

Oil reserves threatens Lake Chad World Heritage future

Sentinel-3 SLSTR RBT acquired on 19 December 2016 at 09:03:17 UTC

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Sentinel-3 SLSTR RBT acquired on 25 March 2017 at 09:14:33 UTC

Sentinel-2 MSI acquired on 26 July 2017 at 09:30:39 UTC

Sentinel-1 CSAR IW acquired on 12 November 2017 from 17:13:54 to 17:14:19 UTC

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[3D Layerstack](#)

Fig. 1 - S3 SLSTR (18.11.2016) - Lake Chad lies between Chad, Niger, Nigeria and Cameroon.

[2D view](#)

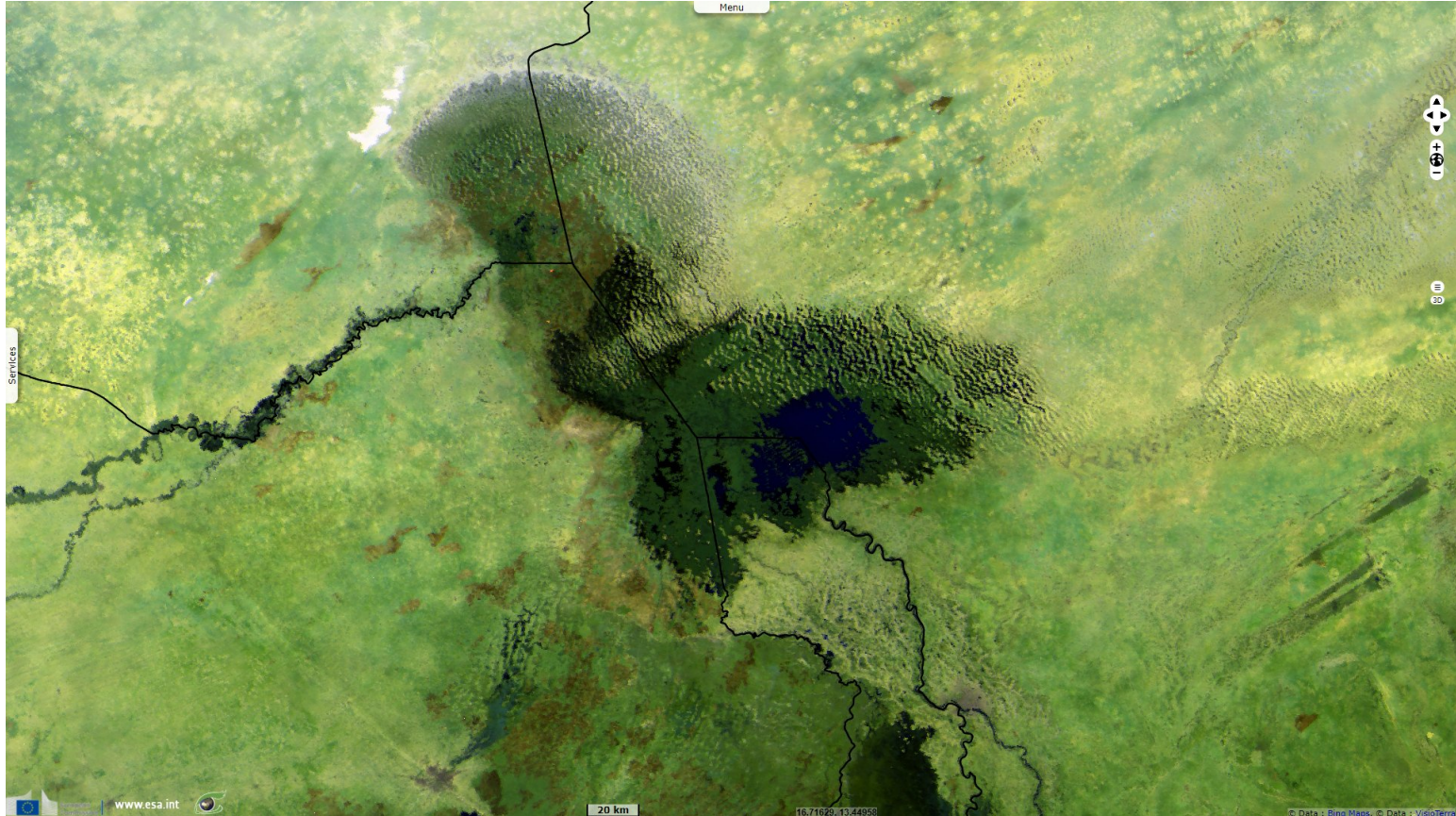
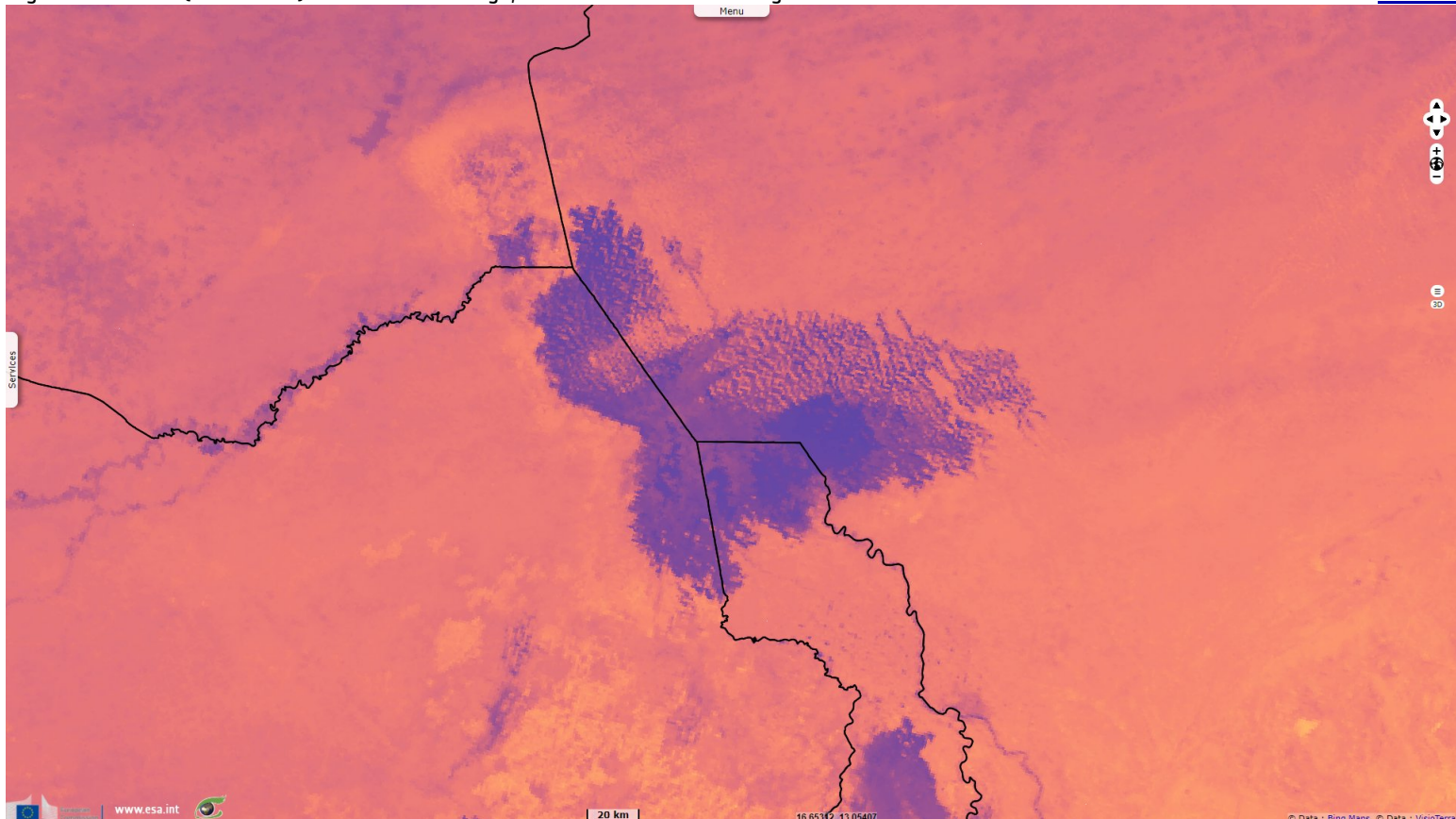


