

# Salt marshes retention capacity for carbon and nitrogen at Ria de Aveiro lagoon (Portugal)

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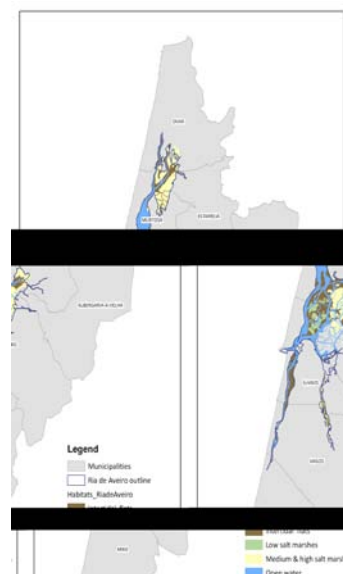
**Introduction:** Estuarine and coastal ecosystems are widely known for their high productivity [1], nutrient retention capacity, and as nutrient buffers that contribute to maintain ecosystem health. Hence, these ecosystems provide important ecological services, recognized as economical values to human population and to the overall system [2]. In saltmarshes, different plant species are adapted to different environmental conditions; this entails unique responses to eutrophication and pronounced differences among species with respect to carbon sequestration [3].

In the present study, we quantify and compare the contribution of *Spartina maritima* and *Juncus maritimus* to nitrogen and carbon retention capacity in the Ria de Aveiro saltmarshes.

**Methods:** The Ria de Aveiro is located along the Atlantic Ocean on the northwest coast of Portugal (40°38'N, 8°44'W) and is a temperate shallow coastal mesotidal lagoon (45 km length; 10 km wide). The system is characterised by four main channels with significant areas of intertidal zones, comprising mud and sand flats, salt marshes and islands.

*S. maritima* and *J. maritimus* mono-specific stands were monitored for one year in three salt marshes. Aboveground and belowground biomass, detritus, carbon and nitrogen content of both plant species were quantified bi-monthly during the sampling period. Rhizosediment was also sampled for later analysis of organic matter, total carbon and total nitrogen. In addition to this, environmental parameters including salinity, Eh, pH and temperature were measured *in situ*. Biomass, carbon and nitrogen production was calculated following previously describe methods [3].

**Results:** Halophyte biomass diverged between the studied species with *J. maritimus* having greater biomass than *S. maritima*. Accordingly, nitrogen and carbon content in the plant aboveground and belowground material and sequestration in the rhizosediment differed between plant species.



**Fig. 1:** Ria de Aveiro salt marshes (source: [4]).

**Discussion:** In the present study, the nutrient retention capacity of salt marshes depends on plant species, seasonal dynamics and environmental variables. Both *J. maritimus* and *S. maritima* play crucial roles as nutrient buffers in salt marshes, with rhizosediment an important carbon and nitrogen reservoir.

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**References:** [1] McLuscky and Elliott (2004) *Oxford University Press*, 214 pp.; [2] Costanza et al. (1997) *Nature* **387**:253-260; [3] Sousa et al. (2010) *Estuarine Coastal and Shelf Science* **87**:640-646; [4] AMBIECO (2011) POLIS Litoral Ria Aveiro, 226 pp.