

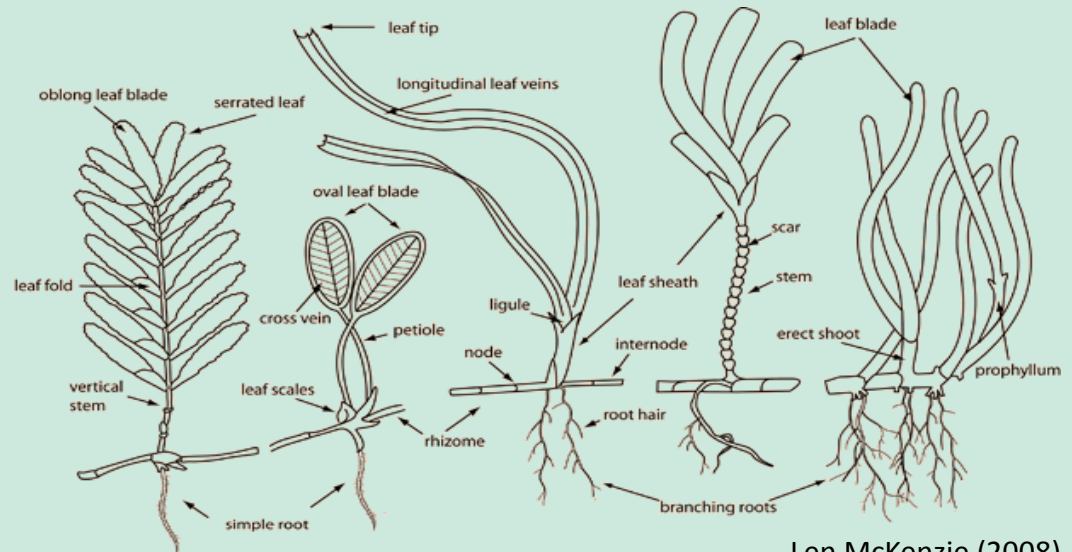
Seagrass Habitats Distribution and Ecological State Along the Southern Bulgarian Black Sea Coast

D. Deyanova, D. Berov, V. Karamfilov



The Seagrasses

- Marine vascular flowering plants
- Inhabit shallow habitats on soft bottom sediments
- Perform very important ecosystem service
- Responsible for 5-15% of the carbon storage in the ocean
- Spread world wide
- Natura2000 and MSFD



Decline

- Runoff of nutrients and sediments
- Construction and dredging
- Destructive fishing
- Natural causes

