

Requested addendum to Final Report for NUCFAC Project: “Trees and People” – a two-way street: A research program to assess the direct and indirect effects of urban tree-planting programs in the face of climate change.

PRODUCTS

Data collection protocols for tree planting outcome evaluation

(https://www.indiana.edu/~cipec/research/bufrgproj_nucfac_datacollection.php):

Vogt JM, Mincey SK, Fischer BC, Patterson M (2014) Planted Tree Re-Inventory Protocol. Version 1.1. Bloomington, IN: Bloomington Urban Forest Research Group at the Center for the Study of Institutions, Population and Environmental Change, Indiana University. 96p

Bloomington Urban Forestry Research Group (2014) Resident Survey to Assess Neighborhood Social Characteristics and Tree-Planting Outcomes. Bloomington, IN: Bloomington Urban Forest Research Group at the Center for the Study of Institutions, Population and Environmental Change, Indiana University. 8 pp. Last updated March 5 2014.

<https://www.indiana.edu/~cipec/research/BUFRG%20Resident%20Survey.pdf>

Bloomington Urban Forestry Research Group (2014) Interview Script for Neighborhood Leaders and Tree-Planting Project Leaders, originally developed for use with the “Evaluating the Ecological and Social Outcomes of Neighborhood and Nonprofit Urban Forestry: NUCFAC Grant” project.

Bloomington, IN: Bloomington Urban Forest Research Group at the Center for the Study of Institutions, Population and Environmental Change, Indiana University. 8 pp. Last updated May 21 2014.

<https://www.indiana.edu/~cipec/research/BUFRG%20Neighborhood%20Interview%20Script.pdf>

Bloomington Urban Forestry Research Group (2014) Interview Script for Nonprofit Employees Involved in Neighborhood Tree-Planting, originally developed for use with the “Evaluating the Ecological and Social Outcomes of Neighborhood and Nonprofit Urban Forestry: NUCFAC Grant” project. Bloomington, IN: Bloomington Urban Forest Research Group at the Center for the Study of Institutions, Population and Environmental Change, Indiana University. 8 pp. Last updated April 9 2014. <https://www.indiana.edu/~cipec/research/BUFRG%20Nonprofit%20Interview%20Script.pdf>

Bloomington Urban Forestry Research Group (2014) Individual Survey to Assess the Impacts of Participation in Data Collection Activities, originally developed for use with the “Evaluating the Ecological and Social Outcomes of Neighborhood and Nonprofit Urban Forestry: NUCFAC Grant” project. Bloomington, IN: Bloomington Urban Forest Research Group at the Center for the Study of Institutions, Population and Environmental Change, Indiana University. 8 pp. Last updated May 22 2014. <https://www.indiana.edu/~cipec/research/BUFRG%20Data%20collector%20survey.pdf>

Peer-reviewed journal articles resulting from NUCFAC data collection

(https://www.indiana.edu/~cipec/research/bufrg_publications.php):

Watkins SL, Mincey SK, Vogt J, Sweeney SP (2016) Is planting equitable? An examination of the spatial distribution of nonprofit urban tree-planting programs by canopy cover, income, race, and ethnicity. *Environment and Behavior* 1-31

<http://eab.sagepub.com/content/early/2016/03/15/0013916516636423.abstract>

Widney S, Fischer BC, Vogt J (2016) Tree mortality undercuts ability of tree-planting programs to provide benefits. *Forests* 7(3)(65), 21p (Special Issue - Urban and Peri-urban Forest Diversity and Ecosystem Services) doi: 10.3390/f7030065.

Vogt JM, Watkins SL, Widney SE, Fischer BC (2015) Comparing trees across cities and over time: The need to standardize at-planting data. *Arborist News*, 24(6): 27-31.

Peer review publications associated with NUCFAC pilot research:

Vogt JM, Watkins SL, Mincey SK, Patterson M, Fischer BC (2015) Explaining planted-tree survival and growth in urban neighborhoods: A study of recently-planted trees in Indianapolis. *Landscape & Urban Planning*, 136: 130-143. DOI: 10.1016/j.landurbplan.2014.11.021.

<http://www.sciencedirect.com/science/article/pii/S0169204614002898>

Vogt JM, Fischer BC (2014) A protocol for citizen science monitoring of urban trees. *Cities and the Environment*, 7(2):4. 26p. (<http://digitalcommons.1mu.edu/cate/vol7/iss2/4>)

This article will also be reprinted in the following compendium:

Vogt JM, Fischer BC (2016) A protocol for citizen science monitoring of urban trees. In: Blum J (ed.), *Urban Forests: Ecosystem Services and Management*, CRC Press, a division of Taylor and Francis.

