



Urban Trees as an Upstream Solution to Promote Human Health

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Canada



**World Forum on
Urban Forests**
Mantova 2018



World Health Organization Definition of Health

*A state of complete
physical, mental, and social well-being
and not merely the absence
of disease or infirmity (1946)*

Urban Nature for Health



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City Trees and Human Health: A Systematic Review



Purpose: carefully collect and synthesize the peer-reviewed evidence concerning city trees and human health

Sponsors:



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Health
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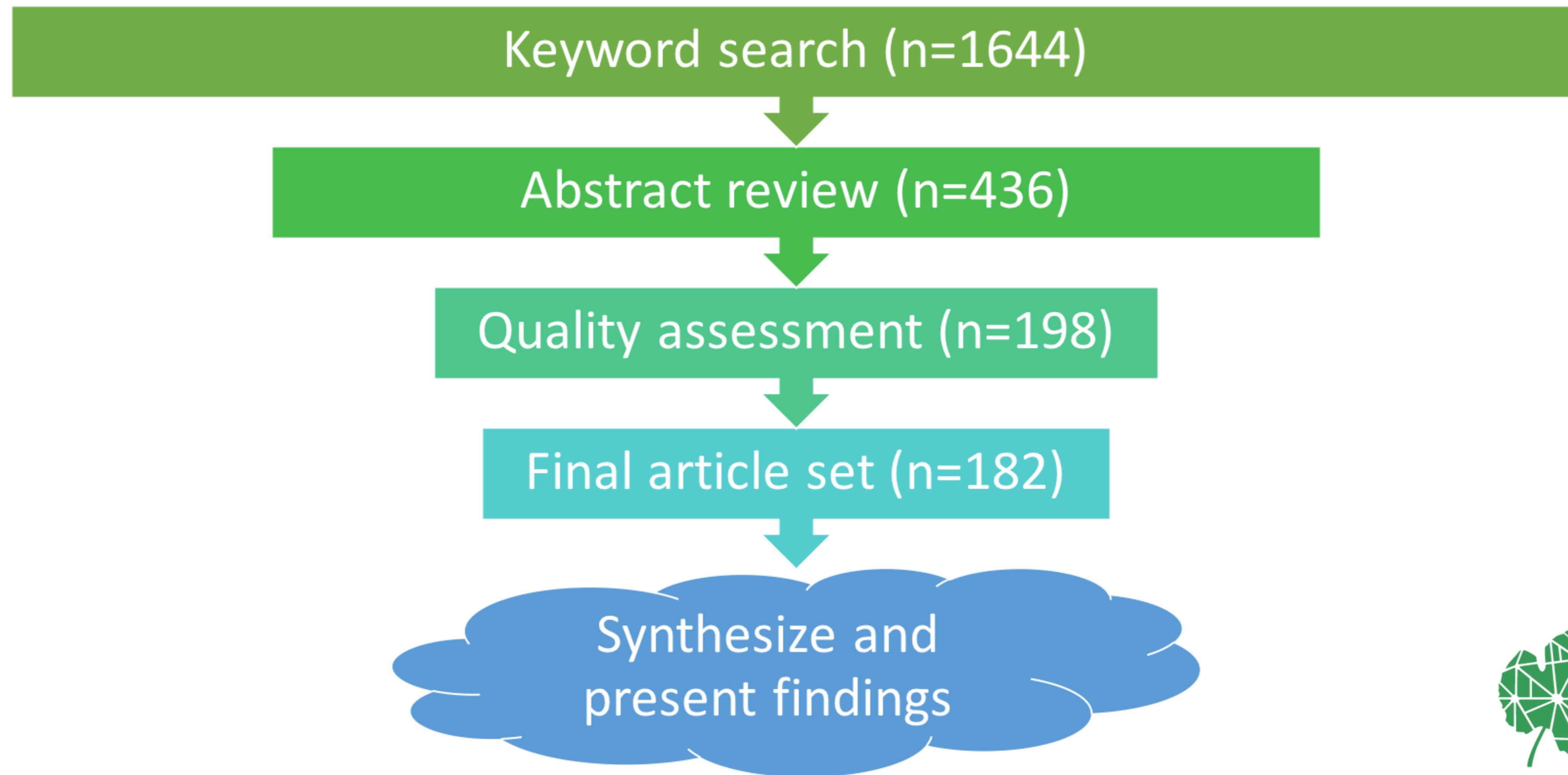
Canada
Natural Resources Canada
Canadian Forest Service

Project Team

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Methods





Final Article Collection

 182 articles

 diverse methods, populations, measures,
and study locations

 conducted by multiple disciplines

study examples and synthesis

Urban Forests and Newborns

the natural environment and pregnancy outcomes . . .

10% increase in tree-canopy cover
within 50m of a house
= lower number of low weight births
(1.42 per 1000 births)



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Donovan et al., Health & Place 2011; Hystad et al., Env Health Perspectives 2014



Trees & Physical Activity



- school children in cities grades 6 to 8
- relationship of tree cover to outside-of-school physical activity
- **5% increase in treed area cover = 5% increase in free-time physical activity**

Sacramento, CA Study :: LIDAR x CHIS data

7,900 adults, 250 m buffer, covariates



more tree cover
= better overall
health
= better social
cohesion

Ulmer et al. 2016. *Health & Place*. Multiple health benefits of urban tree canopy: The mounting evidence for a green prescription.

