

Promotion of Global Mapping Project – Activities of the ISCGM Secretariat and Japanese Government –

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Abstract

With the participation of about 130 countries/regions, further promotion of Global Mapping was clearly supported at the World Summit on Sustainable Development in 2002. This paper summarizes the activities of ISCGM secretariat and the Japanese government on Global Mapping since the previous session of UNRCC-AP in 2000. The main issues are: activities at WSSD processes, cooperation with international partners, Global Mapping Partnership Program, capacity building, Global Mapping Forum, cooperation in data development and ISCGM activities.

1. Introduction

Global Mapping project is an international collaborative initiative through voluntary participation of national mapping organizations of the world, aiming to develop globally homogeneous geographic data set at the ground resolution of 1km. The Geographical Survey Institute (GSI) of Japan has been working as the secretariat of the International Steering Committee for Global Mapping (ISCGM) since its establishment in 1996.

Primary objective of the Global Mapping project is to contribute to the sustainable development through the provision of base framework geographic dataset. Now (as of May 2003) 129 countries and regions that correspond to 83% of land area of the Earth are participating in the project. Among them, twelve countries' data have been completed and are downloadable through the Internet from the ISCGM website at <http://www.iscgm.org/>.

This paper summarizes activities from 2000 to 2003 of GSI, MLIT and other ministries of Government of Japan as well as activities of ISCGM from the secretariat's point of view, for promoting Global Mapping.

2. ISCGM Meetings

ISCGM consists of twenty members (as of May, 2003) who represent national mapping organizations and regional geographic information organizations; namely, Antarctica (SCAR), Australia, Bangladesh, Canada, China, Colombia, Europe (EuroGeographics), France, India, Iran, Japan, Kenya, Republic of Korea, Malaysia, New Zealand, Niger, South Africa, United Kingdom and United States of America (in alphabetical order). The committee is chaired by Professor D.R.F. Taylor at Carlton University, Canada.

ISCGM has held its meetings nearly once a year at places all around the world. The seventh and eighth ISCGM meetings were held in Cape Town, South Africa in 2000 and in Cartagena, Colombia in 2001, respectively. The ninth ISCGM meeting was held in Budapest, Hungary in September, 2002. This was the first meeting chaired by Professor Taylor, the newly elected chairperson. Reported and discussed issues included: activities at WSSD processes, EuroGlobalMap project, ESRI's Global Map/GSDI Grant Program, progress of Global Mapping including steady increase of participation and the release of Kenya Global Map, the first one in Africa, liaison organizations' reports, Phase 2 plan, re-activation of Working Group 2 that deals with specifications of Global Map, establishment of Working Group 4 that deals with global raster data development, data policy, and amendment to Rules of ISCGM. This meeting resolved many pending issues and made a new starting point although there still remain many issues in order to further promote and

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accelerate the development of Global Mapping.

3. Activities at WSSD Processes and Their Result

Since one of the important outcomes of the project is achieving sustainable development through wider use of its products for sound decision-making, ISCGM actively participated in the World Summit on Sustainable Development (WSSD or Johannesburg Summit) and its preparatory processes to this end. As the result, the adopted *Plan of Implementation of WSSD* emphasizes the necessity for promoting development and wider use of earth observation technologies, including global mapping and calls for encouraging initiatives and partnerships for global mapping. Also, Global Mapping became a registered WSSD Type 2 initiative with the goal of completion of global coverage by the year 2007.

Activities in the United Nations have been emphasized in Global Mapping Project for appealing to the international society. The reason is that it is the contribution from survey and mapping field to Agenda 21. The 19th Special Session of the United Nations General Assembly held in 1997, that is also called Rio+5, adopted *Programme for the Further Implementation of Agenda 21*. This document included the term "global mapping." This was the first UN General Assembly document that stated the necessity of Global Mapping as a tool to facilitate public access to information on global environmental issues.

