

Strawberries vs Doñana flamingo, Spain

Sentinel-1 CSAR IW acquired from 11 July 2021 to 24 June 2022 at 06:27:27 UTC (30 products)

Sentinel-3 OLCI FR acquired on 09 May 2022 at 10:42:27 UTC

Sentinel-2 MSI acquired on 25 June 2022 at 11:06:31 UTC

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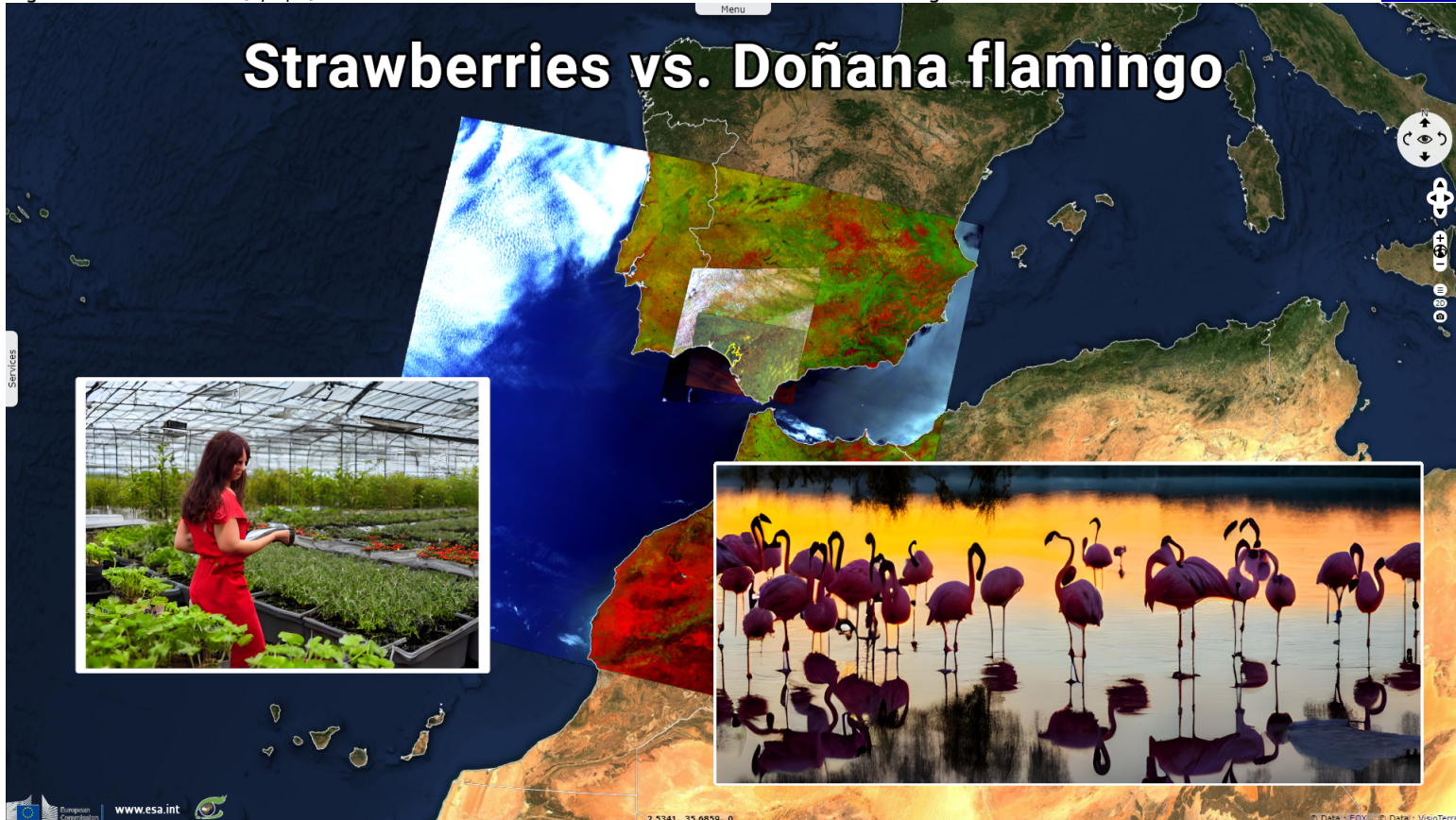
Keyword(s): Agriculture, droughtness, Ramsar site, wetland, biodiversity, Doñana, Spain

[2D Layerstack](#)

Fig. 1 - Three Sentinels (1, 2, 3) tasked to observe the Doñana National Park and its surrounding.

