

Category II – Aquatic Ecosystems

Nutrient Deposition and Alteration of Food Web Structure in High Sierran Lakes: Response by Microbial Communities

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Executive Summary:

High-elevation lakes of the Sierra Nevada, once considered isolated from human impacts, are increasingly experiencing the effects of population expansion. Nutrient loading, the result of increasing atmospheric deposition, and the stocking of non-native trout, halted in National Parks but continuing on Forest Service lands, are major anthropogenic impacts to these remote ecosystems. The ecological impacts of both trout stocking and atmospheric pollutants have been studied in high-elevation lakes of the Sierra for nearly two decades, and have been shown to impose significant and lasting impacts at a regional scale, including eradication of endangered species, alterations to algal productivity, and changes in zooplankton population dynamics. Connecting these shifts to ecosystem function and biogeochemical cycling is necessary for understanding and predicting ecological impacts in these lakes, yet this has not yet been a focus, despite the documented sensitivity of alpine lake ecosystems to even minor changes in water chemistry or nutrient availability.