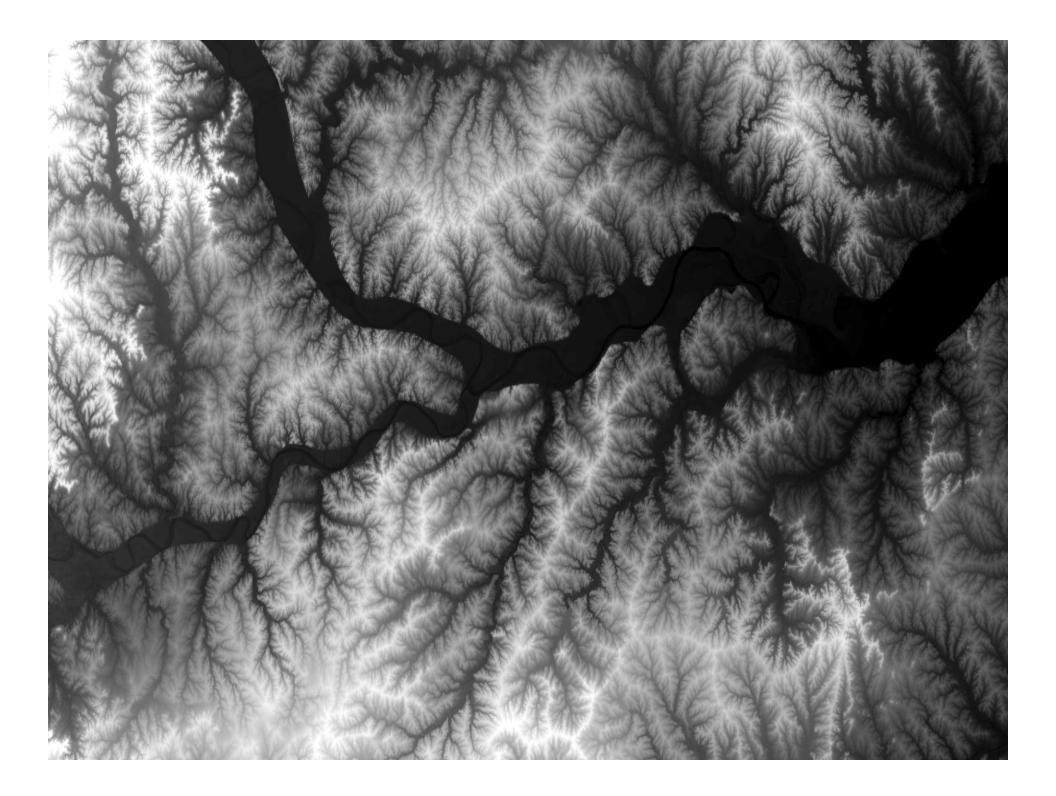


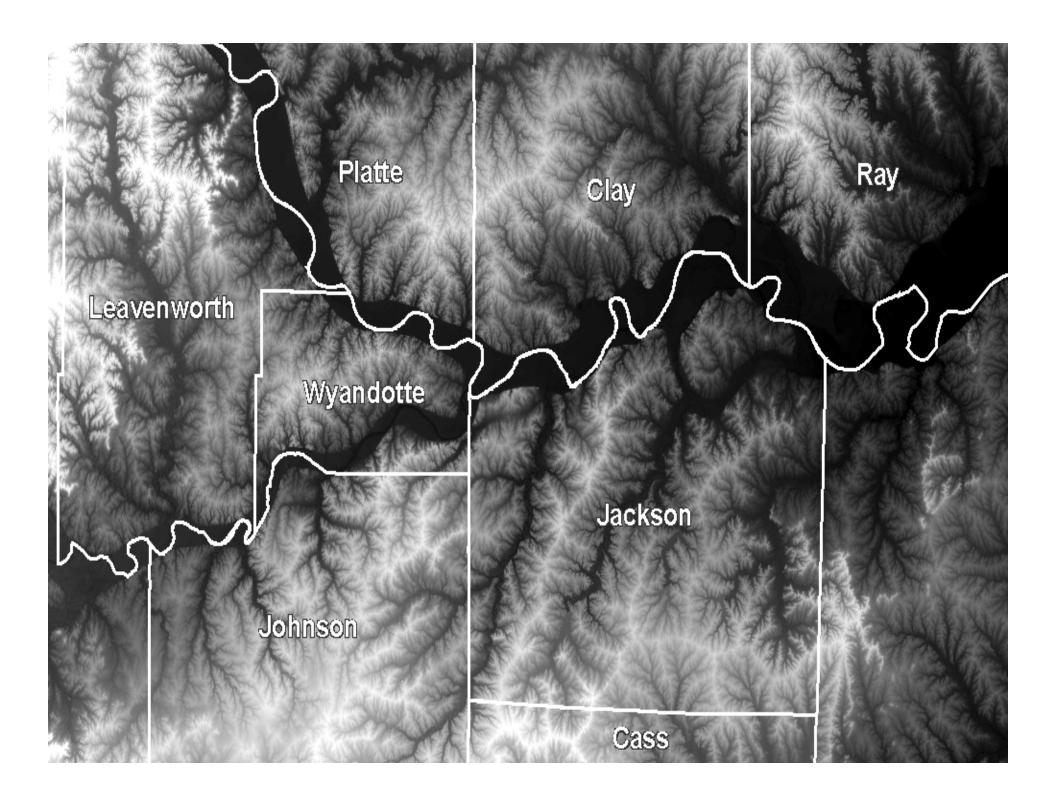
#### **Presentation Goals**

- Share broad green infrastructure protection strategies
- Discuss applicability to the City of Columbia
  - Erosion Control
  - Tree Protection
  - Land Protection
- Question: Do Lenexa and MARC experiences apply to Columbia?

