



The Lake Superior Basin Partner Team's

***“Guide to Understanding the Hydrologic
Condition of Wisconsin’s Lake Superior
Watersheds”***

& companion

“Marengo River Watershed Test Case”

Watershed Health Project – Phase I

Stable Solutions LLC &
Community GIS, Inc.
October 29, 2007



Project Sponsors

Lake Superior Basin Partner Team

Great Lakes Commission

Great Lakes Basin Program for Soil Erosion & Sediment Control

Northern WI Land Conservation Committees

Bad River Band of Lake Superior Chippewa Indians

USDA - Forest Service

UWEX Basin Education Program

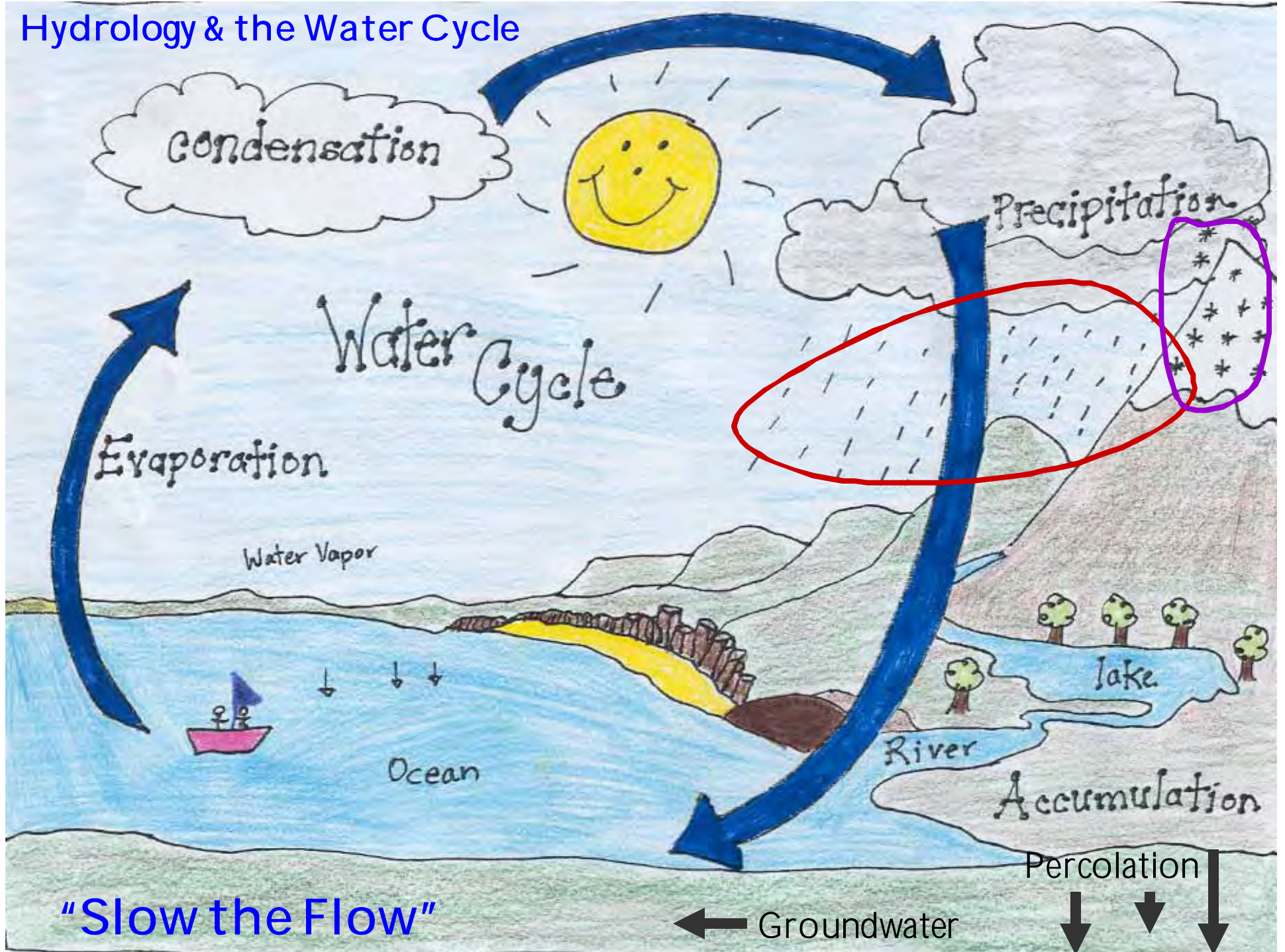
UW Sea Grant

UW Dept. of Rural Sociology

WI Department of Natural Resources

"Slow the Flow"
Watershed Health Initiative

Hydrology & the Water Cycle



"Slow the Flow"

