

# Focus on Portugal wildfire

Sentinel-3 OLCI FR acquired on **01 August 2018** from 10:42:03 to 10:45:03 UTC

Sentinel-3 OLCI FR & SLSTR RBT acquired on **04 August 2018** at 11:04:30 UTC

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Sentinel-2 MSI acquired on **08 August 2018** at 11:21:11 UTC

Sentinel-3 OLCI FR & SLSTR RBT acquired on **09 August 2018** at 10:34:34 UTC

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Keyword(s): Emergency, disaster, climate change, forestry, urban, wildfire, Portugal



[2D Layerstack](#)

Fig. 1 - S3 OLCI (01.08.2018) - 6,4,1 colour composite - Dust tongue blowing toward Algarve region.

[2D view](#)

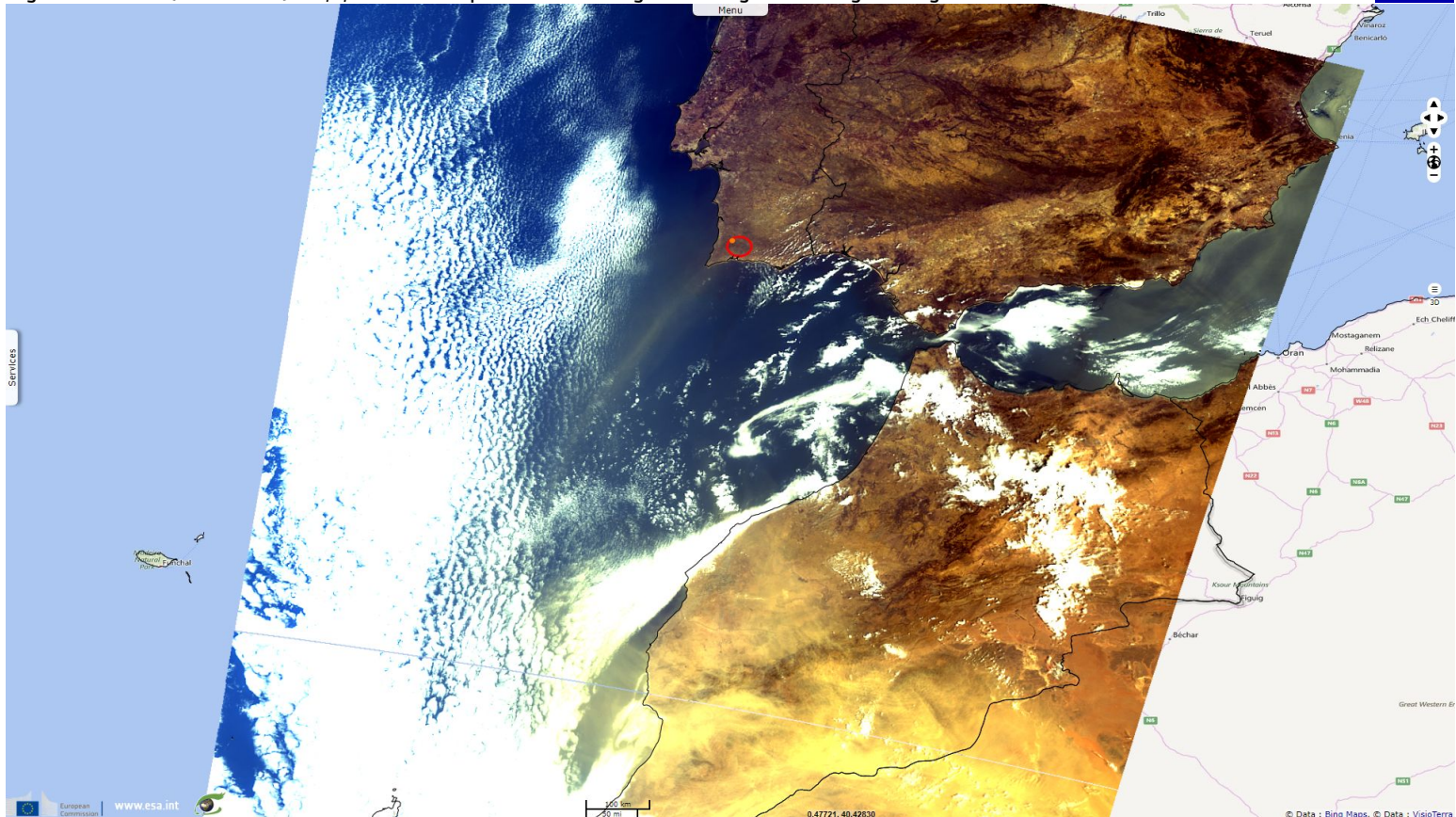
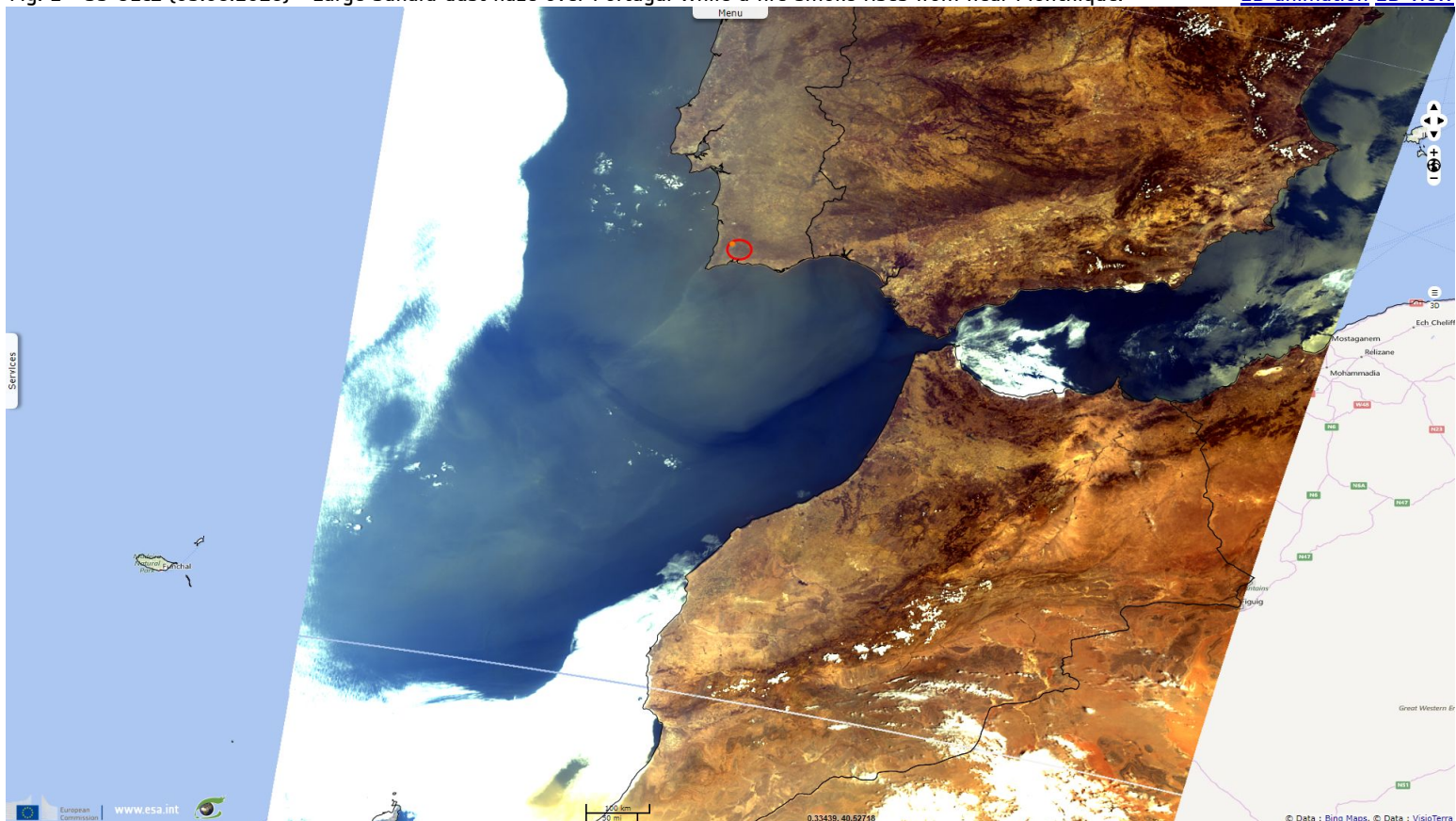


