

Nickel mine threatens environment in Guatemala

Sentinel-1 CSAR IW acquired on 22 October 2014 at 00:05:42 UTC

...

Sentinel-2 MSI acquired on 23 October 2015 at 16:23:32 UTC

Sentinel-3 OLCI FR acquired on 15 February 2017 at 15:43:29 UTC

Sentinel-1 CSAR IW acquired on 22 June 2019 at 00:06:28 UTC

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

Keyword(s): Land, mine, natural resources, environment, pollution, air quality, water quality, agriculture, Guatemala

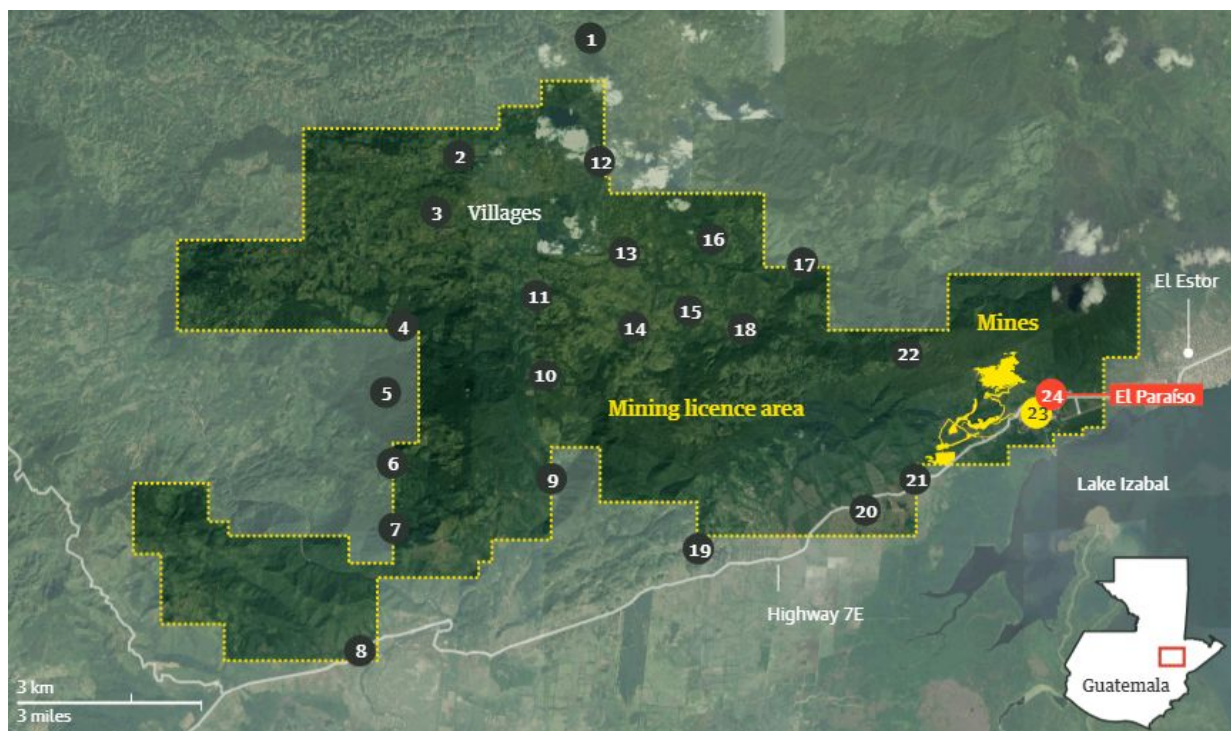
[2D Layerstack](#)

Fig. 1 - S3 OLCI (15.02.2017) - 10,6,3 natural colour - Lake Izabal is located east, near the Atlantic coast of Guatemala.

