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The Historical Geography and Biogeography of Tidal Salt Marshes

ABSTRACT

This paper introduces the quaternary historical geography of tidal salt marshes, emphasizing parameters (extent, distribution, connectedness, etc.) that vary at multiple temporal and spatial scales, and that significantly influence the biogeography of their endemic taxa. Perhaps surprisingly, for features that are predominantly temperate, the emphasis here is on glaciers and on global patterns of glaciation and deglaciation. As the climate oscillates between glacial and interglacial periods, the latitudinal range of salt marsh habitat changes, eustatic sea level rises and falls on the order of 100+ meters, and coastal landforms change; these are among the more direct and profound impacts that have caused tidal marshes to undergo cycles of expansion/contraction and isolation/connection. In addition to discussing the general influences, both direct and indirect, of glacial cycles on tidal marsh biogeography, this paper presents the example of San Francisco Estuary marshes during their most recent incarnation. In particular, results from a study of the history of vegetation change in these marshes have demonstrated that within the Holocene interglacial period there have been profound changes in the biogeography of the tidal marshlands surrounding the Estuary. These changes have both natural causes, e.g., climate variability on time-scales of decades to hundreds of years, tectonic activity, and human causes, e.g., development around the Bay, modifications of the Estuary and its watershed.

Key words: tidal salt marsh, biogeography, glacial cycles, climate variability

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