USDA Natural Resources
Conservation Service

Ecological site R144AY004CT
Tidal Fresh Marsh mesic very frequently flooded

Last updated: 5/20/2025
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General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

MLRA notes

Major Land Resource Area (MLRA): 144A–New England and Eastern New York Upland, Southern Part

MLRA 145, Connecticut Valley is based on the concept that glacial Lake Hitchock left finer sediments in the form of varved clays, silts, and fine sands in the middle of a larger and coarser-textured post-glacial environment. The upland areas are mainly comprised of glacial deposits (till and outwash) and/or loess overlying glacial lake sediments, with a mix of recent alluvium and organic residuum in the lower-lying areas directly surrounding the Connecticut River.
The tidal marsh ecological sites are located in the southern section of the MLRA, near the mouth of the Connecticut River along the Long Island Sound coast.

MLRA 144A, the New England and Eastern New York Upland, Southern Part is in the New England Upland section of the New England Province of the Appalachian Highlands Division. The area is nearly level to sloping lowlands on the edges of the valley. North to south running trap rock ridges break up the lowlands with hilly, steep areas. Elevation ranges from sea level to 330 feet (100 meters) in the lowlands and from 650 feet to 1,000 feet (200- 305 meters) on ridges.
The tidal marsh ecological sites are located in the south and eastern sections of the MLRA, near the Atlantic Ocean and Long Island Sound coasts.

MLRA 149B, Long Island-Cape Cod Coastal Lowland is in the Embayed section of the Coastal Plain Province of the Atlantic Plain Division (Fenneman & Johnson, 1946). It is part of the partially submerged coastal plain of New England. It is mostly an area of nearly level to rolling plains, but it has some steeper hills (glacial moraines). Ridges border the lower plains. Elevation generally ranges from sea level to 80 feet (0 to 25 meters), but it is

as much as 410 feet (125 meters) in a few areas.
The tidal marsh ecological sites are located throughout the MLRA, near the Atlantic Ocean and Long Island Sound coasts.

Ecological site concept

Freshwater tidal wetlands, while still physically affected by tidal forces, are beyond the reach of the salt front. Freshwater tidal wetlands exhibit salinity levels of 0.5 ppt (0.8 dSm-1) or less. Lacking salinity, freshwater tidal habitats are sometimes considered riverine habitats (Cowardin et al., 1979), yet other sources consider all tidal wetlands as estuarine (Odum et al., 1984; Odum, 1988). Freshwater tidal wetlands are optimally developed along the lower reaches of large river systems with low gradients near the confluence with the sea.
The vegetation of freshwater tidal wetlands is highly variable ranging from *Acer rubrum* tidal forests to mixed freshwater tidal marshes dominated by Typha spp., *Bolboschoenus fluviatilis*, or *Onoclea sensibilis*, and *Zizania aquatica* tidal flats. Non-native species include the highly invasive *Lythrum salicaria*.

Associated sites

R144AY003CT	**Tidal Brackish Marsh mesic very frequently flooded**

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Onoclea sensibilis* (2) *Bolboschoenus fluviatilis*

Physiographic features

This ecological site occupies the lowest portions of the terrestrial landscape. A distinct ridge primarily composed of organic matter abruptly boarders the neighboring glacial soils. Local relief is 0 to ___ feet (0 to ___ meters). These sites are on toeslopes or do not have a landscape position, with slopes ranging from 0 to __ percent (mean slope of about 1 percent).

A constant water table is found within a few centimeters of the soil surfac due to tidal flooding which occurs about twice daily, during the high tides. Runoff may be recieved at this physiographic site from surrounding uplands.

