



Crowning Achievements

Research Results on Measuring Tree Vitality

In a world of limited resources, it is useful to be able to quickly and objectively predict the vitality (health) of trees so that resources are only spent on those that require care. Over time, greater knowledge of methods for measuring tree vitality should lead to improved management of mature trees.



In the study, "[A novel way of measuring vitality in mature urban trees](#)," Dr. Denise Johnstone (University of Melbourne) tested a method for assessing tree vitality that had not yet been used on urban trees – measuring bark fluorescence. Bark and leaf fluorescence of Morton Bay figs (*Ficus macrophylla*), Plane trees (*Platanus xacerifolia*), and Chinese elms (*Ulmus parvifolia*) were compared with an urban visual vitality index. Predawn water potentials were compared with the urban visual vitality index as a way of determining the cause of physiological stress in the plants as well.

Results were mixed, finding a statistically significant relationship between bark chlorophyll fluorescence and the urban tree vitality index only among Chinese elms, and seeing a significant relationship between bark chlorophyll fluorescence and pre-dawn water potentials in Morton Bay figs and Plane trees but not Chinese elms. Thus, bark chlorophyll fluorescence may become a useful tool for tree vitality assessments, but further work needs to be undertaken to clarify and understand the responses of different species. Read detailed findings on this project and discover additional TREE Fund studies related to fluorescence on the [Research Archive](#) page of the TREE Fund website.

“Nature welcomes inquiry. Nature does not hide its work. Just seek, and you will find.”

- Alex L. Shigo

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Would you like to receive a print version of the TREE Press?
Simply contact Karen Lindell at klindell@treefund.org.

Leading Thoughts

By J. Eric Smith, TREE Fund President and CEO

My father was a career Marine Corps officer back in the days when “unaccompanied tours” (i.e. family members not included) were more the norm than the exception, often for long periods of time. During those times when he was overseas, my mother and I often lived with my grandparents in Ridgeland, South Carolina, in a small cinder block house that my grandfather had built himself. There were lots of cats and dogs around my grandparents’ house, along with an ill-tempered duck named Twiggy who lived on the roof and dive-bombed visitors, and an amazing (to me) tree, right smack in front of the door to the house.



It was a classic Low Country longleaf pine, and it was older than the house; I have pictures of my grandfather and uncle during its construction, and you can see that they tried to preserve as many of the existing trees on the lot as they could, even that one that crowded the front door stoop. And if that wasn’t inconvenient enough, my grandmother later planted wisteria around the tree, and its vines grew huge and thick, completely surrounding the bole of the pine – which is why I loved that tree so much as a little kid, because I could just pop out the front door, stumble over the root-buckled stairs, and use that knotted network of vines to climb to a favorite perch, high enough that I could even see Twiggy on the roof! Perfect!

I claimed that as my very favorite tree for much of my childhood and beyond. Of course, I know now that all the decisions my grandparents made about it were wrong – though they made them with good intentions, hoping for shade, pretty wisteria flowers, curb appeal, etc. The last time I was down that way, I drove by the old house and, not surprisingly, that tree and its choking vines were long, long gone. I suspect removal was an expensive and complicated job, given how knitted into the house that tree must have been when it finally wore out its welcome.

We all teach and preach “right tree, right place” when planting, but I suspect many of us might make the same sorts of mistakes my grandparents did when it comes to building around and in established urban forests, because at heart, we love our trees, and we want to save them all. This is why TREE Fund seeks to cover the full life cycle of trees in our cities when we award our wide spectrum of research grants, recognizing that with rigorous science behind us, we can make better decisions about what goes in, and what comes up, and when, and why.



Come to the TREE Fund After Hours Buckeye Bash

*and stay for
Toast with the Host*

Tuesday, 7 August 2018
Starting at 6:00 pm
Park Street Cantina
Columbus, OH

FREE admission for all
ISA Conference
registrants*

- **Mini-Auction** – Trips and treasures for every budget
- **Golden Ticket Raffle** – \$100 buys a chance to win the auction package of your choice (only 75 tickets available)
- **Ken Ottman Volunteer Award** winner announced
- Free appetizers and two drink tickets

*Sign up at [ISA registration](#).

Learn more at
treefund.org/tfafterhours.

Lead Donors

We are grateful to the following people and organizations who contributed \$2,500+ to TREE Fund in May 2018. See the full list of 2018 Lead Donors who make our work possible at treefund.org/about/our-donors. Thank you!

- American Society of Landscape Architecture
- DeepRoot Green Infrastructure
- Ohio Chapter ISA
- SavATree
- Unitol Corporation
- Vermeer Corporation
- Weaver Leather

National Bike Month Promotion Winner

Congratulations to **Lauren Damplo** of Stoughton, MA, winner of the May Tour des Trees fundraising promotion. Lauren contributed to Paul Seller's ride, and her name was drawn for the Canopy Pants prize. Best of all, we raised over \$9,000 for tree research and education during the promotional period!

Many thanks to all who participated, and to Arborwear for its generosity and making this promotion possible.

Tour des Trees Riders Need Your Help!

