Alvin Upgrades
Near-Term Future

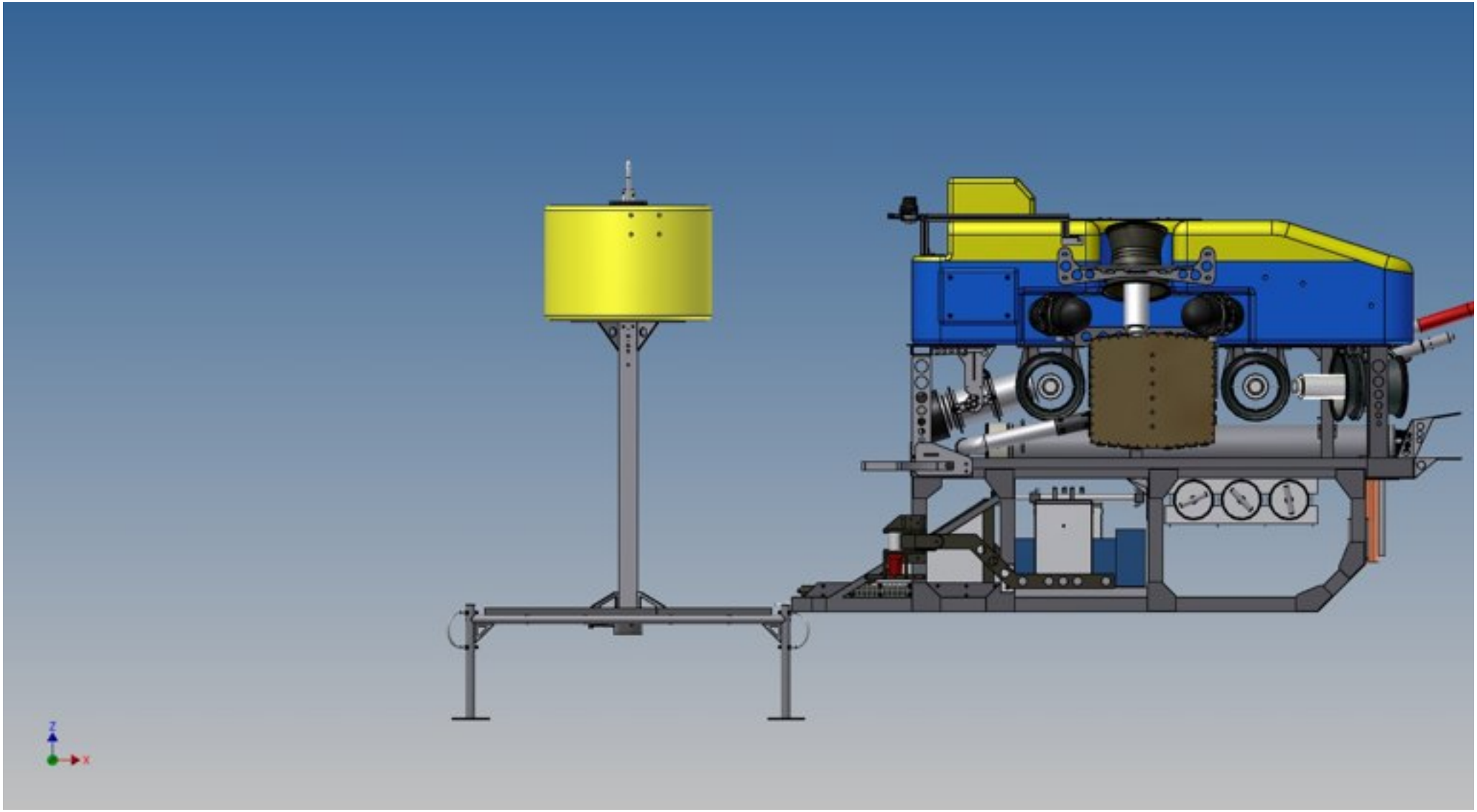
- New Nikon D600 SLR digital still/HD video camera will be gas tested and ready for use in July
- Planned purchase of a replacement CTD that delivers real time data to the *Alvin* data system
- Qualification testing of a replacement scrubber system
- Installation and integration of the Reson multibeam sonar system

