Multi-scale spatial variability of amphipod assemblages from the foliar stratum of the *Posidonia oceanica* (L.) Delile meadow

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Context of the Study

- Ecological communities are patchy
- Several spatial and temporal scales
- Studying spatial patterns is of ecological importance
  - ➢ understand the causes of the distribution and abundance of organisms
  - ➢ provide valuable basis for management and conservation

Context of the Study

- ***Posidonia oceanica***
  - endemic species of seagrass
  - forms large meadows
  - important habitat for mobile invertebrates

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- **Amphipods**
  - large number of species
  - considerable abundance/biomass
  - important trophic ressource

Peter Bryant

Amphipods

Vertical spatial variability of amphipods is better known in *P. oceanica* meadows

Horizontal spatial variability ?

At different spatial scales ?

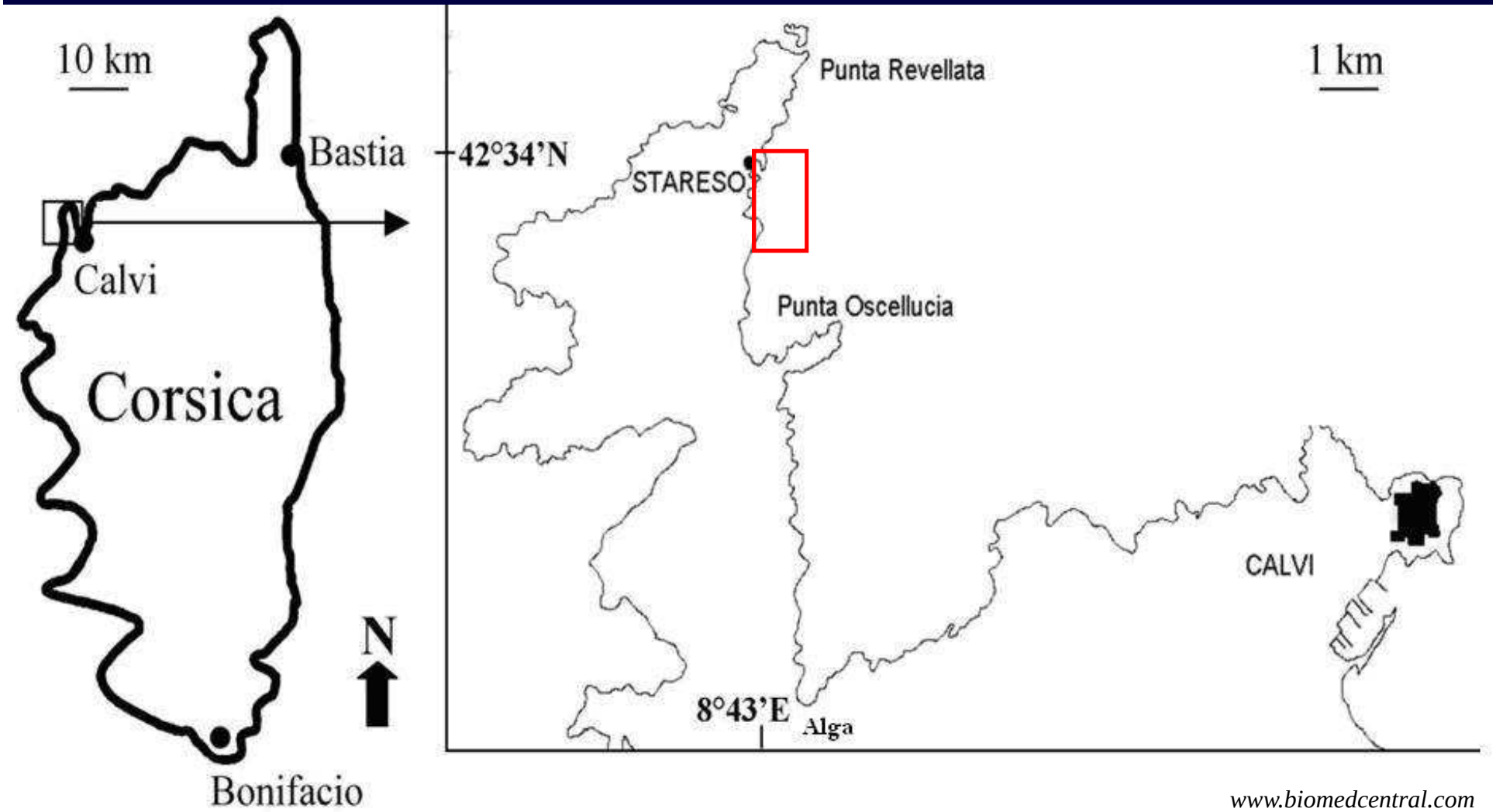
Objective

Assess the spatial variability, at different scales, of amphipods living in the *P. oceanica* meadows

