

Change detection in Gabon forest

Sentinel-1 CSAR IW acquired on 12 and 24 March, 05 and 17 April 2019
Sentinel-1 CSAR IW acquired on 07 and 19 November, 01 and 13 December 2019
Sentinel-2 MSI acquired on 17 April 2019 at 09:30:39 UTC
Sentinel-2 MSI acquired on 08 December 2019 at 09:34:01 UTC

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Keyword(s): Deforestation, Change, Gabon



[2D Layerstack](#)

Fig. 1 - View of the Haut-Abanga forest concession allocated to Rougier Gabon.

[2D view](#)

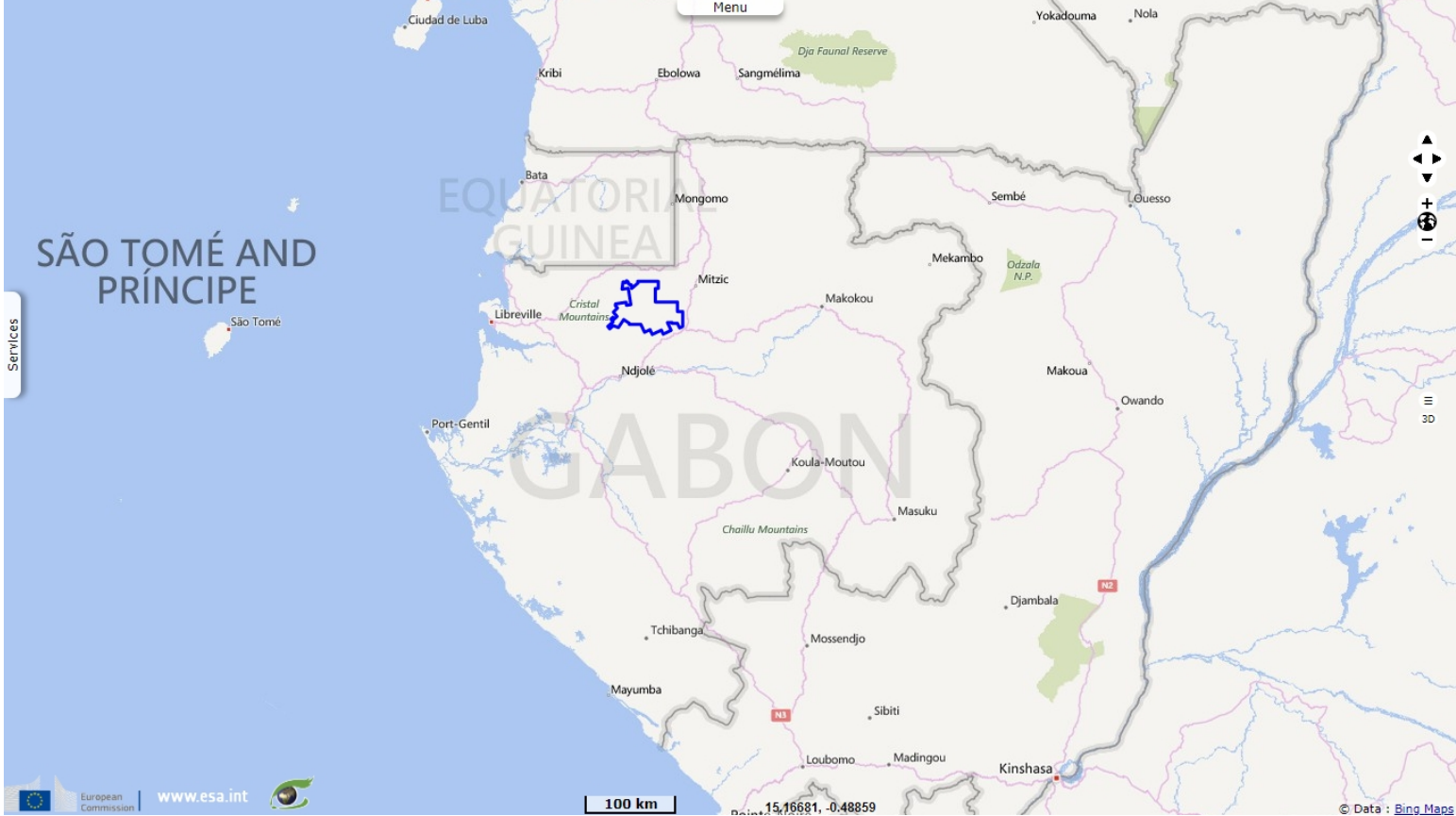


Fig. 2 - Sentinel-1 and Sentinel-2 images used for the study.

