

Cuyahoga Sustainability Network

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Expected Contributions to Sustainability:

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

- **Urban Hydrology and Sustainable Landscapes**
 - **Infiltration in Urban Environments**
- **Economic Demand for Environmentally Sustainable Design**
- **Landscape Influences on Environmental Services**
- **Multiobjective Spatial Decision Making**

Stormwater Management

Hedonic Analysis

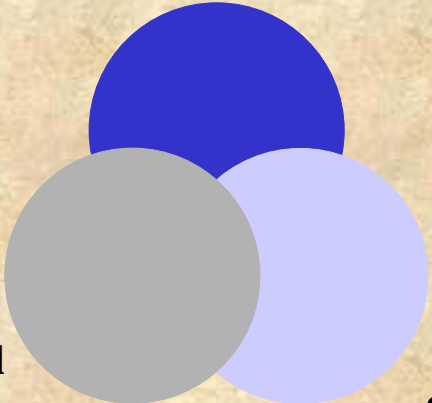
Pervious Concrete

Conservation Design

Infiltration Design

**Engineered
Systems**

Riparian Setbacks



**Natural
Systems**

**Social
Systems**

Spatial Optimization

Home Rule

BioReserve Design

Riparian Setback Zoning

Urban Forestry

Community Sense of Place



Early Lessons Learned:

- **Planning & Development in a Home Rule State**
- **Hedonic Analysis – No Net Cost for Environmental Design**
- **Pervious Concrete – Cold Weather Performance & Design**
- **Urban Forest Services**
- **Ghosts of Landuse Past**

Euclidean Zoning & Community Character

Collaborator Updates

- **Chagrin River Watershed Partners – Solon: Pervious Concrete**
 - **Euclid Creek Watershed Council & Cuyahoga SWCD – CICEET Proposal**
 - **West Creek Preservation Committee**
- Cuyahoga Floodplain Acquisition**

Potential Clients

- **Building Cleveland by Design**
- **Ohio Ready Mix Concrete Association – Draft Spec.**
- **Ohio EPA – Doan Brook TMDL**
- **City Foresters – Cleveland, Cleveland Heights, Shaker Heights**
- **Cleveland AIA**
- **Ohio Balanced Growth Initiative**



Results from CNS Funding

Enabled New Collaborations & Dissemination:

-U.S. Forest Service Northern Research Station

Urban Forestry & Sustainable Landscapes

Decision Support Chesapeake Urban Tree Cover Goals

- Baltimore Ecosystem Study a NSF-LTER site

Urban Infiltration Studies –Cornell Infiltrimeters

- Riparian Setback Zoning & Chesapeake Bay

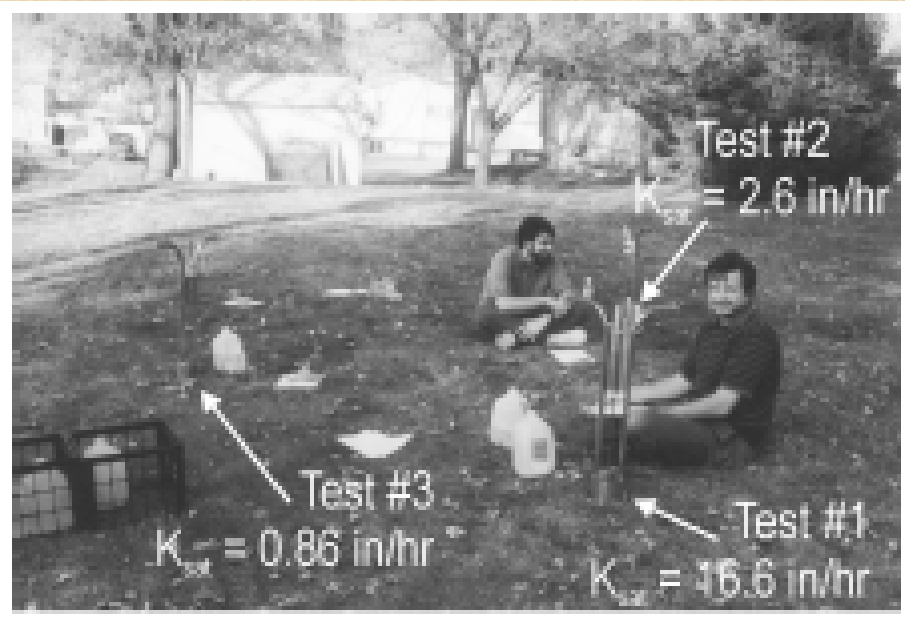


Site Design Hydrology

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Quantifying Site Infiltration



