



## Ridge Flank Hydrothermal Systems and their relationship to the oceanic carbon cycle

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Ridge flank hydrothermal systems represent vast environments that may be habitable by subseafloor microbial life. Oceanic ridge flanks, areas far from the magmatic and tectonic influence of seafloor spreading, comprise one of the largest and least explored microbial habitats on the planet. These potential ecosystems may play a significant role in biogeochemical processes and elemental fluxes that are known to be regulated by these systems. I will discuss the nature of ridge flank hydrothermal environments, and present a framework for delineating a continuum of conditions and processes that are likely to be important for defining subseafloor microbial "provinces." The basis for this framework is three governing conditions that help to determine the nature of subseafloor biomes: crustal age, extent of fluid flow, and thermal state. A brief overview of subseafloor conditions, within the context of these three characteristics for select sites will be described. Technical challenges remain and likely will limit progress in studies of microbial ridge flank hydrothermal ecosystems, which is why it is vital to select and design future studies so as to leverage as much general understanding as possible from work focused at a small number of sites. A characterization framework that perhaps includes alternative or additional physical or chemical characteristics is essential for achieving the greatest benefit from multidisciplinary microbial investigations of oceanic ridge flank hydrothermal systems.