



Metro Nature Design for Public Health :: Urban Ecosystem Services

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overview

assertions about urban ES
human health & wellness evidence
portal – Green Cities: Good Health
planning/design for co-benefits
urban cultural ES

Ecosystem Services

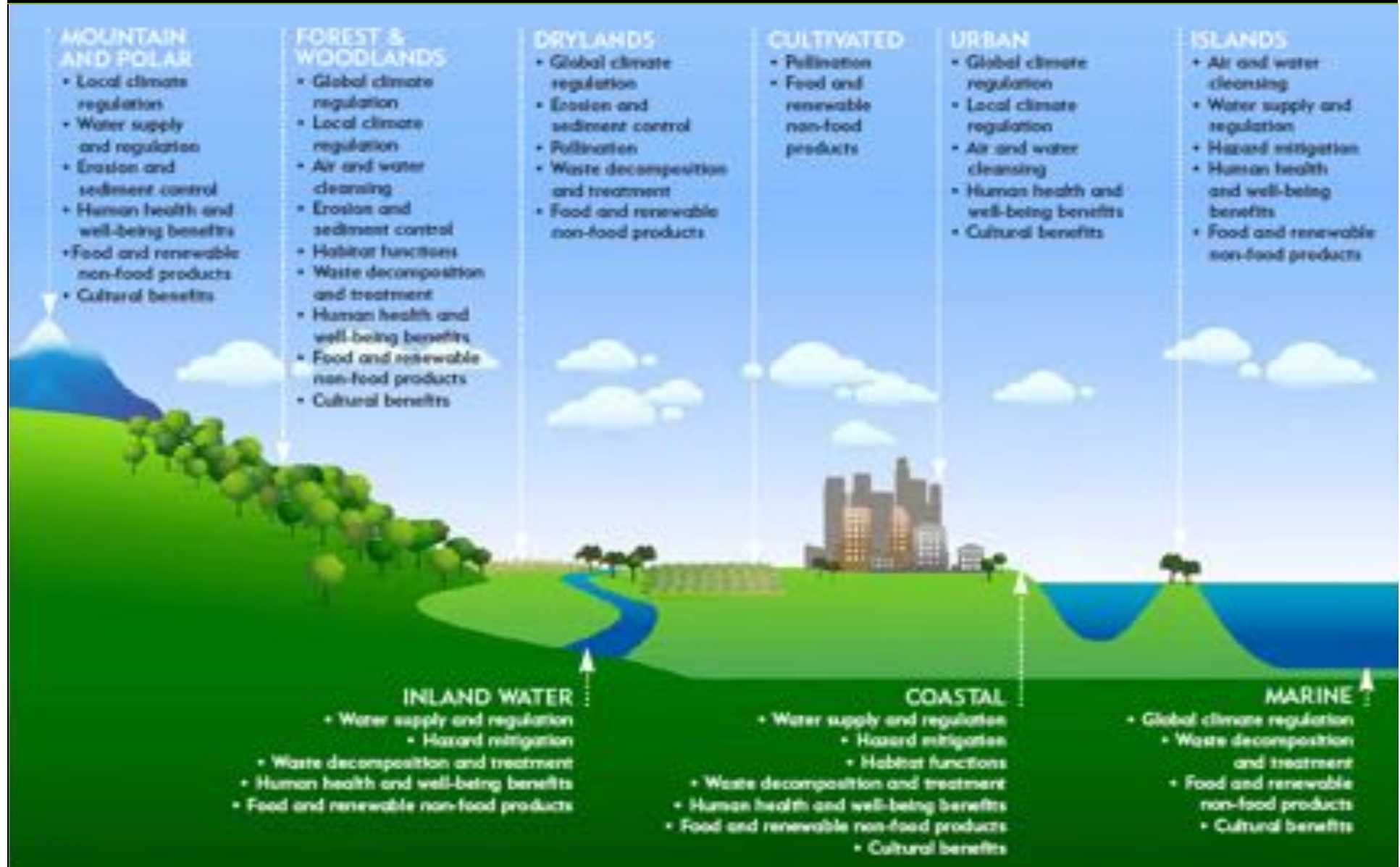


ECOSYSTEM SERVICES	
Supporting Services Nutrient cycling Soil formation Primary production	Provisioning Services Food (crops, livestock, wild foods, etc...) Fiber (timber, cotton/hemp/silk, wood fuel) Genetic resources Biochemicals, natural medicines, pharmaceuticals Fresh water
	Regulating Services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