[2D view](#)

Strawberries vs. Doñana flamingo



This story was written from elements found in the France 24 French paper published on 05/27/2022 under the title "Puits illégaux et marais en péril: en Espagne, les fraises de la discorde" translated by us "Illegal wells and swamps in danger: in Spain, the strawberries of discord" (source [France 24](#)).

The [Doñana National Park](#), located in the province of Huelva in Spain covers nearly 100,000 hectares. Listed as a [UNESCO World Heritage Site](#) and as a [Ramsar site](#) (wetland zone), the park is home to several thousand animal and plant species on 100,000 hectares of lagoons, marshes and forests. Doñana is particularly known for being home to flamingos.



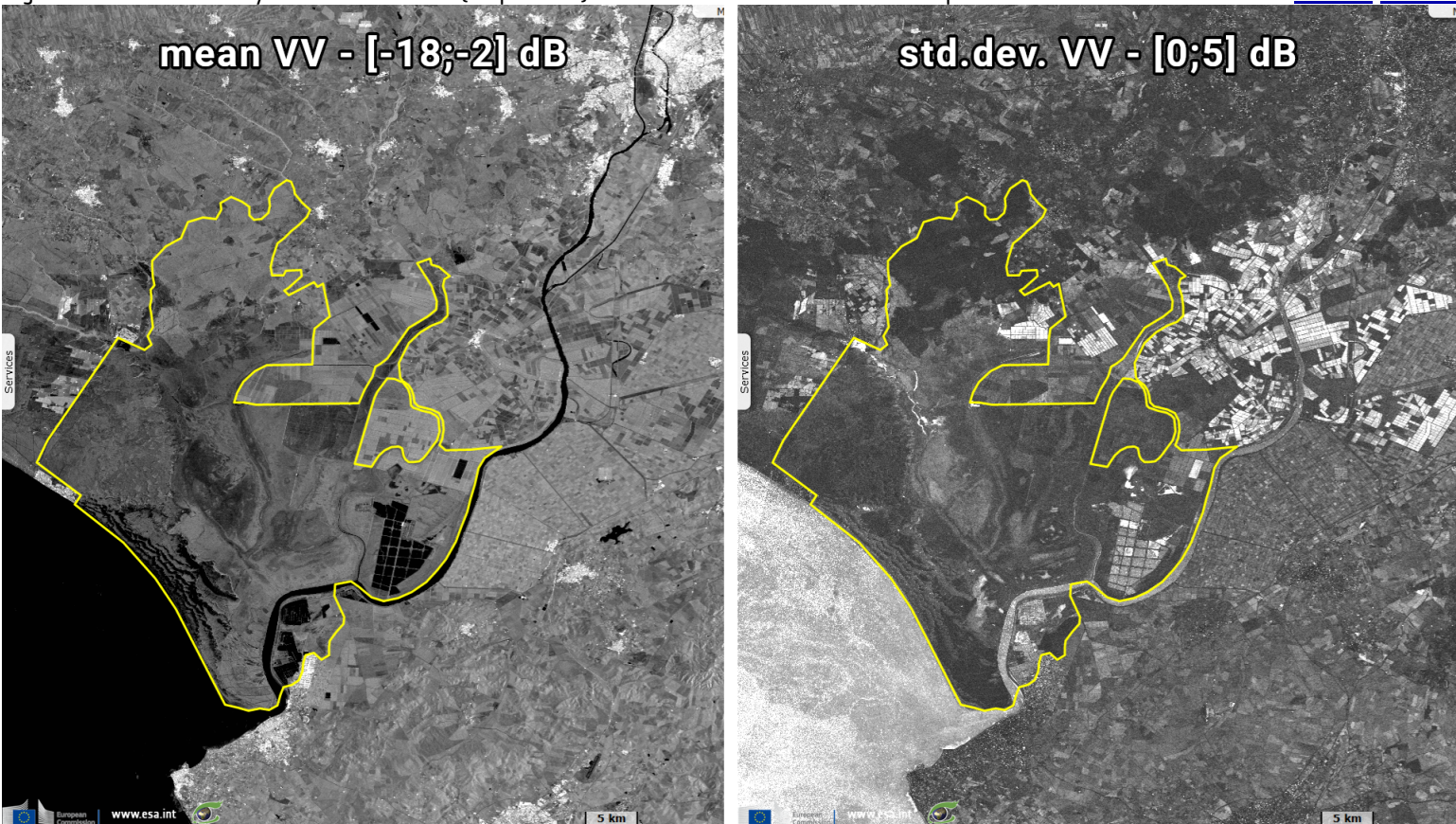
Doñana National Park (source [image](#))

