Applications of Remote Sensing for Volcanic Assessment

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Fig.(1)

http://doi.org.proxybz.lib.montana.edu/10.1016/j.jvolgeores.2003.12.018

ASTER SENSOR FOR VOLCANIC MONITORING

Fig.(1) shows and image of the ASTER sensor abord the Terra Spacecraft
The sensor has 3 VIS/NIR bands, 4 SWIR bands and 4 Thermal bands.
Fig(2) Is an image of an eruption of Mt. Etna, Italy
The top picture is a false color composite using the VIS bands which shows vegetation and an ash cloud. The bottom picture is the same image but is a false color composite using the NIR/SWIR/TIR bands.
The cloud from the eruption shows ash, ice and gases. The thermal band delineates the lava flow.

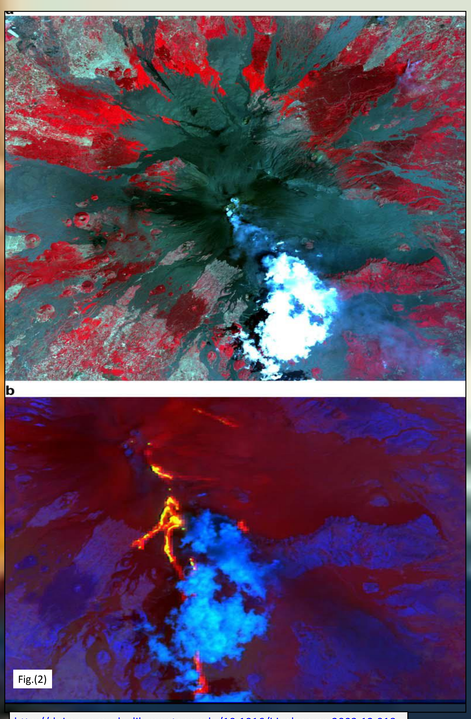

Fig.(2)

http://doi.org.proxybz.lib.montana.edu/10.1016/j.jvolgeores.2003.12.018

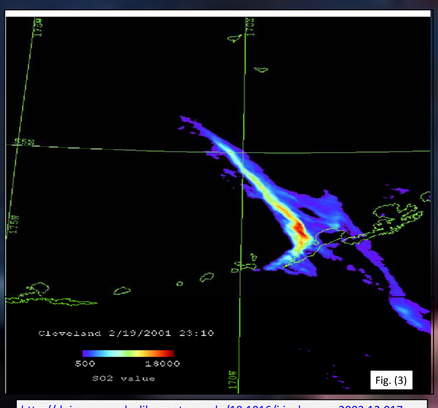

Fig. (3)

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VOLCANIC GAS EMISSIONS

Using the thermal bands 28-32 from the MODIS sensor , gases that are emitted during a volcanic eruption can be detected and quantified. Fig.(3) shows the amount and atmospheric extent of Sulphur Dioxide (SO_2) emitted during an eruption of the Cleveland volcano , Alaska. This was calculated using band 29 on the MODIS sensor.

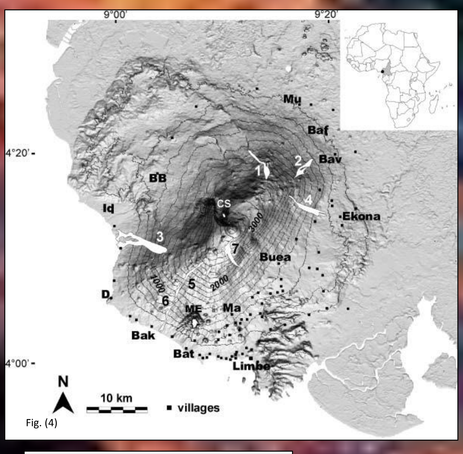

Fig. (4)

http://dx.doi.org/10.1080/01431160802167873

LAVA FLOW MODELING

Using SRTM DEM to create raster images for slope analysis. Spectral data from Landsat TM and ETM+ used to identify lava flow extent. It was also used to identity possible eruptive events. Use of field data can then be used with algorithms to predict future lava flows for risk assessment. See (fig.4)

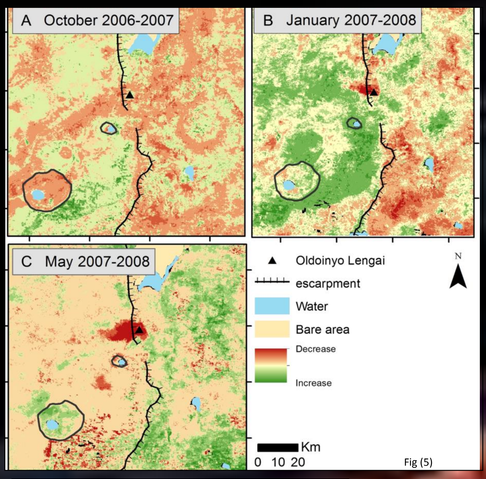

Fig (5)

https://link.springer.com/article/10.1186/s13617-015-0032-z

ASH FALLOUT

Ash fall out can have a significant impact on vegetation. Fig. 5 shows bi-temporal NDVI images of impacted area around Oldoinyo Lengai Volcano, Tanzania after an eruption in Dec 2006. Map (A) shows NDVI prior to eruption. Map (B) shows a decrease in vegetation around volcano. This map shows an increase in vegetation represented by the color green. This is due to the influence of the wet season. Map (C) shows the greatest decrease of vegetation from the impact of ash fallout from the eruption.

Works cited

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Background image pulled from the web:
https://encryptedtbn0.gstatic.com/images?q=tbn:ANd9GcQVLy8rP5nqhKGxZscNbUwvOtc0i8Ho_JwtBrkXalAZlNesuXM-cA