

**Letters of Intent: EPR**  
**Target Date: August 15, 2002**

**Geophysical Monitoring of Magmatic, Tectonic, and Hydrothermal Processes at the East Pacific Rise  
RIDGE Integrated Study Site: Seismicity and High-Temperature Vent Fluid Time Series Studies**

R. A. Sohn and D.J. Fornari, Woods Hole Oceanographic Institution

We plan to submit a proposal to deploy seismic and black smoker fluid temperature monitoring networks to investigate the linkages between magmatic, tectonic, and hydrothermal processes at the EPR IS site. The precise network configurations have not yet been determined, but we will generally follow the bulls-eye concept concentrating on monitoring seismic activity and exit fluid temperatures within the area where nine high-temperature vents are localized ( $9^{\circ} 49.6'N$  to  $9^{\circ} 51'N$ ). The seismic network will include expanding rings of seismic stations to encompass the largest scales of deformation and faulting at correspondingly reduced degrees of spatial resolution. Our vent fluid temperature monitoring program will use upgraded DSPL SeaLogger temperature probes, capable of storing  $\sim 120k$  measurements at data acquisition rates of seconds to minutes and deployment periods of months to up to 2 years. We envision installing multiple probes in individual vents so that time-series data can be recorded at varying rates so that short-term (seconds) to long-term (tidal to months and years) variations in exit fluid temperature can be deduced.

In order to obtain a complete understanding of the magmatic and tectonic cycles the seismic observations must be coordinated with geodetic observations so that ground deformation can be monitored at all time/spatial scales. To this end we will coordinate our efforts with a planned geodetic monitoring proposal to be submitted by Spiess, Hildebrand, and Chadwell at SIO. Seafloor pressure recorders will permit tidal forces to be quantified so that their influence on seismic and vent exit temperature processes can be assessed. We would also like to coordinate with PIs interested in monitoring exit fluid chemistries, and biological activity.