

US EPA ARCHIVE DOCUMENT

Cuyahoga Sustainability Network

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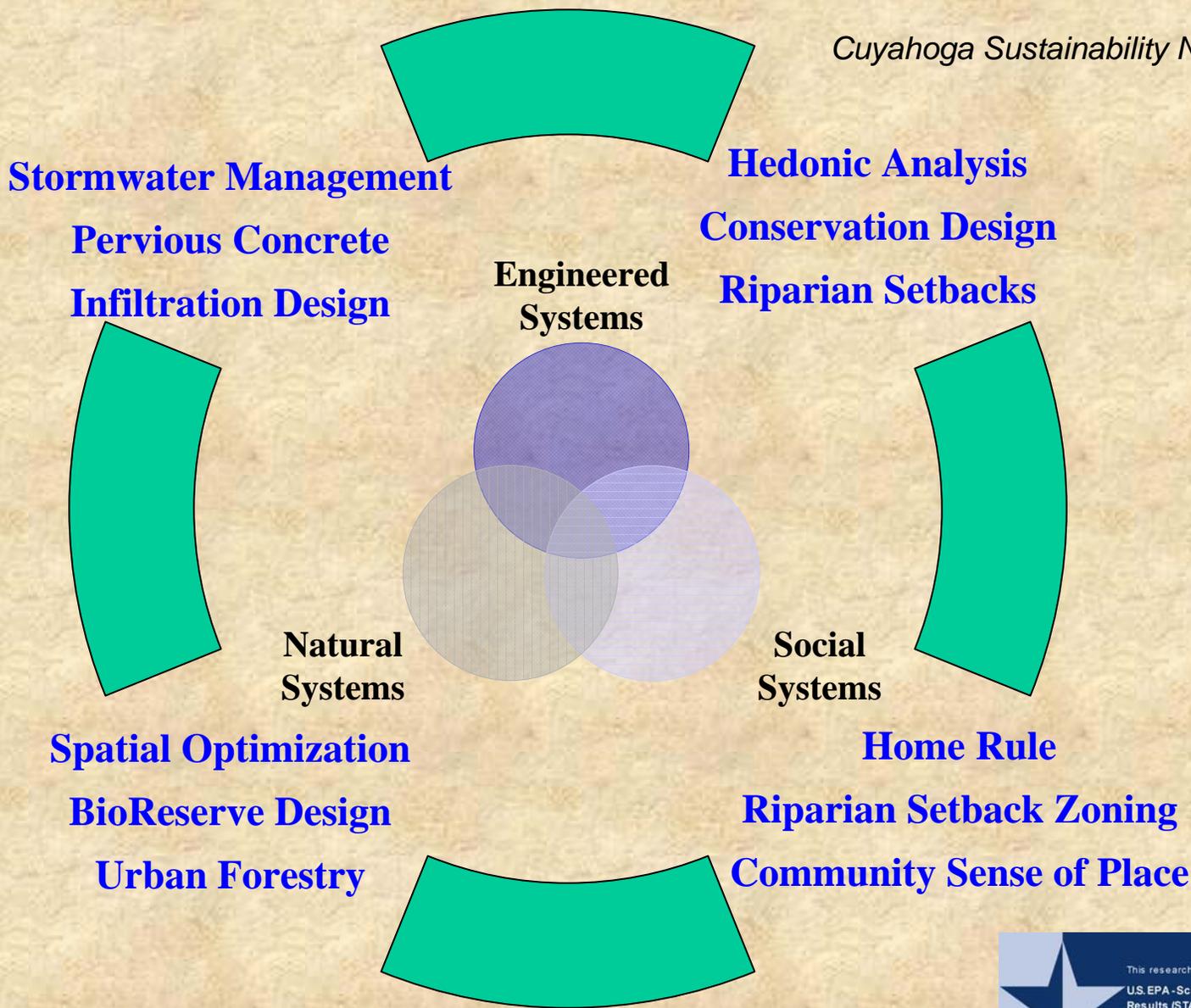
Contributions to Sustainable Decision Making:

Fill Key Information Needs to Foster and Support Sustainable Land Transformation Decision-Making

- Landscape Influences on Environmental Services
- Urban Hydrology and Sustainable Landscapes
- Economic Demand for Environmentally Sustainable Design
- Multiobjective Decision Making



Cuyahoga Sustainability Network



Surprising Results:

- **Suburban History - Ghosts of Landuse Past**
- **Pervious Runoff**
- **Planning & Development in a Home Rule State**
- **Hedonic Analysis – Price Signals for Environmental Design**
- **Pervious Concrete – Cold Weather Performance & Design**
- **Urban Forest Services**



Economic Sustainability: Hedonic Price Analysis

Conservation Design

Riparian Setback Zoning

New Urbanism



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An Economic Analysis of Real Estate Conservation Subdivision Developments

by Alan K. Reichert, PhD, and Hsin-Yu Liang



Prepared for:
Chagrin River Watershed Partners, Inc.

