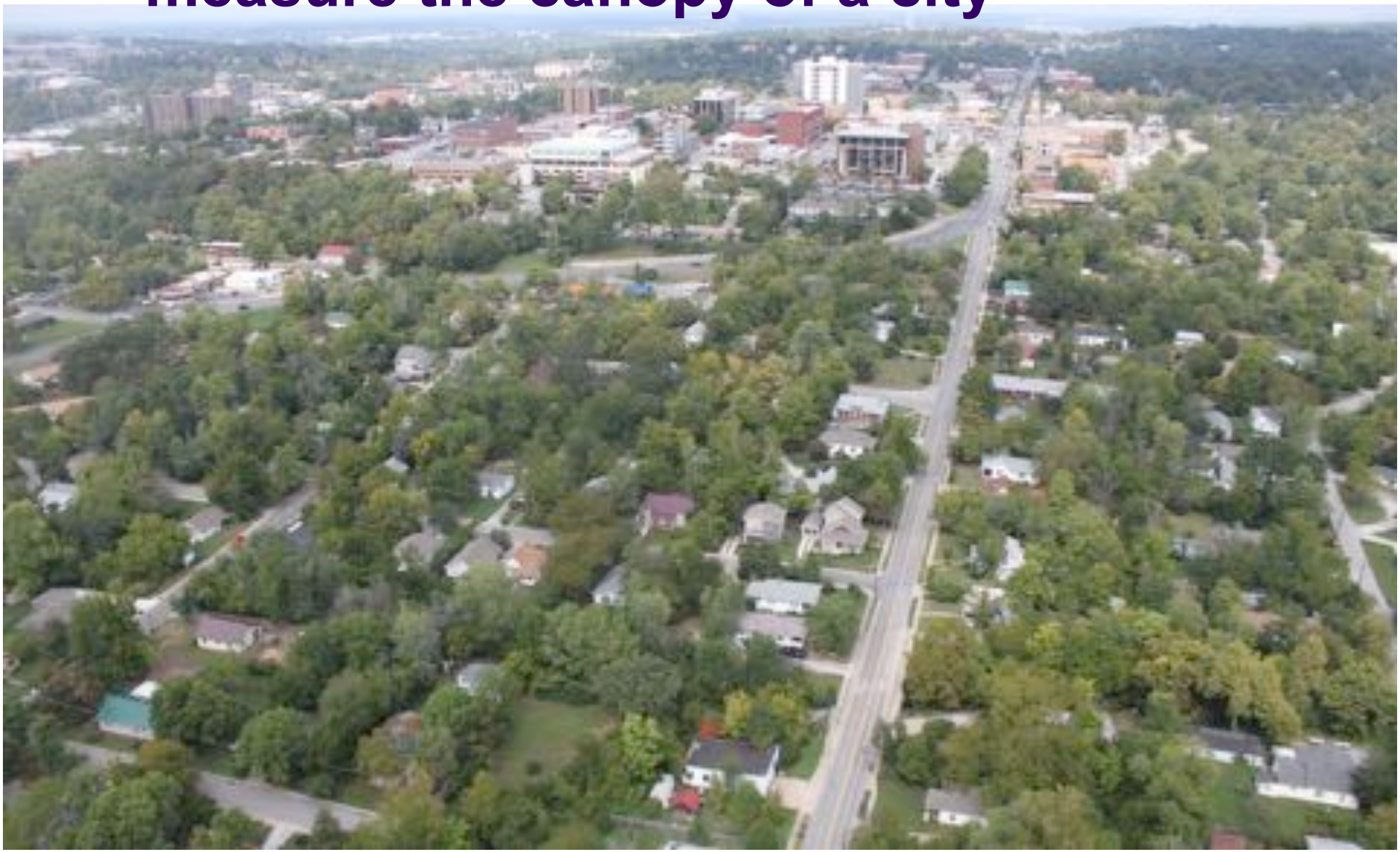
measure the canopy of a city



i-Tree™

Eco (UFORE)

Streets (STRATUM)

