

Sea Level Affecting Marshes Model (SLAMM)-New Functionality for Predicting Changes in Distribution of Submerged Aquatic Vegetation in Response to Sea Level Rise.

Henry Lee II, Deborah Reusser, Melanie Frazier, Lee McCoy, Jonathan Clough

Submerged aquatic vegetation (SAV) is an ecologically important habitat world-wide. In Pacific Northwest (PNW) estuaries, SAV in the lower intertidal and shallow subtidal habitats are dominated by the native seagrass, *Zostera marina* also referred to as submerged aquatic vegetation (SAV). Because of its narrow depth range, these seagrass beds are potentially vulnerable to sea level rise (SLR). The “Sea-Level Affecting Marshes Model” (SLAMM) is a moderate resolution model frequently used to predict the effects of sea level rise on marsh habitats; however a limitation of the current version of SLAMM is that it does not model SAV. Because of the ecological importance of SAV habitats, U.S. EPA, USGS, and USDA partnered with Warren Pinnacle Consulting to enhance the SLAMM modeling software to include new functionality to predict changes in *Zostera marina* distribution in response to sea level rise. Based on known distributions of *Zostera marina* in the Yaquina Bay Estuary, Oregon, we developed a logistic regression model to predict SAV distributions from readily available GIS parameters. Additionally, an R script was developed that can be used to generate the model coefficients for other estuaries where GIS layers of SAV are available. Then, this model was added as a new functionality in version 6.3 of SLAMM. Once the site-specific model coefficients are generated in an estuary, they can be directly input into SLAMM to predict the effects of SLR on SAV distributions under different climate change scenarios.