



Linkages Between Urban Forestry and Human Health Response

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New Partners for Smart Growth Conference
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**in the
background
of today's
busyness**



urban forest benefits



public health benefits

urban greening & city trees

City Trees and Public Health



- risks and toxics in the environment – one side of the story
- another perspective
Howard Frumkin
Centers for Disease Control
nature as health asset
- community and nature planning for health



Physical Inactivity & Obesity



majority of Americans not active enough
goal-30 minutes per day of moderate activity
to reduce risk factors for chronic diseases
(heart, stroke, cancer, diabetes)
significant costs to national health services

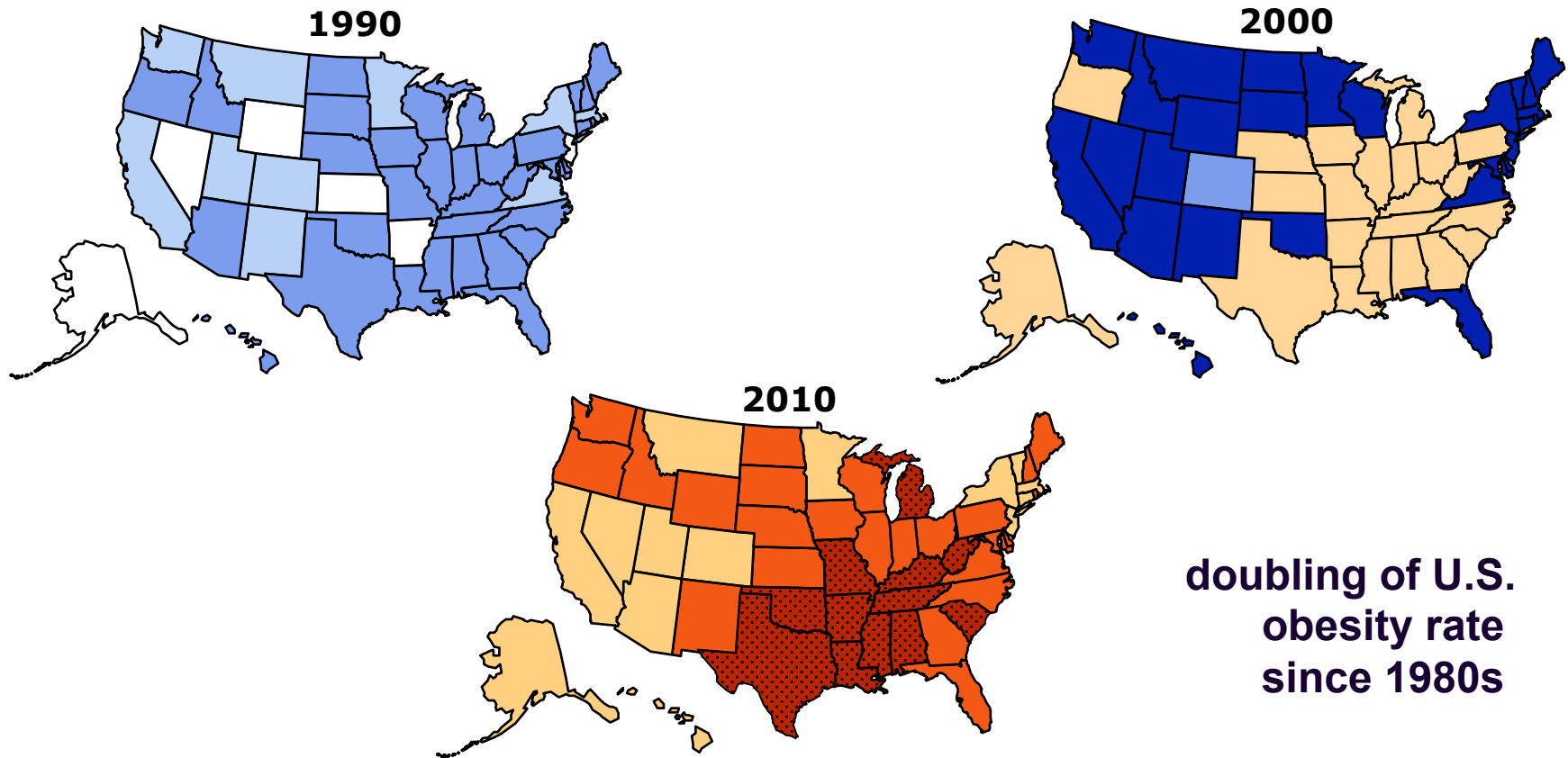
\$168 billion medical costs
17% of all U.S. medical costs

