Considering Beneficiaries ::
Human Health Ecosystem Services

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Lands Management & Investment

analytics models

& ‘stories’
WHO Health Definition

A state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity (1946)
credit: American Planning Association
Determinants of Health
Green Cities: Good Health
www.greenhealth.washington.edu

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Thanks!
to U of WA students:
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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 ~ 3,800 peer reviewed publications

% distribution of entire database
Publications


* Research and publications were funded in part by the U.S.D.A. Forest Service, National Urban and Community Forestry program, as recommended by the National Urban and Community Forestry Advisory Council (NUCFAC).
Nearby nature experiences are important across the entire life cycle, from cradle to grave.

INFANTS

Birth weight influences long-term childhood health and development, and has been linked to some adult diseases. Lower birth weight is associated with both short- and long-term health care costs, such as longer hospital stays and increased illness. Pregnant women who have more tree canopy and green space near their homes generally have healthier birth weights.

IMMUNE FUNCTION

Inflammation initiates the body’s response to injury, infection, and other insults. The ‘hippopotamus hypothesis’ suggests that early contact with outdoor environments stimulates the development of a healthy immune response.

FAMILY DYNAMICS

An infant’s parents and siblings adjust their lives after a baby arrives, and the changes can have an effect on stress and anxiety. Nature views and walks help reduce stress conditions and improve interactions between people within the household.

CHILDREN & TEENS

BIRTH WEIGHT

Potential economic value: $16,000 savings on annual health care costs.

OVERALL HEALTH AND WELL-BEING

Potential economic value: $40,000 savings on health care costs from illness.

RESEARCH SAYS...

Stronger immune systems lead to reduced illness and chronic disease across a lifetime.

Cardiovascular disease is the leading cause of preventable death in the U.S. People exposed to a forested area in their neighborhood have greater nature coverage (particularly tree canopy), but tree cover is worth noting the majority of studies have focused on men.

FUTURE FINANCIAL SUCCESS

Potential economic value: $1,389 increase in high school graduates’ lifetime annual income.

ADHD

Potential economic value: $1,500 savings on medication costs per year.

Depression and anxiety reduce illness, mental distress and depression disorders, and improves body image, self-esteem and life satisfaction.

ADHD

Potential economic value: $5,000 savings on medication costs per year.

RESEARCH SAYS...

Early experiences reduce stress. Nearly 1 in 5 adults experiences major depression each year in the U.S., and associated, heightened, and unconnected disorders are a leading cause of disability. Nature experiences support a reduction in symptoms for improved mental health, and reduced life satisfaction.

CRIME & SAFETY

Potential economic value: $3,000 reduction in costs of crime for victims and property owners per year.

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.

MOBILITY & QUALITY OF LIFE

Potential economic value: $5,000 savings on health care costs from falls per year.

Mild falls are common among older adults, with approximately 1 in 5 adults age 65 or older experiencing a fall each year. Major falls can result in injury, hospitalization, and long-term disability. Nature experiences support a reduction in symptoms for improved mental health and function, reduced disease treatment costs, and improved overall productivity.

HYPERBENSION

Potential economic value: $1,000 savings on health care costs per year.

Hypertension, or high blood pressure, is one of the most common conditions impacting older adults. Views of nature, particularly forests, and ‘forest bathing’ (spending time in a natural, forested setting) decrease diastolic blood pressure.

COGNITIVE DISORDERS

Potential economic value: $1,000 savings on health care costs per year.

