

CREATING A NEW INTERNATIONAL MAP OF THE WORLD: THE GLOBAL MAP EXPERIENCE

TAYLOR D.R.F.

Carleton University, OTTAWA, CANADA

The history of the 1:1 million scale International Map of the World proposed by Penck at the end of the 19th century has been well documented (Penck 1893, Winchester 1995, Pearson et. al. 2006). This ambitious effort ultimately failed due to a variety of political, economic and organizational reasons (Pearson et. al. 2006). About a century after Penck's proposal to create an International Map of the World plans to create a new world map at the scale of 1:1 million were made in response to the environmental challenges of Agenda 21. This effort, entitled Global Map, is the theme of this paper. Again, there are a number of publications which describe Global Map (Maruyama 1998, Pearson et. al 2006, Taylor 2006, Ubukawa et. al. 2008, Taylor 2011 forthcoming). Global Map is a project to develop digital geographic information at 1 km resolution covering the entire surface of the earth with standardized specifications. Global Map is created by the national mapping organizations of the world. The objective is to provide a set of eight digital information layers, four vector and four raster, to aid in sustainable development and environmental decision making. The resulting maps are made available online for public use at marginal cost. At the time of writing (February 2011) 164 nations and 16 regions, including Europe and Antarctica, are involved in creating Global Map and coverage has already been released for 59.8 percent of the world's land surface by area and 52.3 percent by population (www.iscgm.org). Figures 1, 2, and 3 indicate the progress of Global Map in graphic form and the coverage and participation in Global Map.

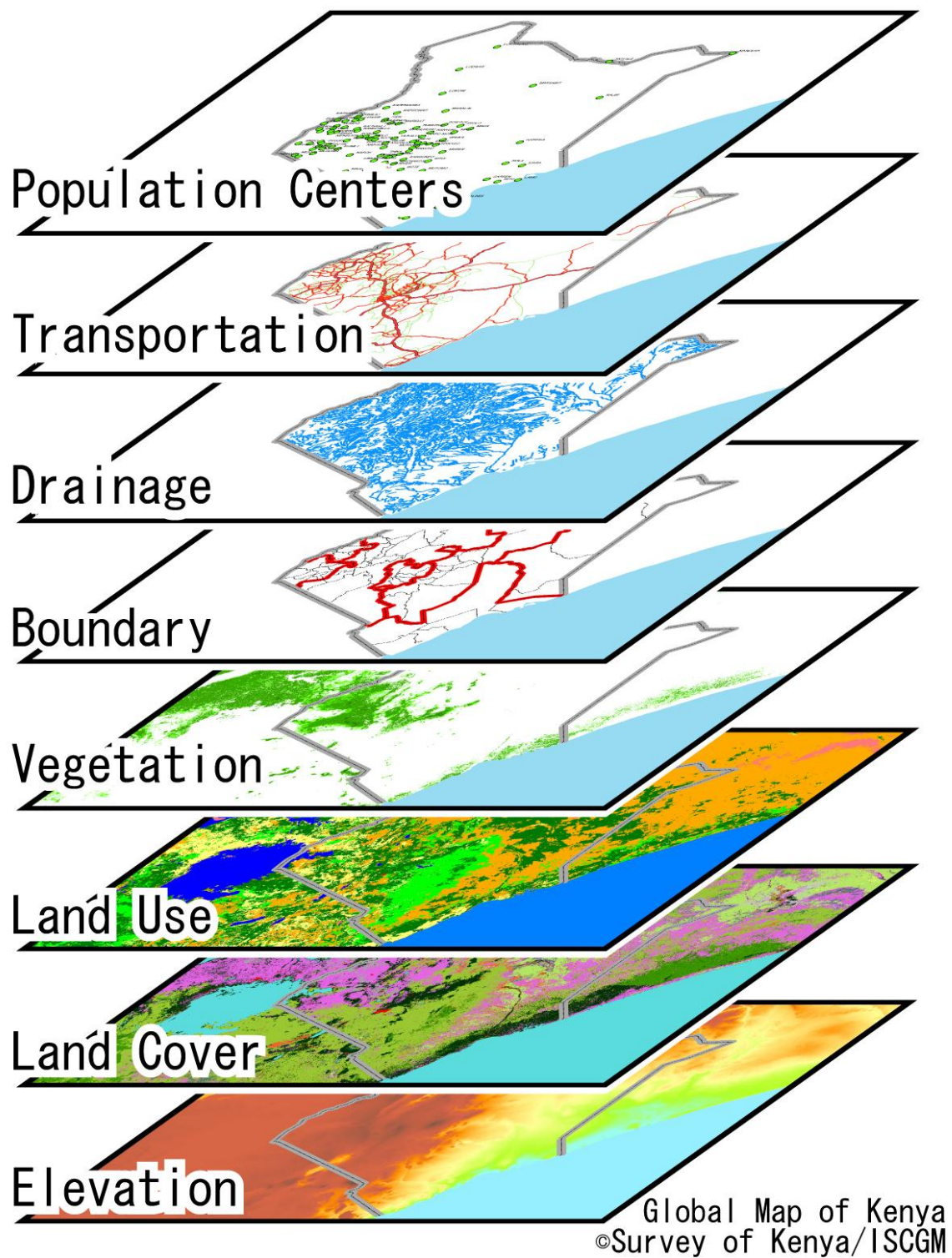
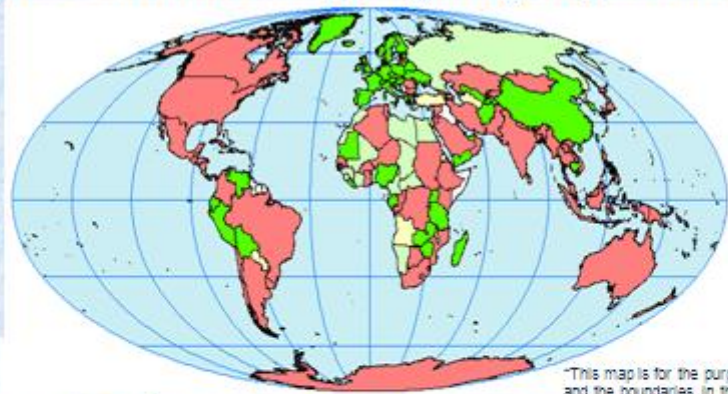


