

Egyptian stream of life

Sentinel-2 MSI acquired on **01 April 2017** at 08:20:01 UTC

...

Sentinel-1 CSAR IW acquired on **14 April 2017** from 15:53:29 to 15:56:03 UTC

Sentinel-3 OLCI FR acquired on **17 June 2017** from 07:50:00 to 07:53:00 UTC

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

Keyword(s): land, climate change, hydrology, agriculture, dam, renewable energy, flooding, erosion, sediments, delta, demography, food security, Nile river, Sahara desert, Egypt



[2D Layerstack](#)

Fig. 1 - S3A OLCI (17.06.2017) - 18-10-4 colour composite - Cropland in Egypt are highly concentrated around lower Nile.

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

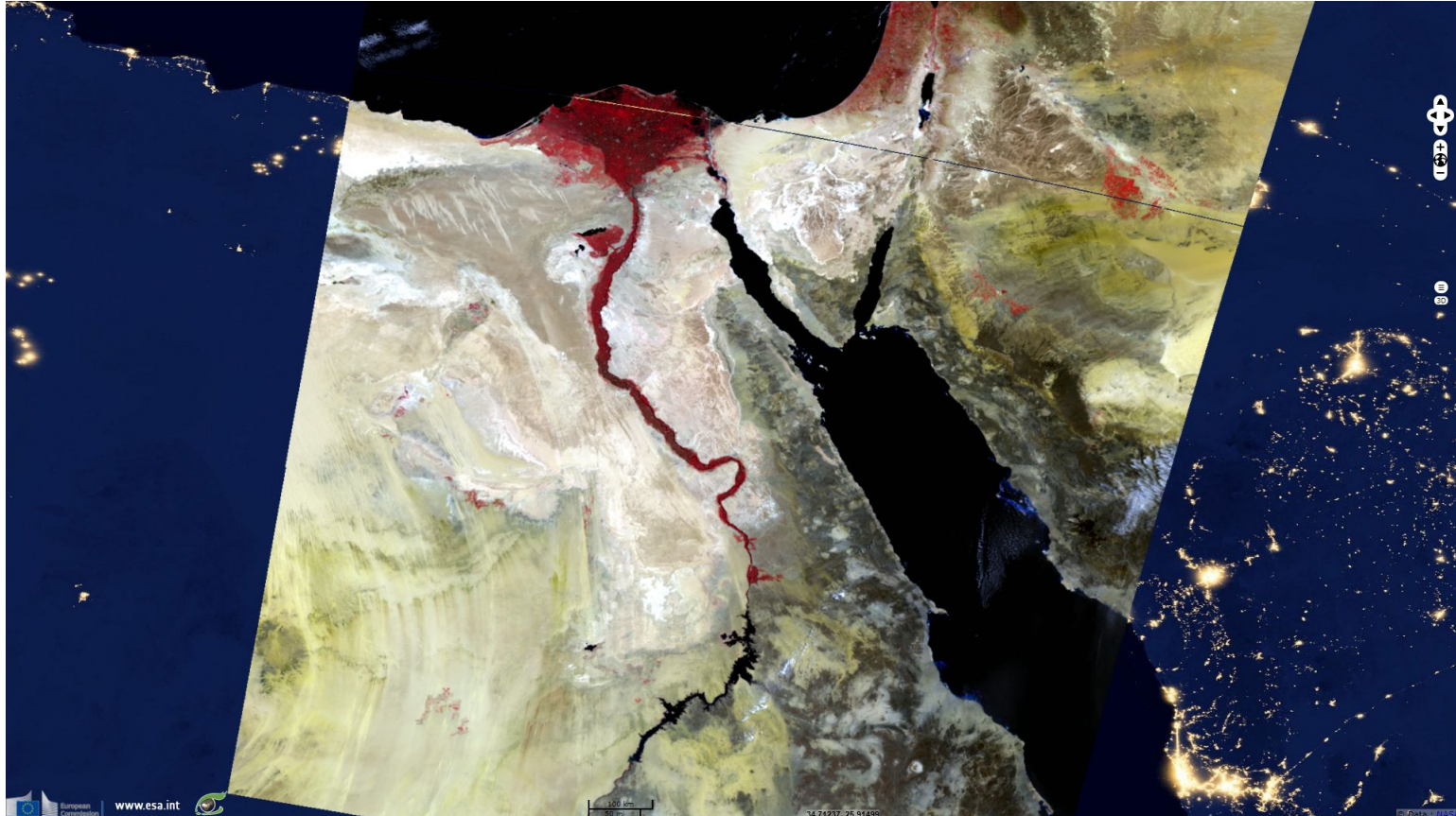
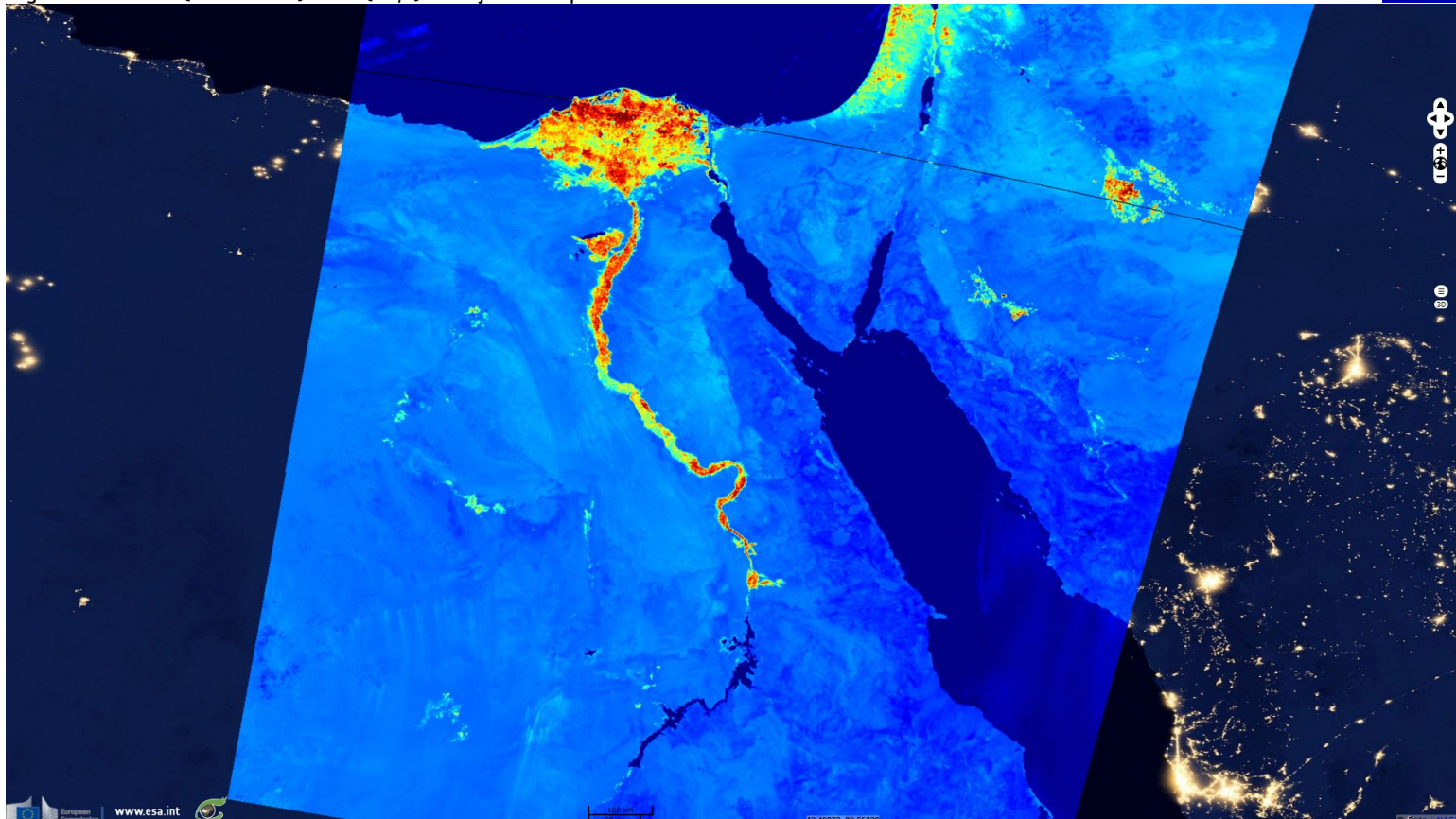