Explore the relationship between the amphipod assemblages and habitat structure

Material & Methods

Study site : Revellata Bay (NW of Corsica)



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Material & Methods

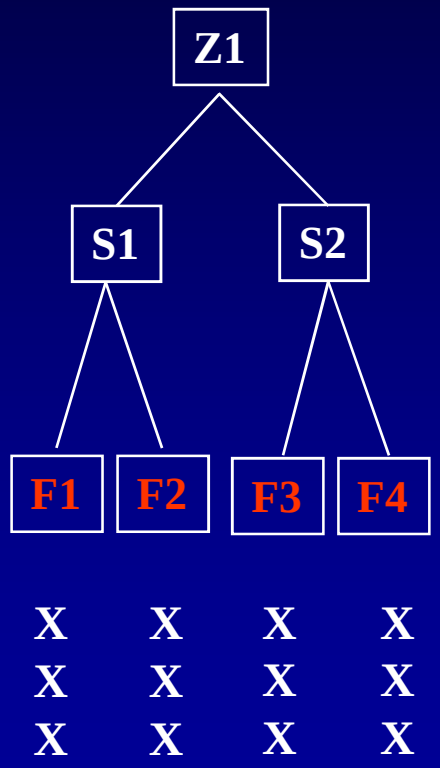
- **Hierarchical spatial sampling design**

Zone

Sites
(~ 100 m)

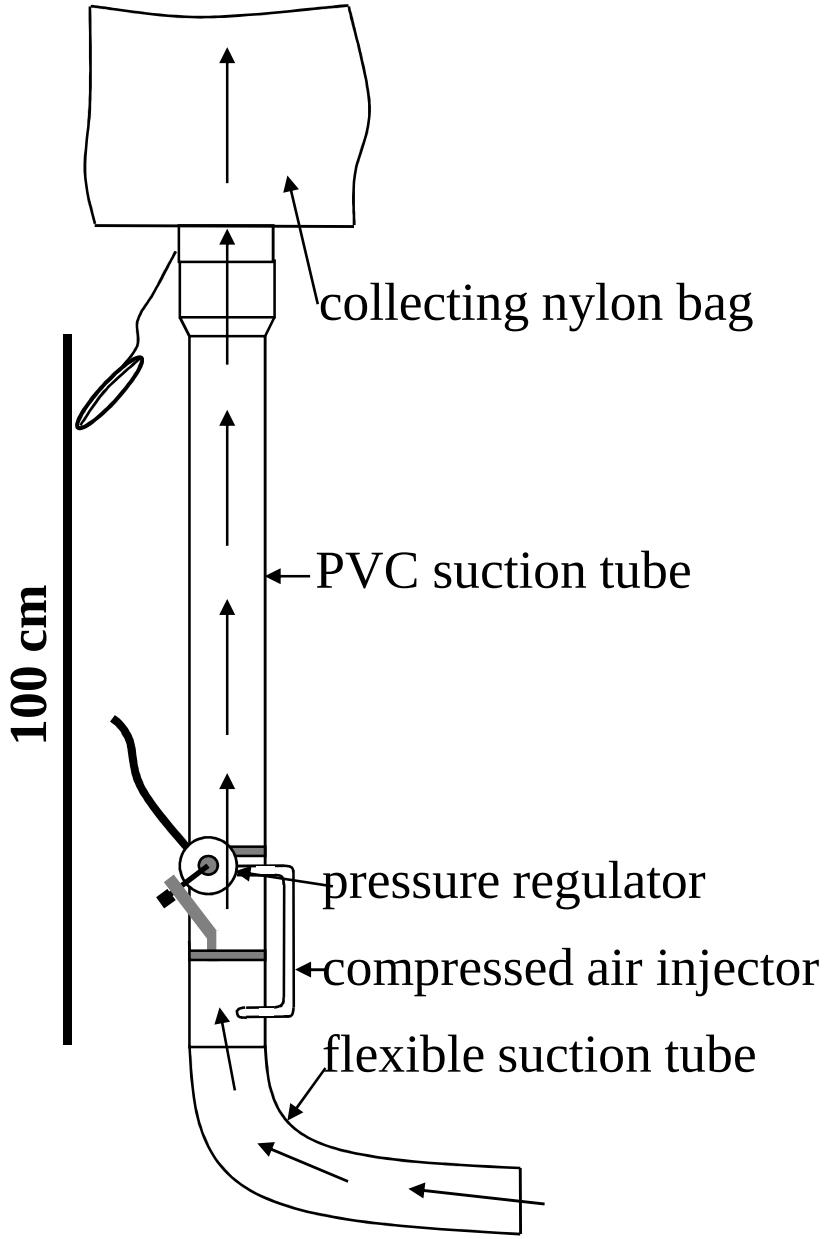
Frames
(~ 10 m)

Samples
(~ 1 m)