#### **Lessons** Learned

- Water is an asset, not a liability
- Solve several problems with every dollar
- Reduce risk of flooding and conserve water quality through integrated, watershed-based planning and design







Source: Center for Watershed Protection

#### How do we make this...

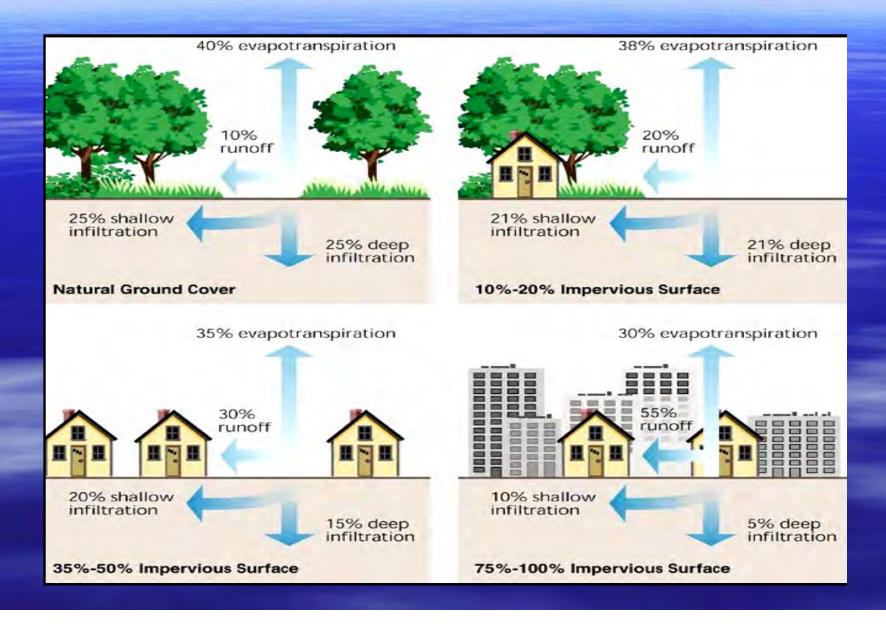
#### function like this?





# ...function like this? Can we make this...

#### Runoff and the Hydrologic Cycle



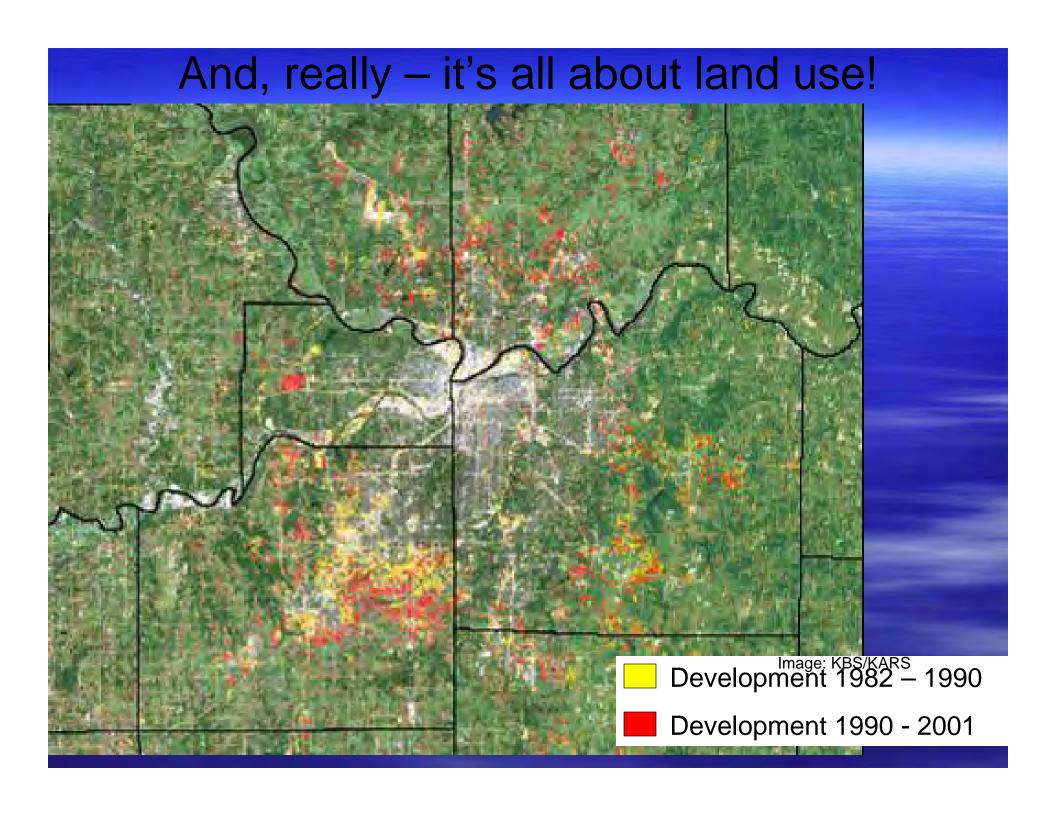
## Watershed Management Policies City of Lenexa (2001)

- 1. Balance natural and built environments
- 2. Identify, protect and restore stream assets
- 3. Conserve water quality through "best management practices"
- 4. Interlocal cooperation
- 5. Municipal responsibility
- 6. Manage risk to public safety and property
- 7. Community participation
- 8. Developed vs. developing areas

# Watershed Management Tools City of Lenexa (2001)

- Watershed-based Approach
  - Master Plan, Watershed Models
- Natural Resource/Stream Asset Inventory
- Comprehensive Plan Update
- Unified Development Code
- Public Education
- Diversified Funding Strategy





# D Miles

#### **Future Land Use**

DRAFT January 2008.