CDC 2010

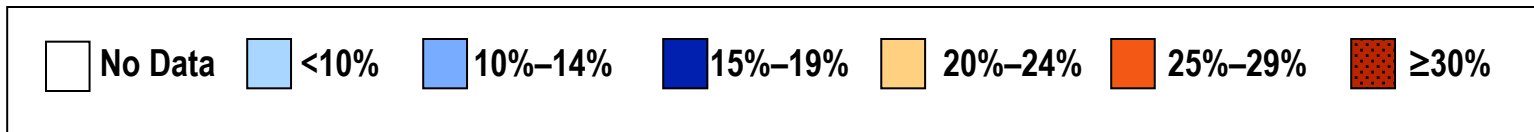
Obesity Trends* Among U.S. Adults

BRFSS, 1990, 2000, 2010

(*BMI ≥ 30 , or about 30 lbs. overweight for 5' 4" person)



**doubling of U.S.
obesity rate
since 1980s**



Source: Behavioral Risk Factor Surveillance System, CDC.

City Trees & Nature

Active Living



	Positive Elements
Physical Environment	higher population density (city core rather than suburbs) higher housing density mix of land uses (such as residential and retail) street design with more connectivity (rather than cul-de-sacs) availability of public transit walking and biking infrastructure (such as sidewalks and bike lanes)
Psycho-Social Environment	safety from crime safety from traffic absence of social disorder aesthetics (including trees and landscape) educational campaigns (such as Walk-to-School) incentive programs (such as work place reimbursement for transit use)

