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Changes in extreme temperatures during spring and summer over Mediterranean Spain since the second half of 20^{th} century and their impacts on coastal tourism

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About 10% of European Gross Domestic Product (GDP) and 20 million jobs are accounted by tourism (Tourism Sustainability Group, 2007). Tourism activity is one of the economic sectors more vulnerable to climate change, varying widely the impacts according to relatively recent research on climate change impacts on tourism (Agnew and Viner, 2001; Elsasser and Burki, 2002; Scott *et al.*, 2005), mainly related to extreme weather events (IPCC, 2007).

The Mediterranean area of Spain is one of the most important tourism destinations around the world with a consolidated tourism model. Nevertheless, there is an important seasonality of demand restricted to summer looking for sunny and warm environments.

Here we analyse changes in a set of extreme temperature indices calculated for four Spanish Mediterranean stations: Barcelona (Norheastern Spain), Valencia and Alicante (Eastern Spain) and Malaga (South Spain). Daily maximum and minimum temperature records are provided by the Spanish Daily Adjusted Temperature Series (SDATS) (Brunet *et al*., 2006, 2007). Data is used to develop several temperature extreme indices time series by means of RClimDex software (Zhang and Yang, 2004):

maximum (Tx) and minimum (Tn) temperatures above the 90^{th} and 95^{th} and lower than the 5^{th} and 10^{th} percentiles. The analysis is carried out for spring and summer seasons from 1951 to 2005.

Results show in all cases increases in daytime and nighttime upper percentiles and reductions in daytime and nighttime lower percentiles, in confidence with those obtained by Sigró *et al*., (2007) or Brunet *et al.*, (2008). Related to coastal tourism in Spain, the increase of hot days and nights in summer results in increased discomfort. On the other hand the reduction of cold days and nights in spring can help to reduce the seasonality of tourism demand. This is the challenge 1 of the *Action for more sustainable European Tourism* (Tourism Sustainability Group, 2007).

This is only one of the multiple impacts or "changes of scenario" that anthropogenic climate change will impose over tourism activities. In the framework of the project *Assessing present knowledge of climate change influence on tourism: vulnerability, impacts and adaptation and mitigation measures*, funded by the Science Park for Tourism and Leisure (SPTL) of the Universitat Rovira i Virgili we are working on the identification and research of critical issues related to Climate Change and its impacts over tourism. This project – a state-of-the-art analysis -, is understood as seminal to future research to be conducted in the framework of the SPTL.

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