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Palynological evidences for climatic and oceanic variability off NW Africa during the late Holocene

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Pollen and organic-walled dinoflagellate cyst assemblages from core GeoB9503 retrieved from the mud-belt (50 m water depth) off the Senegal River mouth have been analyzed to reconstruct short-term paleo-oceanographic and paleo-environmental changes in tropical NW Africa during the interval from 4200 to 1200 years before present (BP). Our study emphasizes significant coeval changes in continental vegetation and oceanic environmental changes in and off Senegal. The land-sea correlation is further examined by comparison with paleo-sea surface temperature (SST) reconstructions based on alkenones analyses. These multi-proxy analyses reveal short-term land-sea climatic linkages in the western Sahel during the late Holocene.

Initial dry conditions were followed by a strong and rapid humidity increase around 2,800 years BP when the environment became enriched in woody plants and plants requiring wet conditions. This interval is also characterized by the occurrence of dinoflagellate cysts of river plume affinity. We interpret these observations as the result of enhanced Senegal River runoff with high terrigenous input into the ocean and the local occurrence of cool and less-saline surface waters suggesting discharge-induced upwelling off the river mouth. After 2,500 years BP, the environment slowly became drier again, as indicated by slight increases in sahelian savanna and desert elements. Around 2200 years BP, strong fluctuations in pollen and dinocyst accumulation rates

in conjunction with periodically lowered SSTs, suggest an episodic 'flash flood' events of the Senegal River. The driest phase developed after about 1,800 years BP characterized by the decrease of arboreal pollen and its replacement by pollen from the Saharan group and occurrence of pollen of *Pinus* and *Olea* that have their source areas in North Africa suggesting strong trade winds. Furthermore, high abundances of dinoflagellate cysts of subtropical/tropical affinity, such as *Tuberculodinium vancampoae* and *Lingulodinium machaerophorum*, indicate high nutrient, warm and stratified surface water conditions over the core site.