

The multiplication of dams reduces the Mekong's flow

Sentinel-1 CSAR IW acquired on 06 October 2014 from 22:45:02 to 22:45:31 UTC

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Sentinel-1 CSAR IW acquired on 29 August 2020 from 11:21:38 to 11:24:33 UTC

Sentinel-1 CSAR IW acquired on 04 October 2020 from 22:44:48 to 22:45:13 UTC

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[3D Layerstack](#)

Fig. 1 - S1 (29.08.2020 - 03.09.2020) - Chinese dams built on the Mekong river.

[2D view](#)

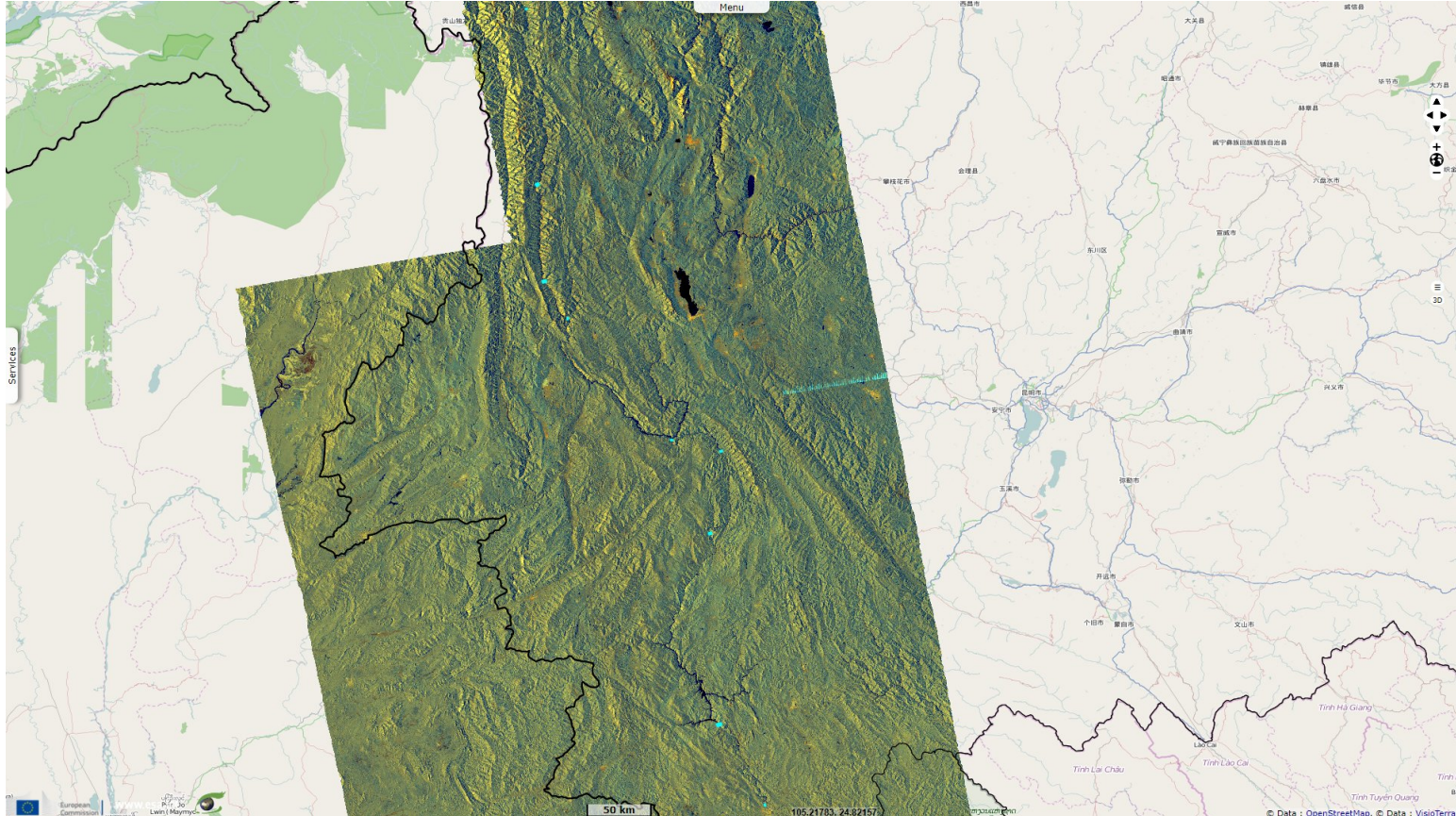
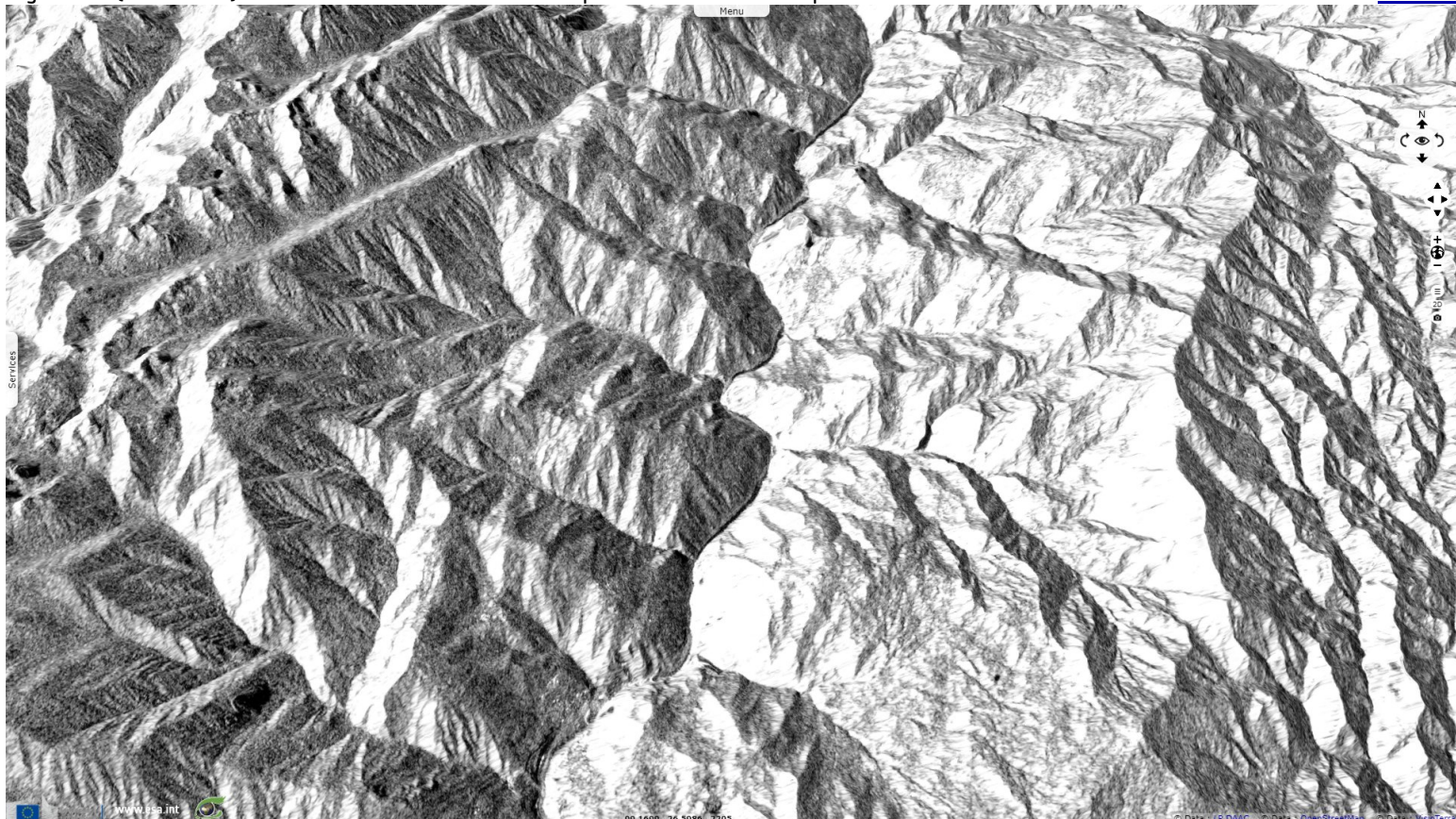


Fig. 2 - S1 (20.08.2015) - Before the construction of Dahuajiao dam in the Yunnan province of China.