**Millennium
Ecosystem
Assessment**

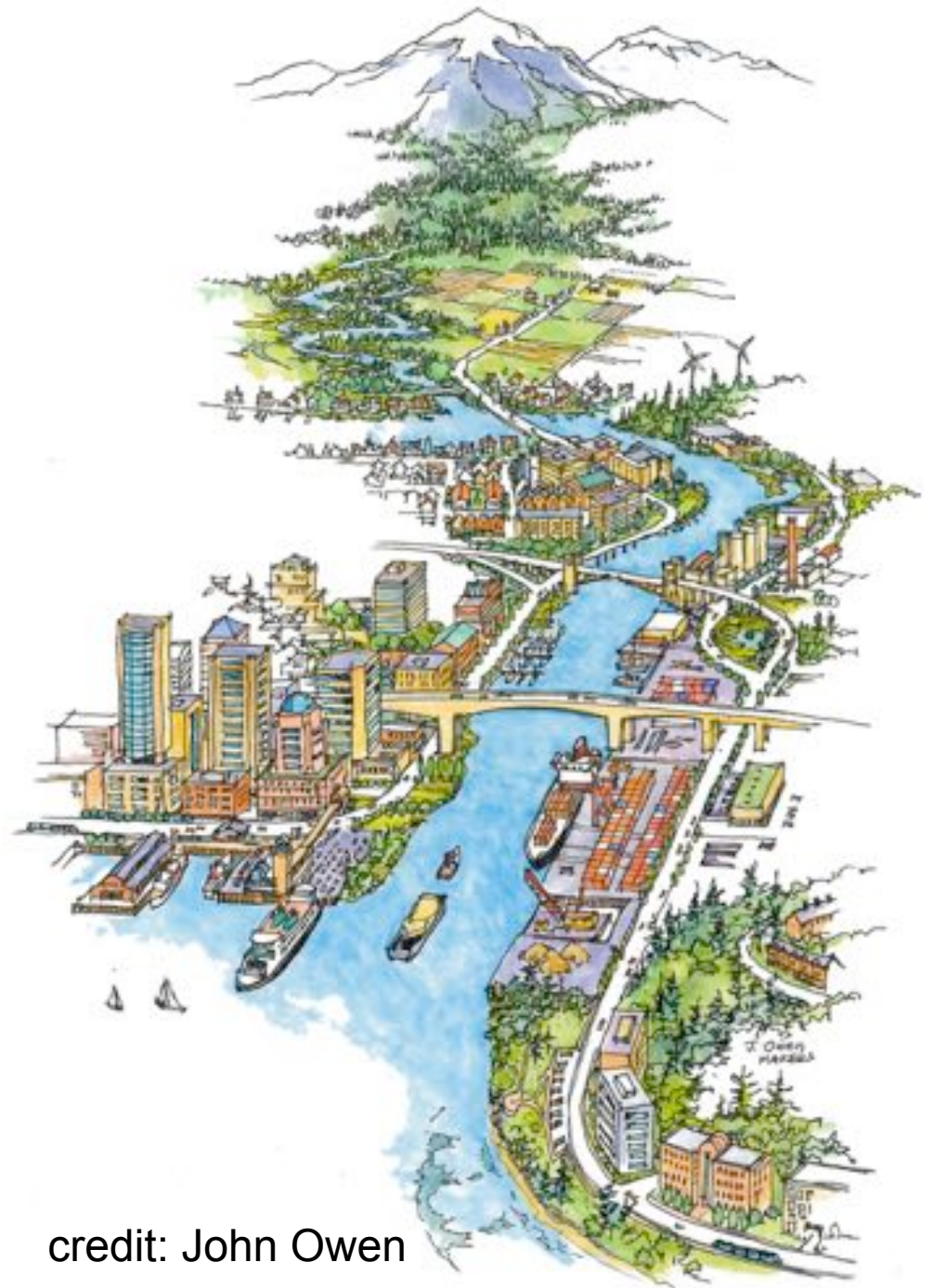
2005

Landscape Gradient :: *Ecosystem Services*



Urban/Rural Systems

- socio-ecological systems
- diverse ecosystem services
- benefits transfer across gradient