Table 1: Determinants of City Walkability



parks, open spaces & trails



make room for pedestrians

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

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





human health & well-being
communities

Donovan et al. 2013. Journal of Preventive Medicine

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

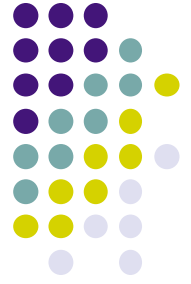
Toledo, Ohio in 2006, pre EAB



2009, EAB in neighborhood



photos: Dan Herms, Ohio State University

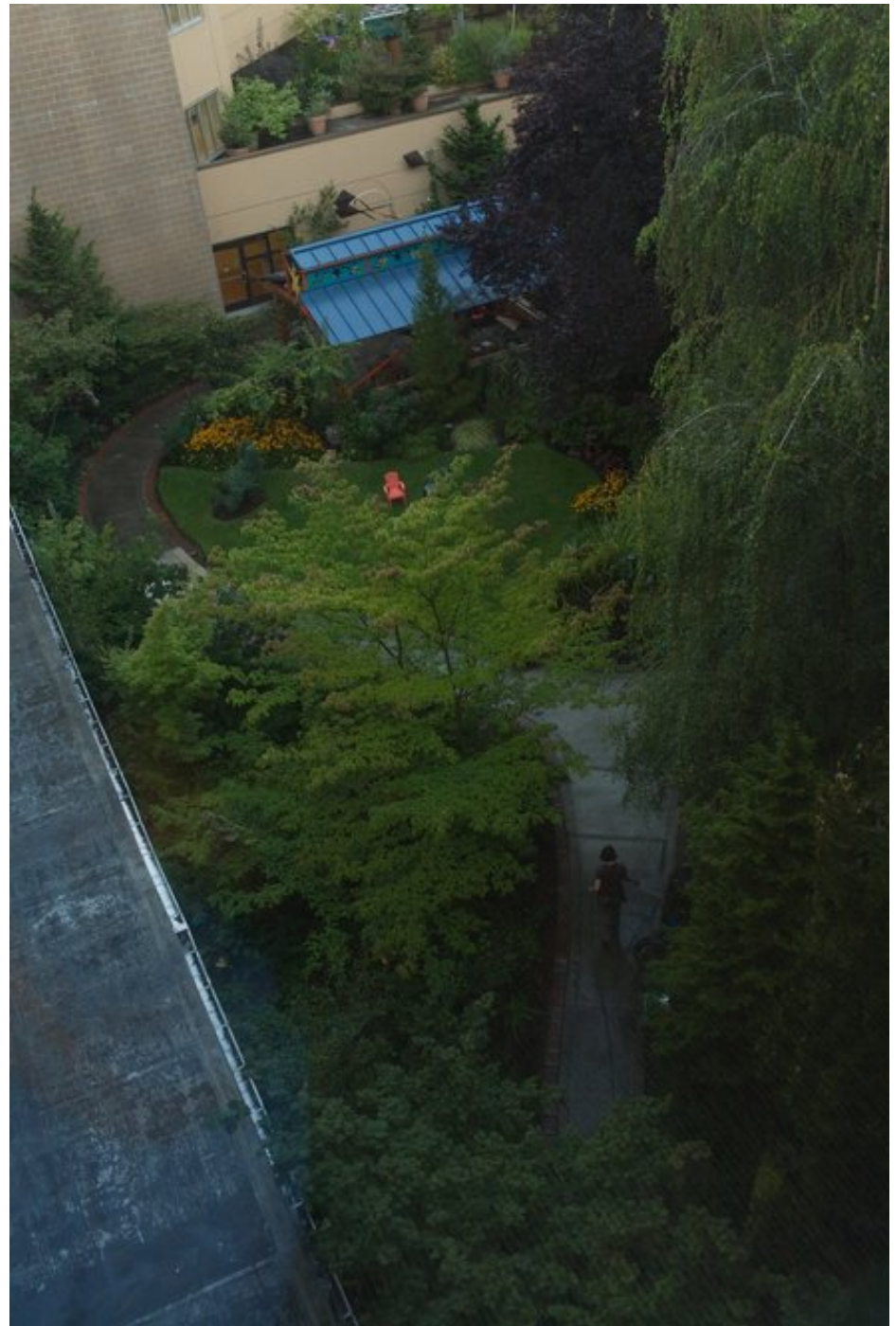


hospital healing gardens: patients; family and friends; professional staff



**health
care \$\$
savings**

healing gardens
soothing
distracting
calm focus





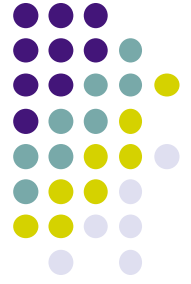
What is the Evidence?

urban greening & city trees
environment
public health
economics

Finding that study



Research Reviews



on-line
resource

summaries
complete:
soon!

next?
economic
valuation

Urban Forestry/Urban Greening Research

Green Cities: Good Health

UAS UNIVERSITY of WASHINGTON

INTRODUCTION RESOURCES FUTURE RESEARCH REFERENCES

Metro nature - including trees, parks, gardens, and natural areas - enhance quality of life in cities and towns. The experience of nature improves human health and well-being in many ways. Nearly 40 years of scientific studies tell us how. Here's the research ...

RESEARCH THEMES

- Livable Cities
- Place Attachment & Meaning
- Community Building
- Community Economics
- Social Ties
- Crime & Fear
- Reduced Risk
- Wellness & Physiology
- Active Living
- Healing & Therapy
- Mental Health & Functioning

www.greenhealth.washington.edu

Research Review and Summaries



Sponsors:

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thanks to U of WA

students:

Katrina Flora

Mary Ann Rozance

Urban Forestry/Urban Greening Research

Green Cities: Good Health

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Green Cities: Good Health



INTRODUCTION RESOURCES FUTURE RESEARCH REFERENCES

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

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.