[2D view](#)



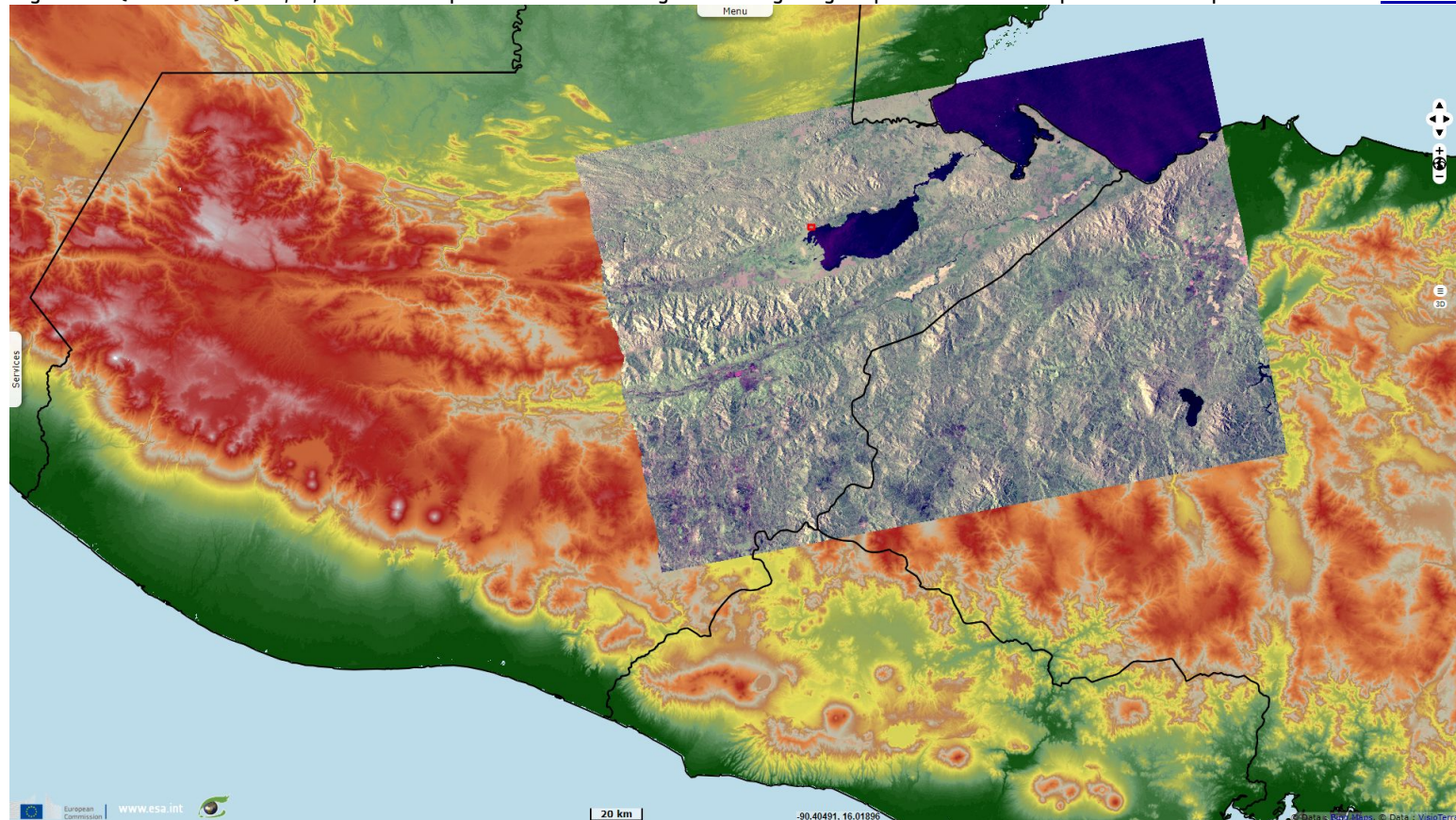
Green Blood, a consortium of 30 international media led by the French group Forbidden Stories, has come together to investigate about Fenix mine, a nickel mine located near Lake Izabal in Guatemala.



Guardian graphic. Image: Google Earth. Source: Compiled using data from the Fenix mine, El Estor municipality, and research by Prensa Comunitaria. Some of these villages do not appear on any previously published map. While every attempt has been made to ensure accuracy, the locations are approximate.