Insect Damaged Tree Loss & Public Health

1990 to 2007, 1,296 counties in 15 states

EAB infected areas vs. no bugs

15,000 more deaths from cardiovascular disease

6,000 more deaths from lower respiratory disease

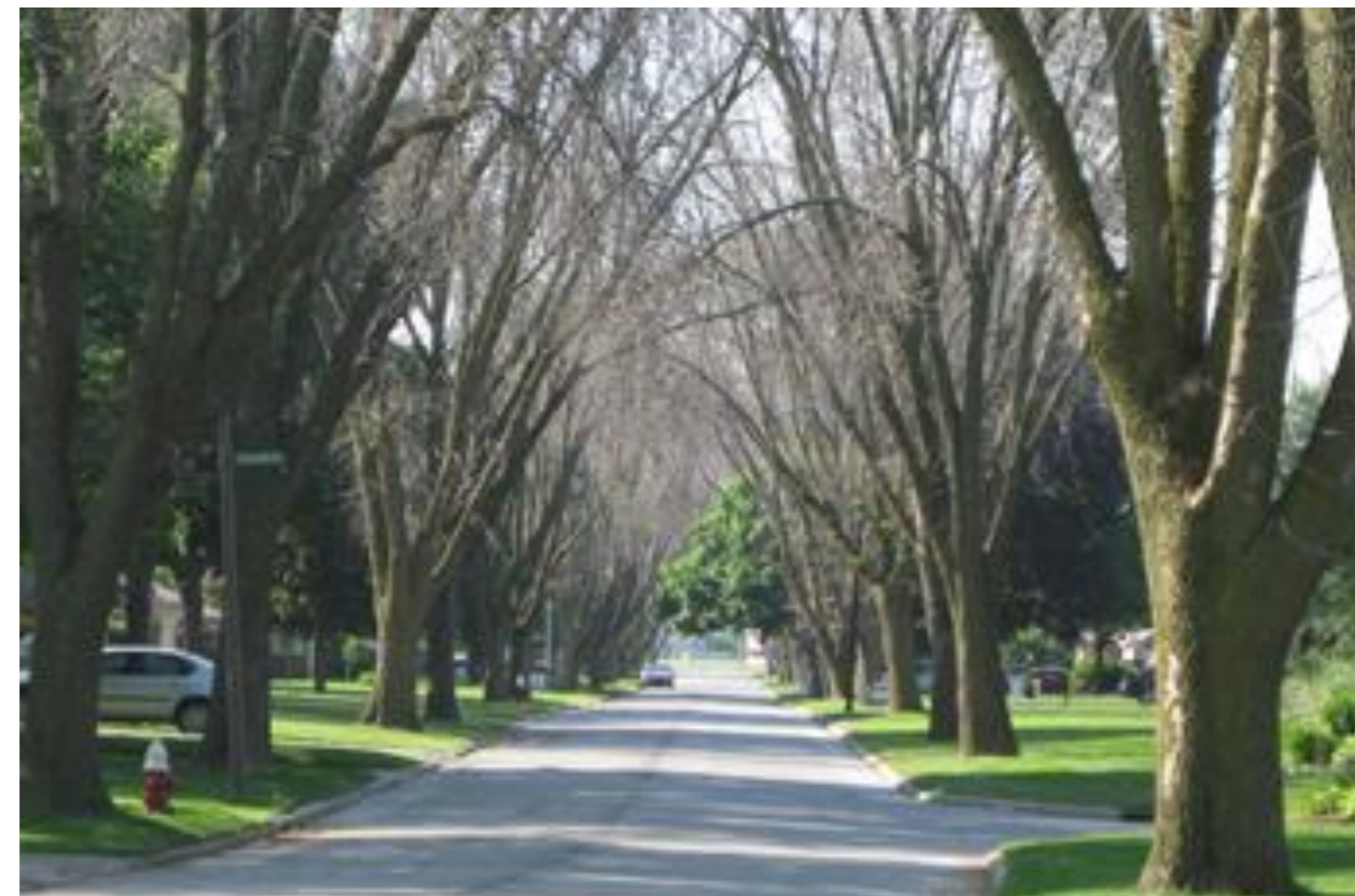
controlled for demographic, human mortality, and forest health data at the county level

