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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 macrobenthic species distributions is discussed.