Fig. 2 - S1 (14.05.2015) - vv,vh,vv colour composite - It lies in a region where geological processes have shaped the landscape.

[2D view](#)



Juliette Garside [wrote](#) for the Guardian: "The road to Guatemala's biggest nickel mine is barely visible through a cloud of red dust, churned up by the 25-tonne trucks that thunder past loaded with ore. As the quarries expand, hundreds of families in the surrounding Mayan villages fear eviction, and the loss of the environment that sustains them. The diggers work night and day, felling trees and excavating 2.6m tonnes a year. The company's arrival created 3000 jobs. But it has also brought conflict. Many report similar problems: water shortages, problems growing crops, coughs, skin rashes and eye infections."

Fig. 3 - S2 (23.10.2015) - 4,3,2 natural colour - El Estor lies next to Fenix mine, El Paraiso settlement is even closer.

[2D view](#)



The Guardian [reminds](#) that, owing to low royalty rate, the State of Guatemala does not benefit from large revenues generated by the mine: "The opencast Fenix mine belongs to the Bronstein family and is run by their Swiss-based Solway group. Solway benefits from Guatemala's low nickel royalty rate, which is calculated at just 1% of all the revenues made from selling the unrefined ore it digs out of the ground. Recent proposals to increase rates to 15% were not implemented."

Fig. 4 - S2 (24.02.2017) - 4,3,2 natural colour - The northern part of the mine has been enlarged since 2015.

[2D view](#)