Snowmelt





“Flashy”
Rains



Photos used with
permission from USGS

A Guide to Understanding the Hydrologic Condition of Wisconsin's Lake Superior Watersheds



prepared by

Wisconsin Lake Superior Task Force Team

with funding from

Great Lakes Commission - Great Lakes Basin Program for Soil Tillation & Sediment Control
Ashland, Bayfield, Douglas & Iron County Land Conservation Commissions
University of Wisconsin Extension Service Adult Education Program
University of Wisconsin Sea Grant
United States Department of Agriculture - Forest Service

and

Grant Oversight Comandres - Technical Work Group

and

Maple Sources LLC
7140 Lincoln Road
Ashland, WI 54806

Communities GIS, Inc.
240 E. Superior Street
Duluth, MN 55802

January 2007

Goal I: The Guide

- Step-by-step
- Customized
- Local example
- Gain understanding of problem areas

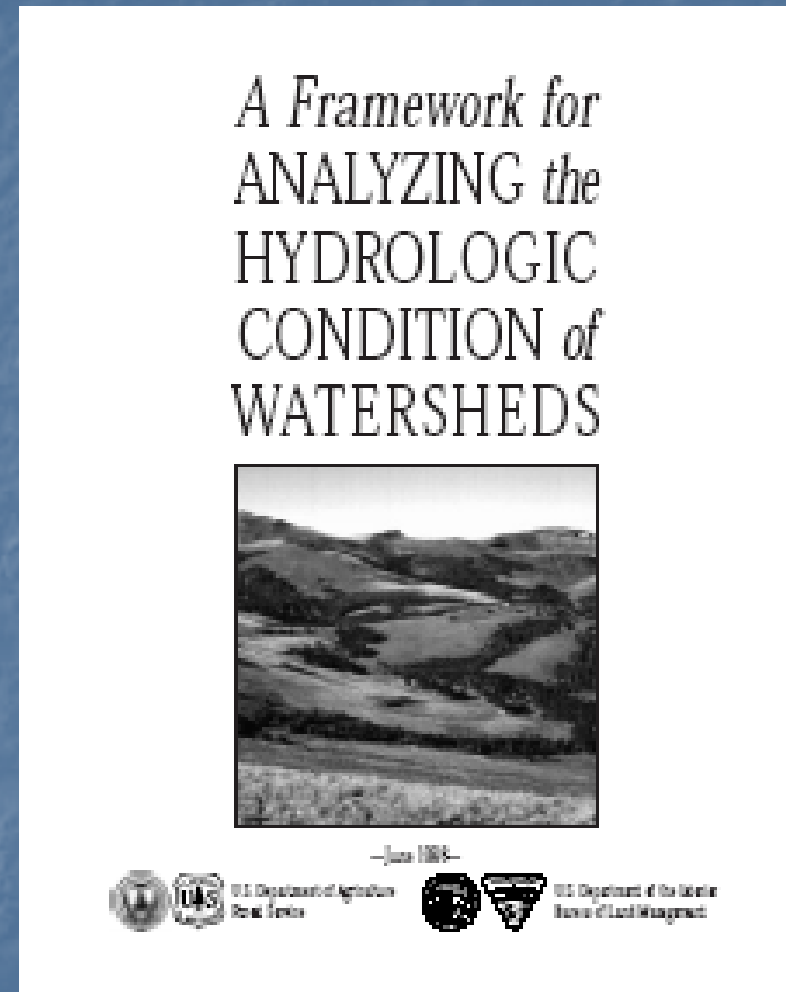
Goal II:

