

Response to EC1, Gerilyn (Lynn) Soreghan

We thank Gerilyn (Lynn) Soreghan for these helpful comments, and can address all the points raised, as follows:

117— the strata “exhibit” rather than “contain”

- We will make this word substitution (“The strata *exhibit* a negative $\delta^{13}\text{C}$ excursion...”).

246— Section 3.2— it might be helpful to begin here by noting the size (and maybe shape) range, where you note they are variable in “size and appearance,” in addition to the references to the relevant figures.

- We will elaborate the description of the glendonites as follows: “The glendonites are variable in size and appearance, with some being cemented or partially cemented (Fig. 3C, E, H and I), and some present as an uncemented *amalgam* of smaller crystals (Fig. 3B, D, F, G), and some retaining their structure but as a porous mesh of calcite (Fig. 3A and J). *In size, they range from small fragments (2 – 5 mm across, Fig. 3A,D,F,I,J) to crystals up to or beyond the than the entire width of the core (Fig. 3B,C).* In some cases, the crystal appears to have grown over and incorporated parts of the host sediment (Fig. 3E,H), yet in others appears to have either displaced the sediment it was growing in (Fig. 3G), or grew up into the water column with later sedimentation burying it (Fig. 3C). *Nearly all the recorded glendonite specimens can be ascribed to a single rosette morphotype (Fig. 3) (following terminology proposed by Frank et al., 2008), except for specimens from Fig. 3D, F, I and J, in which the morphology is unclear due to the fragmented nature or disturbance of the structure during drilling.*”

Fig. 3A illustrates a core that appears to have mud invasion and be a bit disrupted, and indeed the caption notes that these are glendonite fragments in drill mud. Doesn't that mean that these could be out of place, and thus not reliably placed stratigraphically? In other words, why show this example, given the uncertainty of its stratigraphic position? I see that you mention this in lines 257-260, so that is fine.

- We also describe this in Table 1 in the ‘remarks’ column.

315— space needed between words.

- we will add this missing space (“localised increase”).

367— what is meant by “Pore waters... were taken on board at low resolution...” — really two questions— how were the pore waters sampled, and at what resolution? Did I miss this in the Methods? (I couldn't find this detailed in the methods).

- Shipboard sampling and analyses of the interstitial waters were made during the Expedition 396, and the methods and results are published in Planke et al., 2023 a, b and c. We will delete this line from the discussion as it pertains to methods, and add a paragraph to section 2.1 (‘Geological setting’) and sampling to explain this as follows:

“At each Hole, interstitial water (IW) samples were taken at intervals of ~3 m of sediment in the upper 50 metres, ~1 sample every 9.5 m for the lower parts of the cored sediment. Standard IODP methods for IW extraction were used at all sites. Following whole-core recovery to the catwalk, full round samples were collected, sealed and transferred to the shipboard chemistry lab, where sediment exteriors were carefully removed to reduce potential contamination from drilling fluids. The samples were individually ‘squeezed’ - placed into a Carver press and subjected to 35,000 lb force.”

Squeezed fluid was then filtered through a Whatman No. 1 filter (11 μm) and 0.5 mL was discarded. The remaining fluids were collected in acid-cleaned syringes after filtering through 0.45 μm polyethersulfone membranes, and split into aliquots. All analyses of the collected IWs were completed following the standard shipboard methods of the R/V 263 JOIDES Resolution (Planke et al., 2023d), and are published in Planke et al. (2023a) and (2023b)."

495— are they found “throughout” or within discrete intervals? It seems more like the latter?

- The fact that so many glendonites were sampled in numerous intervals within the narrow boreholes from the expedition 396 suggests that there are likely many more glendonite horizons which were missed, and therefore feel that the word “throughout” is more apt.