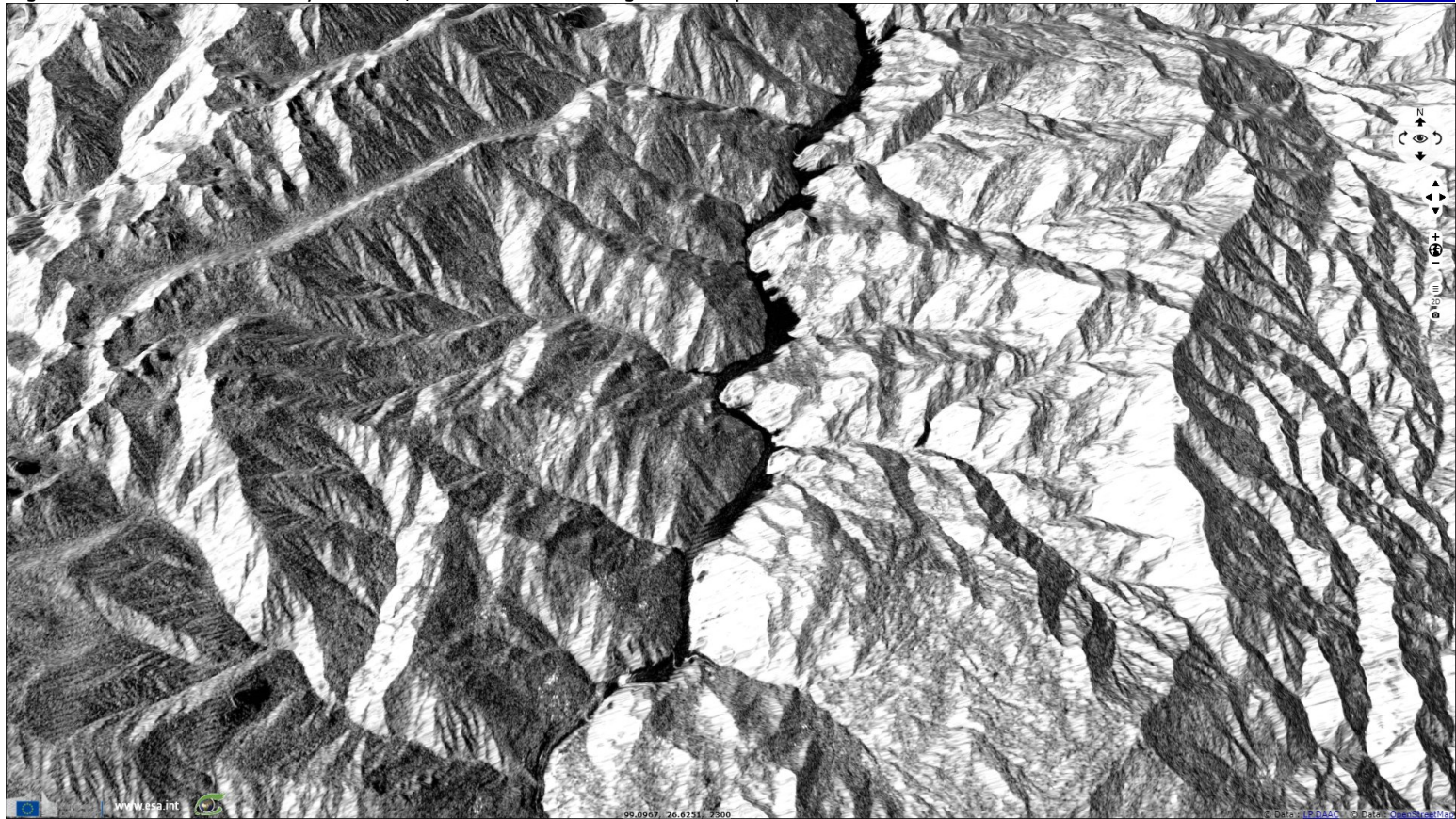
[3D view](#)



The Mekong River Commission For Sustainable Development [describes](#) the Mekong river as "one of the world's great rivers. Covering a distance of nearly 5,000 km from its source on the Tibetan Plateau in China to the Mekong Delta, the river flows through six countries: China, Myanmar, Thailand, Laos, Cambodia and Vietnam."

Fig. 3 - S1 (29.08.2020) - Five years later, view after the building of Dahuagiao dam.

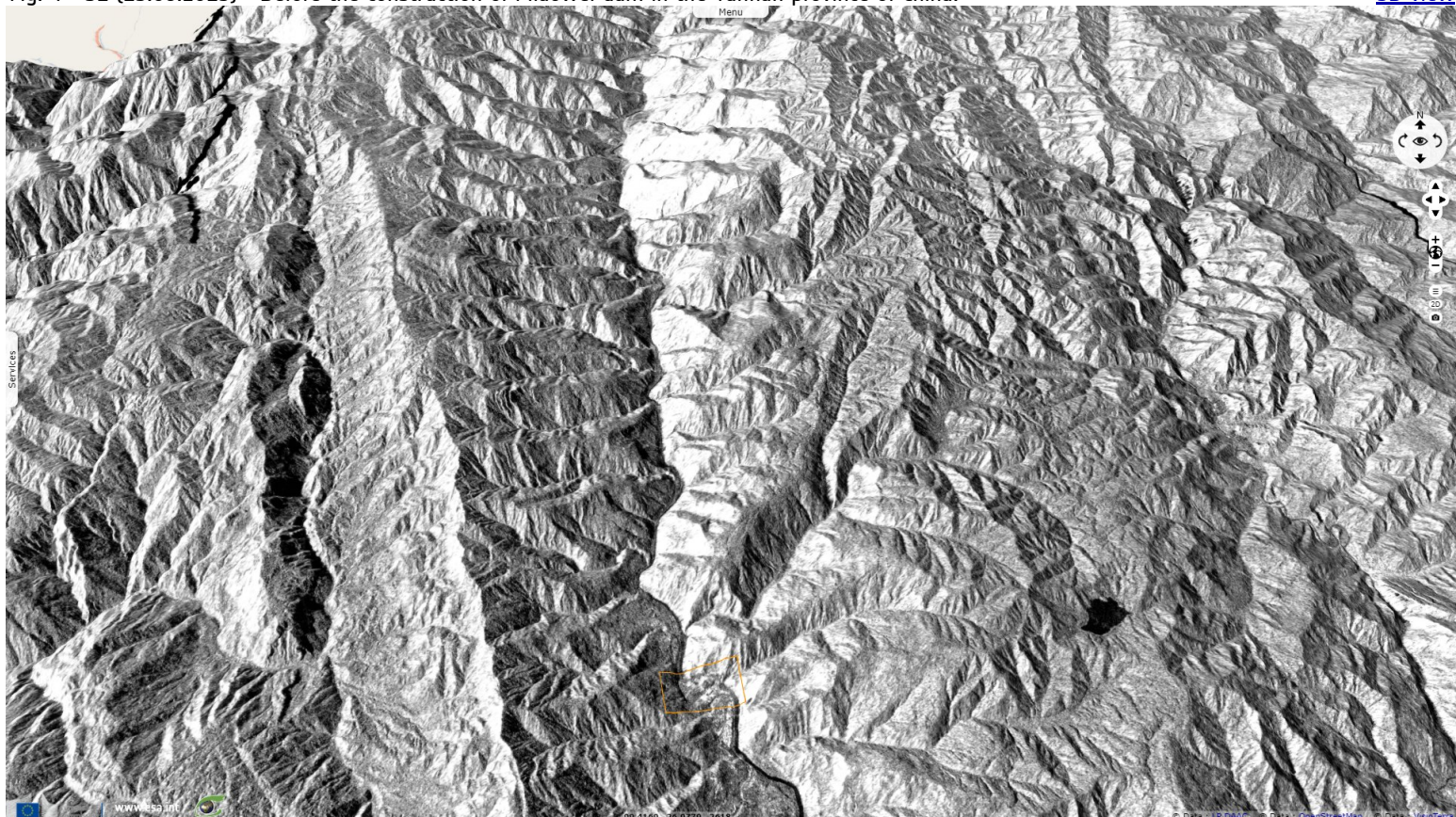
[3D view](#)



"The basin is home to one of the richest areas of biodiversity in the world, with more than 20,000 plant species and 850 fish species discovered to date. An estimated 80% of the nearly 65 million people living in the Lower Mekong River Basin depend on the river and its rich natural resources for their livelihoods, making sustainable development crucial for the environment and communities living in the basin."