The Example Watershed

- Identify test area
 - Determine factors
 - Prioritize
- Recommendations

The 6-Step Approach

1. Review Team
2. Maps
3. Find Information
4. Rate Information
5. Select Important Information
6. Set Restoration Goals

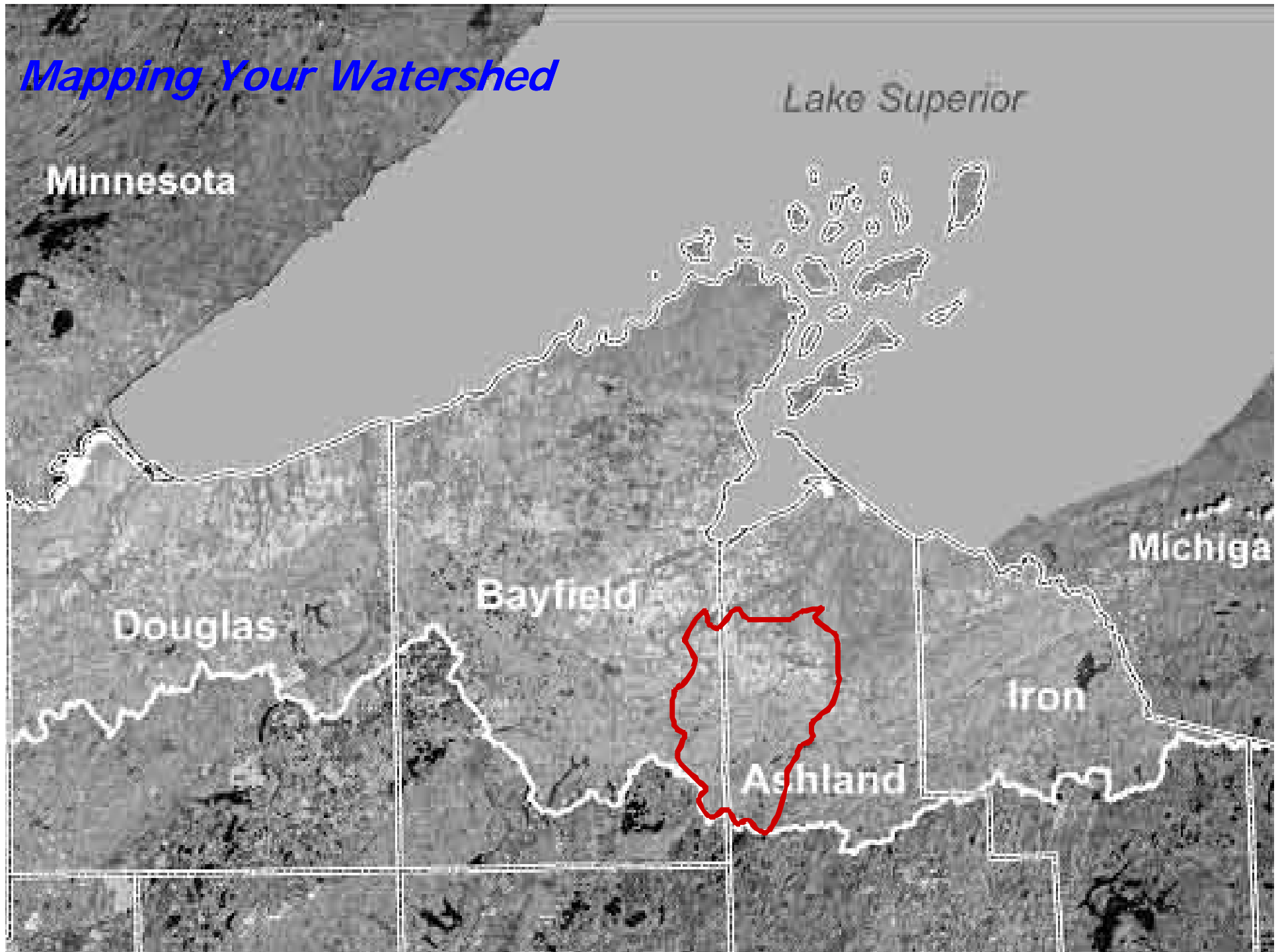




Assembling a Team



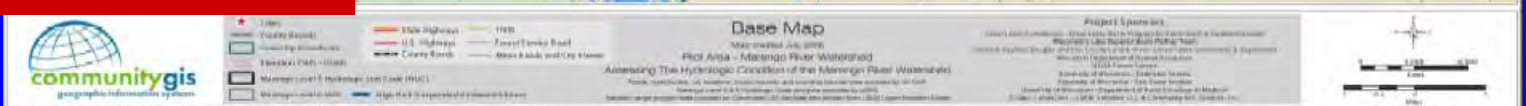
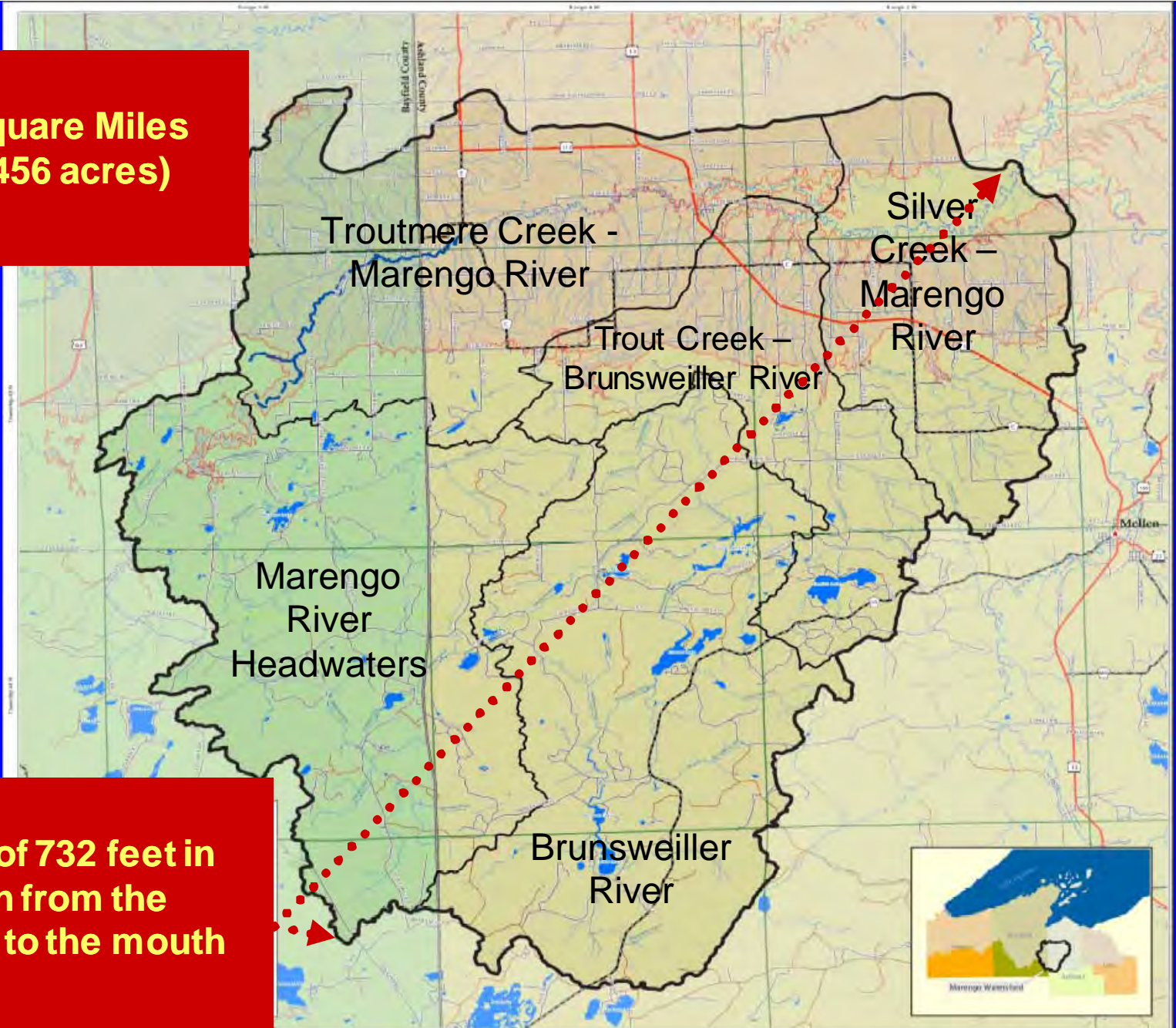
Mapping Your Watershed



