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Projections of European summer tourism demand at a +2 degrees warmer climate.

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Tourism is a billion euros industry for Europe and especially for the southern countries for which summer tourism is an important contribution to their GDP. It is highly dependent on the climate and any future changes will alter the favorability of European destinations. The impact of a potential global temperature increase of 1.5 and 2 degrees on European tourism was investigated in the frame of IMPACT2C FP7 project. Climate information from four ENSEMBLES and five Euro-CORDEX RCMs were used to estimate the Tourism Climatic Index (TCI) under the A1B, RCP4.5 and RCP8.5 scenarios. The monthly averages of the historical TCI estimates were correlated to the recorded monthly averages of overnight stays for all considered NUTS3 regions in Europe. The correlation proved to be significantly high for the majority of these regions with higher values for the European South, while the lowest correlation was attained for Sweden Denmark and Austria. The correlation estimates was then used to provide information about the change in tourism activity due to changes in the future climate favorability through the TCI. The results show that for the May to October “summer tourism” season, and under +1.5 and +2 degrees climate the potential overnight stays are projected to increase in average in almost the entire European domain, except Cyprus which exhibits a consistent decrease, robust across all scenarios. In contrast, for the peak of the summer season between June and August, it is projected that the European south will potentially exhibit decrease in the overnight stays to as high as 20% and for some cases to even higher than 30% (Greece). Key strength of the results are the correlation of measured tourism indicators to a conceptual index, which gives the ability to quantify the change in the tourism indicator, rather than investigating the coarser concept of climate risk.