

Drivers of polychaetes functional α - and β -diversity at regional scale: Disentangling the role of biogenic habitats and environmental variability

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Alterations of the seafloor, particularly loss of biogenic habitats, are homogenizing benthic environments and their associated biota. Apprehending the functional consequences of these changes is critical but requires a thorough understanding of the functional β -diversity of benthic communities. Here, using data from 3 years (2007, 2010, 2013) of the REBENT monitoring programme and 51 sampling locations along Brittany's coastline (France), we assess taxonomic and functional α - and β -diversity of polychaetes assemblages and disentangle their drivers at the regional scale and over four habitats: subtidal and intertidal

bare sediments, subtidal maerl (coralline red algae) beds and intertidal *Zostera marina* meadows. The 1061 sediment samples yielded 137,319 polychaetes belonging to 242 species. Eleven traits and 43 modalities were used to describe the functional effect and response of these species. Among the highly contrasted environments of Brittany, strong within-habitat taxonomic variability was observed, which blurred among-habitat differences. Here, we relate taxonomic patterns and functional variations, in order to propose a model linking environmental and habitat conditions to taxonomic and functional α - and β -diversity. Linking these various facets of diversity facilitates the identification of sites with particular conservation interests.