



Community Green Space for Health & Wellness

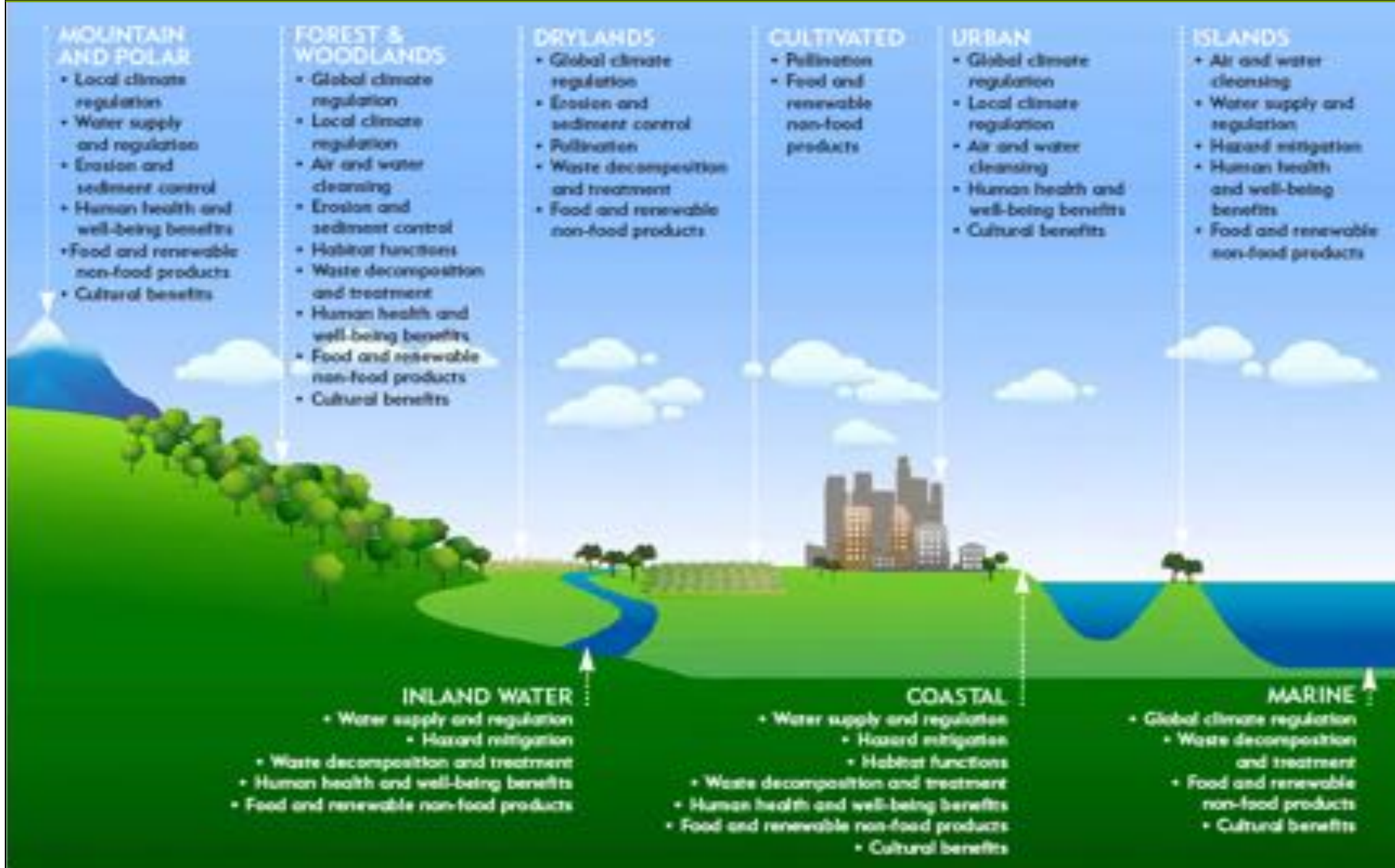
a science review

Kathleen Wolf, Ph.D.
Research Social Scientist

University of Washington (Seattle, USA)
College of the Environment

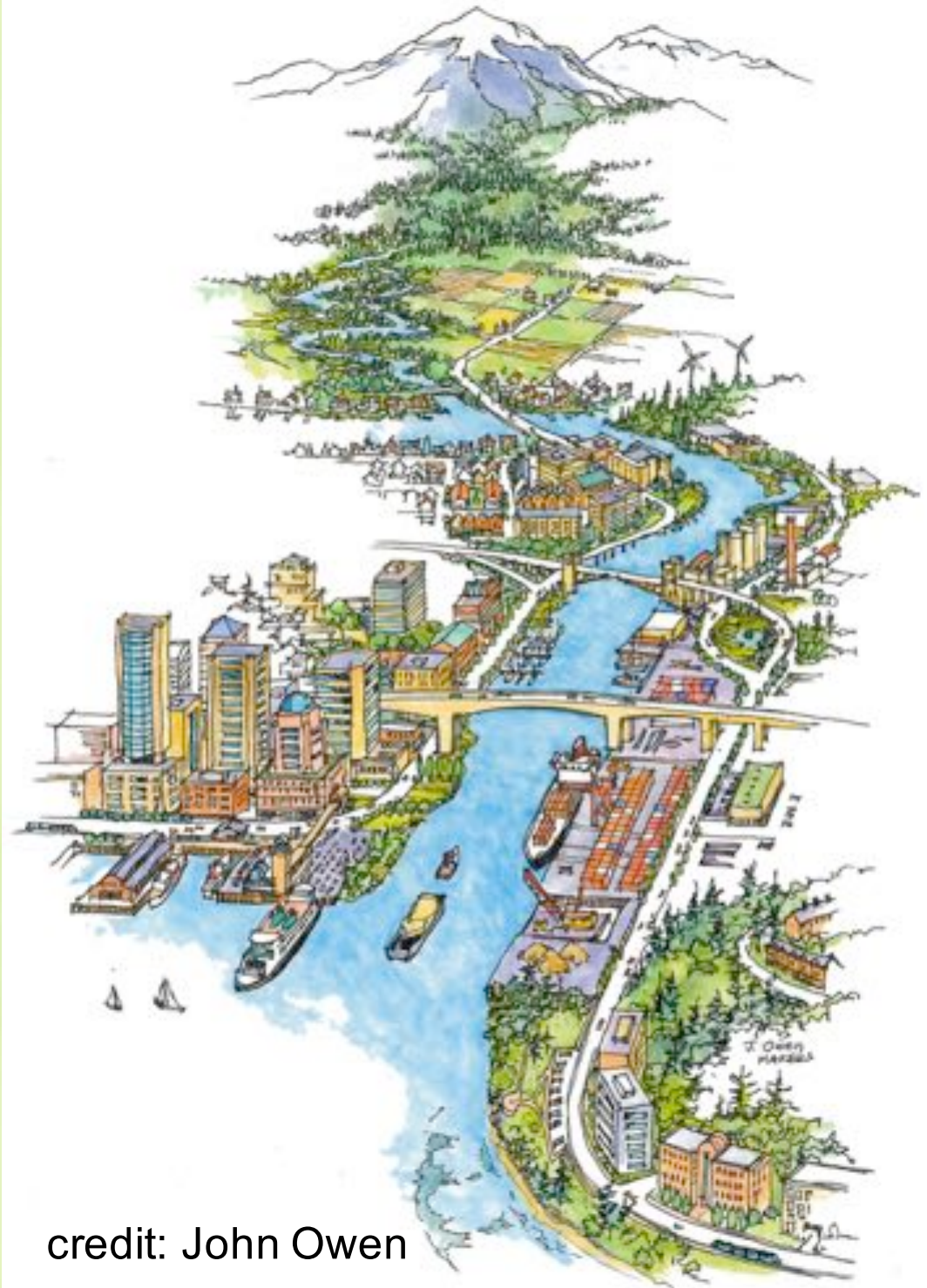
**NACD Urban and Community
Conservation Webinar**
February 18, 2015

Landscape Gradient :: *Ecosystem Services*



Conservation Districts

- ✿ include all landscapes
- ✿ include all people



credit: John Owen

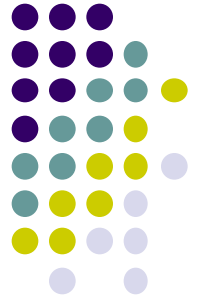
Stormwater Management



Pierce County WA, Chambers Creek Properties



Pierce County WA, Chambers Creek Properties - 4 year growth



Trees & Stormwater Runoff



credit: City of State College, PA

Stormwater Management



Thornton Creek Water Quality Channel (Seattle, SvR Design)
1 hectare, treats runoff from 275 hectares