Jason Upgrades

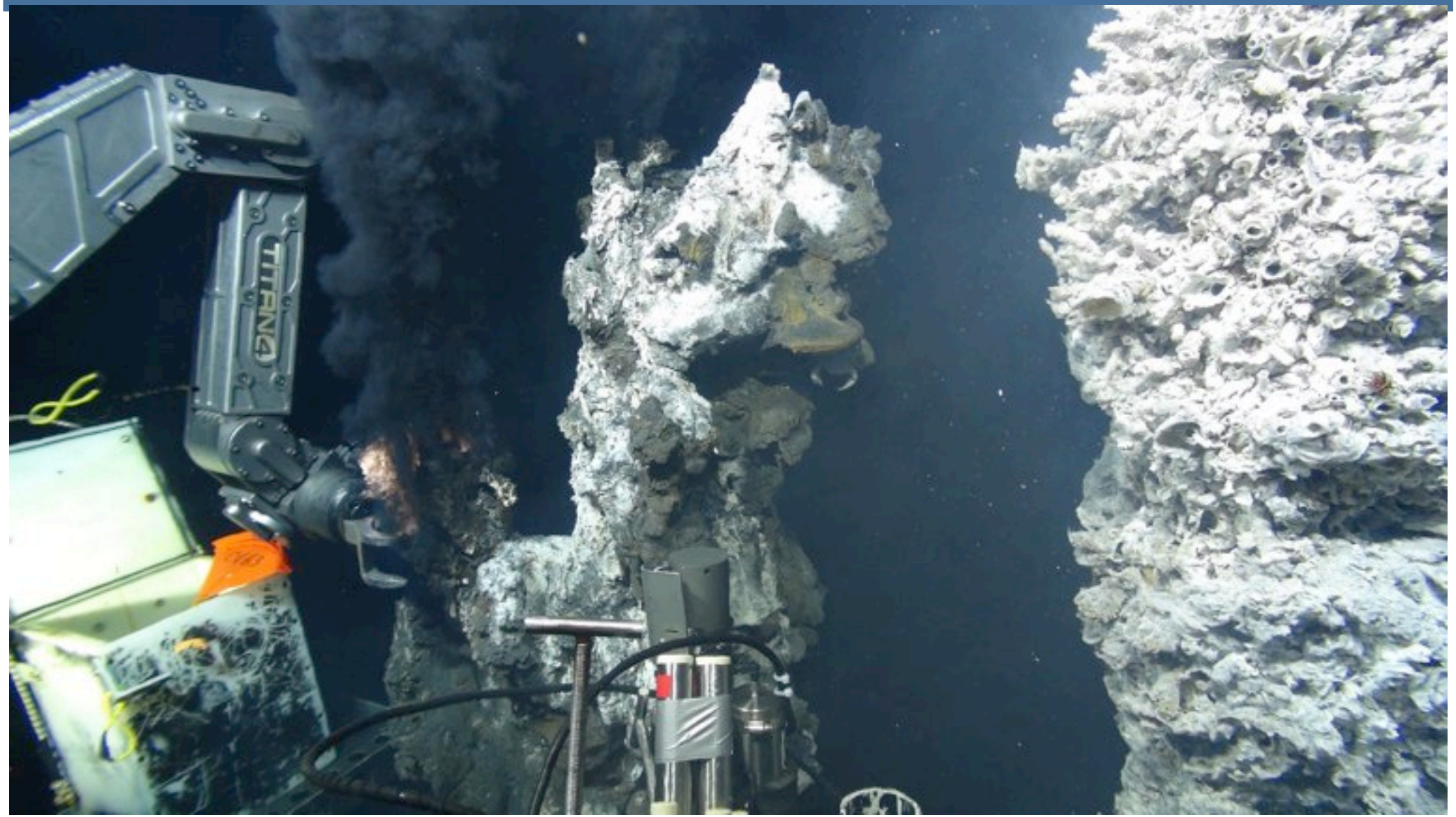
- Super Scorpio integration near completion
- Science camera control improvements
  - One controller for P&T and cam control
- New elevator with syntactic flotation
- New Titan 4 manipulator 2X
- Redesigned multi-chamber slurp
  - Geneva gear index, smaller
- Syringe samplers DSL design
- New Doppler with enhanced bottom lock
  - Already having issues, working with new vendor
- Control van pilot ergonomics
- Monitor replacement underway
- Improved Virtual Van display arrangement
- Framegrabber upgrade
  - 2 new units and code
- Topside GUI and engineer computer
- Multi-viewer for remote station improvements
- New Wideband Mini transponder USBL beacons
  - Lighter, smaller, user interface, reliable
- New LARS HPU design underway