[2D view](#)

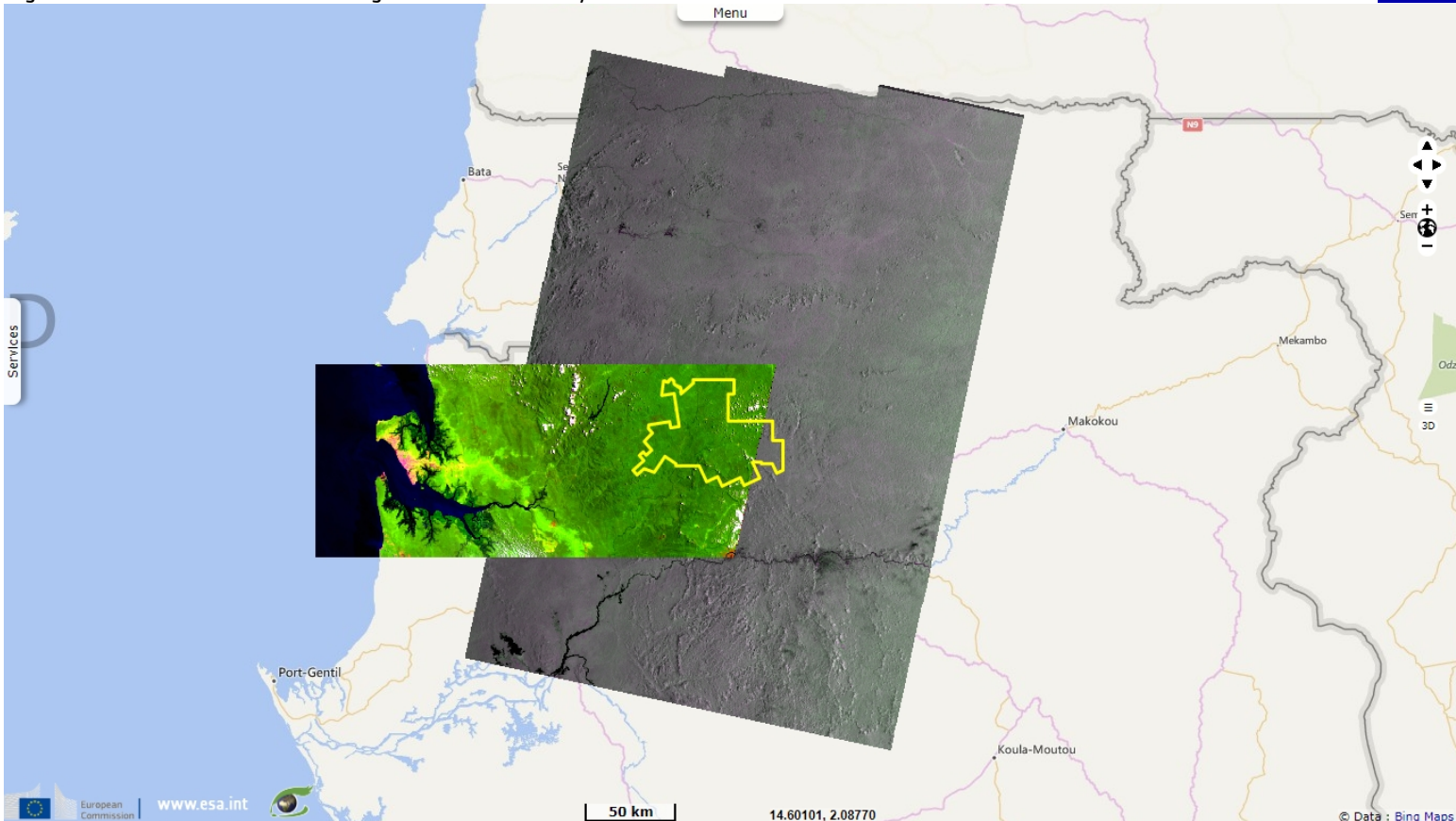


Fig. 3 - S2B- MSI (17.04.2019) - 11,8,2 - North-west outside the concession - View before the extension of deforestation.