Fig. 4 - S1 (13.08.2015) - Before the construction of Miaowei dam in the Yunnan province of China.

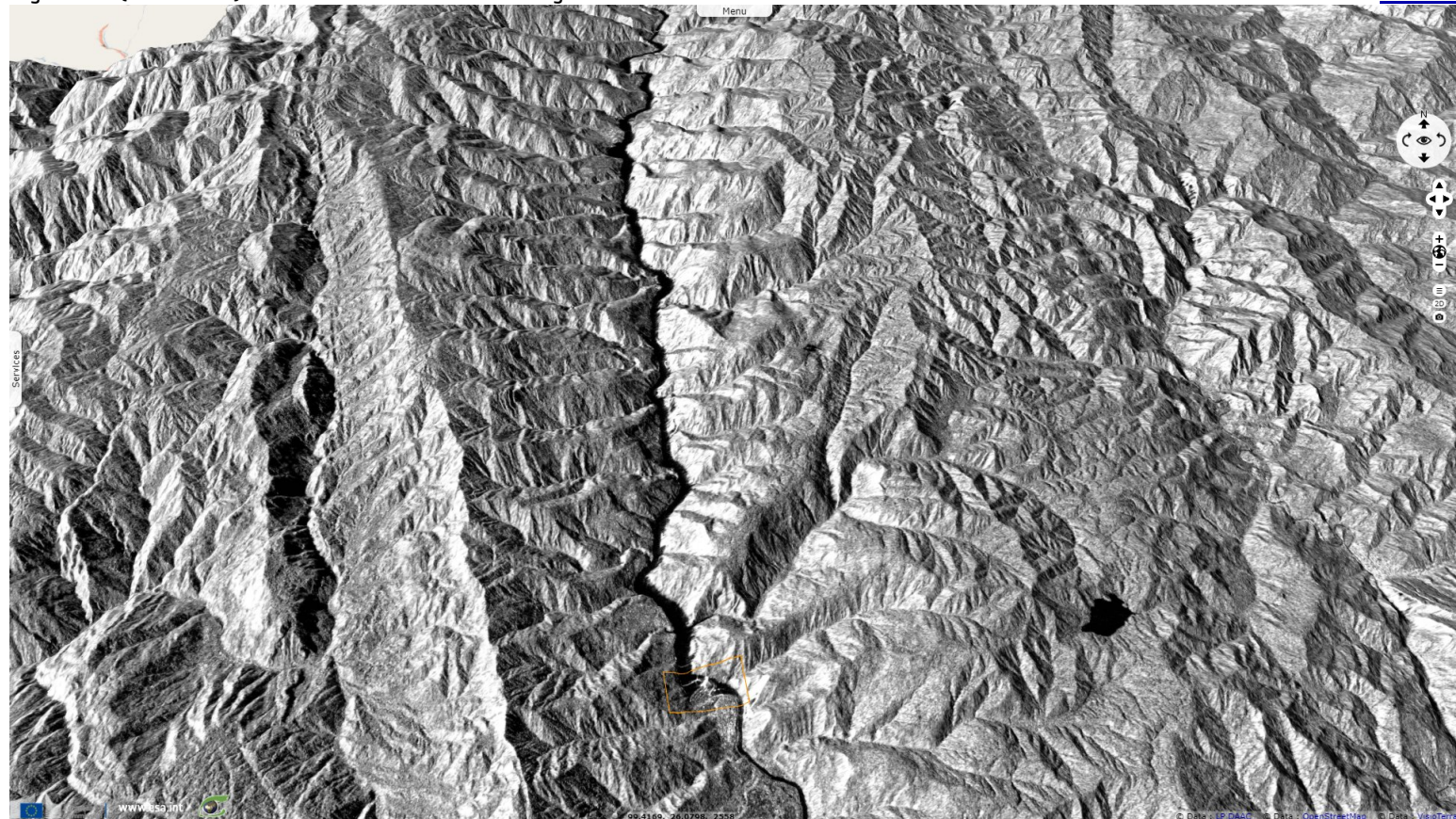
[3D view](#)



An article [published](#) in the Economist in 2016 reminds the importance of the Mekong river: "The Mekong region is Asia's rice bowl: in 2014 lower Mekong countries (Myanmar, Laos, Cambodia, Thailand and Vietnam) produced more than 100m tonnes of rice, around 15% of the world's total. The region's fertile soil depends on nutrient-rich sediment that the Mekong carries downriver, mainly during the rainy season from June to October; more than half the sediment in central Cambodia comes from China. The river and the nutrients it brings also support the world's biggest inland fishery, accounting for a quarter of the global freshwater catch, feeding tens of millions of people."

Fig. 5 - S1 (03.09.2020) - View in 2020 after the building of Miaowei dam.

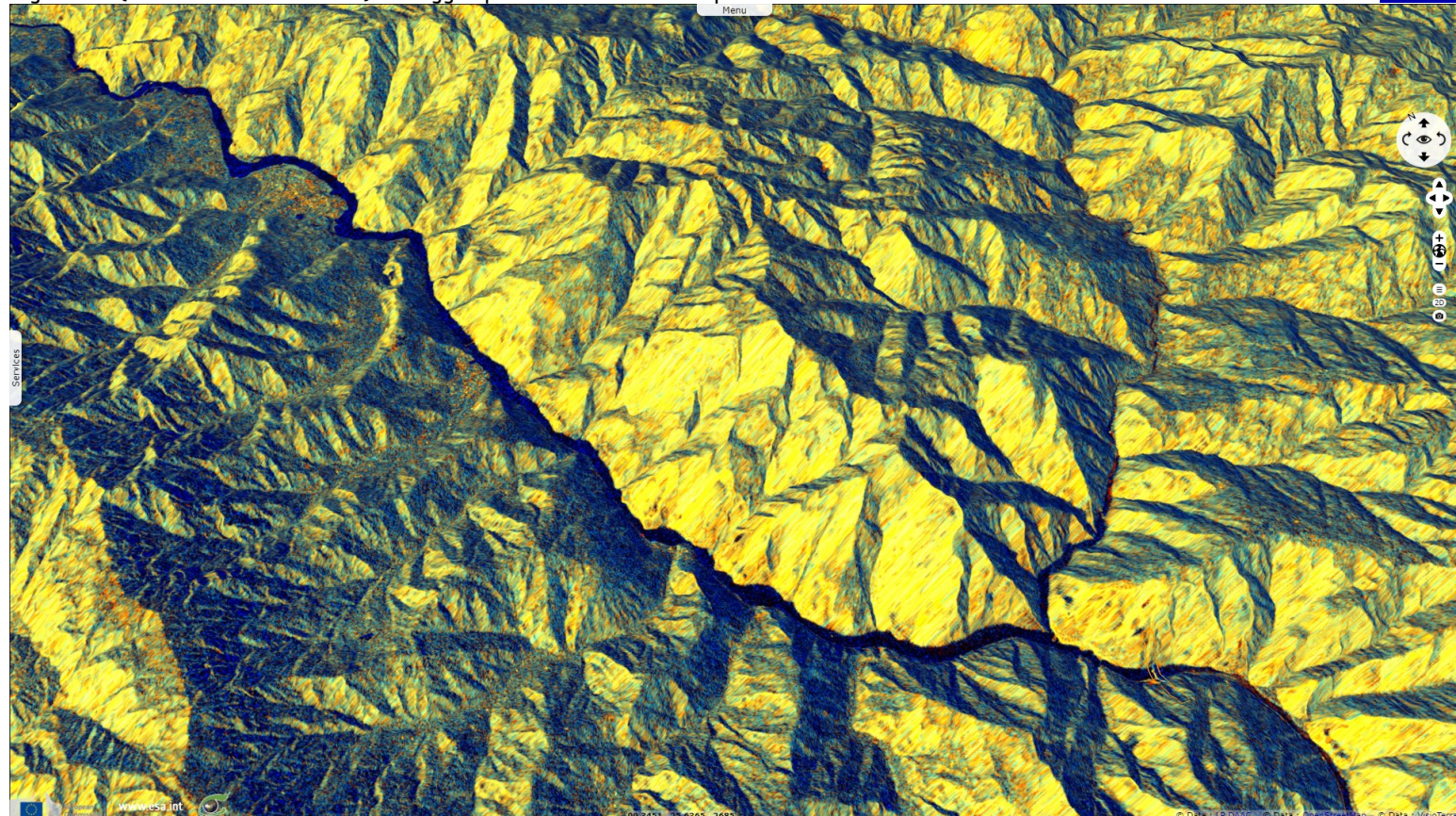
[3D view](#)