Hydro

Vue

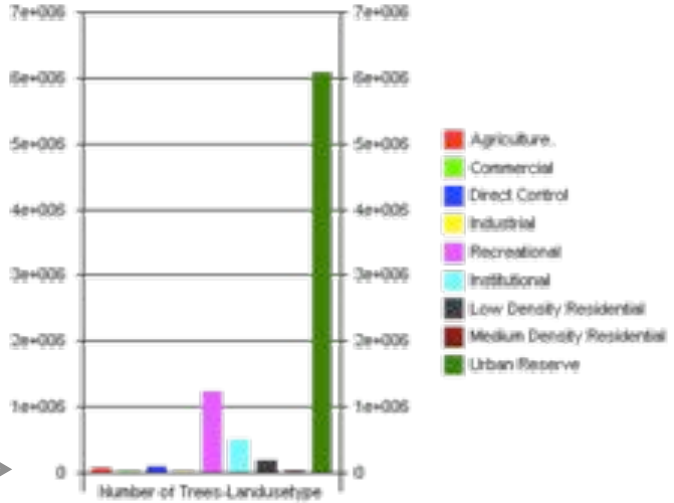
tools provided by USDA

Forest Service

STRUCTURE

FUNCTION

VALUE



MANAGEMENT

photo credits: Seattle i-Tree Training by Al Zelaya

Improving Air Quality

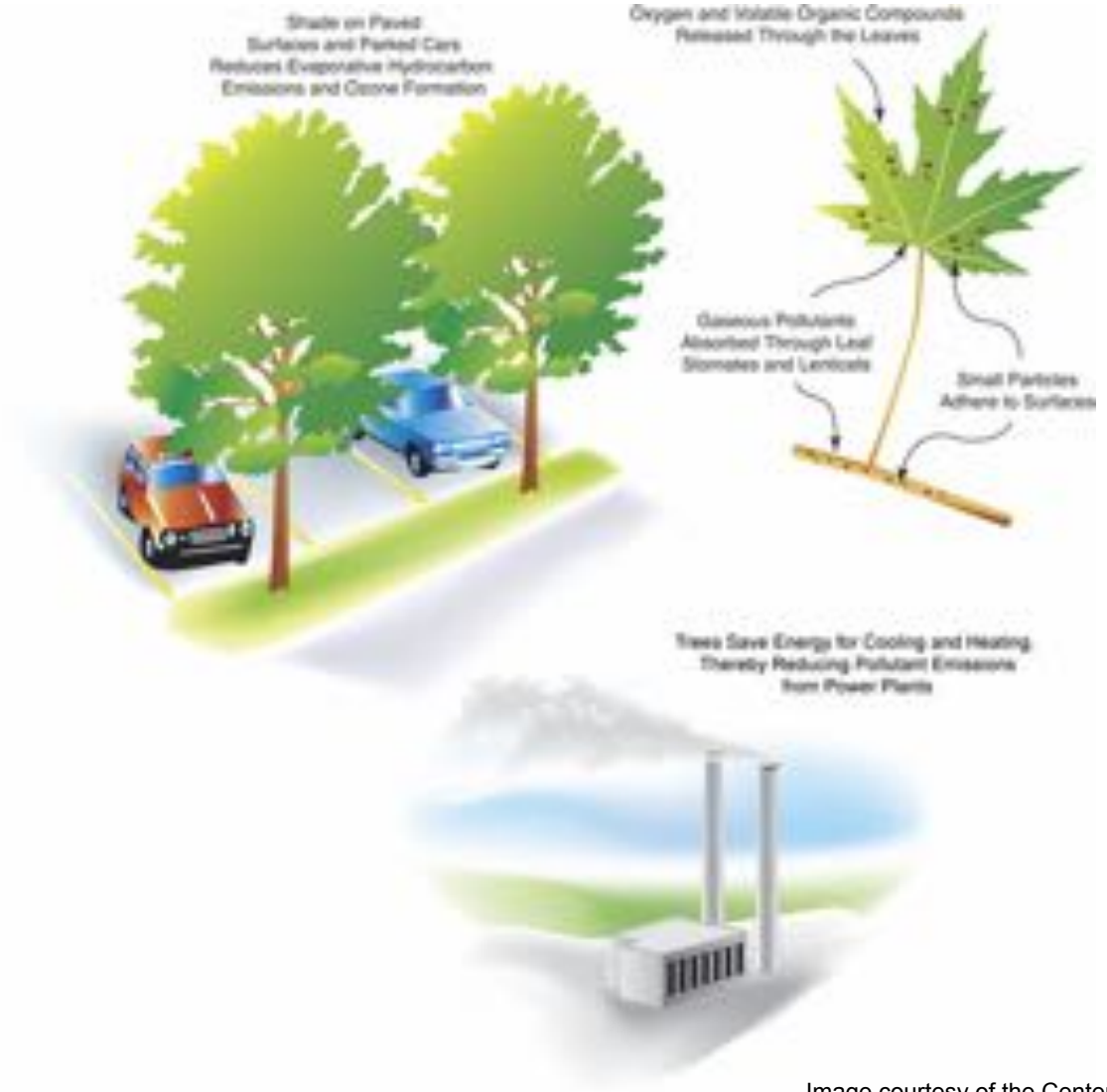


Image courtesy of the Center for Urban Forest Research

Reducing Stormwater Runoff

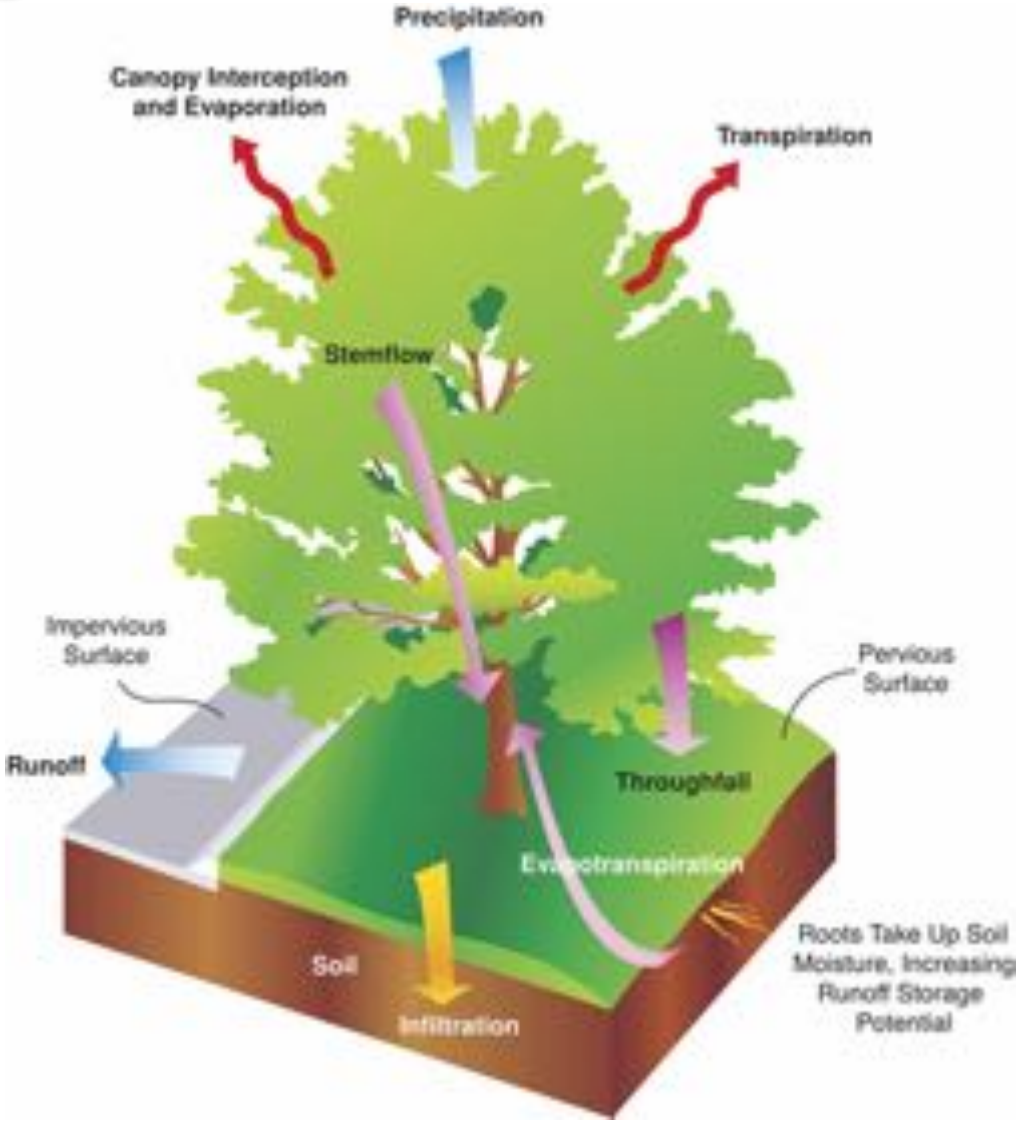


Image courtesy of the Center for Urban Forest Research

Stormwater Management

Pierce County WA, Chambers Creek Properties

Pierce County WA, Chambers Creek Properties - 4 year growth

stormwater management
Parks & People Foundation, Baltimore

Tanner Springs Park

Portland OR

linked to active living network

neighborhood
social cohesion

environmental
education &
social learning

Stormwater Report, online April 2014 (search health)