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

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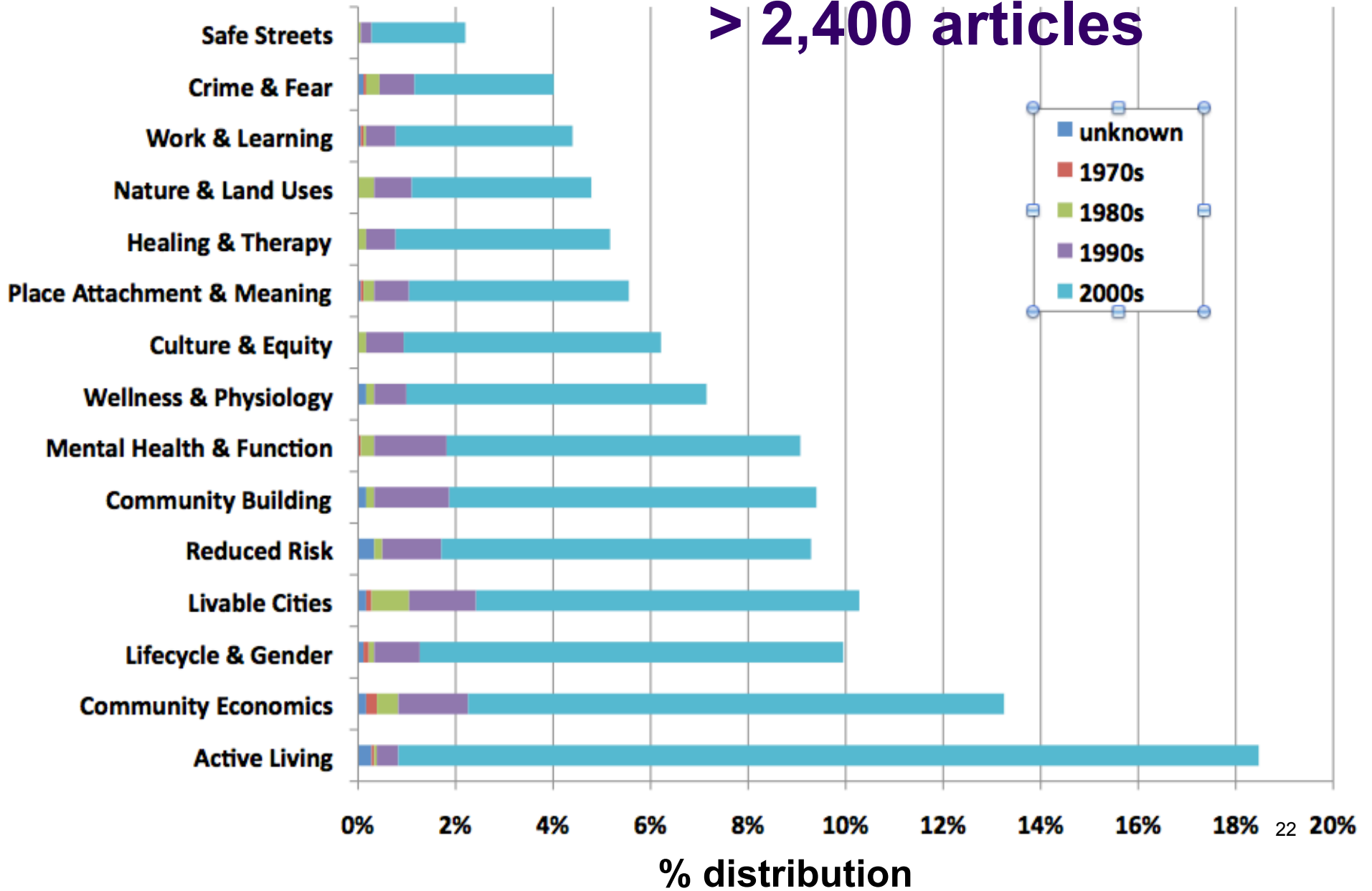


