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GLOBAL-SCALE COMPILATION OF FRESHWATER ZOOPLANKTON: TINY SENTINELS OF ENVIRONMENTAL CHANGES

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Abstract:

Zooplankton communities are the primary conduit of energy from phytoplankton to planktivorous fish in freshwater ecosystems and play key roles in the functioning of these systems. Therefore, they are often proposed as ecological indicators. However, most zooplankton research focuses on a single waterbody or region, and insights from such studies may not be transferable to other waterbodies. To address this knowledge gap, the Zooplankton as Indicators Group (ZIG) of the Global Lake Ecological Observatory Network (GLEON) assembled a zooplankton dataset that also includes physical and chemical lake characteristics. The dataset has a broad spatial and temporal coverage with data from over 290 waterbodies. Each waterbody includes 1 to 60 years of data, with >70% sampled at least monthly during the growing season (>31,000 sampling events represented). We are exploring the environmental drivers of zooplankton community composition and assessing zooplankton as ecological indicators using this new dataset. Further, we are investigating whether relationships between zooplankton metrics and environmental drivers differ among lake characteristics (e.g., deep vs shallow) or regions, including systems such as the Laurentian Great Lakes, mountain lakes, and tropical lakes. Understanding the linkages between zooplankton communities and environmental drivers is essential to forecasting the future state of freshwaters in a changing world and we expect the dataset to have extensive and versatile applications in examining zooplankton dynamics and ecosystem responses to environmental shifts.

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