

# Improving natural risk management by means of virtual surveys through hazardous volcanic contexts by using Augmented and Virtual Reality



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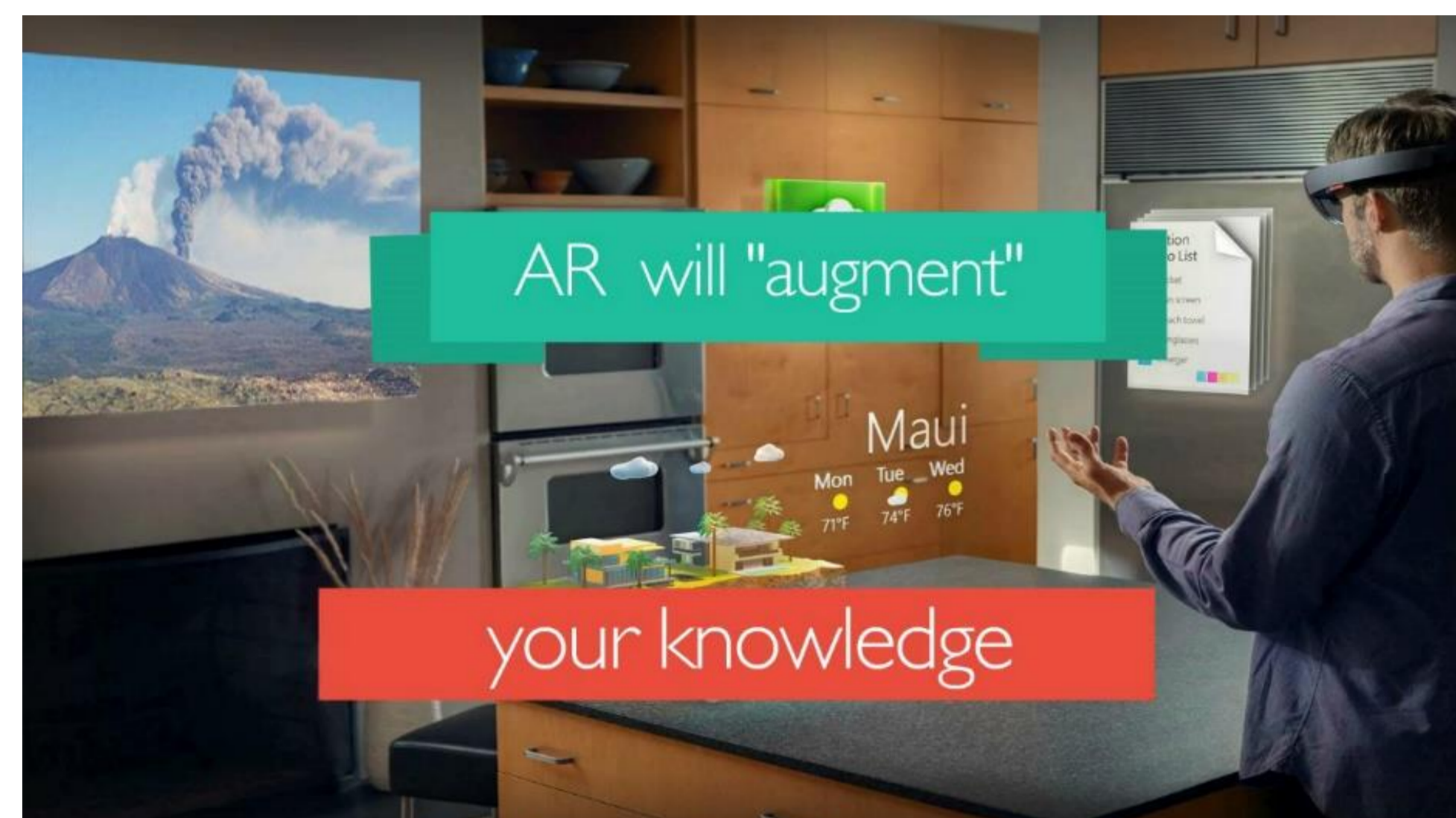
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**Summary** - To ensure an efficient natural risk management, we need an in-depth understanding and assessment of risk as well as the adoption of effective prevention measures. Modern techniques such as Augmented Reality (AR) and Virtual Reality (VR) offer the opportunity to explore our environment for professional as well as educational purposes, conveying useful information not only to scientists, but also to at-risk populations. "Virtual navigation on volcanoes by Augmented Reality and 3D-headset" was a geoevent we organized in the framework of the 6th edition of the Italian "Settimana del Pianeta Terra" (Week of Planet Earth) in October 2018. The geoevent featured AR and Virtual Reality exhibits, highlighting the benefits of these tools in applications for Earth monitoring, also with positive contributions in mitigation actions to reduce the impact of natural hazards.