Problems and reasons



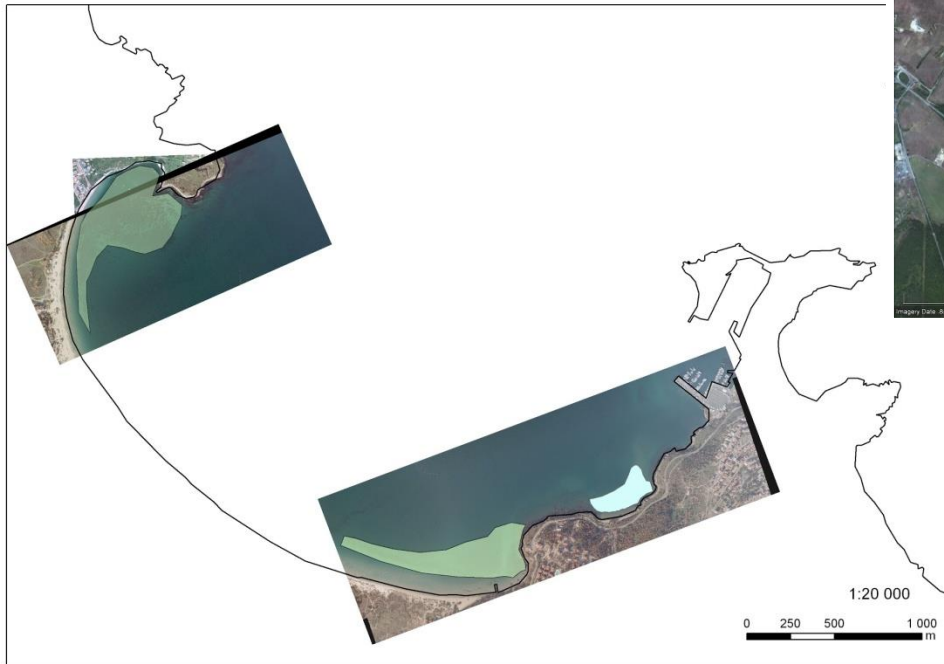
Aim of the study

- Mapping of seagrass meadows
- Preliminary assesment of ecological state

Distribution along the Southern Bulgarian Black Sea coast

Mapping methods

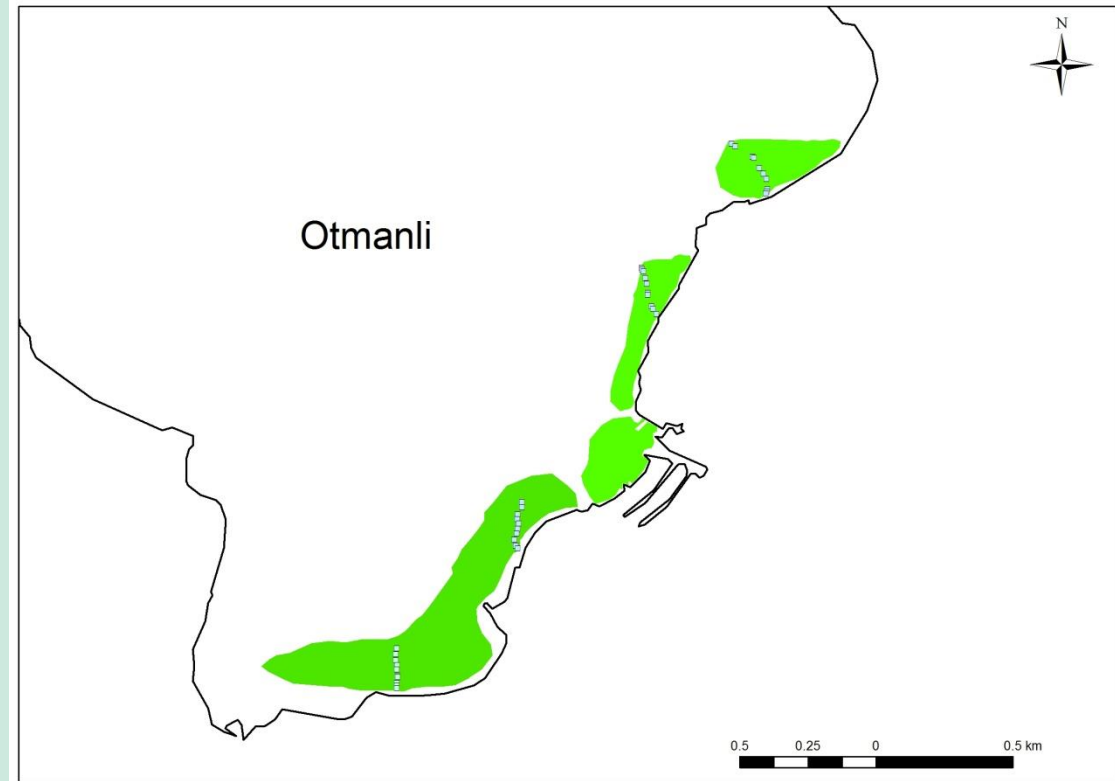
- Satellite and orthophoto images



