

Nature, Health & Well-being

- “It is a scientific fact that the occasional contemplation of natural scenes of an impressive character...is favorable to the health and vigor”
--Frederick Law Olmsted (1865)



Health Place. 2014 May;27:102-5. doi: 10.1016/j.healthplace.2014.02.005. Epub 2014 Mar 3.

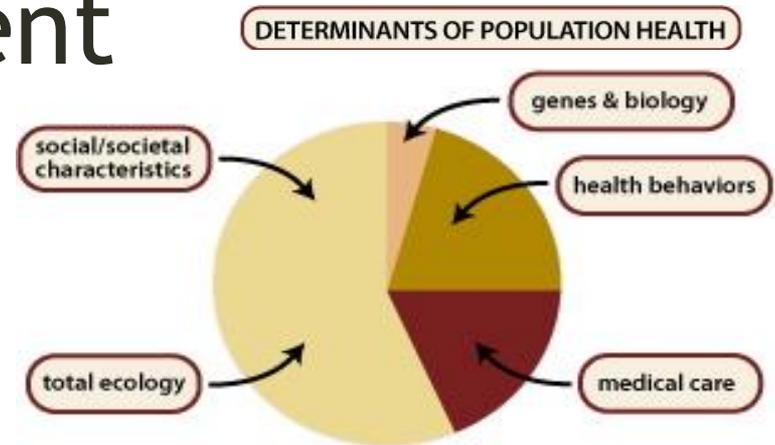
Planning for health: A community-based spatial analysis of park availability and chronic disease across the lifespan.

Besenyi GM¹, Kaczynski AT², Stanis SA³, Bergstrom RD⁴, Lightner JS⁵, Hipp JA⁶.

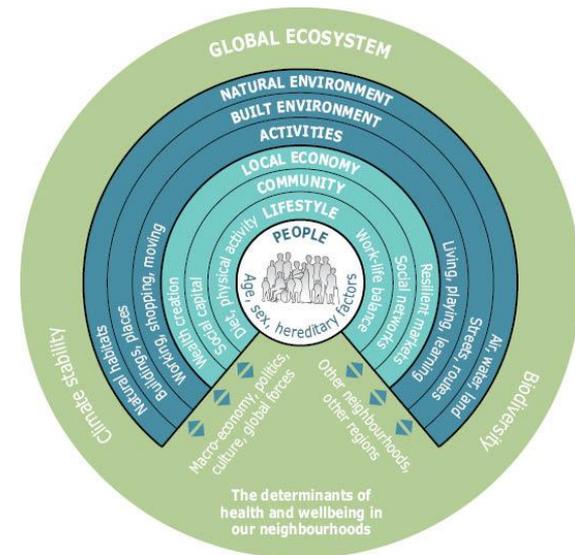
- “...[T]hose without a park within one-half mile from home were more than twice as likely to have 2 or more CHCs (Chronic Health Conditions) compared to respondents that had a park nearby.”

Health & Environment

- More than 50% of health is determined by social and environmental factors
- The Natural Environment is the largest 'sphere' in this socio-ecological "Health Map"

