

Summary of 2025 *Sentry* Debriefs

- **Amanda Achberger** (TAMU) and **Jill McDermott** (Lehigh)
Co-Pis: Lauren Mullineaux (WHOI), Stace Beaulieu (WHOI), Dan Fornari (WHOI)
 - AUV ***Sentry*** & HOV ***Alvin*** on R/V ***Atlantis*** (AT50-33)
 - 9N EPR – Ecology of extinct, off-axis hydrothermal vent sites, monitoring of active on-axis vents, and baseline mapping in preparation for future eruptions
- **Davide Oppo** (U Louisiana) & **Adam Skarke** (Mississippi State U)
 - AUV ***Sentry*** on R/V ***Endeavour*** (EN-731)
 - Search for gas seeps along U.S. mid-Atlantic margin as first stage of a project that will include *Alvin* dives and coring
- **Charlie Langmuir** (Harvard) (no formal debrief)
 - AUV ***Sentry*** on R/V ***Sally Ride*** (SR2510)
 - Siting near-ridge cores in thin sediment to sample buried lavas
- **Jessica Warren** (U Delaware) & **Mark Behn** (Boston College)
 - AUV ***Sentry*** on R/V ***Revelle***
 - Map, image, and dredge the Chain Transform Fault on the Mid-Atlantic Ridge

Sentry Debrief Highlights – Modes of Use

Achberger, McDermott et al.

- I-m-scale multibeam mapping

- Hydrothermal plume detection

- Seafloor photography

- Wave glider enabling concurrent Alvin & Sentry operations

- No user supplied equipment

Oppo & Skarke

- I-m-scale multibeam mapping

- Multibeam water column imaging gas flares

- No user supplied equipment

Sentry Debrief Highlights – Modes of Use

Langmuir

- I-m-scale multibeam mapping

- Sidescan

- Subbottom profiler

- No user supplied equipment

Warren & Behn

- I-m-scale multibeam mapping

- Sidescan

- Seafloor photography

- Wave glider enabling concurrent Dredging & Sentry operations

- No user supplied equipment

Sentry Debrief Highlights – Issues of Note 1

Achberger, McDermott et al.

Planned 13 missions, achieved 12 missions, two with partly compromised data

One mission lost to DVL failure

The descent drop weight failed to release four times, causing Sentry to hit the seafloor three times before the weight could be manually forced to drop

One seafloor impact mid-cruise damaged the strobe head – the remaining seafloor photographs had only half the expected illumination

The Wave Glider failed on deployment and could not be repaired. This cost half a Sentry mission and meant that *Sentry* operations had to be close to *Alvin* operations.

Sentry Debrief Highlights – Issues of Note 2

Oppo & Skarke

One mission lost due to multibeam failure

Langmuir

One mission lost due to multibeam failure

Warren & Behn

Five out of twelve planned dives successful

Two days lost to Sentry shipping delay

One dive lost due to multibeam failure

Fin servo failures on three dives

Weathered out for three days

Bottom photos good on only one dive, otherwise dark

Sentry Debrief Highlights –System Reliability

The core vehicle was largely reliable on two cruises, and had repeated issues on the other two cruises:

Four drop weight failures for Achberger

- Damaged strobe compromised bottom photography
- Due to bad cable, since replaced

Three fin servo failures for Warren

Unilluminated photos for Warren, camera/strobe synch failure?

One dive lost to DVL failure

Three dives lost to multibeam failures

The old Wave Glider failed in its one deployment, the new Wave Glider worked well

Sentry Debrief Highlights – Positives of Note

PI's praised the skill, professionalism, hard work, and enthusiasm of the *Sentry* team.

Expedition leaders were Matt Silvia, Sean Kelley, and Zac Berkowitz

Good communication before and during expeditions

Data quality, packaging, and delivery were good

New Wave Glider working

Sentry Debrief Highlights – Suggestions

More complete sparing of strobe and camera system.

Request for realistic sample data – the data packages to be found at MGDS are not representative of data delivered at sea.

Request to update/expand documentation with respect to the multibeam sonar to enable better choices of altitude and line spacing.