



STONY BROOK UNIVERSITY
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7 January 2019

Dear Dr. de Senerpont Domis,

We are writing to re-submit our manuscript “Seasonal changes in the biomass, distribution, and patchiness of zooplankton and fish in four lakes in the Sierra Nevada, California” for publication as a research article in *Freshwater Biology*. This manuscript was previously submitted in April 2018 (Manuscript ID FWB-P-Apr-18-0175). Following review the paper was declined, but we were invited to resubmit the manuscript as a new submission if we substantially revised it to address the reviewers’ and your own concerns.

Reviewer 1 had mostly minor comments and edits which we have attempted to address in the new manuscript. Most significantly, we have added new data from CTD casts in each lake, presented in a new Figure 4. We altered the analysis comparing the nets and acoustics to include acoustic data within 25 m of the location of the net cast, rather than within 10 minutes of the time of the cast (i.e., a spatial rather than temporal radius). We feel that this makes the results easier to interpret. Additionally, we combined Tables 1 and 2 per the reviewer’s suggestion.

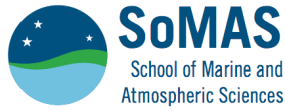
Reviewer 2 had several more significant concerns. The first of these was the suitability of a standard regression comparing acoustic and net-based zooplankton abundance, given that the x-variable (acoustic biomass) was measured with error. In response to the reviewer’s suggestion, we have analyzed the data using a geometric mean regression as well as standard least-squares regression and recorded the results of both. The slope from the geometric mean regression is not significantly different from that obtained via ordinary least-squares, which increases our confidence that this analysis is suitable for the purposes of this paper.

The second reviewer’s second major concern was the lack of uncertainty estimates for the acoustic biomasses. This issue is more complicated. Acoustic biomass estimates contain uncertainty from multiple sources, from instrument calibration and animal target strength to limited sampling and geostatistical errors. While these errors can be estimated, doing so requires its own assumptions and typically relies on conditional Monte Carlo simulations. While such exercises are regularly performed in acoustic surveys used for e.g. fishery stock assessments, we believe the greater statistical rigor is not worth the added methodological complexity for the purposes of this paper. We have added text in the discussion section justifying this decision, and citing prior work which has undertaken the calculation of biomass errors for acoustic surveys.

The final major concern of Reviewer 2 was the unreliability of fish biomass estimates in Lake Tahoe, based on the limited extent of sampling relative to the size of that lake. This concern is a reasonable one. We have thus removed these biomass estimates from the results and tables, and added an explanation for doing so in the Methods.

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Finally, a concern shared by yourself and the second reviewer was the descriptive nature of this study and the lack of explicit hypotheses. This study was in fact conceived as a “descriptive study using relatively new methods,” and as such we are hesitant to add hypotheses on *post hoc*. However, we did have several expectations for the types of patterns we would observe; we have tried to describe these more explicitly at the end of the Introduction. Hopefully, the inclusion of these expectations makes our motivation and theoretical framework for this study clearer.

The remaining comments by the two reviewers were mostly minor. Where requested, we have added more detailed descriptions of our methods, and corrected a couple of discrepancies between figures/tables and the text which were left over from an earlier version of the analysis. We have also clarified the units and presentation of some data in the Results.

The contributions of both authors were as follows: JDW conceived the study. SSU and JDW collected data in the field. SSU analyzed the data and drafted the manuscript; both authors edited it.

We believe that the comments of the two reviewers have considerably improved the paper since its original submission. We thank you for your time and consideration of our manuscript.

Sincerely,

Joseph D. Warren