The economic insurance value of ecosystem resilience

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Ecosystem resilience, i.e. an ecosystem’s ability to maintain its basic functions and controls under disturbances, is often interpreted as insurance: by decreasing the probability of future drops in the provision of ecosystem services, resilience insures risk-averse ecosystem users against potential welfare losses. Using a general and stringent definition of “insurance” and a simple ecological-economic model, we derive the economic insurance value of ecosystem resilience and study how it depends on ecosystem properties, economic context, and the ecosystem user’s risk preferences. We show that (i) the insurance value of resilience is negative (positive) for low (high) levels of resilience, (ii) it increases with the level of resilience, and (iii) it is one additive component of the total economic value of resilience.