The Limits to Adaptation: A Systems Approach

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The ability to adapt to climate change is delineated by capacity thresholds, after which climate damages begin to overwhelm the adaptation response. Such thresholds depend upon physical properties (natural processes and engineering parameters), resource constraints (expressed through market prices), and societal preferences (from prices as well as cultural norms). Exceedance of adaptation capacity will require substitution either with other pre-existing policy responses or with new adaptation responses that have yet to be developed and tested. Previous modeling research shows that capacity limited adaptation will play a policy-significant role in future climate change decision-making. The aim of this study is to describe different types of adaptation response and climate damage systems and postulate how these systems might behave when the limits to adaptation are reached. The hypothesis is that this behavior will be governed by the characteristics and level of the adaptation limit, the shape of the damage curve in that specific damage area, and the availability of alternative adaptation responses once the threshold is passed, whether it is more of the old technology, a new response type, or a transformation of the climate damage and response system itself.