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# Species-specific negative density dependence and disturbance interactions on biodiversity

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Ecosystems everywhere face threats from human invasion to climate change. Species diversity that drive these systems face numerous challenges that threaten their survival. Each challenge effects each species differently. Additionally these challenges interact among themselves, where in some cases they exacerbate each other and in other cases they cancel themselves out.

We investigate forest diversity with respect to interactions between disturbance and conspecific negative density dependence (CNDD). Disturbances take many forms from storm damage to pathogens. CNDD is the phenomena where members of the same species compete for resources. Although each of these phenomena have been studied separately, they have rarely been studied together which is critical since a particular disturbance can effect CNDD differently than another disturbance. Understanding these interactions is necessary to understand how biodiversity can be maintained.

We focus on two questions: (1) Does disturbance alter the strength of CNDD? (2) How are diversity patterns generated by the interaction of these two phenomena? We propose a novel quantitative framework for simultaneously investigating CNDD and disturbance that involves both field experiments and computer simulations. Simulations will be parameterized in part with our field data, and allow for exploration in a broader range of variables and scenarios.