



Integration of a simplified water resources model into an interactive platform to assess climate change impacts in Europe

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The EU-FP7 project CLIMSAVE aims at the development of a user-friendly and interactive internet application that will allow stakeholders to assess climate change impacts and vulnerabilities. This integrated assessment platform (IAP) is a system of coupled surrogates for state-of-the-art models of environmental and socio-economic sectors including water resources and water use. Additionally, the IAP will enable stakeholders to explore adaptation strategies for reducing climate change vulnerability, discovering where, when, and under what circumstances such actions may help.

The IAP is designed as a tool to support the development of plausible scenarios of global change and corresponding adaptation strategies in the course of participatory stakeholder workshops. Thereby, stakeholders and scientists describe the possible future development of socio-economy and the environment as well as appropriate adaptation options to cope with the likely changes. Subsequently, these qualitative descriptions are quantified and consistently analysed as to their consequences using the IAP as an interactive tool. This procedure is repeated iteratively with altered qualitative scenario descriptions and quantifications. In this manner, stakeholders can explore the uncertainties and cross-sectoral benefits or conflicts related to the scenarios and corresponding adaptation strategies. Whereas the analysis of a scenario with state-of-the-art models usually takes several weeks to months due to the complexity of the modelling exercise, the interactive use of the user-friendly IAP facilitates a large number of iterations in the course of a single workshop. Hence, the number of workshops in a scenario building process can be considerably reduced saving time and travelling expenses for stakeholders.

As a precondition for the interactive application of the IAP, the modelling results must be available within a few seconds after the user started the (re-)evaluation of a certain scenario setting. Additionally, the results must be displayed concisely on the screen once the evaluation is finished. Therefore, information presented to the user must be very limited. In order to meet these essential requirements, simplified surrogates for computationally demanding and complex, state-of-the-art simulation models for the sectors water resources, agriculture, forests, biodiversity, coasts, and urban development are coupled.

In this paper, we give a brief overview of the IAP and the linkages between the surrogate models. We will illustrate how the integrated platform can be used in a stakeholder process. This includes an overview of the various screens displaying the modelling results and the different possibilities to interact with the tool in order to specify scenarios and adaptation strategies. As an example to demonstrate the advantages of using simplified models in the IAP, we will present the approach of the sectoral model for water resources and water use, which was developed as a surrogate for the global model WaterGAP. Finally, we will discuss the limitations of the simplified approach to model flow parameters such as average river discharge and discharge exceeded in 10% and 90 % of the time. To this end, we will compare the results of the simplified hydrological model to the corresponding output of the WaterGAP model.