

Ozone levels tend to be above recommended levels at this time of year in South West Spain

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Surface ozone levels in the south west of the Iberian Peninsula usually exceed the protection threshold established by EU regulations for people and plants in spring and summer, according to data gathered between 2000 and 2005 by four measuring stations in Huelva, one of them next to the Doñana National Park.

The limits established to protect human and plant health by the European Directive on ozone are usually exceeded from April onwards, especially during the summer, in the south west of the Iberian Peninsula, according to a study carried out by researchers at the National Institute of Aerospace Technology (INTA) and the University of Huelva (UHU).

Understanding this situation, which is common in many developed countries, will help public authorities to take measures to prevent health and environmental risks associated with increased levels of this contaminant gas.

The new study, published in the journal *Environmental Science and Pollution Research*, shows the levels of seasonal surface ozone variation measurements between 2000 and 2005 for the first time at the stations in the autonomous region of Huelva in El Arenosillo (very close to the Doñana National Park), Cartaya, Valverde and Huelva city.

The threshold established for human health by the European Directive is

exceeded during the spring and summer months, particularly at El Arenosillo and Valverde. The level for plant protection is also exceeded at a rate ranging from 131 days per year at Cartaya to 266 at Valverde, on average.

The scientists identified "a clear daily cycle", with minimum levels recorded at about 7am, shortly after dawn, while the highest levels were recorded at about 3pm. Average concentrations varied from 57.8 micrograms/m³ at the station in Huelva to 78.5 micrograms/m³ in Valverde.

The journey of ozone

Surface or tropospheric ozone (as distinct from the stratospheric ozone of the [ozone layer](#)) is considered one of the greatest [atmospheric pollutants](#) in rural, suburban and industrial areas, as its oxidising effect impacts on human health, vegetation and ecosystems. It is also a greenhouse gas, contributing to climate change. This ozone stems from photochemical reactions between nitrogen oxides and volatile organic compounds, which may be natural or manmade in origin.

The new study explains that the daily movements of coastal breezes move polluting emissions from the urban and industrial zone of Huelva inland from the south east. This means certain leeward areas, in the north east, are affected by high ozone levels, which is what happens in Valverde.

The authors stress that their work is "a very useful tool that will help environmental policy makers in taking decisions and devising strategies to reduce [ozone](#), and will also open up new areas of research about the behaviour of this gas".

More information: Jose A. Adame, Juan P. Bolívar y Benito A. De la

Morena. "Surface ozone measurements in the southwest of the Iberian Peninsula (Huelva, Spain). Environmental Science and Pollution Research 17 (2): 355, Feb 2010.

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