Sentinel Vision
SED-985
06 December 2021

3D Layerstack

Glacial outburst flood at Grimsvotn caldera, Iceland

Sentinel-2 MSI acquired on **10 October 2021** at 12:43:09 UTC
Sentinel-1 CSAR IW acquired on **17 November 2021** at 18:50:48 UTC
...
Sentinel-1 CSAR IW acquired on **11 December 2021** at 18:50:47 UTC

Author(s): Sentinel Vision team, VisioTerra, France - svp@visioterra.fr

Keyword(s): Geohazard, polar, cryosphere, ice cap, glacier, volcano, river, flood, hydrology, Iceland

Fig. 1 - COP DEM - The Grímsvötn is a subglacial volcano located under the northwestern side of the Vatnajökull ice cap in Iceland. 3D view

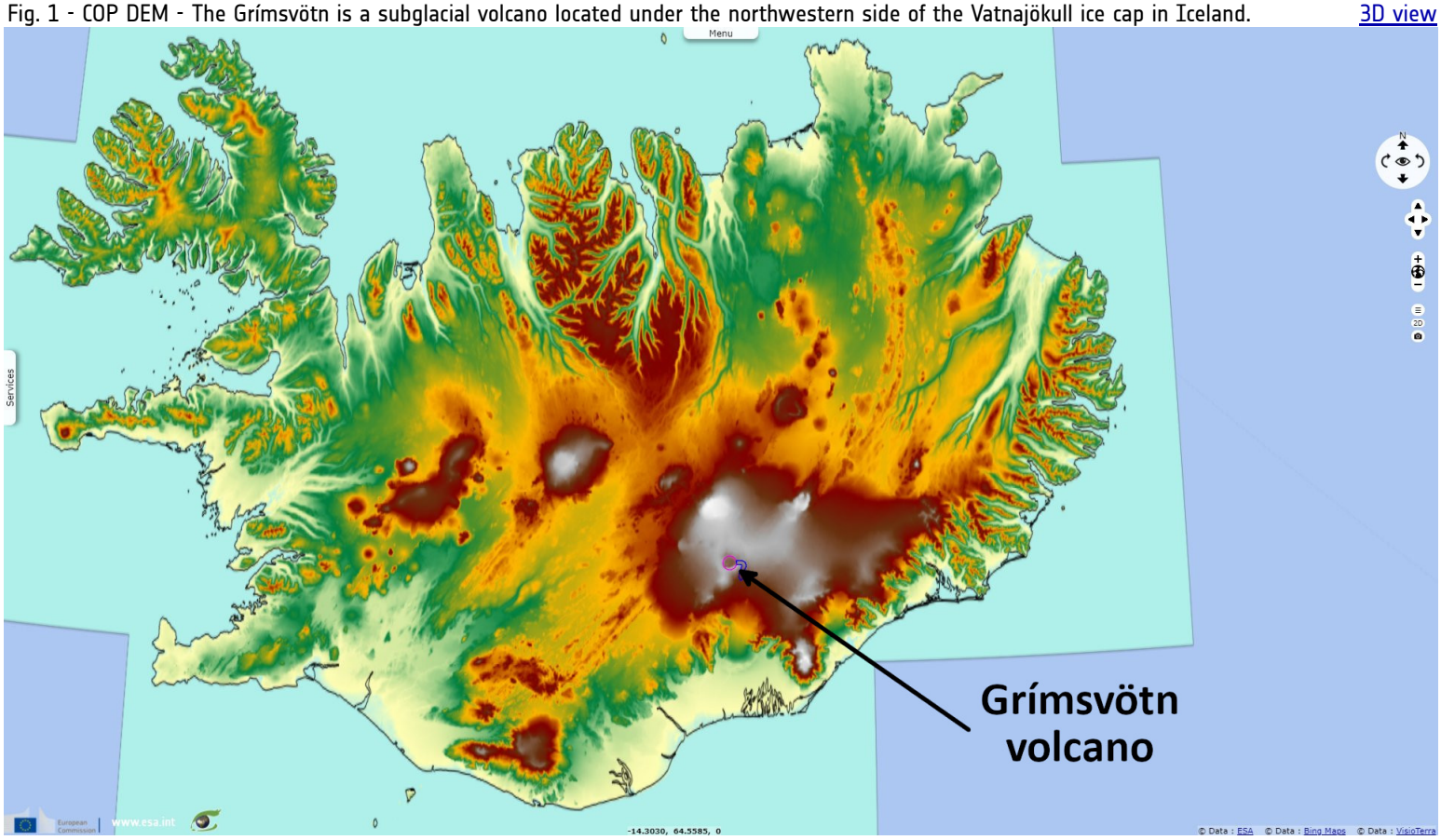


Fig. 2 - S2 (10.10.2021) - A jökulhlaup (glacial outburst flood) was reported, due to subsidence of the ice shelf in Grímsvötn's caldera. 3D view

