

FINAL REPORT

FOREST SERVICE GRANT NO. : __USDA-FRST, 12-DG-11132544-386__

Period covered by this report: ____2012-15____

NOTE: Please review the following information and revise/complete as necessary.

Issued to: Center for the Study of Institutions, Population and Environmental Change, Office of the Vice Provost for Research at Indiana University Bloomington

Address:

Office of the Vice President for Research
Carmichael Center, Suite 202
530 E. Kirkwood Avenue
Bloomington, IN 47408-4003

Congressional District Number: State of Indiana

Project Name: “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.

Contact Person/Principal Investigator

Name: Burnell C. Fischer

Phone Number: 812-855-3148

Fax Number: 812-855-3150

E-Mail Address: bufische@indiana.edu

Web Site Address (if applicable): https://www.indiana.edu/~cipec/research/bufrg_about.php

Date of Award: September 9, 2012

Grant Modifications: One nonprofit partner – TreesForever (Des Moines IA) dropped out of the programs in the first year.

Date of Expiration: December 31, 2015

Funding: Federal Share: _\$173,206_ **Grantee Share:** _\$188,385_ **Total Project:** _\$361,571_

FS Grant Manager: Phil Rodbell

Address: USDA Forest Service – NA, 11 Campus Blvd, Suite 200, Newtown Square, PA 19073

Phone Number: 610-557-4133

Fax Number: 610-557-4136

Email: prodbell@fs.fed.us

Project abstract (as defined by initial proposal and contract): (note: original grant abstract below)

We seek funds for an interdisciplinary, collaborative, multi-city research program to evaluate urban tree-planting programs' *direct effects* – survival/growth of urban trees – and *indirect effects* – engaging neighborhoods/individuals in tree-planting programs and other community projects aimed at adapting to climate change. We have partnered with Alliance for Community Trees and six tree-planting nonprofit organizations across the eastern United States to expand the research we are conducting with Keep Indianapolis Beautiful. We seek to collect data via two protocols: re-inventories of planted trees for data on tree-specific and local environmental variables, and survey and interviews of about social, indirect effects for data on

individual/community characteristics and management practices. We will conduct these protocols in each organization's city to assess the outcomes of their programs.

Results of this research will (1) help close the gap between the organizations' desired knowledge and existing practices; (2) generate data for national-scale assessment of community tree-planting programs in the face of climate change; and (3) inform best practices for volunteer planting programs and environmental stewardship, particularly for climate change. We are requesting \$173,206 and will have \$188,365 matching funds, mostly in-kind, from participating groups to perform this large-scale, holistic assessment of urban tree-planting programs.

Project objectives:

1. Evaluate the **ecological outcomes (benefits)** and **success (survival and growth) of trees** planted by urban nonprofit tree-planting programs.
 - Does the design of the nonprofit tree-planting program affect planted-tree survival and growth?
 - Does the design of the neighborhood tree-planting project affect planted-tree survival and growth?
 - What are the ecosystem services (benefits) provided by planted trees, given observed survival and growth rates?
2. Evaluate whether tree-planting programs have **social effects on neighborhoods** and individuals. Are there changes in:
 - Community capacity (Social cohesion, neighborhood ties, trust)?
 - Local collective activities?
 - Individual knowledge about the environment and about urban trees?

Objectives met successfully:

Objective 1 – met successfully

Objective 2 – met successfully

Objectives not met (including explanation):

The general objective of linking volunteer urban tree-planting programs to community/neighborhood adaption to climate change was not fully realized. We found that at the very local level of the neighborhood, climate change was not perceived to be a significant issue although it can be considered relevant when reconciled with issues of environmental stewardship and public health. However, we did explore the effects of collaborative tree planting on neighborhood characteristics related to adaptation and resilience and found some evidence that planting can improve ties between neighbors. However, these benefits are not automatic. If nonprofit organizations want to focus on community building, they should do it intentionally and carefully.

How will this project increase the knowledge we have about urban forestry? How will the public benefit?

- 1) Regarding urban forest management, this project increases the emphasis on urban tree-planting recordkeeping and re-inventory protocols so as to accurately assess the outcomes of tree-planting in the urban forest. The public will benefit from such data collection and analysis in two ways: 1) resources will be spent more wisely and efficiently in urban tree-planting based upon better knowledge of what defines a successful tree-planting outcomes, and 2) Communities/neighborhoods can be better prepared ahead of time per what is expected of them to have a successful tree planting and early tree maintenance experience.
- 2) Several previous studies examined the distribution of municipal (or mixed municipal-nonprofit) tree-planting activities. These studies found that municipal planting was more likely to occur in areas with higher income and higher tree canopy cover, which suggests that current planting activities might make existing income-based inequities even larger. We find the opposite in our study of nonprofit plantings—the

probability that a neighborhood was the location of a tree-planting project *decreased* as neighborhood canopy cover and household income *increased*.

Previous studies did not explicitly look at tree-planting with respect to race and ethnicity, even though race and ethnicity have historically been influential in driving urban forest distribution. When we include race and ethnicity in our models we find that tree-planting is less likely to occur in areas with a larger percentage of minority residents. In addition, we find that when canopy cover or income was low, plantings were even less likely to have occurred in neighborhoods with high percentages of racial or ethnic minorities. Findings suggest nonprofit plantings might reduce existing income-based inequity in canopy cover, but risk creating or exacerbating race-based inequity and risk leaving low-canopy minority neighborhoods with relatively few program benefits. It is important to note that this describes the outcomes of nonprofit activities, but does not describe the intentions or decisions of the organizations. Further research should illuminate ways in which environmental equity can be obtained.

- 3) We found that if annual survival of planted trees was not greater than 93%, the annual benefits for that population of trees will decline over time.

What specific quantifiable results were produced (bullet highlights and/or attach products)?

See the Addendum, which includes citations and links to all project products.

How the results were disseminated to the public?

Results have been distributed via peer reviewed research journals (several completed and others still in progress), in applied journals (i.e. Arborist News), presentations at professional (i.e. ISA) and users conferences (i.e. Partners Conferences in Urban Forestry) (see Addendum for complete listing of conference presentations, and through news stories, website, etc. Our nonprofit partners have also utilized the results and fact sheets produced with city-specific results for dissemination to their own local stakeholder groups.

If a no-cost time extension was requested for this project, why was it needed?

Yes. Funding cycle did not align with field data collection so an extension was requested and granted through December, 2015.

List the active partners (key individuals or organizations) involved in the project:

Alliance for Community Trees (ACTrees), Greening of Detroit (Detroit, MI), Forest ReLeaf of Missouri (St. Louis, MO), Keep Indianapolis Beautiful (Indianapolis, IN), Pennsylvania Horticultural Society (Philadelphia) and Trees Atlanta (Atlanta GA).

Comments considered of importance but not covered above (Project lesson's learned): See Addendum to Final Report

This report was prepared by:

Name: Burnell C. Fischer & Jess Vogt

Title: Clinical Professor Emeritus (IUB) and Assistant Professor (DePaul University)

Phone Numbers: 812-855-3148

Date: March 31, 2015