ABSTRACT SUBMISSION

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Restoration potential of tidal freshwater swamps following saltwater impact of hurricane surge in coastal South Carolina, USA

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Tidal freshwater swamps are unique wetland systems occupying low relief coastal areas subjected to both upland runoff and tidal flooding. These systems are especially vulnerable to climate change impacts of sea-level rise and increased drought/flood frequency. Coastal forests of South Carolina suffered both wind damage and saltwater flooding from Hurricane Hugo in 1989. Areas affected by saltwater flooding demonstrated little to no natural regeneration for several years following Hugo. Baldcypress seedlings were planted in salt-stressed coastal forests on Hobcaw Barony near Georgetown, SC to monitor long-term soil salinity effects on tree growth and survival. Baldcypress-dominated wetlands were selected for restoration including an unaffected freshwater depression (Crabhaul), a surge-flooded forest (Boardwalk) affected by minimal saltwater retention, and a saltwater-impacted site (Marsh Road) exhibiting salinity residuals for 30 months following the hurricane. Survival and height growth were measured annually from 1991-2003. After 13 years, survivorship was 7.9%, 21.7%, and 79.0% at Boardwalk, Crabhaul, and Marsh Road, respectively. From an initial height of 70 cm, seedlings grew 176 cm, 417 cm, and 636 cm by 2003 in Crabhaul, Boardwalk, and Marsh Road. Results show that water levels may be inhibiting natural regeneration on all sites and shading from shrub ingrowth and canopy trees have affected survival and growth at Crabhaul and Boardwalk sites. The superior response of seedling survival and growth at the Marsh Road site demonstrates that freshwater flushing can be adequate to enable recovery of salt-impacted areas.

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