Fig. 2 - S3A OLCI (17.06.2017) - NDI(17,8) with jet look up table - The few oases in the desert are also visible to the west.

[2D view](#)



Nile river was a key element in the founding of Egyptian civilization. Not only did it provide water to men, cattle and crops using then innovative irrigation systems, but its yearly flooding also brought sediments keeping the soil fertile. Finally, it also provided a mean of transportation.

Fig. 3 - S2A (01.04.2017) - 8-11-2 colour composite - Aswan High Dam was built to generate energy and regulate the flow of Nile river. [2D view](#)

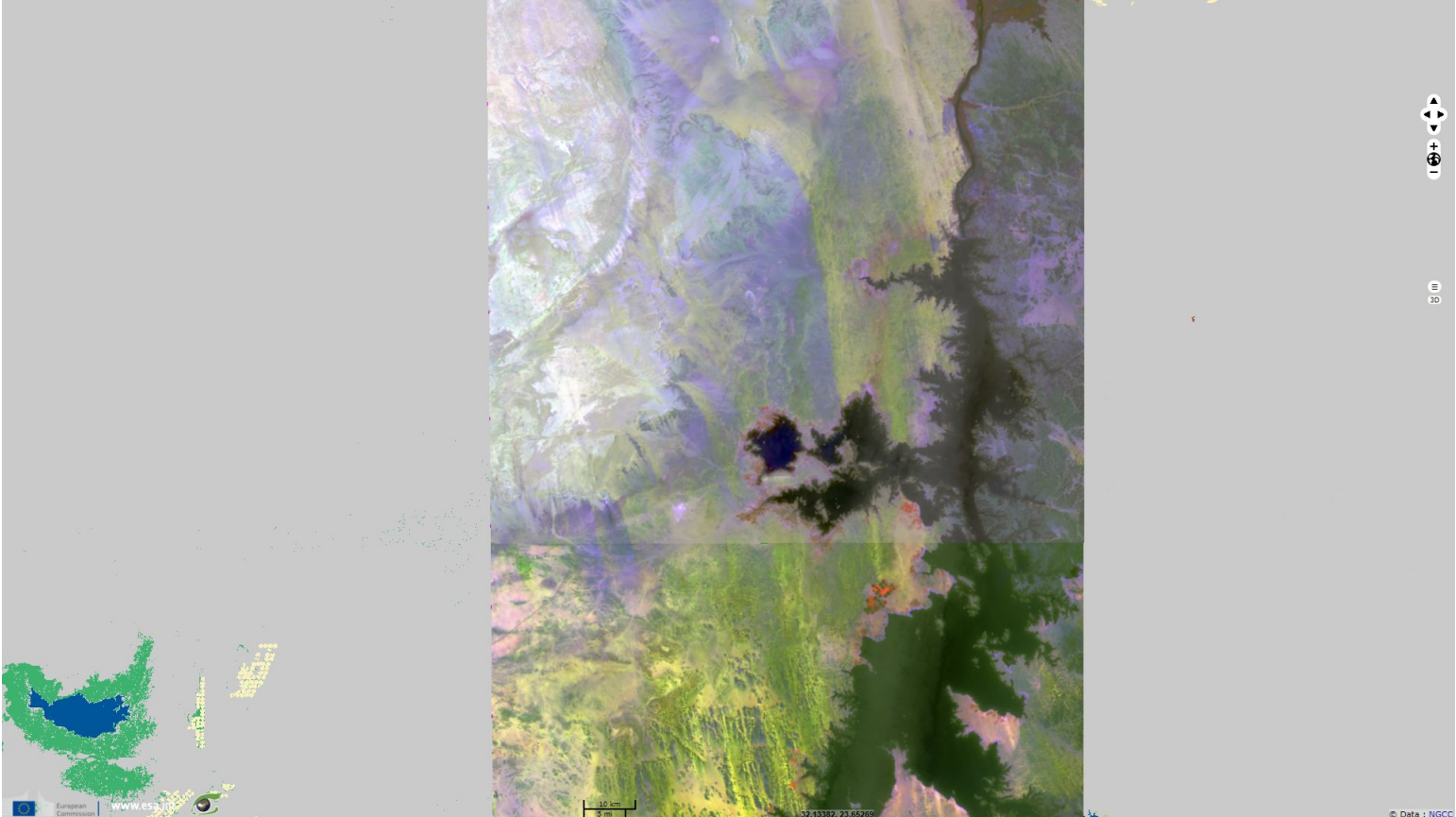
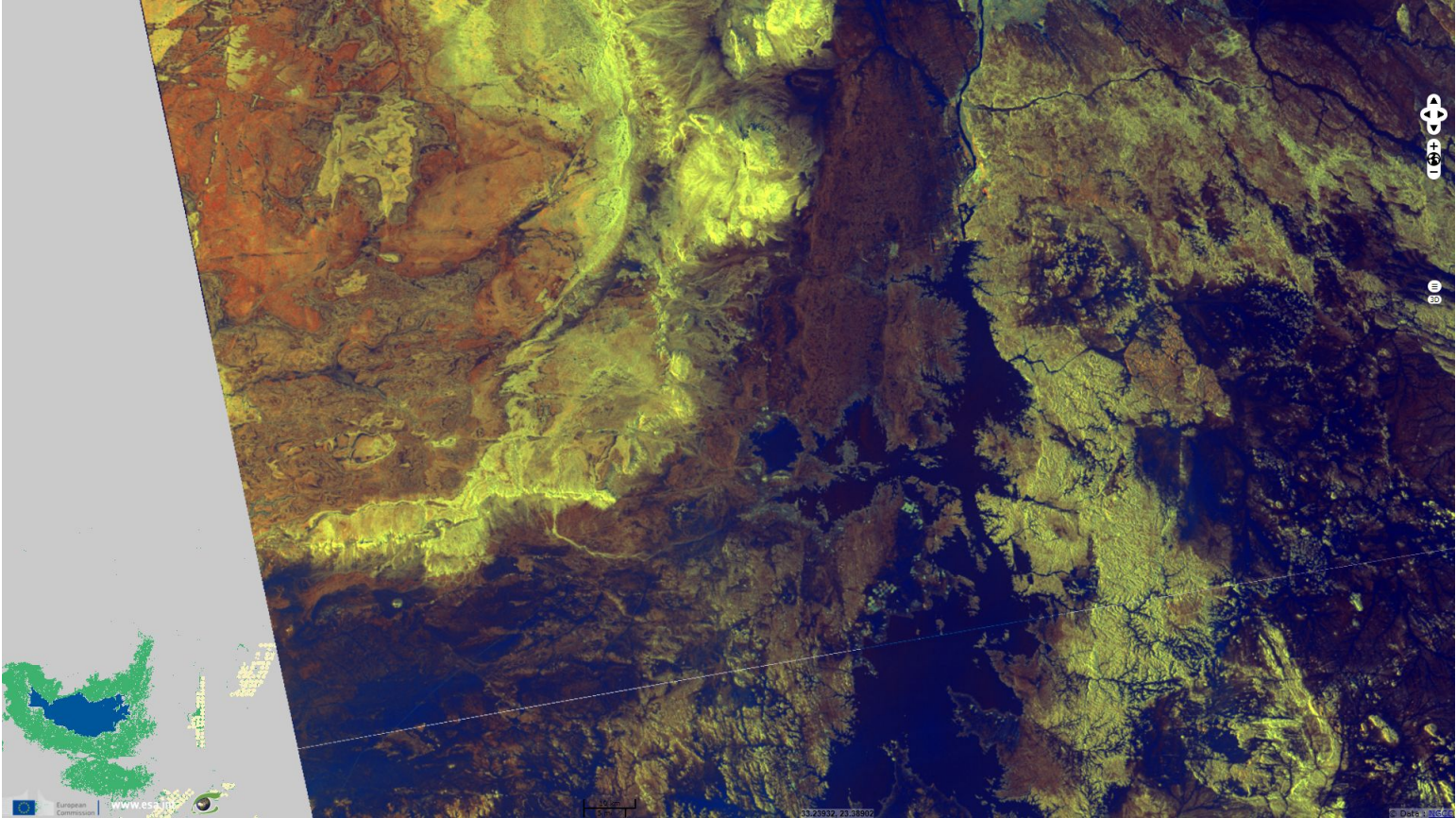


