



Spring Lake Stormwater Integrated Assessment Project

Rein in the Runoff

Public Meeting
June 25, 2008



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Annis Water Resources Institute

Grand Valley State University

Presentation Outline

- ❖ Why stormwater is a problem
- ❖ Who we are
- ❖ What we're doing to address it
- ❖ How you can get involved



Photo credit: Progressive AE



Why do we care about stormwater?

- ❖ Stormwater discharges are generated by runoff from land and impervious areas during rain and snow events
 - Paved streets
 - Sidewalks
 - Parking lots
 - Driveways
 - Building rooftops

Stormwater Impacts

- ❖ Impervious surfaces increase runoff volume, velocity and pollutants
- ❖ Reduce recharge to aquifers
- ❖ Increase erosion and sedimentation
- ❖ Potentially toxic to stream biota



Photo credit: Spring Lake Lake Board

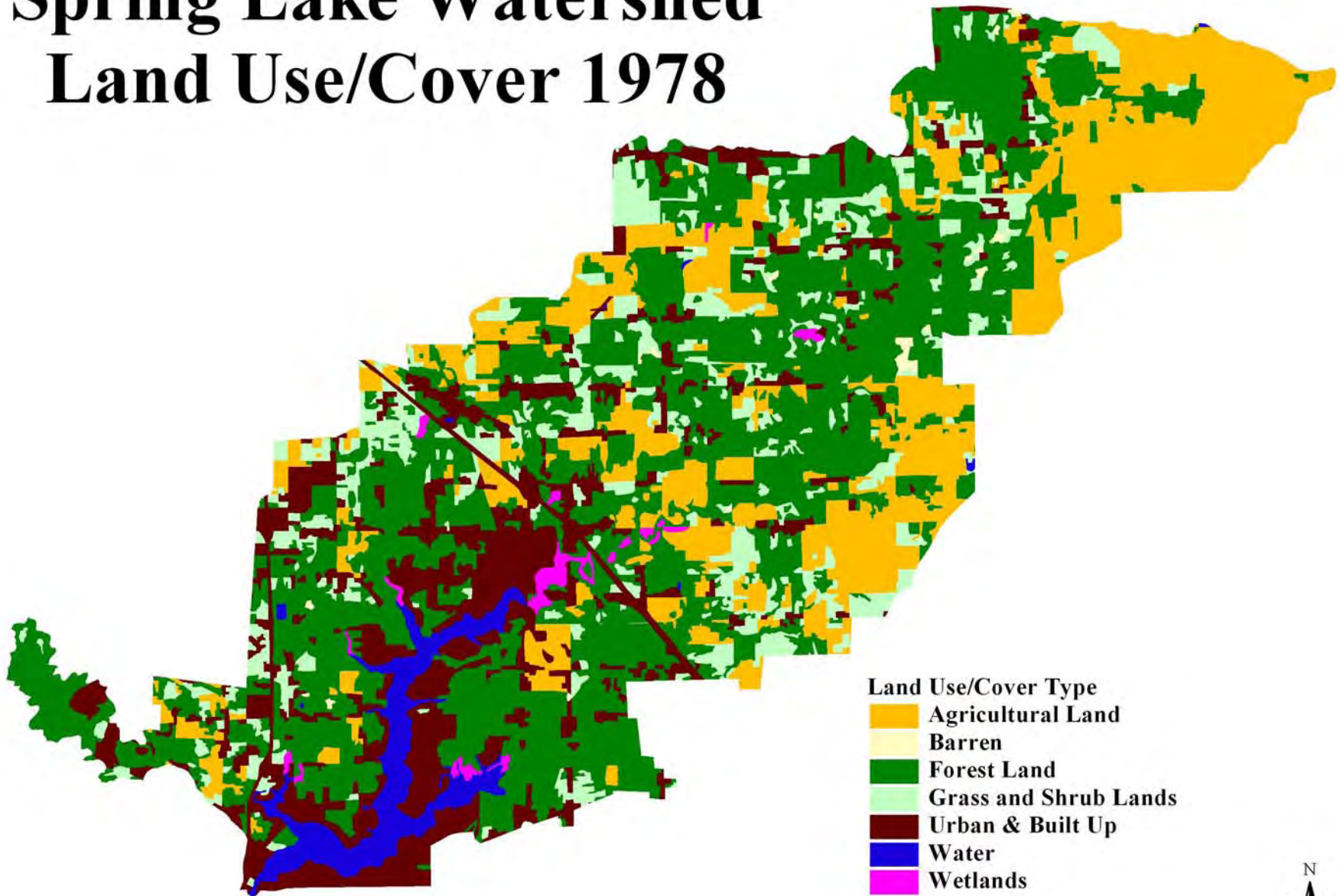


Photo credit: E. Isely



Photo credit: J. Morse (Muskegon Chronicle)

