



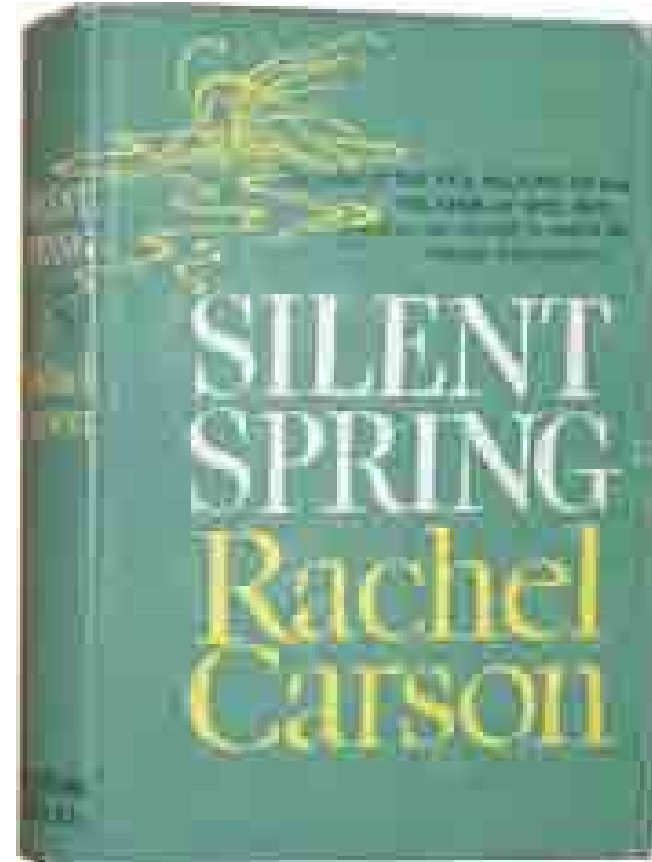
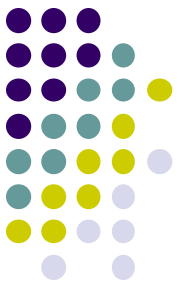
Landscape Benefits: Balancing Risk and Livable Spaces

Kathleen Wolf, Ph.D.
Research Social Scientist

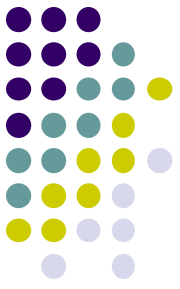
University of Washington
College of the Environment

October 2012

Rachel Carson (1907-1964)



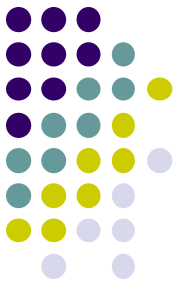
1962



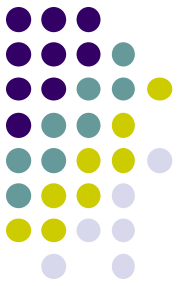
A Remarkable Career

- aquatic biologist, U.S. Bureau of Fisheries
- 1950s full time nature writer
- 1951 *Sea Around Us*, National Book Award
- *The Edge of the Sea*, *Under the Sea Wind*
- 1962 *Silent Spring*, national pesticide policy
- launched grassroots environmental movement
- creation of the Environmental Protection Agency

Pervasive Pesticides



Environment = Toxin, Risk



Love Canal
Niagara



River, OH



(Associated Press)



