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► To cite this version:

Clélia Duran, Andréa Bouchard, Christine Dupuy, Hélène Agogué, Robert Duran, et al.. Seasonal dynamic of benthic communities in coastal marshes (Charente-Maritime, France). 18th International Symposium on Microbial Ecology (ISME 18), Aug 2022, Lausanne, Switzerland. . hal-04295308

HAL Id: hal-04295308 https://hal.science/hal-04295308

Submitted on 20 Nov 2023

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Seasonal dynamic of benthic communities in coastal marshes (Charente-Maritime, France)

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Marshes environments

Vast diversity of environment and habitats

Ensure ecosystem services thanks to their microbial communities

Fresh marsh

Salted marsh

Largely exploited for human activities

Impacted by climate change and human activities

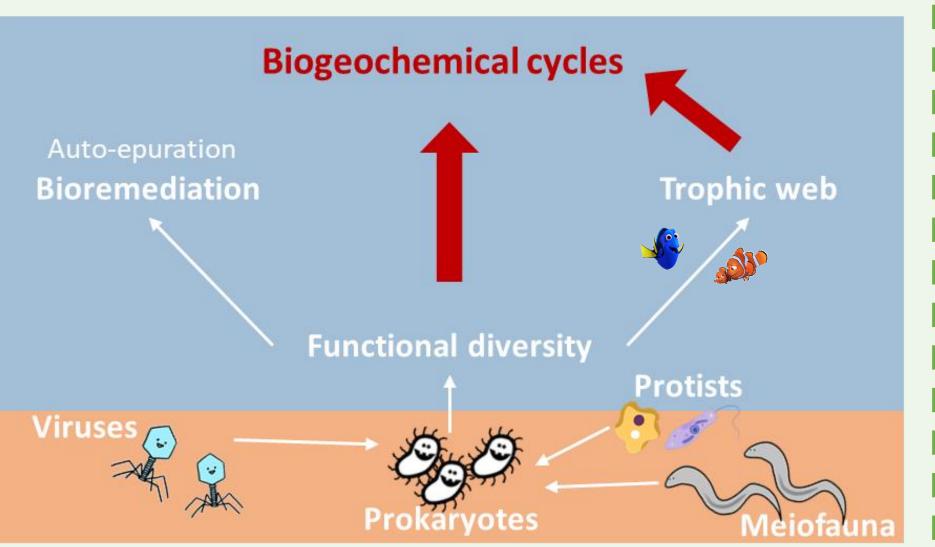
Saltwork marsh

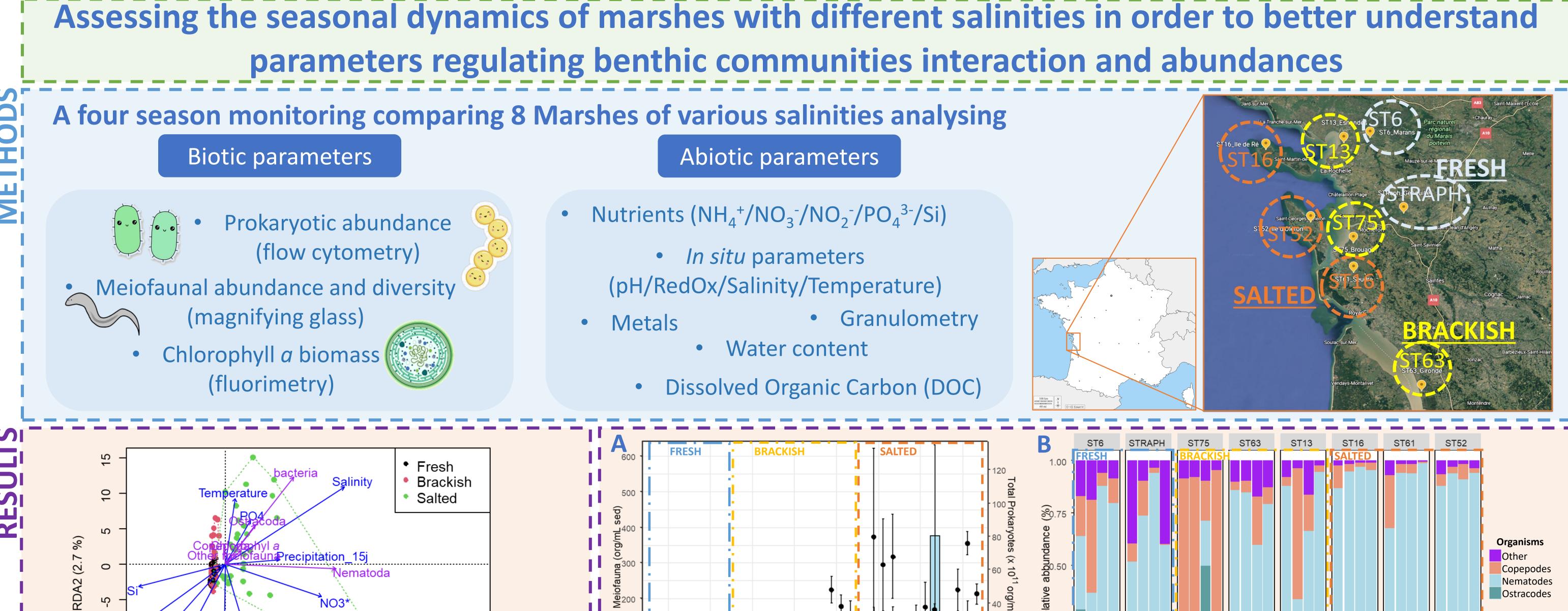
Microbial benthic communities

Are at the basis of trophic webs in sediments thanks to their

functional diversity

Regulated by biotic parameters such as trophic interactions Affected by abiotic parameters (e.g. salinity, temperature, light, nutrients, pollutants,...)





