

Supplementary Information

Supplementary Table S1: Table with a summary of demagnetization data results. Sample identification, Core location indicating core, section and depth (mbsf), Declination, Inclination, Sample intensity (in A/m²), MAD values and remarks including the steps used for interpretation. Resultant orthoplots are depicted in Fig. S1.

Supplementary Table S2: Concentrations of GDGTs at Site 274. All samples and corresponding depths, age of sample, GDGT peak area values, TEX₈₆ (Schouten et al., 2002) and BIT index values (Hopmans et al., 2004), Methane Index (Methzhang) values (Zhang et al., 2011), GDGT2/Crenarchaeol ratios (Weijers et al., 2011), GDGT-0/Crenarchaeol ratios (Blaga et al., 2009) and GDGT-2/GDGT-3 ratios (Taylor et al., 2013), and RING index (Sinninghe Damsté, 2016). SST calibrations from Kim et al., 2010; Kim et al., 2012. SSTK10L = linear calibration of Kim et al. (2010). Discarded samples (OUTLIER=TRUE) with outlier values are based on BIT > 0.4, GDGT2/GDGT3 > 5, GDGT0/cren > 2 and Methzhang > 0.3.

Supplementary Table S3: Total palynomorph assemblage counts DSDP Site 274 cores 43–21.

Supplementary Table S4: Correspondence analysis (CA) scores of the dinocysts assemblage data from DSDP Site 274.

Supplementary Figure S1: Orthogonal plots of representative samples. Most of the samples used for the correlation show two distinctive directions, both in normal samples and in reversed samples. Inclination values are also indicated. Open plots indicate inclinations (vertical projection). All calculated directions are available in Table S1. Samples were calculated by means of the Paldir and paleomagnetism.org (Koymans et al., 2016) programs.

Supplementary Figure S2: Relevant GDGT indices to filter out biased outliers (red crosses) in the generated GDGT data (Table S2), plotted against sample depth (mbsf). The red line marks the limit of reliable values. a) TEX₈₆ (Schouten et al., 2002). b) BIT index values (Hopmans et al., 2004). c) Methane Index (Methzhang) values (Zhang et al., 2011). d) AOM index (GDGT2/Crenarchaeol ratios) (Weijers et al., 2011). e) Water column overprint values (GDGT-2/GDGT-3 ratios) (Taylor et al., 2013). f) Methanogenesis values (GDGT-0/Crenarchaeol ratios) (Blaga et al., 2009).

Supplementary Figure S3: Cross plot between the ring index and TEX₈₆ values of samples from DSDP Site 274. The lines mark the outer ranges of the ring index (Zhang et al., 2016), outside of which samples have outlying values (marked as crosses). The shade of blue indicates the sample depth (mbsf).