The 2018 Tour riders are doing the hard part pedaling 530 miles through Ohio, July 29 through August 4. Will you do the easy part – supporting their ride?

There's no better time to donate than now. We're celebrating the start of summer with a special incentive for donors. **June 18 to 24 ONLY** – every \$50 gift to the Tour earns you a chance to win a [Stretch Cambium Jacket](#), courtesy of Arborwear.

Get the flexibility of a soft shell with the durability of a work coat. [Donate](#) for a chance to feel good about supporting tree research and education, and a chance to win.

The prize drawing will take place on June 27. Thank you for supporting the Tour and good luck!



Create Your Own Virtual Tour des Trees

Do you...

- Like cycling but less than 530 miles in a week?
- Have a conflict with this year's Tour dates?
- Like other fitness activities more than cycling?
- Have a passion for urban trees and want to help them thrive?

Consider creating your own Virtual Tour! *You* decide the activity and amount you want to raise in support of TREE Fund. Learn more [HERE](#) and sign up [HERE](#) before August 4. Thank you!



Volunteer Spotlight: Paul Fletcher

TREE Fund is pleased to recognize **Paul Fletcher, BCMA, RCA** of Bartlett Tree Experts in our Volunteer Spotlight this month. Paul has been a TREE Fund Trustee since 2015 and currently chairs the Development Committee that oversees all fundraising and stewardship efforts for our organization. Due to Paul's championing, TREE Fund will be holding its December 2018 Trustee and Liaison Meeting, as well as hosting a Research Workshop, at the Bartlett Research Labs in Charlotte, NC. Paul and his wife, Kristin, have also chosen to spend their last two summers as Tour des Trees Event Team volunteers, and will be doing the same again this year. Thank you, Paul, for the many things you do for TREE Fund!



To suggest someone for the Spotlight, please contact [Karen Lindell](#).

The Word on Webinars

Save the date for our next TREE Fund webinar on **August 23 at 12:00 p.m. (Central)**. Dr. Brian Kane of the University of Massachusetts, Amherst will speak on “Arboricultural Biomechanics” during this free one-hour program.

- Pre-registration is highly recommended and will open in late July.
- Earn 1.0 CEU from ISA, SAF, or NALP for the live broadcast.



Visit treefund.org/webinars to get more information, see upcoming webinars, and watch past broadcasts.

TREE Fund is a 501(c)3 nonprofit whose mission is to support scientific discovery and dissemination of new knowledge in the fields of arboriculture and urban forestry.

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RESEARCH REPORT

Tree Research and Education Endowment Fund

Vol. 1, No. 1 – June 2018

Trees and Nearby Nature for Health: What is the Economic Value?

by Kathleen Wolf, PhD

A balanced diet and regular exercise are some of the basics for good health, and a daily dose of nature may be equally important! But if people even think about the health benefits of nature, it is usually in terms of personal choice or individual benefits, such as consuming organic food or drinking bottled water. What's missing is the awareness of the community-level health benefits that everyday experiences of nature provide.¹

Evidence of Health Benefits

The [Green Cities: Good Health](#) web site (GCGH) summarizes nearly 40 years of evidence about nature and human health in cities. Literally thousands of studies, from all around the world, show that “metro nature”—the various landscapes and vegetation of urban places, such as parks, gardens, green infrastructure and the urban forest—provides positive and measurable health benefits that improve quality of life.

Other opportunities have come along while constructing the GCGH science review. For instance, collaborating with The Nature Conservancy, we've produced several research outreach products:

- *Outside Our Doors: The Benefits of Cities Where People and Nature Thrive* ([pdf link](#))
- *Cascading Benefits: Designing Green Stormwater Infrastructure for Human Wellness* ([pdf link](#))
- *The Power of Trees* ([video link](#))

Economics – The Need

As my team worked on GCGH we realized there was a crucial missing component – understanding the economic value. Various tools, such as i-Tree, estimate the environmental services of trees, and provide economic values for some of those benefits. I felt that human health would also show substantial economic benefit. Any margin of saved costs is important, as U.S. annual health services costs are more than \$3.3 trillion, about 18% of the GDP.²

Urban foresters, park managers, and environmental planners are often asked to justify the expenses of providing trees, parks and nature in the face of many civic needs. Cities and firms can readily tally the costs of planting and maintenance, but the economic returns are less apparent. Translating environmental services, increased property values,³ and human health benefits to monetary terms helps urban natural resources professionals make the case for metro nature. Economics can't capture all the values that people hold for nature, but it earns you a place at the table in budget and policy discussions.



Health Benefits Valuation

Our team was made up of myself and several economists. Dr. Alicia Robbins, then a post-doctorate at the University of Washington, helped construct a value framework.⁴ Dr. Stephen Grado, professor of forestry, and Marcus Measells, an extension associate, both with Mississippi State University's Department of Forestry, lead the work on the valuation strategies. Project funding was provided by the U.S.D.A. Forest Service, State and Private Forestry, on recommendation of the National Urban and Community Forestry Advisory Council.

