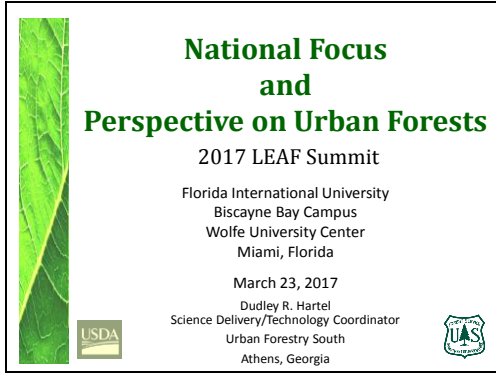




Slide 1





**National Focus
and
Perspective on Urban Forests**

2017 LEAF Summit

Florida International University
Biscayne Bay Campus
Wolfe University Center
Miami, Florida

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Dudley R. Hartel
Science Delivery/Technology Coordinator
Urban Forestry South
Athens, Georgia

This is the *National Focus and Perspective on Urban Forests* presentation developed by Dudley Hartel representing Janette Davis, Assistant Director of Cooperative Forestry for Urban & Community Forestry at the 2017 LEAF Summit in Miami, Florida.

Urban Forestry South supports U&CF programs to municipalities primarily through state agencies in the Southern Region (USDA FS Region 8) and other national and regional partners.

Urban Forestry South (UFS) is a science delivery center that is jointly funded by the Southern Research Station (SRS) and Region 8 and is associated with the SRS research work unit **SRS-4952 Integrating Human and Natural Systems**. UFS focuses on a range of science delivery and technology activities that supports urban forest management, children and nature connection, tree health, tree biology, health benefits of urban forest ecosystems, urbanizing forestry issues, and the measurement of ecosystem services derived from trees in urban settings.

Urban Forestry South provides technical support and science delivery primarily to the state UCF Coordinators, major municipal areas, and to local K-12 schools and universities. At the national level, UFS is active with the USFS National Technology and Science Delivery Team, Urban Forest Strike Teams, Urban Forest Inventory and Analysis, the USFS Every Kid in a Park and Conservation Education Teams, the International Society of Arboriculture, and others.

Urban Forestry South promotes the benefits of outdoor activity through our Kids in the Woods program, which connects middle school and elementary students with local birds, forests, and creeks. We deliver professional development workshops and organize field tours for teachers and natural resource professionals on outdoor learning and related topics. Additionally we conduct research that explores how outdoor learning may affect student achievement, behavior, motivation, and perceptions of nature.

In addition to our work with the SRS, the regional UCF program is also active in research to support efforts of our state partners. Research partners and focus areas include Georgia Institute of Technology (GIS database management and urban heat island), Auburn University (tree inventory), University of South Florida (remote sensing and urban forest environmental service), University of Alabama (regional ecosystem services database and Urban FIA), Virginia Tech (trees and stormwater), University of Tennessee (green stormwater infrastructure), University of Florida (children and nature connection), and University of Washington (urban forest and human health).

Dudley Hartel, Annie Hermansen, & Eric Kuehler are Urban Forestry South in Baton Rouge (LA), Gainesville (FL), and Athens (GA).

Presenter Notes – 23Mar17
Urban Green & Human Health

Professionals involved:

- Medical doctors/practitioners Rx
- Planners Parks
- Researchers green/health relation
- Education Student achievement
Green schools
- Public Health Disease vectors

Organization/Agencies involved:

- NGOs TNC, TPL
- Professional APA, ISA
- Agencies CDC
Energy
USFS
EPA
Parks



Slide 2

In this presentation...

- U&CF National Program
- National Approach to Science Delivery
- Partners & Collaboration: State forestry agencies, NUCFAC, The Nature Conservancy, Sustainable Urban Forestry Coalition, American Forests, and Urban Waters Federal Partnerships
- Trees and Human Health
- National Case Studies
- Federal Agencies
- Resources

The objective of this presentation is to introduce ...

USDA FS national approach to interpreting and using urban forest research (the national technology & science delivery team) – with trees and human health as the focus for this presentation.

