Geophysical Research Abstracts
Vol. 15, EGU2013-615, 2013
EGU General Assembly 2013

Detection of Events Impacting the Insurance Industry in Historical and PiControl Experiments from the CMIP5 Project

Madeleine-Sophie Deroche, Francis Codron, Pascal Yiou, and Mathieu Choux
LSCE / LMD,University of Pierre et Marie Curie, Paris, France (madeleine-sophie.deroche@lmd.jussieu.fr)

A methodology aimed at detecting extreme European winter storms has been developed using a catalogue of ten reference storms known as extremes for the insurance industry. We define thresholds from the distributions of the maxima of three variables: the Relative Vorticity at 850 hPa, the Mean Sea Level Pressure Anomaly and the ratio of the 10m wind speed over its 98th percentile. Once events for each variable are detected, we look for common events and define them as potentially damageable events. Insofar, the methodology has been applied to the ERA Interim and NCEP2 datasets, giving satisfying results: the number of common events is smaller than the number of detected events for each variable and allows us to isolate potentially damageable events (including the ten reference) from other detected events.

The CMIP5 experiment provides a multi-model ensemble of simulations with different spatial and temporal resolutions. This analysis aims at assessing how CMIP5 models (with a spatial resolution finer than 2.5°), compared to the reanalyses, perform in:
- reproducing extreme values of Relative Vorticity at 850 hPa, Mean Sea Level Pressure and 10m Wind Speed in the high frequency datasets (insofar, studies on climate change mainly focused on daily and monthly outputs)
- generating extreme European winter windstorms as defined by our methodology

In this study, we consider the 6-hourly outputs of a selection of CMIP5 models (selection based on the spatial resolution) and apply our methodology of European storm detection. We focus on two sets of experiments: the historical experiment (changing conditions are imposed with natural and anthropogenic forcings) and the piControl experiment (constant pre-industrial conditions are imposed). An inter-comparison of the distributions of the maxima of each variable as well as the final detected events is performed between models for the two experiments and compared to the previous results obtained with reanalysis datasets.
This study is a first step toward the generation of a catalogue of
European storms, by using state-of-the art climate models.