Non-peer reviewed articles:

Vogt JM (2015) Trees and People: Outcomes of Neighborhood and Nonprofit Tree Planting. *Urban Tree Growth & Longevity Newsletter*, April.

http://www.urbantreegrowth.org/uploads/1/1/1/7/11172919/vogt_trees&people.pdf

Final report and fact sheets to each nonprofit organization

(https://www.indiana.edu/~cipec/research/bufrg_publications.php):

Widney S, Fischer BC, Mincey SK, Vogt JM, Watkins SL, Bergmann R, Westphal L (2015) Forest ReLeaf of Missouri Planted Tree Re-Inventory Report: Survival, Condition, and Benefits of Recently Planted Trees. Bloomington, IN: Bloomington Urban Forest Research Group at the Center for the Study of Institutions, Population and Environmental Change, Indiana University. 15 pp. (Short version brochure also available.)

Widney S, Fischer BC, Mincey SK, Vogt JM, Watkins SL, Bergmann R, Westphal L (2015) The Greening of Detroit Planted Tree Re-Inventory Report: Survival, Condition, and Benefits of Recently Planted Trees. Bloomington, IN: Bloomington Urban Forest Research Group at the Center for the Study of Institutions, Population and Environmental Change, Indiana University. 15 pp. (Short version brochure also available.)

Widney S, Fischer BC, Mincey SK, Vogt JM, Watkins SL, Bergmann R, Westphal L (2015) Keep Indianapolis Beautiful Planted Tree Re-Inventory Report: Survival, Condition, and Benefits of Recently Planted Trees. Bloomington, IN: Bloomington Urban Forest Research Group at the Center for the Study of Institutions, Population and Environmental Change, Indiana University. 16 pp. (Short version brochure also available.)

Widney S, Fischer BC, Mincey SK, Vogt JM, Watkins SL, Bergmann R, Westphal L (2015) Pennsylvania Horticultural Society Planted Tree Re-Inventory Report: Survival, Condition, and Benefits of Recently Planted Trees. Bloomington, IN: Bloomington Urban Forest Research Group at

the Center for the Study of Institutions, Population and Environmental Change, Indiana University. 16 pp. (Short version brochure also available.)

Widney S, Fischer BC, Mincey SK, Vogt JM, Watkins SL, Bergmann R, Westphal L (2015) Trees Atlanta Planted Tree Re-Inventory Report: Survival, Condition, and Benefits of Recently Planted Trees. Bloomington, IN: Bloomington Urban Forest Research Group at the Center for the Study of Institutions, Population and Environmental Change, Indiana University. 16 pp. (Short version brochure also available.)

Conference presentations

Vogt J (2016) Examining the relationship between collective action and community capacity of neighborhood residents: Do nonprofit and neighborhood tree planting projects improve communities? 55th Annual Minnesota Shade Tree Short Course, March 15-16, 2016, St. Paul, Minnesota, United States. (Contributors to this project: Fischer BC, Watkins SL, Mincey SK, Widney SE, Westphal LM)

Widney SE, Vogt J, Fischer BC (2016) Tree mortality undercuts ability of tree-planting programs to provide benefits. Association of SPEA PhD Students Conference, February 19, 2016, School of Public and Environmental Affairs, Indiana University, Bloomington, Indiana, United States.

Mincey S, Watkins SL, Vogt J, Fischer BC, Bergmann R, Widney SE (2016) Neighborhood-scale urban forest management: Mediating factors and public health outcomes. National Symposium in Parks and Recreation in Public Health, February 11, 2016, Bloomington, Indiana, United States. (Poster)

Vogt J, Watkins SL, Mincey SK, Fischer BC, Widney S, Bergmann R, Westphal L, Sweeney S (2015) Neighborhood and nonprofit urban forestry: Results of a 5-city study. International Society of Arboriculture 2015 Annual International Conference and Trade Show, August 8-12, 2015, Orlando, Florida, United States.

Widney SE, Vogt J, Fischer BC (2015) Estimating current and future benefits of recently planted trees with i-Tree Streets: Successes, challenges, and lessons learned. Arboriculture Research and Education Academy (AREA) Student Presentations. International Society of Arboriculture 2015 Annual International Conference and Trade Show, August 8-12, 2015, Orlando, Florida, United States.

Mincey SK, Vogt JM, Watkins SL, Fischer BC, Widney S, Bergmann R, Westphal L, Sweeney S (2015) Neighborhood and nonprofit urban forestry: Results of a 5-city study. Association for Environmental Studies and Sciences 2015 Conference: Confronting Frontiers, Borders, and Boundaries, June 24-27, 2015, San Diego, California, United States.