Our efforts for the Johannesburg Summit began with the participation in the ninth annual CSD (Commission on Sustainable Development) session held in April, 2001. The activities include holding side events to raise awareness about Global Mapping and the importance of geographic information. Preparatory meetings at regional level were held and then in total four Preparatory Committee meetings (PrepCom1 to 4) of global scale were held.

ISCGM was accredited the status of NGO (non-governmental organization) for the WSSD at the PrepCom3 Meeting. This was a significant step in the process of our efforts toward the Summit, because this enabled participation of ISCGM committee members and advisors in PrepComs and the Summit itself. Several important members of ISCGM thus attended these conferences and made presentations at side events. This

contributed very much to strengthen the activities of ISCGM in the whole process of the Summit.

Presentations were given at side event of each preparatory meeting. The lecturers included Japanese staff from MLIT or the National Space Development Agency of Japan (NASDA) as well as ISCGM committee members and advisors to emphasize internationality of the project.

Global Map and earth observation were recognized as contribution to sustainable development in the policy of Japanese government towards the Summit. Thus Global Mapping got supports from delegation of Japanese government, especially the Ministry of Foreign Affairs (MOFA), the Ministry of the Environment (MOE) and the Ministry of Education, Culture, Sports, Science and Technology (MEXT). It benefited us very much and helped "promotion of the Global Map" to be described in the *Implementation Plan of WSSD*.

Implementation Plan of WSSD, the major result of the Summit, describes that Global Mapping initiatives and partnerships be promoted as cited in the following.

132. Promote the development and wider use of earth observation technologies, including satellite remote sensing, global mapping and geographic information systems, to collect quality data on environmental impacts, land use and land-use changes, including through urgent actions at all levels to:
 - (a) Strengthen cooperation and coordination among global observing systems and research programmes for integrated global observations, taking into account the need for building capacity and sharing of data from ground-based observations, satellite remote sensing and other sources among all countries;
 - (b) Develop information systems that make the sharing of valuable data possible, including the active exchange of Earth observation data;
 - (c) Encourage initiatives and partnerships for global mapping.
133. Support countries, particularly developing countries, in their national efforts to:
 - (a) Collect data that are accurate, long-term, consistent and reliable;

- (b) Use satellite and remote-sensing technologies for data collection and further improvement of ground-based observations;
- (c) Access, explore and use geographic information by utilizing the technologies of satellite remote sensing, satellite global positioning, mapping and geographic information systems.

Type 2 is collection of registered partnership initiatives that governments and NGOs contribute to global environmental protection and sustainable development with their own responsibility. Type 2 initiatives are not negotiated while Type 1 documents such as *Plan of Implementation of WSSD* and *Johannesburg Declaration on Sustainable Development* (Political Declaration) have to be agreed by negotiations between governments.

Global Mapping was registered under the name of ISCGM as a Type 2 partnership/initiative of WSSD. ISCGM has expressed its plan to complete global land area coverage of the Global Map by the year 2007 under partnerships with national mapping organizations, relevant academic societies and international organizations. This document is reported in the web page of the United Nations, and a summary is also reported in the summary collection of Type 2 which the United Nations compiled.

Global Mapping was also included in *Koizumi Initiative (Concrete Actions of Japanese Government to be taken for Sustainable Development - Towards Global Sharing)*, which was introduced in a plenary session of WSSD. This *Koizumi Initiative* includes the Global Mapping as follows.

Koizumi Initiative (excerpts)

2. Important Areas and Concrete Measures

1) People and Hope (Human Resources Development)

- In order to realize sustainable development, it is indispensable that the ordinary people of the world are motivated with hope to make full use of their ability under good governance.
- To that end, human resources development (in the fields of education, health and gender) is an area of the greatest importance. In other words, investing in people and sharing knowledge and technology are the

keys to sustainable development.

