

**Bordering seas of the western part of the European continent.  
Example of the coastal zone of the French North Sea English Channel  
Atlantic coast**

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Located at the end of the Western Europe, France has a maritime coastal zone of more than 3800 km largely opened in the North-eastern Atlantic influence for its North Sea English Channel and the near Atlantic on which carries this presentation. The Atlantic Ocean is a succession of rocky and sandy coast in the northern part with large intertidal zone, with two large estuaries (Loire and Gironde) and a large continental shelf. The southern part of the Gironde is a low sandy straight coast (260 km), the continental shelf become narrows towards the south with the presence of Cap Breton canyon. There is a high hydrodynamism, with ecological units homogenous and progressive, from the intertidal zone (tidal range lower than 5 m) to the bathyal zone, even to the abyssal zone. The English Channel is an epi-continental shallow (50 m deep in average) sea with very high tides (> 12 m in the Mount St Michel Bay) and a bio-geographical cross road and a range of ecological conditions wider than that of the other European seas: coarse sand and pebbles are dominant in the sub-littoral floors. In the west, the rocky shores are dominant, as in the east there is a succession of long sandy beaches and cliffs. A single major estuary: the Seine River. There is a high diversity of habitats and high species richness in the west part, an impoverishment of diversity in the east part. The southern part of the North Sea is characterized by a reduction of the hydrodynamism due to the tide along a strictly sandy coast.

Interface between the continental and oceanic systems, these bordering seas were the subject of many recent research programs in order to better apprehend their functioning, their production, their dynamics and their future changes (National Coastal Environment Programme with several sites: Bay of Biscay, Arcachon Lagoon, - and Marennes-Oleron zone, Mont Saint Michel Bay, Bay of Seine, and Southern part of the North Sea-Eastern part of the English Channel, LITEAU Programme, and research programmes on the three main estuaries: Gironde Estuary coordinated by the GIS ECOBAG), Loire Estuary coordinated by the GIP Loire and the Seine Estuary coordinated by the GIP Seine Aval). The continental inputs in the continental shelf result in many dysfunctions of these estuarine, littoral and coastal ecosystems, of which some of them occur in all the bordering seas (eutrophication) and others affect more limited sectors (contamination via the estuarine inputs, harbour and balneal installations). Due to many conflicts in these littoral zones, the Integrated Coastal Zone Management should be an essential approach in the process of sustainable development of these bordering seas. This global management approach is essential to integrate natural or chronic anthropogenic processes such as the filling of the estuarine zones, erosion of cliffs, change of the sea level, rational management of the marine resources, and new anthropogenic pressures such as new harbour installations (container dikes, marinas), the need for extracting the sea aggregates for human constructions and the development of offshore wind mills fields. An overview as complete as possible of recent and in progress researches on these bordering seas maritime is given in order to highlight the main characteristics of these ecosystems and to underline the future challenges for European marine researches for Integrated Coastal Zone Management of these coastal zone of great interests.