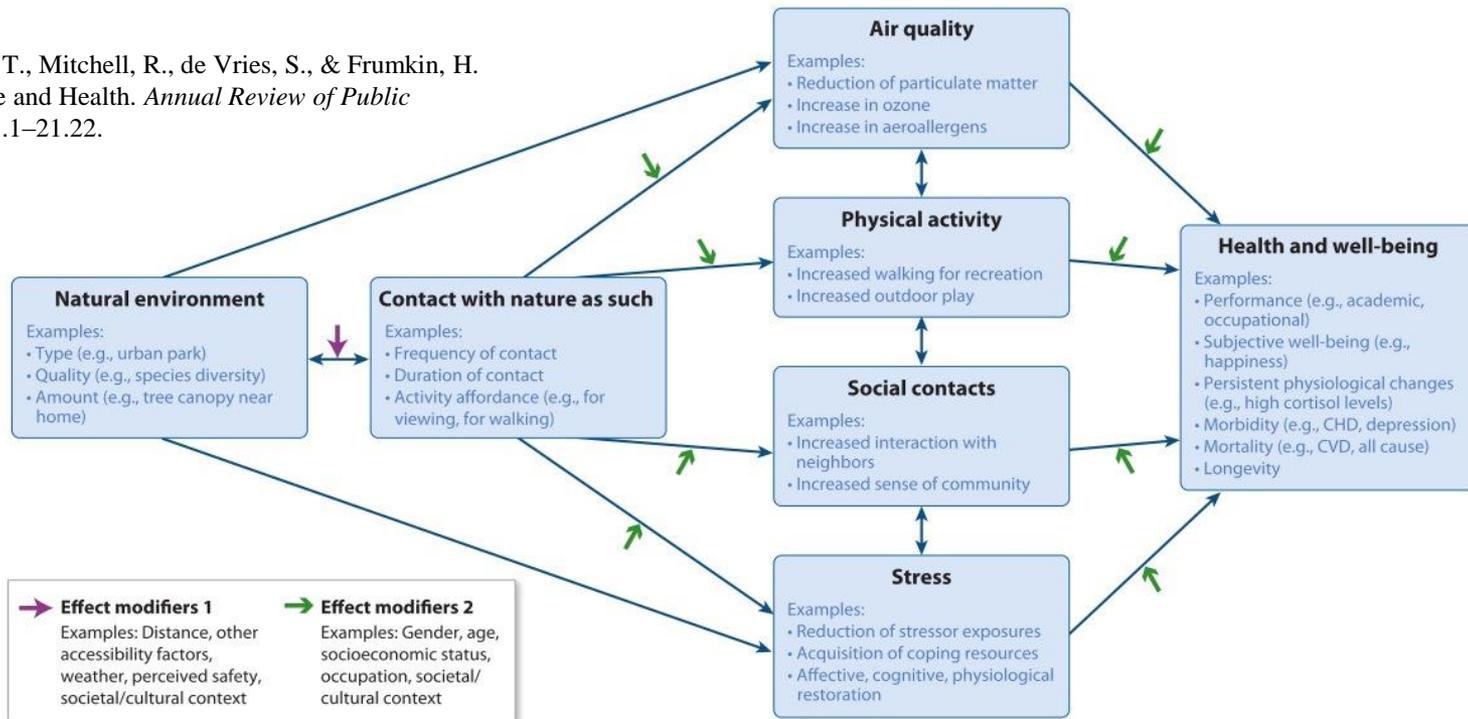


CDC, 1999



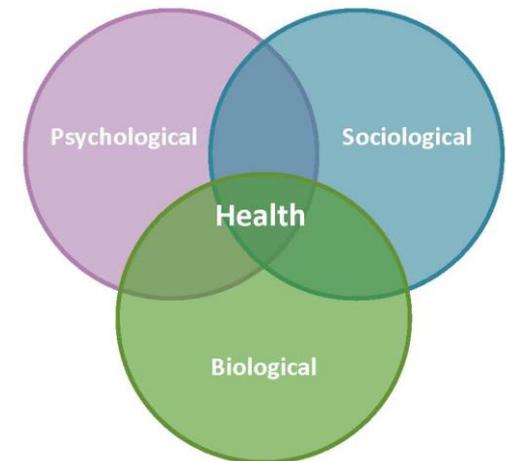
Barton & Grant, 2006

From: Hartig, T., Mitchell, R., de Vries, S., & Frumkin, H. (2014). Nature and Health. *Annual Review of Public Health*, 35, 21.1–21.22.



