



Etna, a giant of ice and fire awakes

Sentinel-2 MSI acquired on 17 February 2017 at 09:50:41 GMT

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Sentinel-2 MSI acquired on 26 March 2017 at 09:40:31 GMT

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Keyword : land, volcano, eruption, geohazard, Italy, Sicily

[2D](#)

[3D](#)

Fig.1 - S2A MSI (09.03.2017) - 11-8-4 colour composite

[2D view](#)

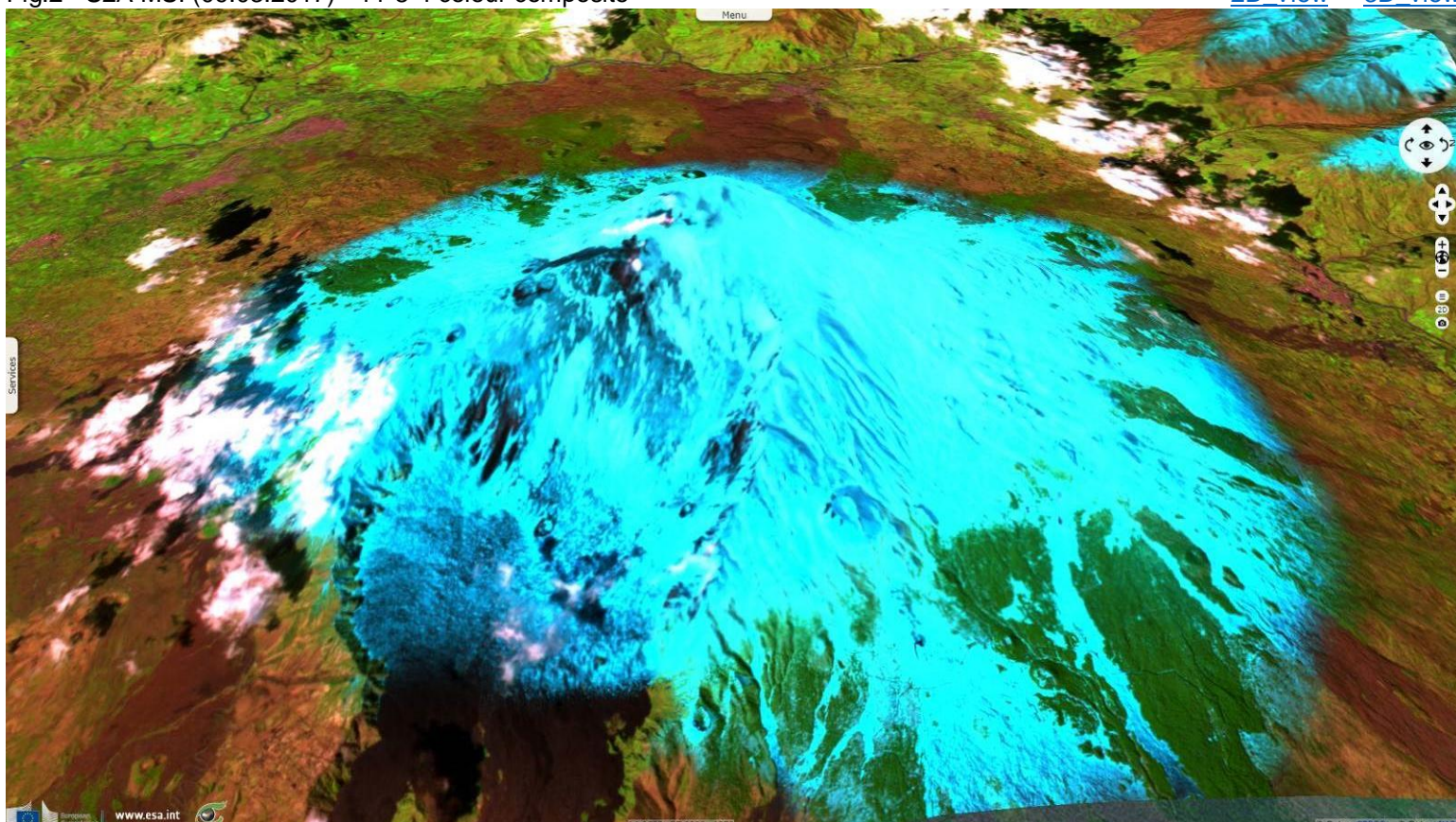
[3D view](#)



