

Humboldt Kolleg

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### *Global Challenges of the 21<sup>st</sup> Century*

- 1) Technological development and human health/ quality of life*
- 2) Climate change and environmental sustainability*
- 3) Democracy and cohesion in Europe*

### *Short- and Long-term Climate Adaptation in Cities*

Nowadays the knowledge about recent and future climatic conditions of regional climate simulations is not so relevant as the knowledge of the implications and communication of effects for different purposes and financial sectors. For human health, the strongest implications are heat waves and the modes in which they can affect daily life and, in general, public health. For this reason, after the 2003 European heat wave, warning systems have been developed and implemented in daily weather forecasts. Heat Health Warning Systems (HHWS) consist of weather forecasts for specific times (usually 1-2 days), a combination of weather conditions in relation to health, mostly with human biometeorological models, and the definition of thresholds based on epidemiological data – specifically mortality information, nocturnal conditions for inhabitants in houses, specific information for elderly people living in cities. Additionally, warnings and information should be communicated in a relevant and appropriate way in order to reach the specific target groups, first aid services and emergency organisations. The HHWS build a valuable example for short term adaptation – especially in cities. For instance, the re-design of the "Platz der Alten Synagoge", an urban place in Freiburg in Breisgau, in South-West Germany, has led to discussions. In the run-up to the re-design, its influence on thermal heat stress on humans during the summer months was carefully analyzed and quantified using micro scale models. The results of this analysis present valuable examples on how long-term adaptation possibilities should be assessed in the era of climate change.

**Andreas Matzarakis** has been leading the Research Center Human Biometeorology of the German Meteorological Service in Freiburg since August 2015 and is responsible for the Heat Health Warning System in Germany. Appointed as extraordinary Professor at the University of Freiburg since October 2006, Prof. Matzarakis received a degree in Meteorology from the Physics Department of the Ludwig-Maximilians-University in Munich and a Ph.D. degree in Meteorology and Climatology from the Aristotle University of Thessaloniki. From 1995 until 2001, he was a research assistant at the Meteorological Institute of the Albert Ludwig University of Freiburg and

obtained his habilitation with a study on the "thermal component of the urban climate" in 2001. He was appointed Professor at the University of Freiburg in October 2006. His research is mainly focused on urban climatology, human-biometeorology, tourism climatology and climate impact research. Prof. Matzarakis developed several models and tools in applied climatology and biometeorology such as RayMan Model, the SkyHelios Model and the CTIS (Climate-Tourism/Transfer-Information-Scheme). He is editor of the Biometeorology section of the Atmosphere Journal and President of the Society for the Promotion of Human Biometeorological Research in Germany.