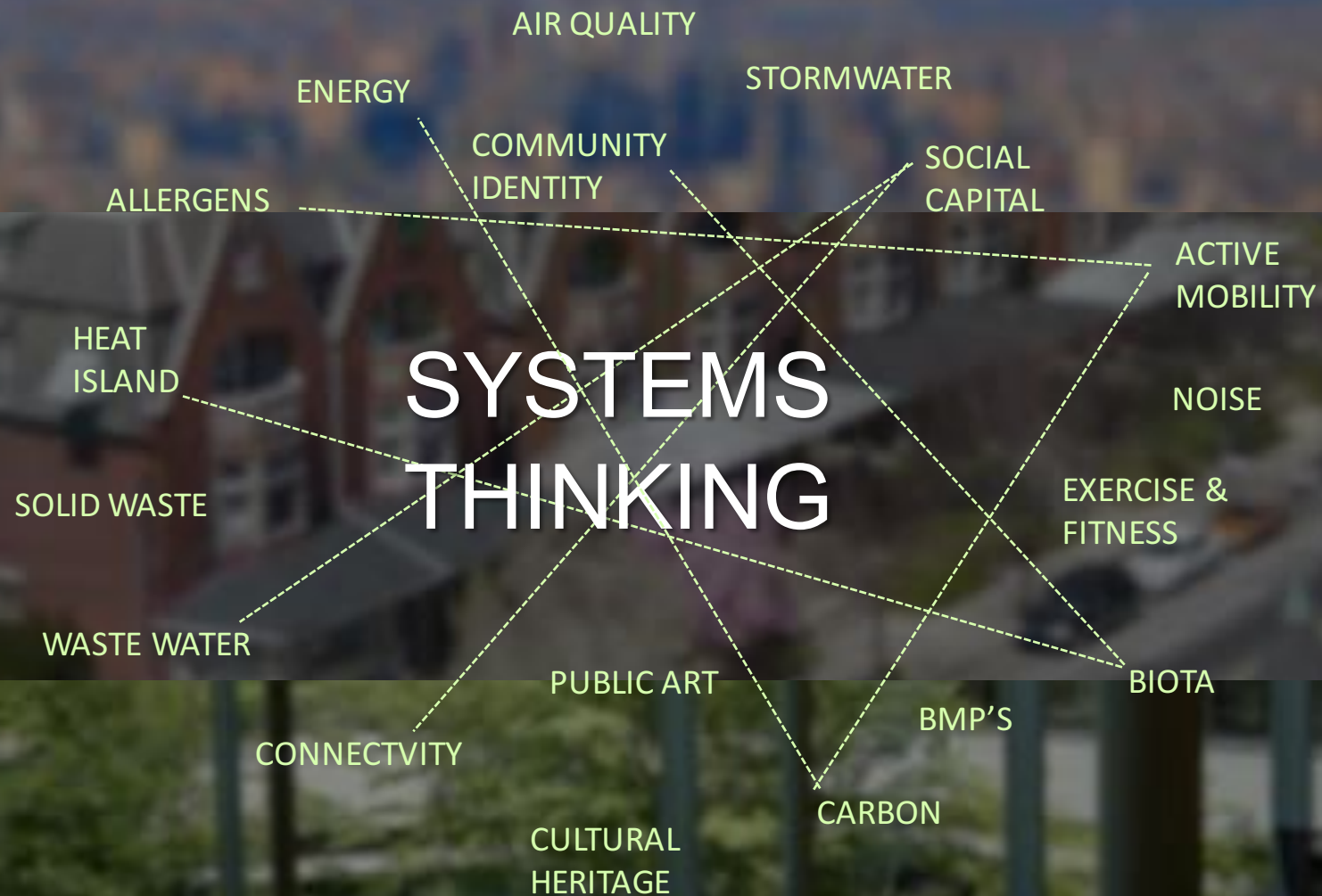


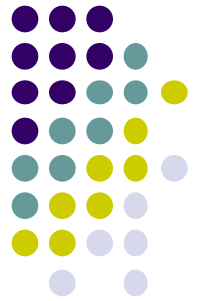
in cities & communities

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

SO
multi-tasking nature
creating co-benefits

credit: American Planning Association





green stormwater infrastructure tools & strategies





Tanner Springs Park

Portland OR



linked to active living network



**neighborhood
social cohesion**



**environmental
education &
social learning**





Community Green Space for Health & Wellness

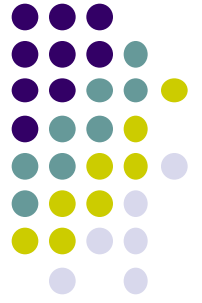
a science review

Kathleen Wolf, Ph.D.
Research Social Scientist

University of Washington (Seattle, USA)
College of the Environment

**NACD Urban and Community
Conservation Webinar**
February 18, 2015

evidence about human wellness & ‘nearby nature’





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 Green Space for Health & Wellness

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



