Exploring the Return on Investment Case for Drinking Water Protection in the Upper Mississippi River Basin

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PROJECT INTRODUCTION

From 2008-2012, Minnesota ranked first in the nation for wetland-to-cropland conversion, and second for forest-tocropland conversion¹. This land use change may be contributing to increases in nutrient and sediment pollution in the Upper Mississippi River Basin.

Over one million Minnesotans receive drinking water from the Mississippi River². As such, water providers have a financial interest in maintaining or improving the basin's water quality in order to manage treatment costs now and into the future.



Research Questions

- Figure 1 Upper Mississippi River Basin and dominant land use classes in Minnesota.
- What is the value of source water protection to drinking water utilities under changing land use?
- Could utilities see a return on investment (ROI) by engaging in watershed conservation efforts?

METHODS

We employed a multi-tiered approach to explore potential economic benefits of source water protection under dynamic land use conditions. Specifically, we outline four key strategies.

1. Talk to utilities to identify needs and obtain data.

We spoke with the cities of Minneapolis, St.



Cloud, and Hastings to understand their treatment processes and obtain water quality and cost data.

3. Link modeled water quality to treatment costs and determine **ROI potential.**



We used the outputs of our water quality model to quantify changes in treatment costs relative to costs of conservation.

2. Model water quality under future land use scenarios.

We used a cloudbased model to predict water quality under moderate and aggressive agricultural expansion in the basin.

4. Develop a set of enabling conditions.

We took what we learned in the Upper Mississippi River Basin, and information from case studies, to better understand where ROI may be attainable.















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An analysis of Minneapolis treatment costs showed a 1% reduction in phosphorus would save around \$340 annually.



Based on other case studies, the strongest ROI case for watershed-level drinking water protection occurs in smaller basins with pollutant levels near a regulatory threshold.

More information on this project, including a digital copy of this poster and a final report, is available at the MNHeadwaters Group Project website https://mnheadwaters.weebly.com. To contact the MNHeadwaters team, please e-mail **gp-mnheadwaters@bren.ucsb.edu**.



³ U.S. Environmental Protection Agency (2016). Hydrologic and Water Quality System (HAWQS)

FURTHER INFORMATION

Model. Beta version. June 2016.