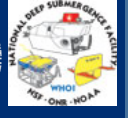


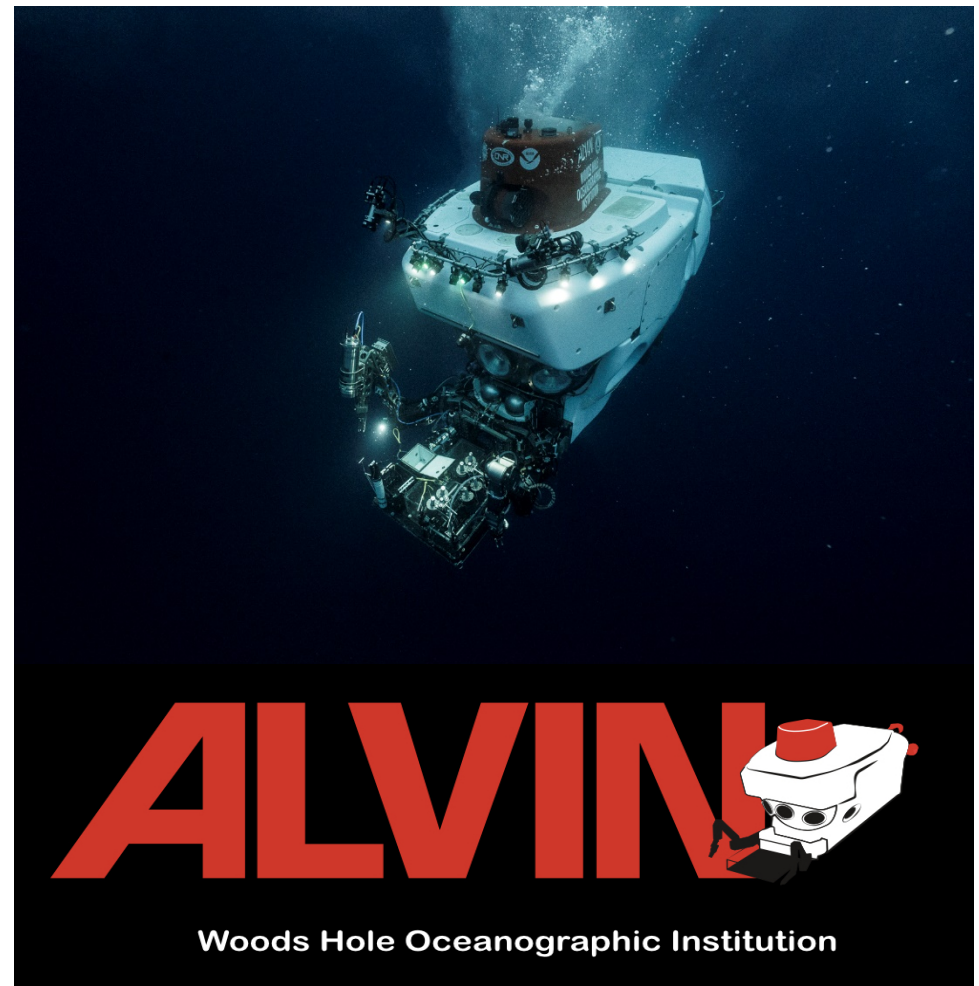


NDSF 2017 Vehicle Operations Summary

Alvin Operations

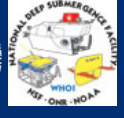


- 111 operating days
- 5 cruises
Costa Rica, East Pacific Rise, Mayaguana, NW Atlantic
- 60 dives
- 429 hrs submerged
- Longest dive: 9.5 hrs
- Average dive: 7.1 hrs
- Avg bottom time: 5.1 hrs
- Average depth: 1,983 m