Urban Forests and Newborns

the natural environment may affect
pregnancy outcomes . . .

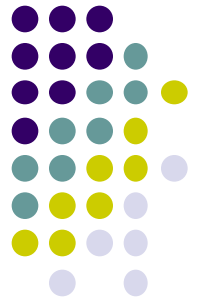


10% increase in tree-canopy cover
within 50m of a house
= lower number of low weight births
(1.42 per 1000 births)

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



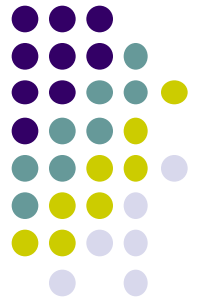
Nature & Psych Development children's play & imagination



**Richard
Louv -
Last
Child in
the
Woods**

Fiddleneck Forest School

Washington Park Arboretum (Seattle)



cognitive
social &
physical
learning



Hygiene Hypothesis

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

Lowry et al. 2007. Neuroscience



Eat Dirt!



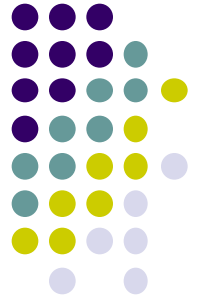
School & Learning





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



Classroom Views & Stress



School No.1



School No.4

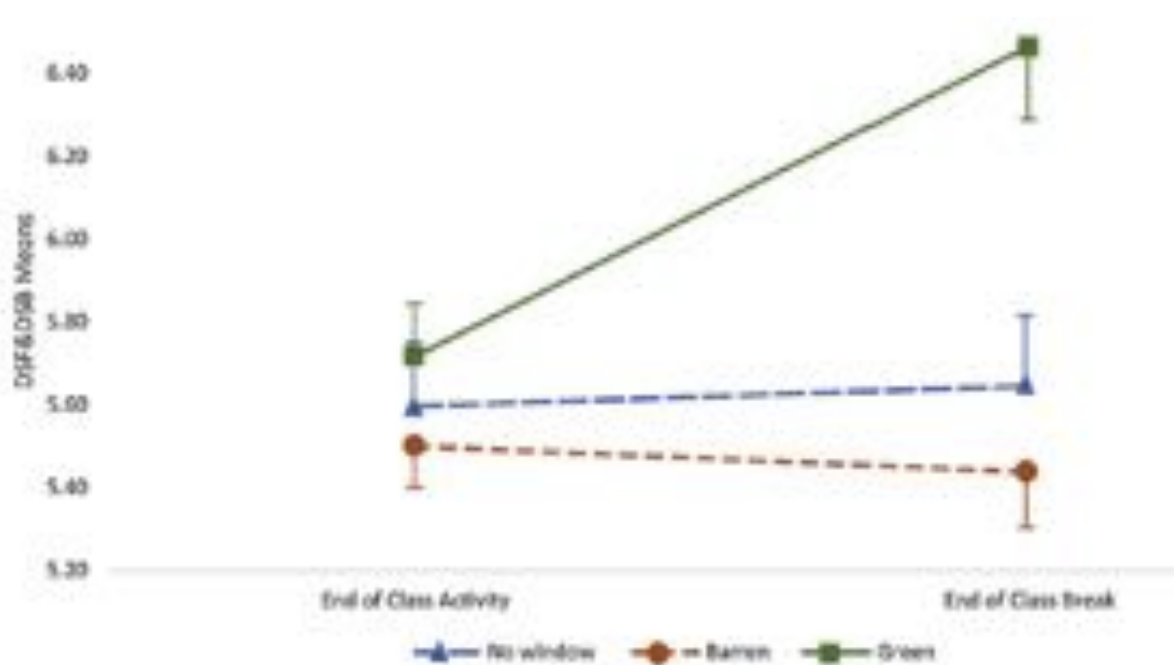
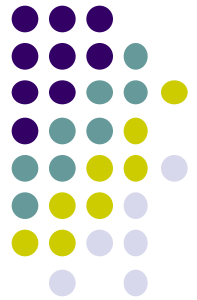


