



Multi-model vs mixed-physics ensemble of climate runs: implications for climate change impacts in cropping systems

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This work compares the uncertainty of impact projections of climate change on agriculture when using climate ensembles built with different criteria. Two ensembles based on Regional Climate Models were used: a multi-model ensemble of 5 RCMs at 50 x 50 km of resolution and a mixed-physics ensemble of 5 different parameterizations of the RCM PROMES. Both ensembles of climate were used to run crop simulations.

A crop model was used for simulating growth and development of irrigated wheat across main agricultural areas of Spain. These simulations extended the work done in Ruiz-Ramos et al. (2009) for maize, including contrasting growing seasons in the uncertainty analysis. The simulations considered 10 years of control climate and 10 years of A2 IPCC SRES scenario, for the five members of both ensembles of climate.

Uncertainties analysis focused on the degree of coincidence on the sign of impact of crop yield projections, and on the magnitude of impacts when comparing projections from ensemble members. The results allowed for evaluating the contribution of RCM parameterizations to uncertainty generated through the modelling chain from climate to impacts. They also provided insights about the constraints and proper use of different sorts of ensembles of climate for evaluating agricultural impacts of climate change.

References

Ruiz-Ramos M, Domínguez M, and Gaertner MA, 2009. Contribution of changes in RCM parameterizations to uncertainties in the projections of climate change impacts in cropping systems. Geophysical Research Abstracts, Vol. 11, EGU2009-7773.