

# ***Interactive comment on “Metagenomic insights into the metabolism of microbial communities that mediate iron and methane cycling in Lake Kinneret sediments” by Michal Elul et al.***

## **Anonymous Referee #2**

Received and published: 29 September 2020

This study “Metagenomic insights into the metabolism of microbial communities that mediate iron and methane cycling in Lake Kinneret sediments” use metagenomics to investigated microbial communities associated with iron reduction and methane cycling from both natural Lake Kinneret sediments and iron amended slurry incubations. The data and interpretation is generally good. While I find the topic of this study certainly interesting for Biogeosciences, there are several aspects which should be addressed before publication.

Lack of accompanying geochemical analysis, enzyme assay or transcripts analysis make the study descriptive, mostly putative or based on prediction from reference

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database in results and discussion. Moreover, metagenomic analysis of four treatments shows not much difference between them or at least the authors didn't present much difference, which questions the experiment design or validity of method due to poor coverage of metagenomic method, especially when targeting a minor group in a complex sample.

Metagenomics analysis only covers the ferruginous part of sediment core, so the title, abstract and descriptions throughout the text should be specific, rather than use "whole" lake sediment.

The names of microbes and genes should be in italic, first letter of proteins should be in Capital, please check and correct throughout the whole text.

Line 35 "on average" and "up to" are redundant and not logical here, delete one.

Line 40 "largely unknown" is not precise here, actually there have many studies in recent years, in ferruginous sediments will be more specific

Line 46 change depleting to depleted

Line 71 Diversity of what?

Line 208-211 Did the author measure concentrations of H<sub>2</sub> and SO<sub>4</sub> in this study? Otherwise, they need to explain how they get these numbers.

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Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2020-329>, 2020.

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