

The Preferential Loss of Small Geographically Isolated Wetlands on Prairie Landscapes

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Abstract

Reliable estimates of wetland loss require improved wetland inventories and effective monitoring programs. To improve upon current wetland inventories, a novel method for mapping wetlands using an automated object-based approach was developed for a regional watershed located in central Alberta. This approach used digital terrain objects derived from Light Detection and Ranging (LiDAR) data for which 130,157 wetlands were identified. Using this LiDAR derived wetland inventory, wetland loss estimates (% number and % area) were obtained by applying a wetland area vs. frequency function to the wetland inventory for the watershed. Using this power law, it was found that historically, there has been a 69.3% number loss and a 9.96% area loss when we accounted for mixed pixels. When we removed any wetland less than the estimated minimum mapping unit (0.02 ha), a 16.17% number and a 2.56% area loss within the watershed was estimated. This wetland loss is a concern as it is concomitant with a loss of ecosystem services.

Keywords: wetland, object-based techniques, area, frequency, Alberta

Geographic Location: Beaverhill watershed, Alberta, Canada

How does your project link to Canadian aquatic ecosystem services?

My project links to Canadian aquatic ecosystem services by mapping wetlands and estimating wetland loss rates which will help policy makers and managers to better develop strategies to mitigate wetland loss and conserve the important aquatic ecosystem services wetlands provide.