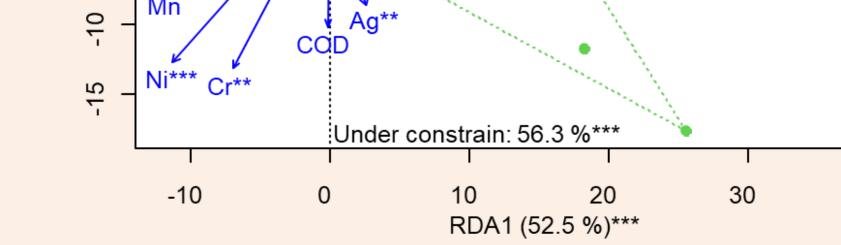
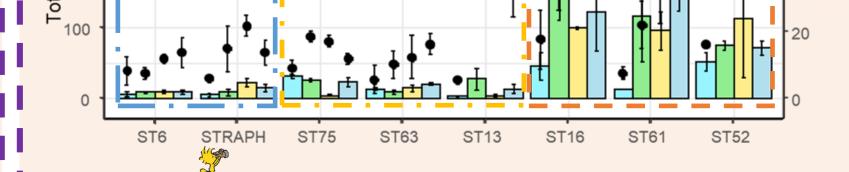


Fig 1: RDA analysing biotic parameters against abiotic factors for all sites. Significativity was tested with ANOVA (*** <0.001; ** <0.01 ; * <0.05).

NO3*

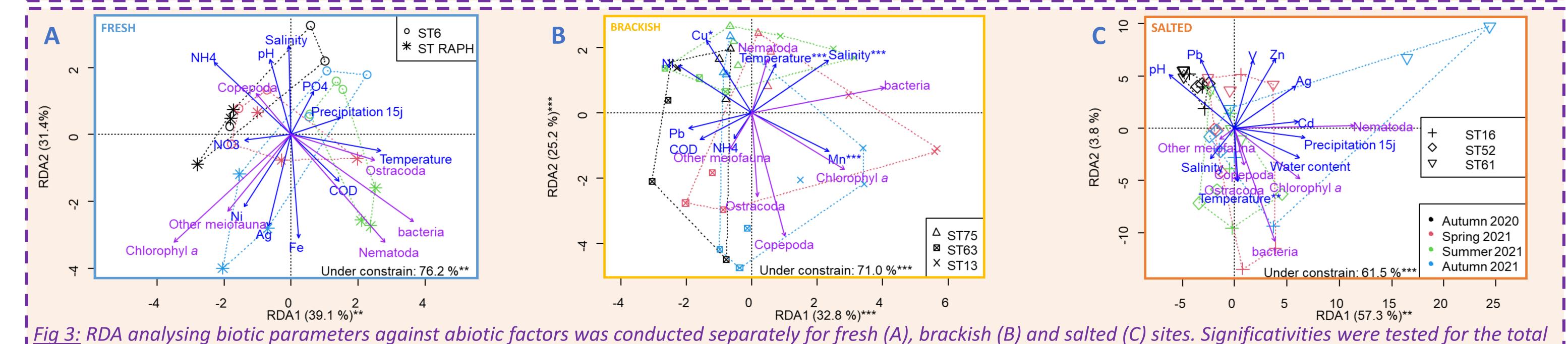
Separation of the samples depending on **salinity**





Season Autumn 2020 Spring 2021 Summer 2021 Autumn 2021 Autumn 2021 Summer 2021 Autumn 2021 Salted sites presented a higher meiofaunal abundance*** dominated by Nematodes. Fresh and brackish samples had lower meiofaunal abundance with higher proportion of copepods*, ostracods** and other organisms***.

Prokaryotic abundance was high in all sites but higher in salted stations***.



model, axis and variable with ANOVA (*** <0.001 ; ** <0.01 ; * <0.05).

Fresh sites showed the **highest** seasonal effect. Prokaryotes were more abundant in seasons with higher DOC and temperature and lower NH⁴⁺ concentrations.

brackish prokaryotic sites In abundance decreased with salinity and for seasons with high level of Pb and NH₄⁺. Chlorophyll *a* was lower in sites with high **metal** concentrations.

The lowest seasonal effect was observed in salted sites. Prokaryotic and meiofaunal abundances were lower in samples with higher metal concentration.

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- **Salinity** is the main driver of community variation depicting a clear separation of salted and fresh/brackish marshes with a more pronounced **seasonal effect** that can be observed in fresh sites.
- Organisms abundances suggest that **prokaryotes** could be used as good indicators of ecological status in all marsh types and **meiofauna** in salted marshes.
- Meiofauna, prokaryotes and chlorophyll *a* hinted *a* sensitivity to metals in brackish and salted sites.
- **Environmental DNA** analysis will be conducted to understand factors controlling community composition.
- All information gathered will be useful to define potential **bioindicators evaluating ecological statuses**.