Fig. 4 - S1B IW (14.04.2017) - VV-VH-NDI(VH,VV) colour composite - Resulting lake Nasser is world's third largest reservoir by volume. [2D view](#)



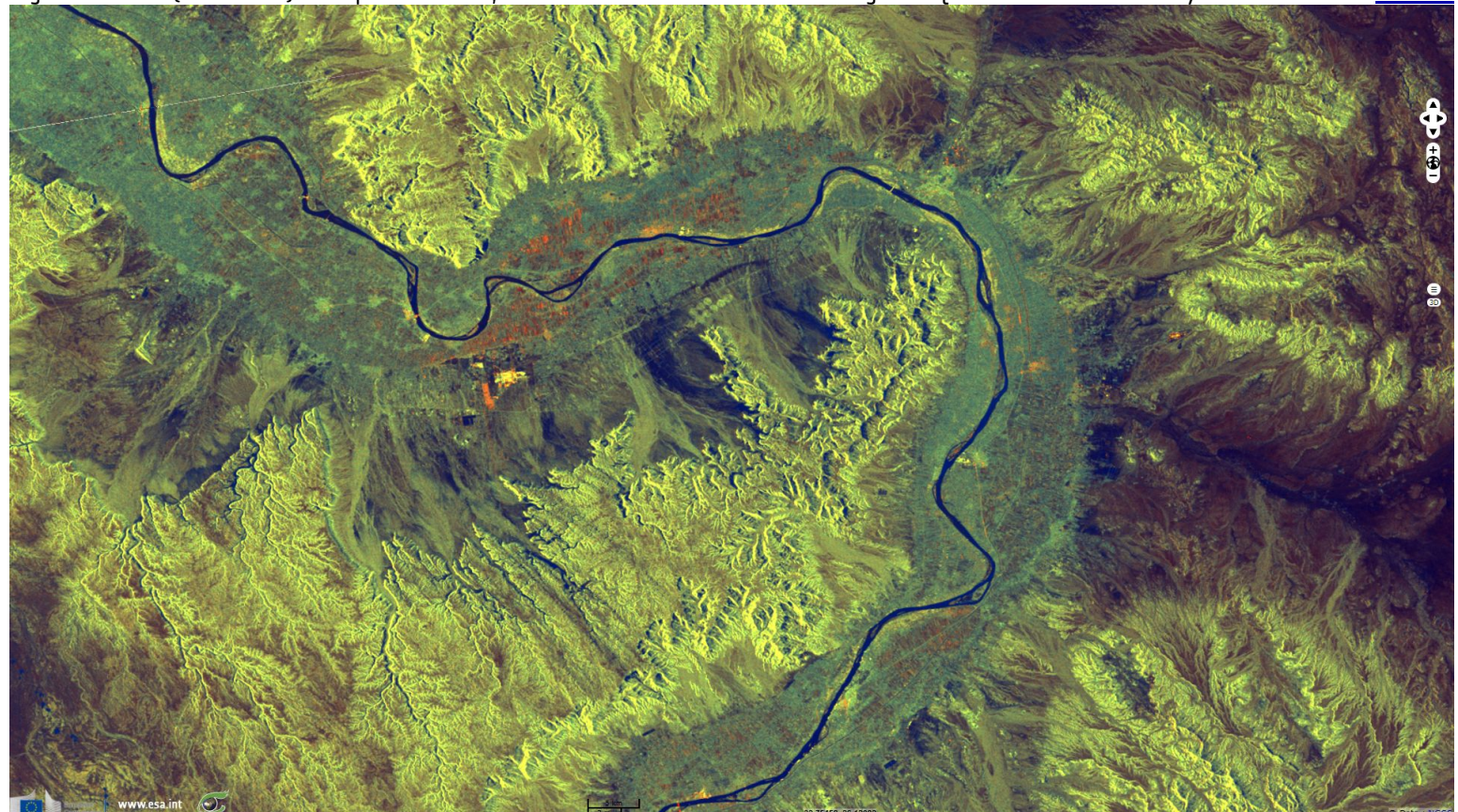
The Egyptian Revolution of 23 July 1952 marked the end of the monarchy and the British occupation of Egypt. Afterwards, authorities decided the construction of Aswan high dam which was completed in 1970 thanks to support of the Soviet Union. The resulting lake was named after Gamal Abdel Nasser, the revolution leader then president of Egypt.

