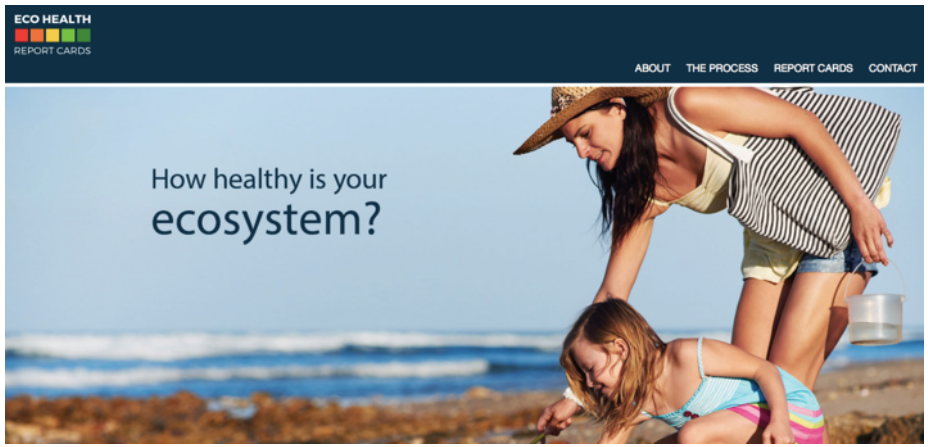
How are we doing on invasive species?

Developing scientifically based report cards



Bill Dennison

Great Lakes Panel on Aquatic Nuisance Species
and Associated Meetings
3 Nov 2016

University of Maryland
CENTER FOR ENVIRONMENTAL SCIENCE

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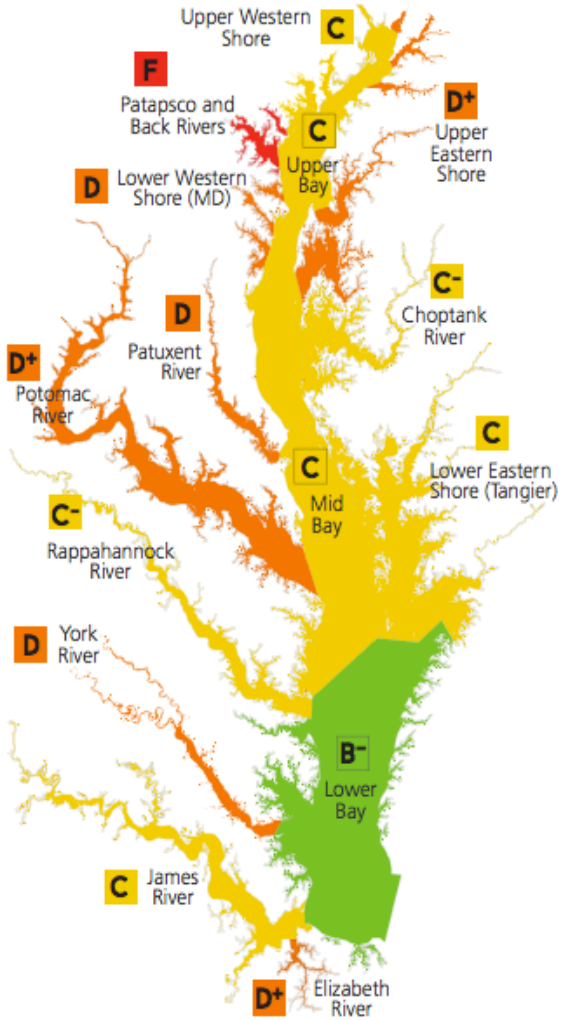
Environmental report cards

Tool to

- integrate data
- engage stakeholders
- catalyze actions

What is a report card?

- Broad-level assessments of a region or system
- Communicate complex information
- Based on real data: transparent and defendable
- Provide accountability
- Engage communities



The 5-step report card process

1 Create a conceptual framework

Create a framework defining goals and major aspects of each goal that should be evaluated over time.

2 Choose indicators

Select indicators that convey meaningful information and can be reliably measured.

3 Define thresholds

Define status categories, reporting regions, and method of measuring threshold attainment.

4 Calculate scores

Source	Station	Region	Date	DO Value
DNR	CCC0008		4/29/09	9.00
DNR	CCC0008		4/29/09	9.50
DNR	CCC0008		4/29/09	9.70
DNR	CCC0008		5/28/09	8.90
DNR	CCC0008		5/28/09	9.00
DNR	CCC0008		5/28/09	9.00

Calculate indicator scores and combine into index grades.

5 Communicate results

A vision for America's Watershed **Report Card**

Communicate results using visual elements, such as photos, maps, and conceptual diagrams.

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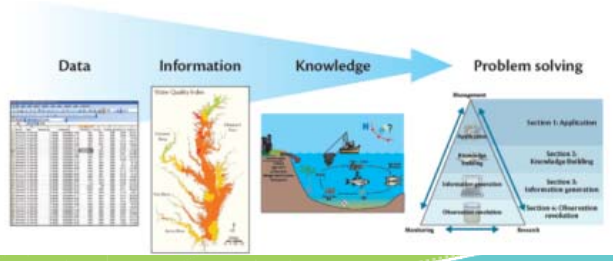
Why do report cards work?

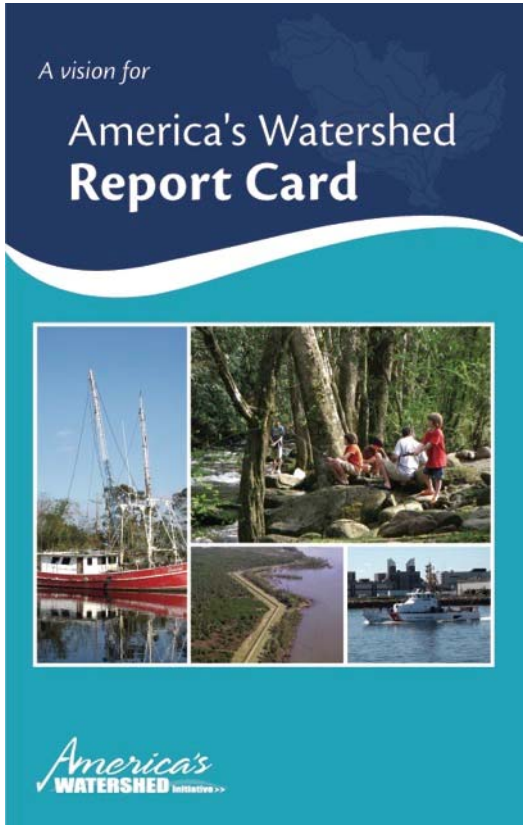
Peer pressure is a powerful human motivator