However, the Doñana park is threatened with drought caused by water withdrawals carried out by the surrounding farms. The main crop concerns strawberries produced in all seasons mainly in greenhouses. The province of Huelva alone produces nearly 300,000 tons of strawberries per year, representing 90% of Spanish production. Among the 100,000 people concerned by this culture, the harvest in Andalusia requires the recruitment of

more than 16,500 women per year, mainly of Moroccan origin. The water deficit is 85% due to illegal withdrawals from farms representing more than 1,560 football pitches. These irregularities have been the subject of several complaints from the European Commission. A bill to increase irrigation rights in the region was recently championed by the right-wing Partido Popular, governing Andalusia, with the support of the far-right Vox party. Many environmental organizations are protesting against this bill. WWF obtained the support of supermarket chains to oppose the project (see the [notice](#) "The main European supermarkets ask President Juan Manuel Moreno Bonilla to abandon the plan to legalize illegal irrigation in Doñana").

Fig. 2 - S1 time-series July 2021 to June 2022 (30 products). Mean and standard deviation of VV polarisation.

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



The two previous images present the statistics calculated on each of the two polarizations over long periods from July 2021 to June 2022. This time series has 30 products. The irrigated plots show strong backscatter variations (right images). This is also the case for the Veta La Palma fish farm, particularly in VH polarization.

Fig. 3 - S1 time-series July 2021 to June 2022 (30 products). Mean and standard deviation of VH polarisation.

