

S2S prediction of summer heatwaves in the Iberian Peninsula using machine learning methods

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Summer heatwaves are extreme events that have large socio-economic impacts on mortality rate, crop yields, energy demand or water resources. The Iberian Peninsula, and more generally southern Europe, is particularly prone and vulnerable to such events. Therefore, a reliable prediction of southern Europe summer heatwaves on long timescales would be key to alleviate the impacts of heatwaves on society.

In this ongoing study we aim at better understand and improve southern Europe summer heatwave prediction on sub-seasonal to seasonal timescales (S2S). To do this, we use a machine learning regression model based on a tree structure. The best set of predictors is determined by the Coral Reefs Optimization algorithm with Substate Layers. Thus, an optimization problem is addressed with the aim of improving the prediction.

Here, we will present the initial results of this ongoing work and the next steps. We focus first on the Iberian Peninsula only. Various predictors have been used: the SST, the 500hPa-geopotential, the local soil moisture, the outgoing longwave radiation, and the sea ice cover. And two approaches have been implemented so far to identify the best set of predictors.