

ABE and Sentry: Scientific Survey Capabilities

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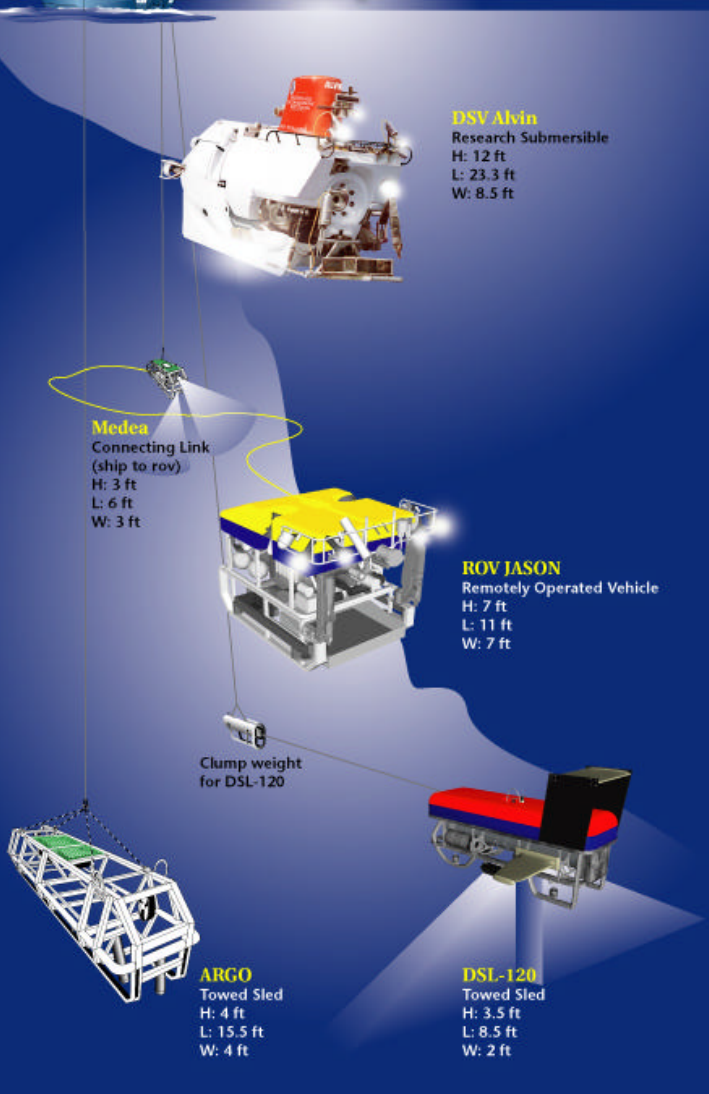
WHOI National Deep Submergence Facility Vehicles

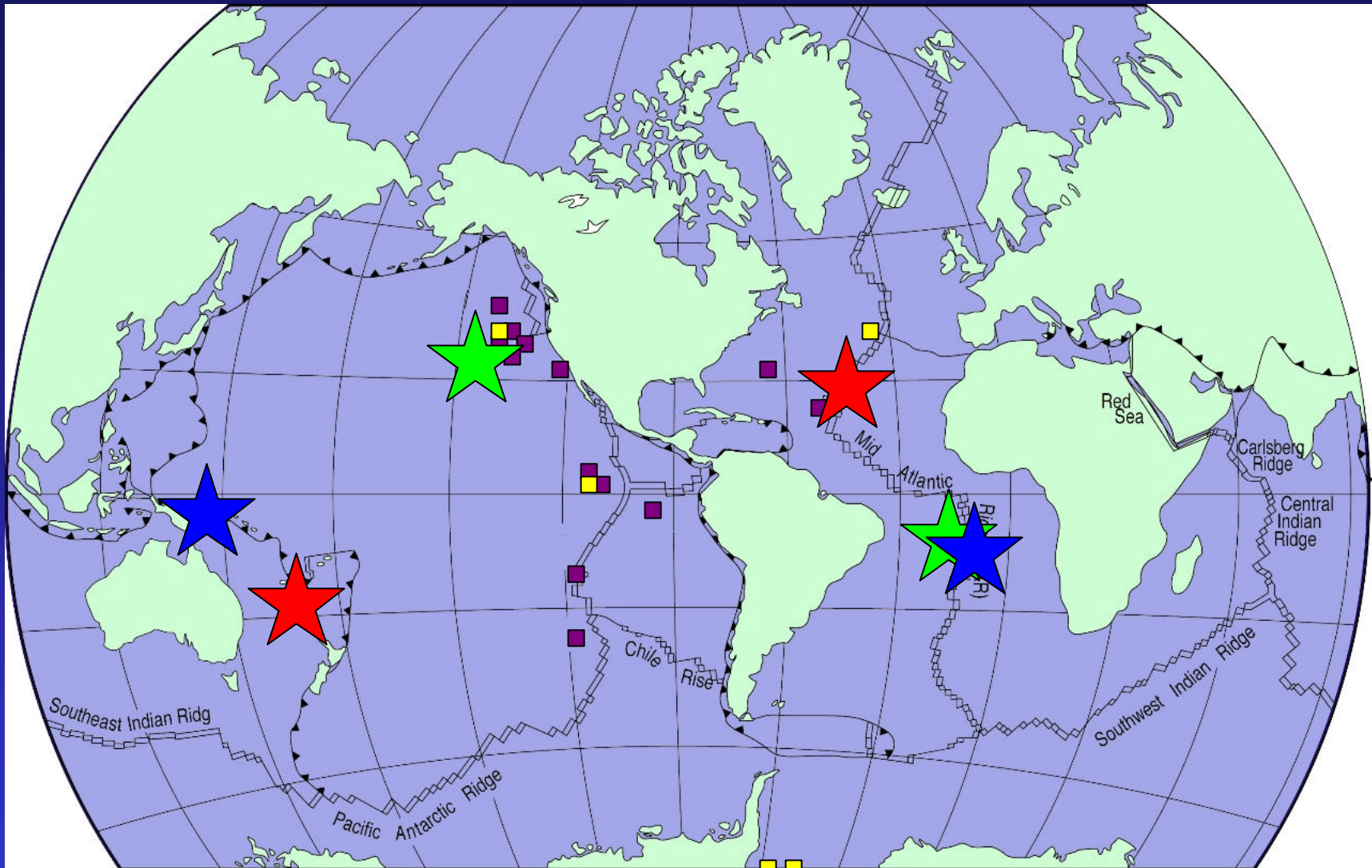
R/V Atlantis
 Length: 274.5 ft
 Beam: 52.5
 Cruise Speed: 15 kts
 DSV Alvin Tender
 Accommodates:
 23 crew and
 36 scientific staff

DSV Alvin
 4500 m
 14,764 ft
 Accommodates:
 1 pilot and
 2 scientific staff

JASON/Medea
 6000 m
 19,800 ft

ARGO
DSL-120
 6000 m
 19,800 ft





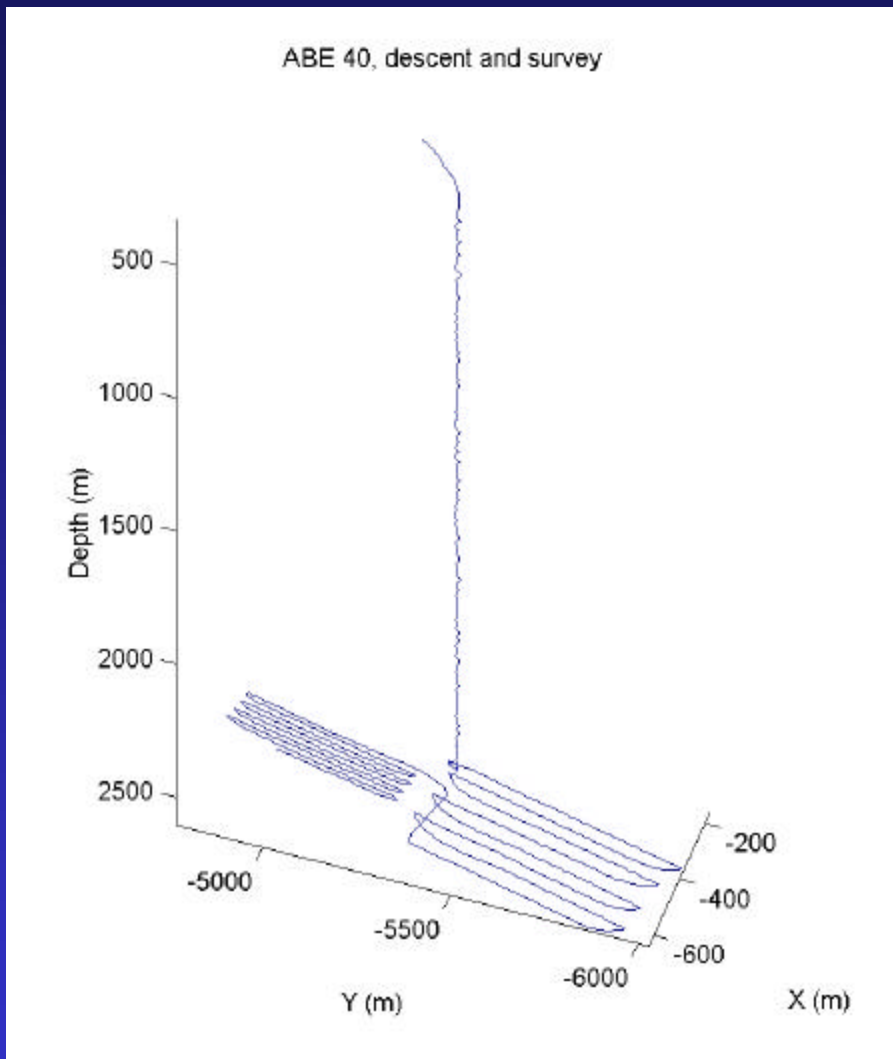
To date:

199 deep ocean dives
 >3000 km of bottom tracks
 >1500 hours survey time

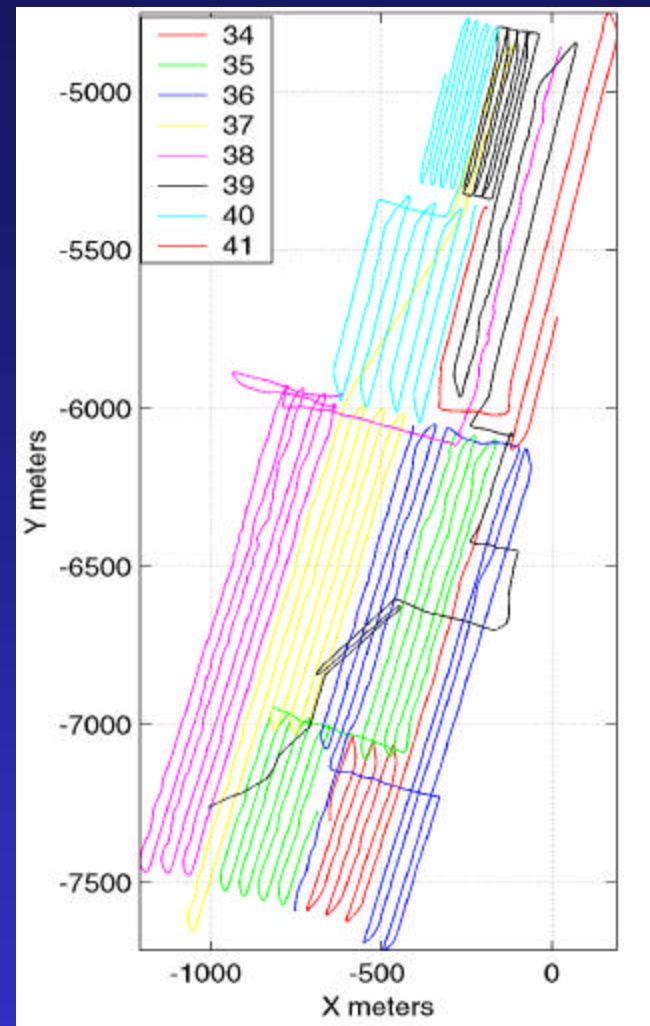
■ completed

ABE Highlights

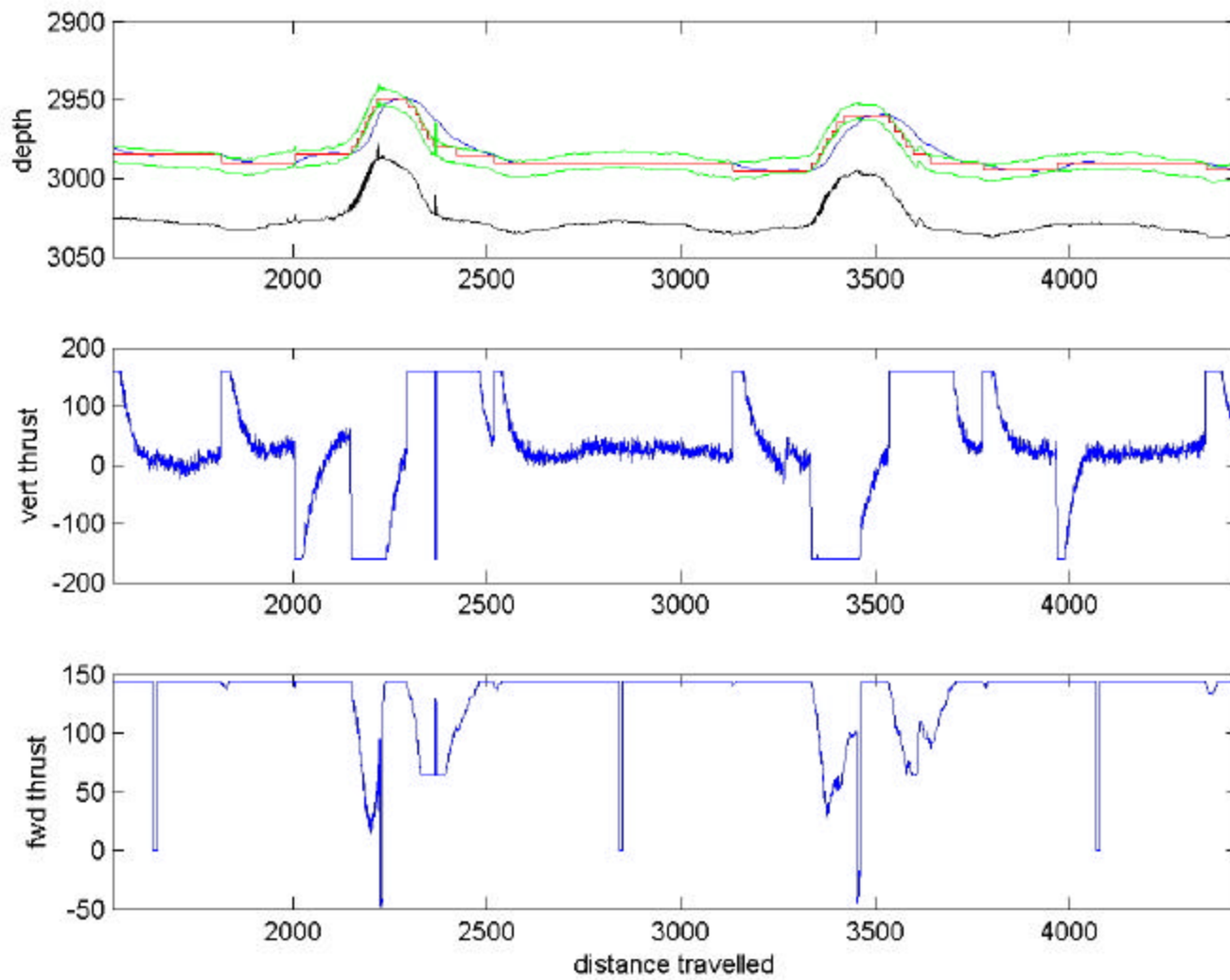
- 1996: First science operations, lava flow thickness through navigated magnetic measurements
- 1999: Bathymetric/magnetics mapping, Southern East Pacific Rise (17S)
- 2000: Hydrothermal vent heat flux measurement, Juan de Fuca Ridge
- 2002: Multibeam bathymetric mapping, Explorer Ridge
- 2003: Mapped Lost City site, Mid Atlantic Ridge
- 2004: First AUV-based vent discoveries, Eastern Lau Spreading Center
- 2005: Vent site discoveries, SMAR. Observatory/Cable Route mapping, Juan de Fuca Ridge
- 2006: Repeat surveys SMAR 5S, vent discoveries 5S, 8S, 9S
- 2006: Admitted to National Deep Submergence Facility