Environment & Health Boost

Review and Special Articles

Beyond Toxicity Human Health and the Natural Environment

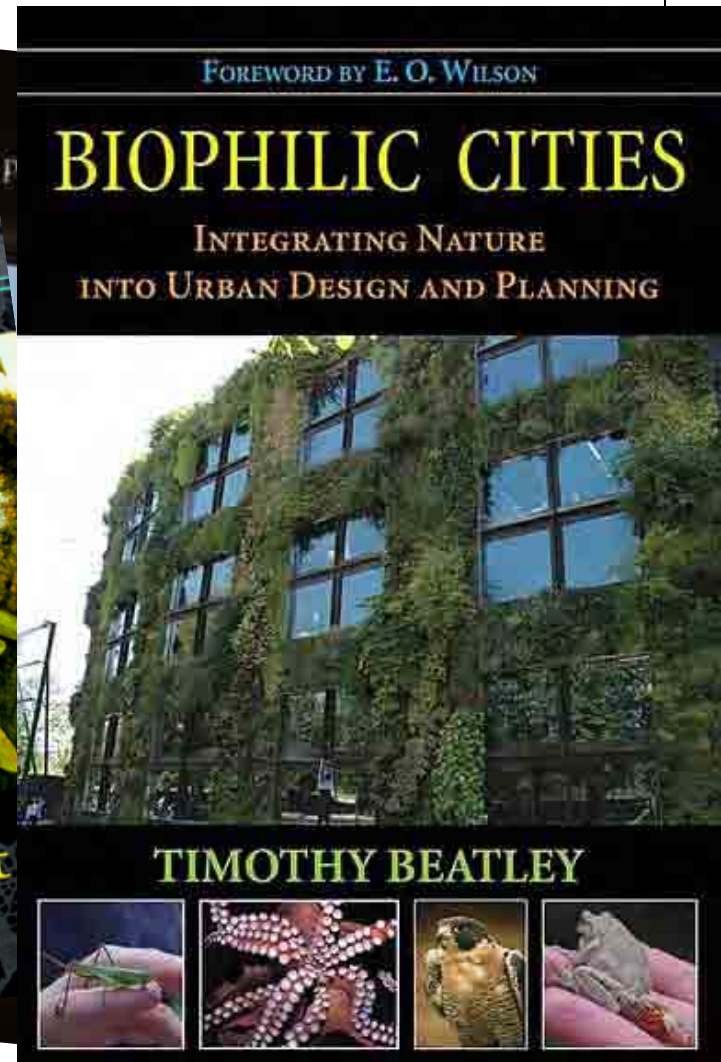
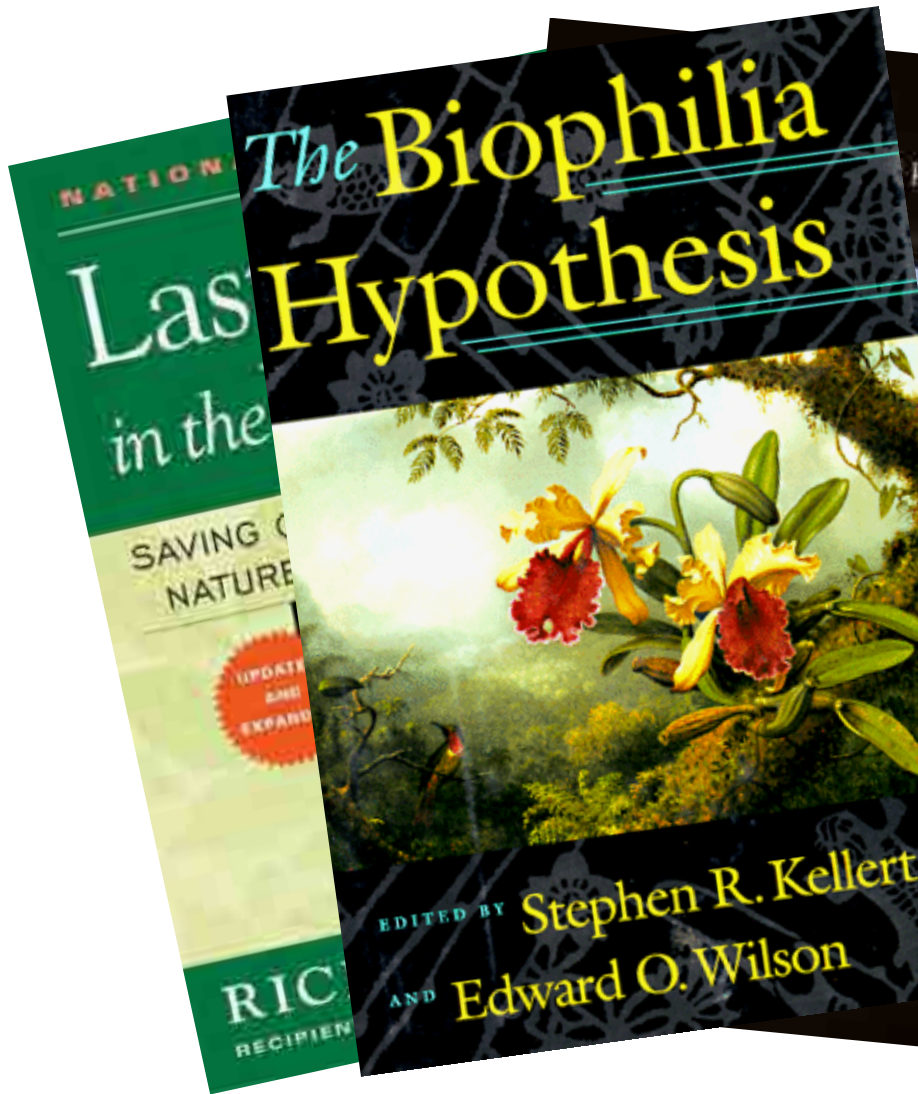
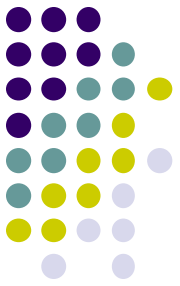
Howard Frumkin, MD, DrPH, FACP, FACOEM

Abstract: Research and teaching in environmental health have centered on the hazardous effects of various environmental exposures, such as toxic chemicals, radiation, and biological and physical agents. However, some kinds of environmental exposures may have positive health effects. According to E.O. Wilson's "biophilia" hypothesis, humans are innately attracted to other living organisms. Later authors have expanded this concept to suggest that humans have an innate bond with nature more generally. This implies that certain kinds of contact with the natural world may benefit health. Evidence supporting this hypothesis is presented from four aspects of the natural world: animals, plants, landscapes, and wilderness. Finally, the implications of this hypothesis for a broader agenda for environmental health, encompassing not only toxic outcomes but also salutary ones, are discussed. This agenda implies research on a range of potentially healthful environmental exposures, collaboration among professionals in a range of disciplines from public health to landscape architecture to city planning, and interventions based on research outcomes.

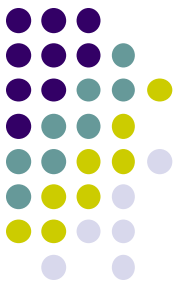
Medical Subject Headings (MeSH): animals, ecology, environmental health, nature, plants, trees (Am J Prev Med 2001;20(3):234-240) © 2001 American Journal of Preventive Medicine

American Journal of Preventive Medicine, 2001

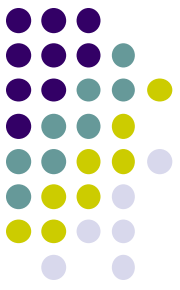
Nature :: From Poison to Necessity



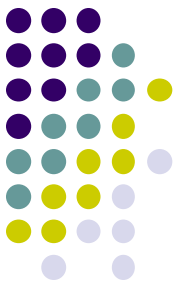
Restorative Nature Beyond the City



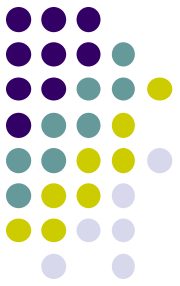
Evidence about the importance of ‘nearby nature’