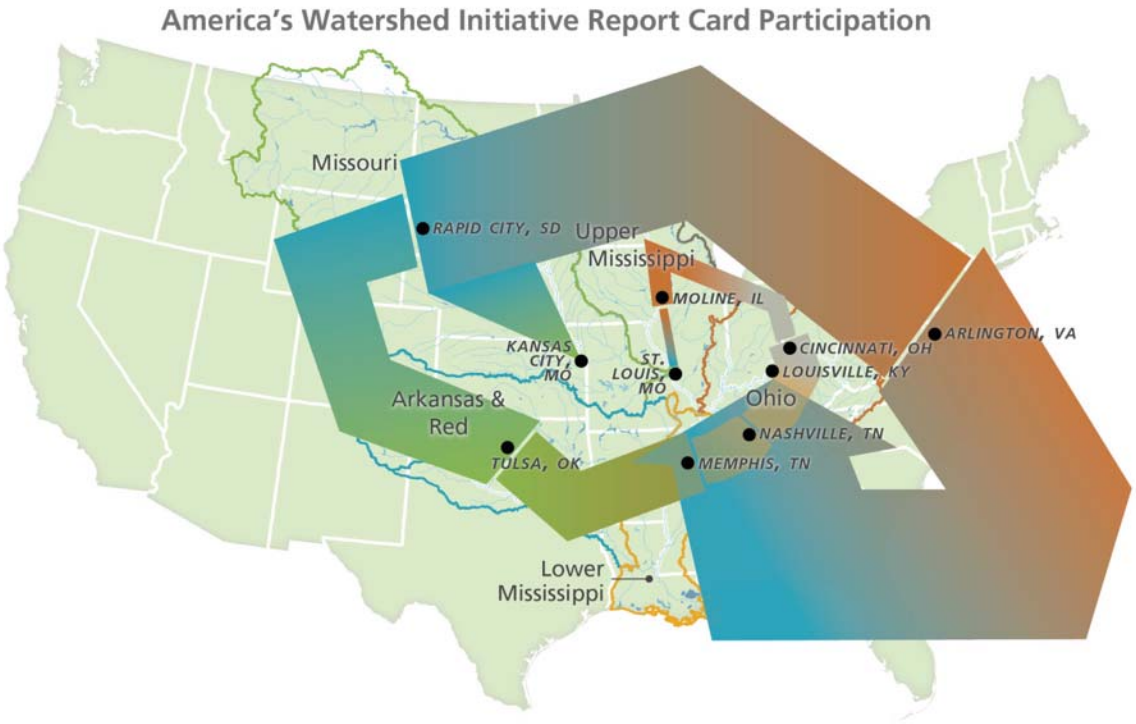
Educational report cards are a common experience

Report cards *synthesize* large amounts of data



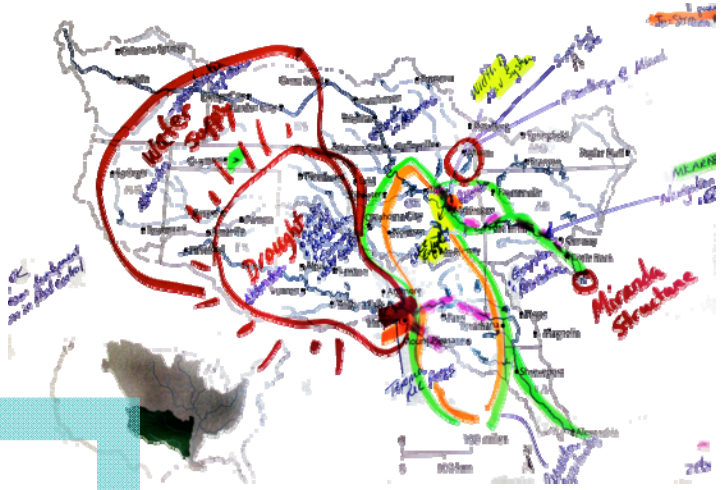
Mississippi river: a case study in stakeholder engagement