Land use data is from city and county plans and 2005 appraiser's data. All recent future land use data changes may not be included. MARC has converted all local land use types to a common set of classes.

#### Legend

#### Future Land Use Type

Agriculture/Vacant

Rural Policy Area - .1 Units per Acre (UPA)

Rural Residential - .2 UPA

Urban Fringe - .5 UPA

Residential SF Large Lot - 1 UPA

Residential SF Very Low - 1.5 UPA

Residential SF Low - 2.5 UPA

Residential SF Medium - 5 UPA

Residential MF Low - 8 UPA

Residential MF Low-Med - 12 UPA

Residential MF Medium - 15 UPA

Residential MF High - 20 UPA

Residential MF Very High - 30 UPA

Protected/Parks

Public/Semipublic (Low) - .22 Floor Area Ratio (FAR)

Public/Semipublic (High) - .3 Floor Area Ratio (FAR)

Commercial (Low) - .2 FAR

Commercial (High) - .3 FAR

Office (Low) - .25 FAR

Office (Medium) - .275 FAR

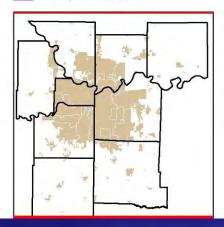
Mixed Use (Low) - .17 FAR

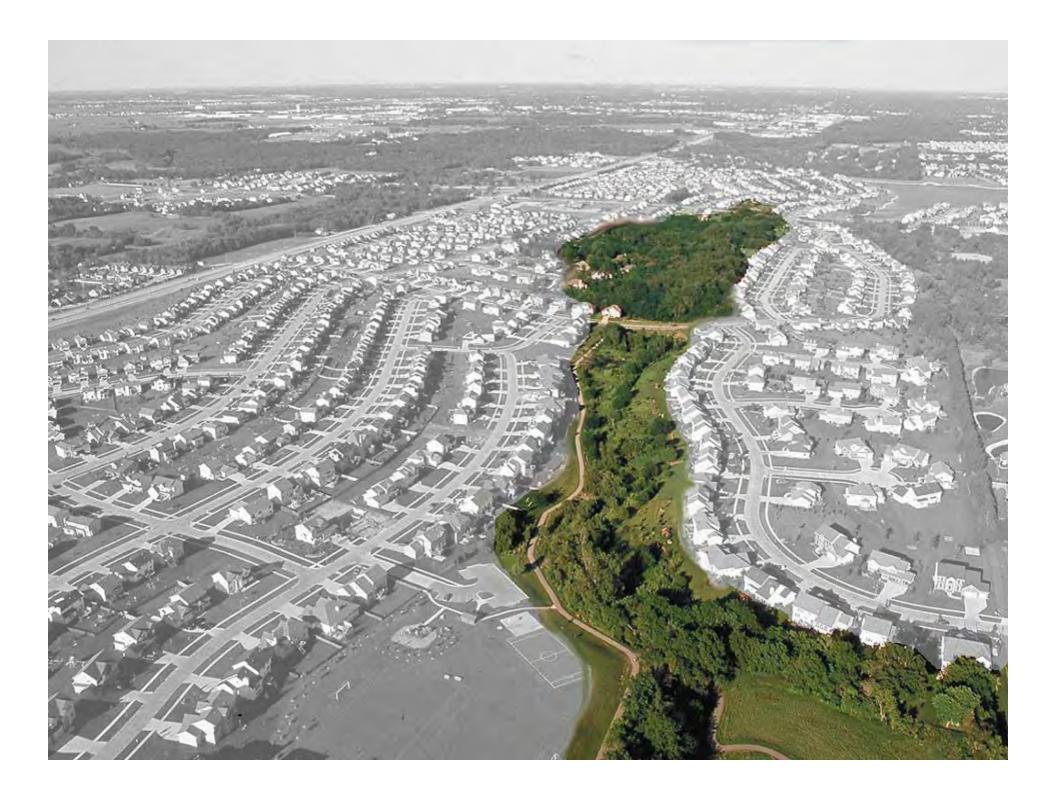
Mixed ose (Eow) - 117 174K

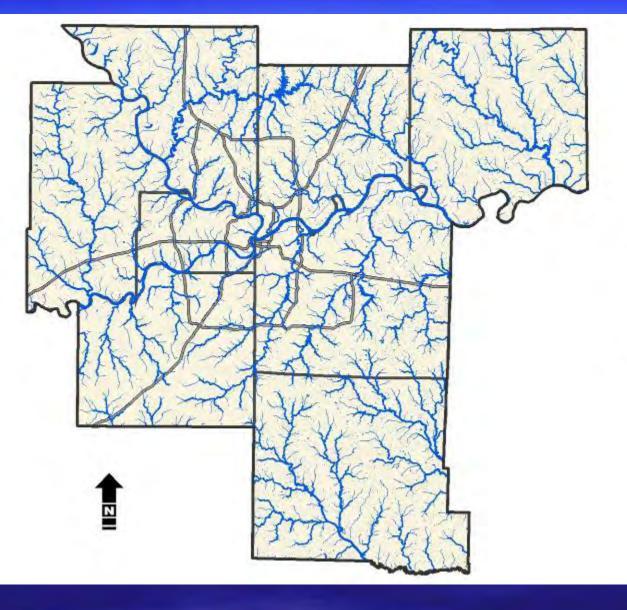
Mixed Use (High) - .65 FAR

Industrial/Bus. Park (Low)- .2 FAR

Industrial/Bus. Park (High) - .24 FAR



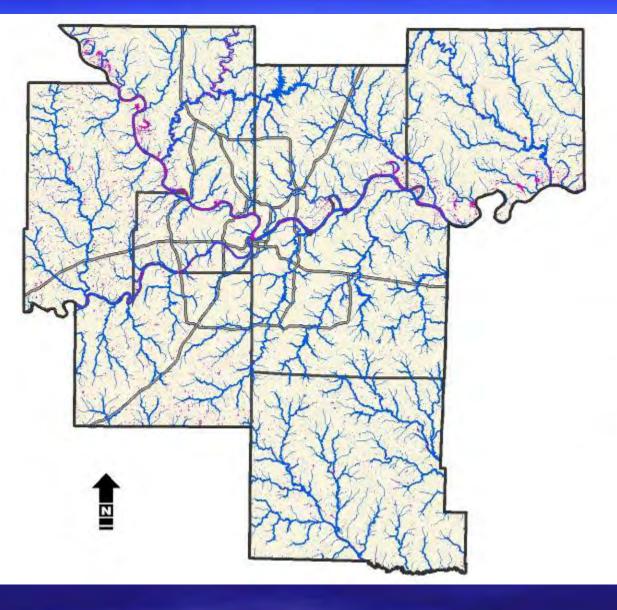




Lakes

Rivers

Streams

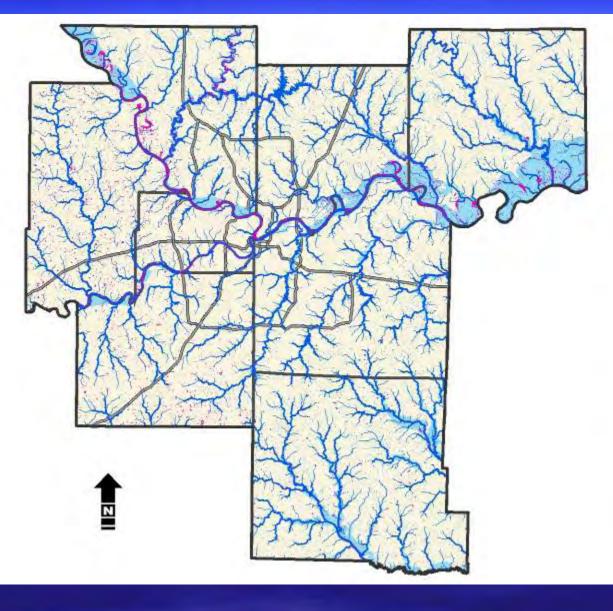


Lakes

Rivers

Streams

Wetlands



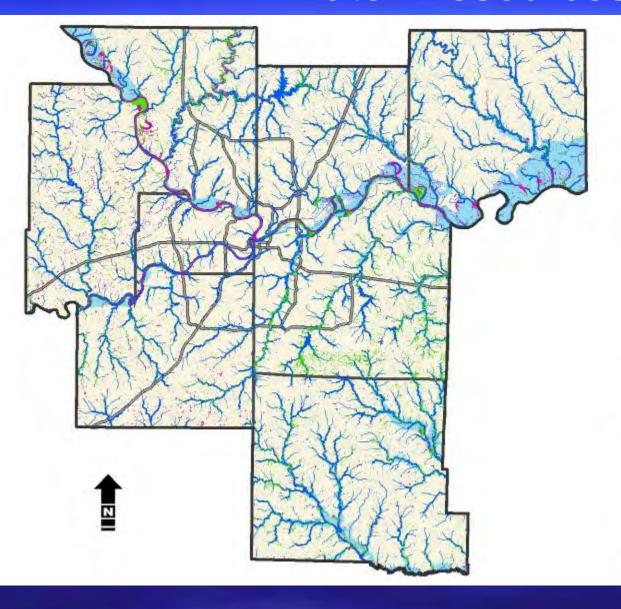
Lakes