co-benefit opportunities

Urban Forest Pharmacy: Nature for Healthy Communities

Kathleen Wolf, Ph.D.
Research Social Scientist

University of Washington (Seattle)
School of Environmental and Forest Sciences
USDA Forest Service, Pacific NW Research Station

Urban Forestry & Green Infrastructure
MS Annual Urban Forestry Conference
August 20 & 21, 2015

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

in the background

trees & metro nature for human health & well-being

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

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]

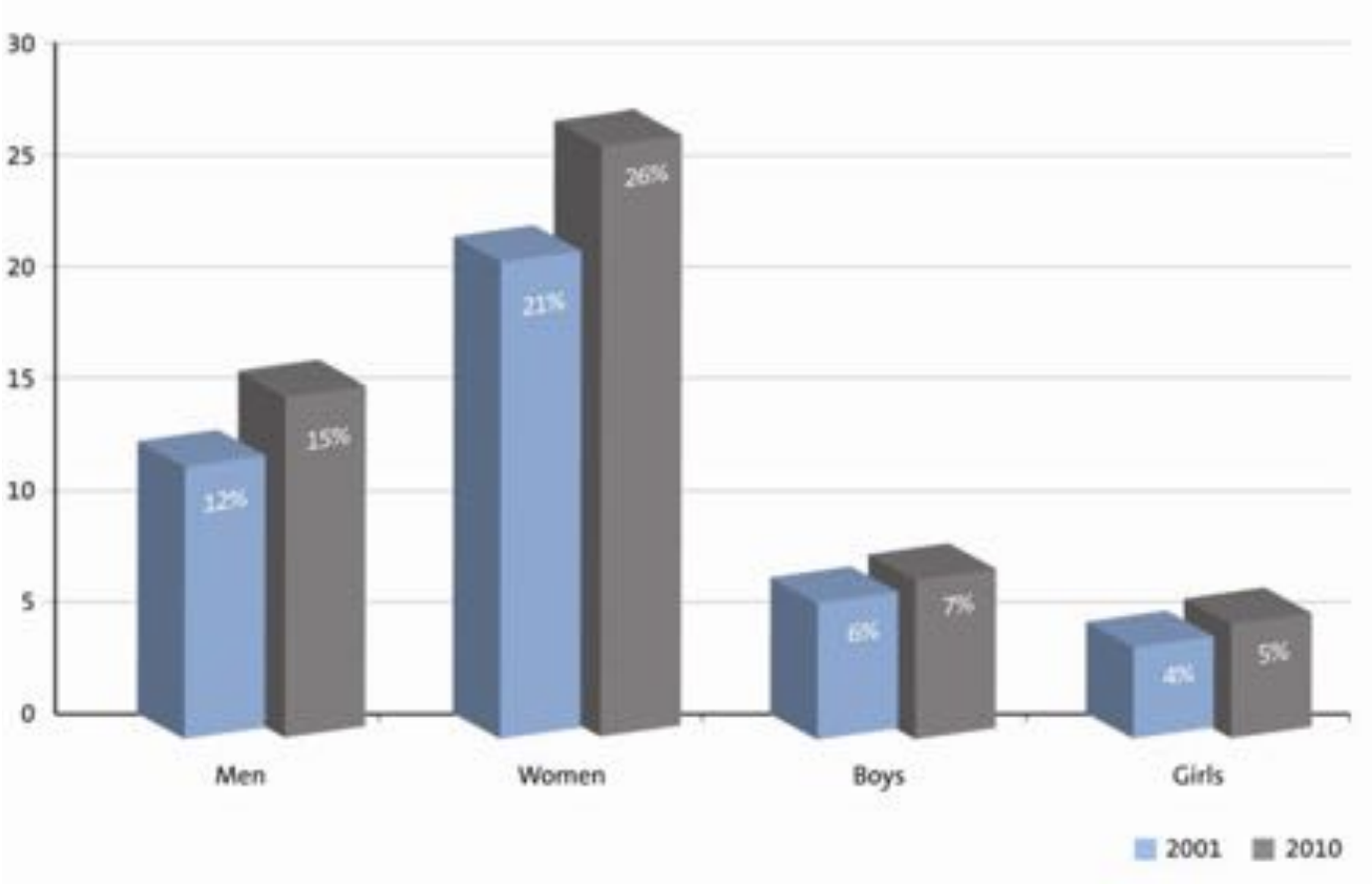
Mental Health
treatment & therapy

Restorative Nature Benefits Only Beyond the City?