Fig. 2 - S3 SLSTR (19.12.2016) - As seasons change, so does the water and vegetation cover.

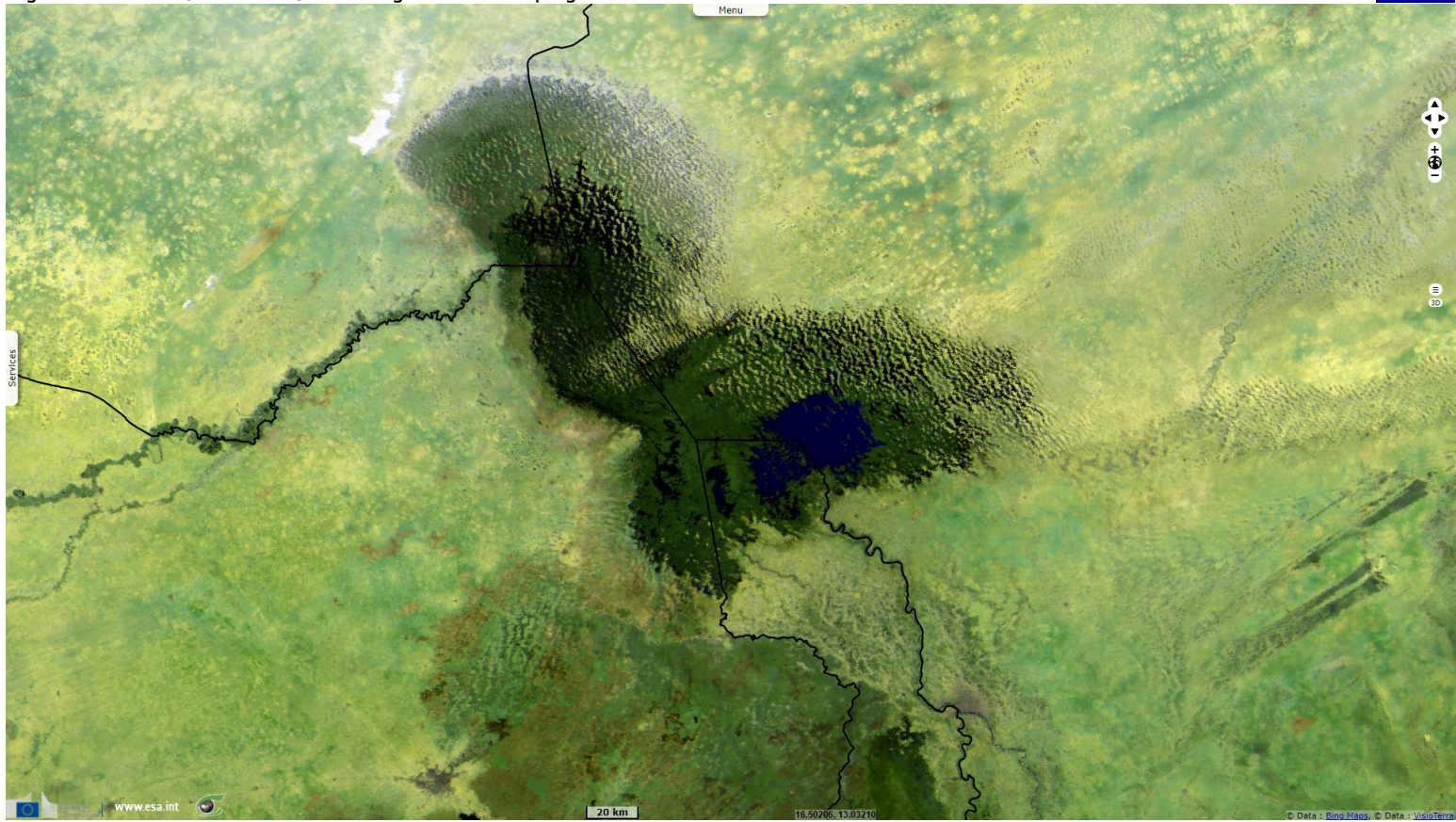
[2D view](#)



Nigeria, Cameroon, Niger and Chad have filed for the recognition of Lake Chad as a UNESCO World Heritage site. It is currently on the tentative list where it is [described](#) as follows: *"The Lake Chad is a vast area of fresh water located in the middle of sand dunes which covers territories in 4 countries: Nigeria, Cameroon, Niger and Chad. Paleography informs us that the Lake Chad has been constantly evolving with respect to the environmental conditions. Its geology has undergone variations which are the object of numerous controversies. The current area is around 17,000 km² (measured during its high point at the end of the rainy season). It is an endorheic lake fed mainly by the Logone Chari and Komadougou watercourses."*

Fig. 3 - S3 SLSTR (30.01.2017) - The vegetation cover progresses toward the north.