Spring Lake Watershed Land Use/Cover 1978

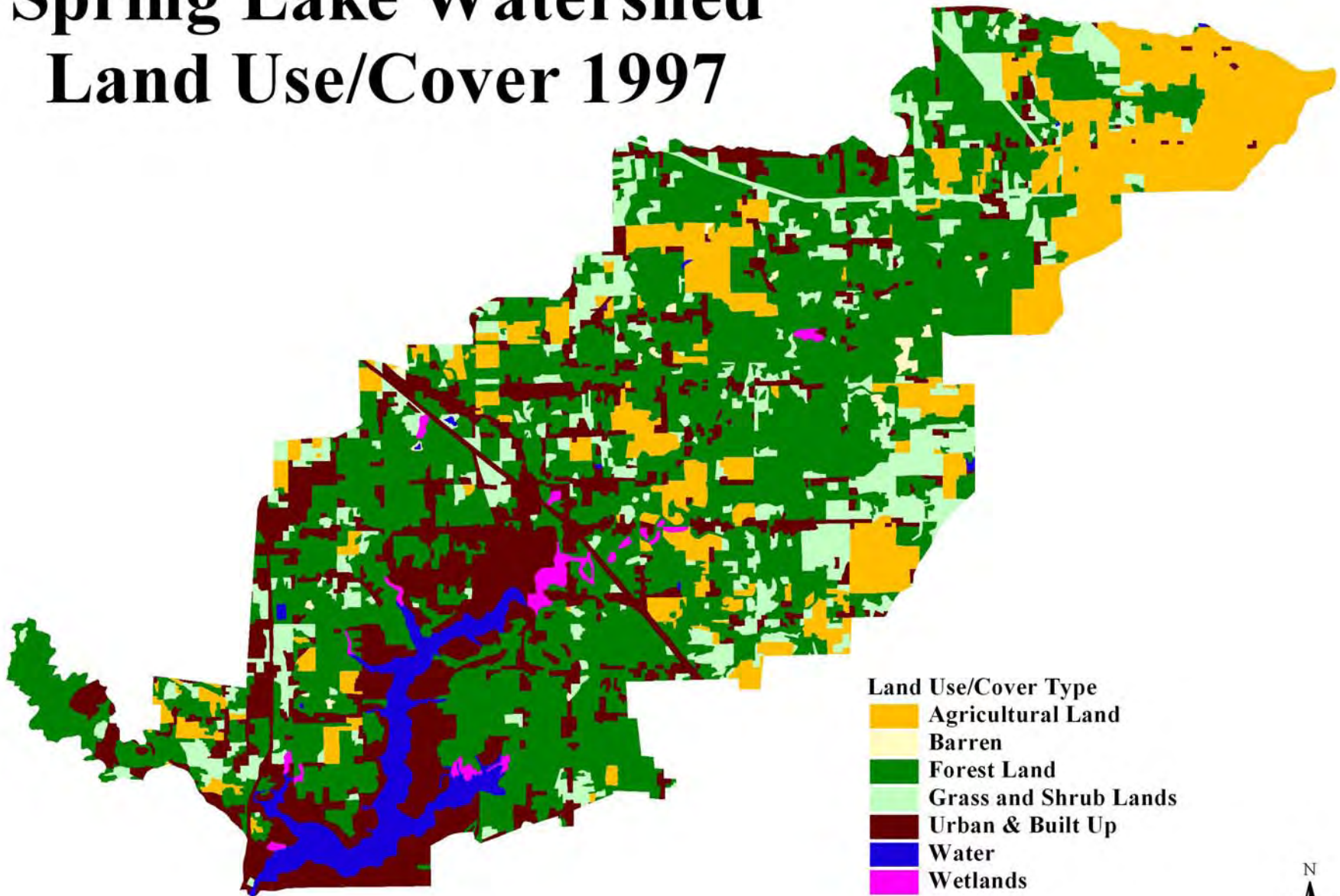


- Land Use/Cover Type**
- Agricultural Land
 - Barren
 - Forest Land
 - Grass and Shrub Lands
 - Urban & Built Up
 - Water
 - Wetlands

