

# Reserves and sanctuaries in the Atacama desert plateau

Sentinel-1 CSAR IW VV acquired on **15 March 2017** from 23:05:22 UTC to 23:05:51 UTC  
Sentinel-2 MSI (4 tiles) acquired on **09 April 2017** at 14:37:51 UTC

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Keyword(s): Land, Ramsar, wetlands, reserves, salar, laguna, volcanoes, natural resources, Inca, archaeology, observatories, ESO, Bolivia, Chile, Argentina, Andes, Atacama, Altiplano

[2D Layerstack](#)

Fig. 1 - Global view of two consecutive S1 tiles and four S2 tiles on the Atacama desert showing reserves and sanctuaries.

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

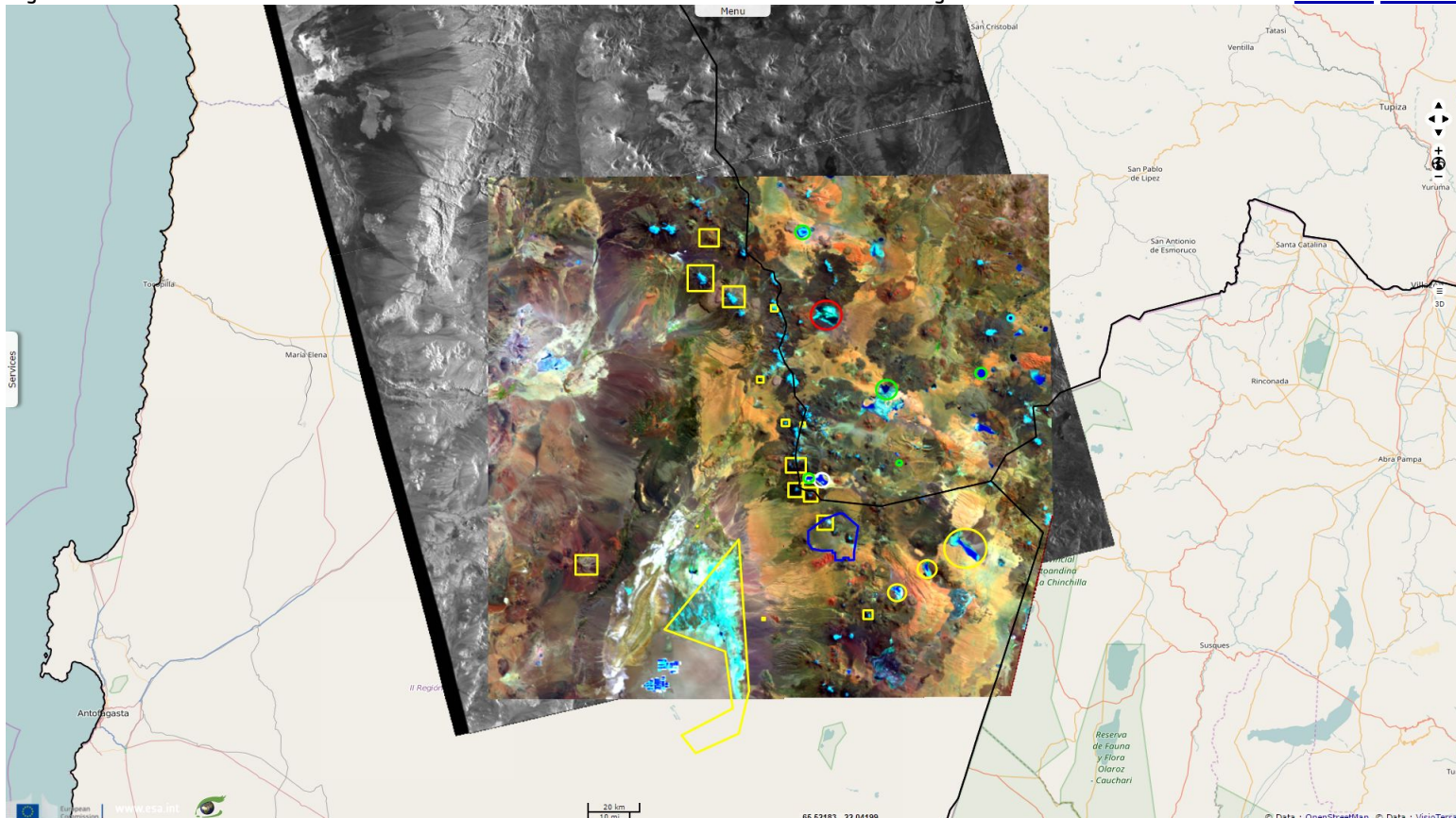


Fig. 2 - S2 image showing the Llano de Chajnantor Observatory, a group of astronomical observatories located nearly 5000m high.