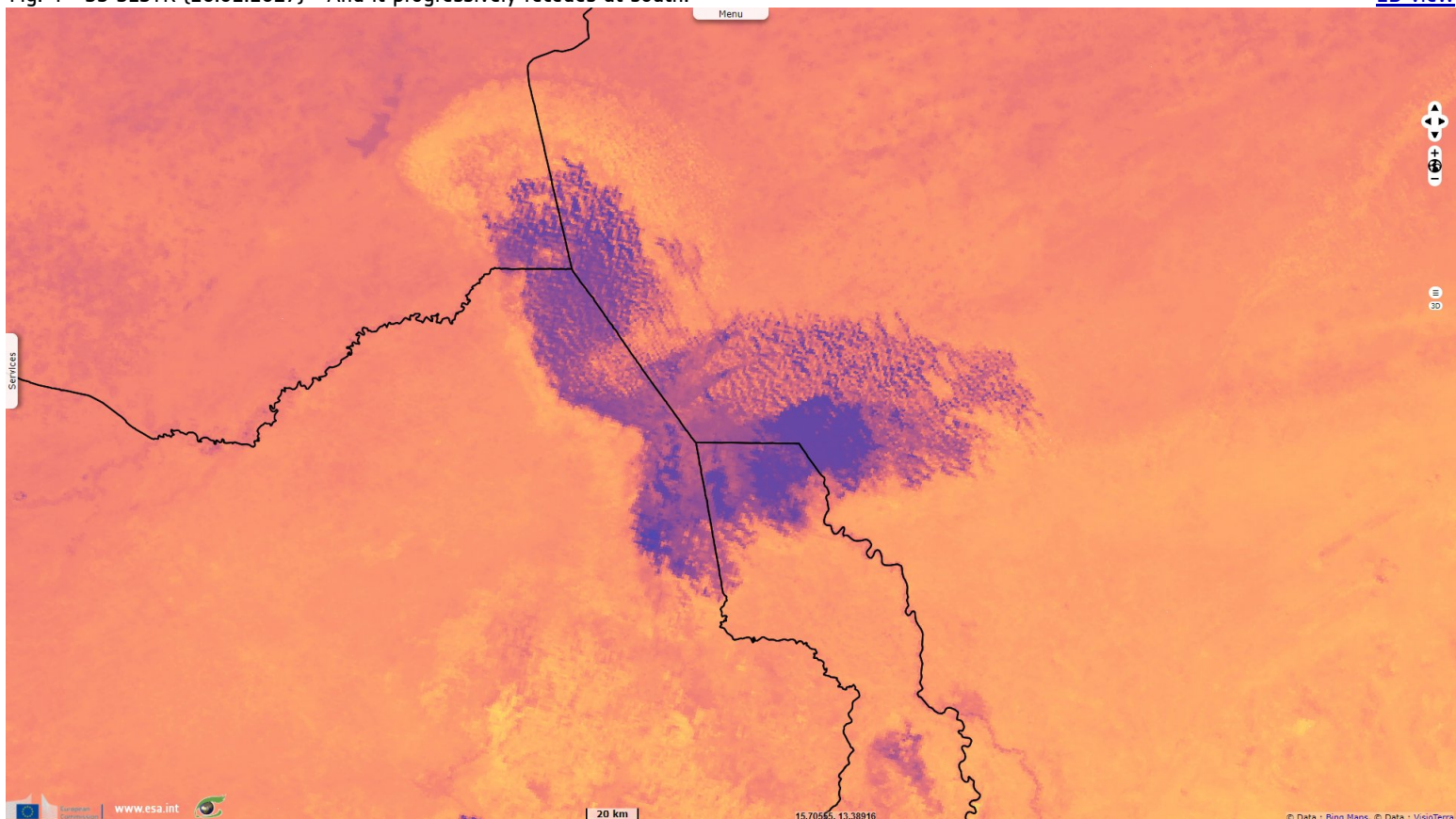
[2D view](#)



"This ecosystem contains a great variety of wet zones which include open water, polders, temporary or permanent ponds, some of them being rich in natron. Around the lake, sand deserts and water meet in a complex network of meanders which are sometimes cultivated. Receding waters in dry season expose wide floodplains on the banks of the lake. They shelter water plants such as papyrus and spirulina but also numerous animal species such as the migratory birds, which use these plains as resting areas."

Fig. 4 - S3 SLSTR (26.02.2017) - And it progressively recedes at south.

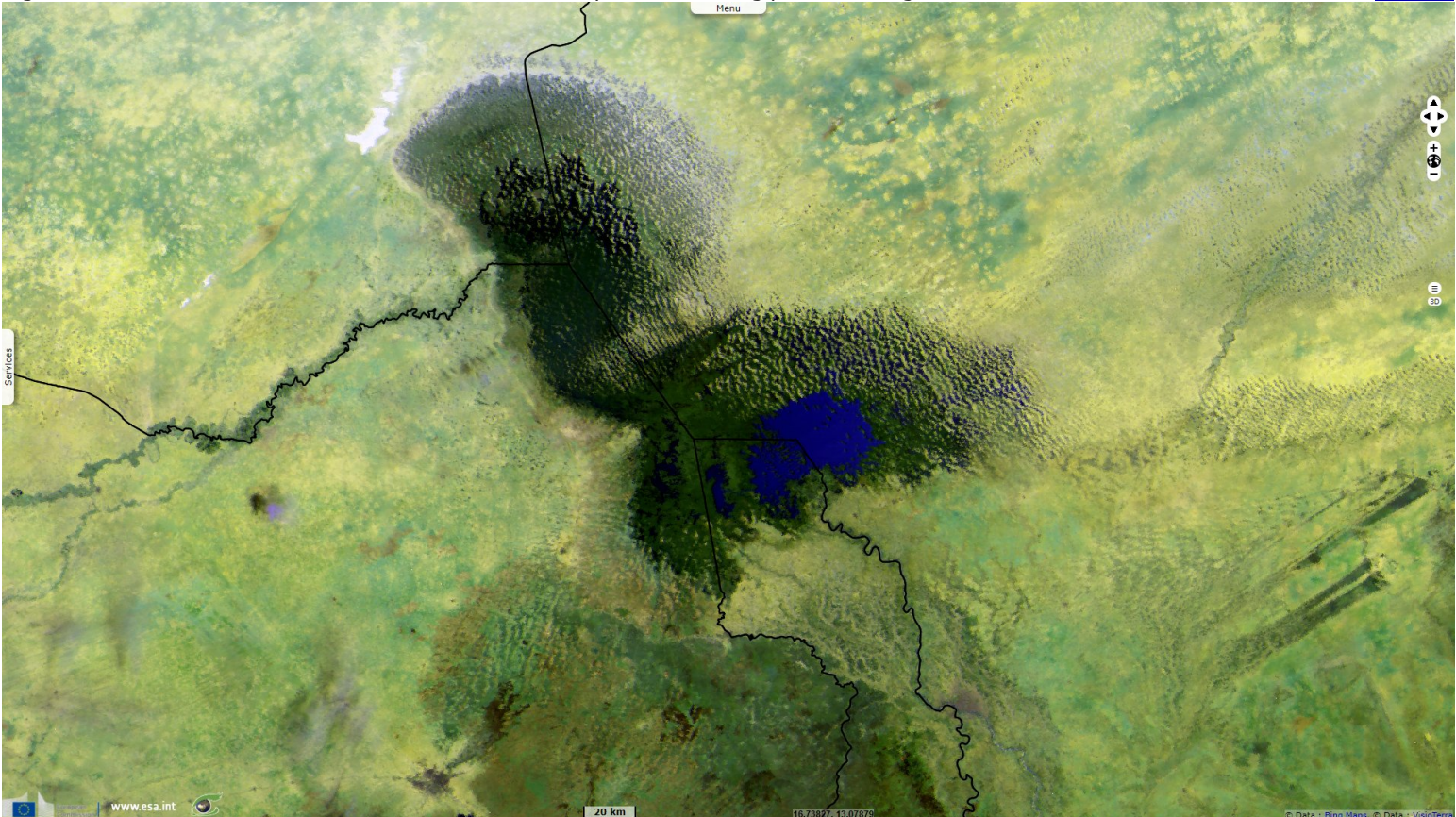
[2D view](#)



