

Seamless Digital Geological Map of Japan 1:200,000, and its application

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INTRODUCTION

Geological Survey of Japan, AIST (GSJ/AIST) has compiled geological quadrangle maps of Japan at 1:200,000-scale since the 1950's. However, as differences in year of compilation and progress in geological science have resulted in changes in interpretations, there was much discordance regarding classification of stratum or geological period in neighboring quadrangles, as well as misalignments in geological features such as contacts. The Seamless Digital Geological Map of Japan 1:200,000 (Figure 1) was compiled as a solution to this problem, to serve as a more comprehensible and accessible geological map.

This mapping project started in 2002 and will be finished in 2011. This map is the first geological map at the scale of 1:200,000 covering the whole country with the universal national legend.

SEAMLESS GEOLOGICAL MAP

The seamless geological map is based on the 1:200,000-scale quadrangle geological sheet maps published by GSJ/AIST, and also uses the engineering geological map and other geological maps published by the local governments. The universal national legend (Figure 2) for this seamless geological map is classified based on the rock types and ages. This legend is a refinement of the legend for the Geological Map of Japan at 1:1,000,000-scale (Geological Survey of Japan/AIST, 2003).

The process to produce the seamless geological map is as follows (Figure 3). 1. Geological maps are digitized into vector format. 2. Each geological attribute of the map is correlated to its closest equivalent in the universal national legend. 3. Discontinuous geological boundaries between neighboring maps are harmonized with each other in the Geographic Information System (GIS). If we are obliged to use outdated geological source maps for the seamless geological map, the newest interpretation and geologic attributes are used with these maps. Thus the seamless geological map may include the newest geological information.

APPLICATION

DRAFT -- To be published in DMT'07 Proceedings
(see <http://ngmdb.usgs.gov/Info/dmt/>)

The seamless geological map is released on the AIST website (<http://riodb02.ibase.aist.go.jp/db084/>) as Research Information Database (RIO-DB). At this site, the public can view the seamless geological map with continuous zoom, and can download raster images of the map. This map on the web is shown with a shaded DEM and road map based on data from the Geographical Survey Institute, in order to more clearly indicate the location of the mapped area.

The map is simply drawn with the universal national legend, so it is easier for people without special knowledge of geology to understand the information on the map. In addition, people can change the scale of this digital map quickly, and clip any parts of the map wherever they like. The map is intended to be used for many purposes, especially in education and popularization of geology, and in interdisciplinary studies of earthquakes and geochemistry.

The seamless geological map will be updated frequently to provide the newest geoinformation. This map has been accessed 600,000 times in one year of 2006 on the internet. We aim to improve the quality of the map for society.

REFERENCE

Geological Survey of Japan/AIST, 2003, Geological Map of Japan 1:1,000,000, 3rd Edition, 2nd CD-ROM Version.

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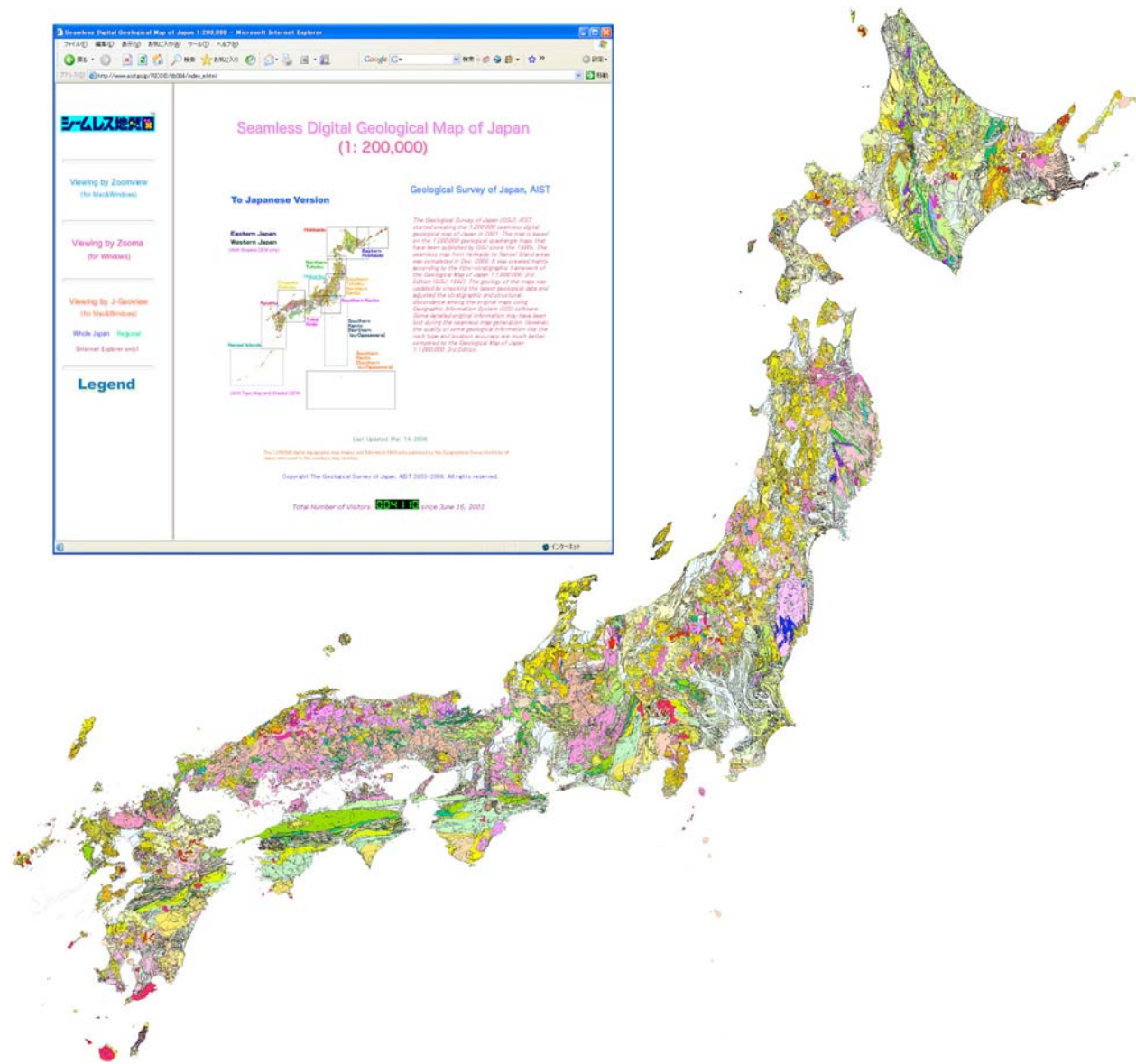