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

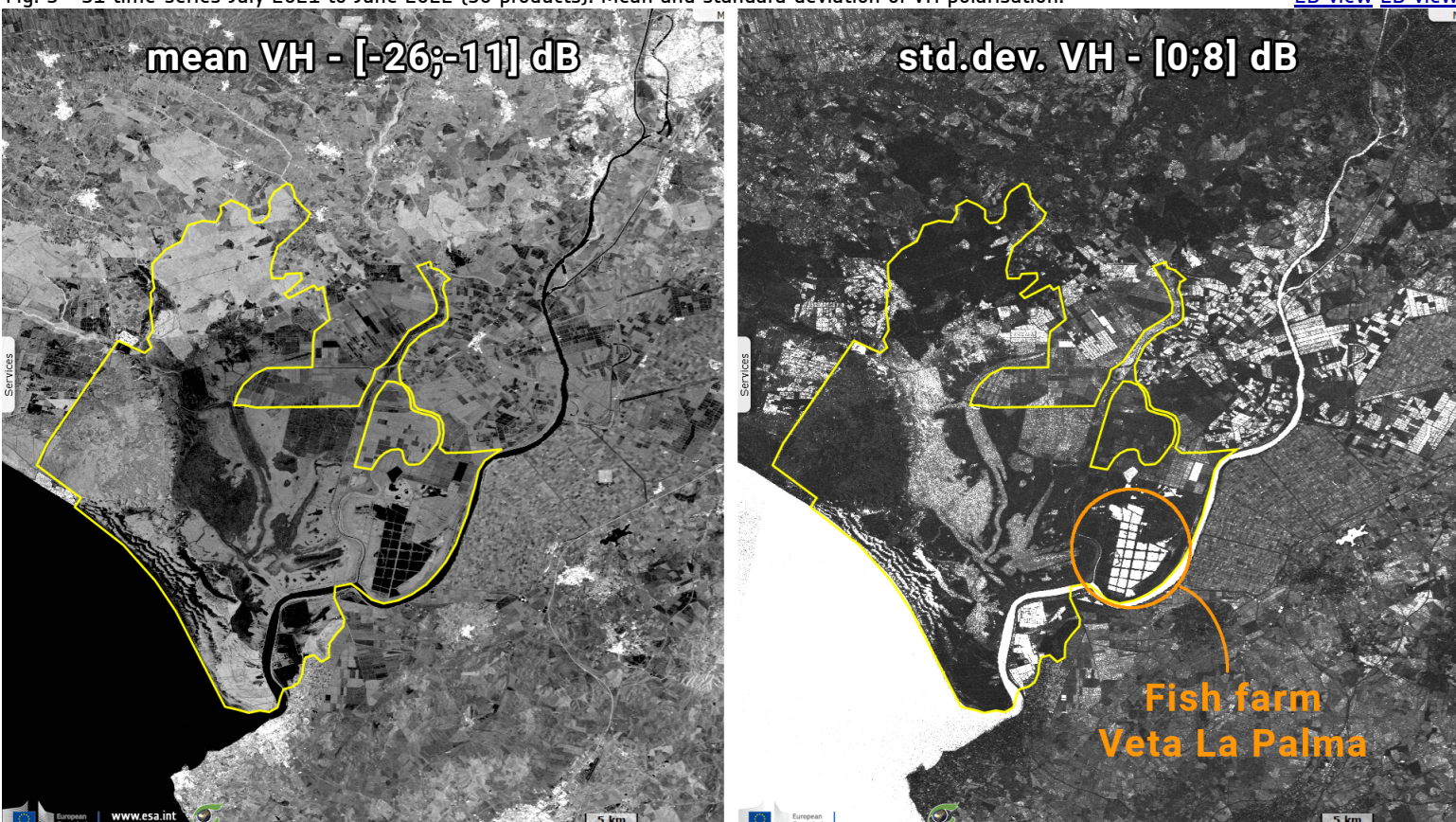
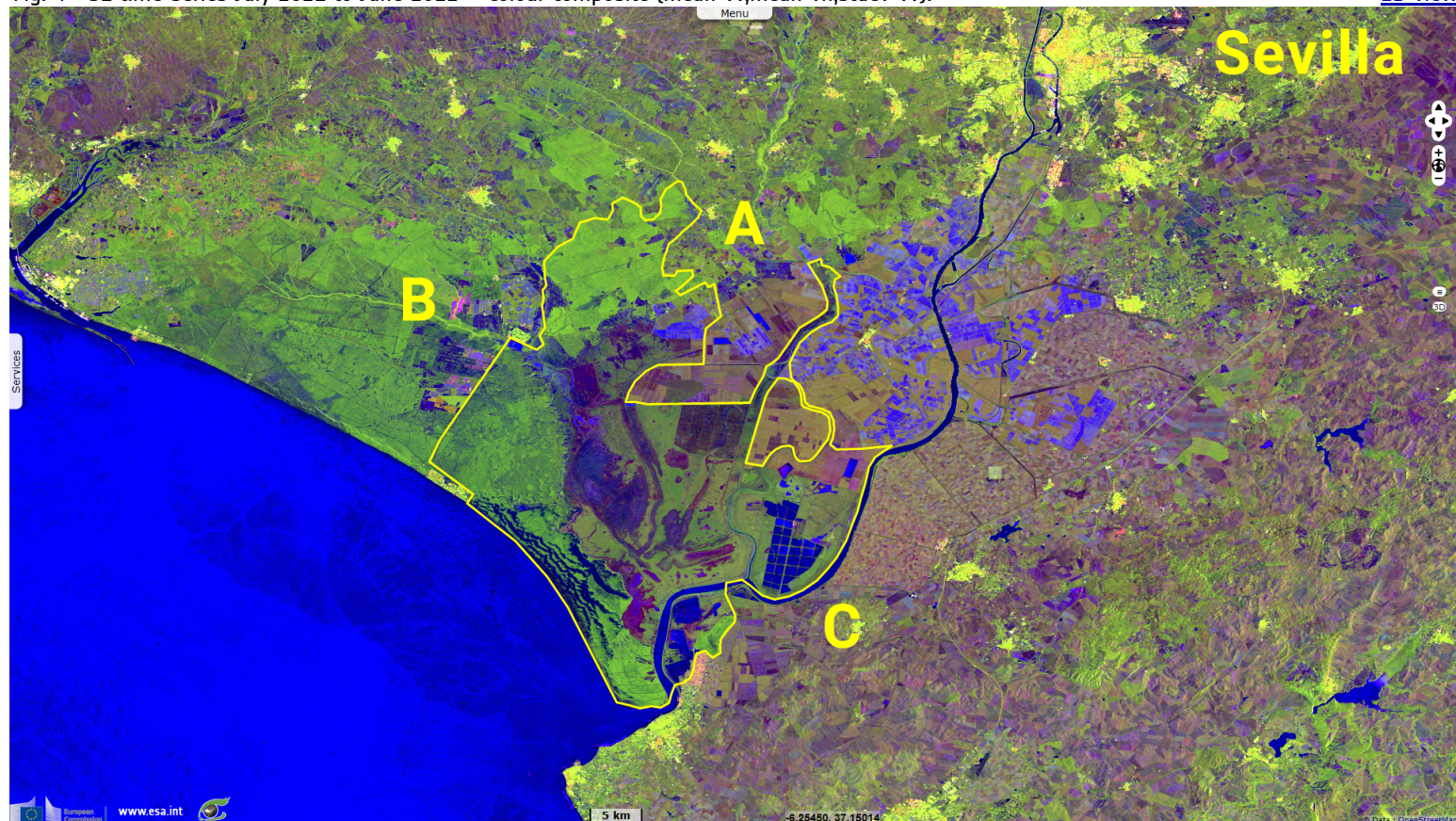


