Trees, Mind, and Heart
Enriching Our Cities

Dr. Kathleen Wolf
Research Social Scientist
University of Washington
College of Forest Resources
May 2009
Trees & Heart

seasonal celebration

national relationships
Trees & Heart
hope, peace & inspiration
Trees & Heart
Ann Frank: history, grief, memorial
Trees & Heart
Savannah’s Candler Oak: anger, action
Trees, Mind, and Heart
Enriching Our Cities

heart & mind
intuition to scientific knowledge
trees are necessity, not just amenity!
ALPHA - Awaji Landscape Planning & Horticulture Academy: near Kobe, Osaka, Kyoto
Global Urbanization

1900 - 14% of humanity lived in urban areas, 2000 - 47%
Japan: compact cities
busy
(frantic!)
street life
civic forests
sacred forests
forests of contemplation
“front yards” in Japan
Trees, Mind, and Body
Enriching Human Capital

U.S. productivity
working at our best!
city trees & urban greening research
Natural Capital

tangible materials, resources & products

e.g. wood, ore & minerals, range animals
Ecosystem Services

- intangible
- human life support
- emerging/new markets
City Trees & Nature
Ecosystem Services

- Air pollutants reduction
- Nitrogen, phosphorus and sediment interception
- Carbon emissions reduction & sequestration
- Urban heat-island cooling
- Reduced “bad” ozone
- Stormwater runoff reduction
- Wildlife habitat
Social Science Contributions

Human Capital and Economics

- stock of skills and knowledge embodied in a person’s ability to perform labor so as to produce economic value

- direct - education and training

- indirect – professional development, computer training, medical care plan, life skills workshop
Basis of U.S. Economy?

natural capital – 20th century

human capital – 21st century
Richard Florida
the Creative Class
City Trees & Nature

= human capital investment

= economic value for business & community
City Green &
public health
mental health
healing
therapy
research evidence!
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

310-580,000 deaths per year
$100 billion medical costs (1995)
9.4% of all U.S. medical costs
Obesity Trends* Among U.S. Adults

1985

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)

Source: Behavioral Risk Factor Surveillance System, CDC.
Obesity Trends* Among U.S. Adults

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Source: Behavioral Risk Factor Surveillance System, CDC.
Obesity Trends* Among U.S. Adults
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Source: Behavioral Risk Factor Surveillance System, CDC.
Obesity Trends* Among U.S. Adults
2005

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)

Doubling of adult obesity rate since 1980.

Source: Behavioral Risk Factor Surveillance System, CDC.
children & obesity

ages 6 to 11
A brisk walk in the park keeps Mary II in shape for her dog show. Her owner, Columbia resident Carol Shandorf, got up early to give her 3-year-old Doberman his regular exercise. They typically jog 3 miles in Bartlam Park.
parks, open spaces & trails

need access & facilities
make room for pedestrians
+ walk to school, Naderi et al. 2008, ITE Jrnl
Nature, Human Health & Walkable Neighborhoods

- Environments: Neighborhood Streets (Tokyo)
  - tree-lined streets
  - nearby parks
  - vs. barren streetscapes

- Outcomes: Elderly People & Walking
  - less illness
  - lower mortality rate

walkable places = health & happiness
Roadside Landscape & Traffic Stress Response

- Roadside Features - Driving Simulations
  - Forest, golf course, strip mall

- Physiological Response
  - E.g. heart beat, blood pressure

- Results
  - Nature scenes - return to baseline faster, less response to new stressors
  - Immunization effect

Americans travel 2.3 billion miles per day on urban freeways & highways
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

Workplace Nature Views

Plants in Workplace

- **Productivity**
  - 12% quicker reaction on computer tasks
  - reports of being more attentive

- **Less Stress**
  - lower systolic blood pressure

Lohr et al. 1996. J. of Environmental Horticulture
directed attention fatigue
mental restoration

reflection
typical retail street in urban Japan
Namba Parks, Osaka
view from nearby hotel
interior retail space

ground level
small plazas, retail entry
passive nature experiences
Namba Parks: retail success & nature experience benefits
Wellness & Healing