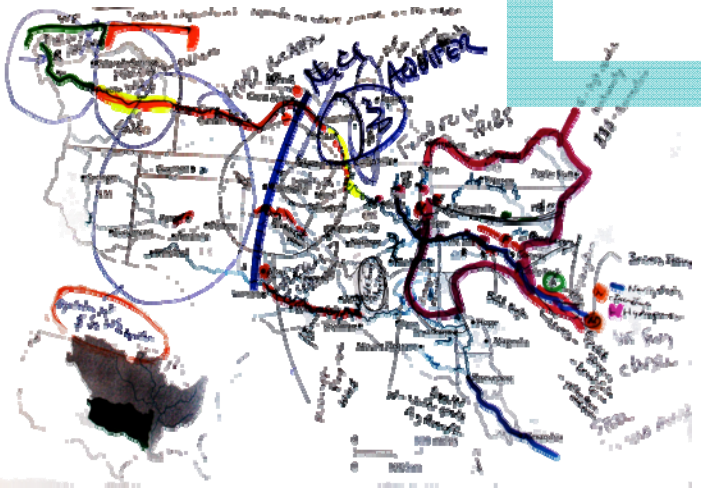




various regional workshops

Arkansas and red river basin

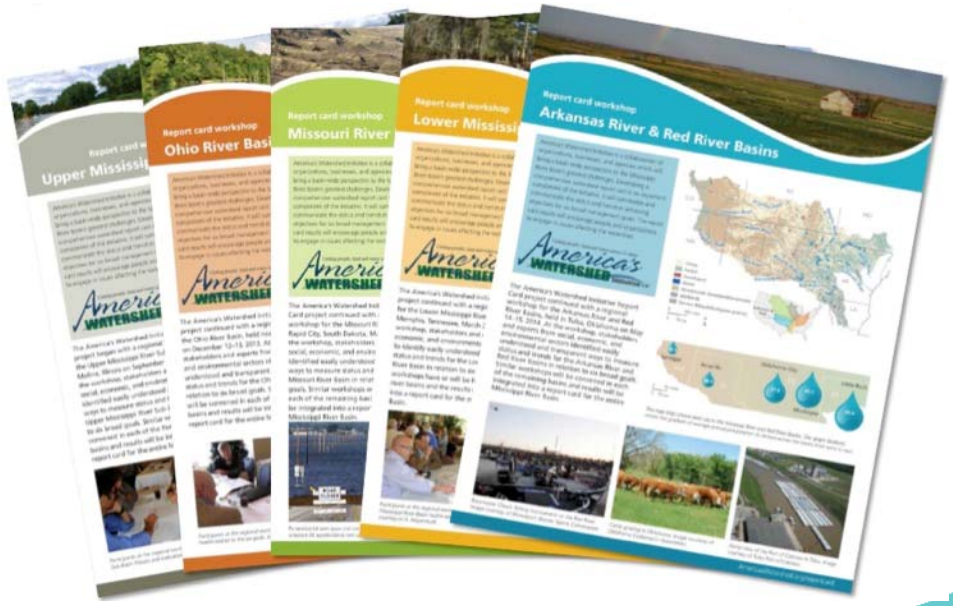




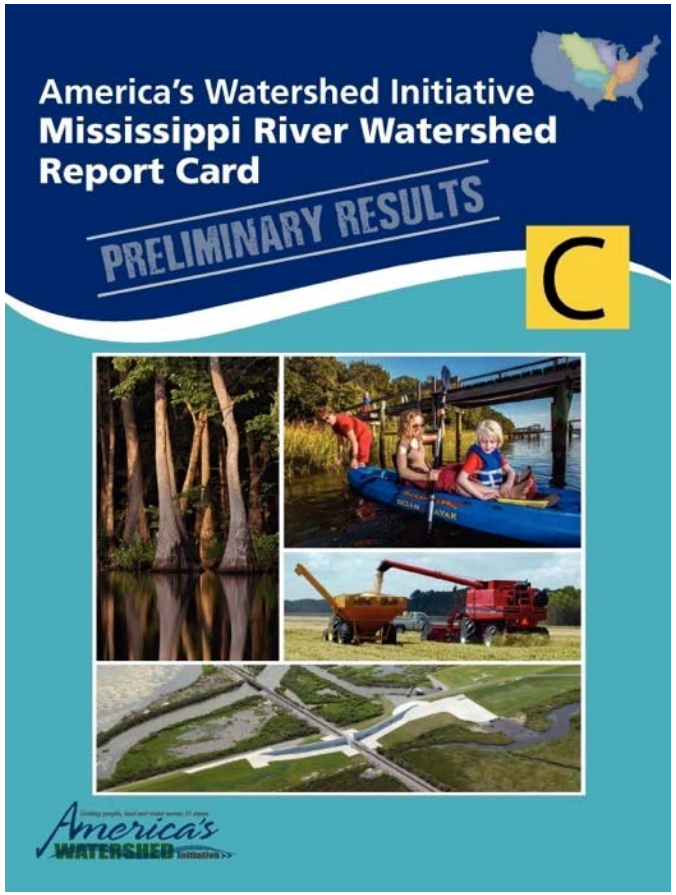
over 700 workshop participants

Expertise from

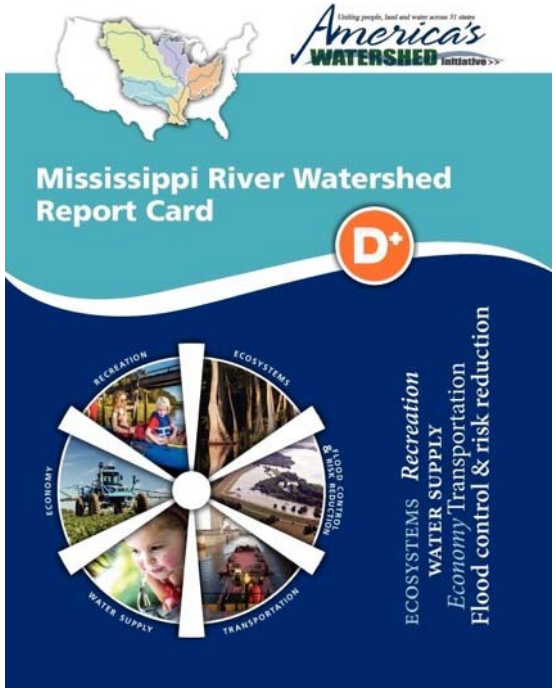
- 400+ businesses and organizations
- 180+ organizations and basin groups
- 100+ state and local government agencies
- 140+ business organizations
- 145+ federal agencies
- 85+ academic institutions