Finding that study



Research Reviews



Urban Forestry/Urban Greening Research

Green Cities: Good Health

UAS
HILLEN A. COHEN SCHOOL OF FORESTRY
W 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



on-line
resource

summaries
complete:
November 2012

www.greenhealth.washington.edu


[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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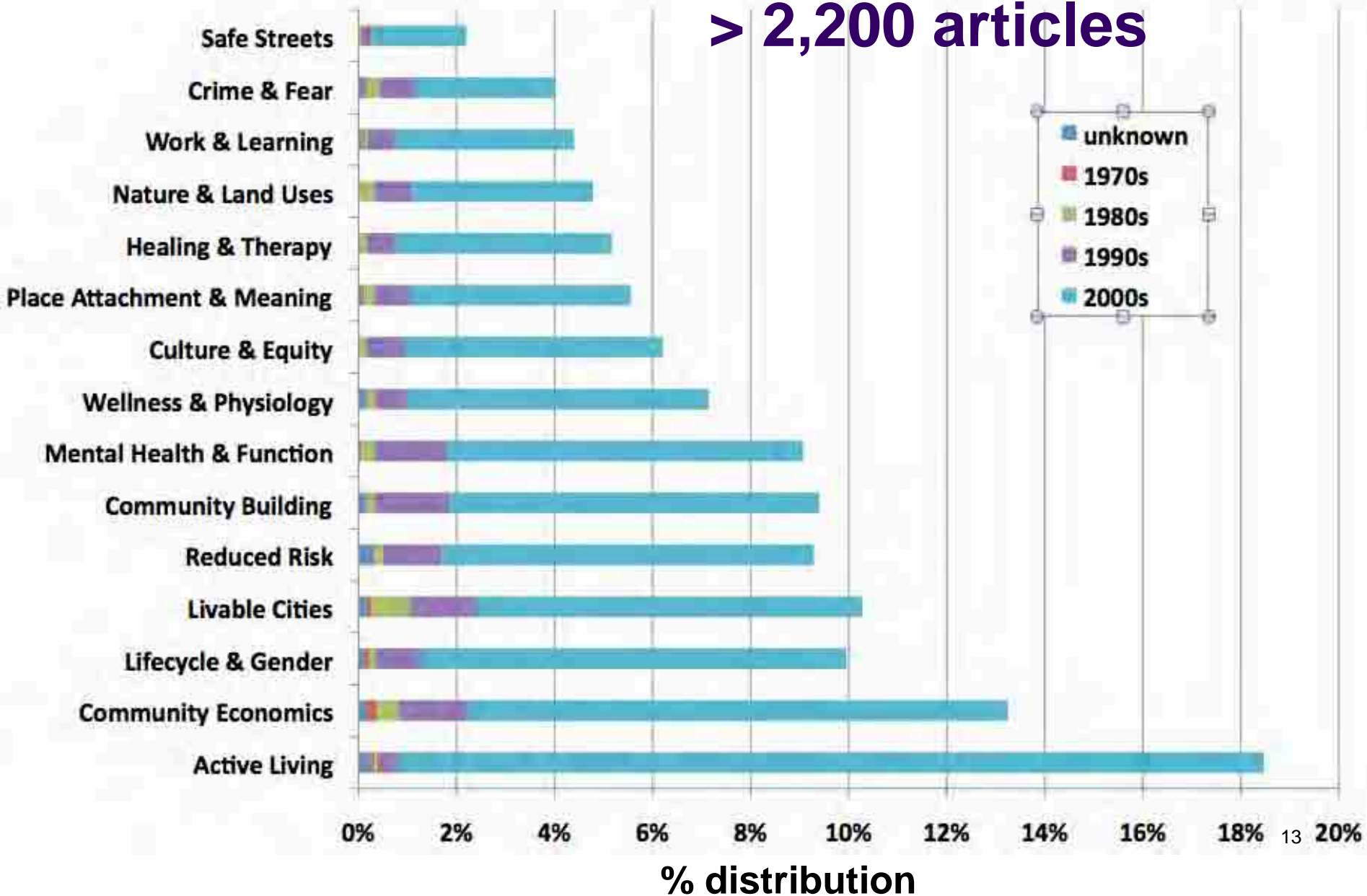

street trees boost market value of houses, providing tax revenue for communities



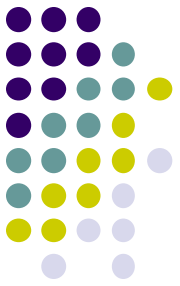
Urban Green :: Human Health & Well Being



> 2,200 articles



Research Review and Summaries



Sponsors:
University of Washington
USDA Forest Service, U&CF Program
NGO partners

thanks to U of WA
students:
Katrina Flora
Mary Ann Rozance

Urban Forestry/Urban Greening Research

Green Cities: Good Health

UAS UNIVERSITY OF WASHINGTON

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- Active Living
- Healing & Therapy
- Mental Health & Functioning



The Evidence of Nature, Well-Being and Livable Spaces

examples from the research



The Evidence of Nature, Well-Being and Livable Spaces

**well managed forest canopy
in central business districts**

Trees & Retail Environments Research



Trees & Shopper Environments Research

- Research Questions •

 - trees and visual quality?

 - trees and consumer behavior?

 - trees and product pricing?

