First-Year Research in Earth Sciences: Dunes

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Abstract: Invasive insects and pathogens have long plagued North American forests, resulting in loss of native species and geomorphological change. This study evaluates the effects of these invaders on the wooded dunes of PJ Hoffmaster and possible effects this invasion may have on dune stability and ecology. Tree density, composition, and girth were recorded across three visits utilizing point-quarter vegetation transects and large vegetation quadrats paired with wind measurements. American Beech (*Fagu granifolia*), Red Oak (*Quercus rubra*), and Sugar Maples (*Acer saccharum*) constituted a majority of tree cover with Hemlocks (*Tsuga Canadensis*) occurring in concentrated groups. Wind speed was inversely correlated with tree density which generally increased with distance from the active dune slopes. There was no evidence of pathogenic infection found during fieldwork, suggesting that no infection has spread throughout the park as far as the coast. Due to the prevalence of Red Oak, oak wilt and its effect on dune stability may be a serious concern in the near future. The groupings of Hemlock may hinder the rapid spread of the Woolly Adelgid by limiting the contact between individuals.