Toledo, Ohio in 2006, pre EAB



photo credits: Dan Herms, Ohio State U

2009, EAB in neighborhood



Improving Depression

20 adults with major depression
walk in a park setting and a built setting

🌿 50-minute walks one week apart

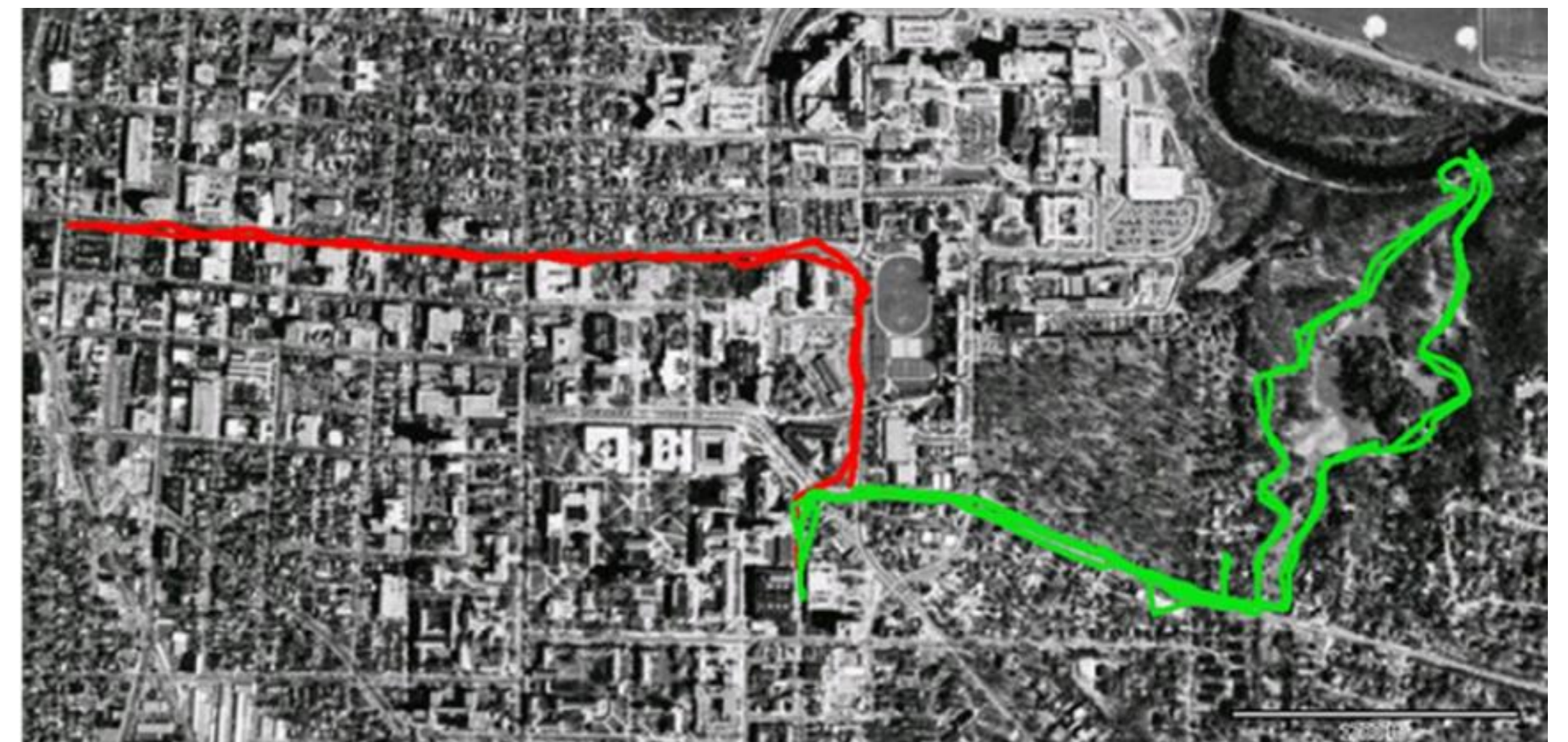
🌿 before-after testing:

🍀 Mood: Positive and Negative Affect (PANAS)

🍀 Cognition: Backward Digit Span (BDS)

Berman et al. 2012. *Journal of Affective Disorders*

cognitive and affective
improvements after
walking in a
nature setting





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City Trees & Human Health

newborn & infant health

increased physical activity for kids

overall adult health

social cohesion

respiratory & cardiovascular health

reduced depression



Diabetes

One in ten of the world's population will have type 2 diabetes by 2035.



Heart Disease

Heart disease is a major contributor to the growing global pandemic of cardiovascular disease and stroke.



Mental Illnesses

Mental disorders represent an ever-increasing burden, to all ages of the population, challenging mental health and health systems.



Cancer

A leading cause of chronic-disease related death in the world. More than 30% of cancers are preventable.



Lung Diseases

Chronic lung diseases such as asthma, lung cancer, and chronic pulmonary obstructive disease.

