

Theme: geodesy and remote sensing

# InSAR Monitoring of the Dutch volcanoes in the Caribbean

The Dutch islands of Saba and St. Eustatius are located in the far north of the Lesser Antilles, a subduction zone hosting seventeen active volcanoes. Even though the volcanoes of this chain provide a high to very high threat according to the USGS ranking system (Ewert, 2007), most of them display a “monitoring gap”.

InSAR observations are an ideal way to observe surface deformation of volcanoes and thus cover this gap, especially as these volcanoes are located in remote areas. Furthermore, InSAR observations can be used to cover large areas and can pick up subtle signals which may be missed by continuously recording GNSS stations.

Research using TerraSAR-X X-band and Sentinel-1 C-band data in the region has shown that significantly large areas cannot be monitored with InSAR due to the loss of radar coherence caused by tropical rain forest covering the Caribbean islands. Moreover many of the islands have steep slopes resulting in layover and shadowing effects.

In this project you will generate interferograms and if possible time series, using ALOS-1 and ALOS-2 L-band data, to identify if the coherence indeed improves significantly compared to X- or C-band data. Are we able to track deformation through time using L-band data? If so, this may be crucial for timely warning of local authorities in case of unrest at a volcano.



Mt. Scenery volcano on Saba



The Quill volcano on St. Eustatius

Ewert, J.W., 2007. System for ranking relative threats of US volcanoes. *Natural Hazards Review*, 8(4), pp.112-124.

**Informatie:**

- Dr. Elske de Zeeuw – van Dalftsen (E.deZeeuw-vanDalftsen@tudelft.nl) (Room 2.21, Thursdays only) (☎ 015-2786292)
- Prof.dr.ir. Ramon Hanssen ([R.F.Hanssen@tudelft.nl](mailto:R.F.Hanssen@tudelft.nl)) Room 2.13 (☎ 015-2785436)