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# Chronic erosion in Wissant Bay coast, northern France - Causes and trials of management projects

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Cape Gris Nez to the southwest and Cape Blanc Nez to the northeast limit's Wissant Bay. This extreme northern coast of France, facing the Dover Strait, is one of the most rapidly eroding sector of coast in France. Shoreline retreat has exceeded 250 m in the last fifty years in the central and western parts of the bay, while the eastern sector of the bay is now a zone of accretion, after being a sand-starved zone in the past, when the western sector was either stable or in accretion. The reasons for these changes are still not clear. They seem to involve interactions between a nearshore sand bank and the activity of current gyres related to the projecting headland of Cape Gris Nez, beach rotation processes and human activities, notably past aggregate extraction from the nearshore sand bank which acted hitherto as both a dissipater of incident storm wave energy and as a coastal sand source.
The aim of this paper to contribute to the understanding of these long-term changes and investigate the mechanisms of this mildly embayed coast evolution. To this end, 10-years of topographic profile data throughout the bay were analysed and confronted with offshore wave data. This analysis complements a previous analytical effort that determined gross rates of annual shoreline retreat by time slices of several decades from the careful interpretation of long series of ortho-rectified aerial photographs. The overall data suggest chronic sand bleeding from the western sector of the beach and longshore transport to the east, within a framework of what appears to be an ongoing beach rotation process within a dominant longshore sediment transport cell between the headland of Cape Gris Nez and the bold chalk cliffs of Cape Blanc Nez.
Retreat of the beach-dune barrier in the western sector of Wissant Bay poses a threat in the coming years as there is a likelihood of storm breaching of the narrow dune barrier. Face to this critical situation, a proper management strategy involving a good understanding and an integrated view of beach and coastal dynamics, as well as defence strategies covering not only the beaches but also the dunes and the nearshore zone must be applied. This can only be effectively done within the framework of the immediate implementation of Integrated Coastal Zone Management.