Developed a suite of indicators



More consultation before publishing the final report



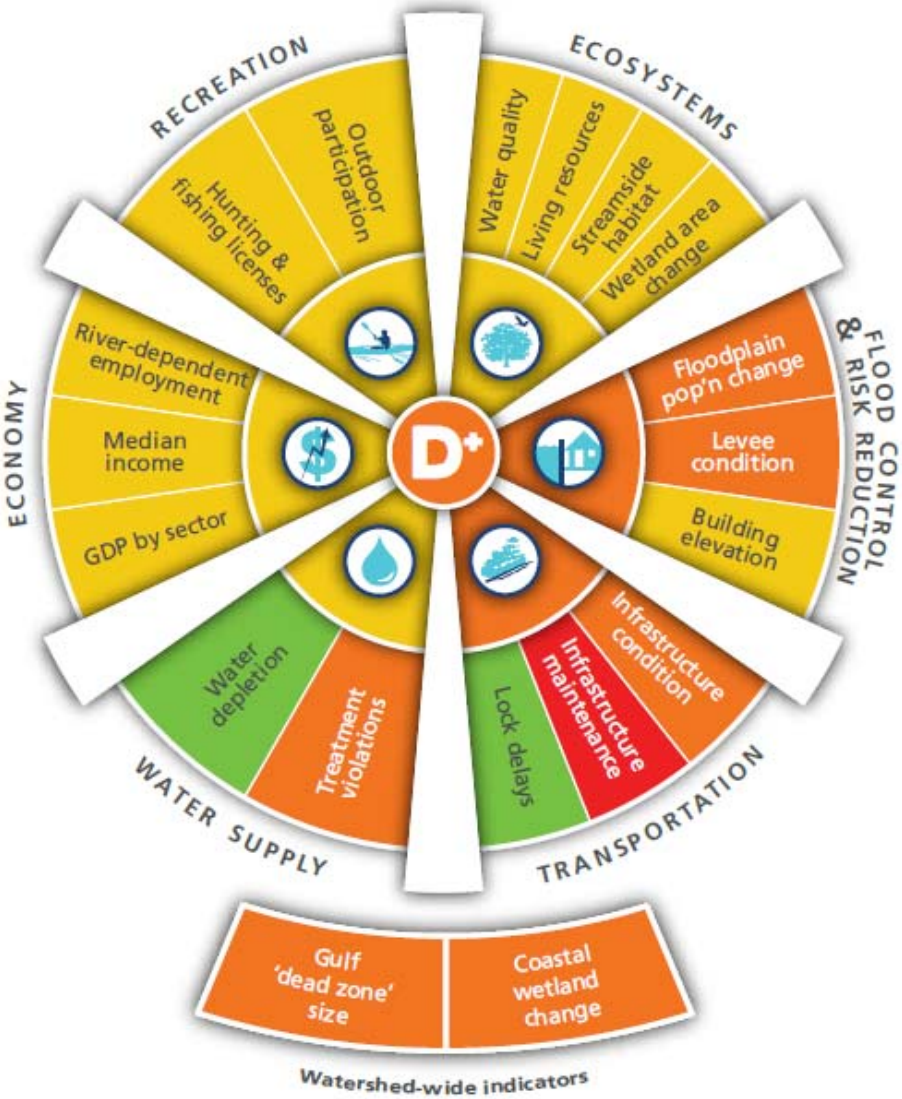
GOALS

- Ecosystems
- Flood Control & Risk Reduction
- Transportation
- Water Supply
- Economy
- Recreation

GRADES

- **A** Very good
- **B** Good
- **C** Moderate
- **D** Poor
- **F** Very poor
- No data

Mississippi Watershed Results



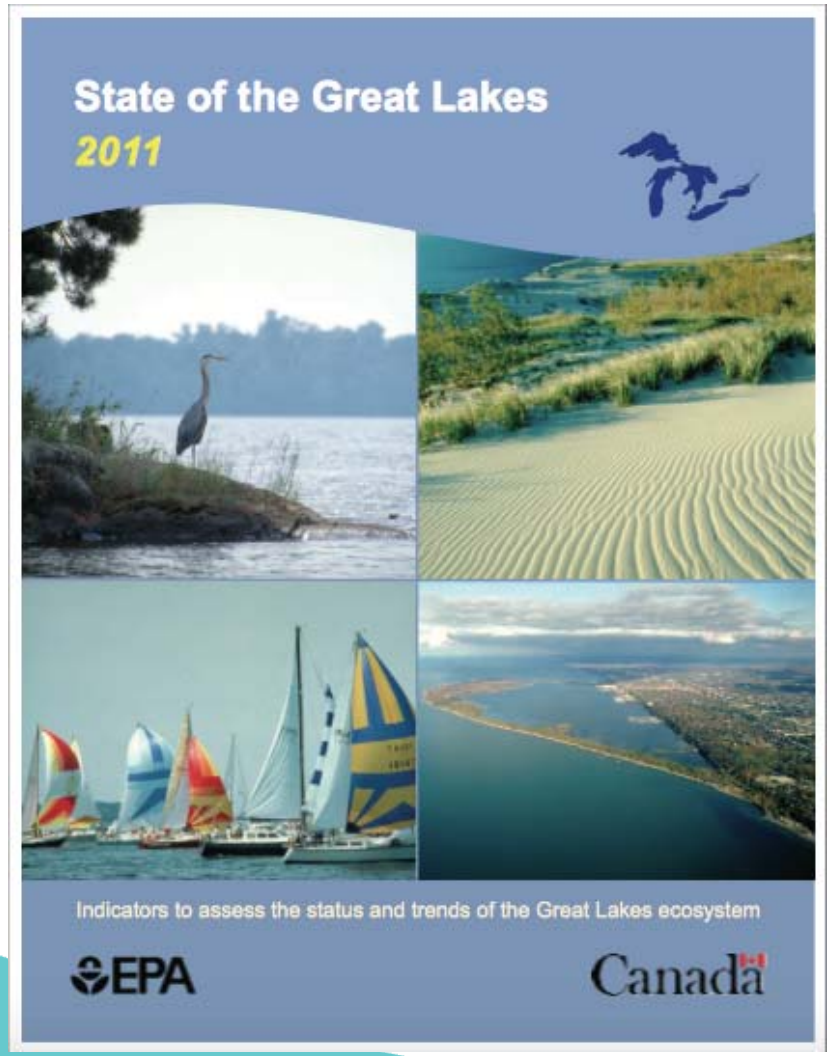
An interactive website and printed report cards communicate the results

http://americaswater.wpengine.com/

Report cards summarized

- Synthesize environmental and socio-economic data
- Assess ecosystem health within a socio-political context
- Engage stakeholders and community from start to finish
- Directly compare different geographic regions
- Grades incentivize political leaders to improve future grades
- Provide avenue for regular public dialog that can build community knowledge
- Community ownership empowers citizens to make changes

