

Deadly landslides in Philippines

Sentinel-2 MSI acquired on 24 June 2018 at 02:23:31 UTC

Sentinel-3 SLSTR RBT acquired on 12 September 2018 from 00:53:26 to 00:56:26 UTC

Sentinel-1 CSAR IW acquired on 12 September 2018 at 21:31:00 UTC

Sentinel-1 CSAR IW acquired on 24 September 2018 at 21:31:00 UTC

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[3D Layerstack](#)

Fig. 1 - S3 SLSTR (12.09.2018) - S2,S3,S1 - Mangkhut approaching Philippines, red S1 footprints encase Itogon & Naga cities.

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

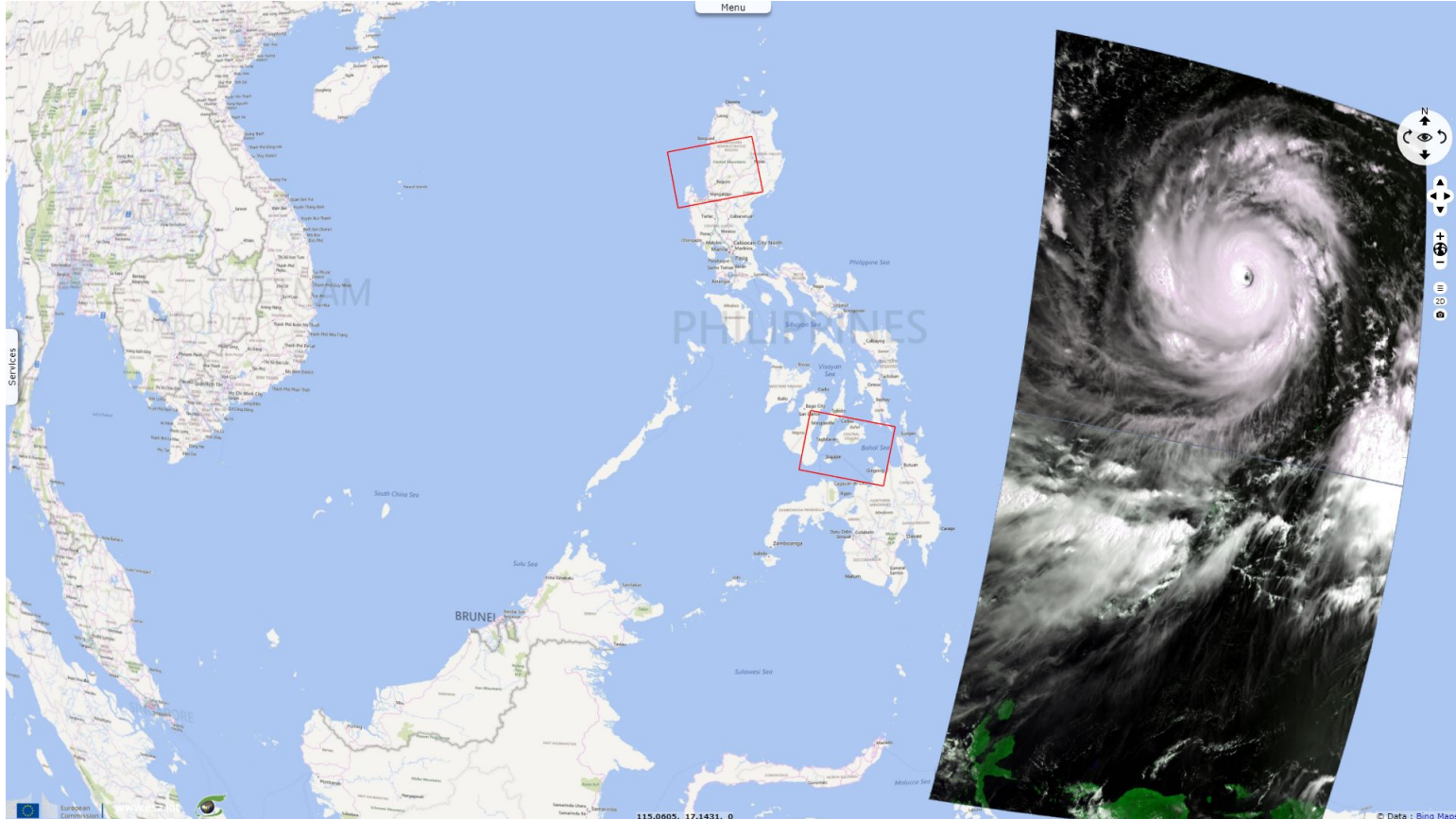
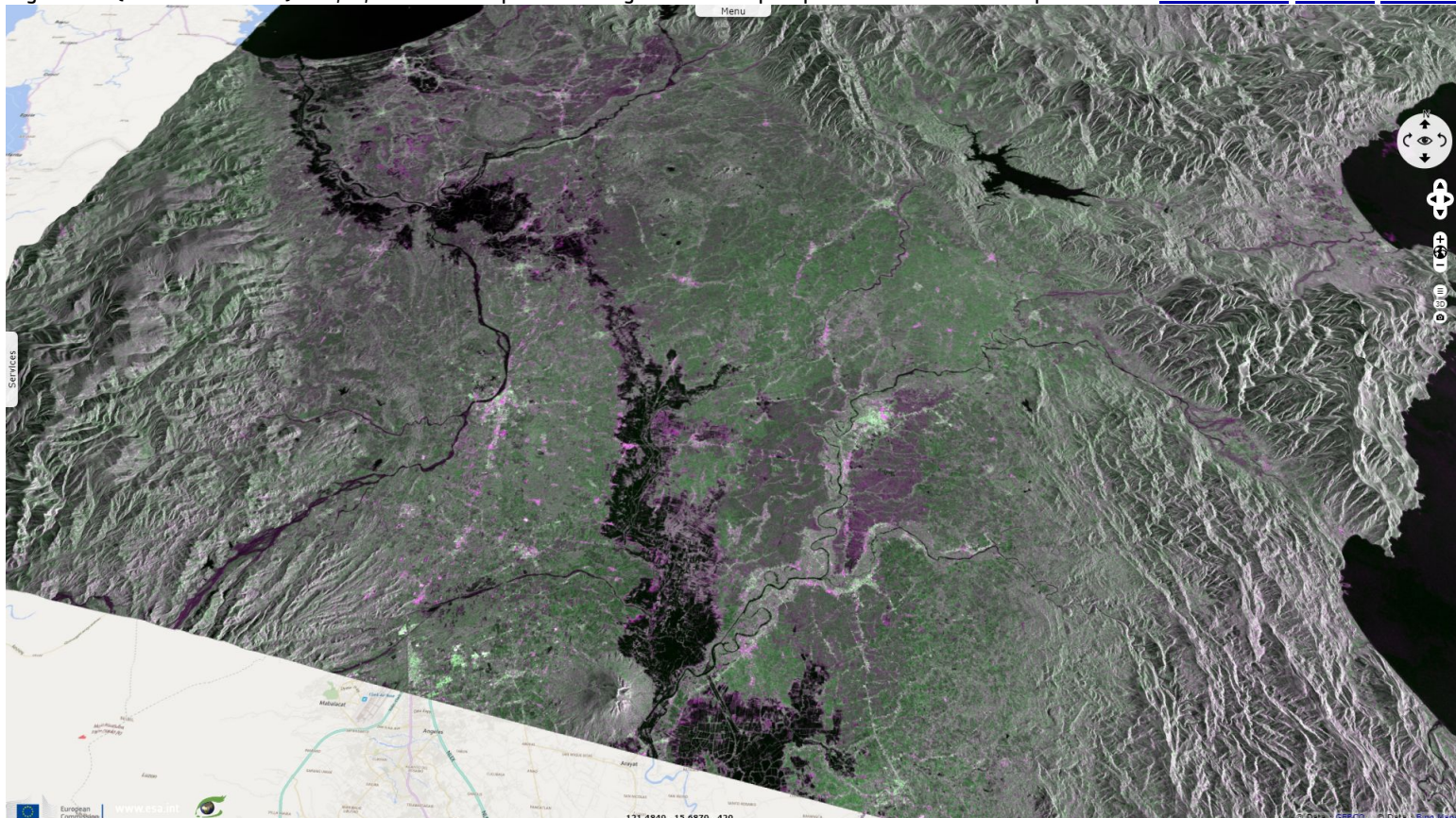


Fig. 2 - S1 (04 & 16.09.2018) - vv,vh,vv colour composite - Mangkhut-caused precipitations flooded Luzon province.