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

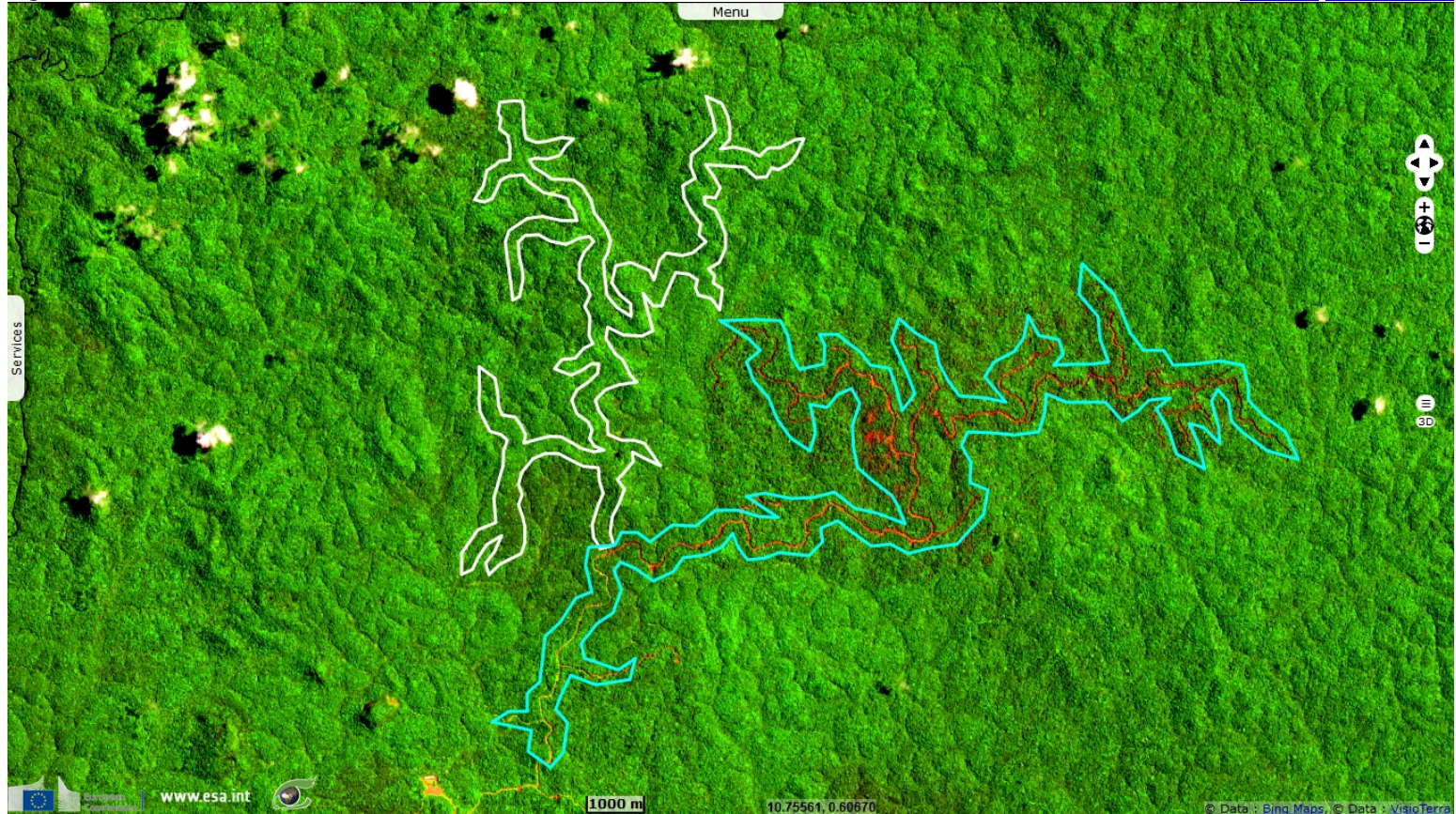
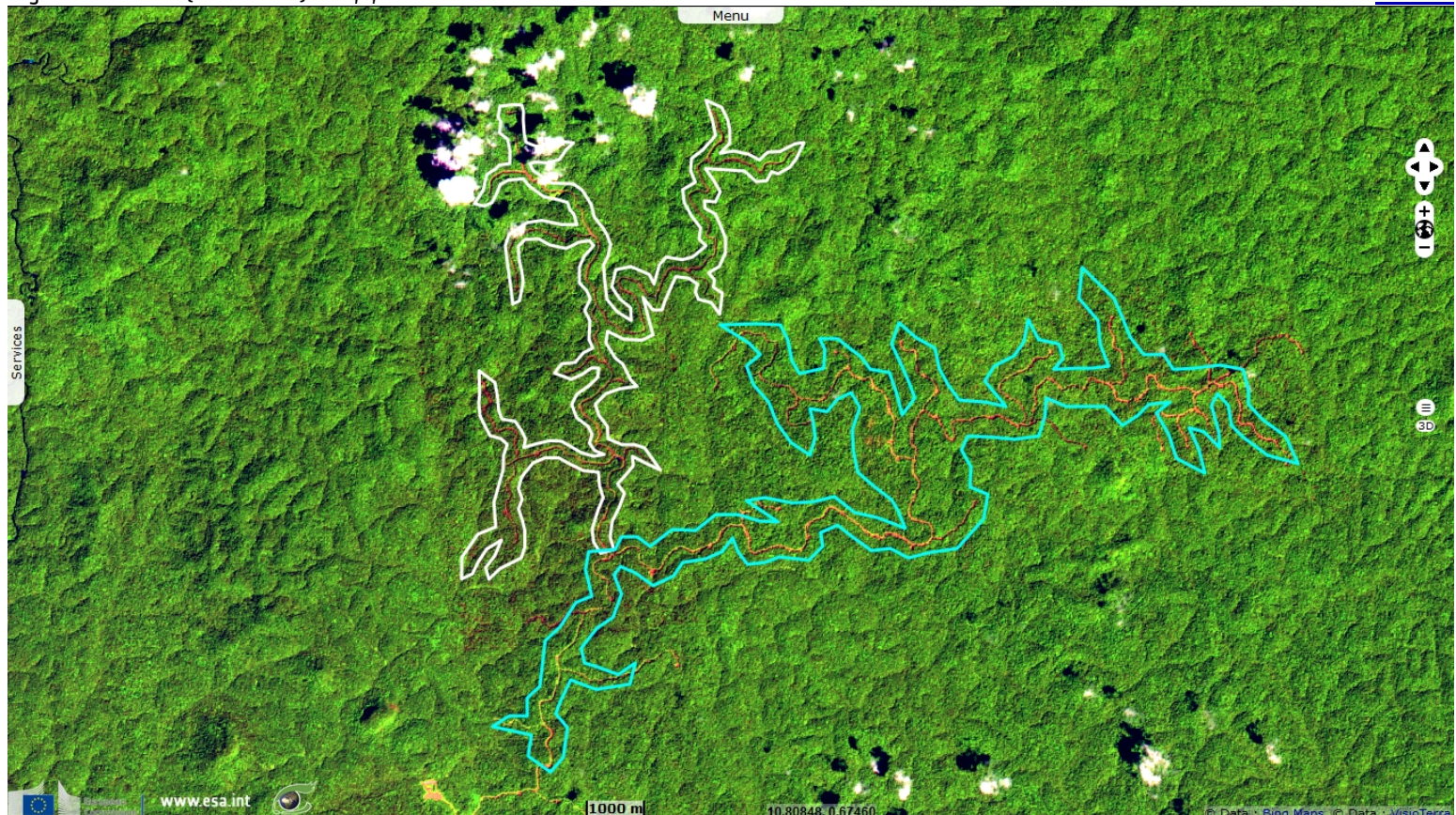


