

R/V Atlantis Cruise AT 37-11

**This cruise was funded by NSF MGG (OCE-1558712) :
Pyrite, metal sulfide and aluminosilicate nanoparticles as
kinetically stable sources of iron and other metals to the ocean.**

Study Area: 9° 50' North East Pacific Rise (EPR) area.

**March 27, 2017 (Departed Puntarenas, Costa Rica) to April 18
2017 (arrived Manzanillo, Mexico)**

NDSF facility used: *DSV Alvin*

***Alvin* dives 4877-4892**

15 dive days were allocated to this grant.

Plus an engineering dive for a total of 16 dives.

Two main scientific objectives:

- 1) determine the extent of nanoparticulate (NP) pyrite in hot vent waters and determine if NPs form in waters above the vent orifice.**
- 2) determine if iron, magnesium and other metals form silicate or aluminosilicate NPs in waters above the vent orifice.**

Other Scientific Objectives:

- 3) determine if hydrogen peroxide and other reactive oxygen species (ROS) form in vent plume and other waters.**
- 4) If ROS are present, do they lead to Mn(III) formation at low pH?**
- 5) obtain 4K high definition video of the entire (eco)system for science, education and outreach purposes.**
- 6) use a new Ethernet/wireless AIS ISEA IV [Analytical Instrument Systems, Inc., (AIS)] electrochemical analyzer for all in-situ electrochemical measurements.**
- 7) Night ops included 7 CTD casts.**

Notable items

DSV *Alvin*, the pilots and PITs performed well. There were only 2 pilots as a 3rd pilot had a family emergency and returned home.

There were 4 PIT dives in this sequence.

***Alvin* equipment performed well (except for 3 instances).**

On the 6th dive (PIT dive), there was a **hard ground so *Alvin* resurfaced.**

Atlantis experienced an electrical black out late in the day, the next day the A-frame computer had a glitch that needed repaired before the dive commenced.

There was some difficulty with the temperature probes, but a ICL was used as replacement.

Recent Eruption?

Most previous sites such as Ty and Io vents were no longer active.

Mussel bed and East Wall were no longer active.

CTD transmissometer data could not detect activity at V and L vents.

Samples of glassy basalt were collected for distribution to several marine geology colleagues. An expedition next December will map the area.

Education and Outreach

The **main blog** “CEOE dives deep along the East Pacific Rise” was produced and maintained by **Lisa Tossey** and can be found at <http://www.ceoe.udel.edu/our-people/profiles/luther/east-pacific-rise>. The blog included over 160 posts and 42 videos produced for the blog, social media and public outreach. *Atlantis’* internet was *slowly* able to upload materials to the beach. Internet needs to be enhanced.

A **highlights video (11 min)** was produced by **Lisa Tossey**; see Youtube at <https://youtu.be/oG7kY0K1rK4>.

Bill Geppert of Cape Henlopen High School maintained a second blog for his students to ask questions and provide challenges so that Bill could better inform them of life at sea and the science. The blog included 27 posts and linked to the CEOE blog.

Mustafa Yücel and Batuhan Yapan of METU maintained a third blog for their **Turkish audience**. The blog included 18 posts and linked to the CEOE blog.