outdoor space = beauty . . . . and . . . . .

Green Cities :: Good Health

how nature improves human health and wellness

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University of Washington (Seattle)
School of Environmental and Forest Sciences

Western Nursery & Landscape Association
webinar – 25 October 2017

credit: Patch Landscaping

credit: University Village

credit: Arizona Cancer Center at UMC North

Human Health & Wellness

plants and landscape are important!

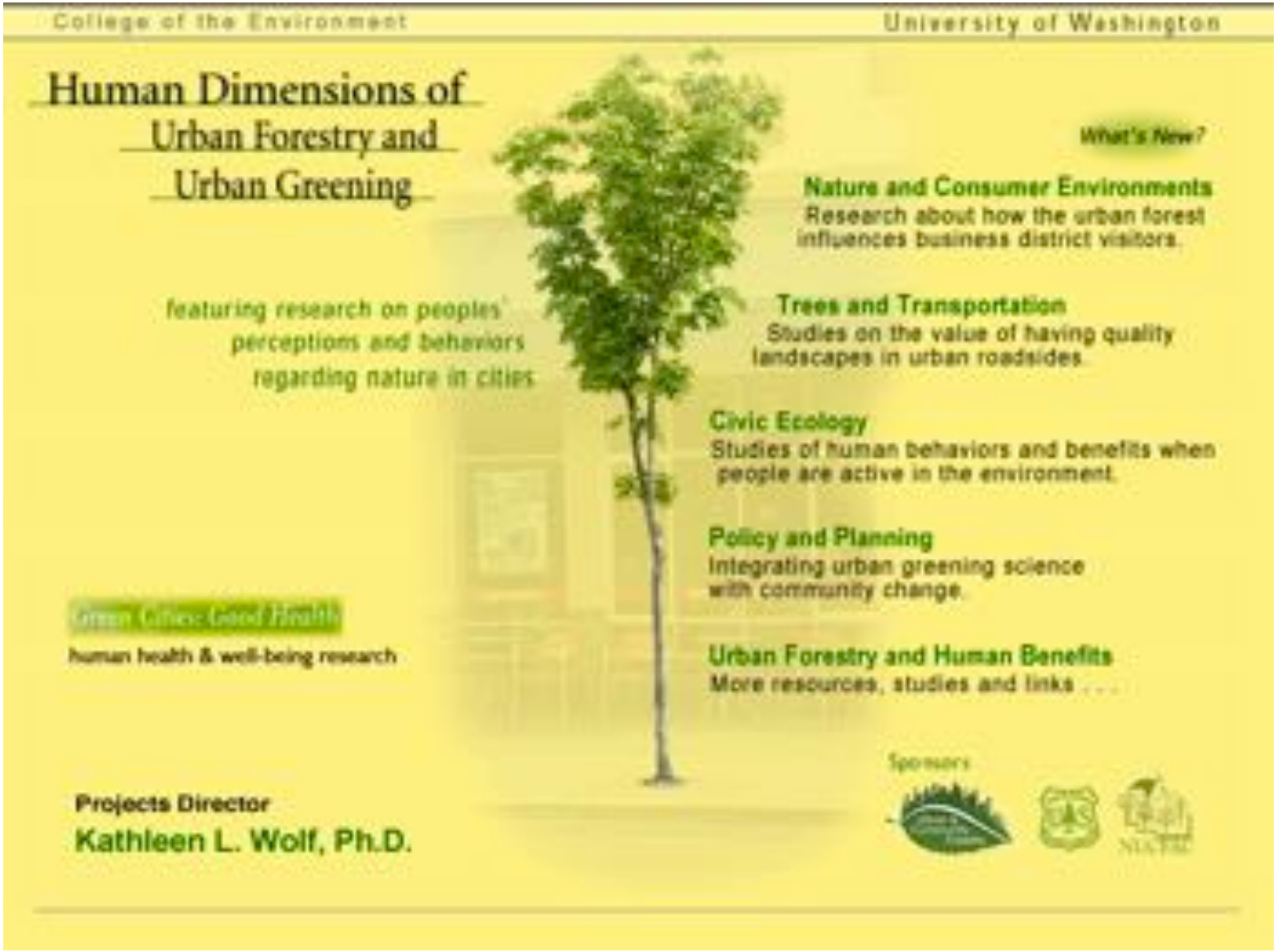
design installations

& facilities management

Outline:
Green Cities :: Good Health

- nature and health?
- resource web site
- details of the evidence
- improved employee, client & user well-being

www.naturewithin.info



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

Metro Nature Diversity

NEARBY NATURE INCLUDES A VARIETY OF SPACES AND PLACES

IMAGE BY MIG / SvR

Sacramento Study :: LIDAR x CHIS data

7,900 adults, 250 m buffer, covariates

more tree cover

= better overall health

= better social cohesion

Ulmer et al. 2016. *Health & Place*. Multiple health benefits of urban tree canopy: The mounting evidence for a green prescription.