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



Typhoon Mangkhut was [highlighted](#) in a previous Sentinel of the Day as it was approaching Philippines. Soon after, it was still a category-5 cyclone, which blew 240km/h winds as it passed over Philippines the 15.09.2018. It also caused heavy rainfalls which provoked flooding and landslides.

Fig. 3 - S2 (01.08.2018) - 4,3,2 natural colour - Itogon mining city in Luzon province.

[3D view](#)



Fig. 4 - S2 (20.09.2018) - 4,3,2 natural colour - Itogon after the landslide that killed 80.

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



Fig. 5 - S1 (04.09.2018) - vv,vh,vv colour composite - Itogon before the landslide.

[3D view](#)

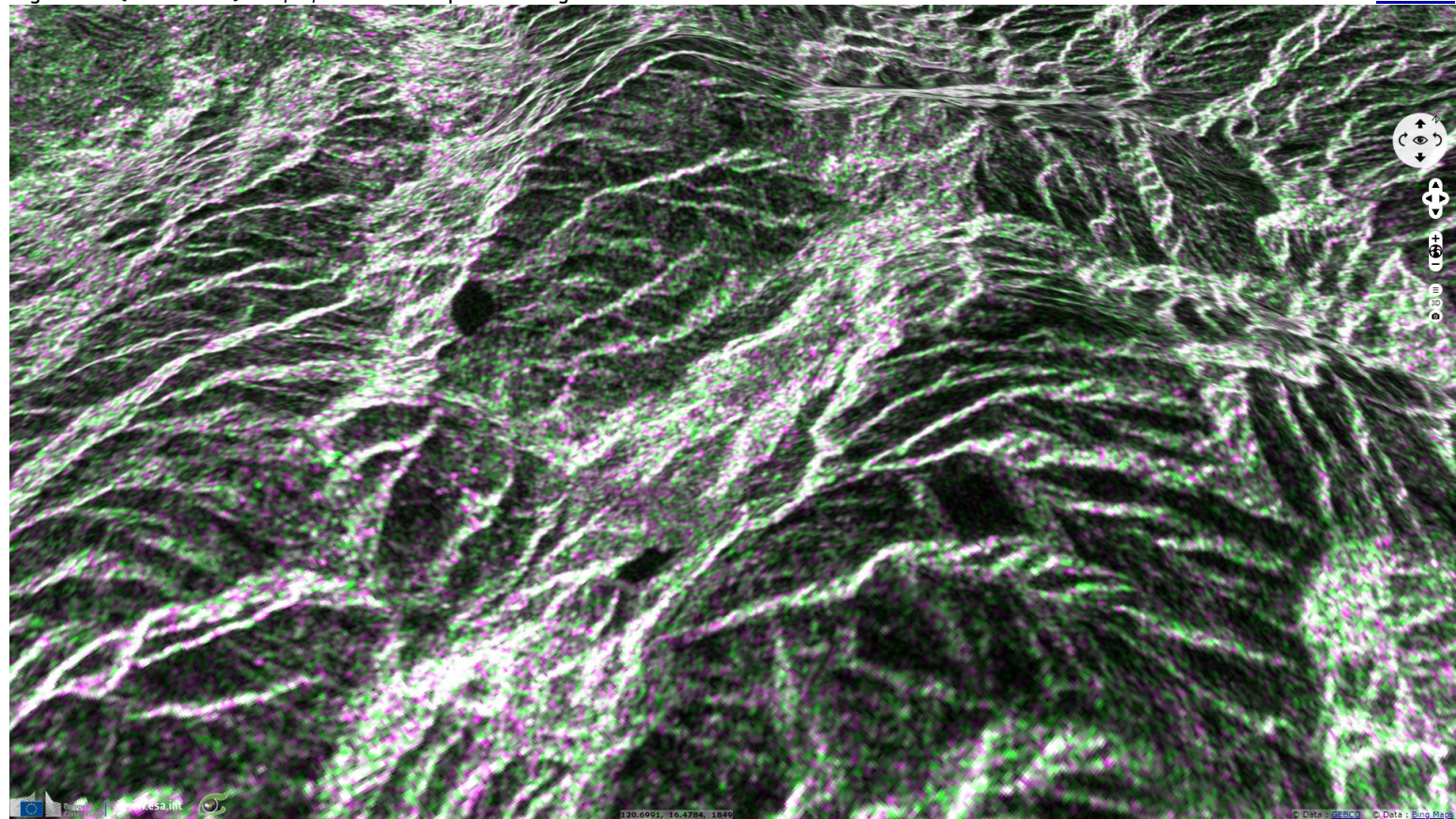


Fig. 6 - S1 (16.09.2018) - vv,vh,vv colour composite - Itogon after the landslide, the alluvial cone shows as a purple triangle

