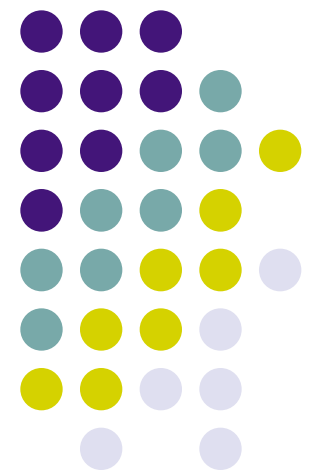
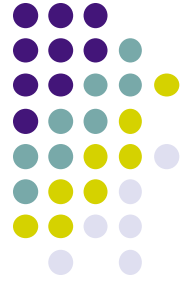


Ecosystem Services in the City

Urban Greening & Public Health 40 year research review

Kathleen Wolf, Ph.D.
Research Social Scientist
University of Washington
NUCFAC :: January 2011





What are ecosystem services?

Ecosystem Services

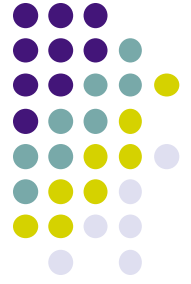
- intangible & tangible products
- human life support & dependency
- emerging/new markets





City Trees & Nature – Ecosystem Services

Biophysical Benefits



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

Improving Air Quality



Image courtesy of the Center for Urban Forest Research

Reducing Stormwater Runoff

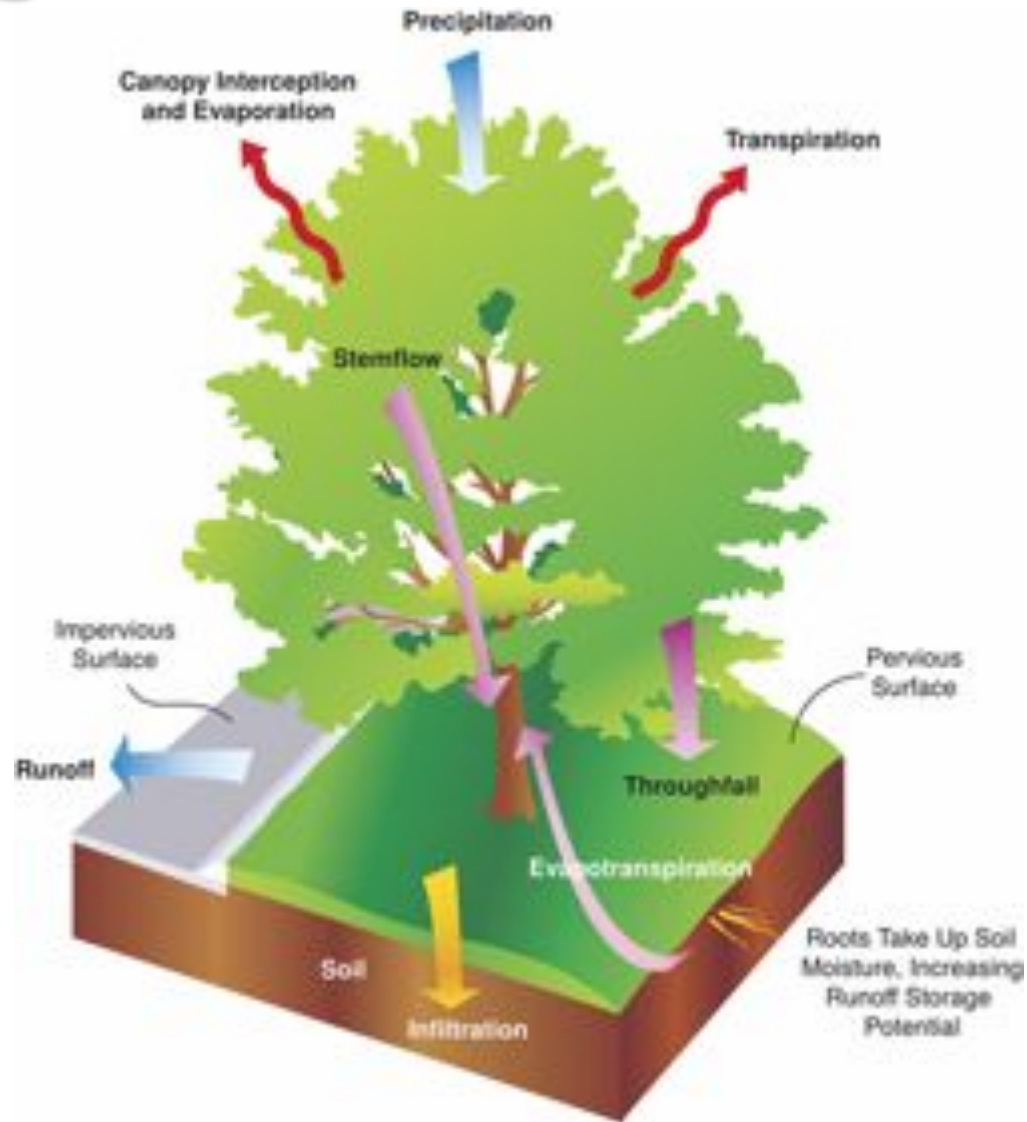


Image courtesy of the Center for Urban Forest Research

i-Tree Suite of Software

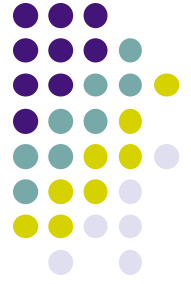


Why are city trees & urban greening important?



**human health,
functioning &
well-being**





**urban greening =
human health & well being:
40 years of research**

Health Benefits Research Summaries



**first phase:
June 2010**

**summaries
complete:
Dec 2010**

**then additional
outreach products**



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

<http://www.greenhealth.washington.edu>

University of Washington, College of the Environment
PI & Editor: Kathleen Wolf, Ph.D.; kwolf@uw.edu

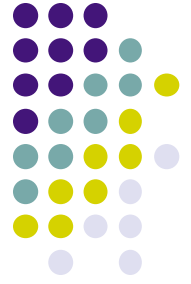
Urban Trees & Greening

Human Health & Well-Being

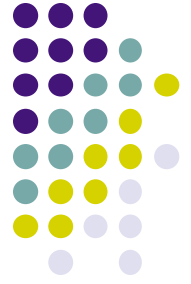


- Nature in Cities is About More Than Beauty and Aesthetics
- Peer-reviewed Research Across 40 Years Demonstrates Well-Being Benefits, such as:
 - healing & therapy
 - improved work and learning
 - community development
- Vegetation Planning & Management is Needed to Produce Benefits