Jason Upgrades

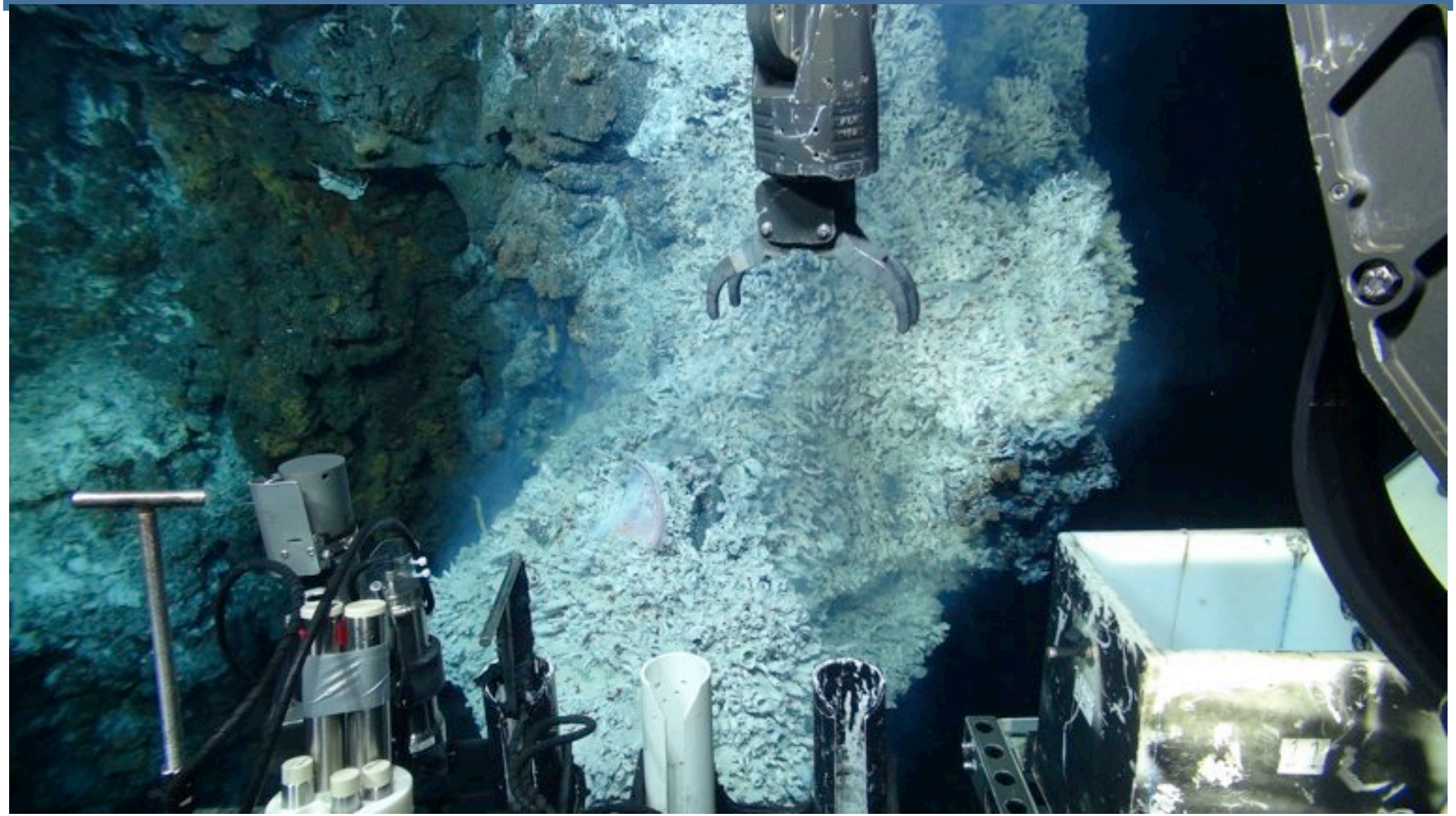
Elevator Redesign



Jason Upgrades
Super Scorpio



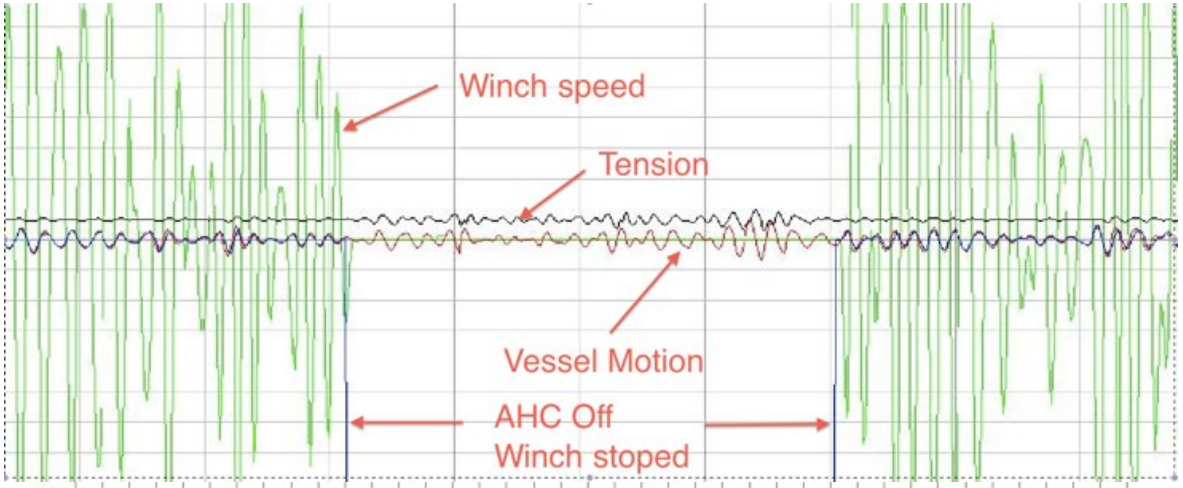
Jason Upgrades
Super Scorpio

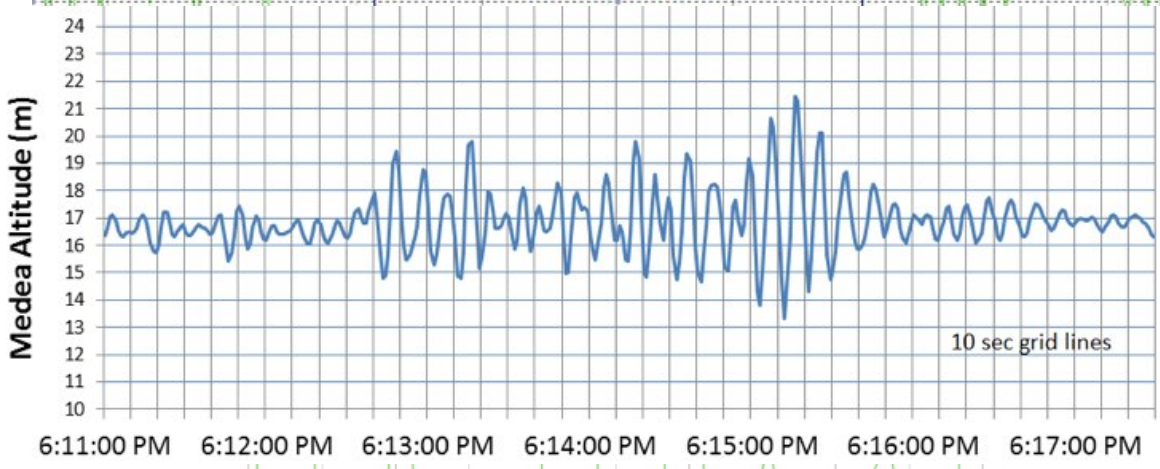


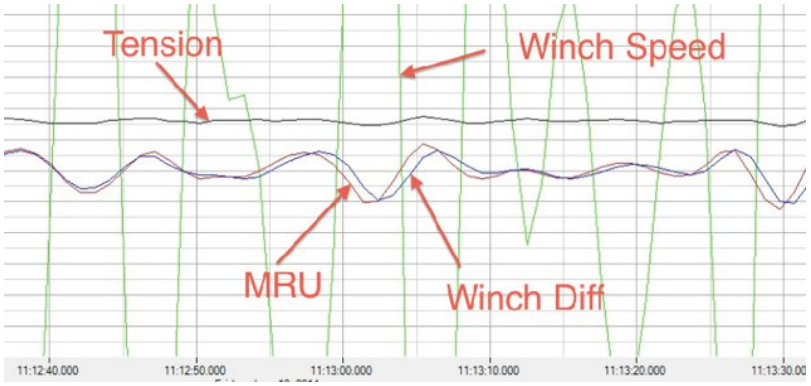
Jason Upgrades
Rapp Winch

- First *Jason* cruise
- Thompson June 10-14
- 48-hour cast to 2,900m
- All functions operational
- AHC tests performed
- Automated pay/haul

