Ascending the Giants

Portland, Oregon
So the tree rustles in the evening . . .

Trees have long thoughts, long-breathing and restful,

just as they have longer lives than ours.

Hermann Hesse, *Trees: Reflections and Poems*
Outline

1. Health & Nature: the evidence
2. Emerging Programs
3. Goals & Metrics
WHO Health Definition

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

- A study found 7% higher rental rates for commercial offices having high quality landscapes.

- Shoppers claim that they will spend 9% to 12% more for goods and services in central business districts having high quality tree canopy.

- 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.
Green Cities: Good Health

database of >4,500 peer reviewed publications
Metro Nature Settings

NEARBY NATURE INCLUDES A VARIETY OF SPACES AND PLACES

- Urban Forest Canopy
- Biophilic Design
- Parks and Gardens
- Green Stormwater Infrastructure
Outside Our Doors
The benefits of cities where people and nature thrive.

design: milepost

co-author:

co-author & printing:
The Nature Conservancy
Science Review

nearby nature & health evidence
> 40 years
> 5,000 publications

what are the ‘stories’?
Story: Human Health Benefits Across the Life Cycle
Urban Forests and Newborns
the natural environment may affect pregnancy outcomes . . .
10% increase in tree-canopy cover within 50m of a house = lower number of low weight births (1.42 per 1000 births)

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

- presence of soil bacteria in body, *Mycobacterium vaccae* = increased seratonin
- boost immune function
- may alleviate depression (dirt or Prozac?)

Lowry et al. 2007. Neuroscience
Eat Dirt!
Sacramento Study :: LIDAR x CHIS data
7,900 adults, 250 m buffer, covariates

more tree cover
= better overall health
= better social cohesion

EAB Tree Loss & Public Health

1990 to 2007, 1,296 counties in 15 states
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

2009, EAB in neighborhood

photo credits: Dan Herms, Ohio State U
Elders: horticulture for mobility & social connections
Lifecycle :: disease & illness

Cumulative U.S. DALYs for the Leading Disease/Disorder Categories by Age (2010)

Disability Adjusted Life Year

Data courtesy of WHO
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Fiddleheads Forest School
Washington Park Arboretum (Seattle)

cognitive
social &
physical
learning
CDC moderate activity recommendations

parks, active living, active transit
Walking Programs

children
elders
families
Shinrin yoku (forest bathing)

- extensive research
- restorative experiences
- workers retirees
- networked system, 52 bases in Japan
Parks Prescription

Date: _______________________
Dr: _______________________
Name: _______________________
I recommend:
☐ Walking      ☐ Other: __________

_______________ minutes a day

_______________ days per week

* Health Canada suggests moderate activity of 30 minutes per day | 5 days a week

Benefits of daily activity

• Improve overall physical and mental health
• Maintain a healthy weight
• Reduce the risk of diabetes and other chronic conditions
• Lower cholesterol levels
• Manage stress and anxiety

Signature: ___________________
Parks Prescription

1. Get a prescription for ParksRx from your healthcare provider.
2. Visit www.REACHforbetterhealth.com
   2.1. Enter your zip code
   2.2. Click
3. Pick your park
4. Exercise in the park and share outcomes with your healthcare provider.

PARKS Rx
Your Prescription For Better Health

This information is provided for educational purposes and is not to be considered medical advice.

www.REACHforbetterhealth.com/ParksRx
Made possible with funding from the Centers for Disease Control and Prevention.
Green Streets for Walkability

evidence of lower frustration and higher meditation when moving into the greener streets

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
Experience the restorative powers of nature and join us for Strolls for Well-Being, a free 10-week program offered at Bloedel Reserve. If not already a member, participants are given a temporary membership to

DAY-USE STROLLS:
Since introducing the Strolls for Well-Being program in 2014, hundreds of people have benefited from the healing effects of nature.
Nature and Creativity

http://www.jimkukral.com/
Give Your Ideas Some Legs

creative test – analogy generation
conditions: sit inside, treadmill walk, walk outside, wheelchair outside

walking outside produced most novel & highest quality analogies – walking opens up free flow of ideas