Prison Inmates :: nature videos

solitary confinement, video room/exercise option

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

Nadkarni et al. 2017. Impacts of nature imagery on people in severely nature-deprived environments. *Frontiers in Ecology and the Environment.*

Landscape
Community
credit: Ignacio Bunster-Ossa
Garden

Finding that study . . . . . .

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

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

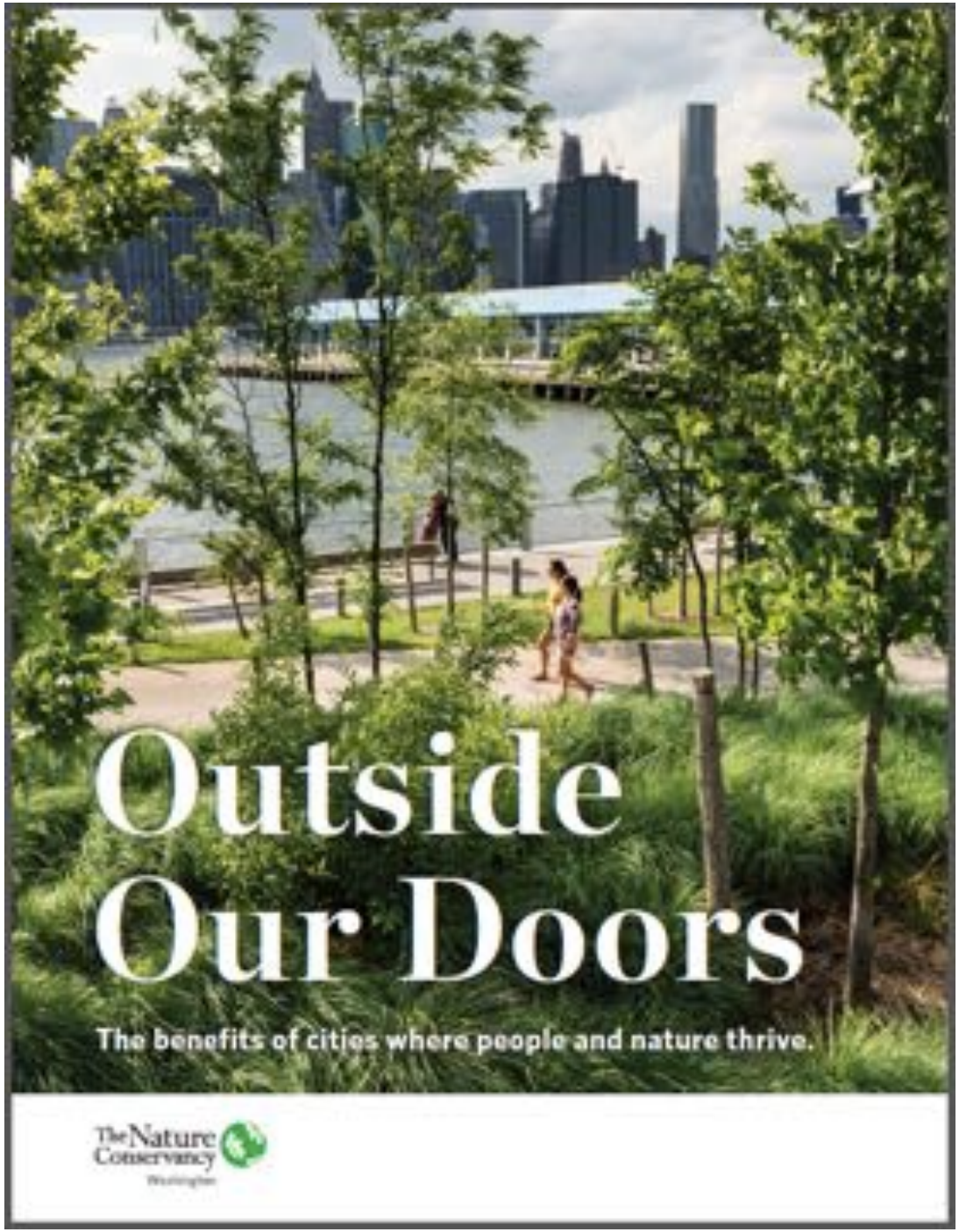
RSS Feed Print

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

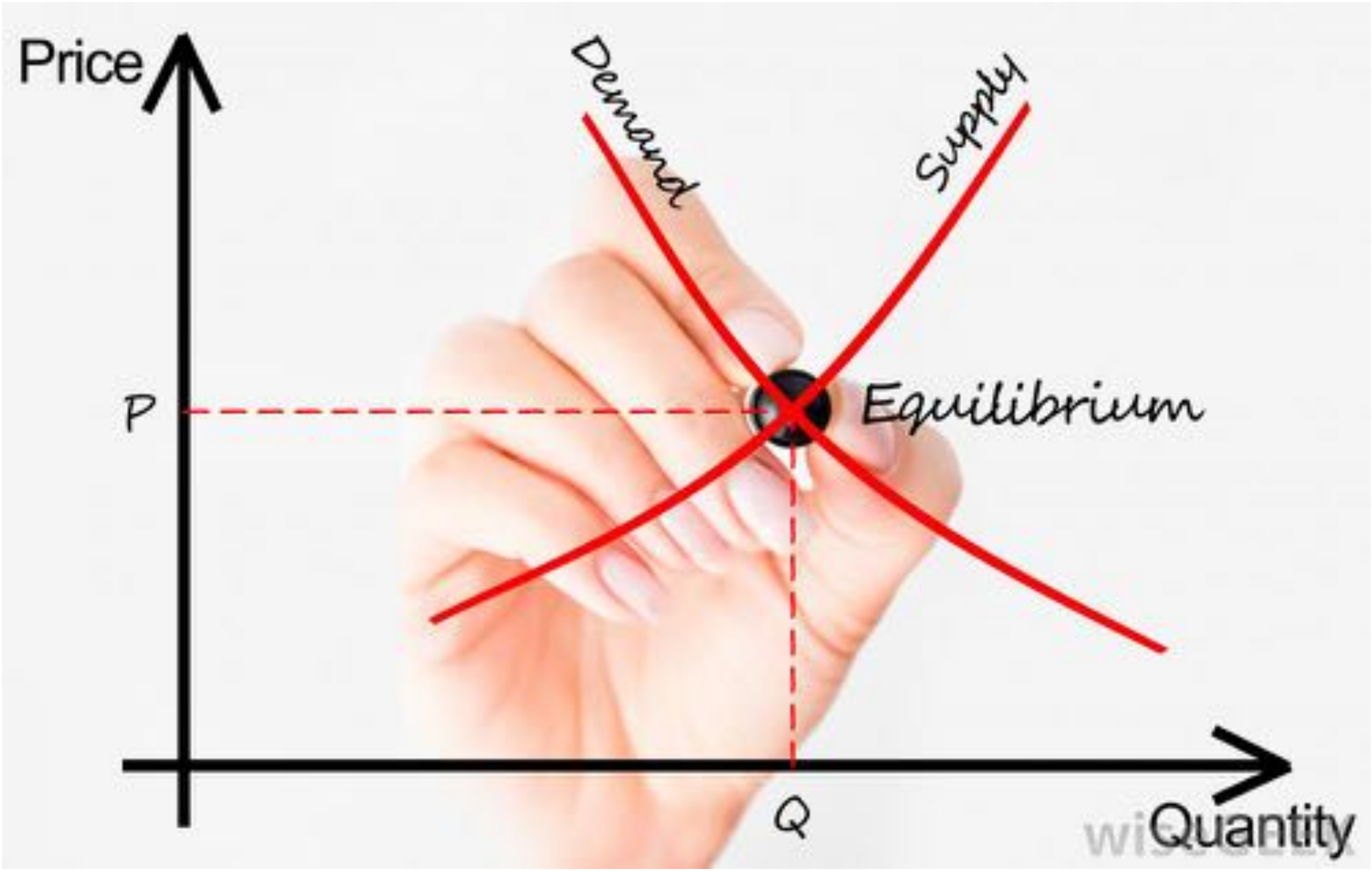
- The presence of larger trees in yards and as street trees can add from 3% to 15% to home values throughout neighborhoods.
- Averaging the market effect of street trees on all house values across Portland, Oregon yields a total value of $1.35 billion, potentially increasing annual property tax revenues $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]