- c) Science & Technology: As a Breakthrough for Sustainable Development
 - Promote Global Environment Monitoring through the Integrated Global Observing Strategy (IGOS) Partnership and Global Mapping
 - Implement environmental science & technology cooperation

4. Cooperation with Partnership Initiatives

ISCGM has liaison status as well as partner relationship with many international and regional organizations or initiatives, such as SCAR, EuroGeographics, CEOS, GISD, GSDI, ICA, ISO/TC211, ISPRS, PCGIAP, PCIDEA, CODI, and UNGIWG. Here we describe a few of cooperative activities with these organizations.

Global Map of Antarctica is now under preparation based on the Antarctic Digital Database (ADD) developed by SCAR. ISCGM is cooperating with SCAR for the conversion of ADD to GM. Issues concerning map projection and mapping of data model was discussed in a paper (Fujimura and Pulsifer, 2003) submitted to the 2nd International Antarctic GIS Workshop.

EuroGlobalMap is a project aiming at providing a digital, seamless million scale data base, based on official data from the contributing countries and covering all of Europe with harmonized data. This is produced under the umbrella of EuroGeographics. EuroGlobalMap is planned to be the European component of Global Map. This is near completion of its first phase.

GSDI (Global Spatial Data Infrastructure) is “coordinated actions of nations and organizations that promotes awareness and implementation of complimentary policies, common standards and effective mechanisms for the development and availability of interoperable digital geographic data and technologies to support decision making at all scales for multiple purposes.” It holds its conference nearly every year. Recent ISCGM meetings were held in the same places as the GSDI conferences for the sake of convenience of participants of the meeting. Global Mapping is well recognized among GSDI as the framework data development activity of global scale. Cooperation between ISCGM and GSDI is mutually

beneficial and ISCGM is participating in the GSDI steering committee. The GSDI Association recognised the efforts of ISCGM in achieving the outcome of the WSSD in the resolution of its 6th conference in 2002.

GISD (Geographic Information for Sustainable Development) aims at applying geographic information to sustainable development projects in Africa and is advocated by the USA. The cooperation between Global Mapping and the GISD will be very effective and this cooperation was agreed at the meeting of Japanese Vice-Minister of MLIT and the NOAA Administrator of USA in Johannesburg, 2002. This was re-affirmed at the meeting of the Japan-US Joint High Level Committee on Science and Technology held in Tokyo on April 21.

5. Global Mapping Partnership Program and the 1ST Global Mapping Seminar in NAIROBI

5.1 Global Mapping Partnership Program (GMPP)

Ministry of Land, Infrastructure and Transport (MLIT), Government of Japan started the "Global Mapping Partnership Program (GMPP)" from FY2002. With the annual budget of about 150,000 US\$, GMPP purposes further strengthening of partnerships to promote Global Mapping activities. The types of partnership are not specifically defined but partnership between developing countries and developed countries, Global Mapping project and other sister organizations, and data providers and users are apparently included.

To realize the purpose above, GMPP includes following activities: 1) Holding international workshops for Global Mapping (Meeting of participating countries); 2) Holding seminars for technical transfer to the developing countries; 3) Dispatching experts to developing countries for technical transfer; and 4) Promoting standardization of Global Mapping data. For the case of FY 2002, GMPP held a side event on Global Mapping at the margin of 4th preparatory committee for WSSD at Bali, Indonesia in June 2002, a symposium on Global Mapping at WSSD in Johannesburg, South Africa in September 2002 and the first session of Global Mapping Seminar in Nairobi, Kenya in August 2002.

GMPP has currently three main focus areas. First, promotion of Global Mapping activities in Africa is

considered important. Since some of African countries have not participated in the Global Mapping project yet, it is crucial to enroll them in the Global Mapping project to achieve whole GM coverage of Africa while supporting them technically. Second, coordination with sister SDI initiatives is required to efficiently implement Global Mapping activities to avoid overlaps and gaps of data development. Third, since enhanced dialogues between data providers and data user bring user-oriented perspectives to Global Mapping implementation, the Program would like to invite representatives of users (both actual and potential) of Global Map data to its activities.

GMPP is hoped to continue its activities by 2007 at least, which will be the target year of global coverage of Global Map, as pledged at WSSD in 2002.

