
Characterizing Spatial Parameters of Forest Canopies Using Fisheye Photography: Applications in Photo Ecometrics

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Abstract

Five case studies are presented that demonstrate how metrics inferred from canopy photography can inform and validate the results from digital aerial photography and other remote sensing platforms. The forests measured include evergreen and deciduous canopies composed of both needle-leaved and broad-leaved tree species. Gap fractions of these forest canopies ranged from 3% to 22%. Significant fine-scale spatial autocorrelation of canopy structure was detected in two subalpine forests. In a conifer-hardwood forest, the canopy opening associated with the stream course still influenced understory light availability 45 m from the stream bank. In contrast, there was no correspondence between distance from the stream and canopy architecture in two *Tsuga*-dominated ravines. Forest stands classified as the same vegetation type and considered replicated sites in field experiments can have significant differences in some canopy metrics. The results from these ecological studies have direct relevance to the design of monitoring regimes based on remote sensing.
