

# Deadly flood after a dam failed, Andhra Pradesh, India

Sentinel-2 MSI acquired on 14 March 2021 at 05:06:51 UTC

Sentinel-1 CSAR IW acquired on 16 November 2021 from 00:31:22 to 00:32:12 UTC

Sentinel-3 SLSTR RBT acquired on 18 November 2021 from 04:24:53 to 05:04:16 UTC

Sentinel-1 CSAR IW acquired on 28 November 2021 from 00:31:22 to 00:32:12 UTC

Sentinel-2 MSI acquired on 04 December 2021 at 05:11:59 UTC

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Keyword(s): Emergency, natural disaster, rainfall, lake, dam, hydrology, flood, India



[2D Layerstack](#)

Fig. 1 - S1 (16.11.2021) - A depression brought heavy rainfall on south-east India.

[2D view](#)

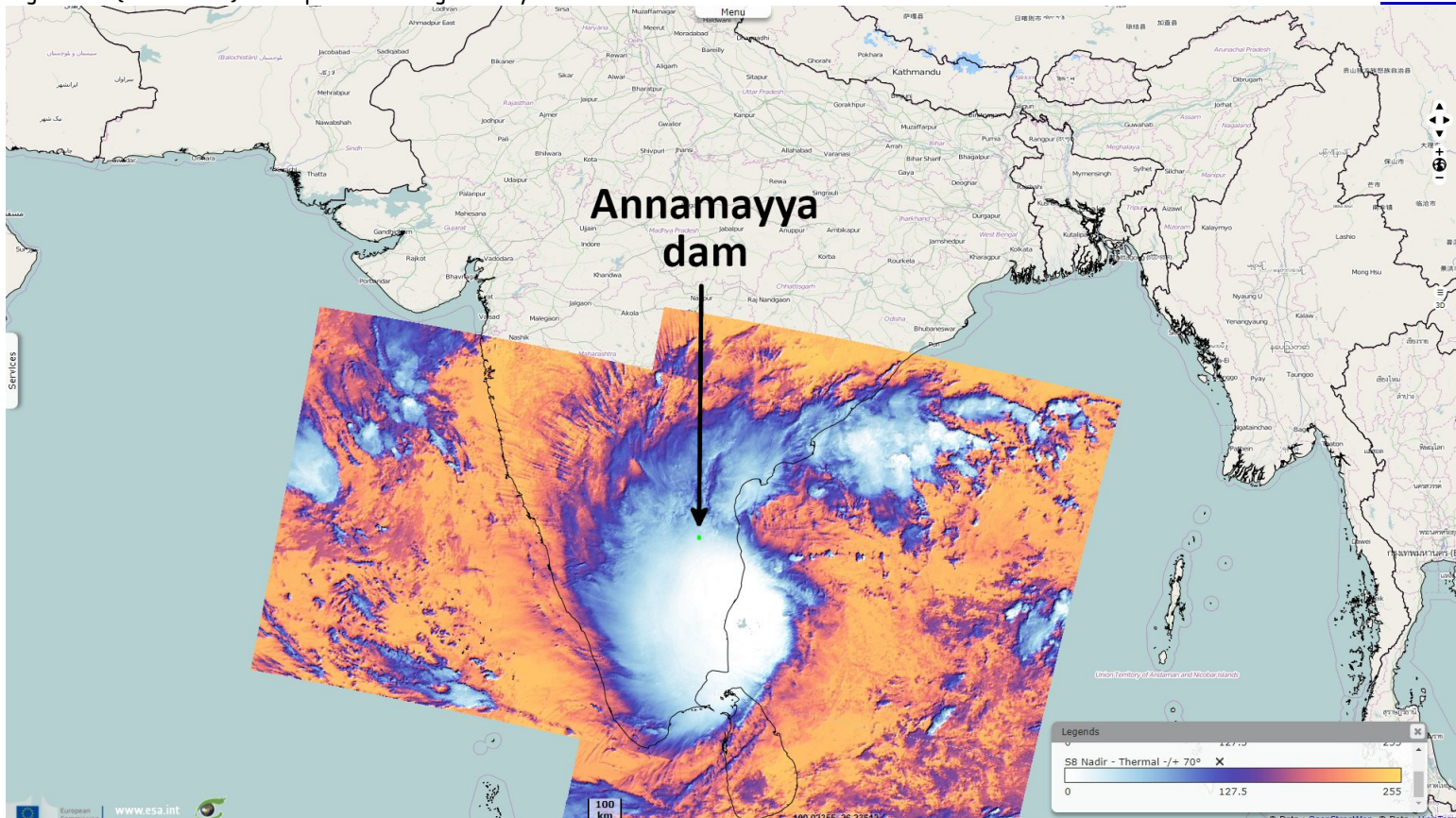


Fig. 2 - S2 (14.03.2021) - The Annamayya Project was constructed upstream of the much larger Somasila reservoir.

