1:5M International Geological Map of Asia (IGMA5000): Working Group V Land Area

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The first draft of IGMA5000 for Working Group V (Fig. 1) is completed in April 2006. The process making the geological map in land area is explained in this abstract.

We adopted GTOPO30 for the topographic base map of IGMA5000 in our group. GTOPO30 is a global 30 arc second (ca. 1km) elevation data provided by EROS Data Center in USGS. The GTOPO30 was made in late 1996. The source data was contributed from NASA (USA), UNEP (USA), USAID (USA), INEGI (Mexico), GSI (Japan), Manaaki Whenua Landcare Research (New Zealand), and SCAR (Antarctica). We used GTOPO30 data for the coastline, river, lake, and shaded topographic map in land area.

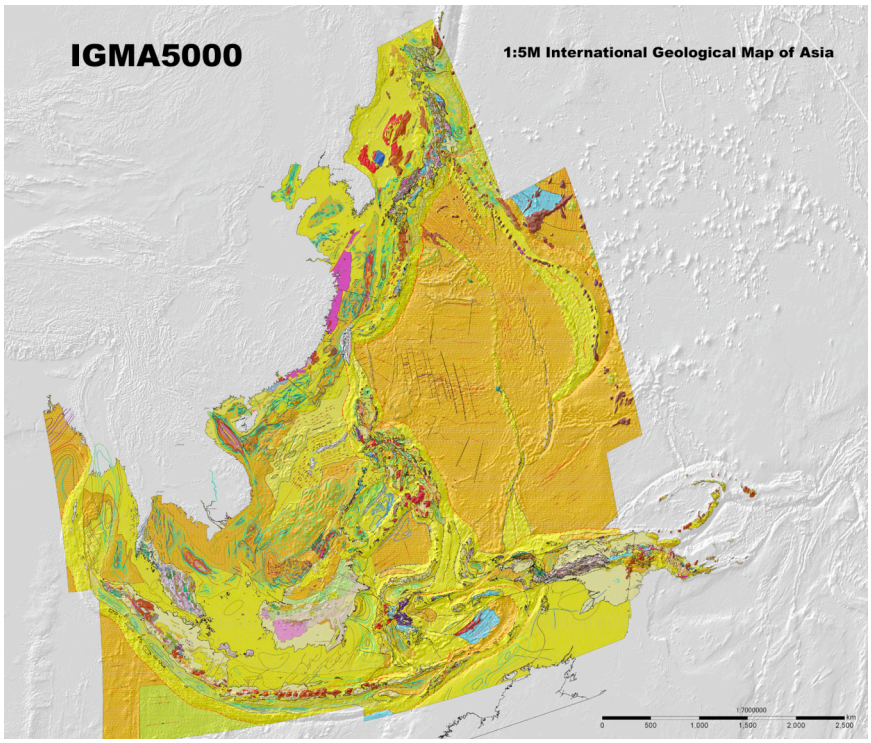

Fig. 1 The First draft map of the IGMA5000 (Working Group V)

The “Digital Geological Map of East and Southeast Asia 1:2,000,000 -Second Edition-“ (Wakita et al., 2004; Fig. 2) is used for the source data. The data is the culmination of the project, Digital Compilation of Geoscientific Map of East and Southeast Asia, Phase I (DCGM Phase I) of the Coordinating Committee for Coastal and Offshore Geoscience Programs in East and Southeast Asia (CCOP), Bangkok. The purpose of the DCGM Project is to develop several layers of Geoscientific data in the CCOP region, and to establish digital compilation methodology in the region as a common project platform. The project was participated by ten of the eleven CCOP member countries –Cambodia, China, Indonesia, Japan, Republic of Korea, Malaysia, Papua New Guinea, The Philippines, Thailand, and Vietnam. The complete data set is made using a GIS software (TNTmips, RVC file). We converted the RVC files to ArcInfo/view (Coverage and Shape) files.