0 1 2 3 4 5 Miles



Spring Lake Watershed Land Use/Cover 1997

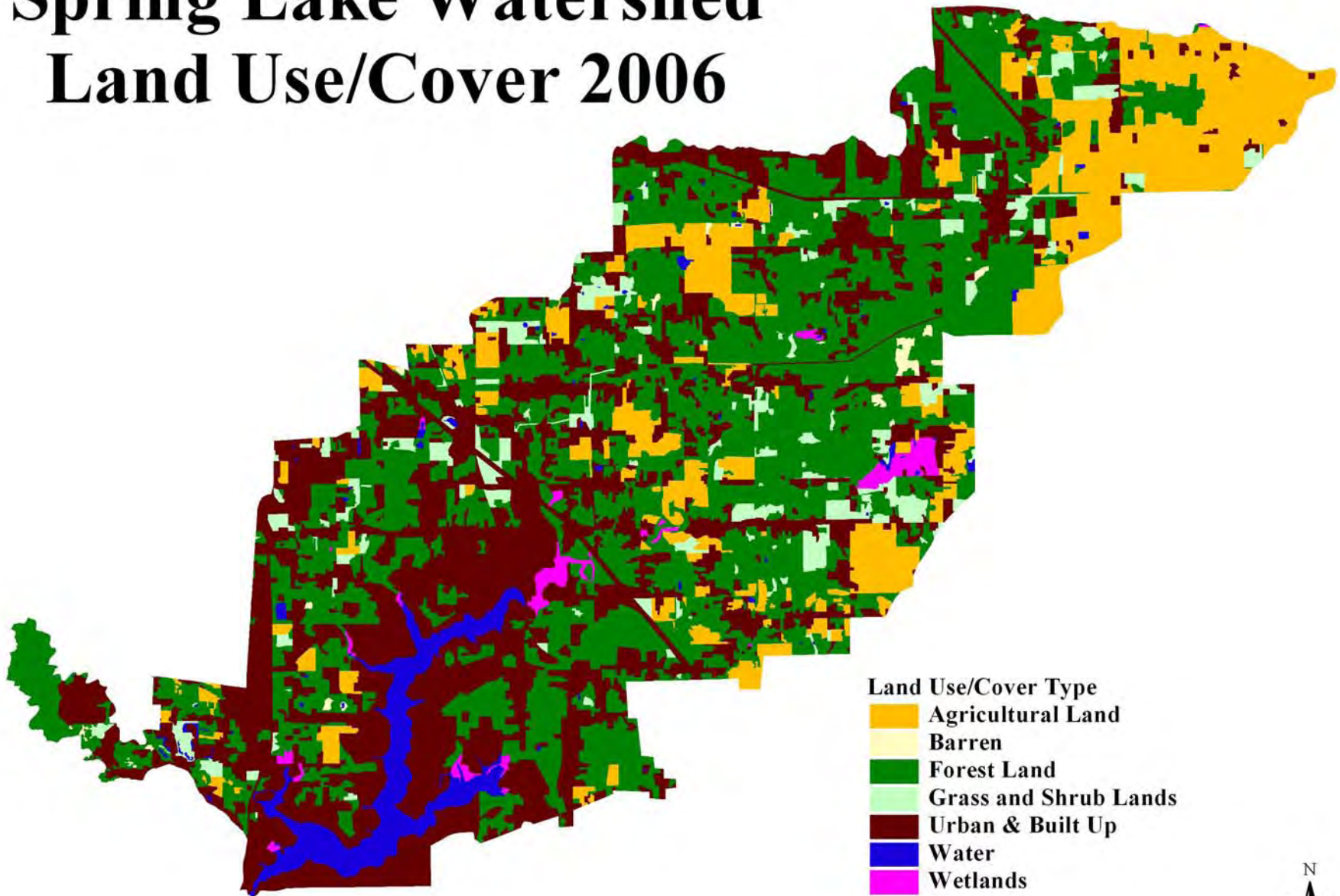


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Spring Lake Watershed Land Use/Cover 2006

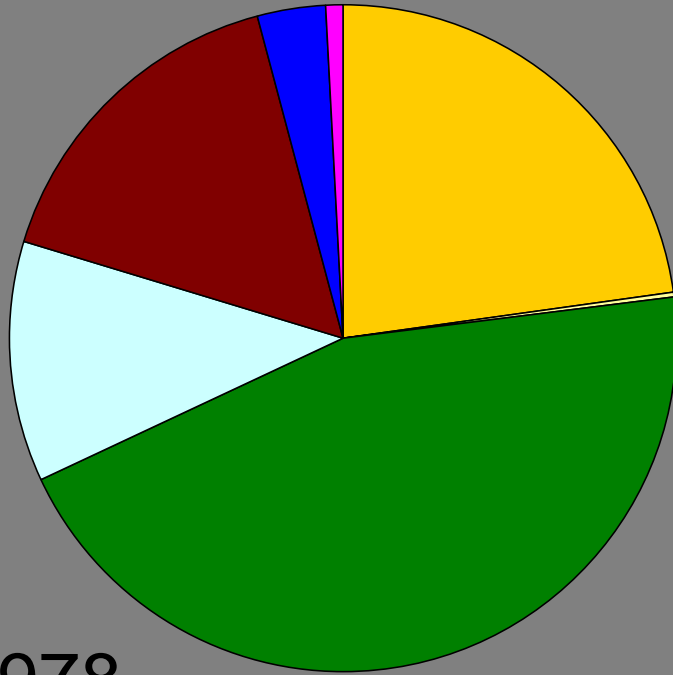


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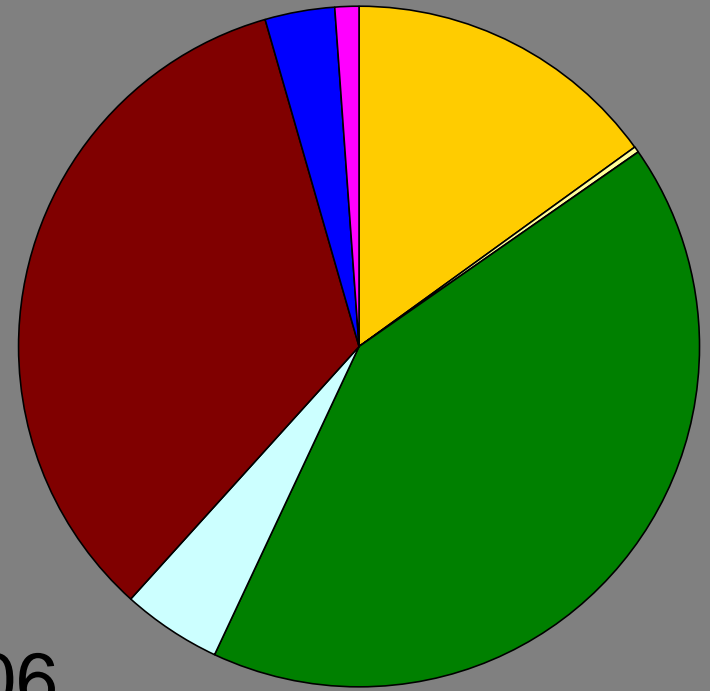
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Spring Lake Watershed Land Use Change



