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Name des Projekts: COMBINE – The Mediterranean Case
Projektnummer:

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Additional regional feedbacks and their influence on regional impacts: The Mediterranean Case

The project „Comprehensive Modelling of the Earth System for Better Climate Prediction and Projection“ (COMBINE, Grant Agreement no. 226520), funded by the 7th framework program of the European Commission, has the aim to reach a better understanding of the feedback of processes on the climate system which have before been neglected in Earth System Models (ESM). Work packages 1-7 dealt with incorporation of these new components into ESMs and produced scenarios both without and with these new components, at both centennial and decadal time scales.

Work package 8 feeds this information and data to the integrated assessment and impact models of selected, important sectors (climate policy, hydrology/water resources, primary production/agricultural production), with the aim to understand and quantify additional impact characteristics which may result from incorporating the new components into ESMs. The scenario analysis will focus on the consequences of feedbacks for assumptions underlying the original scenarios – and more specifically, assess the consequences of feedbacks for climate policy.

It is expected that in some regions of the world regional feedbacks are so strong that a modulation of the global climate change signal can occur. In COMBINE regional dynamical downscaling tools (RCM) with additional feedbacks will be applied to systematically investigate regional feedbacks in the Arctic, the eastern Mediterranean and the Amazon.

The Max-Planck-Institute for Meteorology will contribute to the Mediterranean case study. The Mediterranean has been identified as a region with a particularly pronounced response to climate change (IPCC 2007). Dynamical downscaling simulations of decadal high resolutions runs are planned using the newest version of REMO, including the aerosol model HAM. We will focus on the simulation of regional feedbacks between aerosols, clouds and precipitation. The local scales will be addressed for Greece (Crete) by applying further downscaling to a horizontal resolution to ca. 2x2 km with the newly developed non-hydrostatic version of REMO (REMO-NH). The model output will be used for hydrological modelling and agricultural assessments. Climate scenarios at high spatial resolution for Crete will enable better planning of storage facilities (e.g., dams) based on expected spatial and temporary rainfall patterns, better founded understanding of aquifer recharge, and the distribution/cultivation of more appropriate agricultural products.