

TIDAL FRESHWATER MARSH (NEEDLERUSH SUBTYPE)

Concept: Tidal Freshwater Marshes are very wet herbaceous wetlands, permanently saturated and regularly or irregularly flooded by lunar or wind tides with fully fresh or oligohaline water. The Needlerush Subtype covers the zones dominated or codominated by *Juncus roemerianus* in wind tidal oligohaline areas in the northeastern part of the state.

Distinguishing Features: The Needlerush Subtype is distinguished from all other subtypes by the dominance or codominance of *Juncus roemerianus* in an oligohaline setting. It is distinguished from the Needlerush Subtype of Brackish Marsh by the presence of less salt-tolerant plants such as *Thelypteris palustris* var. *pubescens*, *Osmunda spectabilis*, *Sagittaria falcata*, *Eleocharis fallax*, *Pontederia cordata*, or by association with other Tidal Freshwater Marsh subtypes.

Synonyms: *Juncus roemerianus* - *Pontederia cordata* Herbaceous Vegetation (CEGL004660). Ecological Systems: Atlantic Coastal Plain Embayed Region Tidal Freshwater Marsh (CES203.259). Atlantic Coastal Plain Central Fresh and Oligohaline Tidal Marsh (CES203.376).

Sites: This community occurs on intertidal flats and shorelines, most often in zoned mosaics with other subtypes. Patches are most often in the marsh interior. Extensive areas on the back side of the Currituck Banks appear to be relict flood tidal deltas, similar to back-barrier salt marshes are elsewhere.

Soils: Most occurrences have organic soils, most often Currituck (Terric Haplosaprist) but often Hobonny (Typic Haplosaprist). A few may be mineral soils such as Conaby (Histic Humaquept).

Hydrology: All known examples have wind tidal flooding and are along oligohaline estuaries.

Vegetation: Dense tall herbaceous vegetation is dominated by *Juncus roemerianus*. Dominant species of other subtypes may sometimes be abundant or even codominant, including *Sporobolus* (*Spartina*) *cynosuroides*, *Typha angustifolia*, *Typha domingensis*, *Cladium jamaicense*, or *Schoenoplectus pungens*. Exotic *Phragmites australis* may become established and displace nearly all native plants. The native *Phragmites americana* may also occur, though its distribution is not well known. In 9 CVS plots for this subtype in North Carolina, other species frequently abundant were *Mikania scandens*, *Sagittaria lancifolia* var. *media*, *Hibiscus moscheutos*, *Schoenoplectus* spp., and *Ptilimnium capillaceum*. Other species occasionally abundant included *Galium obtusum*, *Hydrocotyle verticillata*, *Osmunda spectabilis*, *Persicaria sagittata*, *Proserpinaca palustris*, *Persicaria arifolia*, and *Thelypteris palustris* var. *pubens*. Some 50 additional species were present in the plots, and any species of the associated subtypes could also occur. Woody species may be present at low density, potentially *Morella cerifera*, *Toxicodendron radicans*, *Baccharis halimifolia*, *Rosa palustris*, *Persea palustris*, *Pinus taeda*, *Acer rubrum*, or *Taxodium distichum*.

Range and Abundance: Ranked G2G3. This community is known only in the northeastern part of the state, primarily in and around Currituck Sound. It is also known from adjacent Virginia in this area. It can be fairly extensive in these areas.

Associations and Patterns: The Needlerush Subtype most often occurs in zoned mosaics with the Giant Cordgrass, Sawgrass, Cattail, Threesquare, and Shrub Subtype, sometimes with Oligohaline Low Marsh or other subtypes or with Freshwater Marsh Pool. It is most often in the marsh interior, where it may form large patches.

Variation: No variants are recognized.

Dynamics: Dynamics are uncertain. The primary range for this subtype, Currituck Sound and its vicinity, is isolated from the ocean by continuous barrier islands, but this is a relatively recent state. The last inlet on the Currituck Banks closed in 1828. The Tidal Freshwater Marshes developed since that time in areas that were previously salt and brackish. It has been suggested that the *Juncus roemerianus* marshes are relict from a time of saltier water. This would suggest that they developed their distinctive composition by the addition of salt-intolerant species, while also receding in the face of invasion of vegetative spread by the dominants of the other subtypes. Such invasion would have to be irregular, since the present pattern is one of a mosaic of subtypes. A decrease in area of this subtype over time should be looked for, but so far has not been documented.

The long-term fate of this subtype is highly uncertain. Rising sea level and a future period of increased storm intensity likely will eventually breach the Currituck Banks. Once a new inlet forms, it is unclear if tides will keep it open. Tidal range remains low in this area, and the processes that closed previous inlets may continue to operate.

Comments: Although recognized in the NVC, the Giant Cordgrass, Sawgrass, Cattail, and Needlerush subtype may be only marginally distinct. They usually occur in mosaics with each other, may share dominants with each other, and have substantial floristic overlap.

Rare species:

References: