Spring Lake Stormwater Integrated Assessment Project

Rein in the Runoff

Stakeholder Steering Committee Meeting

September 30, 2008

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Annis Water Resources Institute
Grand Valley State University

Agenda

- Project Review (5 min.)
- Stakeholder Update (20 min.)
- Technical Update (20 min.)
- Wrap-Up (5 min.)

Photo credit: E. Isely


Photo credit: AWRI

Integrated Assessment

- Applying existing scientific information
- Educating and involving stakeholders
- Our policy question:
  - Stormwater management alternatives
  - Allowing for future development
  - Mitigate impacts
  - Improve water quality

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 (Ongoing)
   - ❑ Feedback and input (Ongoing)

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

Photo credit: E. Isely

Stakeholder Steering Committee

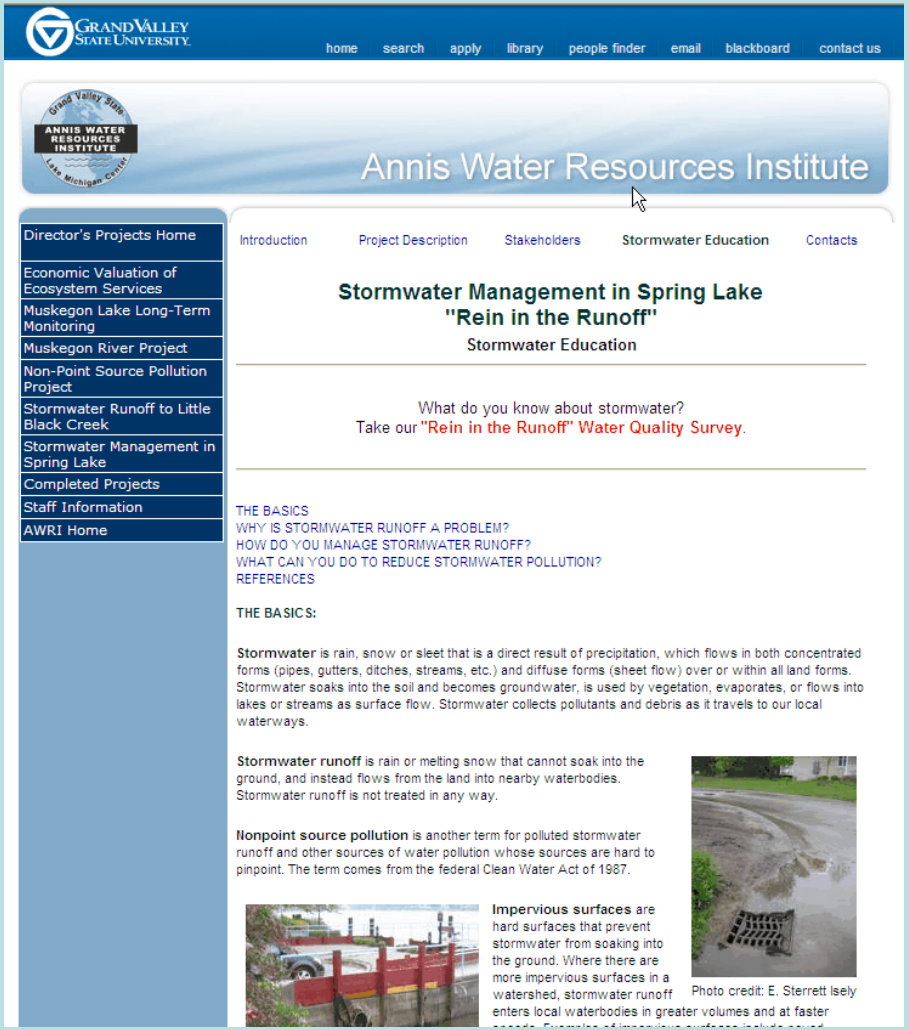
Photo credit: E. Isely

- 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

Project Website

- http://www.gvsu.edu/wri/reinintherunoff

- Web-Pages
  - Introduction
  - Project Description
  - Stakeholders
  - Stormwater Education page
  - Water Quality Survey: http://www.gvsu.edu/wri/waterqualitysurvey



Project Logo

Project Flyers

"REIN IN THE RUNOFF"
Improving water quality in Spring Lake

Sea Grant Michigan

Rein in the Runoff is a collaborative,

community-based project that is identifying the causes, consequences, and corrective actions required to minimize the adverse impacts of stormwater discharges to Spring Lake, the Grand River and Lake Michigan.

Algae bloom in Spring Lake at the Fruitport Boat Launch (July 2008).

Visit our Project Website:

www.gvsu.edu/wri/reinintherunoff

Visit our updated **Stormwater Education** page to learn more about what you can do to minimize your household contribution of pollutants to our waterways.

Take our online water quality survey and tell us what you know about stormwater and stormwater runoff:
http://www.gvsu.edu/wri/waterqualitysurvey

Rain barrels capture rainwater that can be used to water lawns and gardens.

Join us

At our upcoming Stakeholder Steering Committee Meeting at the Spring Lake Library on **September 30, 2008 @ 7:00 – 8:15 p.m.**

The Village of Spring Lake's rain garden provides rainwater and runoff infiltration, and it beautifies the lot (July 2008)

Contact us

For more information about this project.

Elaine Sterrett Isely (iselyel@gvsu.edu)