This dam provides hydroelectricity, prevents droughts and flooding, secures navigation and provides over-year water storage for irrigation. It benefited to Egypt agriculture, industry and service. There were however several drawbacks, such as the accumulation of sediments in the Nasser lake and the erosion of Nile banks and delta coastline, "*at a rate of 125-175 m/year*" for the latter according to (Rozengurt and Haydock, 1993). Moreover, these sediments do not depose on the croplands which used to maintain their fertility. The absence of flooding also causes an accumulation of fertilizers that provokes algae infestation.

Fig. 5 - S2A (01.04.2017) - 11-8-4 colour composite - Cultivated banks Nile near Luxor contrast with the surrounding desert. [2D view](#) [2D animation](#)



Fig. 6 - S1B IW (14.04.2017) - Temples of Karnak, Luxor as well as tombs of ancient Kings and Queens stand in this valley. [2D view](#)



While Egypt covers over one million square kilometers, 99% of its population live within 10 kilometers of Nile river, in the narrow strip of its valley or delta where most fertile soil are located. The Nile is the single source of water for most Egyptian population, which [almost tripled in 65 years since the construction of the dam](#), this poses a challenge to Egypt food security as the [BLUE PEACE for the NILE](#) report expects a 29% decrease of the Egyptian water available per capita between 2010 and 2030.

According to the [Daily News Egypt](#), *Egyptian agriculture crisis worsens, mainly due to lack of water*. This could worsen since there is the "risk of a decline in Egypt's share of the Nile River due to the construction of the Grand Ethiopian Renaissance Dam." Finally, the [BLUE PEACE for the NILE](#) report also warns against the potential consequences of climate change: "It is expected that temperature across the Nile Basin will increase by 1.5 – 2.1 per cent by 2050. Almost the entire Nile region may become arid to semi-arid in the next 30-40 years which will significantly reduce agricultural land."

