

Factors influencing nutrient management behaviour in the Gully Creek watershed.

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Outline

- Previous phase I research – Erin Bishop
- Background
- BMP adoption
- Nutrient management
- Research area
- Research focus
- Goal

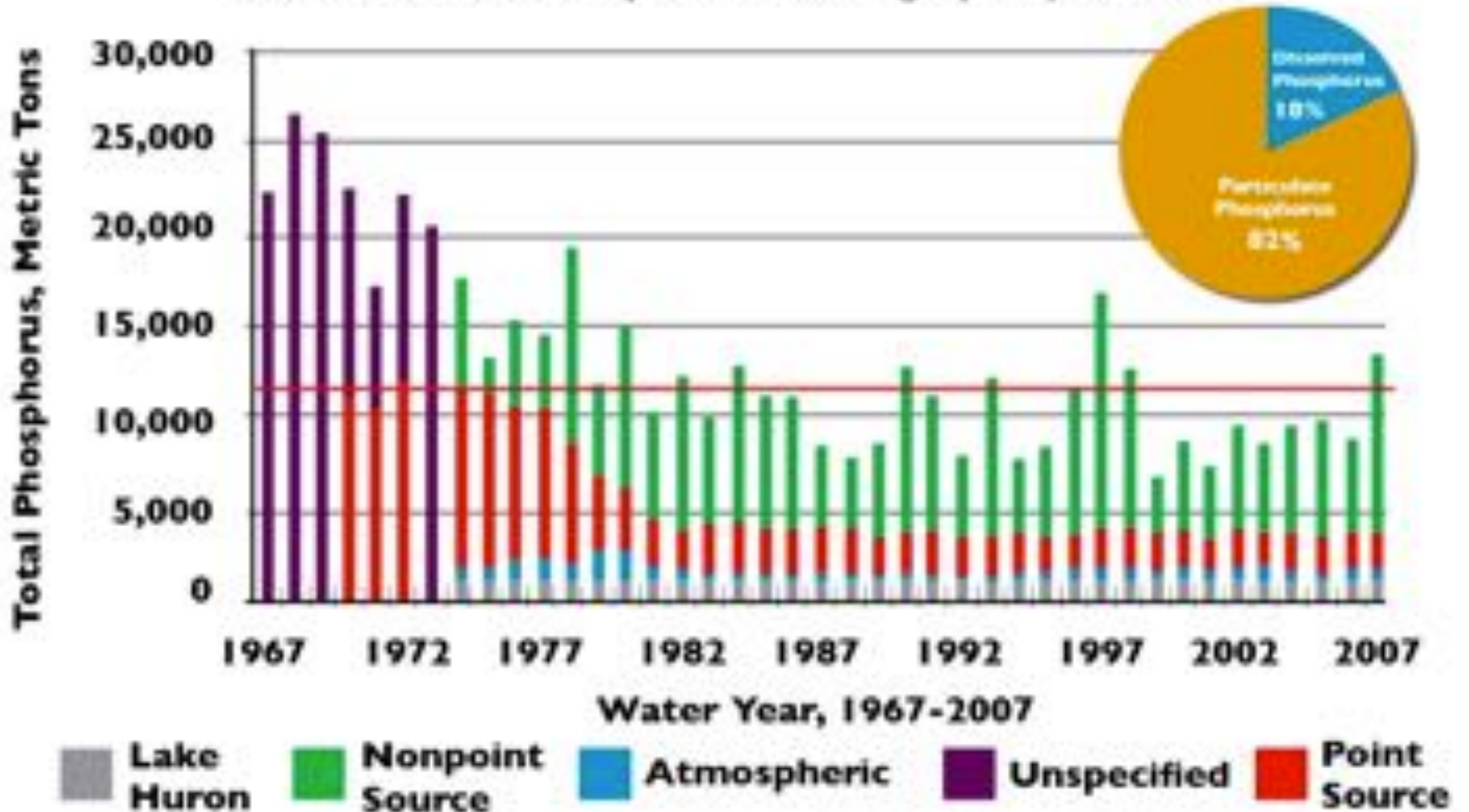
M.Sc Erin Bishop

- Thesis examined the cost-effectiveness of farming systems in PEI to reduce nitrate leaching
- Changing potato variety is the most cost-effective but other approaches (i.e. nutrient management, tillage, crop rotations) increase marginal abatement costs significantly
- Currently working as an economist for the Economic Analysis Directorate at Environment Canada analyzing and writing regulatory impact analysis impact statements for a variety of environmental regulations

Background

- Historic focus on water quality linked to agriculture – GLWQA early 1970s
- Increasing concentrations of phosphorus in Lake Erie
- Recent algae blooms in Lake Erie indicate that current agricultural policy may be ineffective
- Complex policy framework – many stakeholder and institutions involved