5.2 The 1ST Global Mapping Seminar in NAIROBI

Among the activities of GMPP implemented so far, the 1st Global Mapping Seminar was most remarkable one, because it was the first technical transfer opportunity for Global Mapping in Africa. The outline of the Seminar was as follows.

The first Global Mapping Seminar was held in Nairobi, Kenya from 19 to 23, August 2002. 20 experts from 18 African countries¹ attended the seminar to learn about the policy and technical perspective of Global Map and its promotion. The seminar was regarded as an important step for further promoting Global Mapping and spatial data initiatives in African countries.

MLIT, ISCGM and Regional Centre for Mapping of Resources for Development (RCMRD), jointly carried out the Seminar with the support from Survey of Kenya (SOK), Kenya Institute of Surveying and Mapping (KISM) and Japan International Cooperation Agency (JICA).

The Seminar started with a one-day open workshop entitled "Promoting Global Mapping in African Context." The workshop was commemorating the first Global Mapping Seminar. The workshop was held for the purpose of exchanging the opinions and sharing the views on: promo-

¹ Benin, Botswana, Congo, Ethiopia, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mauritius, Namibia, Senegal, Seychelles, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe.

tion of Global Mapping Project in Africa; strengthening partnerships between Global Mapping Project and relevant initiatives and their contribution to sustainable development in Africa. Facilitated by Mr. James Sogoh, principal of KISM, following presentation were made in the Seminar.

- Outline of Global Mapping Project and current status (Mr. Sumio Onishi, ISCGM),
- Implementation of the Project in Africa (Mr. Haggai Nyapola, SOK),
- Activities of Regional Centre for Mapping of Resources for Development (Dr. Wilber Ottichilo, RCMRD),
- African SDI -concepts and components (Dr. Ottichilo, RCMRD for Dr. Kate Lance, US Geological Survey),
- UNEP activities in geographic information field (Mr. Timo Maukonen, United Nations Environment Programme),
- Development of Africover Project (Mr. Luca Alinovi, Food and Agriculture Organization) and
- Introduction of Global Mapping Partnership Project and Input of Global Mapping to World Summit on Sustainable Development (Mr. Toru Nagayama, MLIT).

During three and a half days in the middle of the Seminar, attendants of the seminar listened to lectures on outline of geographic information system, basic operation of ArcView GIS software and processing of Global Map data by using the software. Following the lectures, they took practice of GIS software operation and data processing by using PCs provided for each.

Finally the seminar had a half-day session on further steps for promotion of Global Mapping, with the presentation on establishing spatial data infrastructure (SDI) at national level and the application case study of global map, and following discussions. The seminar closed with the certificate awarding ceremony.

Through carrying out the Seminar, participants generally shared the following points:

- The Seminar provided an good opportunity of transfer of geographic information technology to African countries;
- Both political and technological perspectives of Global

Mapping were paid attention to in a balanced manner;

- Development of Global Mapping will bring double outcomes to developing countries: one is capacity building in geographic information technology and the other is contribution to world community for establishing global spatial data infrastructure;
- Enhancement of partnership with sister initiatives such as FAO/UNEP Africover project should be explored to avoid the duplication of work to be exercised by participating countries; and
- The venue of the next Seminar could perhaps be in West Africa region where the enrollment of countries to Global Mapping project is not sufficient.

6. Capacity Building for Developing Global Map

GSI has been conducting JICA group training courses on Global Mapping for technology transfer to developing countries. The lectures of the course are specialistic on environmental, cartographic and surveying fields. The curriculum of the course includes significance of Global Mapping, structure and development method of Global Map data, and basic and the latest knowledge of related fields. The course is composed of lectures, observation trips and practices. It is about two and half months long, and about five participants attend this course every year.

The objective of the practice is to develop the prototype of the Global Map data of the participants' countries using the source data they brought from their countries. Because the practice is conducted by the technical contact person of the secretariat of ISCGM, this practice helps the developers strengthen mutual communication. The members of the secretariat of ISCGM conduct lectures and practices also in other JICA training courses held in GSI and this helps to raise awareness and disseminate understanding on the importance of the Global Mapping.