Distribution along the Southern Bulgarian Black Sea coast

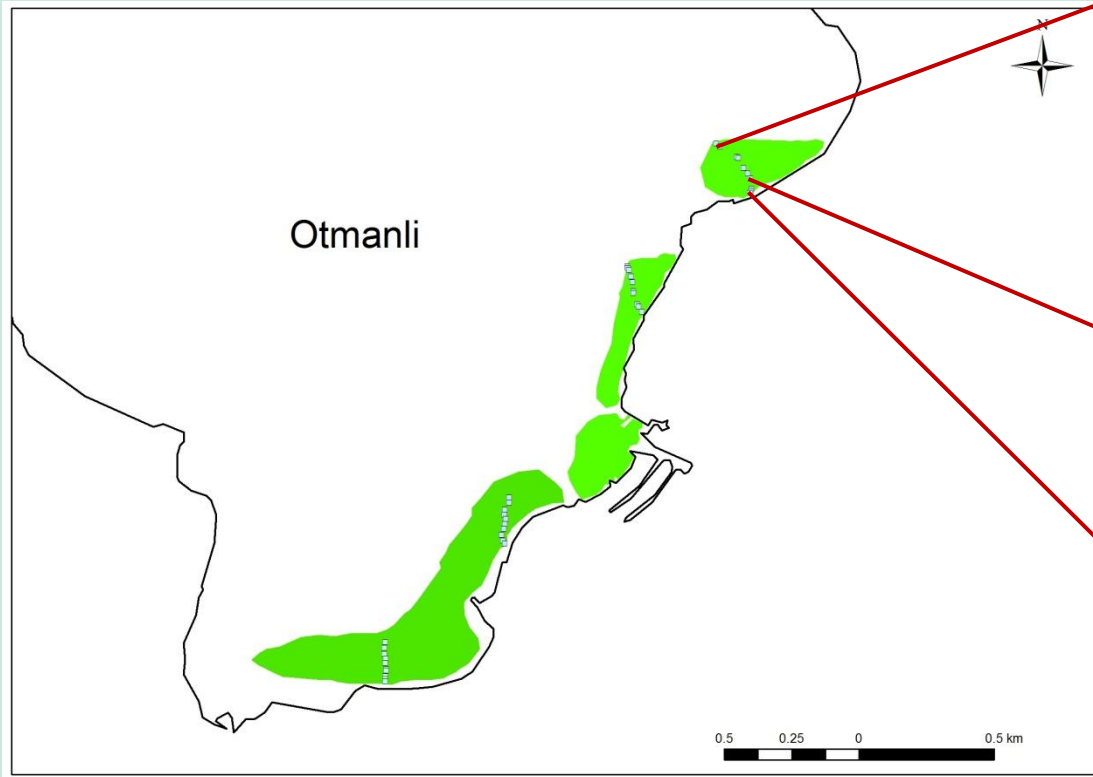
Mapping methods

- Satellite and orthophoto images
- Underwater photo transects



Distribution along the Southern Bulgarian Black Sea coast

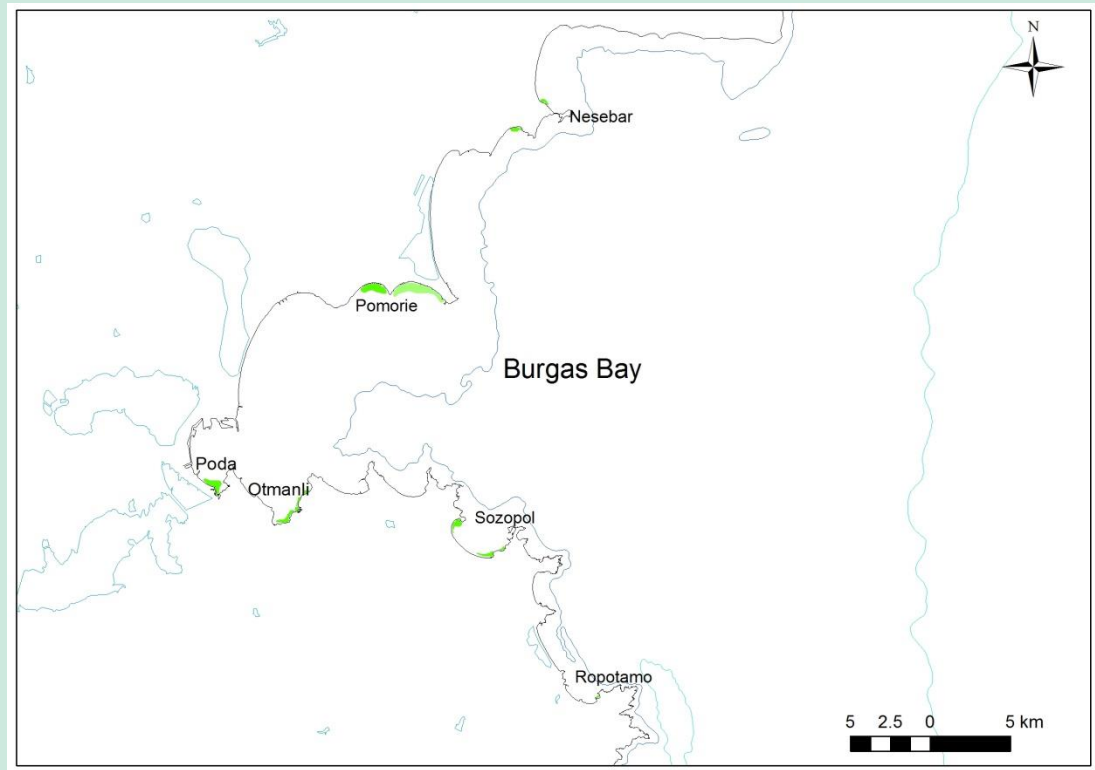