Fig.2 - S2A MSI (09.03.2017) - 11-8-4 colour composite

[2D view](#)

[3D view](#)



The two views above (fig. 1 and 2) use a single 100 x 100 km tile from the Sentinel-2A MSI image acquired the 9th of March 2017 over the island of Sicily in Italy. The 11-8-4 colour composite was selected to discriminate the different elements of the image: forests appears in dark green, agriculture in bright green and pinkish, cities from carmine to pink, hot lava in red, older lava field in brown, snow in cyan, water in blue, clouds in white and shadows in black. In particular, one can recognize the stratovolcano Etna lying in the North East corner of the tile and the coastal city of Catana at its South-East flank. Relief is magnified by a 2x factor.

Fig.3 - S2A MSI (17.02.2017), before the initial eruption - 12-11-8 colour composite

[2D view](#) [3D view](#)

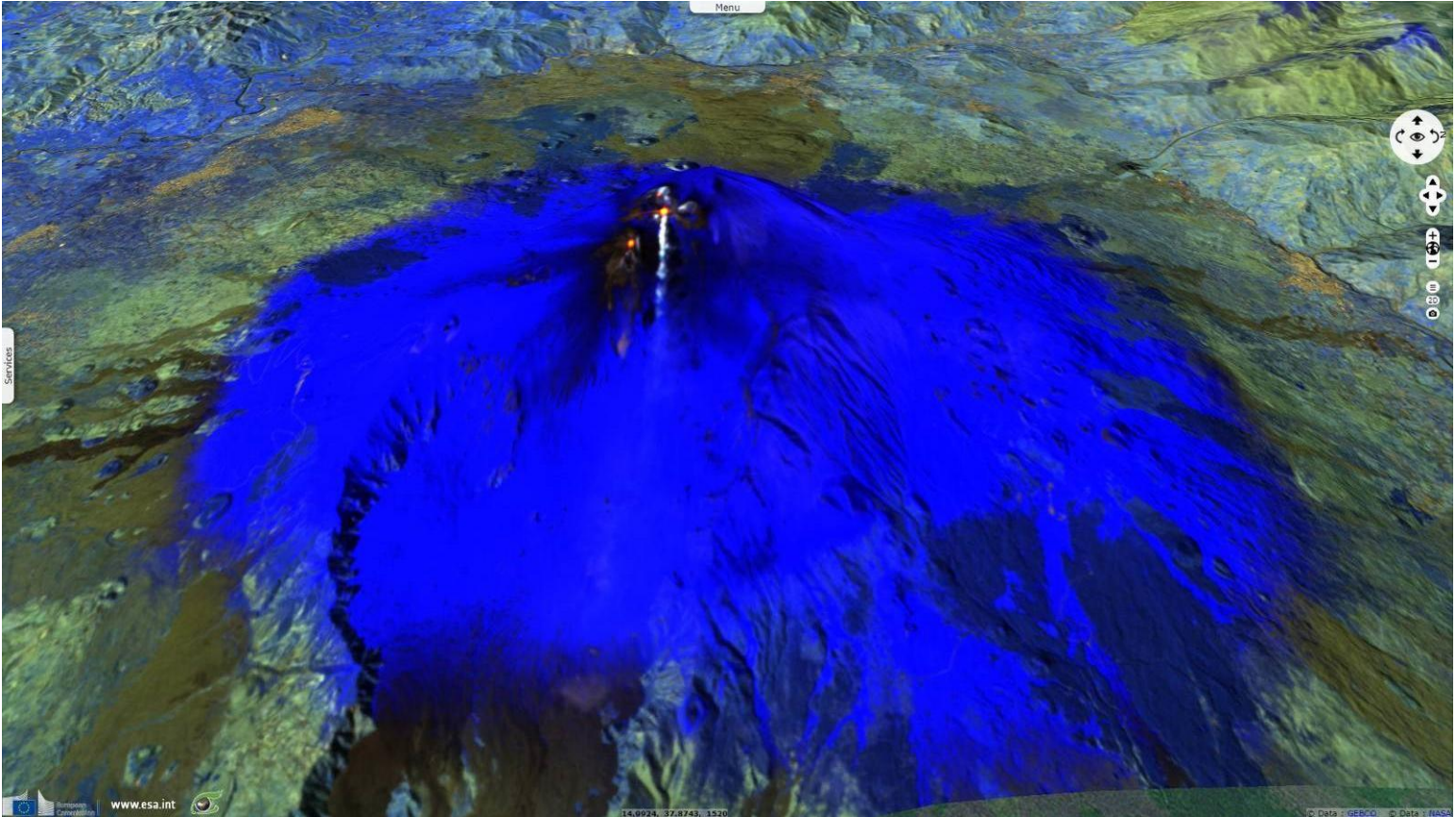
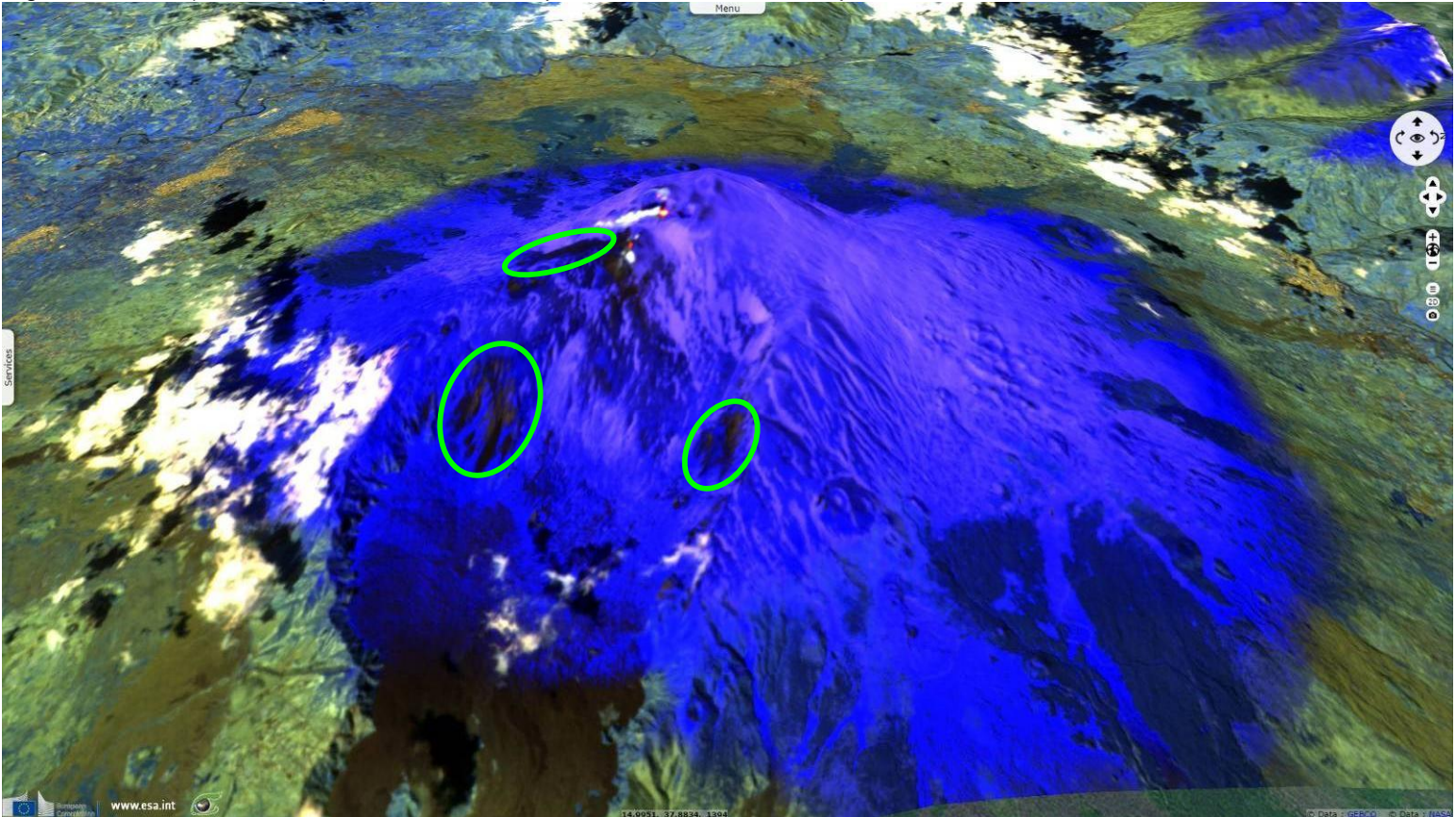


