

Interactive comment on “Seafloor observations at Campeche Knolls, southern Gulf of Mexico: coexistence of asphalt deposits, oil seepage, and gas venting” by Heiko Sahling et al.

Anonymous Referee #3

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The Manuscript by Sahling and colleagues about the Campeche Knolls area of asphalt deposits describes a series of deep-sea reducing habitats that have similarities and yet distinct features compared to those known. While the manuscript is largely descriptive, its careful inclusion of these sites in current knowledge of reducing habitats and appropriate interpretation of its results provides a useful addition to our overall understanding of the diversity of habitats found in the deep sea. In this particular case it also adds to a section of the planet that is largely unknown and yet lies in close proximity to among the best studied regions (the GoM) for similar habitats on the globe. Further, the exciting observations of the vestimentiferan ‘rhizosphere’ community was an intriguing discovery and provides the opportunity for conceptual advancement. This manuscript

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was carefully and well written and thus I have only very minor comments and feel this will be a valuable addition to the literature and is appropriate for Biogeosciences.

The introduction, methods and results were all well written and of appropriate length and depth. The authors demonstrated a clear grasp of the pertinent literature. The discussion nicely placed these results in correct context and then used these to highlight the knowns and unknowns of the regions. Imagery was used powerfully to illustrate the discoveries and I can see that many of these figures will be used in the future in discussions of the different types of reducing habitats in the deep sea.

I have the following minor comments that would marginally improve the manuscript: 4.2.4 – ‘pogonophoran’ has fallen out of favor and I am unfamiliar with Anobturata and it is not in WORMs. Can the authors either provide a reference for Anobturata or use frenulate or monolifera (depending on which it may be – with frenulate the more likely of the two and currently more ‘correct’ (i.e. monophyletic) compared to pogonophoran.) P13 – “we sketched” suggest “we illustrate” P14 - “As well as oil derived from higher hydrocarbons” – I would suggest changing this to “and likely augmented by degeneration of organic carbon that may include higher hydrocarbons”. As Joye et al. found a mismatch between SRR and AOM. They did not completely contribute the sulfide present to longer chain hydrocarbons. P14 “With estimated life spans” – additional age info is found in Cordes et al. 2007 Marine Ecology 28:160-168 that puts smaller individuals (1.1m) at age estimates of 300 years. This provides further evidence for the long term seepage estimates provided by the authors.

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