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Abstract

As a result of discussions based upon common interests, yet with different expertise and approaches, an interdisciplinary team involving two U.S. and eight Hungarian ecologists was formed to implement a collaborative grassland research project funded by the U.S. National Science Foundation, the Hungarian Academy of Sciences, and the Hungarian Science Foundation (OTKA). Our goal was to develop generalizations concerning controls on grassland composition, structure, and dynamics by comparing similar and different types of grasslands across multiple spatial scales on two continents. The specific objectives were to evaluate the importance of current environmental controls on patterns in biodiversity and dynamics in semiarid grasslands, and to evaluate the short- and long-term responses of these grasslands to changes in environmental constraints. Three sites were selected along climatic gradients in each country. Long-term data sets were supplemented with additional sampling for species diversity. An individual plant-based model (ECOTONE) was used to simulate long-term responses to climate and directional changes in climate. Our results showed that the biodiversity and fine scale vegetation patterns show similar trends with increasing aridity in both countries. The ability of ECOTONE to simulate grasslands in Hungary indicates the importance of gap dynamics and related processes in European grasslands as well as in North America. Using the same sampling methods and simulation analyses, we improved our ability to understand controls on grassland structure and biodiversity across climatic gradients. Because our data extend to countries on two continents, our results may have applicability to other semiarid grasslands in the world.