



[2D Layerstack](#)

Nested in Gregory Rift, Lake Turkana is the World's largest desert lake & witness of early Mankind, Kenya

Sentinel-3 OLCI FR acquired on 11 February 2023 at 07:21:53 UTC

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Sentinel-1 CSAR IW acquired on 12 February 2023 from 15:49:27 to 15:49:52 UTC

Sentinel-2 MSI acquired on 20 February 2023 at 07:49:41 UTC

Sentinel-1 CSAR IW acquired on 08 March 2023 from 15:49:26 to 15:49:51 UTC

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Fig. 1 - S3 OLCI (11 & 14.02.2023) - Lake Turkana is situated in the Great Rift Valley in N-W Kenya, bordering S-W Ethiopia & S-E South Sudan.

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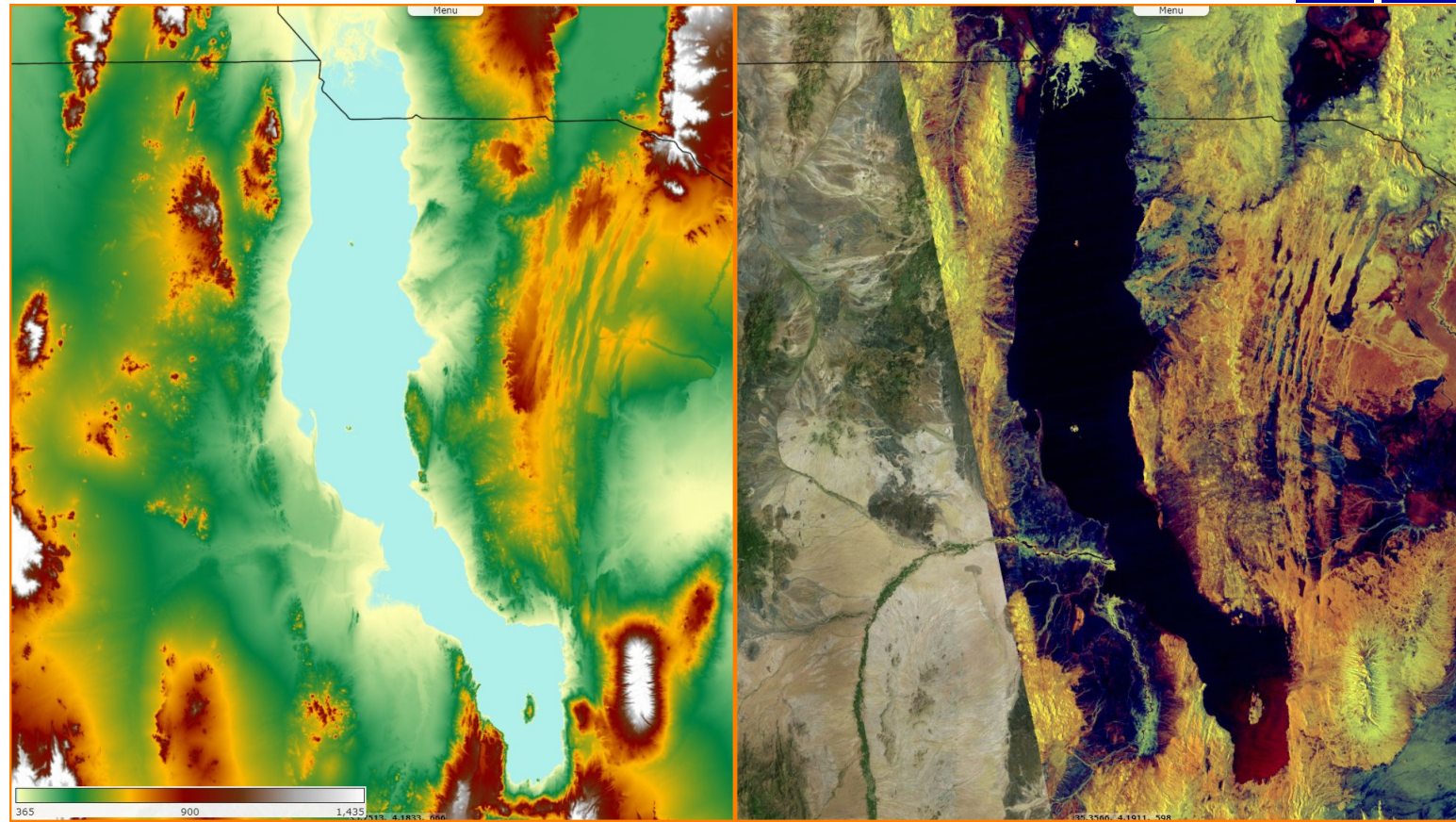
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"Lake Turkana is situated in the Great Rift Valley in the northwestern part of Kenya.", according to the [World Lakes Database](#). "Volcanic activity was frequent during the creation of the Rift Valley and lavas from the Quaternary and Tertiary ages cover much of the floor of the valley in Kenya. The lavas are mainly of alkaline type, which has important implications for the chemical composition of lakes in this area. In the Lake Turkana basin, Tertiary volcanic rocks are found in the south and along most of the western side of the lake, while a later lava flow (Pleistocene) forms a barrier in the southern end of the lake. Quaternary sediments dominate the western and northern side of the lake."

Fig. 2 - COP-DEM / S1 (19.01.2023->08.03.2023) - Lake Turkana occupies the beds of two grabens at north of the Gregory Rift valley in a barren region.

