

# TREES AND PEOPLE: Outcomes of Neighborhood and Nonprofit Tree Planting

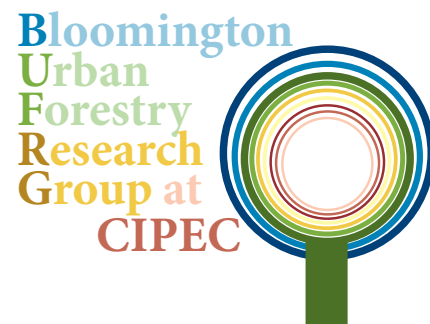
*For the Spring 2015 newsletter of the  
Urban Tree Growth and Longevity Working Group of the  
International Society of Arboriculture*

**JESS VOGT**<sup>1 2</sup>

On behalf of the Bloomington Urban Forestry Research Group ([BUFRG](#)) at the Center for the Study of Institutions, Population and Environmental Change, Indiana University, Bloomington

BUFRG researchers, past and present:

Burney Fischer  
Sarah Mincey  
Matt Patterson  
Shannon Lea Watkins  
Rachael Bergmann  
Sarah Widney



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***What's going on in neighborhoods that plant trees?*** The Bloomington Urban Forestry Research Group (BUFRG) at Indiana University has been asking since the summer of 2011. Actually, it was our friends at Keep Indianapolis Beautiful, Inc. ([KIB](#)) that started asking that question. KIB was interested in knowing what happened in the neighborhoods where they were working with neighbors to plant trees – How many trees survived? How fast were they growing? What were the features of the trees or the growing environment that contributed to tree survival and growth? Did neighborhoods that watered the trees together as a group have higher tree survival than neighborhoods that watered trees individually? And, perhaps most importantly, were neighborhoods that planted trees also working together to do anything else?

With initial funding from the Efroymsen Family Fund, in winter 2011, KIB and BUFRG began working together to [research the ecological outcomes and social outcomes of KIB's tree planting programs](#).

BUFRG designed the Planted Tree Re-Inventory Protocol ([Vogt et al. 2014](#), [Vogt & Fischer 2014](#)), which provides methods that scientists and non-scientists alike can use to collect information about trees planted in cities. The Protocol includes methodologies for measuring the tree itself (size, condition, etc.) the surrounding growing environment (planting area space, proximity to buildings, etc.), characteristics of the nearby community (evidence of care by

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<sup>1</sup> Department of Earth and Environmental Science, Furman University

<sup>2</sup> The Vincent and Elinor Ostrom Workshop in Political Theory and Policy Analysis, Indiana University, Bloomington

adjacent property owners), and evidence of maintenance practices (such as pruning, mulching, and staking).

In summer 2012, five high school students hired as members of KIB's Youth Tree Team collected data on over 750 trees planted between 2007 and 2009 as part of 25 NeighborWoods<sup>3</sup> tree planting projects in 18 different neighborhoods in Indianapolis. In addition, BUFRG



researchers interviewed the residents of these Indianapolis neighborhoods who had worked with KIB to organize the tree planting. We asked these neighborhood tree planting leaders questions about the process of organizing and conducting the tree planting, how their neighborhood watered the trees after they were planted, and any activities the neighborhood did together before and after the tree planting. We combined information from the tree inventory and interviews with information from U.S. Census data about the socio-demographic characteristics of the people who live around the trees.

***What influences tree survival in Indianapolis?*** Results of the tree outcomes were published open-access (available free for all download) in the April 2014 issue of the journal *Landscape & Urban Planning* (Vogt et al. 2015). The 1,345 inventoried trees planted between 2007 and 2009 had a cumulative (total) survival rate of 89.9%, with an annual survival rate of 97.7%. We found, unsurprisingly, that characteristics about the tree, its growing environment, the surrounding community, and maintenance practices all influenced growth and survival. For instance, trees with more impervious surfaces around them experienced lower rates of survival.

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***Cumulative tree survival was 89.9%, with an annual survival rate of 97.7%.***

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Tree survival was also linked to community characteristics. Trees in neighborhoods with higher median household income, or people who had recently moved in were more likely to survive. These findings about how survival is related to community factors are interesting: A greater percentage of recent move-ins might mean that households are experiencing a burst of interest in caring for their property, and perhaps also surrounding trees. Similarly, a greater median household income might be related to more resources to care for these trees, yielding higher probabilities of tree survival.