[2D view](#)

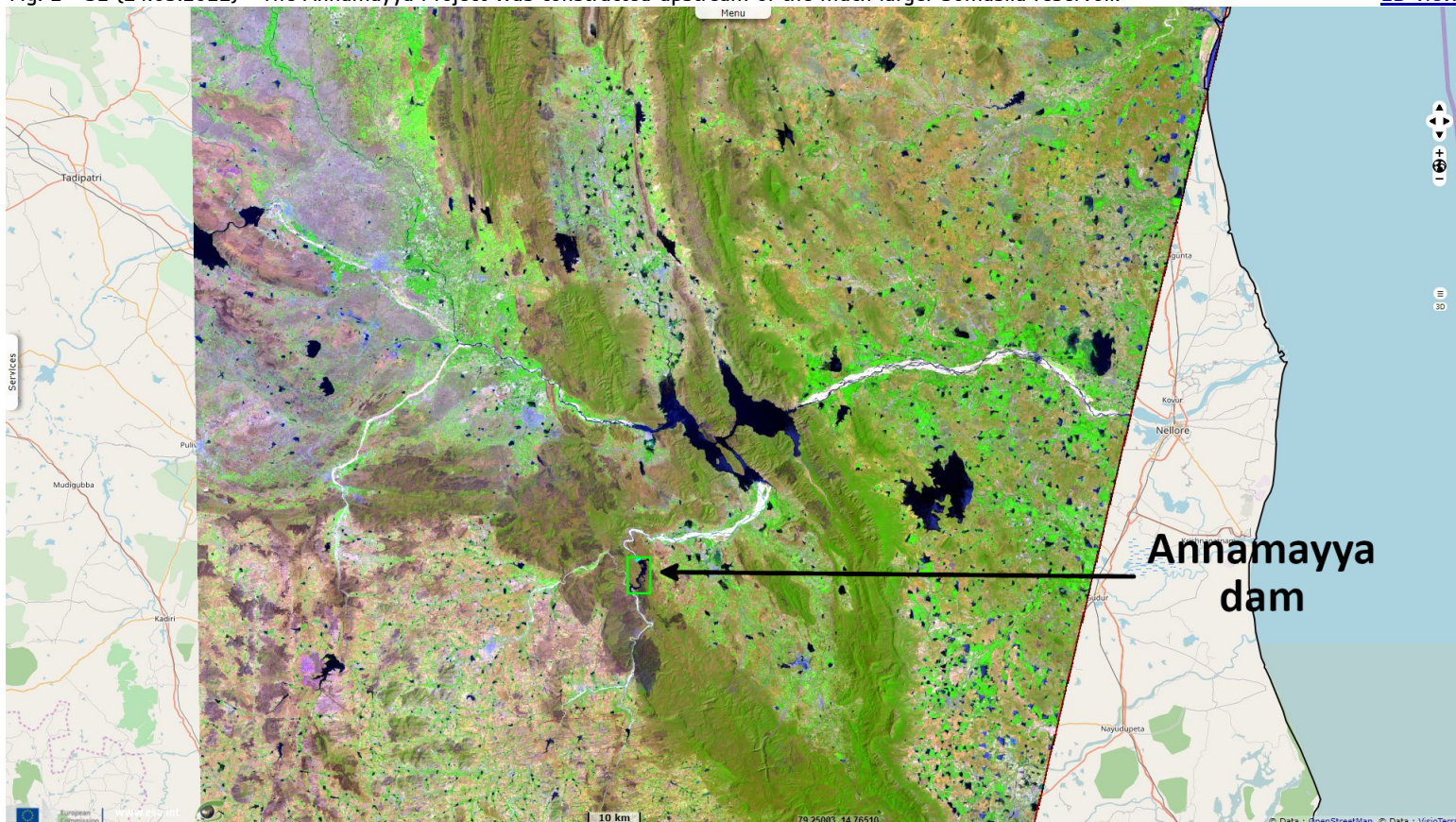
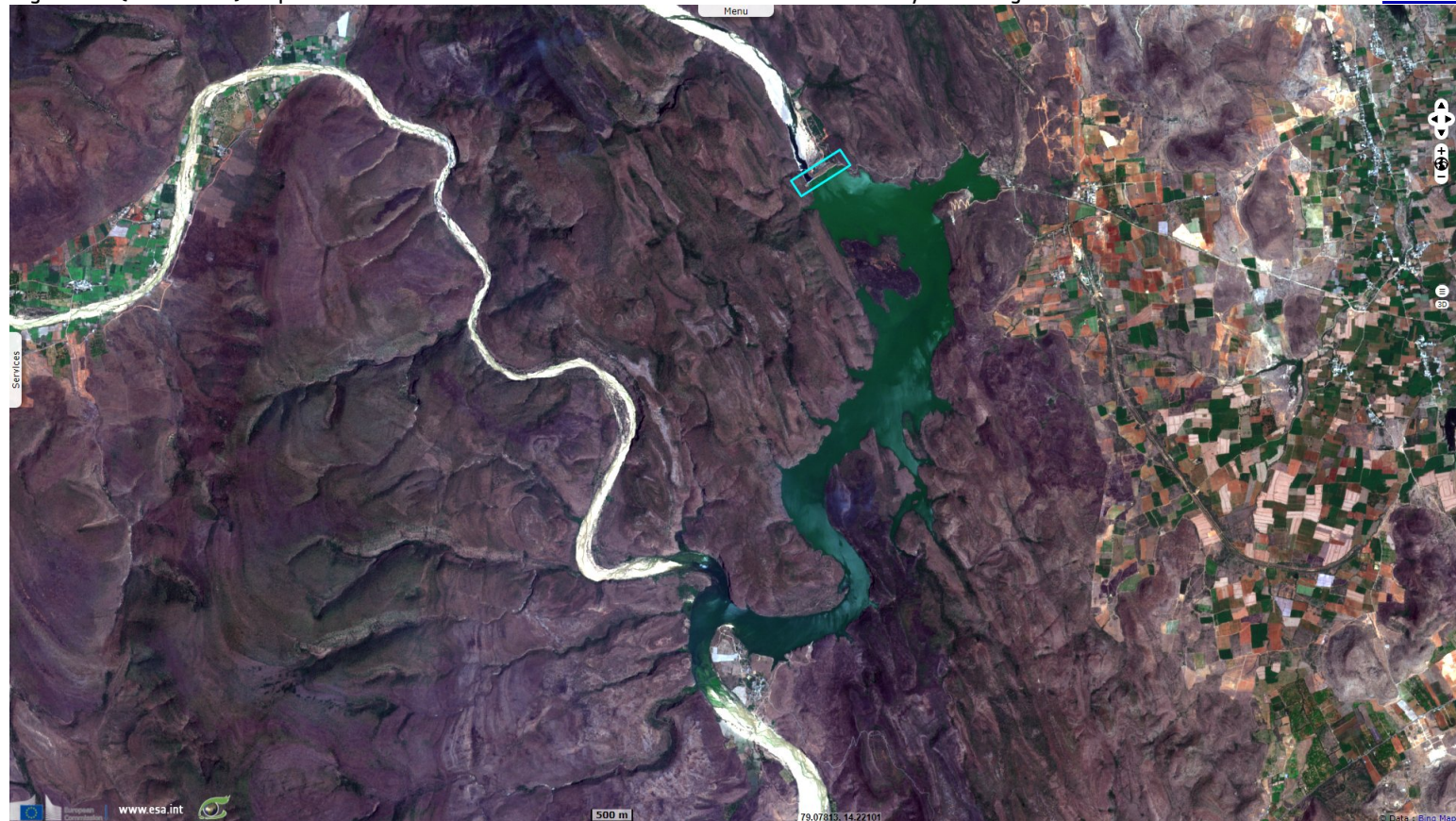




