Figure F1. Bathymetry of Promontório dos Príncipes de Avis west of the Iberian Margin showing locations of Expedition 397 sites, Marion Dufrense (MD) piston cores, and Integrated Ocean Drilling Program Site U1391. Site U1385 was occupied previously during Expedition 339, as was Site U1391. Map modified from Hodell et al. (2024b, 2026).

Figure F2. Core recovery, Holes U1587A–U1587C. White intervals = cores with no or incomplete recovery (see Abrantes et al. [2024] for details). Left: age boundaries of recovered sedimentary section based on the shipboard biostratigraphic and paleomagnetic boundaries. Right: schematic lithology across all holes. Dominant lithologies: nannofossil ooze (light gray) and clay (dark gray and brown) in varying proportions (see text and Hodell et al. [2024b] for details).

Figure F3. Comparison of $CaCO_3$ weight percentage measured by coulometric titration on 125 discrete sediment samples during Expedition 397 (Hodell et al., 2024b) and XRF-derived log(Ca/Ti) values at corresponding core depths, Site U1587. High variance (R^2 = 0.97) shows how well linear model fits data and supports use of log(Ca/Ti) as a proxy for $CaCO_3$ content.

Figure F4. GP modeling of two nondestructive measurements of same cored interval along Site U1587 splice. Symbols = raw measurements. lines = GP fits to data. Note that dispersion of measured L* parameter (color reflectance; proxy for carbonate content [Balsam et al., 1999]) to GP fit is much larger than for scanning XRF measurement of log(Ca/Ti). GP fit explains less of the total variance in L* (92.5%) than in log(Ca/Ti) (98.4%), indicating greater signal-to-noise in XRF in comparison to L* measurements. See text for details.

Figure F5. Revised splice using NGR to tie Holes U1587A and U1587B to fill gap in XRF scanning. Arrows = tie point for revised splice from Holes U1587A to U1587B and from Holes U1587B to U1587A. All hole segments aligned to composite depth scale. cps = counts per second.

Figure F6. Pliocene through Quaternary trends in XRF counts of biogenic elements and log(Ca/Ti) record on Site U1587 composite depth scale. Ca counts were measured at 10 kV. Br and Sr counts were measured at 30 kV. Log(Ca/Ti) was used to refine Site U1587 splice.

Figure F7. Pliocene through Quaternary trends in XRF counts for lithogenic elements on Site U1587 composite depth scale. Fe, Al, Si, and Ti counts were measured at 10 kV. Zr and Rb counts were measured at 30 kV.

Figure F8. Crossplots of elements typically associated with biogenic (Ca, Sr, and Br) and detrital (Fe, Al, Si, Ti, Zr, and Rb) inputs to marine sediments, Site U1587. Linear Pearson correlation coefficients (R) are displayed for each plot. See Table T1 for correlation coefficients and covariance values between elements. Ca, Fe, Al, Si, and Ti counts were measured at 10 kV. Sr, Br, Zr, and Rb counts were measured at 30 kV.