Jason Upgrades
AHC Performance

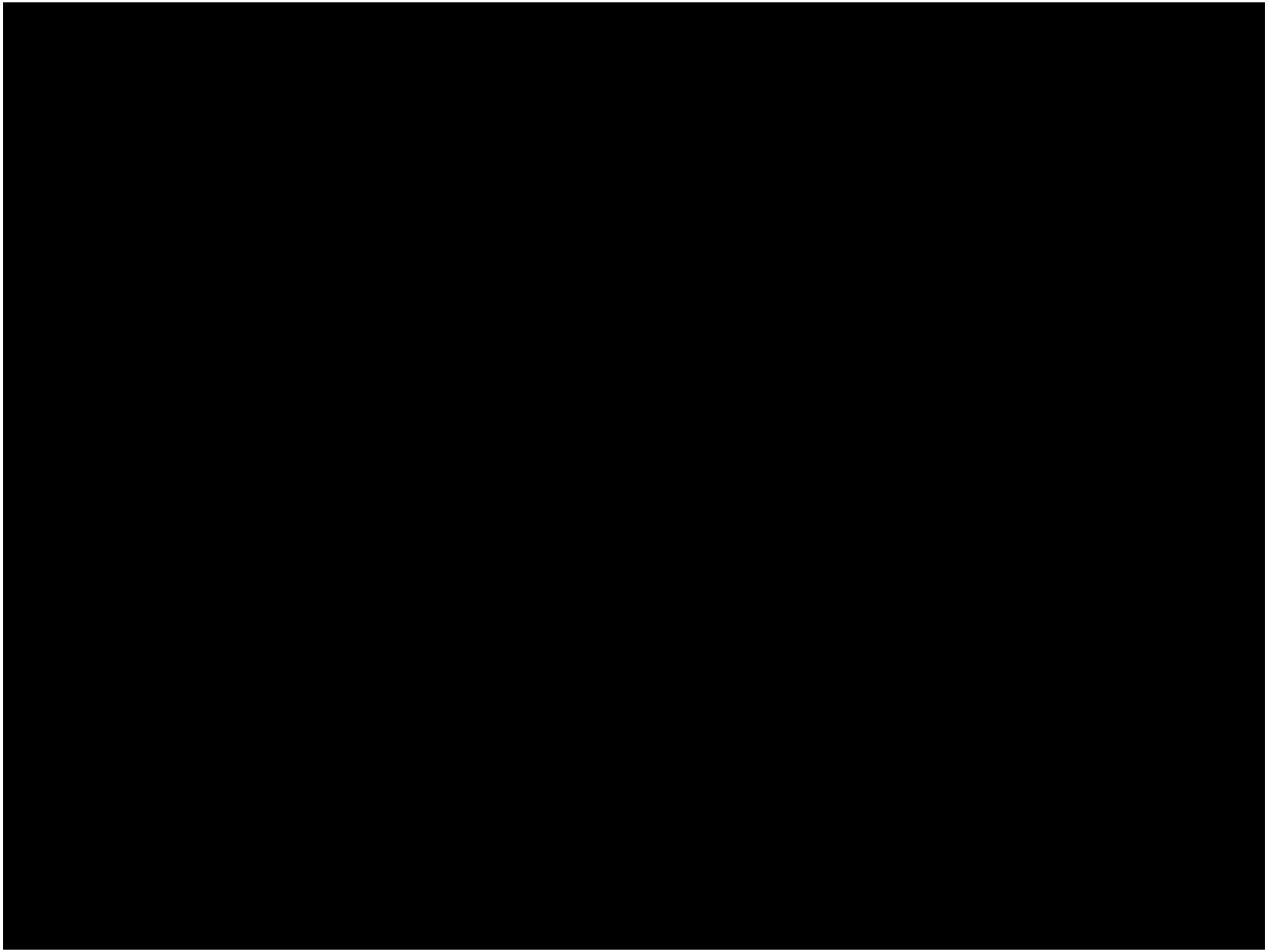






AHC Performance

AHC Performance

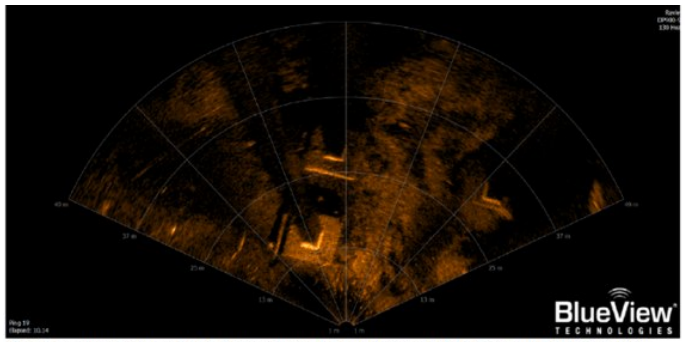


Personnel

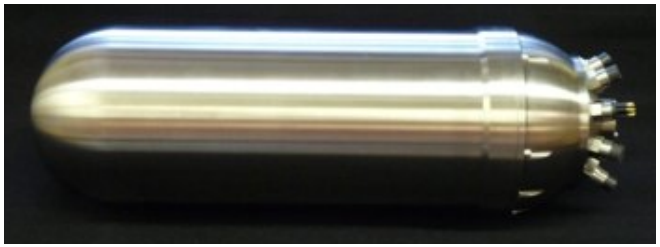
- Now two deep, fully trained in every position. Working on 3rd and 4th level backups & cross training.
- Sean Kelley - EL in Sept 2014
- Greg Kurras – EL in 2015
- Johanna Hansen & Zac Berkowitz – new software engineers
- Also getting more diverse
  - Three different female crew members to date
  - Wide range of ages

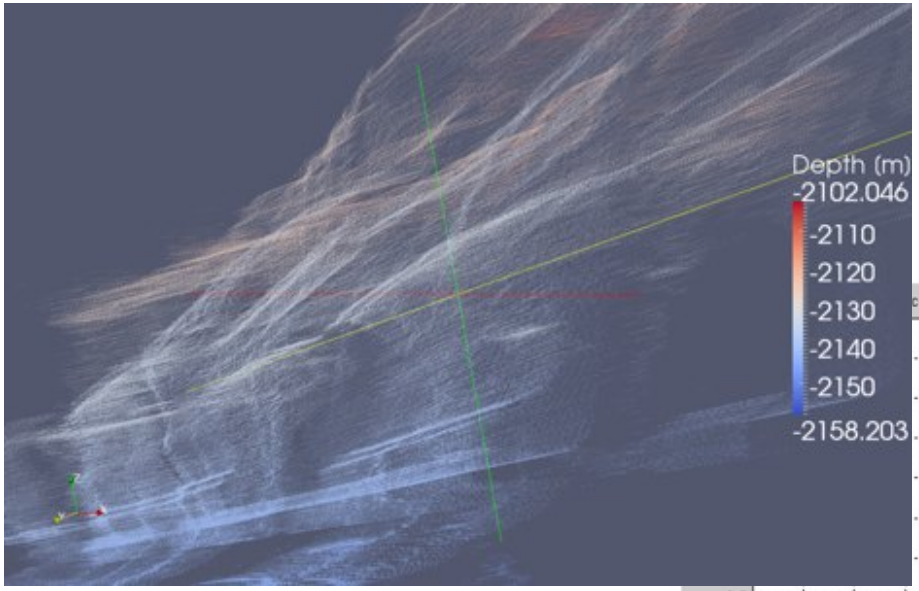
Sentry Upgrades
Sonar Systems

- Reson AUV3 – dual freq, 1/3 power, 15lbs lighter
- New WHOI driver means full reconfigure and start up in water saves power and increases flexibility
- Blueview P900 forward looking – obstacle avoidance and science uses – no cost to NDSF
- Edgetech 2205 Dynamic Focus sidescan (8cm beam width) – no cost to NDSF – on vehicle June 2014