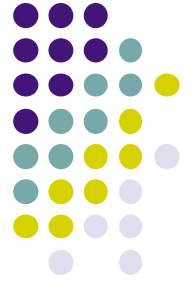
credit: John Owen

Health & Well Being Cultural Ecosystem Services



‘nearby nature’ benefit passive experiences






**in the
background
of public
attentions**

**‘nearby nature’
benefit
active
engagement**

credit: EarthCorps, Seattle





cultural ecosystem services in cities :: evidence

WHO health definition



*a state of complete
physical, mental, and social well-being
and not merely the absence
of disease or infirmity (1946)*

Research Review and Summaries

www.greenhealth.washington.edu



Sponsors:

USDA Forest Service, U&CF Program

University of Washington

NGO partners



thanks!

to U of WA students:

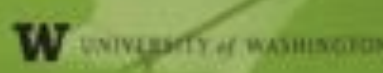
Katrina Flora

Mary Ann Rozance

Sarah Krueger



Green Cities: Good Health



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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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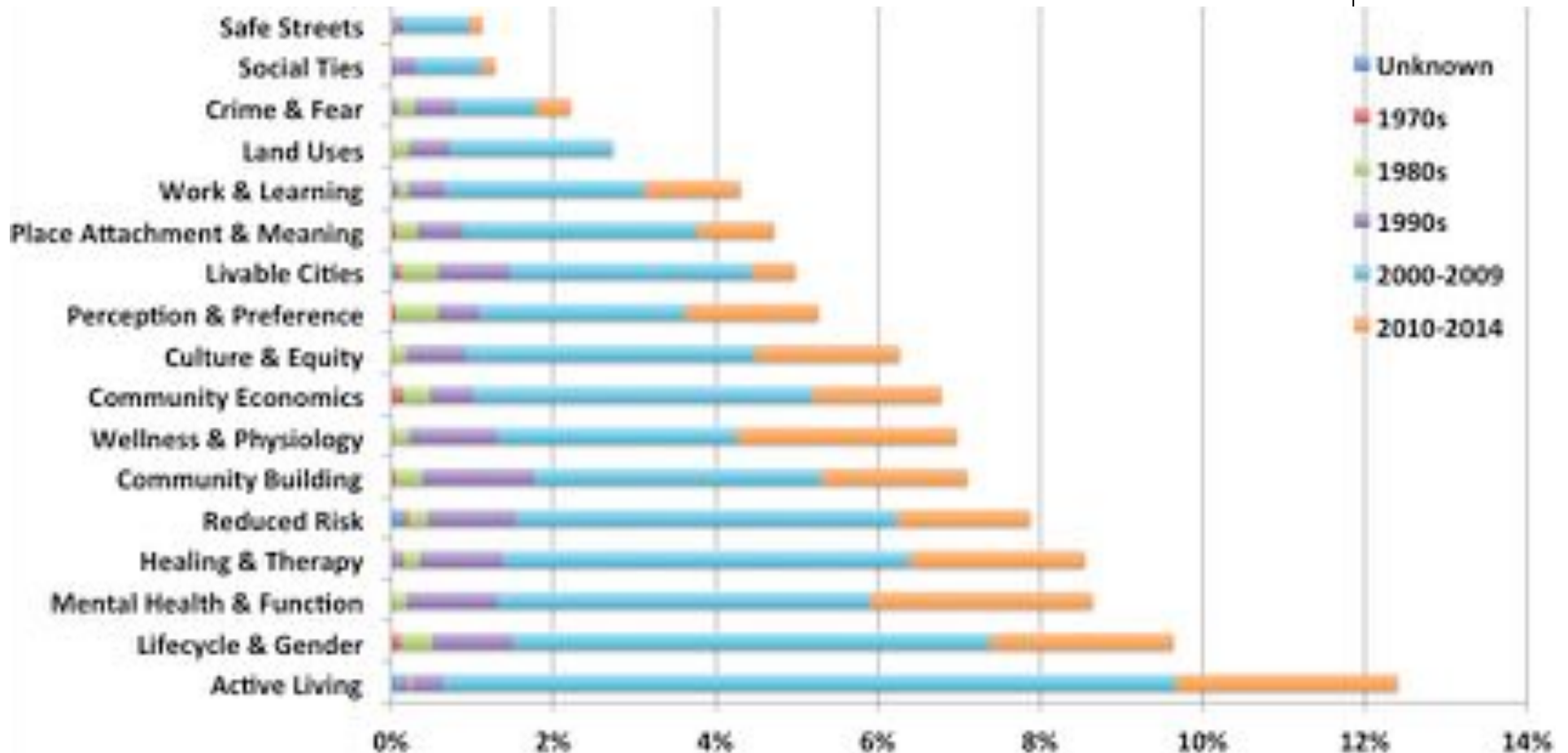