Rivers

Streams

Wetlands

100-Year Flood Plain



Lakes

Rivers

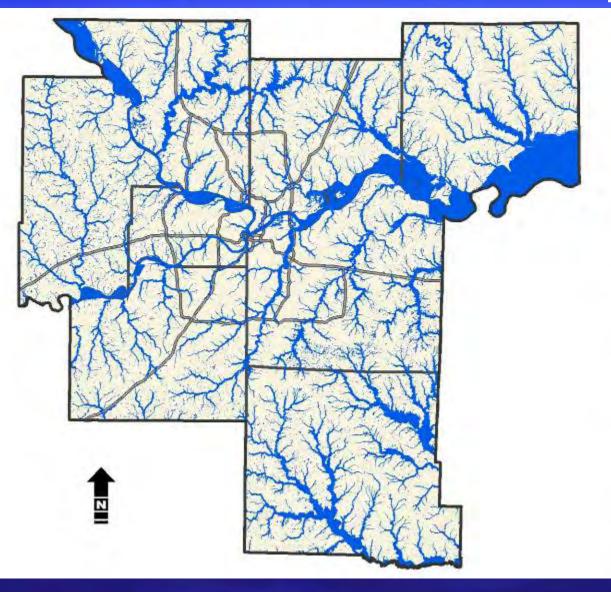
Streams

Wetlands

100-Year Flood Plain

Lowland Vegetation

#### Water Resources Compilation



Lakes

Rivers

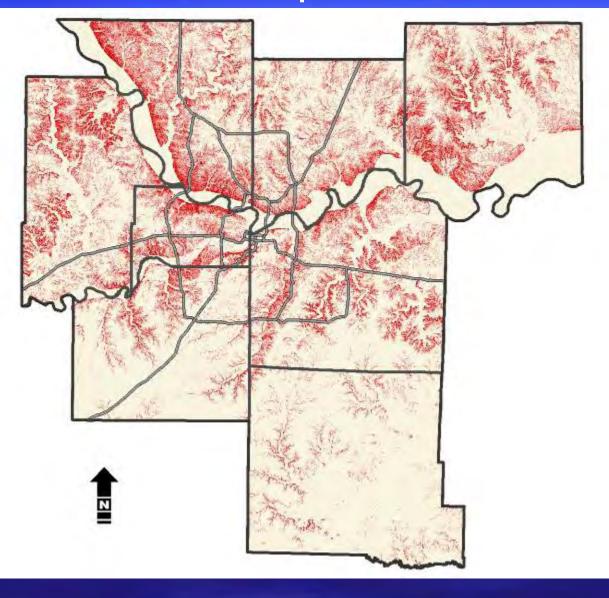
Streams

Wetlands

100-Year Flood Plain

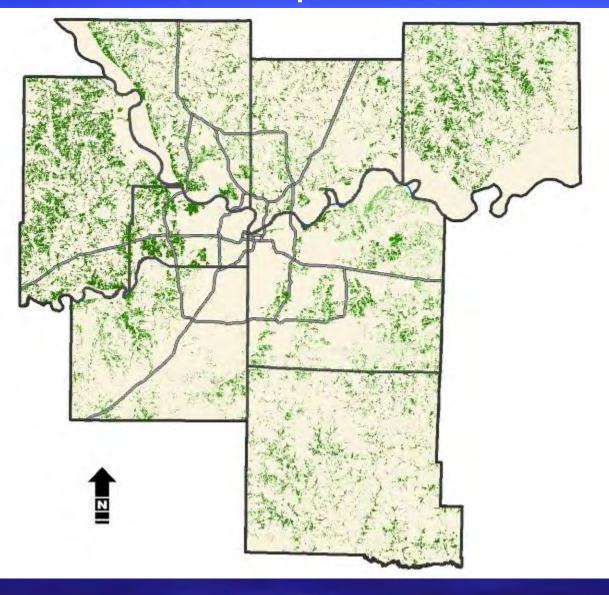
Lowland Vegetation

#### **Upland Resources**



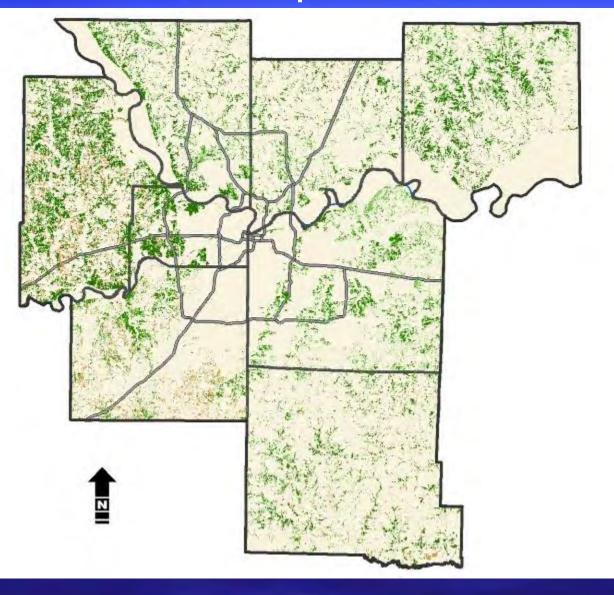
Steep Slopes

#### **Upland Resources**



Forests and Woodlands

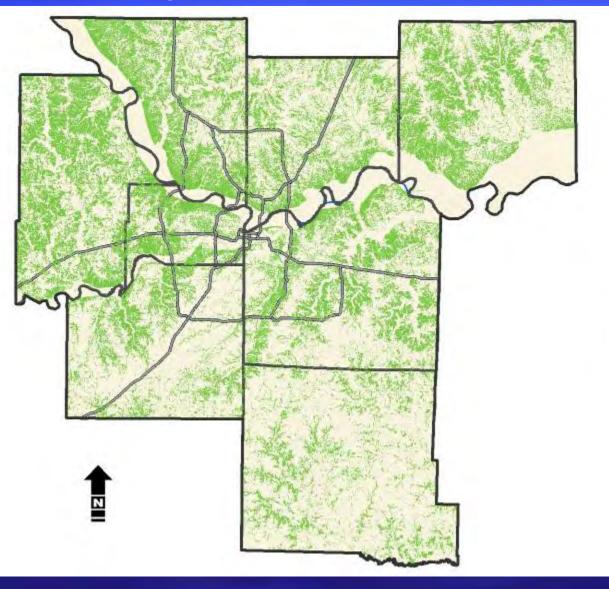
#### **Upland Resources**



Forests and Woodlands

Grasslands

#### **Upland Resources Compilation**



Forests and Woodlands

Grasslands

