

Small scale variations in the microbenthic loop of *Posidonia oceanica* meadows: an experimental interpolation design

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Introduction:

In the sediment compartment of *Posidonia oceanica* meadows, there is a severe lack of information on small scale variations. In an attempt to understand spatial variations of the microbenthic loop (bacteria, organic matter, microphytobenthos and meiofauna), an experiment based on interpolation methods was led in the research station STARESO (Calvi Bay, Corsica, France), in March 2008, at 10 m depth (Fig.1).

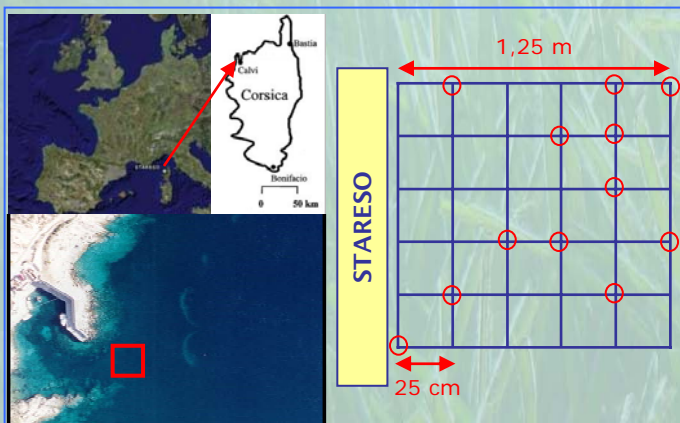


Fig. 1: Sampling site and sampling grid.

Results:

Small scale variations are found for all the measured parameters. They are higher in the first centimeter of the sediment cores and for bacterial biomass and abundance (Fig.2). Significant variations are also observed with sediment depth, except for OM.

Correlations between bacterial and OM biomass ($r=0.80$), and between microphytobenthos biomass and HPO_4^{2-} ($r = 0,67$) are also shown (Fig.3).

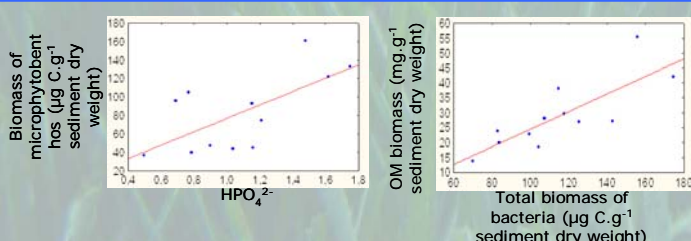


Fig. 3: Correlations between microphytobenthos and HPO_4^{2-} and biomasses of OM and bacteria.

Conclusions:

Small scale variations in the sediment are important in *P.oceanica* meadows and must be taken into account in sampling strategies.

Methods:

A sampling grid (Fig.1) was put in the *P. oceanica* meadow. Twelve points were selected randomly to assess and describe the spatial distribution and variations of seagrass density, bacteria, organic matter (OM), microphytobenthos and nutrients ($\text{NO}_2^- + \text{NO}_3^-$, NH_4^+ , HPO_4^{2-}) by taking sediment cores.

Spatial distributions were calculated by DIVA (Data Interpolating Variational Analysis), a method adapted by the GHER (MARE Centre, ULg, Belgium).

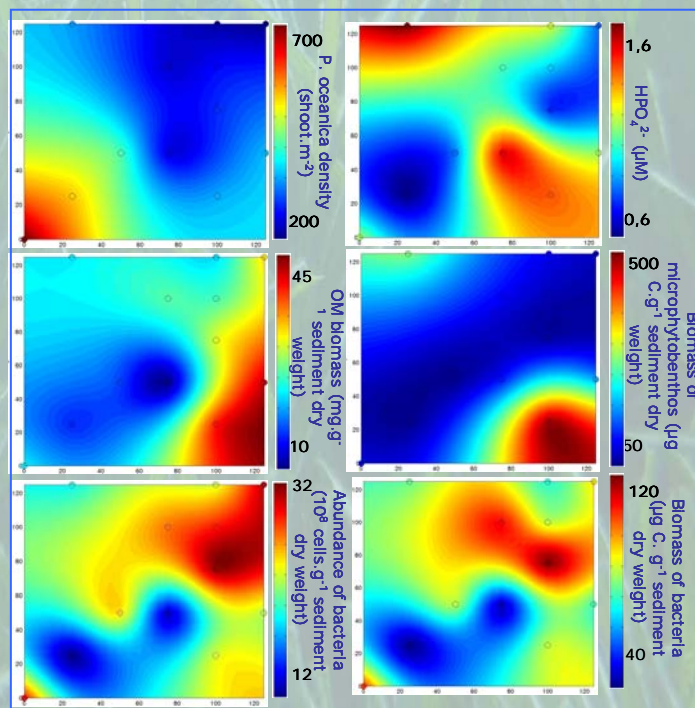


Fig. 2: Distribution maps for *P. oceanica* density, HPO_4^{2-} , biomass of organic matter (OM), microphytobenthos, biomass and abundance of bacteria in the first centimeter of the sediment cores.

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