**218 Square Miles
(139,456 acres)**

**6th
Level
HUC**

**Difference of 732 feet in
elevation from the
headwaters to the mouth**

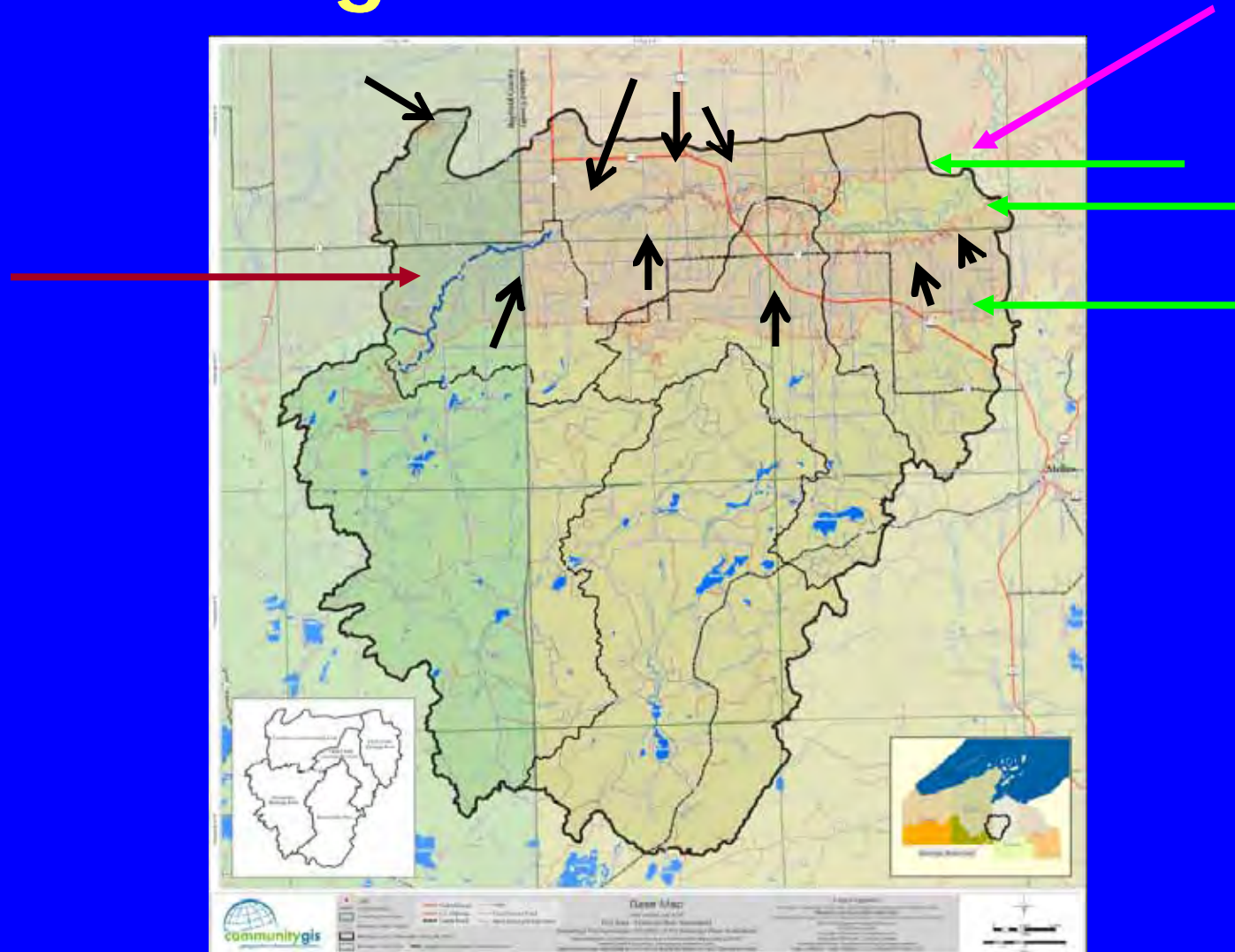


Finding Watershed Information

Information Categories

- Climate
- Surface & Ground Water
- Drainage Basin Characteristics

Identified Areas of Concern in the Marengo River Watershed



Marengo River—Levee building, May 2003 flood



*Used with USGS
permission*

Example Rating Table (excerpt)