- World Health Organization (1948)

- 'Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity'

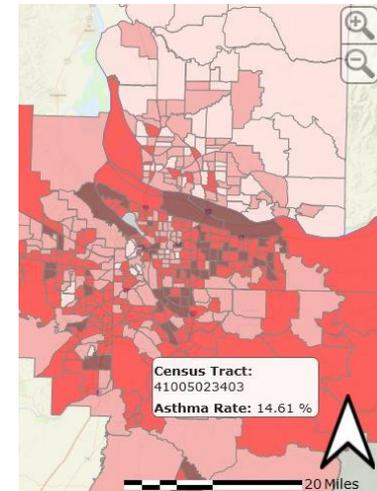
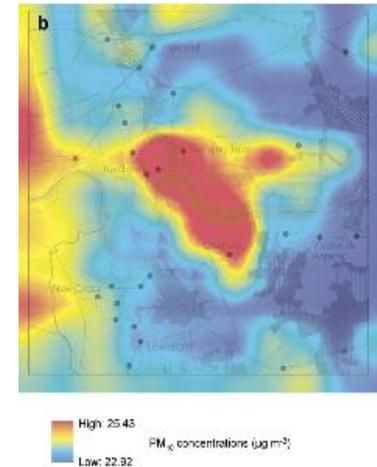


Vegetation, Air Pollution and Health

- Pulmonary & Cardiovascular Disease
 - Asthma, Bronchitis, Lung Infections, Cancer
 - Heart attack, Blood Pressure, Carbon Monoxide
- ↑Tree density associated with a 23% ↓prevalence of asthma in children in NYC
 - Lovasi et al, 2008



Tiwary et al, 2009



Physical Activity (PA)

- Parks: Accessibility, Proximity
 - ↓ Obesity, Heart Disease, Diabetes
 - Safety, Cleanliness, Facilities
- “Green Exercise”
 - ↑ Duration, Intensity, Mood

Health Place. 2012 Jan;18(1):46-54. doi: 10.1016/j.healthplace.2011.09.003. Epub 2011 Sep 16.

A study of community design, greenness, and physical activity in children using satellite, GPS and accelerometer data.

Almanza E¹, Jerrett M, Dunton G, Seto E, Pentz MA.

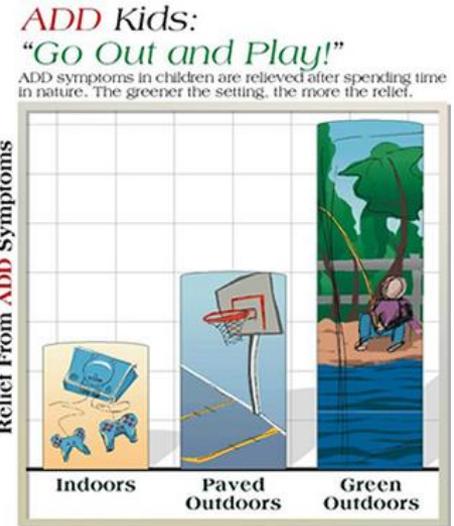
“Green Time” vs. “Screen Time”
<30 min outside vs. >8hrs inside



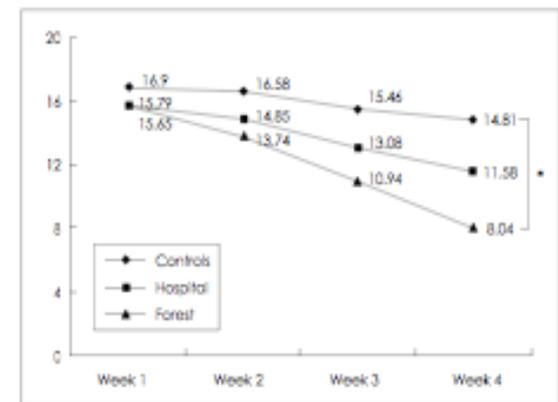
Attention, School Performance & Mental Health

- Green spaces:
 - 12% ↓ ADHD symptoms
 - 5% ↑ standardized test scores
 - ↑ Academic Performance
 - ↑ Creativity, Innovation
 - ↑ Social skills & Interaction

- ↓ Depression, Anxiety
 - May be beneficial CAM treatment



Faber-Taylor, Kuo & Sullivan, 2001



Kim et al, 2009

Stress

- Mind-Body Medicine (e.g. *Psychocardiology*)
- Psychoneuroendocrinology & Psychophysiology

