Coalescence in the Lake Washington story: Interaction strengths in a planktonic food web

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ABSTRACT: Lake Washington is arguably the most famous case study of lake pollution and subsequent recovery, and the widely cited story implicates just a few major players in the lake's food web transformations. "The Lake Washington story" historically highlights key players that negatively affect other taxa—filamentous cyanobacteria, the influential grazer *Daphnia*, and its predator *Neomysis*. This food web model has been based variously on experiments, observation, and educated inference. Here we tested the robustness of that historical conceptual model in a single multivariate analysis of long-term data. Most aspects of the historical model are supported, but the analysis also suggests key roles for food resources not previously considered—the nutritious cryptomonads and ubiquitous picoplankton. This cohesive analysis helps align the historical model with recent studies emphasizing "bottom-up" controls in Lake Washington and similar systems, and demonstrates the usefulness of using long-term data analysis to validate results from traditional ecological approaches.

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