Prepared by:
Center for Housing Policy & Research
Brian A. Mikelbank

September 2008

Hedonic Analysis of Riparian/ Wetland Setbacks

Riparian Setbacks; Technical Information for Decision Makers

www.crwp.org/pdf_files/riparian_setback_paper_jan_2006.pdf

- **Local Governments Commission**
- **Colorado League of Women Voters**
- **Chesapeake Bay Local Government Information Network**
- **Community Forest Resource Center**
- **Mass. Dept Fish and Game**
- **Arizona NEMO** (*Nonpoint Education for Municipal Officers*)
- **New Hampshire Fish and Game Department**
- **Maryland DNR**
- **Connecticut Association of Conservation and Inland Wetland Commissions Inc.**
- **Wisconsin DNR**
- **Maine DEP**
- **Montana Water Course**
- **Westchester County, NY Department of Planning.**
- **Association of State Wetland Managers**

Cleveland's Urban Forest

Annual Air Quality Benefits ~\$3 billion

- Cuyahoga County Green Print
- Cleveland Metroparks
- City of Cleveland Street Trees

“Train the Trainer”

D. Nowak, R. Pouyat
U.S. Forest Service
Northern Research Station

baltimoresun.com

On a mission to add to greenery

Volunteers armed with computers collect data on
Baltimore's trees

By Alia Malik Sun reporter July 28, 2007



Sun photo by Mauricio Rubio, July 18, 2007

Hydrologic Services:

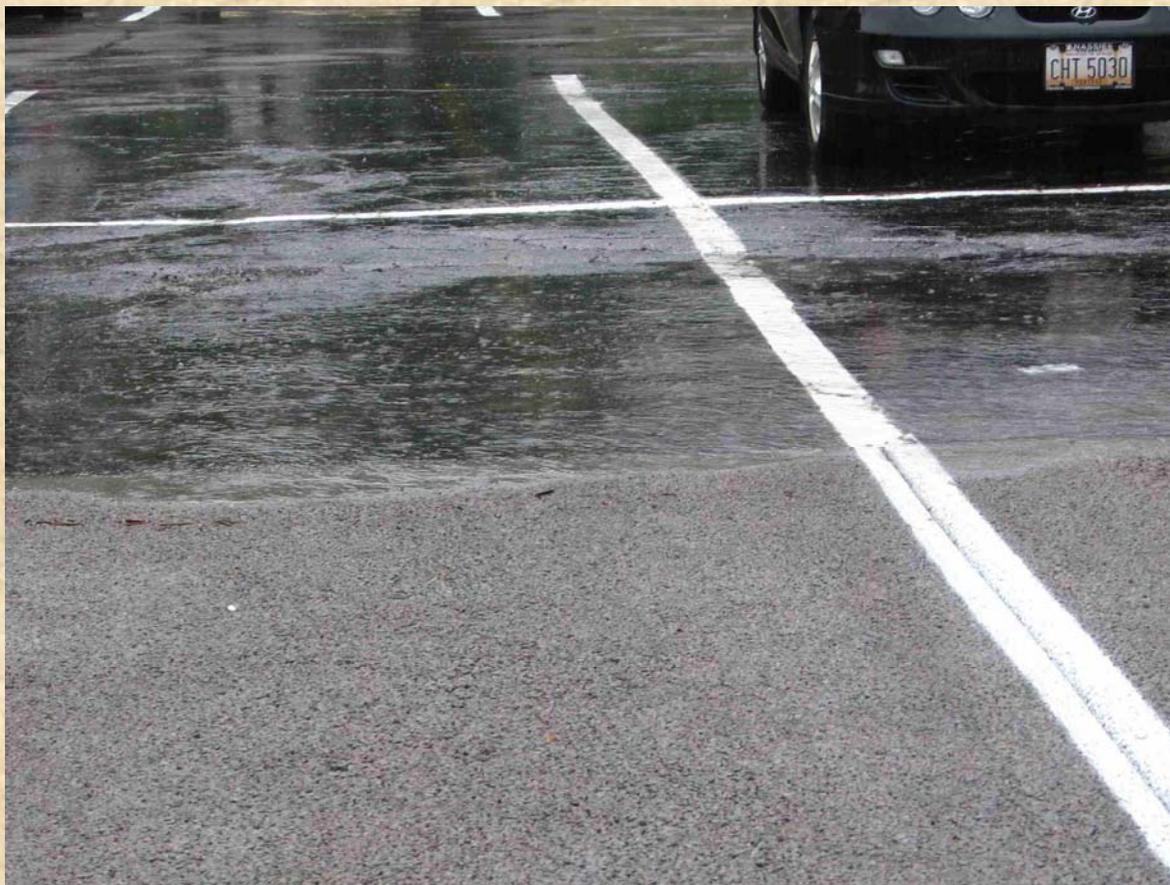
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Sustainable Landscapes & Pervious Concrete

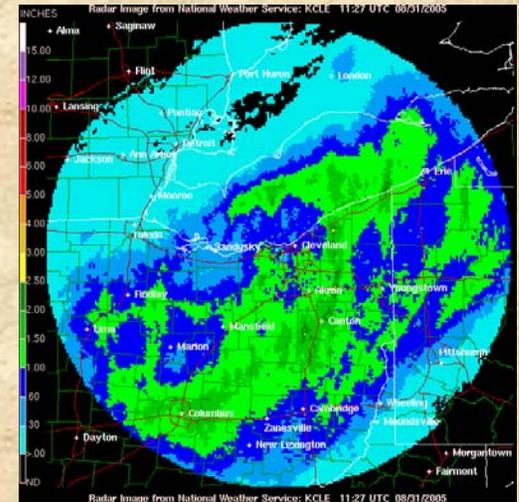


Cleveland State University & Ohio Ready Mix Concrete Association

Pervious Concrete Test Plot



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**Tropical Storm Katrina
Storm Totals:**

31Aug 2005 - 07:27 EDT

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Hydrologic Services: Quantifying Site Infiltration

IIHR Digital Infiltrometer Controller



CRWP

LID Performance Monitoring

EPA National Community
Decentralized Wastewater
Demonstration Project

-Matt Morrison – EPA NRML
-USGS Ohio District

- Rain garden: max water level
- Pervious pavement outflow
- Pervious pavement soil moisture (TDR nests)
- WQ: Temp & conductivity + TSS, TP, Cl, turbidity, total & dissolved metals
- Parking lot surface runoff: quantity and quality

