Designing Metro Nature for Health & Economics
sustainability, co-benefits & sacred

Kathleen Wolf, Ph.D.
Research Social Scientist

University of Washington
College of the Environment

Casey Trees/American Planning Association
Washington, DC.; 26 March 2015
Trending . . . . .

Sanitary City
Sustainable City
Sacred City
Sanitary City

The Sustainable City
Pierce County WA, Chambers Creek Properties - 4 year growth
stormwater management

Parks & People Foundation, Baltimore
in cities . . . . .

expensive land values
reduced public funds
increasing community needs
new parks??

SO . . . . . .
multi-tasking nature
creating co-benefits
co-benefit design opportunities
place making:
vertical + horizontal surfaces
design concept
design concept

bring people in!
Tanner Springs Park
Portland OR
linked to active living network
neighborhood social cohesion

environmental education & social learning
design concept

biodiversity &
soft fascination
Urban Greening, Trees & Nearby Nature = Metro Nature

the social pillar of sustainability
health & well being benefits
nearly 40 years of evidence across the life course
Research Review and Summaries
www.greenhealth.washington.edu

Sponsors:
USDA Forest Service, U&CF Program
University of Washington
NGO partners

thanks!
to U of WA students:
Katrina Flora
Mary Ann Rozance
Sarah Krueger
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.
Metro Nature :: Human Health & Well Being

> 3,000 articles in database

% distribution of entire database
cradle to grave

nature for health
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
Nature & Psych Development
children’s play & imagination

Richard Louv - Last Child in the Woods
Green High School Campuses

- cafeteria & classroom window views with greater quantities of trees and shrubs
- positively associated with:
  - standardized test scores,
  - graduation rates
  - %s of students planning to attend a four-year college
  - fewer occurrences of criminal behavior

Matsuoka. 2010. Landscape & Urban Planning
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

photos: Dan Herms, Ohio State University
CDC moderate activity recommendations

parks, active living, active transit
Green Streets for Walkability

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

Aspinall et al. 2013. The Urban Brain: Analysing Outdoor Physical Activity with Mobile EEG. British Journal of Sports Medicine
Physical Activity & Depression Reduction

- Review of 13 high quality studies
  - exercise recommended for mild to moderate depression
  - people who are willing & motivated
  - associated meditation and mindfulness are important

Elders: mobility & social connections
The Sacred City
The Nature Sacred Principle
TKF Foundation, Maryland
Design Elements

NatureSacred :: Open Spaces Sacred Places
portal :: path :: surround :: destination
portal :: path :: surround :: destination
Nature and Mindfulness

- focus
- soft fascination
- undirected attention
Mindfulness/Meditation Training

- meta analysis; clinical/non situations
- focus on moment-to-moment experience and mental awareness
- more veridical perception (reality check)
- reduce negative affect
- improve vitality and coping
- medical symptoms & sensory pain

Mindfulness/Meditation Training

- healthy workplace employees
- 8 week mindfulness training
- brain electrical activity – positive affect
- brain activation – reduce stress event response
- more antibodies after influenza vaccine = better immune function

Davidson et al. 2003. Alterations in Brain and Immune Function Produced by Mindfulness Meditation. Psychosomatic Medicine
What is the Economic Value?
Elements of Economic Valuation

- what is the benefit?
- who experiences nature and gets benefit?
- what is the green condition or situation that provides benefit?
- scale of value question (community, province/state, nation)
- what are the costs/income gained/lost associated with the benefit?
Valuation Strategies

- factor income
- avoided or replacement cost
- burden of illness
- hedonic pricing
- stated preference/contingent valuation
- revealed preference (e.g. travel cost)
- quality adjusted life years
- benefit/cost
## Green & Health Economics

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<th>Benefit</th>
<th>Metro Nature</th>
<th>Outcome</th>
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<tbody>
<tr>
<td>Newborn Birth Weight</td>
<td>canopy cover and birth weight</td>
<td>more tree canopy-fewer small for gestational age babies</td>
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<tr>
<td>Attention Deficit Hyperactivity Disorder</td>
<td>greener play areas vs built outdoor or indoor settings</td>
<td>reduced symptoms potentially reducing medication</td>
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<tr>
<td>School Performance</td>
<td>green views from classrooms and cafeteria</td>
<td>reduced dropout rate - average annual income</td>
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<td>Crime Reduction</td>
<td>trees and lawn in outdoor common areas</td>
<td>reduced violent and non-violent incidence and costs</td>
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<tr>
<td>Cardiovascular Disease</td>
<td>presence of residential tree canopy</td>
<td>reduced incidence or severity of cardiovascular disease</td>
</tr>
<tr>
<td>Alzheimer’s Disease</td>
<td>wander garden in care facility</td>
<td>reduced medications for patients</td>
</tr>
</tbody>
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Wolf et al. in press. Urban Forestry & Urban Greening
Summary

sanitary to sustainable to sacred
metro nature for co-benefits
human health & wellness

Green Cities: Good Health
economics - preliminary
Human Dimensions of Urban Forestry and Urban Greening

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

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.

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

Urban Forestry and Human Benefits
More resources, studies and links...

Projects Director
Kathleen L. Wolf, Ph.D.