16A.4 EXAMPLES OF CLIMATE AND TOURISM RESEARCH FOR TOURISM DEMAND

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1. INTRODUCTION

Climate information and knowledge about the influence of the atmospheric environment on humans are important questions in tourism climatology. The atmospheric environment affects humans and can in some cases lead to physiological strain with resulting impacts on health, as for example, those caused by summer heat waves. However, to be useful, information on these should be standardised and include the full inventory of factors that might affect human health and well being, at a spatial resolution that is sufficiently detailed to be useful. These factors should include intensity of UV-radiation, air quality, noise pollution and thermal bioclimatic conditions.

The objective of this paper is to present methods and results how to evaluate climate conditions for tourism demands. The first part of this paper explores a method of the assessment of the thermal component using thermal index. The second part of this paper presents spatial information on climate and tourism for Greece**.**

2. METHODS

A full application of thermal indices on the energy balance of the human body gives detailed information about the effects of the thermal environment on humans and these can be applied in tourism climatology. One possibility is the application of PMV (Predicted Mean Vote) and PET (Physiologic Equivalent Temperature) (VDI, 1998). Both thermal indices are well recommended and include all important meteorological and thermo-physiological parameters (Matzarakis, 2001b).

For the calculation of thermal indices based on the human energy balance, meteorological (air temperature, wind speed, air humidity and short and long wave radiation fluxes) and thermo physiological (activity and clothing) data are required. The RayMan model, which has been developed for urban climate studies and can be applied for different analyses in meso and micro scale in applied climatology, is presented here (Fig. 1). The model is a helpful tool for the assessment of tourism and climate related issues. RayMan can be run by the use of synoptical and climatological data. The final output of the model is the calculated mean radiant temperature which is required in the energy balance model for humans and thus for the assessment of urban bioclimate and the resulting thermal indices, e.g. PET (Matzarakis et al., 2000). The model is developed based on the German VDI-Guideline 3787 Part I (VDI, 1998).

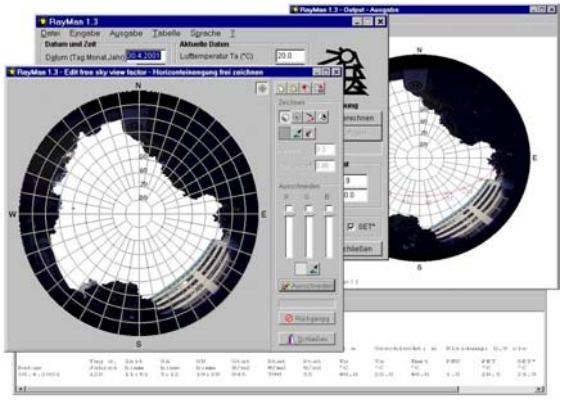

FIG. 1. Window menus of *RayMan* 1.3 allowing import and export of urban structures for the calculation of mean radiant temperature T_{mrt} and thermal indices.

Tourism-related atmospheric/climate information and results for single stations as well as generated maps are required. The link between the point data as PET can be done by maps. For the construction of climatic and bioclimatic maps, stochastical-statistical models, by the application of linear multiple regression can been used (Matzarakis, 2001a).

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3. RESULTS

Sample analyses for tourism climate conditions can be analysed by RayMan by the use of synoptical and climatological data. Fig. 2 gives the annual variation of Physiological Equivalent Temperature (PET) in Pafos/Cyprus at 5 and 13 UTC for the Period 1. February 2000 to 31. January 2001 (Andrea, 2000).

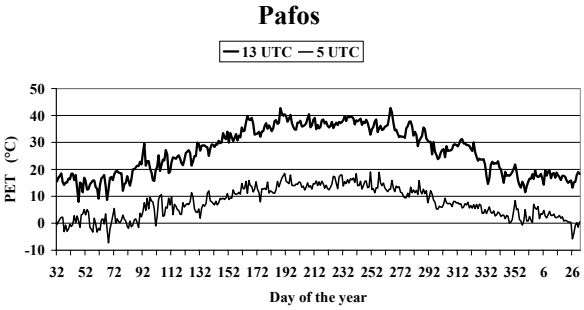

FIG. 2. Physiological Equivalent Temperature (PET) at 5 and 13 UTC in Pafos for the period 1.2.2000 to 31.1.2001.

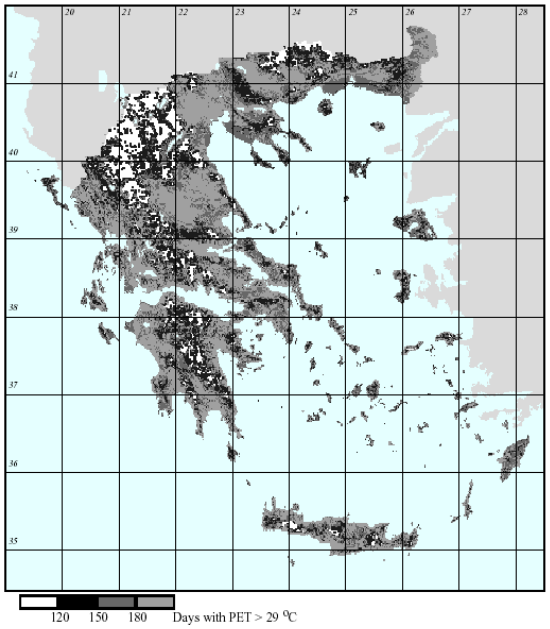

FIG. 3. Spatial distribution of days with Physiological Equivalent Temperature (PET) > 29 °C in Greece at 12 UTC.

As a typical example of tourism climate mapping based on thermal indices Fig. 3 gives the spatial distribution of days with Physiological Equivalent Temperature (PET) > 29 °C in Greece at 12 UTC for the period 1980-1989. This kind of maps can be helpful for the duration of the tourism period.

CONCLUSIONS

For the evaluation of climate conditions for tourism detailed information about the thermal environment are required.

The information must also be presented in a way that can be easily understood, not only by people in other disciplines but also by members of the public.

Methods and results have been documented and are now available and downloadable in internet for general use. RayMan is available under (http://www.mif.uni-freiburg.de/rayman). Climate Information for Greece is available and downloadable in Internet (http://www.mif.uni-freiburg.de/tourclimgr).

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