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Spatio-temporal patterns in benthic macrofauna on a brackish mudflat (Schelde estuary, NW-Europe): results of ten years monitoring

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Estuarine ecosystems are characterized by largely varying physicochemical conditions, especially in the meso-/oligohaline zones. Knowledge of the environmental variability and related population effects on a range of spatio-temporal scales is fundamental to a better understanding of their functioning, stability, resilience and the way they are influenced by human impacts.
This study combines spatial and temporal variations in macrobenthic populations (and their environment) on a brackish mudflat in the Schelde estuary (NW-Europe). From 1990 to 1999, long –term year-to-year variations were monitored on 24 sites, short –term monthly variations on two sites.
The variation in macrobenthos and the physicochemical environment due to seasonal dynamics, spatial pattern, and annual as well as long-term trends, was quantified. The macrobenthic community on the mudflat was characterized by a few dominant species (*Corophium*, *Heteromastus*, *Nereis*, Oligochaeta), with spatial distributions related to sediment characteristics. Considerable year-to-year variation was observed and seasonality was evident for all species. It is argued that in the meso-/oligohaline zone, where salinity shows large seasonal fluctuations, benthic communities change frequently during the year, resulting in communities that seldom progress beyond early benthic-community succession. Annual variations are less pronounced. The impact of the construction of a containerterminal (1994), adjacent to the mudflat, on the macrobentic species distributions is discussed.