Constant depth: 12-13 m

Material & Methods

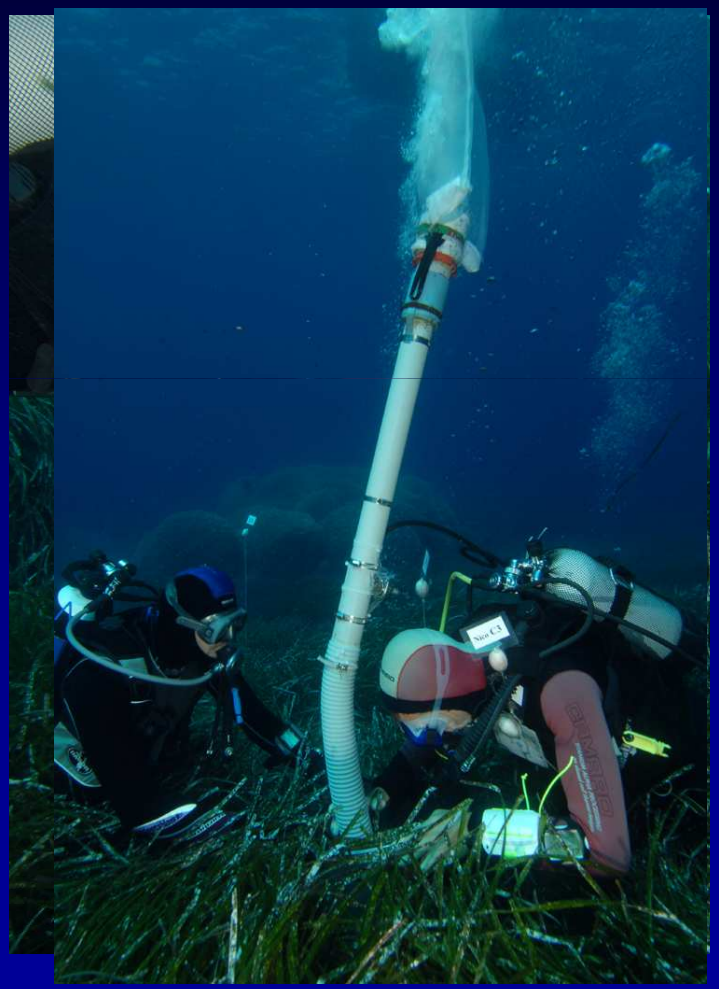


Air-Lift

- non destructive method
- quantitative estimation
- capture samples at small spatial scale ~ 1 m

Material & Methods

- **Sampling area of the meadow is previously delimited by a PVC cylinder (0,129 m^2)**
- **Aspiration of the leaves included in the cylinder, with the vagile fauna (2 min)**
- **Sampling was realized between 10h30 am and 3h00 pm (March 2007)**



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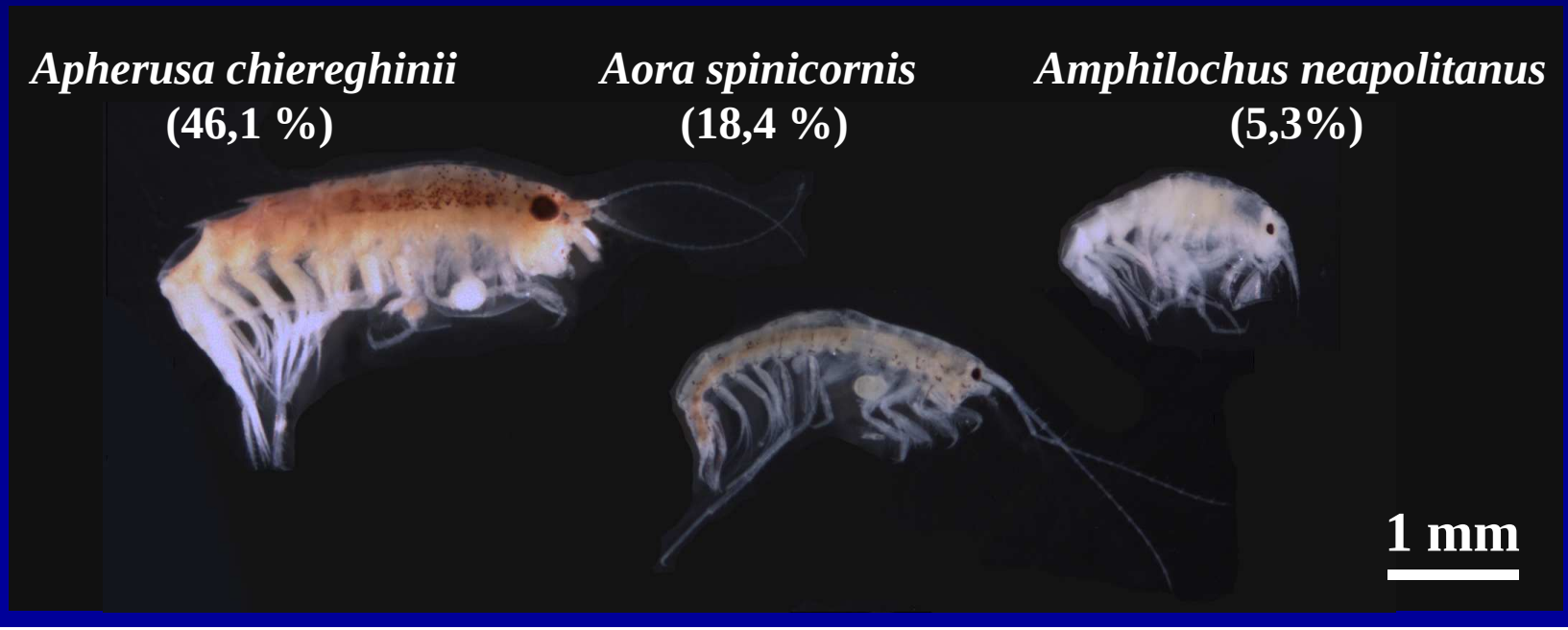
Results and Discussion