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

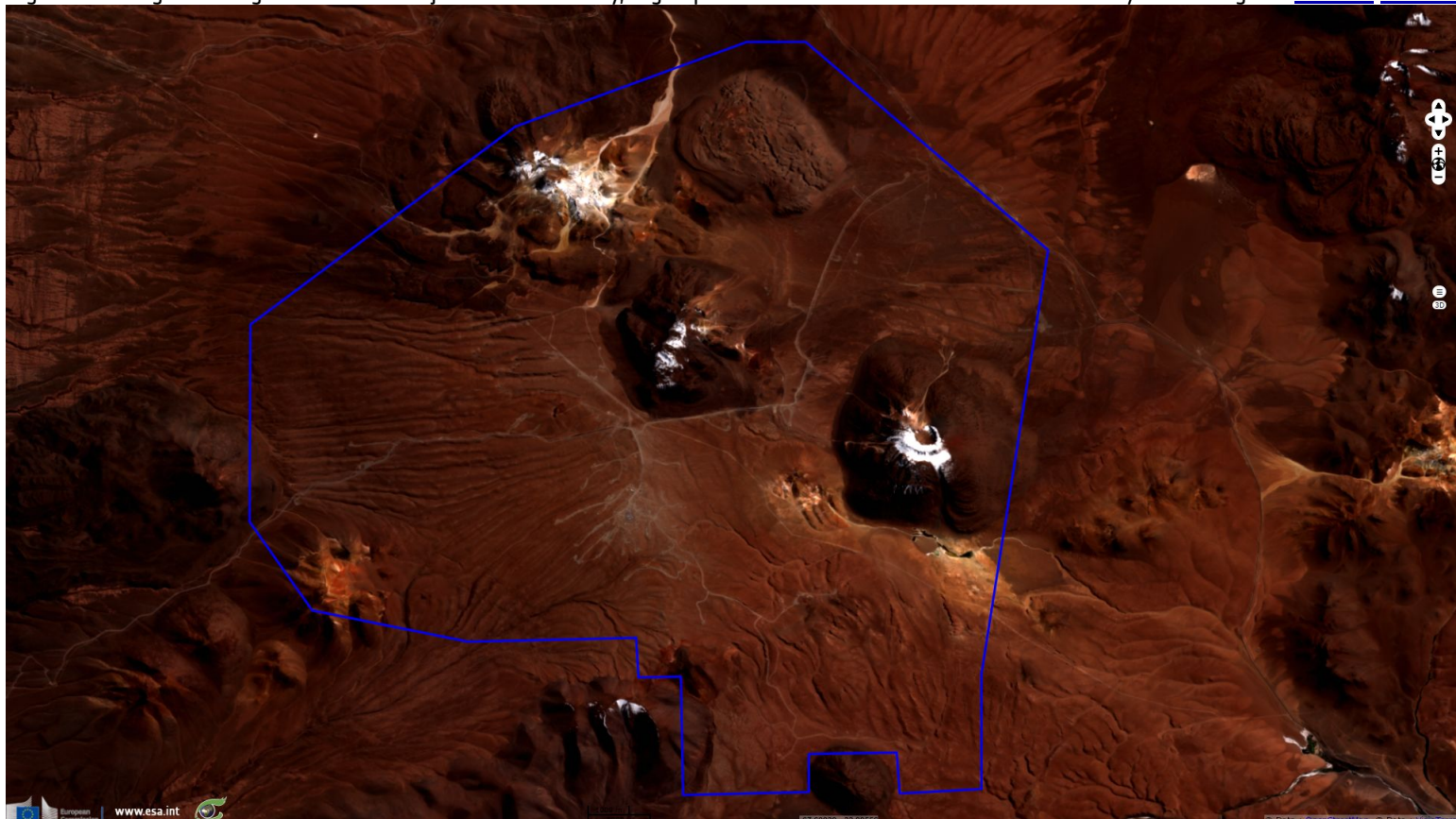
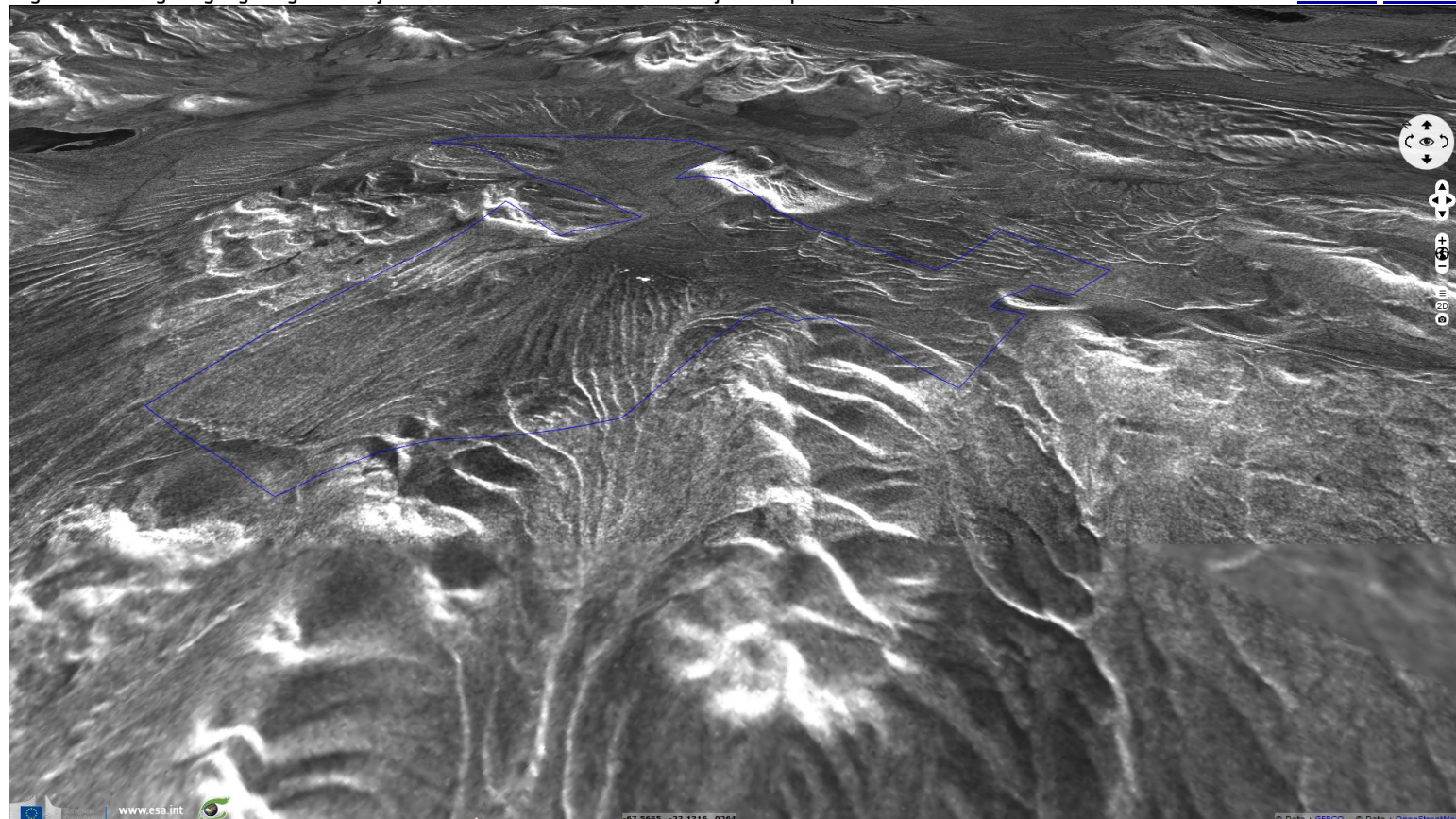




