# Urban Tree Research \$

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# Supply & Demand

Disclaimer: \$ amounts in this presentation are estimated based on surveys and/ or what limited published information was available at the time. Please recognize that these are not exact \$ amounts and are not meant for publication or mass distribution. Thank you.

# Demand (\$)

# Scientists doing urban tree research

- Academic programs that offer degrees in Arboriculture, Urban Forestry, Horticulture, etc. = 306
- Public gardens with research programs that are nonaffiliated with a specific school = 176
- Government = 26 (at least)
- Industry = 14 (at least)
- Other = ?
- Estimate of <u>522</u> scientists who may require funding to perform urban tree research



# Papers in urban tree research (2013)





(Google Scholar = <u>552</u> results with "urban tree" in 2013)

# Urban tree research

#### Supply = ?

**Demand = ?** 

Scientists or papers = 500





# Cost of urban tree research

Mean = \$40,566



(16/66 TREE fund grant recipients 2004-2013)

# Urban tree research

### Supply = ?

**Demand = \$20M/yr** 

Scientists or papers = 500

\$/publication = \$40,000



# Supply (\$)



#### Funding for urban tree research Federal = \$1.4M Private = \$54K

(16/66 TREE fund grant recipients 2004-2013)

# Federal funding for urban tree research



- USDA National Urban & Community Forestry Advisory Council
- USDA Animal & Plant Health Inspection Service
- USDA National Research Initiative Competitive Grants Program
  - USDA Cooperative State Research, Education & Extension Service (NIFA)



# Major federal funding sources for R&D





# Major federal funding sources for R&D







Federal funding for R&D (2009-2013) Total -9.2% Applied research -8.9% Basic research -14.2% Development -7.2%











# Potential federal \$ for urban tree research

#### USDA-FS = \$310M

- Impact of climate change on natural resources
- Nanotechnology to develop commercial applications for hazardous woody fuels
- Urban tree research = \$3M





(Allred et al. 2013; Scott & Smith 2013)



# Potential federal \$ for urban tree research



#### NSF-BIO = \$76IM

- Synthesizing life-like systems
- Understanding the brain
- Predicting organisms' characteristics from their DNA sequencing
  - Studying interactions between Earth and its climate and biosphere
- Understanding biological diversity
- Urban tree research = \$7M



(Allred et al. 2013; Scott & Smith 2013)

# Potential federal \$ for urban tree research

#### US-EPA = \$1.6M

- Urban water restoration
- Community revitalization
- Economic development
- Underserved communities
- Urban tree research = \$400K





# Urban tree research

Supply = \$10M/yr

Federal = \$10M/yr

Demand = \$20M/yr

Scientists or papers = 500

\$/publication = \$40,000



# Potential state \$ for urban tree research

State	Program	Goals / Awards	Research
Illinois	Urban and Community Forestry Grant Program	Tree planting, inventory, and management	No
Indiana	Community Forestry Grants Program	Tree inventory (\$66,465), planting (\$38,900), and outreach (\$40,000)	No
Michigan	Community Forestry Grants Program	Tree inventory, management, and planting	No
Minnesota	USDA-FS Competitive Allocation Grant	Tree planting projects	No
Wisconsin	Urban Forestry Program Grants	Tree planting, inventory, and EAB (\$560,680)	No



# Urban tree research

Supply = \$10M/yr

- Federal = \$10M/yr
- State = 0

# Private = ?

Demand = \$20M/yr

- Scientists or papers = 500
- \$/publication = \$40,000



# Private \$ for urban tree research (2013)

Source	Awards (# & \$)	Research
Tree Research & Education Endowment Fund	8 @ \$10-25K (\$100,000)	Yes
Horticulture Research Institute	I2@\$7-50K (\$306,000)	Yes
Sustainable Forestry Initiative	10 @ \$ 10-50K (\$250,000)	Yes
The Morton Arboretum	5 @ \$10-25K (\$100,000)	Yes
Alliance for Community Trees	?	?
Arbor Day Foundation	?	?
American Forests	?	?





(TREE fund grants 2004-2013)



(TREE fund grants 2004-2013)



Mean = 26%

Importance for early-career scientists

10/16 respondents have earned less than \$300,000



(16/66 TREE fund grant recipients 2004-2013)



Importance for early-career scientists

<30 publications = 41%

>30 publications = 8%

<\$1,000,000 = 38%

>\$1,000,000 = 3%

(16/66 TREE fund grant recipients 2004-2013)

# Susan Day – Virginia Tech

- TREE Fund dollars have been absolutely CRITICAL for me to continue to do research in urban forestry/ arboriculture because these are some of the few funds that actually are targeted to exactly what I want to do.
- I have used them as leverage to expand projects with other funding.
- A lot of urban forestry funds are available for "projects" and "outreach" but not real research.
- I wish there was enough money in TREE Fund grants to actually fund students.



# Taryn Bauerle – Cornell U

There is an extreme limitation for funds to work on research in urban forestry or urban landscapes.



# Mike Arnold – Texas A&M

- TREE fund grants have allowed us to leverage many additional funds for grants and fellowships.
- Total leveraging on TREE funds was probably 4-5 times the grant level.



Bryant Scharenbroch – The Morton Arboretum

- TREE Fund has provided me five grants which is roughly 30% of my research funding.
- TREE Fund has been instrumental for me to build the MASS laboratory which has produced (2007-2013):
  - Publications = 22
  - Presentations = 74
  - Graduate students = 7
  - Undergraduate students = 41



- One of the few funders of urban tree <u>research</u>
- Critical for early-career scientists
- Important for leveraging



# TREE FUND Tree Research & Education Endowment Fund