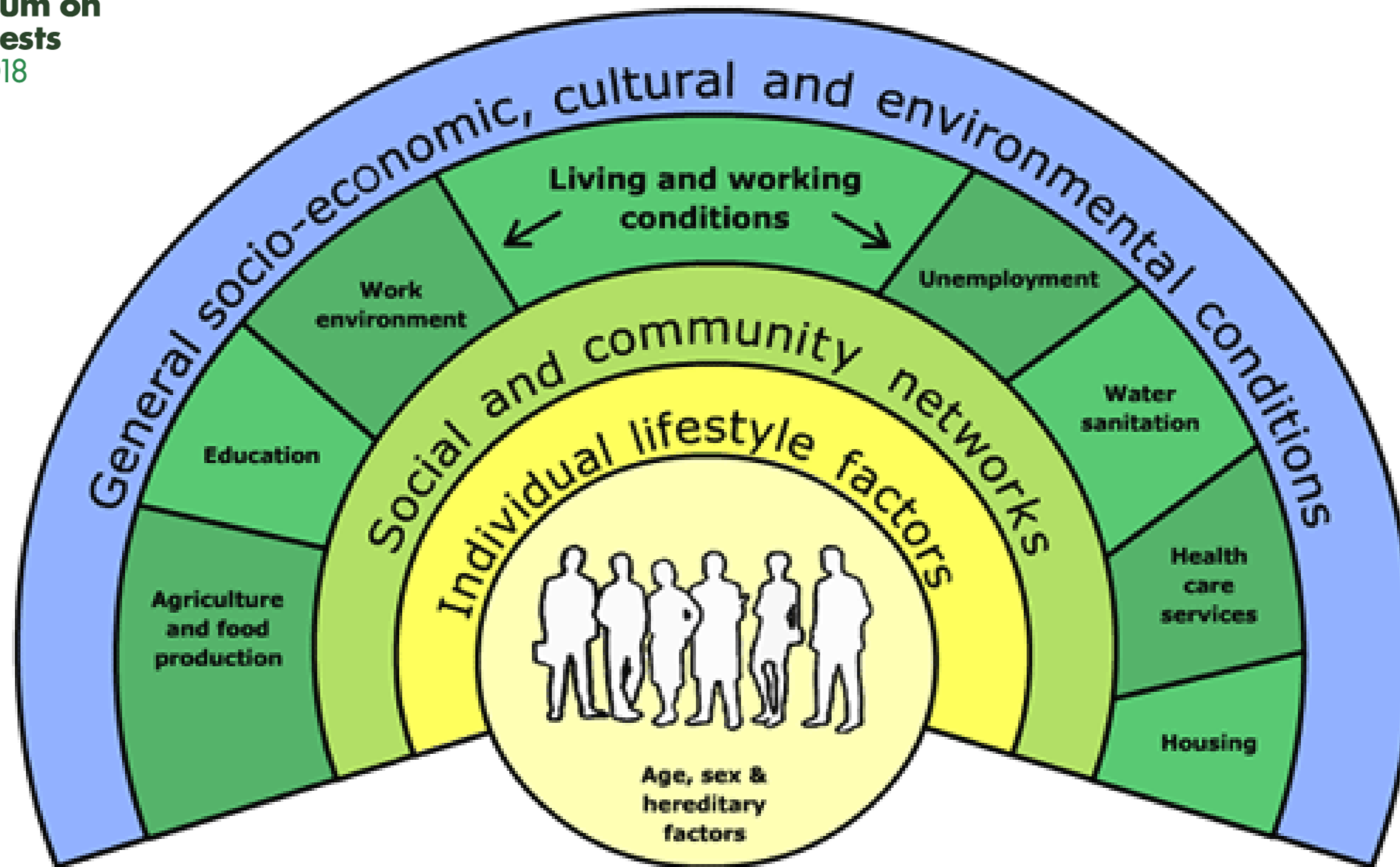


GACD

GLOBAL ALLIANCE FOR CHRONIC DISEASES
AN ALLIANCE OF HEALTH RESEARCH FUNDERS

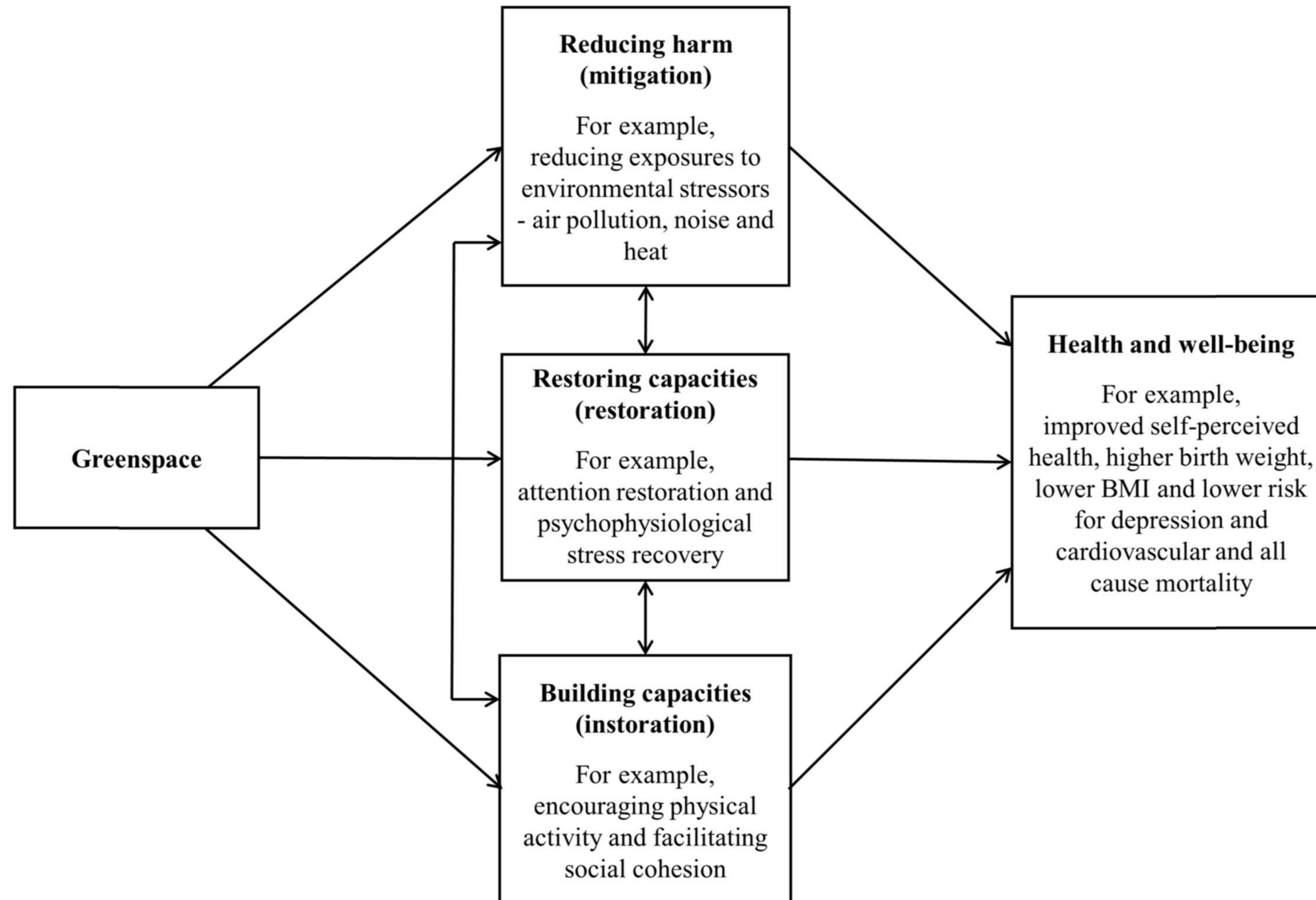


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Social Determinants of Health