Fig.4 - S2A MSI (09.03.2017), after the initial eruption - 12-11-8 colour composite

[2D view](#) [3D view](#)



These two views above (fig. 3 and 4) show a pair of Sentinel-2A MSI tiles acquired over the 3330 m high cone of Mount Etna the 17th February 2017 and the 9th of March 2017, before and after an eruption that happened the 27th of February. The colour composite 12-11-8 was chosen to highlight both lava and snow over Etna. The overall snow cover increased on the 9th March

image, potential newly cooled lava flow (green) can be distinguished by the surrounding melted snow while Smoky red dots near the top of the cone highlight the lava outlet.

[Istituto Nazionale di Geofisica e Vulcanologia \(INGV\)](#) described this event: “On the late afternoon of 27 February 2017, the Strombolian activity that had started at a vent located in the former “saddle” between the old and new cones of Etna's Southeast Crater (SEC) showed a rapid increase, and lava overflowed from the vent, forming a flow that descended the south flank of the SEC. This eruptive episode, the first significant eruptive event at Etna since the summit eruptions of May 2016, is still going on as of late 1 March 2017, though at diminishing intensity.

The lava overflow started shortly after 17:00 UTC on 27 February; initially the lava rapidly spilled down the steep flank of the SEC, but then slowed after reaching the gently sloping terrain at its base, slowly expanding south-southwestward, toward the old cone of Monte Frumento Supino. During the night of 27-28 February, the activity was characterized by frequent Strombolian explosions, which launched incandescent lava fragments up to 200 m above the vent, while lava continued to overflow to the south.

