

Development of Seamless Digital Geological Map of Japan (1:200,000) Google Maps version -intuitive geological map-

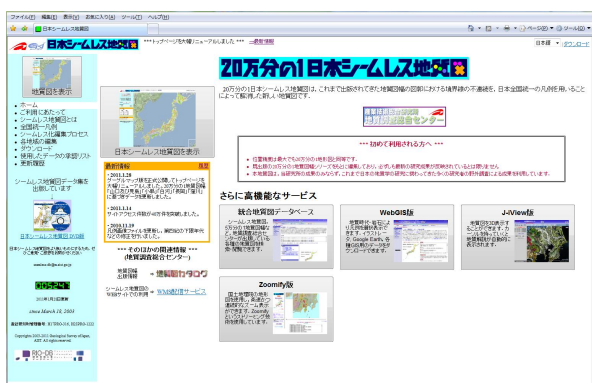
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Seamless Digital Geological Map of Japan (<http://riodb02.ibase.aist.go.jp/db084/index.html>) is a digital geological map in scale of 1:200,000 published by Geological Survey of Japan (GSJ), National Institute of Advanced Industrial Science and Technology (AIST). It has a structurally and stratigraphically smooth geological boundary, and is based on a nationally-standardized legend based on the geological map of Japan 1:1,000,000 3rd edition (GSJ, 1992). It was developed by (1) creating nationally-standardized legend, (2) digitizing existing paper-based geological maps in vector format, (3) replacing each geological attributes by the nationally-standardized legend, (4) smoothing geological boundary of adjacent maps on GIS (Geographic Information System). It's been published on the Web since 2003, and users are able to select from among several user interfaces in accordance with the intended use and preference. Methods of data representation have been modified to suit the needs of the uses. Google Maps version is the latest and default user interface which uses Google Maps API (Application Programming Interface) and Google Earth API provided by Google, and it's been repeatedly improved with the help of comments by users. The major characteristics of the Google Maps version are intelligible operability and fast imaging speed.

Fast operation of Google Maps version is provided by "Image Pyramid" and "AJAX (Asynchronous JavaScript and XML)". The image pyramid, also known as "tile matrix set" in WMTS (Web Map Tile Service) standard defined by OGC, consists of a base image tile and a series of consecutively smaller sub-image tiles in lower resolution. As users zoom in or out on the map, different resolution level of image is displayed, and the image pixels of geological map are only loaded when a tile section comes into view. AJAX is a group of interrelated web development technique used for creating interactive web applications on client-side. It allows web pages to retrieve small amounts of data from the server, and update parts of a web page without reloading the entire page.

Google Maps version was developed with a goal of making and releasing geological maps in foolproof way. It is designed especially for end-users; therefore, users are able to change opacity of the geological map, zoom in or out, and search a specific location intuitively. Google Maps version doesn't require any plug-in unlike other user interface within our website, hence it is less reliance on user environment such as OS and browser. Development of Google Maps version serves as the foundations for future development of user-friendly digital geological map.



Keywords: GIS, Seamless, Geological Map, Google Maps API, AJAX, Image Pyramid