IR: 24.0 – 0.74 cm/hr

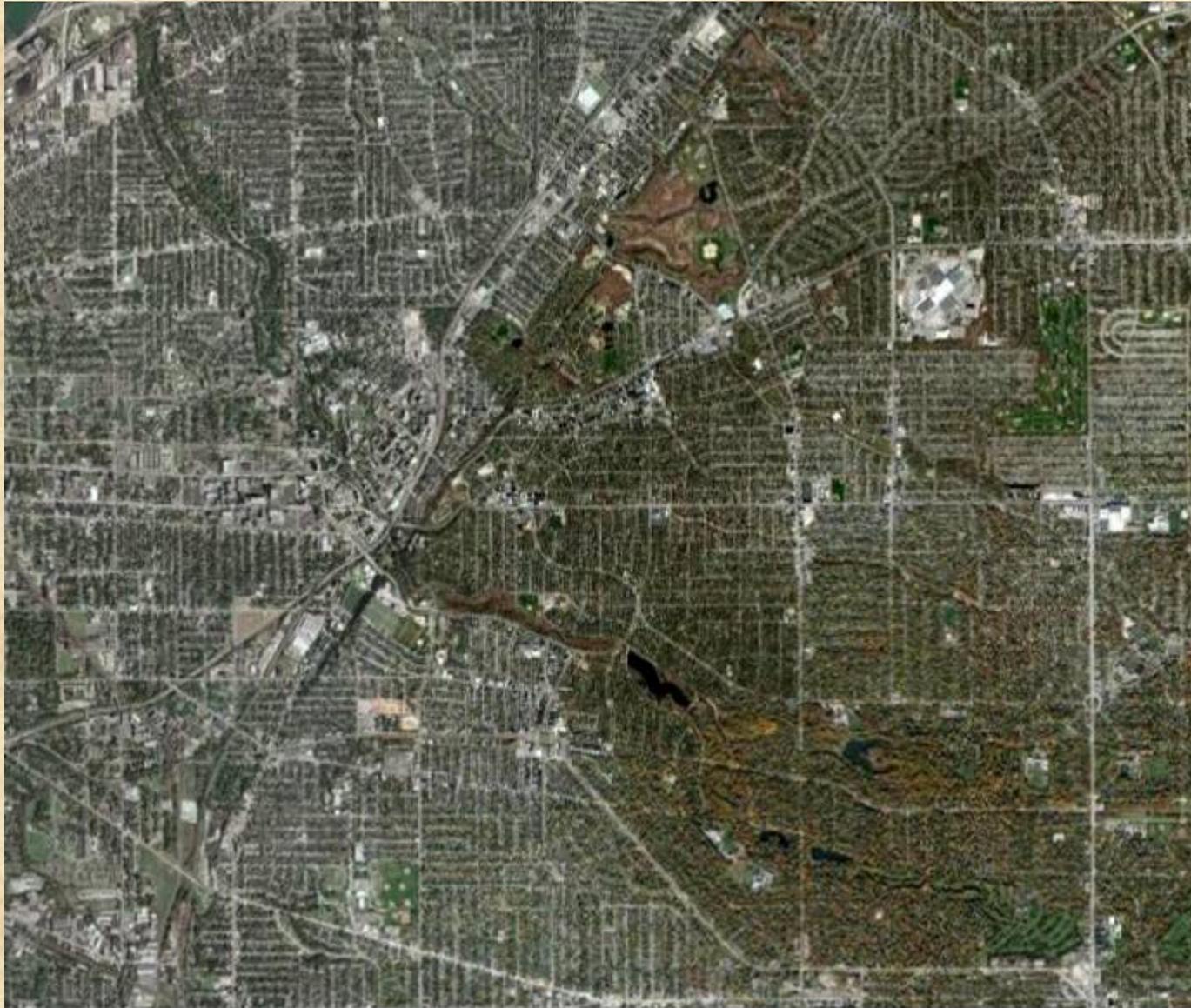


Cawrse & Associates — Chagrin River Watershed Partners

Suburbanization and Greenspace

Ghosts of Land Use Past

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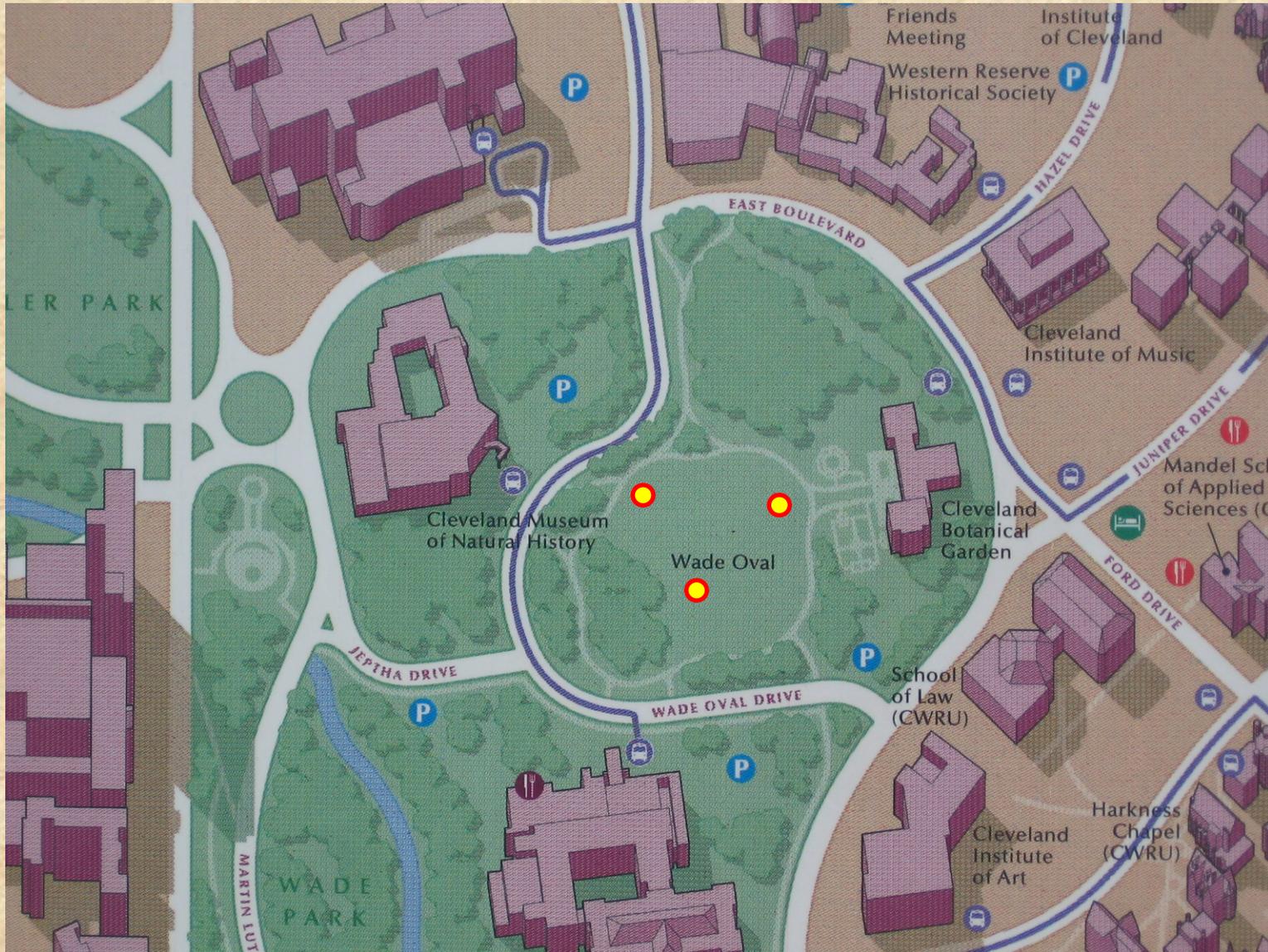




© 2007 Sanborn

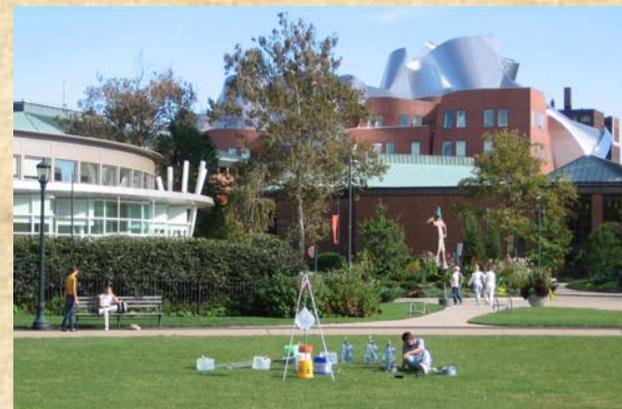