street trees boost market value of houses, providing tax revenue for communities



Urban Green :: Human Health & Well Being

> 2,400 articles





Eco-Health Relational Browser Environmental Protection Agency

www.epa.gov/research/healthscience/browser/

Eco-Health Relationship Browser

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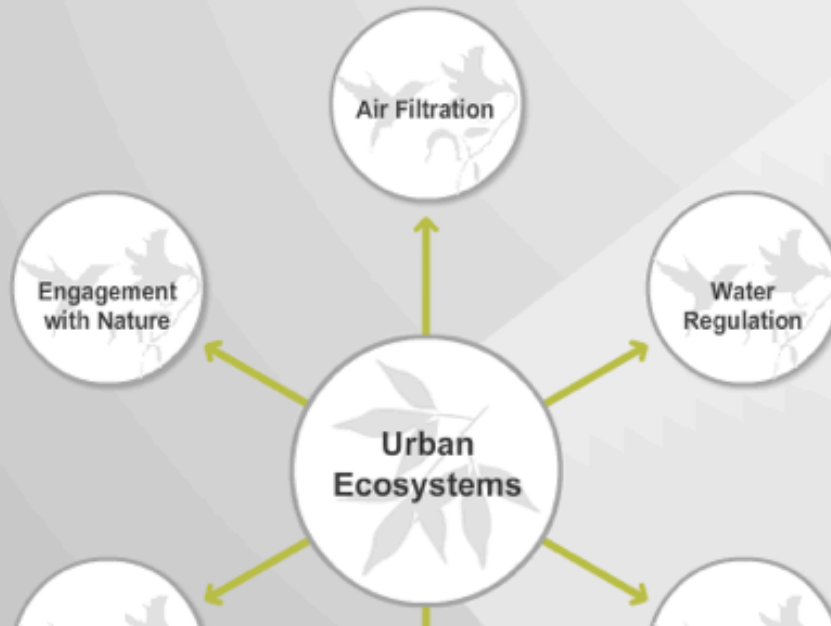
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Bibliography

Eco-Health Relationship Browser: Public Health Linkages to Ecosystem Services

Urban Ecosystems

Click a topic bubble or choose a topic from the dropdown list above.
Hover over linkages (+) to view relationship between elements.