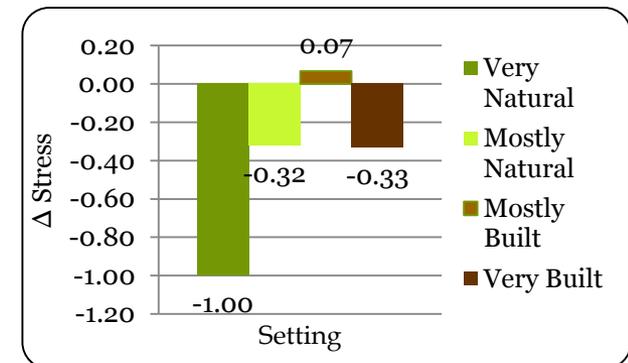
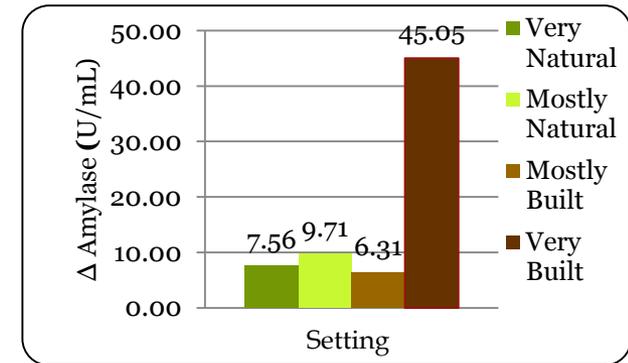
- Blood Pressure
- Cortisol
- Blood Sugar
- Neurotransmitters
- Immune System
- Hormones



Very Natural

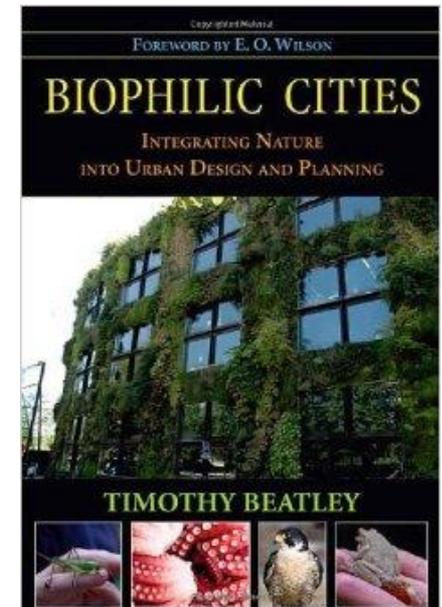


Mostly Built



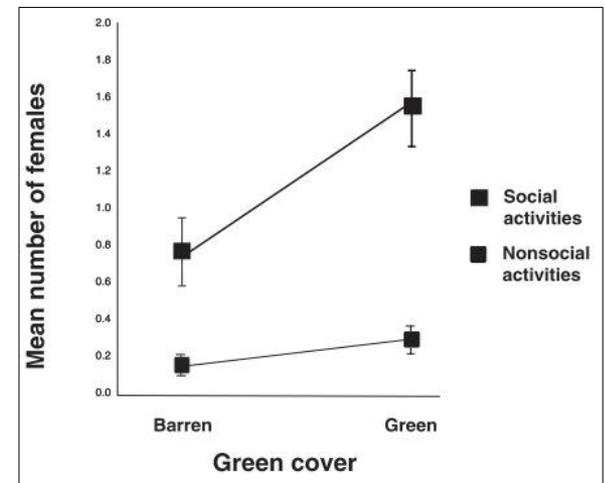
Mental Well-being

- Evidenced-based increase:
 - Joy, Happiness, Vitality
 - Self-esteem, Sense of Purpose
 - Empathy, Altruism
 - Volunteering/Community
- Biophilia: Inherent Human affinity for nature & living things
- Positive Psychology & Salutogenesis
 - Evidence-based areas connecting human flourishing with ↓disease



