

The continuing - and accelerating, rate of sea level rise has many negative implications for coastal areas and particularly for salt marshes. We investigated possible changes in salt marsh habitat for a 132 ha salt marsh in the Bandon National Wildlife Refuge on the southwest Oregon coast using a zero-dimensional marsh equilibrium model (Morris 2002; available at <http://129.252.139.114/model/marsh/mem.asp>) that uses both physical and biological data. We modeled the possible future marsh elevations in 0.10m increments for a total of 18 model runs. Model parameters included a predicted 0.60m rise in sea level by 2100, which lies in the medium confidence range for RCP2.6 (high end) and RCP 8.5 (low end) and an initial sea level rise rate of 0.18 cm/yr. The initial elevation data comes from our site surveys as does the elevation range of vegetation, the root:shoot ratios, and the maximum root depths. All other model parameters, including suspended sediment concentration, above ground biomass, organic matter decay rate, below ground turnover rate, and fraction of refractory carbon were left at the original model settings, which are representative of South Carolina marshes. The modeled data were then assigned to pixels in a 1/3 arc second DEM in 0.10 m bins that matched the initial, surveyed elevations. Using a hydrologic definition, we classified pixels as tidal flat (<MSL), low marsh (MSL-MHW), or high marsh (>MHW). We assume the tidal range does not change with future sea level rise; thus, for 2050 and 2100 we re-classify pixels based on their elevation relative to the modeled mean sea level. In 2050 some tidal flat area converts to low marsh as the model is sensitive to suspended sediment concentration. However, tidal flat area increases in 2100 as the increasing rate of sea level rise suppresses low marsh plant viability. Low marsh increases in 2050 and again in 2100. High marsh decreases modestly in 2050 but more dramatically in 2100. It is important to note that this salt marsh is completely constrained on its eastern margin by dikes and HWY 101. Hence, the high marsh cannot transgress at this and many similar locations along the Oregon coast.