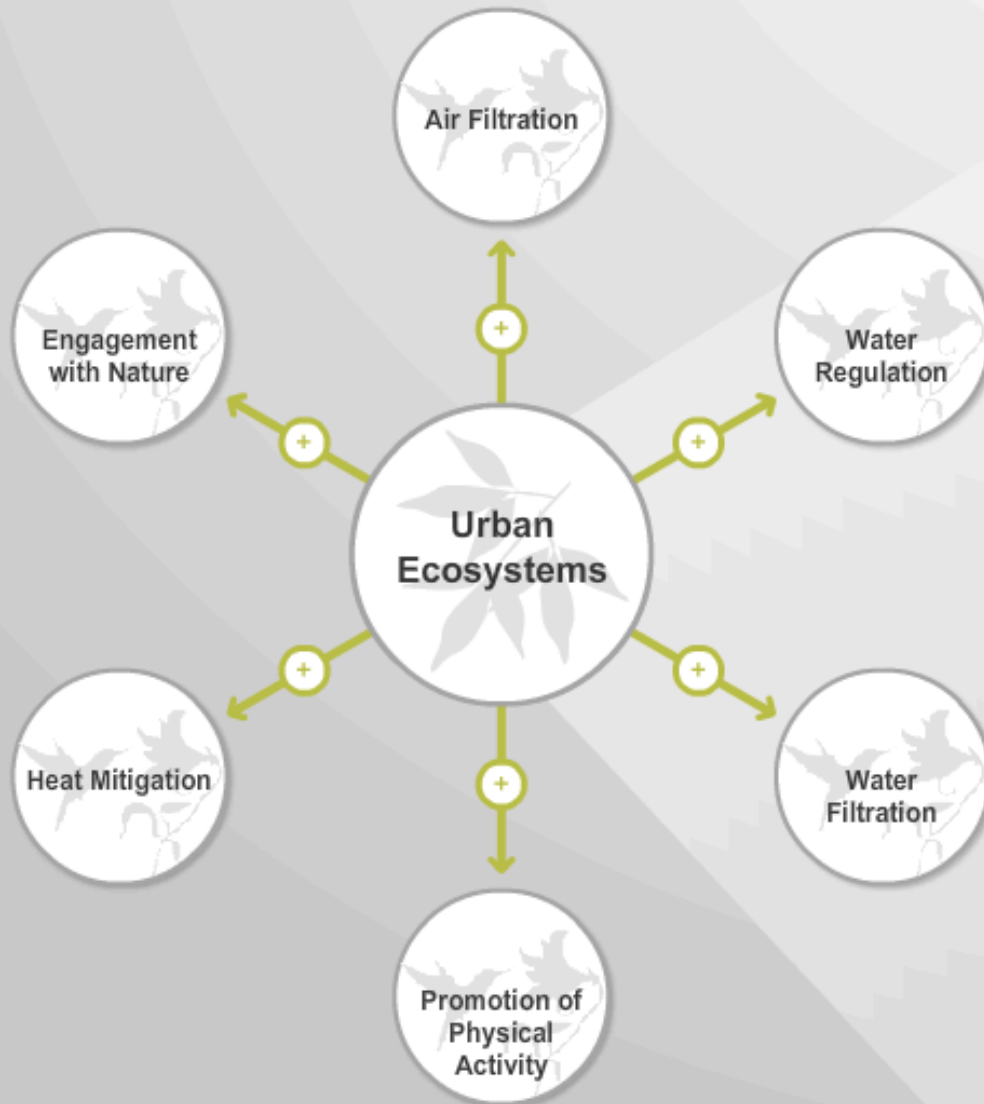


Details

Description

An urban ecosystem is a dynamic system that contains both built and natural elements on a regional scale. In an urban ecosystem, human, plant and animal communities are situated within an urban environment. Urban ecosystems can mimic the function of natural ecosystems and thus provide their own important ecosystem services that contribute to human well-being in those urban areas. Various green environments such as shade trees, urban green spaces and urban forests can exist within a single urban region. The services provided by urban ecosystems include filtering water runoff, providing areas for physical activity and recreation such as hunting and bird watching, and mitigating the Urban Heat Island effect by reducing heat absorption from surfaces.

Click a topic bubble or choose a topic from the dropdown list above.
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Forests

Urban Ecosystems

Wetlands

--- Health Outcome ---

ADHD

Aggression

Anxiety

Arthritis

Asthma

Birth Outcomes

Details

Description

An urban ecosystem is a natural or semi-natural area within an urban region. Urban ecosystems provide a range of ecosystem services to their own residents and to those in surrounding environments such as shade trees, urban green spaces and urban forests can exist within a single urban region. The services provided by urban ecosystems include filtering water runoff, providing areas for physical activity and recreation such as hunting and bird watching, and mitigating the Urban Heat Island effect by replacing heat-absorbing impervious surfaces and increased shading from shade trees.

Citations of Key Studies

Guidotti. 2010; Hancock. 2002



Eco-Health Relationship Browser Bibliography

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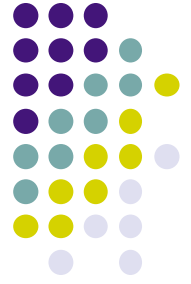
Abbey DE, N Nishino, WF McDonnell, et al. 1999. Long-term inhalable particles and other air pollutants related to mortality in nonsmokers. *Am. J. Respir. Crit. Care Med.* 159(2): 373-38.

Akbari H, DM Kurn, SE Bretz, JW Hanford. 1997. Peak power and cooling energy savings of shade trees. *Energy and Buildings* 25(2): 139-48.

Adams P, GE Hendershot, MA Marano, eds. 1999. Current estimates from the National Health Interview Survey, 1996. Hyattsville, MD: US Department of Health and Human Services, Public Health Service, Office of Health Research, Statistics and Technology. National Center for Health Statistics; 1999 (200): 1 - 203.

Almanza E, M Jerrett, et al. 2012. A study of community design, greenness, and physical activity in children using satellite, GPS and accelerometer

Urban Greening & Health Evidence Framework



How do we fund city trees & urban greening?

- **taxes from property assessments & property sales excise taxes**
- **utility fees :: stormwater, electricity**
- **special fees districts**
- **avoided health costs of medical treatments, businesses & institutions**
- **expanding partnerships :: new committed collaborators**

Human Dimensions of Urban Forestry and Urban Greening

featuring research on peoples'
perceptions and behaviors
regarding nature in cities

Green Cities: Good Health

human health & well-being research

Projects Director

Kathleen L. Wolf, Ph.D.



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.

Urban Forestry and Human Benefits

More resources, studies and links . . .

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