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Interest of hydrogeological study in the interpretation of pollen proxies for palaeo-climate reconstitution: example from Senegalese niayes

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The Niayes of Senegal are interdunal fens, allowing propitious conditions to agriculture, despite a sahelian climate, thanks to the availability of fresh groundwater, coast proximity and distant recharge from a well rain-fed elevation. An azonal humid gallery forest settled 10000 years ago, and thrived throughout Holocene despite contrasted climatic conditions. Exploratory modelling of the zonal hydrogeology has been conducted for different periods with Cast3M code. The progressive onset of humid vegetation required both the high pluviometry of the African Humid Period, and shallowing groundwaters under sea-level rise. Vegetation degradation at 7500 cal BP resulted from climate minoration, possibly worsening until 4000 cal BP. The watertable allowed the degraded forest to persist during that period. Thus pollens, as water-availability proxies, yield the combined signatures of atmospheric hydrology, and hydrogeology.