Fig. 4 - S1 time-series July 2021 to June 2022 – Colour composite (mean-vv,mean-vh,stdev-vv).

[2D view](#)



This colour composite highlights the wetlands and the most irrigated plots. In contrast, urban areas have constant backscatter throughout the year and appear yellow. The areas in red (average in VV) correspond more to bare soils while the green colour reveals more unirrigated or poorly irrigated vegetation as well as forests, orchards or scrubland.

Fig. 5 - (A) Outdoor crops seen by Sentinel-2 (left) and by Sentinel-1 time-series (right).

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



In the Sentinel-2 optical image, water reservoirs can be identified (in blue). These reservoirs as well as the heavily irrigated plots are well rendered by the standard deviation of the VH polarization. Whether in optics or radar, the different plots are clearly identifiable.

Fig. 6 - (B) Greenhouse crops seen by Sentinel-2 (left) and by Sentinel-1 time-series (right).

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

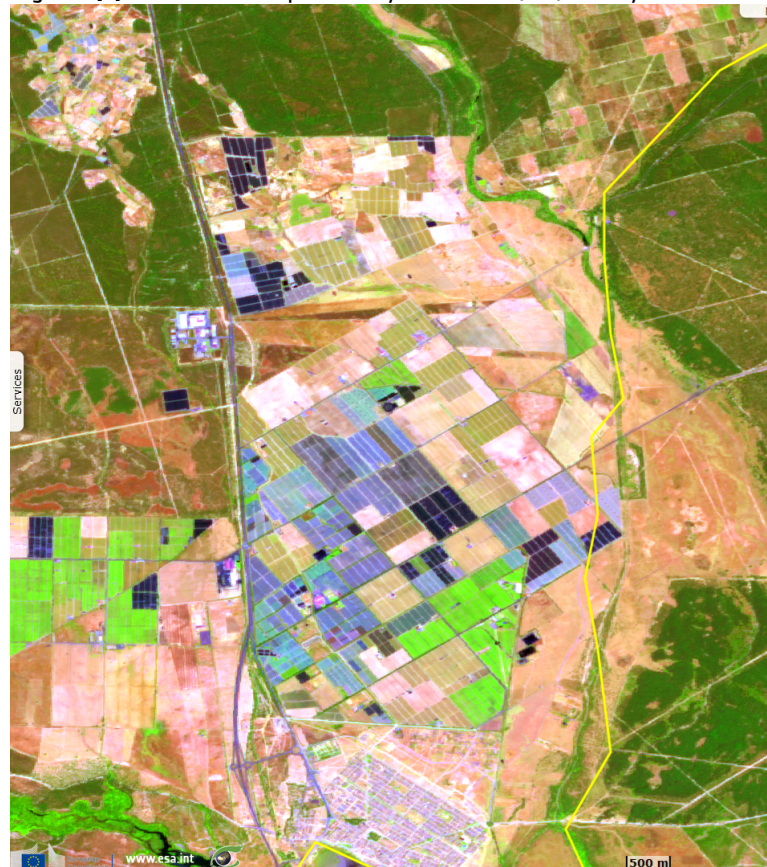














Fig. 7 - (C) Fish farm Veta La Palma seen by Sentinel-2 (left) and by Sentinel-1 time-series (right).

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



*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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