

## **Paleoenvironmental and paleoclimatic conditions in the Tagus River Estuary during the Holocene**

**Authors:** Santos, C. (1,2), Abrantes, F.(1,2), Rodrigues, T.(1,2), Voelker, A. (1,2) and Vis, G-J.(3)

- 1) Unidade Geologia Marinha, LNEG, Estrada da Portela, Zambujal, 2610-143 Amadora, Portugal
- 2) CIMAR Associated Laboratory, Rua dos Bragas, 289; 4050-123 Porto, Portugal
- 3) TNO Built Environment and Geosciences, Amsterdam, Netherlands.

**Abstract:** Estuaries constitute the frontier between terrestrial, fluvial and marine environments, representing areas of high biological productivity that are particularly sensitive to global, regional and local environmental and climatic changes. The lower Tagus valley experienced a transgression period from 12000 – 7000 calendar (cal) years BP (Vis *et al.*, 2008;QSR). Trying to understand the interaction between land-river and ocean, we are studying paleoenvironmental conditions of the Tagus river estuary, using a 52,76 m long core drilled near Vila Franca de Xira (38°56'24''N; 8°56'19''W, 2 meters elevation). The age model of this core is based on 6 AMS <sup>14</sup>C dates. Marine/estuarine productivity and river input have been reconstructed for the last 14 000 calendar years BP, using a high resolution, multi-proxy study of diatoms, C<sub>37</sub> alkenones, higher plant C<sub>23</sub> – C<sub>33</sub> n-alkanes and C<sub>20</sub> – C<sub>30</sub> n-alkan-1-ols, Fe and Ca content derived from XRF analysis and Total Organic Carbon (TOC). Our data shows that major river input events (as revealed by higher concentrations of terrestrial lipid biomarkers and phytoliths) control the primary productivity at this site because increased productivity – maxima in diatoms, C<sub>37</sub> alkenones and TOC – are synchronous. Marine and brackish diatom genera and C<sub>37</sub> alkenones occur between ca. 11500- 4500 cal years BP indicating a marine to brackish environment, probably in a shallow marine pro-delta. After 4500 cal years sea level had risen so much that the marine influence was reduced (low abundance of marine diatoms) and the environment was similar to the modern, i.e., a brackish tidal flat. Further work is needed to improve the understanding of this estuarine record.