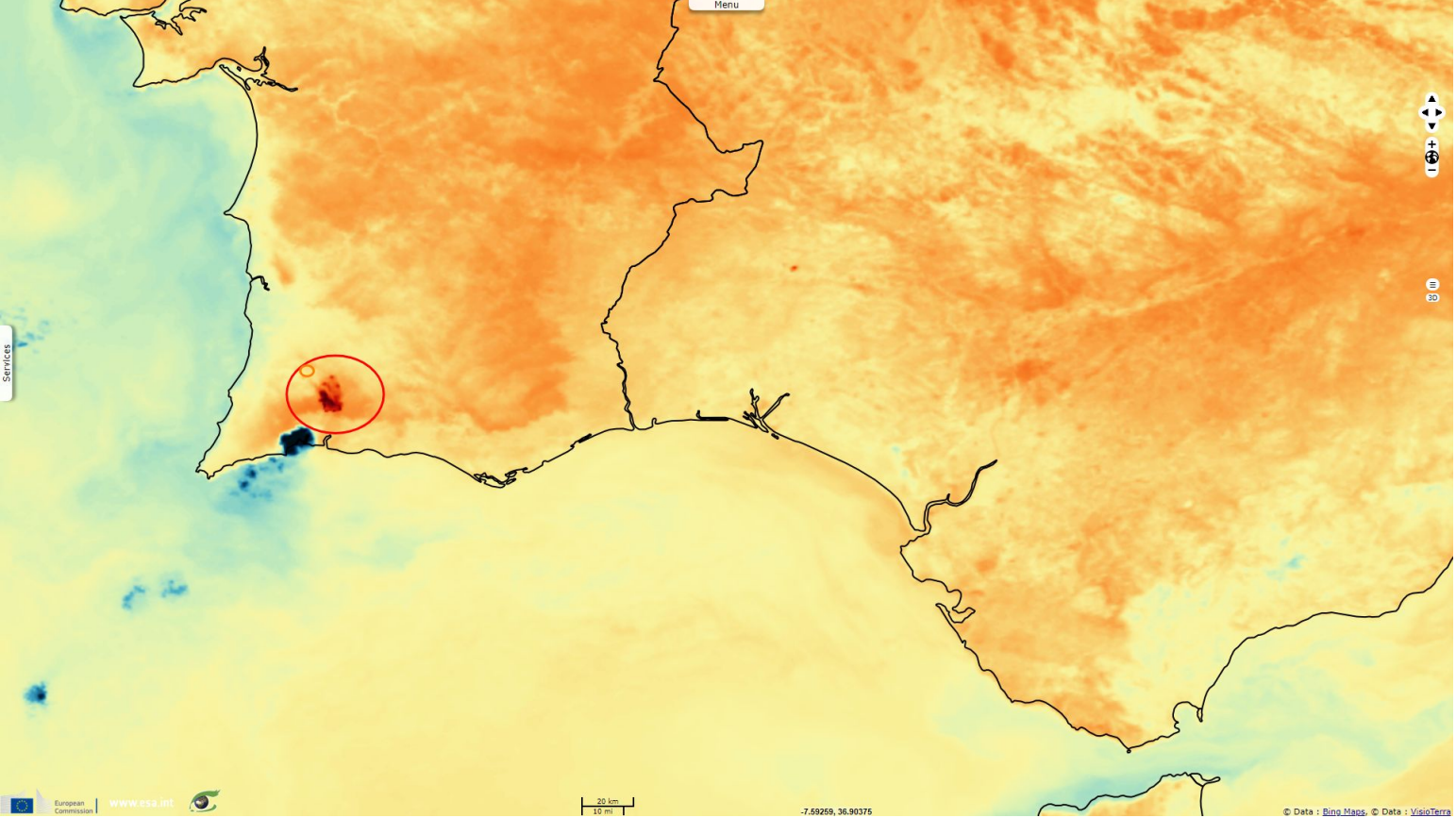
Fig. 2 - S3 OLCI (05.08.2018) - Large Sahara dust haze over Portugal while a fire smoke rises from near Monchique.

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



Around 1000km<sup>2</sup> vegetation burns each year in Portugal. In June 2017, a large wildfire had consumed 600km<sup>2</sup> of forests in central Portugal as covered in the Sentinel Vision story [Deadly forest fire in Portugal mapped by Sentinel-3](#). The scenario seemed to repeat in early August 2018 as a forest fire started near Monchique and expanded up to 270km<sup>2</sup>, scorching land mostly the Algarve region. This happens in the context of a global record of heat in July 2018, but also while burning air from the Sahara reached the Iberian peninsula as shown above.

Fig. 3 - S3 SLSTR (05.08.2018, 21:55) - S8 thermal band with colour map - The fire shows even more on night views of the thermal image. [2D view](#)



Several pointed the absence of "cadastro florestal", a land register of the numerous private forest owners. This goes along with insufficient fire prevention by lack of maintenance in the mostly private Portugal forests. Finally another cause is that among other tough choices to recover from piling deficits, Portugal neglected firefighting capabilities, hence their lack of water bomber.