© 2006 Google

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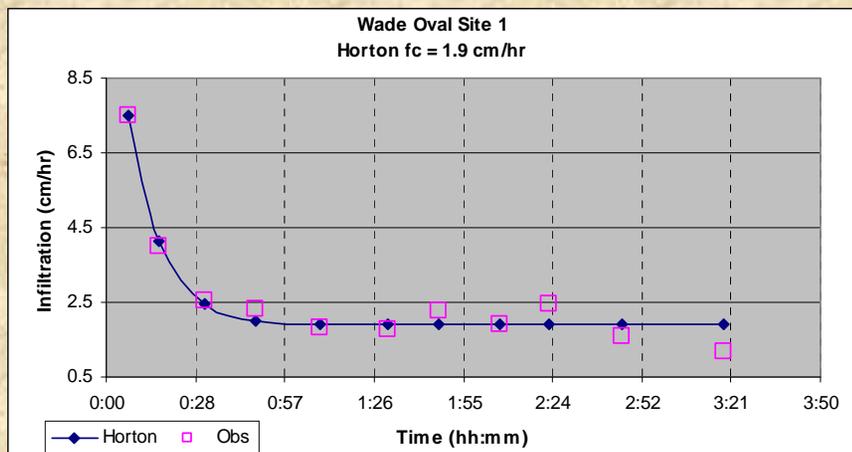
Wade Oval Infiltration

Cuyahoga Sustainability Network

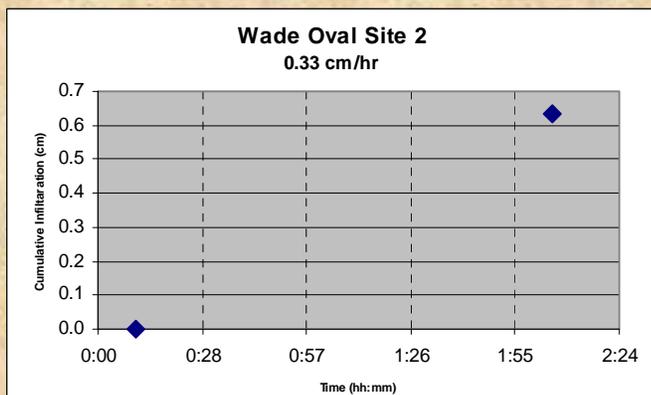


Wade Oval Infiltration

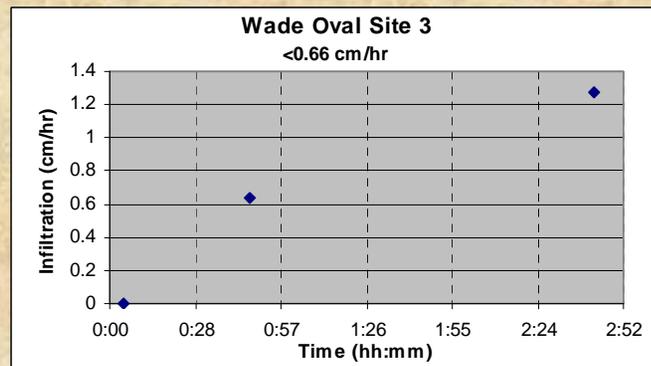
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**1.8
cm/hr**



