HOW TO ACHIEVE MULTIPLE BENEFITS FROM GREEN STORMWATER INFRASTRUCTURE: A FORESTRY RESEARCH APPROACH
USDA Forest Service, Pacific Northwest Research Station

Dale Blahna, Presenter
Tracy Stanton
Amir Sheikh
Kathleen Wolf
Weston Brinkley

New Partners for Smart Growth, January 8, 2016
Presentation Outline

1. USFS urban research program
2. Green Cities Research Alliance (GCRA)
3. Green-Duwamish Watershed as a research landscape
4. GCRA as collective impact initiative
Caring for the Land *and* Serving People!

- Forest Service Strategic Plan
  - Engage urban America
  - Ecosystem services: Recreation & water
  - Environmental justice
  - State & Private Forestry (UCF Program)

- USFS R&D
  - Urban natural resources stewardship
  - Urban forest inventory
  - Urban field station in PNW?

- “All lands approach. . .”

~ 80% of region’s population is urban
Forestry Research in the City Restoration, Stewardship & Env Sustainability
USDA Forest Service, Pacific Northwest Research Station

7 year research program

• urban start from ARRA funding
• metro Seattle partnerships
• practical applications
• volunteer stewardship, jobs, training, & tools
Green Cities Research Alliance

Sustainable cities through science, policy, and citizen action

USDA Forest Service
Pacific NW Research Station

University of Washington
UW Remote Sensing & Geospatial Lab

Parks & Recreation Division
City of Seattle
Productive Effort: 2009-2014

$1.25 million for 4 years
~ $335 K per year
~$100 K matching

Jobs (tech, science, mgmt)
• 3.5 FTE for 4 years

Science Products & Outreach
• 46 peer-reviewed publications
• 26 professional publications
• 3 in progress/review
• 40+ scientific/scholarly presentations
• 75+ professional presentations
GCRA
Research Themes and Accomplishments

Future Applications

GREEN INFRASTRUCTURE
Natural Resources Assessment
- Forest Landscape Assessment Tool
- iTree Forest Ecosystem Values

URBAN WATERS PARTNERSHIP
Ecosystem Restoration
- Urban Resources Monitoring
- Restoration Economics

ENVIRONMENTAL JUSTICE
Civic Stewardship
- Stewardship Mapping
- Volunteer Stewardship Engagement

STEWARDSHIP OUTCOMES
Ecosystem Services
- Forest Ecosystem Values
- Urban Agriculture
- Residential Choice Location

Socio-Ecological Systems :: Landscape Gradient

Completed projects 2009 - present

Human Health & Well Being
- Green Cities: Good Health
- Urban Forest Health Outcomes

Wolf, 2013
PNW Station Urban Forest Research Priorities

Build on PNWRS strengths to establish long-term research program of work to document and quantify benefits of trees, vegetation, and community forestry activities for individual, social, and ecological health and sustainability.

1. Fundamental human health responses to trees & vegetation
2. Health consequences of stewardship participation
3. Large landscape scale interactions of forest & human health

1. Multiple co-benefits of trees & GI: replicate ecological function and address health, social, economic disparities
2. Natural landscape-level laboratory
3. Long-term, participatory work

Public Health & Well-being
Green-Duwamish Research Landscape
Urban FIA & Geospatial Assessment
Green-Duwamish Research Landscape

- Urban-wildland gradient
- Socio-economic diversity
- Co-benefits natural lab
Reveg Strategies

- **Green stormwater infrastructure (GSI)**
  - Green from Gray (EPA $.5B consent decree)
  - Middle green restorations
  - ‘Regreen the Green’ (WRIA9 communities)
  - South Park Green Spaces Coalition
  - King County GD strategy

- **Co-benefits strategy**
  - Pollution removal
  - Salmon habitat
  - Public health
  - Quality of life
  - Environmental justice

- **Natural lab & quasi-experimental designs**

- **Pilot, demo watershed?**
Who and where are priority populations?

