

505 **Supplementary Figure captions**

**Figure S1** Classification and regression trees for **(a)** decomposition rate ( $k$ ) and **(b)** stabilization factor ( $S$ ). Step-wise splitting of the data set was conducted based on the predictor variables temperature, tidal amplitude, salinity class, soil type, ecosystem type, and elevation zone. Minimum size of child nodes was set at 4 corresponding to at least two sites, V-fold cross validation was set at  
510 5.

**Figure S2** Decomposition rate ( $k$ ) and stabilization factor ( $S$ ) in high (orange) and low (blue) elevated zones of 21 tidal wetland sites. Shown are mean values  $\pm$  SE and results of one-way ANOVA (ns,  $P > 0.05$ ; \*  $P \leq 0.05$ ; \*\*  $P \leq 0.01$ ). Information on dominant plant species and difference in elevation between zones is given below site names.

515 **Figure S3** Decomposition rate ( $k$ ) and stabilization factor ( $S$ ) along salinity gradients of four estuarine regions. ANCOVA results are included. Models included estuaries as random factor and separately tidal amplitude and temperature as covariates resulting in similar probability values for estuary and salinity effects. Shown are mean values  $\pm$  standard deviations.

520

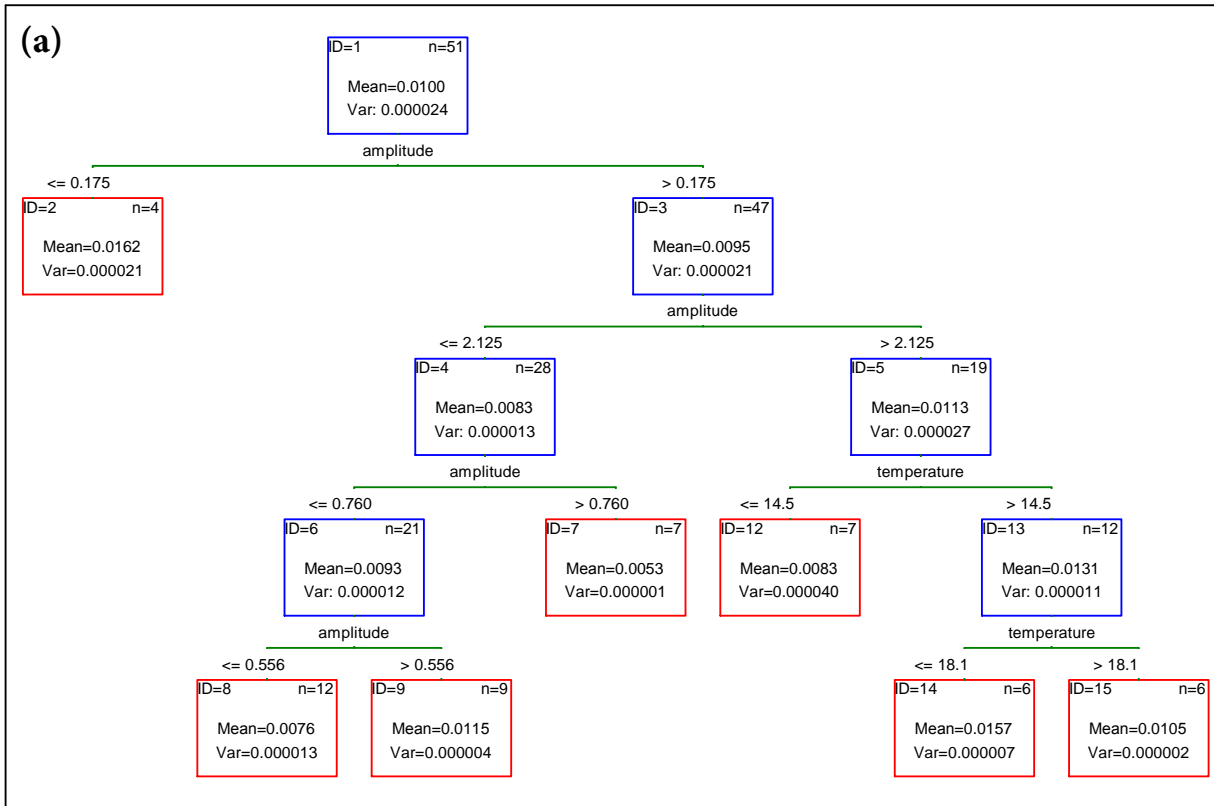
525

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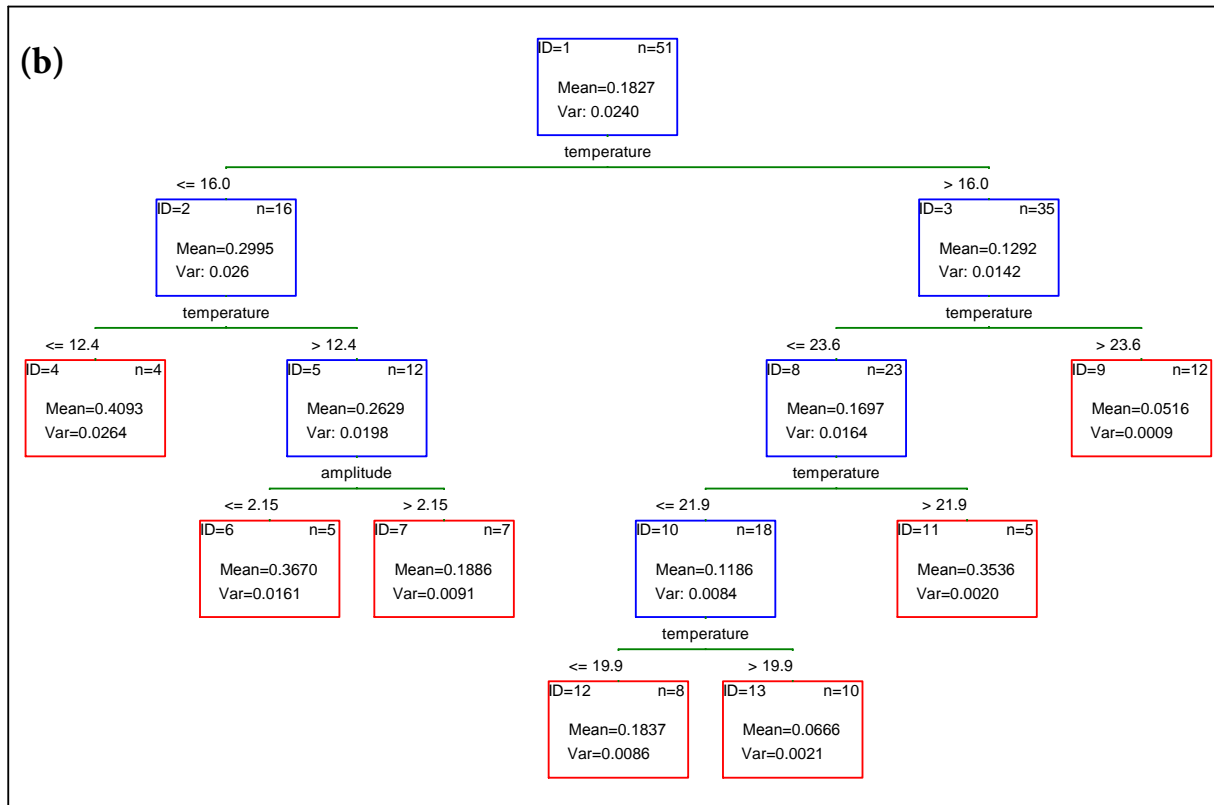
# Figure S1

## Tree graph for k



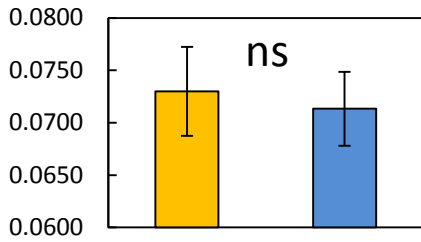
**Figure S1** Classification and regression trees for decomposition constant (k) (A, top panel) and stabilization factor (S) (B, bottom panel). Step-wise splitting of the data set was conducted based on the predictor variables temperature, tidal amplitude, salinity class, soil type, ecosystem type, and elevation zone. Minimum size of child nodes was set at 4 corresponding to at least two sites, V-fold cross validation was set at 5.

## Tree graph for S

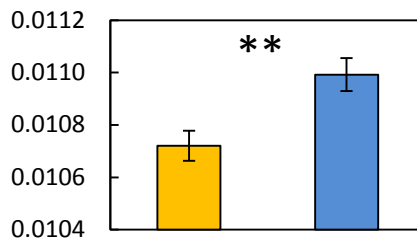


**Figure S2**

stabilization ( $S$ )



decomp. rate ( $k$ )

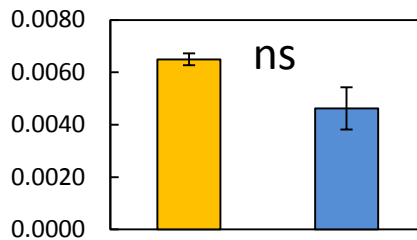
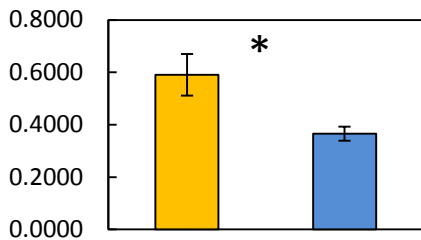


**Dongtan, China**

*Phragmites australis*;

*Scirpus mariqueter*

$\Delta$  elevation: 50 cm

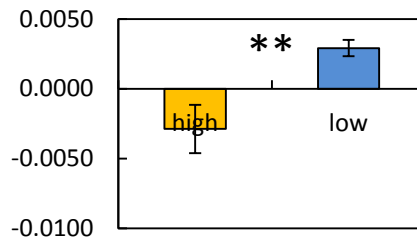
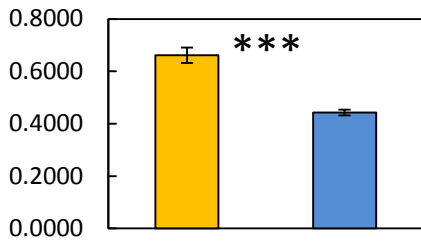


**Spiekeroog, Germany**

*Festuca rubra*;

*Puccinellia maritima*

$\Delta$  elevation: 42 cm

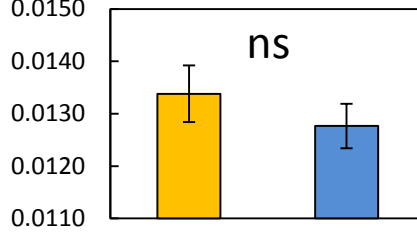
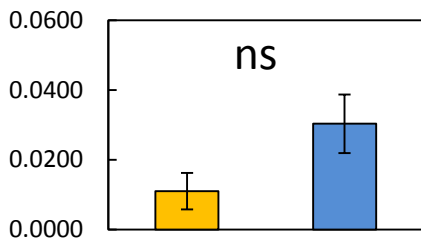


**Rimouski, Canada, QC**

*Plantago maritima*;

*Spartina alterniflora*

$\Delta$  elevation: 160 cm



**Patuxent, United States, MD**

*Impatiens capensis*; *Polygonum*

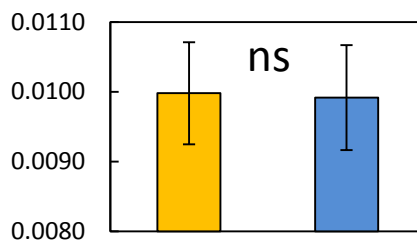
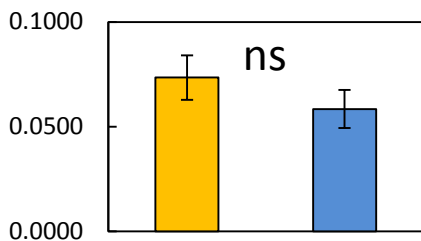
*arifolium*; *Bolboschoenus*

*fluviatilis*

*Nuphar lutea*; *Hydrilla*

*verticillata*

$\Delta$  elevation: 126 cm

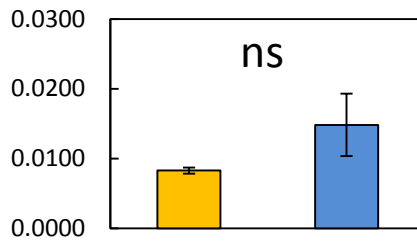
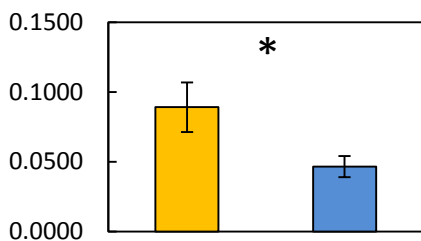


**Laws Point, United States, MA**

*Spartina patens*;

*Spartina alterniflora*

$\Delta$  elevation: 10 -130 cm



**TIDE project, United States, MA**

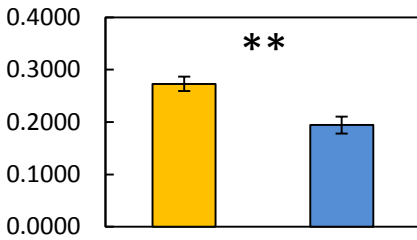
*Spartina patens*;

*Spartina alterniflora*

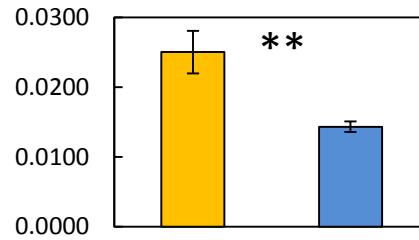
$\Delta$  elevation: 10 -130 cm

Figure S2 continued

stabilization ( $S$ )



decomp. rate ( $k$ )

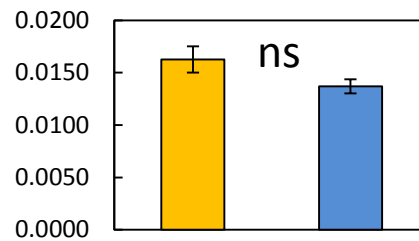
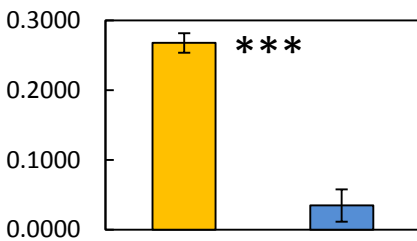


**Dieksanderkoog, Germany**

*Elymus athericus*;

*Puccinellia maritima*

$\Delta$  elevation: 50 cm

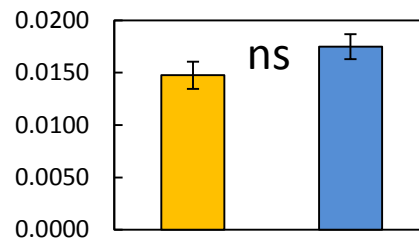
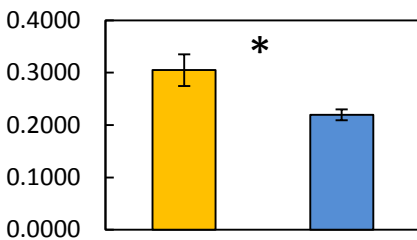


**Sönke-Nissen-Koog, Germany**

*Elymus athericus*;

*Puccinellia maritima*

$\Delta$  elevation: 20 cm

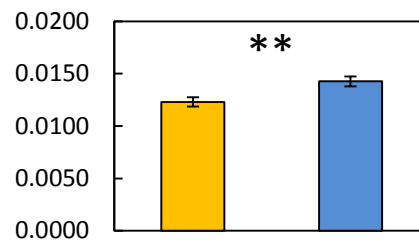
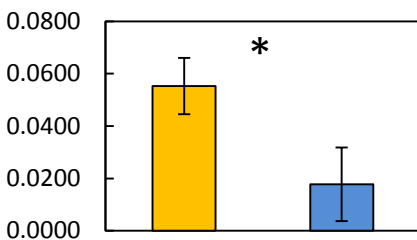


**Noord Friesland Buitendijks, The Netherlands**

*Elymus athericus*;

*Elymus athericus*

$\Delta$  elevation: 15 cm

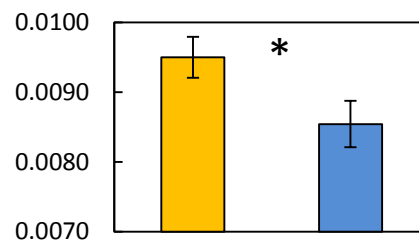
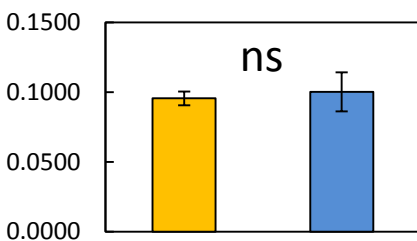


**Ameland, The Netherlands**

*Elymus athericus*;

*Spartina anglica*

$\Delta$  elevation: unknown

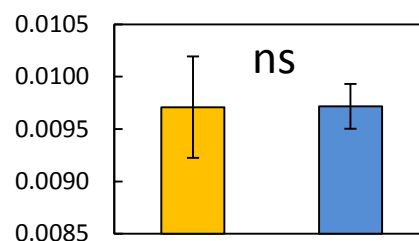
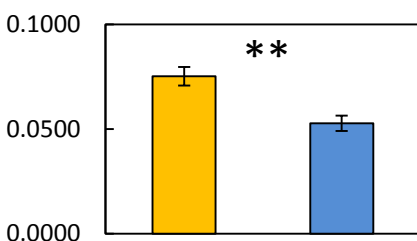


**Twin Cays, Belize**

*Rhizophora mangle* (dwarf);

*Rhizophora mangle* (fringe)

$\Delta$  elevation: unknown



**Isla Solarte, Panama**

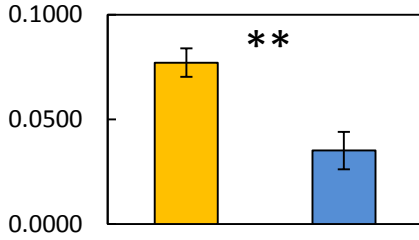
*Rhizophora mangle* (dwarf);

*Rhizophora mangle* (fringe)

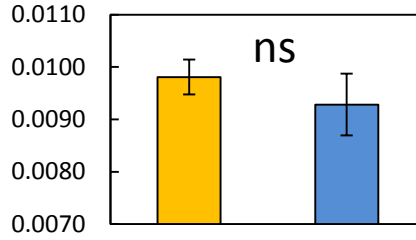
$\Delta$  elevation: unknown

# Figure S2 continued

stabilization ( $S$ )



decomp. rate ( $k$ )

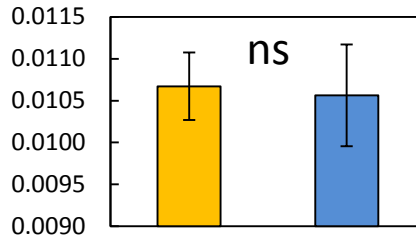
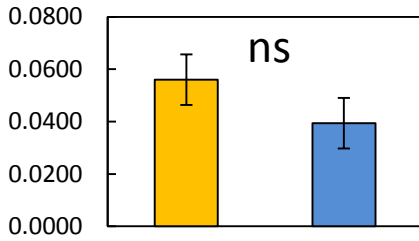


## Isla Crisobal, Panama

*Rhizophora mangle* (dwarf);

*Rhizophora mangle* (fringe)

$\Delta$  elevation: unknown

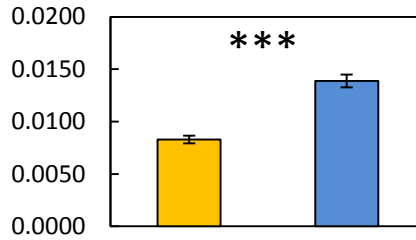
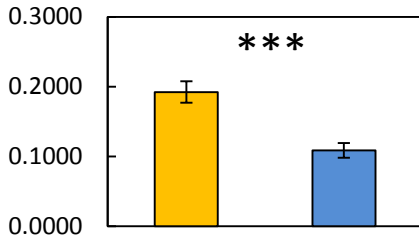


## Isla Popa, Panama

*Rhizophora mangle* (dwarf);

*Rhizophora mangle* (fringe)

$\Delta$  elevation: unknown

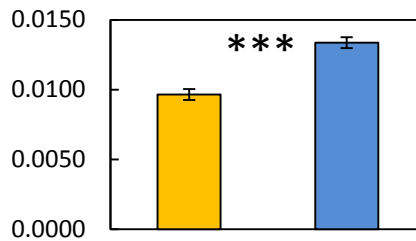
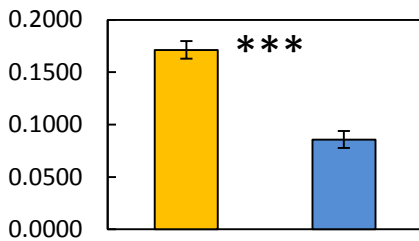


## Coon Island, United States, CA

*Spartina pacifica*;