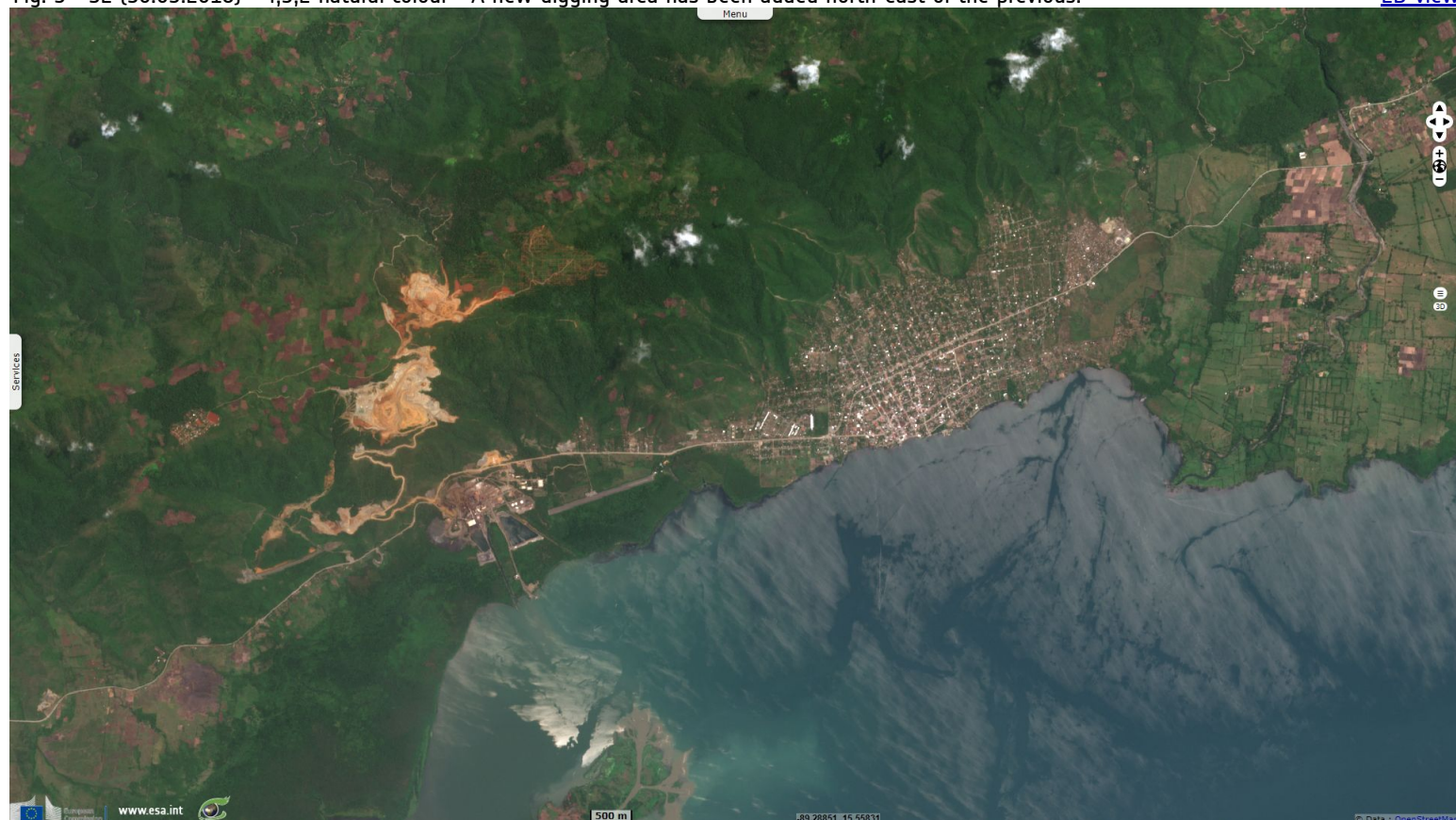


"The company says its subsidiaries comply with the law, and the price Pronico pays is pegged to the London metal exchange, where nickel prices slumped in 2015 and 2016. When nickel reaches a certain price, Solway says both of its Guatemalan subsidiaries pay "voluntary" royalty taxes of 2% to 3%.

While the media often refer to Solway as a Russian firm – many of its workers have moved to Guatemala from Russia and Ukraine – the Bronsteins describe their business, and themselves, as European. They have a small headquarters in the Swiss town of Zug, and mining interests around the world. The privately owned company is controlled by a family trust. The ownership structure is obscured by an offshore network that ranges from Cyprus to Malta, the British Virgin Islands, and St Vincent and the Grenadines."

Fig. 5 - S2 (30.05.2018) - 4,3,2 natural colour - A new digging area has been added north-east of the previous.

[2D view](#)



Le Monde [relates](#) a pollution test using an adapted sensor: "At the exit of El Estor, 5 km from the mine, the sensor warns: 'high pollution, health risk beyond a forty-eight hours exposure'. At 3 km from the mine, the level of pollution goes to 'very high', 'exposure limited to twenty-four hours'. At 1 km, it panics: 'maximum risk, do not stay exposed more than one hour.'"

Yet, no panel warns of health risk. On the road wrapped in a sticky orange cloud of dust dust, maintained by the passage of trucks, workers work without a mask and with bare hands. 'The children are coughing, we have red patches on the body. We can not help it, we live here,' says a group of women from a village close to the mine. 'The long-term impact is worrying,' says Anibal Coti, director of a medical center in El Estor. We already have chronic bronchitis, asthma, pneumonia.'

Given to Prensa Comunitaria to establish statistics for one month, the air sensor confirmed the existence of a constant and abnormal pollution, in a city with no other industrial activity than the mine: during peaks of pollution, the concentration of coarse particles is six times higher than the WHO recommendations of 300 PM10. 'These are the levels measured in China during major episodes of pollution,' said Boris Quennehen, air specialist of the French start-up Plume Labs.

The chimneys spew red smoke - the pollution filters are removed to save money on maintenance, according to concordant sources."



Left: Red smoke rising from the Fenix refinery - Source: Forbidden Stories.

Right: Trucks near the mine - Source: Forbidden Stories.

Fig. 6 - S2 (20.04.2019) - 4,3,2 natural colour - A new development of Fenix mine complex has started in the south-west.

