*Forecasting the weather
- ensemble techniques
in probabilistic weather prediction*

The Dilemma in Thermal comfort estimations

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The quantification of the thermal environment nowadays is based on the human energy balance and the derived thermal indices (i.e. Physiologically Equivalent Temperature or Universal Thermal Climate Index). The advantage of these indices based on the human energy balance is the possibility their application to environments ranging from cold to hot conditions. The recent thermal indices have limitations because of the different used approaches or parameterization of the human energy budget and the specific requirements.

The advantage of the thermal indices is that using an output from human energy balance calculations like temperature is easy understandable by non-specialists in human biometeorology. The other advantage is that most of the thermal indices require the same meteorological input data (air temperature, air humidity, wind speed and mean radiant temperature) and thermo-physiological information (activity and heat transfer of clothing covering skin surface). Additional relevant thermo-physiological information like gender, age, weight, height etc. are also included but are not of high relevance for applications in climatology and biometeorology.

For applying thermal indices, the import parameters contain pronounced variability in the spatial and temporal dimension. The spatial and temporal dimension includes also the interrelations between indoors and outdoors and in addition to that the frequency of use of different spaces and locations during day and night. Further, the input parameters vary with measurement height and different transfer techniques into appropriate input conditions of thermal indices.

So not only the appropriate and exact knowledge of a thermal index is of importance but also the variability of the input parameters. Several examples for this influence of input parameters and their variability on thermal indices are shown.