Urban Green Infrastructure: co-design for water & health co-benefits

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stormwater retention
Health Definition

A state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity (1946)
Social Determinants of Health

- General socio-economic, cultural and environmental conditions
  - Work environment
  - Unemployment
  - Agriculture and food production
  - Education

- Social and community networks
  - Living and working conditions
  - Water sanitation
  - Health care services
  - Housing

- Individual lifestyle factors
  - Age, sex & hereditary factors
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:
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Sarah Krueger

Research Reviews & 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 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.
Outside Our Doors
The benefits of cities where people and nature thrive.
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
health agencies recommend moderate activity for health promotion & disease prevention

parks, active living, active transit
Walking Programs

children
elders
families
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
Evidence to Action

40 years of research
nearby nature for health benefits
> 4,000 published articles
research to application
Stormwater Management

Seattle USA

Thornton Creek Water Quality Channel (SvR Design)
1 hectare, treats runoff from 275 hectares (1 hectare = 2.47 acres)
Malmo, Sweden – SUDS for cloudburst management
Malmo, Sweden – SUDS for cloudburst management
Intentional green infrastructure design for human health outcomes

cos-author:

The Nature Conservancy

co-author & printing:
University of Texas Medical School, Austin
SITES Landscape Architect, Heather Venhaus
stormwater management
human health & well being
patient & medical staff interactions
patient & medical staff interactions
PROPOSED SOLUTIONS IN THE LICK RUN WATERSHED

Cincinnati USA

Dave Gamstetter
St Francis Early Success Project - 2010
St. Francis Court Apartments Bioretention Features
Before & After

2009: Two levels of unused parking lots

2012: Two bioinfiltration basins with walking path
Spring 2011, Ponding after rain event
Summary

from site to systems level solutions

evidence of nature for health
green infrastructure opportunities
solutions :: complexity & diversity
co-design for co-benefits
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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