Fig. 2. Attention scores at the end of class activity and break (Means and SE).

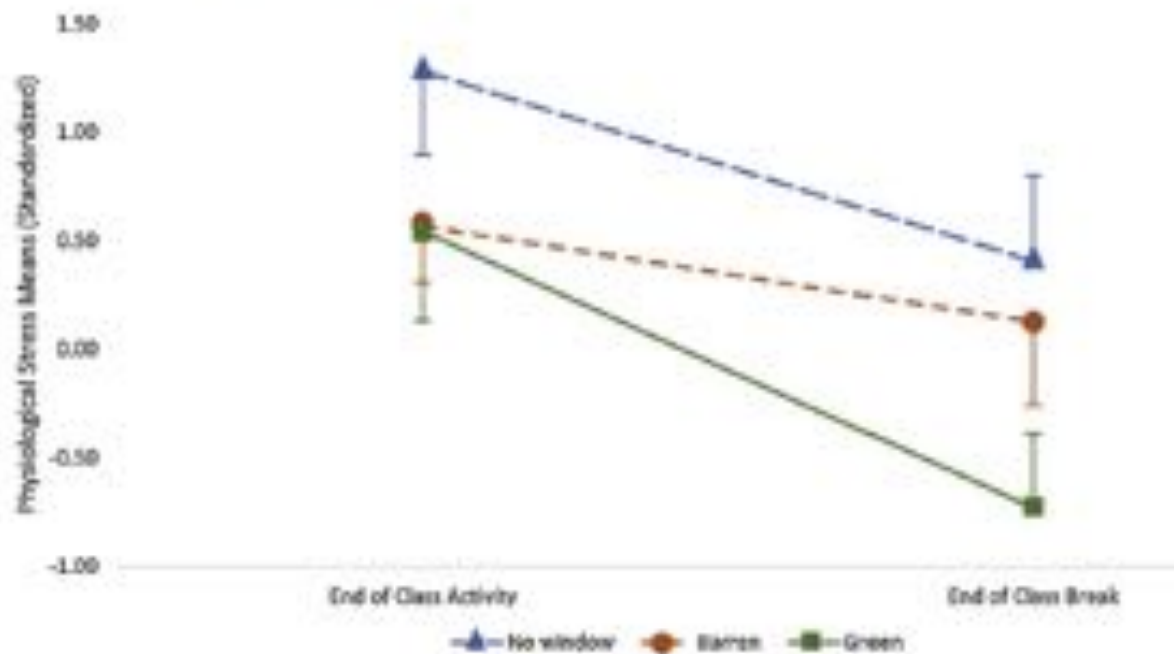


Fig. 3. Physiological stress at the end of class activity and break (Mean and SE).

attention
scores

Classroom Views & Stress

stress
scores



What is the Evidence?

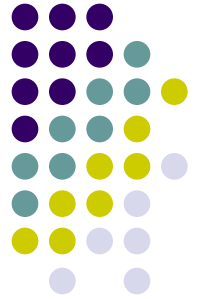
Trees, Urban Greening, Metro Nature
Human Health, Welfare & Function

Finding that study



Green Cities: Good Health

www.greenhealth.washington.edu



Sponsors:

USDA Forest Service, U&CF Program

University of Washington

NGO partners

thanks!

to U of WA students:

Katrina Flora

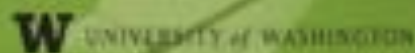
Mary Ann Rozance

Sarah Krueger



research review & summaries

Green Cities: Good Health



[INTRODUCTION](#) [RESOURCES](#) [FUTURE RESEARCH](#) [REFERENCES](#)

[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

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.