Fig. 3 - S2 (14.03.2021) - Optical view of the lake in March 2021. The dam is located in the cyan rectangle.

[2D view](#)



A depression over the southwest Bay of Bengal brought heavy rainfall to parts of Tamil Nadu, Puducherry and Andhra Pradesh in southeastern India from 16 November 2021. It caused a large flooding as documented by [Floodlist](#): "*India's Disaster Management Division (DMD) reports that at least 24 people have lost their lives after floods in the state of Andhra Pradesh that began last week.*"

Fig. 4 - S2 (04.12.2021) - Optical view of the lake after the dam failure. The lake has emptied while the upstream waters are stronger than previously.

[2D view](#)

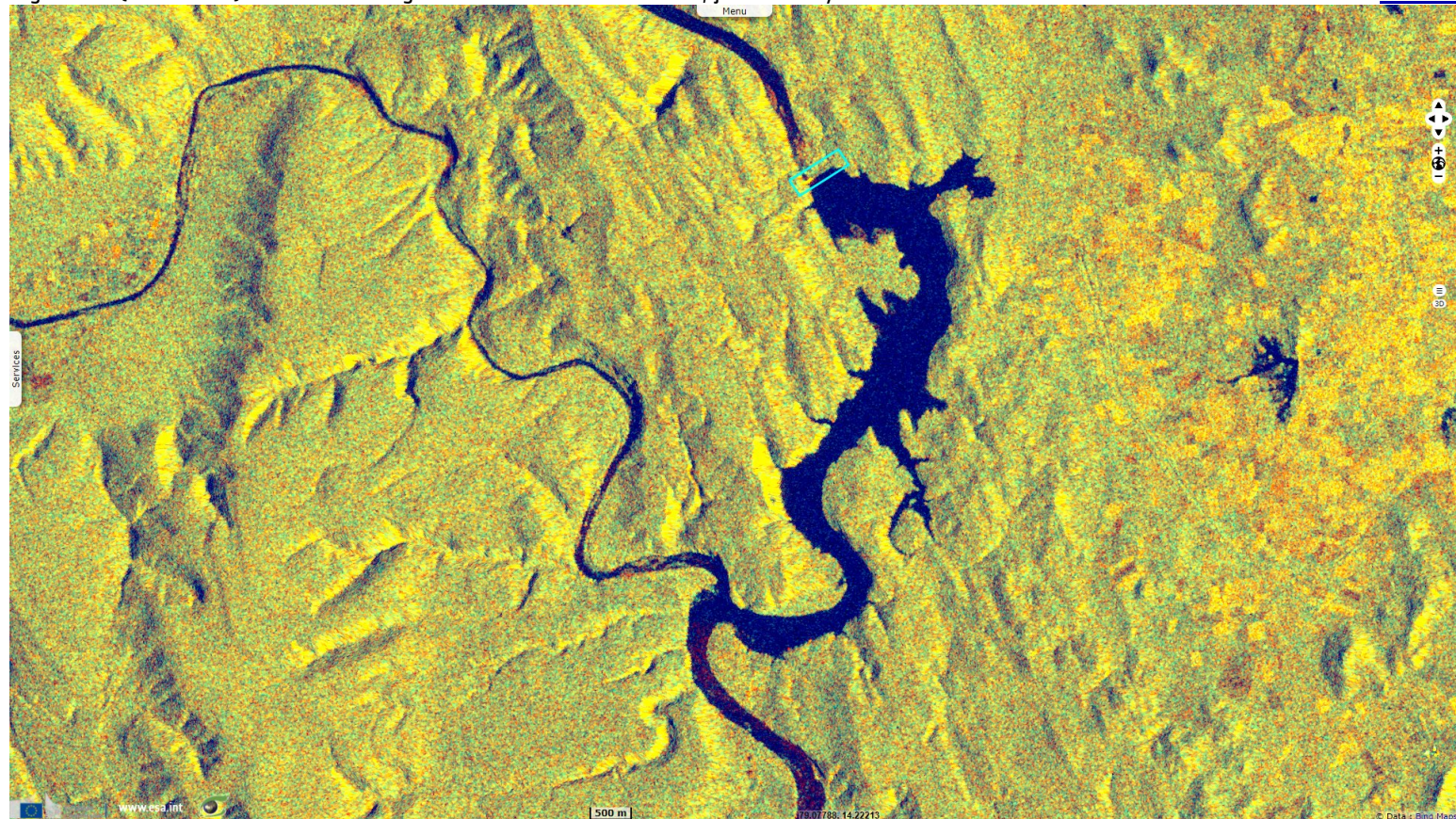


"DMD said that, as of 21 November, 24 people had lost their lives and 17 were missing. Flooding affected 36 279 people and 1366 villages across the districts of Tirupati, Chittoor, Kadapa, Anantapur and Nellore. Teams from state police, India's Navy using helicopters and National and State Disaster Response Forces have rescued hundreds of flood victims. Over 2000 houses have ben damaged and 31 827 people displaced and moved to 13 relief shelters."



Fig. 5 - S1 (16.11.2021) - Last radar image of the lake before the storm, just two days later.