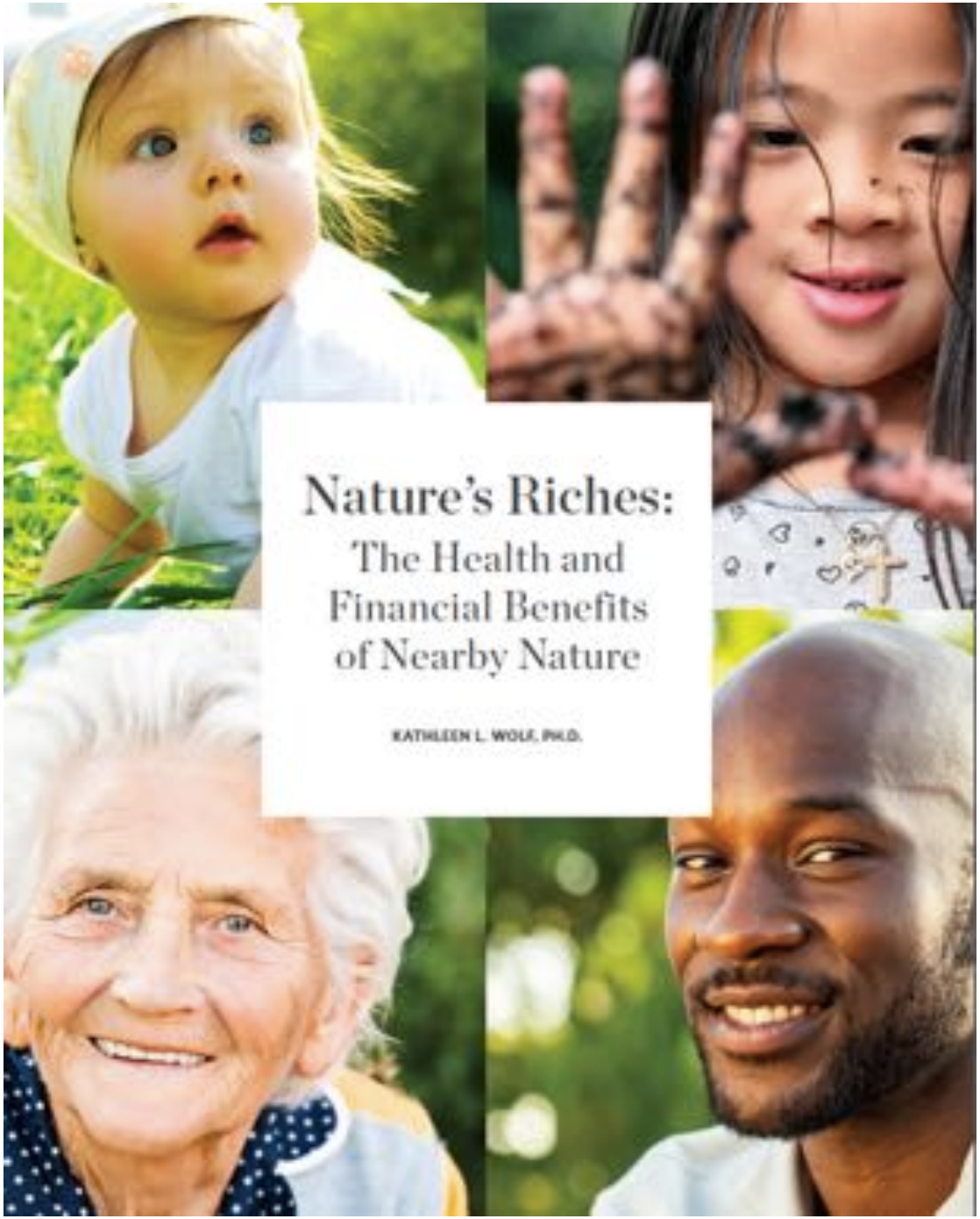
design: milepost

co-author

co-author & printing: The Nature Conservancy



source.wisegeek.com



design: milepost

author: FOREST SERVICE U S DEPARTMENT OF AGRICULTURE

printing: The Nature Conservancy

annual value of $11.7 billion U.S. (2015 dollars)

- cradle to grave human life cycle
- varied expressions of urban greening (metro nature)
- evidence based human health and wellness benefits
- just beginning the analysis!

