in the background

trees & forests provide so many benefits!

Trees & Nature for Human Health!
healing & general wellness

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Northern Rockies Tree School
Livingston, MT :: September 30, 2015

evidence about
human wellness & ‘nearby nature’

Community Trees & Metro Nature for Health

take-away #1

environments build health
more than individual choice
possible in the city & town

WHO health definition

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

science & evidence re: environment

role of ‘metro nature’?

not a panacea, but important!

Determinants of Health

Community Trees & Metro Nature for Health

take-away #2

scientific evidence – 40 years!
many health & well being benefits
life course concept
‘cradle to grave’

THE
LIFE & AGE
OF
WOMAN
STAGES OF WOMAN'S LIFE FROM THE CRADLE TO THE GRAVE.

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

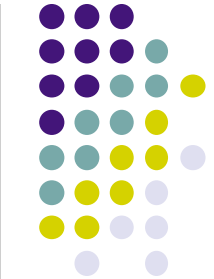
Fiddleneck Forest School
Washington Park Arboretum (Seattle)

cognitive
social &
physical
learning

School & Learning

Matsuoka. 2010. Landscape & Urban Planning

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

What is the Evidence?

Trees, Urban Greening, Metro Nature
Human Health, Welfare & Function

Finding that study . . . . . .

Green Cities: Good Health
www.greenhealth.washington.edu

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

thanks!
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Sarah Krueger

research review & 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

RSS Feed Print

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.

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

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]

To Your Good Health!

disease prevention!
health promotion!

fine-tuning the tree message
enlisting more partners

back
on
track . .

Donovan et al. 2013. Journal of Preventive Medicine

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

Trees & Crime Reduction

- trees in the public right of way are associated with lower crime rates
  - smaller, view-obstructing trees are associated with increased crime
  - larger trees are associated with reduced crime

Donovan & Prestemon. 2012.
Environment and Behavior

Green & Crime Reduction

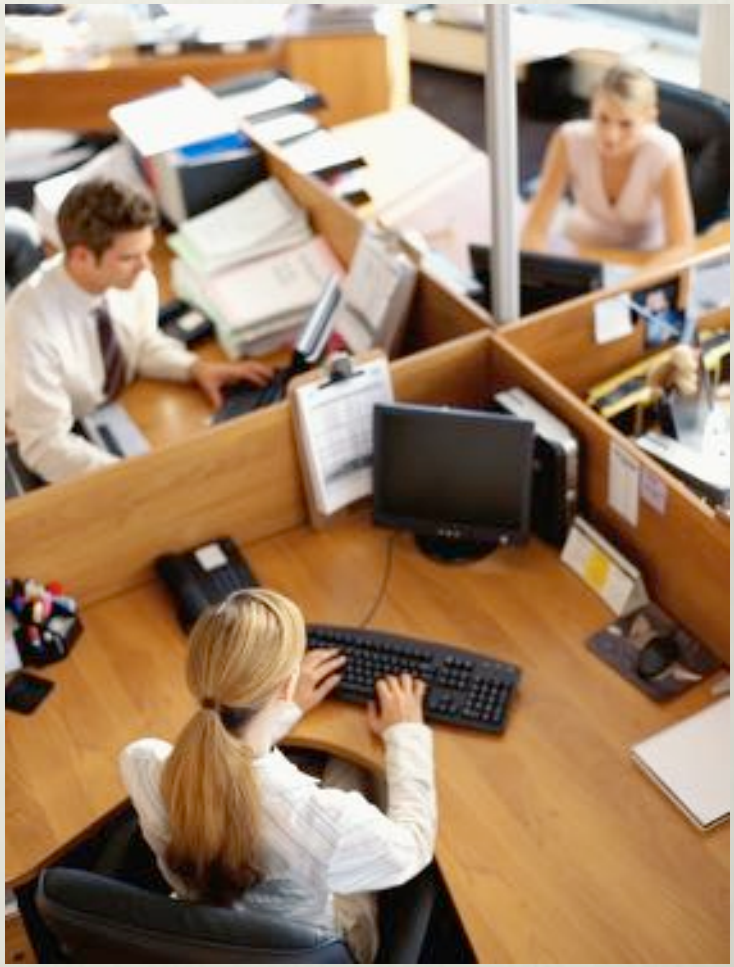
- vacant lot greening in Philadelphia (4 sections)
  - consistent reductions in gun assaults across 4 sections
  - consistent reductions in vandalism in 1 section

Branas et al. 2011. *American Journal of Epidemiology*

our evolution?!

