Incorporating climate change trends to near future variability of crop yields in Iberia Peninsula

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In this study, we analyze the effects of near future climate variability on cropping systems in Iberian Peninsula (IP). For this purpose, we generated climate sequences that simulate realistic variability on annual to decadal time scales. The sequences incorporate nonlinear climate change trends, using statistical methods and and an ensemble of global climate models from the Coupled Model Intercomparison Project (CMIP5). Then, the climate sequences are temporal downscaled into daily weather data and used as inputs to crop models. As case study, we evaluate the impacts of plausible future climate scenarios on rain-fed wheat yield two agricultural locations in IP.

We adapted the method by Greene et al., (2012 and 2015) for informing climate projections for the coming decades with a combination of seasonal to interannual and anthropogenically forced climate change information for accounting the Near-term Climate Change. Long-term data containing solar radiation, maximum and minimum temperature and rainfall are needed to apply this method. The climate variability observed was decomposed into long-range trend, decadal and interannual variability to understand the relative importance of each time scale. The interannual variability was modeled based on the observational records.
The results of this study may have important implications on public and private sectors to analyze the probabilistic projections of impacts and agronomic adaptations of near future climate variability in Iberian Peninsula.

References
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