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Exploiting a volcanic resource: mapping rapid changes at Dallol Volcano, Ethiopia with Planet satellite images and community engagement for risk reduction.

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Dallol volcano is in the Danakil Depression of Ethiopia and hosts a rapidly changing geothemal field. It is known widely as 'the Yellowstone of Africa', for the colourful saline acidic pools, pillars and as a site for extreme life. It is one of the main adventure tourism sites in Ethiopia. The Dallol area also hosts huge potash reserves, and has been a goal for miners since the early 1900's. The volcano takes the form of a low shield of salt, probably uplifted by multiple intrusions, such as occurred in 2004. There have been violent eruptions of hot brines, the last being around 2014, and eruptions of hot bischofite flows are a ongoing from the base of the dome. We use high resolution Planet satellite imagery over the last two years (Planet Team (2017). Planet Application Program Interface: In Space for Life on Earth. San Francisco, CA. https://api.planet.com), Google Earth images, our own field observations, and those from social media and tourist guides to track the changes. This provides us with high spatial and temporal record of the shifting activity that is invaluable for: 1) starting a baseline monitoring, 2) differentiating annual climatic, volcanic / tectonic and anthropomorphic related changes, 3) providing a short time forecasting for visitors of the activity to expect. Our aim is to install, over this season, the basics of a community participation program, where visitors (guides, tourists, scientists, locals etc.) can contribute and benefit by providing ground imagery and reports to compare with the raw and the analysed satellite data. This will allow for greater understanding of the visitors of the Dallol system, greater respect for the environment and for the risks posed by Dallol to visitors. Ultimately this will help preserve the site, protect visitors and allow the maximum benefit to be gained from a sustainable development of the Dallol volcano. In this presentation we present the first results from this mapping and show the variability of the Black Mountain Bishofite (Magnesium Chloride) flows, and the rapid changes in the central geothermal area.