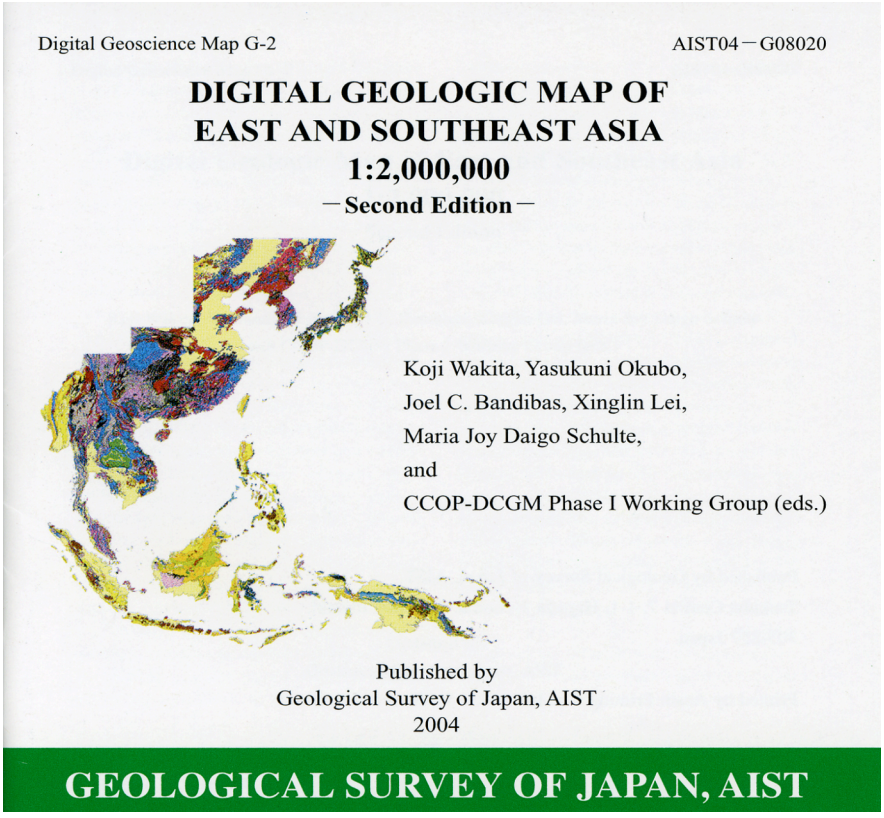

Fig.2 Source data “Digital Geologic Map of East and Southeast Asia 1:2,000,000 second edition” (Wakita et al., 2004)

We match the geological map data to the coastline of the GTOPO30 (Fig. 3). A lot of gaps were seen between the original data and the coastline of GTOPO30. Sometimes more than 10 km gaps were seen in Indonesia area. The Rubber Sheet Method is used to move a selected area. Then we matched the coastline to the GTOPO30. This matching process was the most difficult part of this project.

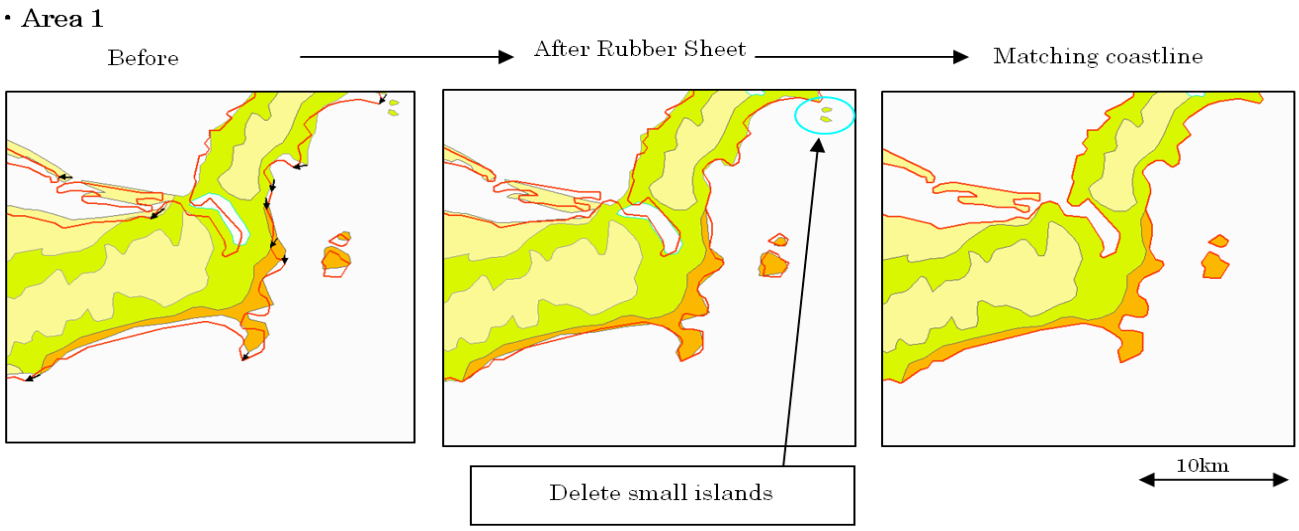

Fig.3 Matching coastline to GTOPO30 using Rubber Sheet Method. Location is Eastern Hokkaido, Japan.