Steep Slopes

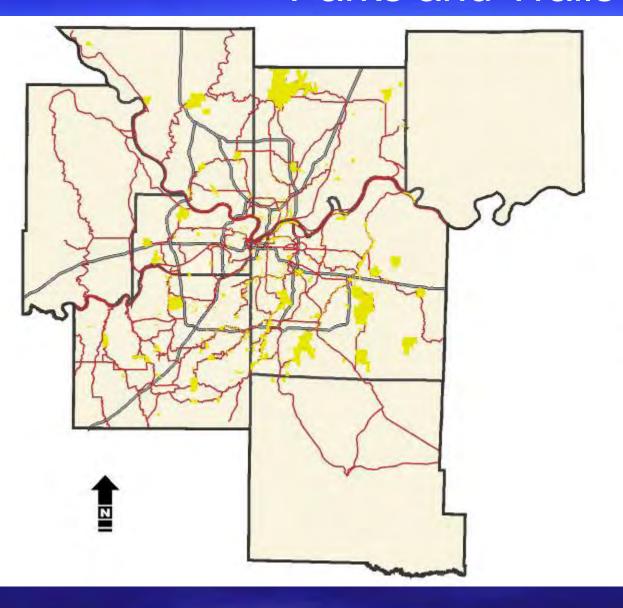
#### Water and Upland Resources



Water Resources

**Upland Resources** 

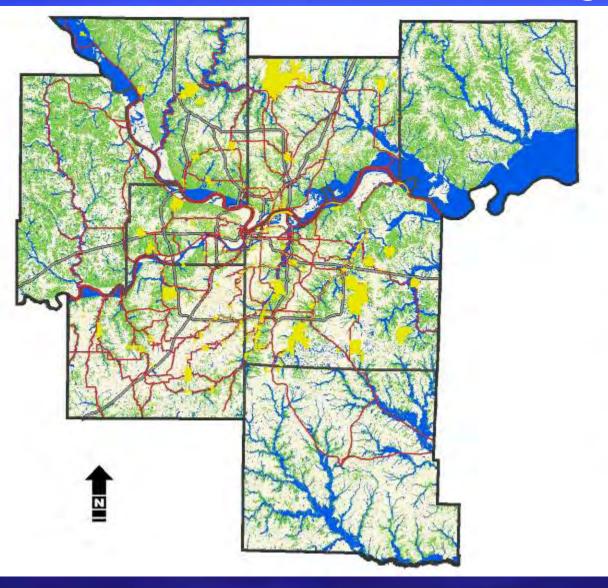
#### Parks and Trails



Parks

Planned & Existing MetroGreen Trails

#### Green Infrastructure Planning Starting Point

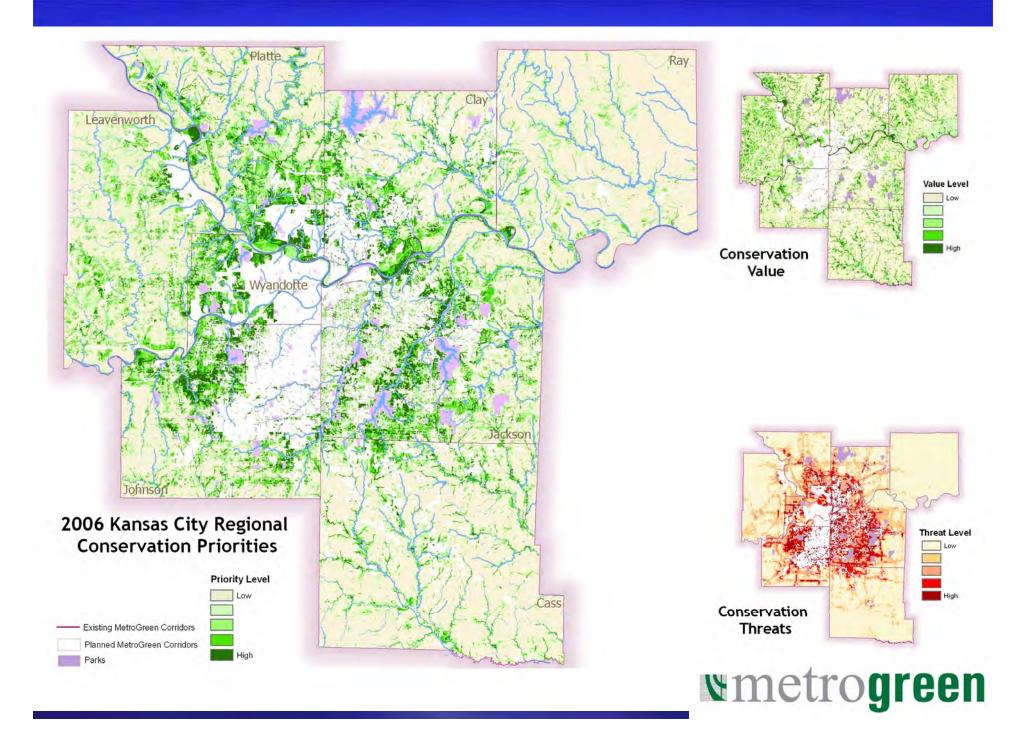


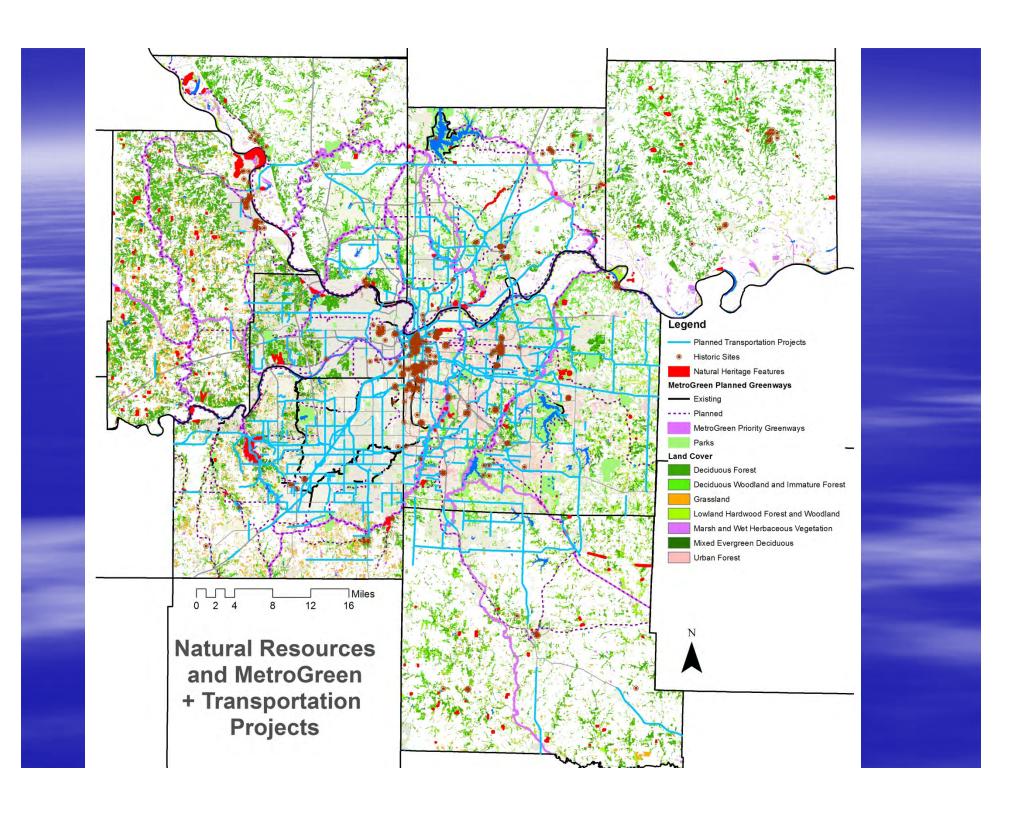
Water Resources

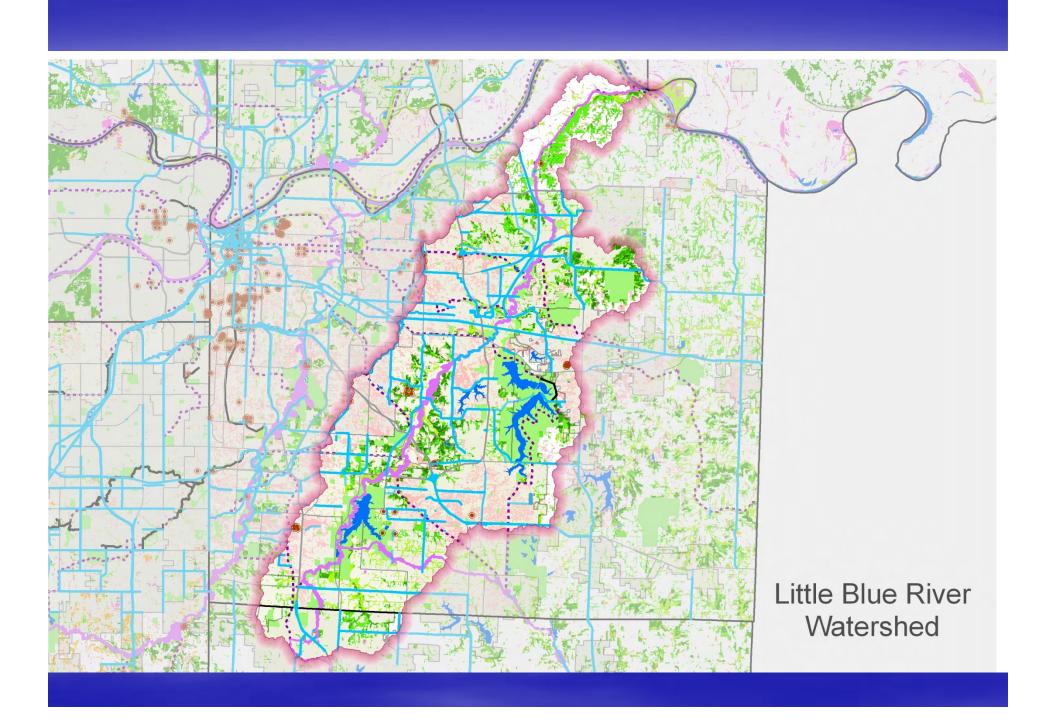
**Upland Resources** 

Parks

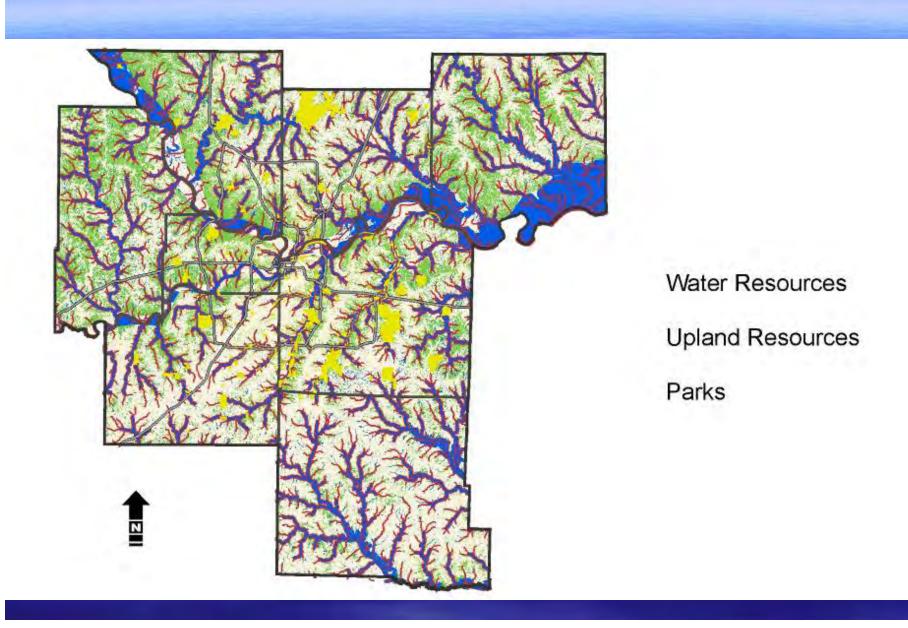
Planned & Existing MetroGreen Trails



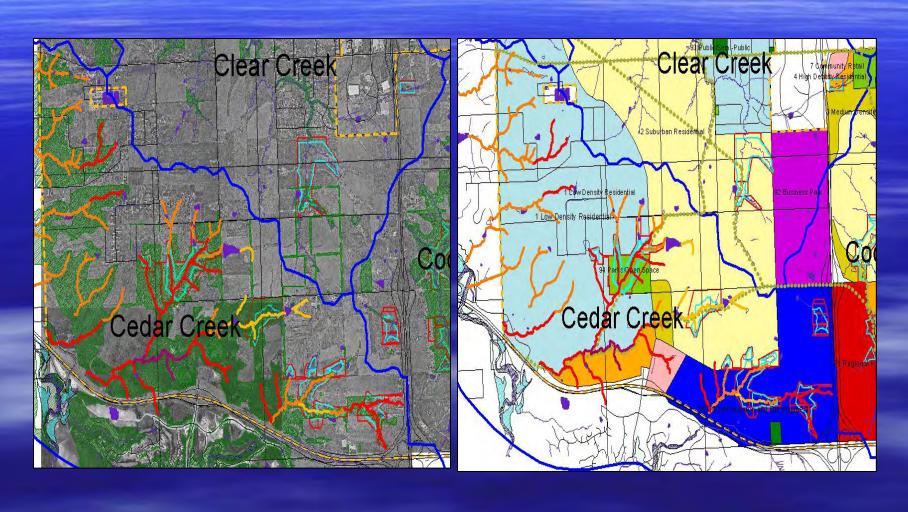




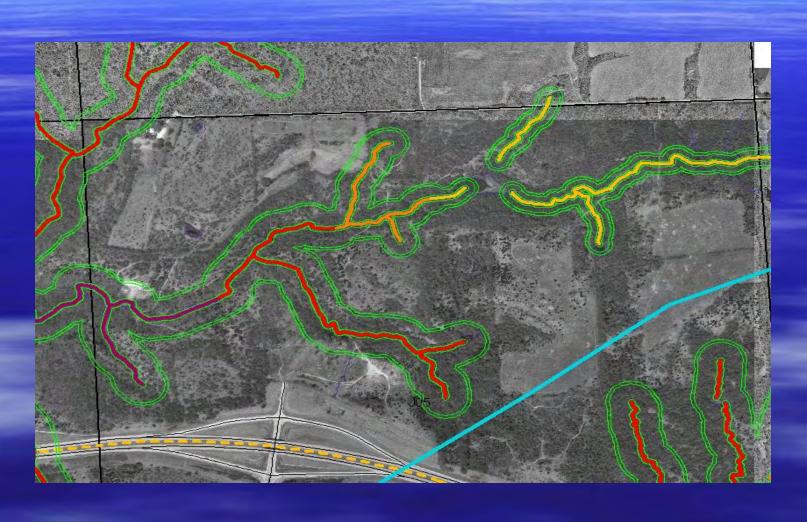