Attention Restoration Theory

Rachel & Stephen Kaplan, U of MI



directed attention fatigue . . . .

Workplace Nature Views

- **Well-being**
  - desk workers without view of nature reported 23% more ailments in prior 6 months
- **Job Satisfaction**
  - less frustrated and more patient
  - higher overall job satisfaction and enthusiasm

Kaplan, R. 1993. Landscape and Urban Planning

ART Design Elements

- being away
- ‘soft’ fascination
- extent
- compatibility

the
better
office
cubicle!

bottom line =
$$ benefits of trees & nature

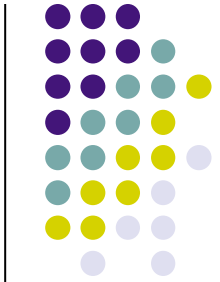
Shinrin-yoku Forest Bathing

- extended forest walks
  - reduced ‘fight or flight’ nervous system activity
  - lower cortisol – a stress indicator
  - increased immune function
  - lower pulse rate & blood pressure

combatting obesity
U.S. moderate activity recommendations
parks, active living, active transit

CANINE CONSTITUTIONAL

Nature, Human Health & Walkable Neighborhoods



- Environments: Neighborhood Streets (Tokyo)
  - tree - lined
  - parks

- Outcomes: Elderly People & Walking
  - less illness
  - lower mortality rate over 5 years

Takano, Nakamura, Watanabe. 2002.
Journal of Epidemiology & Community Health

Green Streets for Walkability

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

Aspinall et al. 2015. 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

Josefsson et al. 2013. Physical Exercise Intervention in Depressive Disorders. Scandinavian Journal of Medicine & Science in Sports

Hygiene Hypothesis

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

Lowry et al. 2007. Neuroscience

Eat Dirt!

Effects of nature window view on recovery from surgery (Roger Ulrich, 1984)

hospital healing gardens:

patients; family and friends; professional staff

health care $$ savings

Legacy Good Samaritan Medical Center
Stenzel Healing Garden 1997
Rehabilitation Institute of Oregon

Oregon Burn Center Garden

Hospital Staff – Respite and Support

Nature: A stress coping resource for employees 24-7

thanks to
Teresia Hazen
for slides

Elders: mobility & social connections

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

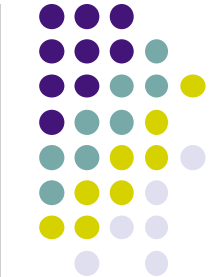
Detweiler et al. 2009. *American Journal of Alzheimer's Disease and Other Dementias*

Tim Lynch Associates

www.rph.org/eden.html

urban forest benefits

Elements of Economic Valuation



- What are the benefits?
- Who experiences nature and gets benefits?
- What is the green condition or situation that provides benefits?
- Scale of value question (i.e., community, province/state, nation)
- What are the costs/income gained/lost associated with these benefits?

Valuation Sources

Benefit	Metro Nature	Outcome
Newborn Birth Weight	increased tree canopy cover near mothers' homes	fewer small for gestational age babies
Attention Deficit Hyperactivity Disorder	greener play areas vs built outdoor or indoor settings	reduced symptoms potentially reducing medication
School Performance	green views from classrooms and cafeteria	reduced dropout rate - average annual income
Crime Reduction	trees and lawn in outdoor common areas	reduced violent and non-violent incidence and costs
Cardiovascular Disease	presence of residential tree canopy	reduced incidence or severity of cardiovascular disease
Alzheimer's Disease	wander garden in care facility	reduced medications for patients

ecosystem services & benefits transfer

Potential Annual Cost Savings and Increased Income Associated with Human Health and Well-being Benefits Derived from Metro Nature

