

# Don't touch me baby - just leave me alone: Ecosystem services of unmanaged salt marshes

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# Ongoing area gains in salt marshes

Success



(A) Natural (island) salt marsh

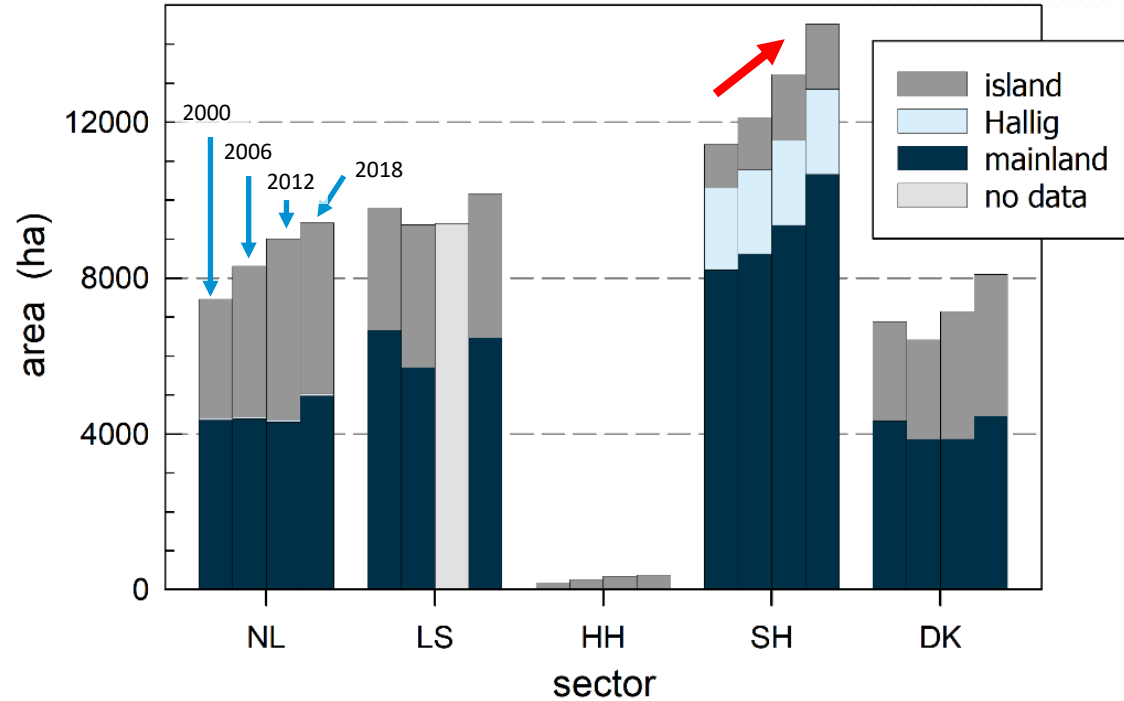


(B) Artificial (mainland) salt marsh



(C) Hallig island salt marsh

Esselink et al. (2017)