"The region boasts remarkable biodiversity; only the vast basins of the Congo and the Amazon compare to or surpass it. There are more than 20 000 types of plant and nearly 2500 animal species; freshwater dolphins and giant catfish; spiders 30 centimetres across and, in a limestone cavern in Thailand, a day-glo pink, cyanide-secreting millipede."

Fig. 6 - S1 (29.08.2020 - 03.09.2020) - Gongguoqiao dam in the Yunnan province of China.

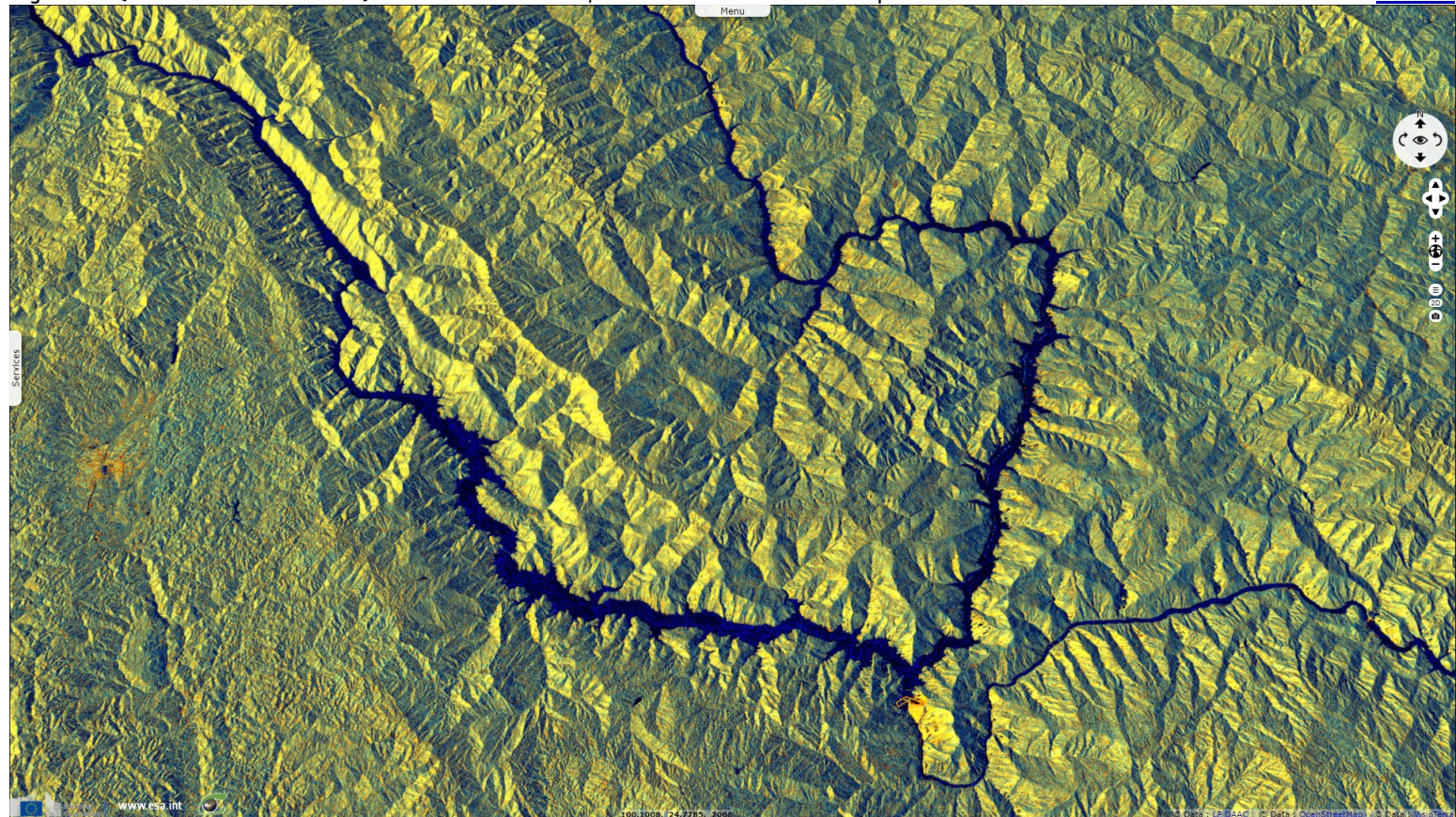
[2D view](#)



The Gongguoqiao Dam is a gravity dam on the Mekong River in Yunlong County of Yunnan Province, China. The primary purpose of the dam is hydroelectric power generation. Construction began in 2008 and the first generator was commissioned in 2011. The 900MW power station was fully operational on 21 June 2012. It has a capacity of 120 000 000 m3.

Fig. 7 - S1 (29.08.2020 - 03.09.2020) - Further downstream, Xiaowan dam in the Yunnan province of China.

[2D view](#)



The Xiaowan Dam is an arch dam on the Lancang (Mekong) River in Nanjian County, Yunnan Province, southwest China. The primary purpose of the dam is hydroelectric power generation and it supports a 4200 MW power station. Constructed between 2002 and 2010, it is the world's second highest arch dam at 292 m. It is also third highest among dams of all types behind Jinping-I and Nurek and the third largest hydroelectric power station in China. The dam's reservoir has a normal storage capacity of 15 km³

Fig. 8 - S1 (29.08.2020 - 03.09.2020) - Manwan dam in the Yunnan province of China.