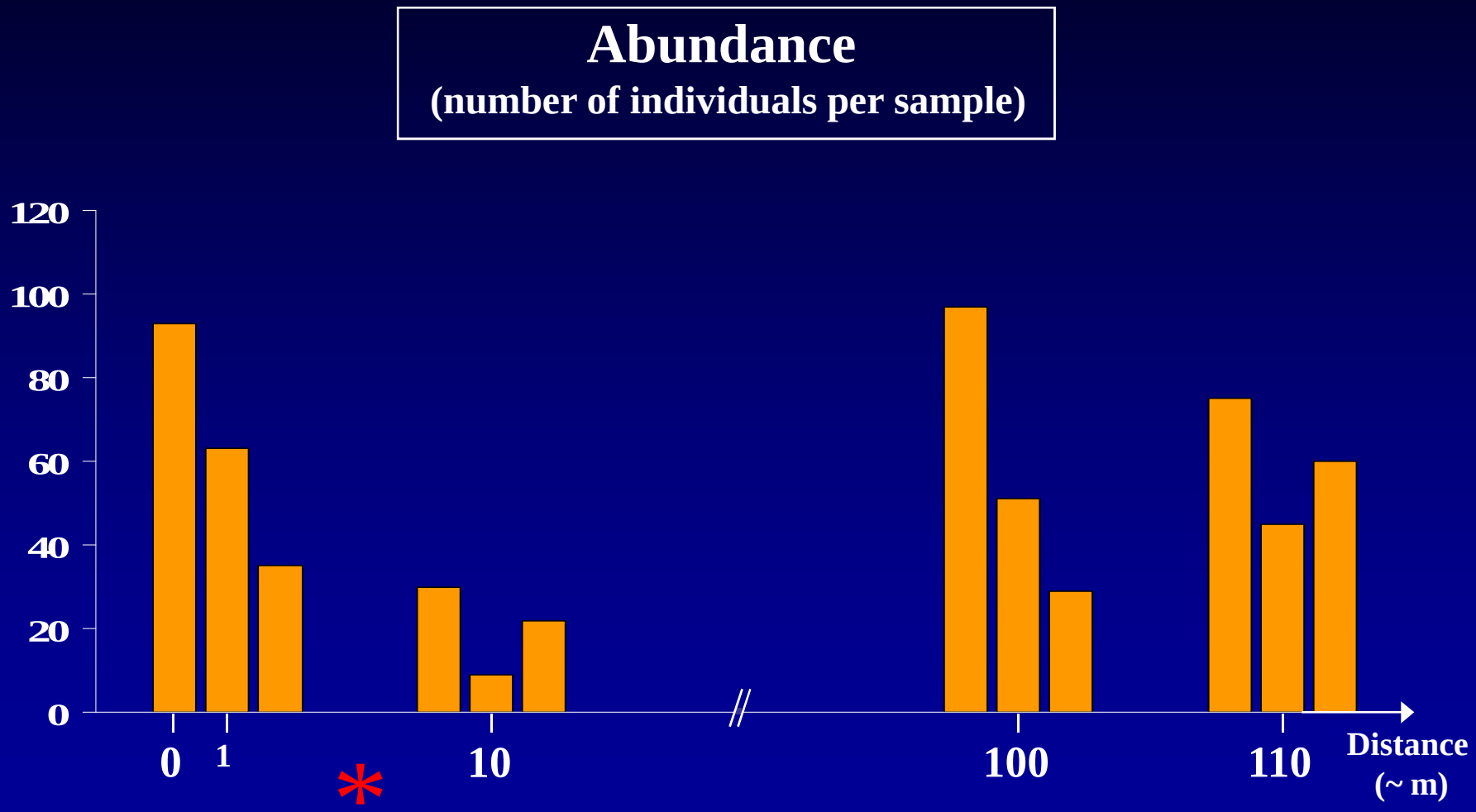
Community Structure

General Characteristics

- **Abundance :** 727 amphipods
- **Sample richness :** 30 species
- **Variable diversity :** low to medium (H´: 0,45 - 1,88)
- **Dominant species :**