IIHR Digital Infiltrometer



BES: Cornell Infiltrometer

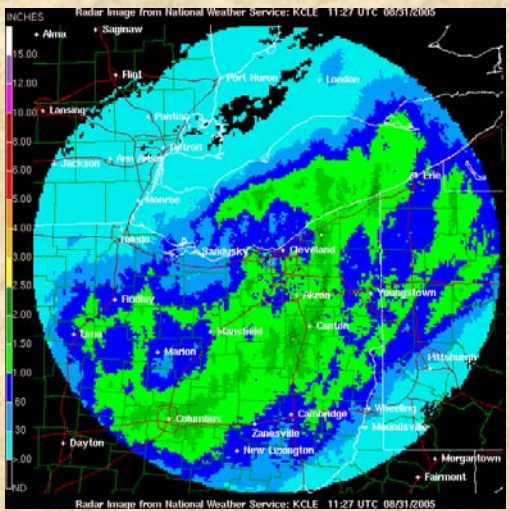
Environmental Sustainability: Pervious Concrete

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Cleveland State University & Ohio Ready Mix Concrete Association

Pervious Concrete Test Plot



**Tropical Storm Katrina
Storm Totals:**

31Aug 2005 - 07:27 EDT

**Economic Sustainability:
Hedonic Price Analysis**

Amenity Values Estimated from Sales Transactions

Conservation Design – 40% Open Space

Riparian Setback Zoning

New Urbanism

Social Sustainability

Ghosts of Land Use Past

The Heights & Early Suburbanization

Rockefeller, Ambler, Wade

Euclid Golf

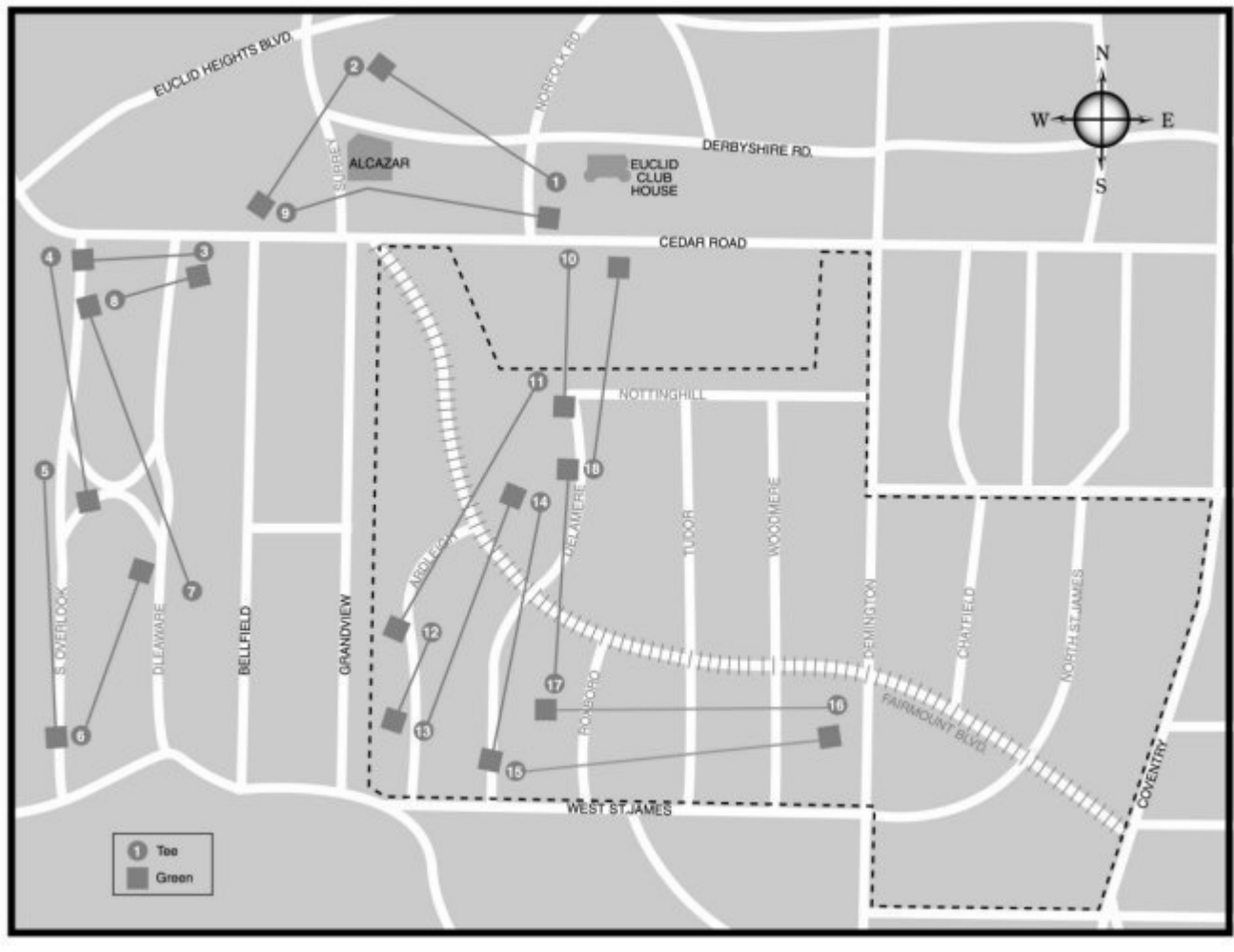
Deed Restrictions

Euclidean Zoning

Euclid v. Ambler

Shaker Nature Center and the Clark Freeway

Euclid Golf



We Aim to Provide Home Sites for Refined, Cultured People