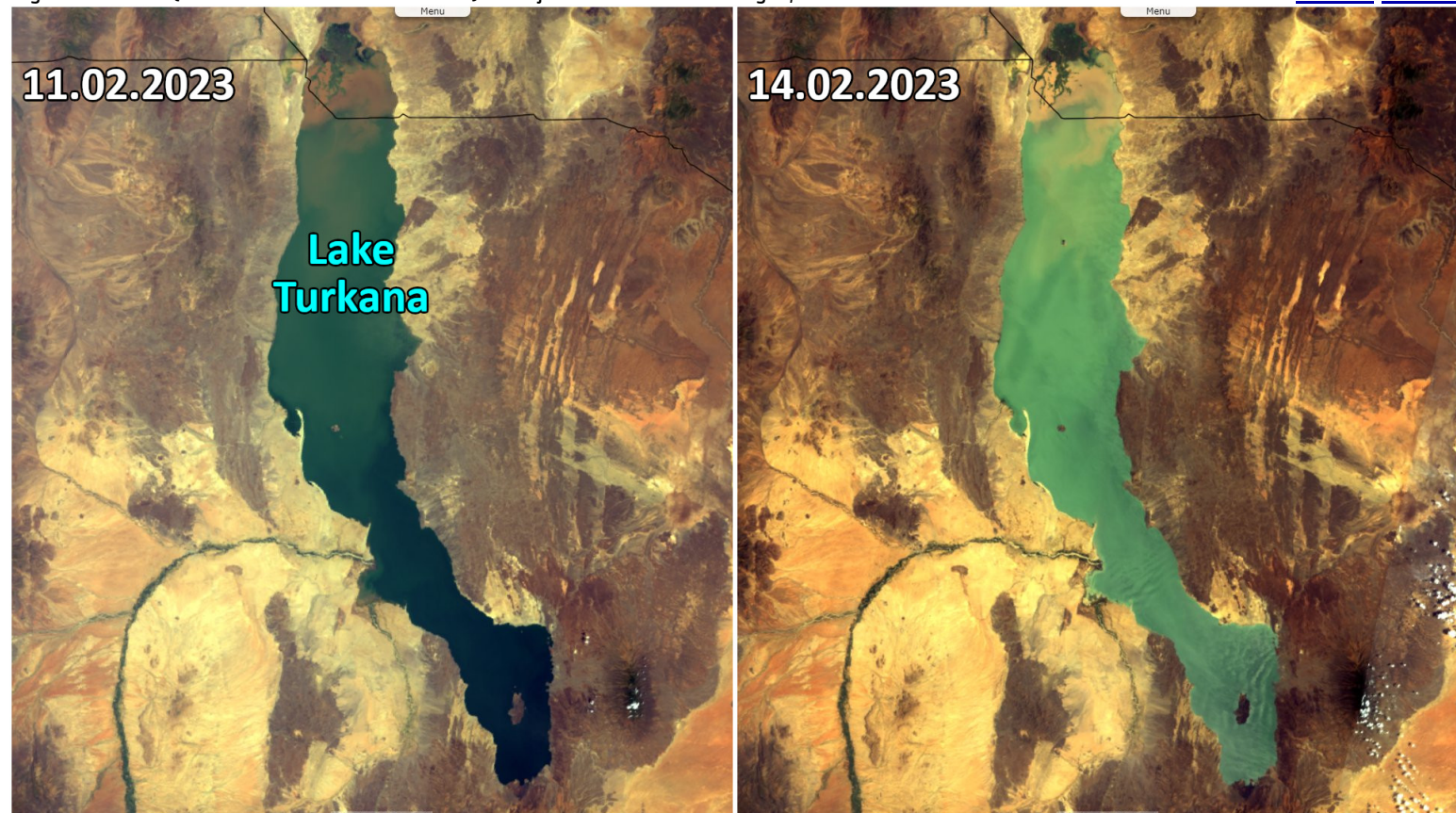
[3D view](#) [3D view](#)



It is the world's largest permanent desert lake and the world's largest alkaline lake. By volume it is the world's fourth-largest salt lake after the Caspian Sea, Issyk-Kul, and Lake Van (passing the shrinking South Aral Sea). Lake Turkana is a UNESCO World Heritage site, which sheet [explains](#) the importance: *"The most saline of Africa's large lakes, Turkana is an outstanding laboratory for the study of plant and animal communities. The island parks are the breeding habitats of the Nile crocodile *Crocodylus niloticus*, the hippopotamus amphibious and several snake species. The lake is an important flyway passage and stopover for palaeartic migrant birds."*

