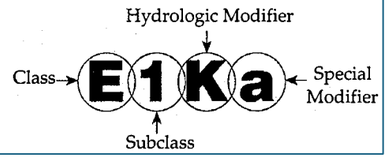
How to translate a Wisconsin Wetland Inventory classification code into the National Wetland Inventory classification code.

Components of the Classification System

The classification codes describe the class, subclass, and general hydrologic characteristics of a wetland mapping unit. Some classification codes will also have a "special modifier." The classification code will usually contain 3 or 4 letters and digits, as shown to the right.

When small patches of different covertypes (at least 30% of the cover) are intermingled within the wetland mapping unit, a mixed classification code will be used. Mixed classes are separated by a slash (e.g., T3/S3K), with the taller form of vegetation listed first.



In this clip from the WWI Classification guide, **E1Ka** is the WWI classification example code.

Step 1: Examine the first letter of the classification code (CLASS).

- The class codes are found at the left of the table in the WWI guide.

CLASS AND SUBCLASS		DESCRIPTION	SUBCLASS EXAMPLES
A	Aquatic bed	Plants growing entirely on or in a water body	—
	(1) (Submergent)	(Aquatic bed plants growing entirely under water)	(Milfoil, coontail, pondweeds)
	2 Floating	Aquatic bed plants having structures which float at the water surface	Rooted or free floating
	3 Rooted floating	Rooted aquatic bed plants which have floating leaves	Pond lilies, water shield
	4 Free floating	Aquatic bed plants which float freely on the water surface	Duckweed, water meal, surface algae
M	Moss	Wetlands where the uppermost layer of vegetation is moss	Sphagnum moss
E	Emergent/wet meadow	Herbaceous plants which stand above the surface of the water or soil	—
	1 Persistent	Plant remains persist into next year's growing season	Narrow- or broad-leaved
	2 Narrow-leaved persistent	Persistent emergents having grass-like leaves without petioles	Cattail, most sedges and grasses
	3 Broad-leaved persistent	Persistent emergents with wide leaf blades	Stinging nettle, some asters
	4 Nonpersistent	Emergent which fall beneath the water and decompose over winter	Narrow- or broad-leaved
	5 Narrow-leaved nonpersistent	Nonpersistent emergents with grass-like leaves without petioles	Wild rice, some bulrush stands
	6 Broad-leaved nonpersistent	Nonpersistent emergents with wide leaf blades	Arrowhead, pickerel weed
S	Scrub/shrub	Woody plants less than 20 feet tall	—
	1 Deciduous	Shrubs which drop their leaves in the fall	Needle- or broad-leaved
	2 Needle-leaved deciduous	Stunted tamaracks	Stunted tamaracks
	3 Broad-leaved deciduous	Deciduous shrubs other than tamarack	Willows, alder, young green ash
	4 Evergreen	Shrubs which keep their leaves over winter	Needle- or broad-leaved
	5 Needle-leaved evergreen	Evergreen shrubs with needle-like or scale-like leaves	Stunted black spruce
	6 Broad-leaved evergreen	Evergreen shrubs with wide leaf blades	Labrador tea, leatherleaf
	7 Dead	Dead shrubs	Shrubs killed by flooding
	8 Needle-leaved	Any coniferous shrubs	Deciduous or evergreen
	9 Broad-leaved	Any broad-leaved shrubs	Deciduous or evergreen
T	Forested	Woody plants taller than 20 feet	—
	1 Deciduous	Trees which drop their leaves in the fall	Needle- or broad-leaved
	2 Needle-leaved deciduous	Tamaracks	Tamaracks
	3 Broad-leaved deciduous	Deciduous trees other than tamarack	Black ash, elm, silver maple
	5 Broad or Needle evergreen	Evergreen trees with needle-like or scale-like leaves	White cedar, black spruce, balsam
	7 Dead	Dead trees	Trees killed by flooding
	8 Needle-leaved	Any coniferous tree	Deciduous or evergreen
F	Flats/unvegetated wet soil	Exposed wet soils which do not support vegetation	—
	0 Subclass unknown	Soil characteristics undetermined	—
	(1) (Cobble/gravel)	(Flats composed of gravel and larger stones)	(Gravel bar in a fast flowing river)
	(2) (Sand)	(Flats composed of sand)	(Sand flats in the Wisconsin R.)
	(3) (Mud)	(Flats composed of silt and clay-sized mineral particles)	(Mud flats in the Mississippi R.)
	(4) (Organic)	(Exposed muck)	(Organic flats exposed by drawdown)
	(5) (Vegetated pioneer)	(Flats supporting herbaceous pioneer vegetation which is killed by rising water levels before the next growing season)	(Cocklebur growing on a sand flat)
W	Open water	Lakes and ponds with a depth of 6 feet or less, and unvegetated river sloughs	—
	0 Subclass unknown	Bottom characteristics undetermined	—
	(1) (Cobble/gravel)	(Cobble or gravel bottom)	—
	(2) (Sand)	(Sand bottom)	—
	(3) (Mud)	(Mud bottom)	—
	(4) (Organic)	(Muck bottom)	—