[2D view](#)



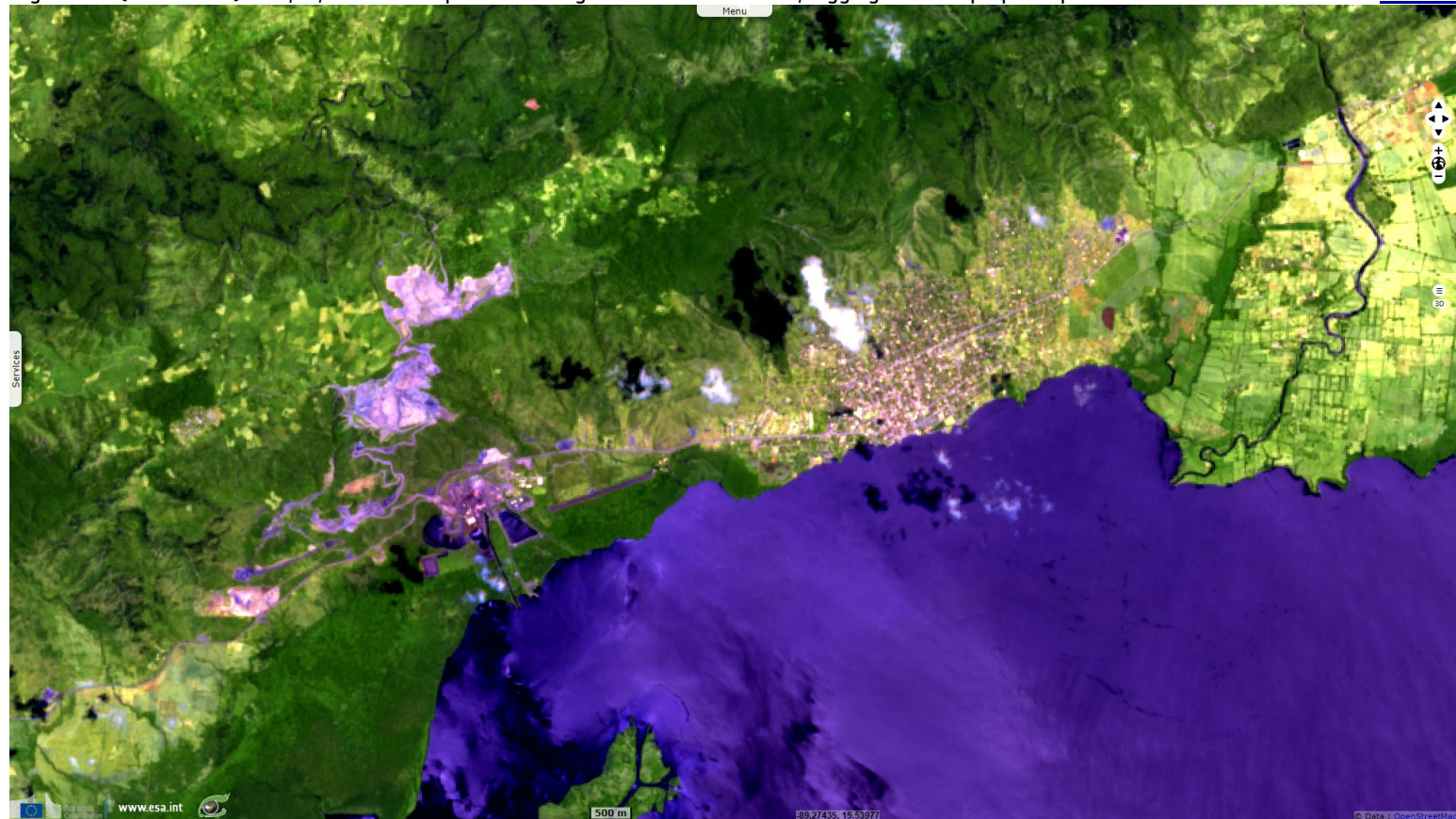
According to [The Guardian](#), "A recent water analysis obtained by Prensa Comunitaria for this investigation raises fresh questions. Produced by Amasurli, the government-funded agency for the sustainable management of the Izabal basin, it concludes the lake is undergoing "eutrophication" – an excessive richness of nutrients leading to overgrowth of plant life.