street trees boost market value of houses, providing tax revenue for communities



Metro Nature :: Human Health & Well Being

> 3,000 articles in database



% distribution of entire database



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*



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



Elders: mobility & social connections



Metro Nature & Health Evidence Framework

cultural ES:
identities
capabilities
experiences

Fish & Church, 2014





urban planning & management for eco services co-benefits

urban tree canopy assessments

structure
benefit/service
value



Reducing Stormwater Runoff

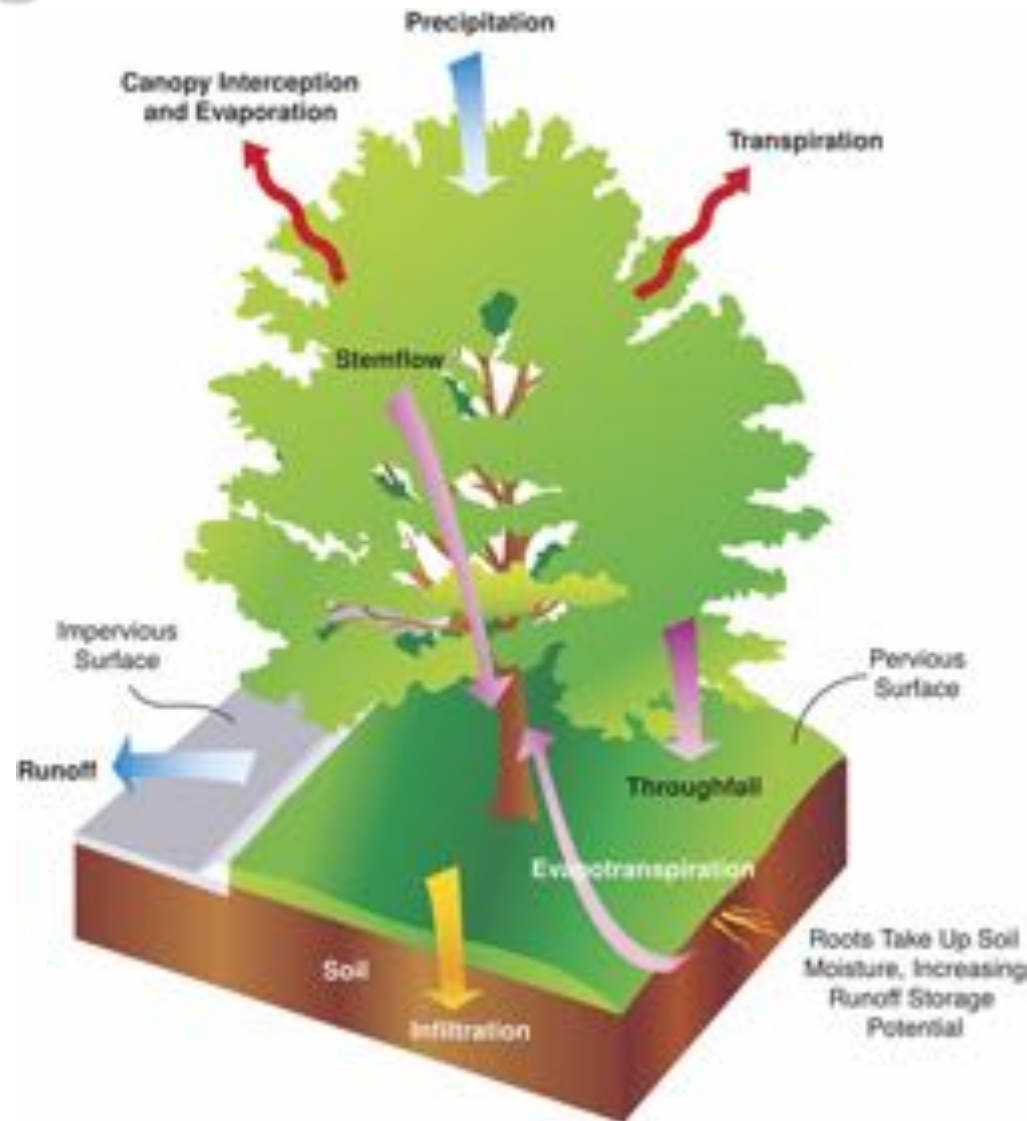


Image courtesy of the Center for Urban Forest Research