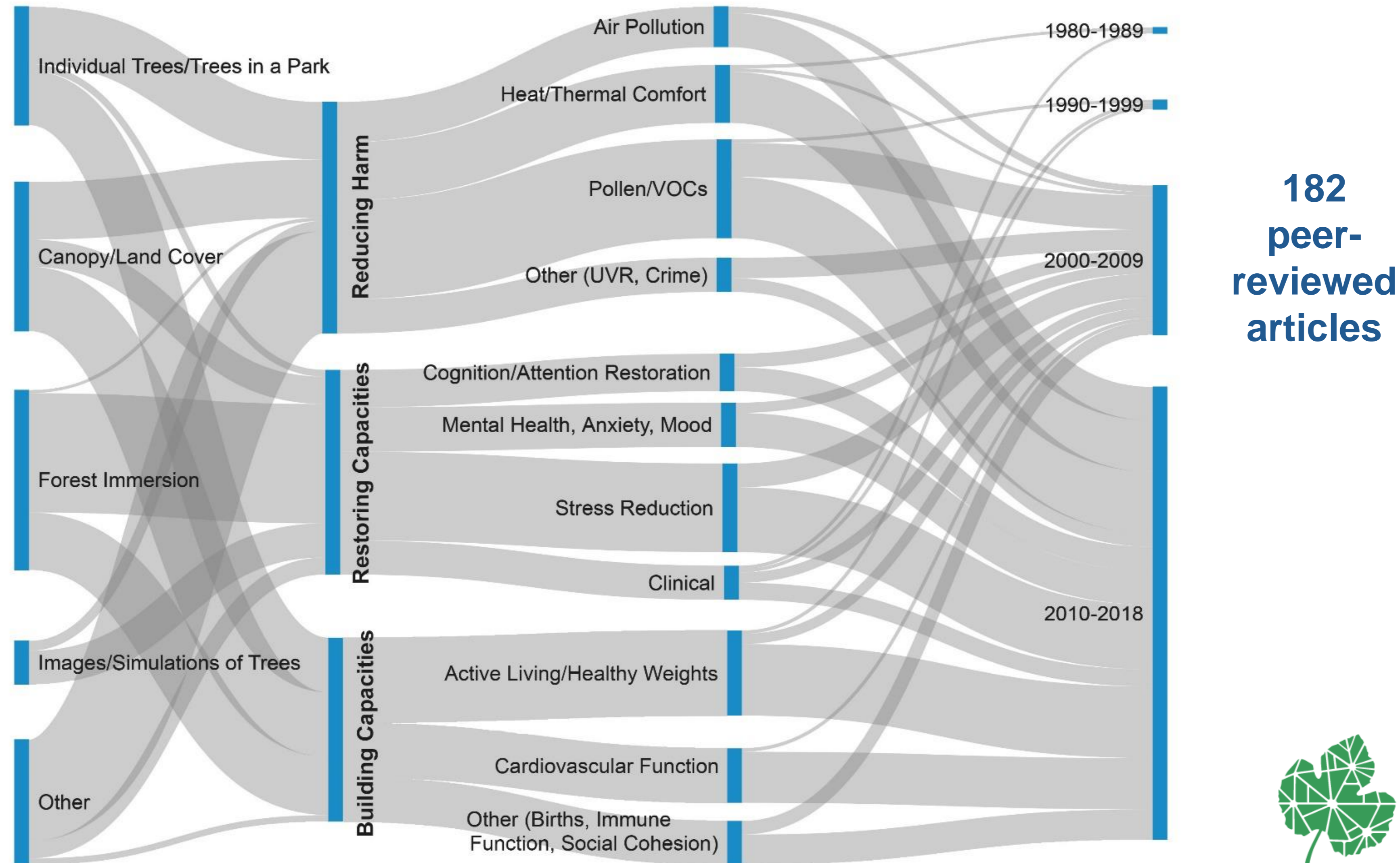
Greenspace & Health Pathways



Markevych, I., et al. 2017. Exploring pathways linking greenspace to health: Theoretical and methodological guidance. *Environmental Research* 158, 301-317.