In 2018, nitrite salts were 54 times higher than the "regular" (safe) level, and phosphates were twice as high. The results for 2017, the year of the red stain, are missing. Amasurli's explanation is that monitoring was "not realised" that year. What causes the eutrophication? The report concludes this is due to agriculture and sewage. Independent experts agree with this. A 2019 chart for 11 water quality monitoring stations shows the highest levels of nitrites and phosphates were found at the mouths of two canals that connect with the refinery.

One is an entry canal, which takes water from the lake to cool the furnaces. The other is an exit canal, built to take water back to the lake. No one has an explanation for the results from the canals. Solway insists it does not use nitrites or phosphates in its processes. It says its exit canal has been closed since the refinery reopened in 2014."

Fig. 7 - S2 (20.04.2019) - 12,11,4 colour composite - Storage basins show in blue, digging areas in purple & pink.

[2D view](#)



Le Monde [interviewed](#) other sources about these results: *"This coloring is not natural. We can talk about ecological disturbance, argues Lucas Barreto Correa, a Brazilian biologist. All existing analyzes show characteristic elements of mining activities. The official discourse presents inconsistencies."*

In August 2017, the fishermen had had two German laboratories analyze samples of water taken from the canal adjacent to the mine, which empties into the lake. The table prepared by one of them had shown nickel contamination, with a level of concentration 600 times higher than the thresholds set by WHO.

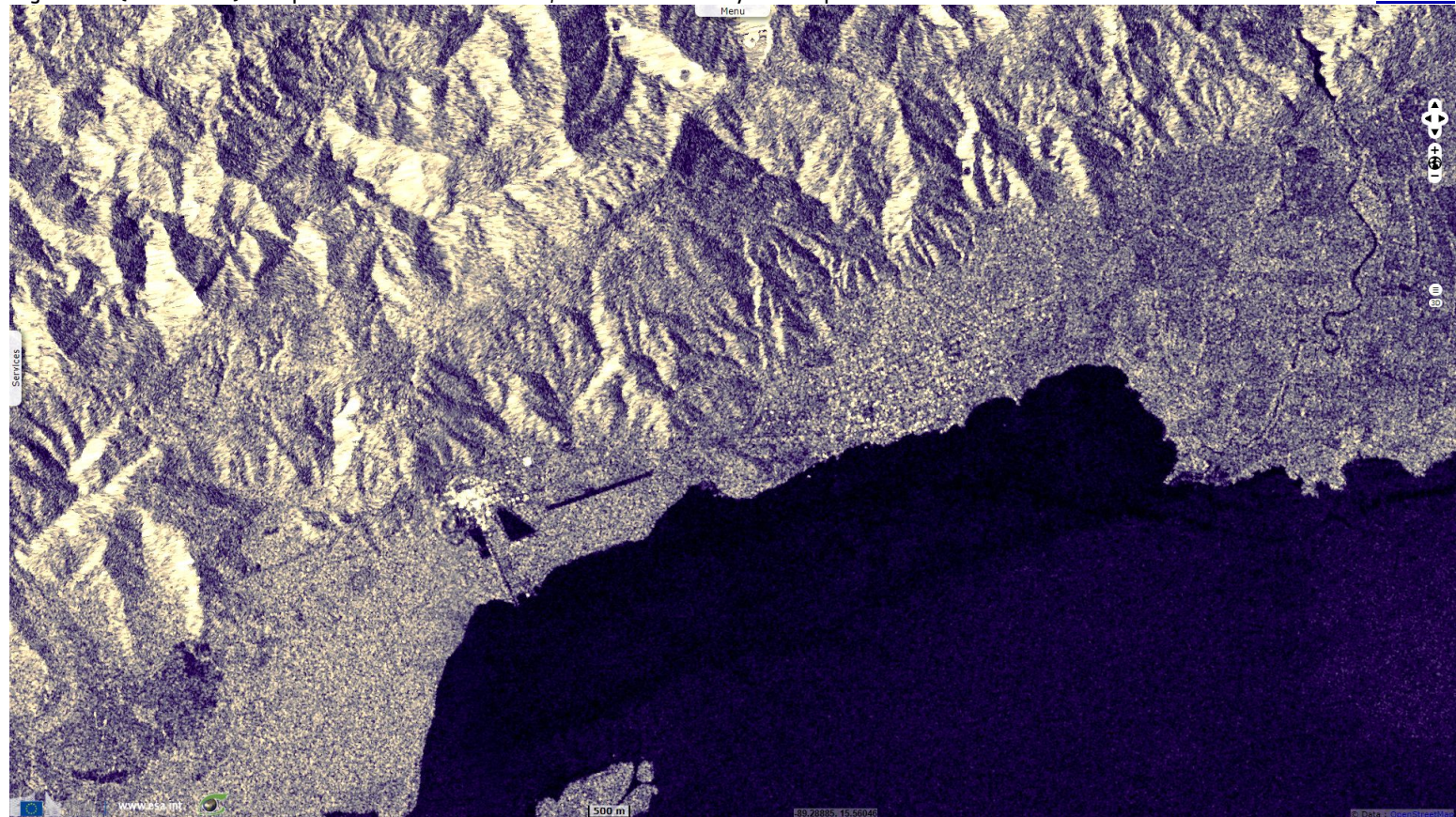
For Forbidden Stories, the Portuguese expert Eduardo Limbert, for his part, examined the available studies: 'There is fairly strong evidence that the mine and the plant are contaminating the lake, he says. Government information does not provide evidence that the lake's red stain was caused by a proliferation of microalgae.'