Consolidated Demographics:
People of Color, Income, & English Proficiency
Census Tract, 2010

<table>
<thead>
<tr>
<th>People of Color Score</th>
<th>Median Household Income Score</th>
<th>Lack English Proficiency Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.5% - 18.0%</td>
<td>1</td>
<td>0.0% - 3.3%</td>
</tr>
<tr>
<td>18.2% - 27.1%</td>
<td>2</td>
<td>3.4% - 5.7%</td>
</tr>
<tr>
<td>27.2% - 35.4%</td>
<td>3</td>
<td>6.8% - 11.0%</td>
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<tr>
<td>35.4% - 51.1%</td>
<td>4</td>
<td>11.1% - 17.1%</td>
</tr>
<tr>
<td>51.2% - 91.2%</td>
<td>5</td>
<td>17.2% - 58.8%</td>
</tr>
</tbody>
</table>

Equity and Social Justice Demographics

Note: Each category uses the Quintile classification method. A score is assigned to each Quintile class: 1 - 5. The total score for each classification is the 33.3% weighted total for categories People of Color, Median Household Income, & Lack of English proficiency. The weighted total is sorted using the Natural Breaks classification method. A lower score indicates less diversity, higher income, & higher English proficiency. A higher score indicates more diversity, lower income, & lower English proficiency.
To identify geographic areas of need, King County census tracts were rank-ordered from highest to lowest percent of adults by the areas noted above. The tracts were then divided into 10 groups. Dark reds show tracts with the highest rates; dark blues show tracts with lowest rates (note: the Life Expectancy map ranks shortest in dark red to longest in dark blue).
“Collective Impact” Approach

(Kania & Kramer 2011)

Large scale change requires broad cross-sector coordination, yet the social sector remains focused on isolated interventions.

- Address complex social & environmental problems
- Involves many organizations
- Similar goals, BUT
- Often act & judged independently
- “Isolated impact” with joint value
- Ongoing, applied research—unique application
GCRA as Collective Impact Initiative?

- **Common Agenda**
  - Research, Seattle urban environmental sustainability
  - Jobs, practitioner collaboration

- **Shared Measurement Systems**
  - ARRA: Jobs, tools, and training
  - PNW: Research, pubs, reports, outreach, events

- **Mutually Reinforcing Activities**
  - *UW Data portal/sharing, GIS, OneHub*

- **Continuous Communications**
  - Monthly meetings, events, OneHub

- **Backbone Support Organization . . .**
Backbone Support—The Key

* Requires dedicated staff separate from the participating organizations with a very specific set of skills to serve as the backbone for the entire initiative.*

* Three key roles:
  * Project manager
  * Data manager
  * Facilitator

* GCRA “Patchwork” Backbone
  * Funding went to the research/fieldwork
  * Structure and organizing was voluntary
  * PNW Station salaries and outreach
  * Primarily voluntary participation in each role
Leadership Strategy

Collective Impact-Virtual Partnership Framework

- Organized by core group of partners
- Core group meets to identify key projects
- Connect groups who share similar interests & goals related to a specific project (and funding opportunities)
- Project groups meet to implement collaborative approach
- Periodic reports to existing multi-stakeholder groups in region

Green Cities Research Alliance Operating Procedure

Core Team ➔ Organizations and Existing Partnerships ➔ Core Team + Specific Project Partners

Reporting Results

Project Ideas
Thank you!

Dale Blahna  dblahna@fs.fed.us

Team members:
Kathleen Wolf, Univ. of Washington & USFS PNW Research Station
Tracy Stanton, Coordinator, Urban Waters Partnership
Amir Sheikh, USFS PNW Research Station, ORISE Fellow
Weston Brinkley, Street Sounds Ecology, LLC
Geoff Donovan, USFS PNW Research

http://www.fs.fed.us/pnw/research/gcra/index.shtml
http://www.urbanwaters.gov/pdf/GreenDuwamishBackground.pdf