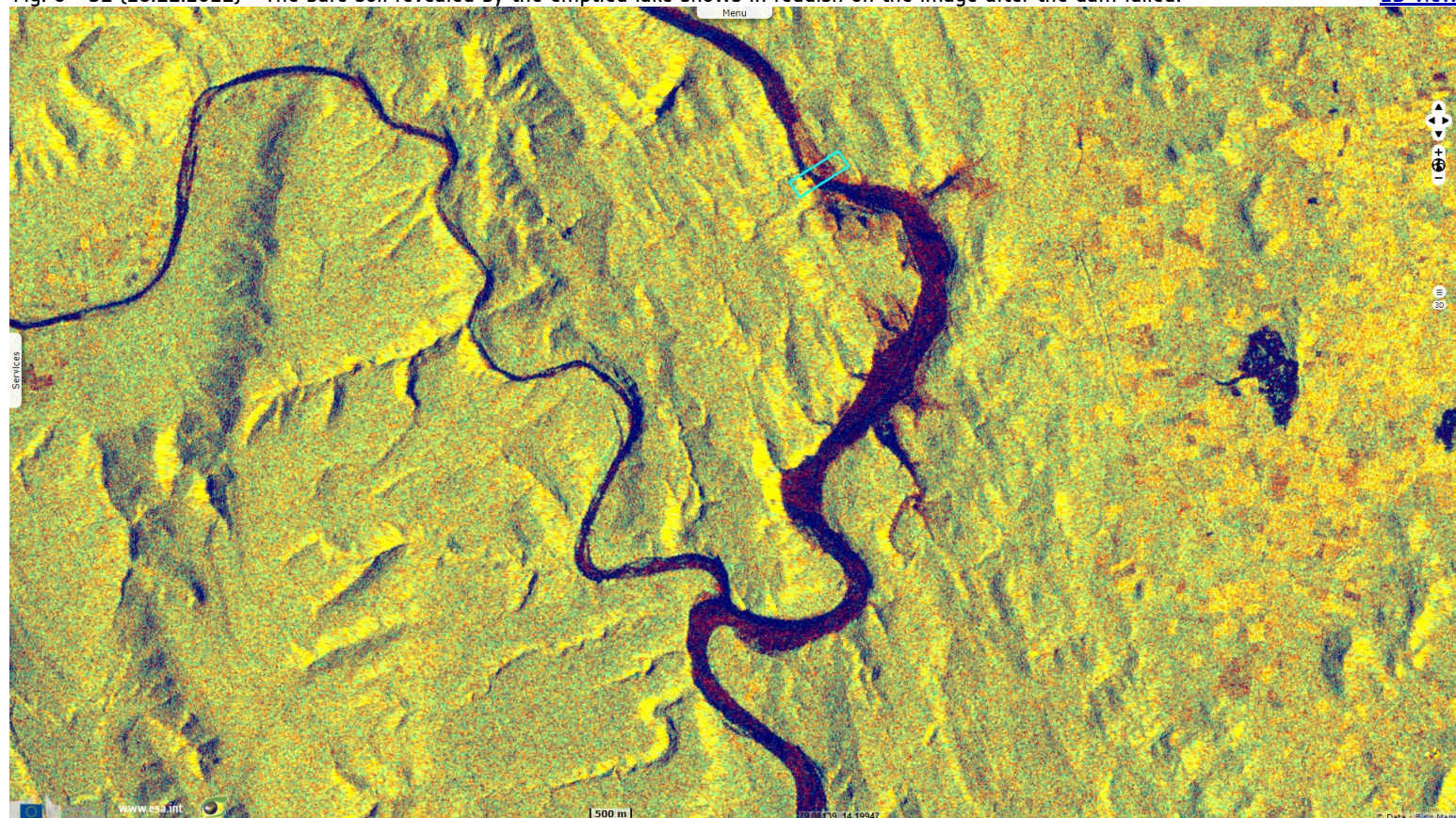
[2D view](#)



"Some of the worst of the flooding was a result of the failure of the earthen dam of the Annamayya project on the Cheyyeru river near Badanagadda village in Kadapa District." The Annamayya Project was constructed across the Cheyyeru river which is a tributary to the Pennar river. "The project is located near the Badanagadda village, Rajampet Mandal, Kadapa District. DMD said that following huge rainfall from 18 November 2021, heavy inflows caused severe damage to the dam, washing parts of it away on 19 November. At least 15 people died in the flooding downstream, with many more missing."

