

IMPACTS OF CLIMATE CHANGE ON THE OCCURRENCE OF EXTREME EVENTS: THE MICE PROJECT

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It is widely accepted that climate change due to global warming will have substantial impacts on the natural environment, and on human activities. Furthermore, it is increasingly recognized that changes in the severity and frequency of extreme events, such as windstorm and flood, are likely to be more important than changes in the average climate. The EU-funded project MICE (Modelling the Impacts of Climate Extremes) commenced in January 2002. It seeks to identify the likely changes in the occurrence of extremes of rainfall, temperature and windstorm due to global warming, using information from climate models as a basis, and to study the impacts of these changes in selected European environments. The objectives are: a) to evaluate, by comparison with gridded and station observations, the ability of climate models to successfully reproduce the occurrence of extremes at the required spatial and temporal scales. b) to analyse model output with respect to future changes in the occurrence of extremes. Statistical analyses will determine changes in (i) the return periods of extremes, (ii) the joint probability of extremes (combinations of damaging events such as windstorm followed by heavy rain), (iii) the sequential behaviour of extremes (whether events are well-separated or clustered) and (iv) the spatial patterns of extreme event occurrence across Europe. The range of uncertainty in model predictions will be explored by analysing changes in model experiments with different spatial resolutions and forcing scenarios. c) to determine the impacts of the predicted changes in extremes occurrence on selected activity sectors: agriculture (Mediterranean drought), commercial forestry and natural forest ecosystems (windstorm and flood in northern Europe, fire in the Mediterranean), energy use (temperature extremes), tourism (heat stress and Mediterranean beach holidays, changes in the snow pack and winter sports) and civil protection/insurance (windstorm and flood). Impacts will be evaluated through a combination of techniques ranging from quantitative analyses through to expert judgement. Throughout the project, a continuing dialogue with stakeholders and end-users will be maintained.