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***Temporal Dynamics of Microbial Communities in Four Yellowstone National Park Hot Springs***

The microbial communities of Yellowstone National Park (YNP) thermal features have been well-characterized, and have provided a wealth of information about thermophilic microbial community ecology. However, there has been little study of how these communities change in composition over time. The objective of this project is to use culture-independent methods to characterize the microbial community composition of four acidic YNP hot springs with weekly sampling over a six-month sampling period spanning multiple seasons. Analyses will be conducted using high-throughput 16S rRNA sequencing to determine community composition and quantitative PCR to determine population abundances in tandem with geochemical analyses, in order to assess how and why microbial communities respond to spring geochemical fluctuations over time. In addition to the three springs sampled continuously over six months, emphasis will be placed on microbial community succession in a newly formed hot spring that appeared during the course of sampling to provide insight into the establishment and succession of thermal feature microbial communities. I hypothesize that seasonal variances in climatic factors, especially precipitation, will have a pronounced impact upon hot spring communities due to the mixing of surface waters with subsurface hydrothermal waters. Preliminary molecular and geochemical results will be presented in context of temporal dynamics of the system.

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