- **Methods:**

 - mail out/in surveys**

 - national or local sample**

 - residents/nearby city residents**

partners: U of Washington, NGOs, business organizations
funded by USDA Forest Service

Image Categories (sorted by ratings)

**Pocket Parks
mean 3.72
(highest)**



**Scale : 1=not at all,
5=like very much, 26
images**



**Full Canopy
mean 3.63**

**Enclosed
Sidewalk
3.32**



**Intermittent
Trees
2.78**



No Trees
mean 1.65
(lowest)

(high - 3.72)



1. Place Perceptions

- Place Character
- Interaction with Merchants
- Quality of Products

2. Patronage Behavior

- travel time, travel distance
- duration & frequency of visits
- willingness to pay for parking

3. Product Pricing

- higher willingness to pay for all types of goods
- higher in districts with trees – 9-12%



Place Marketing

**Relationship
Marketing**



The Evidence of Nature, Well-Being and Livable Spaces

nature and mental performance

Attention Restoration Theory

Rachel & Stephen Kaplan U of MI



directed attention fatigue



Kaplan, R. 1993. Landscape
and Urban Planning.

Workplace Nature Views

- **Well-being**
 - desk workers without view of nature reported 23% more ailments in prior 6 months
- **Job Satisfaction**
 - less frustrated and more patient
 - higher overall job satisfaction and enthusiasm

Nature Response Neuroscience

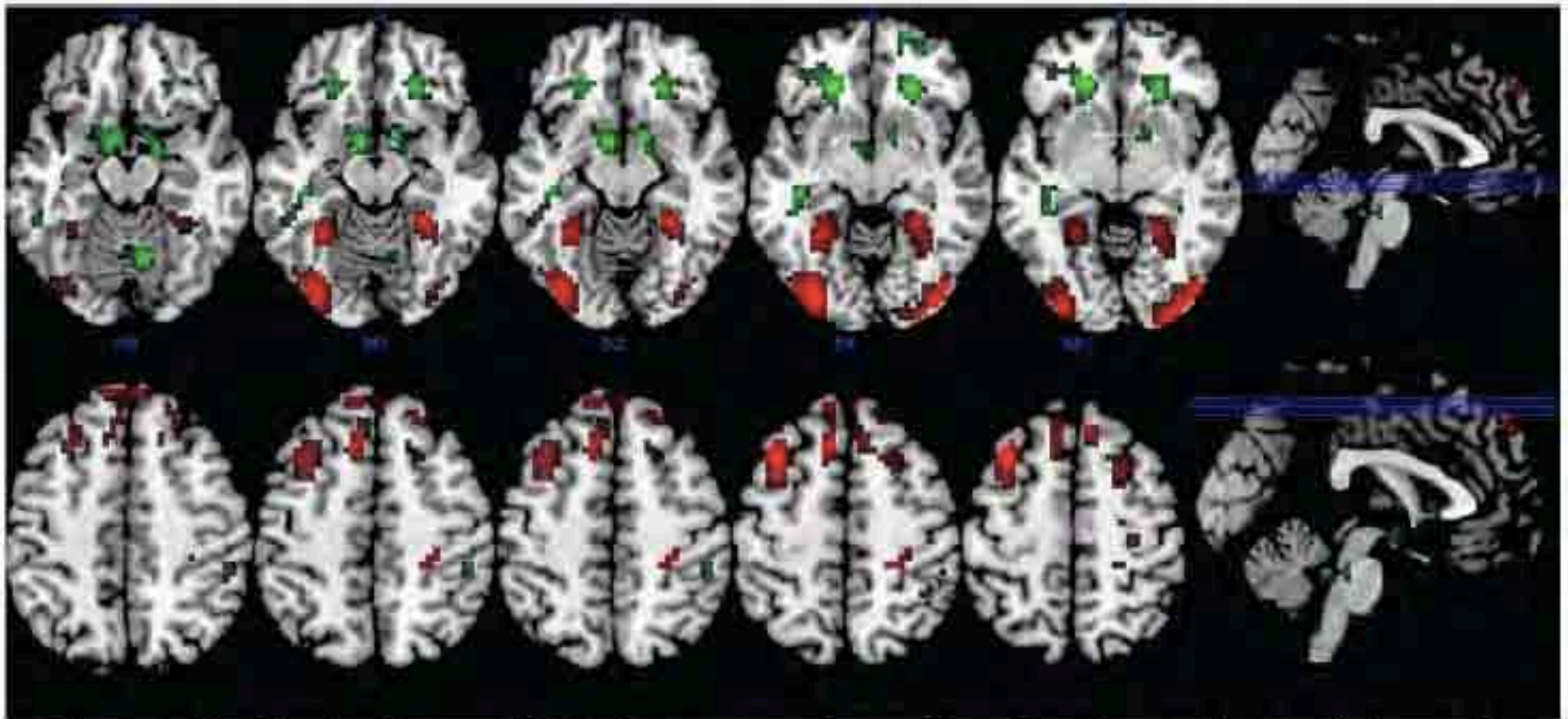
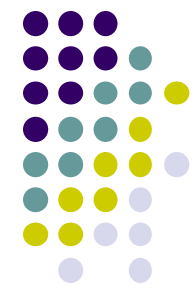


Figure 5: Brain Areas that show greater activation for nature pictures in green, and areas that show greater activation when viewing the urban pictures in red. Activations are displayed with a $t\text{-stat} > 2.0$.

Horticulture Therapy & Brain Activity





方法

実験1:

課題①: 2種の土を混ぜる

課題②: 土を鉢に入れる

課題③: 花を鉢に植える

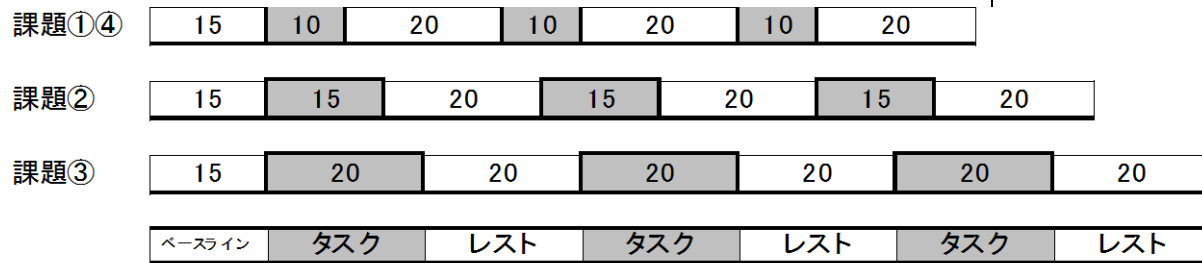


図. 各課題の手順(数字は秒)