Figure 1: The Eight Layers of Global Map

It should be noted that there are four vector layers and four raster layers.

Progress of Global Mapping Project (as of Feb 2011)



*This map is for the purpose of reference and the boundaries in this map are not authorized by any organizations.

Legend
■ data available ■ data for verification
■ developing data ■ considering joining the project
■ not participating in the project

	Countries and Regions	Area ratio (%)	Population ratio (%)
Available	75	59.9	52.5
Verification	64	19.1	38.2
Developing	41	17.6	6.5
Total	180	96.6	97.2

Figure 2

Progress of participation and data development

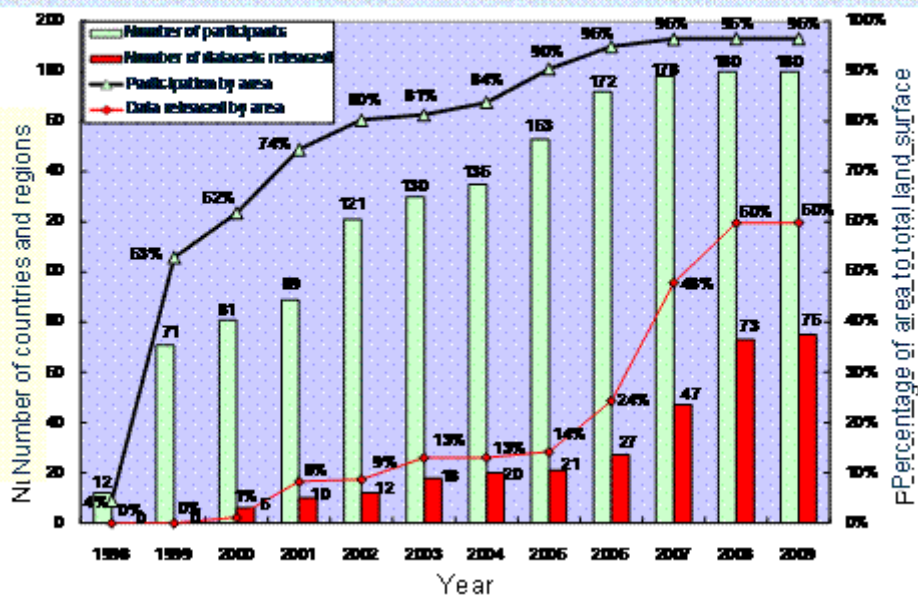


Figure 3

Global Map is now entering Phase III of its existence and in September 2010 ISCGM released a new set of standards and specifications (ISCGM, September 2010). Although progress has been slower than anticipated, Global Map has been much more successful than the ill-fated International Map of the World (Pearson et. al., 2006). Much of this success is due to the process by which Global Map has been created and the management model on which it continues to build. Such issues rarely get the attention they deserve in cartographic literature and it is on these that this paper will focus. These include: the wide consultative process, which took place in advance of formal action; the focus on specific goals and measurable outcomes; standards and specifications, which were arrived at by mutual consent and which were designed in a pragmatic manner so that every nation, including those less technologically advanced, can use them; a strong capacity building component; responsibility for creation of coverage lies at the national level with

clear benefits to the national mapping organizations participating including complementarity with national efforts to create spatial data infrastructures; an international framework built from the bottom up; a democratic management structure controlled by the members who are limited to the heads of national mapping organizations; strong administrative and financial support through a central secretariat in Japan; linkages to all major organizations involved in the creation of geospatial information at the international and regional levels; and endorsement by the United Nations from the outset and renewal of this endorsement on an ongoing basis.

Each of these issues will be considered briefly. The consultation process to create Global Map began around 1990 and in 1991 a book in Japanese was published entitled “An Image Survey Watching the Earth” by the Geographical Survey Institute of Japan (Geographical Survey Institute, 1991). The proponents of Global Map were well aware of the lack of success of the International Map of the World (IMW) and a deliberate attempt was made to avoid the major weaknesses of the IMW process including an extensive international consultation process (Pearson, et. al., 2006). The Geographical Survey Institute of Japan (renamed the Geospatial Information Authority of Japan) consulted widely among its own staff and then extensively with the international community, especially national mapping organizations, before launching the idea of creating Global Map. The United Nations process was also used and the invitation to participate in Global Map went out with UN and ECOSOC endorsement. The ISCGM Secretariat continues to participate actively in the UN Process to promote global Mapping, such as active involvement in the World Summit for Sustainable Development held in Johannesburg in 2002 (Masamaru and Akiyama, 2003). As a result, a resolution on global mapping was adopted by the Summit and ISCGM was recognized as an implementing agency. This extensive and sustained consultation process has been important to the success of Global Map. Consultation with national mapping organizations is an integral and important facet of the global mapping process.

The specific goal of ISCGM is to facilitate the completion of Global Map as outlined earlier in this paper and this goal has measurable outcomes. The creation of Global Map coverage can be measured and maintained and the latest progress is shown in Figures 1, 2 and 3. The standards and specifications for Global Map were arrived at by mutual consent and were designed to ensure that all of the nations agreeing to participate in the process were able to meet them, not just the most technologically advanced ones. Substantial revision of the standards and specification for Global Map took place in 2009/10 and again, a pragmatic and inclusive approach was used (ISCGM, 2010). The major changes include a change in the vector data format from VPF to GML 2.3.1 (ISO 91136) and the adoption of a metadata profile based on ISO 19115. The tile size is determined by each nation. Scale is also an issue for many of the smaller nations as the 1:1 million scale is too small to be of utility and Global Map has agreed to accept data at larger scales such as 1:250,000 to address this problem. The standards and specifications adopted were those which all nations included could meet, not necessarily the absolute best available.

Not all nations are at the same stage of technological development and the need for capacity building was recognized from the outset of the global mapping process. When joining the process to create Global Map nations are asked to identify the level of involvement they wish to undertake. Countries self-identifying at level “A” agree to help other countries complete their coverage. Level “C” countries require assistance to complete their coverage and level “B” countries complete coverage for their own country. The Japan International Cooperation Agency (JICA) gives support to mapping agencies in the developing world and part of that assistance involves support for the creation of Global Map. One of the latest examples of this assistance is East Timor, which is currently developing its Global Map coverage. Japan’s Ministry of Lands Infrastructure and Transport (MLIT) has supported a Global Map workshop in Africa for a number of years and since 1994 MLIT has helped facilitate an annual scholarship program funded by JICA which brings participants from national mapping organizations to the Geospatial Information Authority of Japan for several weeks of training in the production of Global Map. Both ESRI and Intergraph have provided grant support in the form of software to nations involved in global mapping. As a result of these efforts developing nations have been among the first to complete their Global Map coverage (Taylor, 2011).

