

Assessing Canopy Structure using LIDAR in Second Growth vs. Old Growth Sites in Forest Park, Portland, Oregon

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Abstract

Forest Park in Portland, Oregon incorporates 5,200 acres and is one of the largest urban parks in the United States. Established in 1948, this park was preserved as an “undisturbed, natural forest”, however, it underwent significant logging in the early 1900s and now only 0.5% of the forest is considered “old-growth”. Pacific Northwest old-growth forests are considered bastions of biological diversity and are typically characterized by large Douglas-firs, large accumulations of woody debris, and several canopy layers. Old-growth forests are still poorly understood and understudied. Our goal was to use LiDAR data in order to visualize and quantify several forest metrics, including; canopy height, canopy density, and structural complexity between old-growth and second growth forests. We used 2019 DOGAMI LiDAR data and the USFS Fusion visualization software to perform a detailed forest analysis. We used the resulting metrics to perform a statistical analysis in R. Our results indicate that the old-growth forest sample has a taller forest canopy, more structural complexity, and a greater number of forest gaps than the second growth forest sample. On a local scale, understanding these metrics can influence current and future management plans on the succession of Forest Park while on a global scale, we will be contributing to a better characterization of old-growth forests in the Pacific Northwest.