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

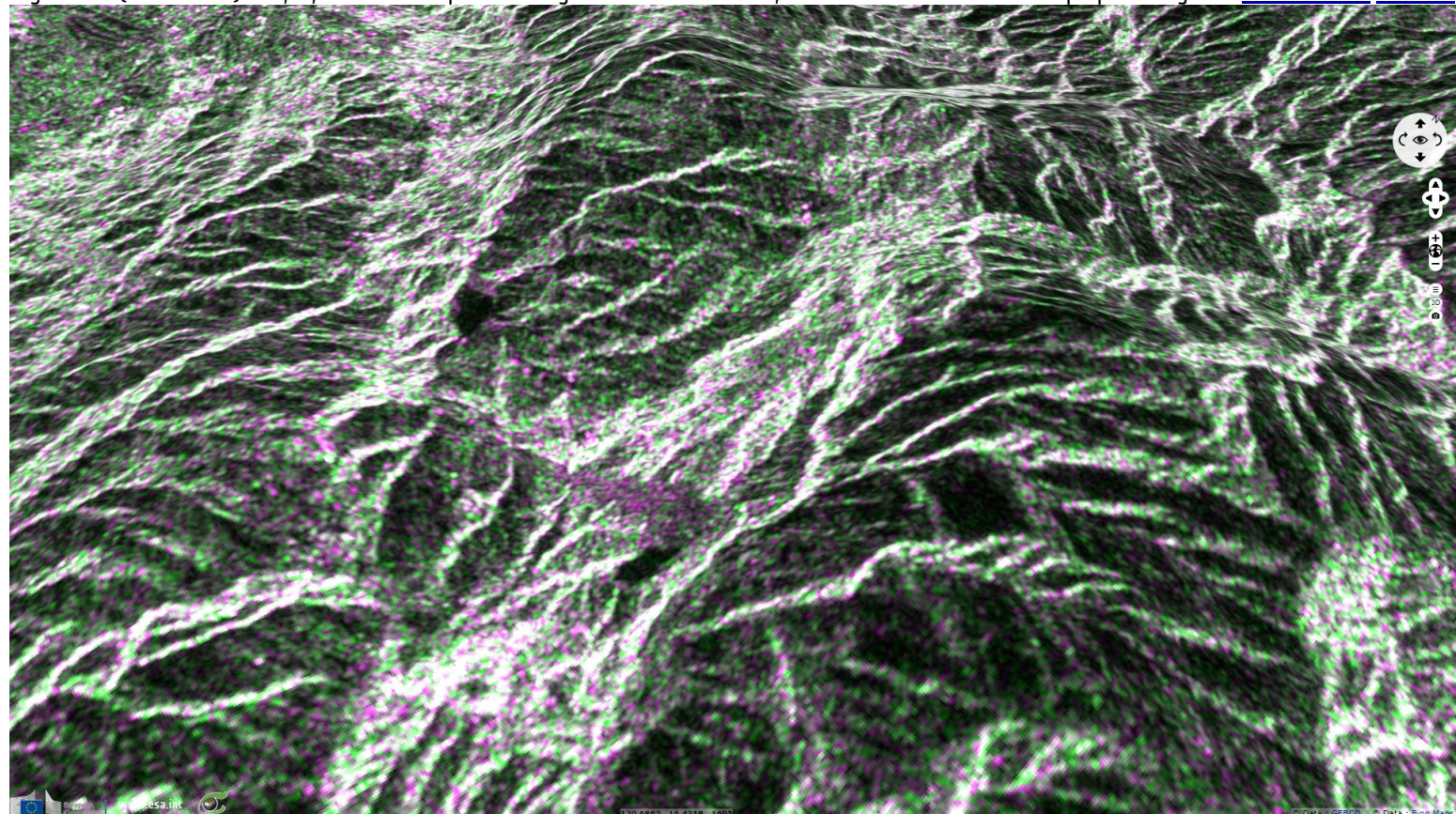


Fig. 7 - S2 (24.06.2018) - 4,3,2 natural colour - Naga city in Cebu Province before rainfalls triggered a landslide around its mine.