Climate	Table 4.1: Marengo River Watershed Subjective Ratings & Rationale			
Information	Results	Flow	Habitat Quality	Timing
Rain Amount Duration Frequency Intensity	<p>Rainfall directly impacts stream flow on lake Superior's clay plain. This is especially apparent once heavy clay soils are saturated or frozen with almost zero infiltration. Normal infiltration is 1.1 inches per hour. Streams rise and fall in direct relation to the amount, duration and frequency/intensity of rainfall events.</p> <ul style="list-style-type: none"> • General 25-year, 24-hour precipitation is 4.66 inches (USGS, 2002) • Annual precipitation ranges from 30.02 – 33.46 inches per year (USGS, 2002) 	1 1 1 1	1 1 1 1	1 1 1 1
Snow	<p>There is great variability in the Marengo Watershed as a portion of the pilot area is in the <i>snow belt</i> and a portion is not. Neighboring watershed comparisons (USGS, 2002) –</p> <ul style="list-style-type: none"> • Bad River Watershed 94.5 – 96 inches • Trout Brook 91.5 inches (tributary near Marengo) • White River 66.1 inches (near Ashland) • Used 96 inches annual snowfall 	1	1	1
Wind	<p>Wind speeds and direction early in the spring contribute to both the amount and timing of flow in the Marengo River Watershed and for all Lake Superior watersheds for that matter.</p> <ul style="list-style-type: none"> • Average wind speeds are 10 miles per hour. 	1	2	1
Evapotranspiration	<p>No information source found. We do know that evaporation and transpiration play a part in spring runoff events and peak flow events. We just don't know the impact and importance of this process.</p>	2	3	2

