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Utilization of Global Map for Asia and the Pacific Region*

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Summary

Global Mapping Project aims to develop digital geo-information framework datasets of the whole land area of the globe through international cooperation of National Mapping Organizations (NMOs) of the world. Steered by the International Steering Committee for Global Mapping (ISCGM), the Project completed the development of Global Map version 1 in 2008. It is now making efforts to revise specifications for Global Map version 2 and to promote further use of Global Map to build Geospatial Infrastructure.

Acronyms

GLCNMO: Global Land Cover by National Mapping Organizations
GML: Geography Markup Language
GSI: Geographical Survey Institute of Japan
IPCC: Intergovernmental Panel on Climate Change
ISCGM: International Steering Committee for Global Mapping
ISO: International Organization for Standardization
JICA: Japan International Cooperation Agency
KML: Keyhole Markup Language
LCCS: Land Cover Classification System
LULUCF: Land use, Land-use change and Forestry
MLIT: Ministry of Land, Infrastructure, Transport and Tourism of Japan
MODIS: MODerate resolution Imaging Spectroradiometer
NMO: National Mapping Organization
PCGIAP: Permanent Committee on GIS Infrastructure for Asia and the Pacific
PDF: Portable Document Format
SDI: Spatial Data Infrastructure
TICAD: Tokyo International Conference on African Development
TIFF: Tagged Image File Format
UNFCCC: United Nations Framework Convention on Climate Change
UNCED: United Nations Conference on Environment and Development
WMS: Web Map Service
WSSD: World Summit on Sustainable Development

1. OUTLINE OF GLOBAL MAPPING PROJECT

1.1 Introduction

Global Mapping Project is an international cooperation initiative through voluntary participation of National Mapping Organizations (NMOs) in the world, aiming to develop digital geo-information framework datasets ensuring spatial resolution at 1 km. Primary objective of the Project is to contribute to sustainable development, environmental conservation and natural disaster mitigation through provision of basic geo-information framework datasets.

The Project was initially proposed by Ministry of Construction of Japan (present Ministry of Land, Infrastructure, Transport and Tourism of Japan) in 1992, in conjunction with the adoption of Agenda 21 at United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro. Preparatory works for concretization of the proposal thereafter eventually resulted in the establishment of the International Steering Committee for Global Mapping (ISCGM) in 1996.

In 1998, ISCGM sent a letter to all NMOs in the world with recommendation of Mr. Habermann, the Director of the United Nations Statistic Division, to invite them to participate in the Global Mapping project. As a result, there was a big increase of participating organizations in the project, and the development of the Global Map was started.

Being chaired by Prof. D. R. F. Taylor of Carlton University, Canada, the Committee consists of twenty members (as of October 2009) representing NMOs and regional geographic information organizations. The secretariat of ISCGM has been served by Geographical Survey Institute (GSI), the National Mapping Organization of Japan.

Global Mapping was notably referred to in paragraph 132 of "the Plan of Implementation" adopted at World Summit on Sustainable Development (WSSD) in Johannesburg in 2002 (United Nations, 2002). The project was registered as a WSSD Type 2 initiative with the goal of completion of global coverage by the year 2007.

With the effort of participating NMOs and supporting stakeholders, the first global coverage was achieved by releasing Global Map version 1 on the occasion of Global Mapping Forum in Tokyo in June 2008.

1.2 GLCNMO and Global Percent Tree Cover

The highlight of Global Map version 1 is the completion of global coverage of land cover layer and vegetation layer. The datasets are named as Global Land Cover by National Mapping Organizations (GLCNMO) for the former and Global Percent Tree Cover for the latter. GLCNMO has twenty land cover classes, based on land cover classification system (LCCS) (Figure 1). Meanwhile Global Percent Tree Cover describes the tree coverage ratio ranging from 0 to 100% (Figure 2). Under the ISCGM initiative, two datasets derived from MODIS data obtained in 2003 were developed by GSI and the Center for Environmental Remote Sensing (CEReS), Chiba University with the contribution of several tens of NMOs for training data identification and data verification.

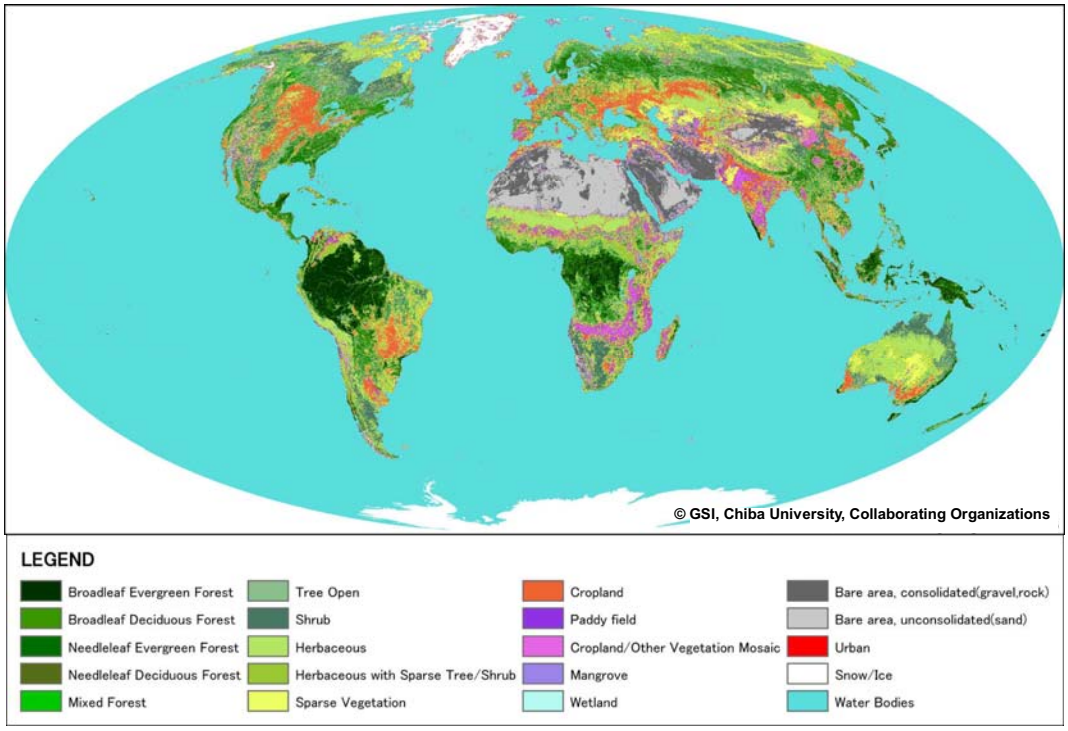

Figure 1: GLCNMO Image

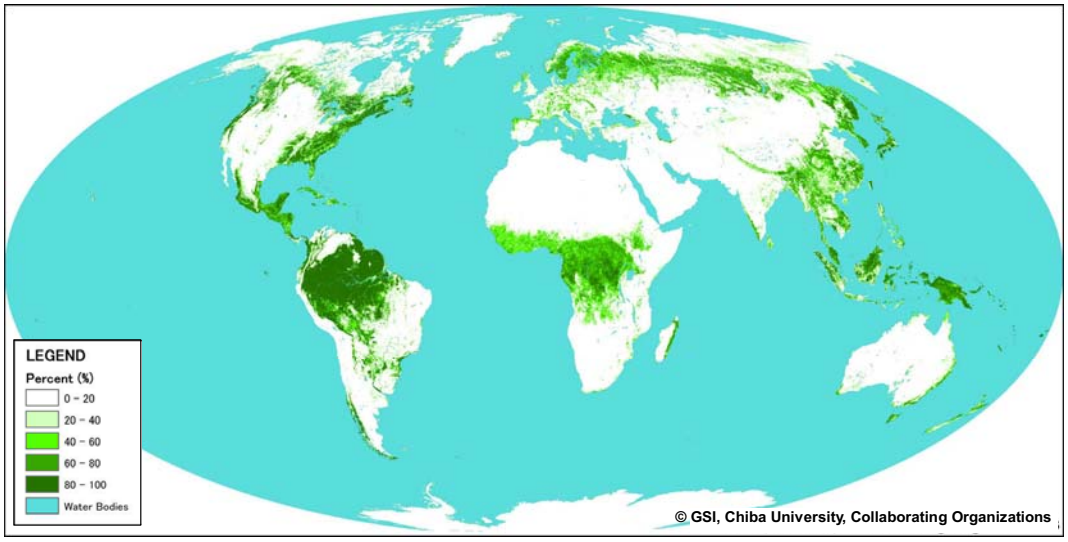

Figure2: Global Percent Tree Cover Image

2. UNDERTAKINGS OF JAPANESE GOVERNMENT

Japanese government has been promoting this project with the primary objectives mentioned above. As one of the governmental agencies of Japan, Geographical Survey Institute (GSI) has been serving as the secretariat of ISCGM and tackling various activities energetically as follows.

2.1 Fourteenth Session of the Conference of the Parties (COP14) of UNFCCC in Poznań, Poland

Figure 3:Poznań International Fair, Poznań

COP14 of United Nations Framework Convention on Climate Change (UNFCCC) took place in Poznań, Poland from 1 to 12 December 2008 to discuss international policy framework to cope with climate change. More than 9,000 people from governments, international organizations, NGOs, researchers and press attended the Conference.

MLIT and the ISCGM secretariat jointly participated in the Conference to promote the use of Global Map version 1 to facilitate the discussions on measures against climate change.

Figure 4: Global Map presentation

At the side seminar on 9 December hosted by the Japanese Government, one of the authors of this report, Takayuki Nakamura made a presentation entitled "Utilizing Global Map for Addressing Climate Change."

The presentation drew interest of an audience of 150 not only about the outline of Global Map, but also on the possibility of use of Global Map in climate change fields. These fields include formulating adaptation measures in response to adverse effects of climate change such as sea level rise; grasping forest areas and forest distribution in an effort to Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (REDD); and calculation of greenhouse gases (GHGs) emissions and removals from Land Use, Land-Use Change and Forestry sector (LULUCF).

Their interests in Global Map in COP 14 indicate their big demand for the geographic information in environmental problem solution, which is also an encouraging message that both National Mapping Organizations and ISCGM have more and more room to assist in climate change policy formulation at national and international levels through distributing necessary geo-information, up to and beyond 2012.

