Wetland classification and hydric soil characteristics in Saskatchewan's agricultural regions

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THE PROBLEM

Wetlands are frequently cultivated in the Canadian Prairies, especially under drought conditions which are becoming more frequent and variable with climate change (Johnson et al., 2010).

The Stewart & Kantrud (1971) Wetland Classification System (S&K) which depends primarily on vegetation, is difficult to apply to wetlands that are altered by agricultural practices.

In other wetland classification systems, hydric (saturated) soil indicators are used to support wetland delineation but no previous research has examined the relationships between hydric soil indicators, soil classification, and wetland classification in Canada (Government of Alberta, 2015; USDA, 2025).

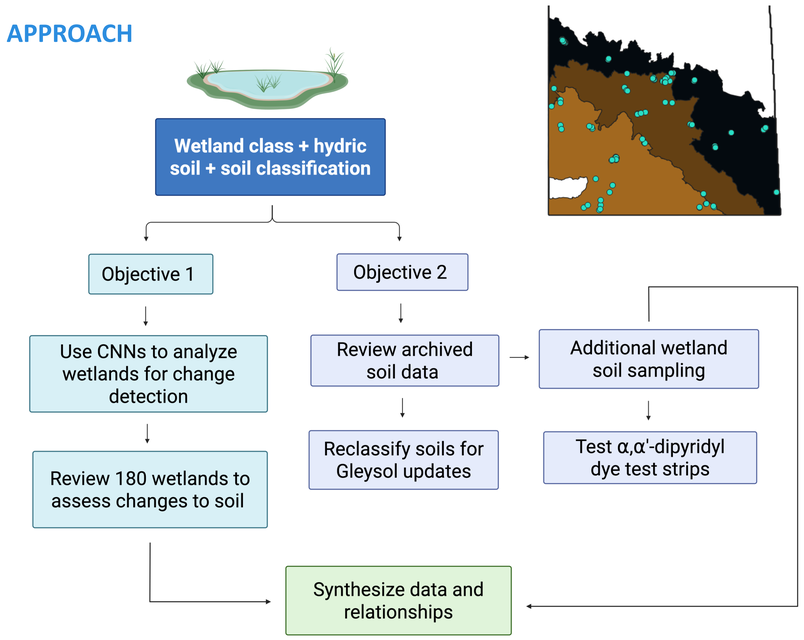
Recognizing the role of these indicators is essential for bridging the gap between agricultural management and effective wetland conservation.

OBJECTIVES

1) Utilize high-resolution hydroperiod PlanetScope imagery to characterize flood pattern, water permanence, and inundation frequency using convolutional neural networks (CNNs) to facilitate efficient change detection.

2) Evaluate the relationship between wetland classification (S&K), hydric soil indicators, and soil classification (CSSC) within Saskatchewan's cultivated wetlands. Determine how hydroperiod (wetland class), soil zone, salinity, and land management history may influence these relationships.

APPROACH



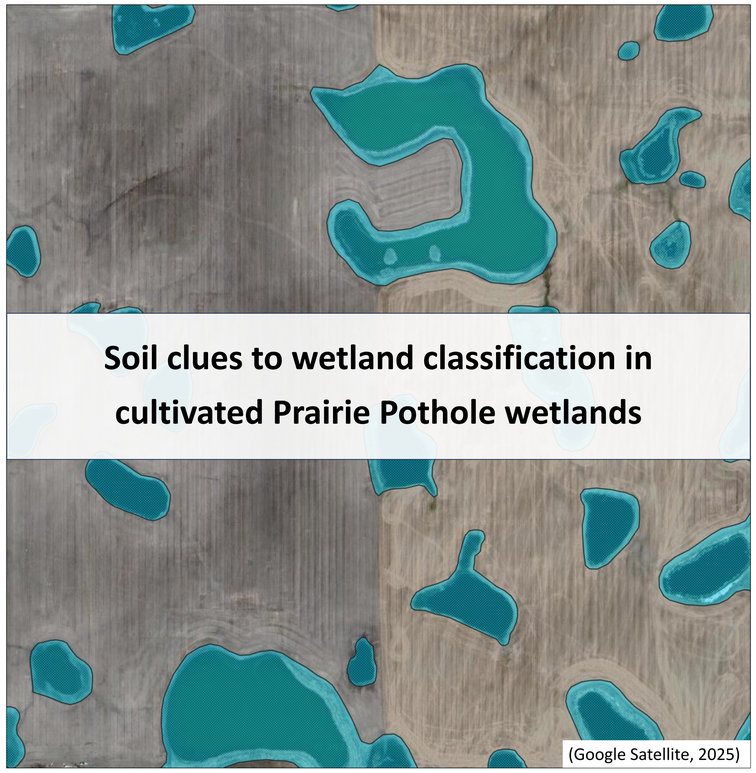



Photo: Brittany Claeys


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CONTACT INFO

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DELIVERABLES

- ❖ Evaluation of updates to the Gleysolic soil order
- ❖ Validation of α,α'-dipyridyl dye test strips
- ❖ Integration of soil indicators to support wetland classification
- ❖ Application of remote sensing to assess changes to Prairie Pothole wetlands


Photo: Brittany Claeys


Humic Gleysols
Langham, SK
Photo: Chantel Chizen

SIGNIFICANCE

The relationships between hydric soil indicators, soil classification, and wetland classification have not been investigated for Prairie Pothole wetlands. This research aligns with federal wetland conservation policy by addressing knowledge gaps in wetland identification, classification, and management (Government of Canada, 2024). The findings will strengthen evidence-based wetland management and policy, driving sustainable land-use decisions and enabling the successful implementation of guidelines such as those from Saskatchewan's Agricultural Water Stewardship Policy.

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