C-EXTREME - The terrestrial Carbon cycle under climate variability and extremes a Pan-European synthesis

The aim of this project is to achieve an improved knowledge of the terrestrial carbon cycle in response to climate variability and extremes, to represent and apply this knowledge over Europe with predictive terrestrial carbon cycle modelling, to interpret the model predictions in terms of vulnerability of the terrestrial in particular soil carbon pools and give according advice to EU climate and soil protection policies.

This objective will be achieved by integrating three major types of recent and new solid scientific carbon cycle data, from:

- soil process studies,
- a network of established ecosystem manipulation experiments, and
- long-term observations spanning several times-scales (e.g. eddy covariance data, tree rings and growth, crop yields, long-term remote sensing data on soil moisture and vegetation activity and soil carbon inventories).

The integration will be reached by establishing a consistent and harmonized data base and by confronting the terrestrial carbon cycle models with the multiple data sets within a Bayesian model identification and improvement procedure. Specific model development concerning processes affected by extreme events (e.g. soil carbon destabilization, tree growth response incl. lag effects and mortality) will be included and followed by model testing and improvement against the data made available in the project.

The improved models will simulate terrestrial processes relevant to carbon balance and soil erosion at pan- European scale using regionalized climate scenarios with explicit inclusion of extreme climatic events. Since we are using several climate scenarios and an ensemble of models we will be able to characterize the uncertainties in prediction coming from models and climate scenarios. We will interpret the empirical evidence from the observational work and the model simulations in a framework of vulnerability assessment and disseminate and discuss results with stakeholders at EU level.

Research area:	ENV.2008.1.1.3.1. Impacts of climate variability, extreme events and increasing atmospheric greenhouse gas concentrations on terrestrial carbon storage, exchange flows and soil carbon dynamics
Organisation:	MAX PLANCK GESELLSCHAFT ZUR FOERDERUNG DER WISSENSCHAFTEN E.V. Hofgartenstrasse, MUENCHEN, GERMANY
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