[2D view](#)

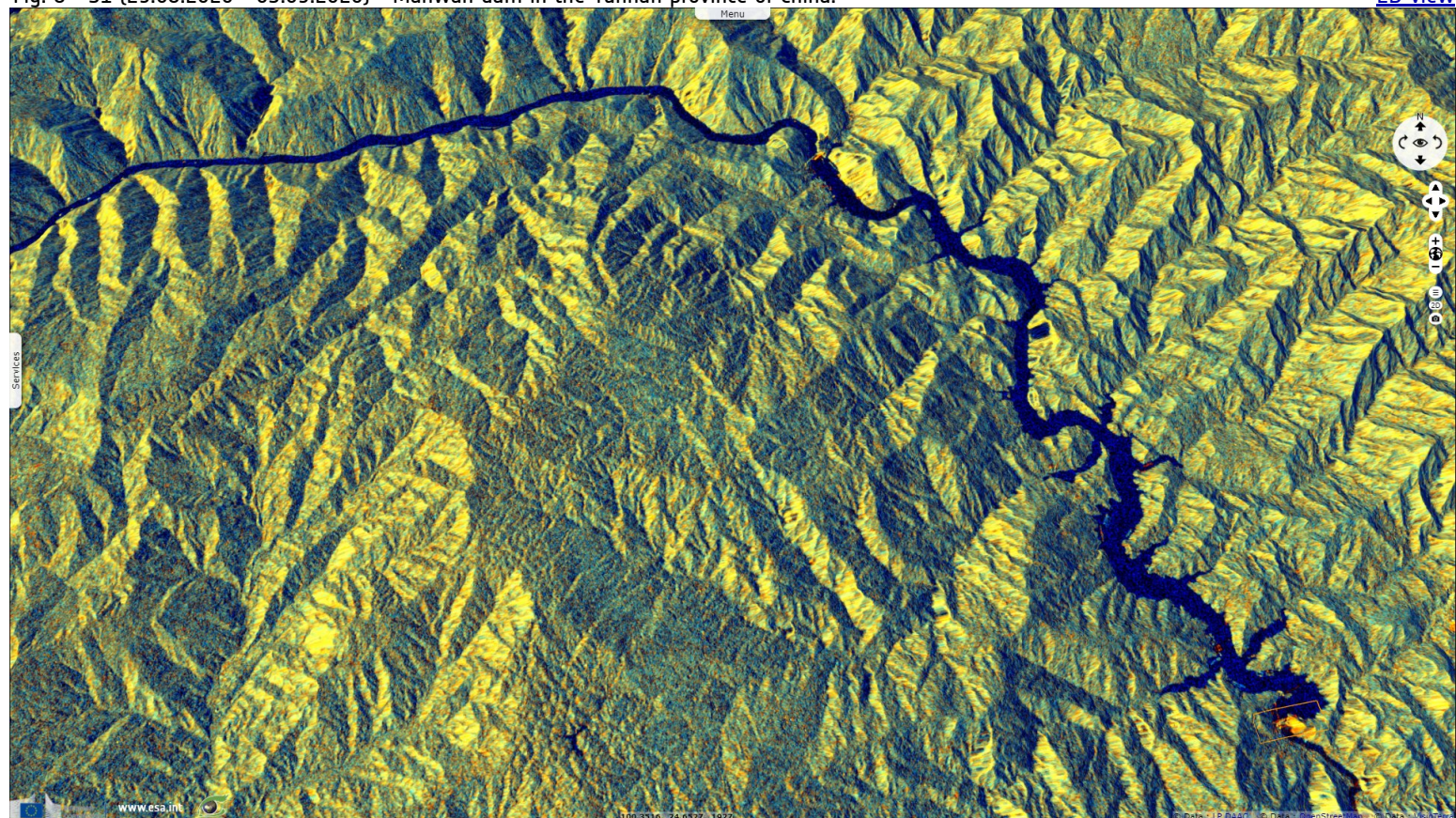


Fig. 9 - S1 (29.08.2020 - 03.09.2020) - Dachaoshan dam in the Yunnan province of China.

[2D view](#)

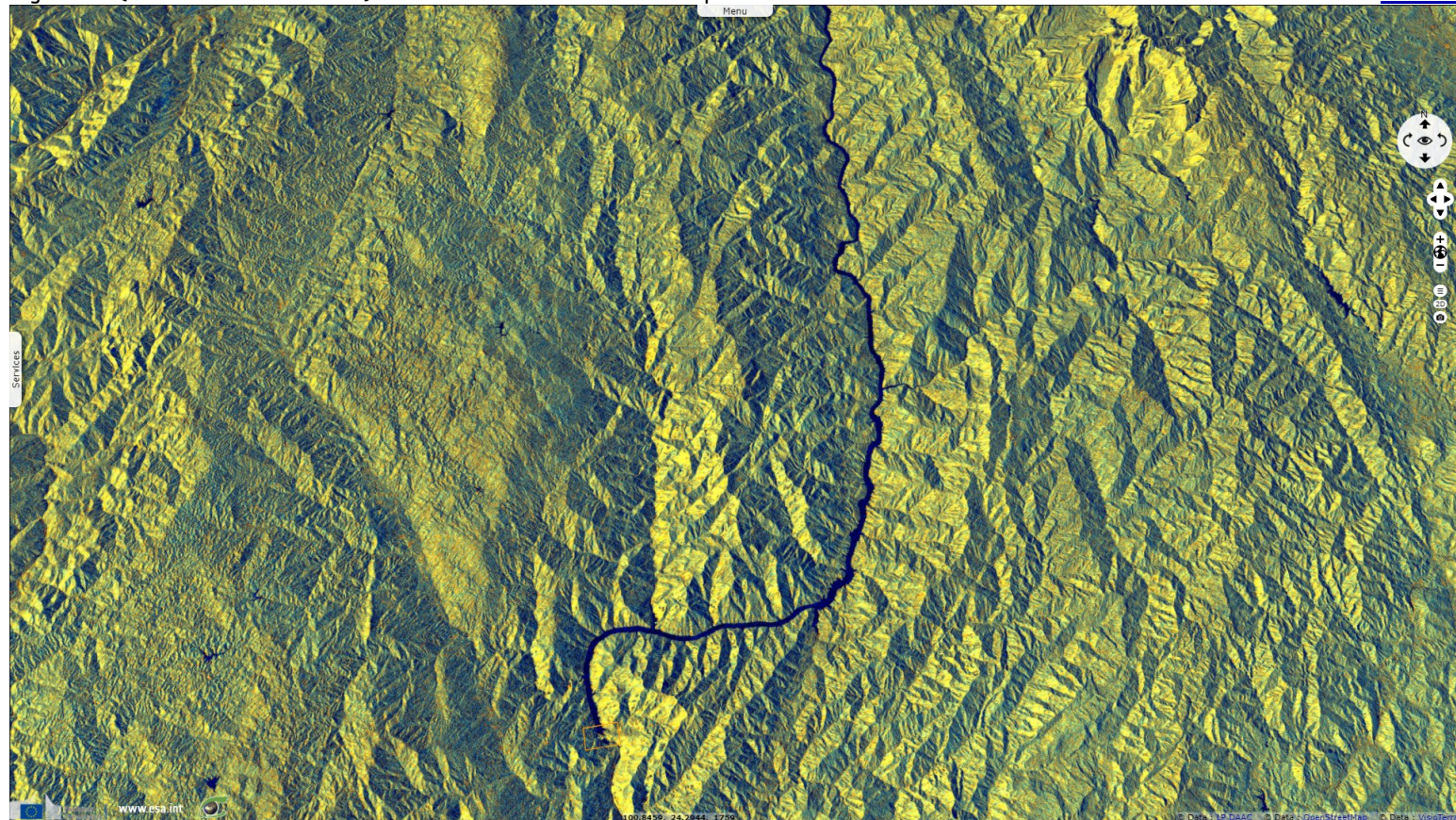
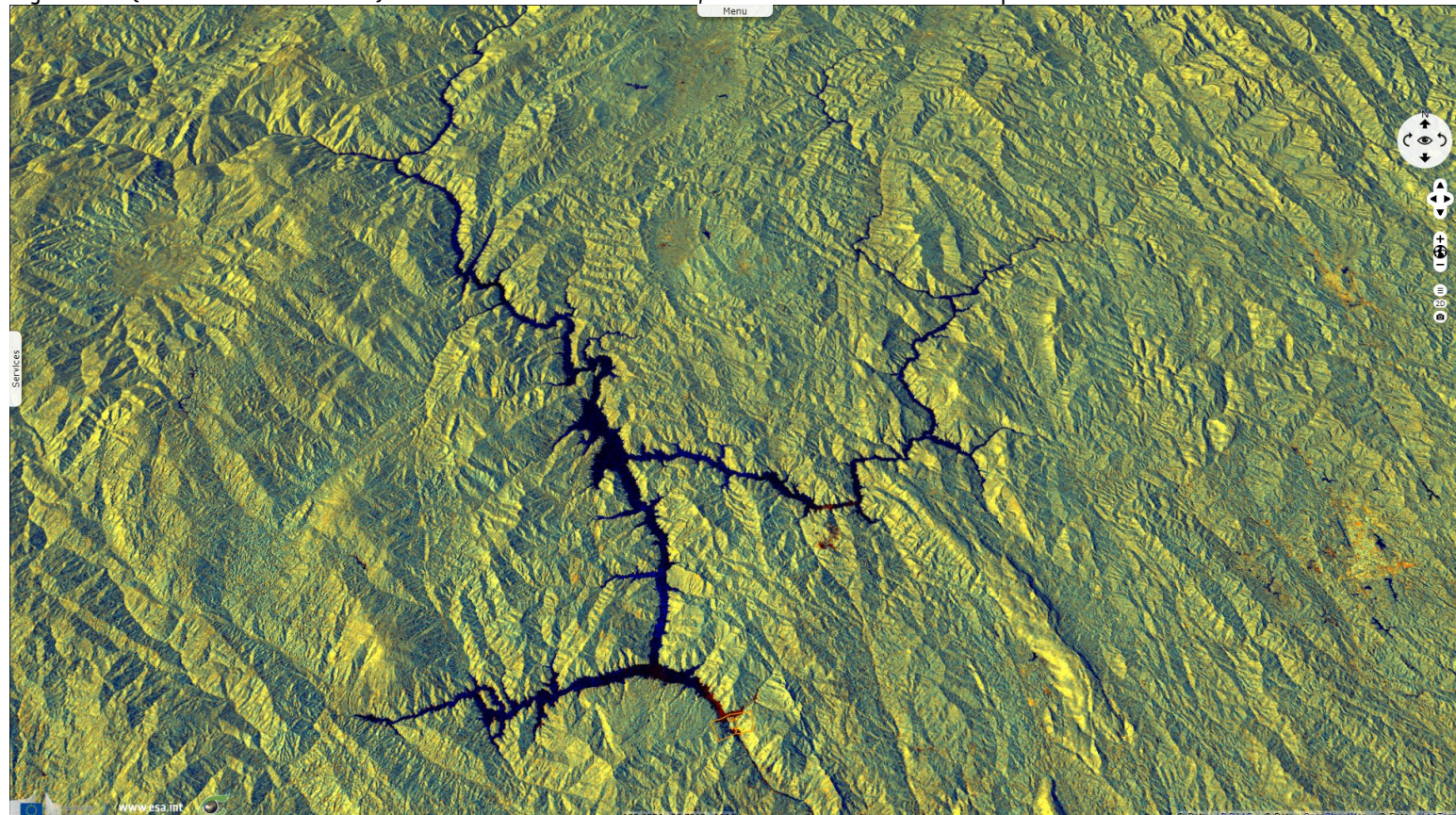