Natural environments are significantly associated with cognitive function and memory. Older adults who live near green spaces have better cognitive function and memory, and those who engage in nature walks have improved mood and cognitive function.

contributing analysts:
Dr. Stephen Grado & Marcus Measells, MSU; Dr. Alicia Robbins, Weyerhaueser
Stories’ of Nearby Nature & Human Health

stormwater management & biophilic design
children, outdoor activity & ADHD
veterans & stress response
Metro Nature & Health Evidence Framework

Synthesis of 40 years of peer-reviewed literature

‘Stories’ of Nearby Nature & Human Health

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green stormwater infrastructure tools & strategies

= mini parks?

credit: Seattle Public Utilities
Stormwater Management

Thornton Creek Water Quality Channel (Seattle, SvR Design)
1 hectare, treats runoff from 275 hectares (1 hectare = 2.47 acres)
linked to active living network
Walking Programs

children
elders
families

walking meetings
Shinrin yoku (forest bathing)

- extensive research
- restorative experiences
- workers retirees
- networked system, 52 bases in Japan
green stormwater infrastructure

Philadelphia

reduction in narcotics arrests (18–27 %) for green not gray

vs. 65% increase across city

Kondo et al. 2015. Journal of Public Health
'Stories’ of Nearby Nature & Human Health

stormwater management & biophilic design

children, outdoor activity & ADHD

veterans & stress response
Change in % Population for ADHD Treatments
2001 - 2010

America’s State of Mind, Medco Health Solutions, Inc
% of Americans Ages 20-44 on ADHD Meds
2001 - 2010

America’s State of Mind, Medco Health Solutions, Inc
ADHD and nature contact

- 96 children aged 7-12 diagnosed ADD or ADHD
- Parents gave postactivity attentional functioning ratings (PAAF) – 4 measures:
  - Can’t stay focused on unappealing tasks (homework or chores)
  - Can’t complete tasks
  - Can’t listen and follow directions
  - Easily distracted

Faber Taylor. 2001. Environment & Behavior
ADHD and nature contact benefit

- 17 children aged 7-12 with diagnosed ADHD
- 20-minute guided walks
  - Park
  - Neighborhood
  - Downtown
- Pre-walk puzzles
- Post-walk cognitive test

Faber Taylor & Kuo. 2009. *Journal of Attention Disorders*
‘Stories’ of Nearby Nature & Human Health

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Walter Reed National Military Medical Center, Bethesda, MD

- Iraq/Afghan wars: Brain injury and PTSD in 30% of force
- Military/Vet suicides: 20% of all U.S. suicides
- Drugs and surgery relatively *ineffective*

slides credit: Frederick Foote, M.D.
Project Manager for the Green Road Project
The Green Road Project
A model program of the Institute for Integrative Health
Naval Support Activity Bethesda
Home of Walter Reed National Military Medical Center
The Green Road: Healing with *Wild* Nature

- Natural woodland
- Maximum encounter, minimum disruption
- Highlight core elements
  - Water
  - Stone
  - Trees
  - Animals
Stream restoration heals the landscape and invites access to the water
The Commemorative Structure invites participants to quietly contemplate nature, remember the fallen, and reflect on their own lives in a place that gives prospect and refuge with little separation from the landscape.
Fallen tree trunks remain throughout the grounds, contribute to the ecological continuum and symbolize the fallen soldiers’ legacy in the ever vigilant struggle for freedom.
Stone, wood and water are the durable and life-affirming materials of choice.
Green Road Research Team

measures of veterans (and associates):
cognition
mental health
physiology and healing
social
Veterans Outdoor Therapy

Les Winkeler/The Southern Illinoisan

World-Herald News Service

Hope for the Warriors

Outward Bound
Military Service & Health Impacts

- Military service to civilian transition
- Prevalence of Stress Response
- Service carry-overs
  - Purpose/mission oriented
  - High commitment & exertion
  - Advanced skill sets
  - Social cohesion/comraderie
Civic Stewardship for Healing

urban forest restoration
community tree plantings

American Forests

Tree People, Los Angeles

parks
public gardens
street trees
neighborhood
community gardens

The Heights Community Garden, Dayton OH

local food
food security
child education
nutrition
food donations
Conclusions

• Evidence of beneficiary response & outcomes
• Urban to rural & wildlands gradient
• Importance of ‘place’ in ecosystem management & investment
• Crosswalk ecosystem and human scales
• Analytics support ‘stories’
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.

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

Projects Director
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