Project: XXX
Project title: ISI-MIP

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Intersectoral Impact Model Intercomparison Project (ISI-MIP)

Abstract

ISI-MIP is a project coordinated by the Potsdam Institute for Climate Impact Research and funded by the Federal Ministry for Education and Research (BMBF) running from April 1, 2012 to August 31, 2013. ISI-MIP aims at providing a synthesis of climate change impact projections that is consistent across key sectors of societal interest (agriculture, water, ecosystems, coastal infrastructure, and health). The project is designed to quantify climate-induced impacts at different levels of global warming and to assess the robustness of the projections based on the spread over different impact models and different climate projections, to better understand the differences between a 2°, 3° and 4° warmer world. Such information is highly relevant to the political discussion of optimal mitigation and adaptation strategies. The project will deliver global-scale results for immediate inclusion in the upcoming Fifth Assessment Report (AR5) of the IPCC and in the review process of the 1.5°C / 2°C target initiated by the UNFCCC Cancun agreements. The broader objective of the project is to seed a long-term research and community-building process, focusing on consistent and regular intercomparison of impact models across multiple scales and sectors. This is intended to complement the highly effective scenario-based efforts in the climate modeling and integrated assessment modeling communities.

More specifically the research objectives of the project are:

1. To set up a consistent climate and socio-economic scenario framework to be used in global climate impact assessments, based on a new generation of scenarios (Representative Concentration Pathways [RCPs] and Shared Socio-Economic Pathways [SSPs]);
2. To provide a quantitative assessment of global climate change impacts at different levels of global warming;
3. To provide basic uncertainty estimates based on the quantification of inter-model variations;
4. To apply society-relevant impact metrics that allow comparison of impact models within individual sectors;
5. To provide the basis for an integration of model-based climate impact assessments at global and regional scales;
6. To identify important research gaps (such as the representation of the effect of extreme events in global climate impact models) and develop strategies to address these in the near future.
7. To assess if global mean temperature change is a good indicator for the impact. In the case there is a strong scenario dependence of impacts at different levels of

global warming, additional indicators such as CO_2 concentration, GDP, or population might be needed to “project” impacts.

ISI-MIP brings together research groups from five different research areas and 32 different international institutions, 27 different impact models are involved. The ISI-MIP fast-track aims to quantify the uncertainty in the impacts of climate change, both across climate impact models and sectors, and for different levels of global warming. These two objectives are embedded in a set of sector-specific scenarios described in the modeling protocol. The list of chosen scenarios represents a compromise between ensuring harmonization across the sectors and exploring the sector-specific modeling uncertainties. The minimal setting of runs spans both the climate model and the climate scenario space to a basic extent. All four RCP concentration scenarios are to be run using data from one global climate model (GCM). These four runs will allow the comparison of climate impacts at different levels of global warming. Additionally, four more priority GCMs are considered together with those RCPs producing the highest and lowest end-of-century forcings (RCP8.5 and RCP2.6 respectively). Where applicable, only the middle-of-the-road socio-economic scenario (SSP2) is used in the minimal setting. Highly relevant sensitivities (e.g. to CO_2 fertilization) are also considered here. The minimal setting also includes control runs, which will allow the effects of economic development and population growth to be disentangled in post-processing. Further along, the impact of different scenarios for socio-economic changes is explored, utilizing the newly developed SSPs.