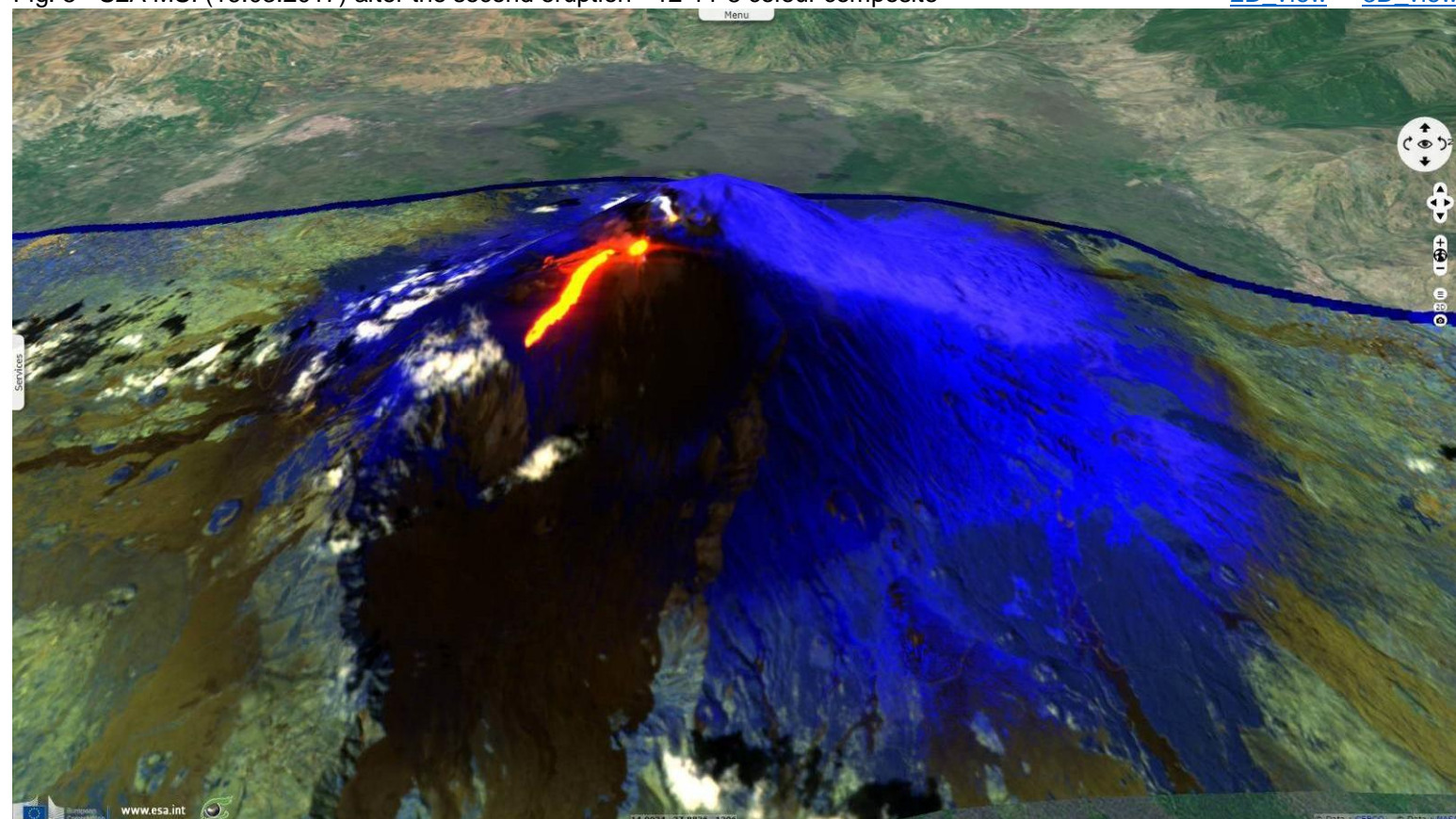
During a field survey carried out by INGV-Osservatorio Etneo staff on 28 February, the eruptive activity continued with minor fluctuations, and there were also sporadic emissions of vapor and brownish ash (old pulverized rock material) from several points within the New Southeast Crater (NSEC), whose latest activity had occurred between 6 and 8 December 2015. The lava flow was slowly advancing on top of snow above Monte Frumento Supino, its most distant front at about 2800 m elevation and 1.2 km from the vent. A conspicuous new pyroclastic cone was growing around the active vent, and had already reached a height well above the highest points on the SEC and NSEC, which stand at about 3290 m.

On 1st March, the activity continued with essentially the same characteristics as on the previous day. The most advanced lava flow had stagnated at about 2700 m elevation and little more than 1.5 km from the vent. The new pyroclastic cone continued to grow rapidly, both in height and width, and its eastern base had started to fill the depression of the NSEC. On the late evening, the eruptive activity showed a marked reduction in intensity, and the volcanic tremor amplitude diminished rapidly.”

The latest three images (fig. 5, 6 and 7) were acquired the 16th, 19th and 26th of March, soon after the second eruption. The progressive snowmelt (in particular on the southern flank) makes harder the distinction between newly cooled and older lava flows than in the previous pair of images but the active lava flow is not limited to the crater on these images and spectacularly highlighted by the colour composite.

Fig. 5 - S2A MSI (16.03.2017) after the second eruption - 12-11-8 colour composite

[2D view](#) [3D view](#)



INGV reported also: “After the end of the latest eruptive episode, on the late evening of 1 March, sporadic, weak explosive activity had continued at the active vent; during the past few days this activity had shown a gradual intensification. In the early morning hours of 15 March, a small lava flow started oozing down the south flank of the SEC-NSEC cone complex. After 07:00h UTC (=local time -1), the eruptive activity rapidly intensified, and the volcanic tremor amplitude showed a marked rise. By 09:00h UTC, Strombolian explosions were nearly constant and generated modest amounts of volcanic ash that was rapidly dispersed in the atmosphere. The lava flow had reached the base of the cone and was slowly expanding on the gently sloping terrain toward south. During the late afternoon, the lava continued to advance on top of the lava flow of the previous eruptive episode. The intensity of the Strombolian activity reached a peak around 17:40-17:45h UTC, but in the evening there was a gradual diminution of both the eruptive activity and the volcanic tremor amplitude, after which both showed fluctuations. The lava flow was no longer fed. However, shortly before 23:00 UTC, a new small lava flow was emitted from a vent on the south flank of the cone.”

