

Introduction & Aims

Tourism is highly dependent on climatological and weather conditions. As a result, climate change may have a large impact on tourism patterns. The implications vary between different tourism types and activities, according to the type of weather they require. This study explores how climate change may alter the frequency of a range of weather types across Europe, and discusses the possible implications for 'summer-time' tourism activities.

Weather Types

Besancenot (1989) developed a system of nine weather types (see Table 1). The weather types are intended to resemble the intuitive weather categories that tourists use. The approach was originally developed to analyse local frequency distributions of these weather types, based on daily weather data from local weather stations. Gómez Martín (2006) applied it in Catalonia.

Methods & Data

The (change in) incidence of the nine weather types is assessed by counting the number of days belonging to each of them according to five different climate models. Frequencies are calculated for two time slices per climate model: the simulated baseline period of 1961-1990 ('1970s'), and the future period of 2071-2100 ('2080s'). The required daily data – results from the integrations of a suite of climate models forced with the SRES A2 scenario – are available from the PRUDENCE project.

Nr	Description	Typical activities
1	Very nice and sunny	Sunbathing
2	Nice and sunny	Light activities
3	Cool and sunny	Hiking and similar activities
4	Nice weather, partly clouded	Light activities
5	Nice weather, with an occasional shower	City visits
6	Hot and sultry	Water-side activities
7	Nice weather, with strong winds	Hiking and similar activities
8	Rainy	Unfavourable (indoor activities)
9	Unfavourable (residual category)	Unfavourable (indoor activities)

Table 1: Besancenot's (1990) weather types and typical activities associated to them.

Results

In Summer, large losses of favourable days (type 1-7) are expected for the Mediterranean (Med), with some gains towards the North (Fig 1). In this latter area, major increases are projected for the year as a whole, whereas the Med may suffer slight decreases. The Med is well-known for its Type 1 (sunbathing) weather, but is projected to lose much of its competitive edge (Fig 2). Much of Crete's summer, for example, may become unfavourable (Fig 3). For most weather types, the five models generally coincide in the direction of change, but the magnitude of change varies.

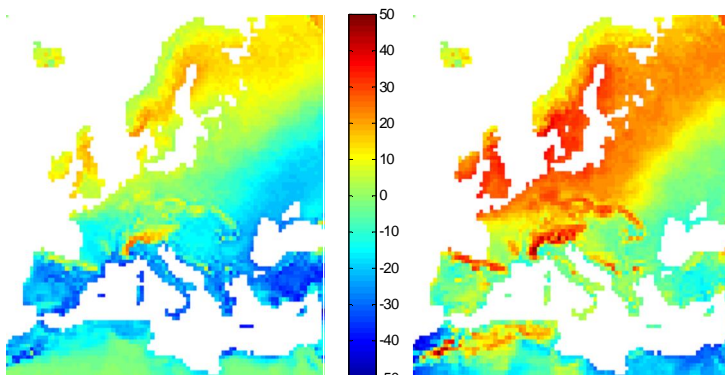


Fig 1: Change in the number of favourable days (type 1-7) between the 1970s and the 2080s in a mean summer (left) and mean year (right), according to the HadRM3P/HadAM3P model.

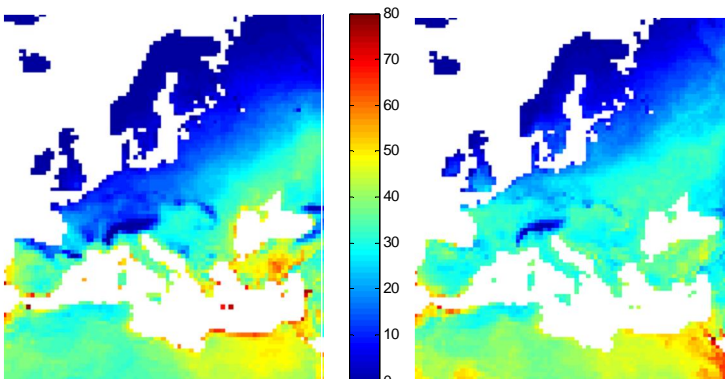


Fig 2: Number of days of type 1 in an average summer of the 1970s (left) and the 2080s (right), according to the REMO/HadAM3H model.

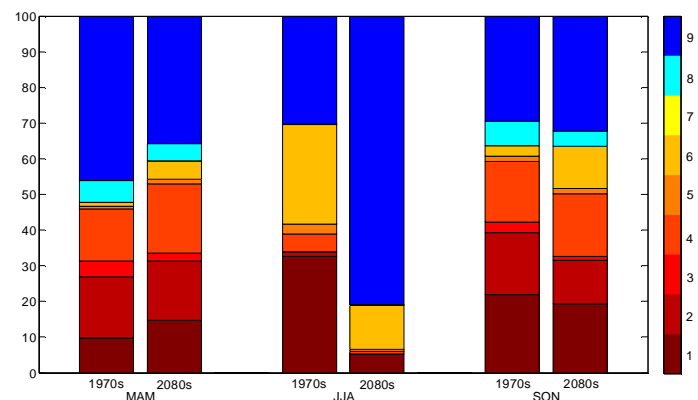


Fig 3: Frequency (in %) of the nine weather types in Crete in three seasons: March, April, May – MAM, June, July, August (JJA) and September, October, November (SON) in the 1970s (left bar) and the 2080s (right bar), according to the HadRM3P/HadAM3P model.

Discussion and Future Research

The projected northward shift of favourable conditions coincides with previous studies based on the Tourism Climate Index (e.g. Amelung and Viner, 2006). The weather type approach is richer, however, as it provides useful information for a range of tourism activities. It shows, for example, that northern Europe is unlikely to become very popular for beach tourism (type 1) in the next decades. Key issues for future research are a thorough comparison between model results in order to test robustness; further exploration of the implications for different types of tourism activities; and the use of additional scenarios.

References

- Amelung, B., & Viner, D. (2006). Mediterranean tourism: Exploring the future with the Tourism Climatic Index. *Journal of Sustainable Tourism*, 14(4), 349-366.
- Besancenot, J.-P. (1989). *Climat et Tourisme*. Paris: Masson.
- Gómez Martín, M. B. (2006). Climate potential and tourist demand in Catalonia (Spain) during the summer season. *Climate Research*, 32(1), 75-87.

Acknowledgements

Data have been provided through the PRUDENCE data archive, funded by the EU through contract EVK2-CT2001-00132.

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