課題①



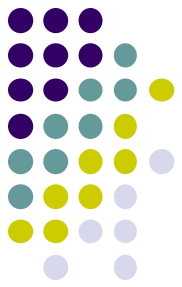
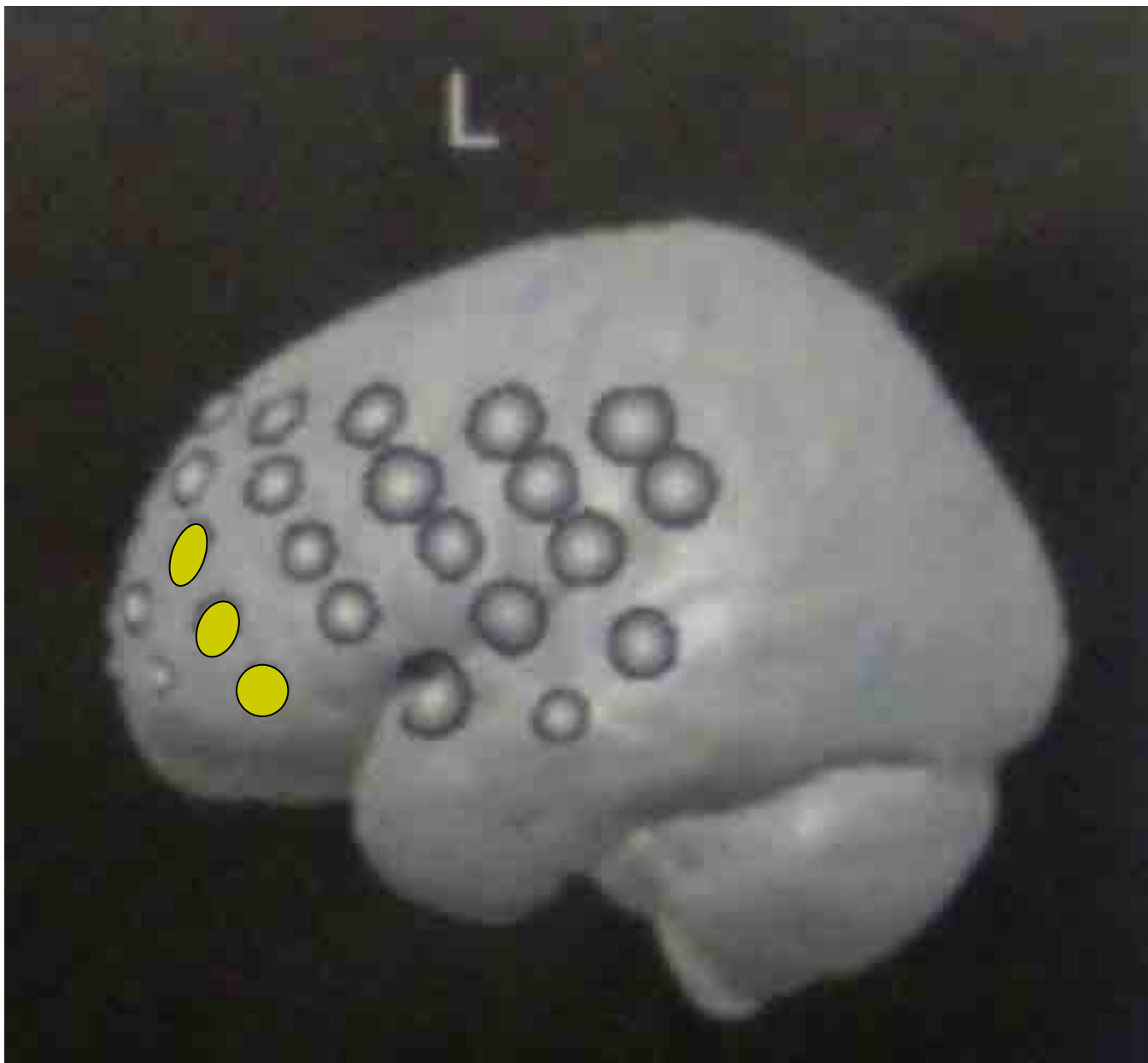
課題②