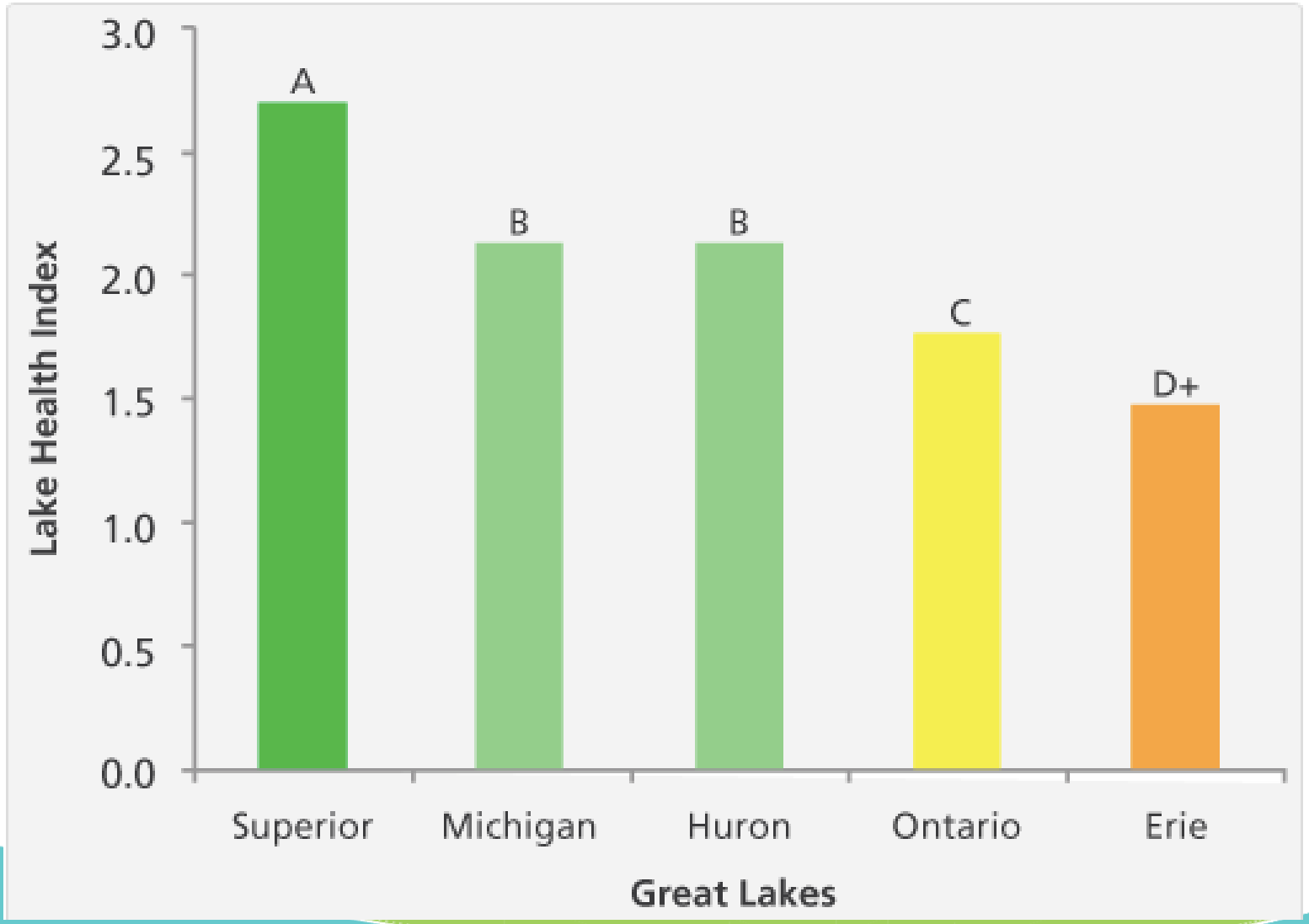
Developing a Great Lakes Health Index



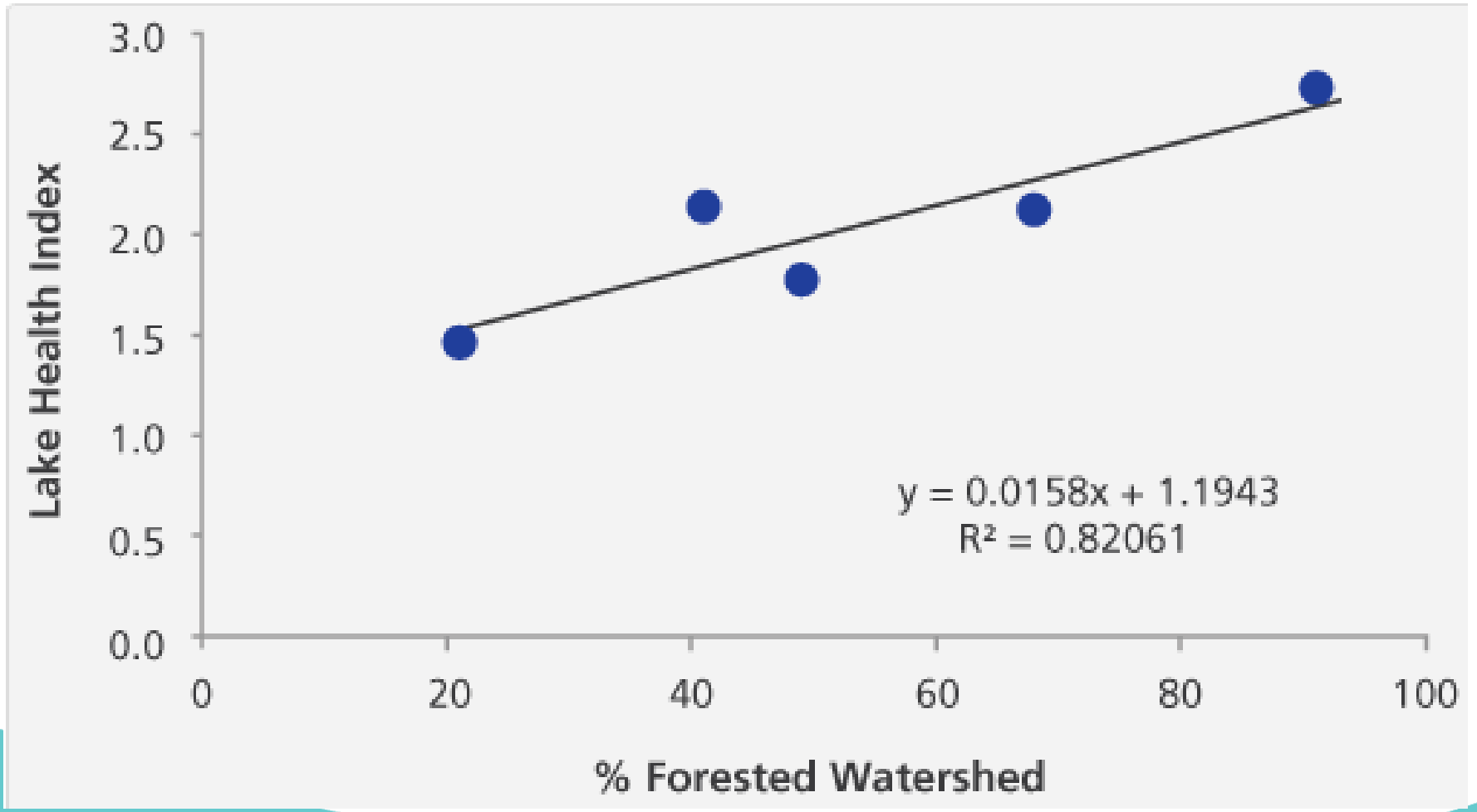
Water quality indicators
- Nutrient conc.
- Toxicants
- Fish contamination
- Bird contamination