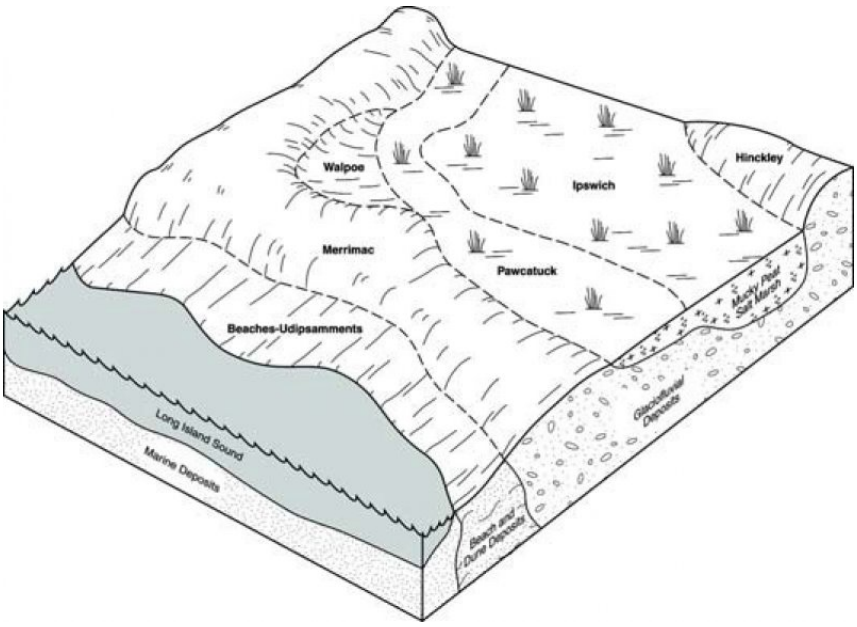

Figure 1. Salt Marsh Block Diagram

Table 2. Representative physiographic features

Landforms	(1) Salt marsh (2) Coastal plain
Flooding duration	Extremely brief (0.1 to 4 hours) to very long (more than 30 days)
Flooding frequency	Frequent to very frequent
Ponding duration	Very brief (4 to 48 hours) to very long (more than 30 days)
Ponding frequency	None to occasional
Elevation	0–15 m
Slope	0–3%
Ponding depth	0–25 cm
Water table depth	127–0 cm
Aspect	Aspect is not a significant factor

Climatic features

In winter, the average temperature in the region is 32.0 degrees F and the average minimum daily temperature is 24.0 degrees F. The lowest temperature on record is -39 degrees F in Portland Maine on February 16th 1943. In summer, the average temperature in the region is 47.7 degrees F and the average maximum daily temperature is 56.8 degrees F. The highest temperature, which occurred at La Guardia Airport in New York on July 3, 1966, is 107 degrees F.

The average annual total precipitation is about 48.1 inches (1222 mm). Of this, about 4.0 inches (102 mm), or 66.5 percent, usually fall in April through November. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period

of record was 20.3 inches (51.6 cm) at Riverhead Research Farm in New York in 2005. Thunderstorms occur on about 20 days each year, and most occur in July.
Monthly precipitation in the Northeast is fairly uniform throughout the year. Occasional drought is a normal, recurrent feature of virtually every climate in the United States. However, even with a temperate moist climate, normal fluctuations in regional weather patterns can lead to periods of dry weather. The last severe droughts in the Northeast occurred 2000, 2001-2002, 2005, 2007-2008, 2010 and again in 2012, while extreme droughts have not occurred since 2002 (NDMC 2014).
The average annual snowfall is 31.1 inches (79.0 cm). The greatest snow depth at any one time during the period of record was 31.9 inches (81.0 cm) recorded on February 8, 2013 in Portland, ME. The heaviest 1-day snowfall on record was 22.3 inches (56.6 cm) recorded on December 17th 1970 in Portland, ME.
The Atlantic hurricane season runs from June 1st to November 30th. The estimated return period for hurricanes passing within 50 nautical miles of this area of coastal New York and New England ranges 13-43 years with an average of 22.3 years. The return period for major (i.e. Category 3 or greater) hurricanes ranges 52-180 years with an average of 88.0 years. From 1950-2011, these coastal counties have had four Category III hurricane strikes recorded in 1954 (2), 1960 and 1985. They have had one Category II hurricane strike in 1991 and one Category I hurricane strike in 1976 (NOAA NWS 2013).
Future projections indicate that greenhouse warming will cause the globally averaged intensity of tropical cyclones to shift towards stronger storms, with intensity increases of 2–11% by 2100 (Knutson et al 2010).

Table 3. Representative climatic features

Frost-free period (average)	184 days
Freeze-free period (average)	210 days
Precipitation total (average)	1,219 mm