"A peculiar feature of the Lake Chad is the profusion of hundreds of islands and small islands, of which numerous are inhabited by several communities such as the Kotoko, Mouloui, Barma, Boulalan, Babalia, Kanembou, Haoussa, who live from its resources and rely on the resilience of the lake to perpetuate their ways of life. This cohabitation between Man and nature which has been perpetuated for centuries gives a true cultural landscape dimension to this vast lake."

Fig. 5 - S3 SLSTR (25.03.2017) - Then fires come with the dry season, burning part of the vegetation.

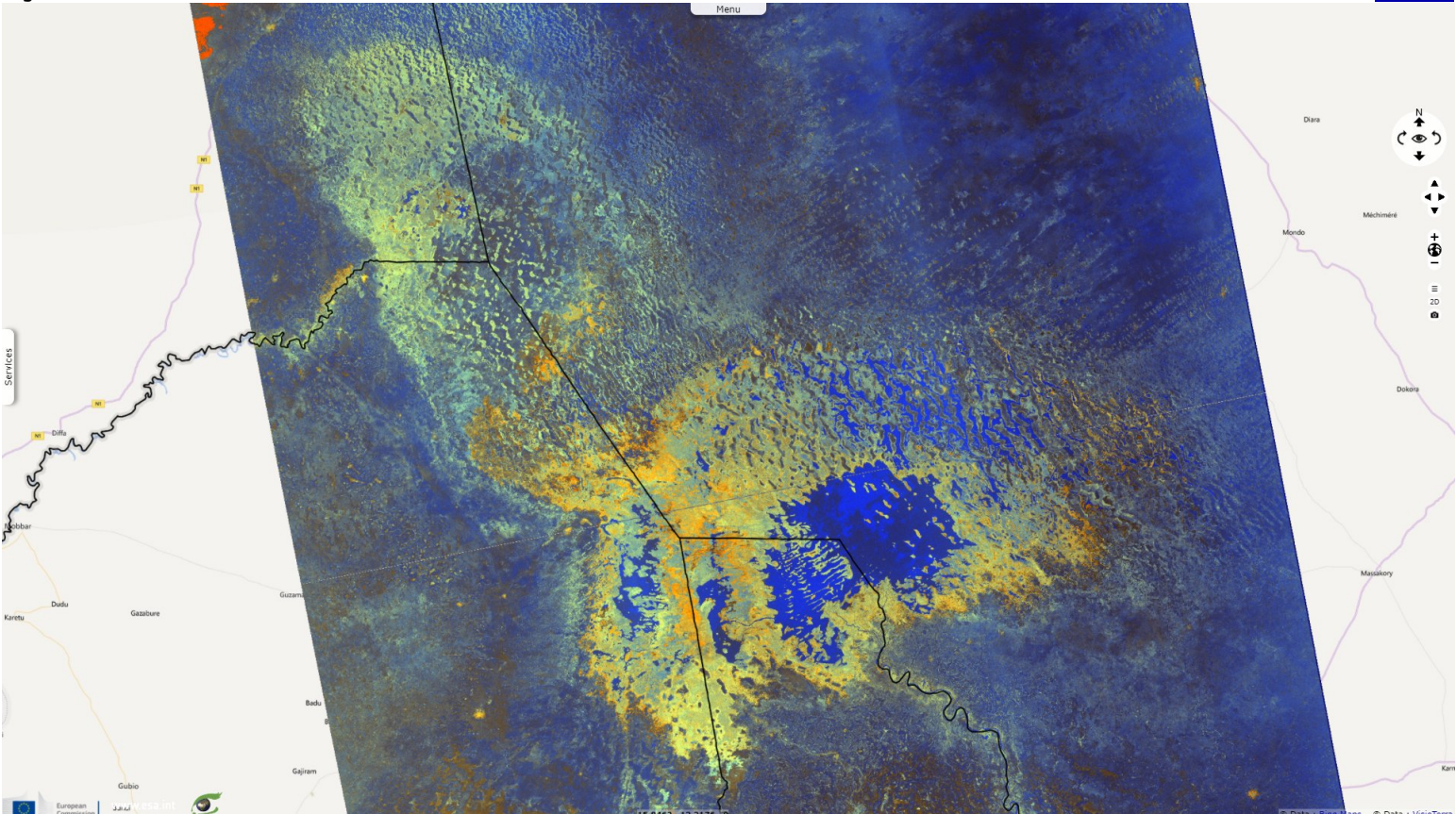
[2D view](#)



"The earliest human presence around the lake can be traced to the Paleolithic era. The most ancient civilization known is the Sao Civilization, composed of people groups who certainly came from the Nile valley around the 5th century to populate the lake's surroundings. The Sao people's history is inseparable from the lake. They left numerous ethnographic and archaeological remains which teach us that they lived mainly from fishing, hunting and farming. Their rich pottery and everyday objects also show that they were great artists. The fishing, hunting and farming practices of the Sao people constitute the heritage of their descendants today."

Fig. 6 - S1 (12.11.2017) - Radar view in November.

