A relational database for research on alkaline siliceous hot spring microbial mats

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The National Science Foundation Opportunities for Promoting Understanding through Synthesis (NSF OPUS) Program supports work "aimed at synthesizing a body of related research projects conducted by a single individual or a group of investigators over an extended period" (NSF OPUS Program solicitation 08-559). As part of an OPUS grant to Ward, a relational database for research on microbial mats of alkaline siliceous hot springs is under construction. In addition to basic citation and funding information, the database currently contains, for most of Ward's published works, information on the kinds of organisms studied; the kinds of research conducted (e.g., chemical analysis, microscopy, process, molecular, cultivation); and an experiment by experiment description of approach, methods, site and site physiochemical characteristics, collection date, and types of result (e.g., radiolabeling, microsensor, molecular, stable isotope). A citation frequency report is also included. Initial analyses of the database indicate trends in research in the Ward Lab: (i) NSF has been a major sponsor, (ii) the favored sample site switched from Octopus Spring to Mushroom Spring between 1996 and 1999, (iii) there was a stark lack of reporting collection date in papers published before 1994, (iv) seasonal sampling has been uneven, with predominant sampling in summer and autumn, (v) there was a transition from process-based (i.e., metabolic) to nucleic acid-based (i.e., population-based) research around 1989, and (vi) few papers have been heavily cited in the scientific literature. The database will be useful for linking observations made over many decades and revealing unseen patterns and gaps in the understanding of these mat systems. This will guide future research on these model microbial communities.