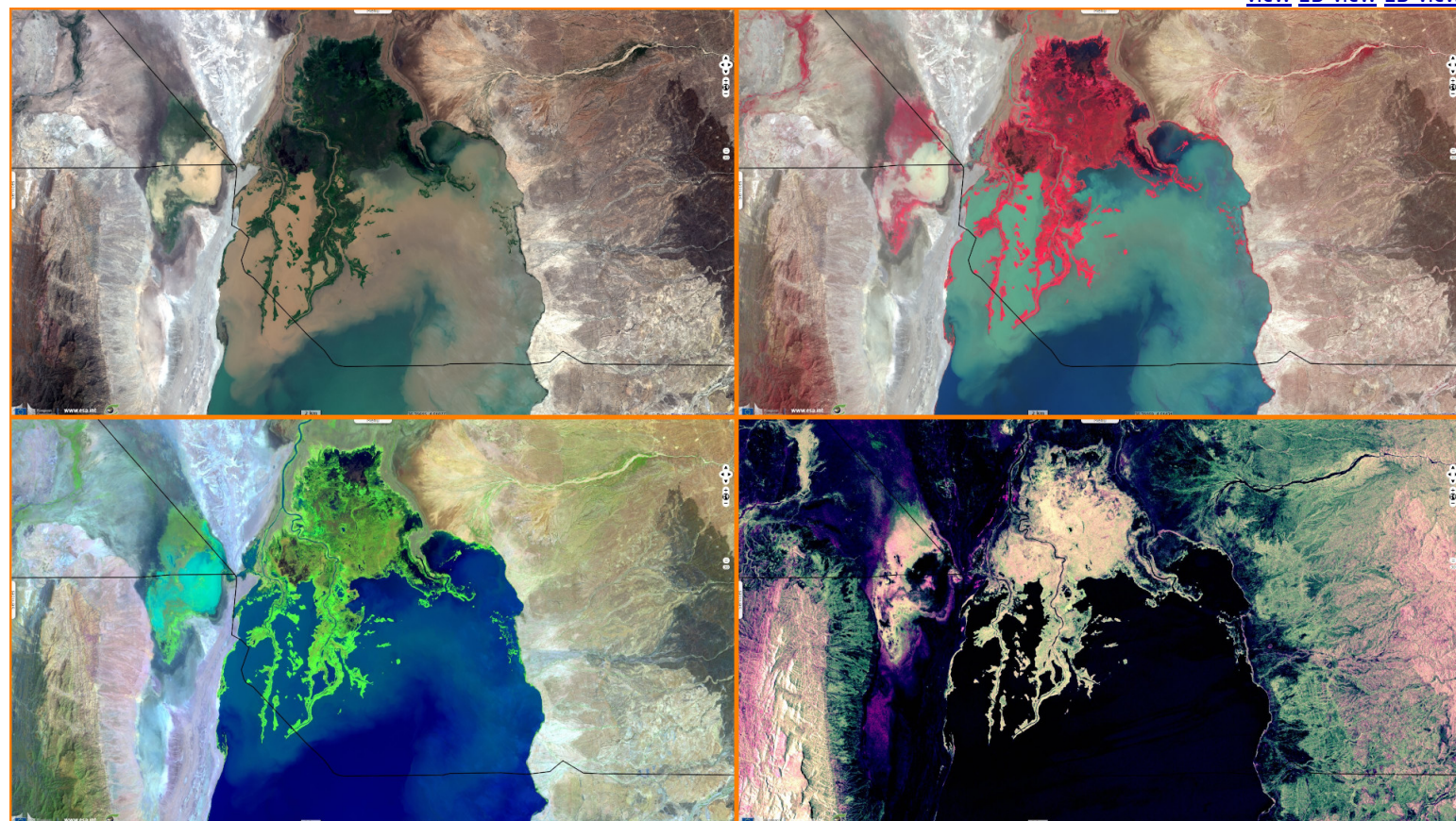
Fig. 3 - S3 OLCI (11.02.2023 / 14 & 18.02.2023) - Subject to fast colour changes, it is nicknamed the Jade Sea.

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



"Surrounded by an arid, seemingly extraterrestrial landscape that is often devoid of life. The long body of Lake Turkana drops down along the Rift Valley from the Ethiopian border, extending 249 kilometers from north to south and 44 km at its widest point with a depth of 30 meters. It is Africa's fourth largest lake, fondly called the Jade Sea because of its breathtaking color. There are numerous volcanic overflows with petrified forests. The existing ecological conditions provide habitats for maintaining diverse flora and fauna."

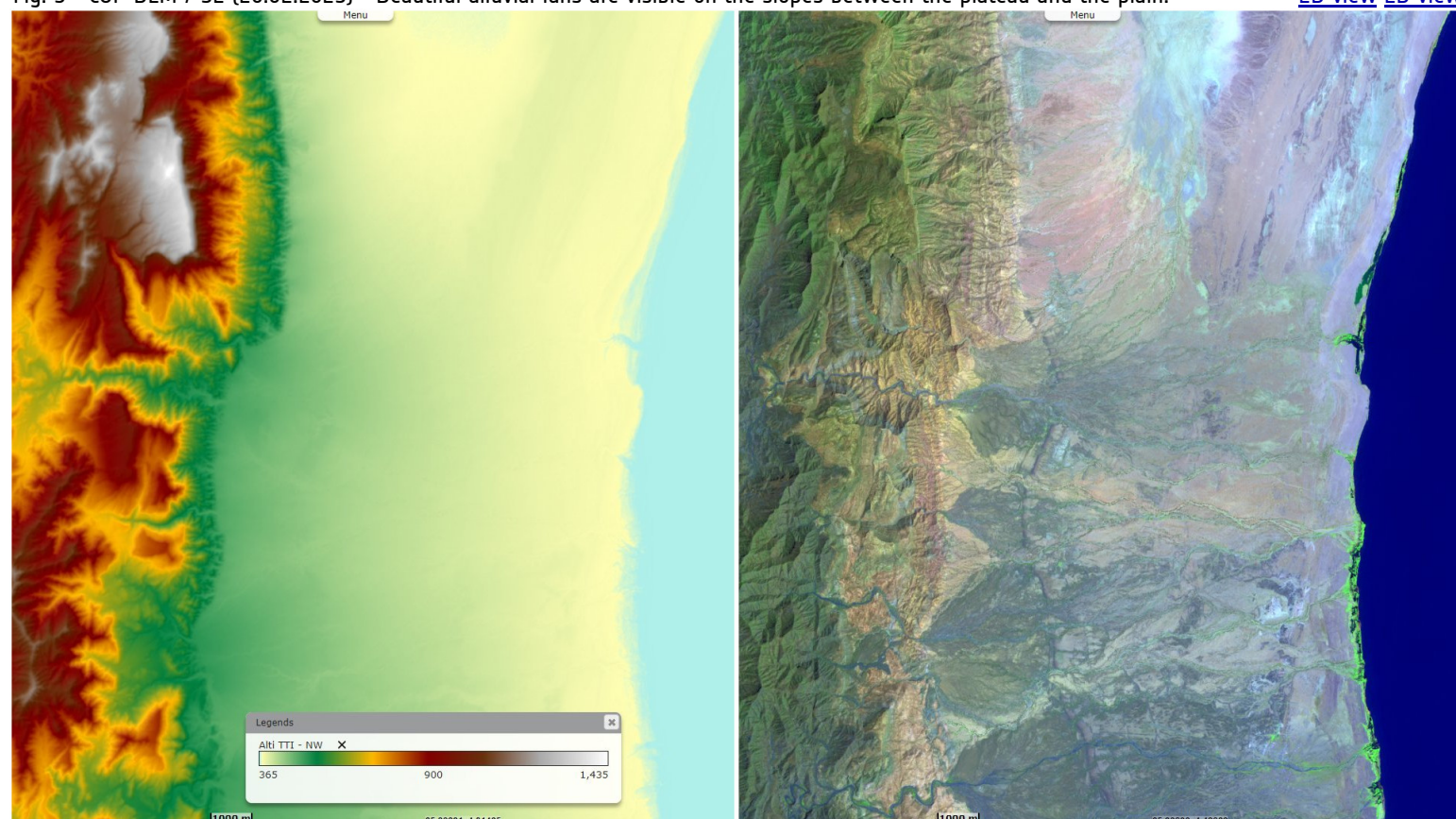
Fig. 4 - S2 (20.02.2023) / S1 (19.01.2023->08.03.2023) - The overwhelming majority of the lake inflow comes from Omo delta at north. [2D view](#) [2D view](#) [view](#) [2D view](#) [2D view](#)



"Lake Turkana is in an arid and hot area. The mean annual rainfall in most of the lake surroundings is less than 250 mm. The occurrence of rainfall is very erratic and unpredictable, although the probability of rainfall is the highest during the 'long rains' in March May. The air temperature recordings at Lodwar show a seasonal pattern with the lowest temperatures in July August, a wide range between 19.5 and 39.9°C, and a mean daily temperature of 29.26°C. The lake is exposed to frequent strong winds, the prevailing wind direction being from the southeast."

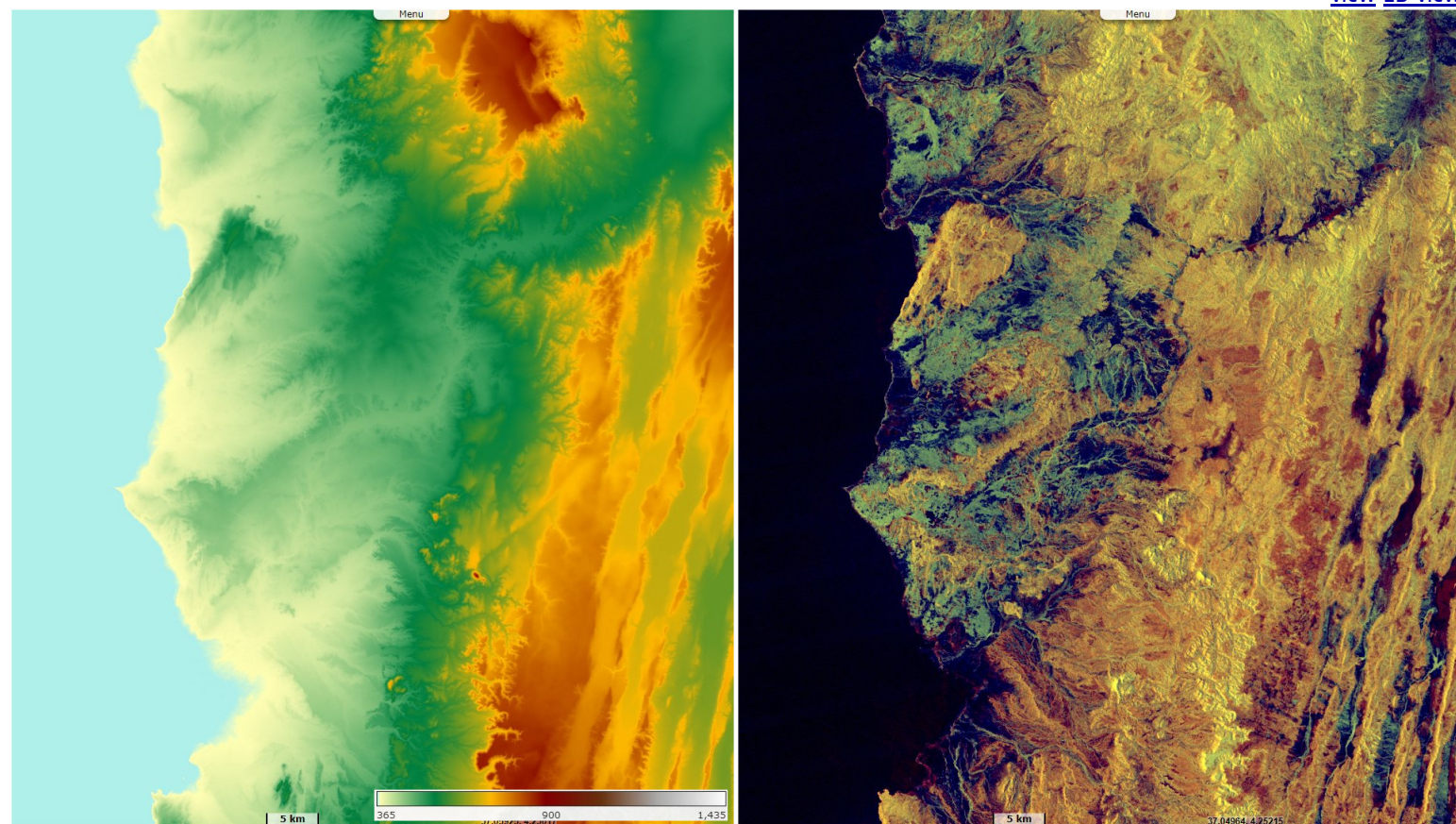
"The development of phytoplankton is limited by the availability of nitrate and light. Light limitation was caused by turbid water and vertical mixing. The sustainable yield of traditionally exploited fish from open lake was estimated to be 15 000-30 000 tons per year."