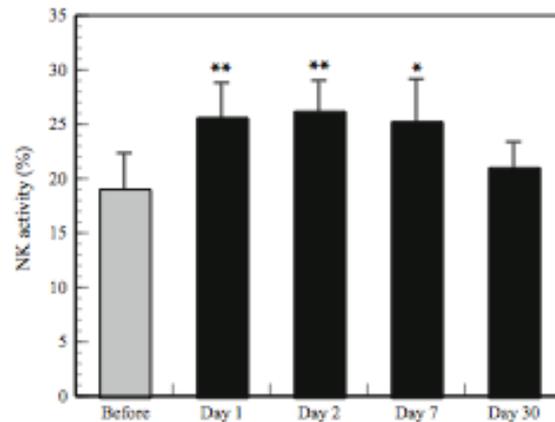
Social Contacts

- Social capital & Social cohesion
- Community Attachment & Place identity
- Mental & Social Aspects of Green Space may be MORE influential for health than PA
- Especially important for:
 - Less mobile (e.g. elderly)
 - Underserved communities



Forest-Air Bathing (*Shinrin-yoku* 森林浴)

- All the Health Benefits of Nature
- Natural Aromatherapy
 - Immune System stimulation
 - ↑Natural Killer (NK) Cells for 30 d

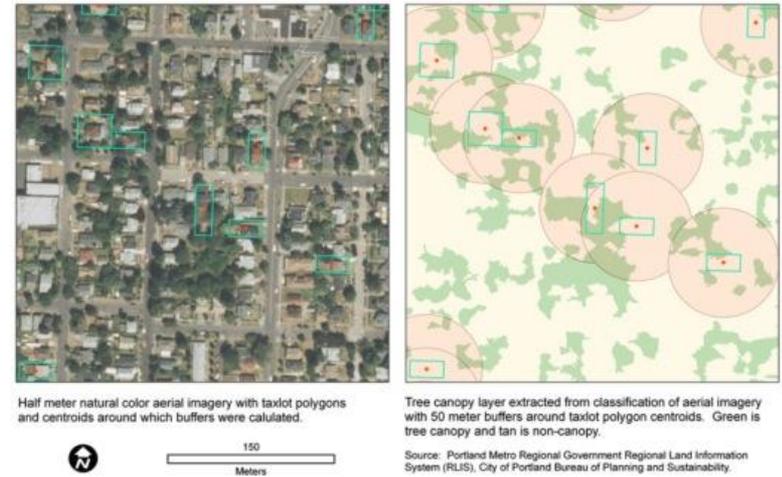


Activity of NK cells Li, 2010

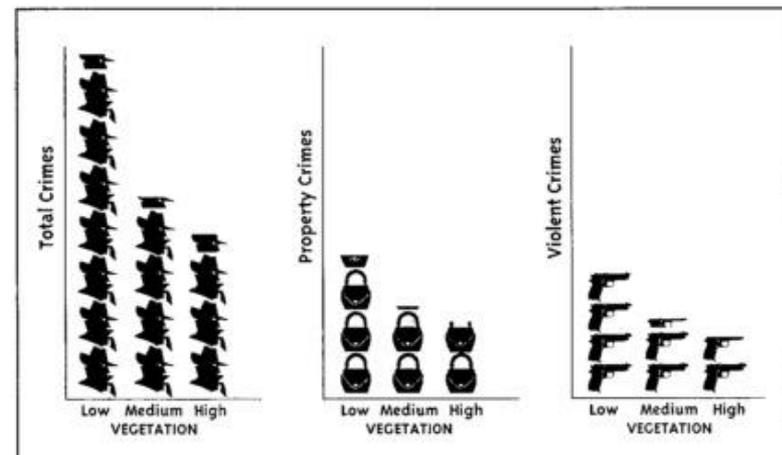
Japanese Ministries of
Health AND Forestry
48 “Forest Therapy Centers”

