



TIPPING POINTS & INDICATORS

Supporting Sustainable Communities in Great Lakes States

PURDUE
UNIVERSITY

Great Lakes
RESTORATION



UNIVERSITY OF MINNESOTA DULUTH

ILLINOIS

Sea Grant
ILLINOIS - INDIANA

CILER
Cooperative Institute for Learning
and Ecosystems Research
University of Michigan

GLERL
Great Lakes Environmental Research Laboratory



Tipping Points and Indicators: Engaging Great Lakes Communities to Develop Tipping Point Action Plans

Jarrold Doucette and Kara Salazar

Purdue University

Illinois – Indiana Sea Grant



TIPPING POINTS & INDICATORS

Supporting Sustainable Communities in Great Lakes States

PURDUE
UNIVERSITY

Great Lakes
RESTORATION



UNIVERSITY OF MINNESOTA DULUTH

ILLINOIS

Sea Grant
ILLINOIS - INDIANA

CILER
Cooperative Institute for Learning
and Ecosystems Research
University of Michigan

GLERL
Great Lakes Environmental Research Laboratory



Research Project Team

- Great Lakes Environmental Research Laboratory – Rutherford*, Mason
- University of Illinois (IISG) – Miller*
- Purdue University – Pijanowski*, Doucette, Pekin, Salazar, Jung, Frederick, Robinson, Kim, Ghadiri
- University of Michigan – Wiley, Riseng
- Michigan State University – Stevenson, Hyndman, Rose, Kendal, Martin
- University of Minnesota - Duluth – Johnson
- University of Windsor – Ciborowski
- University of Illinois - Chicago – Jaffe

* Denotes Principal Investigator



TIPPING POINTS & INDICATORS

Supporting Sustainable Communities in Great Lakes States

PURDUE
UNIVERSITY

Great Lakes
RESTORATION



UNIVERSITY OF MINNESOTA DULUTH

ILLINOIS

Sea Grant
ILLINOIS - INDIANA

CILER
Cooperative Institute for Learning
and Ecosystems Research
University of Michigan

GLERL
Great Lakes Environmental Research Laboratory



Outreach Project Team

- Great Lakes Sea Grant Network Specialists
 - Illinois-Indiana (Salazar, Jaffe, Doucette, TePas)
 - Michigan (Breederland)
 - Minnesota (Schomberg)
 - New York (Penney)
 - Ohio (Lucente)
 - Pennsylvania (Rafferty)
 - Wisconsin (Hart, Noordyk)





TIPPING POINTS & INDICATORS

Supporting Sustainable Communities in Great Lakes States



UNIVERSITY OF MINNESOTA DULUTH



Acknowledgements for Funding Directly for Tipping Points Research





TIPPING POINTS & INDICATORS

Supporting Sustainable Communities in Great Lakes States

PURDUE
UNIVERSITY

Great Lakes
RESTORATION



UNIVERSITY OF MINNESOTA DULUTH

ILLINOIS

Sea Grant
ILLINOIS - INDIANA

CILER
Cooperative Institute for Learning
and Ecosystems Research
University of Michigan

GLERL
Great Lakes Environmental Research Laboratory



Program Overview

- Great Lakes Extension program and companion web-based decision support system (DSS)
 - *Supports community visioning discussions and action plan development*
- Facilitation led by Sea Grant Specialists, Extension Professionals, Partnering Consultants and Agency Staff
- Primary audiences
 - Watershed Planning and Land Use Planning



TIPPING POINTS & INDICATORS

Supporting Sustainable Communities in Great Lakes States

PURDUE
UNIVERSITY

Great Lakes
RESTORATION



UNIVERSITY OF MINNESOTA DULUTH

ILLINOIS

Sea Grant
ILLINOIS - INDIANA

CILER
Cooperative Institute for Learning
and Ecosystems Research
University of Michigan

GLERL
Great Lakes Environmental Research Laboratory



Program Overview

- User needs assessment for professional planners and Extension Specialists (Kim Robinson, PhD)
 - Survey (302 respondents, all 8 GL states, Multiple scales: Municipal, County/Township, Regional)
- Summary of desired elements users want in a DSS
 1. Visioning tools
 2. Current conditions of land use and water resources
 3. Identify and delineate key natural lands
 4. User identified “what if” models for future land use scenarios
 5. Impact of land use change on terrestrial and aquatic species
 6. Impact of land use change on human health and recreation



TIPPING POINTS & INDICATORS

Supporting Sustainable Communities in Great Lakes States



UNIVERSITY OF MINNESOTA DULUTH

ILLINOIS



Program Overview

- Data driven tool and facilitated process to support community visioning discussions and action plan development.

