Nature & Human Health: From Rain Gardens to Public Gardens

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19 June 2018
Community Engagement

stewardship – health benefits – ecosystem function

City of Bellingham
urban forest restoration
riparian restoration
environmental education
nature recovery & schools

Parks & People Foundation, Baltimore
nature recovery & schools

Parks & People Foundation, Baltimore
Parks & People Foundation, Baltimore

planning skills & efficacy
Outline

1. Health & Nature: the evidence, a review

2. Key Studies

3. Program Ideas
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

Dahlgren and Whitehead 1991
Finding the studies . . . . . .
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
Introduction

While 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.

 IPCC, Roger Ulrich, professor and director of the Center for Health Sciences and Health at Texas A&M University, published this month a pioneering study that looked at the recovery rates of gall-bladder surgery patients in relation to the views from their rooms to a Texas hospital. Some of the patients looked out over a garden and grass of trees, while others had a view of the brick wall. Ulrich found that patients with a maximal view spent three days in the bed and used fewer pain medications (Ulrich 1984).

Ulrich's study helped open the door to a new field of inquiry focused on elucidating 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 broad health benefits of nature, including reduced stress, improved mood, and enhanced cognitive function among other mental health benefits. It's clear that nature is a powerful tool for improving human well-being.
design: milepost

author: US Forest Service

printing: The Nature Conservancy

also in Spanish! and Arabic!
Discovery: 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 serotonin
• boost immune function
• may alleviate depression (dirt or Prozac?)

Lowry et al. 2007. Neuroscience
Eat Dirt!
Classroom Views & Stress

Classroom Views & Stress
high school student response

Fig. 2. Attention scores at the end of class activity and break (Means and SE).

Fig. 3. Physiological stress at the end of class activity and break (Mean and SE).

attention scores
stress scores
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

Physical Exercise Intervention in Depressive Disorders.
Scandinavian Journal of Medicine & Science in Sports
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
Alzheimer’s Disease & Dementia
Provide wander gardens & horticulture therapy

• 10.5% reduction in amount of medications used in dementia facility
• 30% fewer falls, accompanied by a reduction in fall severity

Detweiler et al. 2009. American Journal of Alzheimer’s Disease and Other Dementias

www.rph.org/eden.html
Elders: horticulture for mobility & social connections
Biophilic Design :: buildings

integrated nature & architecture & other structures

Parkroyal on Pickering hotel in Singapore 2013

credit: Progressive Times
Discussion

Do you experience health benefits from gardening?

What are the benefits?

How can we provide benefits for others?
Outline

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ADHD Treatments
Change in % Population
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

- 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*
The Children & Nature Network is a leading organization in the movement to connect all children, their families, and their communities to nature through innovative ideas, evidence-based resources and tools, broad-based collaboration, and support of grassroots leadership. C&NH works with NAAEE on programmatic initiatives related to early childhood education the No Child Left Inside Act and its associated parts.
Fiddleheads Forest School
Washington Park Arboretum (Seattle)
cognitive
social &
physical
learning
Gathright et al. 2006. Urban Forestry & Urban Greening
physically disabled & tree climbing!
recreational tree climbing – youth therapy
CDC moderate activity recommendations

parks, active living, active transit
Walking Programs

children
elders
families
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:__________________

Doctors of BC
Parks Prescription

1. Get a prescription for ParksRx from your healthcare provider.
2. Visit www.REACHforbetterhealth.com
3. Enter your zip code
4. Click

Pick your park

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.
Shinrin yoku (forest bathing)

- extensive research
- restorative experiences
- workers retirees
- networked system, 52 bases in Japan
The medicine of being in the forest

We are the leading global voice for forest bathing and forest therapy

Santa Rosa, California
Outline

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Mental Health & Function
Green Streets for Walkability

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

Improving Depression

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- 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.
Mind Full, or Mindful?
constant busyness
attempted multi-tasking
‘out of balance’

Anna and Elena Balbusso, NY Times
Mindfulness/Meditation Training

- healthy workplace employees
- 8 week mindfulness training

Results

- brain electrical activity – positive affect
- brain activation – reduced 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
Nature and Mindfulness

focus
soft fascination
undirected attention

Attention Restoration Theory, Kapan & Kaplan

credit: Michael Hellgren
Nature and Creativity

http://www.jimkukral.com/
role of nature in creativity development

http://daycare.sulekha.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
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Healing and Therapy
Effects of nature window view on recovery from surgery (Roger Ulrich, 1984)

- Shorter stays
- Less pain
- Fewer minor complications
- Better emotional well-being
Legacy Good Samaritan Medical Center
Stenzel Healing Garden 1997
Rehabilitation Institute of Oregon
Oregon Burn Center Garden
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
  - Social cohesion/comraderie
  - Purpose/mission oriented
  - High commitment & exertion
  - Advanced skill sets

credit: NPR.ORG
community tree plantings

American Forests

Tree People, Los Angeles

parks
public gardens
street trees
neighborhood
Prison Inmates :: nature videos
solitary confinement, video room/exercise option

- felt significantly calmer, less irritable, more empathetic
- committed 26% fewer violent infractions

Sustainability in Prisons

- offenders
- facilities
- materials for ecological restoration

sustainabilityinprisons.org
Summary: Knowledge to Practice

- nearly 40 years of research
- critical mass of evidence – action!
- greening and health programs
- contributing to healthier individuals & better communities
Everyday Need & Value

Nerby nature includes a variety of spaces and places

Urban Forest Canopy

Biophilic Design

Parks and Gardens

Green Stormwater Infrastructure
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 . . .

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

Projects Director
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