## FROM PROBLEMS TO SOLUTIONS

Check out the suggestions from Augmented Reality



Communication and data sharing with AR.

You can explore this poster by using Augmented Reality (AR). You will see how AR can "augment" one knowledge, for example, providing useful information on natural hazards, from earthquakes to landslides, to volcanic eruptions. This makes easier data access and evaluation.



Introduction to Plate Tectonic.

Also, the poster documents how visitors of the open-door event "Virtual navigation on volcanoes by Augmented Reality and 3D-headset" had the unique opportunity to navigate easily hazardous volcanic regions by using Virtual Reality and 3D models.



Seismic hazard and mitigation actions.

## 3D EXPLORATION AND VIRTUAL REALITY

We proposed virtual 3D models of volcanic regions in Iceland and Italy (at Etna volcano), which guided the visitors in a virtual survey through hazardous contexts like landslide prone areas and fault zones.



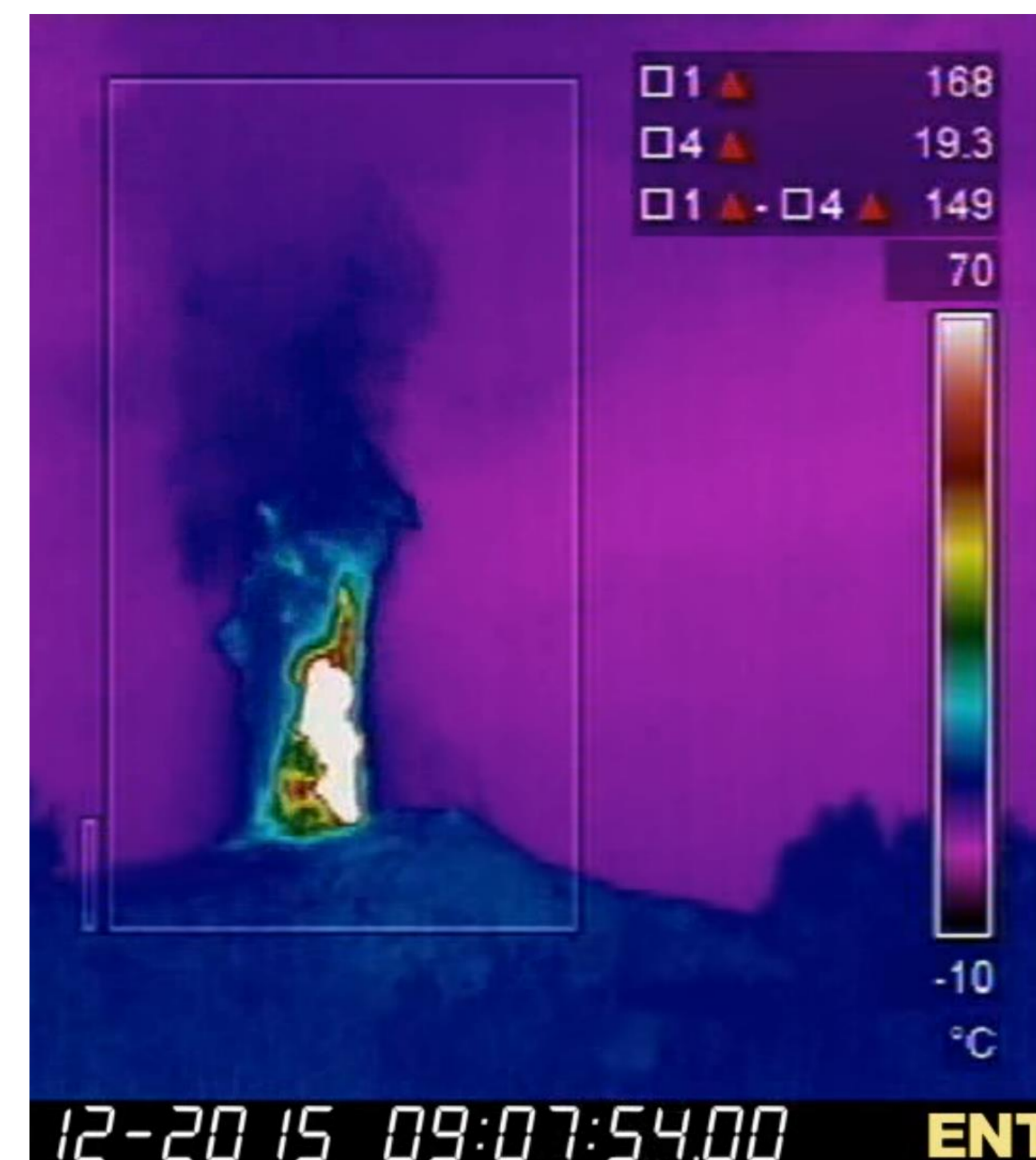
Looking through 3D glasses...