- The letter E (**E**1Ka) represents an **Emergent/wet meadow**, palustrine wetland.

Step 2: Examine the 2nd position of the classification code (SUBCLASS).

- The subclass codes are found to the right of the Class letter in the WWI guide.

CLASS AND SUBCLASS		DESCRIPTION	SUBCLASS EXAMPLES
A	Aquatic bed	Plants growing entirely on or in a water body	—
(1)	(Submergent)	(Aquatic bed plants growing entirely under water)	(Milfoil, coontail, pondweeds)
2	Floating	Aquatic bed plants having structures which float at the water surface	Rooted or free floating
3	Rooted floating	Rooted aquatic bed plants which have floating leaves	Pond lilies, water shield
4	Free floating	Aquatic bed plants which float freely on the water surface	Duckweed, water meal, surface algae
M	Moss	Wetlands where the uppermost layer of vegetation is moss	Sphagnum moss
E	Emergent/wet meadow	Herbaceous plants which stand above the surface of the water or soil	—
1	Persistent	Plant remains persist into next year's growing season	Narrow- or broad-leaved
2	Narrow-leaved persistent	Persistent emergents having grass-like leaves without petioles	Cattail, most sedges and grasses
3	Broad-leaved persistent	Persistent emergents with wide leaf blades	Stinging nettle, some asters
4	Nonpersistent	Emergent which fall beneath the water and decompose over winter	Narrow- or broad-leaved
5	Narrow-leaved nonpersistent	Nonpersistent emergents with grass-like leaves without petioles	Wild rice, some bulrush stands
6	Broad-leaved nonpersistent	Nonpersistent emergents with wide leaf blades	Arrowhead, pickerel weed
S	Scrub/shrub	Woody plants less than 20 feet tall	—
1	Deciduous	Shrubs which drop their leaves in the fall	Needle- or broad-leaved
2	Needle-leaved deciduous	Stunted tamaracks	Stunted tamaracks
3	Broad-leaved deciduous	Deciduous shrubs other than tamarack	Willows, alder, young green ash
4	Evergreen	Shrubs which keep their leaves over winter	Needle- or broad-leaved
5	Needle-leaved evergreen	Evergreen shrubs with needle-like or scale-like leaves	Stunted black spruce
6	Broad-leaved evergreen	Evergreen shrubs with wide leaf blades	Labrador tea, leatherleaf
7	Dead	Dead shrubs	Shrubs killed by flooding
8	Needle-leaved	Any coniferous shrubs	Deciduous or evergreen
9	Broad-leaved	Any broad-leaved shrubs	Deciduous or evergreen
T	Forested	Woody plants taller than 20 feet	—
1	Deciduous	Trees which drop their leaves in the fall	Needle- or broad-leaved
2	Needle-leaved deciduous	Tamaracks	Tamaracks
3	Broad-leaved deciduous	Deciduous trees other than tamarack	Black ash, elm, silver maple
5	Broad or Needle evergreen	Evergreen trees with needle-like or scale-like leaves	White cedar, black spruce, balsam
7	Dead	Dead trees	Trees killed by flooding
8	Needle-leaved	Any coniferous tree	Deciduous or evergreen
F	Flats/unvegetated wet soil	Exposed wet soils which do not support vegetation	—
0	Subclass unknown	Soil characteristics undetermined	—
(1)	(Cobble/gravel)	(Flats composed of gravel and larger stones)	(Gravel bar in a fast flowing river)
(2)	(Sand)	(Flats composed of sand)	(Sand flats in the Wisconsin R.)
(3)	(Mud)	(Flats composed of silt and clay-sized mineral particles)	(Mud flats in the Mississippi R.)
(4)	(Organic)	(Exposed muck)	(Organic flats exposed by drawdown)
(5)	(Vegetated pioneer)	(Flats supporting herbaceous pioneer vegetation which is killed by rising water levels before the next growing season)	(Cocklebur growing on a sand flat)
W	Open water	Lakes and ponds with a depth of 6 feet or less, and unvegetated river sloughs	—
0	Subclass unknown	Bottom characteristics undetermined	—
(1)	(Cobble/gravel)	(Cobble or gravel bottom)	—
(2)	(Sand)	(Sand bottom)	—
(3)	(Mud)	(Mud bottom)	—
(4)	(Organic)	(Muck bottom)	—

