Interactive effects of vegetation and grain size on erosion rates in salt marshes of the Northern Adriatic Sea

Veronica Lo[1], Tjeerd Bouma[2], Carl Van Colen[3] and Laura Airoldi[4]

[1] Universiteit Gent, Faculteit Wetenschappen, Vakgroep Biologie, Onderzoeksgroep Mariene Biologie (MARBIOL), Campus De Sterre S8, Krijgslaan 281, 9000 Gent, Belgium
E-mail: lo.veronica@gmail.com

[2] Royal Netherlands Institute for Sea Research (NIOZ)

[3] Ghent University

[4] University of Bologna

Salt marsh ecosystems provide multiple ecosystem services, including protecting coastlines from erosion via sediment stabilization. The functions provided by salt marsh vegetation are increasingly negatively affected by human pressures such as land reclamation, climate change and eutrophication. We sampled salt marshes across 230 km of the Italian Northern Adriatic coastline and quantified resistance to lateral erosion by exposing the samples to simulated waves in a flume experiment. We analyzed the relationships between erosion and the presence of Spartina vegetation, the local sediment characteristics, and leaf C:N ratios.

Erosion was significantly lower when Spartina vegetation was present across all samples, and in the absence of vegetation, erosion depended on silt content. Our study highlights the interactive effects of vegetation and grain size on erosion rates across the sampling sites, raising important considerations for management of salt marshes for the purpose of coastal protection.