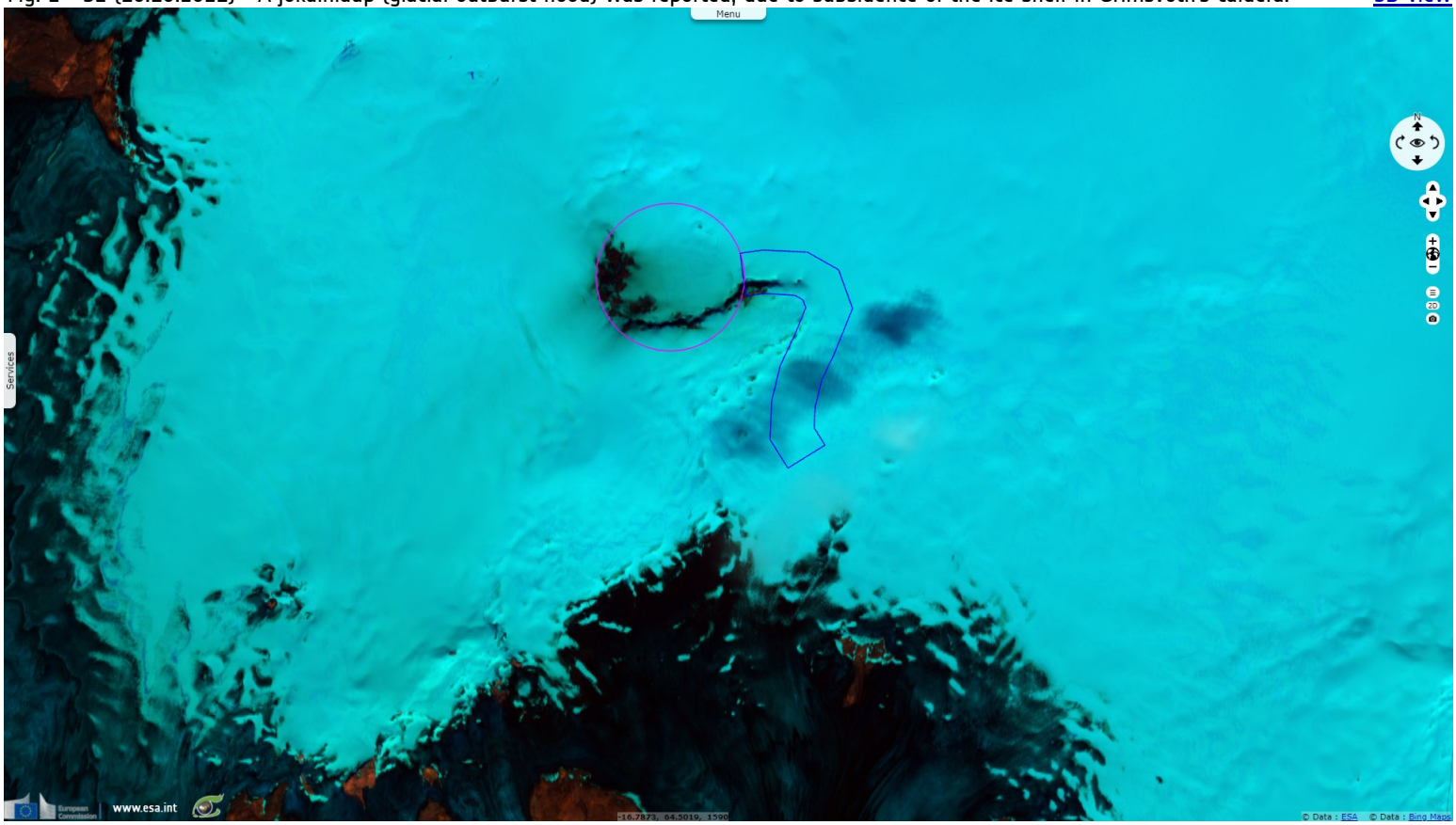


Fig. 3 - S1 (mean 17, 19 & 23.11.2021) - Subsidence of the ice shelf into the underlying lake had begun around 24 Nov. in an area SE of Grímsfjall. 3D view