In many instances, such as Kenya and Brazil, nations have used the experience of creating Global Map coverage as a building block in the creation of their national spatial data Infrastructures, usually at a larger scale and with many more data layers. Creating Global Map is a “win – win” proposition for a nation as national mapping goals are met while creating Global Map coverage. Kenya’s experience with Global Map is an excellent example of this (Mweru, 2005).

Global Map is an international framework built from the bottom up and facilitated by the strong administrative and financial support provided by the ISCGM Secretariat at the Geospatial Information Authority in Japan. The membership of ISCGM is made up of the head of 20 of the world’s national

mapping organizations with broad representation from all continents. All major organizations involved with the creation of geospatial information at the international and regional levels are invited to participate in the global mapping process and many attend ISCGM meetings as liaison organizations on a regular basis. The elected Chair of ISCGM is not the head of a national mapping organization and this is a deliberate choice in order to avoid the perception that the process to complete Global Map is controlled by any one nation. The Chair brings an independent voice to the process. As mentioned earlier in this paper, endorsement by the United Nations has been important to the success of Global Map. The latest manifestation of this is the involvement of ISCGM in the new United Nations Initiative on Global Geospatial Information Management. The UN will convene a Global Summit on this topic in Korea in October 2011. Global Map still faces many challenges. The major one is ensuring that the nations which have agreed to participate complete their coverage. Several nations are lagging behind in this respect. There is also the issue of updating the coverage according to the new specifications. Increasing the use of Global Map is a further challenge. The original purpose of aiding in environmental and sustainable development decision making remains and Global Map is being used in this context as evidenced by Global Map's involvement in United Nations Framework Convention on Climate Change (COP 16) in Cancun, Mexico in December 2010. Global Map use, however, is being expanded for educational purposes and for use in disaster mitigation and management. Although many challenges remain, global mapping is making an important international contribution to society (Taylor, 2011).

REFERENCES

- Geographical Survey Institute of Japan, 1991. *An Image Survey Watching the Earth*, Printing Bureau, Government of Japan, Tokyo (in Japanese).
- International Steering Committee for Global Mapping. 2010. *Manual for Development and Review of Global Map Document Version 2*. Based on Global Map Specifications Version 2. Japan: ISCGM.
- Maruyama, H., 1998. History of Activities for International Agreement on the Development of the Global Map. *Bulletin of the Geographical Survey Institute*, 44: 63-90.
- Masaharu, M., Akiyama, M., 2003. Publicity Activities of Global Mapping at Johannesburg Summit and outcomes of the Summit, *Bulletin of the Geographical Survey Institute*, 49: 56-59.
- Mweru, K. 2005. Kenya's Experience with Global Map. Presentation to the 12th ISCGM Meeting, Cairo, April 15.
- Pearson, A., Taylor, D.R.F., Kline, K. and Heffernan, M., 2006. Geopolitical Ideals and Geopolitical Realities: International Maps of the World from the 1890s to the Present, *The Canadian Geographer*, 50(2): 147-176.
- Penck, 1893. Construction of a Map of the World on a Scale of 1:1 Million. *Geographic Journal*, 1: 213:261.
- Taylor, D.R.F., 2008. *Global Map Standards and Specifications*. Presentation to Standards Workshop, Proceedings of GSDI-10, CD-ROM.
- Taylor, D. R. F., forthcoming 2011. *Global Map: International Cooperation in the Mapping Sciences* in Sinha, E. A., Gundersen, L., Jackson, I, Arctur, D. K. (eds). *Societal Challenges and Geoinformatics*, Geological Society of America Press.
- Ubukawa, T., Kisanuki, J., Katusuka, F., 2008. *Global Map – An International Project*. *Geographische Rundau*, International Edition, 4: 62-65.
- Winchester, S. 1995. Taking the World's Measure; Cartography's Greatest Undertaking Survived Wars and Bureaucratic Snarls Only to Die when it was Nearly Done. *Civilization*, 2:56-59.