NDSF 2017 Vehicle Operations Summary **Alvin Highlights**

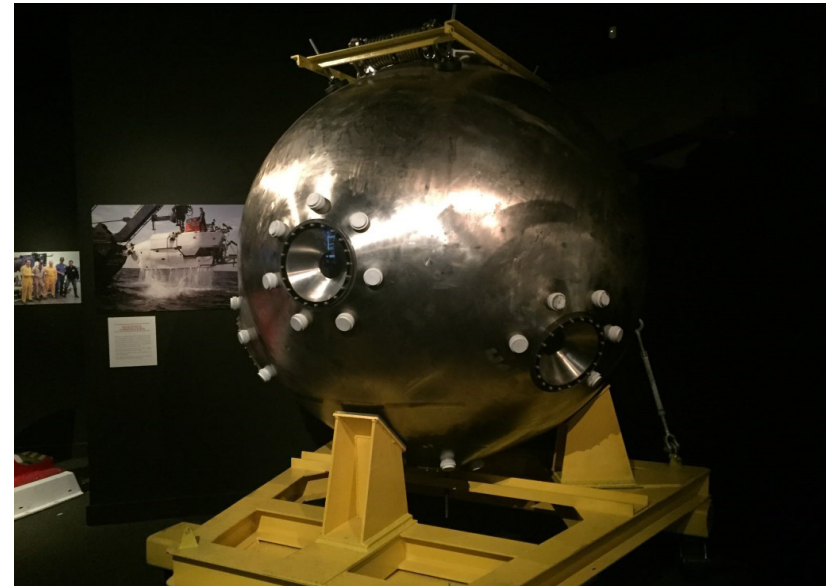
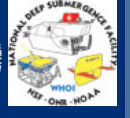


- **Successful science dive operations in Pacific & Atlantic**
 - *No significant issues or lost dive time*
- **Two *Alvin* engineering series, March & June 2017**
 - **March: completed 4 dives**
 - **June: completed 5 dives including 4,500 meter test dive**
 - **Excellent opportunity for team training and vehicle testing**
- **Opportunity for US Navy (DEVRON 5) participation/*Atlantis* crew familiarization**
- ***Alvin* personnel participation with ARG *San Juan* SAR efforts, November 2017**
 - **Todd Litke and Danik Forsman on multibeam watches**
 - **Helped assemble 'MacGyver Camera' from *Alvin* spare gear**



NDSF 2017 Vehicle Operations Summary

Alvin Highlights



- Retired *Alvin* titanium sphere and sail loaned to Ronald Reagan Library & Museum
 - Part of RMS *Titanic* history display through end of 2017

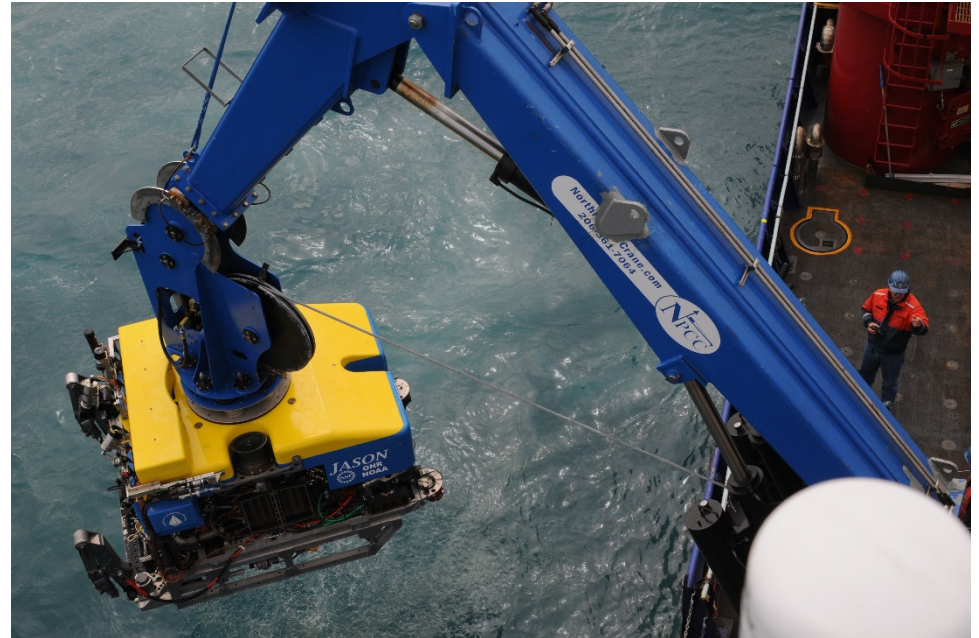


NDSF 2017 Vehicle Operations Summary

Jason Operations



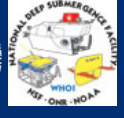
- **158 operating days**
- **7 cruises**
Pito Deep, Chilean Subduction Zone, Axial, OOI, Oregon Margin
- **71 dives, 837 total hrs**
- **On bottom: 666 hrs**
- **Longest: 71 hrs**
- **Average: 12 hrs**
- **Vessels used:** *Atlantis, Revelle*