Fig. 5 - COP-DEM / S2 (20.02.2023) - Beautiful alluvial fans are visible on the slopes between the plateau and the plain. [2D view](#) [2D view](#)



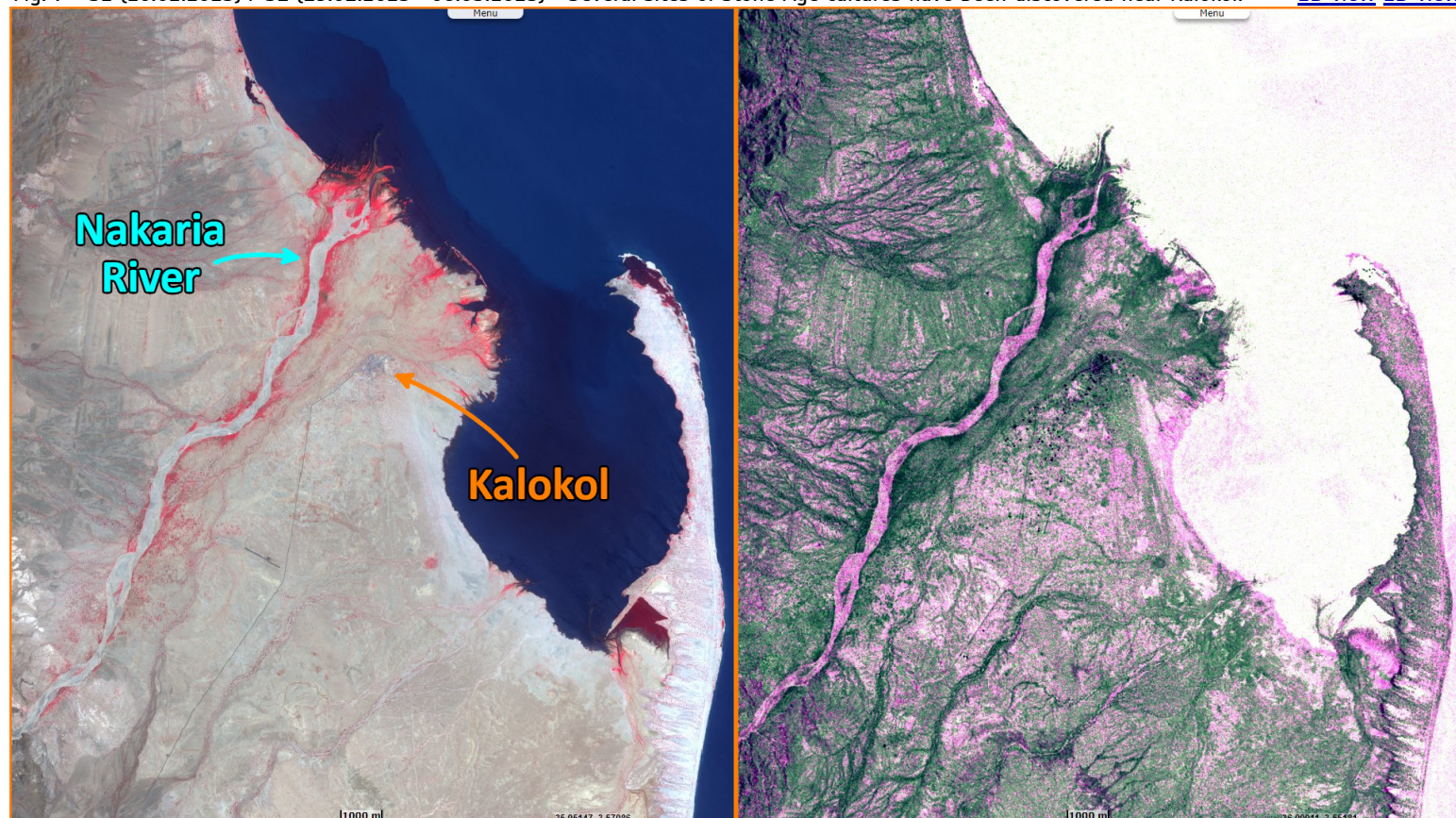
"The main tributary is the River Omo, which enters the lake from the north and contributes more than 90% of the total water influx. Other rivers are temporary, flooding only during sporadic rains. Lake Turkana has no outlet, and water is lost from the lake mainly by evaporation. The evaporation rate has been estimated at 2335 mm per year. The water level of this closed basin lake is determined by the balance between the influx from rivers and groundwater and the evaporation from the lake surface. Therefore the level is sensitive to climatic variations, and subject to marked seasonal fluctuations as well as to long-term periodical changes.", concludes the [World Lakes Database](#)".

