



Developing model-data comparison methods for the Millennium Project

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It is central to understand climate of the past if the importance of changes in present day climates are to be assessed and for reducing uncertainties in predictions of future climate changes. The climate system has, in general, only been instrumentally observed for the past hundred and fifty years. Hence proxy data must be used to represent earlier climates, using measures that are considered responsive to changing climatic conditions. Previous studies comparing proxy and climate model data have been based on only a handful of climate models, which is not a representative approach given the lack of understanding in the climate system and the assumptions made to produce climate models, and also given the large degree of randomness in climate trajectories given a certain climate forcing history. The EU funded Millennium Project was specifically established to aid understanding of these issues. Firstly, by generating a number of synthesized regional proxy-based climate reconstructions for Europe stretching back to 1000 AD, and secondly in the development of a fast variant of the fully-featured HadCM3 UK Met. Office climate model (FAMOUS) to generate a vast model ensemble of experiments. This ensemble can be used to develop statistical distributions for determining the climate sensitivity and likely future climate changes, as many model experiment permutations allow for the large uncertainty in historical forcings, model parameterizations and internal climate variability to be accounted for.

This study involves the development of methods for comparing climate data reconstructed from European regional proxy syntheses from the Millennium Project with the FAMOUS model ensemble.