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Climate reddening increases the chance of critical transitions

Bregje van der Bolt (1), Egbert H. van Nes (1), Sebastian Bathiany (2), Marlies E. Vollebregt (1), and Marten Scheffer (1)

(1) Aquatic Ecology and Water Quality Management Group, Wageningen University and Research, Netherlands, (2) Climate Service Center Germany, Helmholtz-Zentrum Geesthacht, Hamburg

Climate change research often focuses on trends in the mean and variance. However, analyses of paleoclimatic and contemporary dynamics reveal that climate memory – as measured for instance by temporal autocorrelation - may also change substantially over time. We show that elevated temporal autocorrelation in climatic variables should be expected to increase the chance of critical transitions in climate-sensitive systems with tipping points. We demonstrate that this prediction is consistent with evidence from forests and coral reefs. In both examples, the duration of anomalous dry or warm events elevates chances of invoking a critical transition. Understanding effects of climate variability thus requires research not only on variance, but also on climate memory.