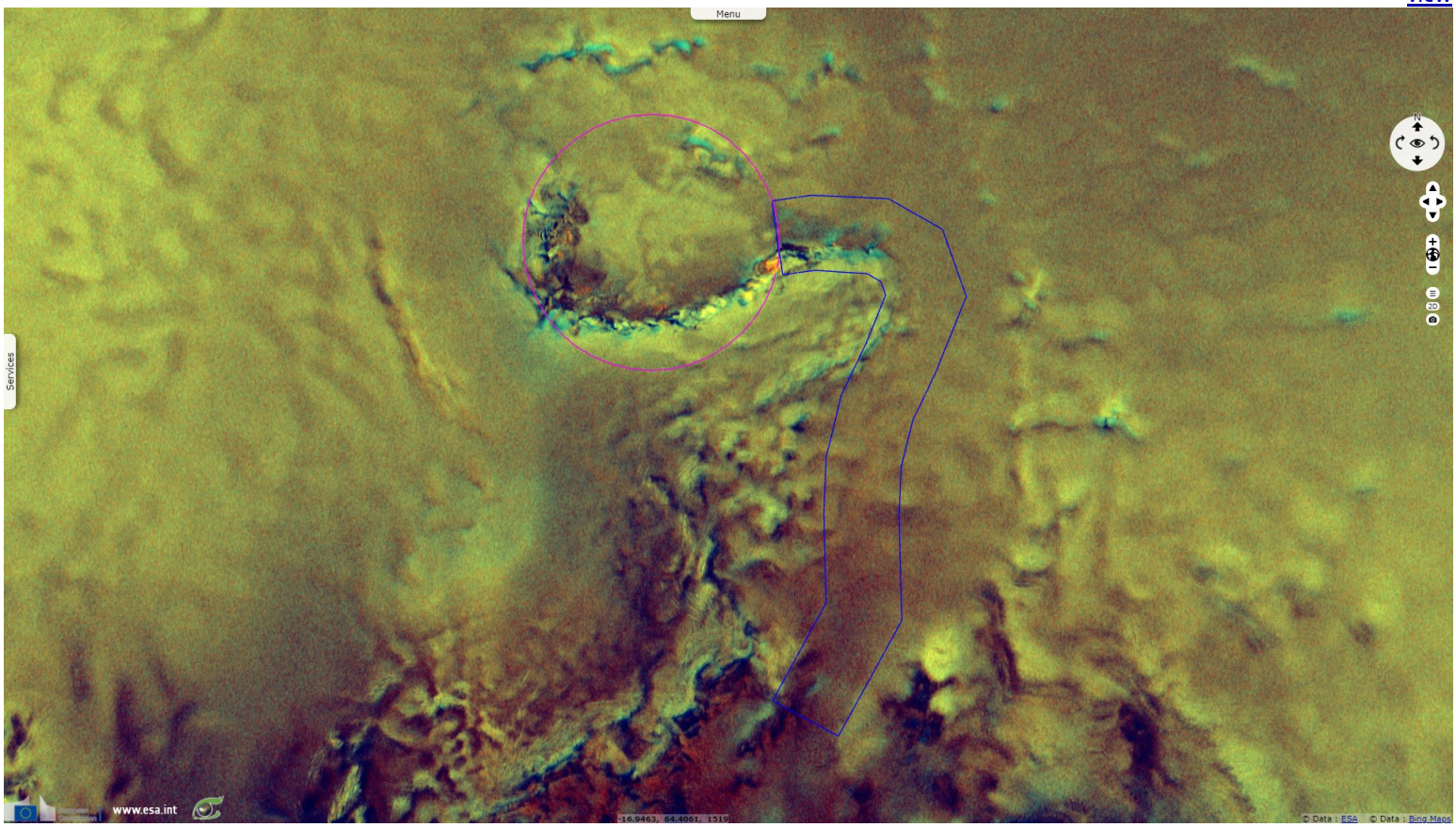
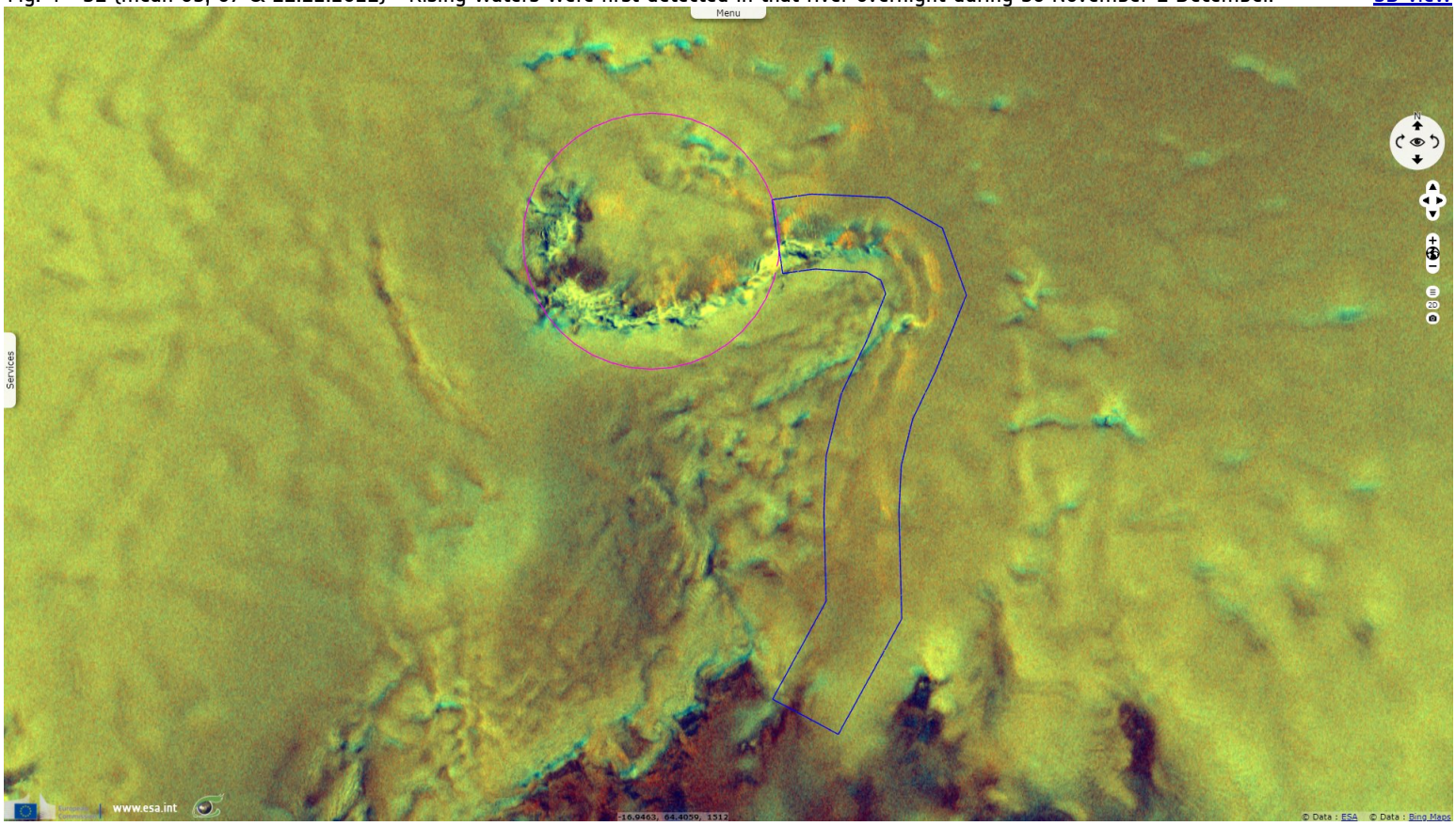