Fig. 6 - COP-DEM / S1 (19.01.2023->08.03.2023) - On the north-east shore of Lake Turkana, Sibiloi National Park encompasses the Koobi Fora site. [2D view](#) [2D view](#)



"The Lower Valley of the Omo is a [UNESCO World Heritage site](#) located in south-western Ethiopia. It extends over an area of 165 km². The age old sedimentary deposits in the Lower Omo Valley are now world renowned for the discovery of many hominid fossils". Lucy, the earliest Homo found to this day, was discovered in the lower Awash River basin in the Afar region of Ethiopia. But this Ethiopian site at north of Lake Turkana has also "been of fundamental importance in the study of human evolution. The Lower Omo Valley includes the Konso and Fejej paleontological research locations with sedimentary deposit going back to the plio-pleistocene period." Over 50 000 fossils have been identified from the lower valley, including 230 hominid fossils, including fragments of Australopithecus.

Fig. 7 - S2 (20.02.2023) / S1 (19.01.2023->08.03.2023) - Several sites of Stone Age cultures have been discovered near Kalokol. [2D view](#) [2D view](#)



"Lake Turkana National Parks are constituted of Sibiloi National Park, the South Island and the Central Island National Parks, covering a total area of 161 485 hectares located within the Lake Turkana basin whose total surface area is 7 million ha." [describes](#) the UNESCO.

An archaeological site within Sibiloi National Park, on the north-east bank of Lake Turkana, "The Koobi Fora deposits are rich in pre-human, mammalian, molluscan and other fossil remains and have contributed more to the understanding of palaeoenvironments than any other site on the continent." "At Kobi Fora to the north of Allia Bay, extensive paleontological finds have been made, starting in 1969, with the discovery of

Paranthropus boisei. The discovery of *Homo habilis* thereafter is evidence of the existence of a relatively intelligent hominid two million years ago and reflect the change in climate from moist forest grassland when the now petrified forest were growing to the present hot desert. The human and pre-human fossils include the remains of five species, *Australopithecus anamensis*, *Homo habilis/rudolfensis*, *Paranthropus boisei*, *Homo erectus* and *Homo sapiens* all found within one locality. These discoveries are important for understanding the evolutionary history of the human species."

Fig. 8 - S2 (20.02.2023) / S1 (19.01.2023->08.03.2023) - Rivers Turkwel and Kerio constitute the rest of the water input.

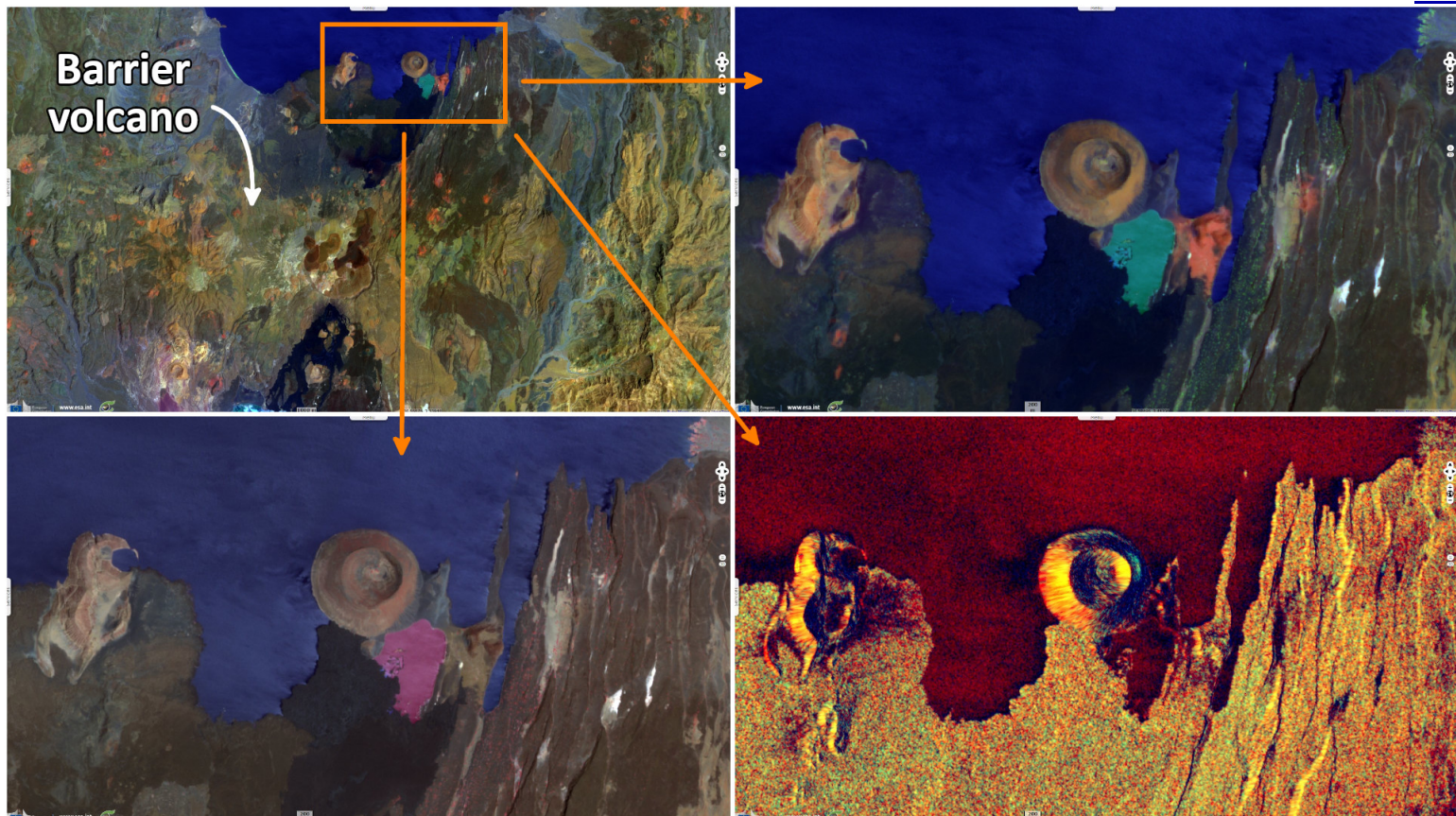
[2D view](#) [2D view](#)