- The national “team” (Urban & Community Forestry (U&CF) and Technology & Science Delivery (TSD)) and approach
 - ✓ U&CF staff across the US (and islands)
 - ✓ TSD In progress:
 - Urban Tree Canopy
 - Green Stormwater Infrastructure
 - Urban green and Human Health
- Partners and collaboration: state forestry agencies (50 states plus islands), NUCFAC, TNC, Sustainable Urban Forestry Coalition connection of urban trees to human health, American Forests (web resource delivery in development), and Urban Waters Federal Partnerships (14)
- Human Health – early USDA FS work – Sullivan & Kuo
- Human Health – K. Wolf, Univ of Washington – Green Cities – Good Health
- Human Health – current literature search (K. Wolf, Univ of Washington)
- Some recent regional examples of urban green & human health: Tampa, EPA’s HIA in Proctor Creek, West Nile Virus (Atlanta)
- UCF and human health - A quick look around the country (handout links)
- More Kids in the Woods – USDA FS

Slide 3

The national U&CF team...

The USDA Forest Service Urban & Community Forestry (U&CF or UCF) national program includes program managers and staff (19) throughout the continental US, Alaska, Hawaii, Caribbean (Tropical Forestry and Southern), and western islands (Pacific Southwest).

USDA Forest Service regions:

- Northern (Region 1)
- Rocky Mountain (Region 2)
- Southwestern (Region 3)
- Intermountain (Region 4)
- Pacific Southwest (Region 5)
- Pacific Northwest (Region 6)
- Southern (Region 8)



- Eastern (Region 9)
- Alaska (Region 10)

U&CF Offices include:

- Washington, DC
- Portland, OR (includes Region 10 - Alaska)
- Vallejo, CA (includes Hawaii and western islands)
- Golden, CO
- Albuquerque, NM
- Atlanta, GA (includes Caribbean)
- Newtown Square, PA

In addition, urban field stations (USDA FS Research) in:

- Baltimore
- Philadelphia
- New York City
- Chicago
- Denver

An **Urban Field Station** is both a physical place and an extensive network of interdisciplinary scientists and partners working on developing research, curating data, and advancing and delivering science to improve the quality of life and natural resources in urban and urbanizing areas, using an integrated socio-ecological approach.

Slide 4



Who we work with...

- State forestry agencies (e.g. Florida Forest Service)
 - ✓ 13 states in the USDA FS Southern Region (Region 8)
 - ✓ State Urban Forest Councils
- National NGOs (e.g.)
 - ✓ Arbor Day Foundation
 - ✓ Trust for Public Land
 - ✓ Nature Conservancy
- Professional Organizations (e.g.)
 - International Society of Arboriculture
 - American Planning Association
- Federal Partners (e.g.)
 - US EPA
 - CDC

The primary delivery partners for the national U&CF program include:

- State agencies (13 in Region 8) in each state and an associated state-wide urban forest councils
- National non-profits (NGOs)
- National organizations representing allied professionals and their regional organizations
- Federal Partners with related interests (health, stormwater, UHI)

Slide 5



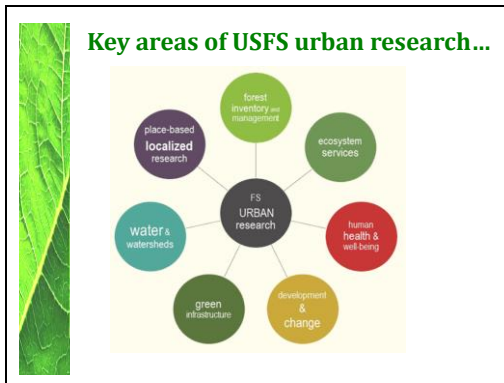
The USDA FS participates in or leads Urban Waters Federal Partnerships (UWFP) throughout the continental US and Puerto Rico. The US EPA is the principal lead for UWFP and includes 13 other Federal Agencies.