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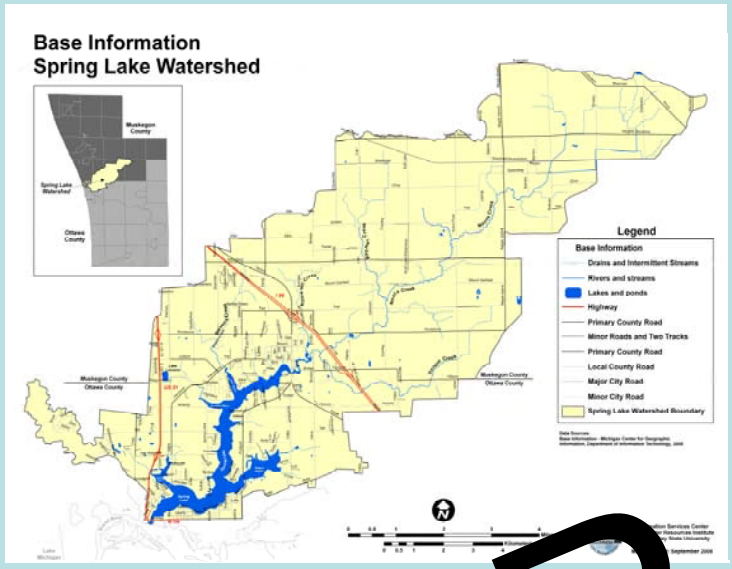
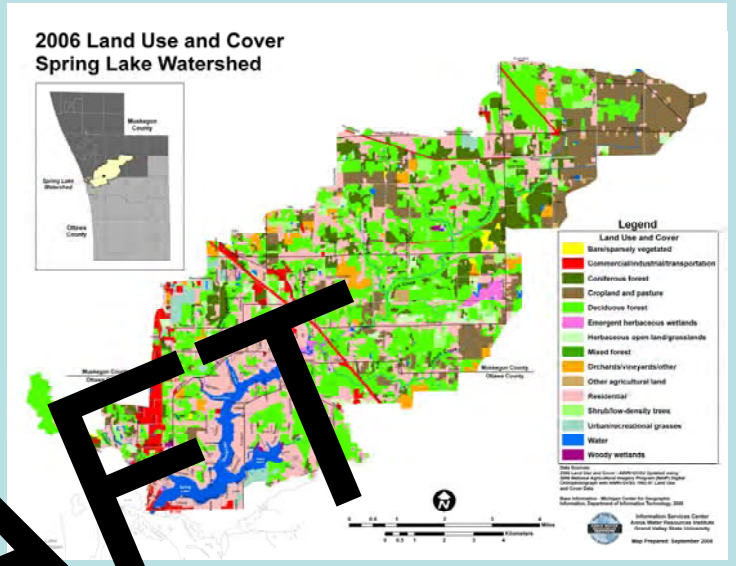
At GVSU's Annis Water Resources Institute: (616) 331-3749

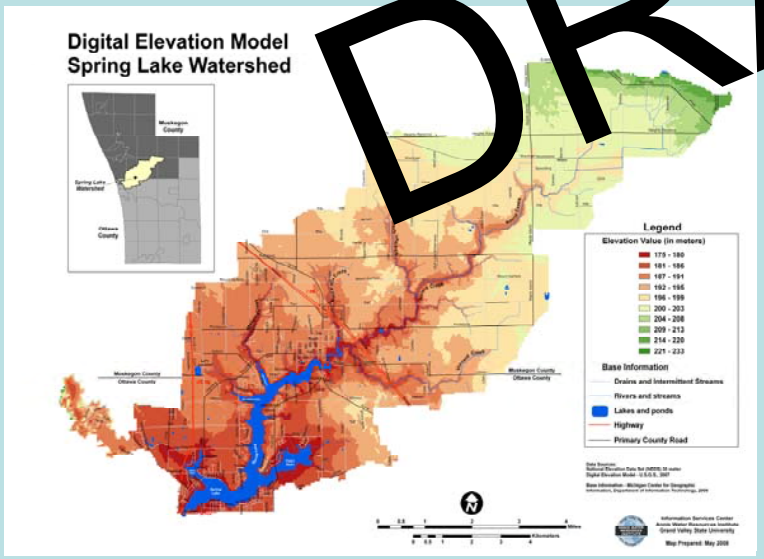
- Distribute throughout watershed
  - Bulletin boards
  - Websites
  - Newsletters
  - Schools
  - Meetings
  - Community events

