

The History and Development of Global Map as a Spatial Data Infrastructure for Sustainable Development in the Middle East and North Africa

D.R.F. Taylor
Chair, International Steering Committee
for Global Mapping (ISCGM)
fraser_taylor@carleton.ca

www.iscgm.org

Cairo, Egypt, April 2005



1

Some Key Factors for Sustainable Development

- ✦ Security and peace
- ✦ Meeting basic needs and alleviating poverty
- ✦ Development of human and social capital
- ✦ Economic growth
- ✦ More equitable distribution of wealth
- ✦ Greater participation in decision making
- ✦ Environment: Land and water
- ✦ Transcendental values: Religion

iscgm.org

Cairo, Egypt, April 2005

2

Spatial Technologies and Spatial Data Infrastructures are not value free.

They can be useful for development but this utility is conditioned by who is using them and for what purposes.

iscgm.org

Cairo, Egypt, April 2005

3

Local and indigenous control of these technologies is critical and is a necessary but not sufficient step to ensure their utility for development.

iscgm.org

Cairo, Egypt, April 2005

4

What is Global Map?

✦ Digital geographic dataset of

- Global coverage
- Consistent specifications
- Worldwide open distribution

iscgm.org

Cairo, Egypt, April 2005

5

Global Map is an operational Global Spatial Data Infrastructure for decision making on environment and sustainable development issues.

iscgm.org

Cairo, Egypt, April 2005

6

Philosophy of Global Map

National mapping organizations will participate voluntarily and make data available for use. Each mapping organization will be responsible for providing data of their territory.

National mapping organizations can provide data for a global, fundamental, consistent database for research and decision making.

iscgm.org

Cairo, Egypt, April 2005

7

History

- ✦ The concept of Global Map began in the 1992 by the Geographic Survey Institute of Japan in response to the needs of UN Agenda 21.
- ✦ A workshop was held in 1994
- ✦ ISCGM was established in 1996 with the late Jack Estes as Chair
- ✦ In 1997 a joint resolution was presented to the UN General Assembly to encourage participation of countries around the world.
- ✦ Being a cooperative endeavour, 132 countries joined the Global Mapping Project by March 2003.
- ✦ Much progress has been made to include developing nations.
- ✦ By 2007, the goal is to have complete coverage of the earth's land surface.

iscgm.org

Cairo, Egypt, April 2005

8

Global Map Specifications

- ✦ Spatial resolution: ca. **1km**
(equivalent to **1:1,000,000** scale)
- ✦ **8 layers**
 - Vector data (point, line, area)
 - Boundaries (Administrative/Coast), Drainage (Rivers/Lakes), Transportation (Roads/Railways/Airport), Population centers
 - Raster data (grid)
 - Elevation, Land Cover, Land Use, Vegetation

iscgm.org

Cairo, Egypt, April 2005

9

Global Data Sets for Global Environment

- ✦ DEM: GTOPO30 (Global 30 second elevation data set) > DTED-1 (Digital Terrain Elevation Data Level -1)
- ✦ Geography: DCW (Digital Chart of the World) > VMAP (Vector Map) Level 0
- ✦ Land use/cover: GLCC (Global Land Cover Characterization) = IGBP-DIS's Land Cover

iscgm.org

Cairo, Egypt, April 2005

10

International Steering Committee for Global Mapping (ISCGM)

- Members : 20 persons from 16 countries
- Advisors : 8 persons
- Chair: Prof. D. R. F. Taylor (Carleton University)
- Member countries and organizations
 - Australia, Bangladesh, Canada, China, Colombia, France, Iran, Japan, Kenya, Korea, Malaysia, New Zealand, Niger, South Africa, United Kingdom, USA, Eurogeographics, SCAR-GGI
- Advisory organizations
 - UN Statistics Division, UN Cartographic Section, UN Environment Program, UN University, ICA, U. S. Department of State
- Secretariat: Geographical Survey Institute, Japan

iscgm.org

Cairo, Egypt, April 2005

11

Organization of the ISCGM

- ✦ Member countries and organizations
 - Australia, Bangladesh, Canada, China, France, India, Iran, Japan, Kenya, Republic of Korea, Malaysia, Mexico, New Zealand, Niger, South Africa, United Kingdom, USA, EuroGeographics, SCAR
- ✦ Liaison organizations
 - UN Statistics Division, UN Cartographic Section, UN Environment Program, UN University, ICA, ISO/TC211 etc.