“This partnership will reconnect urban communities, particularly those that are overburdened or economically distressed, with their waterways by improving coordination among federal agencies and collaborating with community-led revitalization efforts to improve our Nation's water systems and promote their economic, environmental and social benefits.” EPA website – March 2017

In the USDA FS Southern Region (Region 8) we have:

- Lake Ponchartrain (New Orleans)
- Proctor Creek (Atlanta)
- San Antonio River (Bexar County)


Slide 6



The USDA Forest Service research priorities...

Including human health & well-being

Slide 7



Human health and trees - early years...

- Ulrich – 1984 – Hospital stays and view to urban green
- Sullivan & Kuo, et.al.
 - ✓ Early NUCFAC and other (FS) funding – 1997 – 2004
- Frances E. Kuo
- William C. Sullivan
- Topics
 - ✓ Human health benefits of natural landscapes
 - ✓ Children and nature
 - ✓ Crime, aggression, and nature
 - ✓ Inner city and nature
 - ✓ Sense of community and nature

Early connections between green and human health from the medical perspective...

Roger S. Ulrich – 1984 View Through a Window May Influence Recovery from Surgery

and later

Verderber and Reuman - 1987 - Windows, views, and health status in hospital therapeutic environments.

NUCFAC and other (USDA FS) funding for: Sullivan & Kuo, Frances E. Kuo, William C. Sullivan, and their research collaborators.

- <http://willsull.net/publications/>
- <http://lhhl.illinois.edu/about.htm>
- <http://lhhl.illinois.edu/all.scientific.articles.htm>

Slide 8



University of Washington...

Kathy Wolf


- Human Dimension of Urban Forestry and Urban Greening
- Green Cities: Good Health
- Completing current literature search and case studies on human health and urban green for the USDA FS National Technology & Science Delivery team
 - ✓ American Forests hosted webiste

More recently at the University of Washington from the green perspective...

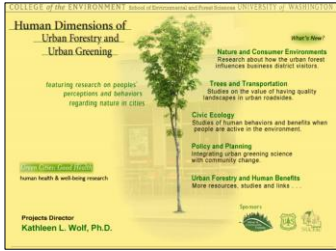
Kathleen L. Wolf, Ph.D.

kwolf@u.washington.edu

Slide 9



University of Washington...



Kathy Wolf, University of Washington websites...

<http://www.naturewithin.info/>



Slide 10



Kathy Wolf, University of Washington websites...

http://depts.washington.edu/hhwb/Top_Introduction.html

People and Nature in Cities: More than 80% of the U.S. population, and more than 50% of all people in the world live in urbanized areas. Nature in cities and towns includes parks, gardens, trees, small landscapes, and natural areas – all providing many benefits. This web site provides an overview of the scientific evidence of human health and well-being benefits provided by urban forestry and urban greening.

- **Benefits Science:** Recent research has revealed the environmental benefits provided by metro nature, such as improved air and water quality, energy savings, and reduced urban heat island effects. The social sciences provide additional evidence of benefits. Nearly 40 years of research shows that the experience of nature is profoundly important to human functioning, health, and well-being.
- **Human Health and Well-Being Benefits:** We may intuitively accept that urban nature is important for public health. This web site presents supporting evidence, confirming intuitions and expanding our knowledge. Given the high population densities of urban areas, every bit of nearby nature has the potential to benefit hundreds to thousands of people daily.
- **Planning for Nature:** People have long recognized that nature in cities and towns provides beauty and respite. However city green improves public health - ranging from individuals to entire communities. Taken as a whole, metro nature is a “green infrastructure” system that can be planned and integrated with built systems (such as transportation and housing) to create more sustainable urban environments.

Presenter Notes – 23Mar17
Urban Green & Human Health

K. Wolf developing design guidelines and BMPs for designing landscapes to better support/provide human health benefits.

Slide 11



Examples from our region...

Using Tampa data from her dissertation, Viniece Jennings (USDA FS) is looking at urban trees in the landscape (both the public and private components) and the impact on cardiovascular and respiratory disease.