Fig. 6 - S1 (28.11.2021) - The bare soil revealed by the emptied lake shows in reddish on the image after the dam failed.

[2D view](#)



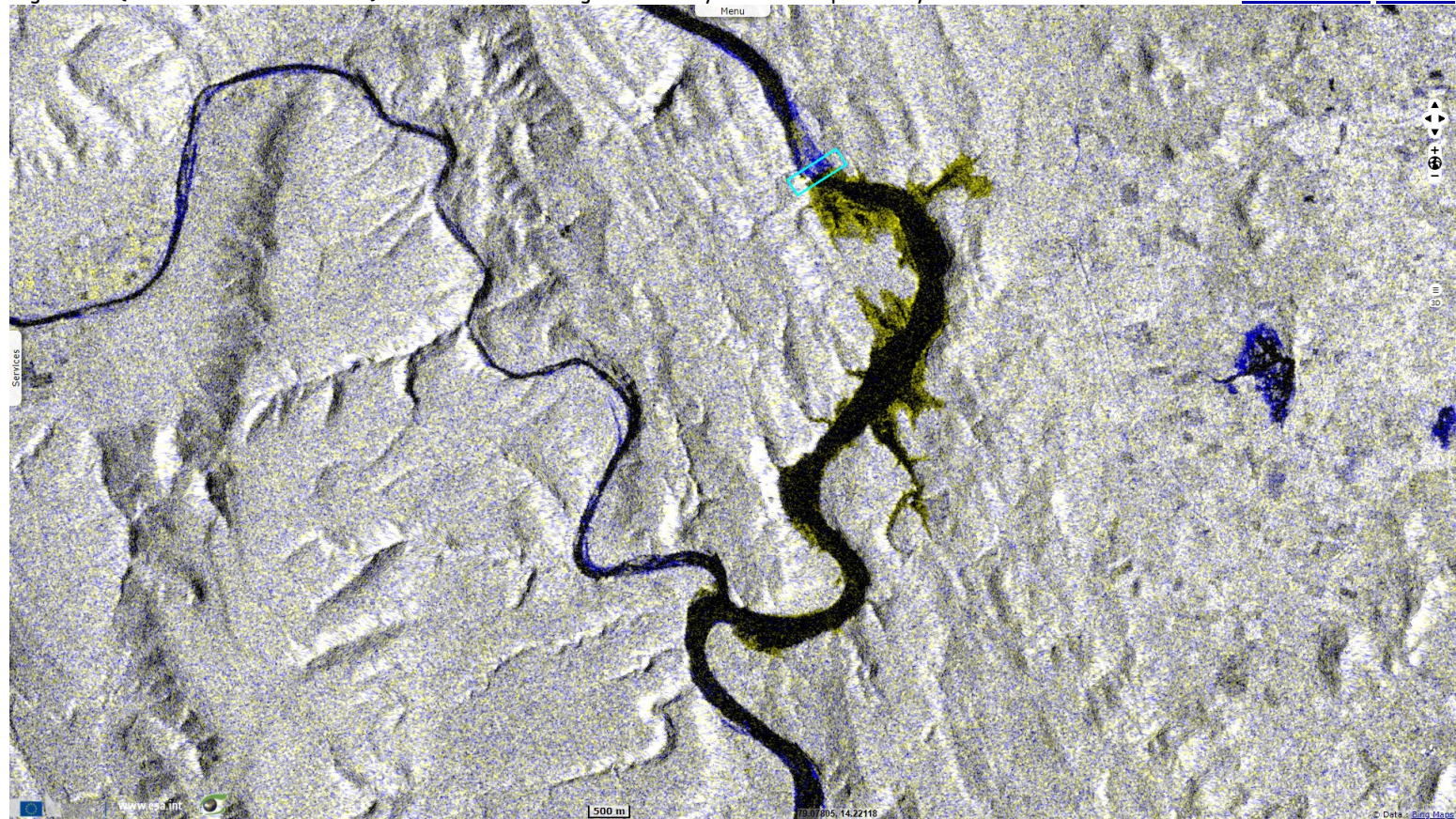
A local newspaper [relates](#): "The flash flood caused due to a breach of the project's earthen bund caught at least 18 people in a watery grave and left many others missing in these villages. A sudden gush of about 200 000 cubic meters / sec of floodwater on Friday, with the level reaching up to 3m height, caught the villagers unawares and scampering for their lives.