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<sup>3</sup> KIB's NeighborWoods is a part of the national NeighborWoods program of the Alliance for Community Trees: <http://neighborwoodsmoonth.org>

**Watering strategy and planting season also impact tree survival.** We found that watering strategy chosen by the neighborhood had some particularly interesting implications for tree survival. On average, trees in neighborhoods that watered *collectively*—a group of neighbors watering all trees together at the same time—had higher rates of survival than trees watered *individually*—by the residents closest to the tree working alone. Tree survival was particularly high for trees planted in the spring and watered collectively, compared to trees planted in the fall and watered either collectively or individually. In fact, individual watering actually yielded slightly higher tree survival for fall watered trees.

We think this finding has to do with the nature of collective activities: Groups that water collectively might be more likely to water more frequently and consistently, because everyone out watering at the same time results in a type of de facto monitoring of one another's activities; neighbors are watching each other and might be watching to make sure each tree gets enough water, that no trees are forgotten, etc. Furthermore, the outstanding probability of survival for trees planted in the spring and watered collectively (2.8 odds of survival compared to 1.0 odds for trees planted in spring and watered individually) may be linked to the momentum of collective action: Tree planting activities are a type of *collective activity*—groups of neighbors worked together with KIB to organize and plant trees. If a tree-planting event occurs in the spring, the trees that are planted will need to be watered weekly throughout the summer months. Watering trees collectively can build upon the collective success of the spring tree-planting activities. Watering collectively trees planted in the fall, however, means that between the tree planting event and the commencement of watering, many winter months will have passed, and the group may lose interest in the trees and in the collective effort required to water those trees. Thus, among trees planted in the fall, individually-watered trees have slightly greater odds of survival than collectively watered trees (2.0 odds compared to 1.7).



**What about other collective activities?** Collective watering as a strategy for watering trees is part of an interesting trend in collective activities we observed in neighborhoods that planted trees. In a paper published in *Arboriculture & Urban Forestry* in March of 2014 ([Mincey & Vogt 2014](#); available free for download), BUFRG published results from interviews conducted with neighborhood tree planting leaders. We found that the neighborhoods that chose to collectively water their trees actually had less prior collective action experience, i.e., the neighborhood tree planting leaders we interviewed reported that the neighborhood did fewer things like crime watches, litter cleanups, barbecues or other social events, etc. Conversely, neighborhoods that chose individual watering actually reported engaging in fewer collective activities after the tree planting than before the tree planting. Together, these findings mean that collective watering was part of an increasing trend in neighborhood collective action. In other words, neighborhoods that plant trees and chose to water those trees together in groups with their neighbors rather than alone were experiencing an overall increase in activities. While this study looked only at tree

planting neighborhoods and thus cannot say whether or not collective watering causes this increase in collective activity, we think it is an interesting finding that should be explored further.

**More trees, more neighborhoods, more cities!** The results above are from a study of trees in neighborhoods in just one city—Indianapolis, Indiana. In fall of 2012, BUFRG was awarded a National Urban and Community Forestry Advisory Council (NUCFAC) grant to study the [outcomes of neighborhood and nonprofit urban forestry](#) in 5 U.S. cities: Atlanta, Detroit, Indianapolis, Philadelphia, and St. Louis. With the help of Alliance for Community Trees, KIB, 4 new local partners ([Trees Atlanta](#), [The Greening of Detroit](#), [Pennsylvania Horticultural Society](#), and [Forest ReLeaf of Missouri](#)), and small armies of citizen scientists in each city, in the summer of 2014, data was collected on trees and local communities in these 5 cities. In each city, a graduate students who was a residents of the city conducted interviews with neighborhood tree planting leaders as well as leaders of neighborhoods where tree-planting activities had not occurred. We also conducted a household survey of randomly-selected residents in neighborhoods that did and did not engage in neighborhood tree planting.

CITY	TREES		SURVIVAL of inventoried trees
	# planted 2009-11	# inventoried 2014 (%)	
<b>Atlanta</b>	21,349	577 (2.7%)	80%
<b>Detroit</b>	7,040	1,241 (17.9%)	79%
<b>Indianapolis</b>	18,283	1,076 (6.0%)	80%
<b>Philadelphia</b>	7,012	1,742 (25%)	59%
<b>St. Louis</b>	>2,000	101	86%

Preliminary results show surprisingly similar cumulative survival rates for trees in Atlanta, Detroit, and Indianapolis (see table). This likely reflects the reasonably similar physical growing conditions for trees in these cities. Philadelphia experienced a slightly lower tree survival rate, which may reflect the much more constrained and “urban” growing conditions here, i.e., lots of trees planted in 4-by-4-foot tree pits or relatively narrow boulevards.

BUFRG is currently performing more detailed analysis of this data to examine the many factors that influence tree growth and survival. We are also still seeing what we can learn from over 150 interviews conducted with nonprofit employees and neighborhood leaders, and from almost 2,000 returned household surveys.

*Check back in with us soon and we'll have more results from our research on trees and people!*

## Sources

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