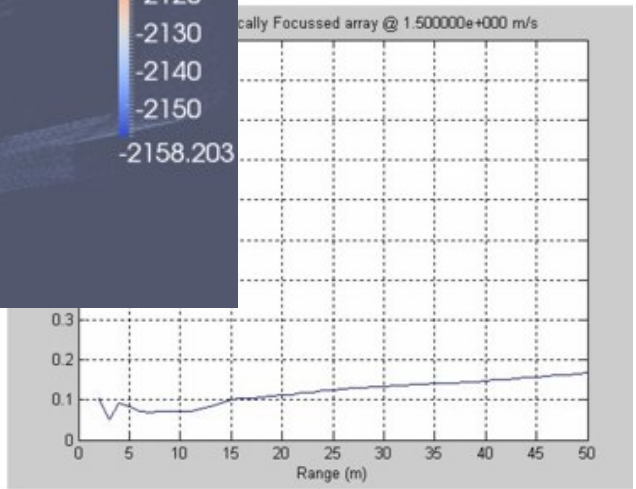


Screen capture of the P900-130 showing bridge footers taken from an ROV in motion.


New Multibeam Sonar



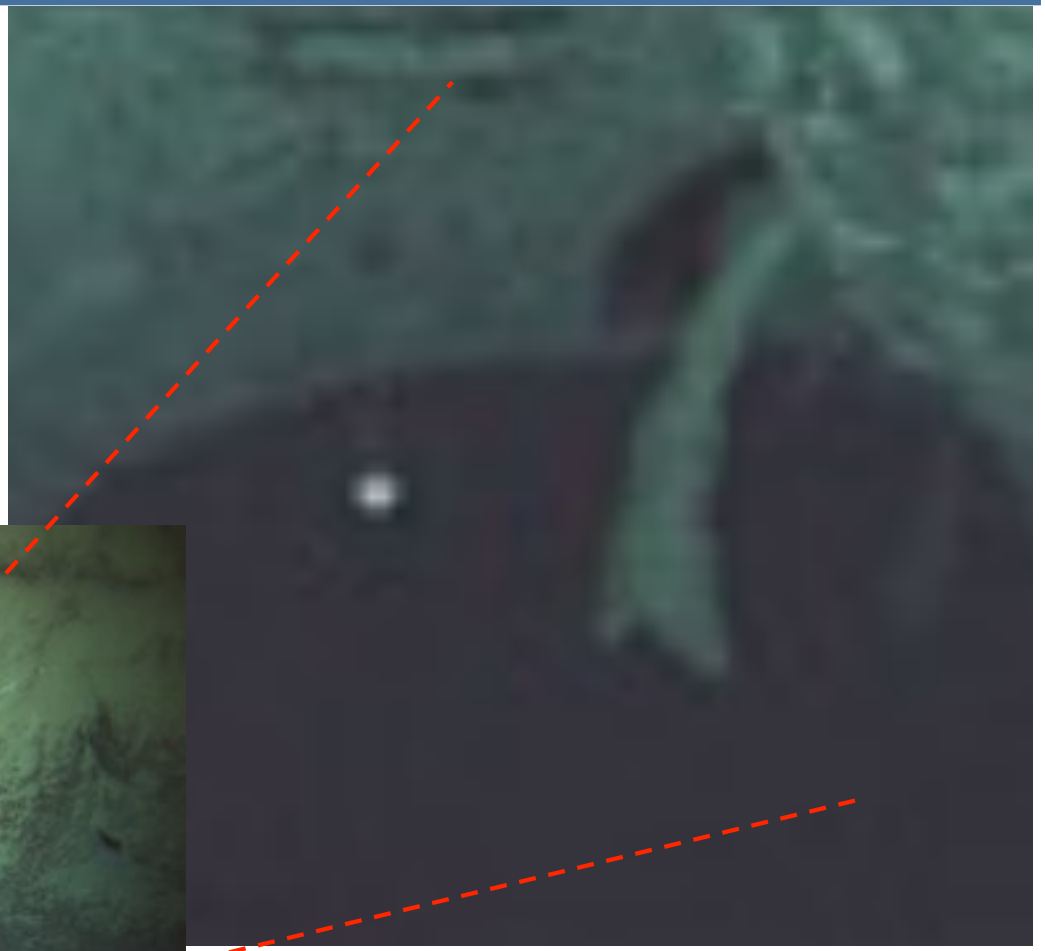
Extreme High Resolution Map of Section of Florida Escarpment with Blueview Sonar