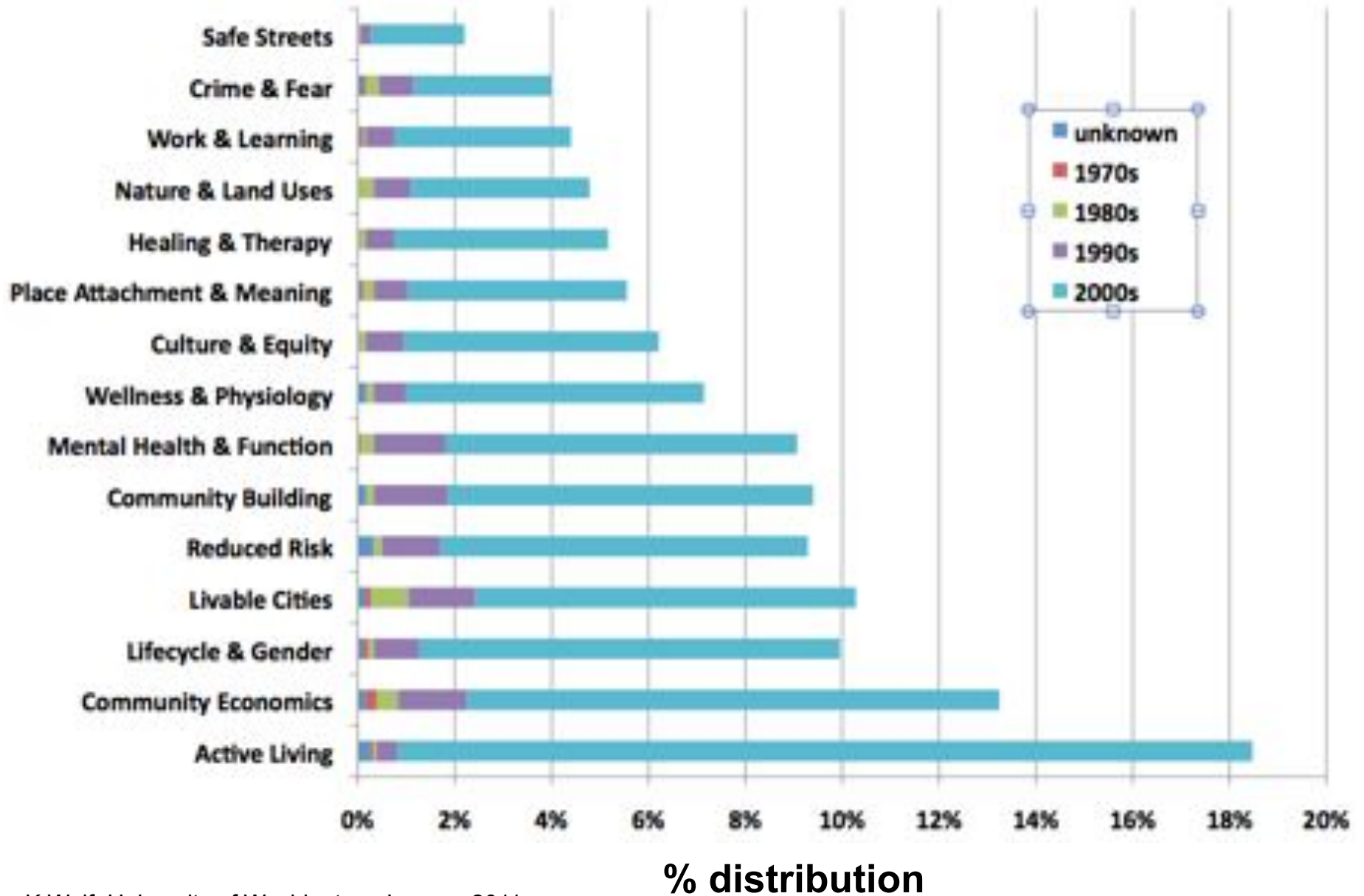
Finding that study



a treasure trove!

