Title:

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

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Abstract (230 words)

Winter has been regarded as a period of relative dormancy in limnetic systems, characterized by diminished biological activity. However, recent studies such as the Great Lakes Winter Grab, have shown that microbial communities remain active and that important biogeochemical processes continue. Here, we present work aimed at understanding the microbial ecology of the Great Lakes during winter and how the winter assemblages impact the following seasons’ community dynamics. We hypothesized that microbial activity across lakes and seasons would be different, and that activity would be modulated by primary production, organic matter, and nutrient availability. We also hypothesized that bacterial production and biomass will covary with primary production and the relationship being the strongest at low nutrient concentrations. 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 dynamics via incubations and genomic approaches, and to measure and characterize nutrient concentrations We found that the activity of microbial communities shifted to focus on respiration during the winter.