**0.33
cm/hr**



**< 0.3
cm/hr**



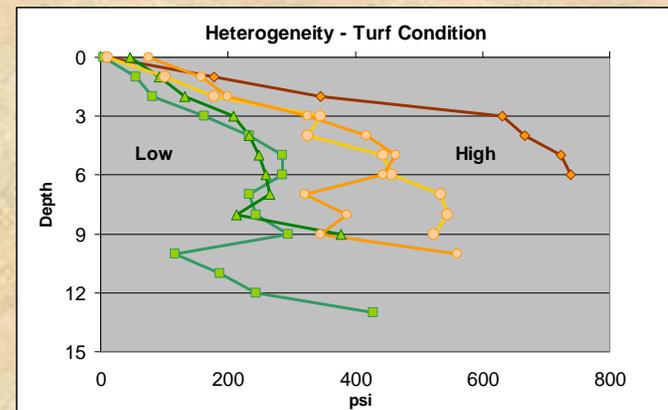
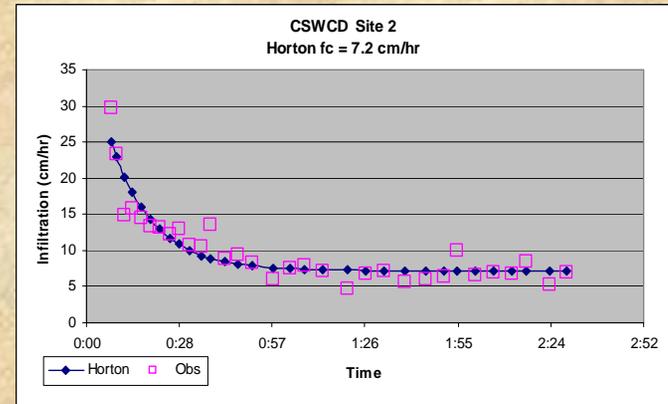
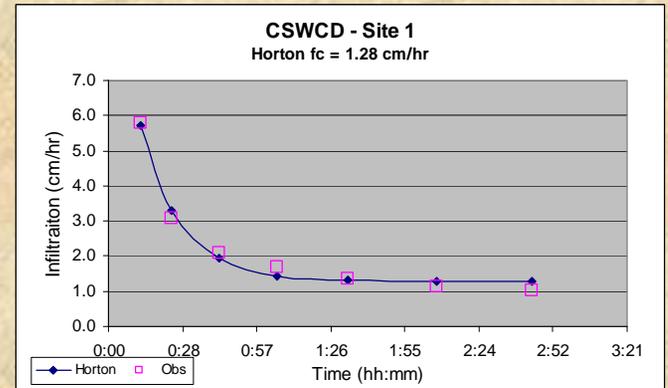
Beyond Impervious Area- Rain Gardens - etc?



