Cruise AT-37-04

- Newport, OR to Manzanillo, Mexico
  October 8 to October 27, 2016
- UM (Kang Ding, W.E. Seyfried, Jr.)
  *Chemical Sensor studies of EPR 9°N Vent fluids: In Situ measurement and monitoring*
- USF/HU (K.T. Scott, Pete Girguis)
  *Metabolism of Riftia Pachyptila under in-situ conditions*

- Vehicles Used
  **Alvin (Nine dives)(8 +1)**
  - Time lost for Weather= 0
  - Time lost for Vehicle equipment= 0
  - Time lost for User provided scientific equipment= 0
  - Average Alvin bottom time = 5H 32M

- Post Cruise Assessment
  - Atlantis and Alvin- Very high marks for all aspects of performance and in meeting goals of the scientific research programs
Chemical Sensor studies of EPR 9°N Vent fluids: Measurement and monitoring

- Approximately 15 vents studied
  - Real-time and time series deployments
  - Survey completed from Bio vent (north) to Ty vent (south)
- Bio9 complex
  - Very active venting
  - Temp = 380°C
  - H$_2$ (0.8-1.0 mm/kg)
- P vent complex
  - Active, new structures
  - Temp = 360-370
  - H$_2$ (0.2 mm/kg)

Figure 5. Bathymetric map of the East Pacific Rise study area near 9°50’N. The map shown here was compiled using bathymetric data available at the Ridge 2000 data portal (http://www.marine-geo.org/portal/ridge2000).
**Time Series in-situ pH at Tica Vent**

![Graph showing pH, pH (mV), and T(°C) over time for Alvin Dive 4842, Ag|Ag2O sensor on Tica vent.](image-url)
Metabolism of Riftia Pachyptila under in-situ conditions

- During cruise AT-37-04, *R. pachyptila* were sampled largely from sites near Tica vent area.
- Incubated in high-pressure aquaria under a variety of conditions spanning those they are known to experience *in situ*.
- Microbial samples will be analyzed at our home institutions to determine enzyme activities, metabolite abundances, and $\delta^{13}$C analyses.
- Incubations were also undertaken to determine whether *R. pachyptila* can use hydrogen gas as an electron donor.

Collaborations
- USGS (Amy Gartman)
- URI (Brea Govenar)
- University of Vienna (Monica Bright)
- University of Hawaii (Dr. Kiana Frank)