Plausible drying and wetting scenarios for summer rainfall in Southeastern South America: assessment of model uncertainty using a storyline approach

Summer rainfall trends in Southeastern South America (SES) affect an area where around 200 million people live. Literature identifies more than one driving mechanism for them, some of which have opposing effects. However, it is still not clear how much each mechanism has contributed to the observed trends or how their combined influence will affect future trends. In this work, we study how SES summer rainfall long-term changes in CMIP6 simulations can be explained by mechanisms related to large-scale extratropical circulation responses in the Southern Hemisphere (SH) to remote drivers such as warming sea surface temperature patterns or the delay of the stratospheric polar vortex breakdown date. While the change projected by the multimodel ensemble mean is a wetting, when considering all plausible large-scale storylines, drying scenarios are also found. In addition, it is shown that the definition of the SES regional box can impact the results, given that if the spatial patterns characterizing the dynamical influences are complex and the impacts can be averaged out if large-scale influences are not considered prior to aggregating. The approach proposed in this study helps building a way forward in tackling the problem of understanding and communicating uncertainty in regional climate change in other regions of the world.

Link: https://uni-leipzig.zoom.us/j/7253736454

Ort: LIM, Stephanstraße 3a, Bjerknes Lecture Hall