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## 7.3. PHYSICAL AND ECOLOGICAL FACTORS

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## ECOLOGICAL ELEMENTS AND PHYSICAL FACTORS

The spatial distribution of plankton in the Gulf of Cadiz is governed by a regime of winds from the west, where there are high concentrations of chlorophyll. The coasts in Cadiz province are characterised by a wide shelf with high concentrations of ichthyoplankton.

In the Straits the maximum concentration of chlorophyll increases from the south-west to the north-west where there is a maximum depth of chlorophyll linked to the thermocline. Biological production on the NE side of the Straits is more constant whilst upwelling induced by the wind means that there is more intense primary production.

The phytoplankton in this area adapts to continual change due to the high variability of the physical environment to the north west of the Alboran Sea. Hydrodynamic phenomena-related physical changes determine biological variability in the Straits of Gibraltar and the north western part of the Alboran Sea.

The distribution of zooplankton, mainly copepods, does not seem to be directly related to the maximum phytoplankton concentration. The copepods are extremely abundant at night and concentrate in the upper layer and throughout the whole column of water.

The combination of a double layer and a counter-current circulation scheme and the upwellings on the sill determine the physical structure and

dynamics of the Straits.

The hydrological and biological features are very closely related in this area.

The temperatures and salinity levels observed within the area of the Straits can be attributed to a mixture of the different types of water. The Straits of Gibraltar connect the Atlantic Ocean and the Mediterranean Sea. Circulation in the Straits is characterised by the existence of two flows or layers: one on the surface of water that flows in from the Atlantic and a deeper and saltier layer that comes from the Mediterranean.

The Atlantic waters mix with the highly saline waters of the Mediterranean in the Alboran Sea. The salinity of the water entering from the Atlantic varies from 36.2 ppm to 36.5 ppm during its migration towards the east through the Alboran Sea.

The main surface water current in the Alboran Sea is made up of two adjacent clockwise gyres that occupy the whole basin and which are called the western Alboran gyre and the eastern Alboran gyre. After passing through the Alboran Sea, the main current of modified Atlantic water continues towards the east along the coast of Algeria. To the east of the eastern gyre the so-called Almeria-Oran Front is formed by the convergence of two very different masses of water. The characteristics of an upwelling have been detected along the Front and high biological activity can be seen.