課題③



フォルダ装着位置は、額の正中位で且つ眉から1cm上とした

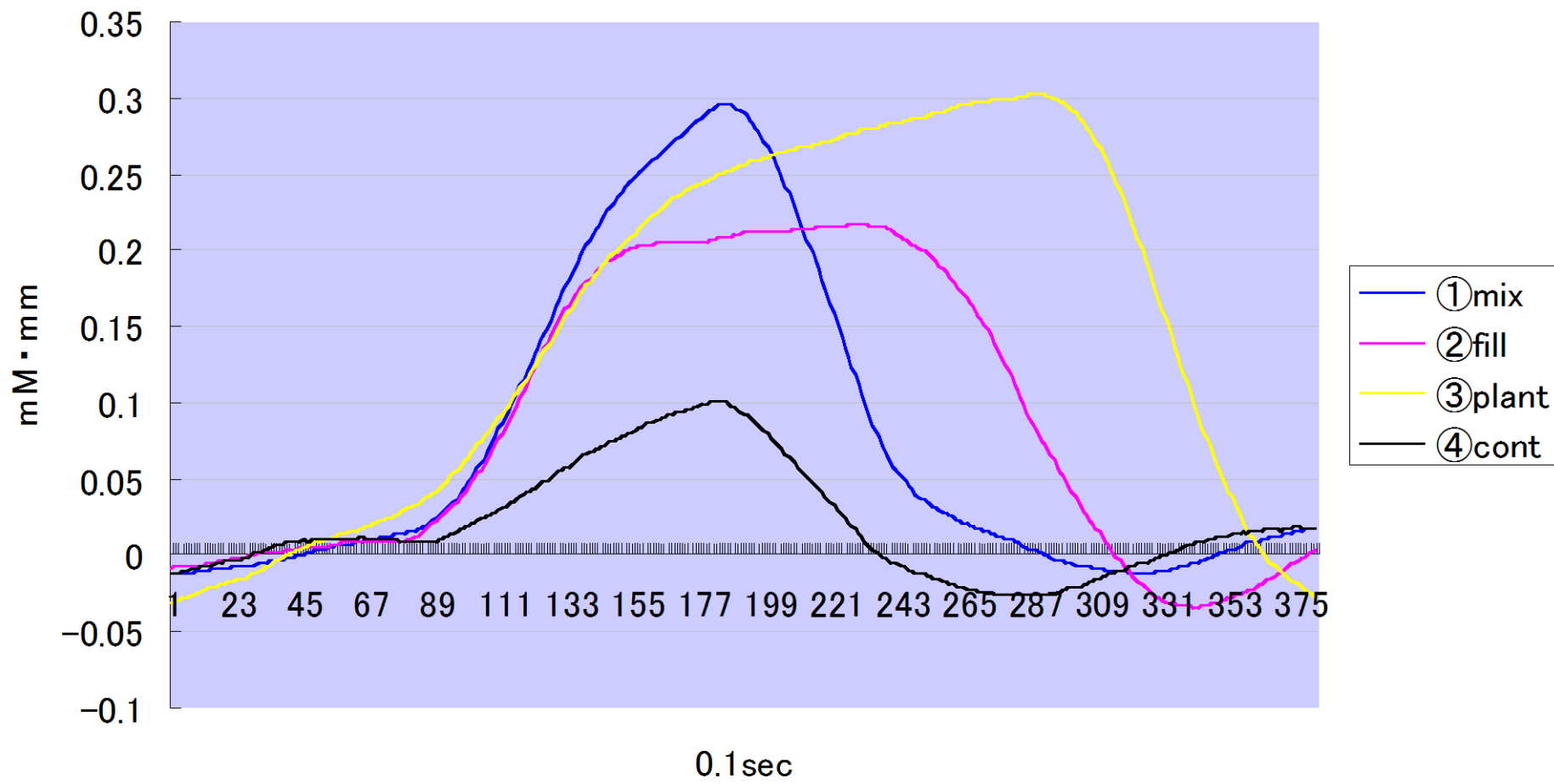


写真引用 福田正人, 三國雅彦. 近赤外線スペクトロスコピーNIRSによる統合失調症と感情障害の診断.

図14. NIRSチャンネルと標準脳との対応. 精神医学49(3). P241. 2007.



園芸作業中のOxy-Hb濃度変化

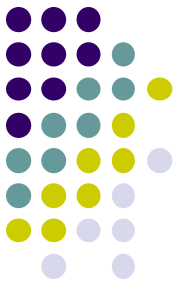




The Evidence of Nature, Well-Being and Livable Spaces

nature and healing or therapy

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



**health
care \$\$
savings**

healing gardens
soothing
distracting
calm focus

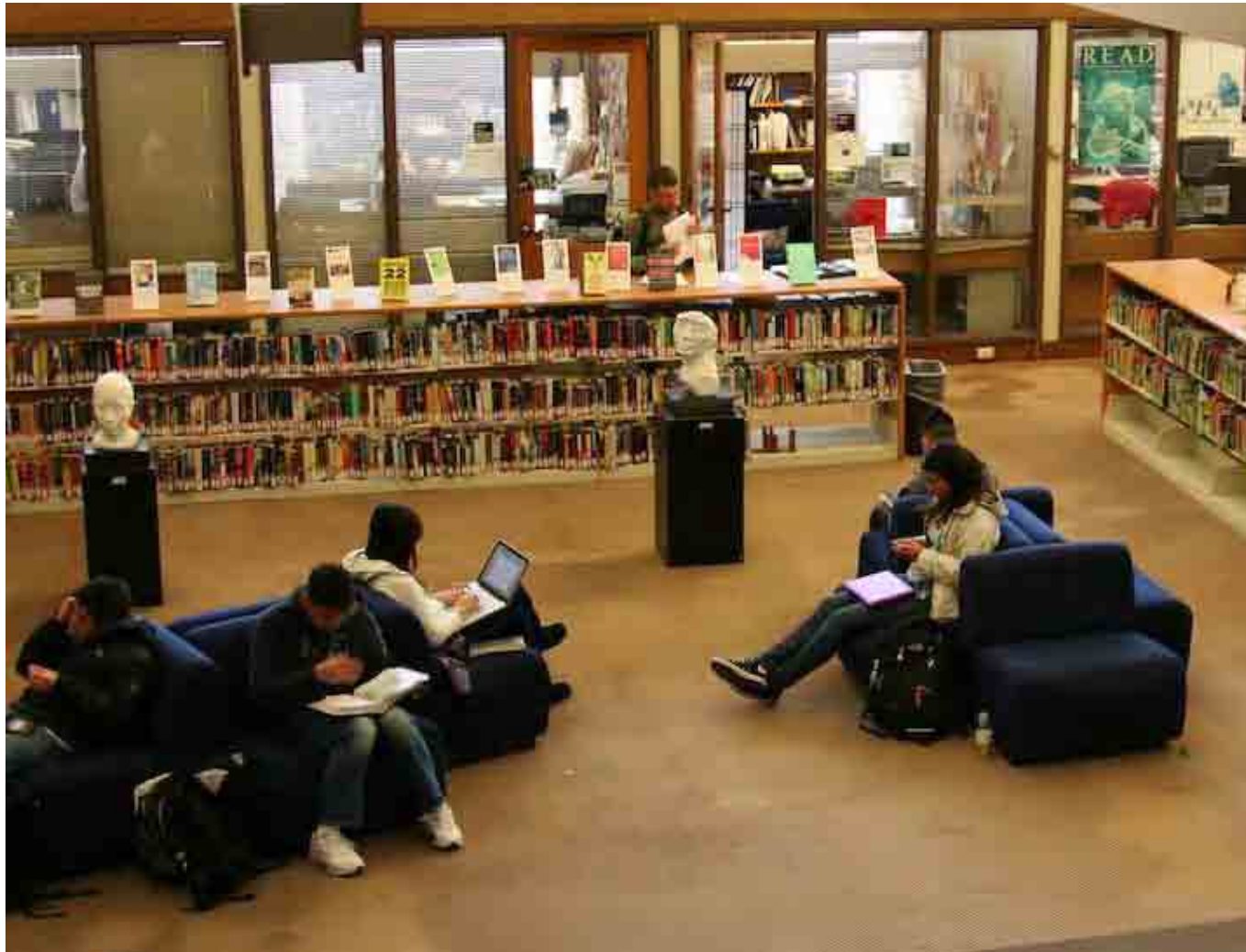
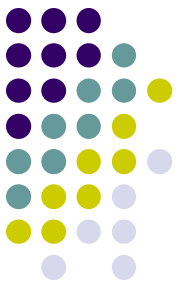


