



## **Prepared for the flood? Ecotypification leads to higher flooding tolerance of the dominant salt marsh grass *Elymus athericus***

Svenja Reents, Peter Mueller, Kai Jensen, Hao Tang, and Stefanie Nolte

University of Hamburg, Institute of Plant Science and Microbiology, Biology, Hamburg, Germany  
(svenja.reents@uni-hamburg.de)

Plant biomass production and species composition are important factors controlling the vulnerability of salt marshes to climate change and particularly accelerated sea-level rise (ASLR). *Elymus athericus* is a dominant salt-marsh grass in the European Wadden Sea, usually restricted to the high-elevated marsh zones. Recently, however, two ecotypes of *Elymus* have been identified on the barrier island of Schiermonnikoog, The Netherlands: a high-marsh and a low-marsh ecotype. In our study, we investigated the adaptations of the low-marsh ecotype causing its range expansion into lower and thus wetter parts of the salt marsh. We exposed both ecotypes in a factorial mesocosm experiment to different flooding frequencies. The low-marsh ecotype sustained significantly more aboveground biomass at the highest flooding frequency than the high-marsh ecotype. As a result of resource allocation from below- to aboveground biomass, the low-marsh ecotype was able to elongate leaves and stems to maintain gas exchange and photosynthesis even at the highest flooding frequency. Our study therefore highlights the importance to consider shifts in genetic structure of a plant population (here: ecotypification) to understand the effects of ASLR on plant biomass production and species composition.