iscgm.org

Cairo, Egypt, April 2005

12

Partnership with other Organizations

- ISCGM has liaison status or communication with many geographic information related organizations/activities such as:
 - Committee on Earth Observation Satellites (CEOS)
 - European Umbrella Organization of Geographic Information (EUROGI)
 - EuroGeographics
 - Geographic Information for Sustainable Development (GISD)
 - Global Spatial Data Infrastructure (GSDI)
 - International Cartographic Association (ICA)
 - International Society for Photogrammetry and Remote Sensing (ISPRS)
 - International Standardization Organization / Technical Committee 211 (ISO/TC211)
 - Permanent Committee on GIS Infrastructure for Asia and the Pacific (PCGIAP)
 - Permanent Committee on Spatial Data Infrastructure for the Americas (PCIDEA)
 - Scientific Committee on Antarctic Research (SCAR)
 - United Nations Geographic Information Working Group (UNGIWG)
 - United Nations Economic Commission for Africa (ECA), Committee on Development Information (CODI)

iscgm.org

Cairo, Egypt, April 2005

13

History of Global Mapping

- ✦ 1992 UNCED
 - Adoption of "Agenda 21"
 - Global Mapping Concept proposed by Japanese government
- ✦ 1996 Establishment of International Steering Committee
- ✦ 1997 Rio+5 (UN General Assembly Special Session)
 - necessity of Global Mapping included in the adopted "Programme for the further implementation of Agenda 21"
- ✦ 2000 Release of Global Maps through the Internet
- ✦ 2002 WSSD
 - Adopted document "Plan of Implementation" describes global mapping
- ✦ 2007 Complete land surface of the Earth to be covered by Global Maps

iscgm.org

Cairo, Egypt, April 2005

14

Implementation of the project

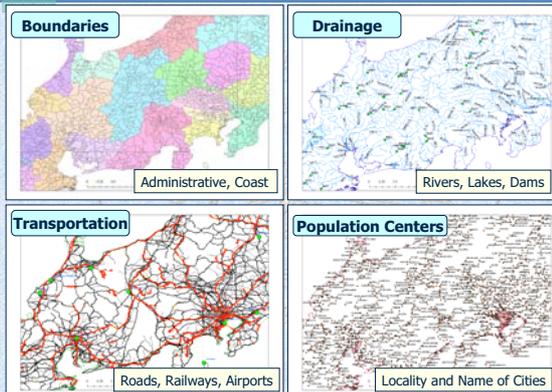
- ✦ Support by United Nations
 - Sent recommendation letter inviting NMOs
- ✦ Contribution depending on capacity
 - Level A: help creation of coverage for Level C countries in addition to their own national coverage
 - Level B: create their own national coverage
 - Level C: provide source materials to A countries while developing national capacity
- ✦ Easy participation
 - No participation fee
 - Send application form with plan of data development
- ✦ Various benefits

iscgm.org

Cairo, Egypt, April 2005

15

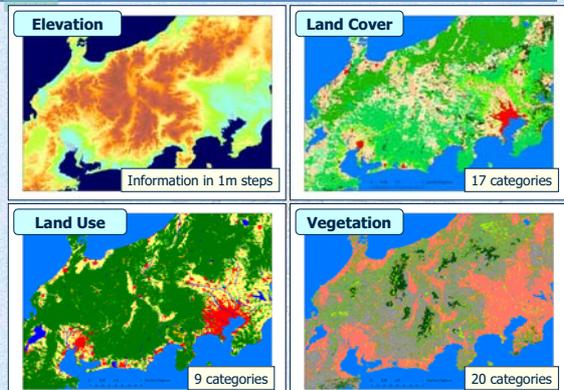
Global Map Data (Vector Data)



rg

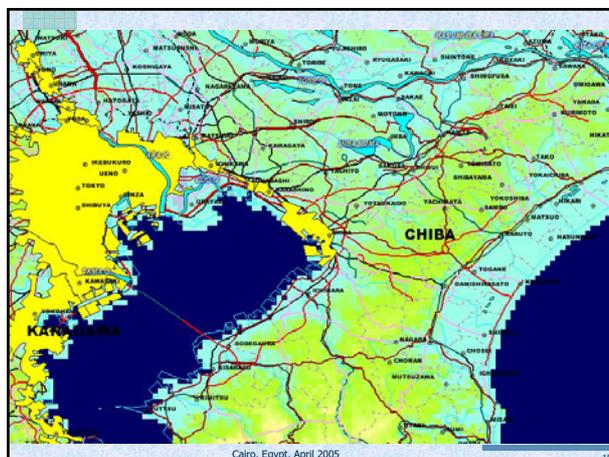
16

Global Map Data (Raster Data)