1978



2006

















Project Team

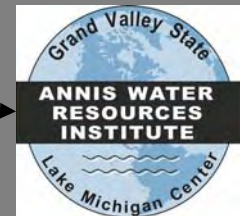
Principal Investigators



Stakeholder Team



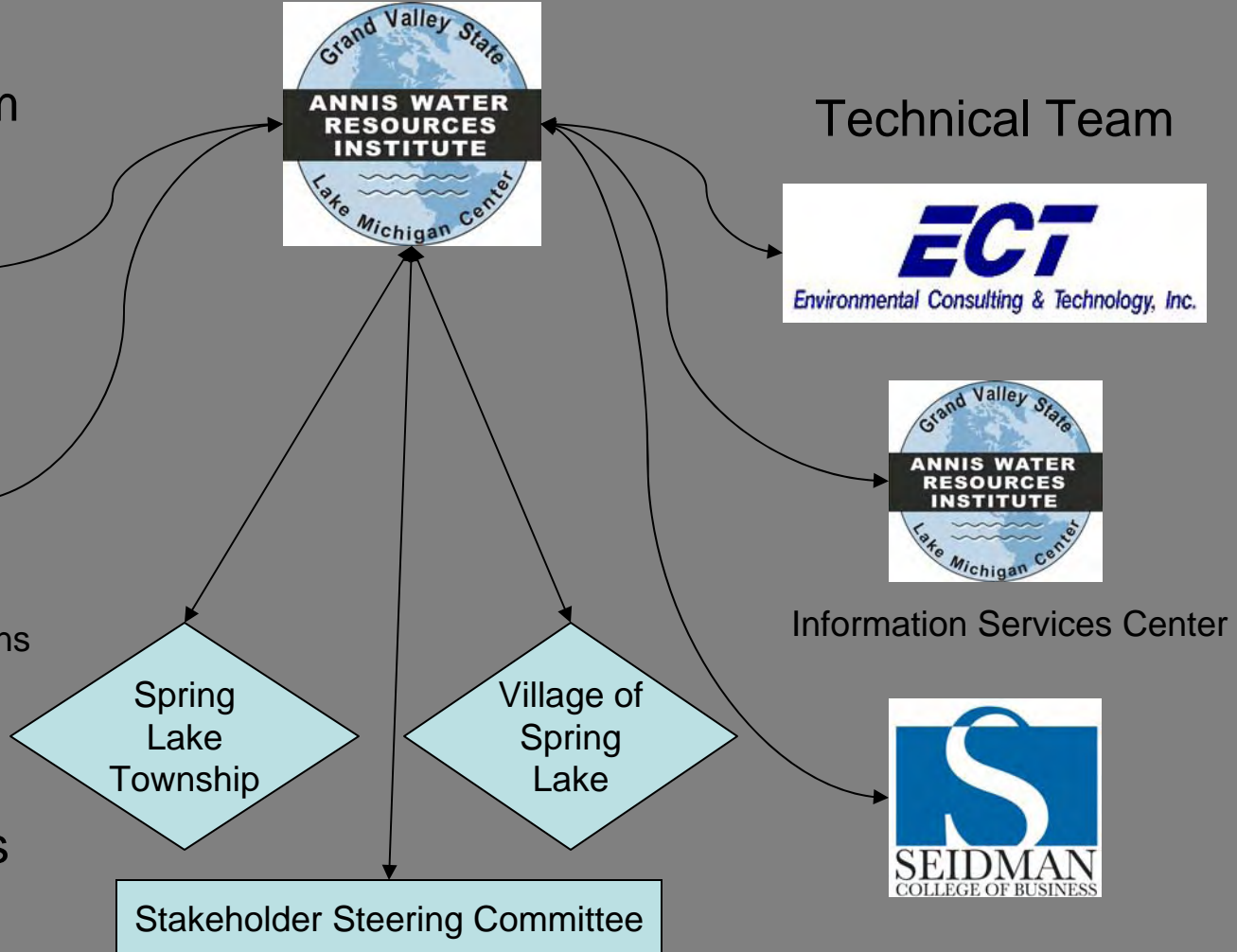
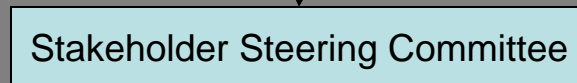
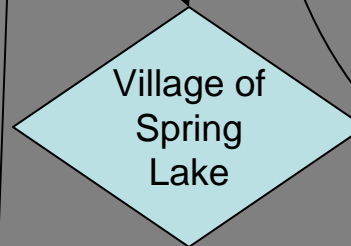
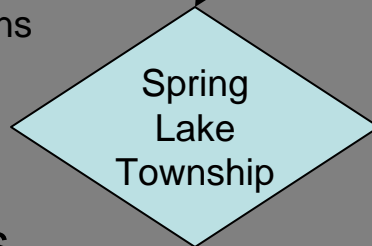
Technical Team



School of Communications

Information Services Center

Project Partners



Integrated Assessment Project

- ❖ Applying existing scientific information
- ❖ Educating and involving stakeholders
- ❖ Applying solutions to policy or management question



Photo credit: NOAA

Policy Question

What stormwater management alternatives are available to the Village of Spring Lake and Spring Lake Township that allow for future development and also mitigate the impacts of stormwater and improve the quality of Spring Lake, the Grand River and Lake Michigan?