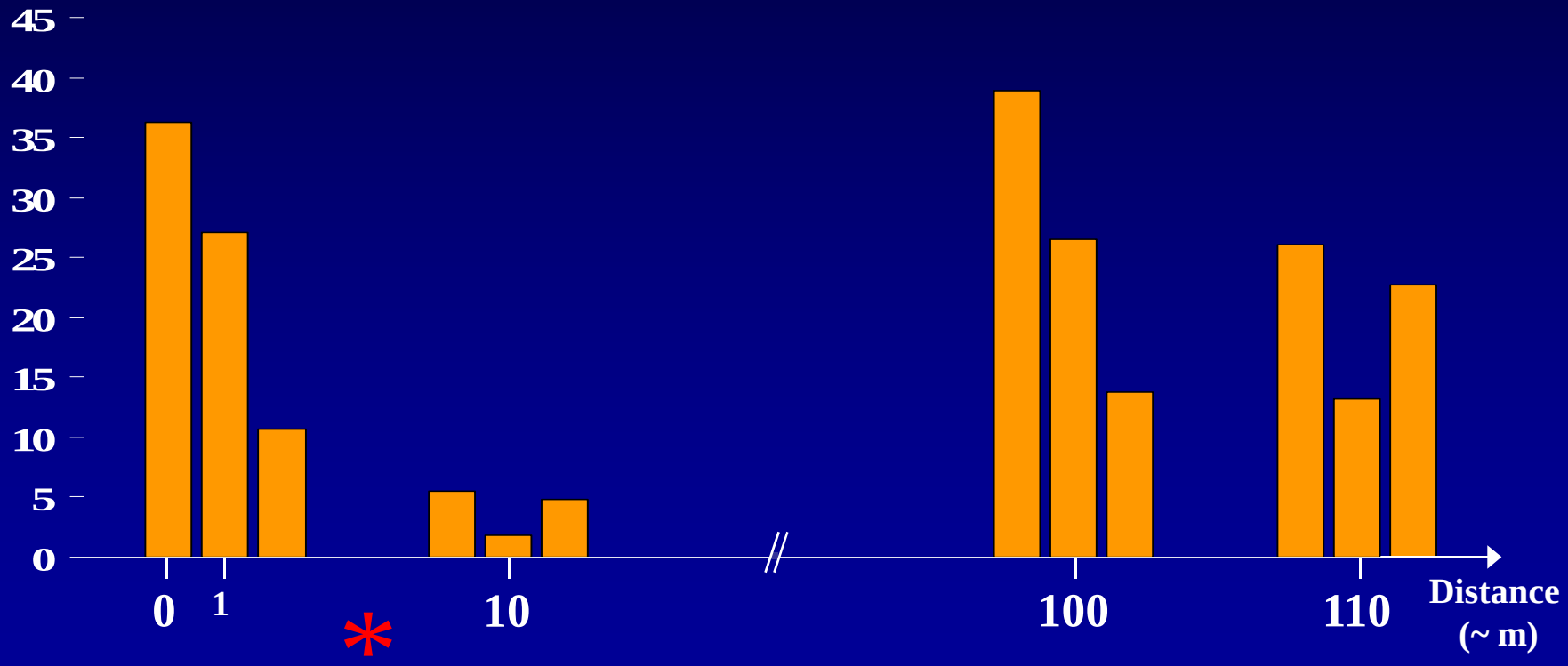


Variations at different spatial scales



Variations at different spatial scales

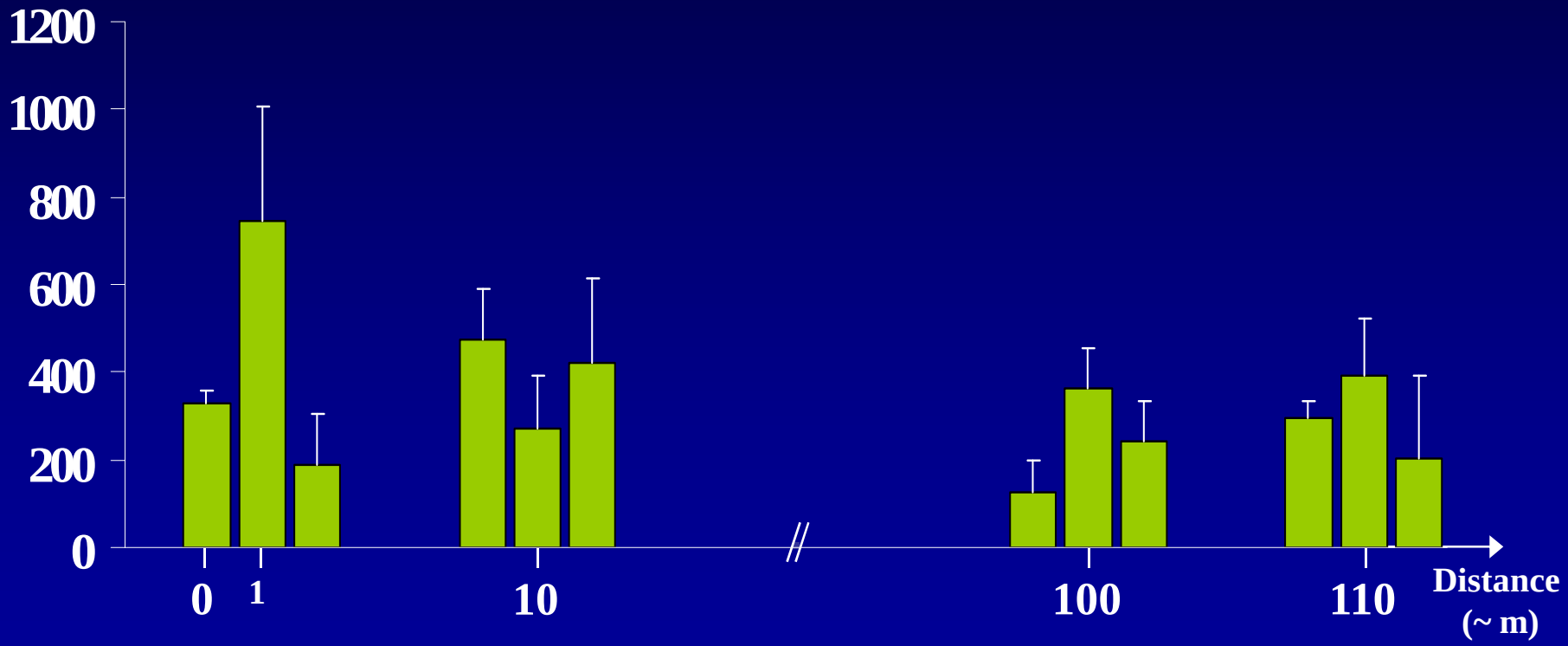
Biomass
(in mg AFDW per m^2 of the meadow)



