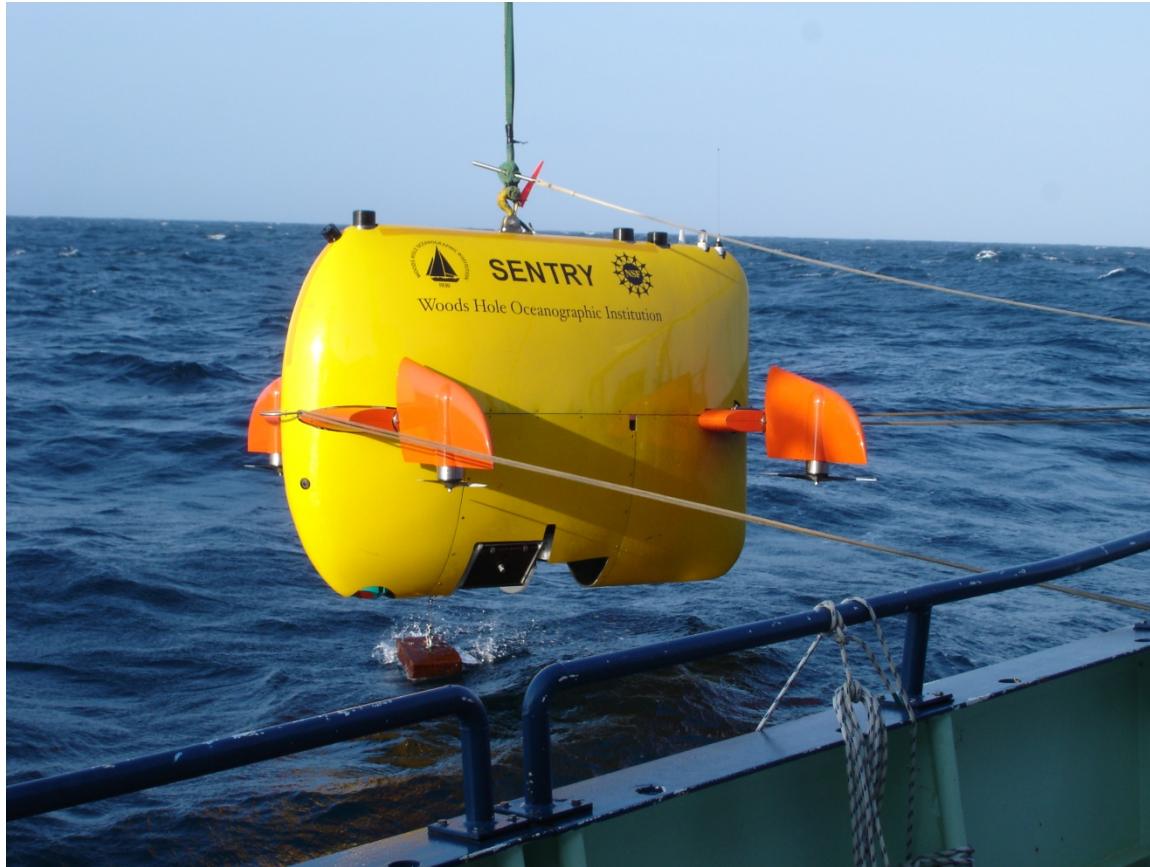


# Sentry Deep Trials

R/V *Oceanus*, April 18-23 2008



# Sentry Deep Trials

DESSC  
June 2008

## Summary

### Objectives:

1. Test basic deep-water functionality
2. Make bathymetric map in deep water
3. Test science sensor suite (CT, magnetometer, optical backscatter, Eh)
4. Demonstrate deep LBL system and DVL/INS
5. Demonstrate bottom-following and track-following
6. Gain experience with launch/recovery



