

## Capacity building initiative for satellite data utilization for evaluation of environmental degradation using FOSS4G

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Recently, satellite image data become more and more easily accessible. For example, NASA provide MODIS and LANDSAT data as Open Data. ESA will provide Sentinel data free and open access for any user. In addition, GIS data will also become accessible under the influence of the global trend of promoting Open Data. In such circumstance, a demands for utilizing satellite images and GIS also have been growing steadily and widely. But, it is still complicated to get original satellite data and how to deal with it for for the non-specialist, such as public employees.

Under such circumstances, Ministry of Education, Culture, Sports, Science and Technology in Japan (MEXT) has considered the plan of removing the barriers on satellite data usage. From 2009 to 2014, we have taken part in this project, and have strived to overcome this problem through the following three points.

1. Developing the Free & Open Source Software for Geospatial (FOSS4G) tools, such as GRASS, QGIS, GDAL/OGR and Proj.4.
2. Making tutorial about processing and analyzing the satellite data with FOSS4G tools.
3. Constructing the e-learning contents of satellite data usage and conducting outreach activity and capacity building in not only Japan but also developing countries.  
(cf. <http://www.osgeo.jp/foss4g-mext>)

In first three years, main targets of our project were Japanese and novice user. We translate QGIS and GRASS GIS menu and manuals into Japanese and improve such FOSS4G tools to adapt Japanese data format and projection. Also, basic and advanced the tutorials for satellite data utilization were published as e-book and e-learning system including video tutorials.

The software and knowledge base have been rapidly improved by our works. These achievements are anticipated to expand base of satellite data users and to create a new utilization scene for space derived products. One of the effective results from this project was shown in actions against the Tohoku Earthquake in 2011. Many people could collaborate on that software base and offered ortho-image of Tohoku region (i.e. Iwasaki et al. 2011, GISA-Japan).

Based on previous result, we are started next project to develop an evaluation system for environmental degradation based on above GRASS and QGIS. In the project we use Global Map (<http://www.iscgm.org/cgi-bin/fswiki/wiki.cgi>) as a fundamental information for evaluating environment. The project had started from 2102 and focused on natural hazard and environmental degradation, especially in developing countries. We will report the status and progress of the project.

Keywords: FOSS4G, Satellite data, Capacity building