



## **Global changes in the synchronicity of seasonal rainfall and temperature**

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Seasonal variations in climatic inputs (in particular, rainfall and potential evapotranspiration) have garnered considerable attention in recent years as controlling factors for hydrological and ecosystem responses. These emphases on the role of climate seasonality come at a time of discernible climate change. Previously, we have shown that the interannual variability in the arrival, intensity, and duration of seasonal rainfall have increased over the past century in parts of the tropics where rainfall seasonality is already high. Here, we analyze globally an index that captures the combined effects of rainfall and temperature seasonality by borrowing methods from statistical and information theories. We differentiate between regions which are similar in the seasonality of rainfall or temperature, but are desynchronized in terms of atmospheric supply and demand (e.g., Mediterranean vs. Monsoon climates). For these regions, we describe how the climate seasonality and the synchronicity of rainfall and temperature have shifted over time, along with changes in their interannual variability. We also demonstrate correlations to intra-annual patterns of vegetation productivity, thereby placing such trends and changes in interannual variability in an ecologically meaningful context.