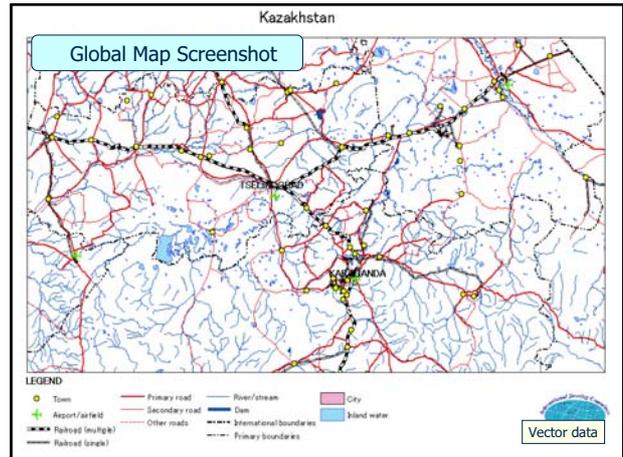
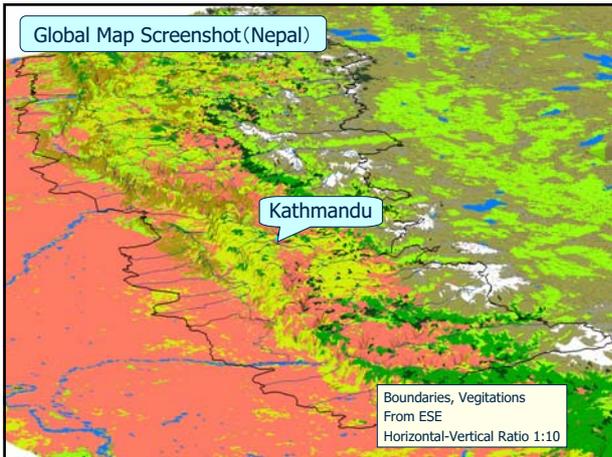
rg

17



Cairo, Egypt, April 2005

18



Benefits of Participation

- Joining the world community of geo-information
- More opportunities for capacity building
- Grant programs by GIS vendors (ESRI and Intergraph)
- Driving force to NSDI establishment

isctgm.org

Cairo, Egypt, April 2005

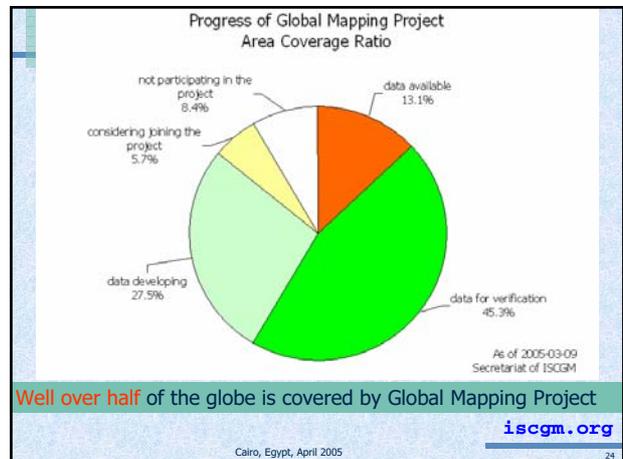
Current Participation Status

Participation status of countries and regions:

- 141 countries and regions are participating in the Global Mapping project
- 20 countries have already released Global Map Version 1.0.
- 31 countries have completed their coverage.
- This corresponds to **well over half** of the earth's land surface.

isctgm.org

Cairo, Egypt, April 2005



A **Spatial Data Infrastructure (SDI)** is an information system based on geographic location to organise, discover, analyse and apply information for policy decisions and actions.

■ An SDI consists of the following elements:

- Geospatial Framework and Content Data
- Metadata
- Clearinghouses
- Services
- Standards
- Partnerships
- Policies

(GSDI Association 2003)

Infrastructure//Examples

Geoconnections Secretariat
N.R. Canada

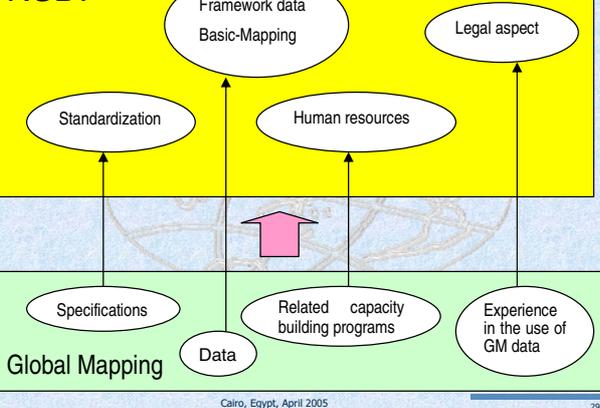


From Global Map to an NSDI

- Basic Mapping in 21st century should be implemented within the concept of NSDI
- Experience of Global Mapping provides NMO with main components of NSDI
 - Framework data: 1:1,000,000 GM of the country concerned
 - Human resources: trained through GM development
 - Standardization: GM specifications are basically compliant with ISO/TC211
 - Legal issues: use of GM will provide such experience

