



## **Reconstructing lava flow field on volcanic areas from Sentinel-2 images**

Annalisa Cappello, Gaetana Ganci, Giuseppe Bilotta, Claudia Corradino, Alexis Herault, Vito Zago, and Ciro Del Negro

Istituto Nazionale di Geofisica e Vulcanologia, Osservatorio Etneo, Catania, Italy (annalisa.cappello@ingv.it)

Mapping of lava flows gives insights into emplacement processes and may aid computer simulations of lava flow paths for hazard assessment studies, providing both input data for predictive lava flow modeling, and tools for iterative validation and/or refining of parameters. Nowadays the huge amount of moderate to high resolution multispectral data provides new opportunities for monitoring extreme thermal events such as eruptive phenomena. Despite retrieving lava boundaries when the flow is still active is quite straightforward, problems arise when a cooled flow should be extracted over older lava flow fields. Here we present a new supervised classifier based on machine learning techniques in order to discriminate recent lava imaged in the MultiSpectral Instrument (MSI) onboard Sentinel-2 satellite. Bands at the spatial resolution of 10 (2,3,4,8) and 20 (5,6,7,8a,11,12) meters are used as input to the classifier. The training phase is performed on those pixels manually labeled as covered by fresh lava, while the testing allows to characterize the entire lava flow field. Results show that this approach is robust in terms of percentage of correctly classified pixels.