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Holocene climate variability in south-western France

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Vegetation and climate changes in western France/northern Spain are documented for the last c. 9000 cal. yr BP in a well dated shelf core, KS05-10, retrieved in the southwestern margin of the Bay of Biscay (Basque country) (43°22'765N, 2°16'744W).

The continuous high resolution pollen record shows orbital and suborbital climate fluctuations similar to those noticed for the North Atlantic region and Greenland. A long-term Pinus, Quercus and Corylus forest reduction follows the cooling trend in Greenland and the general decrease of mid-latitude summer insolation until approximately 350 yr cal. BP. Within the millennial scale variability, the southwestern Bay of Biscay pollen record shows 6 main phases:

The first phase, c. 9000 and 6600 cal. yr BP, is marked by a Pinus and deciduous Quercus forest with Corylus, indicating a humid and temperate climate. During the phase, c. 6600 - 4500 cal. yr BP, the pollen record shows a stable period of rich, mixed Quercus forest. During this interval occurred the establishment of Alnus, Ulmus, Tilia, Fraxinus excelsior-type and Fagus trees and the reduction of Pinus forest. This vegetation assemblage probably indicates an increase in moisture in relatively mild conditions. Fagus became continuously present in the region after c. 4500 c. cal. yr BP in agreement with what have been noticed by continental pollen sequences.

An important contraction of Pinus, deciduous Quercus and Corylus forest occur after c. 3600 cal. yr BP. This evolution is contemporaneous to the maximum expansion of Fagus and the increase of heaths, which may be linked to a weakening of seasonality and more humid summer conditions. A strong forest reduction, involving all trees except pine, and a marked spread of herbaceous plants took place after c. 1400 cal. years BP. The presence of Juglans, Cerealia type and Castanea after c. 550 cal. yr BP and the re-expansion of Pinus after c. 350 cal. yr BP testify the increasing role played by the human activity in the region.