Stormwater Management



Pierce County WA, Chambers Creek Properties



Pierce County WA, Chambers Creek Properties - 4 year growth

stormwater management



Parks & People Foundation, Baltimore



Tanner Springs Park

Portland OR



linked to active living network



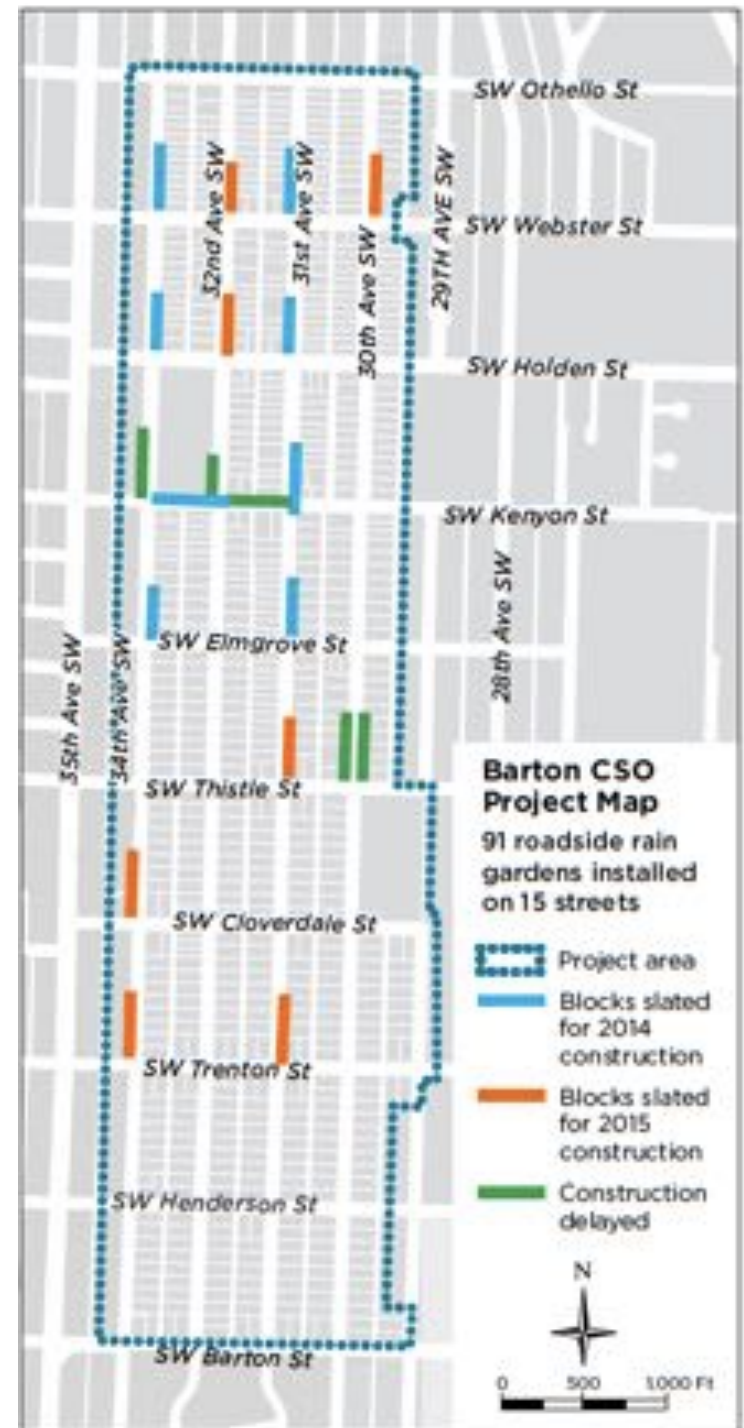
**neighborhood
social cohesion**

**environmental
education &
social learning**



New Study

- Seattle green infrastructure installation - 2016
- eco stormwater management
- human health & wellness
- pre/post analysis
- measures?
property value, physical activity, social capital, mental health, school performance





**urban cultural ES
deeper experiences/intangibles?**

The Ancient Tree Forum

Windsor Great Park tour (UK)