# Sentry Deep Trials

## Reson Mapping Sonar Status

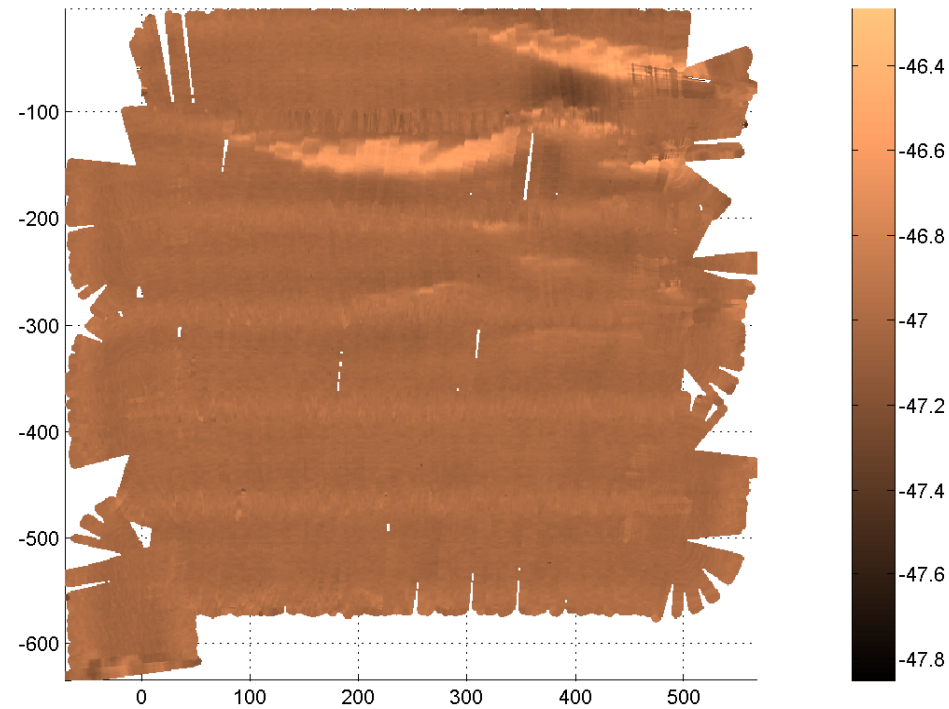
### Reson sonar unreliable

- Sonar failed (ethernet connectivity lost) in the lab before cruise
- Sonar returned to Reson, function returned, no problem found
- Function returned and was lost repeatedly over the cruise, no successful deep mapping trials conducted
- We made a map in shallow water, 6,500 m tracklines
- Sonar presently back at Reson for main CPU replacement/upgrade
- Additional trial required before July cruise



# Sentry Deep Trials

## Reson Mapping Sonar Status



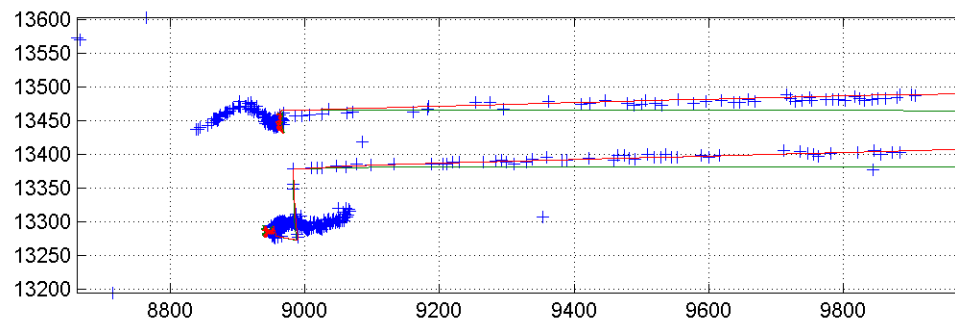
- Seafloor “flat” to ~0.1 meter after correction
- Timing problem (since resolved)