Fig. 4 - S3 SLSTR (08.08.2018) - S6,S3,S2 colour composite - The front of Algarve Fire is visible south-east of the scorched area [2D animation](#) [2D view](#)



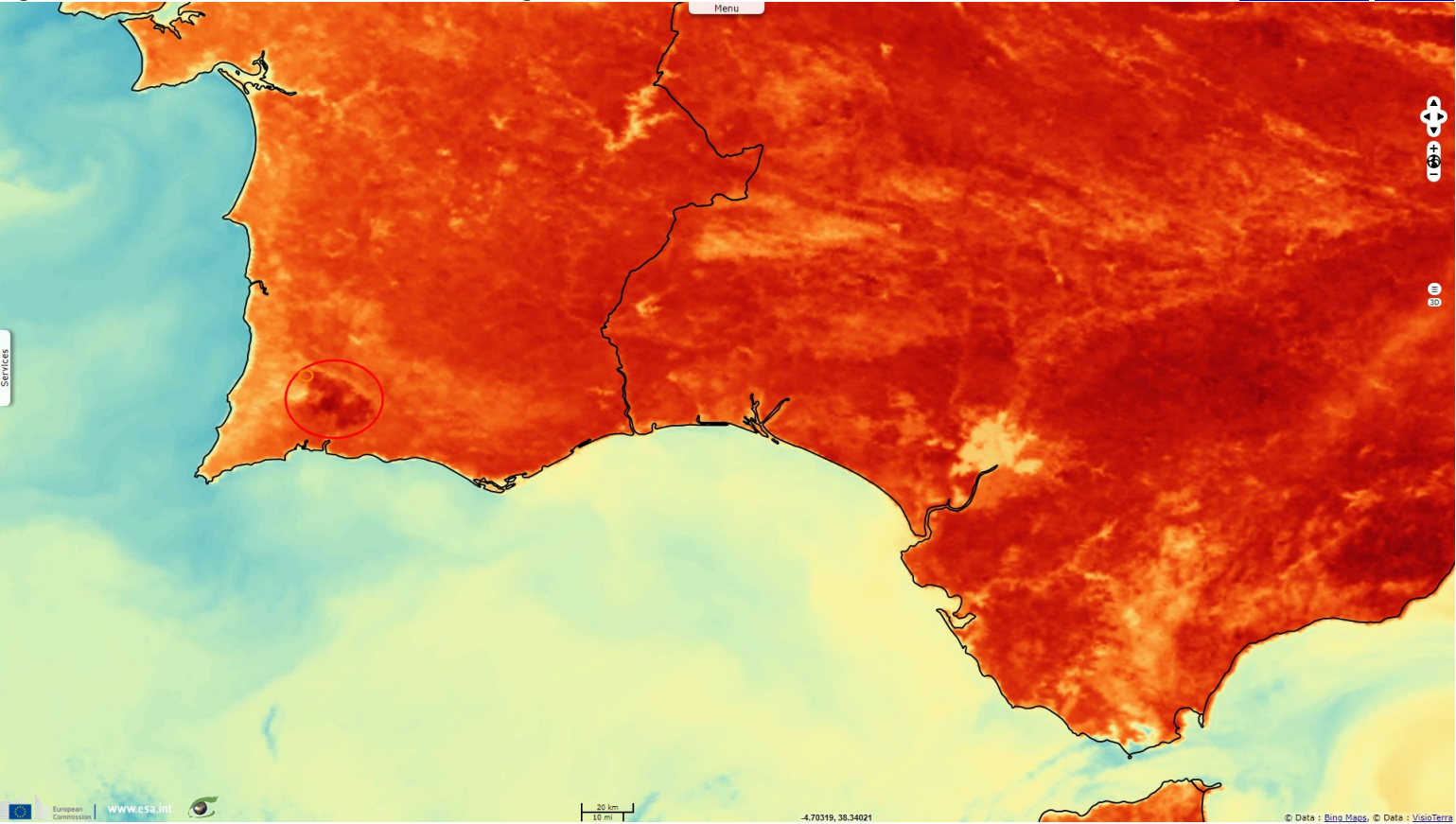
But what could be the main reasons for the recurrent severe wildfires in Portugal might by its dependency on eucalyptus, grown as a cash crop instead of the traditional but already fire-prone pines. A case study of eucalyptus written by the US National Park Service [describes](#) this growth: "Blue gum eucalyptus grows from 98 to 180 feet tall, reaching heights of 260 feet in California. Most growth in height occurs within the first 5 to

10 years, and 60 to 70 percent of total height is usually achieved by age 10. This rapid growth rate is one of the main reasons these trees have been used for plantations."