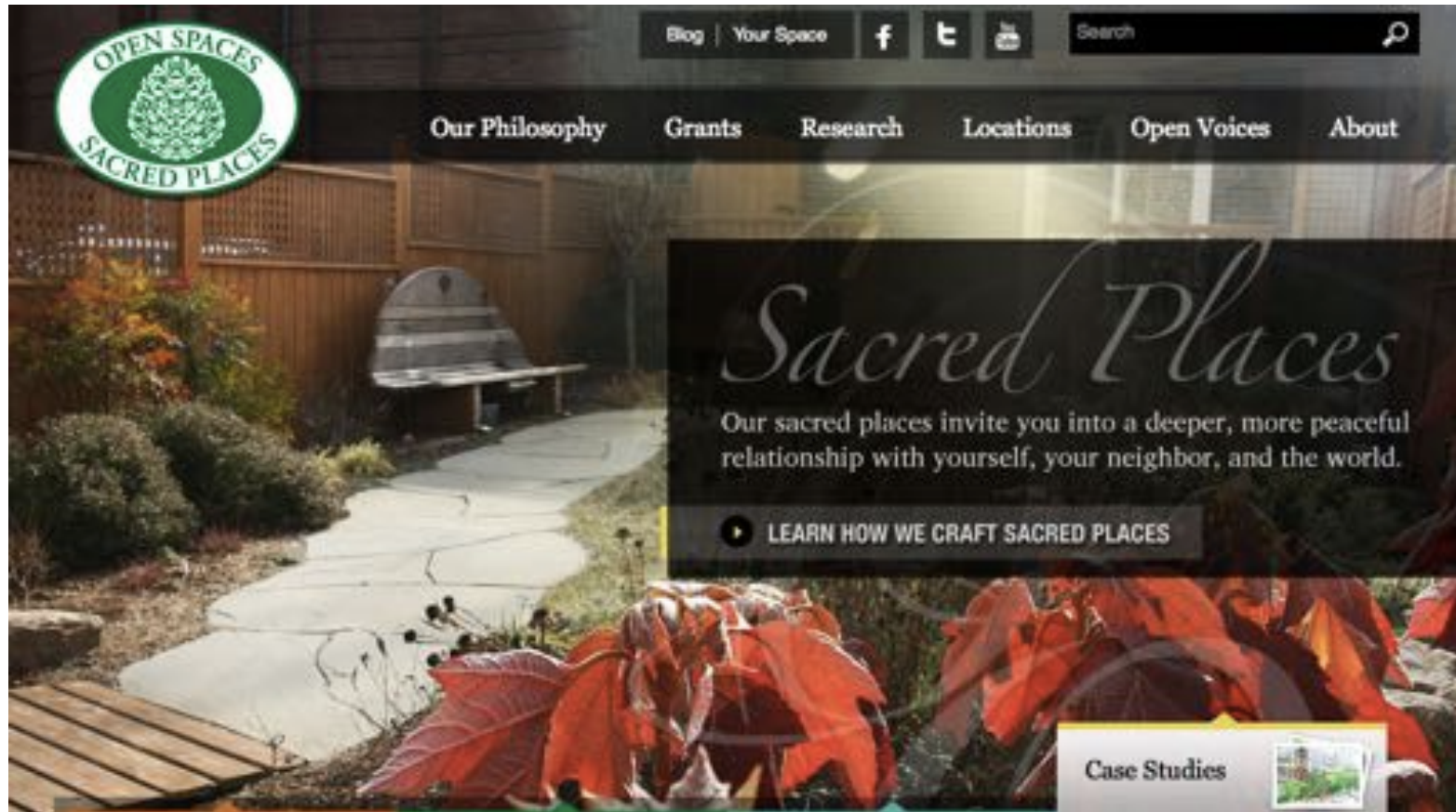








TKF Foundation Annapolis MD



public green spaces that please the eye,
nourish the soul, and help renew communities

Design Elements



 Portal




 Path



 Destination



 Surround

NatureSacred :: Open Spaces Sacred Places

portal :: path :: surround :: destination



portal :: path :: surround :: destination



Nature and Mindfulness

- focus
- soft fascination
- undirected attention



credit: Michael Hellgren



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

Grossman et al. 2004. Mindfulness-based Health Benefits. J. of Psychosomatic Research



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



Summary

- evidence of urban forests/metro nature for human health and wellness
- evidence portal: Green Cities: Good Health
- ecosystem services co-design for co-benefits
- ‘intangibles’ translation to measureable outcomes (of great importance!)

www.naturewithin.info



College of the Environment University of Washington

Human Dimensions of Urban Forestry and Urban Greening

featuring research on peoples' 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.
- Urban Forestry and Human Benefits**
More resources, studies and links . . .

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

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