
Holocene evolution of coastal dunes in western France: regional reconstruction from archaeological and historical data

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Résumé

The long-term evolution of coastal sand-dune systems is known to be controlled by variations in sediment supply, relative sea level (RSL), wind energy, vegetation cover and anthropogenic forcing. The link between episodic sand invasion and changes in climate conditions (enhanced storminess) has been previously evidenced along the Atlantic coasts of Europe from stratigraphical, geomorphological and chronological investigations of recent aeolian sand-dune deposits. While well-constrained timing templates of dune accretion during Holocene were reconstructed in Portugal, Spain and Ireland, available data about the French Atlantic coast are limited to the Aquitaine dune complex (SW France). This lack of data is mainly due to the absence of well-developed palaeosoils interbedded within the aeolian sand deposits, especially in Brittany where only thin humic layers are preserved within the coastal dune sediment sequences. An alternative approach is here applied to the coastal dunes of Brittany by also integrating available and partly revised archaeological dataset, excavated from the end of the 19th century, and used as chrono-stratigraphical markers to reconstruct at a regional scale the periods of coastal dunes mobility during the last ca. 6,000 years. This analysis was further completed with historical data (historical syntheses, archives, old maps,

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historical photos) about the last few centuries. 221 sites distributed along the western coasts of France have been selected to provide accurate information in terms of dune stratigraphy and chronology. A conceptual tool routinely used in archaeology, the Harris matrix, was employed to synthesise these chrono-stratigraphic data about 78 coastal sand-dune systems. Four main episodes of aeolian activity identified during the mid- to late-Holocene period are dated at 4,250-4,100 cal BP (phase 1), 3,250-2,400 cal BP (phase 2), 1,050-700 cal BP (phase 3), and 350-110 cal BP (phase 4). Despite some methodological limitations, archaeological remains appear to be relevant chronological indicators and may be used to reconstruct ancient periods of coastal dune mobility. Finally, an evolutionary model is established about the sand-dune morphological changes that occurred during the mid-to late-Holocene period along the Western France coasts, whereas the nature of the driving mechanisms of sand movement initiation is also discussed.

Mots-Clés: Coastal dune, Holocene, western France, archaeology, chronology, sand, drift event