Peatland response to 7 ky of climate and human influences in the Marais du Vigueirat, Rhône River Delta, France

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Résumé

The Rhône River delta is fringed by peatlands located where the silty sediments of the deltaic plain lap onto the Plio-Pleistocene gravel of the Crau and Costières alluvial fans. Progradation and aggradation in the Rhône delta plain has forced the groundwater which is hosted in these sand-and-gravel aquifers to outflow on the delta sides, leaving only a fraction of the groundwater flowing below the delta into a confined aquifer. A transgressive system tract, starting with peat deposition, overlays the gravel. Along the eastern fringe of the delta, in the Marais du Vigueirat, peat deposition was followed by marine or/and floodplain sediment deposition. Locally, however, the local topography favored the continuous deposition of peat over 7 m, recording ca. 7 kyrs of climate and human control on peat deposition. 38 cores were collected along three transects to constrain the extent of the peat deposits. Three locations at which peat sequences are the most complete were then selected for continuous analysis. Peat facies exhibit rapid spatial and temporal variations, imparted both by the self-organization of the peatland and by external forces. Natural external influences include climate oscillations, flooding by the Rhône River, as well as the diffuse and channeled delivery of freshwater by the Crau water table. Facies variability increases over time, driven by an ever-growing anthropogenic pressure. The evolution of the peatland has been heavily influenced by the irrigation of the Crau alluvial fan since the 16th century, which likely increased phreatic freshwater delivery to the peatland. Since Roman times, the excavation of an increasing number of navigation and drainage canals has triggered repeated peat drainage and degradation. These canals have also variously increased or isolated these peatlands from the Rhône River floods. Here we will present the preliminary results of the stratigraphy of the deposits as well as the geochemical analyses (Rock Eval and CHNS) scheduled at the University of Lausanne.

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