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

[RSS Feed](#)

[Print](#)



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





To Your Good Health!

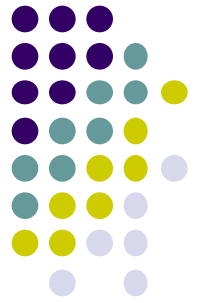
disease prevention!
health promotion!

fine-tuning the conservation message
enlisting more partners

***back
on track***

. . .





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, viewobstructing trees are associated with increased crime
 - larger trees are associated with reduced crime

Donovan & Prestemon. 2012.
Environment and Behavior



Green & Crime Reduction

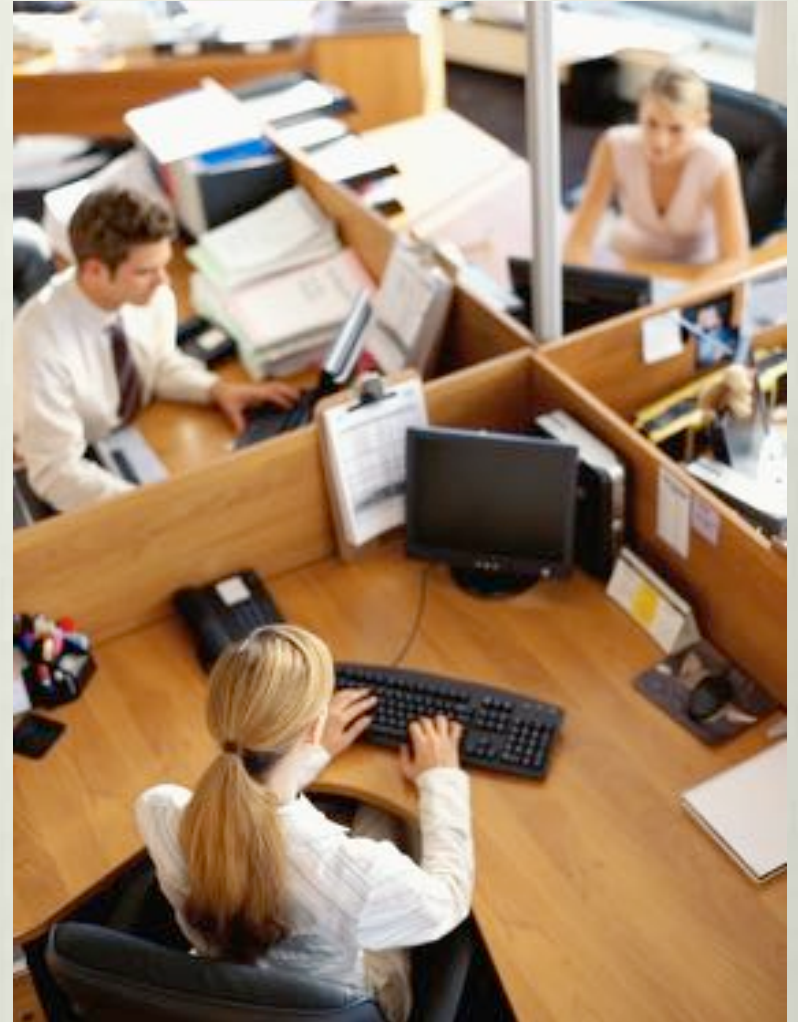
- vacant lot greening in Philadelphia (4 sections)
 - consistent reductions in gun assaults across 4 sections
 - consistent reductions in vandalism in 1 section



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

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

Mindfulness



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

Grossman et al. 2004.
Mindfulness-Based Health
Benefits. Journal of
Psychosomatic Research

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

Nature and Mindfulness

focus

soft fascination

undirected attention

Attention Restoration Theory

Rachel & Stephen Kaplan

credit: Michael Hellgren





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



A photograph of a park scene with a paved path. In the foreground, a man and a woman are roller skating towards the camera. The man is wearing a grey jacket and blue pants, and the woman is wearing a red jacket and blue pants. They are both wearing knee pads. Behind them, a large group of people is walking along the path. Some are walking away from the camera, and some are walking towards it. The path is surrounded by green grass and trees. The lighting suggests it is daytime.

