Community Green Space for Health & Wellness
a science review

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NACD Urban and Community Conservation Webinar
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Landscape Gradient :: Ecosystem Services

MOUNTAIN AND POLAR
- Local climate regulation
- Water supply and regulation
- Erosion and sediment control
- Human health and well-being benefits
- Food and renewable non-food products
- Cultural benefits

FOREST & WOODLANDS
- Global climate regulation
- Local climate regulation
- Air and water cleansing
- Erosion and sediment control
- Habitat functions
- Waste decomposition and treatment
- Human health and well-being benefits
- Food and renewable non-food products
- Cultural benefits

DRYLANDS
- Global climate regulation
- Erosion and sediment control
- Pollination
- Waste decomposition and treatment
- Food and renewable non-food products

CULTIVATED
- Pollination
- Food and renewable non-food products
- Cultural benefits

URBAN
- Global climate regulation
- Local climate regulation
- Air and water cleansing
- Human health and well-being benefits
- Cultural benefits

ISLANDS
- Air and water cleansing
- Water supply and regulation
- Hazard mitigation
- Human health and well-being benefits
- Food and renewable non-food products

INLAND WATER
- Water supply and regulation
- Hazard mitigation
- Waste decomposition and treatment
- Human health and well-being benefits
- Food and renewable non-food products

COASTAL
- Water supply and regulation
- Hazard mitigation
- Habitat functions
- Waste decomposition and treatment
- Human health and well-being benefits
- Food and renewable non-food products
- Cultural benefits

MARINE
- Global climate regulation
- Waste decomposition and treatment
- Food and renewable non-food products
- Cultural benefits
Conservation Districts

- include all landscapes
- include all people

credit: John Owen
Trees & Stormwater Runoff

credit: City of State College, PA
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
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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’
THE LIFESAGE OF WOMAN

STAGES OF WOMAN'S LIFE FROM THE CRADLE TO THE GRAVE

Leaving behind
Her shadow
In memories
Of her future days

Infant.

Walking.

Nursing.

Young woman.

Old woman.

Granny.

Aging woman.

Aged woman.

Laying head
On a pillow
In death's embrace

The stages of a woman's life, from infancy to old age.
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
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!
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
Classroom Views & Stress

**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).
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:
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Mary Ann Rozance
Sarah Krueger

research review & 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 9% 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.
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, 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*
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

ART Design Elements

- being away
- ‘soft’ fascination
- extent
- compatibility
the better office cubicle!

bottom line = $$ benefits of trees & nature
Mindfulness
constant busyness

attempted multi-tasking

‘out of balance’

Anna and Elena Balbusso, NY Times
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

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
**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
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

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*
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
Human Dimensions of Urban Forestry and Urban Greening

featuring research on people's 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.

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

Urban Forestry and Human Benefits
More resources, studies and links

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www.naturewithin.info