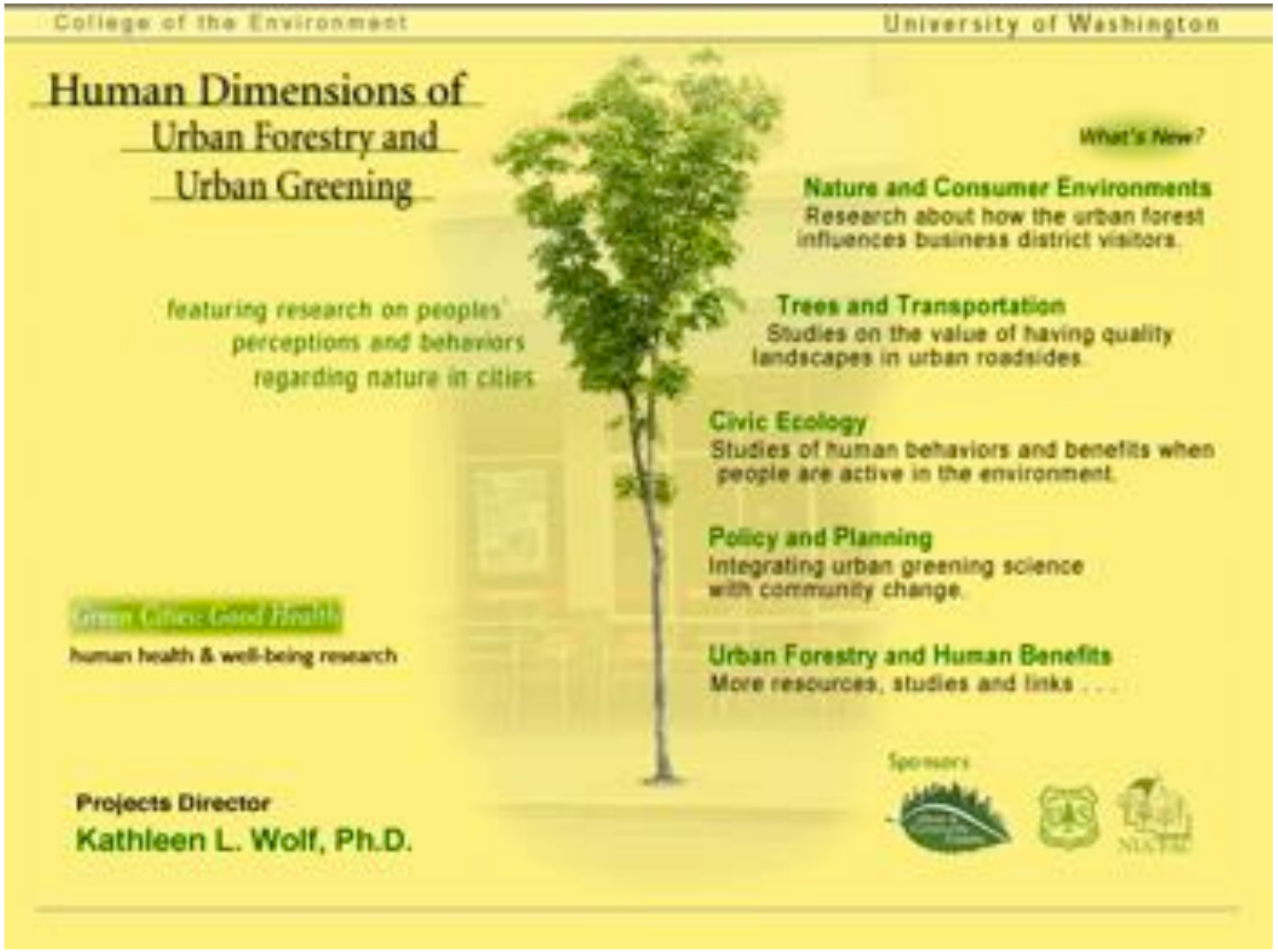
Benefit (geographic scope)	Minimum ($)	Maximum ($)
Newborn Health (U.S.)	5.3	5.3
Attention Deficit Hyperactivity Disorder (U.S.)	383.5	1,917.7
Schools (U.S.)	20.4	1,262.9
Crime (U.S.)	340.6	899.4
Cardiovascular Disease (U.K., U.S.)	1,220.0	1,220.0
Alzheimer's Disease (U.S.)	724.6	1,449.2
Totals	**2,694.4**	**6,754.5**

Millions of U.S. Dollars (2012)

Wolf, K.L., M.K. Measells, S.C. Grado, A.S.T. Robbins. (in review). Economic values of metro nature health benefits: A life course approach. Urban Forestry and Urban Greening.

Summary

nearly 40 years of health evidence
diverse health benefits
'cradle to grave'

trees/nature for disease prevention
& health promotion
economic value potential
expand partnership, collaboration
& clients

www.naturewithin.info