The legend for the land area is shown in Fig. 4. We used the tentative color scheme of stratigraphy for the IGMA5000 (Fig. 2 in the "Database of the 1:5M International Geological Map of Asia, which provided during the first working group Meeting in 2005). The first four digit numbers in the legend indicate stratigraphical framework, which correspond to the number of the tentative color scheme. We made new color and numbers when there was no appreciable color scheme. The last two digit numbers indicate lithological framework (Table 1). We combined these stratigraphical and lithological frameworks for the IGMA5000 legend. For example, NQ_S (1115_01) indicates Neogene to Quaternary sedimentary rocks, E_Vm (1126_06) indicates Paleogene mafic volcanic rocks, and J_Pf (1229_08) indicates Jurassic felsic plutonic rocks.

Fig.4 Legend of IGMA5000 for Working Group V (Land Area)

Table 1 Lithologic abbreviations

Type	Abbreviation	No.
Sedimentary Rocks	S	01
Felsic Volcanic Rocks	Vf	02
Felsic to Intermediate Volcanic Rocks	Vfi	03
Intermediate Volcanic Rocks	Vi	04
Intermediate to Mafic Volcanic Rocks	Vim	05
Mafic Volcanic Rocks	Vm	06
Volcanic Rocks of Unknown Composition	Vu	07
Felsic Plutonic Rocks	Pf	08
Felsic to intermediate Plutonic Rocks	Pfi	09
Intermediate Plutonic Rocks	Pi	10
Intermediate to Mafic Plutonic Rocks	Pim	11
Mafic Plutonic Rocks	Pm	12
Plutonic Rocks of Unknown Composition	Pu	13
High Grade Metamorphic Rocks	Mh	14
Intermediate Grade Metamorphic Rocks	Mi	15
Low Grade Metamorphic Rocks	Ml	16
Metamorphic Rocks of Unknown Grade	Mu	17
Ultramafic Rocks	U	18

Elimination of small features was made using the ArcGIS software (Fig. 5). The areas smaller than 2 mm and line spaces smaller than 1 mm at 1:5,000,000 were eliminated. Especially, a lot of too small features were existed in Japan. Because, the scale of the original data source was 1:2,000,000. We did not change the coastline of GTOPO30 by this process.