- The number 1 in (E**1**Ka) represents **Emergent/wet meadow, narrow-or-broad leaved, persistent vegetation**.

Step 3: There is a possibility to have a mix of two classes. If you see a slash (/) in the WWI code, then you have a mixed class. The same steps apply as above. For this example, E1Ka, is only a single class code. An example of a mixed class code would be (S3/E1K) which would indicate a mix of 1) Scrub/shrub – Deciduous – Broad leaved deciduous vegetation, and 2) Emergent/wet meadow, narrow-or-broad leaved, persistent vegetation.

Step 4: The next position in the code represents the hydrology of the feature. The Wisconsin Wetland Inventory has only 4 descriptions for how much water is present at the time of mapping.

- L – Standing water, Lake
- R – Flowing water, River
- H – Standing water, Palustrine
- K – Wet soil, Palustrine

Hydrologic Modifiers for the Wisconsin Wetlands Inventory

HYDROLOGIC MODIFIER		SITUATION APPLIED TO:	USED WITH SUBCLASSES
L	Standing water, Lake	Lakes of 20 acres or more having a maximum depth of 6 feet or less (smaller lakes and ponds receive the "H" hydrologic modifier)	A1–A4, E4–E6, S7, T7, FØ–F5, WØ–W4
R	Flowing water, River	The abandoned and secondary channels of rivers and streams	A1–A4, E4–E6, T7, FØ–F5, WØ–W4
H	Standing water, Palustrine	Wetlands which have surface water present for much of the growing season	All subclasses
K	Wet soil, Palustrine	Areas which are wetlands, but do not appear to have surface water for prolonged periods of time	MØ, E1–E3, S1–S9, T1–T8, FØ–F5

- The letter K in (E1**K**a) represents **Wet soil, Palustrine.**

Step 5: If there are one or more lower case letters after the hydrologic modifier, then something on the ground has been singled out and considered important enough to note as a special modifier.

Special Modifiers for the Wisconsin Wetlands Inventory

a **Abandoned** — Areas which appear to have been cultivated in the past, but which have since been abandoned from cultivation and have reverted to wetland vegetation.

c **Cranberry bog** — Used to indicate all artificially constructed cranberry bogs.

e **Exposed flats complex** — Wetland mapping units bearing this modifier are a combination of exposed flats (e.g., sand flats in the Wisconsin River) and secondary river channels which are too small to delineate individually.

f **Farmed** — Land cultivated only during drought years and periods of low water table. These areas must have soils classified by the U.S.D.A. Soil Conservation Services as poorly drained or very poorly drained *and* support wetland vegetation during years of normal or high precipitation or periods of normal or high water table.