Underwater photo transects



Distribution along the Southern Bulgarian Black Sea coast

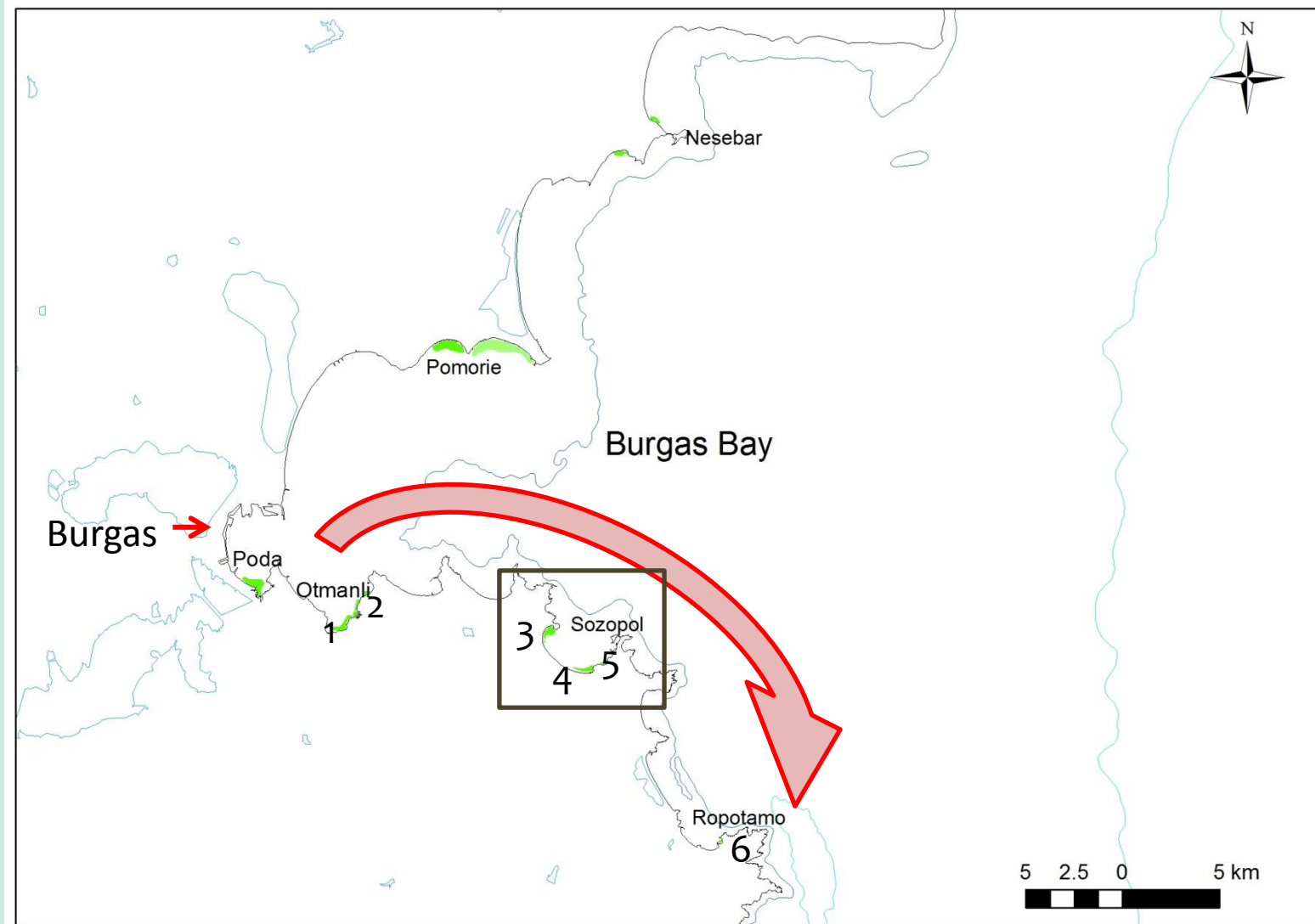
Mapping results

- **12 meadows**
 - 8 ground-troughed
 - 4 only satellite images
- **Total area 295,43 ha**
 - Biggest – Pomorie (138,58 ha)
 - Smallest – Ropotamo (2,27 ha)



