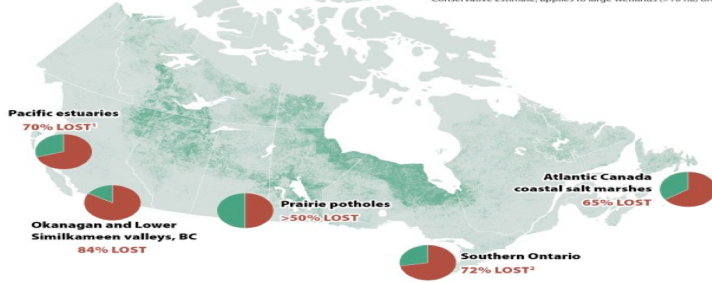


The Costs of Wetland Conservation Vary Across the Agricultural Landscape

Introduction

Historical Wetland Loss in Canada Since Settlement.¹

Remaining
Lost
Lost or degraded
Conservative estimate; applies to large wetlands (>10 ha) only



- ❖ Agricultural development is a major driver of wetland loss in Canada.²
- ❖ Society loses the benefits of wetland ecosystem services from wetland loss.³

Problem Statement

- ❖ Studies on wetland conservation costs have not accounted for heterogeneity in private economic benefits of wetlands (PEB) converted to cropland.⁴
- ❖ The targeting of Wetland conservation policy by accounting for heterogeneity in PEB could be an effective/efficient conservation strategy.⁵

Research Objectives

- ❖ To estimate the heterogeneity in PEB in sub-basin 14, Vermillion River Basin, Alberta.
- ❖ To assess three wetland conservation policy targeting scenarios based on wetland conservation cost and environmental benefits of wetlands.

Study Area

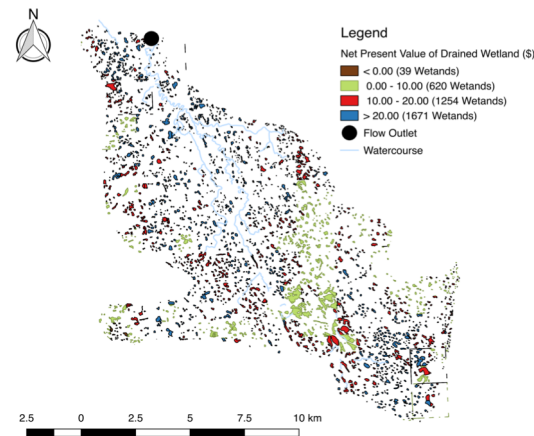
- ❖ The study area is a sub-basin which covers an area of 156.91 km² or 242 quarter sections in the Vermillion River Basin in Minburn County, Alberta, Canada.

Method

- ❖ PEB is the discounted annual crop production returns of drained wetlands
- ❖ less the cost of surface drainage over a 20-year period at an interest rate of 7%.
- ❖ Crop production followed the canola-wheat rotation.
- ❖ We assumed 80% probability of harvesting after wetland drainage.
- ❖ Distance of wetland to watercourse positively affected drainage cost.

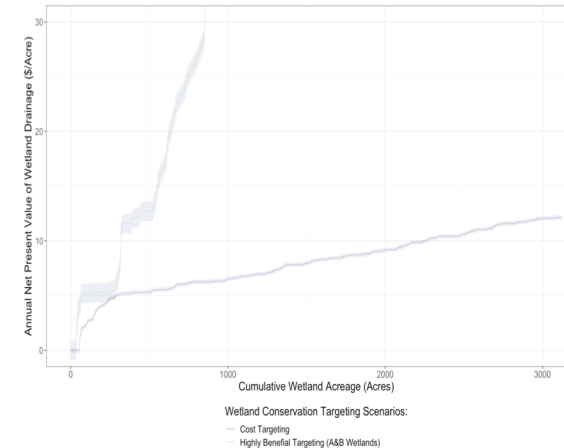
Results

Figure 1. Spatial Heterogeneity in Wetland costs, Vermillion River Basin, Alberta.



- ❖ The supply curve of a wetland ranks wetland costs from lowest to highest and can represent required compensation payments.
- ❖ There is negative correlation between the net present value of drained wetlands and the value of its ecosystem services.

Figure 2. Supply curve of wetland costs by targeting scenario, Vermillion River Basin, Alberta.



Conclusion

- ❖ Wetland conservation policy targeting could be an effective method of conserving wetlands, given wetland conservation budget, in the study area.

References

1. Kraus D. (2019). A world without wetlands. <http://www.natureconservancy.ca/en/blog/a-world-without-wetlands.html>. Accessed on 10/01/2010.
2. De Laporte, A. (2014). Effects of crop prices, nuisance costs, and wetland regulation on Saskatchewan NAWMP implementation goals. *Canadian Journal Canadienne d'agroeconomie*, 62(1), 47- 67.
3. Dias, V., & Belcher, K. (2015). Value and provision of ecosystem services from prairie wetlands: A choice experiment approach. *Ecosystem Services*, 15, 35-44.
4. Cortus, B. (2005). The Economics of Wetland Drainage: A Case Study in Canada's Prairie Pothole Region. M. Sc. Thesis, University of Alberta, Canada.
5. Wu, J., Zilberman, D., & Babcock, B. A. (2001). Environmental and distributional impacts of conservation targeting strategies. *Journal of Environmental Economics and Management*, 41(3), 333-350.

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