

Wind energy lessens under heat wave conditions

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During the summer 2003, high temperatures and drought conditions in Europe led to a reduction of the wind force with direct consequences on the wind energy power, reduced by 22%. The study was recently published in *Journal of Climate*.

The region understudy, Navarra in North of Iberian Peninsula, plays an predominant role in the renewal energy policy in [Europe](#) since more than 70 % of its total energy is produced by [wind energy](#). Under heat wave and [drought conditions](#), this energy demand can increase due to overuse of air condition and refrigeration systems, and therefore is necessary to have reliable predictions in case this extreme event become more frequent in the near future.

The investigation is based on surface measurements collected during the 1992-2004 period in a high-density network (41 stations) combined with high resolution numerical simulations (the grid cells are 2 x 2 km²) during the same period. This high resolution on space is needed due to the complexity of the terrain and the mosaic in land use properties. To our knowledge, these very demanding numerical experiments are pioneer for these semi-climatological regional studies related to wind. The novelty of the study relies on accounting of all the relevant spatial scales that drive the wind diurnal variability.

The large scale synoptic patterns occurred during summer 2003 is the main responsible of the wind reduction, but smaller scale features triggered by the land-atmosphere interactions like sea-breeze or mountain-valley flows play an important role in controlling wind daily features of the surface circulations. The study is therefore a step forward in understanding the interrelation between scales and therefore enabling us an increase of the accuracy of meteorological and climatological forecasts.

More information: ['The effect of heat waves and drought on surface wind circulations in the northeast of the Iberian Peninsula during the summer of 2003'](#), door Pedro Jiménez, et al. *Journal of Climate* 24, 2011

Provided by Wageningen University

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