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Title: Assessing the performance of urban forest carbon sequestration models using direct measurements of tree growth

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2 measurements of tree growth

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11 Abstract

12 Across cities worldwide, people are recognizing the value of greenspace in ameliorating the  
13 health and well-being of those living there, and are investing significant resources to improve  
14 their greenspace. Although models have been developed to allow the quantification of  
15 ecosystem services provided by urban trees, refinement and calibration of these models with  
16 more accurate site- and species-specific data can increase confidence in their outcomes. We  
17 used data from two street tree surveys in Cambridge, MA, to estimate annual tree mortality  
18 for 592 trees and diameter growth rates for 498 trees. Overall tree turnover between 2012 and  
19 2015 was relatively low (annualized 3.6%  $y^{-1}$ ), and mortality rate varied by species. Tree  
20 growth rates also varied by species and size. We used stem diameter (DBH) and species  
21 identity to estimate CO<sub>2</sub> sequestration rates for each of 463 trees using three different model

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