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Remote sensing monitoring and geosite assessment of Dallol, Ethiopia. Putting an isolated and deserted area on map with geoheritage and resilience

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Being one of the hottest and most isolated locations on the Earth, long afflicted by ethnic and political tensions, Dallol "volcano" in the Danakil Depression of Ethiopia is a little visited region, both by scientists and tourists. Although the number of visitors is growing and some research projects were carried out in the recent years (e.g. Carniel et al 2010, Franzson et al 2015) constant monitoring of the rapidly changing environment is missing, as well as underlining the geological importance and the potential risks for visitors.
With a two year time span, monthly satellite image dataset provided by Planet.com, we recorded the high and constantly changing activity of bischofite flows and fumarole ponds, helping to understand the complex geothermal system of Dallol, and delineated the relatively inactive areas, where fieldwork and visitor activity could be encouraged and the active areas where special caution is advised. The analysed images will be published on a website, functioning as a "forecasting" information service for visitors, and retrospect of past activity.
The remote sensing monitoring results are validated by detailed fieldwork, where the assessment of geodiversity is carried out as well. Using and comparing widespread geosite assessment methods (e.g. Reynard et al. 2007, Brilha 2016) in an extreme, desert-like environment, the first description of Dallol geoheritage is presented, raising special awareness about the connection of heritage and resilience and proposing some long-term management practices for the growing number of visitors.