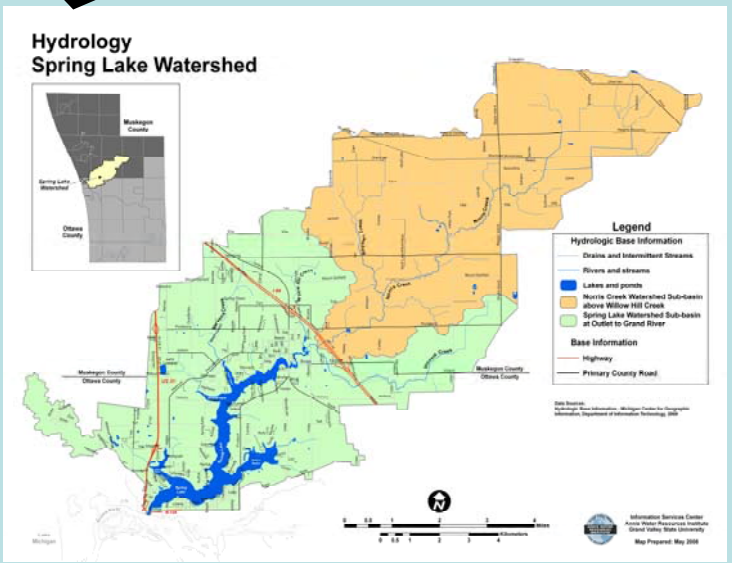
Upcoming Meetings/Events

Watershed Atlas

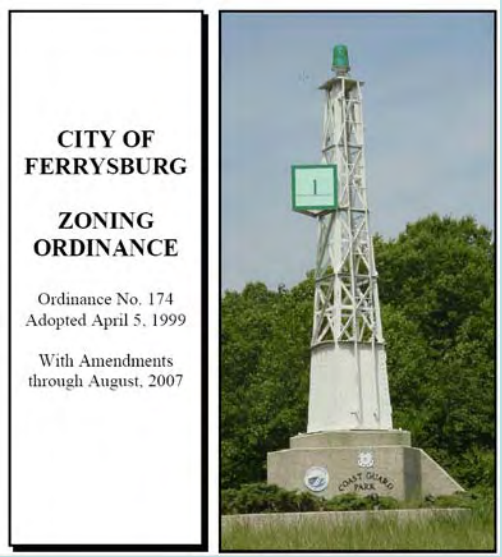


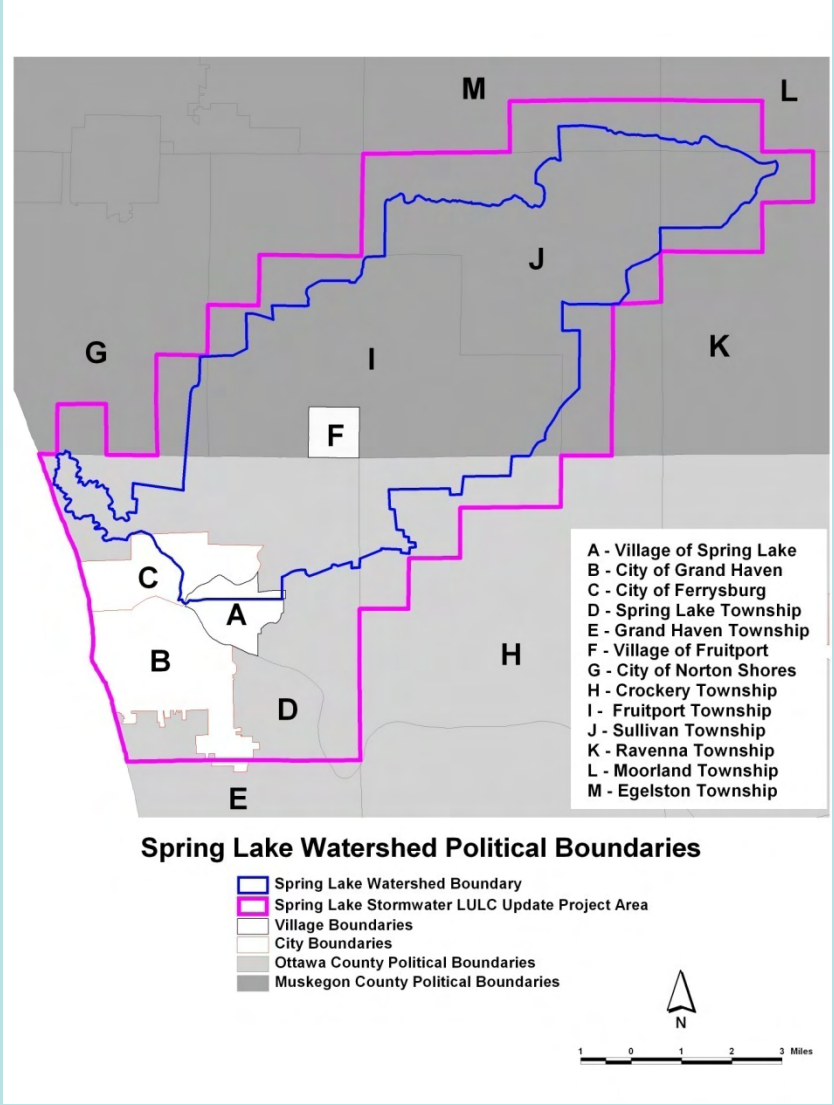




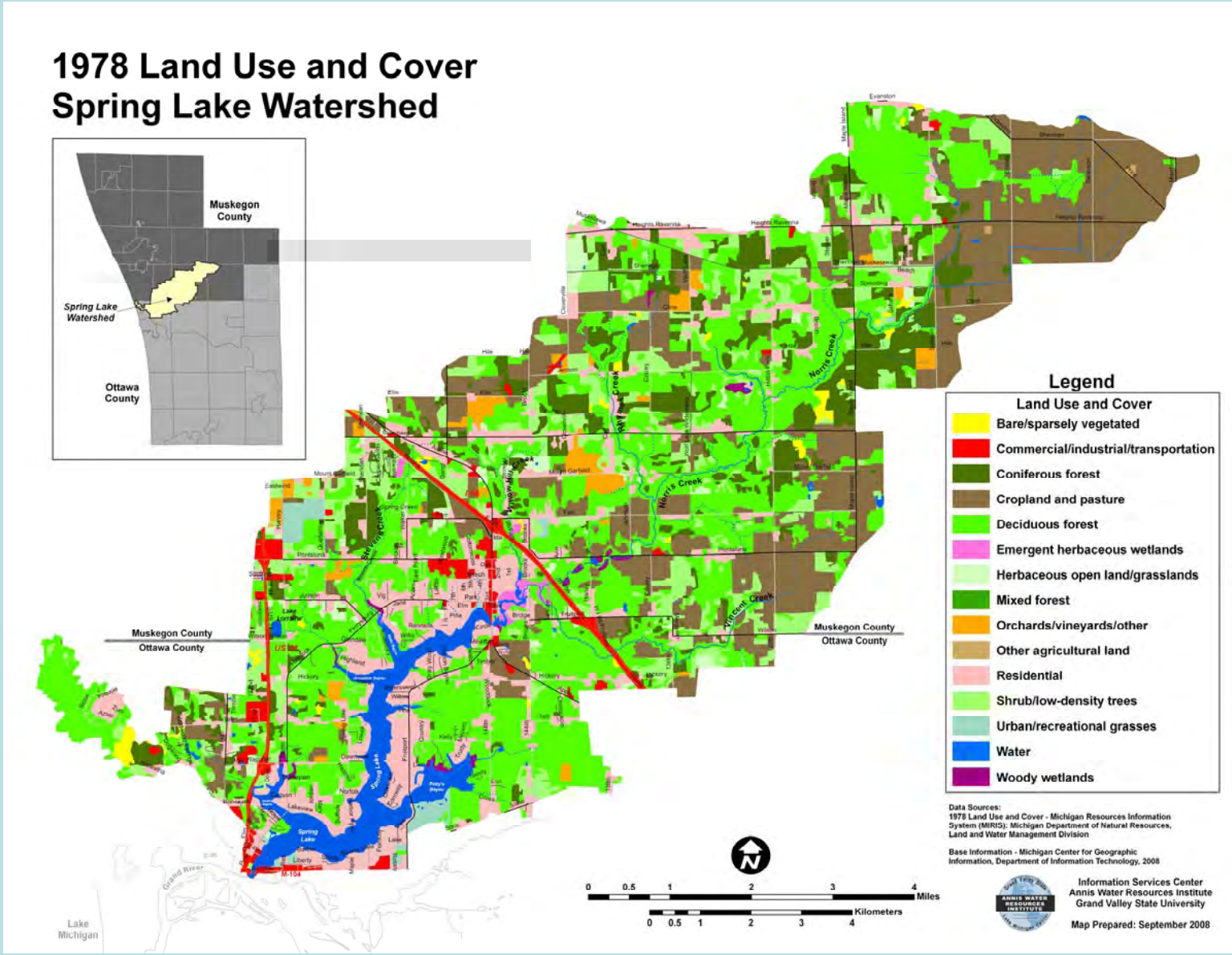