1. Links natural resources management actions to community values

CHARACTERISTICS

Which of the following ten community characteristics are most important to you? Each team member ranks community characteristic priorities and the team averages are used to highlight the most relevant tipping points and indicators action strategies to implement as part of the community watershed action plan.

How To: Each person should rank the characteristics below using a maximum of 30 stars and use the update button to submit their choices.

YOUR NAME :

AVAILABLE STARS : 10/30

CHARACTERISTIC

I can walk, bike, or take public transit. ★ ★ ★ ★ ★

There is common open space or park near house. ★ ★ ★ ★ ★

I am safe from flooding ★ ★ ★ ★ ★

Outdoor recreation areas are easily accessible. ★ ★ ★ ★ ★

I can have a large yard. ★ ★ ★ ★ ★

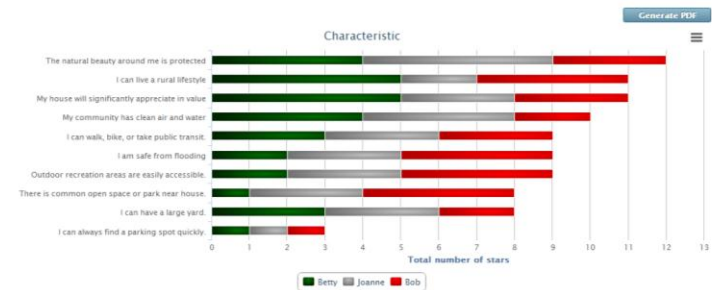
I can always find a parking spot quickly. ★ ★ ★ ★ ★

I can live a rural lifestyle ★ ★ ★ ★ ★

My house will significantly appreciate in value ★ ★ ★ ★ ★

My community has clean air and water ★ ★ ★ ★ ★

The natural beauty around me is protected ★ ★ ★ ★ ★





TIPPING POINTS & INDICATORS

Supporting Sustainable Communities in Great Lakes States



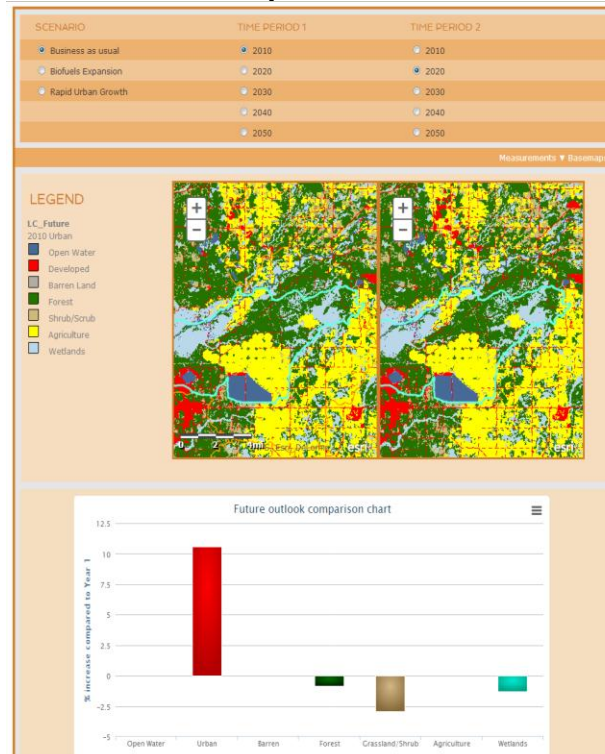
UNIVERSITY OF MINNESOTA DULUTH

ILLINOIS



Program Overview

- Data driven tool and facilitated process to support community visioning discussions and action plan development
- 2. Gives community the ability to see where they are now and where they will be in the future





TIPPING POINTS & INDICATORS

Supporting Sustainable Communities in Great Lakes States



UNIVERSITY OF MINNESOTA DULUTH

ILLINOIS



Program Overview

- Data driven tool and facilitated process to support community visioning discussions and action plan development