According to the Australian magazine [The Monthly](#): "Scandinavian timber companies began buying up vast parcels of Portuguese land to grow *Eucalyptus globulus*, or blue gums, to pulp for paper." Large eucalyptus monocultures have been encouraged by deregulation so that the species "now the exotic blue gum is the most abundant tree in Portugal, covering about 7% of the land", having risen by 13% between 1995 and 2010. It now weighs 1% of Portugal GDP and 4.9% of its exports.

Fig. 5 - S3 SLSTR (09.08.2018) - The fire almost extinguished, the full extent of the burned area still radiates heat.

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



Eucalypts obtain long-term fire survivability from their ability to regenerate from epicormic buds situated deep within their thick bark, or from lignotubers, or by producing serotinous fruits. The Monthly [adds](#): "eucalypts are particularly hardy, capable of regrowing up to three times after harvesting." But while Eucalyptus forests can regenerate and recolonize faster than other trees after a forest fire, they also tend to make wildfires more frequent and more serious.

First, they require a lot of water, up to 200 litres a day for an adult tree, making the area dryer and more susceptible to fire. The US National Park Service case study of eucalyptus [says](#): "Rapid growth is accompanied by rapid water uptake, which is why eucalyptus planting has also been used to convert wetlands into other land use." The Monthly [reminds](#): "it was the drying up of village water supplies that sparked a groundswell of opposition to the 'eucalyptisation' of Portugal. 'Ever since the mid '70s people have been protesting,' explains Pedro Bingre, the regional director of Portugal's major environmental group, Quercus."

Fig. 6 - S3 OLCI (04.08.2018) - 21,16,4 colour composite - Algarve Fire still around Monchique shortly after it had begun.

[2D view](#)



Worse, eucalypts produce a lot of fuel source for fire by generating an abundant long-lasting litter. The case study of eucalyptus written by the US National Park Service [explains](#) : "The Gums, which include *Eucalyptus globulus* have deciduous bark. The annual shedding of bark is one of the main reasons the trees present a significant fire hazard."

This litter decomposes more slowly than it does with other species as [detailed](#) by Robert L. Santos in The Eucalyptus of California: "The eucalyptus is regarded generally as a "dirty tree" because if its litter is left untouched it can pile up to several feet on a grove's floor. This litter consists of falling bark, leaves, branches, and seed pods. They all contain oil which increases the litter's flammability. The oil also slows the decomposition process so the litter remains nearly whole and a fire hazard longer."

Fig. 7 - S3 OLCI (08.08.2018) - 21,16,4 colour composite - Smoke rises from the burned area as the fire has progressed S-E.

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



Finally, the oily nature of eucalyptus and its crown structure facilitate the advance of wildfires, as shown in the US National Park Service case study of eucalyptus, the [wrote](#) : "The bark catches fire readily, and streamers from the loose bark tend to carry fire into the canopy and cast fire ahead of the main front." "Fire spreads quickly in eucalyptus groves. Open tree crowns, and long swaying branches, encourage maximum updraft."













Which is complemented by words of H.H. Biswell, Professor of Forestry and Conservation at the University of California, Berkeley: " *The explosive nature of the eucalyptus and the abundance of fuel produces a very intense fire that 'crowns' -- leaps from tree top to tree top... The fierce blazes have been stoked by the highly volatile oils of the eucalyptus tree, which vaporize under intense radiative heat as the fire approaches and explode, with flames sometimes towering as high as 230 feet*".

Fig. 8 - S2 (08.08.2018) - 12,11,2 colour composite - Shadows highlight the rugged terrain on which the fire spread. [2D animation](#) [2D view](#) [2D view](#)



Portugal authorities evacuated hundreds of people, mobilised 1500 firefighters and several water bombers. Several cities were surrounded by fire but have been saved by firefighters. The perimeter of Algarve fire reached 100 kilometres but it claimed no life, compared to the tragic record reached last year with more than 120 people killed. This lighter toll might also be related to reforms acted since the 2017 fire-caused disasters, correcting several deficiencies pointed out earlier, enacting the creation of a (simplified) land registry and the reinforcement of fire prevention measures.

*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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