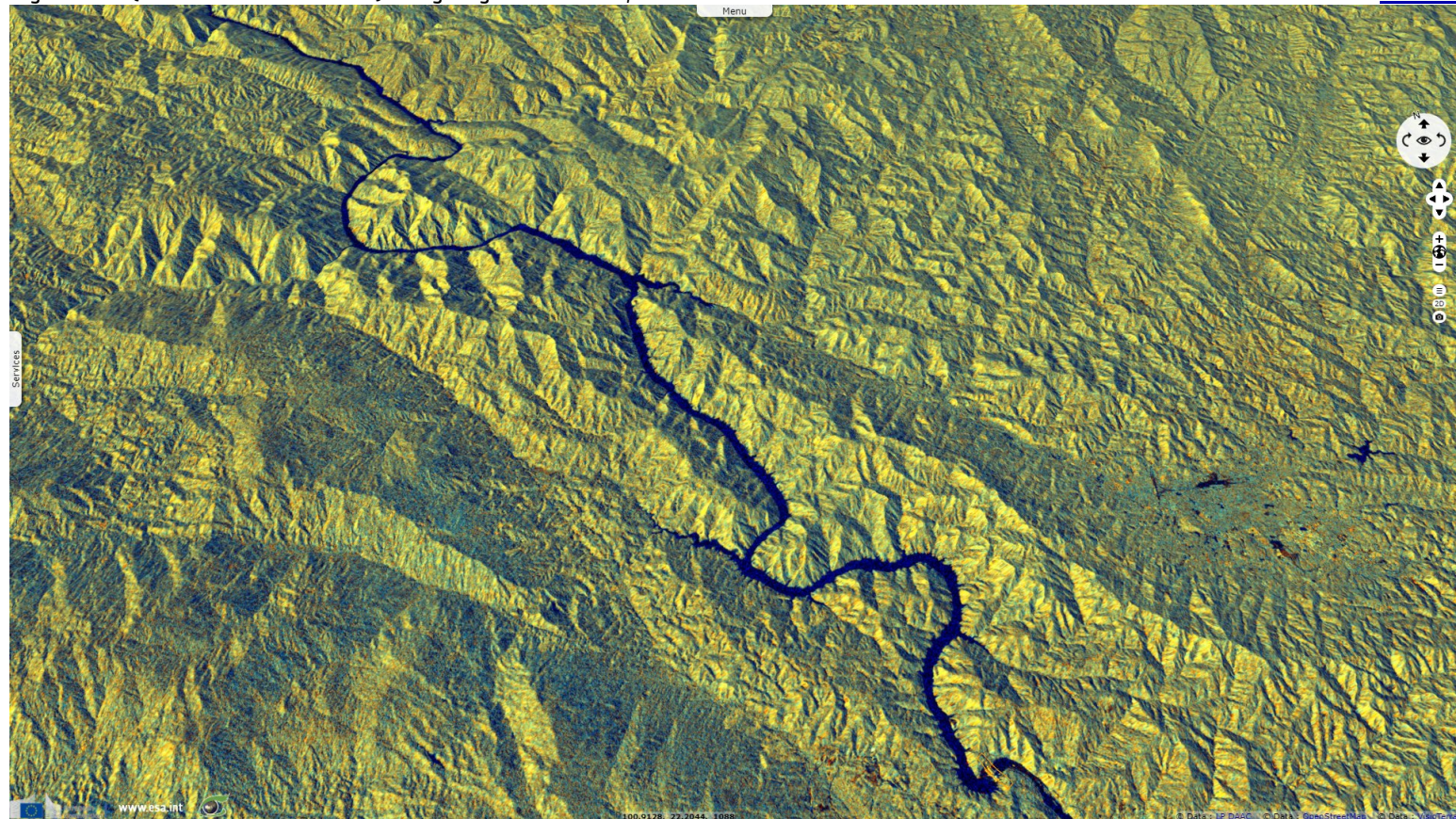
Fig. 10 - S1 (29.08.2020 - 03.09.2020) - Closer to the border with Laos, Nuozhadu dam in the Yunnan province of China.



Nuozhadu Dam is an embankment dam on the Lancang (Mekong) River in Yunnan Province, southwest China. The dam is 261.52 m tall, and creates a reservoir with a normal capacity of 222 km³ with a surface of 3202 km². The purpose of the dam is hydroelectric power production along with flood control and navigation. The total generating capacity of the power station is 58502 MW. Construction on the project began in 2004; the dam's first generator went online 6 September 2012 and the last generator was commissioned in June 2014.

Fig. 11 - S1 (29.08.2020 - 03.09.2020) - Jinghong reservoir lake, the last artificial lake before Laos.