Aquatic-dependent life indicators
- Diporeia crustaceans
- Walleye fish
- Lake sturgeon
- Lake trout
- Benthic diversity
- Prey fish
- Wetland amphipods
- Wetland plants

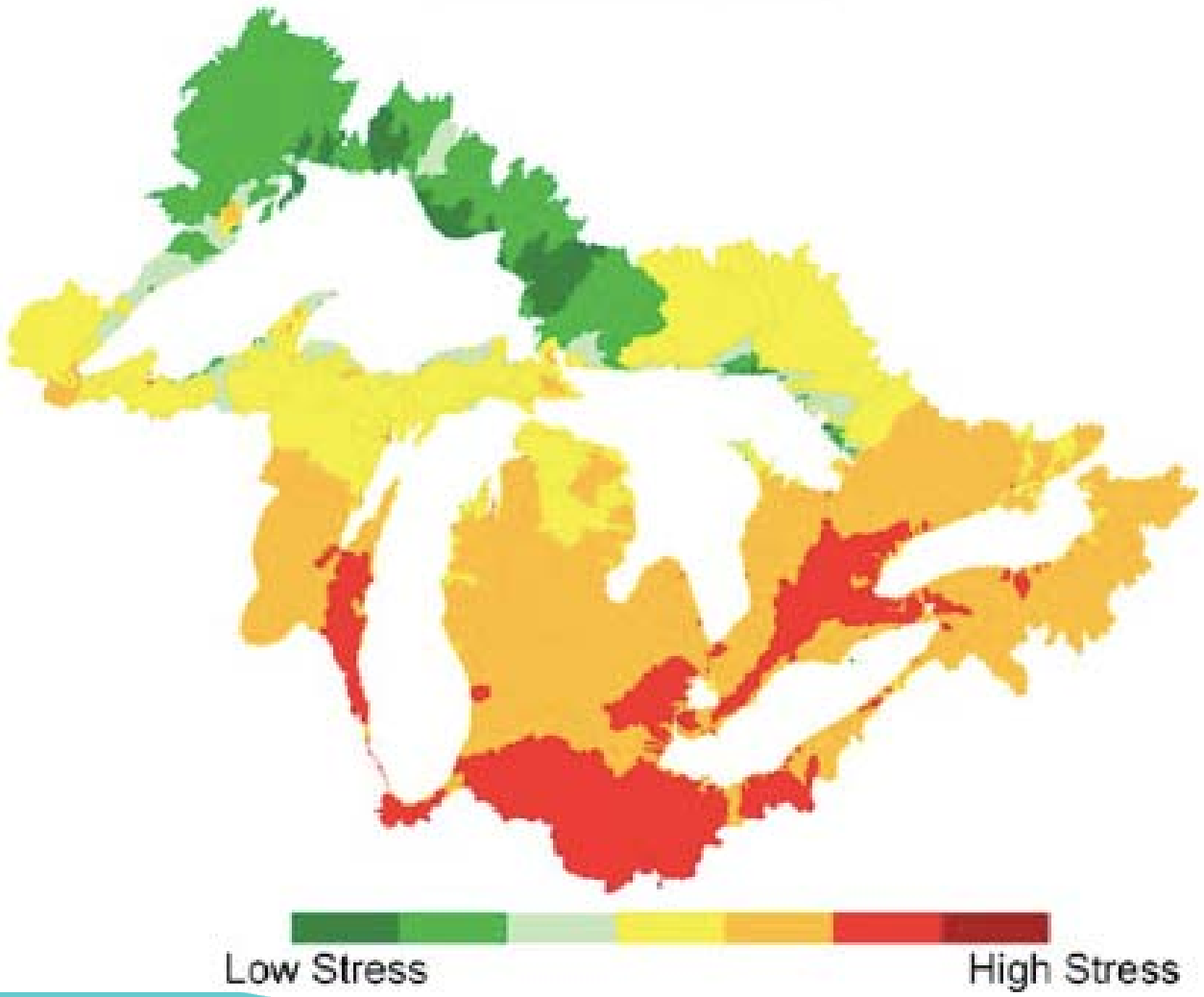
Great Lakes report card example



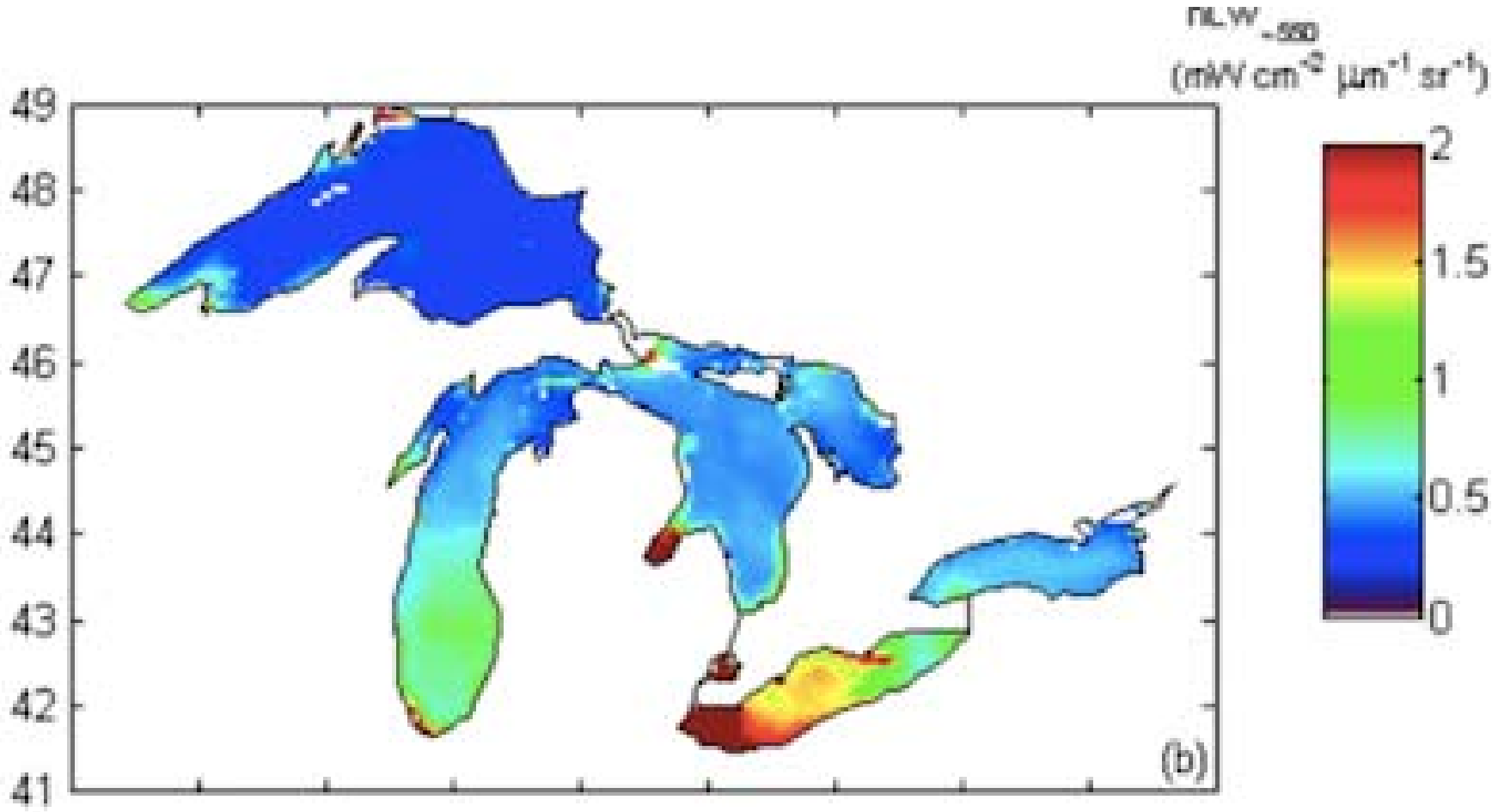
Correlation of Lake Health Index with watershed features



