Health, Well-Being & Urban Cultural ES
a socio-ecological review

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Ecosystem Services

<table>
<thead>
<tr>
<th>Ecosystem Services</th>
<th>Provisioning Services</th>
<th>Regulating Services</th>
<th>Cultural Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supporting Services</td>
<td>Food (crops, livestock, wild foods, etc...)</td>
<td>Air quality regulation</td>
<td>Aesthetic values</td>
</tr>
<tr>
<td>Nutrient cycling</td>
<td>Fiber (timber, cotton/hemp/silk, wood fuel)</td>
<td>Climate regulation (global, regional, and local)</td>
<td>Spiritual and religious values</td>
</tr>
<tr>
<td>Soil formation</td>
<td>Genetic resources</td>
<td>Water regulation</td>
<td>Recreation and ecosystem</td>
</tr>
<tr>
<td>Primary production</td>
<td>Biochemicals, natural medicines, pharmaceuticals</td>
<td>Erosion regulation</td>
<td>2005</td>
</tr>
<tr>
<td></td>
<td>Fresh water</td>
<td>Water purification and waste treatment</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Disease regulation</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Pest regulation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pollination</td>
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<td></td>
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<td>Natural hazard regulation</td>
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</tr>
</tbody>
</table>

Millennium Ecosystem Assessment
Metro Seattle

- socio-ecological systems
- cultural values
  - Microsoft
  - Amazon
  - Starbucks
  - Boeing

credit: John Owen
Social-Ecological Systems

- complexity :: ecosystems + social systems
- bio-geo-physical' unit and its associated social actors and institutions
- heterogeneous & adaptive
- integrated & multidisciplinary
  not ‘stapler science’
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 city trees & forests? not a panacea, but important!
Nature Benefits
Only Beyond the City?
Research Review and Summaries

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thanks!
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Mary Ann Rozance
Sarah Krueger

www.greenhealth.washington.edu
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 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.
- 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.
Metro Nature :: Human Health & Well Being

> 3,000 articles in database

% distribution of entire database
nature & 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
Nature & Psych Development
children’s play & imagination

Richard Louv - Last Child in the Woods
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

Matsuoka. 2010. Landscape & Urban Planning
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
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
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
hospital healing gardens: patients; family and friends; professional staff

health care $$ savings
Hospital Staff – Respite and Support
Elders & Horticulture Therapy
Summary

• urban forests & urban greening provide human habitat for health throughout human life cycle
• evidence portal: Green Cities: Good Health
• ~ 40 years of research, > 3K peer-reviewed publications
Identifying Health Opportunities

- translating evidence to assessment
- prior research – diverse vegetation expressions
- ecosystem services benefit transfer
more than trees . . . nature & health evidence
Urban Tree Canopy Assessment

i-Tree analysis

City of Seattle
forest = silviculture
forest = ecosystem
Top Down Mapping

plus

understory vegetation

for human habitat

school yard landscapes
Remote Sensing-LIDAR

Remote Sensing-LIDAR

LiDAR response to built versus vegetative surfaces.
credit: Qian-Yi Zhou, Stanford University
Veg Assessment Explorations

oblique aerial view

LIDAR point cloud
Veg Assessment Explorations

ground view

LIDAR point cloud
Summary

• urban social-ecological systems

• urban forests/metro nature for human health and wellness (research portal: Green Cities: Good Health)

• vegetation assessment – LIDAR for forest structure

• research needs? causal elements & mechanisms wild to built responses
Human Dimensions of Urban Forestry and Urban Greening

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...

Projects Director
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