Literature Review – City Trees & Human Health

USDA Forest Service, U of WA, Health Canada, Natural Resources Canada



182
peer-
reviewed
articles



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figure credit: Sharon Lam

Limitations of Evidence



- heterogeneity of study methods, few experiments
- heterogeneity of tree or forest interventions
- lack of replication
- did not include qualitative studies
- thus, not able to conclusively state outcomes

Implications of the Review



- city trees are essential for health-supportive environments
- effects of trees vary by receptor, not always beneficial (allergy symptoms due to tree pollen)
- benefits mediated by many factors, including the health status of trees and forests
- integrated and proactive design and management
- manage to maximize health benefits and minimize potential adverse impact
- collaboration between health and environmental professionals, planning guidelines
- health equity, tree distribution

Green Cities: Good Health

www.greenhealth.washington.edu

Sponsors:

USDA Forest Service,
(U&CF Program + Pacific NW Research)

University of Washington

NGO partners

Thanks!

to U of WA students:

Katrina Flora

Mary Ann Rozance

Sarah Krueger

Research Reviews & Summaries





Community Building

Local Economics ▶

Place Attachment & Meaning

Crime & Fear ▶

Safe Streets ▶

Active Living ▶

Reduced Risk

Wellness & Physiology

Healing & Therapy

Mental Health & Function ▶

Work & Learning

Culture & Equity

Lifecycle & Gender

Local Economics

Trees in cities are not grown and managed for products that can be bought and sold on markets, but they do provide many intangible services and functions! This article serves two purposes. First, it introduces valuation methods that are used to convert intangible benefits to dollar sums.^{1,2} Then, it shows how nonmarket valuations can support local decision-making.

Fast Facts

- The presence of larger trees in yards and as street trees can add from 3% to 15% to home values throughout neighborhoods.
- Averaging the market effect of street trees on all house values across Portland, Oregon yields a total value of \$1.35 billion, potentially increasing annual property tax revenues \$15.3 million.⁹
- A study found 7% higher rental rates for commercial offices having high quality landscapes.¹⁴
- Shoppers claim that they will spend 9% to 12% more for goods and services in central business districts having high quality tree canopy.³⁴
- Shoppers indicate that they will travel greater distance and a longer time to visit a district having high quality trees, and spend more time there once they arrive.³⁴

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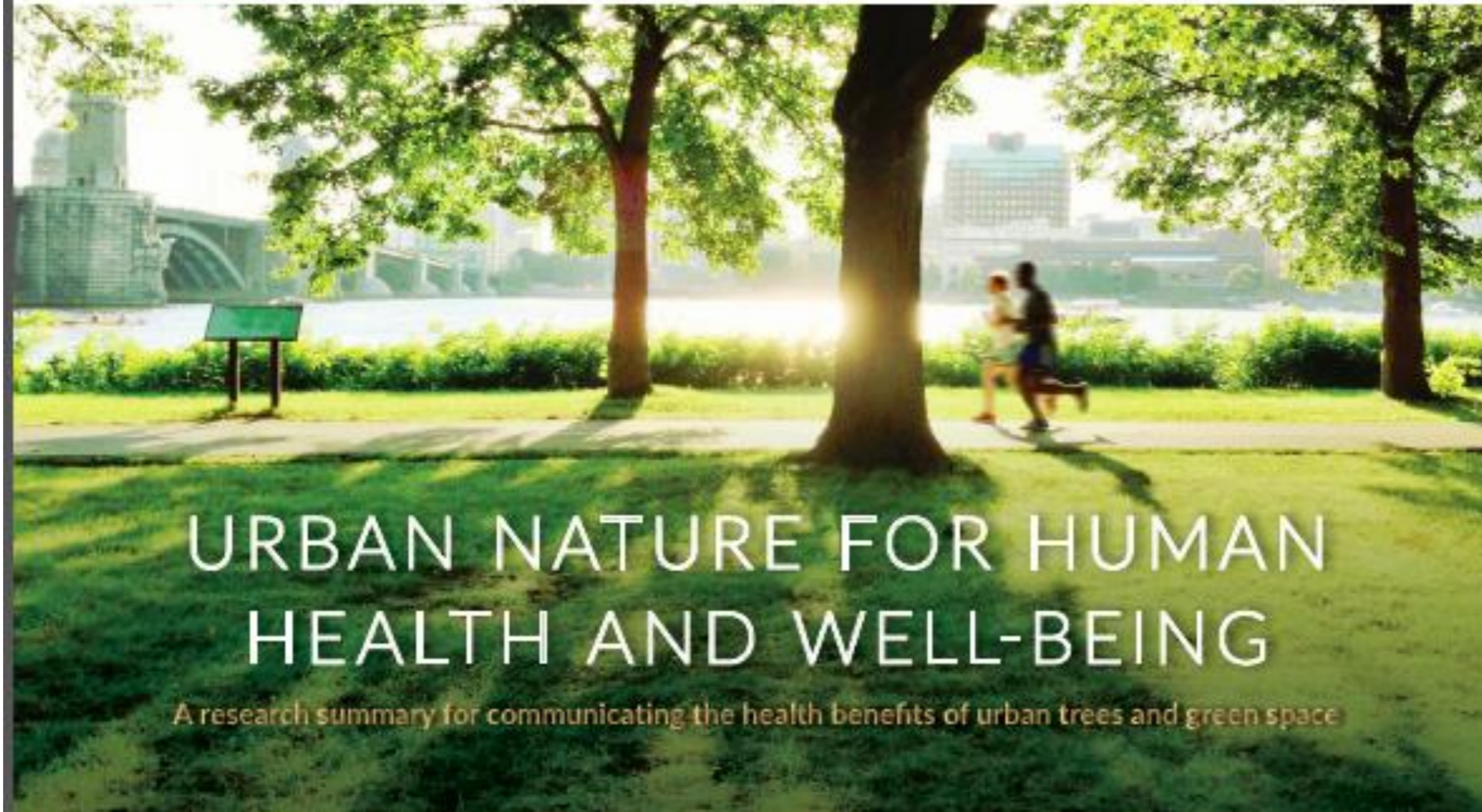