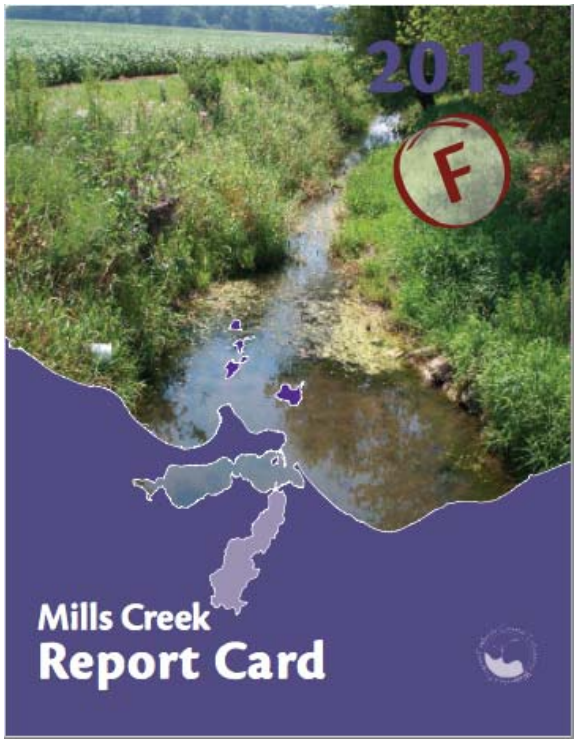
Watershed stress index

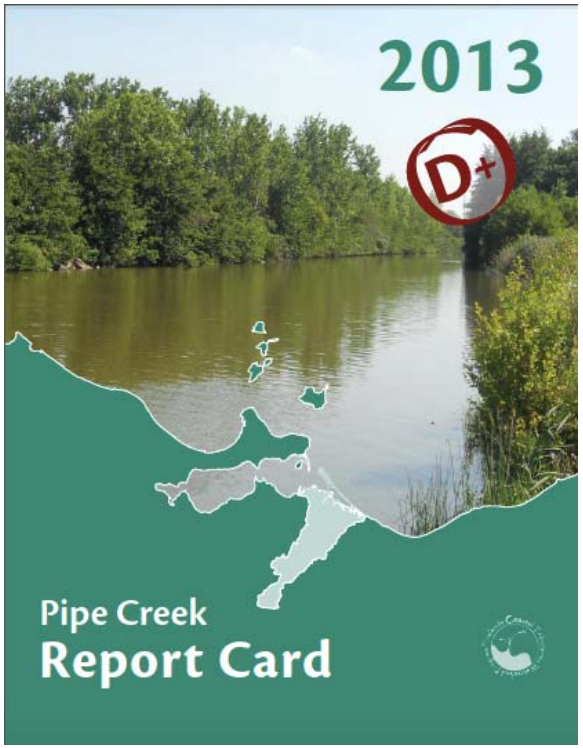


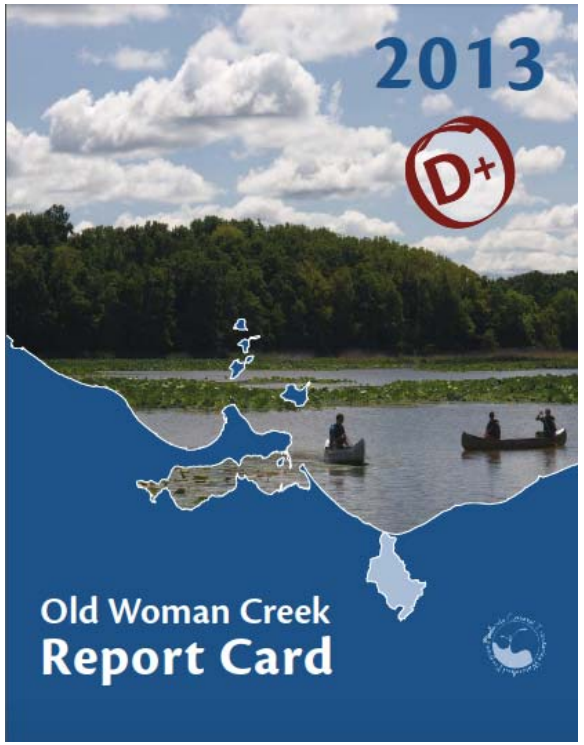
Great Lakes water clarity (1998-2005)