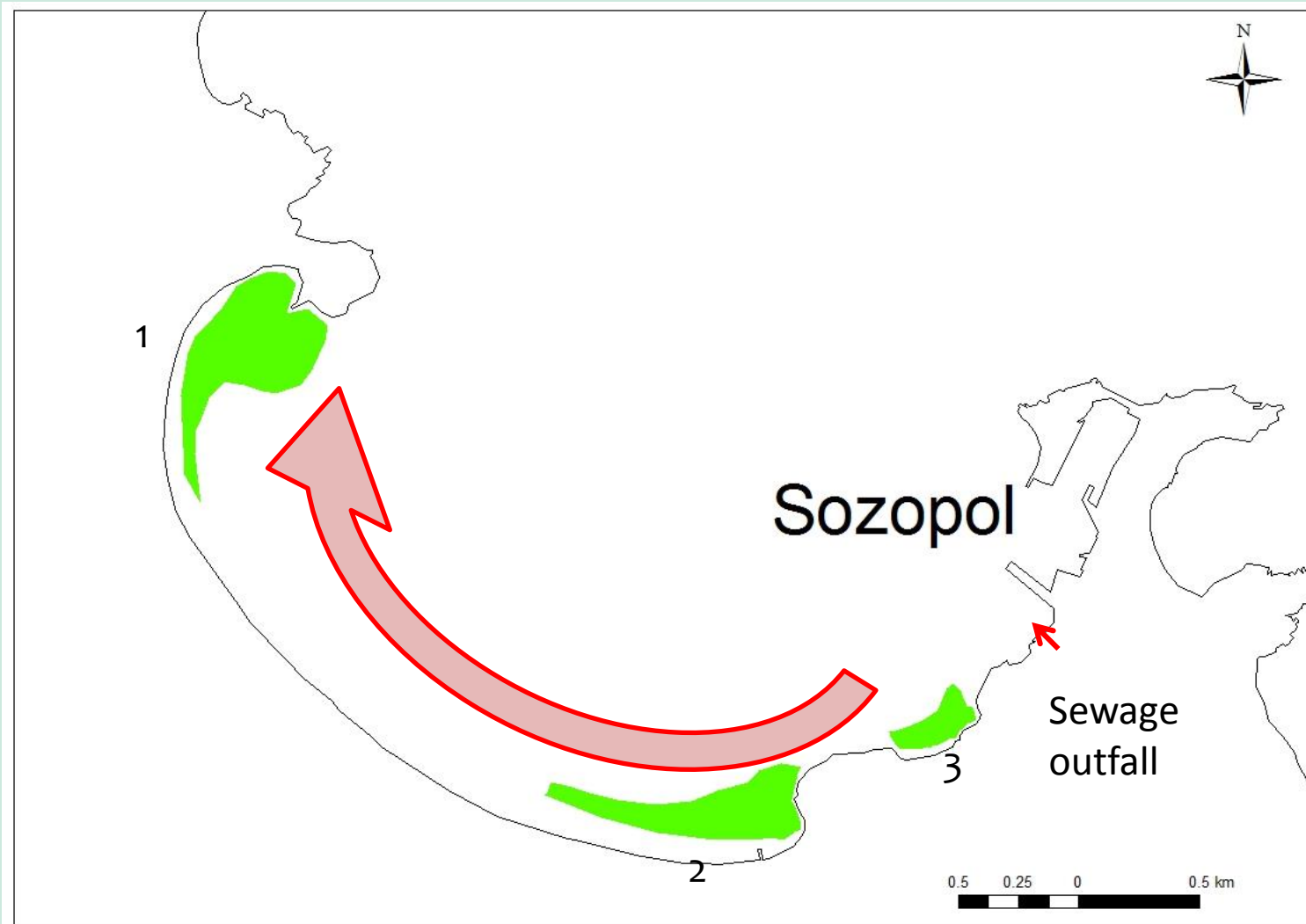
Ecological state

Sampling methods and design



Ecological state

Sampling methods and design



Ecological state

Sampling methods and design

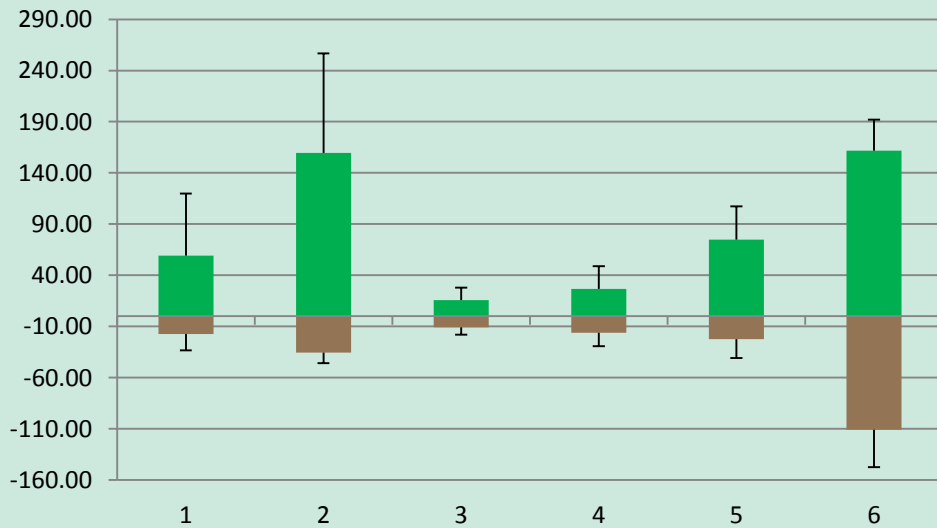
- Destructive sampling
 - Biomass
 - Shoot density
 - **Leaf Area Index**
 - Epiphyte cover



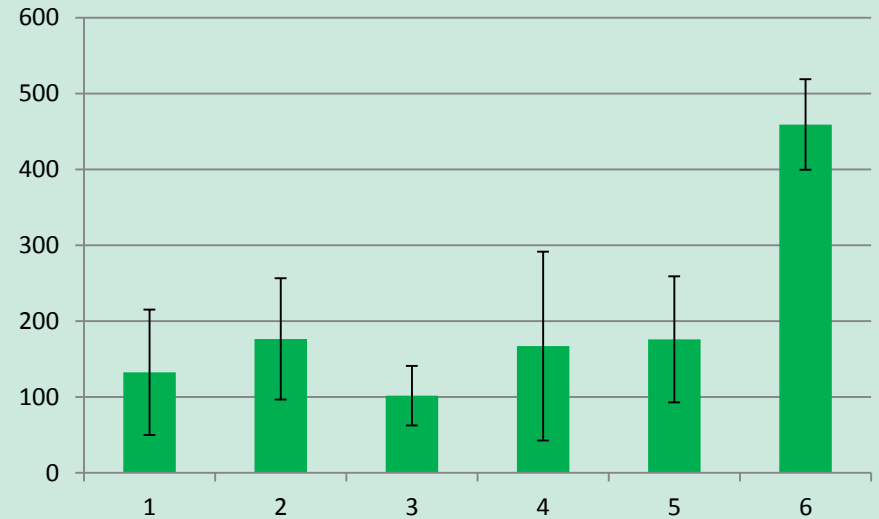
Ecological state

Biomass, Shoot density, LAI and Epiphyte cover (Burgas bay)

Dry biomass g/m²



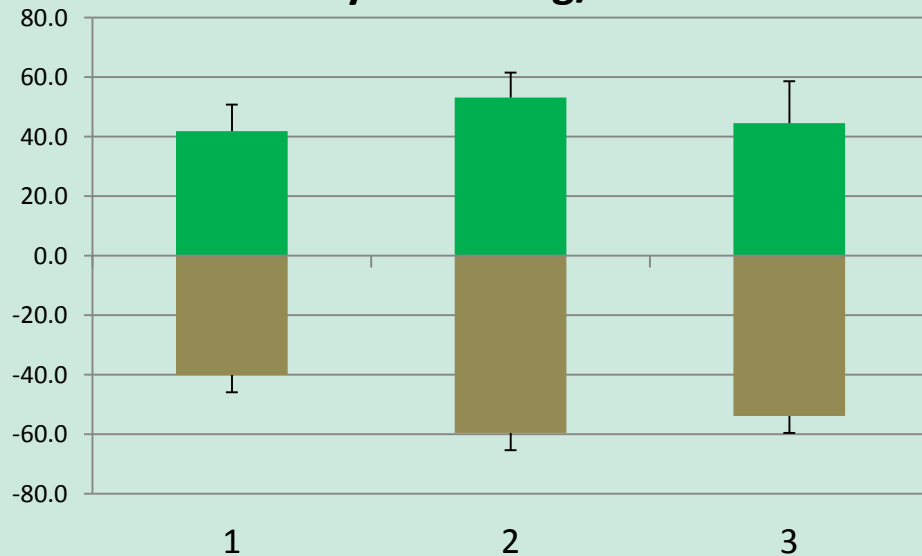
Shoot density (N shoots/m²)