Photo credit: E. Isely



Photo credit: Progressive AE



Photo credit: E. Isely

Project Objectives



Photo credit: E. Isely

- ❖ Increase understanding of the causes and consequences of stormwater runoff
- ❖ Increase stakeholder participation in stormwater control and management
- ❖ Identify regulatory mechanisms to improve local stormwater management and control
- ❖ Provide alternative BMPs for stormwater mgm't

BMPs

The primary way to control stormwater discharges is through the use of Best Management Practices (BMPs)



Photo credit: MDEQ



Photo credit: greenroofs.com



Photo credit: E. Isely

Bioretention Areas/Rain Gardens



Photo credit: R. Denning



Photo credit: Raingardens.org

- ❖ Shallow vegetated landscape depressions
- ❖ Manage stormwater through rapid infiltration and enhanced evapotranspiration

Green Roofs

- ❖ Vegetated layer installed on flat or sloped roof
- ❖ Retain rainfall
- ❖ Provide flow attenuation, aesthetic benefit, reduced air pollution, improved water quality



Photo credit: WMEAC



Photo credit: greenroofs.com

Porous Pavement

- ❖ Porous asphalt or concrete, modular blocks, grass or gravel pavers
- ❖ Good for low-traffic or load-bearing areas
 - Driveways
 - Sidewalks
 - Parking lots
 - Residential streets



Photo credit: MDEQ

Stormwater Planters

❖ Trees and vegetation planted in urban areas

- Parking lots
- Rights-of-way
- Along streets
- Open urban greenspace



Photo: Larry Coffman

Photo credit: MDEQ

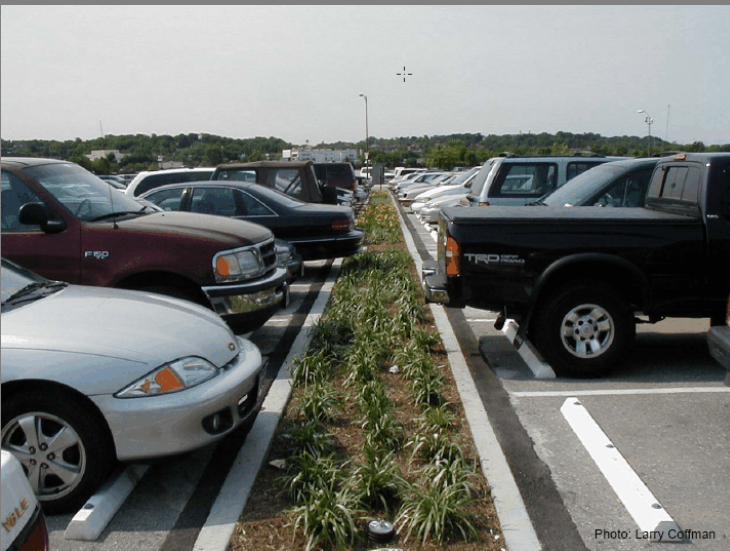


Photo: Larry Coffman

Photo credit: MDEQ

Other BMPs

- ❖ Rain barrels
- ❖ Cisterns
- ❖ Vegetated buffer strips
- ❖ Grassed swales
- ❖ Pocket wetlands