Graeme Lockaby (Auburn University, and Wayne Zipperer (USDA FS)) and others studied an array of risk factors in and around Atlanta, GA, that have been shown to be linked with WNV in other locations. This array was comprehensive and included climate and meteorological metrics, vegetation characteristics, land use / land cover analyses, and socioeconomic factors. Data on mosquito abundance and WNV mosquito infection rates were obtained for 58 sites and covered 2009-2011, a period following the combined storm water – sewer overflow remediation in that city. Risk factors were compared to mosquito abundance and the WNV vector index (VI) using regression analyses individually and in combination. Lagged climate variables, including soil moisture and temperature, were significantly correlated (positively) with



Presenter Notes – 23Mar17
Urban Green & Human Health

HIA is the triple bottom line:

- Environmental
- Economic
- Social

With an emphasis on “health and well-being of members of the community”

vector index as were forest patch size and percent pine composition of patches (both negatively). Socioeconomic factors that were most highly correlated (positively) with the VI included the proportion of low income households and homes built before 1960 and housing density. The model selected through stepwise regression that related risk factors to the VI included (in the order of decreasing influence) proportion of houses built before 1960, percent of pine in patches, and proportion of low income households. ***Journal of Vector Ecology* 41 (2): 232-243. 2016.**

US EPA, to support the Proctor Creek UWFP, used the Health Impact Assessment (HIA) protocol to look at green infrastructure development in the Proctor Creek communities.

“Health Impact Assessment (HIA) is a decision-support tool for promoting sustainable and healthy communities. The foundation of a healthy community is strongest when built upon a decision-making process that balances environmental, social, and economic factors to promote the health and well-being of its members. HIA is a tool designed to investigate how a proposed program, project, policy, or plan may impact health and well-being and inform decision-makers of these potential outcomes before the decision is made.

“HIAs:

- determine the potential effects of a proposed decision on the health of a population and the distribution of those effects within the population;
- consider input from stakeholders, including those impacted by the decision;
- use different types of evidence and analytical methods;
- are flexible based on available time and resources; and
- provide evidence and recommendations to decision-makers in a timely manner.

“HIAs consider the full range of potential impacts of the proposed decision– both positive and negative– on health and those factors known to directly and indirectly affect human health. HIAs provide recommendations for maximizing the potential positive health impacts and minimizing and/or avoiding the potential negative health impacts of the decision. In addition to promoting human health considerations, HIAs also encourage democracy, health equity, and sustainability in decision-making.”

Slide 12

Case studies...

- Rx: Park Prescriptions - Washington, DC
- Buffalo Bayou Houston's Green Transformation
- Green Prescription - Sacramento
- Healing Gardens – Legacy Health – Portland
- Urban Heat Island - Louisville

Five case studies that illustrate the urban green (including trees) and human health connections...

Slide 13

Rx: Prescriptions to Use Parks

Washington DC – Park Rx America

<http://dcparkrx.org/about.php>

“Over 100 million Americans currently suffer from a chronic disease (e.g., coronary heart disease, stroke, high blood pressure, Type 2 diabetes, and mental health conditions). More than two thirds of American adults currently suffer from overweight/obesity, which contributes to chronic disease. Chronic disease results in decreased quality of life, and ultimately, premature death.

“Spending time in natural environments increases physical activity, hence decreasing the risk of developing chronic disease. Park Rx America is a low-cost intervention that utilizes a known, generally trusted, and accessible resource - parks - to influence positive health outcomes. To date, Park Rx America has mapped and rated hundreds of parks in the national capital region, and developed Park Pages (one-page park summaries) searchable database, which is now available to you to help you find the best park for you.”

Slide 14

Buffalo Bayou Houston's Green Transformation

Houston - Buffalo Bayou has been transformed in the first stages of a massive urban greening project that aims to connect waterways throughout the Houston area to create 150 miles of linked trails and parks in an effort to improve the health and quality of life for residents in a city often ranked as one of the fattest in the U.S.

An example of the connections between environmental justice (i.e. access to urban green), exercise, and human health outcomes.

<http://buffalobayou.org/visit/destination/buffalo-bayou-park/>

Slide 15



Sacramento - The Green Prescription research study used health data collected by the University of California Los Angeles for their California Health Interview Survey (CHIS) to evaluate the connection between the amount of tree canopy and human health (population health/public health).

