



## Characterization of cold waves in the eastern Iberian Peninsula for a 70-year period (1947-2016)

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The accumulation of greenhouse gases in the atmosphere is causing a generalized increase in temperatures. The Mediterranean basin is one of the most affected places on the planet, with effects such as an increase in maximum and minimum temperatures, among others, having been described in the scientific literature. However, in spite of this generalized thermal increase, the Mediterranean region still registers episodes of intense cold, some of them of great intensity and which give rise to episodes of cold waves. That is why the main objective of this work is to analyze the evolution of cold waves in the Mediterranean coast of the Iberian Peninsula, specifically in the province of Alicante, an area of great tourist activity and, therefore, of great economic importance in the country. The study covers a period of 70 years (1947-2016) and uses surface temperature data from a dense network of 92 meteorological observatories, which have been previously subjected to a filling and homogenization process. In turn, it uses the HYSPLIT model to analyze the origin of the identified cold waves. The most relevant results are: (1) A total of 93 cold waves have been registered during the 70 years of study; (2) The most recent decade (2007-2016) has been the one with the largest number of cold waves; (3) The annual number of days with cold wave has been decreasing over time, as well as the duration of cold waves, which are now shorter; (4) February and January are, in this order, the months with the largest number of cold waves, which also occur, to a lesser extent, in December, March and November; (5) In recent decades, cold waves have affected a greater surface area, although it has not been observed that they have been colder; (6) The most frequent cold waves have a maritime origin, while those of continental origin are the ones that cause the greatest impact in terms of surface area. It is important to accurately characterize the cold waves in our territory and to deepen our knowledge of them, so that we can adopt adaptation measures in the context of a climate change scenario. This work serves as a starting point for a study that characterizes cold waves in the entire Mediterranean region of the Iberian Peninsula.

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