Beam Width plot for DF sidescan

Sentry Upgrades
New Camera

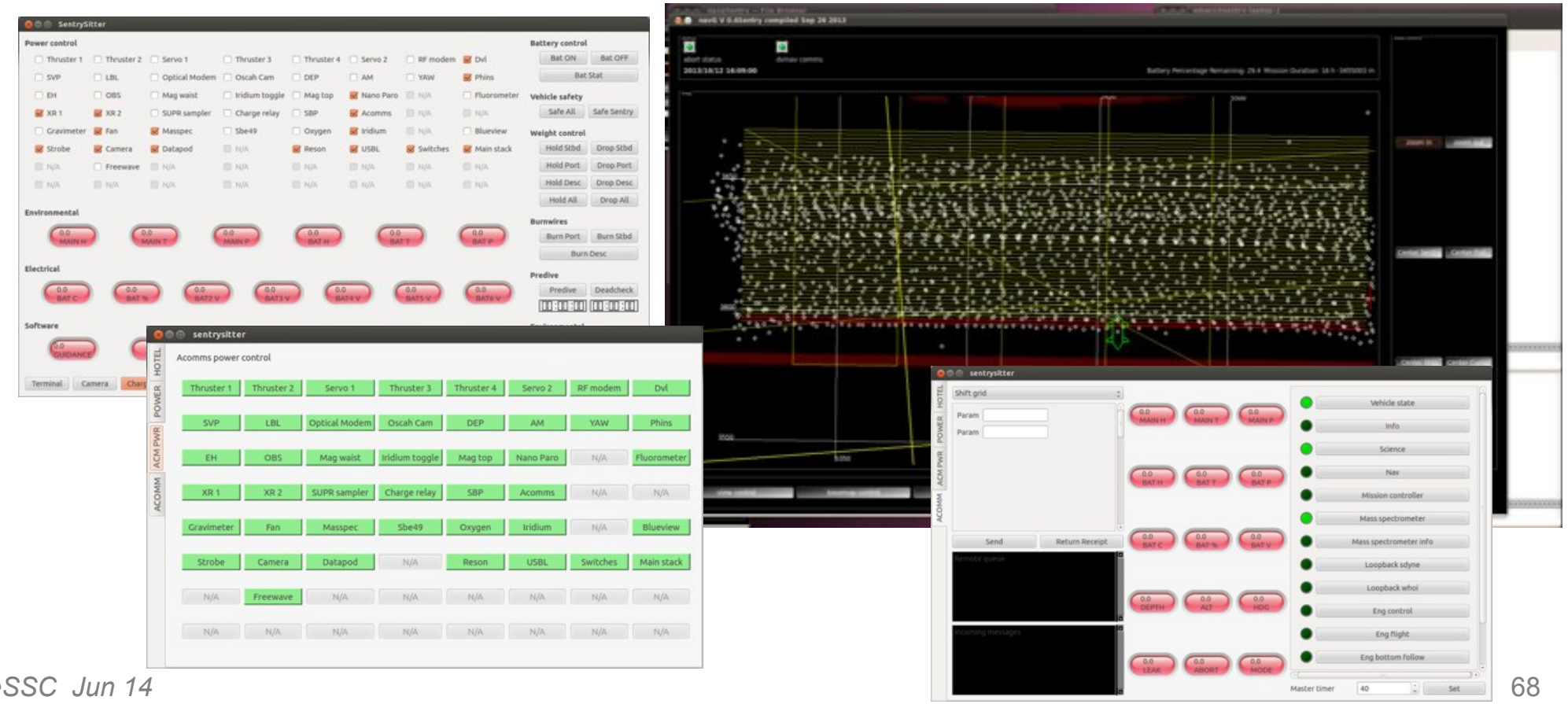
- 11.4MP
- Normally even better res, but this detail is farther than normal from the lens
- Better lit than old camera



Photos courtesy Cindy Van Dover

Sentry Upgrades
User Interfaces

- NavG interface
  - Much more situational awareness for operators
  - Science interface mode, including predicted dive durations, etc.
- *Sentry* Sitter upgrades
  - Integrated GUI tool for *Sentry* – during dive and on deck
  - Enables most tasks without software expert



Sentry Upgrades
Computing & Mob/Demob

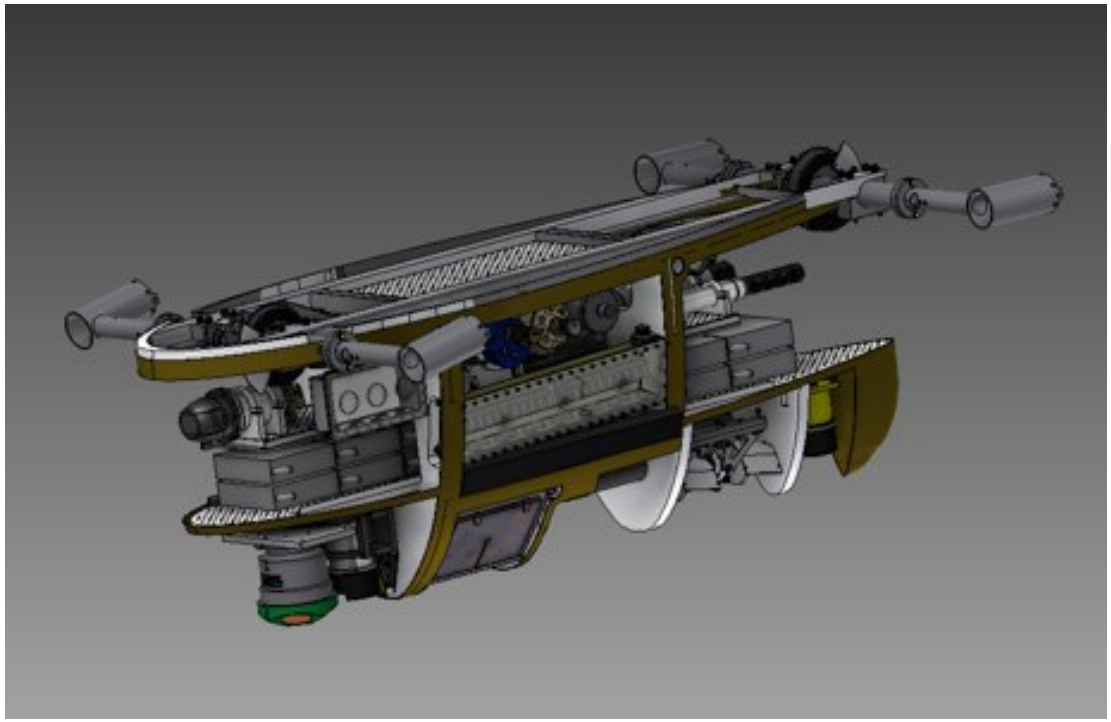
- Continued effort to simplify mob/demob
- Moving to nearly all computing/storage/nav in the van
- Computers accessed by 2 cables to lab space + remote terminals on a video switching system
- Most cables no longer enter the ship

