KLESIS: CLimate science for Evaluation of changing Socioeconomic ImpactS

Description

Climate change (CC) poses numerous risks to society. Amongst these, recent work has quantified the impacts that adverse climate conditions can exert on economic growth and inflation by applying empirical models (EMs) to historical data. Evaluation of the extent to which historical and future CC is changing such impacts is crucial for translating these empirical insights into actionable knowledge. Two key examples are quantifying the historical anthropogenic contribution to intensified impacts, and accurately projecting their near-term changes. These tasks face challenges because climate model ensembles often under-estimate forced changes in impact-relevant conditions such as extremes, and near-term changes are affected by both greenhouse forcing and internal variability, with the latter amplifying or masking impacts over decadal timescales.

KLESIS proposes to extend recent methodological developments in climate science to overcome these obstacles to an accurate evaluation of how climate impacts are changing. First, we will develop and apply statistical methods to attribute historical changes in impact-relevant climate conditions directly from observations. These methods will be tested in climate models, applied to observations and combined with EMs to evaluate the anthropogenic contribution to historical changes in climate impacts on the economy, crucial for informing loss and damage debates. Second, we will extend state-of-the-art decadal climate prediction systems to include impact-relevant conditions. Combining these with EMs will provide near-term estimates of climate impacts which accurately reflect the important and otherwise neglected role of internal climate variability. Finally, near-term projections of impactson economic growth and inflation will be disseminated to stakeholders at the European Central Bank via a 6-month non-academic placement, to develop a framework for the assessment of physical climate risk in their quarterly macroeconomic forecasts.

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