

EMERGENT VALUE-ADDED PRODUCT PROCESSING BY GAUSSIAN STATISTICAL APPROACH FOR SENTINEL-2 DATA

Jung-Chien Hung, Li-Yu Chang

Taiwan Space Agency
8F, 9 Prosperity 1st Road, Hsinchu Science Park, HsinChu City 300, Taiwan (R.O.C.)
clairehung@tasa.org.tw, davidchang@tasa.org.tw

ABSTRACT

In division of satellite processing, TASA (Taiwan Space Agency), Emergent Value-Added Product (EVAP) processing is an important workflow for acquiring satellite images and carrying out the disaster affected area when disaster events are reported and confirmed. The workflow including acquisition tasking and scheduling, ortho image generation, affected area identification and report generation. In the EVAP workflow, a system based on QGIS graphical modeler was developed by applying spectral indices differences of NDVI and NDWI and result of Change Vector Analysis to carried out the change image. Then, a supervised procedure with gaussian statistical approach was applied in the processing algorithm with the change image. By using the proposed EVAP workflow under QGIS, an operator only needs to mark limited disaster affected polygons on multi-temporal images as training samples and all the disaster affected areas can be identified by proposed approach. The major idea is that in general the statistical distribution of the selected training polygons can be regarded as Gaussian and a set of upper and lower bounds can be derived with user specified confidence interval to detect disaster affected areas for the whole image areas. According the test cases in this study with Sentinel-2 images, satisfied result can be carried out with less than 10 training polygons manually marked by operator.

Keywords: Gaussian statistical approach, Confidence interval, QGIS modeler, Supervised procedure, Emergent Value-Added Product.