3. Helps communities identify assets and determine threats to sustainability

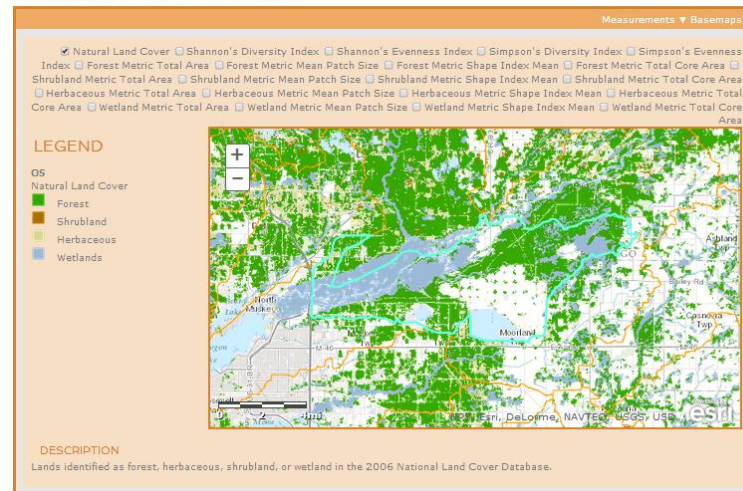
WHAT ARE THE NATURAL RESOURCE ASSETS WE HAVE IN OUR COMMUNITY?

Use the maps below to explore existing natural resource assets for open space, water quality and prime farmland in your watershed.

How To: Hold down your left mouse button over a map and move your mouse to pan. Use the scroll wheel or the + and - buttons on the map to zoom. Use the Measurement tools to examine the size of features and the basemap tool to examine the underlying landscape.

OPEN SPACE

LAND COVER TYPE WITH PATCH SIZE





TIPPING POINTS & INDICATORS

Supporting Sustainable Communities in Great Lakes States



UNIVERSITY OF MINNESOTA DULUTH

ILLINOIS



Program Overview

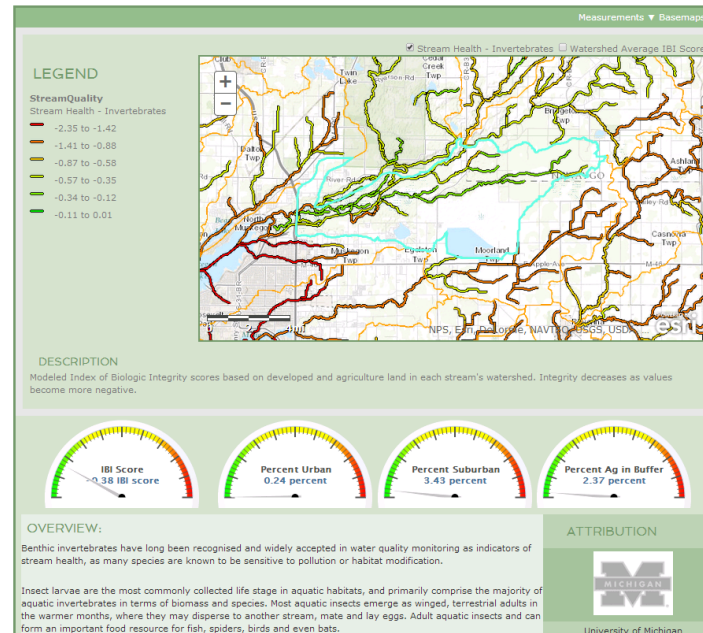
- Data driven tool and facilitated process to support community visioning discussions and action plan development

4. Identifies actions of highest priority with data and tipping points models

STREAM INVERTEBRATE HEALTH

Below are modeled stream invertebrate health indexes based on watershed and riparian buffer land use.

How To: Hold down your left mouse button over a map and move your mouse to pan. Use the scroll wheel or the + and - buttons on the map to zoom. Use the Measurement tools to examine the size of features and the basemap tool to examine the underlying landscape.





TIPPING POINTS & INDICATORS

Supporting Sustainable Communities in Great Lakes States



UNIVERSITY OF MINNESOTA DULUTH

ILLINOIS



Program Overview

- Data driven tool and facilitated process to support community visioning discussions and action plan development

5. Provides a framework for discussing and selecting ordinances, BMPs, and action strategies

CHOOSE ACTION STRATEGIES

Select from the following planning strategies, sample ordinances, incentive options and community education programs that have been filtered based on your selected priorities and desired community characteristics to improve future watershed conditions.