Left: The red stain on Lake Izabal in 2017 - Source: [Carlos Choc](#).
Right: A child with a skin rash in El Paraíso settlement - Source: [Juliette Garside](#).

Fig. 8 - S1 (22.10.2014) - vv polarisation - Back in 2014, the mine had not yet reshaped the mountain.

[2D view](#)



The Guardian article also deals with [the impact of the mine on agriculture](#) which used to feed many of the villagers: "Juan Putal May, 52, lives in Semuc, inside the licence area. The principal spiritual guide of his village, he was born and raised here. In recent years, he has noticed changes. 'Areas that were once humid and green are now dry and bare. It doesn't rain as much. Agriculture, it's over.' Ten years ago, a single 'task' or plot would produce 30kg of corn. Today it takes 16 plots to harvest the same quantity. Chili will no longer grow; lemons shrivel on the tree."



The opencast Fenix mine, El Estor, Guatemala - Source: [Guardian](#).

Fig. 9 - S1 (14.05.2015) - vv,vh,vv colour composite - 6 months after, the radar image shows new infrastructures.

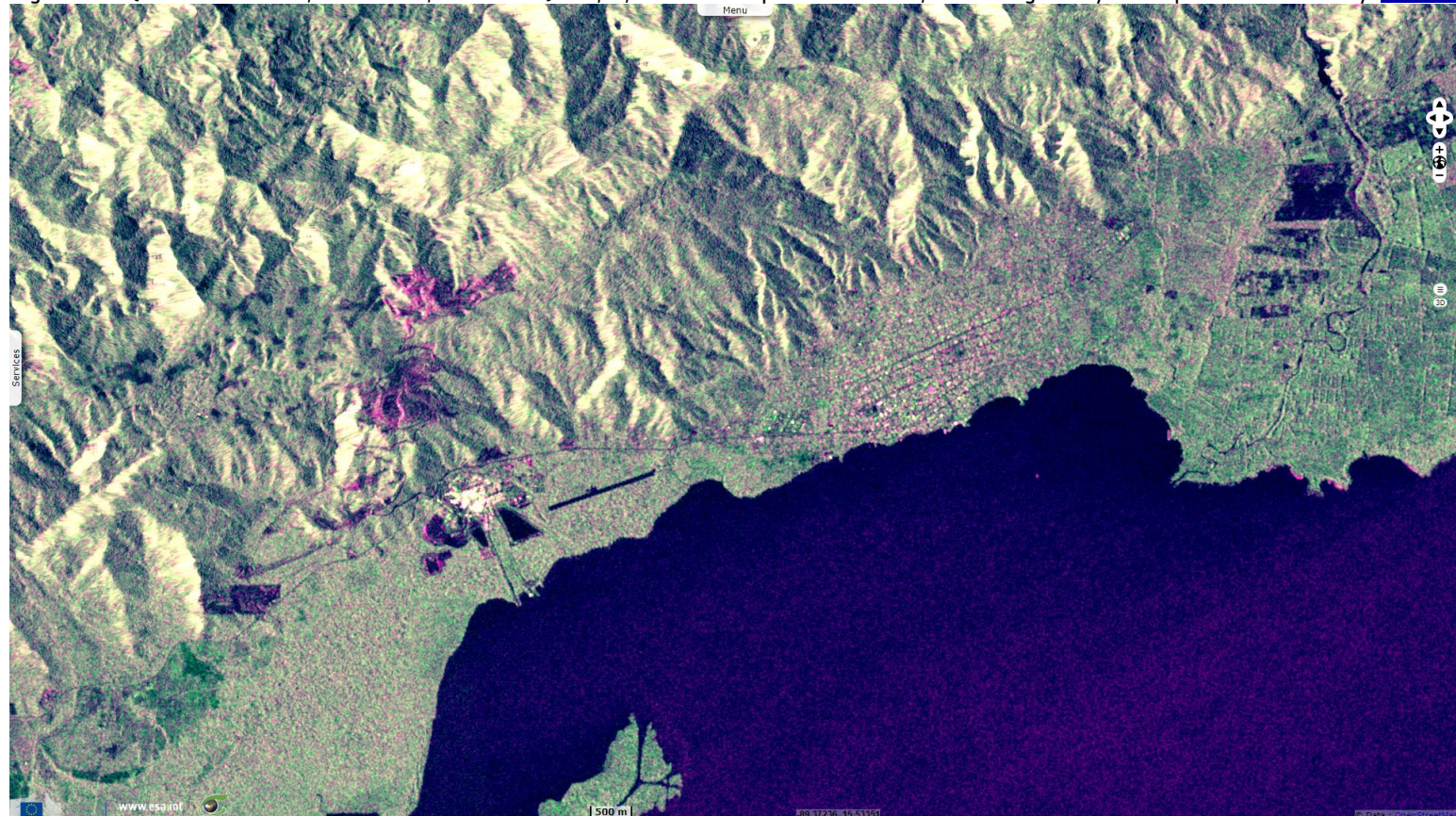
[2D view](#)



Last but not least, "stories of death and violence swirl around Fenix", The Guardian [writes](#). Le Monde [relates](#) that: "In 2007, when the mine belonged to the Canadian Skye Resources, 11 women were raped in meetings in the remote village of Loto Ocho. They identified the criminals, members of the private security of the mine, the army and the police."

