



TOURISM CLIMATE INDEX OVER THE MEDITERRANEAN

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Key words : Climate projections, Mid-century, Tourism, Mediterranean, TCI

Target groups

- **Tourism planning authorities**
- **Tourist offices**
- **Tourism investors**
- **Tourism operators**

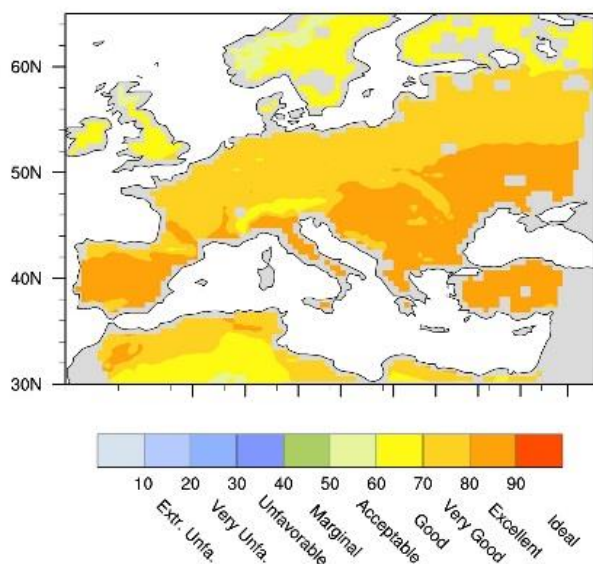
Relevance to the Case-Study Requirements

Tourism climate indexes (TCI) are commonly used to describe the climate conditions suitable for tourism activities, in a planning, investing or weather forecasting perspective. The 'reference' TCI was defined by Mieczkowski (1985). In the context of climate change, there is a renewed need for applications in a longer-term perspective, notably to estimate the economic impacts of climate change on tourism. Therefore, it is important to understand better users' needs and data issues, so as to specify better tailored indexes.

The Approach

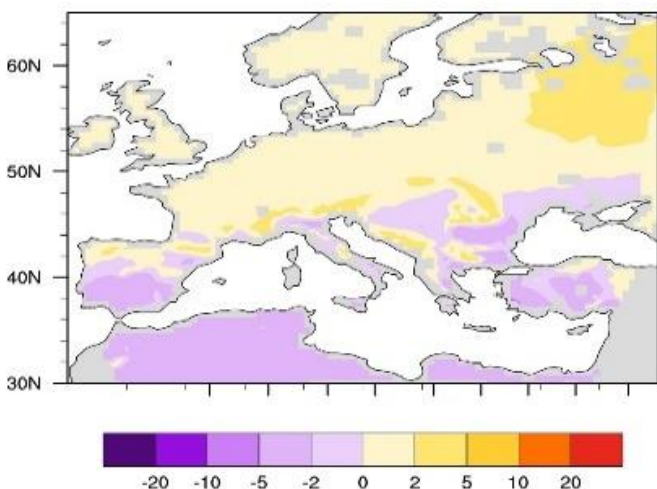
Nine of the atmospheric regional climate model simulations performed within the EU FP6 ENSEMBLES project were used to calculate the TCI for the Mediterranean region. Only a limited number of the ENSEMBLES models could be used as many variables are needed to calculate the TCI: temperature, precipitation, humidity, wind and sunshine duration. TCI values and the number of days with a TCI greater than 70 (which corresponds to a TCI of 'Good' and above) is looked at in present climate and in projections of the near future (2021-2050). The simulations are at 25 km horizontal resolution and follow the A1B greenhouse gas emissions scenarios. Comparaison with gridded station-based observations is not possible as the variables required to calculate the TCI are not available over the Mediterranean region.

The Product



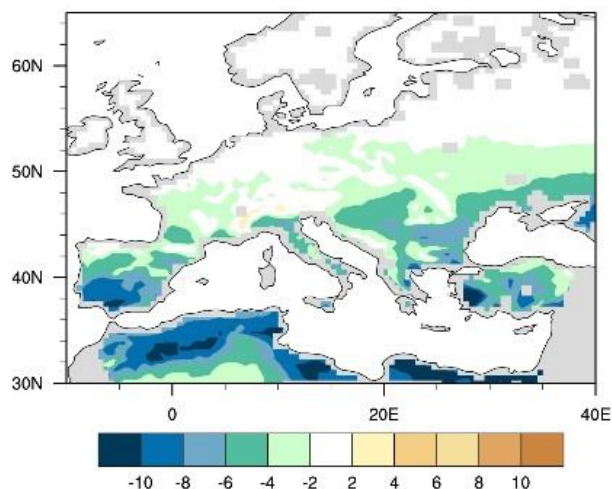
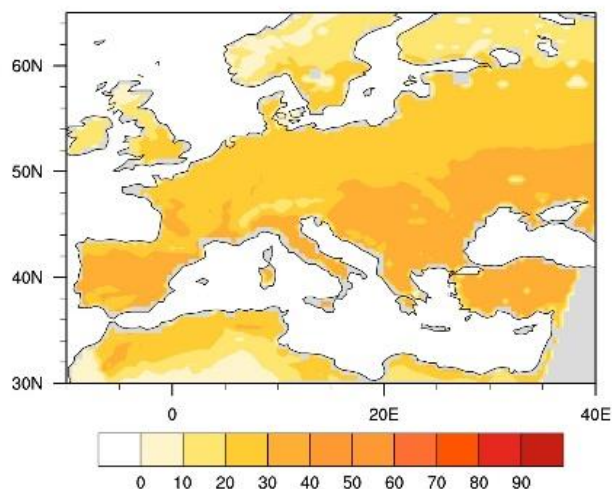
The mean TCI is calculated for the nine different models over the period 1971-2000 in summer. The orange to red colours represent a comfortable index. The regions surrounding the north of the Mediterranean Sea and the Black Sea have the highest index values.

TOURISM COMFORT INDEX OVER THE MEDITERRANEAN



The change in the summer TCI over the period 2021-2050 compared with 1971-2000 (averaged over nine models) indicates a decrease of the TCI around the Mediterranean basin and North Africa in the future. An increase in the TCI is found in northern Europe.

The number of days with a TCI greater than 70 (i.e. Good and above) is shown below (left side) for the different models over the period 1971-2000 (ensemble mean). There are around 60 such days over the Mediterranean basin for the summer season. The change in the number of days greater than 70 over the period 2021-2050 (right side) indicates a decrease of the TCI around the Mediterranean basin of between 4 to 10 days, with the strongest decrease in the southern part.



Making the Product Usable

The new simulations carried out within the MED-CORDEX initiative should all have the required variables for calculating the TCI, thus providing a larger ensemble of models than is presented here. The simulated TCI values cannot be validated against observations as no gridded station-based observations over all Europe for all the required variables are currently available. This limitation also means that we cannot bias correct the model output. In the future, we are hoping that more observed data will become available over Europe which will allow us to propose some corrections. Still, the product in its present state provides more comprehensive information than previous analyses, which were often based on one model only, and thus will help stakeholders to make more robust decisions.

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