GREAT LAKES COVER CROP INITIATIVE

A partnership forged to protect the Great Lakes by helping farmers use cover crops and conservation tillage systems to reduce pollution
# Great Lakes – By the Numbers

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Number of Nations whose land drains to the Great Lakes</td>
</tr>
<tr>
<td>5</td>
<td>Number of lakes that make up the Great Lakes</td>
</tr>
<tr>
<td>8</td>
<td>Number of States whose land drains to the Great Lakes</td>
</tr>
<tr>
<td>21</td>
<td>% of the World’s fresh surface water held by the Great Lakes</td>
</tr>
<tr>
<td>84</td>
<td>% of North America’s surface fresh water held by the Great Lakes</td>
</tr>
<tr>
<td>191</td>
<td>Number of years water is retained in Lake Superior</td>
</tr>
<tr>
<td>94,250</td>
<td>Number of square miles of surface area in the Great Lakes</td>
</tr>
<tr>
<td>201,460</td>
<td>Number of square miles of land that drain to the Great Lakes</td>
</tr>
<tr>
<td>162,000,000</td>
<td>Tons of cargo transported on the Lakes in 2002</td>
</tr>
</tbody>
</table>
Great Lakes Water Quality Concerns

- Sedimentation
Great Lakes Water Quality Concerns

- Sedimentation
- Nutrient Runoff
Great Lakes Water Quality Concerns

- Sedimentation
- Nutrient Runoff
  - Algal Blooms
Issues in the Lakes
## Damage to the Economy

<table>
<thead>
<tr>
<th>State or Province</th>
<th>2008 GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York</td>
<td>$1,144,481,000,000</td>
</tr>
<tr>
<td>Illinois</td>
<td>$633,697,000,000</td>
</tr>
<tr>
<td>Ontario</td>
<td>$584,460,000,000</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>$553,301,000,000</td>
</tr>
<tr>
<td>Ohio</td>
<td>$471,508,000,000</td>
</tr>
<tr>
<td>Michigan</td>
<td>$382,544,000,000</td>
</tr>
<tr>
<td>Minnesota</td>
<td>$262,847,000,000</td>
</tr>
<tr>
<td>Indiana</td>
<td>$254,861,000,000</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>$240,429,000,000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$4,528,128,000,000</strong></td>
</tr>
</tbody>
</table>
Great Lakes – An Important Global Resource

• Obviously, for many reasons, the Great Lakes are a critical resource not only for the US, but also North America and they also have global significance.

• What can we do to protect them?
Who is the GLCCI?

- We are agricultural educators from Indiana, Ohio and Michigan, representing:
  - Extension
  - Universities
  - Non-profit
  - NRCS
  - Conservation Districts

The Ohio No-Till Council
Ohio Federation of Soil and Water Conservation Districts
Michigan Conservation Districts
Meet the Team - CTIC

Chad Watts – Project Director - CTIC
Meet the Team – Michigan State University

Christina Curell, MSUE – Lake Michigan

Paul Gross, MSUE – Lake Huron
Meet the Team – The Ohio State University

Florian Chirra – OSUE – Lake Erie
Land Use in the Great Lakes

**LAND USE, FISHERIES & EROSION**

**LAND USE**
- Intensive General Farming
- Low-intensity Farming/Pasture
- Coniferous Forest
- Mixed-wood Forest
- Deciduous Forest
- Urban Areas

**COMMERCIAL FISHERIES**

**SHORELINE EROSION**
- Minimal
- Moderate
- Severe

**Scale:** 1:6,000,000

**NOTE:**
1. Each bar represents the average catch over a five-year period.
2. The species shown for each lake are those which have been consistently important since 1950.
3. The data are not corrected for trends or fluctuations in catches.

**Legend:**
- **U.S. catch**
- **Species of fish caught**
- **Canadian catch**

**Tones**

- Lake Erie
- Lake Ontario
- Lake Superior
- Lake Huron
- Lake Michigan
GLCCI Priority Watershed Areas

Legend
- Cities
- GLCCI_Watersheds
- <all other values>
- LAKEBA SIN
  - Erie
  - Huron
  - Michigan
  - Great_Lakes_Streams
  - lakes

Map showing prioritized watershed areas in the Great Lakes region, with cities and rivers marked.
What is GLCCI?

• Funded by the US EPA - Great Lakes Restoration Initiative (GLRI) in 2010

• Goal was to provide:
  • Technical Support
  • Educational Support
  • Social Support

• Objectives:
  • Work with farmers to:
    • Plant 15,000 acres of cover crops
    • Conduct 18 educational meetings to help farmers use cover crops and conservation tillage systems on their farms
Technical Support

• Providing expert one-on-one assistance to farmers to help them to successfully plant cover crops as part of a conservation system on their farm
Technical Support

• Is about getting cover crops incorporated into the production systems.
• Starts with science based assessment of farmers needs and opportunities
• Developing the plans for the best options for using cover crops to address the farmers resource concerns: erosion, compaction, N source, N scavenger, soil builder, etc.
Choosing a Cover Crop

What are your objectives?
What is your cropping system?
What is your tillage system?
What is your climate?
What are your soil types?
What are your soil characteristics?
Technical Support

• Working with farmers to connect the dots
• An ongoing process of assessment, recommended practices, implementation, evaluation and reassessment
• Innovation, testing new systems and practices to meet the farmers needs and protecting the waters of the Great Lakes
Educational Support

- Providing educational opportunities to help farmers better understand how to incorporate cover crops on their farms as part of a conservation farming system.
Workshops