Fig. 4 - S2A- MSI (08.12.2019) - 11,8,2 - North-west outside the concession - View after the extension of deforestation.

[2D view](#)



Sentinel-2 images acquired in the optical domain are subject to cloud cover. The image acquired on April 17 and December 8, 2019 are exceptional and have very few clouds covering the coast of Libreville to the Haut-Abanga concession. Figures 3, 4, 5, 6, 7 and 8 focus on a network of recently opened or re-opened trails in the west of the concession in the "Crystal Mountain". Figures 3 and 4 show the colored composition 11,8,3 affecting the medium-infrared (11), near-infrared (8) and blue (2) bands on the RGB planes (Red, Green, Blue). The infrared bands are less sensitive to light clouds and make it possible to distinguish bare soils that appear orange in color. Figures 5 and 6 show the Sentinel-2 images in the optical domain. The colored compositions 4,3,2 in fig. 5 use the red (4), green (3) and blue (2) bands assigned to the RGB planes (natural colors). We can clearly see the light colored tracks on a dark green background of the primary forest. To map the difference between two dates, we calculate the difference of the digital counts in each of the spectral bands on the fly. The colored composition thus shows the loss or the gain for each of the 3 bands of the colored composition. Fig. 7 illustrates the difference calculated between the Sentinel-2 acquisitions in the optical domain for the 4,3,2 bands in natural colors. The figure shows the recent light orange and older runway openings (i.e. before April 17, 2019) in dark color. Fig. 8 shows the loss or gain of the radar backscatter coefficient at $-3 / + 3$ dB for the VV co-polarization. The track gaps appear in blue and correspond to a decrease in the backscatter coefficient.