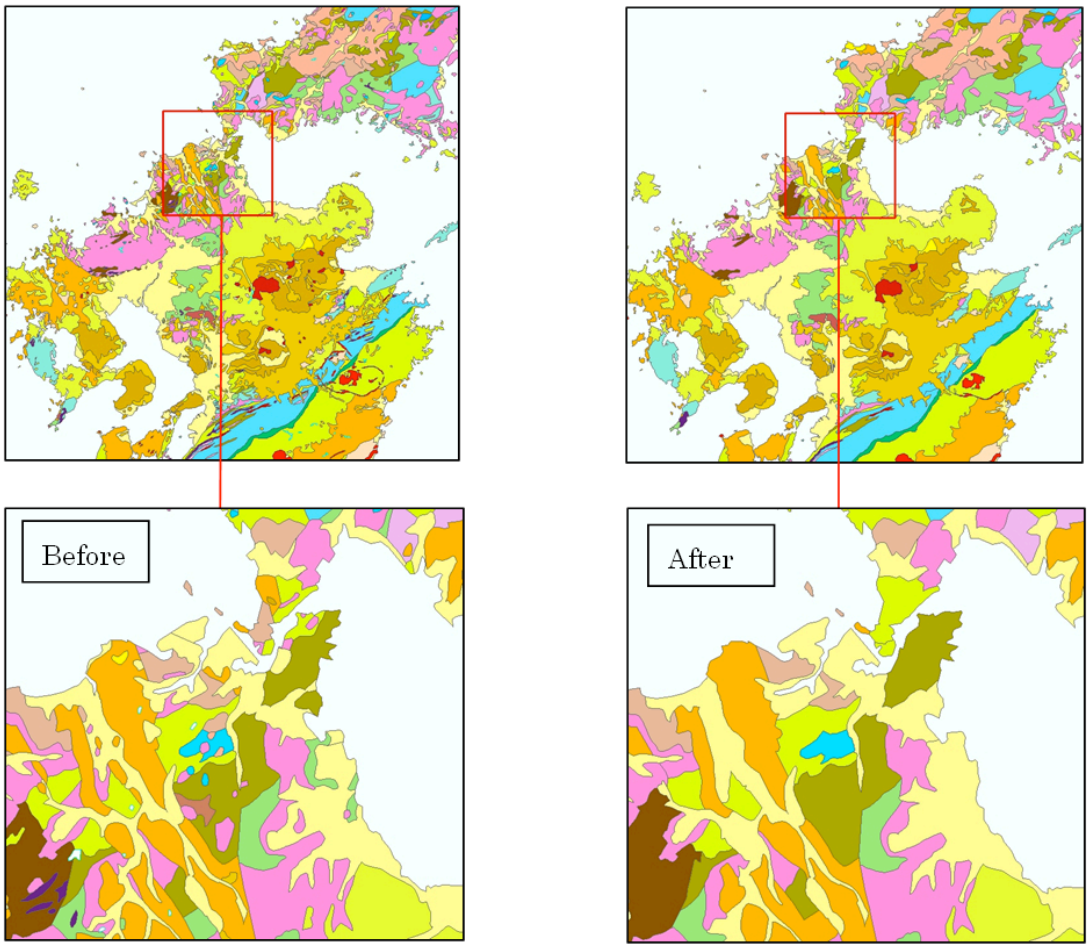

Fig. 5 Elimination of small features (area <2mm^2, line space <1mm, at 1:5M)

The first draft version of IGMA5000 for Working Group V is completed (Fig. 6 and 7). But, some data is already getting old. We have to update the results of recent research works. We did not have enough time to establish the detailed attribute table for each polygon, such as area, country, age, category, volcanic series, metamorphic grade, lithology, and facies codes. This is an important task in 2006-2007.

