

Using Ensemble Information in Impact Assessment

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It is generally assumed, that each step of a modeling chain leads to an amplification of the uncertainty-cascade (e.g. Giorgi, 2010), according to the error growth theory. Giorgi (2010) differentiates between the “bad” uncertainty (knowledge uncertainty: resulting from limited knowledge of processes or insufficient process implementation in the models) and the “good” uncertainty (intrinsic uncertainty: resulting from different emission pathways and internal climate variability). The knowledge uncertainty can in principle be reduced with further research. However, the intrinsic uncertainty will remain and we need to explore the whole bandwidth of possible climate results using climate model ensembles. Thus, impact modeling studies will always need to deal with bandwidths of climate projection results.

We postulate that for a number of impact assessment applications, the uncertainty stemming from the climate model results can be reduced due to the application of the impact model or the impact assessment. We provide examples of analyses from forestry and nature conservation, where the application of the impact model reduces the uncertainty envelope compared to the driving regional climate model results.

Reference:

Giorgi, F., 2010: Uncertainties in climate change projections, from the global to the regional scale. EPJ Web of Conferences, 9, 115-129.