Zoning Ordinances/Master Plans

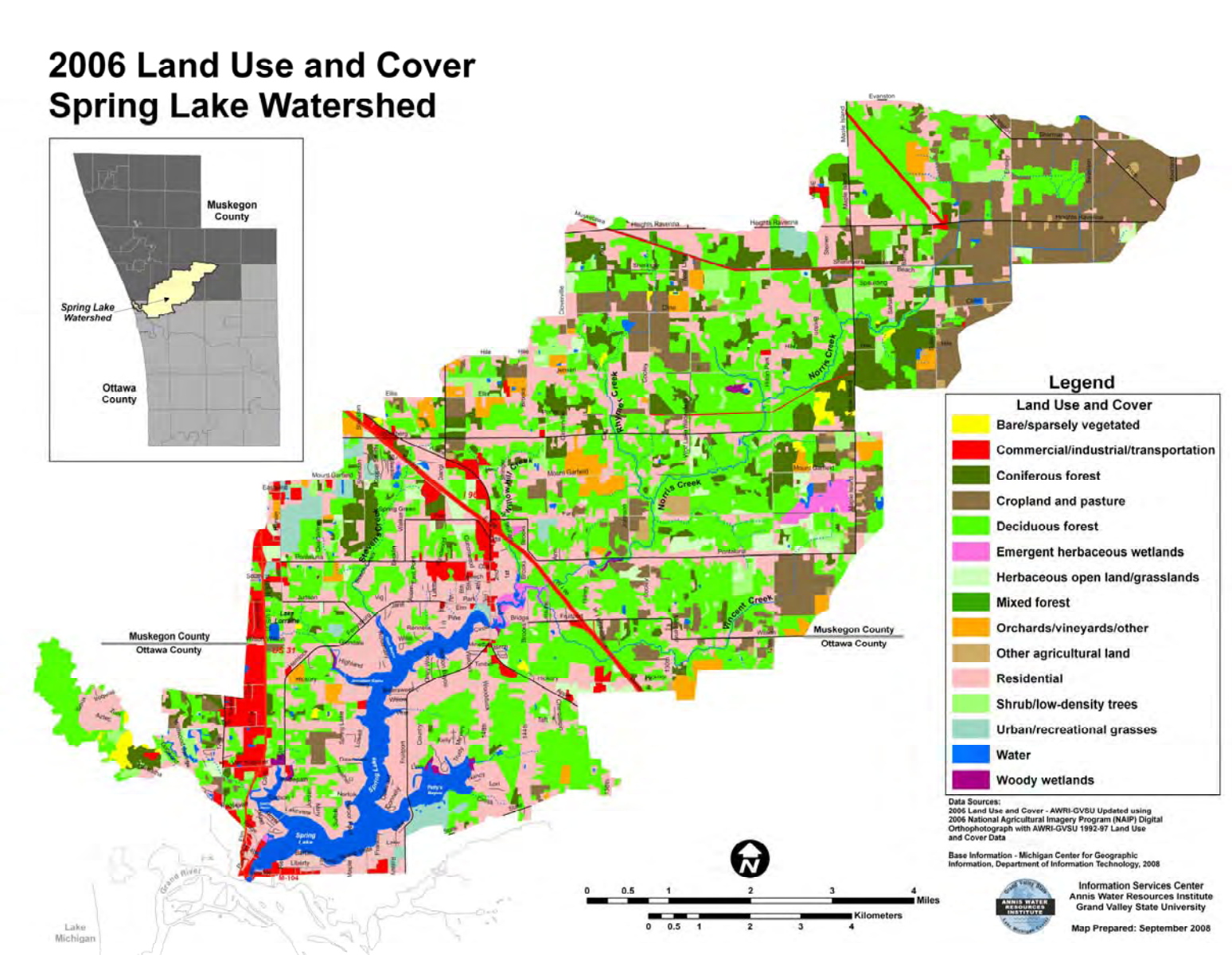




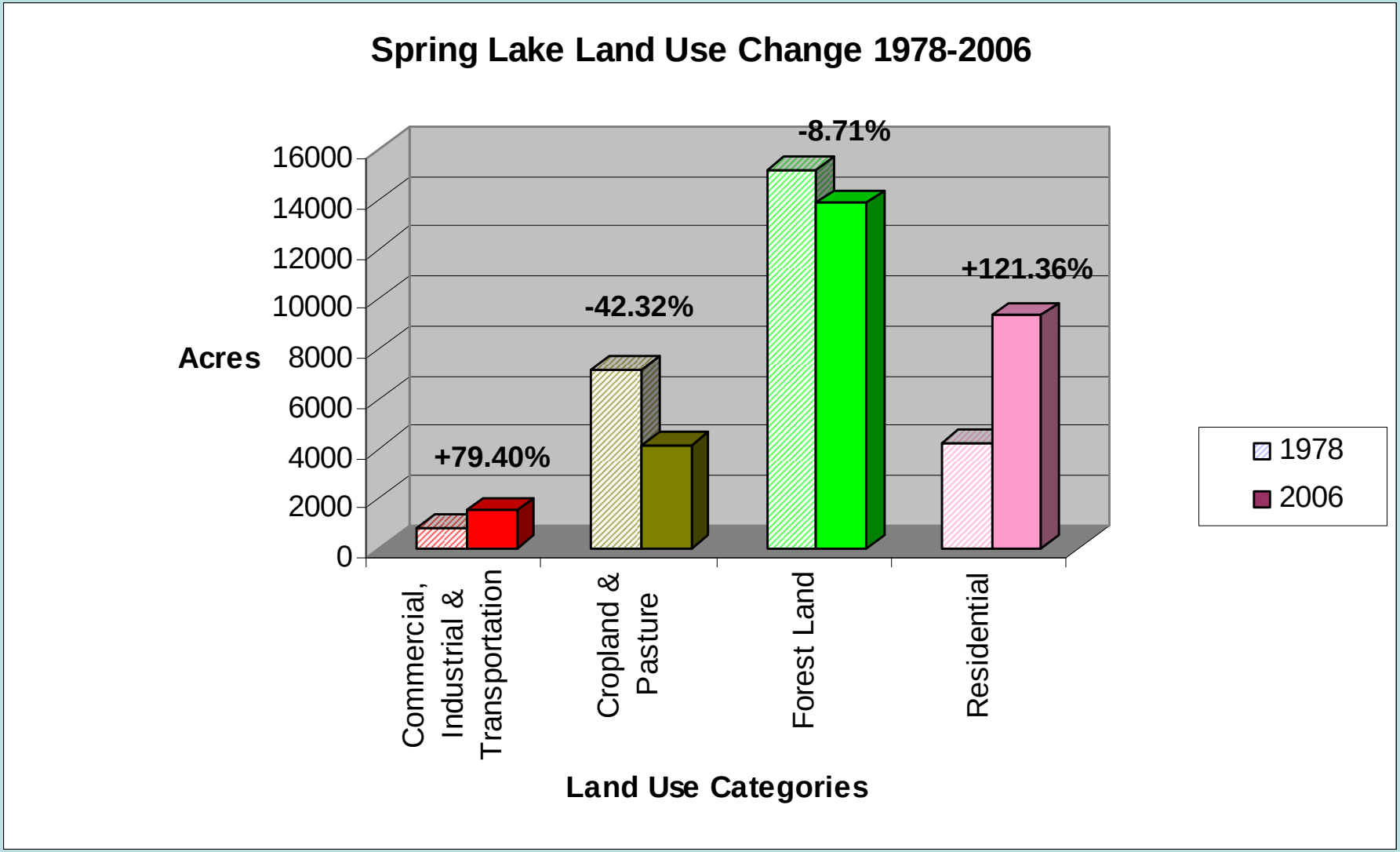
Land Use Change - Then



Land Use Change - Now

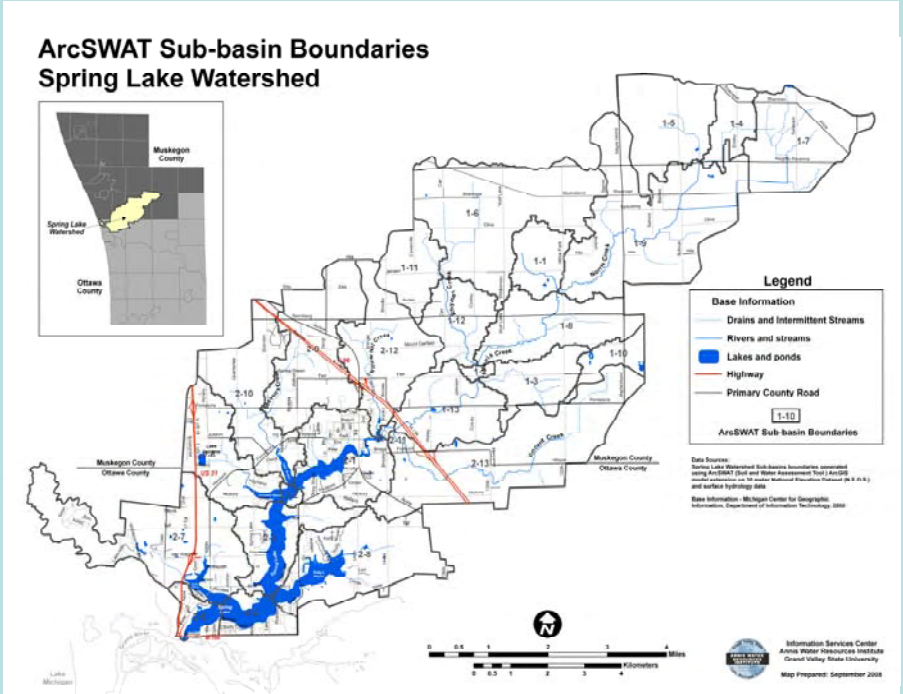


Land Use Change Analysis