Evidence-based ‘Story’

Health across the Human Life Cyle

‘Cradle to Grave’

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

Classroom Views & Stress

School No.1

School No.4

Li & Sullivan. Landscape & Urban Planning, 2016

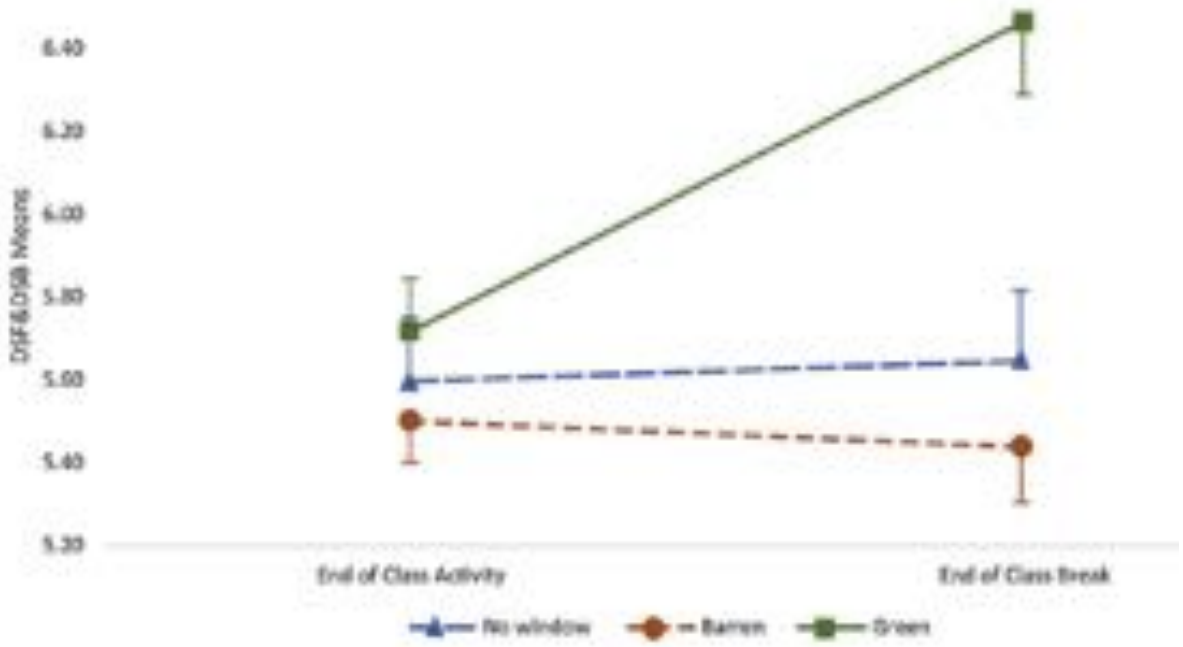


Fig. 2. Attention scores at the end of class activity and break (Means and SE).

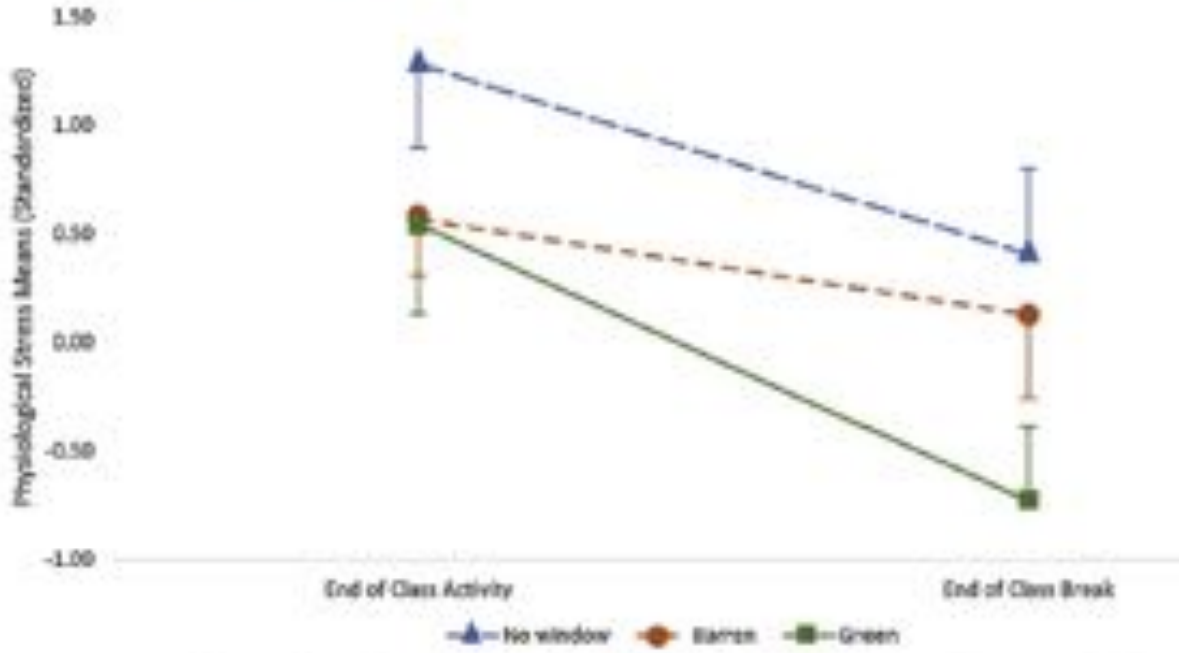


Fig. 3. Physiological stress at the end of class activity and break (Mean and SE).

