Marguerite Xenopoulos, Ph.D.

Editor-in-Chief

*JGR Biogeosciences*

Date

Dear Dr. Xenopoulos,

Please find attached our manuscript entitled, “Effects of hypoxia on coupled carbon and iron cycling differ between weekly and multiannual timescales in two freshwater reservoirs” for consideration as a *JGR Biogeosciences* research article. We conducted integrated whole-ecosystem oxygenation experiments and microcosm incubations to analyze how hypoxia affects iron-bound organic carbon and carbon flux across the sediment-water interface in two eutrophic reservoirs. Our study advances our understanding of how declining oxygen concentrations in lakes and reservoirs around the world may affect the critical role that these ecosystems play in the global carbon cycle.

We anticipate this manuscript will be of broad interest to the readers of *JGR Biogeosciences* by providing a novel analysis of coupled biogeochemical cycles across multiple scales. In this study, we found that short-term (several weeks) periods of hypoxia can decrease iron-bound organic carbon and total organic carbon levels in reservoir sediments. Conversely, multiannual periods of hypoxia increased total organic carbon in sediments, likely through decreased rates of respiration. Our results highlight the importance of the sediment-water interface in freshwater biogeochemical cycling, as both total organic carbon and iron-bound organic carbon concentrations differed significantly between settling material in the water column and surficial sediment. Furthermore, this paper reinforces the critical role that iron can play in preserving organic carbon in sediment: in this study, we found that approximately one third of the organic carbon in surficial sediment from two freshwater reservoirs was bound to carbon, substantially more that has been previously reported for lakes and many marine sediments.

We recommend the following reviewers, with whom we do not have any conflicts of interest:

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This manuscript has not been accepted for publication before, nor is it under consideration for another journal or book. The research met U.S. legal requirements for responsible research. Each named author has substantially contributed to conducting the underlying research and drafting this manuscript, and all co-authors have approved this submission. No co-authors hold any conflict of interest. As described in the text, all datasets analyzed in this manuscript are available in the Ecological Data Initiative (EDI) repository and additionally included as a supplemental file for manuscript review.

We hope you find this manuscript suitable for publication in *JGR Biogeosciences* and look forward to hearing from you.

Sincerely,

Abigail Lewis, on behalf of the coauthors

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