urban forest &
nearby nature benefits

% of U.S. Population Using Mental Health Medications

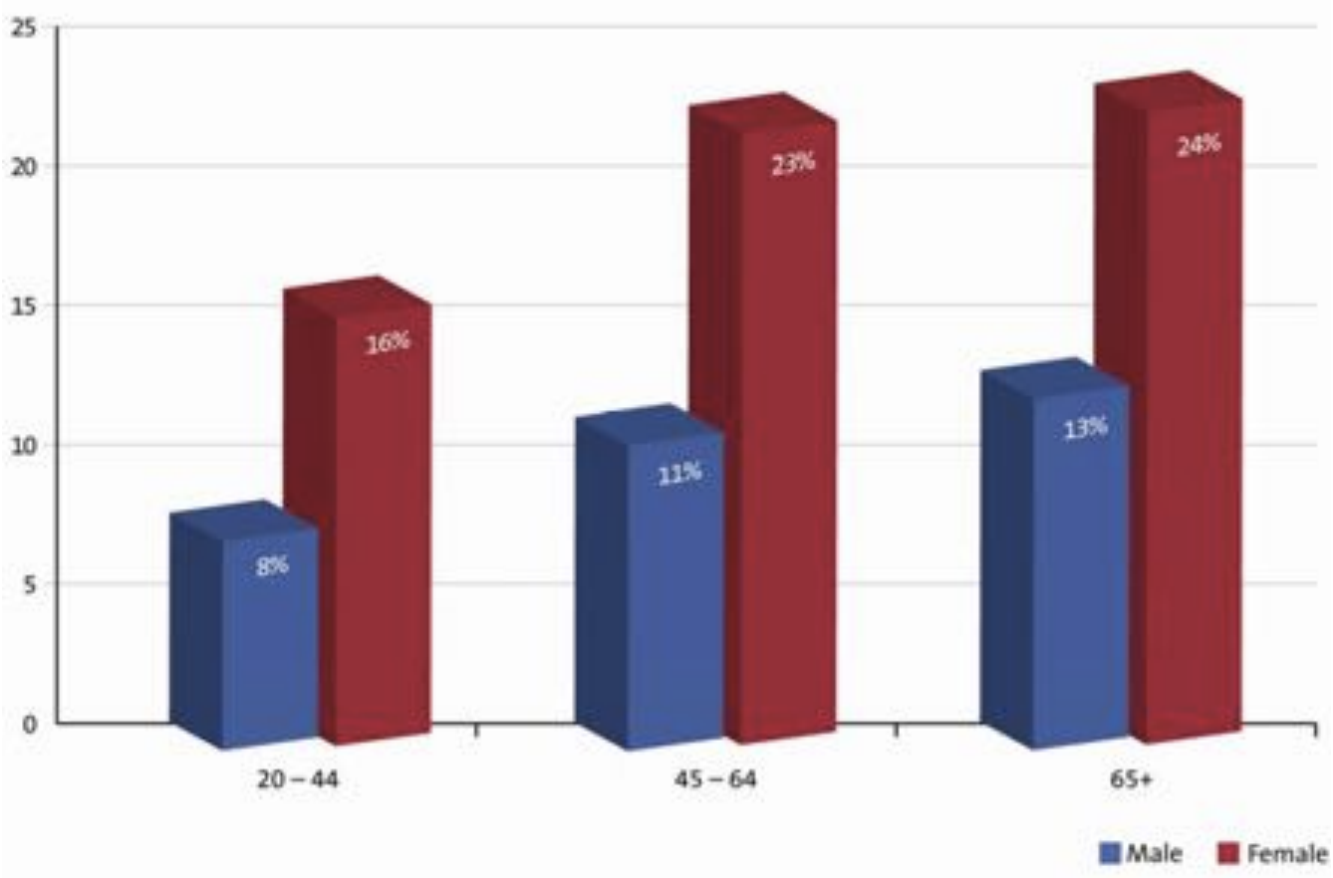
2001 vs 2010



America's State of Mind, Medco Health Solutions, Inc

Prevalence of Adult Antidepressant Use

2010



America's State of Mind, Medco Health Solutions, Inc

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

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

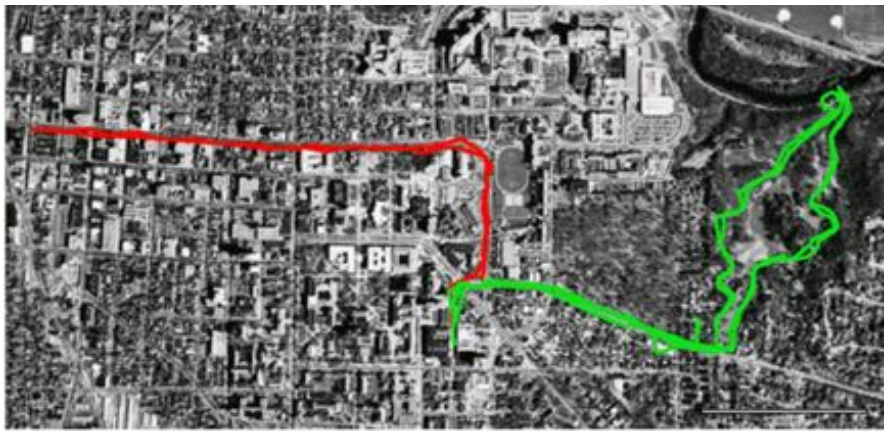
Josefsson et al. 2013. Physical Exercise Intervention in Depressive Disorders. Scandinavian Journal of Medicine & Science in Sports

Improving Depression

20 adults with major depression
walk in a park setting and an urban setting

- 50-minute walks one week apart
- before-after testing:
  - Mood: Positive and Negative Affect (PANAS)
  - Cognition: Backward Digit Span (BDS)

cognitive and affective improvements after walking in a nature setting



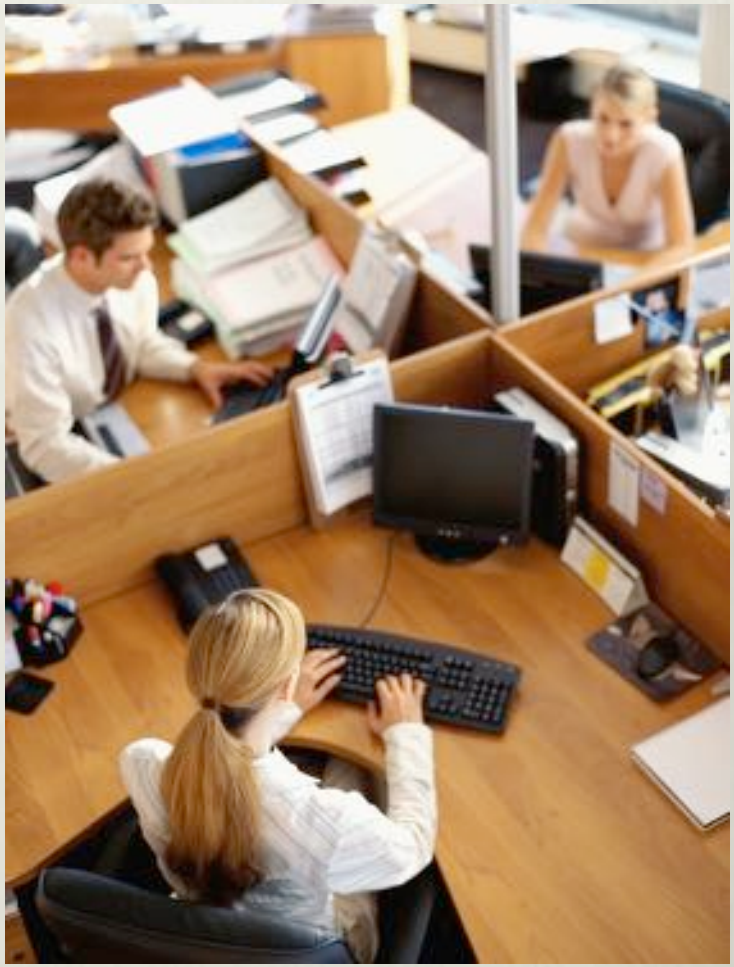
Berman et al. 2012. *Journal of Affective Disorders*

Mental Health & Function
just doing better!