- Benefits of Cover Crops
- Choosing Cover Crops
- Economics of Cover Crops
Field Days

• Cover Crop Species
• Different Seeding Methods
• Cover Crop Benefits to the Environment
Demonstrations

- Cover Crops impact to soil health
- Cover Crops impact to production
- Cover Crops impact to the environment
Social Support

• Aimed at helping producers learn from and interact with one another about cover crops and conservation farming systems
• Promoting a culture of collaboration and learning from one another.
2013 National No-Tillage Conference

- 20 farmers from the GLCCI project area participated with GLCCI to plant cover crops on their farms attended the 2013 National No-Tillage Conference in Indianapolis.
Agricultural Retailer Meeting

- Working with Ag retailers in the Western Lake Erie Basin (WLEB) on how they can connect with conservationists to promote cover crops to farmers
Producer Focus Group

- Sharing “lessons learned” through GLCCI
- Relating stories of how each started using cover crops
- Sharing ideas and strategies on how to promote cover crops to other farmers
- Farmers teaching conservationists, helping shape programs
Conservation In Action Tour 2013

- Producers were given opportunities to attend CTIC’s national conservation tour that highlights conservation agriculture
- The 2013 tour was held in Livingston County, IL around CTIC’s Indian Creek watershed project
Connecting Farmers and Experts

- Cover Crop Listserves
- Publications
- Web-based decision tools
- Informational websites
- Presentations by Experts
What GLCCI Accomplished

- Planted 36,972 Acres of cover crops

Cumulative Cover Crop Acres Planted

- 6,217 acres in 2010
- 10,486 acres in 2011
- 27,454 acres in 2012
- 36,972 acres in 2013
## Total Nutrient Load Reduction

<table>
<thead>
<tr>
<th>Year</th>
<th>Cover Crops Planted</th>
<th>Annual Nitrogen Reduction</th>
<th>Annual Phosphorous Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acres Planted</td>
<td>Pounds per Year</td>
<td>Pounds per Year</td>
</tr>
<tr>
<td>2010</td>
<td>6,217</td>
<td>14,319</td>
<td>4,809</td>
</tr>
<tr>
<td>2011</td>
<td>4,269</td>
<td>7,841</td>
<td>2,527</td>
</tr>
<tr>
<td>2012</td>
<td>16,968</td>
<td>30,928</td>
<td>10,149</td>
</tr>
<tr>
<td>2013</td>
<td>9,518</td>
<td>19,865</td>
<td>6,642</td>
</tr>
<tr>
<td>Total</td>
<td>36,972</td>
<td>72,951</td>
<td>24,126</td>
</tr>
</tbody>
</table>
Load Reductions Achieved

Annual Load Reductions (Lbs / Year)

<table>
<thead>
<tr>
<th></th>
<th>BOD Reduction</th>
<th>P Reduction</th>
<th>N Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>2,847.76</td>
<td>6,641.94</td>
<td>19,864.50</td>
</tr>
<tr>
<td>2012</td>
<td>3,188.18</td>
<td>10,149.05</td>
<td>30,927.52</td>
</tr>
<tr>
<td>2011</td>
<td>743.37</td>
<td>2,526.55</td>
<td>7,840.74</td>
</tr>
<tr>
<td>2010</td>
<td>2,464.66</td>
<td>4,808.65</td>
<td>14,318.70</td>
</tr>
</tbody>
</table>
Sediment Load Reductions

Cumulative Sediment Reduction (tons / year)

<table>
<thead>
<tr>
<th>Year</th>
<th>Sediment Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>385.10</td>
</tr>
<tr>
<td>2011</td>
<td>501.26</td>
</tr>
<tr>
<td>2012</td>
<td>999.41</td>
</tr>
<tr>
<td>2013</td>
<td>1,444.37</td>
</tr>
</tbody>
</table>
Meetings and Presentations

- GLCCI Participated in 81 cover crop educational meetings and field days
  - 3,401 people were impacted at these meetings
- Groups / individuals impacted:
  - Farmers
  - Agricultural retailers
  - Watershed group members
  - Conservation agency staff members
- Partners:
  - Soil and Water Conservation Districts (SWCDs)
  - Watershed groups
  - Conservation Agencies (Local, State and Federal)
What is the potential for cover crops?

<table>
<thead>
<tr>
<th>Acres of Cover Crops Planted in 2012</th>
<th>Cropland Acres in 2012</th>
<th>% of US Cropland where cover crops are used</th>
</tr>
</thead>
<tbody>
<tr>
<td>56,799,829</td>
<td>2,105,821,528</td>
<td>2.7 %</td>
</tr>
</tbody>
</table>

We have a long way to go!
% of Cropland under cover by State

% of Cropland in Cover Crops by State

Legend
- US Rivers
- US Lakes
- U.S. States
- CoversAmt
  - 0.00 - 2.00
  - 2.01 - 5.00
  - 5.01 - 9.00
  - 9.01 - 14.00
  - 14.01 - 24.00

Date: 6/16/2014
Time: 8:24:42 PM
Keys to Success

• Partnerships
  • With other agencies to do meetings and meet with farmers
  • GLCCI partners brought the right mix of expertise to the table
• Direct communication and technical assistance to farmers
• Knowledgeable technical resources
• Momentum behind cover crops and soil health management systems because of soil health focus
• Real issues addressed and positive outcomes achieved
• Really good, committed farmer cooperators who are champions of cover crops and conservation tillage systems and are willing to share their experiences