Fig. 3 - S1 image highlighting the Chajnantor Science Reserve on the Chajnantor plateau which hosts ESO's ALMA and APEX.

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



In [Parque Astronómico de Atacama: An Ideal Site for Millimeter, Submillimeter, and Mid-Infrared Astronomy](#), R. Bustos describes the Chajnantor plateau in the following terms: "The area of Chajnantor, at more than 5000 m altitude in northern Chile, offers unique atmospheric and operational conditions which arguably make it the best site in the world for millimeter, submillimeter, and mid-infrared observatories. Long-term monitoring of the precipitable water vapor (PWV) column on the Chajnantor plateau has shown its extreme dryness with annual median values of 1.1 mm."

Fig. 4 - Panorama picture of the Atacama Large Millimeter/submillimeter Array by Serge Brunier for ESO.

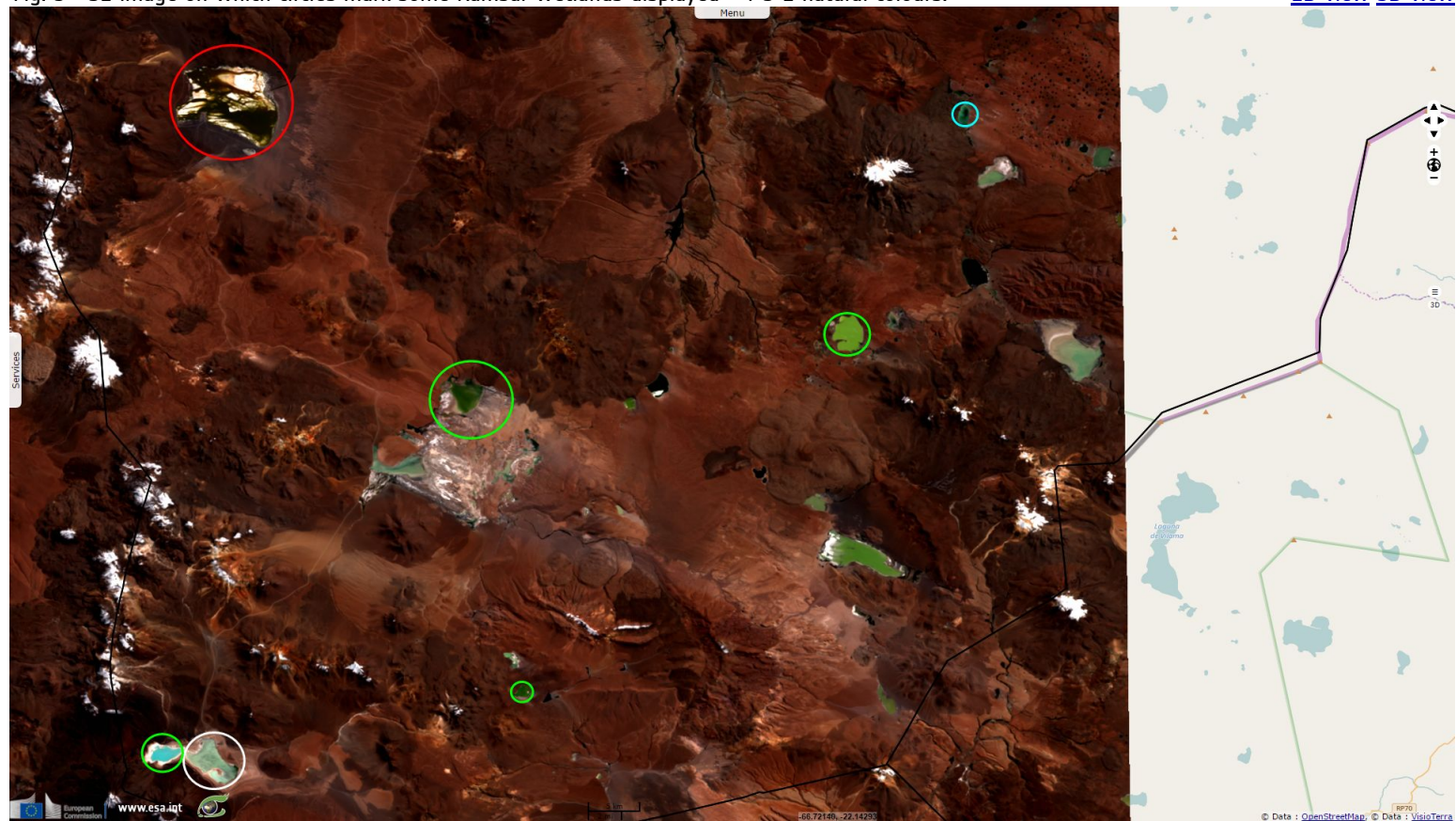


On the Bolivian side of the Altiplano (high plain), numerous endorheic lakes have formed at volcanoes foothold despite the very low precipitations. The high mineral content of these shallow salt lakes and lagunes often defines the colour after which some of them are named. While these lower depressions exceed 4000m altitude, they allowed endemic species to develop despite daily temperature amplitude exceeding 20°, which justified creation of reserves and Ramsar sites.



Fig. 5 - S2 image on which circles mark some Ramsar wetlands displayed - 4-3-2 natural colours.

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



Ramsar commented the wildlife of the [Los Lipez site](#) noting "These wetlands sustain such migratory birds as *Phalaropus tricolor* and *Calidris bairdii*, who use the wetlands as staging sites for roosting and feeding. The Horned Coot (*Fulica corneta*) and Darwin's Rhea (*Rhea pennata garleppi*), a very threatened subspecies, are also present. In addition, ca. 25% and 50% of the global population of the Andean flamingo (*Phoenicoparrus andinus*) and James's Flamingo (*Phoenicoparrus jamesi*), respectively, concentrate in this area. There are also threatened non-avian species such as the endemic frog *Telmatobius huayra*, the Andean Mountain Cat *Leopardus jacobita*, and the colocolo *Leopardus colocoloi*."

Fig. 6 - Picture of Andean flamingos on the Laguna Colorada by Valdeiney Pimenta.





Fig. 7 - S2 image outlining Inca sanctuaries as rectangles - 12-8-3 colour composite, relief magnified by a x2 factor.