2.2 Seventh Workshop on Greenhouse Gas Inventories in Asia (WGIA)

The 7th WGIA was held in Seoul, Republic of Korea from 7 to 10 July 2009 hosted by the Ministry of the Environment of Japan (MoEJ) and the National Institute for Environmental Studies (NIES). The workshop was attended by 100 participants in total, including representatives of government and research institutes of eleven countries: Cambodia, Indonesia, Japan, Lao, P.D.R., Malaysia, Mongolia, Myanmar, Philippines, Republic of Korea, Thailand, and Vietnam, in addition to two international organizations: UNFCCC, IPCC.

Figure 5: Participants of the 7th WGIA

GSI made a presentation on the Global Mapping project at the working group of LULUCF sector. At the presentation, GSI introduced how to interpret Land Cover classes defined in Global Map into

LULUCF and how to calculate each area of land cover 6 classes of LULUCF concretely. The participants learned the existing global scale GIS datasets such as Global Map and its usability.

They become aware of and recognized the importance of cooperation between GIS or Remote sensing experts, including officials at National Mapping Organizations, and people in charge of climate change especially GHG inventories.

GSI expects to build relationship between GIS or Remote Sensing experts, including officials at National Mapping Organizations, and people in charge of climate change especially GHG inventories; to improve skills of relevant people; and to utilize Global Map into promoting GHG inventories in the countries of Asia and the Pacific Region.

2.3 Side Event in G8 Hokkaido Toyako Summit

The G8 Hokkaido Toyako Summit was held from 7 to 9 July 2008. In conjunction with the summit, various events under the theme of environment took place at many places in the host country of the Summit, Japan. Among the events, "Integrated Exhibition of the Environment in celebration of the Hokkaido Toyako Summit" was held form 18 to 21 June 2008, where Global Map booth was set to introduce the purpose, the role and the application of Global Map in global environmental field with panel display, video presentation and PC demonstration.

