Local diversity in heterogeneous landscapes: quantitative assessment with a height-structured forest metacommunity model. *Theoretical Ecology*

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Appendix 4: Transient dynamics in systems with early- and late-successional species

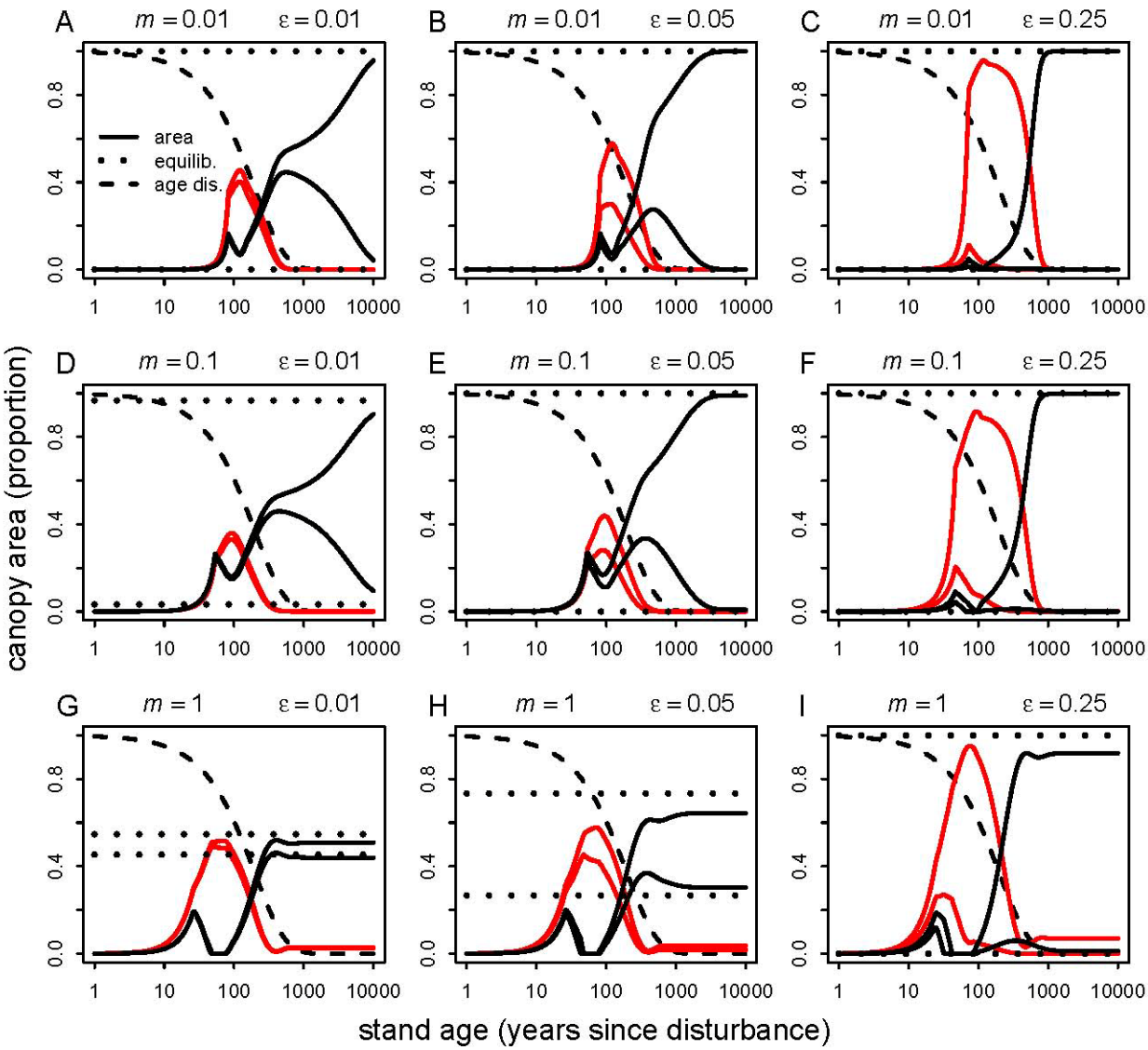

Figure A3. Transient dynamics of canopy area in a single patch in four-species systems (two early- and two late-successional species). In each patch, there is one dominant and one subordinate species within each successional guild. The canopy areas (proportion of ground area) of the dominant and subordinate early-successional species are shown by the upper and lower red solid curves, and those of the late-successional species by the upper and lower black solid curves. The dominant species has a proportional advantage ε in each of the five performance rates: growth and mortality in the canopy and understory, and fecundity. Columns 1-3 have ε = 0.01, 0.05, and 0.25, respectively. Rows 1-3 have m (inter-patch dispersal rate) = 0.01, 0.1, and 1, respectively. The probability density function (pdf) for the negative exponential patch-age distribution (with mean age = 200 years) is shown by the dashed line (the pdf is scaled in the figure to have a maximum of one). Equilibrium approximations for the late-successional dominant and subordinate species' canopy areas (from Eqn. 13) are shown by the dotted lines. In cases where the linear approximation yields values outside the meaningful range (i.e., canopy area of dominant > 1; Fig. 1), the approximations are plotted at 0 and 1 (no local mixing). Baseline parameters values (ε = 0) for the early- and late-successional species are in Appendix 2.