

# Hyperbolic extremes and species dynamics in polychaete populations

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One of the key features of environmental and geophysical field studies is their high variability at many different time and space scales. The dynamics of many natural populations involve the alternation over variable periods of time of phases of extremely low abundance and short outbreaks. The objective of this work is to characterise the dynamics of three 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. Abundance and species richness of polychaete populations display high variability, which was 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.