



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.