Tens of houses in these villages downstream the project were reduced to rubble. The villagers lost everything, except the clothes on their person. Crops in hundreds of acres stood destroyed. Tens of cattle heads were washed away. Nothing of the household items was left as the deluge gulped them."



Fig. 7 - S1 (16.11.2021 & 28.11.2021) - This multitime image shows in yellow areas previously underwater.

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



In blue, one can see areas that were overflowed by excess water, upstream and downstream of the collapsed dam.

Fig. 8 - S2 (14.03.2021) - Focus on Annamayya dam before the event.

[2D view](#)





Fig. 9 - S2 (04.12.2021) - The dam has been swept away, only the western part remains, muddy waters now go through unstopped.

[2D view](#)



Fig. 10 - S1 (16.11.2021) - Last radar image of the dam structure.

[2D view](#)

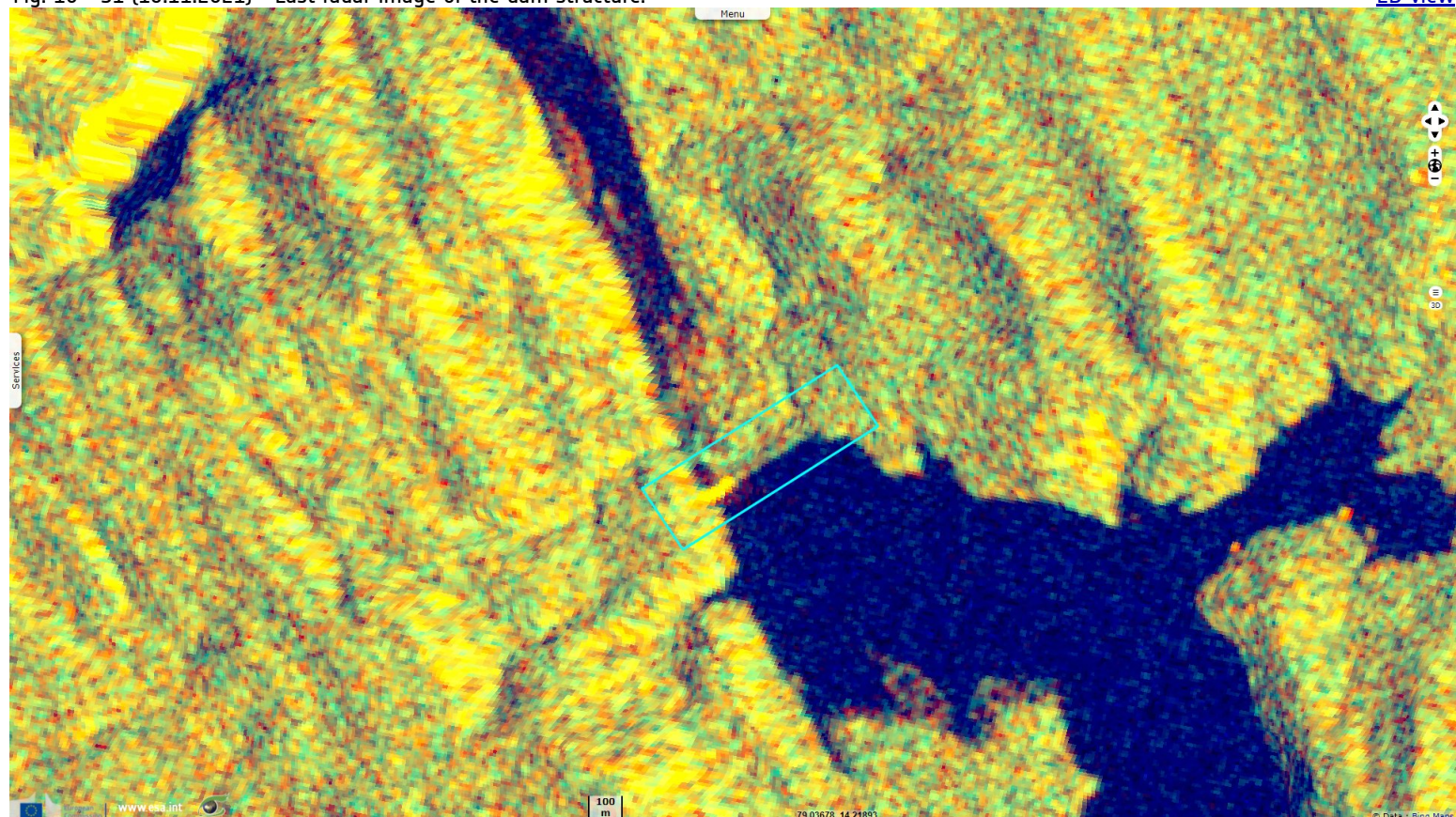




Fig. 11 - S1 (28.11.2021) - A patch of land downstream has also been revealed behind the eastern section of where the dam stood.

[2D view](#)

