

# Oxford County, Nova Scotia Land Cover Classification

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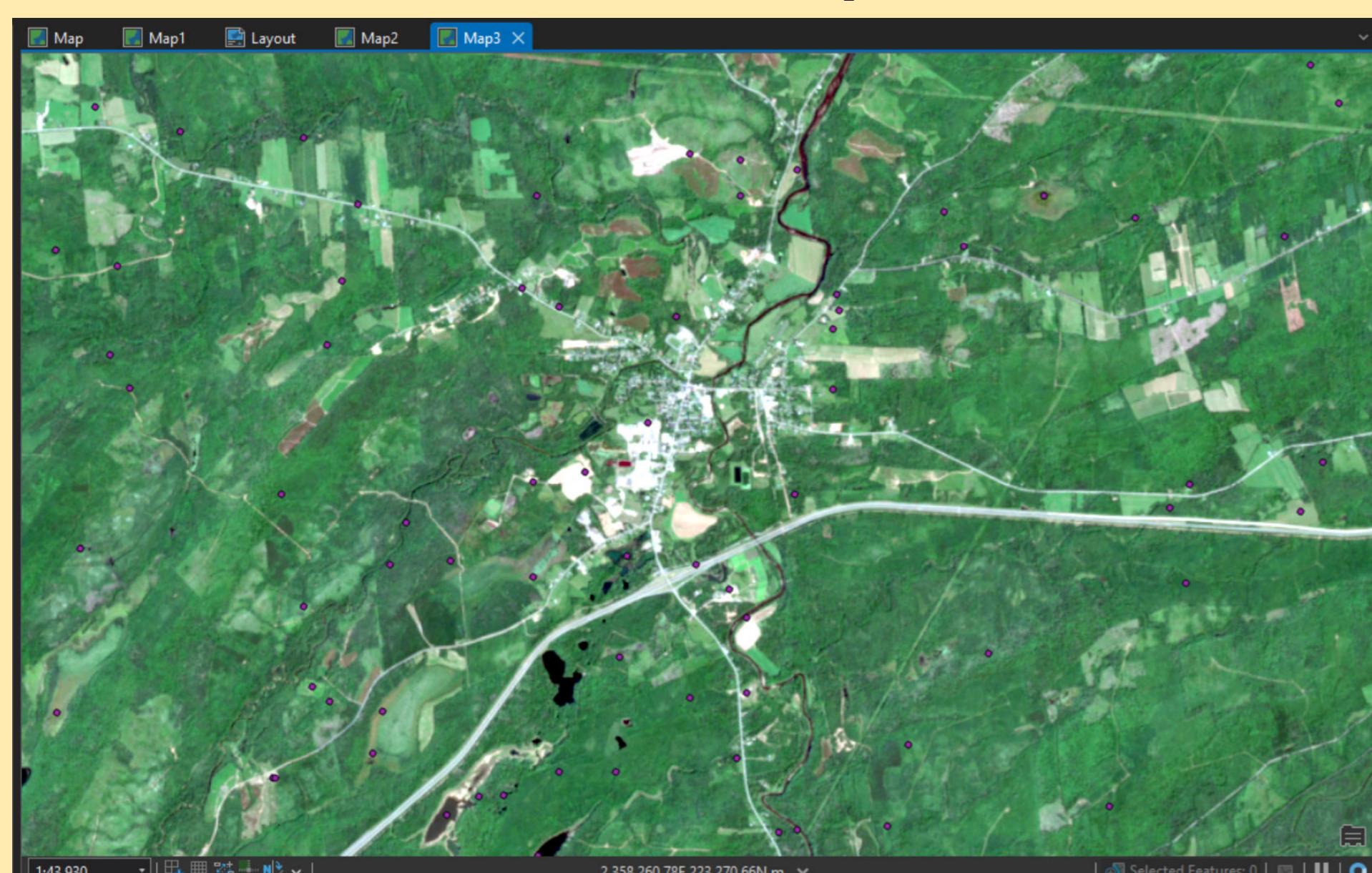
## Overview

Land cover classification was performed for Oxford, Nova Scotia using Sentinel-2 imagery and object-based image analysis (OBIA). The study aimed to classify major land cover types like forest, cropland, urban areas, wetlands and waterways using supervised classification methods.