Vogt JM (2015) Neighborhood and nonprofit urban forestry: Results of a 5-city study. Future Earth 2015 Young Scientists Networking Conference, sponsored by the International Social Science Council (ISSC) and the International Council for Science (ICSU), May 24-30, 2015, Villa Vigoni, Menaggio, Italy. (Poster)

Vogt JM, Widney SE, Watkins SL, Mincey SK, Fischer BC, Bergmann R, Sweeney S, Westphal L (2015) Tree survival in social-ecological systems: Results of a 5-city study. Association of American Geographers 2015 Annual Meeting, April 21-25, 2015, Chicago, Illinois, United States.

Watkins SL, Mincey SK, Sweeney S, Vogt JM, Widney SE, Fischer BC, Bergmann R, Westphal L (2015) The distributional results of current land-use decisions: Might nonprofit street tree plantings reduce disparity in urban canopy cover? *Association of American Geographers Annual Meeting*, April 21-25, 2015, Chicago, Illinois, United States.

Fischer BC, Farmer JR, Vogt JM, Widney SE (2015) The roles of environmental nonprofits in delivering tree planting and lake monitoring services for government agencies. *Advancing the Field(s) of Nonprofit Management: New Structures, New Solutions*, April 16-18, 2015, Indiana University, Bloomington, Indiana, United States.

Watkins SL, Mincey SK, Sweeney S, Vogt JM, Widney SE, Fischer BC, Bergmann R, Westphal L (2015) Do nonprofit street tree plantings reduce neighborhood disparity in urban canopy cover? *Association of SPEA PhD Students Conference*, April 17, 2015, School of Public and Environmental Affairs, Indiana University, Bloomington, Indiana, United States.

Widney SE, Vogt JM, Fischer BC (2015) Survival, growth rates, and benefits of recently planted urban trees. *Indiana Academy of Science 130th Annual Meeting*, March 21, 2015, Indianapolis, Indiana, United States.

Watkins SL, Vogt JM, Mincey SK, Fischer BC, Bergmann RA, Widney SE, Westphal L, Sweeney S (2014) Examining the relationship between collective action and collective efficacy of neighborhood residents: Do neighborhood street tree plantings yield social benefits? *Association for Public Policy Analysis and Management Annual Conference*, November 6-8, 2014, Albuquerque, New Mexico, United States.

Vogt JM, Fischer BC (2014) Trees and people: A comparative assessment of five non-profit tree planting programs. *2014 Partners in Community Forestry Conference*, November 5-6, 2014, Charlotte, North Carolina, United States.

Fischer BC, Vogt JM (2014) Trees and people: Assessing urban greening organizations' neighborhood tree planting program outcomes – An interactive session with researchers. *Alliance for Community Trees (ACTrees) Day at the 2014 Partners in Community Forestry Conference*, November 4, 2014, Charlotte, North Carolina, United States.

Watkins SL, Vogt JM, Mincey SK, Fischer BC, Bergmann RA, Widney SE, Westphal L, Sweeney S. (2014) Does participation in nonprofit urban tree-planting programs improve neighborhoods? Examining the impact of collective action on neighborhood residents. *International Union of Forest Resource Organizations World Conference*, October 5-11, 2014, Salt Lake City, Utah, United States. (Poster)

Watkins SL, Vogt JM, Mincey SK, Fischer BC, Bergmann RA, Widney SE, Westphal L, Sweeney S (2014) Does participation in nonprofit urban tree-planting programs improve neighborhoods? Examining the impact of collective action on neighborhood residents. *Arboriculture Research and Education Academy (AREA) Student Presentations. International Society of Arboriculture 2014 Annual International Conference and Trade Show*, August 2-6, 2014, Milwaukee, Wisconsin, United States.

Bergmann RA, Watkins SL, Vogt JM, Mincey SK, Fischer BC, Widney SE, Westphal L, Sweeney S (2014) Tree survival in urban neighborhoods: Examining the role of community knowledge. *Arboriculture Research and Education Academy (AREA) Student Presentations. International Society*

of Arboriculture 2014 Annual International Conference and Trade Show, August 2-6, 2014, Milwaukee, Wisconsin, United States.