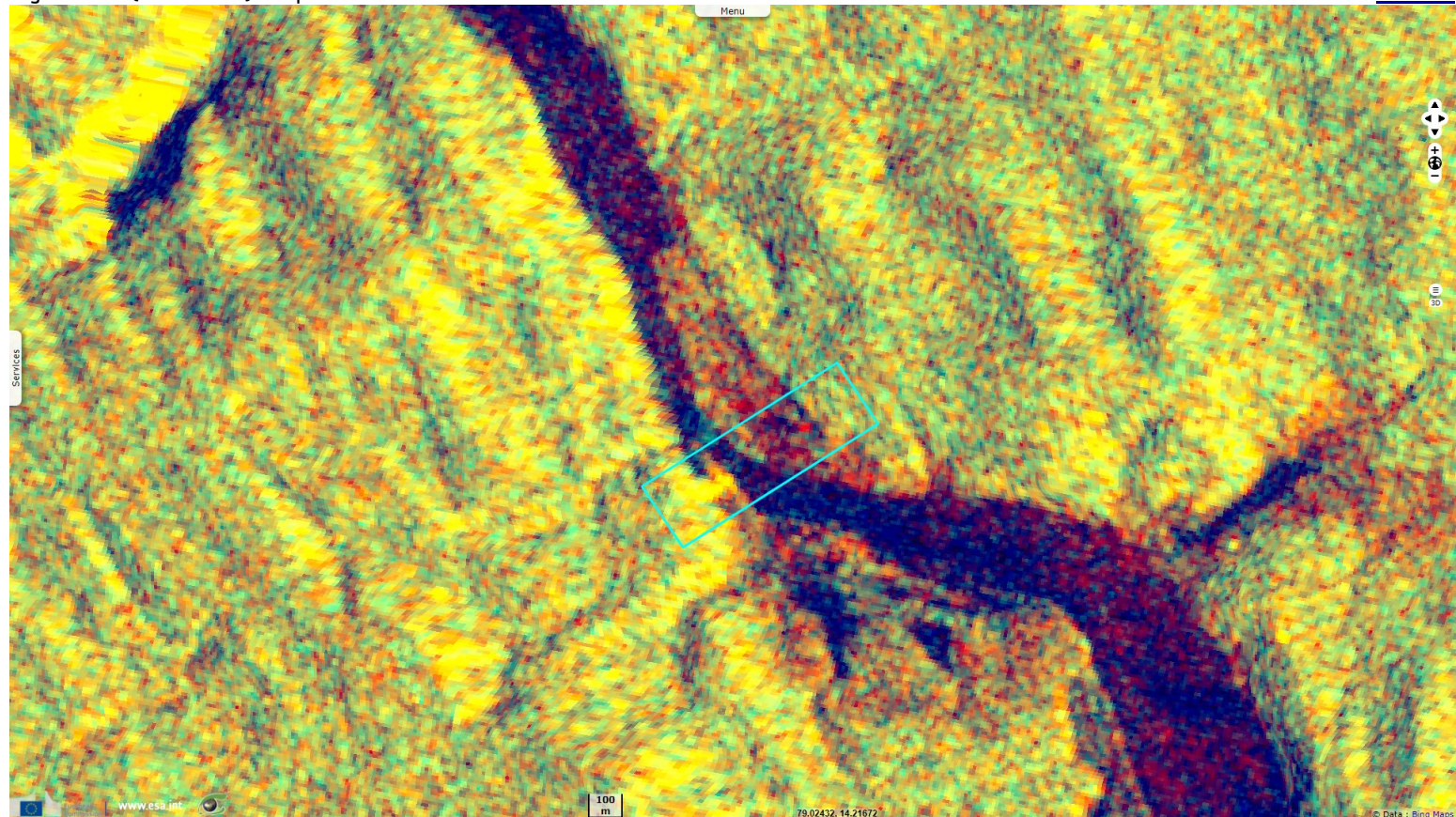
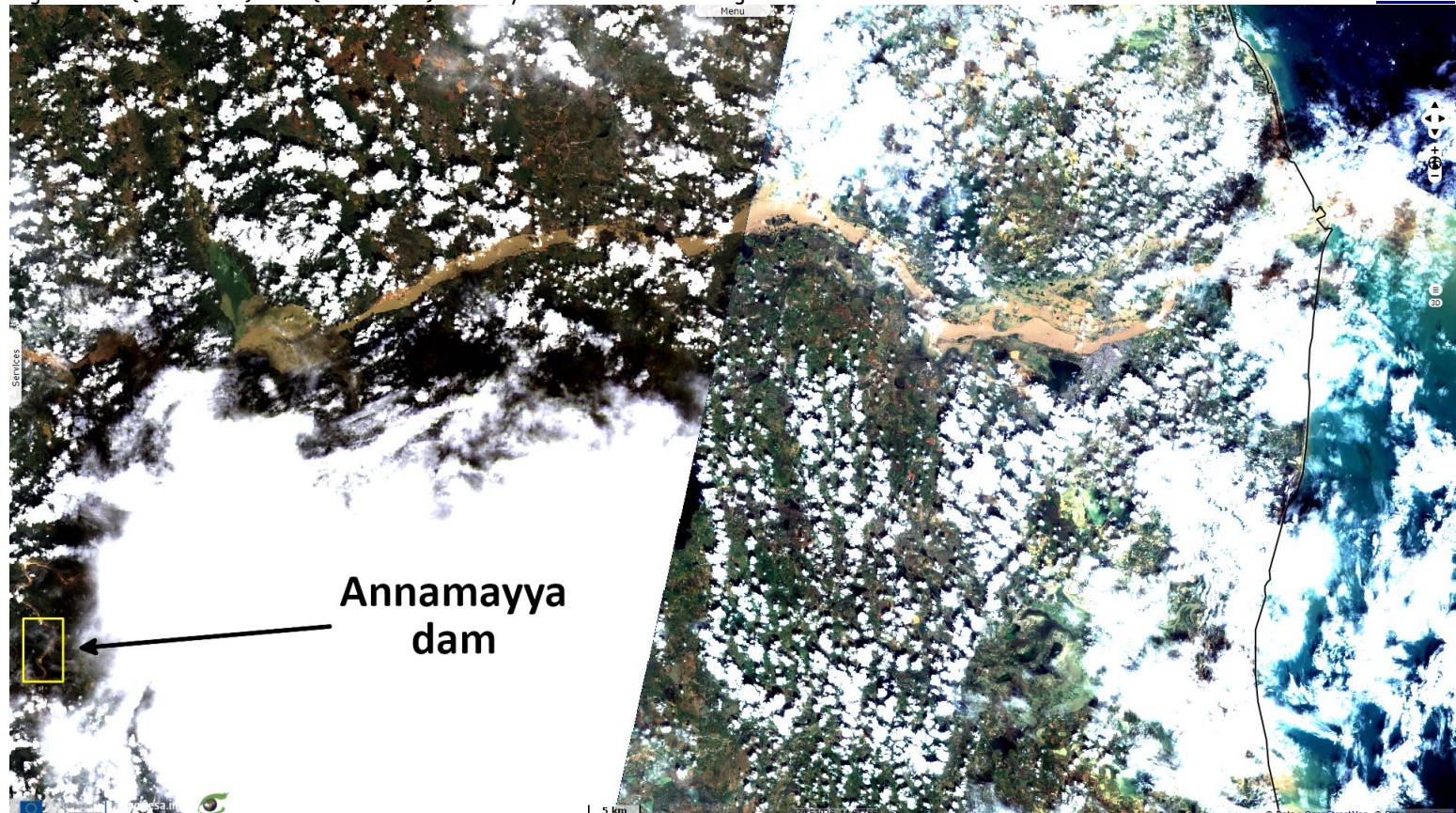














Fig. 12 - S2 (21.11.2021) & L8 (22.11.2021) - Muddy waters flooded the region downstream.

[2D view](#)



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