How To: Click the title area of an action strategy to expand the window and view the entire strategy. Click the check box on the right side of a strategy to include it in your watershed action plan.

PLANNING

WATER RESOURCES PLAN Include

PRIME FARMLAND PROTECTION PLAN Include

DESCRIPTION
A type of open space plan that identifies prime agricultural land and productive farms in order to protect and promote agricultural activity.


STRENGTHS
By protecting prime agricultural soils and farmland on the urban fringe or in rural areas, communities can guide growth to areas that are already developed and thus promote their food security and the maintenance of their economic base.

WEAKNESSES
Protecting some agricultural activities (hobby farms, e.g.) can result in very large lot (5-acre and above) sprawl without protecting farms of sufficient size or capital to be able to employ efficient and sustainable food, livestock and crop production and harvesting processes.

EXAMPLES

EXAMPLE 1: STATE/GENERAL GUIDANCE OR EXAMPLES
State/Contact: OH, Joe Lucente
Description: Ohio Balanced Growth Program
[Ohio Balanced Growth Program](#)

EXAMPLE 2: STATE/GENERAL GUIDANCE OR EXAMPLE STATE
Contact: MI, Mark Brederland
Description:
Notes: Local ordinances only





TIPPING POINTS & INDICATORS

Supporting Sustainable Communities in Great Lakes States

PURDUE
UNIVERSITY

Great Lakes
RESTORATION



UNIVERSITY OF MINNESOTA DULUTH

ILLINOIS

Sea Grant
ILLINOIS - INDIANA

CILER
Cooperative Institute for Learning
and Ecosystems Research
University of Michigan

GLERL
Great Lakes Environmental Research Laboratory



Program Overview

- Data driven tool and facilitated process to support community visioning discussions and action plan development
 - Links natural resources management actions to community values
 - Gives community the ability to see where they are now and where they will be in the future
 - Helps communities identify assets and determine threats to sustainability
 - Identifies actions of highest priority with data and tipping points models
 - Provides a framework for discussing and selecting ordinances, BMPs, and action strategies
- Final action plan includes customized community scenario maps and tailored action strategies



TIPPING POINTS & INDICATORS

Supporting Sustainable Communities in Great Lakes States



UNIVERSITY OF MINNESOTA DULUTH

ILLINOIS



Website Overview

<http://tippingpointplanner.org>

1. Visioning

- 1.1 Project Description
- 1.2 Community Characteristics

2. Community Overview

- 2.1 Past Land Use Change
- 2.2 Future Land Use Change
- 2.3 Natural Resource Assets
- 2.3 Areas of Environmental Concern

3. Tipping Points

- 3.1 Prime Farmland Locations
- 3.2 Open Space Locations
- 3.3 Runoff and Water Quality
- 3.4 Stream Invertebrate Health
- 3.5 Nutrients Sources (MI only)
- 3.6 Coastal Wetland Health

4. Action Strategies

5. Action Plan



TIPPING POINTS & INDICATORS

Supporting Sustainable Communities in Great Lakes States

PURDUE
UNIVERSITY

Great Lakes
RESTORATION



UNIVERSITY OF MINNESOTA DULUTH

ILLINOIS

Sea Grant
ILLINOIS - INDIANA

CILER
Cooperative Institute for Learning
and Ecosystems Research
University of Michigan

GLERL
Great Lakes Environmental Research Laboratory



Project Timeline

- Beta Version – October 2013
- Train the trainer (Sea Grant Specialists)
– October 2013
- Training and pilots in Great Lakes states – Spring 2014
- Final changes based on state pilots – May 2014
- Additional program enhancements - Spring 2014 and Ongoing





TIPPING POINTS & INDICATORS

Supporting Sustainable Communities in Great Lakes States

PURDUE
UNIVERSITY

Great Lakes
RESTORATION



UNIVERSITY OF MINNESOTA DULUTH

ILLINOIS

Sea Grant
ILLINOIS - INDIANA

CILER
Cooperative Institute for Learning
and Ecosystems Research
University of Michigan

GLERL
Great Lakes Environmental Research Laboratory



Contact Us

Technical Contact

Jarrold Doucette

jdoucett@purdue.edu

(765) 494-3573

Program Contact

Kara Salazar

salazark@purdue.edu

(765) 496-1070