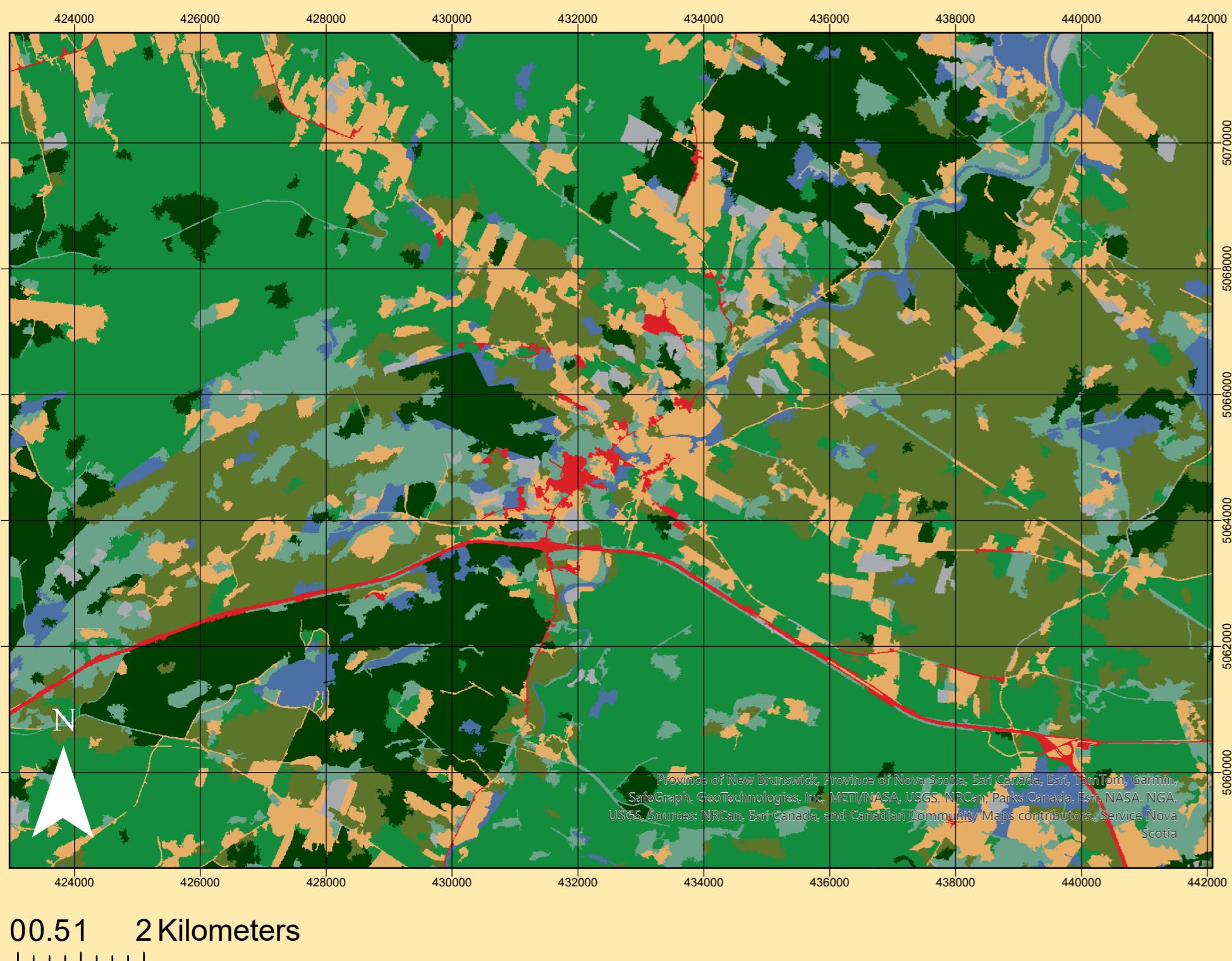
## Area of Interest



## 240 Stratified Random Accuracy Assessment Points



## OBIA Results



OBIA Legend	
EnrieSala_S2_RGBN_OBIA	
Class_name	
Temperate coniferous forest	
Broadleaf deciduous forest	
Mixed forest	
Wetland	
Cropland	
Barren Lands	
Urban	
Water	

ClassValue C_1	C_5	C_6	C_14	C_15	C_16	C_17	U_Accuracy	
C_1	33	13	42	1	1	2	0	0.358696
C_5	42	52	52	2	3	0	4	0.327044
C_6	21	21	44	0	3	2	2	0.463158
C_8	0	0	0	0	0	0	0	0
C_10	0	0	0	0	0	0	0	0
C_14	19	9	12	3	7	0	3	0.043478
C_15	5	7	8	2	33	4	5	0.434211
C_16	1	0	2	0	0	0	0	0
C_17	0	0	0	0	0	2	3	0.6
C_18	13	2	6	2	0	0	0	0.137931
Total	134	104	166	10	47	10	17	0
P_Accuracy	0.246269	0.5	0.26506	0.3	0.702128	0	0.176471	0.325142

## Introduction

Oxford, Nova Scotia requires accurate land cover mapping to support environmental monitoring and urban planning. This study utilized Sentinel-2 imagery with 10m resolution to classify land cover types using object-based image analysis. The classification focused on distinguishing between temperate forest types, cropland, wetlands, water, barren and urban areas.

## Methods

### Data Acquisition and Preprocessing:

- Sentinel-2 RGBN imagery (10m resolution)
- Study area defined as Oxford County
- Reference data collected using stratified random sampling

Using object-based image analysis with optimized segmentation parameters (Spectral: 15.53, Spatial: 13). A Support Vector Machine classifier categorized ten land cover classes using training samples, with accuracy assessed through 200+ stratified random points across Oxford, Nova Scotia.

## Results

- Poor discrimination between forest types
- Low accuracy for urban areas
- Misclassification for wetland areas and water

## Discussion

The classification results indicate significant challenges in distinguishing from similar land cover types, i.e. forest classes and water/wetland classes.

The low Kappa coefficient (0.180) suggests limited agreement between classified and reference data even though the classification process was repeated multiple times in order to improve the final classification results.

Improvements could be achieved through:

- Refined training sample selection
- Adjusted segmentation parameters
- Possible merging of similar classes
- Additional spectral indices for better class separation

The results highlight the complexity of land cover classification in areas with mixed forest types, water/wetland areas and urban-rural transitions.

Disclaimer: This map is produced by Enrie Sala as a portion of the requirements of the GIS Certificate program at the Centre of Geographic Sciences, NSCC, Lawrencetown, Nova Scotia.



This project is unedited, unverified, and intended for education purposes only.

Source:  
ESRI, Copernicus, Google Earth Pro, COGS, NSCC, James Norton, Enrie Sala