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Evaluation of seasonal weather forecasts for agriculture applications in southeastern Europe

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Predicting and preparing for changes in agricultural ecosystems is crucial in an era of rapid global warming. Climate model projections are the only tool we have in assessing the risks for the global food system and they provide some foresight for decision-makers as they develop their adaptation and mitigation strategies. One big challenge in the development of these projections is that we can only evaluate them at the time of their validity, i.e., in many decades from now. However, some knowledge can be gained by assessing the vulnerability of certain crops to anomalous weather and climate conditions at shorter time scales as well. In this work, we analyze past ensemble seasonal forecasts (1 to 6 months lead time) from several weather centres across the world and evaluate their performance based on reanalysis data. The ultimate goal is to assess the impact of uncertainty and biases in seasonal weather forecasts on crop yields, with a focus on the wheat and corn production of southeastern Europe. This will be achieved through the collective efforts of meteorologists, climatologists, and agronomists in the Augures project. Apart from its applicability on an operational seasonal prediction basis, assessing the strengths and limitations of probabilistic crop yield forecasting offers valuable insights for the usability of agricultural projections at longer time horizons.