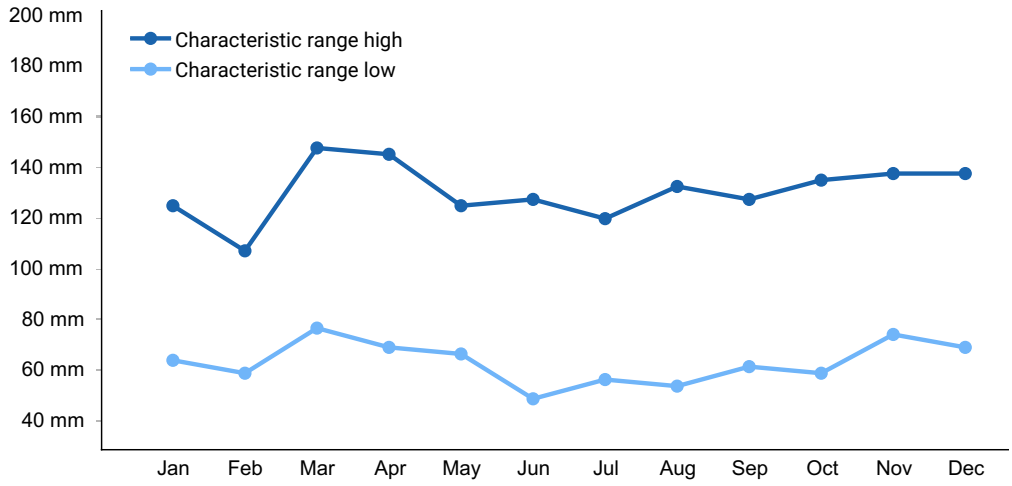

Figure 2. Monthly precipitation range

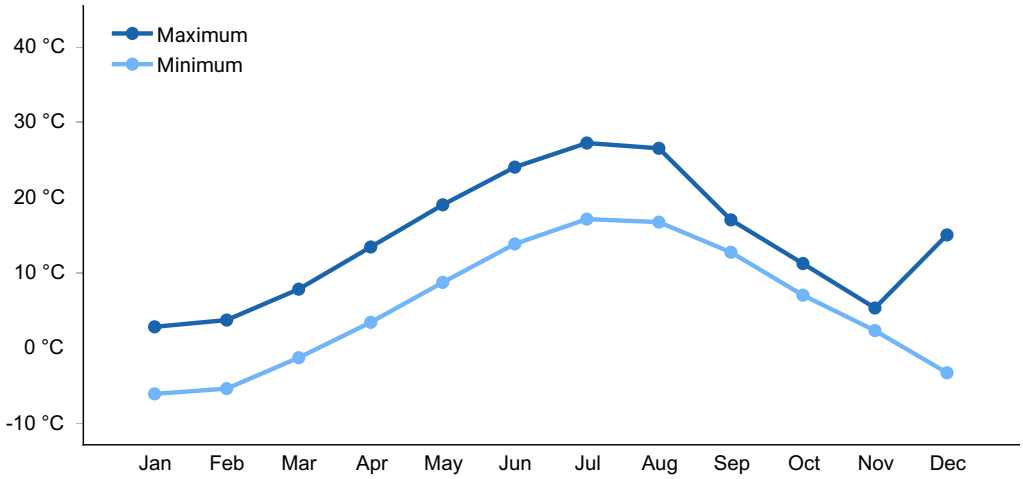

Figure 3. Monthly average minimum and maximum temperature

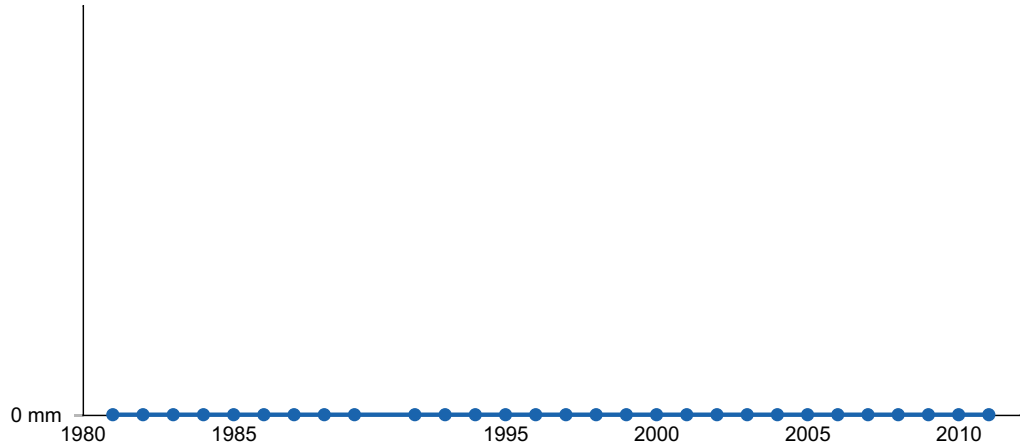

Figure 4. Annual precipitation pattern

Influencing water features

Soil features

This ecological site is represented by soils in the Histosols and Entisols soil orders. Major soil series for this ecological site are Ipswich and Westbrook with some areas of Matunuck and Pawcatuck. Depth of organic material is variable.
These soils have a mesic soil temperature regime, an aquic soil moisture regime, and mixed mineralogy (Soil Survey Staff, Official Series Descriptions, available online). They have histic epipedons that are shallow to deep to a mineral material (alluvium, glacial till, outwash, or marine deposits) and generally have a sandy or sandy skeletal or a coarse-loamy particle size class when applicable. There does not seem to be a correlation between depth to mineral material and vegetative community type.

A seasonal high water table (SHWT) is at the surface due to tidal flooding. The soil series associated with this ecological site are interpreted to be poorly drained according to Connecticut drainage class standards. Saturated hydraulic conductivity in the soil material is moderately high to very high (Soil Survey Staff, 2013).

