6 March 2018

To the Editor:

We are submitting the 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*.

In this study, we used a two-frequency echosounder system to make estimates of zooplankton and fish biomass in four high-altitude lakes. In two of these lakes, we repeated surveys four times over a year, revealing the seasonal cycle in biomass at two trophic levels. For three of the lakes, ours are the first-ever biomass estimates. These measurements are the first of their kind in alpine lakes in North America, and will help establish baselines for these lakes in a rapidly changing environment.

In addition to overall biomass estimates, our acoustic methods let us measure spatial trends, both vertical and horizontal, in the distribution of zooplankton. They also let us quantify the spatial patchiness in the distribution of zooplankton. This is an often-overlooked aspect of lake ecosystems. Even in the small lakes we sampled, significant horizontal trends and patchiness were present, raising questions about the processes that generate this spatial heterogeneity.

This is the third manuscript from the current project, funded by an NSF RAPID grant in response to the 2013 Rim Wildfire in California. In the first, published in *Frontiers in Ecology and the Environment*, Williamson et al. (2016) reviewed and synthesized the effects of fires and other extreme events on lakes, in particular with respect to their exposure to ultraviolet light. In the second (Urmy et al. 2016, *Geophysical Research Letters* 43 (8)), we showed that it was possible for a plume of smoke haze to alter the UV environment and the distribution of zooplankton in a lake many kilometers away from the wildfire producing it. The current manuscript also builds on the work of Warren et al. (2016, *Limnology and Oceanography: Methods* 14 (4)), who showed how a high-frequency echosounder could be used to detect small (~1 mm) zooplankton and make estimates of their biomass.

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.

Thank you for your time and consideration of our manuscript.

Sincerely,

Joseph D. Warren