MARITIME EVERGREEN FOREST (SOUTH-ATLANTIC SUBTYPE)

Concept: Maritime Evergreen Forests are evergreen hardwood-pine forests of barrier islands and coastal spits. Salt spray is a major environmental influence on these communities, and its influence generally is indicated by a distinctively streamlined canopy form. The South-Atlantic Subtype encompasses the forests from southeastern North Carolina southward, where *Sabal palmetto* mixes with the dominant combinations of *Quercus virginiana, Quercus hemisphaerica*, *Pinus taeda*, and *Juniperus silicicola*.

Distinguishing Features: The Maritime Evergreen Forest type is distinguished from all other communities by the combination of evergreen forest vegetation with a canopy greater than 5 meters tall when not recently distsurbed, along with location on a barrier island or comparable coastal spit. The South Atlantic Subtype is distinguished by the native presence of *Sabal palmetto* in the stand. *Sabal palmetto* may be a small component or may codominate; it generally is well distributed in the community but may be absent from individual plots. South of North Carolina, *Pinus elliottii* also distinguishes this subtype.

Synonyms: *Quercus virginiana - (Pinus elliottii var. elliottii, Sabal palmetto) / Persea borbonia - Callicarpa americana* Forest (CEGL007032).
Ecological Systems: Central Atlantic Coastal Plain Maritime Forest (CES203.261).

Sites: The South Atlantic Subtype occurs on barrier islands, on stable dunes, swales, and flats protected from salt water flooding and from the most extreme salt spray.

Soils: Examples are mapped as Newhan or Fripp (Typic Quartzipsamments) but could potentially occur on other sandy Entisols.

Hydrology: Hydrology is typical of the theme as a whole, ranging from apparently xeric to mesic. Salt spray is significant enough to shape the canopy and to exclude many plant species but is less extreme than that in Maritime Shrub.

Vegetation: Vegetation is generally a closed forest with a dense canopy, though the canopy may be open or may be dominated by understory species in recently disturbed areas. The canopy is composed of varying combinations of *Quercus virginiana, Quercus hemisphaerica*, *Pinus taeda*, and *Juniperus silicicola*, with small to large numbers of *Sabal palmetto*. In CVS plot data for Bald Head Island, the hardwoods dominate and are constant while *Pinus* and *Sabal* have somewhat lower constancy and cover but are both widely distributed in the community as a whole. Understory species with high constancy and cover are *Prunus caroliniana, Cartrema americana*, and *Persea borbonia*, and *Cornus florida, Ilex opaca*, and *Carpinus caroliniana* are also frequent and abundant. The shrub layer ranges from sparse under dense canopy to dense where the canopy is broken. *Ilex vomitoria* dominates the shrub layer in our examples. *Callicarpa americana* and *Sabal minor* are frequent. Vines are abundant, with *Toxicodendron radicans, Muscadinia rotundifolia*, and *Smilax bona-nox* always present with high cover in plot data, and *Gelsemium sempervirens, Smilax auriculata*, and *Berchemia scandens* are also frequent and abundant. The herb layer is generally moderate to sparse. *Mitchella repens* is constant and most extensive in this layer. Other frequent species include *Asplenium platyneuron, Galium bermudense, Carex* sp.,

Dichanthelium commutatum, Sanicula canadensis var. *canadensis*, *Chasmanthium laxum*, and *Oplismenus setarius*. *Pleopeltis michauxiana* and *Tillandsia usneoides* are frequent as epiphytes.

Range and Abundance: Ranked G2. In North Carolina, the South Atlantic Subtype occurs only in the Smith Island (Bald Head Island) complex and along the southern Brunswick County coast. The association extends southward to Florida and westward to Alabama and possibly Mississippi.
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Associations and Patterns: Maritime Evergreen Forest may grade into Maritime Shrub on the seaward side in places, but more often is bordered by steep encroaching dunes with adjacent Dune Grass communities. On the inland side, it grades to Salt Marsh or other marsh edge communities.

Variation: Because of its limited range in the state, this community has little recognized variation. As with the Mid Atlantic Subtype, within its few occurrences, it ranges across microsites that appear xeric to mesic or intermittently wet without visible change in vegetation. Some plots from Bald Head Island consistently are distinguished in analysis because they are dominated by understory species left after storm-caused canopy mortality. Farther south, within its range, *Pinus elliotii* replaces *Pinus taeda* as the predominant pine, and *Sabal palmetto* becomes more abundant.

Dynamics: The dynamics of this community are generally similar to those of the Mid Atlantic Subtype. Because all examples in North Carolina are on islands that have long been stable, there are no known areas in early primary succession and no areas with composition known to be altered by past logging. Some areas have been heavily disturbed by storms, leading to shrubby open forest that can persist for years. The changes documented at Bull Island in South Carolina, an example of this subtype, illustrate the kind of dramatic changes that are possible. Bull Island initially had a large area dominated by *Pinus taeda*, noted for its age (Helm, et al. 1991). Hurricane Hugo killed almost all the pines, while *Sabal palmetto* doubled in density and basal area in the aftermath. Pines regenerated in subsequent years. *Quercus virginiana* was moderately reduced by the storm. At the same time, oak regeneration failed in some areas, apparently due to rising water tables in wetter areas and to increased salt spray where the island was eroding (Conner, et al. 2005).

These forests are very susceptible to alterations in wind flow patterns, because of the effect on salt spray deposition. Breaks in the canopy can potentially create eddies that concentrate salt spray deposition and lead to death of trees around the opening.

Comments:
The analysis of CVS data by Medford (2018) did not recognize the clear distinctness of this community. The 8 plots that represent this subtype were lumped with plots of Coastal Fringe Evergreen Forest, perhaps because a coincidental high cover of deciduous understory species influenced the clustering algorithm more than the smaller cover of the more distinctive *Sabal palmetto*.

Sabal palmetto - *Quercus virginiana* Saturated Forest (CEGL007040), a hydric hammock community of central and southern Florida has been attributed to North Carolina, reportedly from the Bald Head Island complex. While the South Atlantic Subtype occurrence contains a few marginally wet swales dominated by these species, patches are very small and not distinct from

the surrounding forest. It does not seem constructive to equate these small patches with this distant, nonmaritime association, which contains many additional southern species.

Rare species: *Oplismenus setarius, Sabal palmetto, Cyperus tetragonus, Teloschistes flavicans*, others.

References:

Conner, W.H., W.D. Mixon II, G.W. Wood. 2005. Maritime forest habitat dynamics on Bulls Island, Cape Romain National Wildlife Refuge, SC, following Hurricane Hugo. Forest Ecology and Management 212: 127-134.

Helm, A.C., N.S. Nicholas, S.M. Zedaker, and S.T. Young. 1991. Maritime forests of Bull Island, Cape Romain, South Carolina. Bulletin of the Torrey Botanical Club 118: 170-175.

Medford, H. 2018. A refined classification of maritime forest communities of the Carolinas. Research paper. UNC-Chapel Hill.