attention scores

Classroom Views & Stress high school student response

stress scores

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

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*

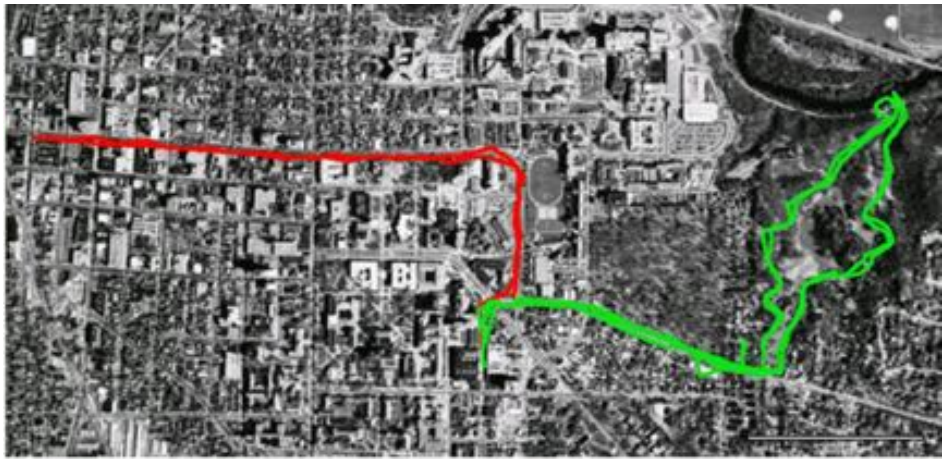
Improving Depression

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



Neighborhoods with Trees

10 more trees on a city block?

health benefits comparable to $10,000 household income increase OR being 7 years younger

Kardan et al., 2015, *Scientific Reports*

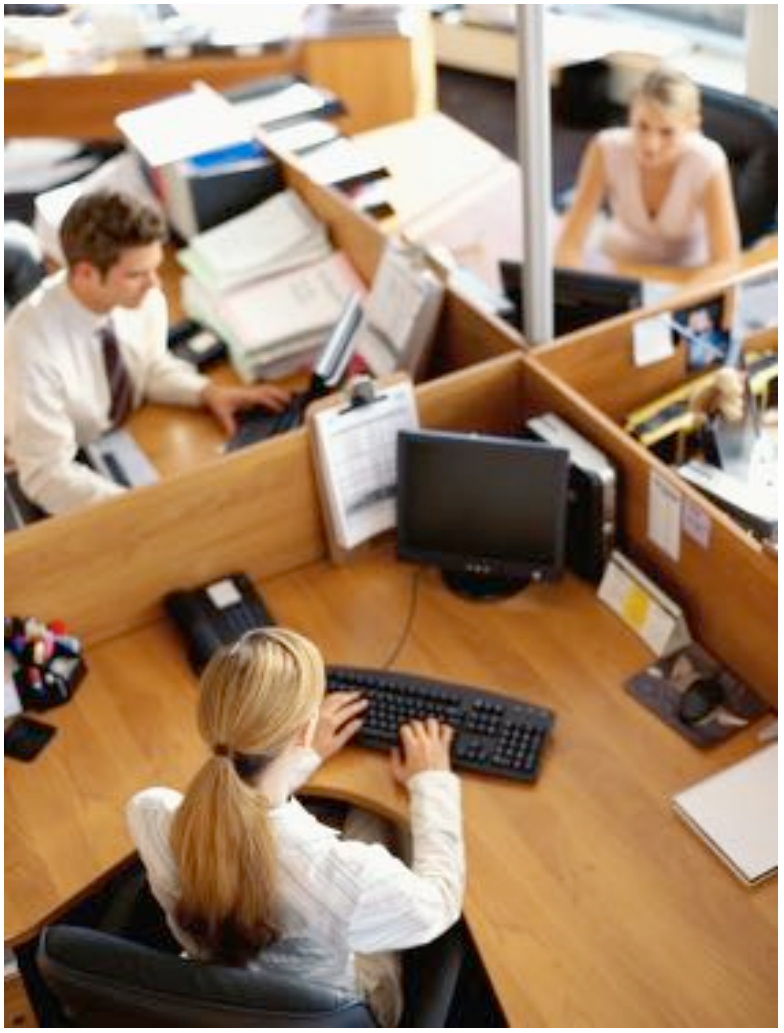
Walking Programs

children
elders
families

public/
private
sectors

Attention Restoration Theory

Rachel & Stephen Kaplan, U of MI



Workplace Nature & Attention Recovery

- **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*

the
better
office
cubicle!

