

Understanding Nutrient & Sediment Loss at Soaring Eagle Dairy - 1


## History of Manitowoc County Discovery Farms Project Area

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DISCOVERY FARM S


### How did it begin?



- Manitowoc County is a leader in terms of dairy expansion or modernization.
- The increase in cows/farm was accompanied with an increase in requests for limits on animal expansions.

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### How did it begin?



- Growth of the dairy industry produced some turmoil and controversy.
- A small group of local people decided to investigate the potential of having a Discovery Farms Project in Manitowoc County.

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### How did it begin?



- Effort began in the fall of 2003
- Manitowoc County committed to bringing together a diverse group of stakeholders, raise some funding and participate in an outreach and education program.

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### How did it begin?



- Main factor for selecting this as the first Discovery Farms Project Area was:
  - Interest and commitment to finding out the cause of severe algae blooms in Lake Michigan near the village of Cleveland, Wisconsin

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### Algae Blooms



- Several factors play a role in algae development
  - Water clarity (light penetration)
  - Increased nearshore phosphorus concentrations
  - Water temperatures

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## Water clarity

- “The primary factor responsible for the recent increase in *Cladophora* abundance appears to be increased water clarity, resulting from zebra and quagga mussel filtration”.

Harvey Bootsma  
Great Lakes WATER Institute  
University of Wisconsin-Milwaukee



## Water phosphorus

- “A secondary factor may be a moderate increase in nearshore dissolved phosphorus concentrations in the past decade. Mussels are the major source of dissolved phosphorus”.

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## Water phosphorus

- We may need to lower the nearshore target phosphorus concentration to compensate for increased light availability.
- Reducing P concentrations in Lake Michigan is a long-term process, due to large stores of P in watershed soils, and the lake’s long P residence time.



## Water phosphorus

- Agriculture plays an important role in the potential to deliver phosphorus to Lake Michigan.
  - The goal of this project was to better understand these losses.



## Project Goals

- How much phosphorus is entering Lake Michigan from agricultural fields receiving manure?
- What crops or farming systems contribute the highest losses of phosphorus?



## Project Goals

- What phosphorus form (particulate or dissolved) is leaving the fields?
- What management practices reduce these losses to acceptable levels?
- What are acceptable levels of phosphorus loss from agriculture?





### Project Coordination

- First formal meeting of the group was held in late December 2003.
- Elected a Manitowoc County Discovery Farms Advisory Committee (19 people).




### Project Coordination

- Unique collaboration of agricultural, conservation and environmental interests
- Notable for its unique partnership among agricultural, governmental, conservation and environmental interests




### Project Coordination

- UW-Extension, along with the U.S. Geological Survey (USGS) work with privately-owned farms to find the most economical and effective ways of complying with environmental regulations and protecting the environment while maintaining farm profitability.




### Mission Statement

- ***The Manitowoc County UW Discovery Farms Project Area will gather on-farm research data, which may be used to determine the environmental and economic effects of currently available Best Management Practices. This data will be used to evaluate and improve Best Management Practices in order to achieve a healthy and sustainable agriculture in a healthy and sustainable environment.***




### Mission Statement


- ***Research results will be used to educate and improve communication among the agricultural community, consumers, researchers and policy-makers. It is our intent that based on this research; recommendations will be developed to improve Best Management Practices and regulations.***




### Program Goals



- Collect and utilize research data and information to educate a wide variety of audiences.
- This was and continues to be done through dozens of press releases, media events, educational workshops, field days and newsletters.






### Program Goals

- Practices identified and developed through this program are likely to be applicable on farms that have similar farming systems and/or similar physiographic settings and soil types.


### Program Goals

- Lessons learned will not only help farmers improve their already strong environmental stewardship but will also aid in the protection of both ground and surface water.
- Benefits all citizens of the county






### Topics covered

- Nutrient management plan development
- Agricultural non-point pollution
- Goals and operation of the Discovery Farms Project



### Topics covered

- Collection of water quality data
- Types of farming systems in Wisconsin
- Understanding a “typical” storm


### Topics covered

- Lessons learned from the data in northeastern Wisconsin
- Impact of tile lines on surface water quality
- Best Management Practices that decrease surface and groundwater pollution

### Topics covered



- Methods to reduce phosphorus levels in dairy cattle diets
- Groundwater improvement action steps
- Successful manure handling systems







### Topics covered

- Manure spill response demonstration
- Crop consultant, custom manure hauler and dairy nutritionist discussion groups



### Funding

- More than \$52,000 was raised through a wide variety of fundraising campaigns
- Monitoring equipment costs about \$30,000/site
  - Discovery Farms had four sites
- Operating a site costs about \$45,000 annually



### Information Available

- **Briefs / Articles** - two page articles summarizing the information gathered through the study. For this project there are six briefs including:
  - History of the Manitowoc County Discovery Farms Project Area
  - Farm, Site and Study Design
  - Equipment, Procedures and Sampling



### Information Available

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  - The Water Budget at SED – Understanding Surface Water Runoff
  - Sediment and Nutrient Losses
  - Impact of Discovery Farms Research on: Agricultural Management at Soaring Eagle Dairy, Public Perception, and Future Discovery Farms Research Site Criteria


### Information Available

- **Factsheets** – four page factsheets that provide much of the information and data gathered. These factsheets include the following topics:
  - History of the Manitowoc County Discovery Farms Project Area
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### Information Available

- **Presentations and slides** –presentations are organized in the following manner on our website:
  - History of the Manitowoc County Discovery Farms Project Area
  - Farm, Site and Study Design
  - Equipment, Procedures and Sampling
  - The Water Budget at SED – Understanding Surface Water Runoff
  - Sediment and Nutrient Losses
  - Impact of Discovery Farms Research on: Agricultural Management at Soaring Eagle Dairy, Public Perception, and Future Discovery Farms Research Site Criteria



### For Additional Information

<http://www.uwdiscoveryfarms.org>

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