- Surgery Recovery
  - shorter post-operative stays
  - less use of potent pain drugs, better attitude

- Lifestyle Recovery
  - attentional fatigue restored
  - relationships and career coping

Healing Gardens
- institutional design -
U of WA Hospitals Surgery Pavilion
NIRSによる園芸療法の基礎研究
—園芸が人の前頭連合野に与える影響—
Effects of gardening to frontal cortex

豊田正博1), 杉原式穂1), 柿木達也2)

TOYODA Masahiro, SUGIHARA Shiho, KAKIGI Tatsuya
University of Hyogo
Awaji Landscape Planning & Horticulture Academy

1)兵庫県立大学自然・環境科学研究所
／兵庫県立淡路景観園芸学校
2)兵庫県立西播磨総合リハビリテーションセンター
Elders & Horticulture Therapy
方法
実験2:
課題④: 左右の腕を体の前で弧を描くように動かす

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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

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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.
園芸作業中のOxy-Hb濃度変化
Social Benefits

- studies at the University of Illinois, Landscape and Human Health Laboratory

Dr. Frances Kuo
Research Director

http://www.lhhl.uiuc.edu/
Chicago Public Housing with & without green spaces

Wm. Sullivan & F. Kuo
University of Illinois
lower levels of fear
less violent & aggressive behavior
more self-discipline for girls
reduced ADHD symptoms
better neighbor relationships
better coping with life’s challenges
fewer reported crimes
Trees, Mind, and Body
Enriching Human Capital

What’s Next?
1. human well-being research access
2. Sustainable Sites Initiative
3. Stewardship Mapping-Seattle

thanks to US Forest Service support!
Research Review “lite”

Nature in the City

Urban Livability

Across the ages many people have noted that the experience of nature is an important factor in creating places that are livable and, supportive for humans. Life satisfaction and a positive outlook are the products of encounters with nature and greenery in cities. Read about the research.

RESEARCH THEMES

- Urban Livability
- Place Meaning and Attachment
- Community Capital
- Local Economics
- Social Ties
- Safety and Crime
- Reduced Risk
- Physiology & Health
- Physical Activity & Health
- Healing and Therapy
- Mental Health and Functioning
- Education and Learning
- Lifecycle & Special Populations
- Land Uses

U of WA
USFS
first phase:
July 2009
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The Sustainable Sites Initiative: evidence-based site design
LEED Ratings

- Certified
- Silver
- Gold
- Platinum
Bronx Library
(New York City)

New Construction Certification

score: 34
rating: Silver
ECOSYSTEM SERVICES

All sites **CAN** provide ecosystem services
CURRENT RESEARCH

SOILS

HUMAN HEALTH & WELL-BEING

MATERIALS

VEGETATION

HYDROLOGY
For more information, visit www.sustainablesites.org/cases
PROJECT SCHEDULE

GUIDELINES AND PERFORMANCE BENCHMARKS Draft 2008
Released November 2008

GUIDELINES AND PERFORMANCE BENCHMARKS 2009
Target publication - Fall 2009

RATING SYSTEM
Target publication - 2011

PILOT PROJECTS PHASE
From 2010 - 2012

REFERENCE GUIDE
Target publication - 2012
For more information:
www.sustainablesites.org
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Urban Natural Resources Stewardship: NYC

How do you visualize the overlapping relationships between resources (left) and organizations plotted by STEW MAP (right)?
Natural & Human Capital
Seattle launch: Stew Map
Beauty & more . . .
trees must be a part of our cities!
Trees, Mind, Heart . . . Economic Vitality

- Ecosystem services (e.g. iTREE)
- People are the U.S.’s greatest asset
- Also nurture social & human capital
- City trees & natural resources are essential!

- People think, learn, work well & are healthy?
  = economic vitality!
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.

Urban Forestry and Human Benefits
More resources, studies and links . . .

Research Director
Kathleen L. Wolf, Ph.D.

www.naturewithin.info