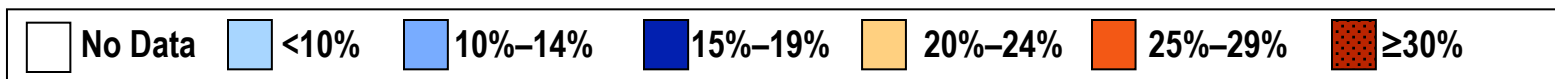
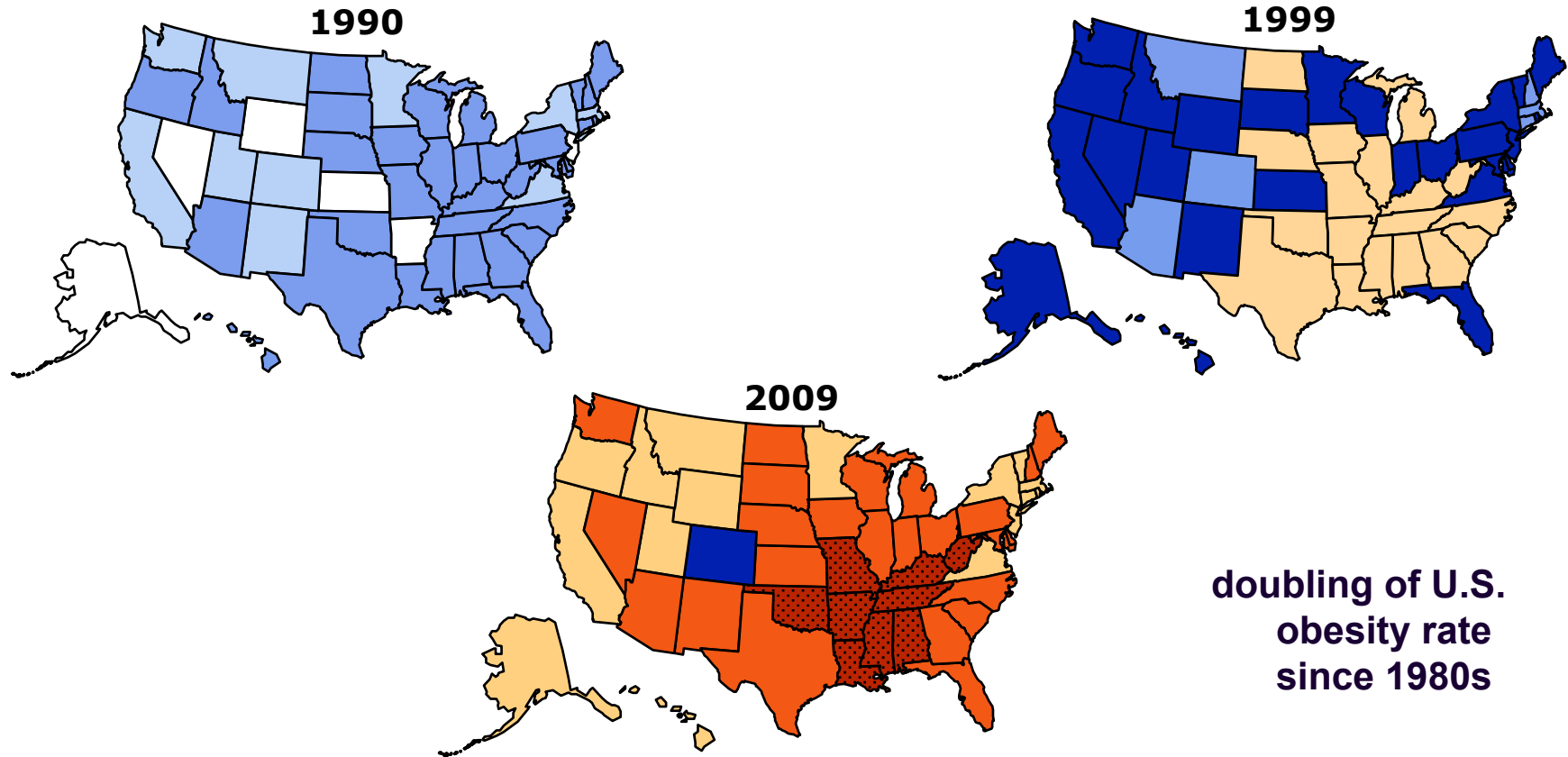