The Kerio and Turkwel contribute 98% of the river water flowing into Lake Turkana on Kenyan territory (which makes up only 2% of the total riverine inflow). In their lower courses both these rivers are dry a part of the year.

Fig. 9 - S2 (20.02.2023) / S1 (19.01.2023->08.03.2023) - Young lava and domes at the southern extent of lake Turkana. [2D view](#) [2D view](#) [2D view](#) [2D view](#)

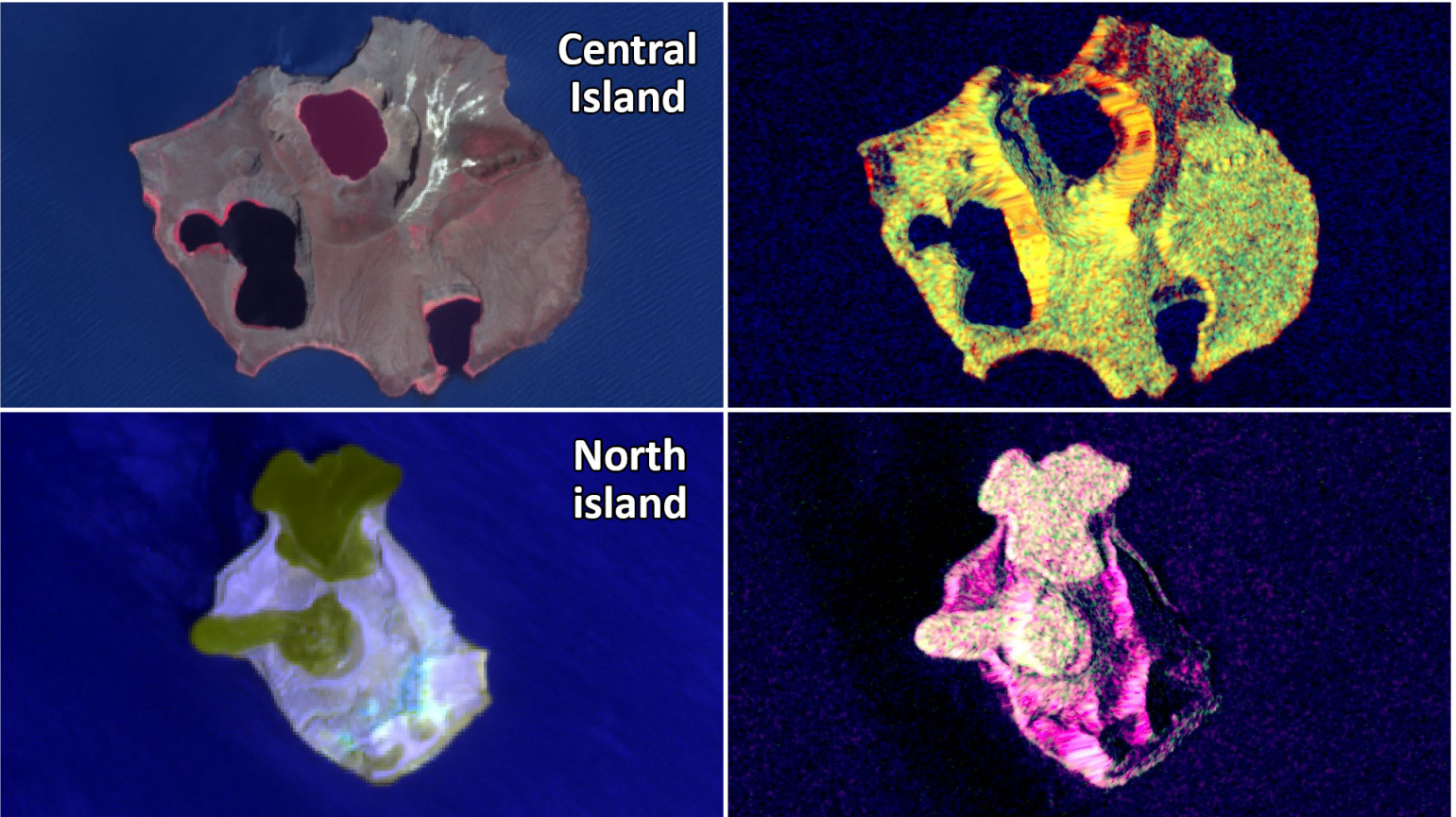
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Kenya Wildlife Service [presents](#) the environment of the park, writing: "Located on the wild and rugged shores of Lake Turkana – the cradle of mankind - Sibiloi is home to important archaeological sites including Koobi Fora where the fossil remains have contributed more to the understanding of human evolution than any other site in the continent. The area is characterized by semi-desert habitat and open plains flanked by volcanic formations including Mount Sibiloi, where the remains of a petrified forest can be seen.