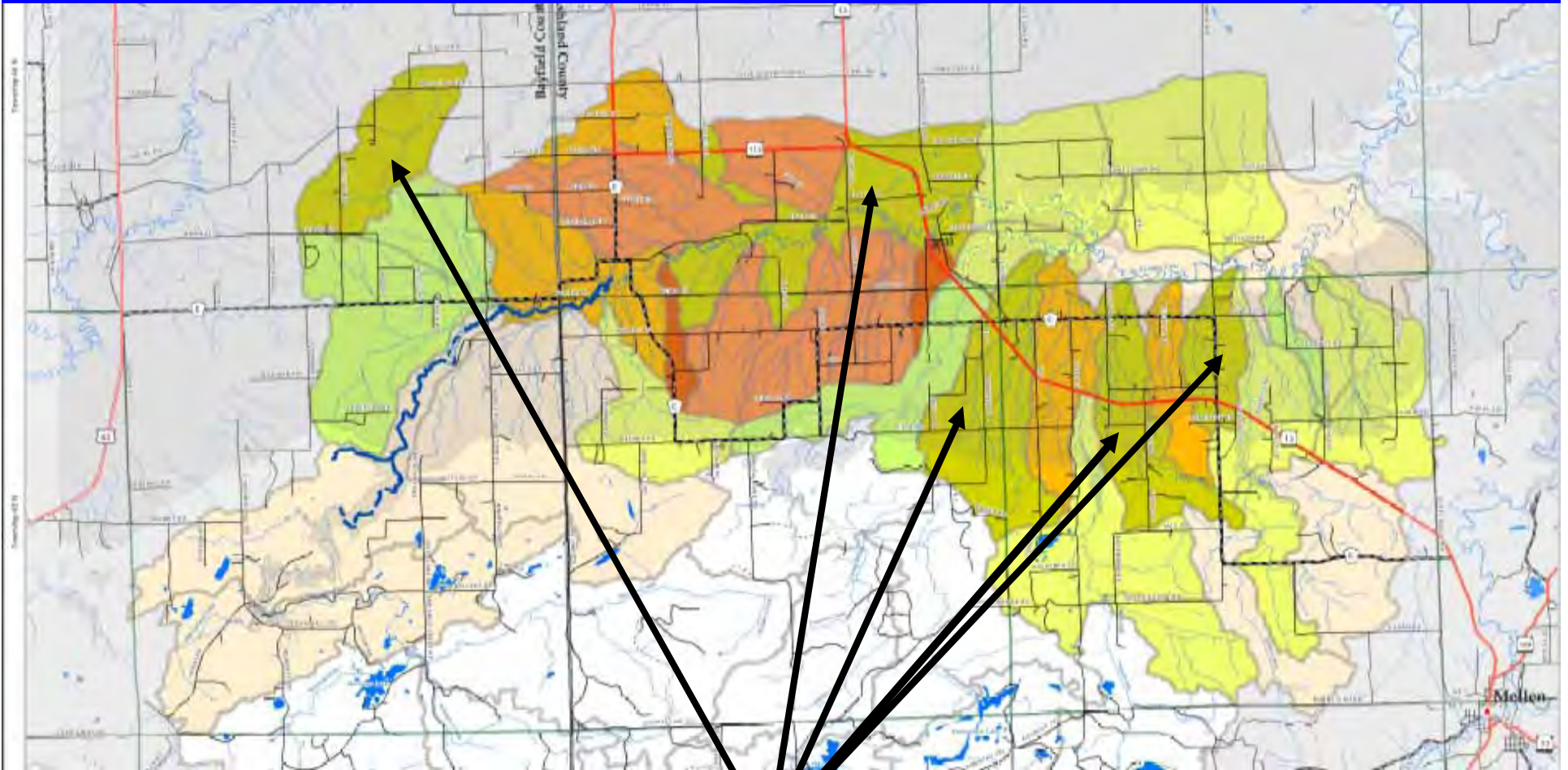
Watershed Features

(Ratings of 1 for flow, quality, or timing of water)

- Rain
- Snowfall
- Maximum Temperature
- Wind
- Wetlands / Riparian Areas
- Channel Geometry
- Topography
- Soils
- Geology
- Forest Age Class & Vegetation
- Riparian Buffer
- Nonmetallic Mining
- Road Ditches
- Agriculture

Selecting Important Features

Recommendations - Vegetation



CommunityGIS, Inc, 2004

**Hydro-units with 50-60%
open land**

Recommendations – Transitional Areas & Areas of Concern



Photos - N. Larson



Recommendations - Agricultural Areas & Wetlands



Photos – Stable Solutions LLC



Recommendations - Transportation System

Photos - Stable Solutions llc

Recommendations - Rural Development

Increase in Percent Impervious Area in a Watershed

Failing Septics



Photos - Stable Solutions llc



Town of Morse



Ballou Creek, 2003



Town of Lincoln



Marengo River, 2005

Recommendations - Habitat Improvement

Photos - Stable Solutions llc

<http://basineducation.uwex.edu/lakesuperior/>

Address <http://basineducation.uwex.edu/lakesuperior/watershedmgmt.htm>

Watershed Management Strategy in the Marengo River Watershed



About this Project:

Many groups throughout the Lake Superior basin are taking a keen interest in their watershed. A group of natural resource professionals and citizens, called the "Wisconsin Lake Superior Basin Partner Team" is working on this project. The goal is to produce a guide to help groups in the basin assess hydrology as an important step in their watershed plan. The Team is using the Marengo River watershed as a test case. The final guide book and Marengo watershed assessment will be available in 2007. Drafts are posted on this website.

Meeting Materials :
[May 4, 2006](#)

Press Releases:
[ABDI Awarded Grant to Address Soil Erosion and Sediment Control](#)

[Local Group Begins Watershed Health Project](#)

Watershed Health Initiative

Assessing the Hydrologic Condition of the Marengo River Watershed, Wisconsin (01/2007):

[Pages 1 thru 30 - Marengo Report *](#)

[Page 31 - Post Card](#)

[Pages 33 & 34 - GLBP Newsrelease](#)

[Pages 35 & 36 - GOCN Newsrelease](#)

[Pages 37 & 38 - Newsrelease](#)

[Pages 39 & 40 - Marengo Project Brochure *](#)

[Pages 41 thru 43 - Table 2.1 & 2.2 **](#)

[Pages 45 thru 47 - Table 3.1](#)

[Pages 49 thru 52 - Table 3.2](#)

[Pages 53 thru 64 - Table 4.1](#)

[Page 65 - Table 5.1](#)

[Pages 67 thru 72 - Table 6.1](#)

Internet

start

Microsoft PowerPoint ...

Template2 - Microsoft...

1:18 PM



END

**Sandra Schultz, CPESC
Stable Solutions LLC**

October 29, 2007