Who appreciate purer air, larger lots, greater privacy—where one can have his own “vine and fig tree,” where his children can have good schools and spacious play grounds, without the dangers of the streets. All these benefits can be obtained at prices to suit the individual purse.

Shaker Heights the Year Round

Many people who have gone heretofore to the country for the Summer have become tired of moving so often; of staying in town until June and hurrying back in September, on account of school, and have accepted Shaker Heights as their home the year round. It's altitude makes it several degrees cooler in Summer, and frequently in the Winter, that which is rain in town, is Snow on Shaker Heights, showing that the air is drier and more healthful.

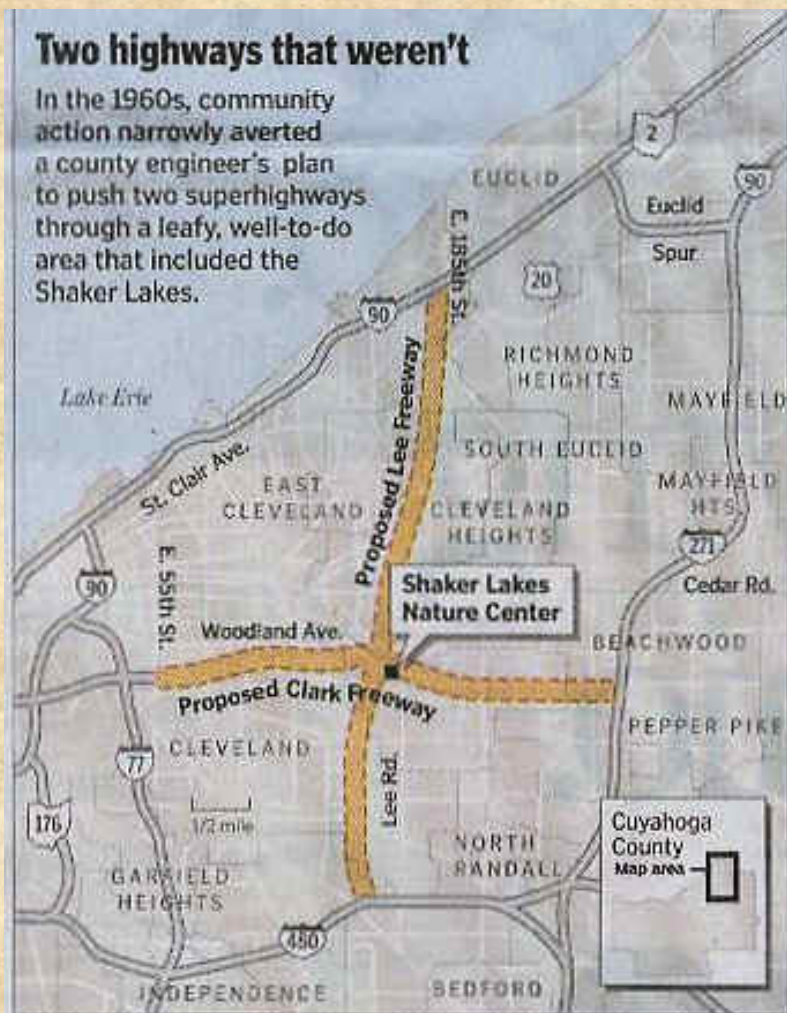
If you don't want to buy on Shaker Heights, don't talk to Shaker Heights residents. It's contagious.