g **Grazed** — Wetlands which are used for pasturing livestock.

j **Central Sands complex** — Wetland mapping units bearing this modifier occur mainly in Central Wisconsin where small areas of peat, wet sand, and dry sand ridges are so intermingled that they cannot be delineated individually.

m **Mats** — Used to indicate areas where wetland vegetation is floating on water as a mat, rather than being rooted in soil.

r **Red clay complex** — Wetland mapping units bearing this modifier occur mainly on old lake plains adjoining Lake Superior, where small areas of wet and dry clay soils are so intermingled that they cannot be delineated individually.

s **Ridge and swale complex** — This landform occurs mainly along the Lake Michigan coast, where narrow beach ridges (strand lines) were formed parallel to the shore as the water in Lake Michigan receded during post-glacial times. Depressions (swales) between the beach ridges contain wetland vegetation, but the ridge themselves are dry. The complex is used to indicate areas where the swales are too small to delineate individually.

v **Vegetation recently removed** — Used to indicate areas where the vegetation has recently been totally or partially removed by clearing, shearing, logging, or other means.

w **Floodplain complex** — This modifier describes the floodplains of rivers and streams which are composed of small areas of seasonally flooded wetlands, wet meander scars, oxbow lakes, and/or small inclusions of upland, all of which are too small to delineate individually.

x **Excavated** — Used to indicate wetlands which have been artificially excavated, usually for the purpose of creating ponds. Gravel pit ponds and other ponds created by mining are not considered to be wetlands unless they support wetland vegetation.

z **Evidence of muskrat activity** — When muskrat lodges can be detected on the aerial photographs, this modifier is used.

- The letter a in (E1K**a**) represents **Abandoned** cultivated land.

So, E1Ka represents an area where farming was practiced in the past but has likely reverted back to a landscape where emergent wetland vegetation is supported and evident and saturated, wet soils are apparent.

What would E1Ka be in the National Wetland Inventory classification system?

The NWI classification system represents inland wetlands, lakes, rivers and streams, estuaries, and marine environments – both fresh and saltwater. Wisconsin has no saltwater environments, and those portions will not be discussed here. Estuaries exist in Wisconsin, but are simplified using the Lacustrine, Riverine and Palustrine systems.

The NWI classification is coded as:

(**System)** + (**Class 1**) + **/**(**Class 2** – if any) + (**Water Regime** (hydrologic modifier for amount/duration of water)) + (**Special modifier** – if any – only one) + (**Soil modifier** – if known) + (**Water Chemistry modifier** – if known)

- If any additional Wisconsin DNR special modifiers are added they are placed after a period, placed after the NWI code
  - + (**.**) **Wisconsin DNR special modifiers** – if any – up to 2)

Step 1: The System is Palustrine, so the first letter for the code is **P**.

Step 2: There is no second class or subclass in E1Ka.

Step 3: The EMERGENT class in the Palustrine table is represented as **EM**

Step 4: The PERSISTENT subclass in the Palustrine table is represented as the number **1**.

Step 5: The WWI hydrologic modifier representing the hydrology (K – WET SOIL) now has to be given a more specific water regime which describes both amount and duration of water. If you review the NWI Water Regimes table at the end of this document, there are now 10 hydrologic choices. Wet soil (K) in WWI represents ALL ***saturated*** conditions. In the NWI system, saturated wet soil conditions might be:

B – Seasonally saturated – wet in the spring, but then conditions tend to become drier later in fall.

D – Continually saturated

The landscape position, geomorphology (e.g., bowl-shaped depression, flat terrain, or sloping area), and any ground activities are assessed. Mapping resources such as LiDAR-based elevation models, multi-year leaf-on/off imagery, and ground-based surveys play a role in determining the water regime.

Step 6: The WWI special modifier a (E1K**a**) representing abandoned farmland is normally not represented in the NWI system, but Wisconsin DNR has adopted most of the previous special modifiers and added them to the NWI list. You can find them within the Special Modifiers table. Abandoned farmland is now given the letter **c**.