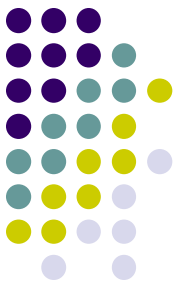


The Evidence of Nature, Well-Being and Livable Spaces

nature, schools, & learning

School & Learning

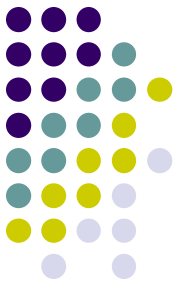




the nature advantage

- College students with more natural views from their dorm windows
 - scored higher on tests of capacity to direct attention
 - rated themselves as able to function more effectively

Tennessen & Cimprich. 1995.
Journal of Environmental Psychology



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



Parks & People Foundation, Baltimore

nature recovery & schools



Reading Circle





Parks & People Foundation, Baltimore

first phase - reading circle



Parks & People Foundation, Baltimore

nature recovery & schools

Parks & People Foundation, Baltimore

planning skills & efficacy




THE SUSTAINABLE SITES INITIATIVE™



SITES™: Measuring and Rewarding Sustainable Landscapes



THE SUSTAINABLE SITES INITIATIVE™



An interdisciplinary effort to create voluntary national guidelines and a rating system for sustainable land design, construction and maintenance practices for landscapes of all types, with or without buildings



AMERICAN SOCIETY OF
LANDSCAPE ARCHITECTS

*ASLA Library & Education
Advocacy Fund*



Lady Bird Johnson

Wildflowercenter

THE UNIVERSITY OF TEXAS AT AUSTIN



UNITED STATES
BOTANIC GARDEN

For more information: visit www.sustainablesites.org
or email info@sustainablesites.org

