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EVOLUTION OF MAIN NUTRIENTS IN THE LAS TABLAS DE DAIMIEL NATIONAL PARK (TDNP) DURING THE LAST 1000 YEARS

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This study presents the evolution of the main nutrients in TDNP, from geochemical and pollen analysis of sediments covering the last millennium, to show the relationship among biogeochemical cycles, bioproduction, climate and human interactions.

1. Medieval Warm Period (c. XI-XV): Warm and humid conditions and no human interference allowed the permanence and expansion of a shallow water body with oxygenated bottoms by charophytes.

2. Little Ice Age (LIA) (c. XVI-XVII): Man-wetland interaction was really low. Bioproductivity and organic carbon storage decreased as consequence of fast and extreme climatic fluctuations and the continuity of high decomposition rates.

3. Pre-industrial period (c. XVII-XIX): Man pressure increased (farming). An initial increase in biomass production favoured preservation of organic matter but natural mechanisms of the ecosystem were able to return the system to the previous state.

4. Anthropogenic period (c. XIX-XXI): Human interference with the environment is extreme. Agriculture and related activities became the main sources of local economical growth and population increased quickly. During the 1960´s N and P values raised up to levels never registered before, due to eutrophication.

The TDNP nutrient cycles show an equilibrium controlled by four main variables: humidity, temperature, bioproductivity and redox conditions and the wetland is now eutrophic.

During a natural or low human pressure stage, this balance was sustained by positive and negative feedbacks among variables. But human interference, broke the feedbacks.

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RAPID ENVIRONMENTAL CHANGE AND CULTURAL CONNECTIONS, THE TROPICS AROUND 4000 YEARS BEFORE PRESENT: A REVIEW

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Palaeoecological data recording a pronounced environmental shift centred about 4000 yr BP are presented from tropical Africa and South America. The environmental shift is manifested as a change in the hydrological budget and vegetation: the majority of sites in tropical Africa recording a shift to drier environmental conditions that is in opposition to South America. This pronounced Holocene environmental shift is particularly interesting, as the marked changes within the tropics are either weakly recorded, or non-existent, at more extensively studied temperate and Polar latitudes. The climate mechanisms responsible for this shift are reviewed and a model developed to explain such a strong signal from the tropical areas without associated changes at high latitudes. We propose changes in Pacific Ocean sea-surface temperature regime, and the establishment of El Niño conditions has imparted a direct influence on tropical Atlantic SST that could explain the rapid changes in terrestrial palaeoecological records.