Relating productivity patterns to functional diversity of North Sea macrofauna – knowledge increase by functional focus?

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The benthic compartment is central to ecosystem services in shelf seas. Assemblages with a higher diversity have been suggested to operate more effectively. However, there is no general ecological relationship between diversity and ecosystem functioning due to species-specific effects and environmental influences. We are taking a trait-based and large-scale observational approach to link patterns in macrofaunal functional diversity with ecosystem functioning in the southern North Sea, a marginal sea of the North Atlantic. Secondary production serves as a quantitative measure of ecosystem functioning. It is calculated with taxon-specific empirical production models, while functional diversity is expressed in indices based on trait dissimilarities. Using spatially implicit regressions, we analyze how secondary production is related to functional diversity and environmental factors. Further, we explore whether models are improved by substituting functional diversity with specific key traits potentially related to secondary production. The North Sea has a long history of cumulating local and global human influences. Knowledge on the predictive value of trait diversity for maintaining productivity in our system is needed for succeeding research on consequences of changes in biodiversity for ecosystem functioning.