bottom line =
$$ benefits of trees & nature

credit: Progressive Times

Biophilic Design

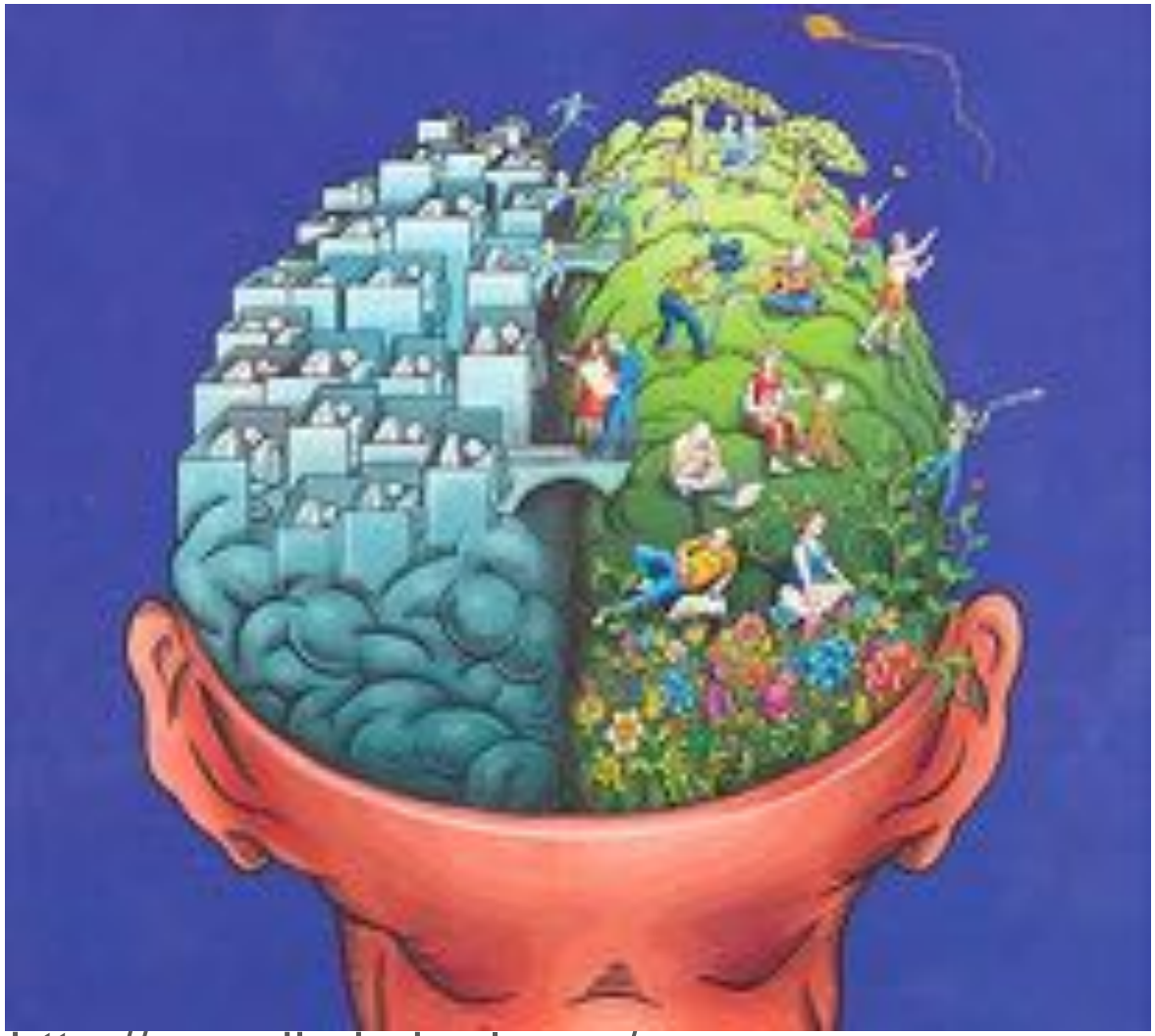
Terrapin Bright Green

integrated nature & architecture

Walking Meetings

creativity, energy, communication, health

Nature and Creativity



http://www.jimkukral.com/

http://daycare.sulekha.com

role of nature in creativity development

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

www.concur.com

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