combatting obesity

U.S. moderate activity recommendations

parks, active living, active transit

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





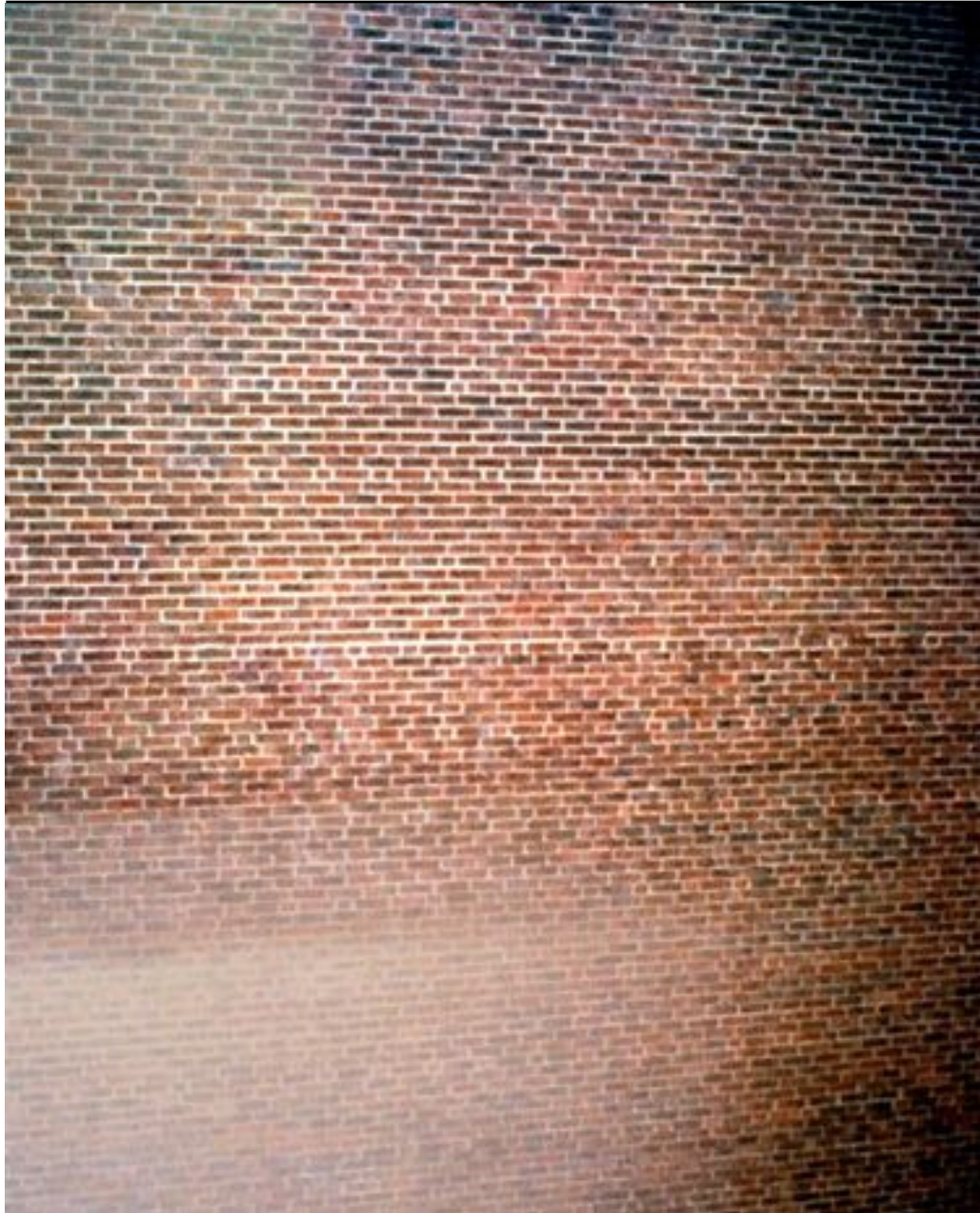
Physical Activity & Depression Reduction

- 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



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



photos credit: Teresia Hazen

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

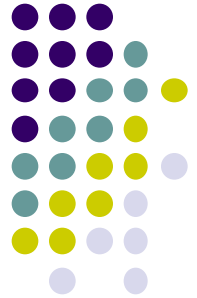


Summary

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

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

www.naturewithin.info



College of the Environment University of Washington

Human Dimensions of Urban Forestry and Urban Greening

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

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.

Sponsors

