DEATH BY *ULVA*

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ABSTRACT

We report on a series of field and laboratory mesocosm experiments where we examined the effects of two levels of decomposing *Ulva* on *Spartina alterniflora* growth, soil biogeochemistry, and nitrogen dynamics. Monitoring of porewater revealed rapid mineralization to ammonium from decomposing *Ulva*, with porewater levels quickly attaining potentially toxic concentrations. In addition, *Ulva* soil amendments were associated with elevated porewater sulfide levels. Plant uptake of *Ulva*-derived nitrogen was documented using an ^{15}N label, but higher nitrogen availability did not subsidize growth. In fact, higher levels of *Ulva* exposure resulted in pronounced reductions in above and belowground productivity, while lower levels of *Ulva* exposure resulted in reductions in belowground productivity only. Our findings support the hypothesis that decaying *Ulva* mats may create hotspots of adverse physiochemical conditions in salt marshes, similar to those reported for benthic and tidal flat habitats. Furthermore, decaying *Ulva* mats may compromise the erosion resistance of salt marshes via decreased plant belowground biomass. We conclude that additional field and laboratory studies are needed to establish more concretely which *Ulva* related stressors are primary, and whether similarly adverse responses are observed under natural field conditions.