#### Stream setbacks



## Natural Resource Inventory



#### Stream Setback Ordinance





## Redefining terms

Community Planning



Engineering Design Environmental Management



#### **Technical Tools**

Standards and Specifications (APWA 5600)

Conserve



Flexible Decision-Making Guide (Matrix)

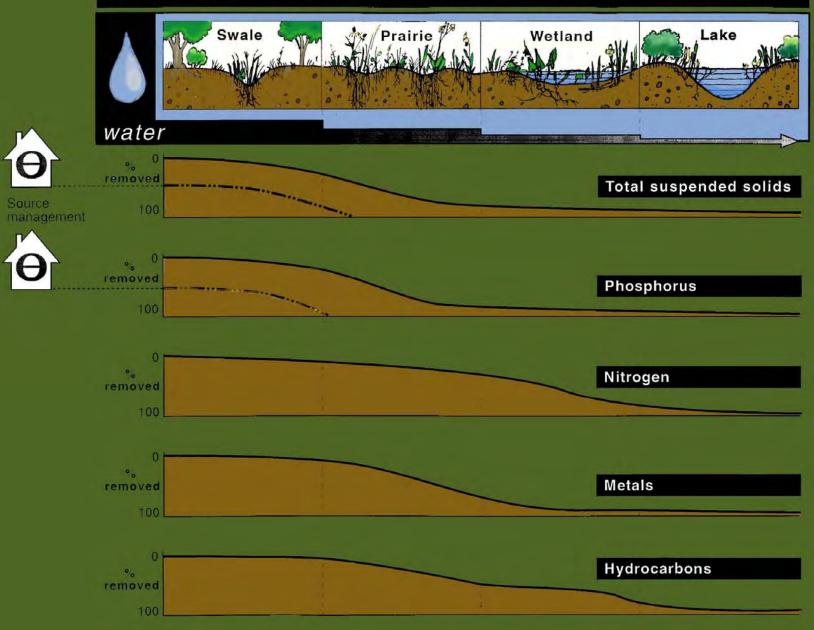


Restore

Best Management Practices (Manual)



#### **Stormwater Treatment Train**



### Demonstration projects









# Erosion Control Ordinance are designed to stop this!







#### **Erosion Control Ordinance**



### **ESC** Principles

- Prevention erosion control first!
- Keep sediment on-site
- Limit extent and duration of exposure
- Integrated stormwater and erosion control
  - planning, design, inspection and maintenance

#### Some tree protection opportunities

- Tree ordinances
- Landscape ordinances
- Erosion and sediment control
- Stormwater management
- Site design
- Natural resource elements in comprehensive plans

#### **Lessons Learned**

- Water is an asset, not a liability
- Solve several problems with every dollar
- •Reduce risk of flooding and conserve water quality through integrated, watershed-based planning and design
- •For new regulations: a soft approach is helpful (consensus building, technical support, education, etc.)



# PHILOSPHY Triple Bottom Line





- Mid-America Regional Council
- 816-701-8352
- Tjacobs@marc.org