➢ **High heterogeneity of the meadow**

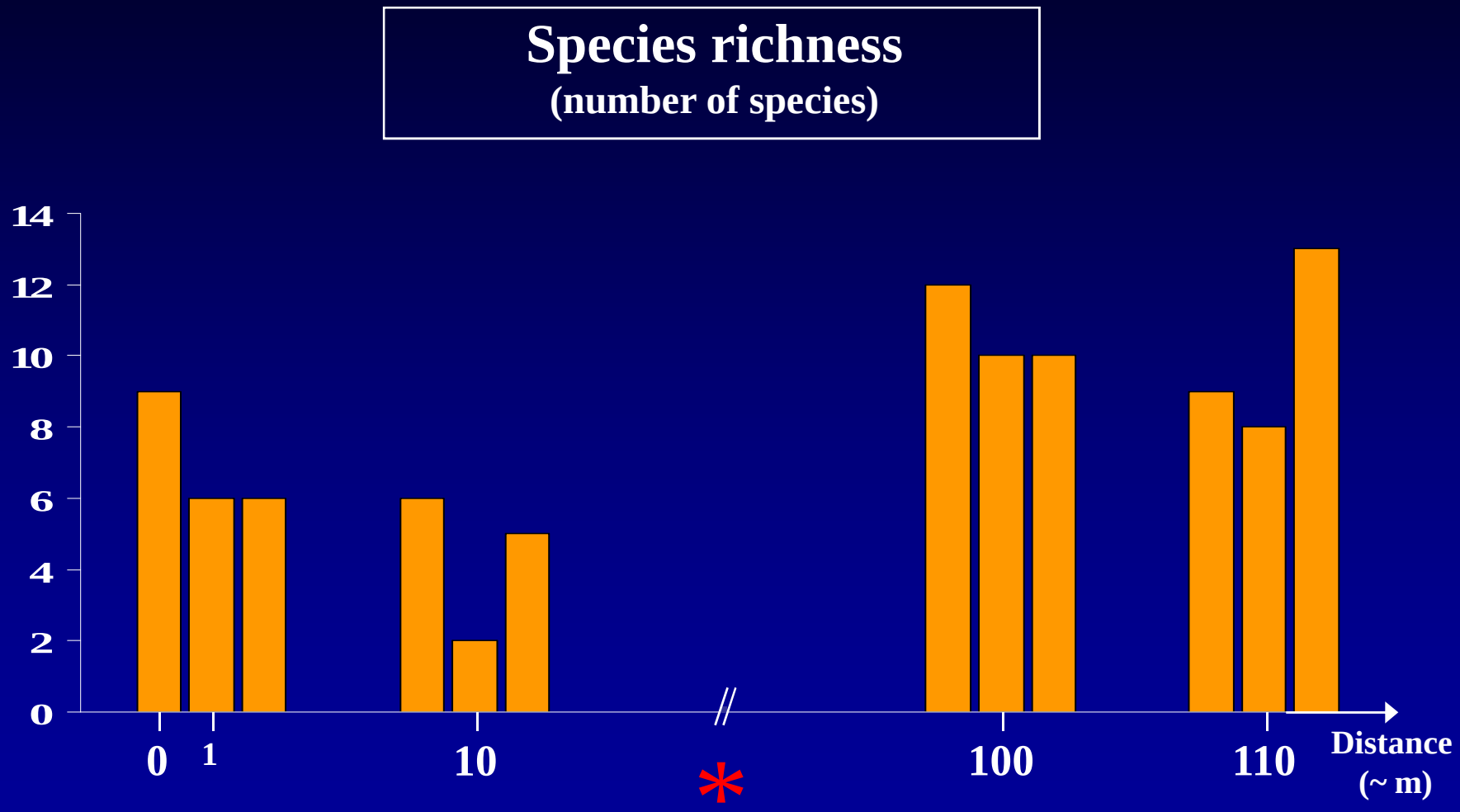
Variations at different spatial scales

Density of the meadow
(number of shoots per m^2)