Watkins SL, Mincey SK, Vogt JM, Bergmann R, Fischer BC (2013) A research design for evaluating the outcomes of neighborhood and nonprofit urban forestry. Workshop Colloquia presentation at The Vincent and Elinor Ostrom Workshop in Political Theory and Policy Analysis, April 17, 2013, Indiana University, Bloomington, Indiana, United States. (Co-presenter, Paper co-author) Paper available:
http://www.indiana.edu/~workshop/colloquia/materials/papers/ForestryGrp_Research%20Design_NUCFAC_.pdf

Additional funding leveraged:

U.S. Forest Service, Northern Research Station (2013-2019)

P.I.s: Burnell C. Fischer

Collaborators: Jessica M. Vogt, Sarah K. Mincey, Shannon Lea Watkins, Rachael Bergmann

Proposal title: *Evaluating the impacts for neighborhoods from nonprofit urban forestry*

\$35,000 awarded over 18 months to expand household surveying capacity of the NUCFAC project

Indiana University Office of Sustainability, Graduate Sustainability Research Development Grant (2013-2014)

P.I.: Jessica M. Vogt

Faculty mentor: Burnell C. Fischer

Proposal title: *Evaluating the Social Outcomes of Neighborhood Urban Tree Planting: Does Tree Planting Improve Neighborhood Sustainability?*

\$5,000 awarded over 12 months to enhance the social survey methodology by adding comparison groups to the research design and increasing the sample size for the NUCFAC project

Furman University Research and Professional Growth Committee (2014-2015)

P.I.: Jessica M. Vogt

Proposal title: *Impacts of neighborhood tree planting projects: Results of qualitative interview analysis*

\$670 awarded to purchase an NVivo software license to support qualitative neighborhood interview analysis for the NUCFAC project

DePaul University College of Science and Health Research and Faculty Development Committee Faculty Summer Research Program (2016)

P.I.: Jess Vogt

Proposal title: *Motivations and mechanisms for neighborhood tree planting*

\$4,200 awarded for summer salary to support qualitative neighborhood interview analysis and supervision of student research assistance for the NUCFAC project

Media Stories about Our Research

Laskow S (2015) How Trees Can Make People Happier (and Vice Versa). Science of Cities (February 3, 2015) and Science of Cities (Next City) EBook, p 19-20.

Indicators of project success (from Table 5, NUCFAC Grant Proposal, 2012)

<u>Indicator</u>	<u>Goal</u>	<u>Outcome</u>
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Short term indicators		
Number of tree-planting participants interviewed per partner organization.	20	Across all cities: 64 tree planting interviews;
Number of surveys completed and returned per partner organization (response rate).	100(30%)	471(17.5%)
Number of tree inventoried and included in community-planted trees database.	16, 000 trees ¹	5,453
Intermediate-term indicators		
Number of successful (accepted for publication) articles emerging from the results of the project.	at least 3	3 peer reviewed to date
Number of fact sheets distributed to volunteers, participants and donors by each partner organization.	200	Unknown (fact sheets likely shared on websites and via emails so cannot determine “how many” were distributed.)
Long-term indicators		
Number of annual requests for the use of the community-planted tree database.	2 requests	TBD in future years
Number of additional ACTrees member organizations expressing interest in future participation in further extension of the research proposed here.	10 in 3 yrs	Numerous interested

Final Trigger Question (from Phil Rodbell, 2-23-16): *After all of your learning through the development and implementation of evaluation protocols, interviews, and local project findings on the success of urban tree programs, what is your best advice to nonprofits regarding best practices in planting and stewardship in the face of a changing climate?*

- 1) Although this study was interested in the impacts of trees on the social fabric of communities, the most frequently self-reported benefit was neighborhood beautification!
- 2) Tree planting (a collective action) provides some measurable benefits to residents, regardless of whether the trees survive or not – we did see a slight increase in ties among neighbors. However, neighborhood benefits of tree planting are small and not automatic. If nonprofit organizations want to focus on social benefits of tree planting, they should do it intentionally and carefully.
- 3) Follow-up tree care is also a type of collective action, and we found that a majority of re-inventoried trees exhibited no maintenance of any type. Although cumulative survival 3-5 years after planting was greater than 80% for most cities (except Philadelphia), if annual survival does not stay above 93%, the annual benefits for the population of trees will decline. Care/maintenance can increase survival.
- 4) Nonprofits need to keep better data at the time of planting (i.e. location, location, location!) so that they can re-inventory trees to determine success and compare outcomes between neighborhoods and cities.
- 5) Our results show that tree-planting projects were less likely to have occurred in neighborhoods with high canopy cover and/or high income, which suggests that nonprofits are serving those neighborhoods in need of subsidized trees. However, we also found plantings were less likely in neighborhoods with higher percentages of racial or ethnic minorities, suggesting these projects might result in inequitable future canopy cover.
- 6) In the face of a changing climate, nonprofit-led neighborhood tree planting projects should include active follow-up care and management (watering) by neighborhood residents in the establishment period to maximize tree benefits. They should continue to target lower canopy cover and lower income neighborhoods. Identifying and address barriers to the participation of minority neighborhoods would be an especially important contribution to sustaining the fabric of cities.

¹ Original estimate of 16,000 trees was based upon concept of 8 city study, never updated in proposal to reflect only 5 cities. Lesson learned that relying on nonprofits to re-inventory large numbers of trees is difficult.