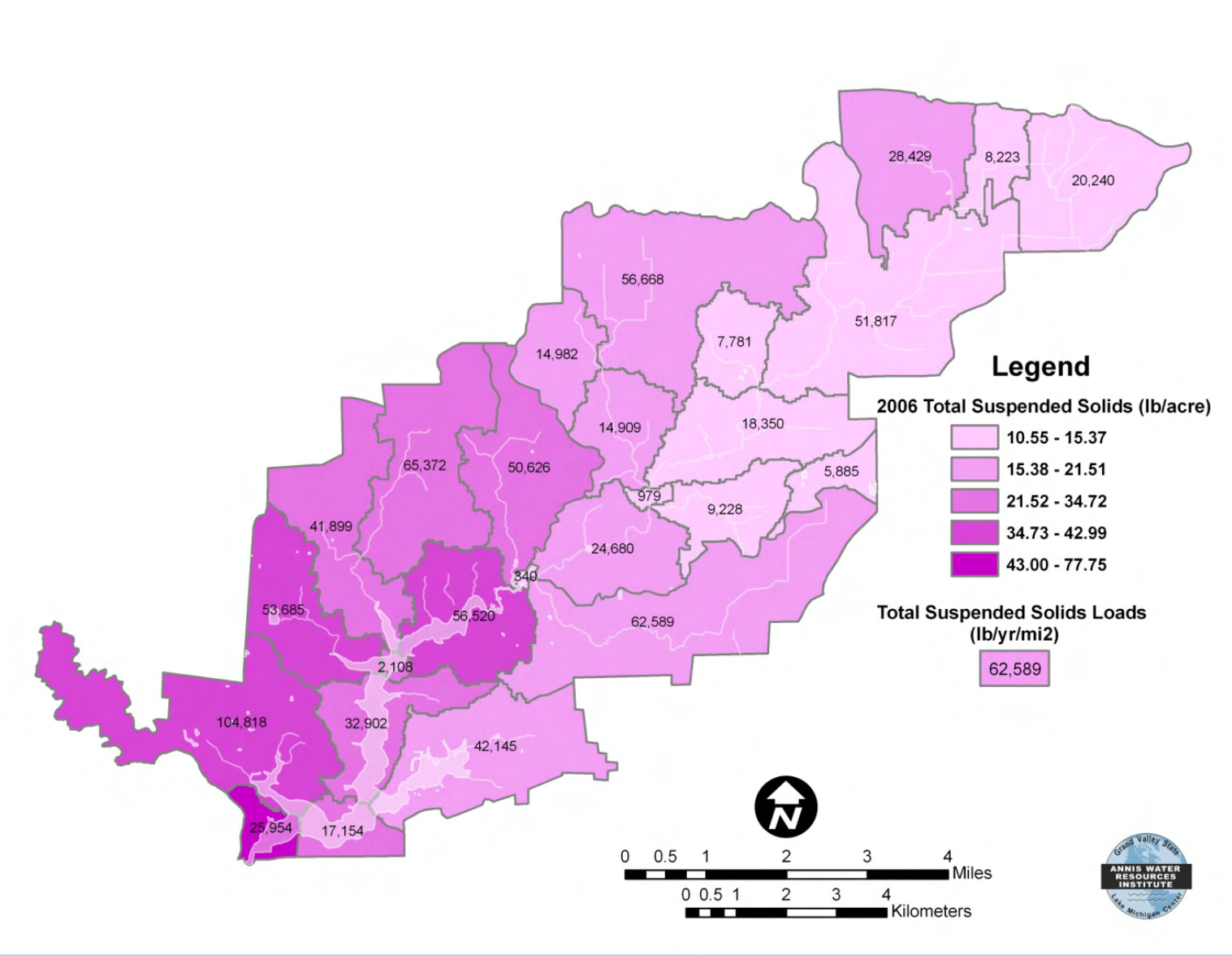


PLOAD

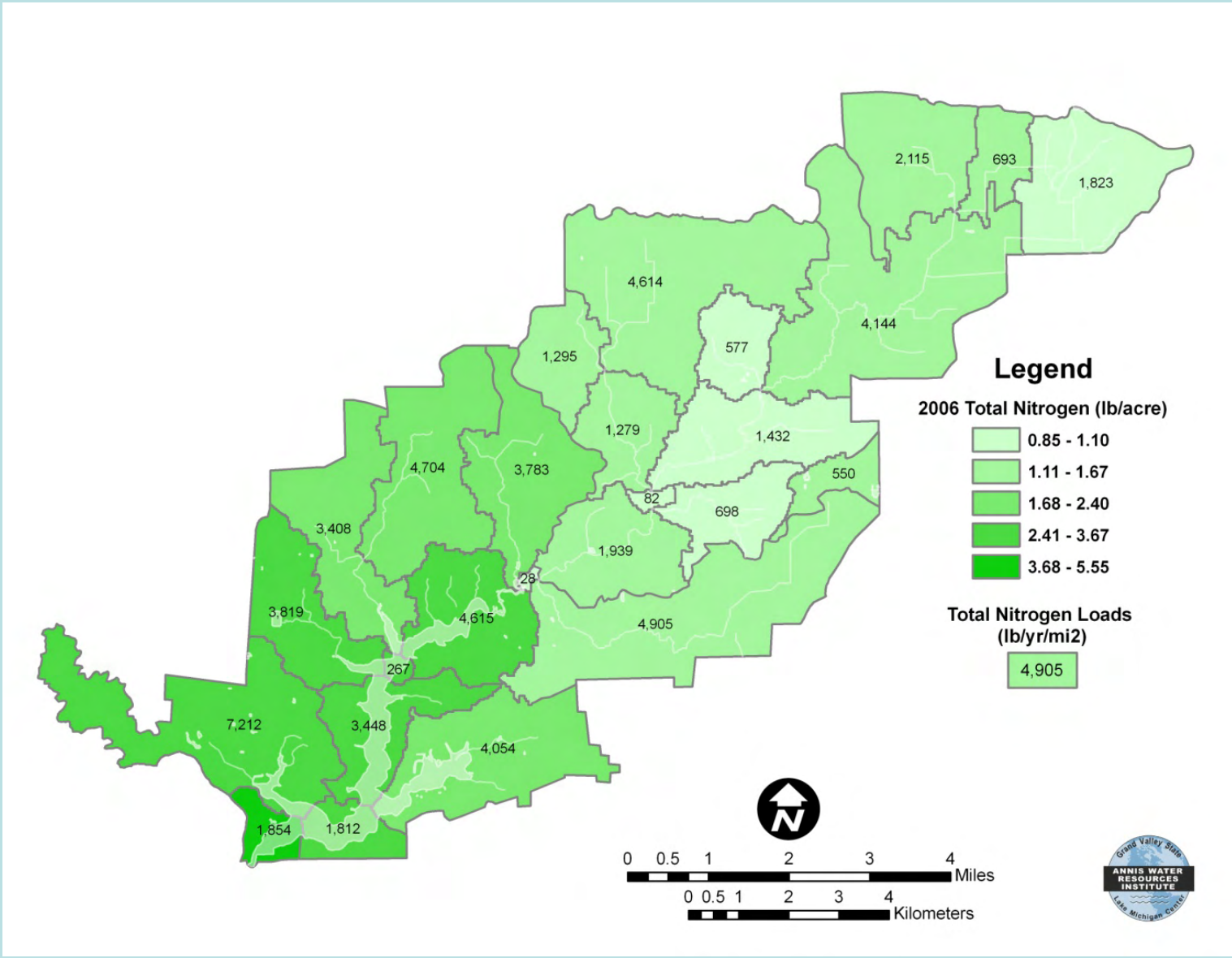
- Strengths
  - Simplified GIS-based model
  - Estimates annual average nonpoint source pollution
  - Can take BMPs into account
- Weaknesses
  - Generic screening tool
  - Simple Method limited to sub-basins < 1 sq. mi.
  - Export Coefficient Method largely untested
  - Required modification to take into account differences in soils, yearly rainfall, runoff