[2D view](#)

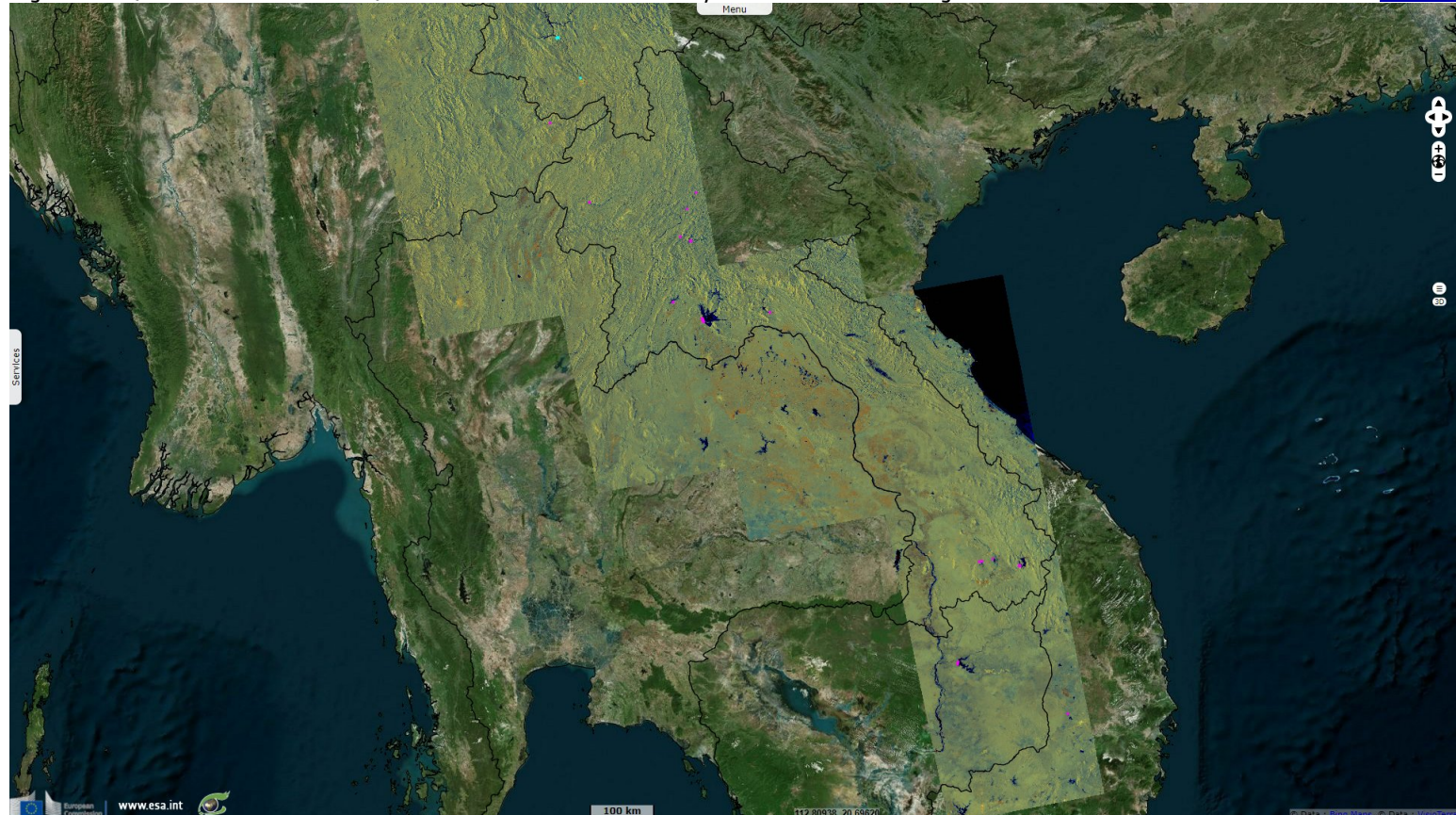


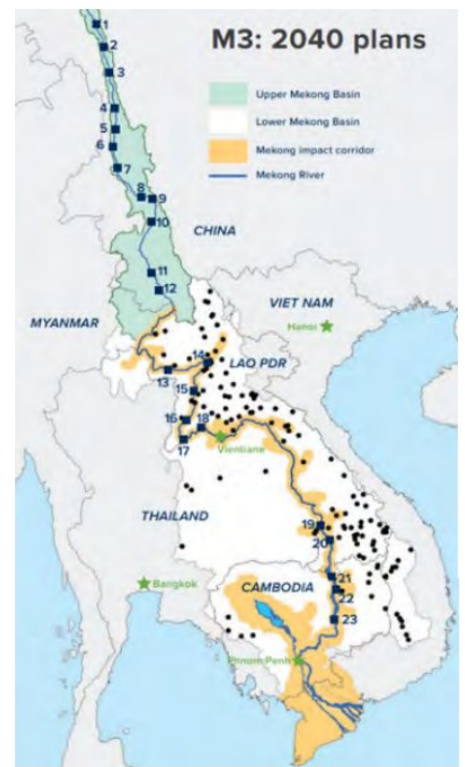
The Jinghong Dam is a gravity dam composed of roller-compacted concrete on the Mekong River near Jinghong in Yunnan Province, China. The main purpose of the dam is hydroelectric power production and it has an associated 1750 MW power station. Part of the power generated is sold to Thailand under an agreement with China. It has a capacity of 249 000 000 m³ and covers a surface of 510 km².

As of January 2020 it is the nearest Chinese dam upstream of the Thai border, and has helped to cause huge fluctuations in river levels, affecting people's livelihoods downstream by disrupting the river's natural cycle. It, along with the many other dams on the river, is exacerbating the effects of climate change and impacting the ecosystem, disturbing the migratory patterns of fish as well as riverbank plants and local agriculture downstream.

Fig. 12 - S1 (29.08.2020 - 03.09.2020) - Several of the dams financed by China are shown in magenta.

[2D view](#)





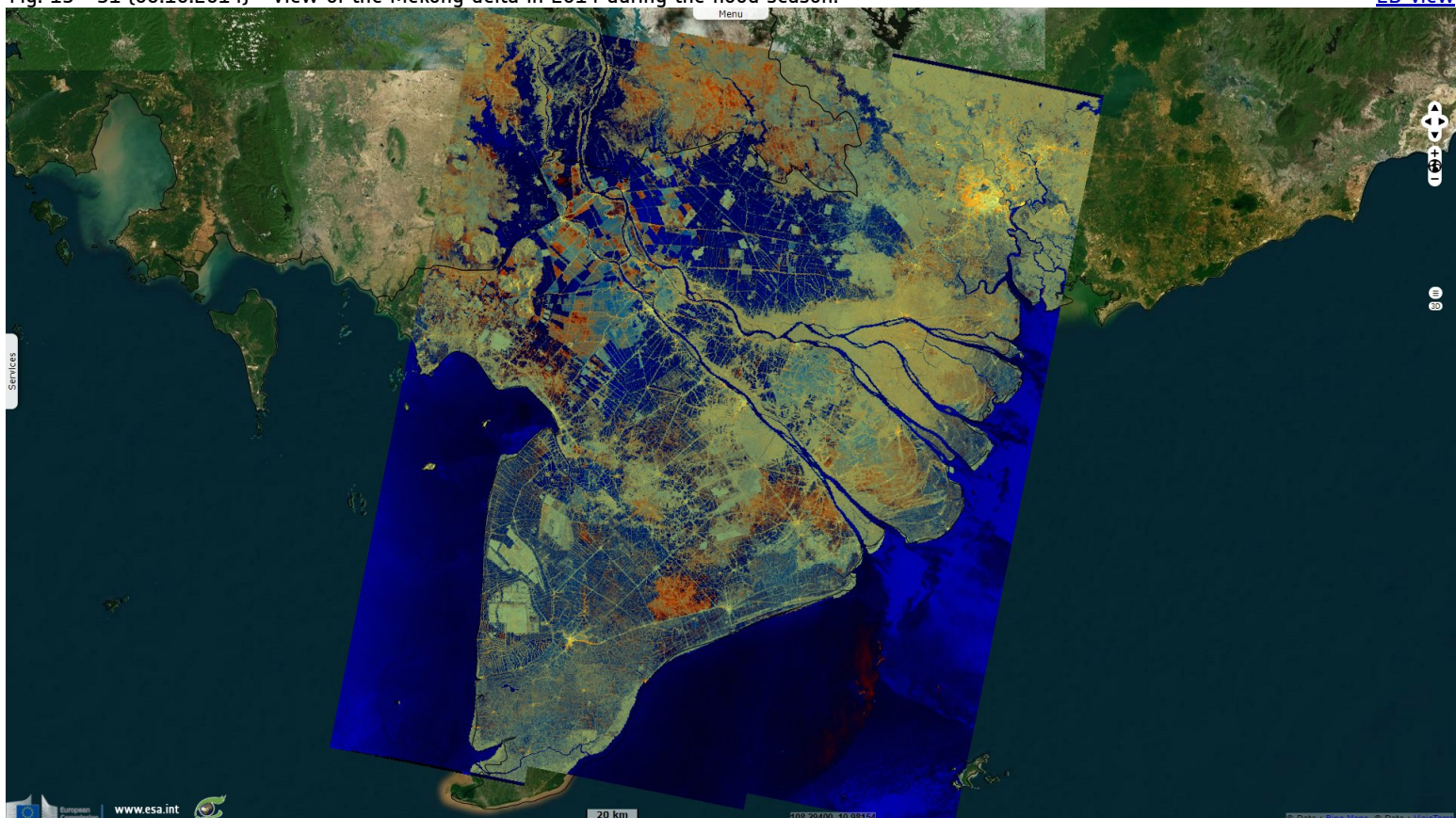
● Tributary hydropower dams ■ Mainstream hydropower dams