Fig. 5 - S2- MSI (17.04.2019) - 4,3,2 - View before the deforestation.

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

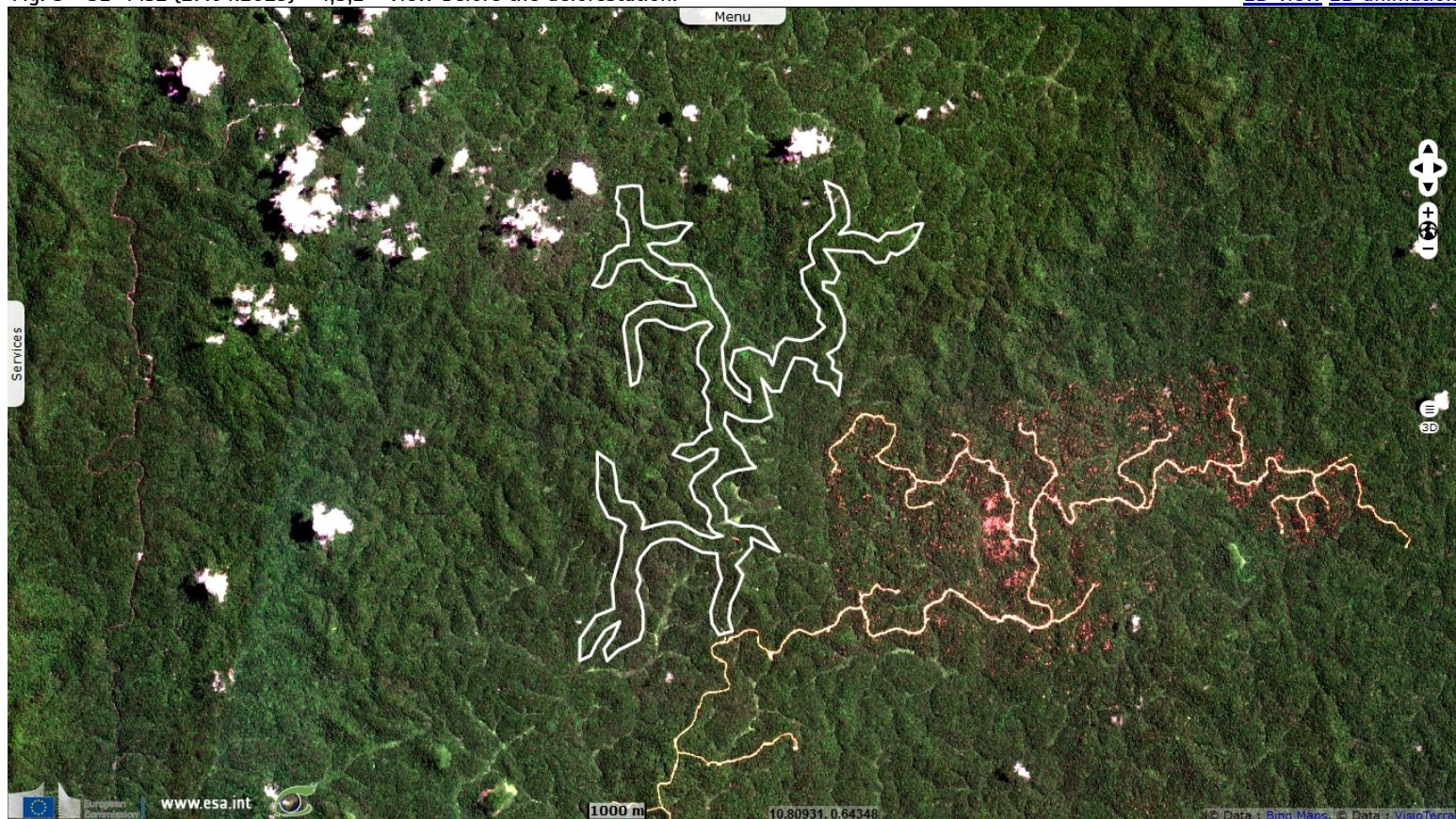
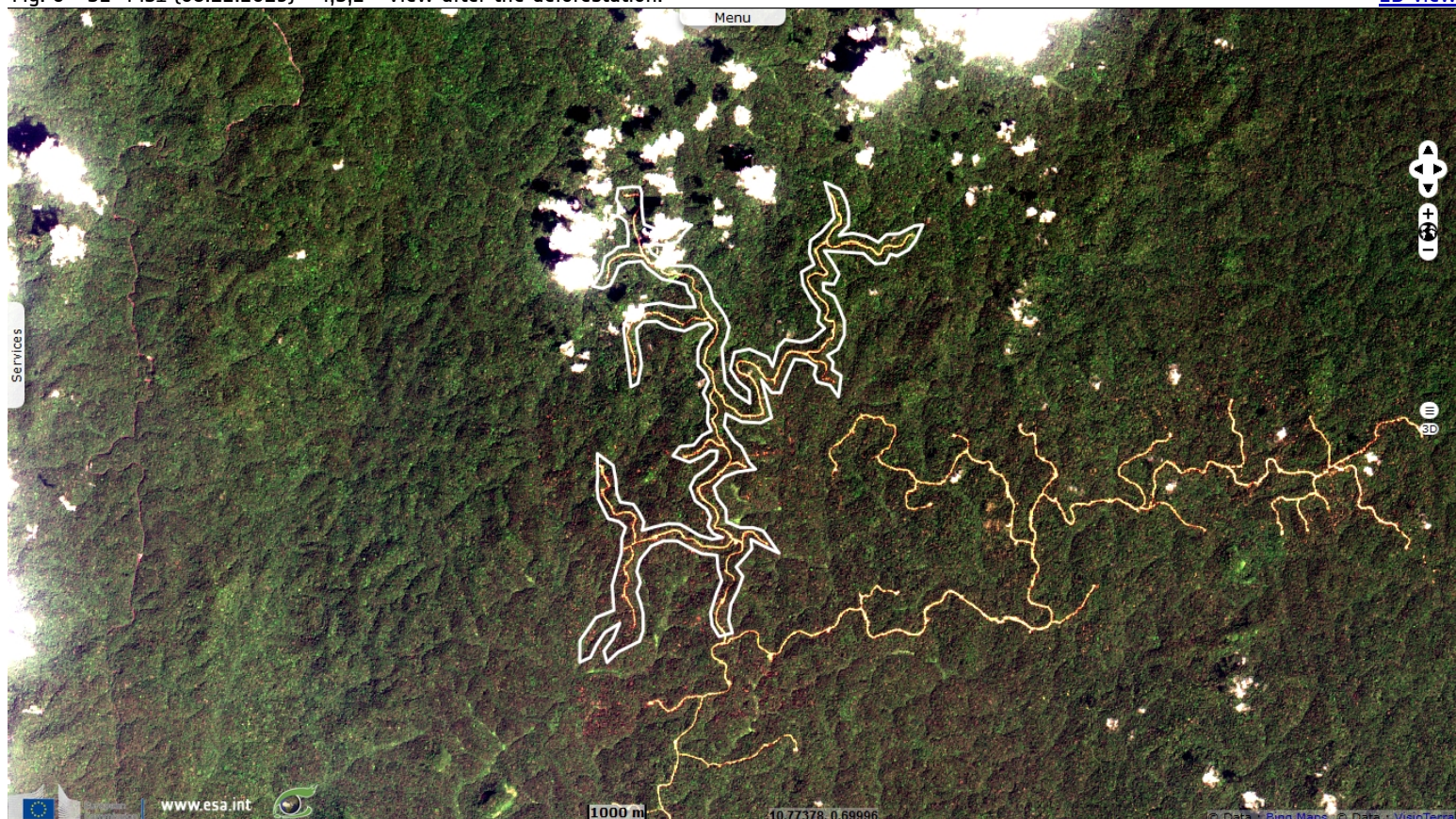


Fig. 6 - S2- MSI (08.12.2019) - 4,3,2 - View after the deforestation.

