

WEB BASED RAPID MAPPING OF DISASTER AREAS USING SATELLITE IMAGES, WEB PROCESSING SERVICE, WEB MAP SERVICE, FREQUENCY BASED CHANGE DETECTION ALGORITHM AND J-IVIEW

Joel Bandibas*^a, Masashi Matsuoka^a and Koji Wakita^a

^a Geological Survey of Japan, AIST,

Site 7, 1-1-1 Higashi, Tsukuba, Ibaraki 305-8567, Japan;

Tel.: +81-8033007996;

E-mail: joel.bandibas@aist.go.jp

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Abstract: Timely identification of areas affected by natural disasters is very important for successful rescue and emergency relief efforts. This study focuses on the development of a cost effective and efficient system of identifying areas affected by natural disasters, and the efficient distribution of the information. The developed system is composed of 3 modules which are the Web Processing Service (WPS), Web Map Service (WMS) and the user interface provided by J-iView, an online mapping system developed at the Geological Survey of Japan (GSJ). WPS is an online system that provides computation, storage and data access services. WMS is a standard protocol that provides a simple HTTP interface for requesting geo-registered map images from one or more geospatial databases. It provides remote access of the satellite images. In this study, the WPS module sends requests to WMS servers to get the satellite images used for land cover change detection. It also implements the land cover change detection software that maps the areas affected by natural disaster. In this study, the change detection software is based on the frequency based change detection algorithm developed at GSJ. The developed system was used to identify areas covered by pyroclastic flows and volcanic ash after the 2010 eruptions of Merapi and Bulusan volcanoes using PALSAR images. It was also used to identify areas affected by the March 11, 2011 tsunami in northeastern Japan using ASTER images. The initial results of the study show that the developed system could be used to quickly map areas affected by natural disasters.