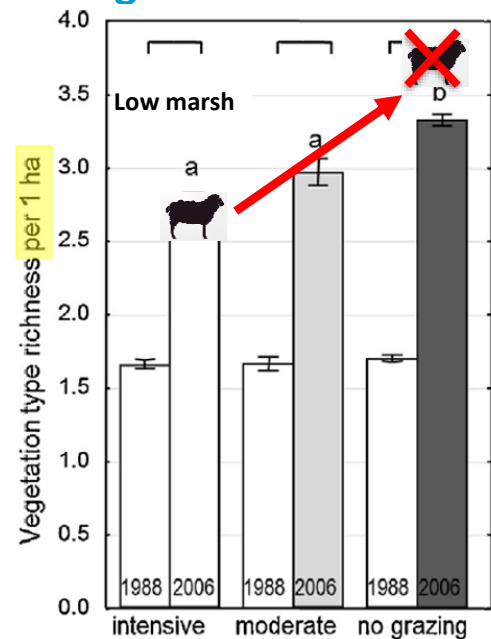
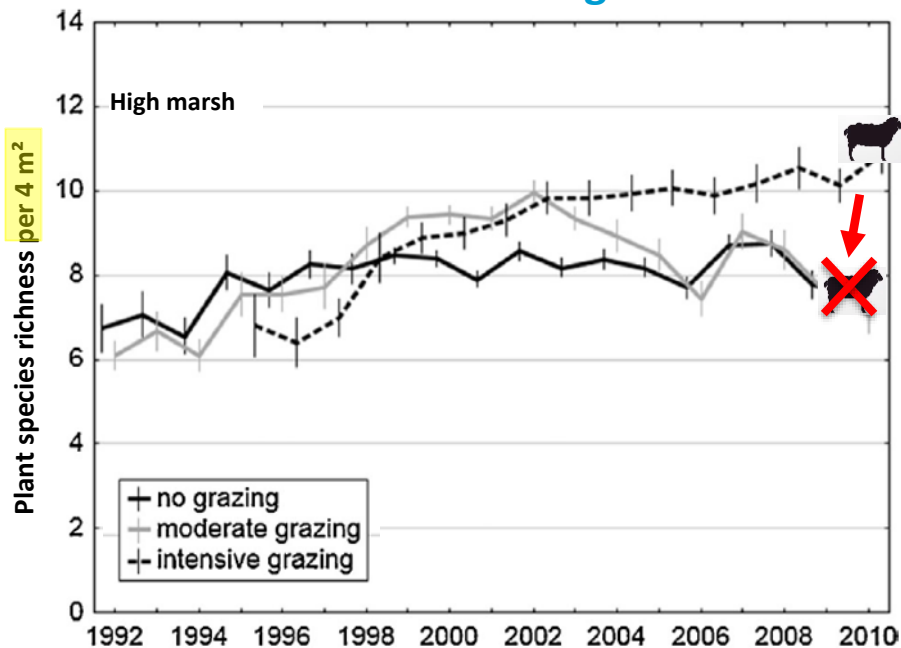
Elschott et al. (in press)

# Dont graze me baby – „biodiversity“

What is „biodiversity“?