Figure 1. Seamless Digital Geological Map of Japan 1:200,000 and its website (<http://riodb02.ibase.aist.go.jp/db084/>).

Universal National Legend

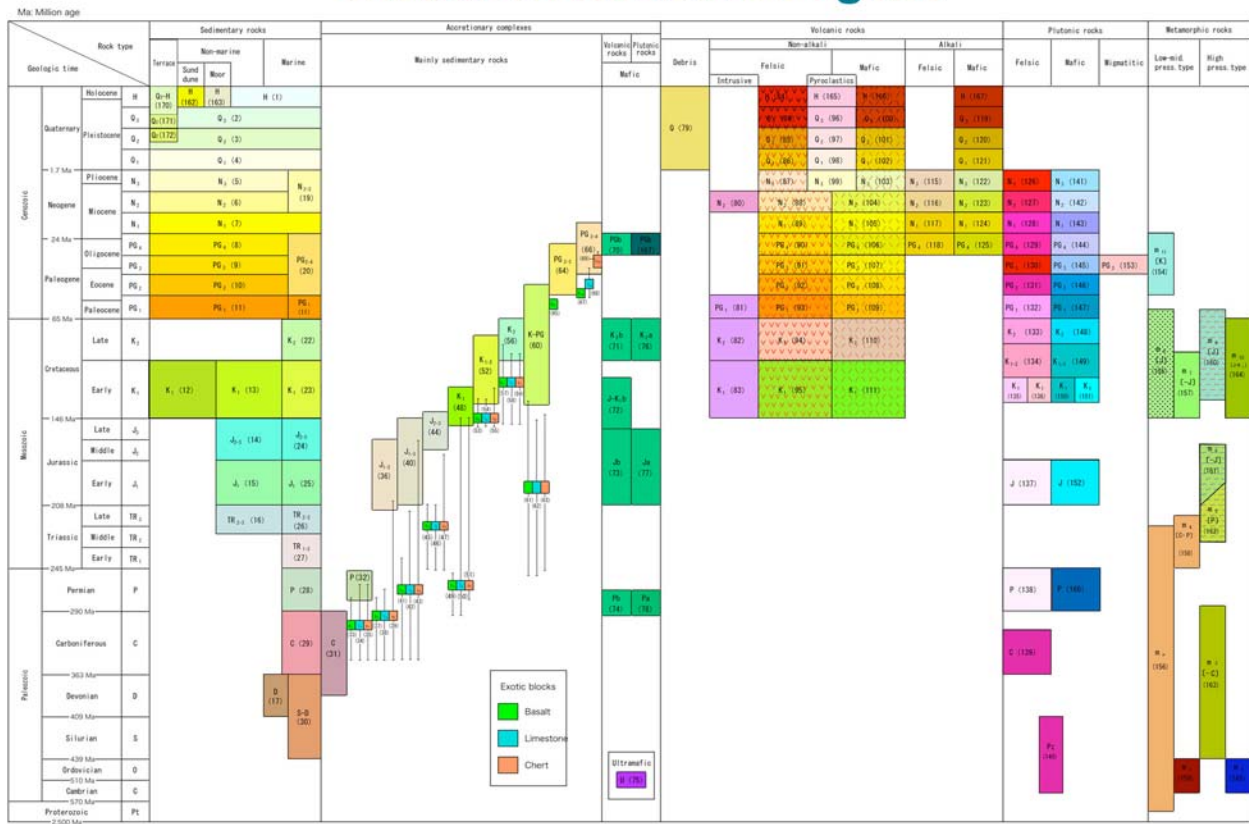
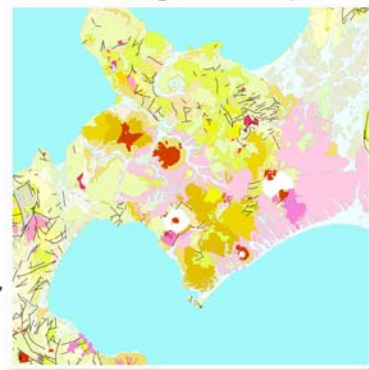


Figure 2. Universal national legend.

Quadrangle of original geological maps



Seamless Digital Geological map



Legend
standardization

Conversion to
seamless maps

Geological border
alignment

Figure 3. Process to produce the seamless geological map.