

According to the Brazilian Institute of Environment and Renewable Natural Resources (IBAMA), "Thick and viscous oil debris has contaminated 139 locations spread over 2,000 kilometers across nine Brazilian states since early-September".

"Experts told BBC News the spill could be the worst-ever disaster for coral reefs in the region. Crude has washed up on more than 1,300 miles of beaches in nine states — affecting the rich landscape and diverse marine life. At least 15 sea turtles, two seabirds and one fish have been found dead, according to officials" (source: [CBS News](#)).

"The oil only appears as it washes ashore, as it has been since September 21. Oceanographer Maria Christina Araujo said that in such a biodiversity it is virtually impossible to remove oil. Speaking to [Phys.Org news](#), she added that the damage could be irreparable and the ecosystems will take years to recover. In Pernambuco state alone, 30 tonnes of oil has already been removed by volunteers" (source: [The sun](#)).

The mystery of oil spills in NE Brazil

[2D layer stack](#)

[2D view](#)

Fig.1: View of the nine Brazilian states affected by the spill discovered on September and October 2019.



Fig.2: Photos showing damage of the oil spill in the NE Brazil coasts.



Radar imagery is known as a powerful tool to detect oil spills floating in the sea surface because the oil has the capacity to smooth the sea surface short waves named "Bragg waves". Then, the oil spills are seen as dark patches on the radar images.

Fig.3 shows oil spills observed three times at the same location by Sentinel-1 images acquired on the 7, the 19 and the 31 October 2019. This phenomenon has been observed recently and does not appear in the 173 scenes acquired since October 2016. These oil slicks are located about 60 kilometers offshore the Ceara state beaches.

One may recognize four sources of slicks that could be correlated to subsurface installations like FPSO (Floating Production Storage and Offloading) or submarine pipelines or surface marks of a recently sinking ship... (?) Thanks to Brazilian citizen who will have more information about this source.

Fig.4 shows the corresponding surface current and wind acquired at the same date of the Sentinel-1 images shown in Fig.3. The strong current in the area is in the background of the image. The blue vectors show the direction and magnitude of these surface currents, while the yellow arrow indicates the direction of strong surface winds. Currents and winds are oriented from east to west / northwest. If these dark marks correspond to oil, it remains relatively little surface (too volatile or on the contrary agglomerating quickly to sink) and would be quickly dispersed by the winds and currents.

**Oil spills (?) seen by
Sentinel-1 HR radar**
Assumption to confirm!

Fig.3: S1A scenes - VV polarisation - Oil spills seen in Ceara state water.

[2D animation](#)

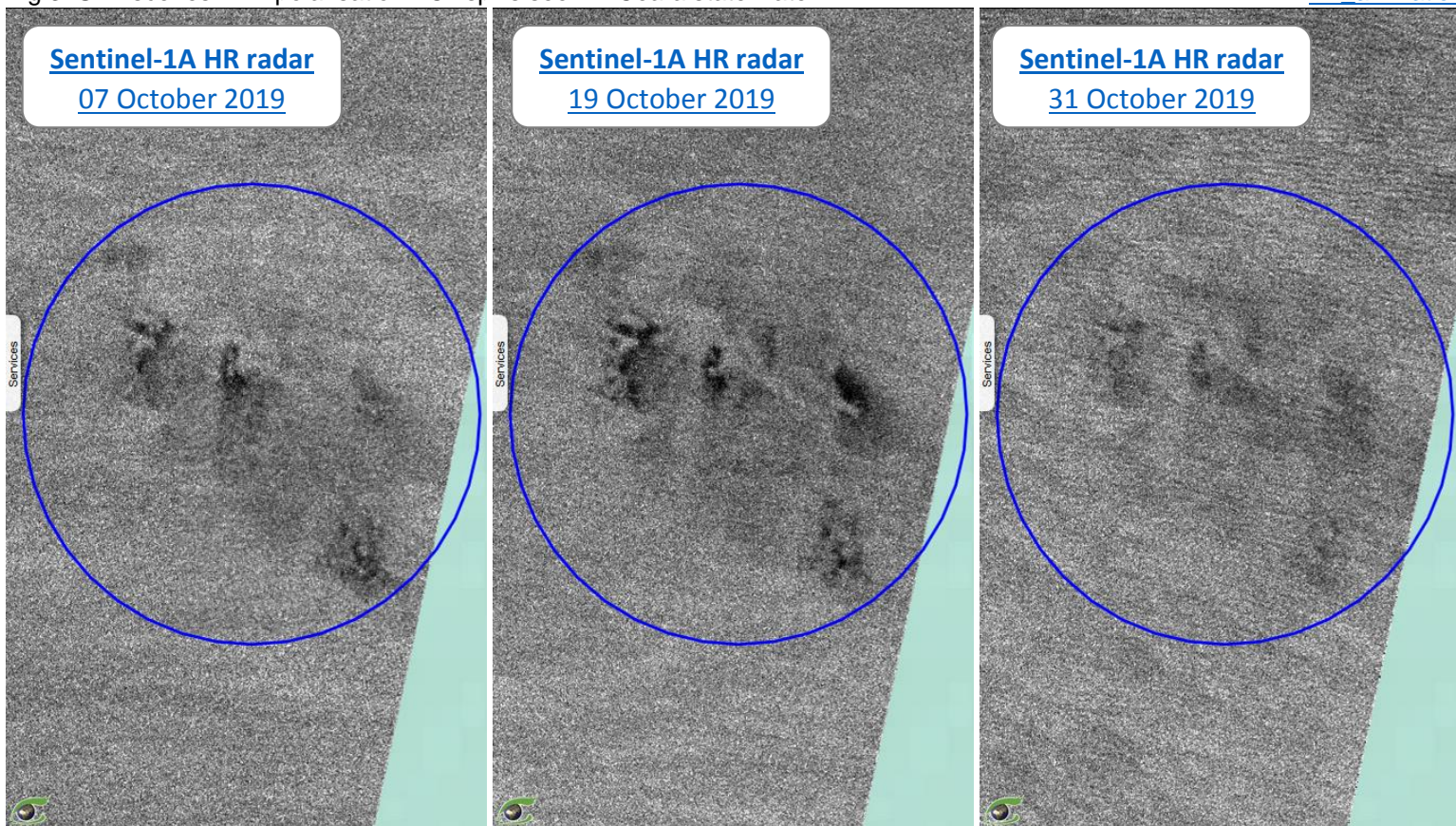


Fig.4: Wind and current acquired on the same date as the S1 images above.

[2D animation](#)