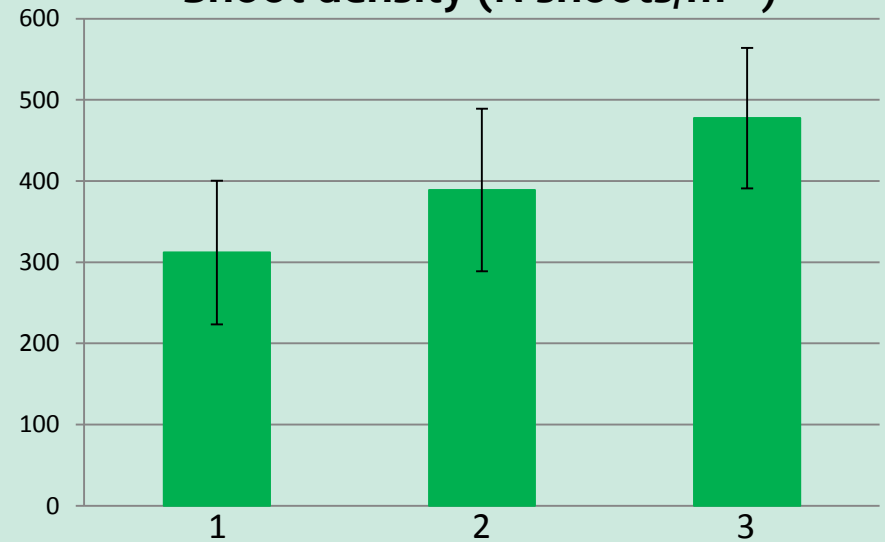
Ecological state

Biomass, Shoot density, LAI and Epiphyte cover
(*Sozopol bay*)

Dry biomass g/m²

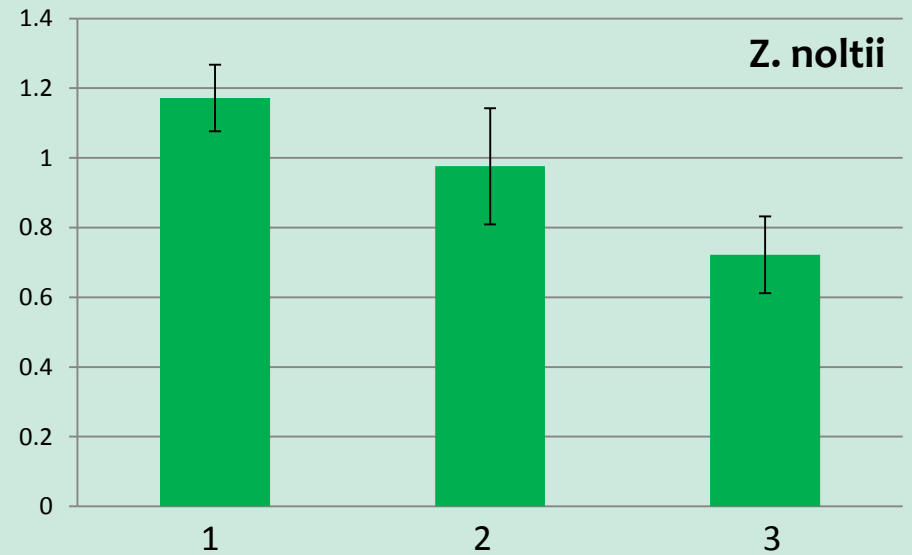
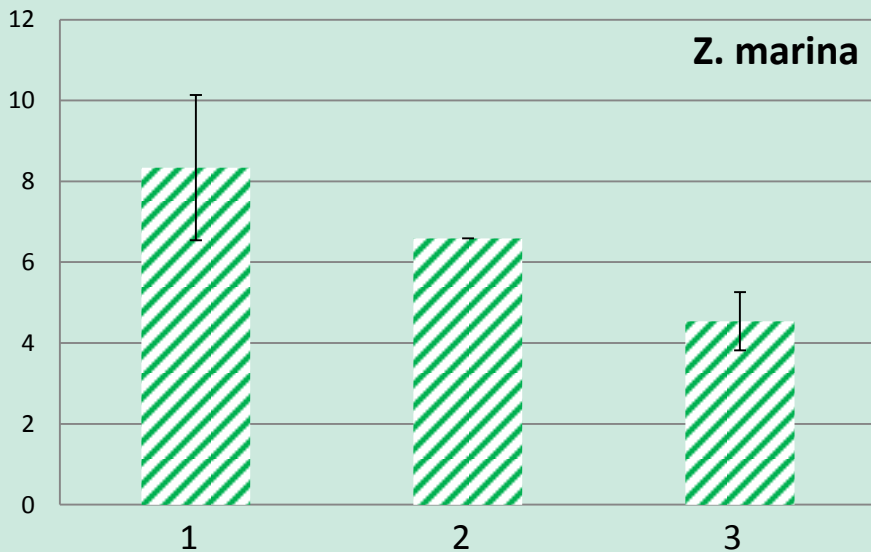


Shoot density (N shoots/m²)