CSWCD Rain Garden

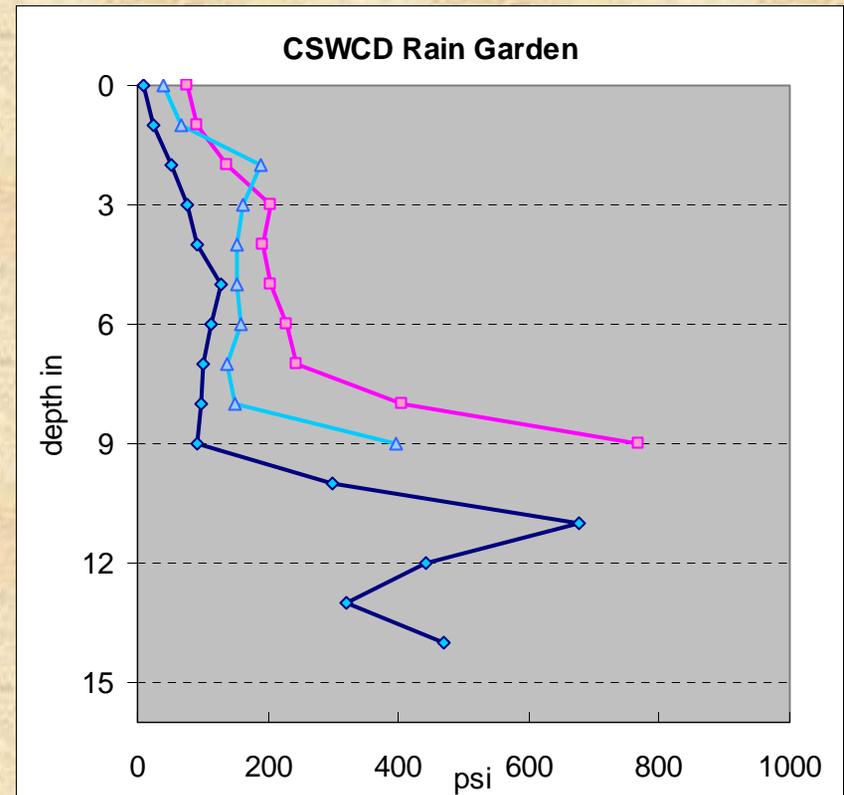
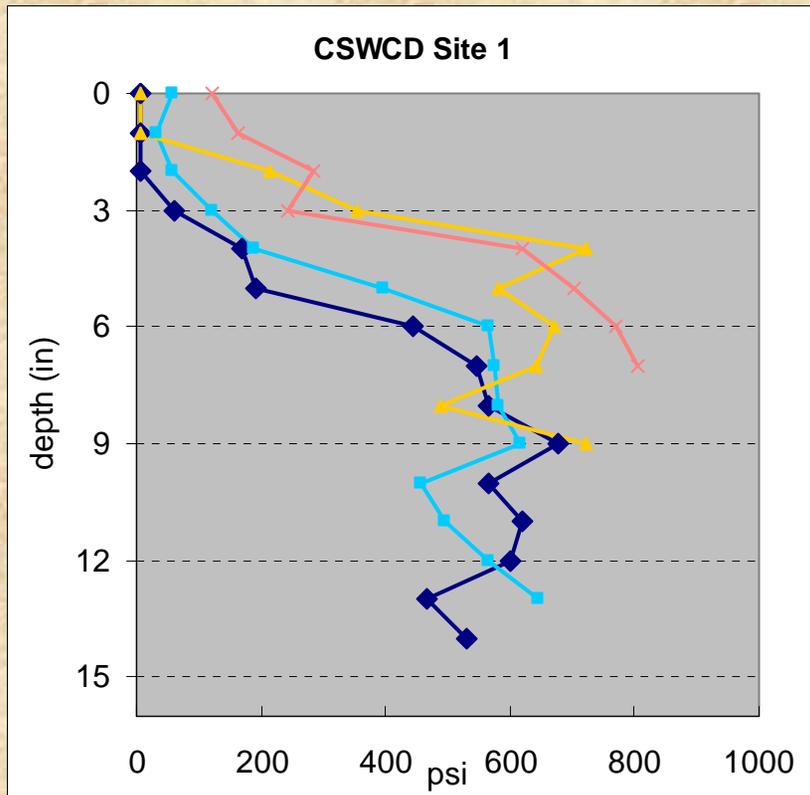
Infiltration and Soil Compaction

Cuyahoga Sustainability Network



CSWCD Rain Garden

Infiltration and Soil Compaction







“Engineered Topography”

Cuyahoga Sustainability Network







No-Mow Lawns

Cleveland Botanical Garden

City of Cleveland

Cuyahoga Sustainability Network



Growing "Greener" Grass

Cleveland Botanical Garden is experimenting with different types of grasses and other plants for lawns that are beautiful, time-saving and earth friendly. Find out more inside!