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



Fig. 8 - S1 (12.09.2018) - vv polarisation, σ_0 processing, Naga city before the landslide.

[3D view](#)

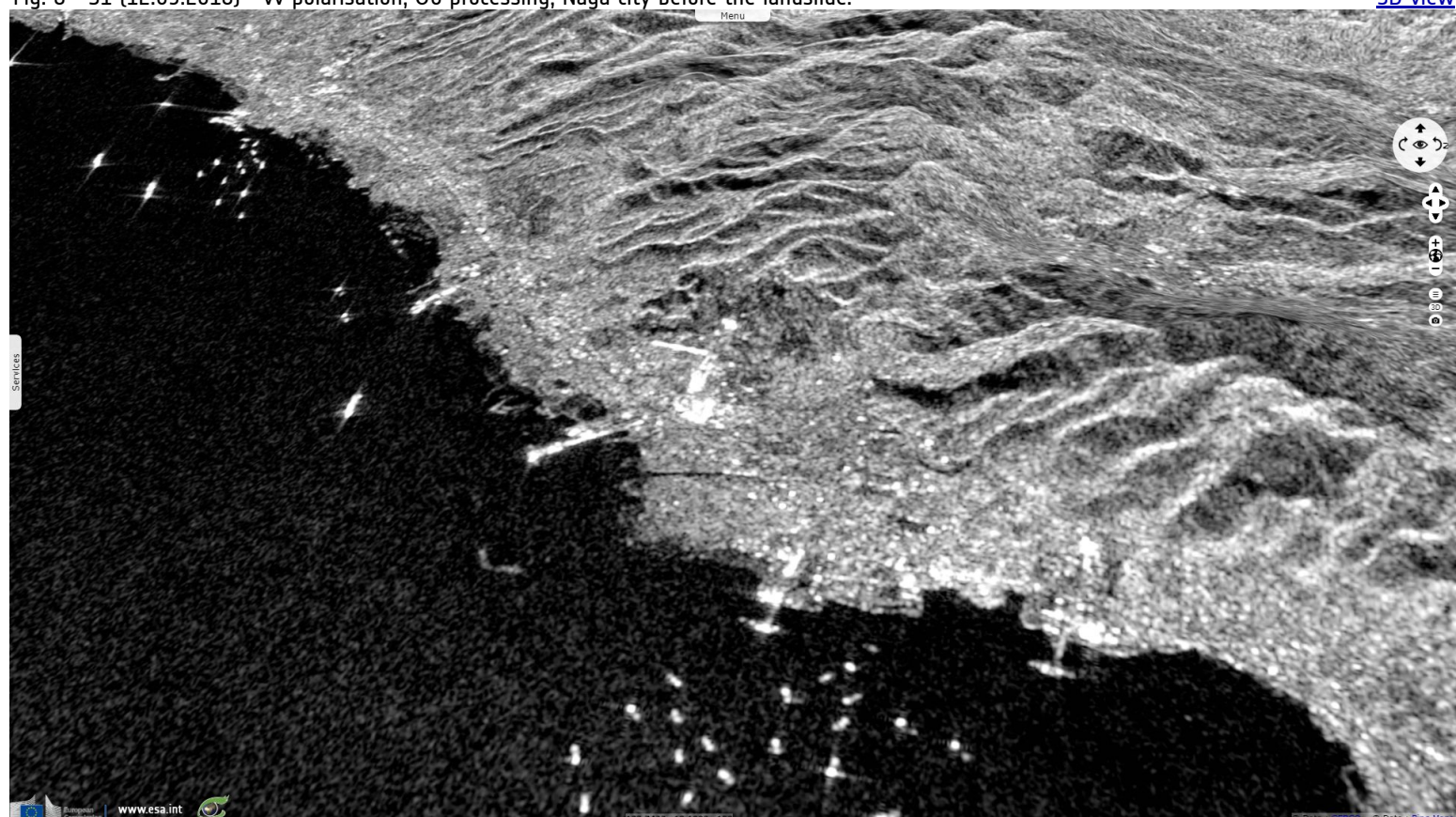
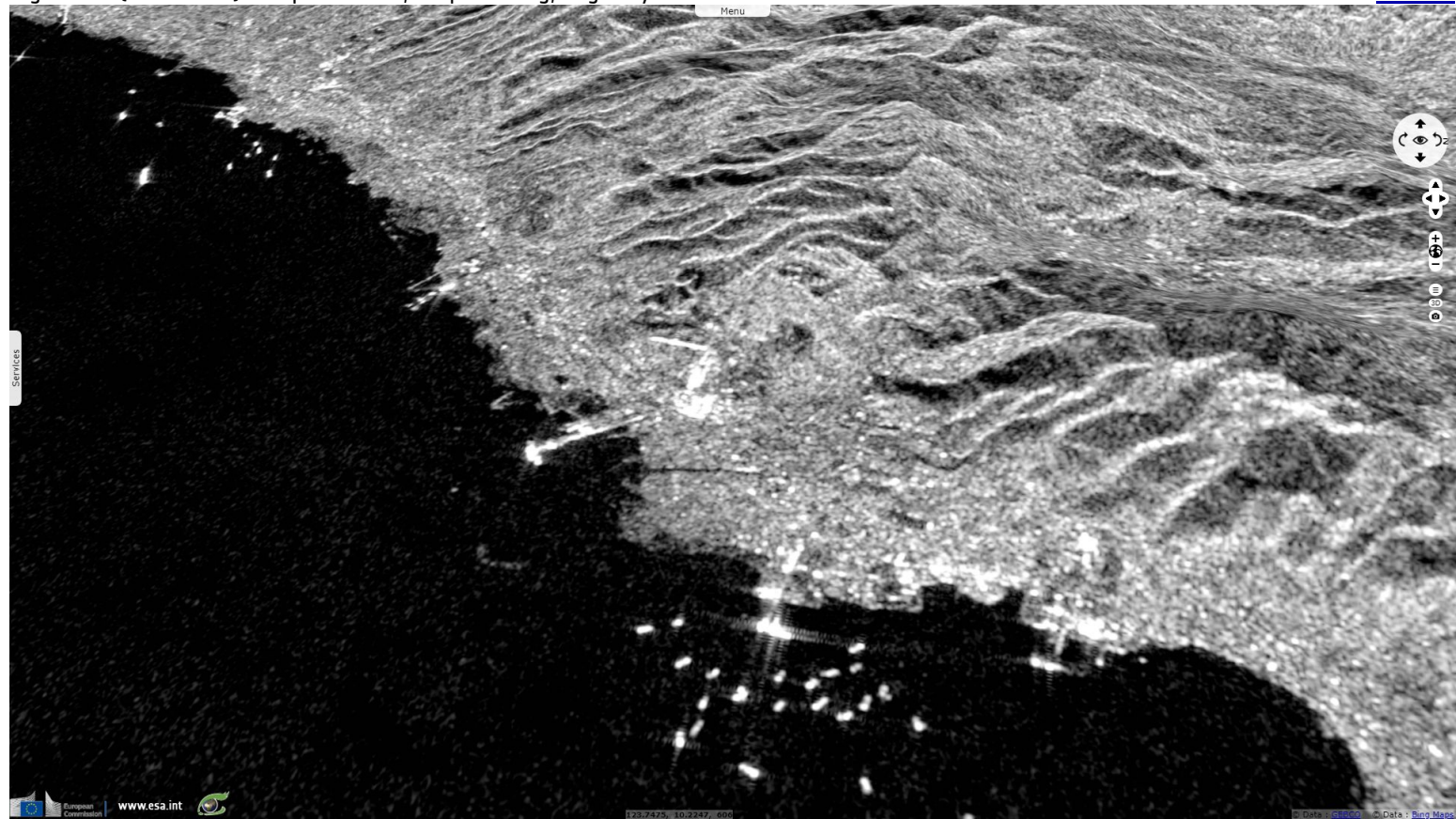