- **IMPORTANT: ALL WISCONSIN SPECIAL MODIFIERS ARE ADDED AFTER ANY NWI MODIFIERS AND PLACED AFTER A PERIOD (.)**

So, the NWI representation for E1Ka could be one of two choices.

- PEM1B.c
- PEM1D.c

The National Wetland Inventory Classification System with Wisconsin DNR additions

The Lacustrine classification is split into two tables based on the depth of the lacustrine area with Table L1 for shallower limnetic areas and Table L2 for deeper littoral areas.

System	Table L1. Lacustrine (Lake) >=20 acres					
Subsystem	Table L1. Limnetic areas > 2.5 m [8.2 ft] deep					
Class	RB	Rock Bottom	UB	Unconsolidated Bottom	AB	Aquatic Bed
Subclass	1	Bedrock	1	Cobble-Gravel	1	Algal
	2	Rubble	2	Sand	2	Aquatic Moss
			3	Mud	3	Rooted Vascular
			4	Organic	4	Floating Vascular

System	Table L2. Lacustrine (Lake) >=20 acres											
Subsystem	Table L2. Littoral areas < 2.5 m [8.2 ft] deep											
Class	RB	Rock Bottom	UB	Unconsolidated Bottom	AB	Aquatic Bed	RS	Rocky Shore	US	Unconsolidated Shore	EM	Emergent
Subclass	1	Bedrock	1	Cobble-Gravel	1	Algal	1	Bedrock	1	Cobble-Gravel	2	Nonpersistent
	2	Rubble	2	Sand	2	Aquatic Moss	2	Rubble	2	Sand		
			3	Mud	3	Rooted Vascular			3	Mud		
			4	Organic	4	Floating Vascular			4	Organic		
									5	Vegetated		

System	Table P1. Palustrine – Inland wetlands															
Class	RB	Rock Bottom	UB	Unconsolidated Bottom	AB	Aquatic Bed	US	Unconsolidated Shore	ML	Moss Lichen	EM	Emergent	SS	Scrub-Shrub	FO	Forested
Subclass	1	Bedrock	1	Cobble-Gravel	1	Algal	1	Cobble-Gravel	1	Moss	1	Persistent	1	Broad-Leaved Deciduous	1	Broad-Leaved Deciduous
	2	Rubble	2	Sand	2	Aquatic Moss	2	Sand	2	Lichen	2	Nonpersistent	2	Needle-Leaved Deciduous	2	Needle-Leaved Deciduous
			3	Mud	3	Rooted Vascular	3	Mud			3	Sedge****	3	Broad-Leaved Evergreen	3	~~Broad-Leaved Evergreen~~
			4	Organic	4	Floating Vascular	4	Organic			4	Native Grass****	4	Needle-Leaved Evergreen	4	Needle-Leaved Evergreen
							5	Vegetated			5	*Phragmites australis*	5	Dead	5	Dead
											6	Reed Canary****	6	Deciduous	6	Deciduous
											7	Cattail****	7	Mix 2/4****	7	Mix 2/4****
											8	*Glyceria maxima*****	8	Alder****	8	White Cedar****
													9	Buckthorn****		

System	Table R1. Riverine													
Subsystem	1-Tidal 2-Lower Perennial 3^ -Upper Perennial 4*-Intermittent													
Class	RB	Rock Bottom**	UB	Unconsolidated	AB	Aquatic Bed	SB	***Streambed	RS	Rocky Shore	US	Unconsolidated	EM	^ Emergent
Subclass	1	Bedrock	1	Cobble/Gravel	1	Algal	1	Bedrock	1	Bedrock	1	Cobble/Gravel	2	Nonpersistent
	2	Rubble	2	Sand	2	Aquatic Moss	2	Rubble	2	Rubble	2	Sand		
			3	Mud	3	Rooted Vascular	3	Cobble/Gravel			3	Mud		
			4	Organic	4	Floating Vascular	4	Sand			4	Organic		
							5	Mud			5	Vegetated		
							6	Organic						
							7	Vegetated						