‘nearby nature’ experiences passive encounters for benefit

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

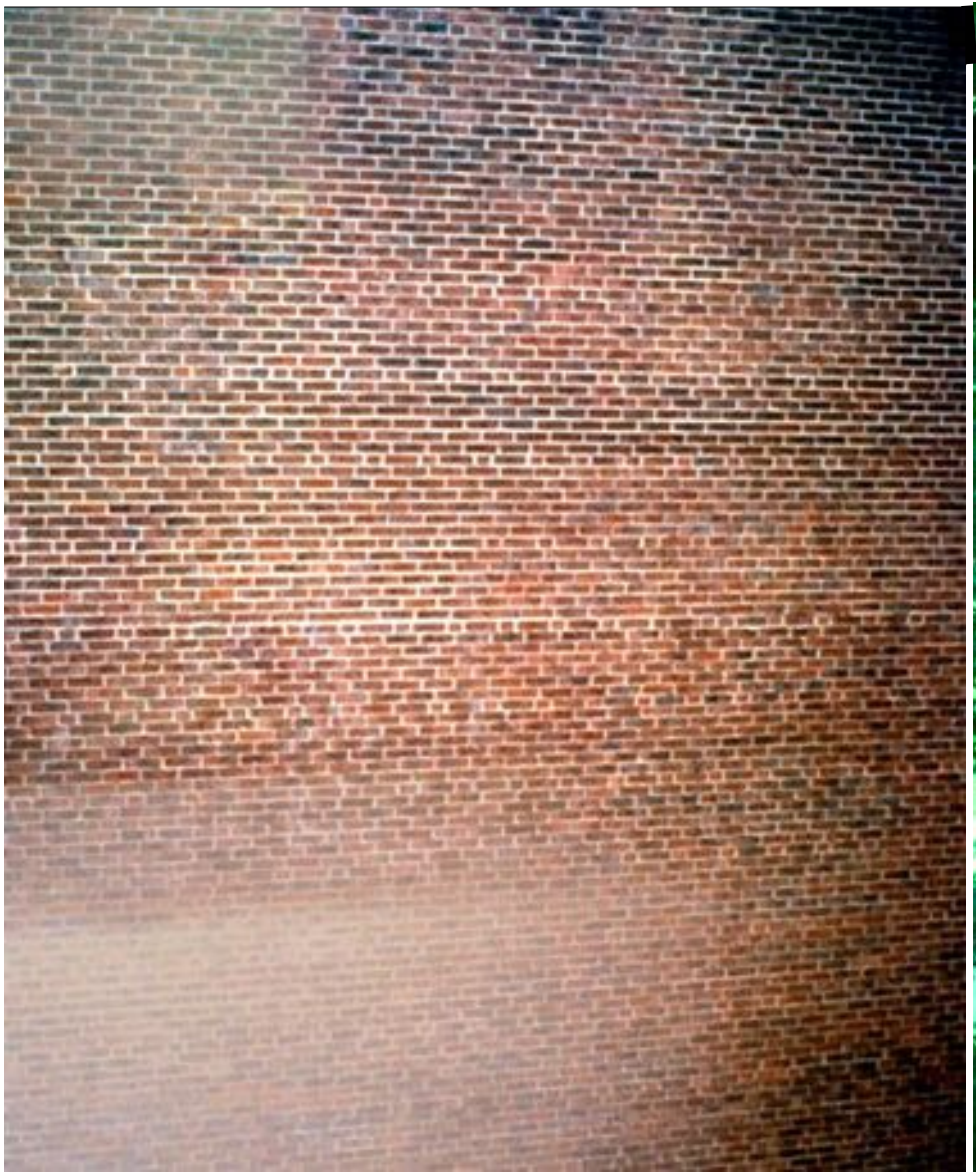
ART Design Elements

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

the
better
office
cubicle!

bottom line =
$$ benefits of trees & nature

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



hospital healing gardens:

patients; family and friends; professional staff

health care $$ savings

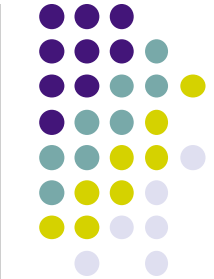
Hospital Staff – Respite and Support

Nature: A stress coping resource for employees 24-7

thanks to
Teresia Hazen
for slides

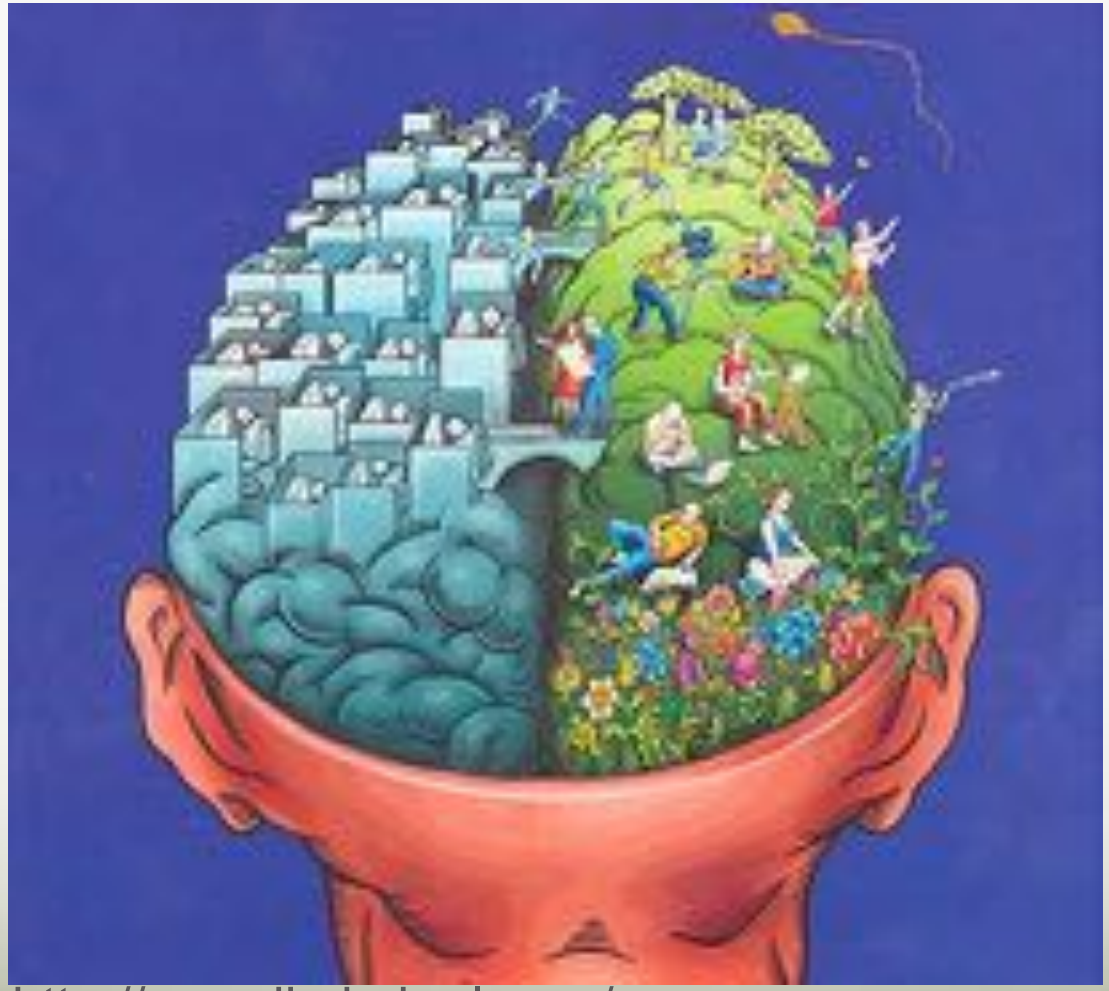
Matsuoka. 2010. Landscape & Urban Planning

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

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 in Denmark

https://www.concur.com

nature:
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

Mindfulness

Anna and Elena Balbusso, NY Times

constant busyness

attempted multi-tasking

'out of balance'

Nature and Mindfulness

focus
soft fascination
undirected attention

Attention Restoration Theory, Kapan & Kaplan

credit: Michael Hellgren

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

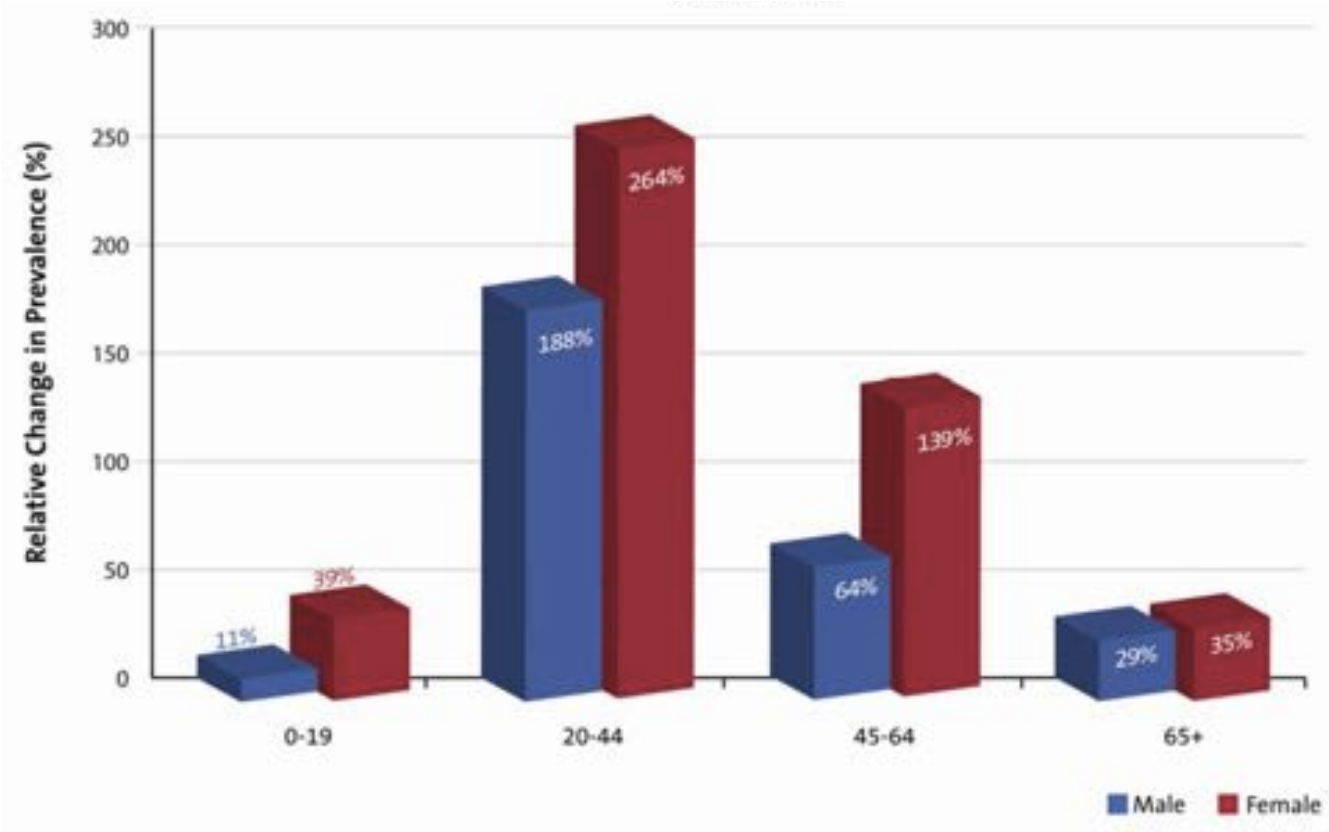
- healthy workplace employees
- 8 week mindfulness training
- brain electrical activity – positive affect
- brain activation – reduce stress event response
- more antibodies after influenza vaccine = better immune function

