

ANALYSIS OF URBAN AND NATURAL FOREST COMPOSITION ACROSS THE UNITED STATES

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Abstract.—It has been suggested that urban forestry tree planting practices are creating a homogenous urban forest, with the same limited number of species dominating urban landscapes across North America. There is also concern about urban forests as pathways for invasive pests and pathogens to adjacent natural forests. However, to date urban forest inventory data have been limited and data collected from different cities were often incompatible. To begin to address the issue of urban forest composition, tree species data were obtained 150 U.S. and Canadian cities which had conducted inventories for use with the i-Tree Eco (UFORE) or i-Tree Streets (STRATUM) models or which maintained comprehensive street tree databases. Relative basal area of each tree species was calculated by city and land use class and (where possible) for each city as a whole. Those data were combined with data from nearby natural forests from the U.S. Forest Service Forest Inventory and Analysis (FIA) Program. The data were then analyzed using PC-ORD to determine which cities' urban forests were most similar to one another (using cluster analysis) and how species composition related to large-scale environmental variables (using non-metric multi-dimensional scaling). Environmental and geographic explanatory variables used included latitude, longitude, elevation, total annual precipitation, and plant hardiness zone.

Preliminary analysis of urban forest data alone showed that urban forests as a whole clustered by species composition data along rough geographic and climatic lines. More intensively managed portions of the urban forest (e.g., street trees) tended to cluster in ways less closely related to geography and climate. Analyses of the urban data together with natural forest data indicate that urban forests are generally more similar to one another than they are to nearby natural forests. Street tree populations were most similar in their species compositions while other components of the urban forest showed greater variation. The more intensively managed segments of the urban forest were also less similar to adjacent natural forests. Urban forests also tend to resemble the natural forests of the eastern United States more than they resemble western forests.

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