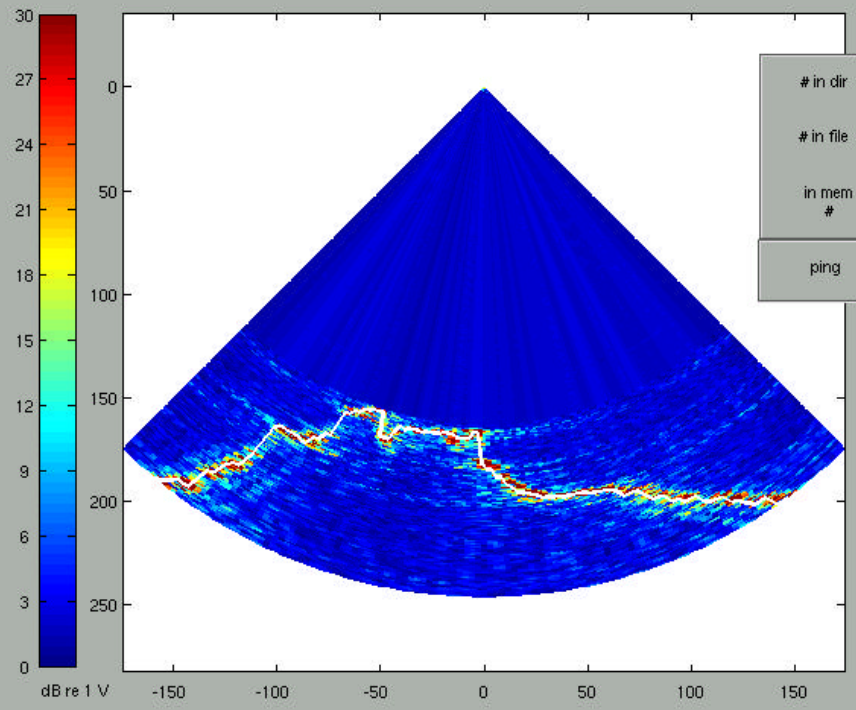
Precise
Descents



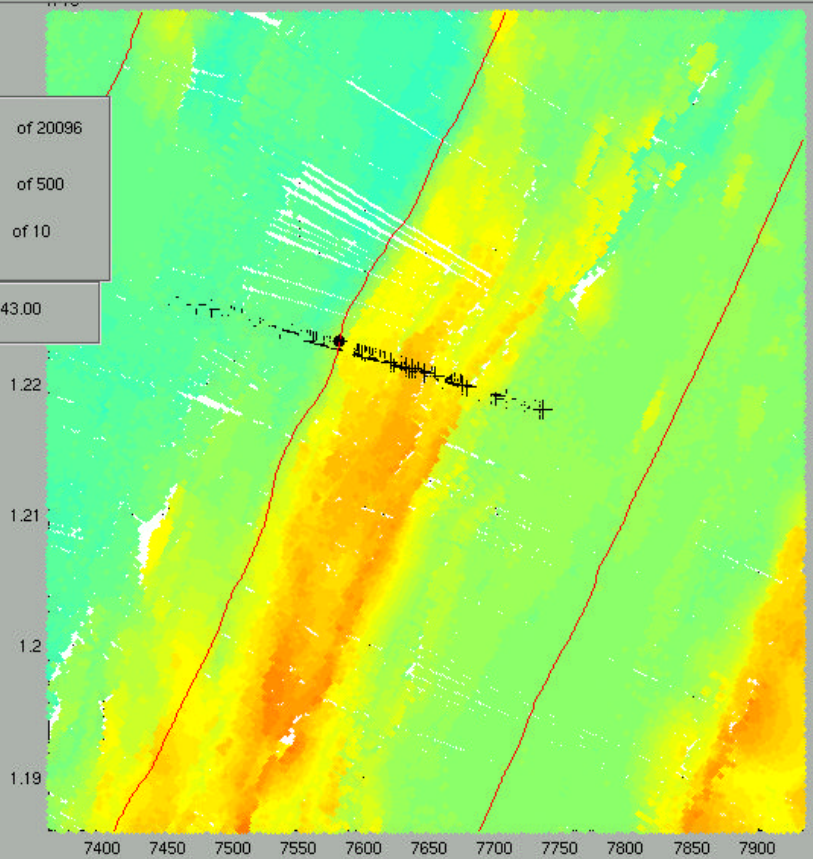
Tracks from 8
dives



File Special



in dir 8633 of 20096
 # in file 133 of 500
 in mem # 10 of 10
 ping 7:5:43.00



PLAY 1 REV STOP BACK FORW KILL

filter settings

Threshold 14 dB re 1 V

Median Gate
 npts: 10
 fixed thrshld: 30
 minpts: 5

Range Gate

beamforming settings

Disp Ping
 Disp Bot

swath angle 90

Window Elements

Bnt detect Averaging Mode

Ping Averaging Mode

disp in dB re uPa

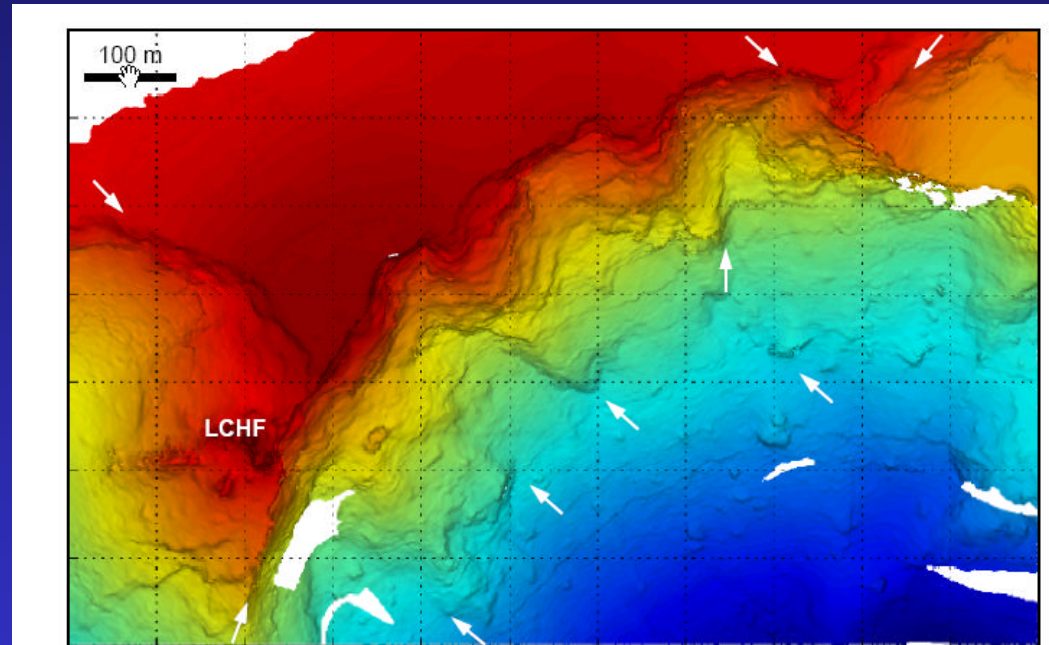
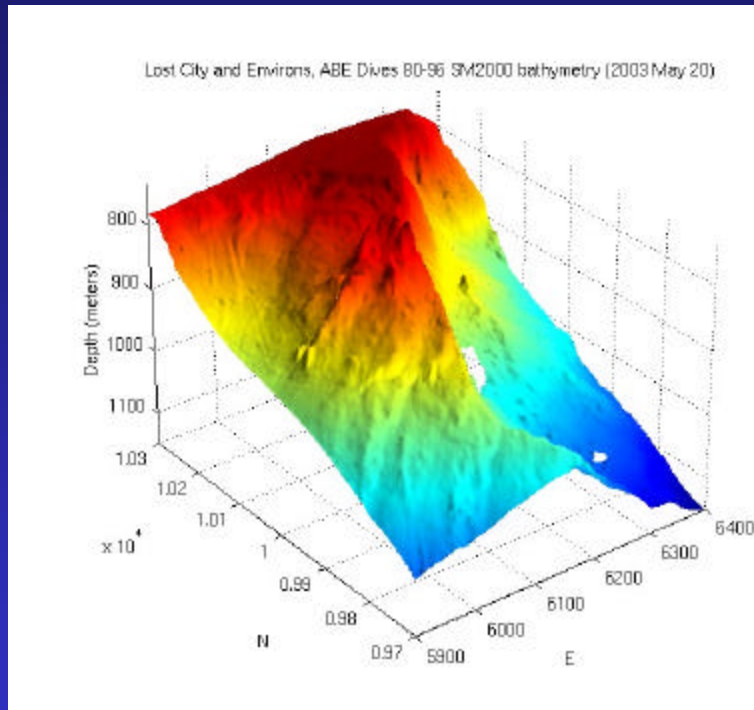
2090 2106 2125 2144 2163 2182 2202 2221 2240 2259 2279 2292