Photo credit: E. Isely



Photo credit: Spicer Group

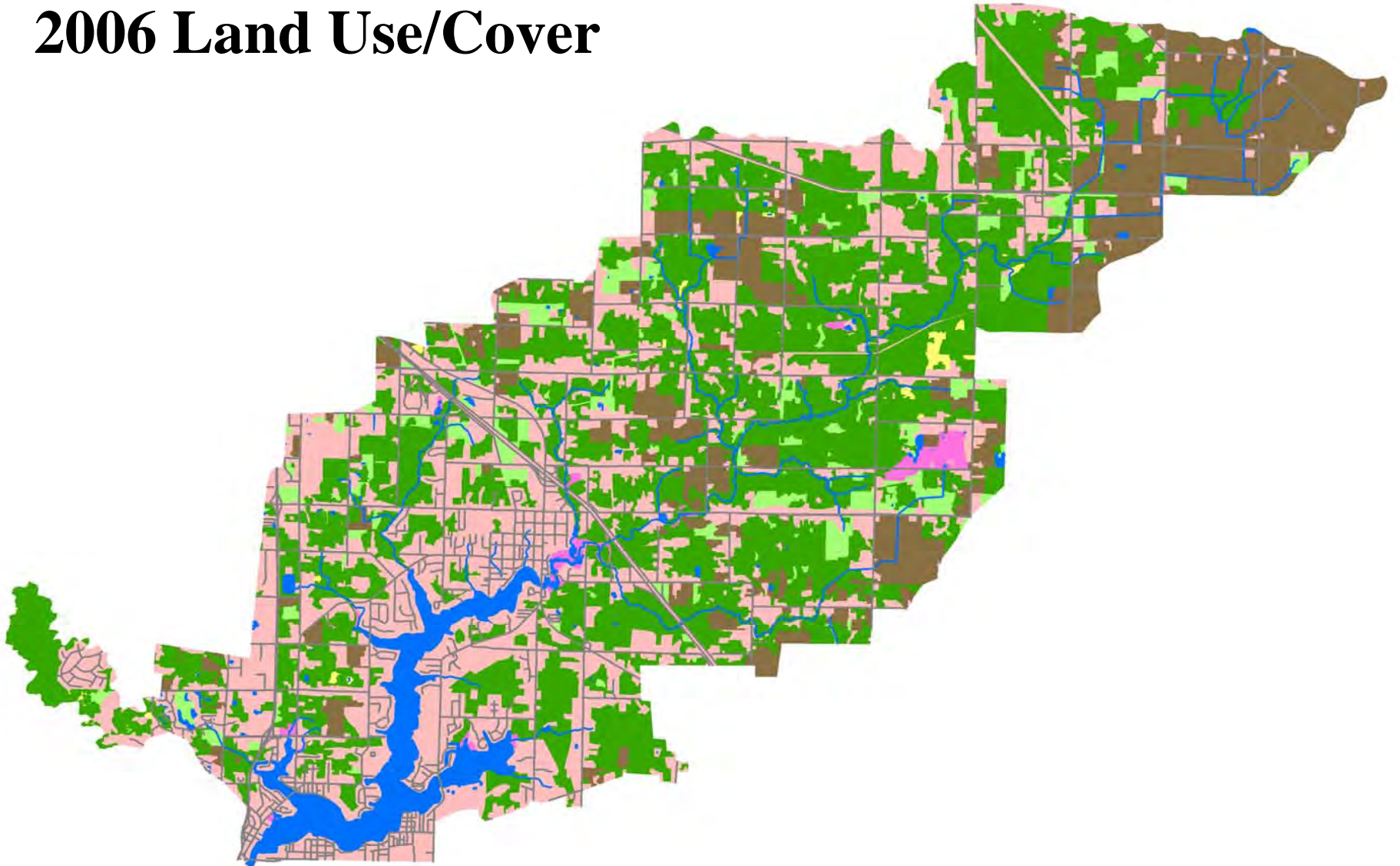
Project Work Plan

1. Step 1: Document status/trends of stormwater problem
 - ✓ Examine existing datasets and information
 - ❑ Identify the scope of the stormwater problem in Spring Lake watershed
 - ✓ Develop conceptual ecological model
2. Step 2: Describe environmental, social, economic causes
 - ✓ Presentations to stakeholders
 - ✓ Stakeholder Steering Committee
 - ❑ Public meetings
 - ❑ Feedback and input
3. Step 3: Generate forecasts
 - ❑ Model simulations (PAM, L-THIA, Pload)
 - ❑ Stakeholders review future development scenarios
 - ❑ Develop menu of site-specific BMPs
4. Step 4: Provide technical guidance implementing BMPs
5. Step 5: Present final options
 - ❑ Review and revise findings
 - ❑ Final report and presentations