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

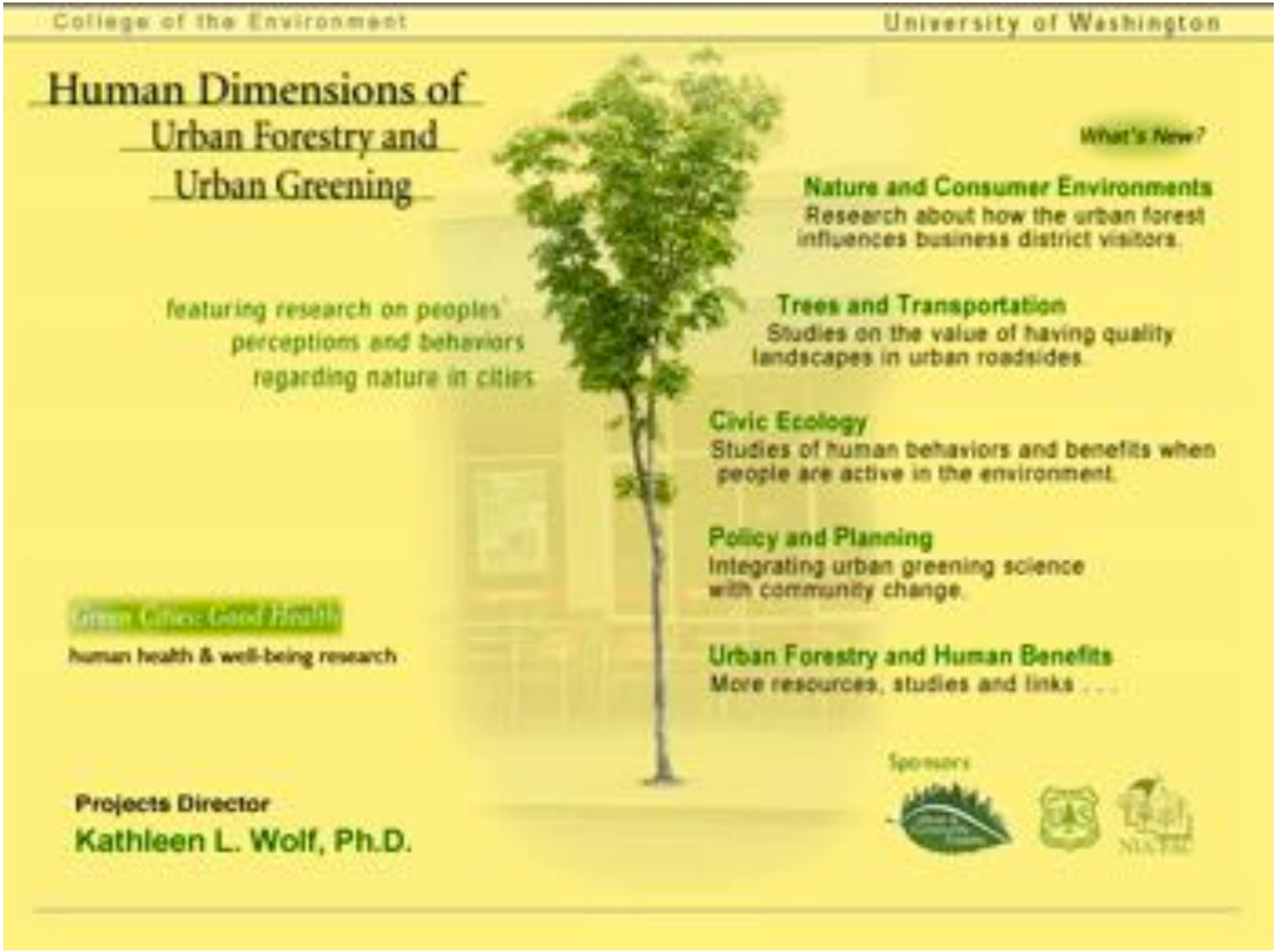
Summary:
Green Cities :: Good Health

- environmental, social & health research findings
- cradle to grave benefits
- possible health savings
- improved employee, client & user well-being

Fiddleheads Forest School
Washington Park Arboretum (Seattle)

cognitive
social &
physical
learning

Elders: horticulture for mobility & social connections

Raleigh, North Carolina

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