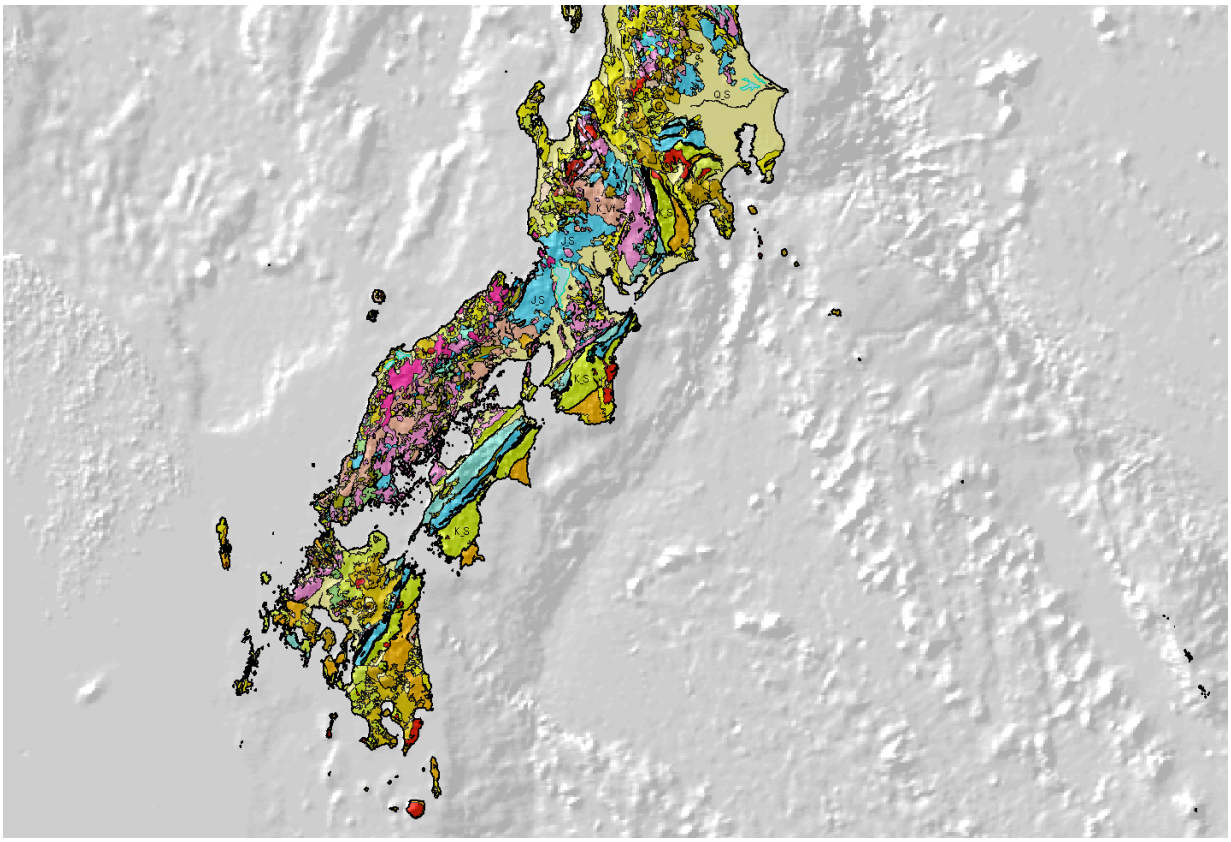

Fig. 6 Southern part of Japan (Shaded topographic map is based on ETOPO2 and GTOPO30)

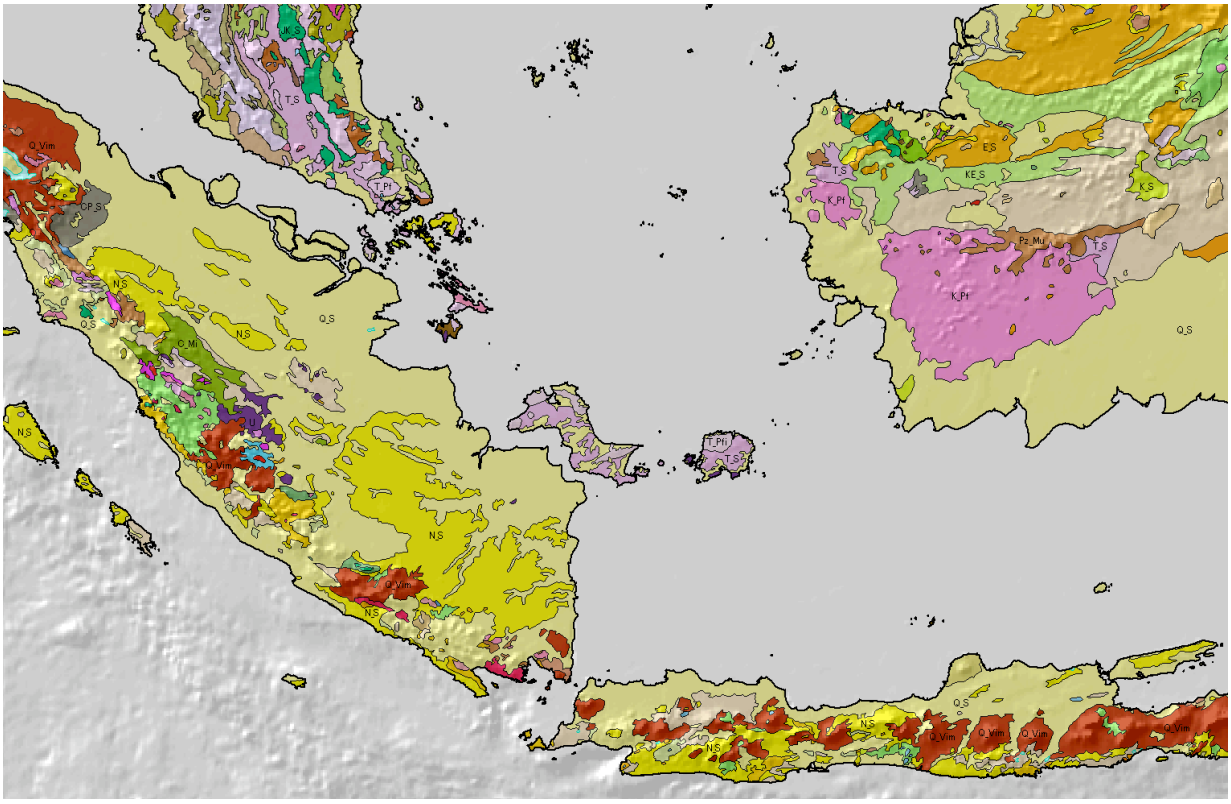

Fig. 7 Malaysia and Indonesia (Shaded topographic map is based on ETOPO2 and GTOPO30)