Soils associated with this ecological site are formed in organic material deposited over mineral till, outwash, alluvium, or marine deposits. The organic material is derived mainly from native herbacious tidal marsh species, but has been found to be woody with depth as a relict of post-glacial sea level rise. Though most of the material is composed of organic material which generates acids as it breaks down, the salts and minerals deposited by the ocean keep the pH and EC values values high (____SITE). These unique chemical properties along with sustained periods of saturation are what allow the Spartina species and other salt marsh vegetation to out-compete other species and give the marshes their distinct community banding.

Table 4. Representative soil features

Surface texture	(1) Mucky fine sandy loam (2) Silt loam
Drainage class	Very poorly drained to somewhat poorly drained
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

The vegetation of freshwater tidal wetlands is highly variable ranging from *Acer rubrum* tidal forests to mixed freshwater tidal marshes dominated by Typha spp., *Bolboschoenus fluviatilis*, or *Onoclea sensibilis*, and *Zizania aquatica* tidal flats. Non-native species include the highly invasive *Lythrum salicaria*.

State and transition model

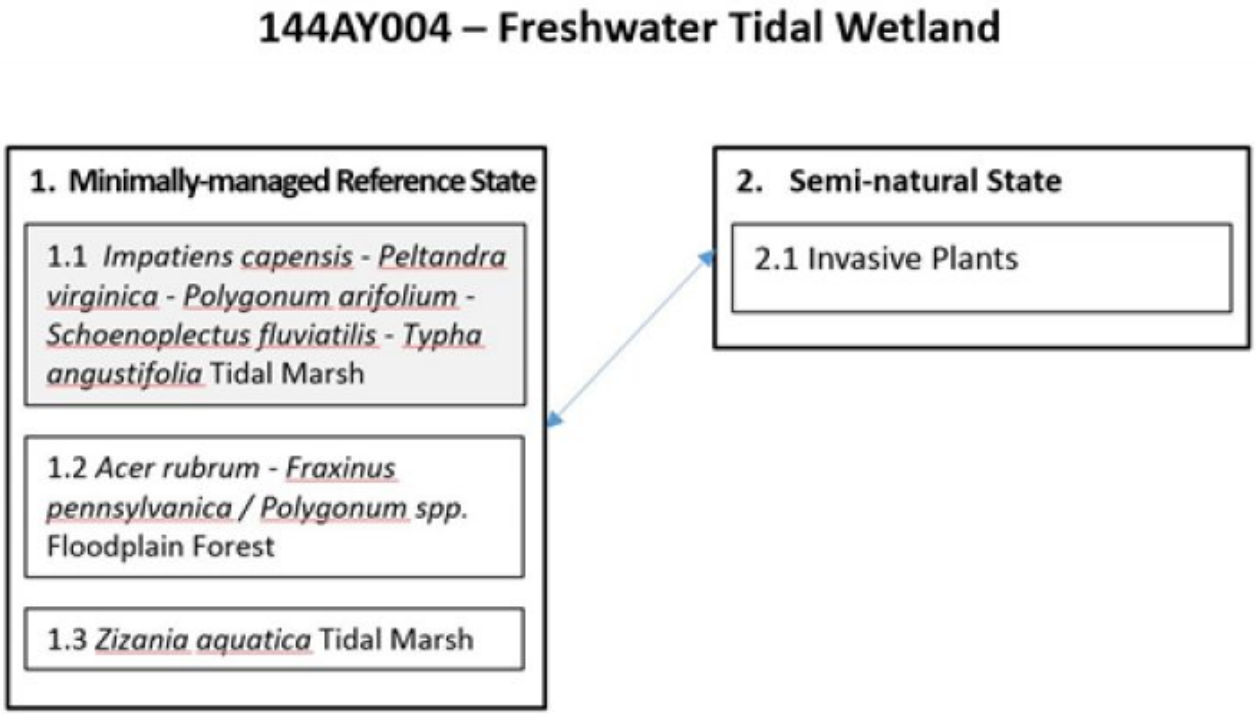

Figure 6. STM_144AY004_Fresh Water Tidal wetland

Transition	Drivers/practices
T1-2	Disturbance
R2-1	Wetland enhancement, Planting, Upland Wildlife Mgmt

Figure 7. STM_144AY004_Fresh Water Tidal Wetland

Other references

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Contributors

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Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	
Contact for lead author	
Date	12/08/2025
Approved by	Greg Schmidt
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

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2. **Presence of water flow patterns:**

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3. **Number and height of erosional pedestals or terracettes:**

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

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5. **Number of gullies and erosion associated with gullies:**

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6. **Extent of wind scoured, blowouts and/or depositional areas:**

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7. **Amount of litter movement (describe size and distance expected to travel):**

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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

    Dominant:

    Sub-dominant:

    Other:

    Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

14. **Average percent litter cover (%) and depth (in):**

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:**

17. **Perennial plant reproductive capability:**