Oppezzo & Schwartz. 2014. Journal of Experimental Psychology
Nature & Creative Professionals

focused interviews, Denmark
makes us more curious
supports flexible thinking
recharges directed-attention

aids 2 phases of the creative process: Preparation phase and Incubation phase
sensory dimensions: space & serene

Plambech & Konijnendijk van den Bosch. 2015.
Urban Forestry & Urban Greening
Walking Meetings

creativity, energy, communication, health
Effects of nature window view on recovery from surgery (Roger Ulrich, 1984)

- Shorter stays
- Less pain
- Fewer minor complications
- Better emotional well-being
Massachusetts General Hospital

credit: Frank Oudeman
Legacy Good Samaritan Medical Center
Stenzel Healing Garden 1997
Rehabilitation Institute of Oregon
Oregon Burn Center Garden
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1. Health & Nature: the evidence
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Nearby nature experiences are important across the entire life cycle, from cradle to grave.

<table>
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<tr>
<th>INFANTS</th>
<th>CHILDREN &amp; TEENS</th>
<th>ADULTS</th>
<th>OLDER ADULTS</th>
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<tr>
<td><strong>BIRTH WEIGHT</strong></td>
<td><strong>OVERALL HEALTH AND WELL-BEING</strong></td>
<td><strong>DEPRESSION AND STRESS</strong></td>
<td><strong>MOBILITY &amp; QUALITY OF LIFE</strong></td>
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<td><strong>ECONOMIC IMPACT</strong></td>
<td><strong>IMMUNE FUNCTION</strong></td>
<td><strong>CARDIOVASCULAR DISEASE</strong></td>
<td><strong>HYPERTENSION</strong></td>
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<td>8.6% SAVINGS ON ANNUAL HEALTH CARE COSTS.</td>
<td>STRONGER IMMUNE SYSTEM LEADS TO REDUCED ILLNESS AND CARDIOVASCULAR DISEASE ACROSS A LIFETIME.</td>
<td>LONG-TERM SAVINGS ON TREATMENT COSTS ANNUALLY.</td>
<td>91.7-92.4% SAVINGS ON HEALTH CARE COSTS FROM FALLS PER YEAR.</td>
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Research about nature benefits and economic value is fairly new. Some of the quantified health benefits of nature in cities are easier to convert to economic value than others. Here are some preliminary valuations - estimated for the entire U.S. on an annual basis.

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<td>81.2-85.8% ANNUAL SAVINGS ON MEDICAL SERVICES, NOT COUNTERING THE VALUE OF HOME CAREGIVER SERVICES.</td>
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Cardiovascular Disease is the leading cause of premature death in the U.S. People who smoke significantly reduce risk of CVD if their neighborhoods have greater nature coverage (particularly tree canopy). However, it is worth noting the majority of studies have focused on men.

**CRIME & SAFETY**

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Among one in five older adults experiences mental and cognitive disorder, with age having the greatest risk factor. In 2014, about 15% of people aged 65 or older were affected by Alzheimer's disease. Those with dementia have three times as many hospital stays per year as other elders. Exposure to nature improves symptoms related to cognitive disorders, such as agitation, depression, and reduced mobility.

**contributing analysts:**
Dr. Stephen Grado & Marcus Measells, MSU; Dr. Alicia Robbins, Weyerhaeuser
healthy trees.
happy people.
11 more trees in a city block

decreased cardio-metabolic conditions =

increase in annual personal income of $20,000, or

moving to a neighborhood with $20,000 higher median income

Kardan, et al. 2015. Scientific Reports 5, 11610
Canopy Cover & Stress

images of canopy cover varied 0-60%

Vegetation & Mental Health

• vegetation cover and afternoon bird abundances
• lower prevalence of depression, anxiety, and stress:
  depression, more than 20% cover,
  anxiety, more than 30% cover,
  stress, more than 20% cover

Summary:

Knowledge to Practice

- nearly 40 years of research
- critical mass of evidence – now what?
- greening or health programming
- integrating urban forest goals with broader urban systems needs
Human Dimensions of Urban Forestry and Urban Greening

- 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...

- Green Cities: Good Health
  human health & well-being research

Projects Director
Kathleen L. Wolf, Ph.D.