Methodology

1. Download Wetland Inventories from US (USNWI) and CAN (CNWI)

Canada - https://data-donnees.az.ec.gc.ca/data/sites/habitat/canadian-national-wetlands-inventory/?lang=en – Downloaded 10 June 2025

US - https://www.fws.gov/program/national-wetlands-inventory/data-download

Downloaded 29 May 2025

*Downloads are made by Provinces/ States

2. Download NALCMS Land Cover – 2020

https://www.cec.org/north-american-environmental-atlas/land-cover-30m-2020/

3. Merge states/provinces vectors

Codes: can_merge.R and us_merge.R

   a. Check and fix geometries when needed;
   b. Reproject to same CRS as NALCMS;
   c. Merge vectors into two main vectors for CAN and US.

4. Rasterize Wetland Invetories (WI) for US and CAN

Codes: rasterize_can.R and rasterize_us.R

*to facilitate visual exploration in QGIS

5. Reclassify vectors – Details in Table 1

Codes: can_reclassify.R and us_reclassify.R

6. Merge reclassified US and CAN Wis

Codes: merge_WIs.R

   a. Merge vectors;
   b. Check and fix geometries of merged layer.

7. Rasterize WI reclassified vector

Codes: rasterize_Wis.R

   a. Rasterize Wis
   b. Check CRS of raster – need to be the same as NALCMS

8. Update NALCMS Land Cover with Wis classes – Details in Table 2

Codes: update_raster.R

9. Plot NALCMS_WI raster

Codes: plot_map.R – Color palette in Table 3

Table 1: Crosswalk between USNWI and CNWI for Reclassification

US NWI			Reclassification to CNWI	Codes
Marine (M)	Sub-tidal (1)	Rock Bottom (RB)	Open-shallow waters	M1RB
		Reef (RF)	not wetland	M1RF
		Unconsolidated Bottom (UB)	Water	M1UB
		Aquatic Bed (AB)	Open-shallow waters	M1AB
	Intertidal (2)	Rocky Shore (RS)	Open-shallow waters	M2RS
		Reef (RF)	not wetland	M2RF
		Unconsolidated Shore (US)	Open-shallow waters	M2US
		Aquatic Bed (AB)	Open-shallow waters	M2AB
Estuarine (E)	Sub-tidal (1)	Rock Bottom (RB)	Open-shallow waters	E1RB
		Reef (RF)	not wetland	E1RF
		Unconsolidated Bottom (UB)	Water	E1UB
		Aquatic Bed (AB)	Open-shallow waters	E1AB
	Intertidal (2)	Rocky Shore (RS)	Open-shallow waters	E2RS
		Reef (RF)	not wetland	E2RF
		Unconsolidated Shore (US)	Open-shallow waters	E2US
		Aquatic Bed (AB)	Open-shallow waters	E2AB
		Streambed (SB)	Open-shallow waters	E2SB
		Emergent Wetland (EM)	Marsh	E2EM
		Scrub-Shrub (SS)	Swamp	E2SS
		Forested Wetland (FO)	Swamp	E2FO
Riverine (R)	Tidal (1)	Rock Bottom (RB)	Open-shallow waters	R1RB
		Unconsolidated Bottom (UB)	Water	R1UB
		Aquatic Bed (AB)	Open-shallow waters	R1AB
		Streambed (SB)	Open-shallow waters	R1SB
		Rocky Shore (RS)	Open-shallow waters	R1RS
		Unconsolidated Shore (US)	Open-shallow waters	R1US
		Emergent Wetland (EM)	Marsh	R1EM
	Lower Perennial (2)	Unconsolidated Bottom (UB)	Water	R2UB
		Aquatic Bed (AB)	Open-shallow waters	R2AB
		Rocky Shore (RS)	Open-shallow waters	R2RS
		Unconsolidated Shore (US)	Open-shallow waters	R2US
		Emergent Wetland (EM)	Marsh	R2EM
	Upper Perennial (3)	Rock Bottom (RB)	Open-shallow waters	R3RB
		Unconsolidated Bottom (UB)	Water	R3UB
		Aquatic Bed (AB)	Open-shallow waters	R3AB
		Rocky Shore (RS)	Open-shallow waters	R3RS
		Unconsolidated Shore (US)	Open-shallow waters	R3US
	Intermittent (4)	Streambed (SB)	Open-shallow waters	R4
	Unknown Perennial (5)	Unconsolidated Bottom (UB)	Water	R5UB
		Unconsolidated Shore (US)	Open-shallow waters	R5US
		Rocky Shore (RS)	Open-shallow waters	R5RS
		Rock Bottom (RB)	Open-shallow waters	R5RB
		Emergent Wetland (EM)	Marsh	R5EM
Lacustrine (L)	No specification		Open-shallow waters	L
	Diked/Impounded		Marsh	Lh
	Excavated		Open-shallow waters	Lx
Lacustrine (L)	Limnetic (1)	Rock Bottom (RB)	Open-shallow waters	L1RB
		Unconsolidated Bottom (UB)	Water	L1UB
		Aquatic Bed (AB)	Open-shallow waters	L1AB
	Littoral (2)	Rock Bottom (RB)	Open-shallow waters	L2RB
		Unconsolidated Bottom (UB)	Water	L2UB
		Aquatic Bed (AB)	Open-shallow waters	L2AB
		Rocky Shore (RS)	Open-shallow waters	L2RS
		Unconsolidated Shore (US)	Open-shallow waters	L2US
		Emergent Wetland (EM)	Marsh	L2EM
Palustrine (P)		No specification	Marsh	P
		Farmed	Marsh	Pf
Palustrine (P)		organic	Peatland	P*g
		Rock Bottom (RB)	Open-shallow waters	PRB
		Unconsolidated Bottom (UB)	Open-shallow waters	PUB
		Aquatic Bed (AB)	Open-shallow waters	PAB
		Unconsolidated Shore (US)	Open-shallow waters	PUS
		Moss-Lichen Wetland (ML)	Peatland	PML
		Emergent Wetland (EM)	Marsh	PEM
		Scrub-Shrub (SS)	Swamp	PSS
			Bog	PSS3D or PSS3B
		Forested Wetland (FO)	Swamp	PFO
			Bog	PFO2D or PFO2B