[2D view](#)



According to [Quartz Africa](#), "Gabon will become the latest African nation to receive funding to preserve its rainforests to mitigate the effects of climate change. As part of a 10-year deal announced on Sunday (Sept. 22), Norway will pay \$150 million to Gabon to battle deforestation and reduce greenhouse gas emissions. The deal is part of the Central African Forest Initiative (CAFI), which was launched by the United Nations in 2015 to link European donors with countries in Africa. The partnership sets a carbon floor price of \$10 per certified ton and will be paid on the basis of verified results from 2016 through to 2025".

Gabon was also one of the guest star of the UN Climate Change Conference COP 25 (2 – 13 December 2019) held in Spain (Source: [LaLibreville](#)).

Fig.7 - Difference between the Sentinel-2 images acquired on December 8 2019 and April 17 2019 - Source: [FLEGTWatch](#).

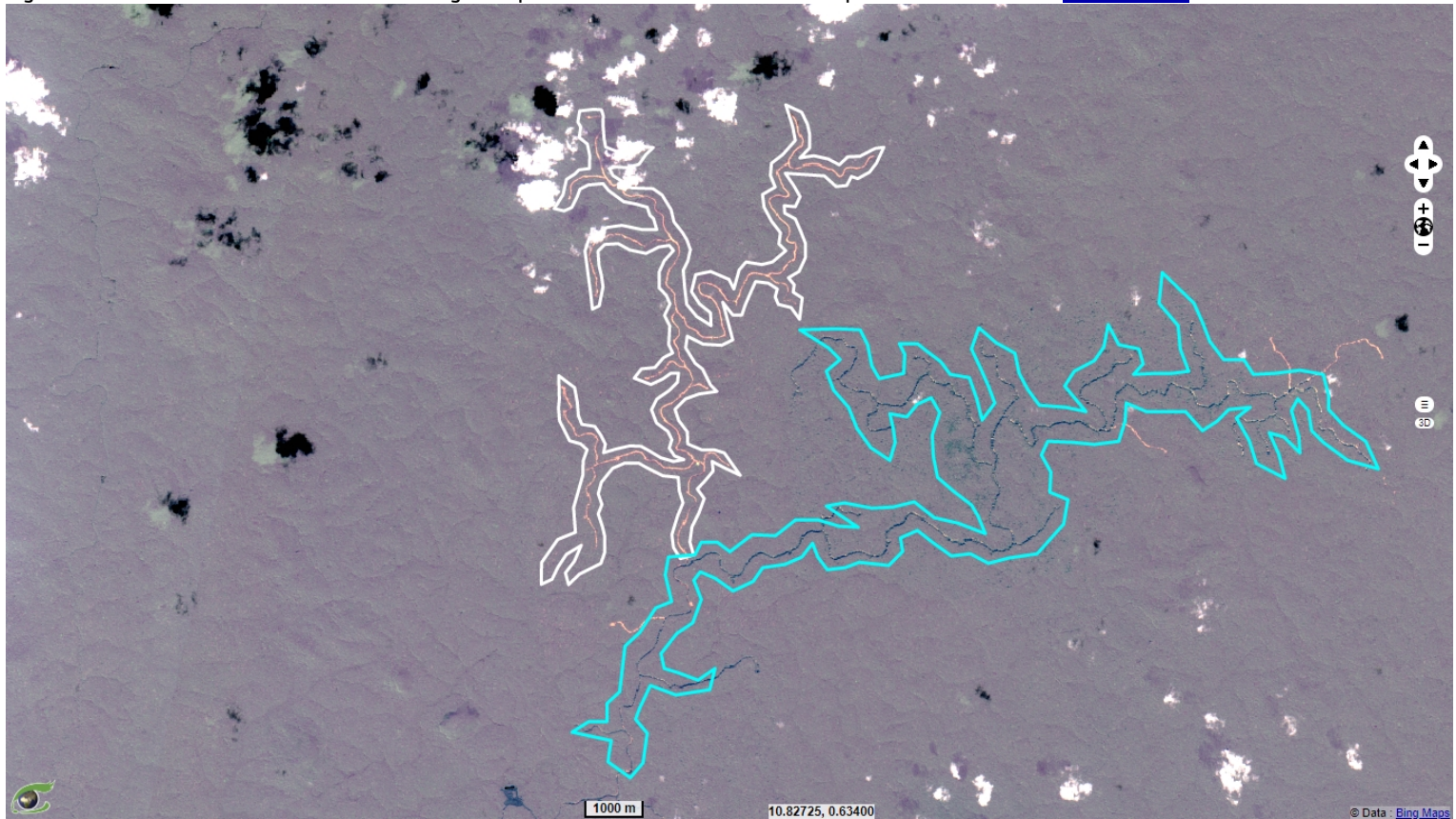
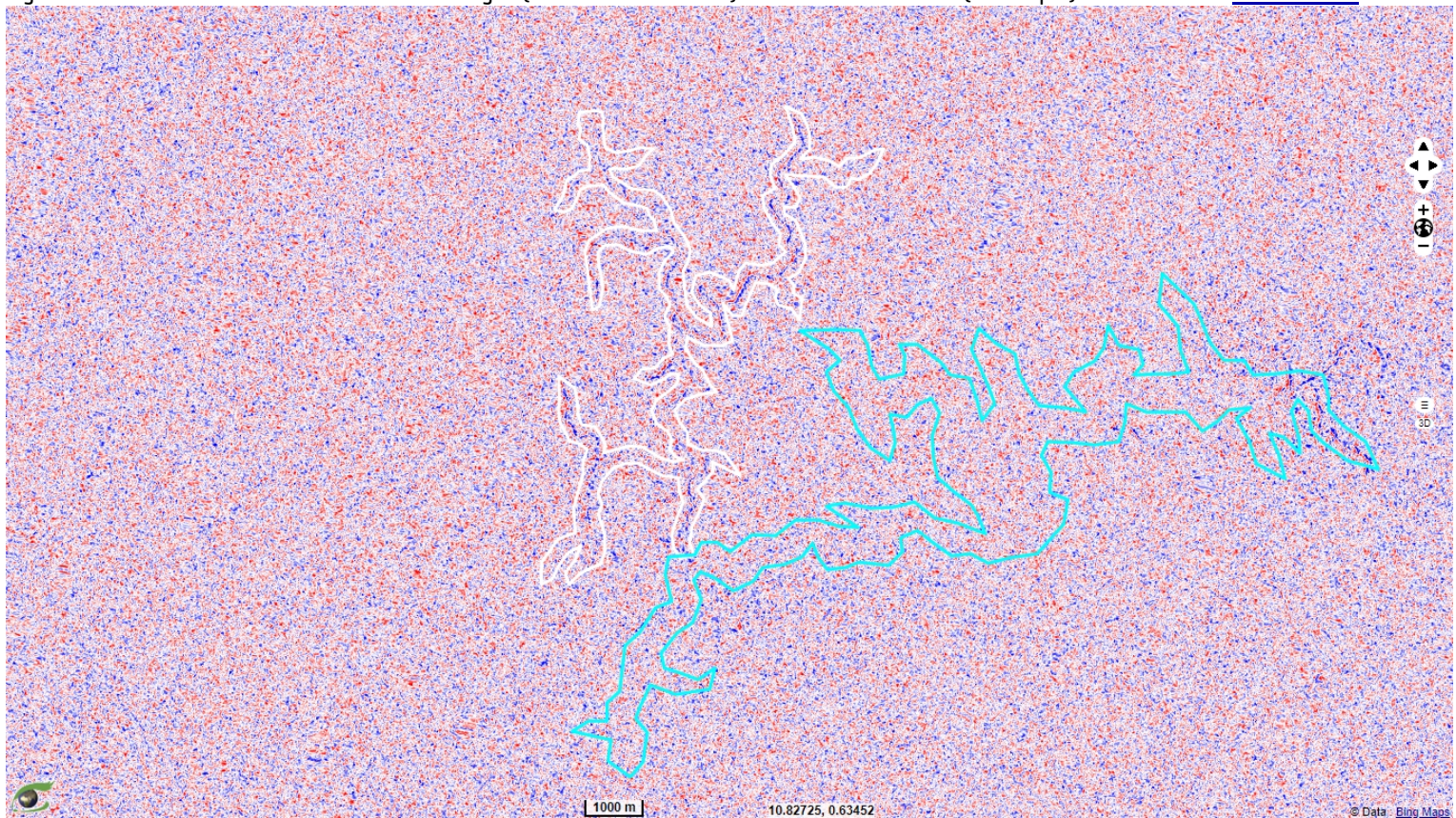


Fig.8 - Difference between the mean of 4 S1 images (November-December) and the mean of 4 S1 (Mars-April) 2019 - Source: [FLEGTWatch](#).



*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 2019, processed by VisioTerra.*

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