Lake Erie Total Phosphorus Loading By Major Source



Data from Rockwell & Dolan, Don Scavia, GESI, USFH

Adapted from National Geographic, 2013

NASA 2011



NASA 2012



NASA 2013

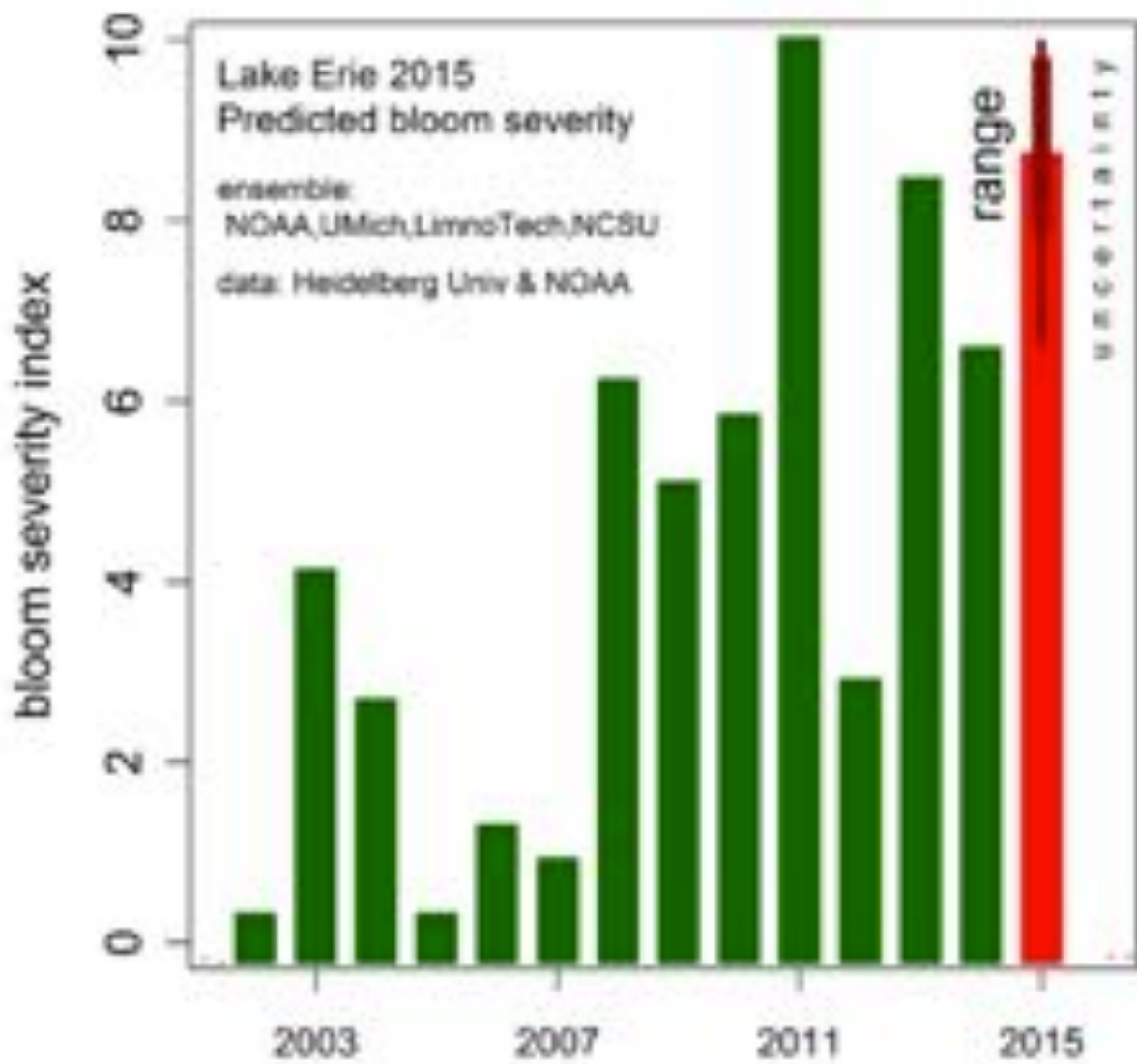


NASA 2015



NASA 2015





(Adapted from NOAA, 2015)

Background

- Beneficial Management Practices (BMPs) have been shown to be effective in decreasing pollution levels from non-point sources
- BMPs include
 - Conservation tillage
 - Nutrient management
 - Cover cropping
 - Water and sediment control basin
 - Forage conservation

Adoption of BMP Policy

- Large scale, long term focus : Great Lakes Water Quality Agreement, Growing Forward 2 (Great Lakes Agricultural Stewardship Initiative)
- Issues with policy
 - NPS
 - Cost
 - Time lag
 - Uncertainty
 - Randomness

Nutrient Management

- Ontario Nutrient Management Act, 2002

“The management, land application and storage of agricultural source materials (ASM) and non-agricultural source materials (NASM) that are applied to agricultural lands as a nutrient, are regulated under the Nutrient Management Act and O. Reg. 267.”

- NMAN Software – recommended rates

Gully Creek Watershed

- Feeds in to the South East coast of Lake Huron
- Full data set of NMAN recommendations and actual nutrient applications 2007-2013
- Watershed 14.3 Km²
- 70% of land agricultural– Soybean/Wheat/Corn
- Rolling topography ~6% average slope
- 19 farmers
- 143 fields

(Oginsky & Yang, 2014)

Research Focus

1. What factors are influencing behaviour to apply nutrients, specifically phosphorus, above or below the provided NMAN rates?
 - Beginning by examining economic and non-economic (technical, institutional and social) factors, farm characteristics and farm operations
 - Land owner vs. operator
 - Enforcement
2. Evaluate the effectiveness of the NMA

Deliverable/Goal

- How can the NMA be used more effectively to increase water quality in the Great Lakes region?
- Understand economic and non-economic factors affecting farmers behaviour towards nutrient management.

Sources

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Thank you.

Comments and Questions?