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Abstract

Individual plant-based gap dynamics models have been used extensively in forests, and less frequently in grasslands. In this chapter, we summarize the use of these models in different ecosystem types, and describe the application of one of these models, ECOTONE, to simulating sand grasslands in Hungary. The structure of ECOTONE is similar to forest models in that the recruitment, growth, and mortality of individual plants are simulated on a small plot through time at an annual time step. Recruitment and mortality have stochastic elements whereas growth is deterministic and dependent upon competition for soil water. ECOTONE was parameterized for sand grasslands in Hungary using data available from the literature. Various possibilities for including heterogeneity in vegetation at the landscape scale are discussed. These possibilities include averaging results from many plots, adding variation to input parameters, conducting simulations for different landscape patches, and conducting spatially-explicit simulations. A major strength of simulation modeling is that it complements field studies, and contributes to new studies by generating testable hypotheses.