

The Benguela current and its effect on the climate of the west coast

The climate and environment on land is strongly influenced by the ocean currents flowing past the landmasses. The south western and southern tip of the African continent receives winter rainfall from cyclones originating over the South Atlantic, and is located at the interface of temperate westerly and sub-tropical climate systems. The climate on the west coast is determined by the seasonal shifts and interplay of the prevailing winds over the Benguela region (which are determined by the South Atlantic high pressure system), and by the eastward moving cold fronts (cyclones) across Southern Africa. During summer, the South Atlantic high pressure system is well developed, but in the winter months, shifts northwards, allowing cold fronts to move in the same direction.



The nutrient-rich Benguela current which flows past the west coast supports a wide range of marine life. The cooling and upwelling of the Benguela current brings moisture-laden sea winds to the west coast which, together with the atmospheric factors, prevent rain from falling in the Namib. The affect of the cold, upwelling Benguela current and the persistent, strong South Atlantic high-pressure system (a stable anticyclone which lies above the Atlantic Ocean at 30° S) are two of the main causes for the present aridity along the south-western coast, the Namib and the dryness of the interior of the sub-continent.

Scientists believe that the present day flow paths of the Agulhas current, and the Benguela Upwelling System was already established during the Mio-Pliocene around 5 Million years ago, and may even have been in place as early as 10 million years ago. The introduction of a cold water current on the west coast accentuated the on-going trend of increased summer drought along the west coast, and strengthening high pressure systems brought drier conditions to the interior. The early development of a Mediterranean climate, which was essentially modern, would have prevented the spread of tropical C₄ plants as these are favoured by a summer rainfall regime and is one of the reasons that research indicates that Langebaanweg was a C₃ dominated environment around 5 million years ago. (See 'Plant photosynthesis and the paleoenvironment')

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