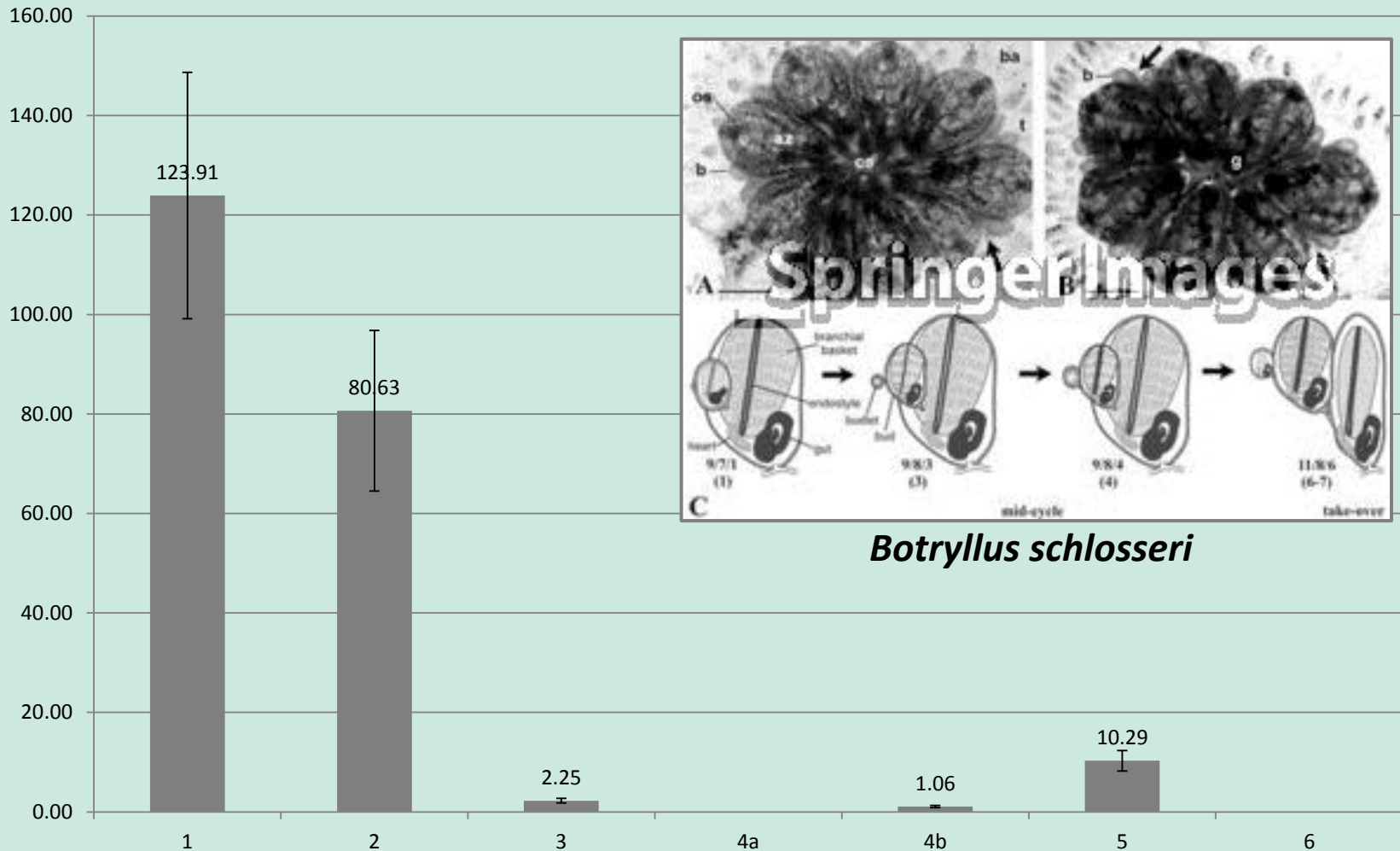
Ecological state

Biomass, Shoot density, **LAI** and Epiphyte cover
(*Sozopol bay*)



Ecological state

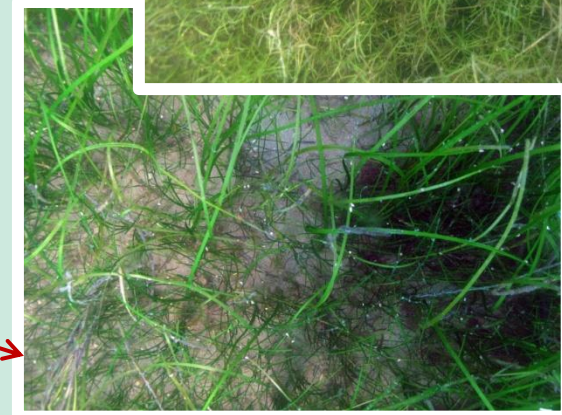
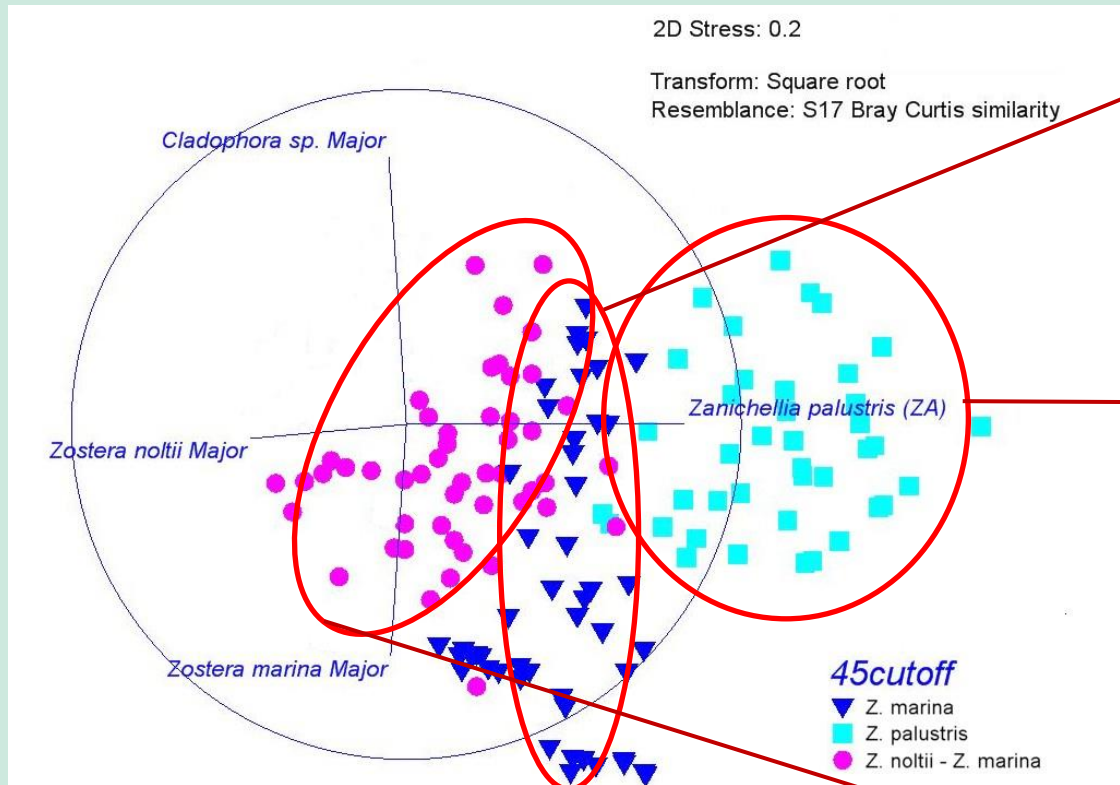
Biomass, Shoot density, LAI and Epiphyte cover





