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Soil salinity and the occurrence of invasive Phragmites australis in Scarborough Marsh

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In North America, *Phragmites australis (Cav.) Trin*. is a common invasive reed that competes well in wetland ecosystems and wet ditches. According to the Maine Department of Agriculture, Conservation and Forestry's Natural Areas Program, *P. australis* is disruptive to both tidal and freshwater marshes throughout Maine, including Scarborough Marsh, the state's largest salt marsh covering an area of 3100 acres (≈ 1,254 hectares). Like many tidal marshes, Scarborough Marsh plays an important role buffering against high tides and flood waters, whilst providing key habitat for numerous species of fishes, birds, and insects. Previous research suggests that changes in soil salinity may be an important factor in the spread of *P. australis* in tidal marshes. In this research, I analyze salinity, temperature, and moisture in the upper tidal reaches of Scarborough Marsh. These data, when combined with plant community dynamics, suggest a correlation between soil salinity and the presence *P. australis*. Results from this research will provide deeper insight and guidance regarding future management efforts at Scarborough Marsh and similar coastal ecosystems systems in the future.

Keywords: *Phragmites australis,* common reed, invasive species, salt marsh, *Spartina altenifora*, wetlands, soil salinity, plant communities