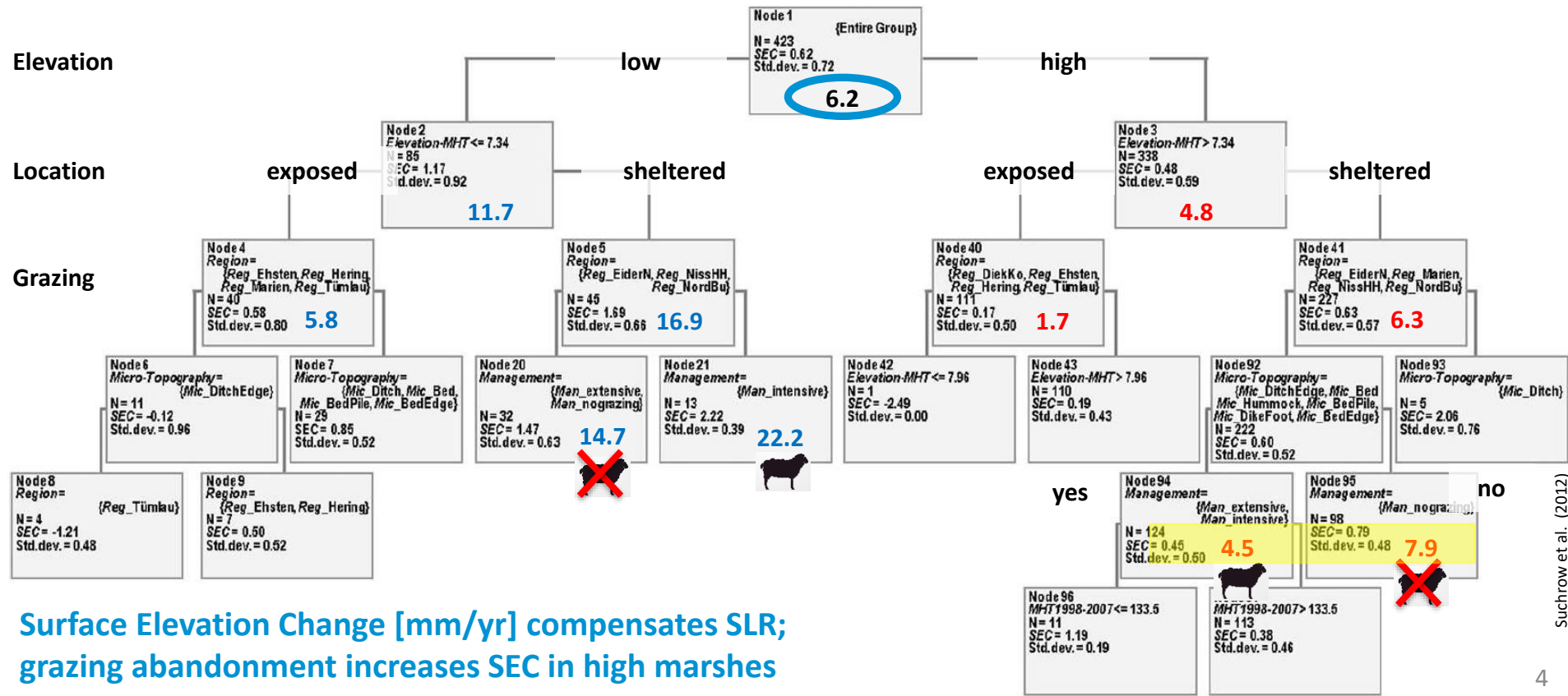


Grazing increases plant species richness on small scales, but decreases vegetation richness at larger scales



Wanner et al. (2014)

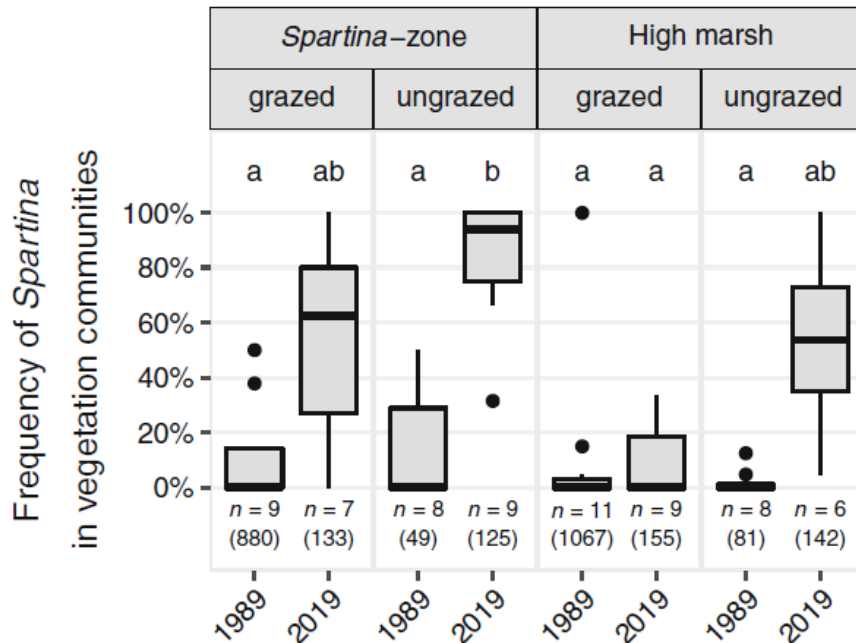
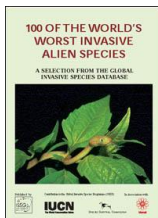
# Dont graze me baby – „resilience to slr“



# Dont touch me baby – *Spartina*

## *Spartina anglica*: native or alien?

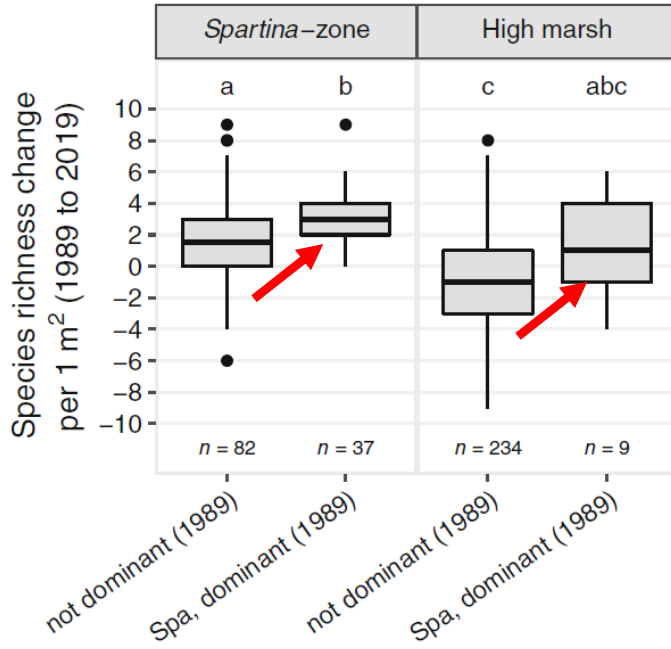
- Evolved from hybrid *S. townsendii* via genome duplication
- S. townsendii* derived in 19<sup>th</sup> century from hybridization of European *S. maritima* and American *S. alternifolia*
- S. anglica* was planted for coastal protection purposes in Wadden Sea in early 20<sup>th</sup> century
- S. anglica* is considered as one of the 100 worst invaders of the world
- What is its effect on 'biodiversity' & ecosystem functioning?**