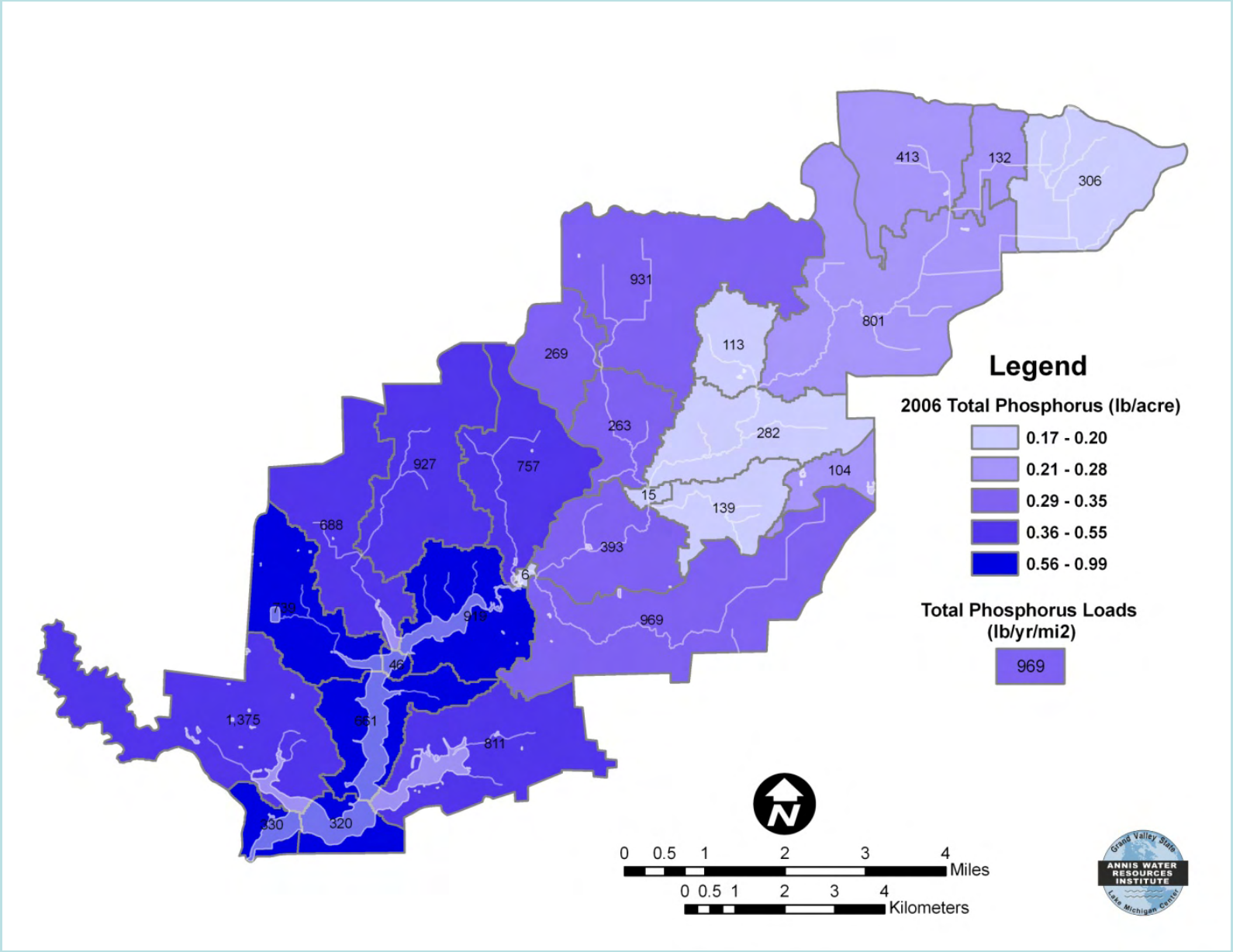
Total Suspended Solids



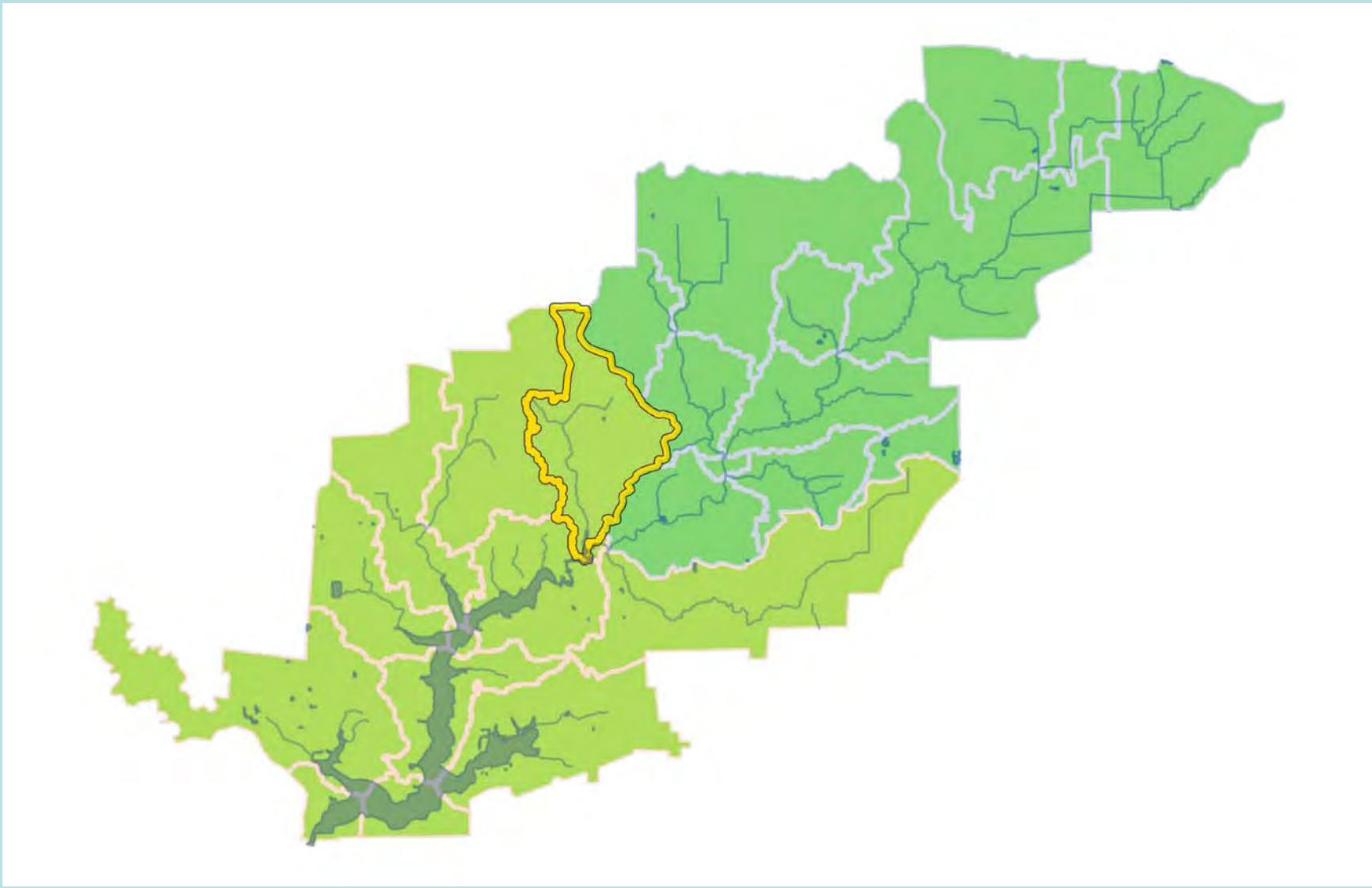
Total Nitrogen



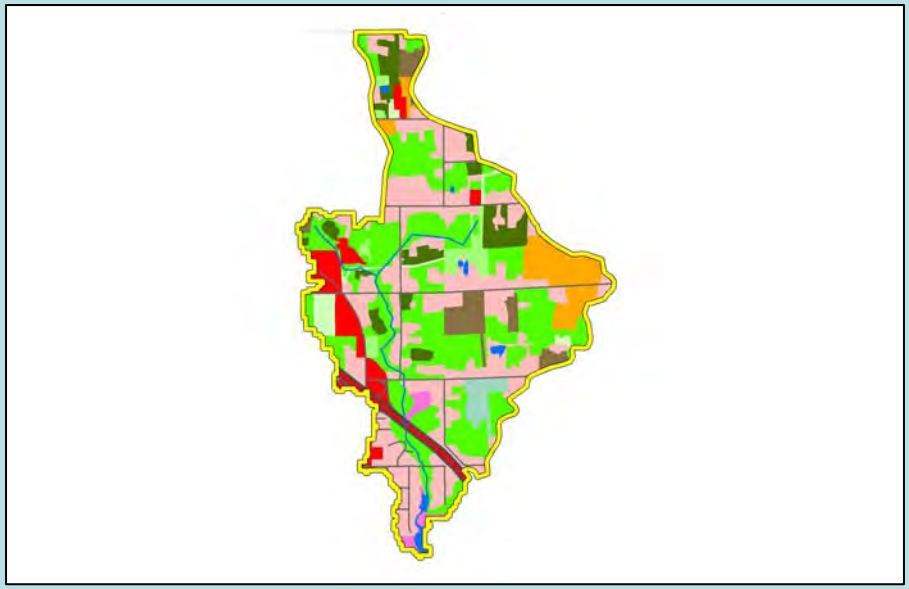
Total Phosphorus

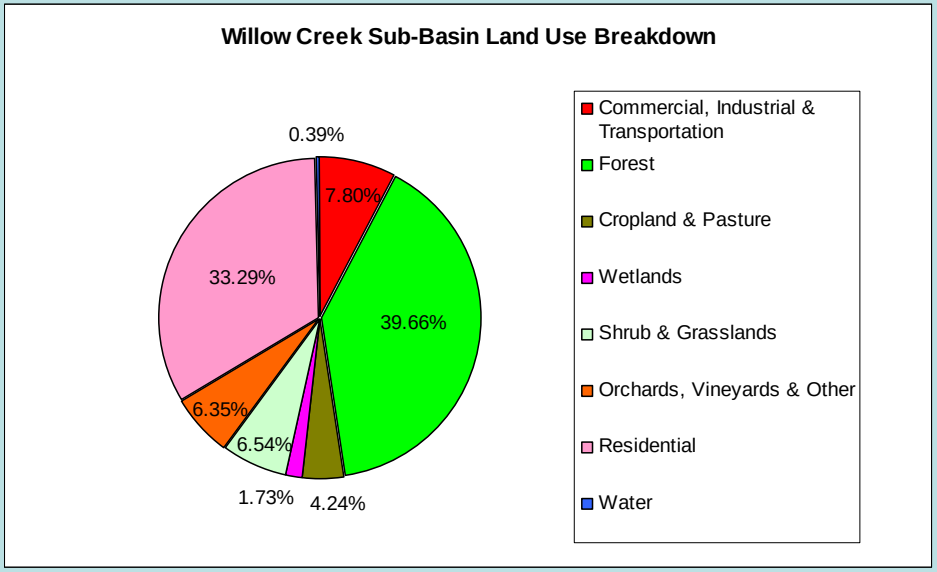


Willow Creek Sub-Basin (2-12)



Willow Creek Land Use (2006)





Land Use & Cover Category	Acres
Commercial, Industrial & Transportation	125.65
Forest	638.64
Cropland & Pasture	68.34
Wetlands	27.82
Shrub & Grasslands	105.39
Orchards, Vineyards & Other	102.23
Residential	536.15
Water	6.21
TOTAL	**1610.43**

BMPs

Average % Reduction of Stormwater Pollutants			
	Total Suspended Solids	Total Phosphorus	Total Nitrogen
Detention Basins as Wetland Basins	80%	60%	30%
Detention Basins as Dry Extended Ponds	60%	20%	30%
Riparian Buffers (5 meter width)	60%	45%	45%
Riparian Buffers (15 meter width)	70%	65%	65%
Riparian Buffers (50 meter width)	80%	75%	75%
Bioretention/Rain Gardens (Filtering Practice)*	60%	80%	20%
Bioswales (Filtering Practice)*	60%	80%	20%
Infiltration (Infiltration Basins/Porous Pavement)	90%	65%	40%

*dependent on management of storm water runoff volume

BMP Application

- Riparian buffers (15 m. width): 32.9 acres
- Bioretention (rain gardens): 9.5 acres
- Bioswales (filtering practices): 29.7 acres

Results

Pollutant	Pollutant Load Reduction
Total Nitrogen	↓ 1.82%
Total Phosphorus	↓ 3.31%
Total Suspended Solids	↓ 2.89%

- Pollutant load reductions will vary
  - Different BMPs
  - Combination of BMPs
  - Amount of BMPs

Wrap Up & Announcements