Seasonal variation in microbial community dynamics and organic matter in the Great Lakes

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Abstract (230 words or less)

Winter has been regarded as a period of relative dormancy in limnetic systems, characterized by diminished biological activity. The Great Lakes Winter Grab has provided evidence that microbial communities remain active during winter, and important biogeochemical processes still occur. Here, we present work aimed at understanding the microbial ecology of the Great lakes during winter. We hypothesized that microbial activity across lakes and seasons would vary, and that activity would be modulated by primary production, organic matter, and nutrient availability. Through the Great Lakes Winter Grab network, we took water samples from each of the Great Lakes and Lake St. Clair. The samples were used to measure bacterial community activity via incubations with tritiated leucine and thymidine and community assemblages via 16S rRNA genomics, and to measure nutrient concentrations. Organic matter in the water samples were characterized via fluorescence excitation-emission matrix spectroscopy. We found that the activity of microbial communities shifted to focus on maintaining homeostasis during the winter.