[3D view](#)

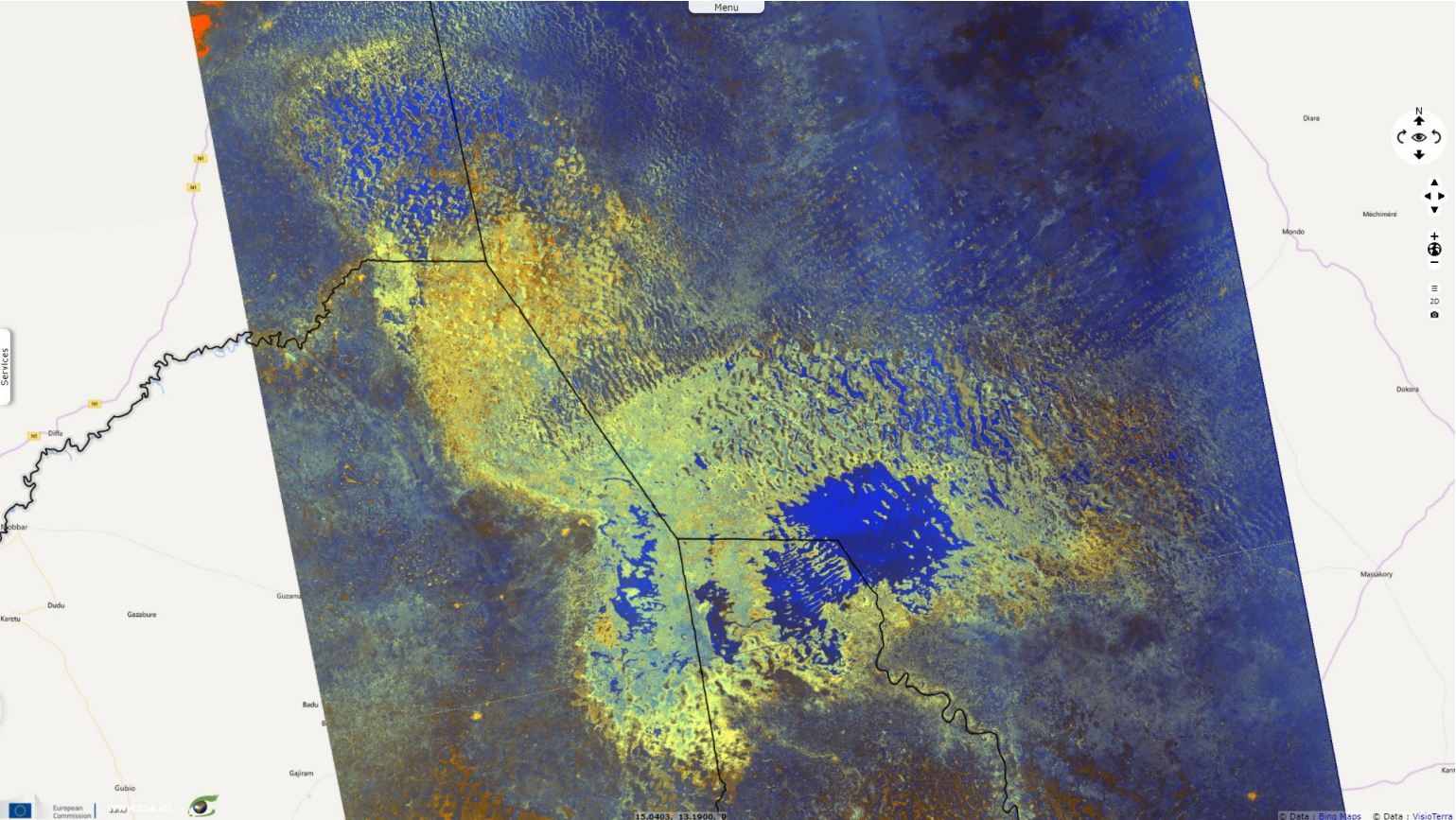


According to the Ramsar sheet of the side, it remains the fourth largest lake in Africa after Lakes Victoria, Tanganyika and Nyassa, and apparently the third largest endorheic lake in the world (after the Aral Sea and the Caspian Sea). The shallow lake is mainly fed by rivers from different

countries and to a lesser extent (10%) by rainfall.

Fig. 7 - S1 (09.04.2015) - The lake is a pool of life for fauna in this arid region.

[3D view](#)