The figure below shows the valuation process. First, we reviewed studies that documented the health effects across different city nature contexts, such as street trees or parks. We selected six social and public health outcomes: increased infant birth weight; reduced attention-deficit hyperactivity disorder (ADHD) symptoms in children; better school performance; and decreased crime, cardiovascular disease, and Alzheimer's disease. Using publicly available economic data our team then estimated the potential health care cost savings, as benefits units and as total economic values. (*continued on back*)



Behind the Research: Meet Dr. Kathleen Wolf

Your research focuses on nature and human health. What is your ultimate goal with this line of study?

Research confirms that humans literally need time in nature, and I'm proud to have been part of that community of science. Evidence demonstrates that everyone needs access to "nearby nature" on a regular basis. Next we need to provide nature programs that encourage more healthful activities. Of late I've become interested in making the availability of nature part of city policy beyond urban forestry, to elevate the science of nature benefits to city-wide change.



What trends do you see in this area of research?

The research is expanding; I think the bigger change is social change. There is now greater public awareness and recognition by public officials of nature and human health benefits. People in environmental health have traditionally focused on clean air and water, and removing toxins. Now they're looking at nature in cities as a salutogenic influence, a way to prevent disease and promote health. This leads to all sorts of new research questions, such as *What is the best "dose" of nature? Where, how much, how often? What are the characteristics of nature (e.g., native plants vs. ornamental) that are better for human health?* and so on. There's also more interest in collaboration across science disciplines. At the University of Washington, we have a cross-campus Nature & Health group that welcomes all comers.

This excerpt of our interview with Dr. Wolf has been edited for length. Read the full interview in the [Recent Updates](#) section of our website.

Research Update

Dr. Wolf updates us on her "Urban forests for human health: a focused economic valuation" project supported by a 2017 Hyland Johns Grant:

The economic valuation is dependent on scientific evidence of positive health outcomes associated with trees. The grant award does not provide enough funding to actually do benefits research, so the first step is to scan existing studies for health effects, followed by the process to monetize them. I am in the midst of the health effects screening, and am doing this in collaboration with Health Canada and Natural Resources Canada. The work has been accepted for presentation at the International Urban Forestry Congress (IUFC) to be held in Vancouver, British Columbia, Canada from September 30 – October 3, 2018. The presentation will cover our benefits screening process and early results. We found that the study set addressed a wide variety of topics, including asthma, noise attenuation, birth weight effects, metabolic outcomes, mental health, etc.

Trees and Nearby Nature for Health: What is the Economic Value? (continued from front)

What did we learn? Our set of benefits, based on having nature readily available to all people, could provide annual savings in the United States of up to \$6.8 billion. For instance, prescription costs for ADHD and Alzheimer's disease could be reduced by nearly \$3.4 billion. Green campuses have been found to be related to increased graduation rates, which results in increased lifetime annual income.⁵

Again, we partnered with The Nature Conservancy to create a booklet that shares the results - *Nature's Riches: The Health and Financial Benefits of Nearby Nature* ([pdf link](#))

Next Projects

We can determine market value for products that we extract from forests such as timber or paper pulp. These things can be bought and sold to establish price. However, health benefits from nature are not readily exchanged on markets, so we had to find proxies, such as less time in the hospital, fewer medications, or less time with therapists.

This project has set up a process we are using to explore other benefits values. We've only scratched the surface. The team has calculated nature-based health economics for older adults. TREE Fund has provided funding for a study focusing on health benefits provided by city trees, woodlands, and the general urban forest.

These are all preliminary numbers, with room to build in more precision. There are also many other health outcomes that could be valued. Yet this research sets the stage for important discussions. The presence of trees and metro nature has economic consequences, an important finding for policy and planning in cities.

Dr. Kathleen Wolf is a Research Social Scientist with the College of the Environment at the University of Washington (Seattle), and is also a research associate with the Pacific Northwest Research Station, USDA Forest Service. Her research focus is the human dimensions of urban forestry and urban ecosystems, particularly human health. Another interest is the translation of scientific evidence for use in local government policy and planning. You can view an overview of her research at [naturewithin.info](#).

¹Lindland, E., M. Fond, A. Haydon, N. Kendall-Taylor. 2015. Nature Doesn't Pay My Bills: Mapping the Gaps Between Expert and Public Understandings of Urban Nature and Health A Frameworks Research Report on Behalf of the TKF Foundation: Washington D.C.

²http://depts.washington.edu/hhwb/Thm_Economics.html

³U.S. Centers for Disease and Medicaid Services, 2016 estimates: <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsHistorical.html>

⁴Wolf, K. L., A. S. T. Robbins. 2015. Metro nature, environmental health, and economic value. *Environmental Health Perspectives* 123, 5, 390-98. <https://www.fs.usda.gov/treesearch/pubs/49509>

⁵Wolf, K. L., M. K. Measells, S. C. Grado, A. S. Robbins. 2015. Economic values of metro nature health benefits: A life course approach. *Urban Forestry & Urban Greening* 14, 694-701. <https://www.fs.usda.gov/treesearch/pubs/49803>