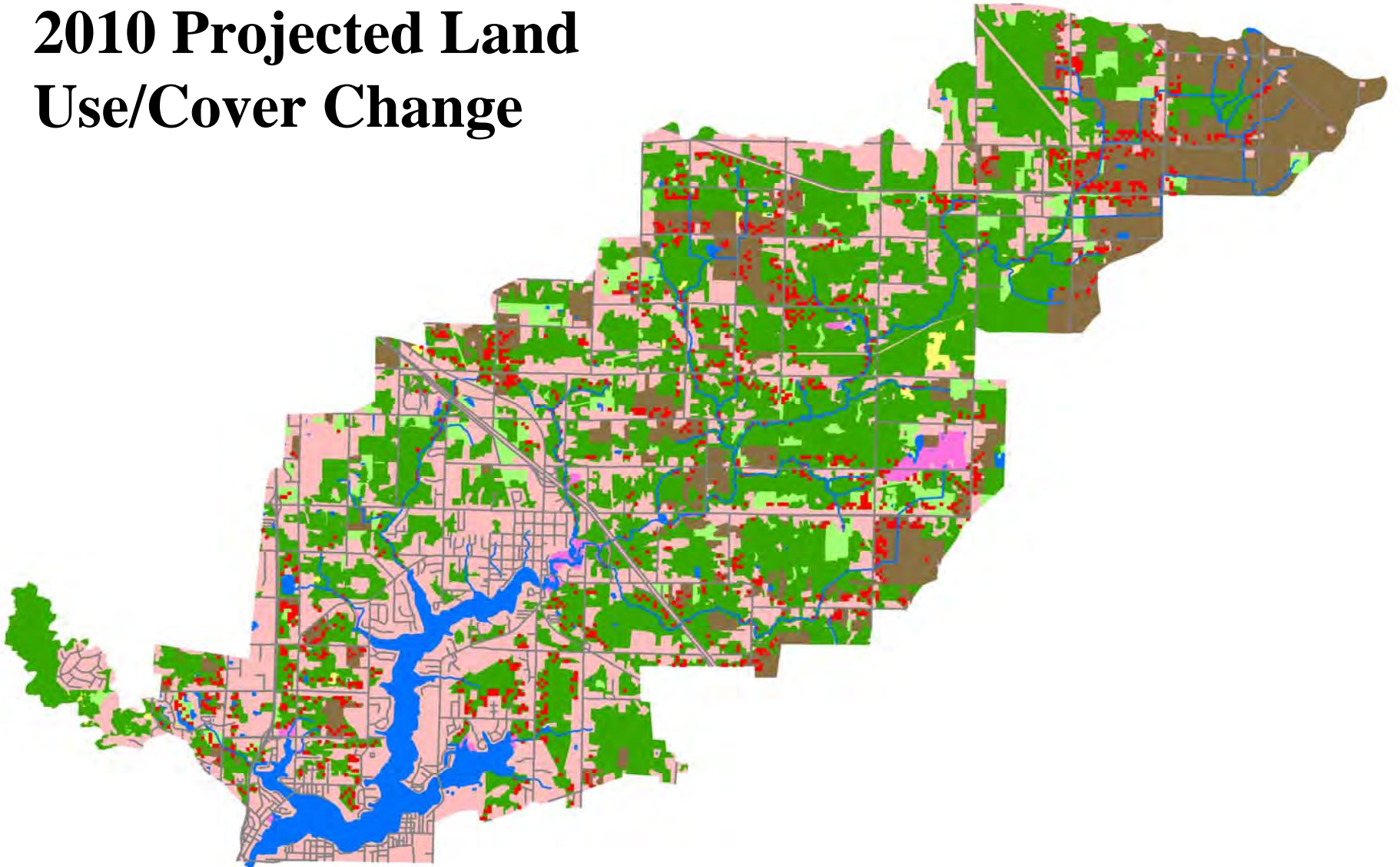


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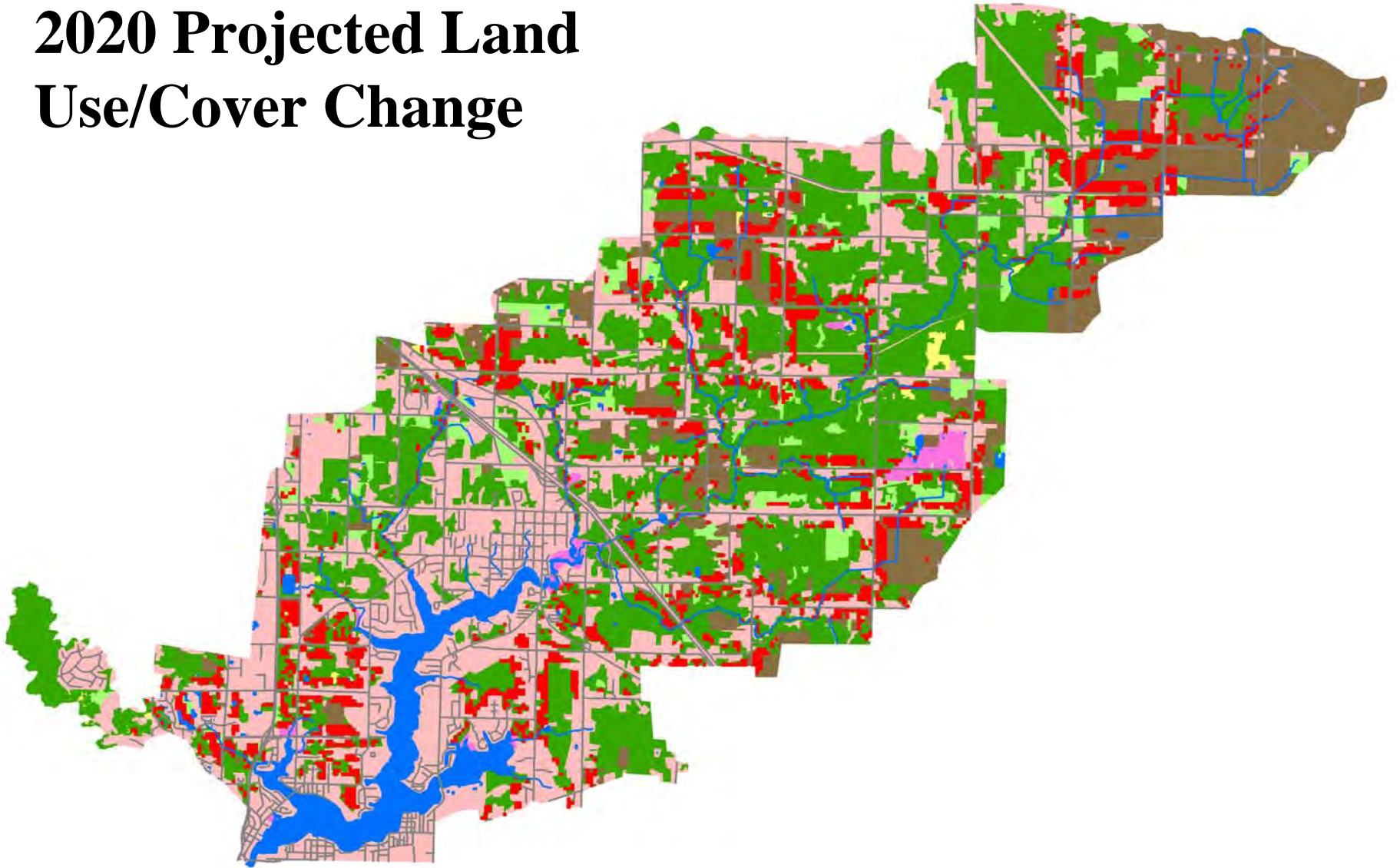
2006 Land Use/Cover