Hydropower dam development - Source: Annual Mekong hydrology, flood and drought report 2018 by the [The Mekong River Commission For Sustainable Development](#)

"Today, the river is rapidly changing as economic development, urbanisation and industrialisation are transforming the basin. The Mekong River contributes significantly to this growth through the opportunities it provides, including hydropower production, agriculture, fisheries, and transport and trade. However, without coordinated and effective development, the Mekong may hinder continued growth. Development pressures are also creating new challenges for the countries in the Lower Mekong River Basin. These include environmental degradation and loss of biodiversity, hydropower development and climate change with the risk of worsening floods and droughts.", [adds](#) the Mekong River Commission For Sustainable Development.

Fig. 13 - S1 (06.10.2014) - View of the Mekong delta in 2014 during the flood season.

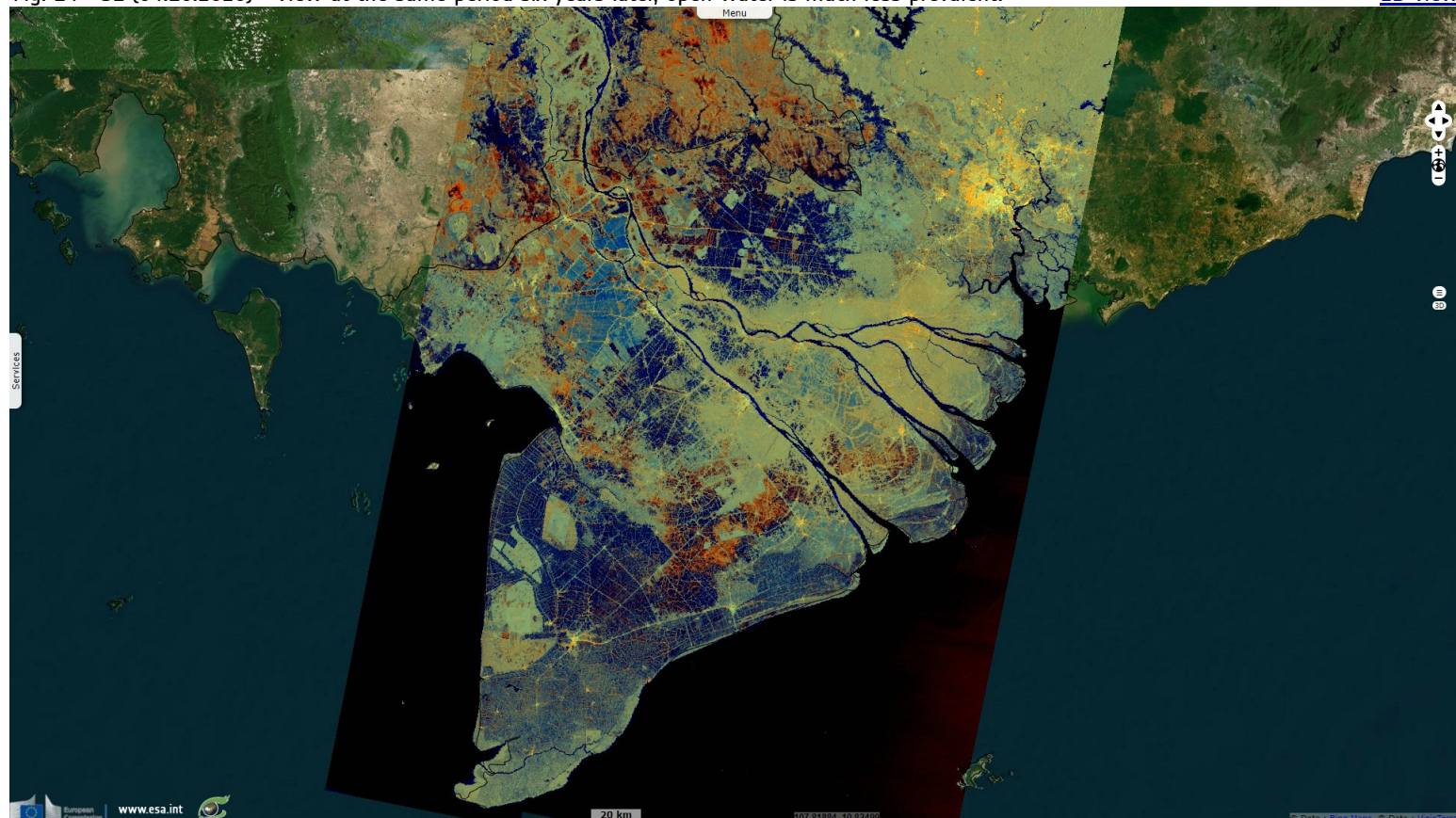
[2D view](#)



Amy Bainbridge of the Australian paper ABC News [warns](#) about the consequences of these projects: "the river is increasingly used to generate renewable energy in the form of dozens of dams for huge hydropower projects. There is growing alarm about the fate of the river's fish and the ecosystem they depend upon. Dams have been built in the upper reaches of the river in China to supply hydropower to a nation hungry for more energy. More dams have been built in Laos, for hydropower projects the Lao Government says will lift the nation out of poverty and make it the 'battery of Asia!'"

Fig. 14 - S1 (04.10.2020) - View at the same period six years later, open water is much less prevalent.

[2D view](#)



The darker curve shows the measured level of the Mekong river while the lighter filled curve shows the expected levels according to rainfalls. The correlation is decreasing sharply since 2010s with the Mekong reaching higher level in the dry season and lower level in the flood season of 2019 as the level followed a worrying trend that year - Source: [Le Monde](#).

"The Jinghong Dam is not the biggest Chinese dam but it is its lowest on the river system and the closest to northern Thailand. Environment groups say it is causing big problems for people living downstream, with China effectively controlling the flow of the river. In a region already suffering a drought, locals and conservationists said China's apparent control over water flows was creating an unfolding ecological disaster. There are growing concerns that dams in China, and further downstream in Laos, are destroying migratory fish patterns. The ABC spoke to fishermen and other locals who said the once abundant catfish were no longer seen around Chiang Khong."

*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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