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## Sub-seasonal temporal clustering of extreme precipitation: Spatio-temporal distribution, physical drivers and impacts

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The successive occurrence of extreme precipitation events on sub-seasonal (weekly to monthly) timescales can lead to large precipitation accumulations and severe impacts for humans and ecosystems. We take here a global perspective to explore the spatio-temporal distribution of sub-seasonal temporal clustering of extreme precipitation (TCEP) and the physical mechanisms that are responsible for it. We first discuss the seasonal distribution of TCEP and its statistical significance, assessed with Ripley's K function. Though TCEP is mainly confined to the tropical oceans, it is also significant regionally in the Northern Hemisphere extra-tropics, especially along the eastern margins of ocean basins. We then examine thanks to Generalized Linear Models how large-scale modes of variability and regional dynamics affect the occurrence of temporal clustering across the world. In the tropics, ENSO, the Indian Ocean Dipole and the MJO all modulate TCEP frequency, while the effect of the North Atlantic Oscillation and Pacific North American pattern dominate in the Northern Hemisphere. We conclude with an impacts-focused discussion of how TCEP affects river discharge across Europe. TCEP leads to a higher and more prolonged discharge response, especially in pluvial-dominated catchments, and thus to higher flooding risk.