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

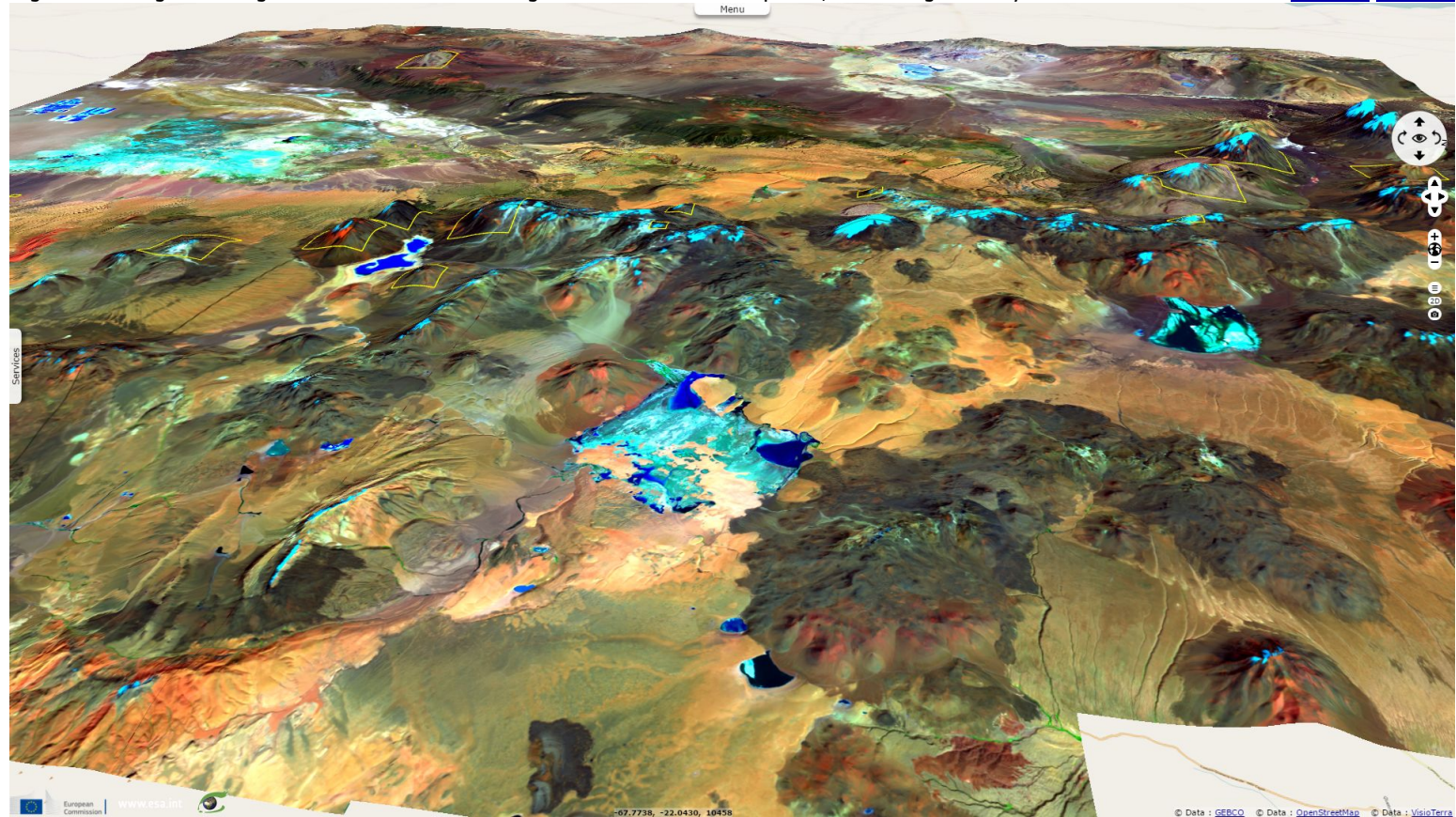
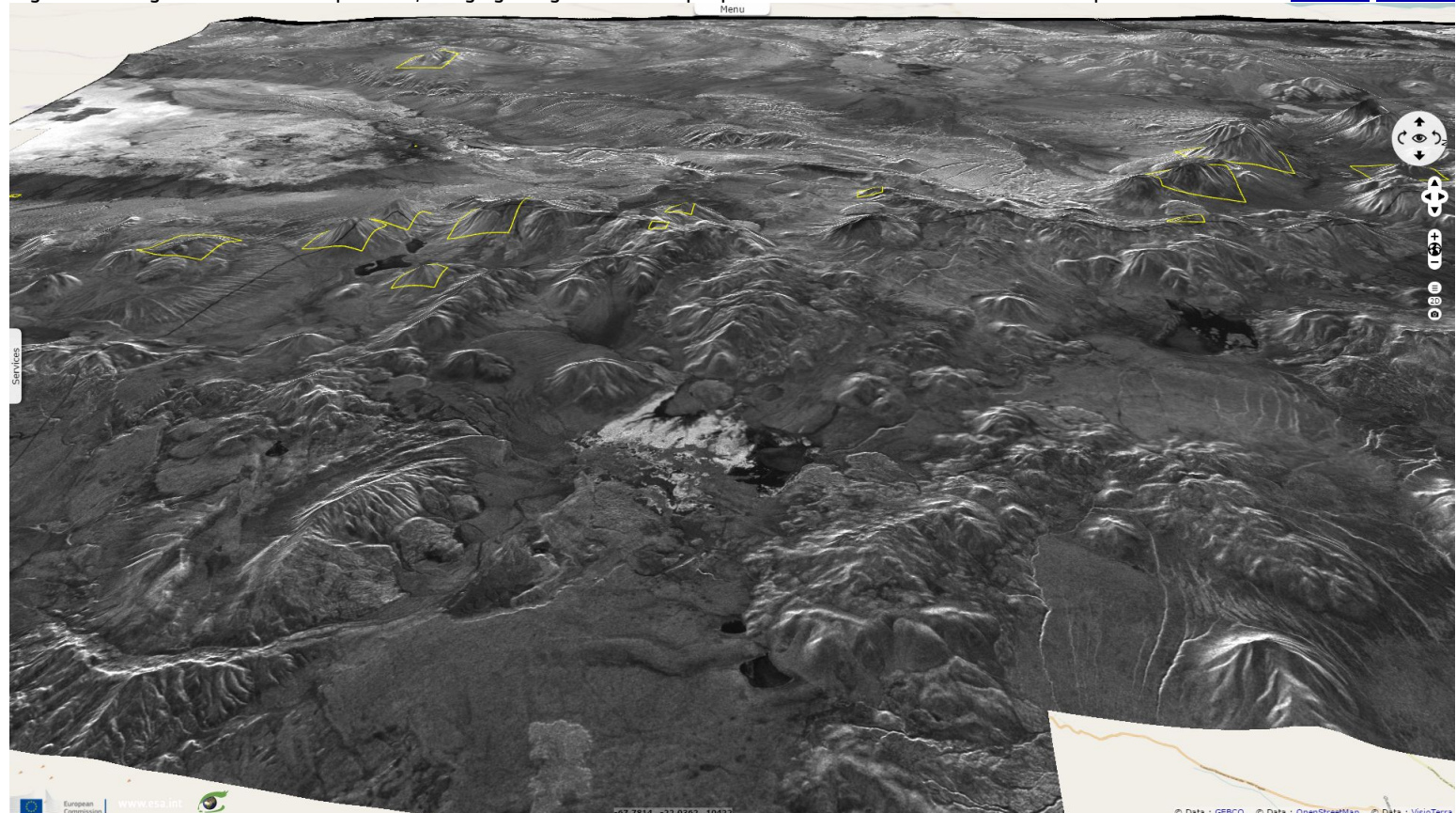


Fig. 8 - S1 magnifies the relief impression, bringing to light how Inca people chose to built sanctuaries at the top of volcanoes.

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















Despite extreme conditions, these mineral resources drove humans to live in these remote areas and contributed to the wealth of the Inca empire. These dramatic landscape also fueled spirituality of the Inca people who built sanctuaries on top of numerous volcanoes of the Cordillera Occidental, some of which exceed 6000m altitude. J. Thomas Besom, « Inka Human Sacrifice and Mountain Worship: Strategies for Empire Unification », p. 11-12, UNM Press. ISBN 978-0-8263-5308-5., 15 April 2013.



Fig. 9 - Picture of the Laguna Blanca and the Licancabur, on top of which lies an Inca sanctuary, by Jerome Dagostino.



*The views expressed herein can in no way be taken to reflect the official opinion of the European Space Agency or the European Union.*

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