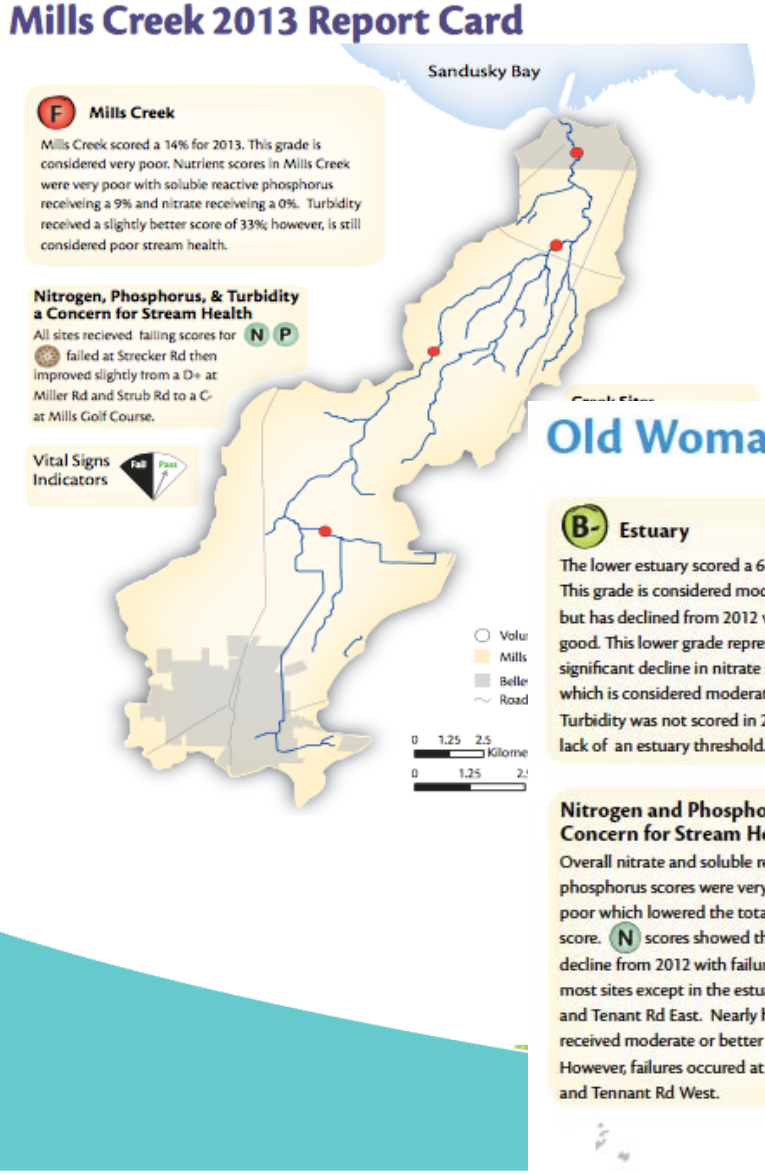
Localized report cards developed for Lake Erie tributaries

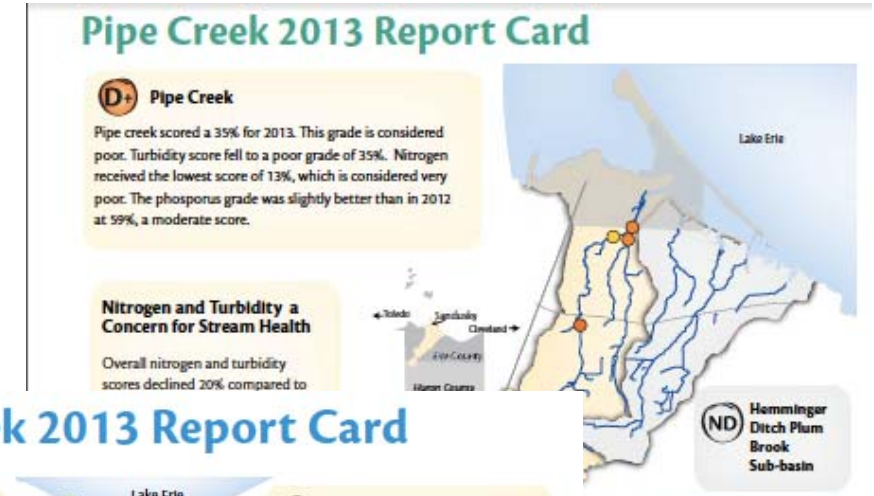


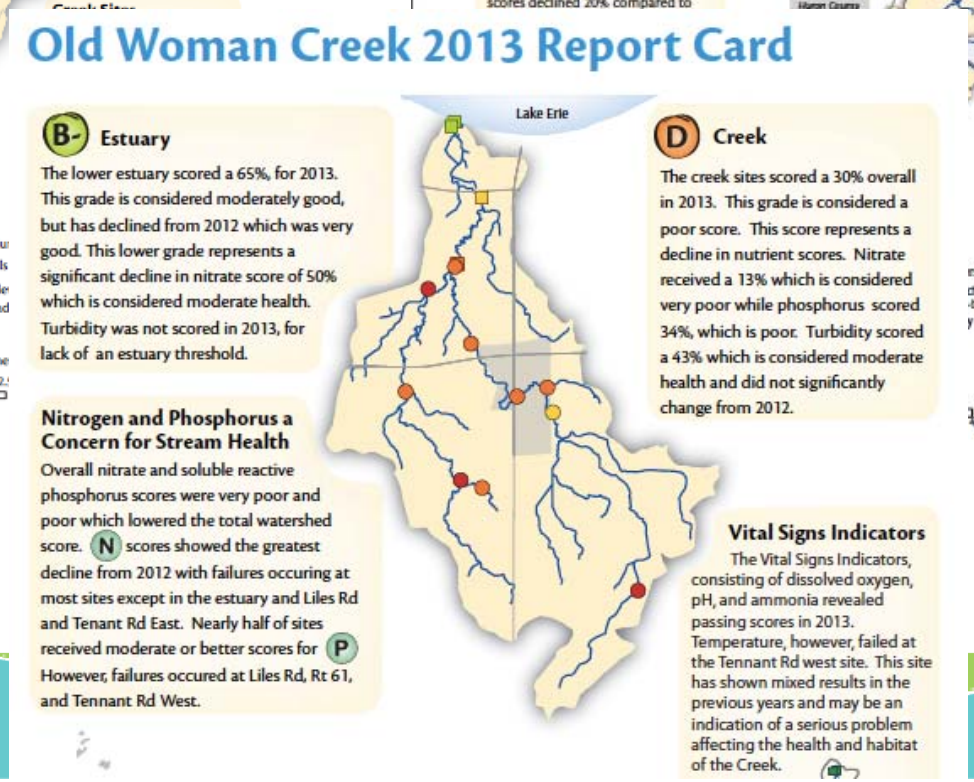




Excess nutrients contribute to low scores







Thank you!

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