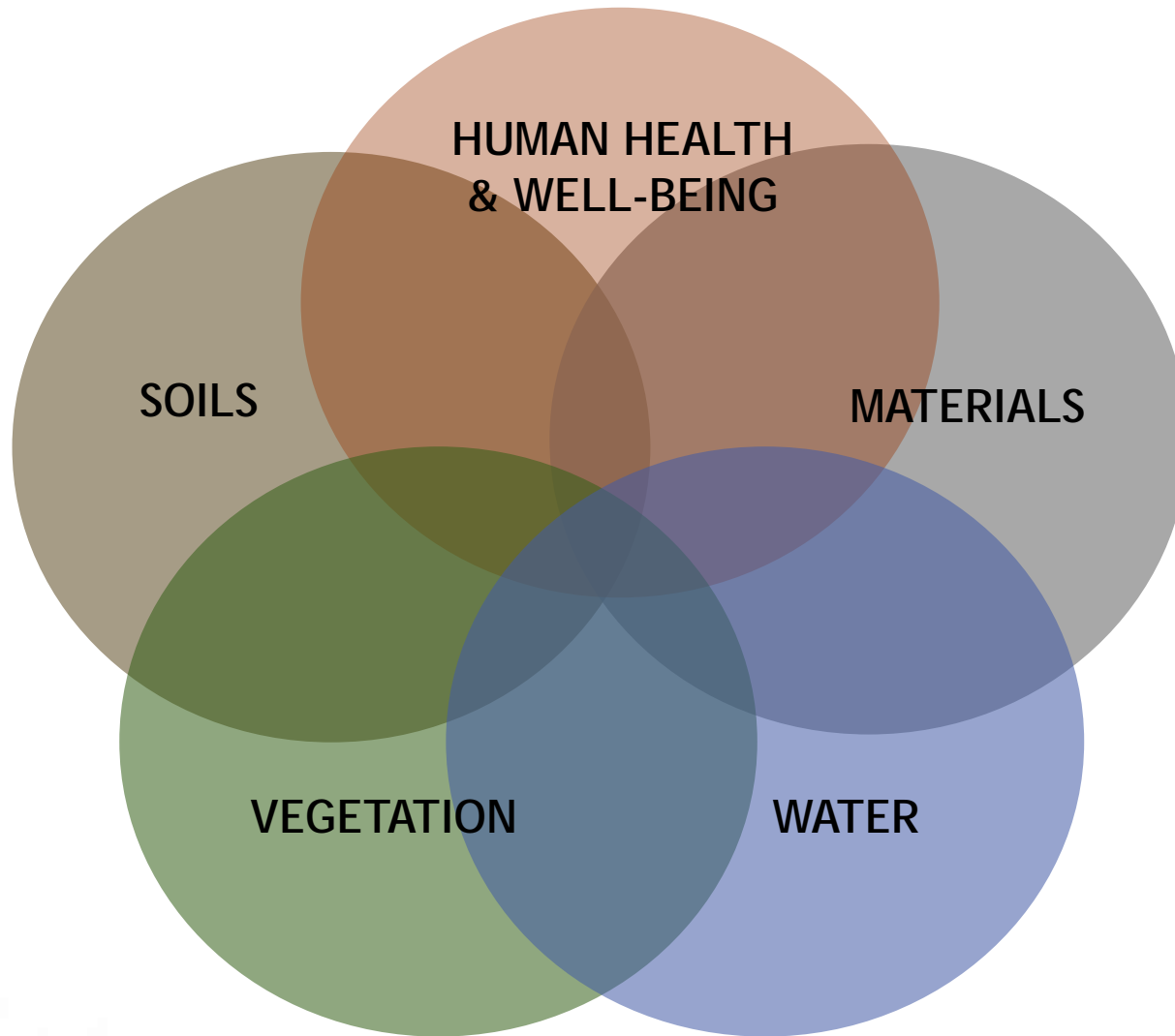


LANDSCAPES GIVE BACK

B E N E F I T S O F S U S T A I N A B L E S I T E S

THE SUSTAINABLE SITES INITIATIVE™

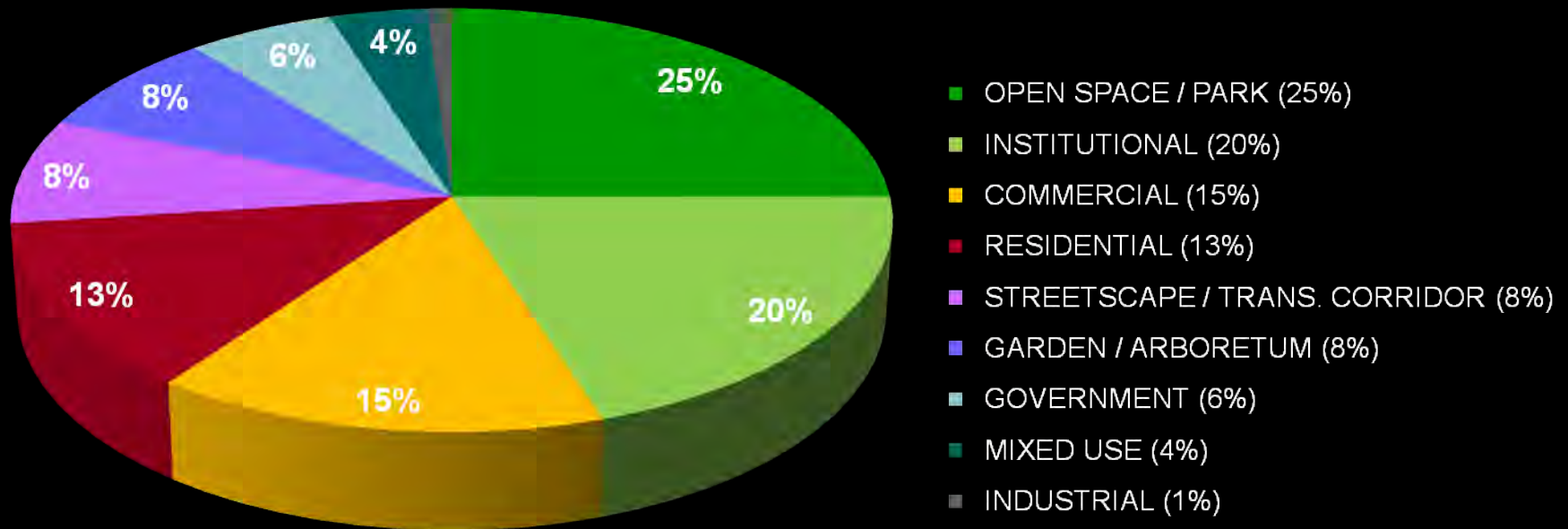
Research & Evidence Based



Project Applications



SITES Pilot Program – Project Types



>150 projects :: two year pilot review

THE SUSTAINABLE SITES INITIATIVE™

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The Sustainable Sites Initiative™ (SITES™) is an interdisciplinary effort by the American Society of Landscape Architects, the Lady Bird Johnson Wildflower Center at The University of Texas at Austin and the United States Botanic Garden to create voluntary national guidelines and performance benchmarks for sustainable land design, construction and maintenance practices. Major funding for the Sustainable Sites Initiative is provided by the Meadows Foundation and Landscape Structures. [Learn more about the initiative](#)



Public Comment Period Opens

SITES has opened a public comment period seeking input on the proposed 2013 Prerequisites and Credits. This incorporates feedback received during the two-year pilot program and additional research from SITES staff and technical advisors. To provide comments, please click [here](#). The public comment period will be open from September 26 - November 5, 2012.

The Green at College Park at The University of Texas at Arlington



The new greenspace at UT Arlington redesigns a brownfield site, turning a past drainage problem into a major site feature and amenity. The 2.6-acre site

public comment on credits & ratings to Nov 5

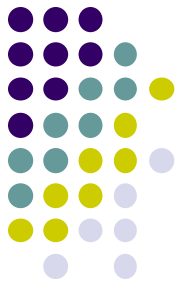


Summary:

history :: nature as risk to nature as necessity

40 years of research about city greening and human health and welfare

credit and recognition for sustainability – SITES



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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