NDSF 2017 Vehicle Operations Summary

Jason Highlights

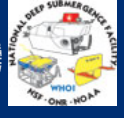


- New control vans
- Two-body and single-body operations on *Atlantis*
- 5,275m max depth
- Cheadle, Pito Deep with *Sentry*
 - *Sentry* & *Jason* ops with reduced staff
 - Magnetics & rock sampling on extreme terrain
- McGuire, Chile
 - Deployed acoustic ranging system for seafloor geodesy
 - Zero *Jason* failures
- OOI-RCA cruises - 120 instruments exchanged
- Camera upgrade to 4K
 - Ultimate goal to provide both stills and video in one cam
 - Tested Sub-C on Cheadle
 - Tested Sulis 4K on Wheat cruise

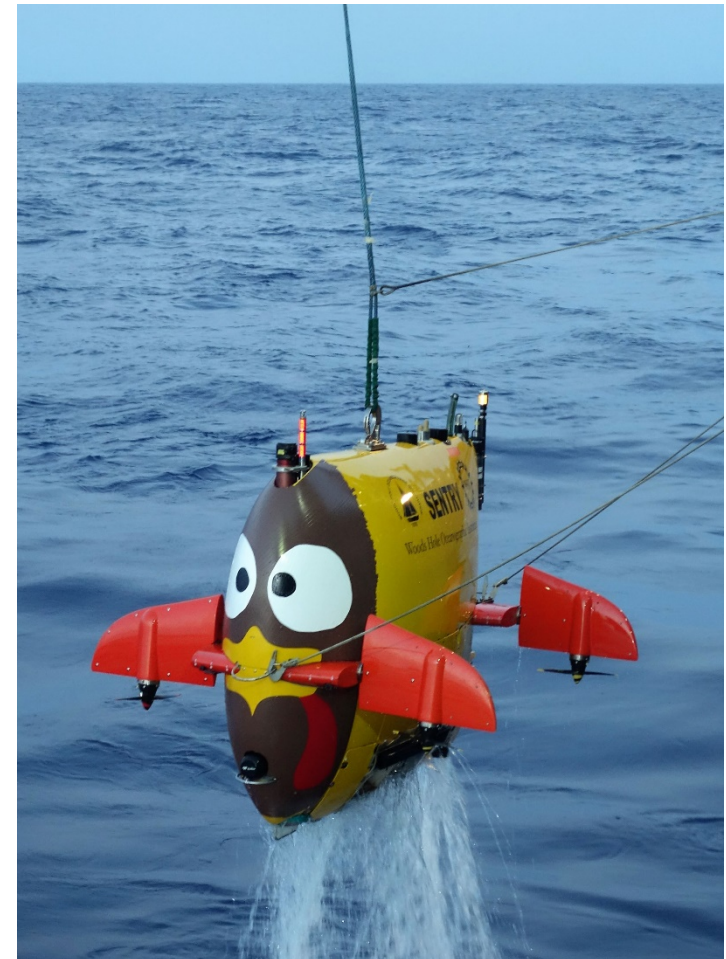


NDSF 2017 Vehicle Operations Summary

Sentry Operations



- **127 operating days**
- **6 cruises**
Pito Deep, Costa Rica, Axial, SEASCAPE, SAB Deepwater, Tongan Volcanoes
- **46 dives, 781 hrs in water**
- **Total survey time: 691 hrs**
- **Average dive time: 17.3 hr**
- **1,758 km of survey**
- **Vessels used:** *Atlantis, Revelle, Pisces, Falkor*





NDSF 2017 Vehicle Operations Summary

Sentry Highlights



- Cheadle Cruise highlights -- submerged operations 3,500m to 5,500m depth, routinely operating on 50 to 90 degree slopes/walls
- Nizinski Cruise highlights -- operating in 4 knots of current in Gulf Stream, collecting both photos and multibeam in canyons.
- Custom integration of USBL and navigation tracking installed on the NOAA fisheries research ship *Pisces*
- Continued training and cross training of WHOI staff for *Sentry* operations:
 - Danik Forsman
 - Theo Guiren
 - Mike Skowronski
- Jennifer Vaccaro, a new *Sentry* hire, completed two cruises training as a software engineer.
- Custom instrumentation integration for Chadwick included CsMaggie. Ph sensor integrated for Cordes and Rubin cruises.
- Nooner-Chadwick cruise included 5 dives total, with 100 hours of *Sentry* sub operations and no issues or problems during the cruise.