No-Mow Lawns

Cuyahoga Sustainability Network

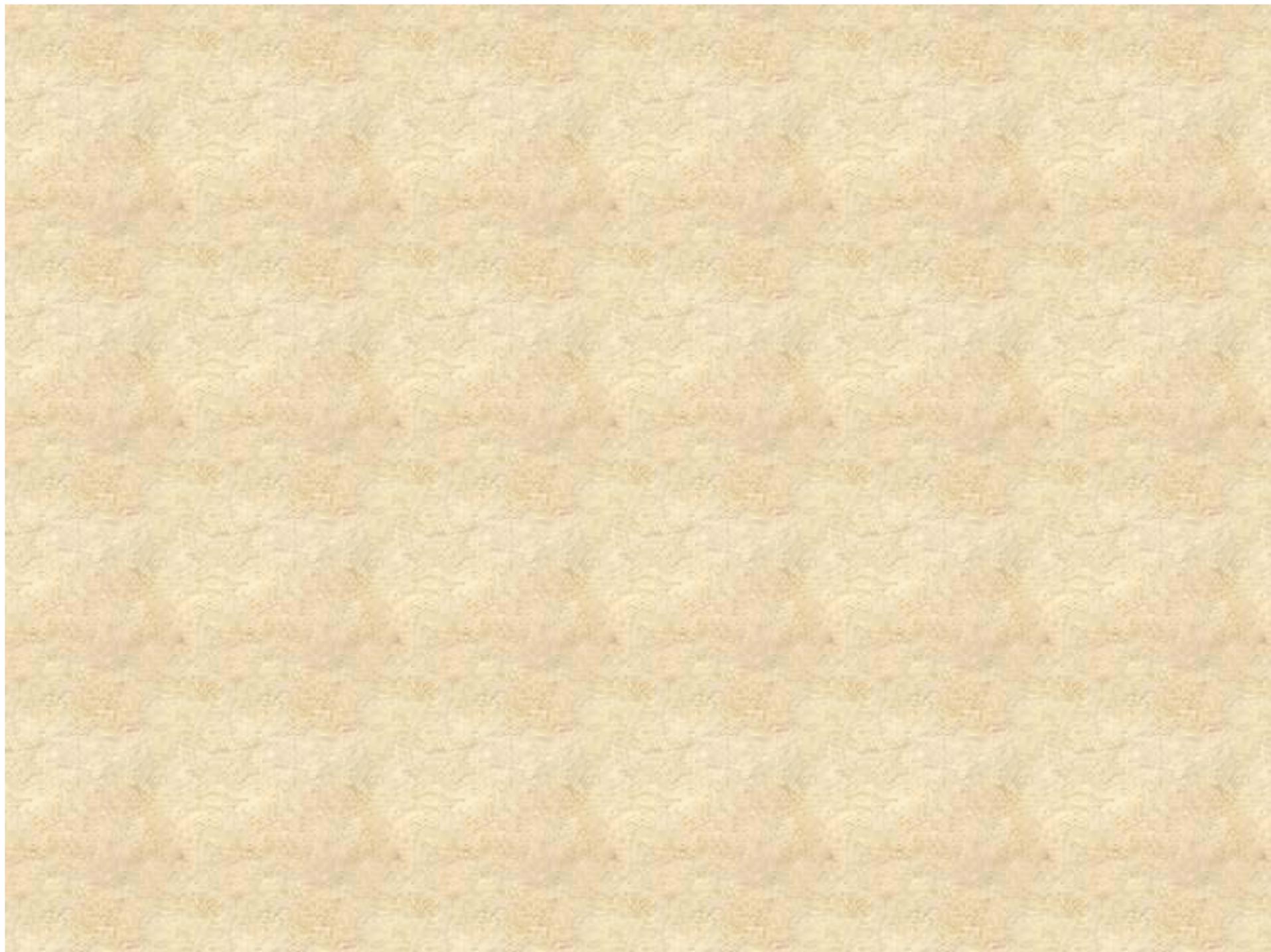


Results from CNS Funding

Enabled New Collaborations & Technology Transfer:

- U.S. Forest Service Northern Research Station
Urban Forestry & Sustainable Landscapes
- Baltimore Ecosystem Study a NSF-LTER site
Urban Infiltration Studies –Cornell Infiltrimeters
- Chesapeake Bay Trust – Pervious concrete Partnership
with CSU, MD-SHA, County Engineers, MDE,
MRMCA, MD-ASCE, MD-USGBC





Collaborator Updates

Cuyahoga Sustainability Network

- **CSU – Parker Hannifin Building – pervious concrete**
- **Chagrin River Watershed Partners – Cawrse Associates**
- **University Circle Corporation**
- **Cleveland Botanical Gardens – low-mow lawns**
- **City of Cleveland – Urban Street Trees**
- **Cuyahoga County Planning Commission – Greenprint**
- **Cuyahoga SWCD – compaction and lawn tillage**



Future Work

- **Community Tree Survey in Cleveland**
- **Urban Forest Services:**
 - Cuyahoga GreenPrint; Cleveland Metroparks; Cleveland Street Trees**
- **Infiltration & Hydrologic Services:**
 - Hydrologic function of rain gardens & urban pervious areas**
 - Lawn treatment for infiltration**
 - No-Mow lawns and lawn care – quality and function**
- **Pervious concrete partnerships in Chesapeake Bay**
- **Spatial Decision Models – New Color & IR Aerials and LIDAR**



Social Sustainability

Ghosts of Land Use Past

Euclid Golf: Suburbanization & Greenspace



August 26, 1919

Dear Mr. Rockefeller:

... One of the most gratifying features of the enterprise is that real estate men look upon this Euclid Golf Allotment as a model development. Mr. Deming has had many visitors from all parts of the United States inspecting the place, and their universal comment has been that only "Mr. Rockefeller" could do such a fine piece of work. ...

Very Truly,
Charles O. Hedyt



PA Lawns –
 Pitt
 Clavenger

Turf Amendment – Balousek 2003

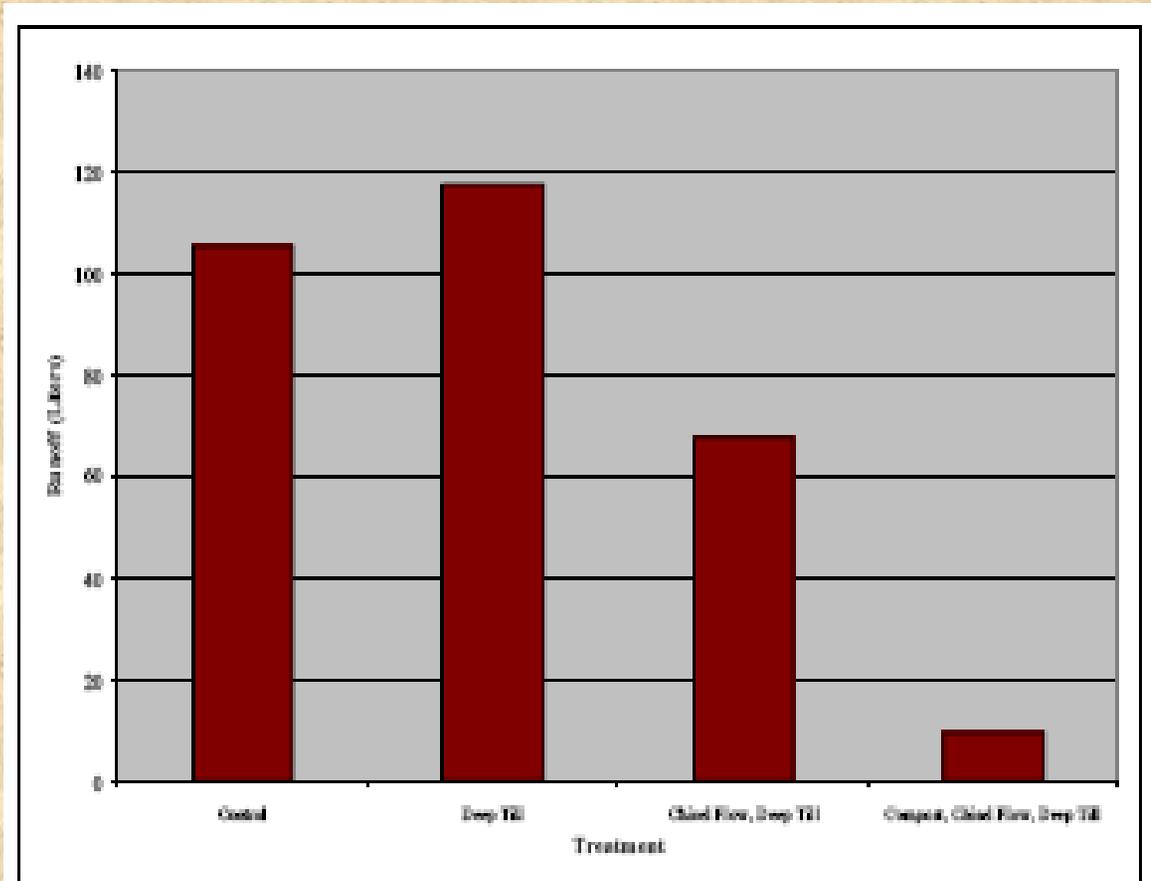


Figure 11. Cumulative runoff for storms larger than 2.5 centimeters.