Fig. 6 - S2A MSI (19.03.2017) - 12-11-8 colour composite

2D view3D view

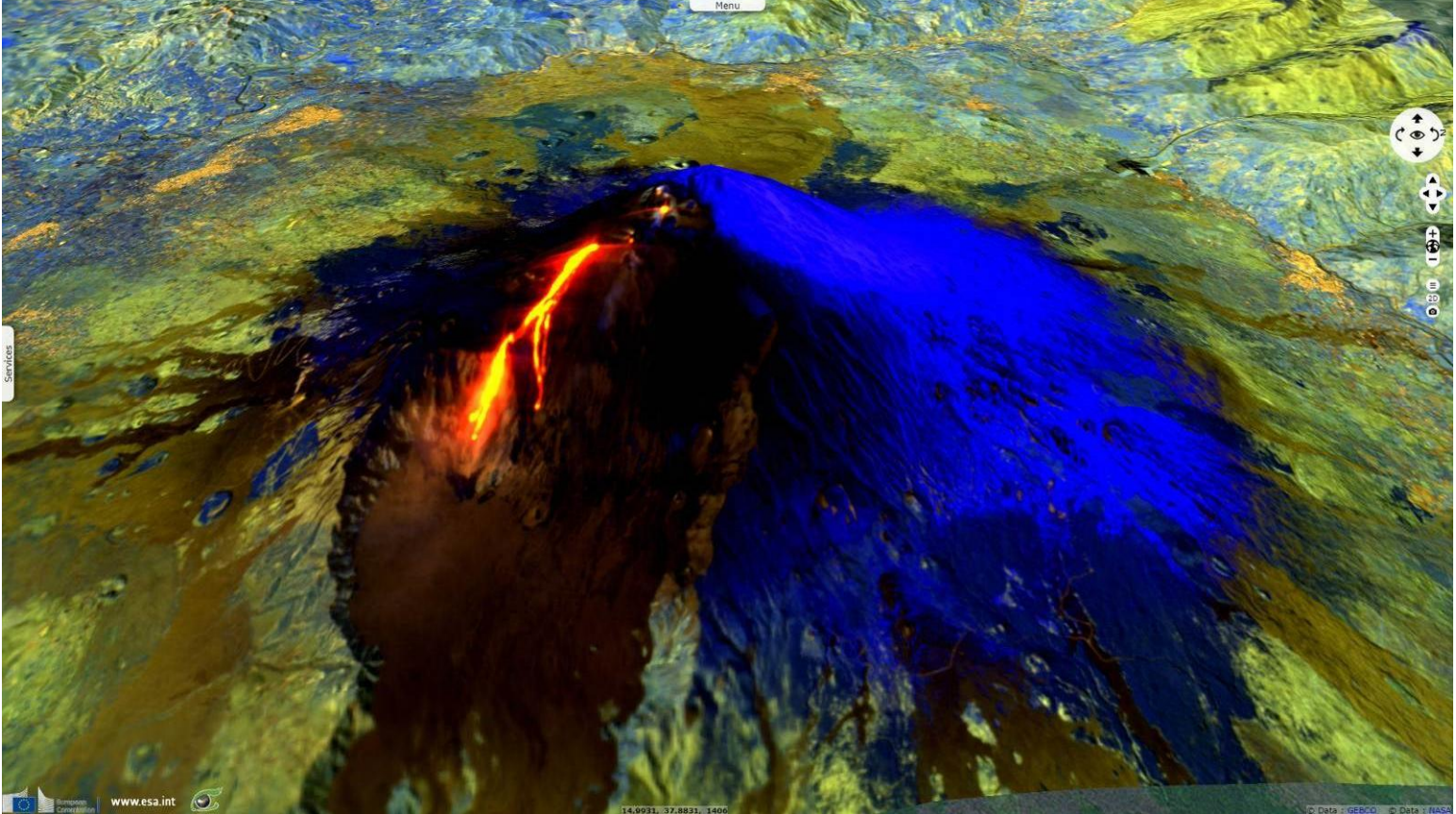
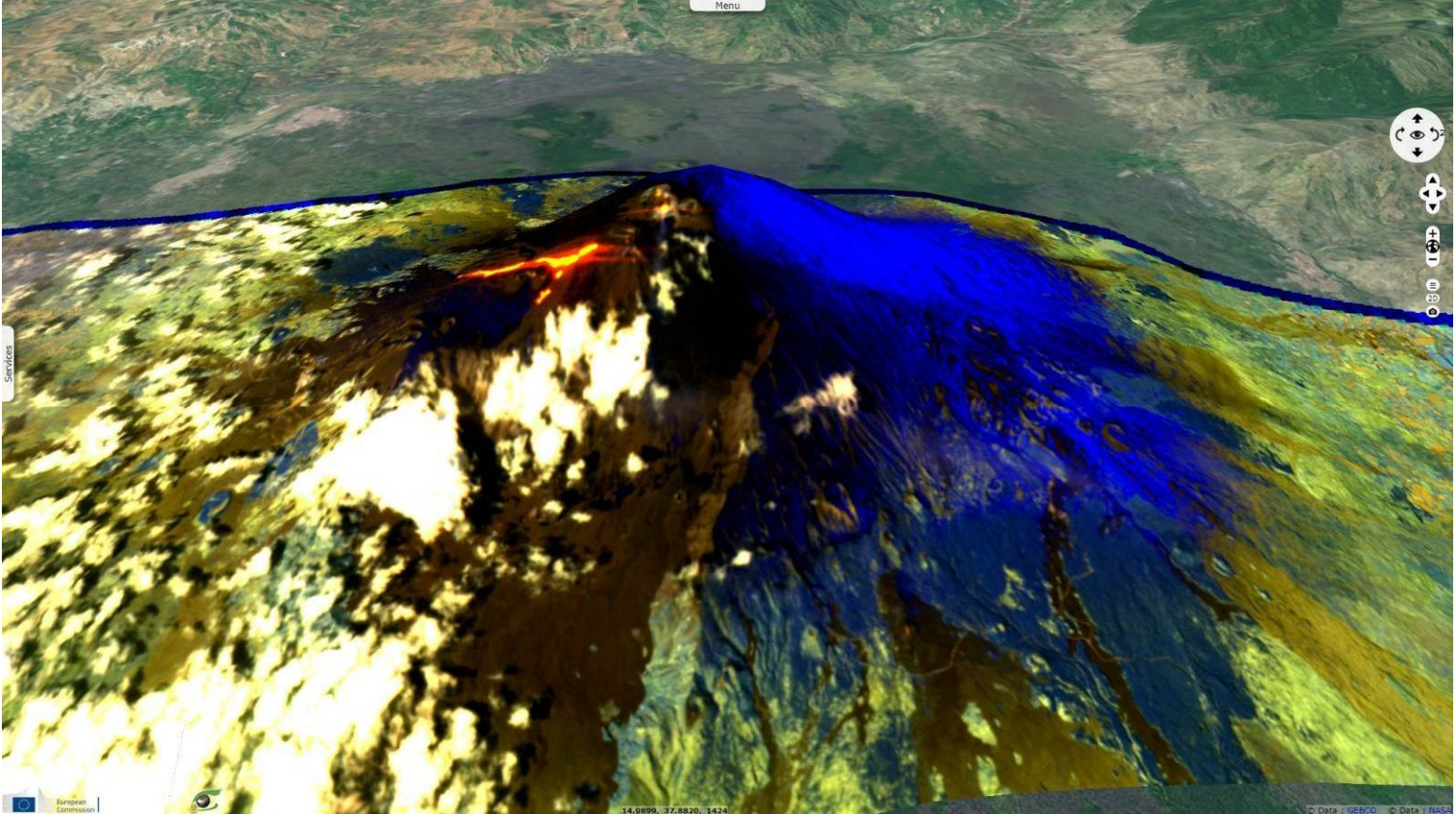














Fig. 7 - S2A MSI (26.03.2017) - 12-11-8 colour composite

2D view3D view



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