7. Global Mapping Forum

In November 1996, the United Nations held "The International Seminar on Global Mapping for Implementation of Multinational Environmental Agreements" under joint auspices of the University of

California, Santa Barbara and the GSI. Participants of the seminar adopted the *Santa Barbara Statement* that included promotion of Global Mapping under international cooperation and creation of Global Mapping Forum to exchange views and information between users and providers of the Global Map.

Based on this statement, the GSI and the ISCGM organized “Global Mapping Forums” in Gifu, Japan in November 1997, in Sioux Falls, United States in June 1998 and in Hiroshima, Japan in November 2000.

Through “Global Mapping Forum 2000,” the participants got a strong impression that the Global Map had become a big international project that attracted world’s attention; that the Global Map data development was being carried out firmly all over the world; and that the Global Map data had started to be applied to various fields.

The fourth Global Mapping Forum is held under the watchword in “Conservation of Global Environment in the 21st Century” from July 12 to July 15, 2003 in Okinawa, Japan. The outline of the program is as follows.

Day 1, Saturday July 12

Opening

Keynote Lecture “Global Mapping: The Status and the Future”

Special Lecture “Biodiversity and Map in Okinawa”

Special Report “Global Mapping: The Status of Development by GSI”

Lecture “Digital Society and Role of the Global Mapping” etc.

Panel Discussion “Global Mapping: Contribution to Water Supply Problem”

Day 2, Sunday July 13

Session-1: Development of Global Geographic Information

Session-2: Development of Global Information by Remote Sensing

Session-3: Application to Human Activity, Disaster Prevention and Environment

Session-4: Distribution of Geographical Information in the IT Era

Day 3, Monday July 14

Session-5: Geographic Database in the countries

Closing Session: In the Future Plan of the Global Mapping Project

Day 4, Tuesday July 15

Technical Tour

Through these presentations, the status of the Global Map development of respective countries is reported and active discussions are held on the usage of global geographic information.

8. Support for Developing Global Map of Other Countries by JAPAN as a “Level A” Participating Country in Global Mapping

There are three levels of participation, i. e. Level A, B and C in the Global Mapping project depending on the economic and technical conditions of different countries. Japan participates in the project in Level A. We develop data of Japan as well as taking a role of developing data of Level C countries in cooperation with National Mapping Organizations (NMOs) of the countries which do not produce data by themselves.

To this end, GSI started a data development project in 1998 for developing countries mainly in Asia and the Pacific region. GSI produces Global Map data using geographical information such as paper maps provided by the relevant countries. To date, data of the following countries have been developed: Thailand, the Philippines, Vietnam and Kazakhstan in 1998; Mongolia Kyrgyz and Bangladesh in 1999; Laos and Nepal in 2000; Myanmar and Sudan in 2001; and Senegal and Liberia in 2002.

9. Future Activities

The ninth ISCGM meeting decided the reactivation of the WG2 and establishment of WG4. There arose several issues to be solved in the present specifications of the Global Map (version 1.1). One is to allow larger scale data. One millionth scale is not suited to some countries with small area territories. There is also argument to develop larger scale data for the second phase of Global Mapping. There is a consensus that Global Mapping should seek the initial goal of global coverage with one millionth scale. But it is necessary to prepare specifications that allow data corresponding to larger map scale. Another

issue is to reflect recent development of international standardization of geographic information. The VPF format currently used as the data format of Global Map is not so widely used and data conversion to this format burdens secretariat with large workload. Based on these observations, we plan to revise the specifications through the activities of the WG2.

Raster data layers of Global Map other than elevation are derived from GLCC data. Some modifications were done by each country for these layers. But necessity of developing new data is increasing and it is possible to develop global raster data from satellite images with appropriate ground truth data. The new working group WG4, chaired by Dr. Ryutarō Tateishi at Chiba University, Japan, started to investigate the method and the strategy for the development of the new land cover dataset at global scale.