Del Bad Nav Plot Aux Get Fix Get Ping

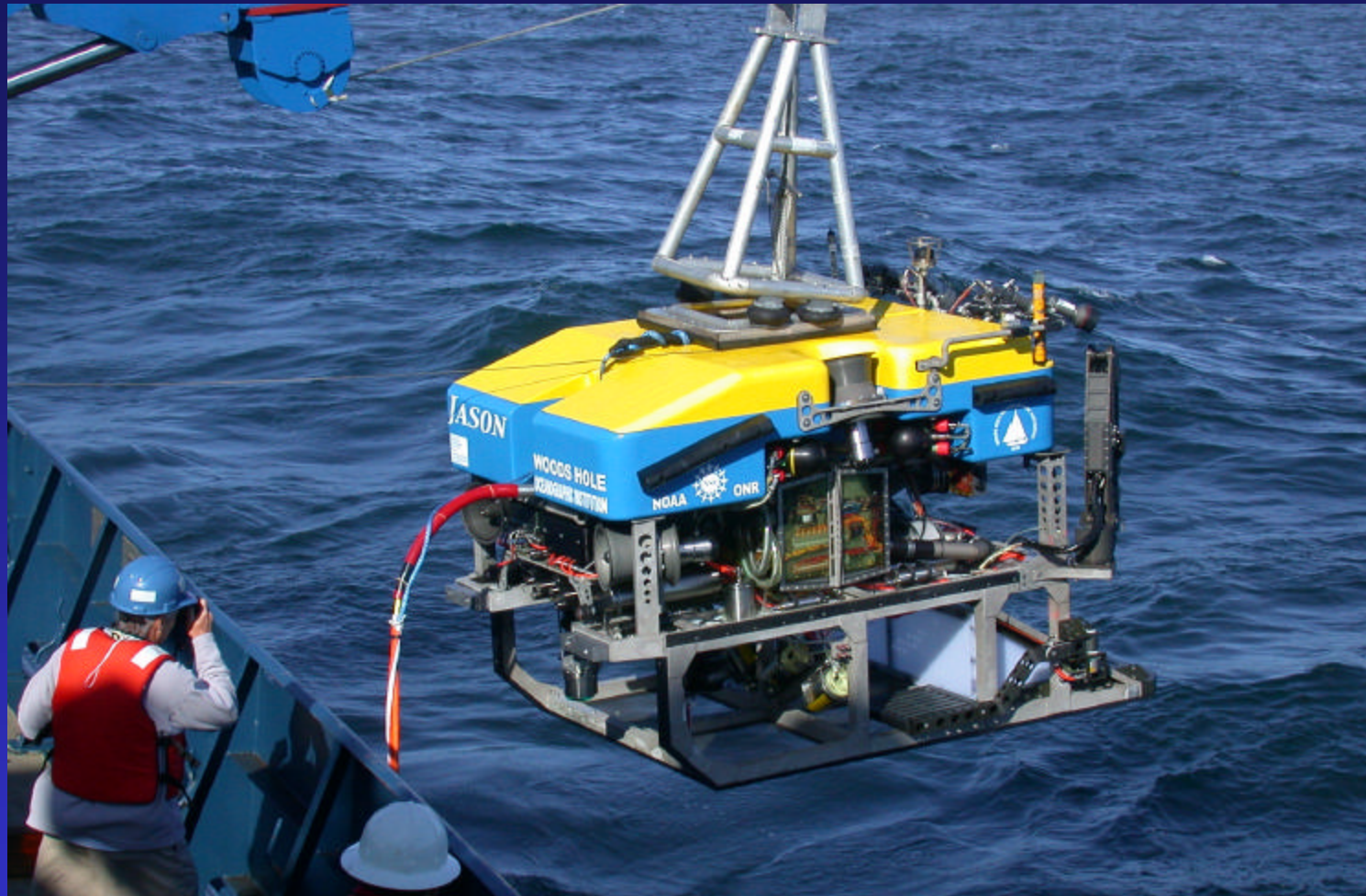
Proc Bathy Proc All Bathy Proc Last Bathy Mark Ping Clear Bathy

loaded new file: SM200509060601.raw
 loading new sonar input file ...
 loaded new file: SM200509060700.raw

