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Effects of climate variability and extreme events on European ecosystem state and function: A CARBO-Extreme modelling study

Christian Beer (1), Nuno Carvalhais (1), Paulo Oliveira (2), Thijs Koelen (1), Giorgio Alberti (3), Sönke Zaehle (1), and Markus Reichstein (1)

(1) Max-Planck-Institut für Biogeochemie, Jena, Germany (cbeer@bgc-jena.mpg.de), (2) Institut für Atmosphäre und Klima, ETH Zürich, Switzerland, (3) Department of Agriculture and Environmental Sciences, University of Udine, Italy

Which are the effects of a changing variability of climatic drivers on ecosystem state and function? For example, what is the relationship between carbon balance or carbon pool size to the frequency of drought or strong precipitation events? What is the impact of a single or repeated spring cold on phenology and productivity?

Being part of the EU-FP7 project CARBO-Extreme, this study will address such questions from a modelling viewpoint for Europe during 1900-2100 using the land surface scheme JSBACH. This model serves as land component within the Max-Planck Earth System Model and operates on a half-hourly basis. Climate forcing 0.5 degree, 1901-2001 came from the EU project WATCH and was overlapped by regional climate model outputs 1950-2100 provided by the EU project ENSEMBLES. Continental-scale model results will be analysed w. r. t. the response of carbon pools and fluxes to changing climate variability, e.g. frequency of drought or frequency of temperature anomalies. In addition, model runs at manipulated Mediterranean forest sites using observed forcings will be analysed w. r. t. the model's validity of the response to climate variability and extreme events.