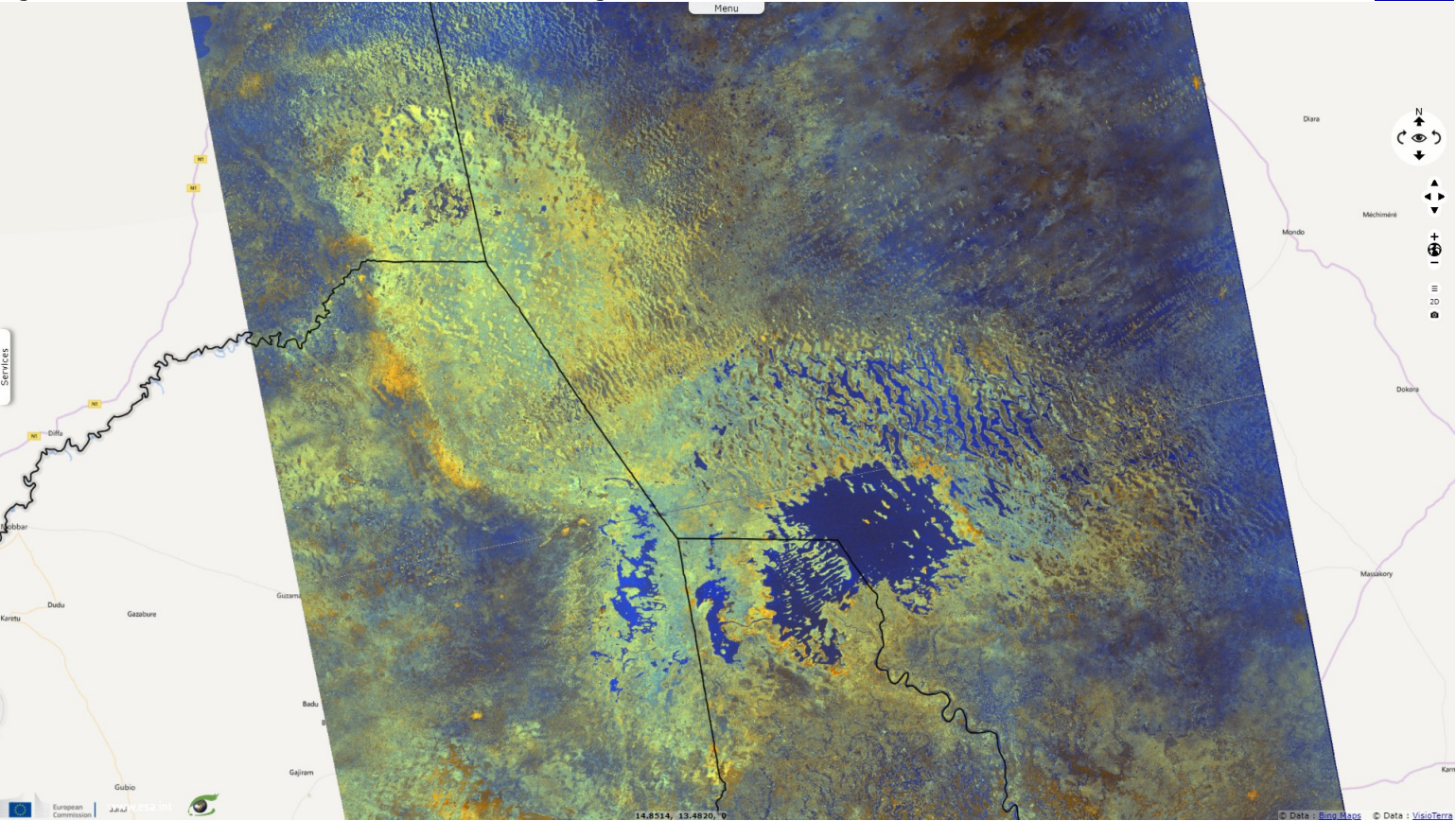


Lake Chad is known to frequently support over 200 000 birds and various other fauna and flora of the region such as the endangered species like the African Clawless Otter, Red Fronted Gazelle and the African Bush Elephant amongst others. Of note is the use of the site as a refuge by hippopotamuses and the Nile crocodile during the dry season.

The site supports internationally important numbers of waterbirds and is essential for some 150 fish species, and is the only place in the country that supports the endemic Kouri Ox, which is threatened by extinction through interbreeding. The lake also regulates the variability of annual water supply, recharges groundwater, and helps to control flooding. Desiccation and sanding over are seen as the main threats.

Fig. 8 - S1 (27.07.2017) - Linear structures are visible, forming islands and bands in the bed of the historical lake.

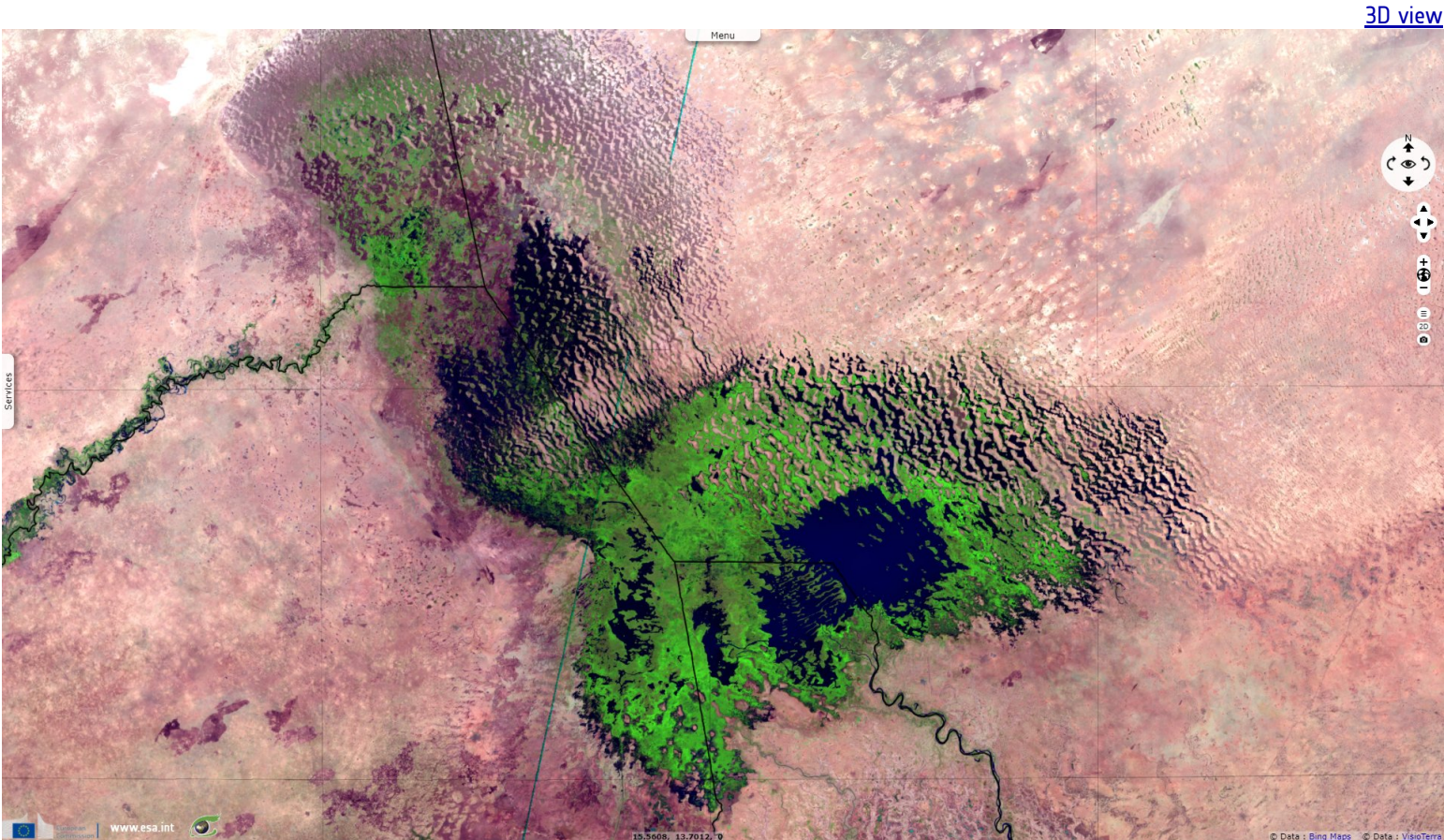
[3D view](#)



However, the Guardian [reveals](#) this promotion as a UNESCO World Heritage is at threat: "in a letter leaked to the Guardian, Chad's tourism and culture minister wrote to Unesco, the body which awards the world heritage designation, asking to 'postpone the process of registering Lake Chad on the world heritage list'. The letter says the government 'has signed production-sharing agreements with certain oil companies whose allocated

blocks affect the area of the nominated property'. The letter asks Unesco to 'postpone the process' in order to 'allow [us] to redefine and redesign the map to avoid any interference in the future'."