Figure 6: Integrated Exhibition of the Environment in Celebration of the Hokkaido Toyako Summit (at Sapporo Dome)

2.4 Global Mapping Forum 2008

"Global Mapping Forum 2008," a three-day-long forum was held in Tokyo and Yokohama, Japan from 5 to 7 June 2008. The forum was jointly organized by the GSI, ISCGM, and the United Nations University (UNU) for the producers and users of Global Map to discuss the expansion of users of Global Map data. It was attended by 346 participants from 26 countries who are mainly heads of National Mapping Organizations of the world and experts of the global environmental field.

Figure 7; Presentation by Dr.Yoshio Tsukio, Professor Emeritus of The University of Tokyo

At this forum, a panel discussion was held titled as "Discussion towards the Development of Global Map Version 2" and adopted "Global Map Tokyo Declaration. "

The Tokyo Declaration states that producers and users of Global Map should further strengthen coordination, including capacity building, so that Global Map can be made more user-friendly to the people of the world to help to better decision-making.

Figure 8:Global Map School

As part of this Forum, "Global Map School" was held at Keio Futsubu School with students of Princess Chulabhorn's College Nakhon Si Thammarat (secondary and tertiary education level). They communicated

each other by exchanging ideas on topics like national characteristics and global environmental problems by using Global Map datasets supported by internet-based video conferencing systems. The objective of this program is to provide a scheme for nurturing international understanding supported by the effective use of geographic information. So far, three sessions have been carried out. One session was between Japan and the Philippines and the remaining two were between Japan and Thailand.

Figure 9;Global Map School

2.5 Fifth World Water Forum

The fifth (5th) World Water Forum was held in Istanbul, from 16 to 22 March 2009 to discuss the importance of water on the political agenda. The Figure 10 was exhibited at the event, which shows the current land cover of the whole land of the globe (background) and the future change in the annual maximum of daily precipitation projected by the global warming simulation with a high resolution climate model. This was created in collaboration between GSI and Meteorological Research Institute (MRI).

