

Applications of Multi-Year Climate Prediction: An Exploratory Discussion on Rainfall in the Sahel Region of Africa

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This paper explores how climate services may potentially incorporate information emerging from the new science of multi-year climate prediction. The geographic focus is the Sahel region of West Africa, which has demonstrated prediction advances for rainfall on the multi-year timescale, and vulnerability to climate hazards. The paper draws on reviews of predictability and applications in the region and a national workshop in Sudan (?Exploring applications of multi-year predictability of Sahel rainfall?, held in Khartoum, October 2018). Decadal prediction is an emerging capability, to date being undertaken primarily as a learning process. However, for the multi-year forecast information, we identify a number of new dimensions that challenge product design and user uptake. Current experiments often present forecasts as the average conditions for a target first year, and then average over subsequent set of years (often years 2-5) raising a question of what a forecast of average conditions for years 2-5 represents in terms of climate to expect, and how annual updates to multi-year forecasts may best be produced and communicated. Stakeholder consultations highlighted some of the concerns noted for existing seasonal forecasts, but now translated into terms for multi-year information, such as confidence in information, need for research on temporal downscaling (which may now include information on the risks of climate anomalies in the individual years that make up the forecast period), capacity development, and that communities would need to be convinced about effectiveness, alongside careful communication, especially in the context of multi-year planning. This paper captures one of the first learning case studies on how applications of multi-year prediction may be explored in a given region, a first step towards climate services development that integrate multi-year information.