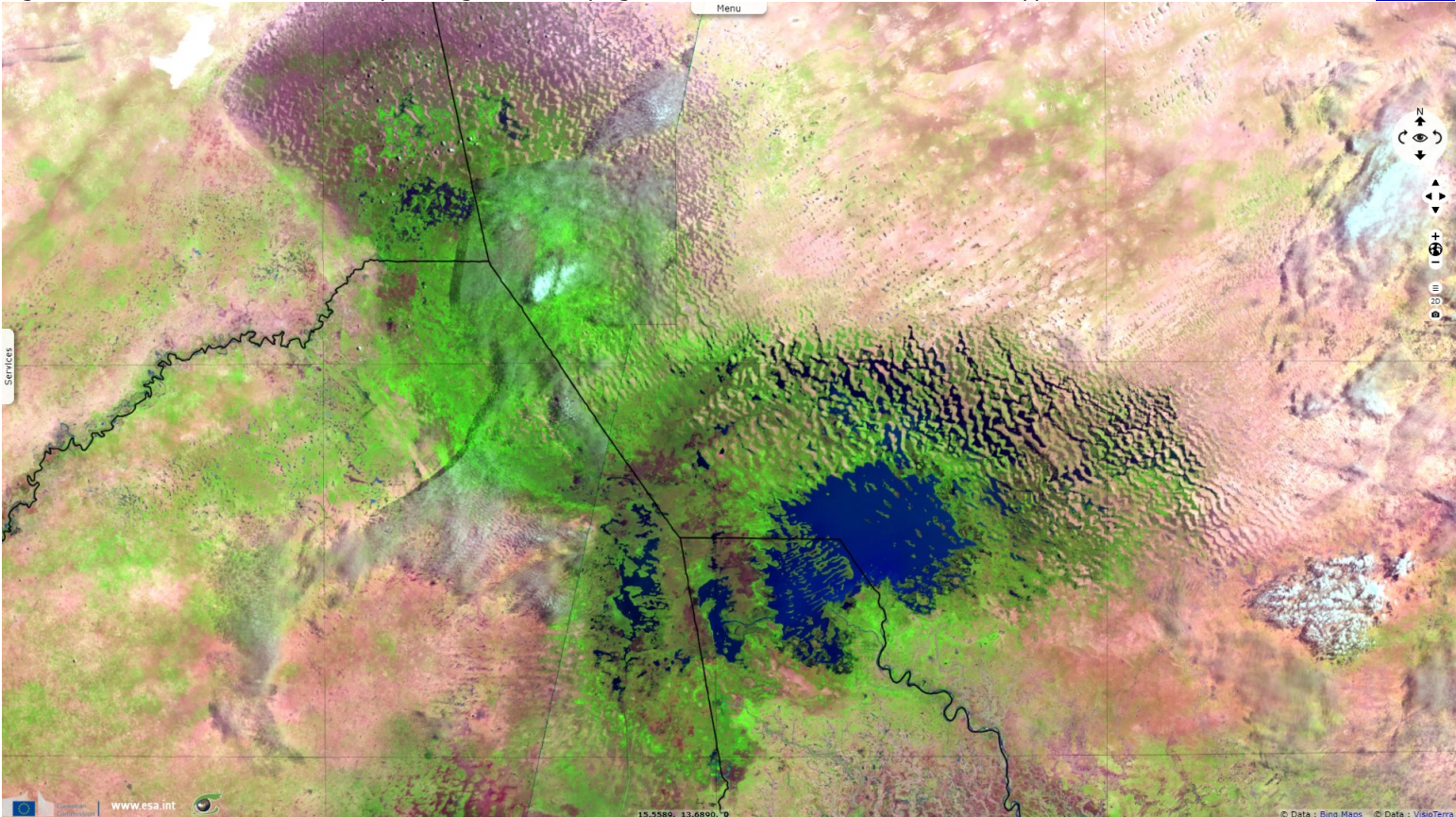
Fig. 9 - S2 (03 & 10.12.2016) - In December, incoming water has not been absorbed by vegetation yet, burnt area of the previous dry season remain visible.



"The request follows a multiyear process involving the governments of Cameroon, Chad, Niger and Nigeria to jointly nominate the Lake Chad cultural landscape to the Unesco world heritage list. It has been nominated as both a natural and a cultural site. It comes as a blow to the other countries' delegations, who had not been informed of Chad's oil ambitions in the Lake Chad basin.

'It is important to recall that the goal of the inscription of a site on the world heritage list is to ensure conservation of its outstanding universal value for future generations,' a spokesperson for the Unesco world heritage site centre said. 'A suspension of the inscription process is not contemplated among the possibilities offered by the provisions of the world heritage nomination process'. If Chad decides to go ahead with oil exploitation, the process would have to be cancelled all together, Unesco said."

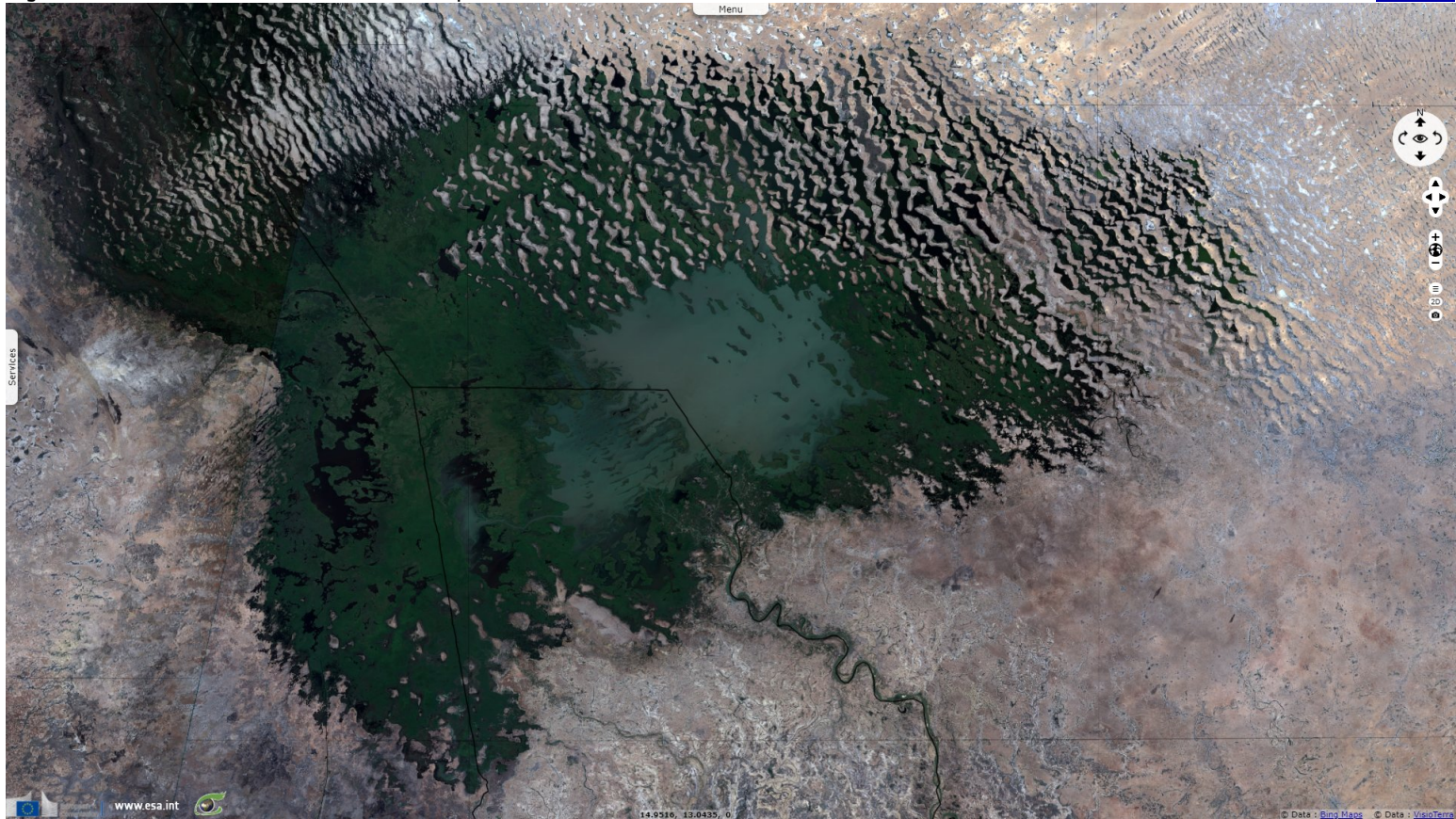
Fig. 10 - S2 (23 & 26.07.2017) - In July, the vegetation has progressed northward but new burnt areas appear.



