

## Reply to reviewer #2:

The manuscript entitled "The dispersal of fluvially discharged and marine, shelf-produced particulate organic matter in the northern Gulf of Mexico" by Yedema and coauthors takes advantage of the combination of organic geochemistry and palynology to determine the origine of sedimentary organic matter and ecological niches in the northern Gulf of Mexico.

The description of geochemical data is complete and discuss the relative abundance of GDGTs, long chain diols and, more classical for this type of study, n-alkanes, alkenones and sterols, leading to assumption on the fate of soil derived, fluvially derived and marine OM.

This is a nice descriptive paper, well-written (even if, as a non-native english speaker, I can not evaluate the use of English language). My only concern is about the apparent lack of a scientific question. The issue of the fate of terrestrial OM at the land-sea interface is, of course, important for C cycling, but the introduction could indicate why and how the present results will contribute to create new knowledges. Assumptions are formulated to discuss the relative preservation of the different sources of terrestrial OM, then there is just to make this point explicit.

Finally, in order to be more efficient on the use of money and energy, I suggest for further research that, at this stage of the knowledges on the northern Gulf of Mexico system, it could be interesting to test hypotheses on the fate of OM with a specific sampling strategy or using experimentations instead of formulating assumptions after the sampling.

This article is close to being published after minor revisions.

*Reply: We thank this reviewer for the positive assessment of the manuscript and praise on its completeness regarding the geochemical data.*

*Regarding the specific comments:*

*-Research question: In this study, we aim to identify the TerrOM composition stored in the northern GoM to assess if specific OM pools are preferentially buried in the sediments. To further motivate our aim, we will add more information on previous biomarker work in the GoM to the introduction and specify the knowledge gaps that remain. We will also further clarify how our dataset will contribute to closing this knowledge gap.*

*- Study design: Studying the dispersal of TerrOM in the northern GoM was the main objective when planning the research expedition. We have deliberately collected sediments along two land-sea transect starting at the river mouths of the AR and the MR, as well as one shelf transect that follows the MAR river plume to trace TerrOM. We will clarify this further in the revised manuscript.*