There are many other issues and action items to be addressed. One example is improvement of web pages of ISCGM. The secretariat of ISCGM will continue to make every effort for the promotion and development of the Global Map.

References

- Estes, John E. and Kline, Karen D. (2000): The International Steering Committee for Global Mapping, Current Status and Future Plans and Challenges, Paper submitted to the 15th United Nations Regional Cartographic Conference for Asia and the Pacific, Kuala Lumpur, Malaysia, United Nations E/CONF.92/L.9.
- Fujimura, Hidenori and Pulsifer, Peter (2003): Data conversion from ADD to Global Map, Paper submitted to the 2nd International Antarctic GIS Workshop, Freiburg, Germany, April 7th-11th, 2003.
- Fukushima, Yoshikazu (2000): Implementation of Global Mapping, *Bulletin of the Geographical Survey Institute*, **46**, 17-31.
- Hoshino, Yoshihisa, Kidokoro, Motoyuki, Akiyama, Minoru, Fukushima, Yoshikazu, Maruyama, Hiromichi and Une, Hiroshi (2000): Promotion of Global Mapping Project, Paper submitted to the 15th United Nations Regional Cartographic Conference for Asia and the Pacific, Kuala Lumpur, Malaysia, United Nations E/CONF.92/L.9.
- Maruyama, Hiromichi (1998): History of Activities for Getting International Agreement on the Development of the Global Map, *Bulletin of the Geographical Survey Institute*, **44**, 63-90.
- Masaharu, Hiroshi and Akiyama, Minoru (2003): Publicity Activities of Global Mapping at Johannesburg Summit and Outcomes of the Summit, *Bulletin of the Geographical Survey Institute*, **49**, 59-69.
- Taylor, D. R. F. (2003): Global Mapping and Spatial Data Infrastructures: Development and Challenges for Dissemination of Geospatial Data, Paper to be submitted to the 16th United Nations Regional Cartographic Conference for Asia and the Pacific, Okinawa, Japan.
- Une, Hiroshi (2001): Toward the Next Stage of the Global Mapping Project – Successful Completion of Phase 1 with Release of Global Map Version 1.0, *Bulletin of the Geographical Survey Institute*, **47**, 13-19.
- Une, Hiroshi and Kajikawa, Shozo (2001): Current Status of Global Mapping Project: Release of Global Map Version 1.0 and Start of Phase II, *Proceedings of the 20th International Cartographic Conference*, **5**, 3378-3379. (Paper version contains only two pages abstract while the CD-ROM version of the Proceedings contains full text in eight pages.)
- Une, Hiroshi, Kajikawa, Shozo and Sato, Hiroshi P. (2002): Global Mapping for Land-Use/Cover Change Study. In: Himiyama, Yukio, Hwang, Manik and Ichinose, Toshiaki eds.: *Land-Use Changes in Comparative Perspective*, 3-19, Science Publishers, Inc.

Web sites

Agenda 21

<http://www.un.org/esa/sustdev/agenda21.htm>

GISD <http://www.opengis.org/gisd/>

Global Mapping <http://www.iscgm.org>

Global Map Version 1.1 Specifications

<http://www.iscgm.org/html4/pdf/gmspec-1.1.pdf>

GSDI <http://www.gsdi.org/>

ISCGM <http://www.iscgm.org>

WSSD (Official homepage by UN)

<http://www.johannesburgsummit.org/>

Koizumi Initiative

[http://www.mofa.go.jp/policy/environment/wssd/
2002/kinitiative.html](http://www.mofa.go.jp/policy/environment/wssd/2002/kinitiative.html)

Plan of Implementation of the World Summit on Sustainable
Development

[http://www.un.org/esa/sustdev/documents/
WSSD_POI_PD/English/POIToc.htm](http://www.un.org/esa/sustdev/documents/WSSD_POI_PD/English/POIToc.htm)