Lost City and Environs

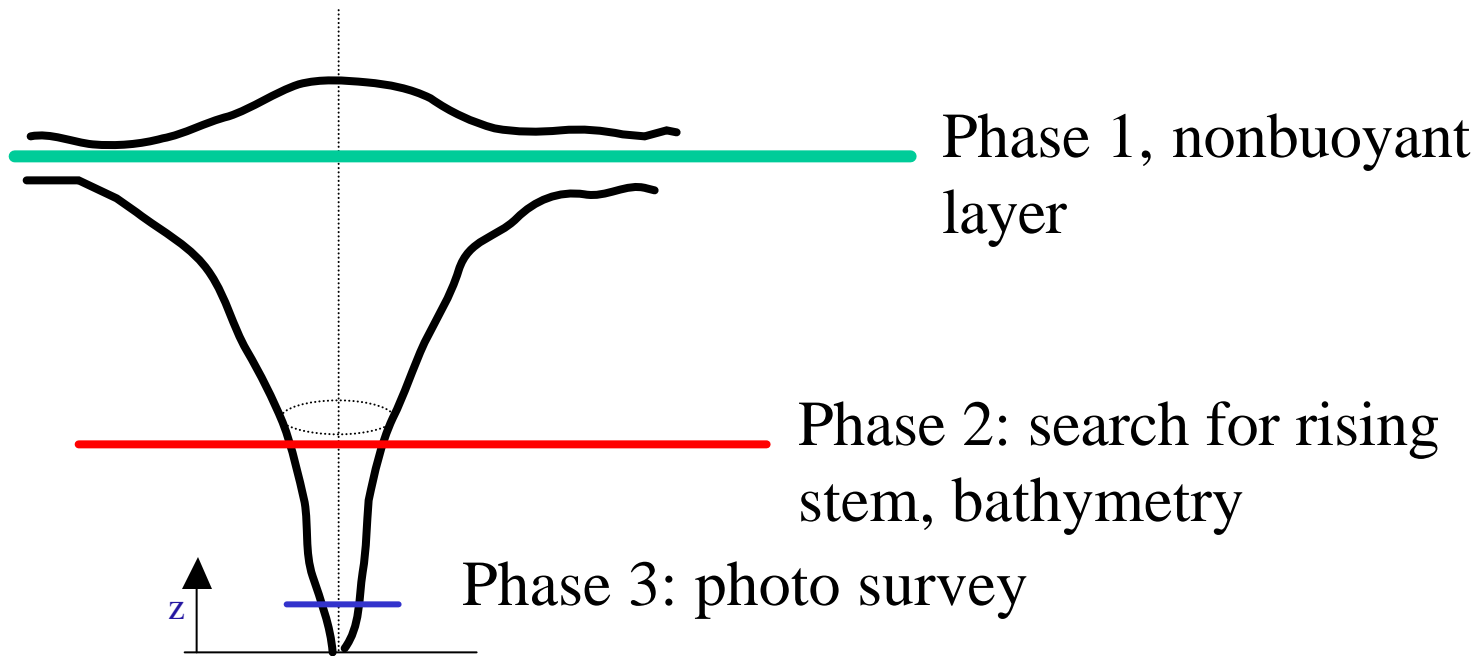


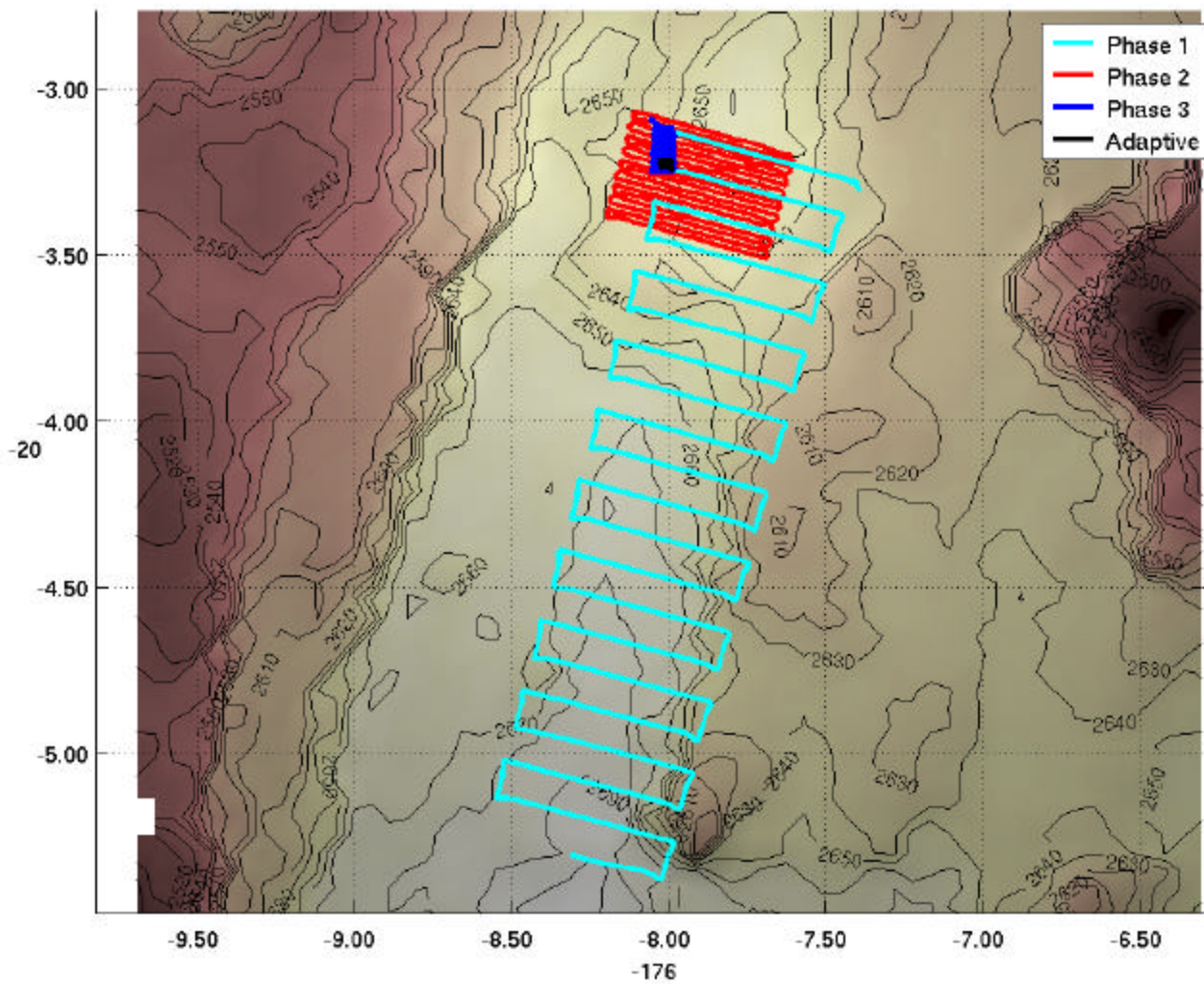
Kelley et al, Science, 2005



Joint Operations with Jason II

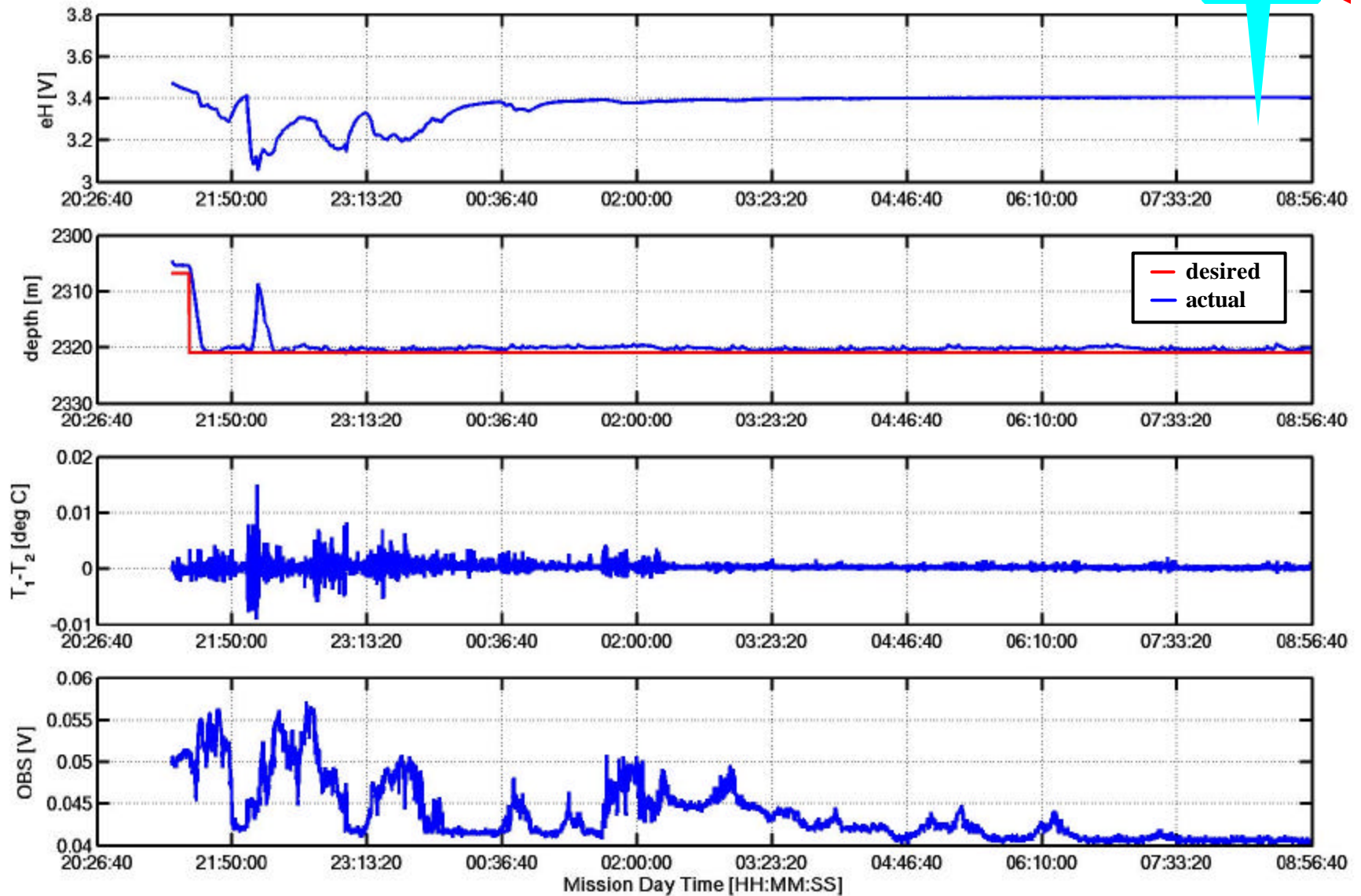
Iview data

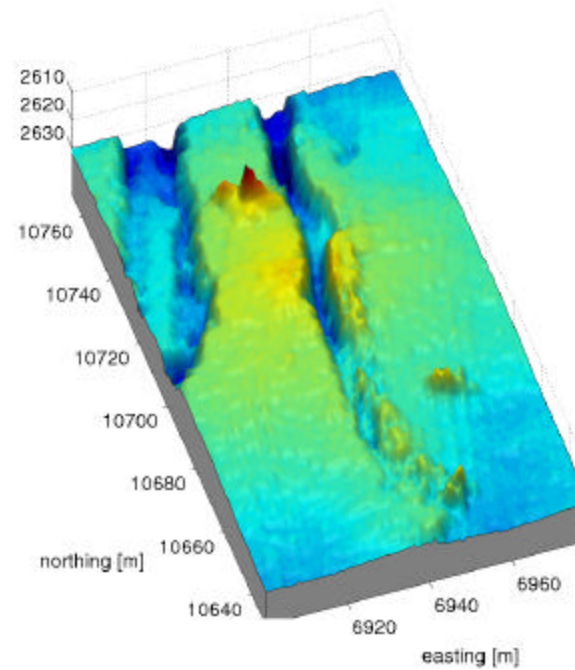
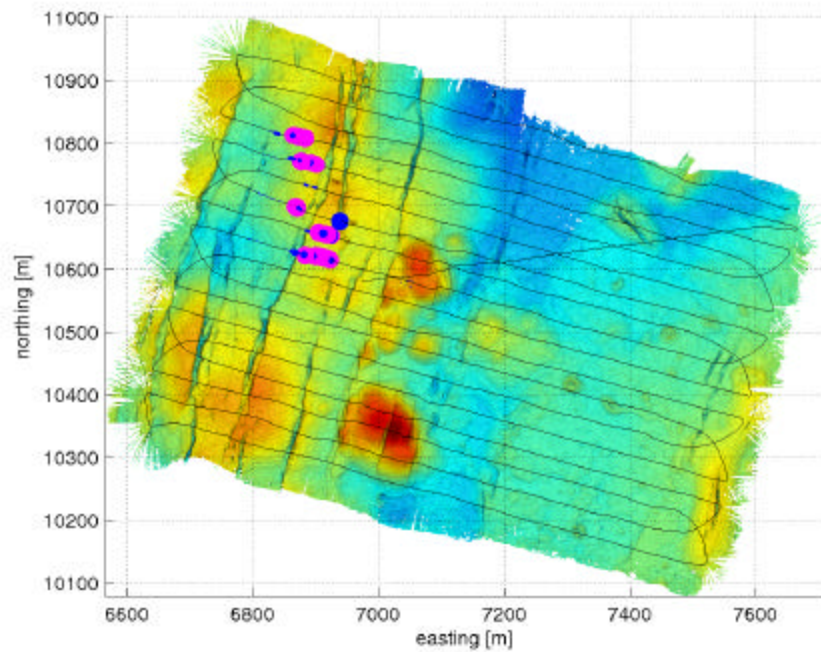