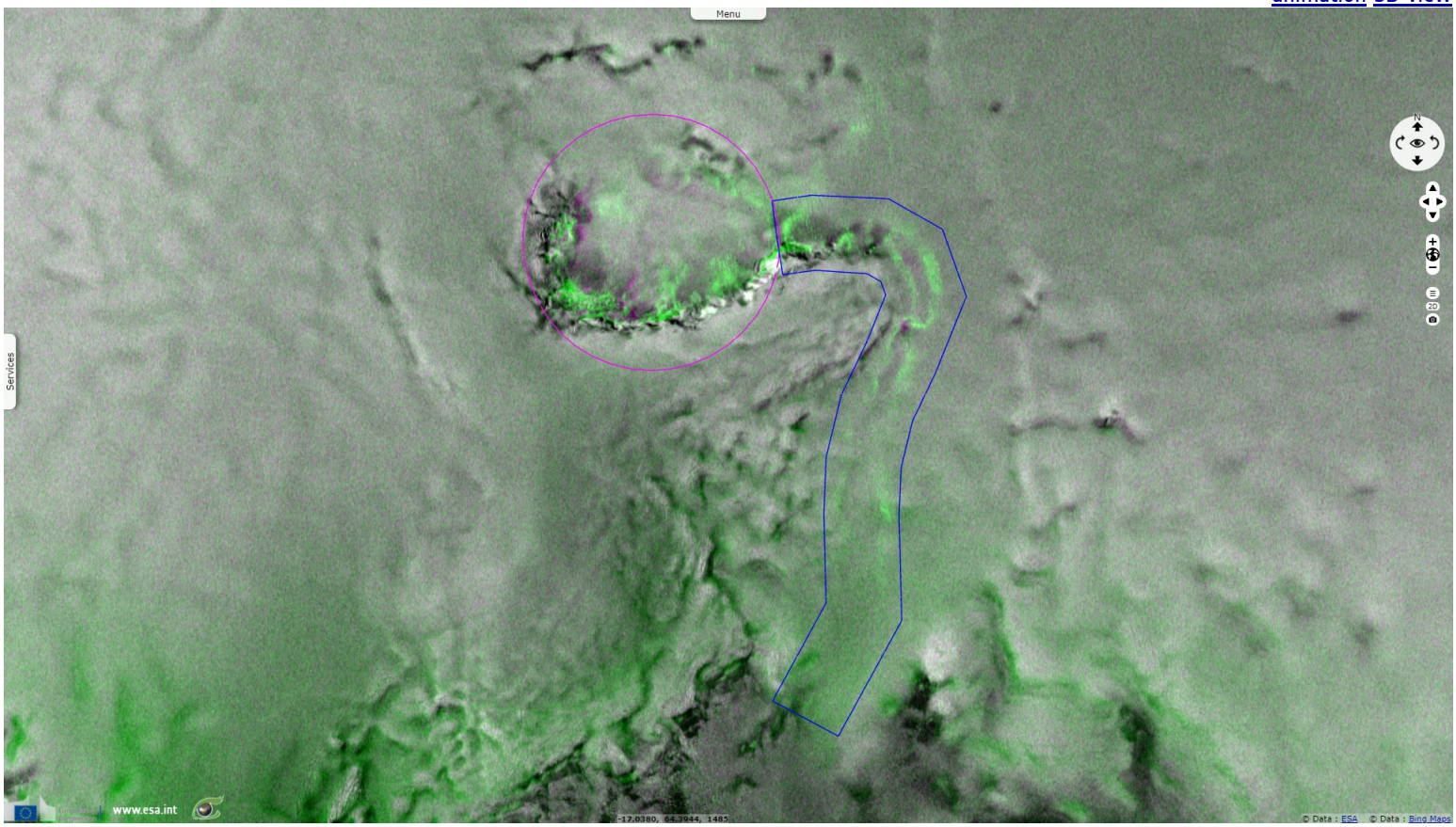