Balousek 2003. "Quantifying Decreases in Stormwater Runoff from Deep Tilling, Chisel Plowing, and Compost Amendment."

<http://www.countyofdane.com/landconservation/papers/quantifyingdecreasesinswrunoff.pdf>

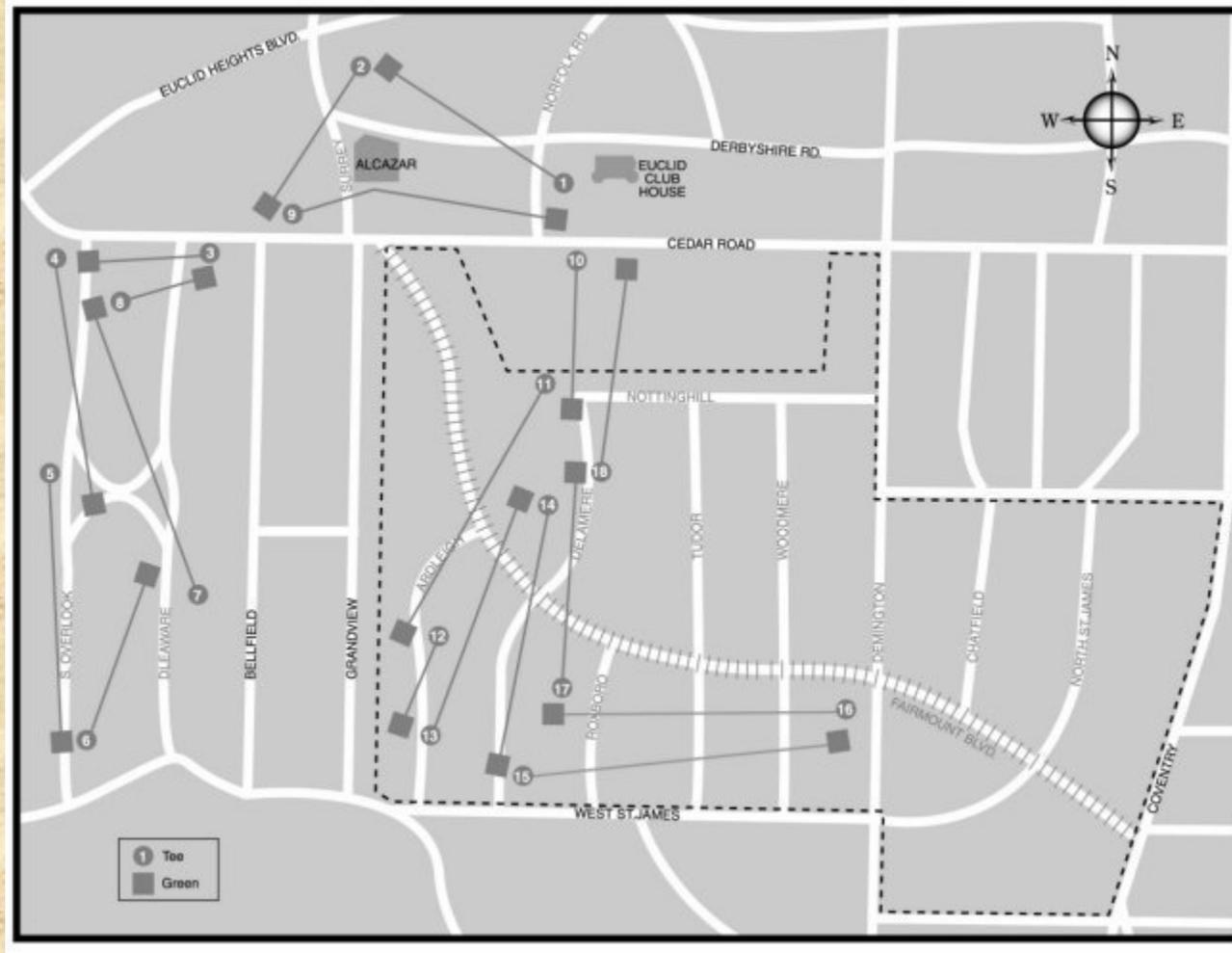
Feedback & Contacts

- **Commoditizing Stormwater – Credits and Trading**
- **Automatically Derived Spatial (GIS/Remote Sensing) Metrics of Sustainable landscapes & design**
- **Landscape Influences on Hydroecology**
- **Urban BMP cost-effectiveness**
- **Riparian Setback / Riparian Buffer Technical Literature**



Euclid Golf

Cuyahoga Sustainability Network



Environmental Sustainability

Hydrologic Services & Sustainable Landscapes

Pervious Concrete

Site Infiltration

Lawns & Green Spaces

Beyond Impervious Area

Social Sustainability

Ghosts of Land Use Past

The Heights & Early Suburbanization

Rockefeller, Ambler, Wade

Euclid Golf

Deed Restrictions

Euclidean Zoning

Euclid v. Ambler

Shaker Nature Center and the Lee-Clark Freeway