Characteristics of long-term dynamics of tree species distribution in Korean mountain forests

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Abstract

The additive models were developed to understand the underlying processes behind the distribution and change of species diversity along topographical environment gradients over the 15 years across Mt. Jiri and Baegun of South Korea. The topographic drivers included are latitude, longitude, elevation, slope, topographic wetness index (TWI), curvature, aspect, and soil type. The additive models showed that the distribution of species diversity is significantly related to topographical gradients, including elevation, latitude, longitude, slope, TWI, and curvature throughout time. Among the topographical variables, elevation was the most significant driver of species diversity distribution across 130 plots, followed by latitude and longitude. In particular, species diversity along the elevation gradient did elucidate pronounced humped-back distribution with high diversity at intermediate elevations. It is also noteworthy that at our site, the change in the distribution of species diversity over time was only significantly influenced by a geographical location (i.e. longitude and latitude).

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