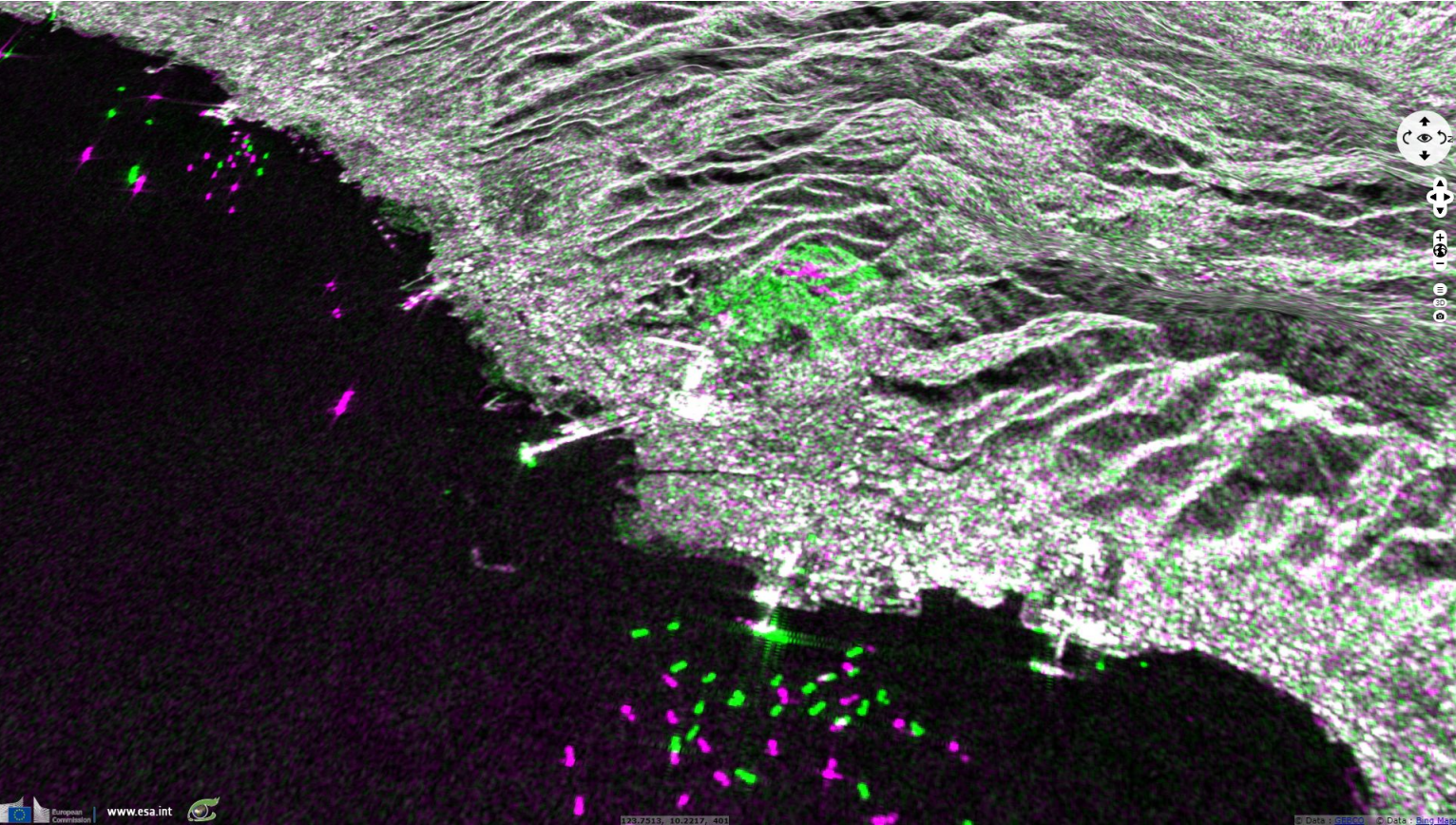
Fig. 9 - S1 (24.09.2018) - vv polarisation, σ_0 processing, Naga city after the landslide.

[3D view](#)



Landslide in Naga City, Cebu Philippines, September 2018. Source: Cebu Provincial Government

Fig. 10 - S1 - red (12.09.2018), green (24.09.2018), blue (12.09.2018), vv polarisation - Multi-temporal view of Naga landslide. [3D animation](#) [3D view](#)















The differences between the images acquired the 12 and the 24 September show in green or magenta. This image highlights a massive landslide that happened within Naga mine on 20 September after a period of heavy rain. It killed 53 people while 50 others remain missing.

According to the Copernicus-endorsed floodlist.com: *"The landslide occurred in or close to a cement quarry. The Philippines Department of Social Welfare and Development said that areas around the quarry have been evacuated, with at least 427 families displaced."* It seems many came back home when the typhoon was announced further North. The wobbly house foundation didn't support the severe rain that poured in a short period of time.

As a consequence, *"Cebu Governor, Hilario P. Davide III visited the area and ordered the temporary stoppage of all quarry operations in Cebu Province. The governor also requested a review into quarry permits issued by the Province to make sure that the areas of operation of these companies are implementing safety measures for the nearby residents."*

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