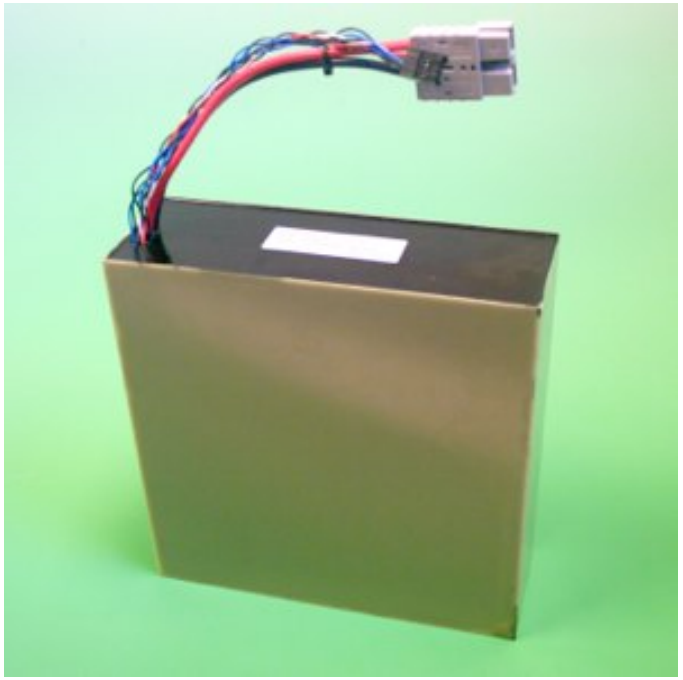
Video Switching System

Racks in *Sentry* Van

Battery System & Data Pod

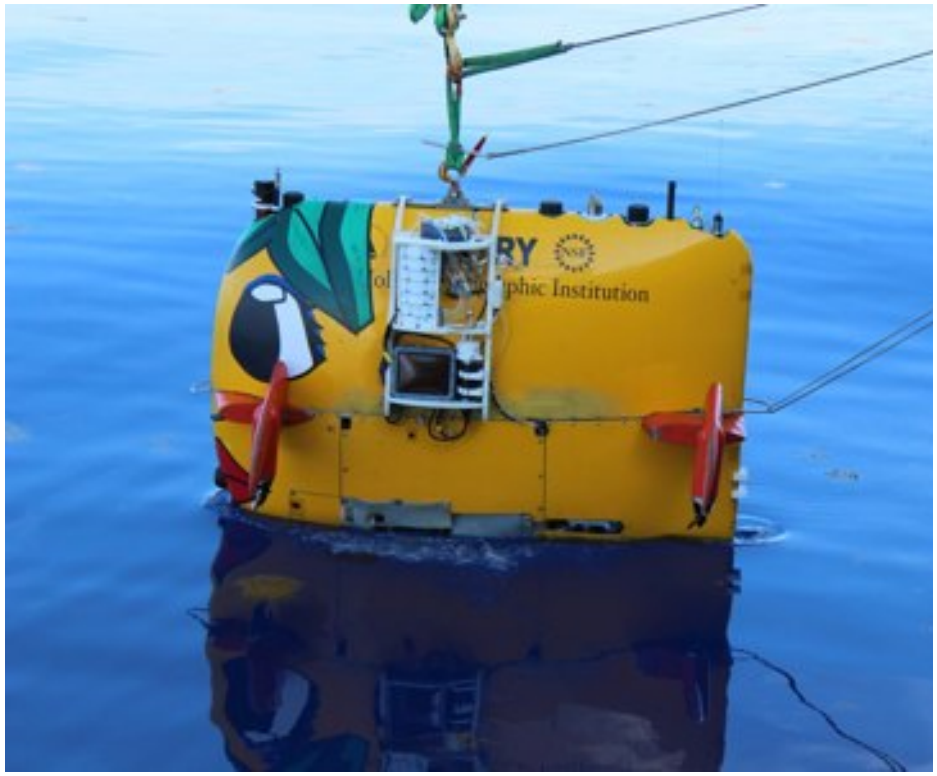
- Will give 3-hour turnaround with 20- to 48-hour dives
- Datapod complete and in use
- Battery upgrade underway (~June 2015?)
  - Custom high density version
  - New instrument config > flexibility
  - Buoyancy neutral





Sentry Upgrades
New Thrusters

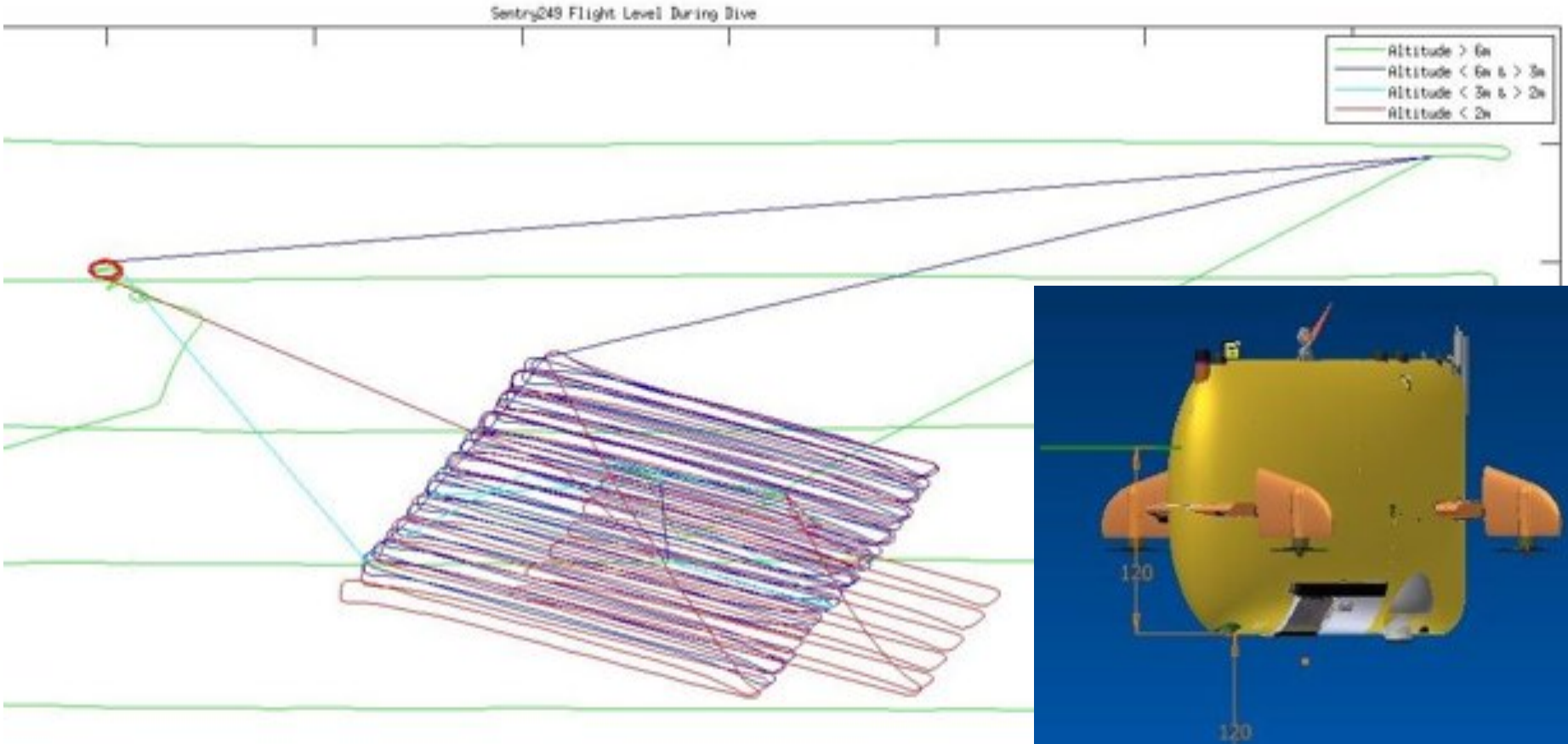
- Increased efficiency
- Top speed 1.2 m/s (2.4 kts) in low current
  - Likely 1.5 – 2 m/s (3-4 kts) with new batteries
- Very likely increased reliability
  - Already tested to 11,000 m
  - Substantial impact testing
  - Lots of test hours
  - 32 *Sentry* dives – no failures
- Much more sophisticated controllers