"Lake Chad, is the setting for one of the world's most complex humanitarian crises, triggered by factors including the climate crisis, religious extremism, population displacement and military operations. Boko Haram has used the lake as a hideout. About 45 million people live off the lake's resources and call its 942 islands and its shores home. "It's a vibrant cultural environment, with unique diversity and political, social and economic systems that are not well known," says Sébastien Moriset from the International Centre for Earth Construction in Grenoble, who worked on putting together the nomination proposal documents."

Fig. 11 - S2 (03 & 10.12.2016) - Focus on the permanent lake at south.

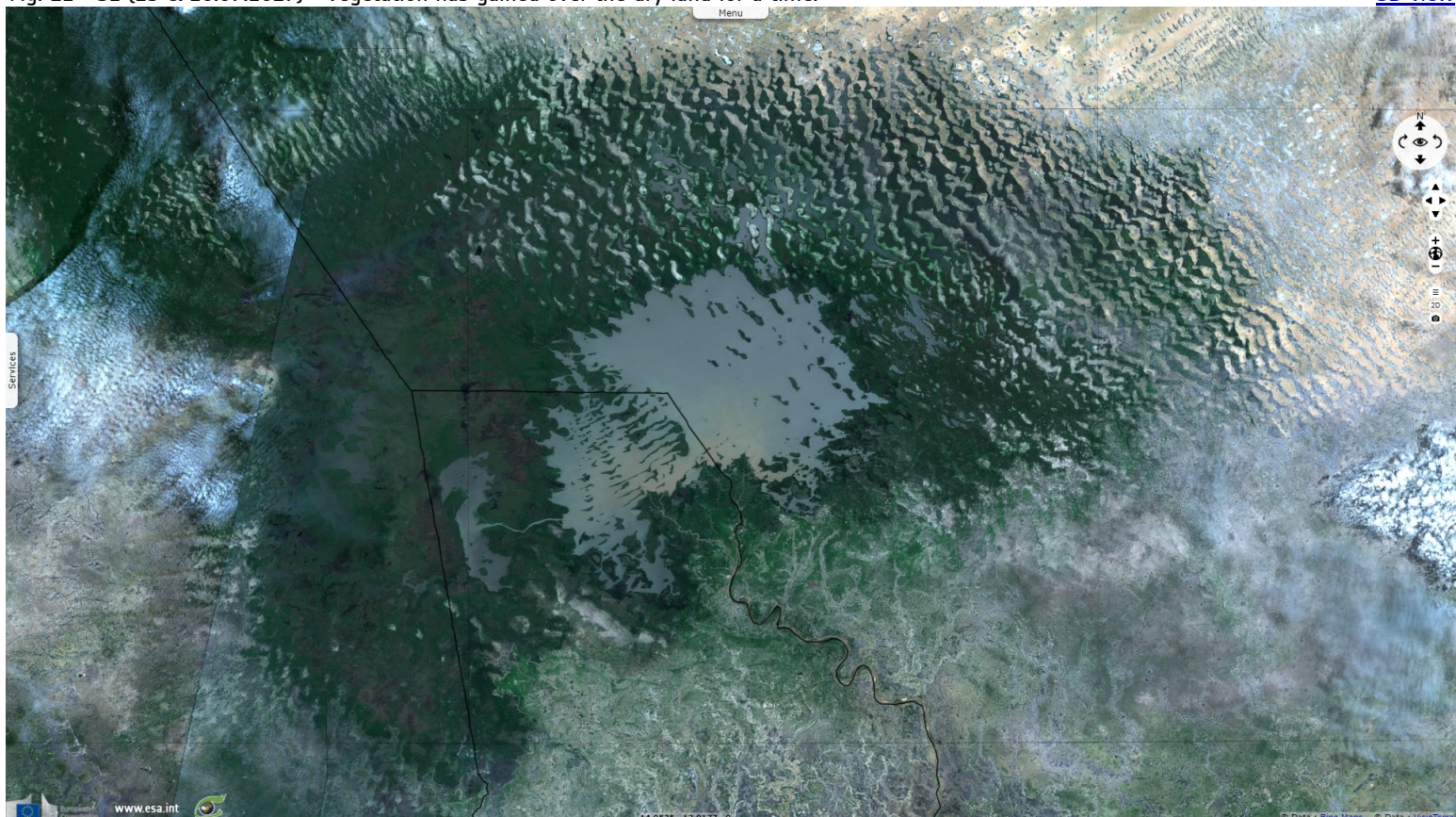
[3D view](#)



"Lake Chad has been physically under threat since the 1970s, when it began receding owing to a drought. Rivers feeding into the lake were drying up, and by the end of the 1990s, it had shrunk to roughly 2,000 sq km, a 95% decline from its peak. As the water retreated, famine came. But the application process has led to the confirmation that the size of the lake has in fact been increasing again in recent years, dispelling the myth of a disappearing lake."

Fig. 12 - S2 (23 & 26.07.2017) - Vegetation has gained over the dry land for a time.

[3D view](#)















"Before the threat of oil, local communities' only experience with mining had been digging for natron, a mineral akin to salt and used in camel feed. Experts say drilling for oil in such an unstable environment could lead to the lake becoming the new Niger Delta, where insurgents have attacked

pipelines and oil spills have polluted waters beyond repair."

"A world heritage listing is seen by many states as a prestigious international status symbol, and a label to attract international cooperation, as well as economic benefits such as tourism. Sites may also receive financial assistance for heritage conservation projects from international donors. 'We cannot give up on this process, we owe it to future generations,' said Hamissou Halilou Malam Garba, Niger's deputy director of wildlife, hunting, parks and reserves. "The lake is a shared resource, no country can do it alone. It would be profoundly unfair", [adds](#) The Guardian.

*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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