Codes that exists in the data but don't have detailed specification.

Table 2: Results of Reclassification and Final Raster Values and Classes.

NALCMS with Wis			
NALCMS	**Wis**	**Final Raster**	**Classes**
0		0	NA
1		1	Temperate or sub-polar needleleaf forest
2		2	Sub-polar taiga needleleaf forest
3		3	Tropical or sub-tropical broadleaf evergreen forest
4		4	Tropical or sub-tropical broadleaf deciduous forest
5		5	Temperate or sub-polar broadleaf deciduous forest
6		6	Mixed Forest
7		7	Tropical or sub-tropical shrubland
8		8	Temperate or sub-polar shrubland
9		9	Tropical or sub-tropical grassland
10		10	Temperate or sub-polar grassland
11		11	Sub-polar or polar shrubland-lichen-moss
12		12	Sub-polar or polar grassland-lichen-moss
13		13	Sub-polar or polar barren-lichen-moss
14	14	14	Wetland (mixed or unclassified)
15		15	Cropland
16		16	Barren lands
17		17	Urban
18	18	18	Water
19		19	Snow and Ice
	20	20	Bog
	21	21	Fen
	22	22	Peatland
	23	23	Swamp
	24	24	Marsh
	25	25	Open-shallow waters

Table 3: Colour Pallete for NALCMS_Wis raster

Value	Classe	RGB
1	Temperate or sub-polar needleleaf forest	0 61 0
2	Sub-polar taiga needleleaf forest	148 156 112
3	Tropical or sub-tropical broadleaf evergreen forest	0 99 0
4	Tropical or sub-tropical broadleaf deciduous forest	30 171 5
5	Temperate or sub-polar broadleaf deciduous forest	20 140 61
6	Mixed Forest	92 117 43
7	Tropical or sub-tropical shrubland	179 158 43
8	Temperate or sub-polar shrubland	179 138 51
9	Tropical or sub-tropical grassland	232 220 94
10	Temperate or sub-polar grassland	225 207 138
11	Sub-polar or polar shrubland-lichen-moss	156 117 84
12	Sub-polar or polar grassland-lichen-moss	186 212 143
13	Sub-polar or polar barren-lichen-moss	64 138 112
14	Wetland	107 163 138
15	Cropland	230 174 102
16	Barren lands	168 171 174
17	Urban	220 33 38
18	Water	76 112 163
19	Snow and Ice	255 250 255
20	Bog	88 124 107
21	Fen	124 150 102
22	Peatland	102 102 77
23	Swamp	65 105 90
24	Marsh	150 180 120
25	Open-shallow waters	150 180 210