

**Letters of Intent: Endeavour**  
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**Physiological and behavioral responses of vent invertebrates to sulfide, temperature, and hypoxia**

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We propose to investigate the relationship between physicochemical parameters and organismal physiology and behavior at the Endeavor integrated study site. The goal of these studies is to provide quantitative information about how tectonic events affect biological communities. Key environmental parameters: sulfide, temperature, and oxygen, will be measured around communities to determine the ranges that are encountered. Behavioral and physiological responses of macrofauna to these parameters will be quantified. From these studies, the magnitude and direction of effects of environment on organisms will be determined. A fiber-optic oxygen sensor/temperature measurement device and flow-injection analysis will be used for in situ monitoring. Measurements of responses of animals maintained in high pressure aquaria to temperature, sulfide, and oxygen will include: behavioral preference within an environmental gradient, lethal limits, critical oxygen partial pressures, metabolic fluxes, and changes in biochemical parameters. In addition, high pressure aquaria will be used to maintain organisms in a shore-based facility allowing studies to take place over a longer period of time and allow participation of a greater number of investigators.