Other Green Space effects

- Birth Outcomes
 - ↓Pre-mature births, Neonatal mortality
 - ↑Birth Weight, Head Circ.
- ↓Crime
 - Property & Violent Crime
- ↑Housing Prices
 - \$21/tree – Single family rental



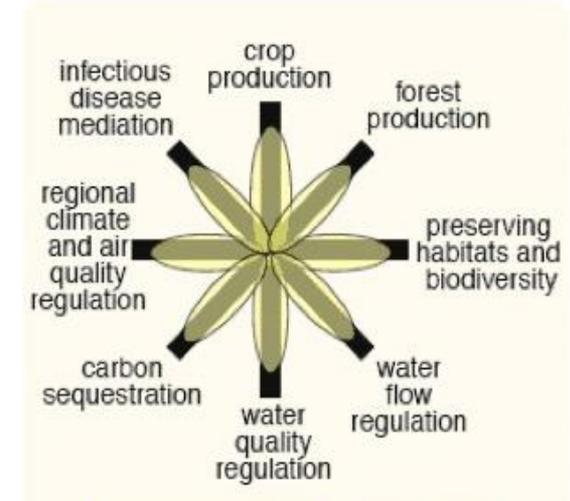
Donovan et al, 2011



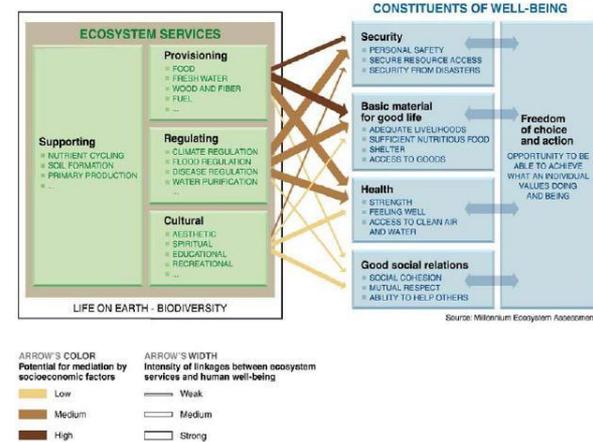
Kuo & Sullivan, 2001

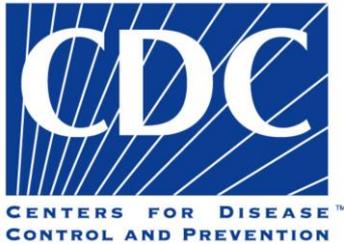
Ecosystem Services

- Greenhouse Gas Sequestration
- Urban Heat Island Mitigation
- Storm-water Absorption
- Biodiversity
- **“An almost complete disconnection from the natural world” is a significantly contributing factor to Chronic Disease**
 - WHO – Preventing Chronic Disease: A Vital Investment (2005)
- Healthy Cities (WHO) & Millennium Ecosystem Assessment

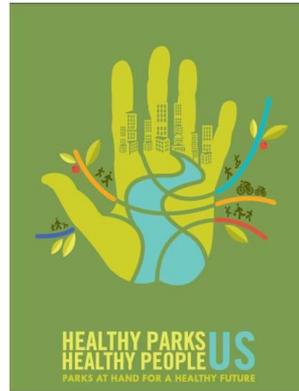


Linkages between ecosystem services and human well-being





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Research

- Questions Good news: No Overdose!!!
 - Dose? Frequency? Dimin. returns or Add. Benefit?
- Methods
 - Surveys? GIS? 'Natural' Experiments?
 - Park counts – SOPARC
 - Trail counts – How far? How often?
- Complexity - Not just DBRCT
- Lack of data should not be a barrier to action
- However, more research will enhance message (\$\$)

Thank You



kbeil@ncnm.edu







- **Charles Jordan**

- **Director, Portland Parks 1989-2003**

- **National Parks advocate**

- “What they do not value, they will not protect. And what they do not protect, they will lose.”



- **Jonathan Jarvis**

- **Director, National Park System**

- **Keynote Speaker – 2011 APHA Meeting**

- “Being outdoors has positive effects on health that don’t cost a dime.”

