

DO BURROWING ORGANISMS INFLUENCE CARBON PROCESSING ON A GLOBAL SCALE? A DATA MINING APPROACH

Bockelmann Frank, Olivier Maire, and Filip Meysman

Vrije Universiteit Brussel (VUB), Laboratory of Analytical and Environmental Chemistry,
Earth System Sciences Research Unit, Pleinlaan 2, 1050 Brussel, Belgium
E-mail: fbockelm@vub.ac.be

There is great interest in the processes controlling the processing of organic matter within marine sediments, because decomposition fuels the benthic ecosystem and burial depletes the active carbon reservoirs of the ocean. A key factor controlling the mineralization of organic matter is thought to be the presence of macrofauna in sediments. In recent years, a number of case studies have shown that bioturbation, and particularly bio-irrigation, increases the oxygen uptake, and hence the mineralization in the sediment. To what extent do macrofauna influence carbon processing on a global scale? To answer this question, we are currently compiling the existing biogeochemical data that link macrofauna to organic matter processing into one database. Targeted process parameters include bioturbation (e.g. biodiffusion coefficients based on radio-nuclides), bio-irrigation (e.g. total and diffusive sediment oxygen uptake), and OM mineralization and burial (e.g. OM input, burial velocity, and decay rate constant). This database is examined with explorative statistics and regression analysis. Preliminary results suggest that such analysis could provide quantitative insight into the effects of burrowing organisms on OM processing on a global scale.