Ecological state

Community structure preliminary results



Ecological state

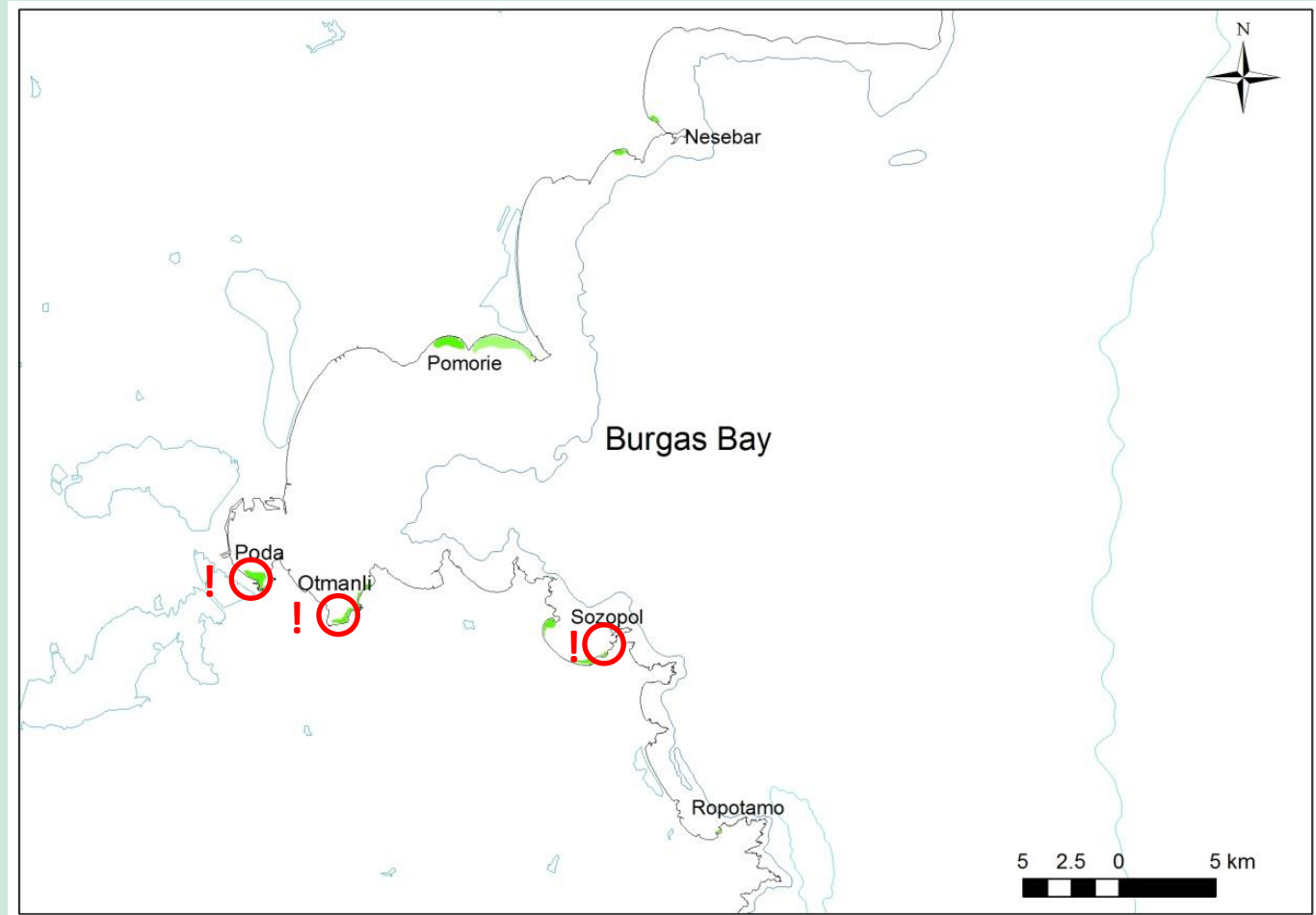
Good Environmental Status preliminary assessment

Total area
 $\leq 295,43$ ha

Dry biomass
GES 60 g/m^2

Shoots density
GES 200 sh/m^2

LAI to be defined



Conclusions

- Seagrass meadows along the Bulgarian coast are located mainly in the Burgas Bay
 - Seagrass meadows in eutrophicated coastal areas are not in good ecological state
 - Measures for their protections are needed in order to fulfill the MSFD criteria
-
- Continue working with uninvestigated seagrass meadows
 - Develop Seagrass based indexes calibrated for the Black Sea



BANDTÁNG, *ZOSTERA MARINA* L.

Thank you!