Fig. 4 - S1 (mean 05, 07 & 11.12.2021) - Rising waters were first detected in that river overnight during 30 November-1 December. 3D view



Water from the lake drained from the E side of Skeiðarárjökull and from a channel in the middle of a trail into the Gígjukvísl River.

Fig. 5 - S1 (red & blue channels: 17, 19 & 23.11.2021; green channel: 05, 07 & 11.12.2021) - By 6 Dec. the ice shelf had subsided a total of ~77m. 3D animation 3D view



By 2 December the flow rate in the river was 930 cubic meters per second, triple what was detected three days before, and 10 times the normal seasonal rate. Daily measurements showed that the flow rate continued to rise, likely peaking at 2800 cubic meters per second during the morning of 5 December. The data indicated that the lake was mostly empty of water by 6 December.

The views expressed herein can in no way be taken to reflect the official opinion of the European Space Agency or the European Union.
Contains modified Copernicus Sentinel data 2021, processed by VisioTerra.

More on European Commission space:						
More on ESA:	S-1 website	S-2 website	S-3 website			
More on Copernicus program:	Scihub portal	Cophub portal	Inthub portal	Colhub portal		
More on VisioTerra:	Sentinel Vision Portal	Envisat+ERS portal	Swarm+GOCE portal	CryoSat portal		

Funded by the EU and ESA SED-985-SentinelVision powered by VisioTerra