

Figure F1. Location map of Expedition 401 sites and earlier scientific drilling targets. Star = Site U1610 in Gulf of Cádiz (Flecker et al., 2025a). ODP = Ocean Drilling Program, DSDP = Deep Sea Drilling Project.

Figure F2. Shipboard MS and NGR with select XRF elemental counts, Hole U1610A. Black lines = rolling means (calculated with window size of 3) of shipboard physical properties (MS and NGR) and selected elements. X-axes for select

elements and MS results have been adjusted to ensure readability of cyclicities. cps = counts per second.

Figure F3. Spearman's correlation plot, Hole U1610. Lower left: crossplots between elements (Al, Si, Ti, Ca, Sr, Mn, and Ba). Diagonal kernel density plots illustrate count distribution of each element. Upper right: heat map ranging -1 to $+1$ (pinks = positive correlations, blues = negative correlations; higher correlation values are reflected in intensity of color).