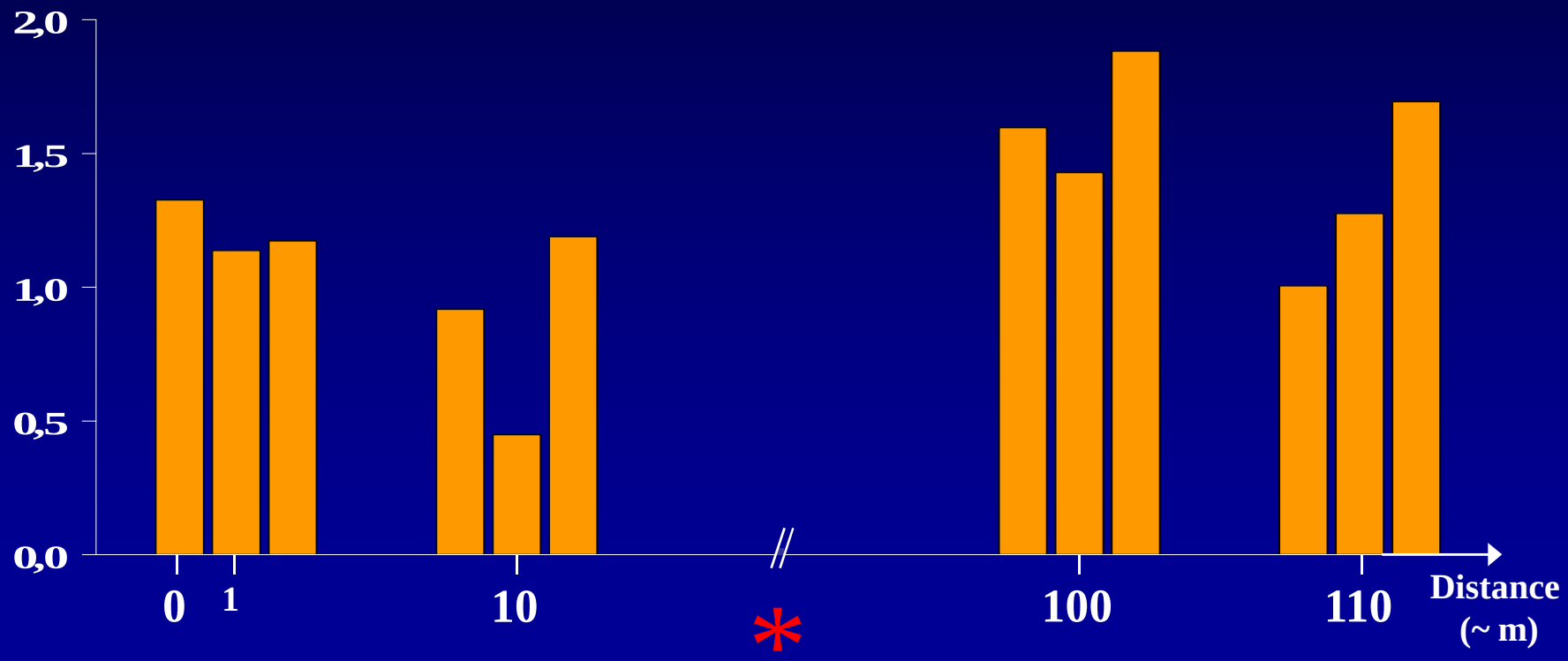
- **High heterogeneity of the meadow**

Variations at different spatial scales



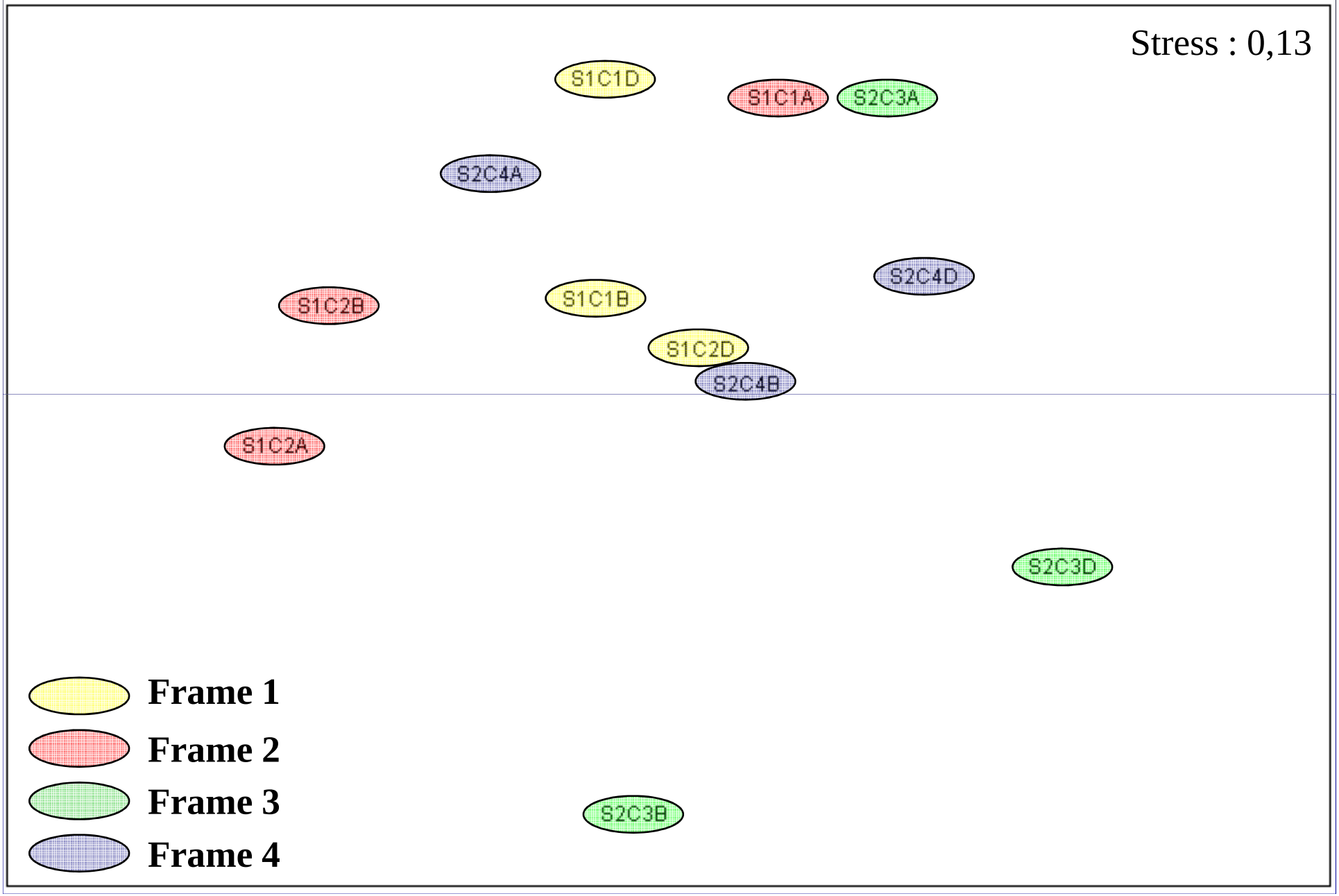
Variations at different spatial scales

Diversity
(*Shannon-Wiener* index, H´)



➢ **Habitat complexity…lower density of the meadow and litter accumulations**

Non-metric Multidimensional scaling



Summary

Influence

No Influence

	Scales		
	~ 1 m	~ 10 m	~ 100 m
Abundance			
Biomass			
Species richness			
Diversity			
Specific composition	No clear pattern		

Conclusions

Our results showed

- **Amphipod community associated with the *P.oceanica* meadow : abundant, rich in species, moderately diversify**
- **Community dominated by a few species**
- **Important spatial variability at different scales**

Conclusions

Our results showed

- **Some scales influenced the characteristics of the community more than others**
  - **Small spatial scale >> abundance and biomass**
  - **Medium scale >> species richness and diversity**

Thank you for your attention

Egidio Trainito, AMP Tavolara-Punta Coda Cavallo

Acknowledgments

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