* Intermittent is limited to Streambed class
** Rock bottom is not allowed in Lower Perennial
*** Streambed is limited to Tidal and Intermittent Subsystems
**** WWI addition - NOT NWI standard
^ ONLY Emergent nonpersistent vegetation allowed with R3 (Upper Perennial) - debate if any R3 streams exists in Wisconsin

All special modifiers are lower case and placed after the Water Regime letter
All **bold** special modifiers are Wisconsin additions and are not collected within National Wetland Inventory database
All Wisconsin modifiers are placed AFTER the NWI modifiers (if any) and placed after the period (.) within the classification code (e.g. PF01C.w or PEM1d.p)

Water Regime		Special Modifiers		Water Chemistry		Soil	
Nontidal		$	**Filled wetland**	**Halinity/Salinity**	**pH modifiers for fresh water**	g	Organic
A	Temporarily Flooded	&	**Fully drained wetland**		a Acid	n	Mineral
B	Seasonally Saturated	b	Beaver activity	1 Hyperhaline / Hypersaline	t Circumneutral		
C	Seasonally Flooded	c	**Abandoned agriculture**	2 Euhaline / Eusaline	i Alkaline		
D	Continuously Saturated	d	Partly drained/ditched	3 Mixohaline / Mixosaline (Brackish)			
E	Seasonally Flooded/Saturated	e	**Ephemeral pond**	4 Polyhaline			
F	Semipermanently Flooded	f	Farmed	5 Mesohaline			
G	Intermittently Exposed	h	Diked/Impounded	6 Oligohaline			
H	Permanently Flooded	j	**Reconstructed wetland**	0 Fresh			
J	Intermittently Flooded	k	**Restored wetland**				
K	Artificially Flooded	l	**Channelized perennial river**				
		m	Managed (marshes)				
		o	**Artificial wetland**				
		p	**Pastured/grazed/mowed**				
		q	**Ruderal vegetation**				
		r	Artificial substrate				
		s	Spoil piles visible				
		u	**Ridge & Swale**				
		v	**Vegetation recently removed**				
		w	**Floodplain complex**				
		x	Excavated				
		y	**Glacial lake plain complex**				
		z	**Upland/wetland boundaries too complex to separate**				

* **bold entries mean WWI additions - not NWI standard**

Below is an explanation of the crosswalk for each main class for NWI and WWI for Palustrine wetlands.

	PALUSTRINE WETLANDS				
NWI CLASS	NWI DESCRIPTION	NWI EXAMPLE	WWI CLASS	WWI EXAMPLE	WWI DESCRIPTION
RB	Rock Bottom	PRB1H, PRBG	W	W0H	Open Water
UB	Unconsolidated Bottom	PUBH, PUBF	W	W0H	Open Water
AB	Aquatic Bed	PAB3H	A	A3H	Aquatic Bed, Rooted floating
US	Unconsolidated Shore	PUS3C	F	F03H	Flats/unvegetated wet soil
ML	Moss-Lichen	PML1C	M	M0H	Moss
EM	Emergent	PEM2B	E	E4K	Emergent/wet meadow
SS	Scrub-Shrub	PSS1B	S	S3K	Scrub-Shrub, Broad-leaved deciduous
FO	Forested	PFO2/4D	T	T8K	Forested (Mixed),Needle-leaved Deciduous/Coniferous
	LAKES AND RIVERS				
	The National Wetland Inventory separates Riverine and Lacustrine environments.				
	The WWI used WOL (Open Water Lake) for lacastrine (lake) and WOR (Open Water River) for back sloughs and cut-off riverine meander scars.				
	For lakes that were known to be deeper than 6ft, Deep Water Lake (DWL) was assigned to the WWI polygon.				
	The 24K Hydro layer was the defacto hydrology layer, not the WWI.				
	The WWI attempted to map detectable wetland vegetation within both the Lake and River systems.				