# Sentry Deep Trials

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## DVL/INS/LBL Navigation



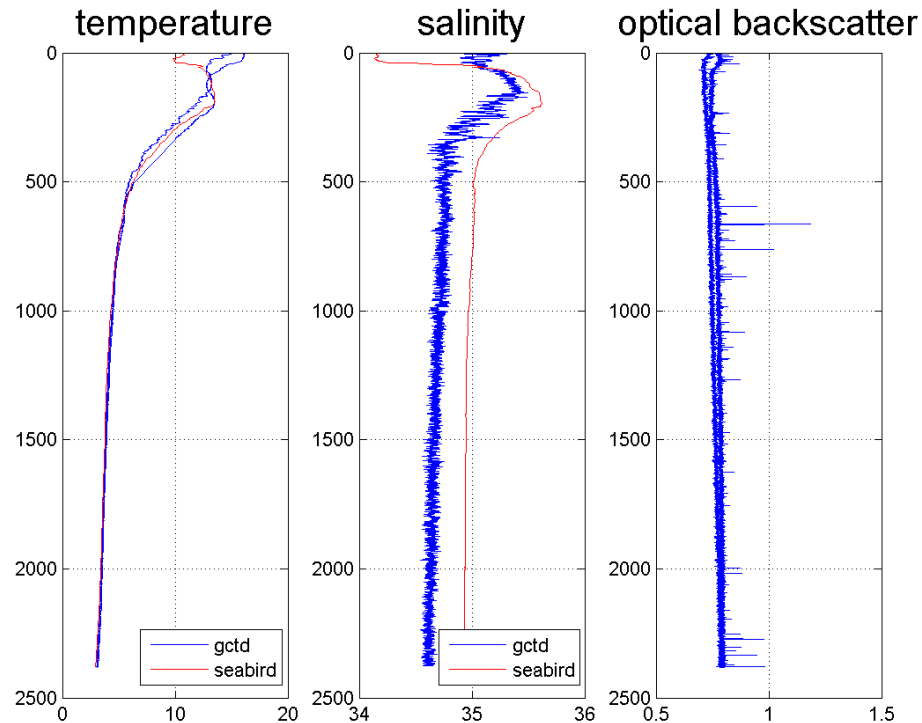
- LBL computed post-dive, but good travel times logged on the vehicle
- INS/DVL functional, rotational adjustments applied



# Sentry Deep Trials

DESSC  
June 2008

## Science Sensors



### Comparing GCTD on *Sentry* with *Oceanus* Seabird

- Good agreement on T
- Calibration issue on C
- GCTD must be mounted on wing root for improved flow
  - improved dynamics
  - reduced noise



# Sentry Deep Trials

## Demonstrated Capabilities

- Basic electromechanical systems worked well (thrusters, servos, weight droppers)
- Demonstrated bottom approach in deep water
- DVL/INS and LBL systems functional
- CT, optical backscatter, magnetometers functional
- Trackline and bottom-following demonstrated
- Descent rate 36 m/min, ascent rate 57 m/min
- Wireless joystick aided in vehicle recovery
- Acoustic abort functional
- Batteries functioned as expected



# Sentry Deep Trials

## Items to be Addressed Before July Cruise

- Reson reliability (in process with manufacturer)
- Time synchronization for Reson computer (fixed)
- DVL/Reson synchronization (fixed)
- Proper response to zero-altitude data (fixed)
- Incorporate LBL fixes in real-time (test in next shallow trial)
- Test bottom-following in more challenging terrain (test in shallow trial)
- CT and magnetometer mounting (in fabrication)
- Additional automation of pre-dive functions (test in shallow trial)
- MB-system bathymetry pipeline (in process with assistance from MBARI)





# Sentry Science Cruise

DESSC  
June 2008

July 2008

- Chief Scientist: John Delaney
- July 22- August 6 2008, Seattle-Seattle, R/V *Thompson*
- Funding: Ocean Observing Initiative
- Objectives: Observatory node site mapping
- Mapping sensors: bathymetry, magnetics, CT, optical backscatter, Eh

