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Clim. Past, 5, 53-72, 2009

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## Millennial-scale climatic variability between 340 000 and 270 000 years ago in SW Europe: evidence from a NW Iberian margin pollen sequence

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**Abstract.** We present a new high-resolution marine pollen record from NW Iberian margin sediments (core MD03-2697) covering the interval between 340 000 and 270 000 years ago, a time period centred on Marine Isotope Stage (MIS) 9 and characterized by particular baseline climate states. This study enables the documentation of vegetation changes in the north-western Iberian Peninsula and therefore the terrestrial climatic variability at orbital and in particular at millennial scales during MIS 9, directly on a marine stratigraphy. Suborbital vegetation changes in NW Iberia in response to cool/cold events are detected throughout the studied interval even during MIS 9e ice volume minimum. However, they appear more frequent and of higher amplitude during the 30 000 years following the MIS 9e interglacial period and during the MIS 9a-8 transition, which correspond to intervals of an intermediate to high ice volume and mainly periods of ice growth. Each suborbital cold event detected in NW Iberia has a counterpart in the Southern Iberian margin SST record. High to moderate amplitude cold episodes detected on land and in the ocean appear to be related to changes in deep water circulation and probably to iceberg discharges at least during MIS 9d, the mid-MIS 9c cold event and MIS 9b. This work provides therefore additional evidence of pervasive millennial-scale climatic variability in the North Atlantic borderlands throughout past climatic cycles of the Late Pleistocene, regardless of glacial state. However, ice volume might have an indirect influence on the amplitude of the millennial climatic changes in Southern Europe.

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Citation: Desprat, S., Sánchez Goñi, M. F., McManus, J. F., Duprat, J., and Cortijo, E.: Millennial-scale climatic variability between 340 000 and 270 000 years ago in SW Europe: evidence from a NW Iberian margin pollen sequence, *Clim. Past*, 5, 53-72, 2009. [Bibtex](#) [EndNote](#) [Reference Manager](#)

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