**Pronounced increase of *Spartina anglica* between 1989 and 2019**

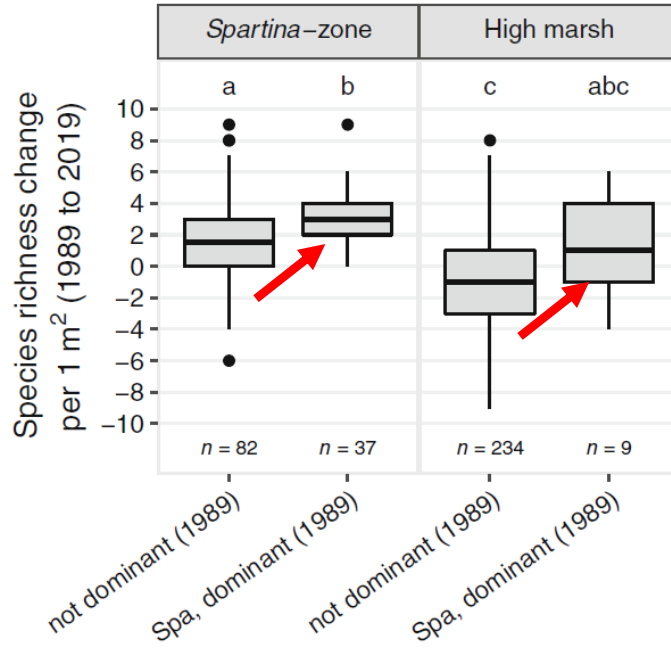
# *Spartina* invasion increases „biodiversity“

## *Spartina* invasion & species richness

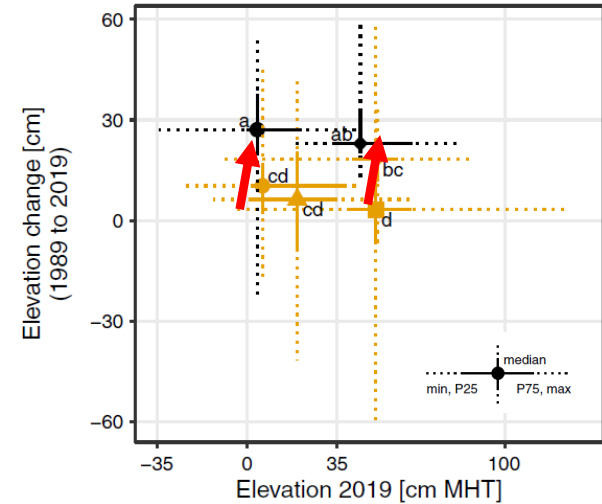


# *Spartina* invasion increases „biodiversity“ & „resilience“

## *Spartina* invasion & species richness



## *Spartina* invasion & surface elevation change



*Spa* (vegetation community) dominant in 1989

Other vegetation communities dominant in 1989

- stable
- ◆ disappeared

- stable
- ◆ disappeared
- ▲ established
- absent

# Take Home Message

- Don't touch me baby - just leave me alone: Unmanaged salt marshes 'benefit' from grazing abandonment
- Biodiversity: Considering relevant spatial scales, plant species richness does not decrease after abandonment; vegetation type richness tends to increase
- Accretion rates: Mainly affected by elevation (flooding frequency) and SSC of flooding water. Under low flooding frequency and/or SSC, higher biomass of abandoned salt marshes increases accretion
- Invasive species: *Spartina* as ecosystem engineer increasing the resilience of salt marshes against sea level rise and increasing plant species richness



**!! Thanks !!**

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