCGM generally meets once each year. Meetings have been held in: Tsukuba, Japan (February 1996); Santa Barbara, California, USA (November 1996); Gifu, Japan (November 1997); Sioux Falls, South Dakota, USA (June 1998); Canberra, Australia (November 1998); Cambridge, United Kingdom (July 1999); and Capetown, South Africa (March 2000). Decisions taken at each meeting are recorded as resolutions.

The business of the ISCGM is undertaken principally at committee meetings, through working groups established to undertake specific tasks, at special workshops and seminars on global mapping, and through the ongoing activities of the secretariat.

D. Activities

Several working groups have been established by the ISCGM to undertake activities that are central to the delivery of the Global Map product. These include:

- Preparation of a statement for consideration by the United Nations through a working group chaired by the USA;
- Preparation of a strategic plan for the Global Map through a working group chaired by Canada;
- Publication of version 1.0 of the technical specification for the Global Map product through a working group chaired by Australia; and
- Consideration of a policy framework for access to the Global Map product through a working group chaired by CERCO.

In addition to these working group activities significant effort has been applied to promoting the Global Map concept and establishing links with complementary initiatives. These activities include:

- Japan and the USA jointly submitting the Executive Summary of the Report on the Interregional Seminar on Global Mapping for the Implementation of Multinational Environmental Agreements to the Fifth Session of the United Nations Commission for Sustainable Development (April 1997) and the Nineteenth Special Session of the United Nations General Assembly (June 1997). A central part of the submission was the Santa Barbara Statement, produced at the Interregional Seminar (held in Santa Barbara November 1996);
- Conducting two Mini-Forums on Global Mapping (Tsukuba March 1997 and March 1999) and two Forums on Global Mapping (Gifu, Japan November 1997 and Sioux Falls June 1998);

- Presenting papers on, and promoting the concept of, Global Mapping at conferences and seminars (eg Cambridge Conference July 1999);
- Delivering Global Mapping training courses to participants from developing countries (Tsukuba June to August 1996 and October to December 1999), convening a meeting on Global Mapping in South-East Asia attended by three countries (Tsukuba March 1998), and conducting an International Workshop on Global Mapping (Tsukuba March 1999);
- Gaining recognition for Global Mapping at the 14th United Nations Regional Cartographic Conference for Asia and the Pacific (Bangkok, Thailand February 1997) and the 6th United Nations Regional Cartographic Conference for the Americas (New York, USA June 1997);
- Creating a Global Mapping homepage on the Internet, and an online discussion group;
- Producing several CD-ROM'S: the Global Map concept; and, sample datasets of Japan and the Mekong river basin;
- Producing a range of Global Map publicity material;
- Establishing Category A liaison between ISCGM and ISO Technical Committee 211; and
- Undertaking a survey on global dataset development

The business of the ISCGM is well described in the Global Mapping Newsletter, published four times each year by the secretariat.

III GLOBAL MAP PRODUCT

Significant data already exists on a global scale. The first edition of the Global Map product will be based on several existing datasets. Over time the reliability and accuracy of Global Map product will be improved by:

- Countries providing better quality data over their jurisdictions;
- Countries entering into cooperative arrangements with other countries in order for data over their jurisdictions to be upgraded and provided; and
- Global data acquisition programs (particularly remote sensing satellite programs).

The base data sets in the first edition of the Global Map product are:

- Elevation in the form of a digital elevation model - initially sourced from the Global 30 Arc Second Elevation Data Set (GTOPO30) from the United States Geological Survey (USGS), EROS Data Centre;
- Land cover, land use and vegetation in the form of a gridded dataset – initially sourced from the Global Land Cover Characteristics Database from USGS, the University of Nebraska-Lincoln and the European Commission Joint Research Centre; and
- Drainage system (rivers, streams, lakes), transportation (roads, railways, airports), political boundaries (including coastlines) and populated places in the form of a vector dataset – initially sourced from the VMAP Level 0 product from the USA National Image and Mapping Agency.

The Global Map product will encompass the entire globe at a scale of 1:1 million. All datasets in the Global Map product will be consistent with this scale and will comply with the Global Map technical specifications. Tiling of the datasets will be required as a way to manage the data efficiently.

IV PROGRESS

The ISCGM has made a commitment to deliver the first edition of the Global Map product to the global community in the year 2000. It is intended that this product will be able to be accessed without restriction and at low cost.

There are currently around 70 countries participating in the construction of the Global Map product (see diagram), another 40 countries or thereabouts are considering participation. Participating countries are classified in terms of their level of participation:

- Level A countries have committed to contribute data of their own and other countries;
- Level B countries have committed to contribute data of their own countries; and
- Level C countries require assistance in the production and contribution of data over their own country. It is envisaged that level C countries will collaborate with level A countries in making their contribution.

V THE ISCGM MODEL OF GLOBAL COOPERATION

Against a background of, on the one hand, rapid globalisation of economic activity and explosive growth in global information and communication technology, while on the other hand, continuing intractable pockets of regional instability and protective national policies on trade and foreign affairs, the ISCGM continues to provide an effective forum for cooperation and collective action at the global level. The reasons for this resilience in a period of rapid change are manifold, and include:

- The pressing need for reliable geographic information by decision-makers who confront significant social, environmental and economic problems at national, regional and global levels;

- The powerful technology now available to gather, process and distribute high value information products of any part of the globe;
- The renewed awareness by NMA's of their responsibility and capability to contribute to the development of global mapping products; and, arguably most importantly
- The vision, perseverance and leadership of firstly, Japan and its NMA, the GSI, and secondly one or two individuals.

Notwithstanding the first edition of the Global Map product is yet to be released, the ISCGM has already delivered a number of beneficial outcomes. These include:

- Providing an opportunity for NMA's to meet and discuss matters of common interest;
- Influencing NMA program priorities;
- Encouraging NMA's to look outwards, to recognise they have a responsibility to both the national and the global community, and to share their valuable products;
- Facilitating common approaches to matters of technical specification and access policy;
- Providing a link to other related forums and initiatives like the Permanent Committees on Geographic Infrastructure for Asia and the Pacific, the Global Spatial Data Infrastructure and the Digital Earth;
- Providing a vehicle for technical education and outreach to developing countries; and
- Facilitating a deeper understanding of datasets residing in many organisations.

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VII REFERENCES

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