Sustainability: assured in a network of NMOs

NSDI



Issues to be addressed for NSDI

- Preparation of framework data at larger scale than 1:1,000,000
- Coordination of the organization in the country through use of GM for sustainable development
- Continuous participation in the international projects or activities

Five Challenges

1. Promoting further participation.
2. Increasing the applications and use of Global Map.
3. Revising Global map specifications.
4. Promoting partnerships.
5. Capacity building.

iscgm.org

Cairo, Egypt, April 2005

31

1. Promoting Further Participation

- ✦ With help from liaison organisations such as ISPRS promotion of Global Map has occurred at the following meetings:
 - Global Mapping Forum 2003, Okinawa
 - Cambridge Conference 2003
 - Mapping Africa for Africans 2003, Durban.
 - UN Cartographic Conferences
- ✦ Support is being offered by:
 - National Mapping Agencies: PCGIAP and PCIDEA.
- ✦ Encouragement for the participation of smaller nations is accomplished through accepting data at larger scales, and by holding meetings in under represented regions.
 - ISCGM, FIG, and GSDI will meet in Cairo, Egypt, in 2005.

iscgm.org

Cairo, Egypt, April 2005

32

2. Increasing the Applications and Use of Global Map

- ✦ A Web Portal is being made in cooperation with ESRI to make Global Map data more easily available online.
- ✦ Presentations of applications and use of Global Map should be encouraged.
 - Ex. GM Forum 2003.
- ✦ Example of use:
 - GM can be used as a framework for NSDI, which is currently being done in Brazil.

iscgm.org

Cairo, Egypt, April 2005

33

3. Revising Global Map Specifications

- ✦ For smaller nations, the scale of Global Map was found to be inappropriate at 1:1 million scale.
- ✦ Data will now be accepted at the 1:250,000 scale as well.
- ✦ Technological changes including the revision of the tiling system, and moving towards more flexible and interoperable specifications were discussed.
- ✦ The raster dataset has also been changed such that the land cover and land use data are merged into a single dataset and a new classification system adopted.

iscgm.org

Cairo, Egypt, April 2005

34

4. Promoting Partnerships

- ✦ Of particular importance are partnerships with regional organisations that have grown out of the UN Regional Cartographic Conferences for Asia and the Pacific and PCIDEA for the Americas.
- ✦ The Committee on Development Information (CODI) of the Economic Commission for Africa and Eurographics.
- ✦ ISCGM became a member of the Joint Board of Geographic Information Societies in 2003.
- ✦ ISCGM became an ex-officio Board member of the Global Spatial Infrastructure Association in 2004.

iscgm.org

Cairo, Egypt, April 2005

35

5. Capacity Building Programs

- ✦ Global Mapping Partnership Program
 - Coordination by MLIT, Japan
 - Further strengthen partnership especially with developing countries
 - Typical example is 5 day long GM seminar at RCMRD in Nairobi
 - Aug. 2002, Aug 2003, Nov. 2004
- ✦ The Group Training Course on Global Mapping
 - 2 and half months long training conducted by JICA, implemented by GSI
 - Started in 1994, and 67 people from 36 countries completed the course
- ✦ Grant Program by GIS vendors
 - e.g. ESRI Global Map/GSDI grant, Intergraph grant

iscgm.org

Cairo, Egypt, April 2005

36

Conclusion

- Global Map is a significant contribution to the implementation of Agenda 21 under the worldwide collaborative efforts by respective countries



iscgm.org

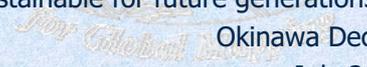
Cairo, Egypt, April 2005

37

“By having complete Global Map coverage by 2007 we will provide a spatial framework to facilitate the actions of the countries of the world both individually and collectively to conserve our fragile environment and make the development of our societies more viable and sustainable for future generations”

Okinawa Declaration

July 2003



iscgm.org

Cairo, Egypt, April 2005

38