O. P. & M. J. Van Sweringen
907 Williamson Bldg.

(OVER)

Two highways that weren't

In the 1960s, community action narrowly averted a county engineer's plan to push two superhighways through a leafy, well-to-do area that included the Shaker Lakes.



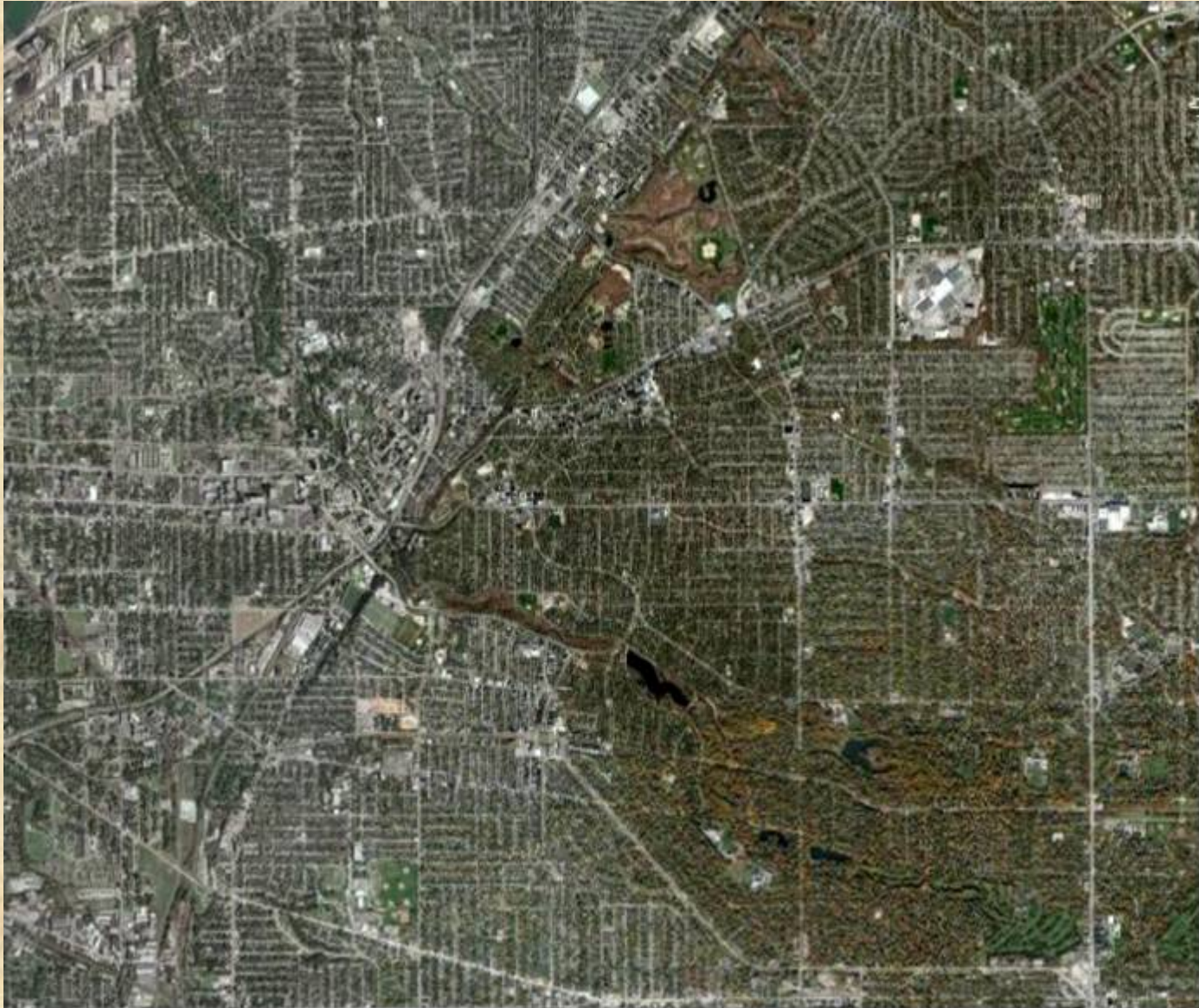
SOURCES: ESRI, TeleAtlas

WILLIAM NEFF | THE PLAIN DEALER

Suburbanization and Greenspace

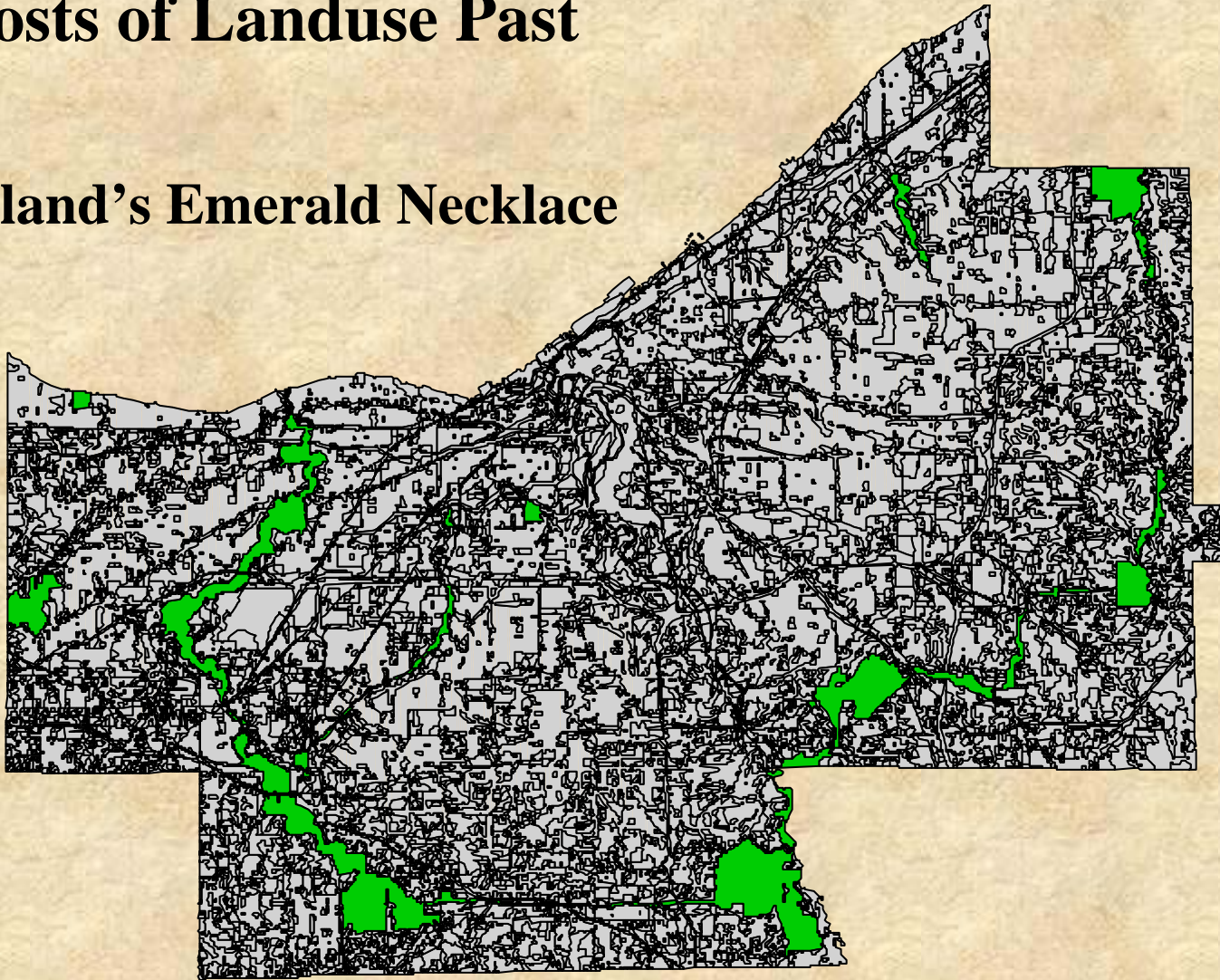
Ghosts of Land Use Past

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Ghosts of Landuse Past

Cleveland's Emerald Necklace



Urban Forest Services

U.S. Forest Service Northern Research Station

Cleveland's Urban Forest Annual Air Pollutant Removal (metric tons)

O₃	191
PM₁₀	240
NO₂	76
SO₂	72
CO	13

Annual Air Quality Benefits ~\$3 billion

Riparian Setback Zoning

1st Generation

Agriculture and Forest Buffer Literature.

What's the “right” width?

2nd Generation

Importance of *contiguity* of riparian corridor.

Tradeoffs among *join non-separable* environmental services.

Emphasize maintaining the *connections exchanges and functions* of the riparian *system* – (i.e. coupling between streams & floodplains)

3rd Generation

Process-Based Predictive Understanding

Landscape Targetting

Efficiency vs. Resilience

Riparian Setbacks; Technical Information for Decision Makers

www.crwp.org/pdf_files/riparian_setback_paper_jan_2006.pdf

Comments and Feedback Welcome



Feedback & Contacts

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

