

Application of spatial density estimation when studying a bioturbation problem

Sophie Dabo-Niang¹, Anne-Françoise Yao²

¹ University Charles De Gaulle, Lille 3, Laboratory GREMARS-EQUIPPE, maison de la recherche, domaine du pont de bois, BP 60149, 59653 Villeneuve d'ascq cedex, France

² University Aix-Marseille 2, Campus de Luminy, case 901, 13288 Marseille cedex 09, France

Abstract: This paper deals with the study of the impact of bioturbation processes due to different types of macrofauna. In the frame of our study, 2-D distribution of a biochemical parameter (for example the oxygen) on different times in order to quantify the spatio-temporal dynamic of the biochemical parameter concentration is collected. We propose heterogeneity measurements based on spatial centralities as spatial mean, median and mode, to understand the bioturbation process. To obtain the mode of a spatial distribution, one usually needs to estimate the spatial probability density. Recent advances on spatial density estimation permit to due such studies.

Keywords: Bioturbation process; Spatio-Temporal Data; Density Estimation.