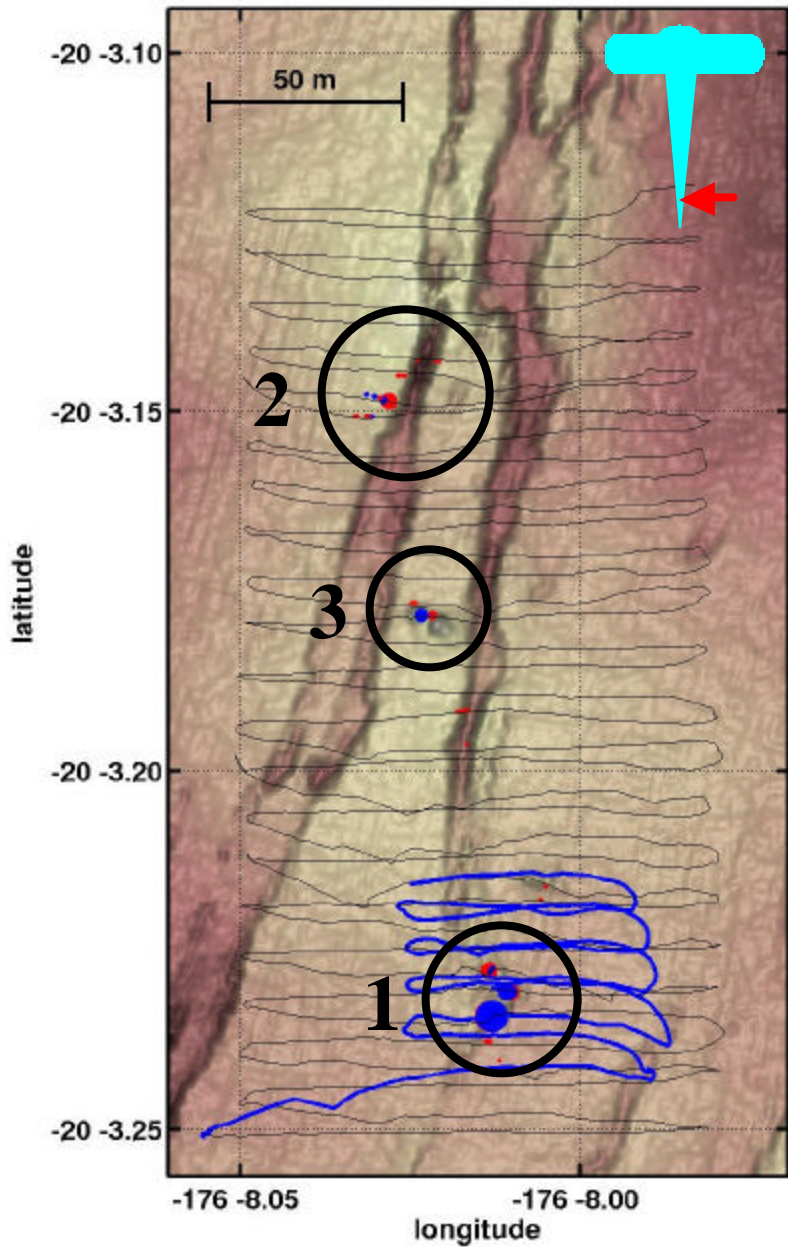
Vent site localization and survey using 3 phase approach

Signals from Buoyant Plume Stems



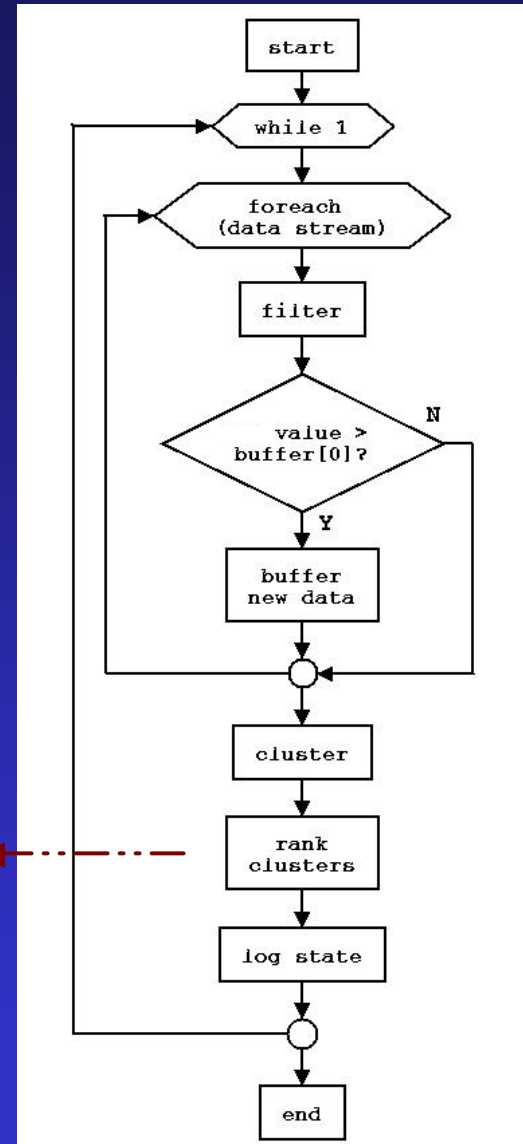


Phase 2 survey, pinpoint vents and make bathymetric map



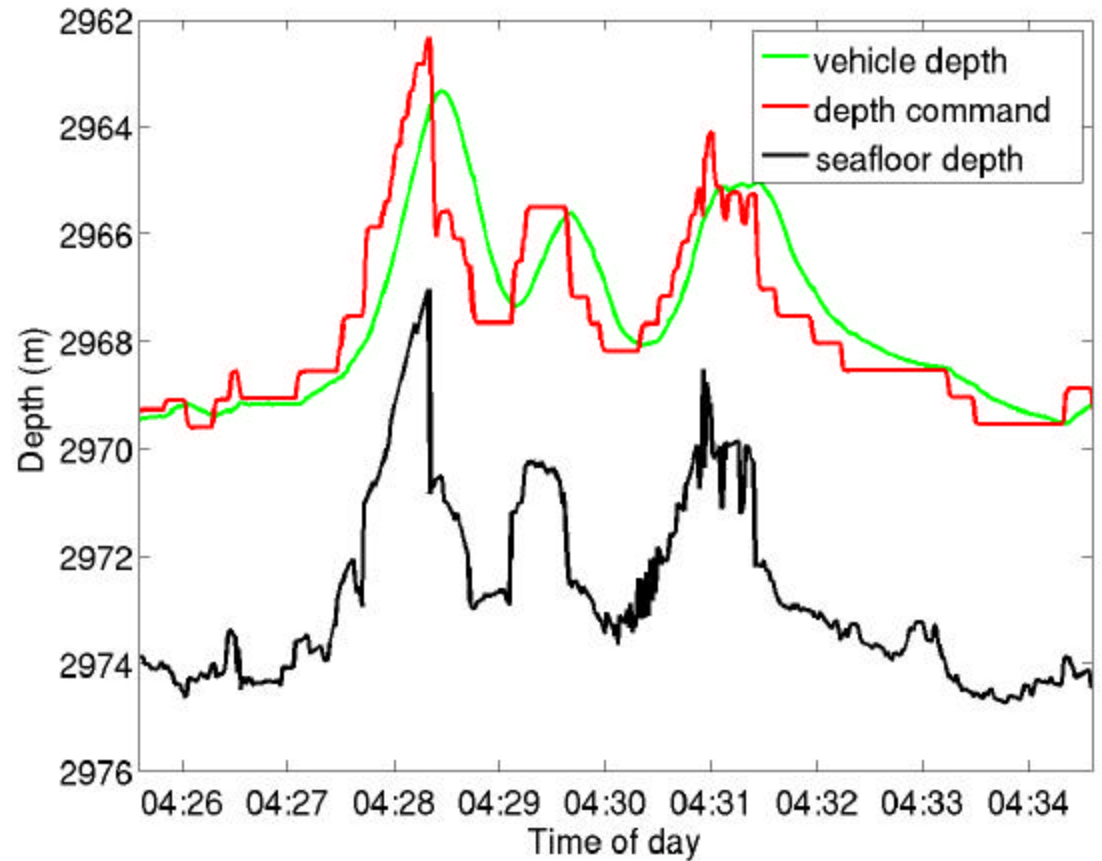
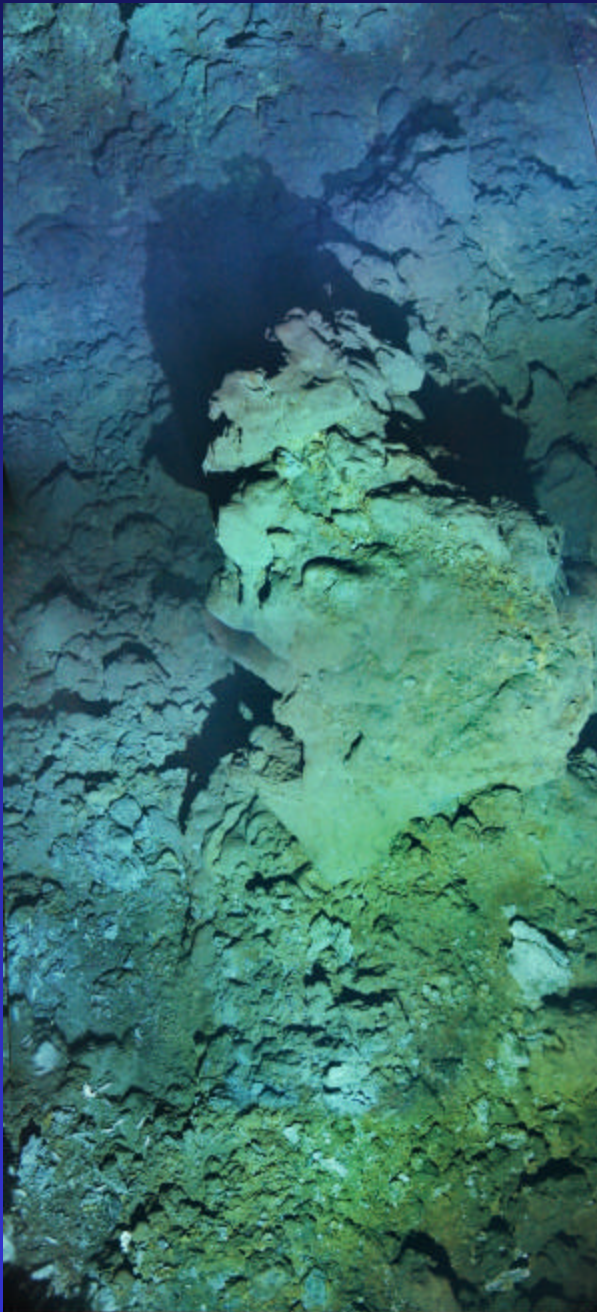
- OBS
- T
- eH