Sibiloi serves as a stopover for migrant waterfowl and is a major breeding ground for the Nile crocodile. Terrestrial wildlife includes zebras, Grant gazelles, lions, leopards, striped hyenas, Beisa Oryx, greater kudu, cheetahs and northern topi among others. A total of over 350 species of aquatic and terrestrial bird have been recorded in Lake Turkana."

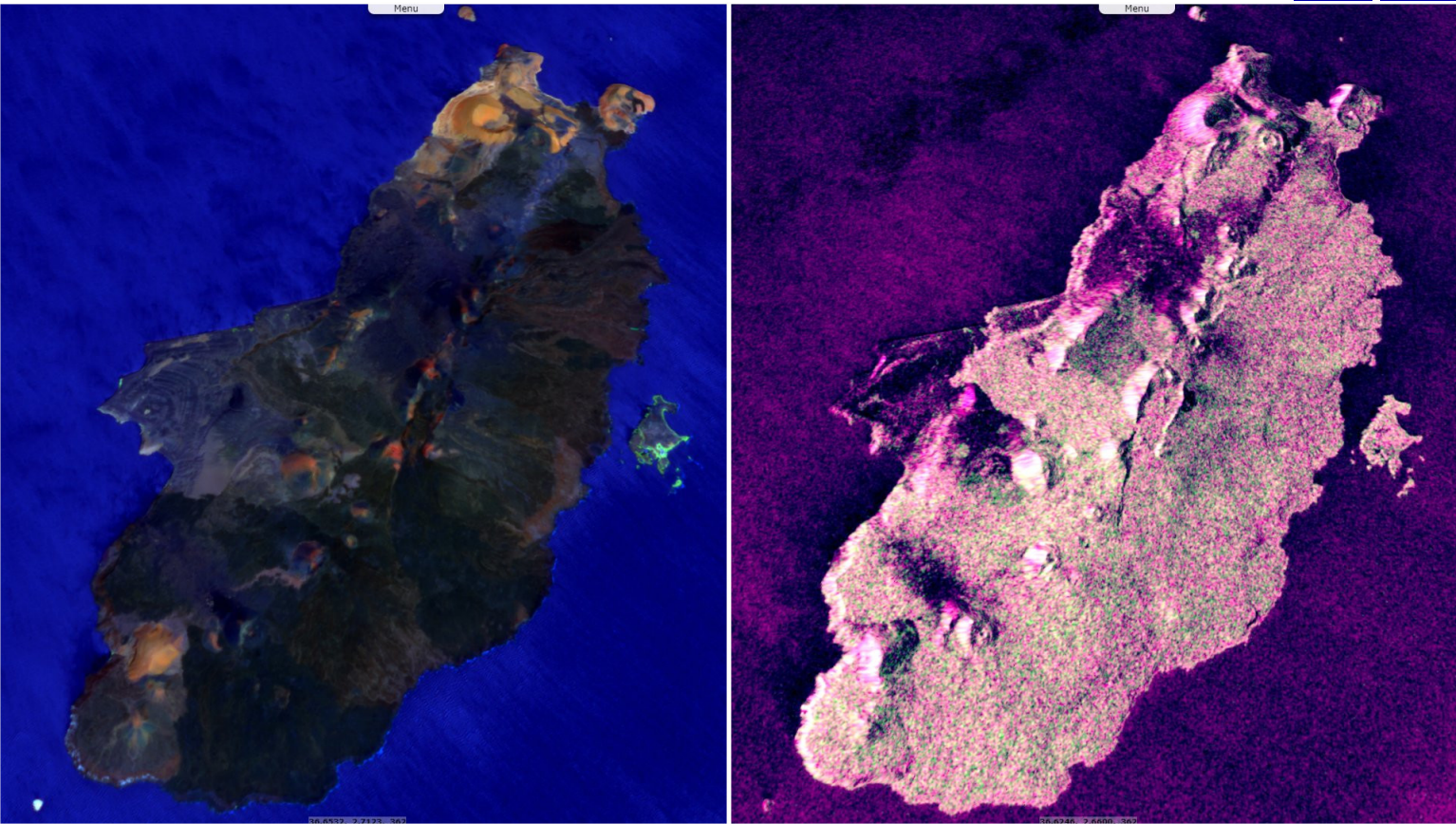
Fig. 10 - S2 (20.02.2023) / S1 (19.01.2023->08.03.2023) - North and Central Island show typical volcanic features. [2D view](#) [2D view](#) [2D view](#) [2D view](#)



Lake Turkana is however endangered as [warned](#) Le Monde: The famous Kenyan palaeoanthropologist Richard Leakey, who has made several major discoveries in Turkana, pisses off when he mentions the Gibe III hydroelectric dam, the highest in Africa (243 metres), inaugurated at the end of 2016 on the Omo, and the major irrigation projects for sugar cane and cotton plantations. 'Sooner or later, we will run out of water in Turkana', he told AFP. 'Ethiopia is doing nothing but encouraging its farmers to grow more cotton and sugar, and they are planning more dams (...). Lake Turkana will be the next Aral Sea.'

An assessment report published on the Unesco website blasts 'a rapid overall decline in water levels since January 2015, when the loading of the Gibe III reservoir began', and points out that seasonal flooding, essential to the fish breeding cycle, has been disrupted. Some 300 000 people depend on fishing around the lake, disruptions that could 'affect the balance of the ecosystem', the report notes.

Fig. 11 - S2 (20.02.2023) / S1 (19.01.2023->08.03.2023) - South Island, also of volcanic origin is much bigger than the former two and a natural park.



*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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