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Influence of vegetation on the infilling of a macrotidal embayment: examples from salt marshes and shingle spit of the Baie de Somme (North France)

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As many estuaries in the English Channel, the Baie de Somme is currently filling with a mean seabed elevation between 1.3 and 1.8 cm/yr. Embankments and polders, as well as sea level rise, increase this natural accretion process, which leads to important modifications of environment uses. Interactions between vegetation and sediment dynamics constitute a key-point to consider, in order to better understand the infilling processes in estuaries. To estimate the effect of vegetation on these processes, two particular environments have been studied in the bay: (i) the mid salt marsh covered with *Halimione portulacoides*, associated with a silty sedimentation, and (ii) the shingle spit, that closes the bay from the South, on which the sea kale (*Crambe maritime*), a protected pioneer species, develops.

Salt marshes progress with a rate of 5-10 m/yr (mean value calculated on the 1947-2011 period). Sedimentological analysis have been conducted on 9 cores (50cm long) collected in three *Halimione* communities of the bay. They are associated with a silty-dominated (38-84 micrometer) sedimentation under the influence of decantation processes. Rhythmicity is observed in the sedimentation, due to the repetition of a two-layer pattern, that includes a dark layer composed of vegetal rests and that would represent annual sedimentation. Annual sedimentation rates (0.7 to 5.8 cm/yr) are consistent with mean values previously recorded.

The shingle spit progresses to the North under the influence of the littoral drift at a rate of 7 m/yr (mean value calculated on the 1947-2011 period). Sea kales are observed on parts formed since several years, above the level of the highest astronomical tides. TLS surveys and sedimentation bars have allowed to measure erosion/sedimentation volumes at the scale of the spit and of sea kale individuals, during spring 2013. Individuals of this species facilitate the trapping of sand, transported by winds from the intertidal flats. Sea kale thus contributes to the maintenance of sand at the surface of the spit during spring (development period of sea kales) and, probably to the progressive silting up of the spit on a longer-term. Thus, sea kale indirectly favours the filling of the bay through the building up and consolidation of the spit that, in turn, enhances sheltered conditions increasing the part of decantation processes in the sedimentation in the bay.

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