Davidson et al. 2003. Alterations in Brain and Immune Function Produced by Mindfulness Meditation. Psychosomatic Medicine

urban nature & health benefits across the life cycle

Change in % Population on ADHD Treatments

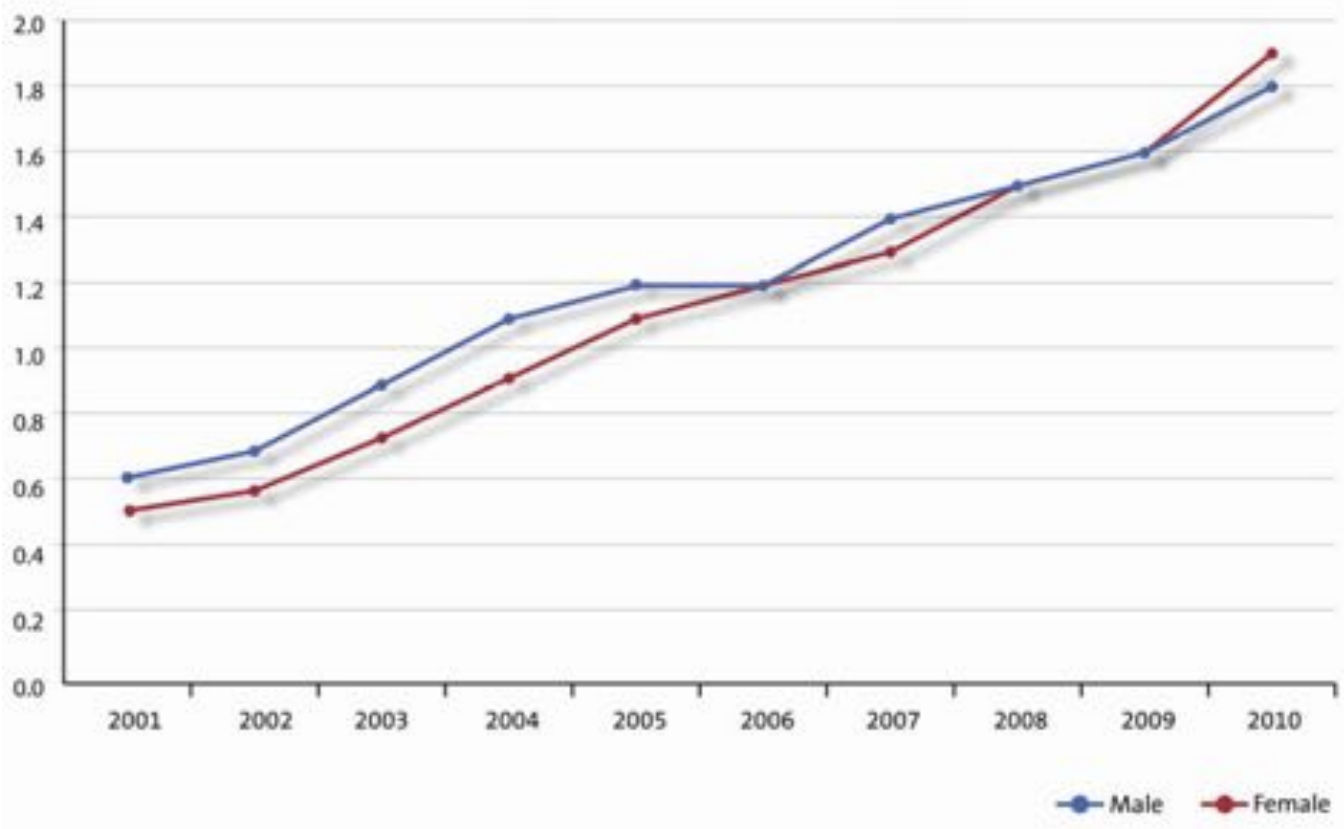
2001 - 2010



America's State of Mind, Medco Health Solutions, Inc

% of Americans Ages 20-44 on ADHD Meds

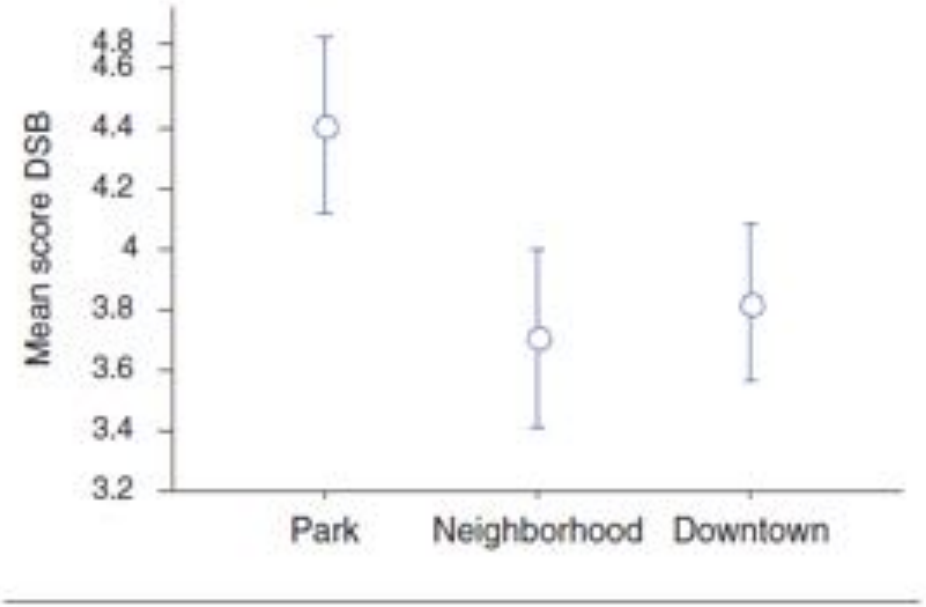
2001 - 2010



America's State of Mind, Medco Health Solutions, Inc

ADHD and nature contact

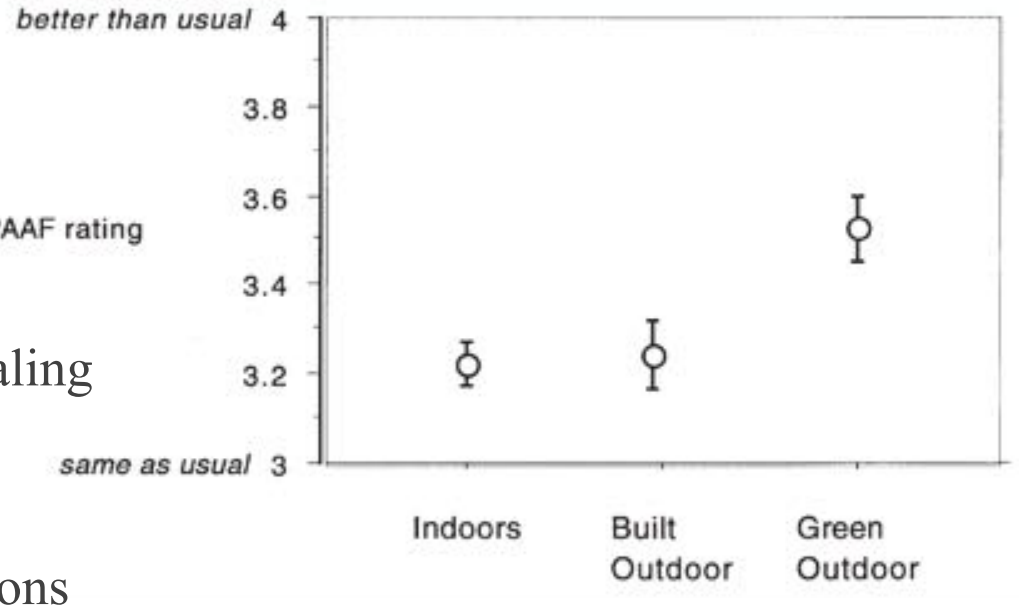
- 17 children aged 7-12 with diagnosed ADHD
- 20-minute guided walks
  - Park
  - Neighborhood