1,706 science publications



Obesity Trends* Among U.S. Adults 1990, 1999, 2009

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



Source: Behavioral Risk Factor Surveillance System, CDC.

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 annual medical costs
17% of all U.S. medical costs

CDC 2010

CANINE CONSTITUTIONAL



By [unreadable]

A daily walk in the park keeps Harvey #1 in shape because dog owners like yours. Consider making Carter-Moore get up early to give her 3-year-old Weimaraner his regular routine. That's exactly my Charles in Berlin Park.



parks, open spaces & trails



make room for pedestrians



walkable places = health & happiness

Nature, Human Health & Walkable Neighborhoods



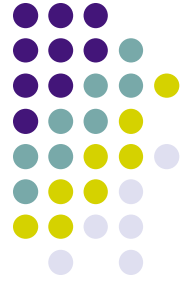
- Outcomes: Elderly People & Walking
 - less illness
 - lower mortality rate
- Environments: Neighborhood Streets (Tokyo)
 - tree - lined
 - parks

Takano, Nakamura, Watanabe. 2002.
Journal of Epidemiology & Community Health

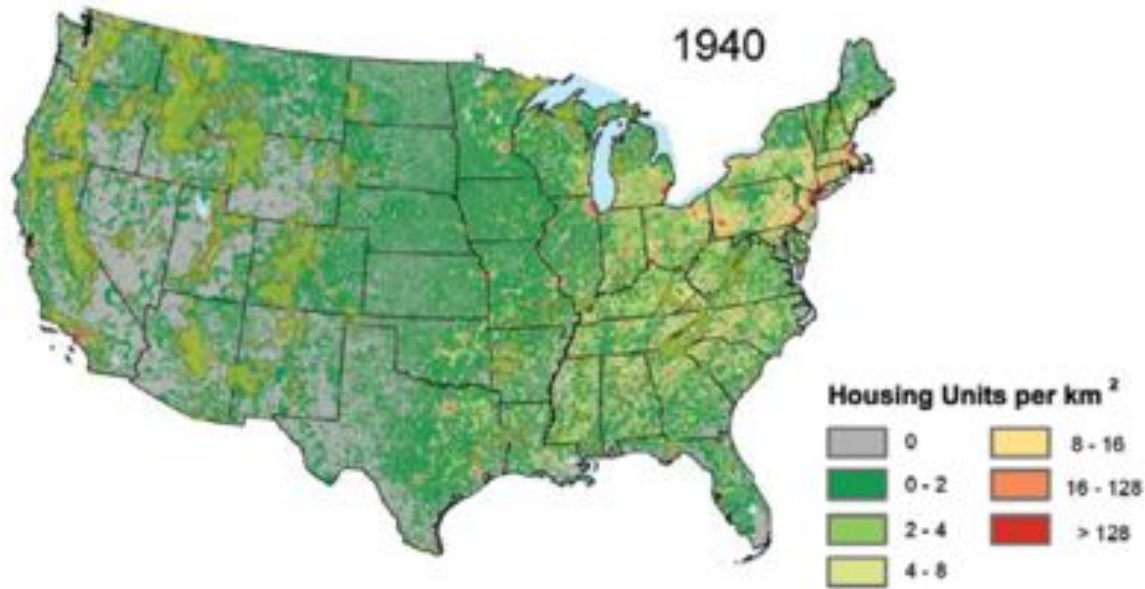


Future Products (2011 - 2012)

- Each theme summary converted to:
 - 1-2 page briefing
 - Powerpoint presentation
- also
 - short videos
 - your ideas?

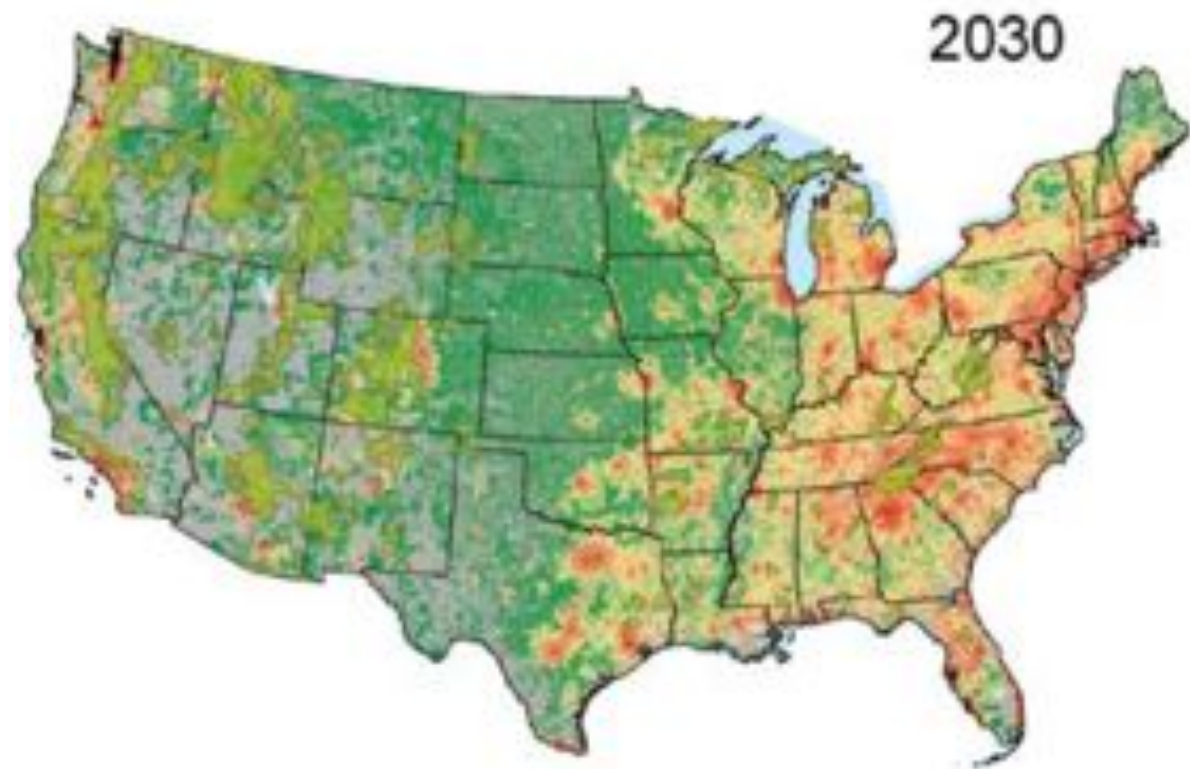


future research?