*Spartina foliosa*

$\Delta$  elevation: 68 cm

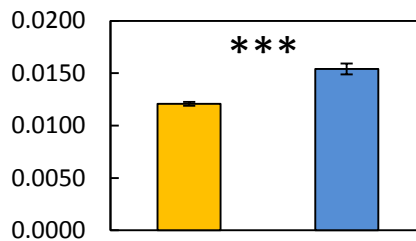
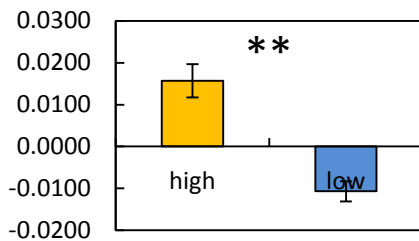


## Rush Ranch, United States, CA

mixed community;

*Schoenoplectus acutus*

$\Delta$  elevation: 61 cm



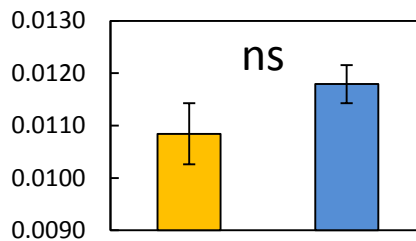
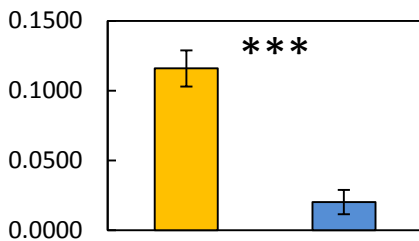
## GCRew, United States, MD

*Spartina patens*; *Schoenoplectus*

*americanus*; *Phragmites australis*

*Spartina alterniflora*

$\Delta$  elevation: unknown



## Wachapreague, United States, VA

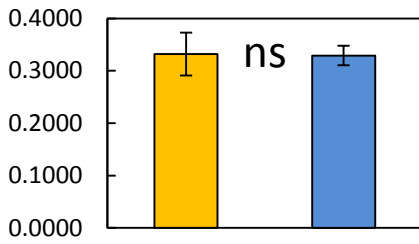
*Distichlis spicata*

*Spartina alterniflora*

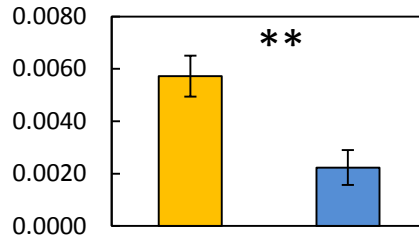
$\Delta$  elevation: unknown

**Figure S2 continued**

stabilization ( $S$ )



decomp. rate ( $k$ )



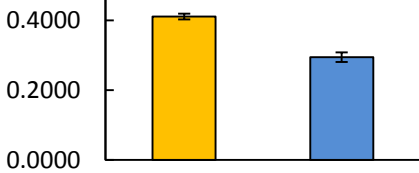
**Venice Lagoon, Italy**

*Sarcocornia fruticosa*;

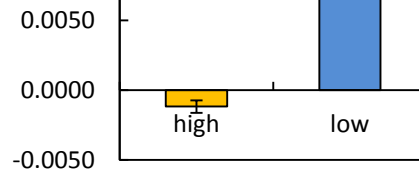
*Salicornia veneta*

$\Delta$  elevation: 19 cm

0.6000



0.0100



**Ebro Delta, Spain**

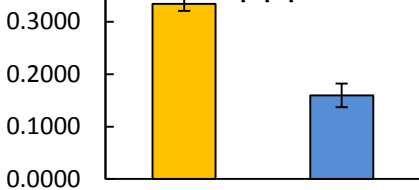
*Paspalum, Phragmites*;

*Salicornia*

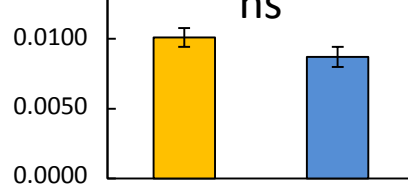
$\Delta$  elevation: 64 cm

(! high marsh brackish, low marsh saline)

0.4000



0.0150



**Dipper Harbour, Canada, NB**

*Plantago maritima; Triglochin maritima*

*Spartina alterniflora*

$\Delta$  elevation: 20 cm

Figure S3