Astonishing 3D images!



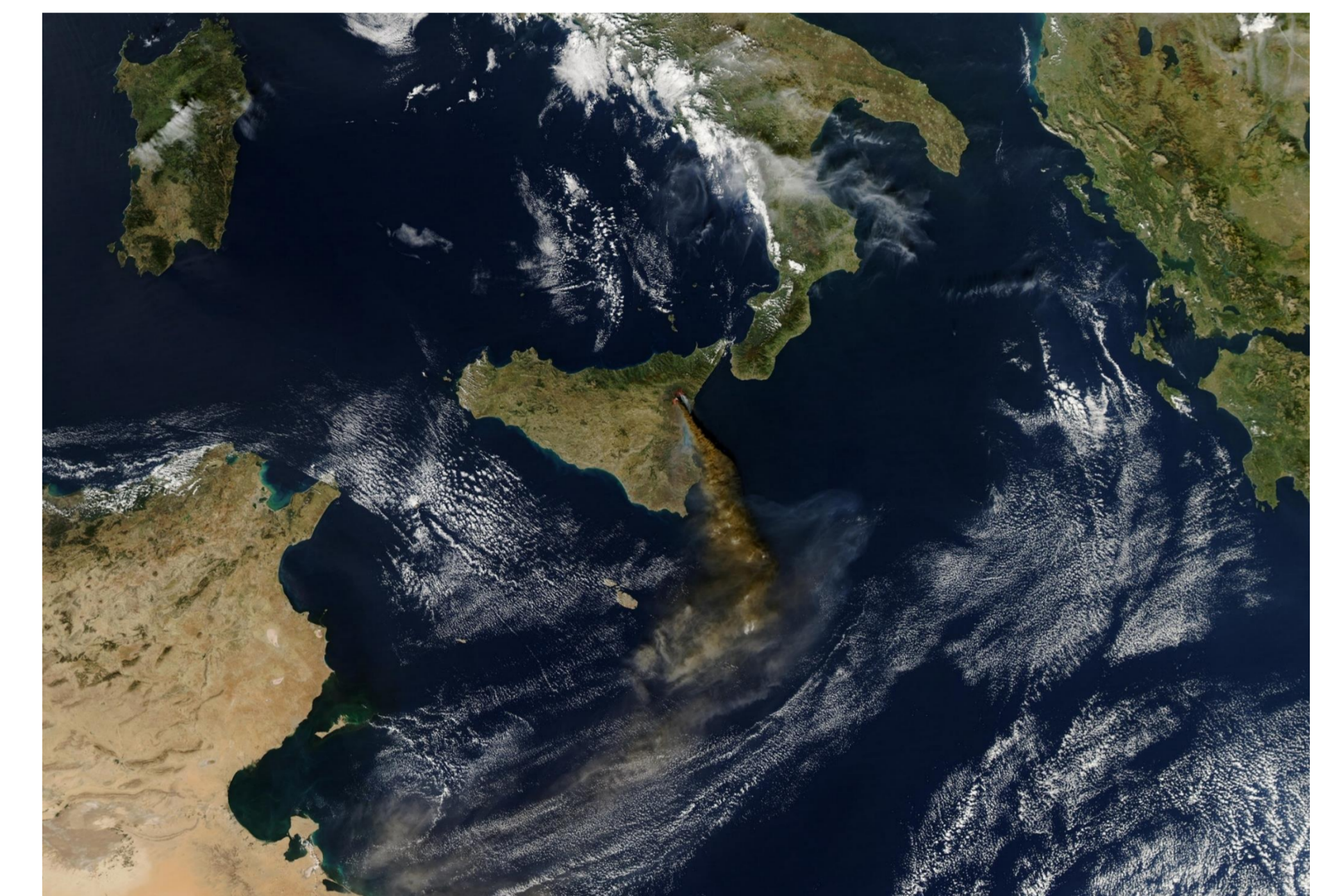
Exploiting drones in geological surveys.



Effects of a lava fountaining episode at Mt. Etna.



Exploring volcanic ash fallout and its disruptive impact.



Monitoring from space: the two images show eruptive activity at Mt. Etna seen from ISS (image credit: NASA), and an INAF antenna, respectively.



The event was supported as part of the 3DTeLC project funded through the Erasmus+ Key Action 2 Strategic Partnerships for Higher Education scheme (Project Reference: 2017-1-UK01-KA203-036719). The video of the drone was made by DRONE by the FlyEye - Team INGV-OE, Massimo Cantarero, Emanuela De Beni, Alfio Messina. We acknowledge Alfio Amantia for the editorial support.