Urbanization Trends (USFS)

> 80% of US population lives in urbanized areas





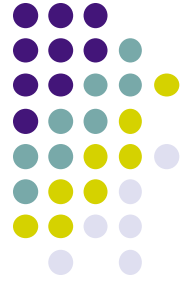
Ecosystem Services Framework

Millennium Ecosystem Assessment 2005

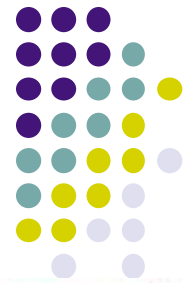
ECOSYSTEM SERVICES	
Supporting Services Nutrient cycling Soil formation Primary production	Provisioning Services Food (crops, livestock, wild foods, etc...) Fiber (timber, cotton/hemp/ilk, wood fuel) Genetic resources Biochemicals, natural medicines, pharmaceuticals Fresh water
	Regulating Services Air 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

expand
how we
consider
cultural
services
in the
urban
context,
(e.g. EPA,
USFS
research)

i-Tree Suite of Software



Lit Review to Community Model



HHWB
benefits
framework

extract
geospatial
“signatures”

valuation
units

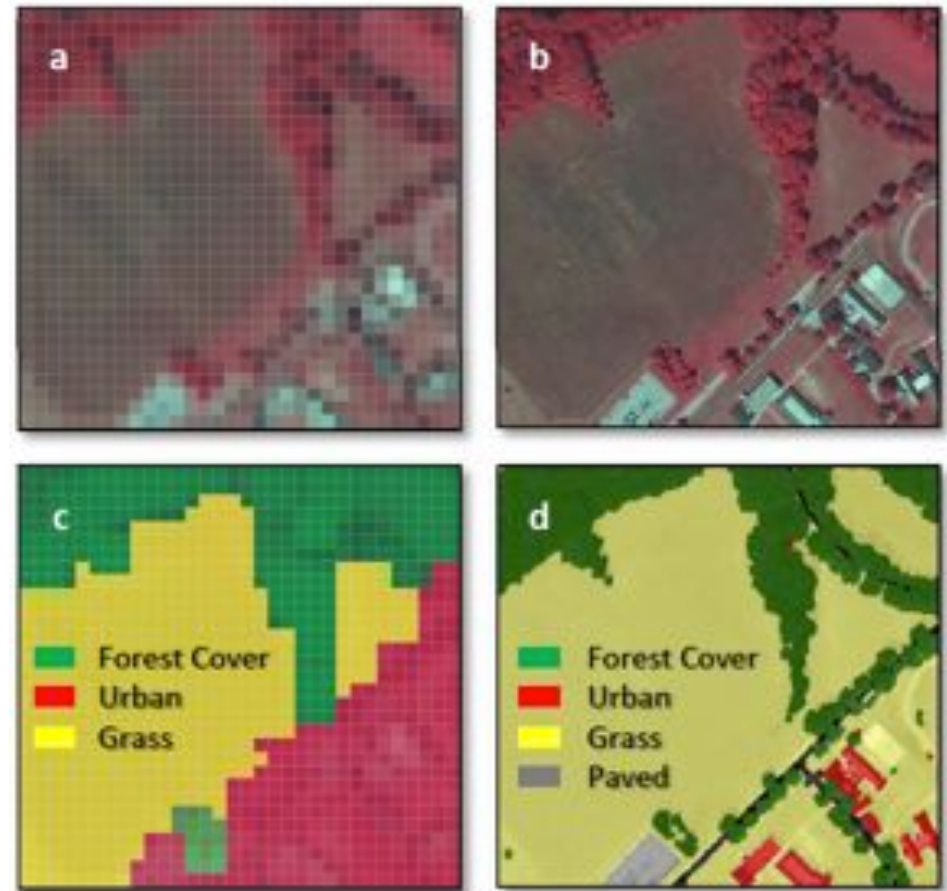
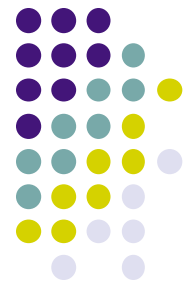


Figure 1. Comparison between a Landsat 30m pixel resolution image (a) classified using per-pixel method (c), and a National Agricultural Imagery Program (NAIP) 1m pixel resolution image (b) classified using Object Based Image Analysis method (d). Note the higher image detail in the OBIA classification and the greater number of classes possible.

NUCFAC 2009 Annual Report Trees & Nature Benefits



- health • quality of life •
- community advantage • public values •

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.

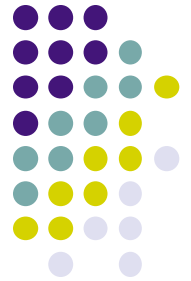
Trees and Transportation
Studies on the value of having quality landscapes in urban roadsides.

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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