<http://www.sactree.com/greenrx>

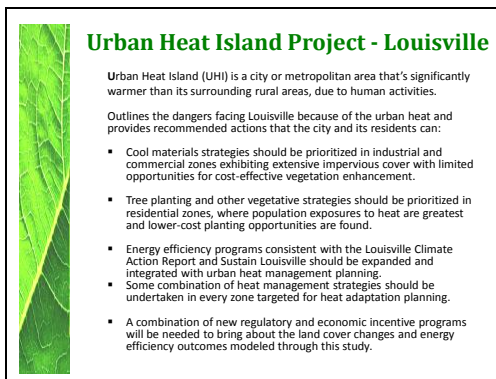
Slide 16



Portland - Healing Gardens - Gardens in health care, called therapeutic gardens, support health and well-being. Research shows that gardens in healing settings provide many benefits, often helping patients to leave the hospital faster, take less pain medication and suffer fewer complications.

Comes “full circle” back to Roger Ulrich’s 1984 “room with a view”.

Slide 17



Urban heat in Louisville was the subject of a comprehensive study, the first of its kind, led by Dr. Brian Stone of the Urban Climate Lab at Georgia Institute of Technology. Dr. Stone outlined the dangers facing Louisville because of the urban heat. He also detailed recommended actions that the city and its residents can take — in businesses, homes, and throughout the community — to reduce urban heat.

“The additional heat in the urban core leads to costlier utility bills but also serious health issues — it’s a real danger to vulnerable Louisville residents. The hotter air exacerbates the effect of air pollution; Louisvillians with asthma or other respiratory problems in UHI-affected areas are put at risk.



The urban heat island effect is caused by many factors, including an abundance of dark-colored asphalt and other surfaces. Downtown Louisville and urban residential neighborhoods — especially those along the Ohio River — are experiencing the urban heat island effect the most.

“We know that too often the ZIP code where you are born can correlate with negative health outcomes. That’s unacceptable,” said Mayor Greg Fischer. “In addition, the added heat causes citizens and businesses to run their air-conditioning longer and higher, which drives up energy costs for citizens and businesses. It also increases pollution, leading to more global warming. It’s a vicious cycle.”

Heat waves often lead to increases in emergency room visits and hospital admissions.

Each year, heat-related ailments contribute to the deaths of 86 Louisville residents, according to Dr. Stone’s study.”

Slide 18



Other related programs...

- More Kids in the Woods (USDA FS)
- Every Kid in a Park (Nat'l Parks)
- Green Schools
- Shade Trees on the Playground (STOP)

Examples of other programs and initiatives related to urban green and human health.

Slide 19

Role of other federal agencies...

- US Environmental Protection Agency (EPA)
 - ✓ Urban Waters Federal Partnerships
 - ✓ Health Impact Assessment (HIA)
 - ✓ Green Stormwater Infrastructure (GSI)
- Centers for Disease Control (CDC)
 - ✓ Built Environment and Health Initiative
 - ✓ Exercise
 - ✓ Infectious Diseases
- Department of Energy
 - ✓ Urban Heat Island

Previously mentioned examples of other federal agencies with roles in the urban green and human health arena.

Slide 20



Trees & human health resources...

Current links to urban green and human health (handout) can be downloaded from www.UrbanForestrySouth.org.

Use "LEAF Summit" in search box.

Slide 21

Dudley R. Hartel
 Science Delivery/Technology Coordinator
 Urban Forestry South
 Athens, Georgia
dhartel@fs.fed.us
 ๒ ๗ ๗ ๗
 747 Maxine Dr.
 Baton Rouge, Louisiana 70808
 (706) 410-5568 cell
www.UrbanForestrySouth.org
LeavesOfChangeWeekly.org
 @interfacedsouth
 @ufs_cuif

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@interfacedsouth Annie Hermansen

@ufs_cuif Dudley Hartel

<https://leavesofchangeweekly.org/>

Urban Forestry South (Hermansen, Hartel, and Eric Kuehler)