

Summary of 2017 *Alvin* Debriefs

6 Cruises, 6 Debriefs
(including two late-2016 cruises)

Alvin Debrief Highlights

- Overall, PIs were pleased with the performance and capabilities of the Alvin, with most of the objectives accomplished.
- While communication generally went well between the expedition leads and the scientists, there were mixed reviews depending on PI
- Given the integration of some new and different electronics, the PIs were impressed by the Alvin group and their ability to integrate these new systems relatively seamlessly
- PI noted some benefits to using Alvin over Jason for certain environments in mobility and sample selection

Pre-cruise and Mobilization

- Pre-cruise planning was complete and overall was very well done. No suggested changes.
- In port mobilization for the 6 cruises was long enough to allow testing of equipment and resolution of technical issues before dives commenced.

Operations –vehicle performance

- Dive delayed because batteries were not charged overnight
- Some grounds occurred, only one required the dive to be aborted.
- Leak detected-resolved within 30 min
- Dive aborted due to suspect CO₂ absorbent.
- Assessment of bottom time alternated between “less than expected”, “just right”, and “better than expected” perhaps due to transits on the seafloor, efficiency in operations.

Operations- NDSF-provided equipment

- Video overlay on port monitor had intermittent recording problems
- Some issues with frame grabber
- HiT probes did not function 100% of the time
- Camera issues included difficulty with switching between camera sources and controlling the pan and tilt .
- Navigation was excellent
- Sample collections went smoothly

Operations- User-provided equipment

- High success rate with integrating user-supplied equipment
 - Note: Fornari-provided external GoPro facilitated dive review (fast turnaround)
- Alvin group helped trouble shoot syringe sampler issues
- Additional cameras added to Alvin (forward, down-looking, and 4K cameras) worked well.

General Recommendations

- Improve the functionality and reliability of user controls and overlay for the Alvin video systems
- Improve moisture control within the sphere
- Enable the availability of imagery data post dive (e.g., external GoPro) to facilitate quick dive review and pre-dive planning by scientists

Summary of 2017 *Jason* Debriefs

4 Cruises, 4 Debriefs

Jason Debrief Highlights

- This is the second season for Jason operating in either single body mode or together with Medea, majority of work was done in single body mode.
- A new control van was designed and put into service; the new van has improved visualization screens and ergonomics and can be configured as a single van to take up less deck space.
- Users felt that the Jason team worked exceptionally hard to accomplish their science.

Jason debrief – Issues.

- The Rapp winch that is now the primary winch used for Jason ops had several failures resulting in lost dive time and equipment retrieval.
- **Suggestion:** Continued evaluation of all aspects of the new winch system.

Jason debrief – Issues.

- Communication, operations, and best practices for service-related cruises with intensive dive plans could be improved.
- **Suggestion:** Improved coordination with either on-site or reverse-site visits prior to cruise ops; potential changes to watch schedules and/or two EL's to handle heavy workloads with many launch & recoveries; review of industry best practices.

Jason debrief – Issues.

- Some challenges of working in single body mode, or switching between single and two body mode, e.g. issues getting Medea operational, extended mobilization time for single-body setup.
- **Suggestion:** Ensure adequate time allowances for engineering when switching between operating modes.

Jason debrief – Issues.

- Data transfer delays from Jason imaging systems to science party.
- **Suggestion:** Implement protocols for more rapid image transfer.

Jason debrief – Issues.

- Imaging systems: fogging of digital still camera; camera controllers complicated to use; video image quality not optimized.
- **Suggestion:** Review of imaging system and possible update of video cameras and digital still camera.

Jason Debrief High Notes

- “4K test camera was great and should be part of standard video system.”
- “Jason group assisted with rigging during short move period; USBL navigation was impressively accurate.”
- “It was clear that the cruise was successful because of the work that Matt & Tito put in to help the engineers design equipment that would work well with Jason. This pre-cruise preparation and coordination was extremely helpful.”

A yellow Autonomous Undersea Vehicle (AUV) named 'Sentry' is being hoisted by a crane over a blue ocean. The AUV has a yellow upper hull and a white lower hull. The word 'SENTRY' is visible on the yellow section. It has a large circular porthole and various sensors and antennas on its top. The background is a vast blue sea under a clear sky.

2017 *AUV Sentry* Debriefs

7 Cruises, all debriefed
(including two late-2016 cruises)

Sentry Debrief Highlights

- Overall, pleased with *Sentry's* performance and generally able to meet their science goals.
- Success with science-supplied sensors integration: Ph, ORP, dissolved O₂, magnetometer
- Concerns about Reson multibeam failed on 4 dives total on 2 of the 7 cruises. Both main system and backup failed on most recent cruise.
- Impressive turnaround. Preliminary bathy often within ~30-60 minutes of the AUV on-deck. Photos and side-scan usually available for next-day planning.

Sentry Pre-cruise Recommendations

- As fly-away system, develop a comprehensive and detailed move checklist. Include who on the team is responsible for follow-up on each item.

Sentry Ops Recommendations

- Consider alternatives to the existing Reson multibeam and vendors with improved shore-side support
- Calibrate magnetometers annually
- Provide end-of-cruise data on a RAID drive
- Continue to uphold standard of excellent communication between EL, Chief Sci, and Master
- Suggest to PI's that if used for photo surveys, assign member of Science dedicated to reviewing all photos and generating ancillary data products broadly (mentioned 2X)
- Investigate the possibility of recording RAW image format and/or lighting systems for photos

Quotes from the debriefs

- “Sentry displayed an ... impeccable reliability...”
 - Sean was “always on his feet in the Sentry lab”
 - Sentry went “up and down like clockwork”
 - “I’m still pinching myself that I got to use them”
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- *And a comment from your FOV: the Sentry Team consistently makes the never-before-attempted seem routine.*