

The GLab to support the geohazards community – experience of the Geohazards Exploitation Platform initiative of the European Space Agency

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Abstract

The Geohazards Lab is an initiative developed within the framework of the Committee on Earth Observation Satellites (CEOS) Working Group on Disasters (WG Disasters) to enable a greater use of Earth Observation (EO) data and derived products to assess geohazards and their impact. The aim is to establish an inclusive and comprehensive process to optimize the use of EO technologies starting from the needs of national and local decision-makers in political and socio-economic sectors relevant to Disaster Risk Management (DRM).

The Geohazards Lab is based on a group of interoperable platforms with federated resources to animate and support the geohazards user community. It is originated by the European Space Agency (ESA), with the support of several other CEOS space agencies and partners, including the Italian Space Agency (ASI), the French Space Agency (CNES) and the German Space Research Centre (DLR), as well as several research institutes including BRGM, INGV, CNR-IREA, CNRS-EOST, NOA, NORUT and IGME.

Based on the success demonstrated during the CEOS Seismic Hazards Pilot activity, the Geohazards Exploitation Platform (GEP, geohazards-tep.eo.esa.int) continues to contribute in the CEOS Geohazards Lab initiative. The GEP is an activity originated by ESA in November 2015 and led by Terradue, to support the geohazards community exploiting satellite EO data to assess geohazard risks. It provides a data delivery mechanism, on-line processing tools and services and an e-collaboration environment to exploit EO data to assess geohazards and their impact. Conventional InSAR services (e.g. DIAPASON and SNAP S-1 DInSAR service), advanced InSAR services (e.g. InSAR SBAS of CNR-IREA), optical on-demand services (e.g. MPIC OPT, ALADIM and DSM OPT of the University of Strasbourg/CNRS EOST) and optical systematic services (e.g. INGV's STEMP for surface temperature mapping, NOVELTIS and INGV's VEGAN services for hot spot and vegetation vigor mapping) have been made available or are currently under integration. New platform functionalities are under implementation, such as the alerting system for automatic deformation mapping that shall trigger the services available on GEP based on seismic events polled from external systems e.g. the EMSC, USGS pager and Copernicus EMS.

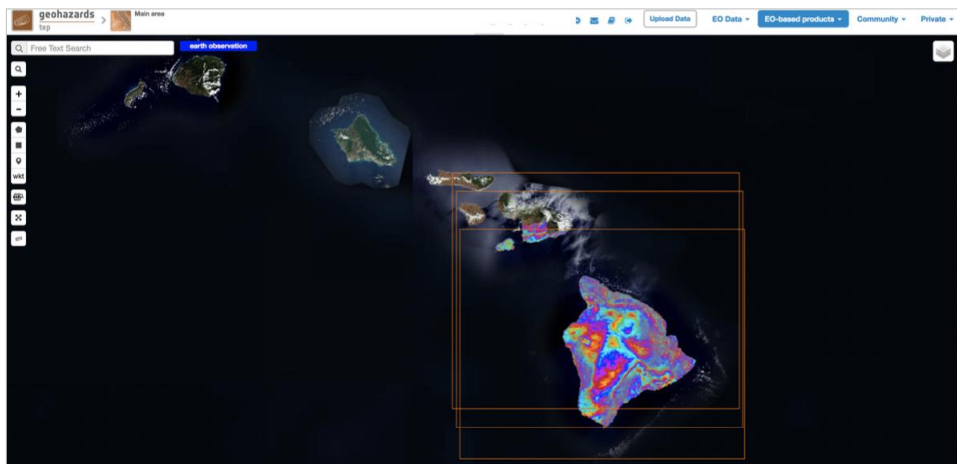


Figure 1. Preview of the Geohazards Exploitation Platform showing InSAR products over Hawaii generated systematically using DLR's S-1 High-Resolution InSAR Browse. Contains modified Copernicus Sentinel-1 data.

The Geohazards Lab envisages building a collaborative framework with expert geoscience centres and users to achieve a greater adoption of EO methods. Its goals are to support the exploitation of online hosted processing capabilities with a focus on cloud processing solutions, define consensus methods in liaison with experts to harmonize EO based products and establish a methodological approach to support the generation of reference ground deformation measurements in support to historical hazard analysis. Focusing on the harmonization of EO based products, the Geohazards Lab intends to coordinate with other available capabilities such as for instance the European Plate Observing System (EPOS), the Norwegian Ground Motion Service (NGMS), the Supra National Ground Motion Service (SNGMS) and the Geohazards Office (initiated by BRGM) to support a scientific animation activity and to work on common guidelines for standards and formats of EO based terrain motion measurements.

The Geohazards Lab supports users with EO expertise from geoscience centres who are the priority intermediaries with end users from local and regional DRM organizations. Users from both the EO and non-EO community can benefit from this effort as it will facilitate (i) the broader use EO products sharing common standards by EO practitioners, (ii) the interoperability of results obtained by different data provides within or outside EO processing platforms and (iii) an easier end-product interpretation by decision makers.