In 2012, three students drowned at a nature reserve owned by Solway. "Have they seen or done anything forbidden? The investigation revealed that the boys had been hit in the head. The trial, which Solway's lawyers have continued to hinder, has just ended at the end of May, in Guatemala, without the mystery being lifted." states Le Monde article

Fig. 10 - S1 (mean 29.05.2019; 10.06.2019; 22.06.2019) - vv,vh,vv colour composite - In 2019, the mining facility has expanded considerably. [2D view](#)















The Guardian [enumerates](#) more recent cases: "Last week, the company's biologist was found guilty of culpable homicide and his former employer ordered to pay reparations to the families. In 2016, when a boiler in the refinery exploded, seven employees were killed. Last year the head of El Gosen village was abducted and then jailed. During his absence, his people were evicted from land which Solway says they were squatting. The company offered them financial assistance to move. "

Tensions in El Estor escalated in March 2017, when a red stain spread across the lake. The Guardian [narrated](#) in another article: "Riot police first

fired teargas, and then used live ammunition. One fisherman was shot dead, another wounded by a bullet from behind. The local station chief, confronted by journalists, still denies ordering his men to fire. There is an investigation, but two years on no officers have been charged."

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

Contains modified Copernicus Sentinel data 2019, processed by VisioTerra.

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



Funded by the EU and ESA

EVT-479-SentinelVision