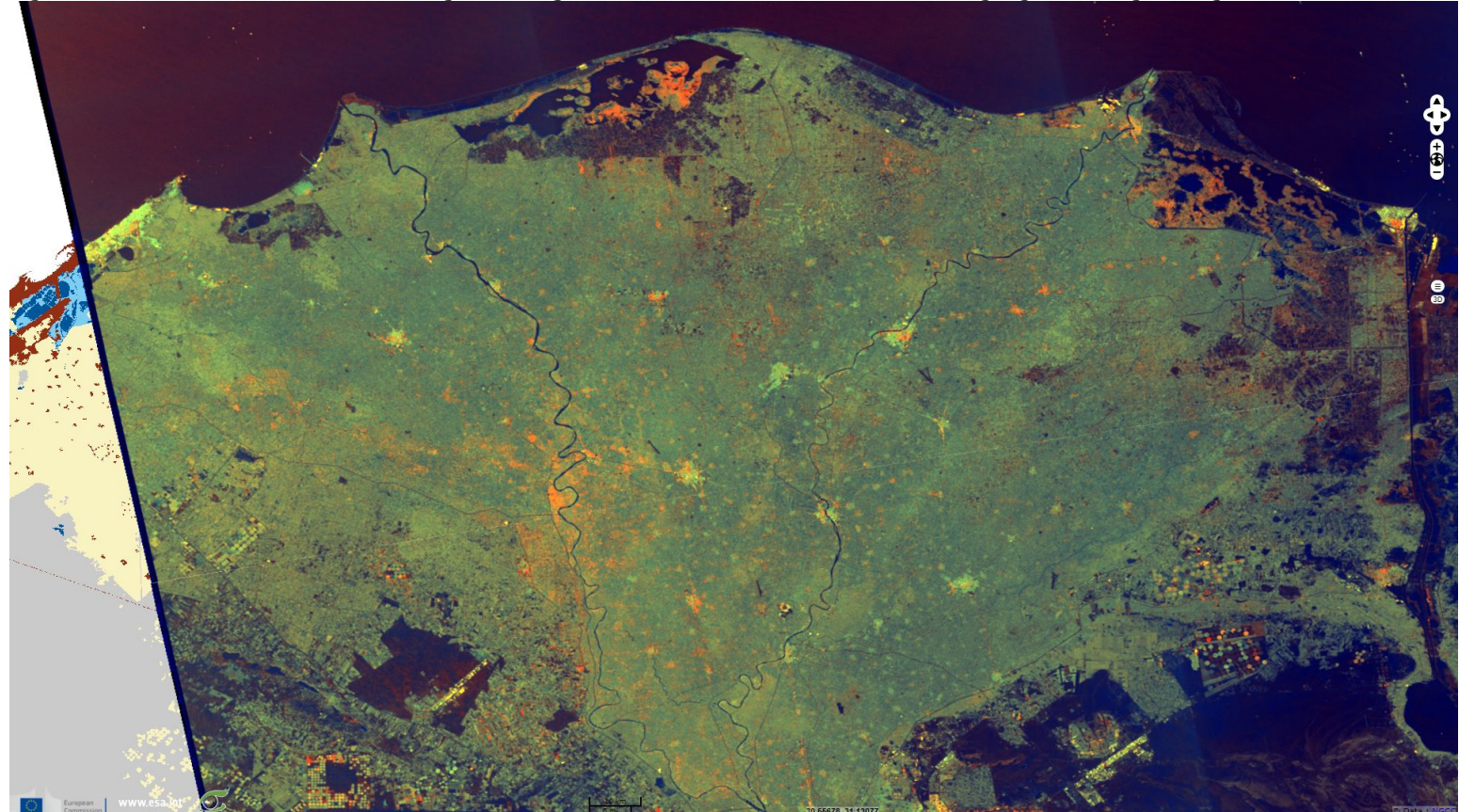
Fig. 7 - S2A (04.04.2017 & 17.04.2017) - 8-4-3 colour composite - Nile delta: vegetation is red, desert grey to pink, cities are greenish.

[2D view](#)















Fig. 8 - S1B IW (14.04.2017) - Nile delta: vegetation is green to blue, desert dark blue, cities are bright green to bright orange.

[2D view](#)



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

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	Proba-V portal