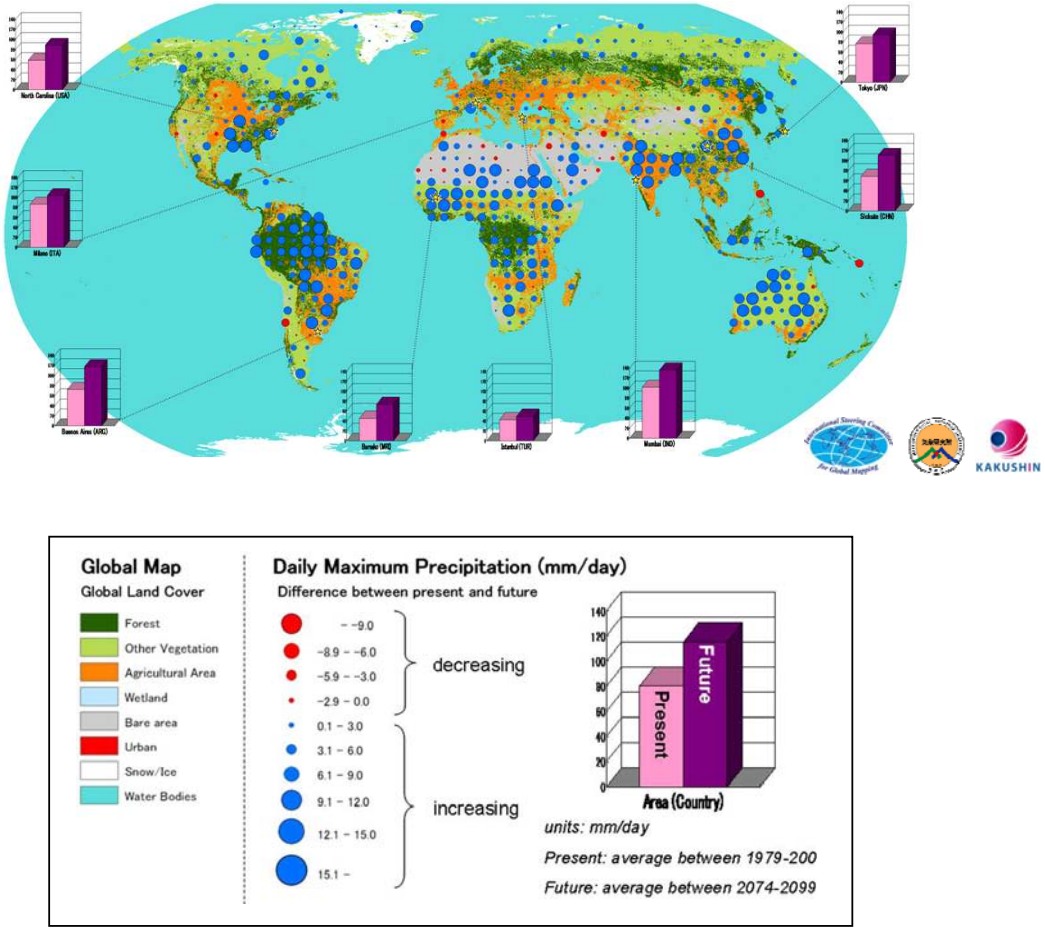

Figure 10: Global Land Cover and Predicted Change in Daily Maximum Precipitation

2.6 Fourth International Conference on African Development (TICAD IV)

The Fourth (4th) Tokyo International Conference on African Development (TICAD IV) was held in Tokyo, from 28 to 30 May 2008 to promote high-level policy dialogue between African leaders and development partners. The Global Map of the African Region was displayed on the screen during the conference. The Global Map was also mentioned in the "TICAD IV Yokohama Action Plan" as "promote technical assistance such as establishing and updating the Global Map data for the Africa, describing the status of its environment in five years" in the actions to be taken in the next 5 years under the TICAD process (chapter 2 of "Addressing Environmental / Climate Change issues" section).

2.7 Global Mapping Seminars in Africa

Figure11:Global Map Seminar

As a part of Global Mapping Partnership Program (GMPP) inviting people of National Mapping Organizations (NMOs) to promote the development of Global Map in the developing and other countries, Global Mapping Seminars in Africa were held with the cooperation of Survey of Kenya and Direction des Travaux Geographiques et Cartographiques (DTGC), in Kenya and Senegal since 2002 to 2008. These seminars were organized by MLIT, ISCGM and SOK/DTGC with the support of the Japan International Cooperation Agency (JICA).

It has been held in Nairobi, Kenya from 2002- 2004 and in Dakar, Senegal from 2005 - 2008, annually and respectively. The objectives of these seminars are as follows:

- To enlighten the significance of the Global Mapping project and facilitate the project participation
- Technological transfer for creating Global Map data and facilitation of the data development
- Promotion of the development of National Spatial Data Infrastructure (NSDI) started from developing Global Map data.
- Information exchange among NMOs in the African Region

2.8 JICA Training Course

Since 1994 and sponsored by JICA, GSI was conducting a group training course on Global Mapping for technology transfer to developing countries. This course was attended by 94 participants from 57 countries in 15 years from 1994 to 2008.

3 CONCLUSIONS

Global Mapping Project is to develop geographic information of the whole land area of the globe with consistent specifications through international cooperation of respective NMOs. The project has completed the first goal of "Global Map version 1, " including GLCNMO and Global Percent Tree Cover. Global Map version 1 is expected to accelerate the use of Global Map. Global Mapping Project is collaborating in the broad range of cooperative frameworks as global geospatial infrastructure. At the same time, it is revising the specification and diversifying data formats for the benefit of producers and users of Global Map.

Promotion of Global Map has steadily advanced in global environmental field internationally. Practical use in different fields such as greenhouse-gases inventories surveillance is also progressing. Another undertakings such as general publicity activity, applications in education and capacity building in developing countries have advanced steadily.

Through these approaches, it is expected that the use of Global Map will be further enhanced to address Global Challenges in the broader range including the field of disaster prevention and management.

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