Geophysical Research Abstracts
Vol. 12, EGU2010-735-1, 2010
EGU General Assembly 2010

Statistical analysis of polychaete population diversity: hyperbolic extremes and species dynamics

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The objective of this work is to characterise the dynamics of four diverse polychaete populations based on long-term benthic surveys of shallow fine sand communities in the Bay of Morlaix (Western English Channel) and in Gravelines (South of the North Sea), France. The abundance and species richness of these populations display high variability, which we analysed using scaling approaches. We found that population density had heavy tailed probability density functions. We analysed the dynamics of relative species abundance in a community of trophically similar species, by estimating a diffusion coefficient which characterises its temporal fluctuations. We conclude on the necessity of using new tools to approach and model such highly variable population dynamics in coastal marine ecosystems.