street trees boost market value of houses, providing tax revenue for communities





United States Department of Agriculture



URBAN NATURE FOR HUMAN HEALTH AND WELL-BEING

A research summary for communicating the health benefits of urban trees and green space



Forest Service

FS-1096

February 2018

Introduction

Writers, philosophers, and naturalists have praised the benefits of nature for human health, happiness, and well-being for centuries, but only relatively recently have researchers begun studying and quantifying the complex relationship between human health and nature.

In 1984, Roger Ulrich, professor and director of the Center for Health Systems and Design at Texas A&M University, published the results of a pioneering study that looked at the recovery rates of gall bladder surgery patients in relation to the views from their rooms in a Texas hospital. Some of the patients looked out over a garden and grove of trees, while others had a view of a brick

wall. Ulrich found that patients with a natural view spent fewer days in the hospital and used fewer pain medications (Ulrich 1984).

Ulrich's study helped open the door to a new field of inquiry focused on illuminating the ways that nature influences our physical, mental, and social lives. More than three decades later, a broad and diverse body of scientific literature describes the human health value of nature, confirming that trees, parks, gardens, and other natural settings are as essential to livable and sustainable cities as the other critical systems that keep their residents moving and working.

Findings from the current literature indicate the wide range of effects.

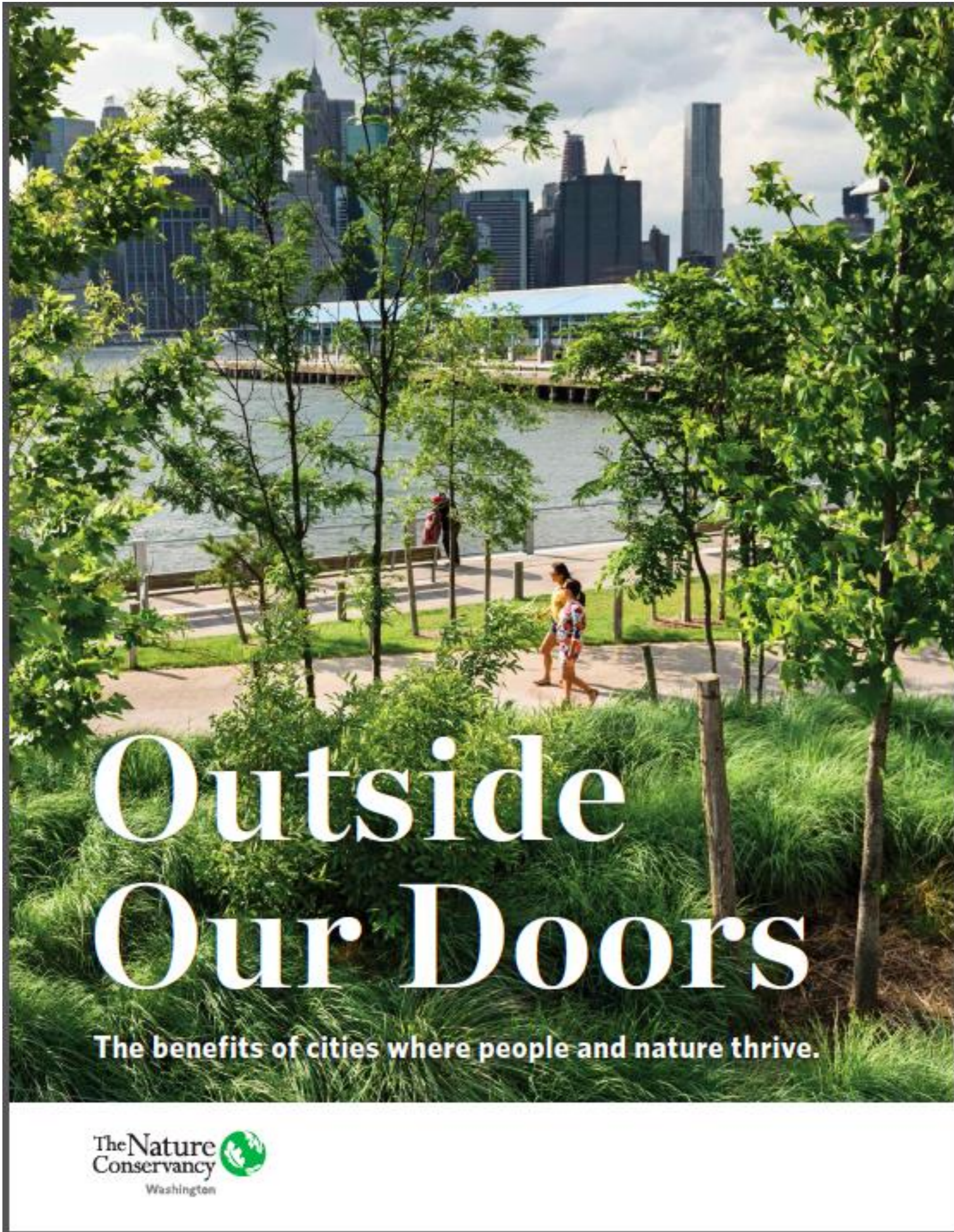
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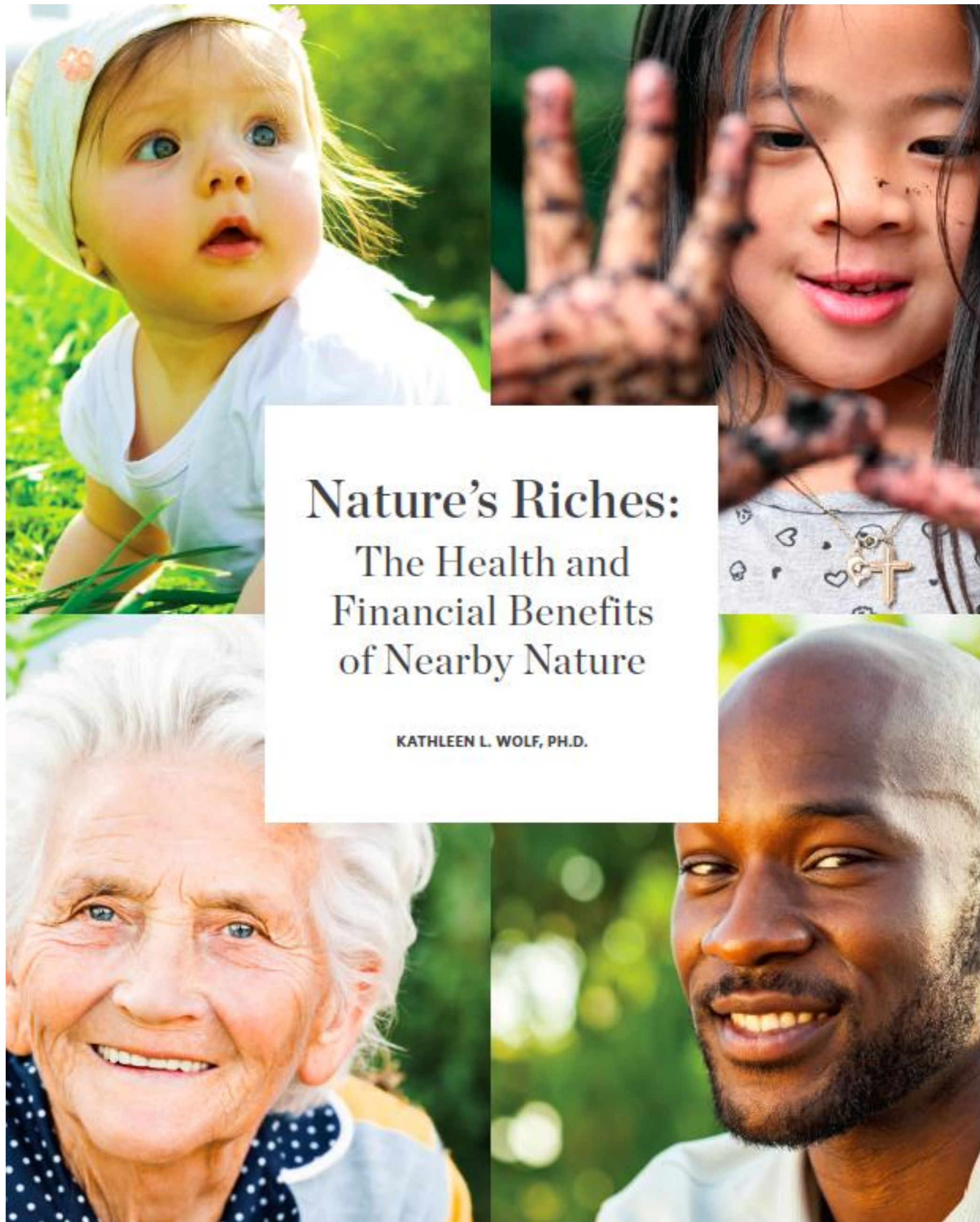
2018



design:  milepost

co-author: 

co-author & printing:
The Nature Conservancy 



Nature's Riches:
The Health and
Financial Benefits
of Nearby Nature

KATHLEEN L. WOLF, PH.D.

design:  milepost

author: 

printing:
The Nature 
Conservancy

also in **Spanish!**
and **Arabic!**



Closing

- trees in cities, create health protective environments
- 3 domains of benefit:
 - reducing harm
 - restoring capacity
 - building capacity
- = more partnerships for collaborative UF planning & management



Human Dimensions of Urban Forestry and Urban Greening

featuring research on peoples'
perceptions and behaviors
regarding nature in cities

Green Cities: Good Health

human health & well-being research

Projects Director
Kathleen L. Wolf, Ph.D.



What's New?

Nature and Consumer Environments

Research about how the urban forest influences business district visitors.

Trees and Transportation

Studies on the value of having quality landscapes in urban roadsides.

Civic Ecology

Studies of human behaviors and benefits when people are active in the environment.

Policy and Planning

Integrating urban greening science with community change.

Urban Forestry and Human Benefits

More resources, studies and links . . .

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