New Thrusters on *Sentry*
Photo courtesy Doreen McVeigh

Sentry Upgrades
Low Level Flight

- *Sentry* flew full survey blocks at 120cm, 150cm, and 200cm for a total of over 8 hours
- Less than the height of *Sentry*

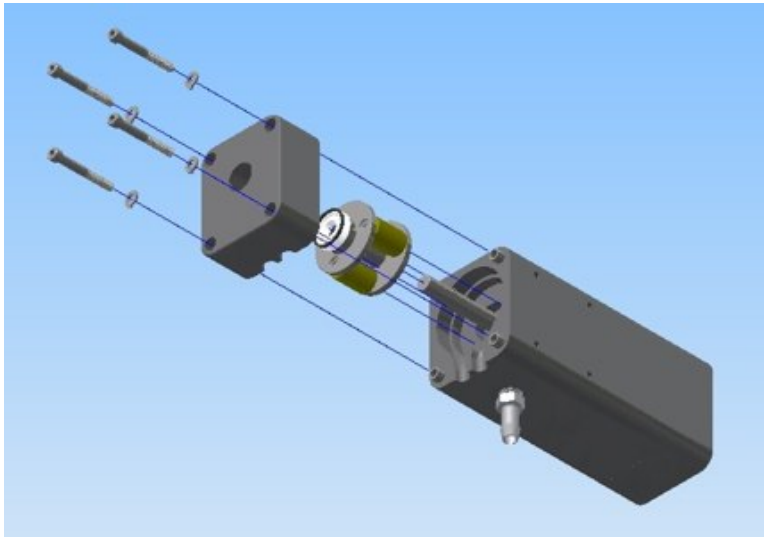


Sentry Upgrades
Operational Capabilities

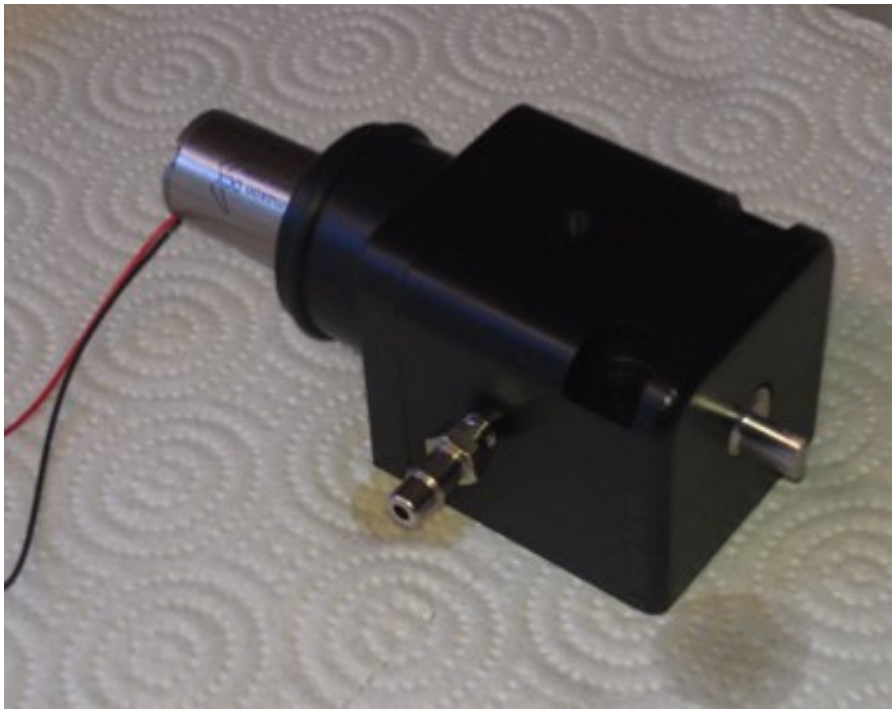
- Currently we do joint ops with *Jason*, but requires *Jason* to leave the bottom for ~45min each launch and recovery
- Flyaway descent
  - Can now launch *Sentry* without interrupting *Jason* bottom activities
  - Done and tested
- Automated surface drive
  - Will allow recovery of *Sentry* without interrupting *Jason* activities
  - Should be ready next time there are joint *Jason/Sentry* operations
- AIS – locator beacon – shows up on any ships radar and longer range than RDF
  - Tested on *Sentry* June 2014
- New Iridium
  - Two-way satellite comms for surface drive
  - More reliable and user-friendly

Anchoring & Weight Releases

- Anchoring
  - Small buoyancy reduction device
  - Multistage drop weight
  - June 2015?? – depends on overhaul time and budgets
- Weight Release Motors
  - Old ones prone to failure and difficult to maintain
  - 1st new one on vehicle Sept 2014 - test
  - Other two to be replaced Dec 2014 or Jan 2015



New Buoyancy System Pump



New Weight Release Motor

Sentry Upgrades
Documentation

- "Scientists Guide to *Sentry* Cruise Planning" on web site
- Major upgrades to *Sentry* website
  - ~70% of envisioned content now live
- All drawings now fully up to date in modern CAD packages
- Revision control system almost fully implemented

Main *Sentry* Page:
http://www.whoi.edu/main/sentry
Planning Guide:
http://www.whoi.edu/fileserver.do?id=159424&pt=10&p=39047