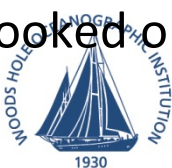


Sentry History & Cruise Background

- Initial construction and tests to depth
- NSF Equip grant for navigation, bathymetry, lights, cameras, CTD
- WHOI Internal Grant (“Access to Sea Program”) for testing/implementation (\$250k)
- Cruise postponed from Fall 2007 until Spring 2008 (*Oceanus*)
- Additional testing, *Tioga* ‘dunk’ test (cost *Oceanus* time, reported at DESSC mtg)
- *Oceanus* cruise; Reson system failed, then only 4 mo. to prepare for JRD cruise
- Doubts about *Sentry* but WHOI & JRD both willing to use *Sentry*. Longer ranges lead to the potential for more efficient mapping.
- ABE booked on another cruise (Lin) and not available as an option for JRD



Sentry Operations - 2008

Sentry made it's first scientific cruise on the R/V *Thompson* in support of John Delaney's work with the Ocean Observatories Initiative. Of primary interest was mapping the areas around Hydrate Ridge and Axial Volcano off of Oregon and Washington for cable and node installation.

Six dives:

Total distance covered:	205 km,
Average dive duration:	16.8 hrs
Depths:	~3000 m to 700 m
Multi-beam sonar survey time	88.4 hrs



Sentry Debrief Summary - Delaney

- First deep water *Sentry* cruise; UW and OOI funded
- Only high-res bathymetry required
- Planning, mobilization/demobilization all fine
- Operations: 18-20 hr dives (not as long as PI anticipated); launch/recovery testing en route
- NDSF Equipment: navigation erratic (INS lock-ups), not as stable as ABE nav (LBL/DVL), resulting in gaps in bathy coverage. Because team was so busy with trouble-shooting gaps were not recognized until later, no time to go back and resurvey. Too much for team to do to keep up with monitoring data collection. Shear pin failures on propulsion system (known problem by WHOI before cruise).
- Personnel: Exceptional team, esp Dana Yoerger as EL, but too many responsibilities on EL (development, calibration, correction, trouble shooting, navigation reduction and bathymetric data) led to delays in delivery of maps.
- Future Needs: side-looking sonar, options for height/swath width using Reson system.



Sentry Problems & Correction

- Navigation errors were experienced during Delaney's cruise. Fixes have been worked out and more robust programming implemented. INS has been reconfigured to prevent lock-up.
- A propeller to shaft connection failure resulted in slippage. This has been remedied with a robust metal hub on the propeller that mates to new thruster shafts with conical seats and keys.
- The increased data processing work load from the Reson multibeam sonar has required an increase in our staff until fully-tested, more automated processing can be implemented and operations staff cross trained. Multibeam pipeline is now in place and is being integrated into the larger NDSF data system.
- Bathymetry gaps and navigation errors are being addressed. Still working on final bathymetry grids, etc.; detailed response to PI after debrief with promise of data completion June 2009



Questions and Concerns

- *Sentry* was not fully ready for expeditionary mode. WHOI should take responsibility for readiness before deployment. Who makes these decisions?
- Should WHOI have held *Sentry* back until fully ready for sake of PI data AND Institution reputation? (Was *Sentry* cruise done for WHOI cost benefit?)
- What did WHOI promise PI? (faith in Dana et al. trumped other doubts)
- How to assure that data processed after cruise are finished and delivered to PI? (Who is responsible and what are the protocols?)
- Are WHOI personnel resources being used optimally, especially Dana?
- How should development be managed? Should Dana be deployed in normal operational mode? How will the next generation of developers be nurtured?
- How should WHOI/NSF develop new systems like *Sentry*? (Is it unfair for a PI to shoulder costs of development—even if willing?) WHOI responsibility? Should NSF be planning to fund engineering/development cruises?
- How will needed future systems be developed? *Sentry* system is not a good model.
- When should *Sentry* replace ABE in NDSF pool? Should WHOI be allowed to offer both in parallel? DeSSC should see a time-table for transition.



Sentry Operations - 2009

Sentry currently has 3 cruises scheduled for 2009

- June 17-30 on the R/V *Brooks McCall* for Chuck Fisher in the Gulf of Mexico to study deep ocean coral
- Aug 01- 15 on the R/V *Thompson* for John Delaney on the JDF ridge to continue the OOI node surveys
- Sept. 13-29 on R/V *Atlantis* for David Valentine off S. California to explore and evaluate petroleum seeps