2010 Projected Land Use/Cover Change



2020 Projected Land Use/Cover Change



2030 Projected Land Use/Cover Change

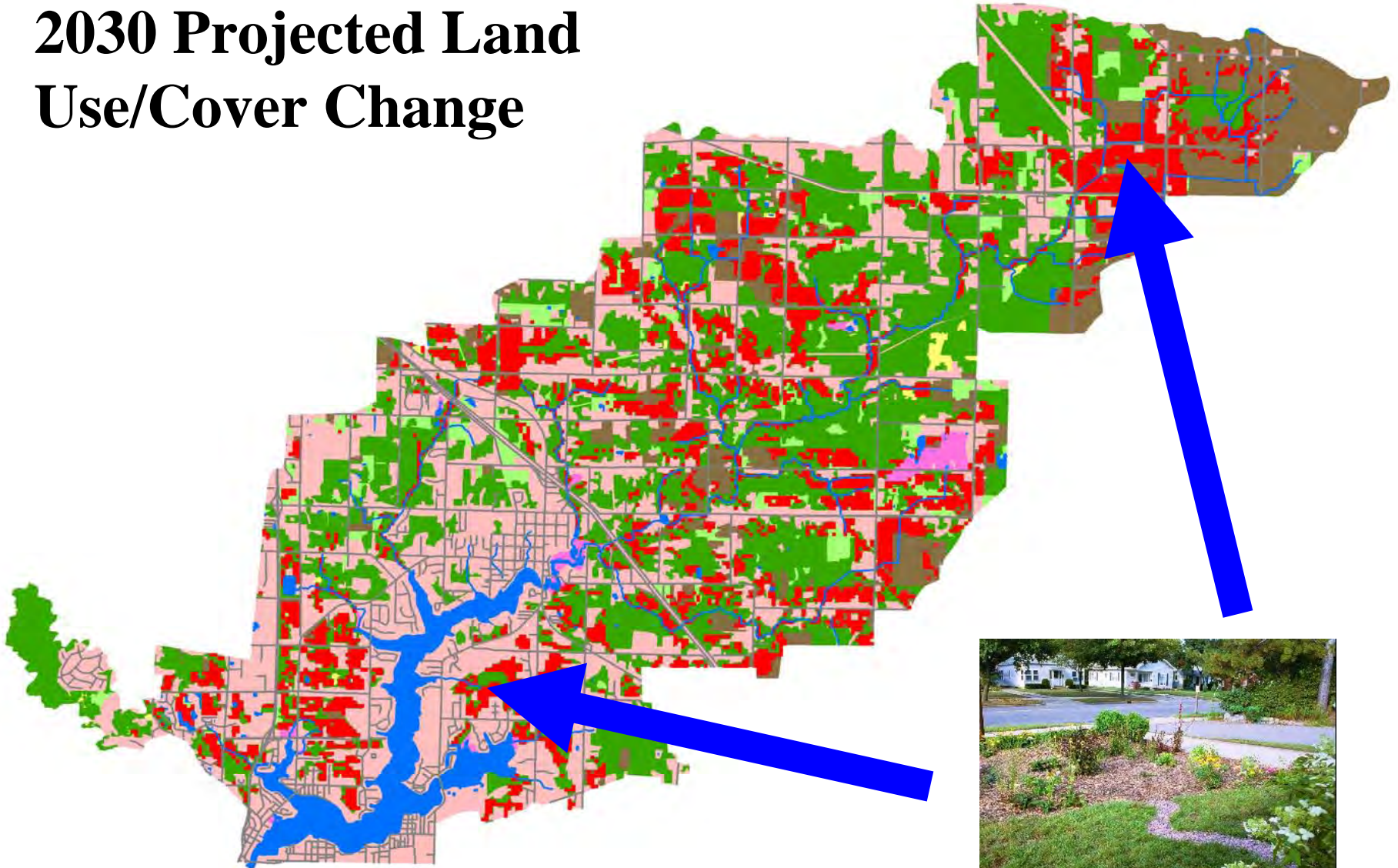




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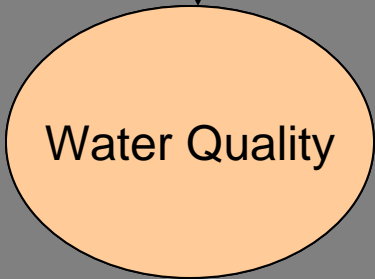
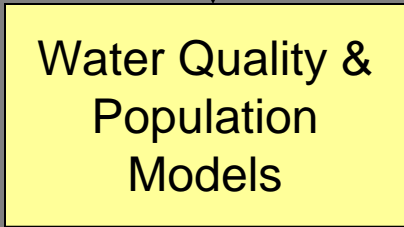
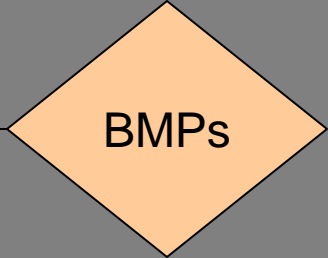
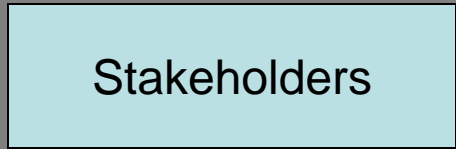
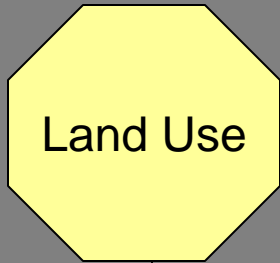




Photo credit: E. Isely

 **Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices**



Stakeholder Process

❖ Stakeholder involvement in all aspects of Integrated Assessment:

- Presentations to community groups
- Stakeholder Steering Committee
- Public education events
- Opportunities to provide feedback, survey cards and on-line survey
- Review of completed integrated assessment



Photo credit: E. Isely

Stakeholder Steering Committee

- ❖ Quarterly project update meetings
- ❖ Assistance in promoting project goals
- ❖ Assistance in identifying stormwater opportunities and challenges
- ❖ Input and review of project goals, progress and products



Photo credit: E. Isely

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