

Kenderes, K., Standovár, T., Timár, G., Molnár, G. & Pataki, Zs. (2006): Application of stereo aerial photographs to study natural gap dynamics in a beech forest. Proc. of the Workshop on 3D Remote Sensing in Forestry, 14-15th Feb 2006, Vienna pp. 348-352

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Short reference: Kenderes et al. (2006)

First author: Kenderes Kata

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Abstract

We used remote sensing methods to reconstruct natural stand dynamics of a semi-natural beech forest (Őserdő Forest Reserve, Bükk Mountains, Northern Hungary). We mapped canopy gaps using aerial photographs taken in 1975, 1980, 1993 and 2000, then we built a GIS database containing the geocoded photographs, the digitised gap contours for each time step, and digital elevation model. The purposes of our analyses were i) to test the applicability of this method; ii) to define descriptive gap characteristics; iii) to analyse gap dynamics of 25 years by following the fate of individual gaps.

Our results show that remote sensing is an important tool for studying the above phenomena. The observed canopy gaps covered 2.3–4.2% of the total area in the different years. Gap creation did not show any preference for special altitude, aspect, or slope steepness within this small study area. Average gap size increased from 39.4 m² to 61.3 m² during the 25 years study period. The number of gaps varied between 125 and 151. On average, slightly more new gaps were created than old ones closed each year (1.75–9.3%, and 3.21–7.89% of original number, respectively). The annual change of gap-area was 0.14–0.53%.

In addition to the information we gained from the stand dynamics of our study site, we also concluded, that the applicability of time series of aerial photographs (limited by differences in tilt and shadow in each photograph) could be greatly

enhanced by applying 3D stereo images for delineating gaps.

Notes

aerial photograph, GIS, beech, semi-natural, gap dynamics, légifotó,
természetközeli bükkös, Fagus, lékdinamika

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