  - Downtown
- Pre-walk puzzles
- Post-walk cognitive test



Faber Taylor & Kuo. 2009.
Journal of Attention Disorders

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*

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

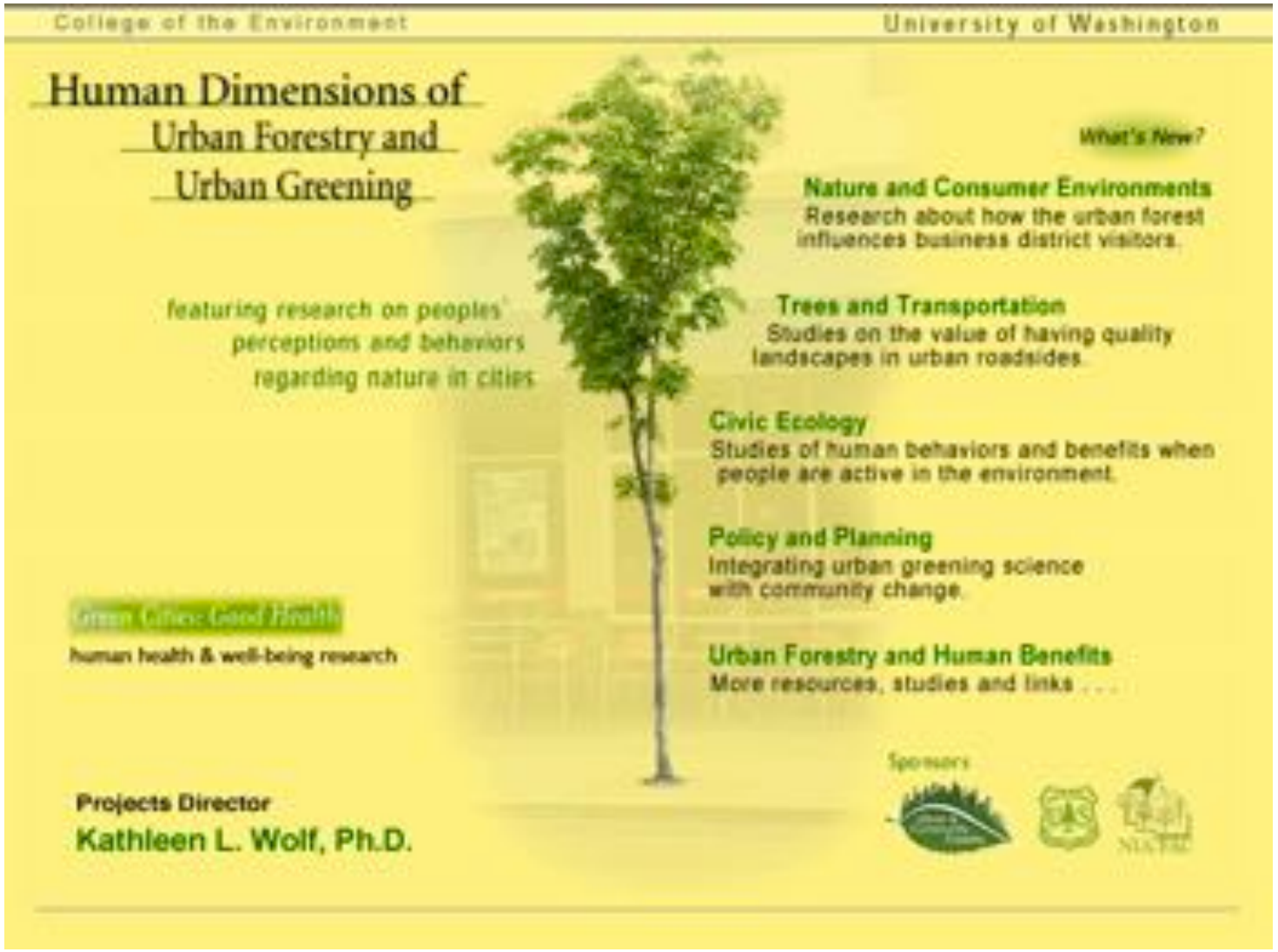
Hygiene Hypothesis

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

Lowry et al. 2007. Neuroscience

Eat Dirt!

Summary

- evidence of human health? Green Cities: Good Health
- ~ 40 years of research, > 3K peer-reviewed publications
- nearby nature for better mental health & function
- ADHD, attention restoration theory, creativity, mindfulness

www.naturewithin.info