mission planner



Temporal Analysis

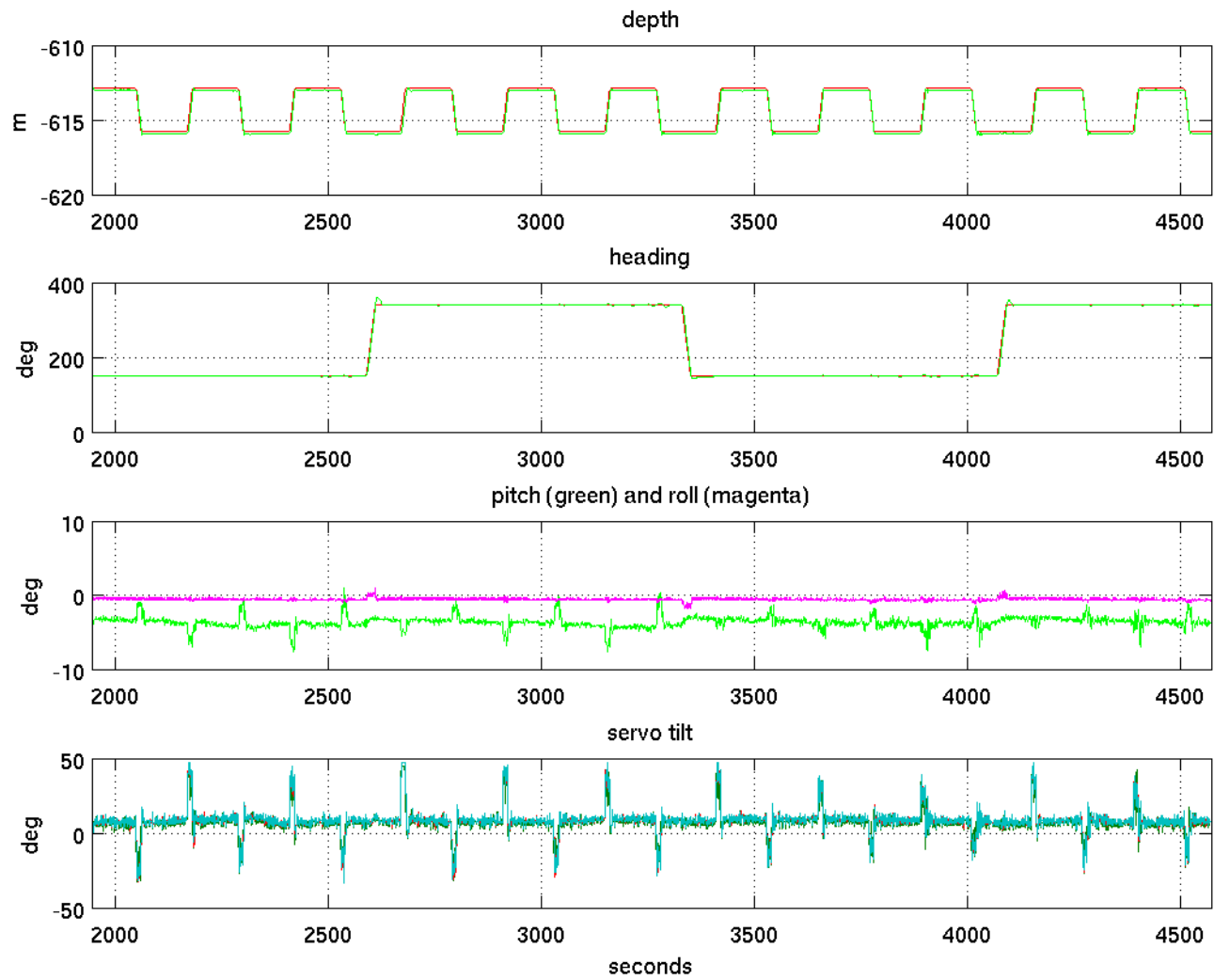
Spatial Analysis

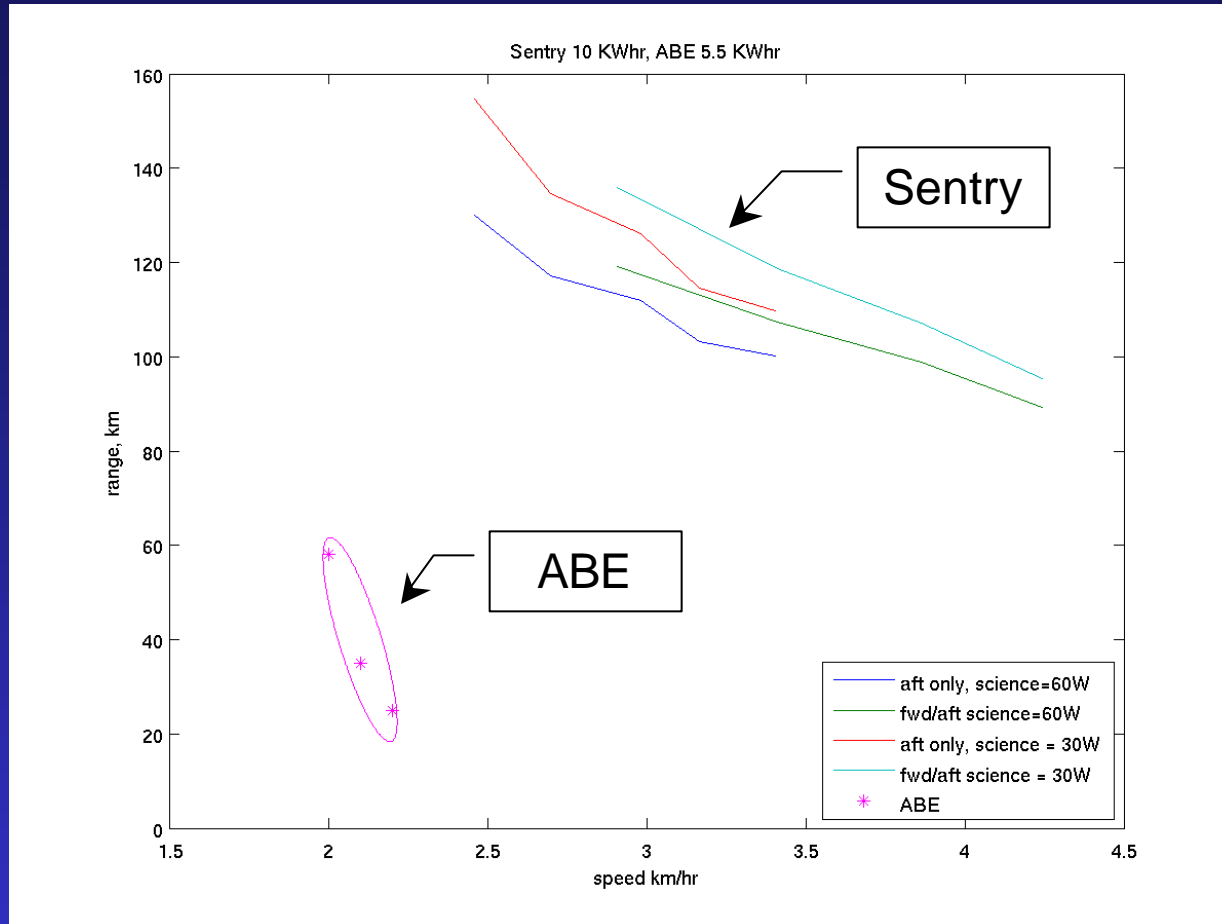


ABE can take digital color photos in rugged hydrothermal vent terrain

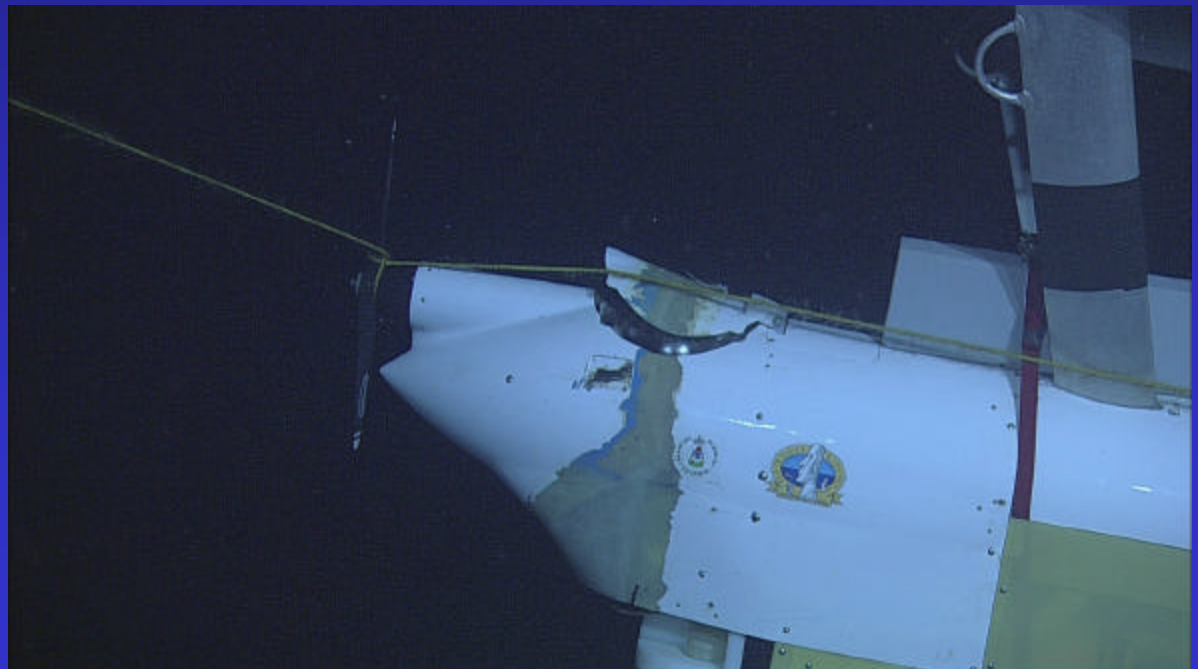
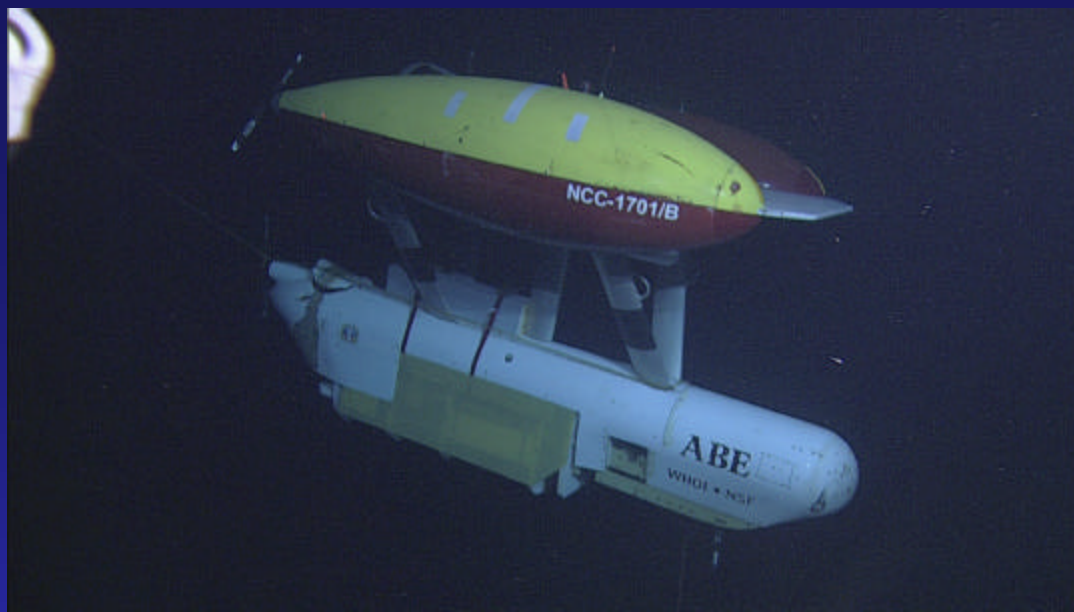
(German, Shank et al, 2006, Yoerger et al, 2006)

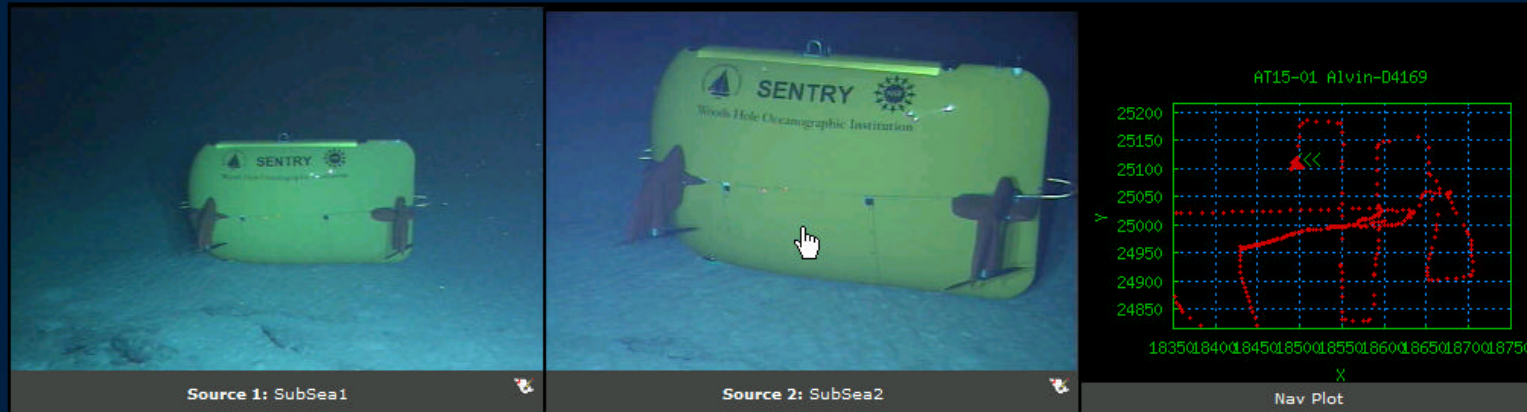




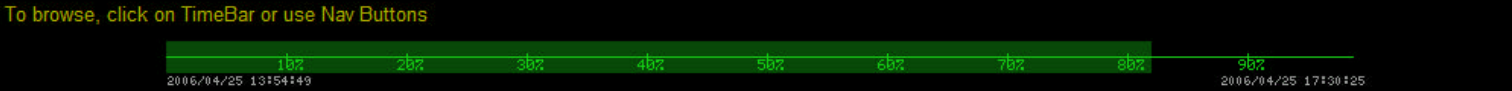


Sentry and ABE range vs speed in several configurations based on experimental measurements.





DAQ.ActiveDive.Alvin	DAQ Time: 2006/04/25 16:54:24 NavTime: 2006/04/25 16:54:22	Hdg: +128.296 Lat: 32 33.589440 N Lon: 64 28.214400 W	Alt: Depth: +2539.972 TDepth: 2539.972	HiTemp: LoTemp: IceTemp: Amb Tmp: 3.086 C
Type: ASNAP NavAttSrc: PWHANA		X: +18493.928 Y: +25115.300 DopAlt: +2.713 Pitch: -4.535 Roll: -0.427		MagX: MagY: MagZ: MagZ2: MagT:
EType: Event:				



ALVINCertification Dive4169 **SnapShot #0360**



Sentry's rescuers: Anton Zafereo (Alvin pilot in training), Gavin Eppard (Alvin pilot), Bruce Strickrott (Chief Alvin pilot).