Healy Science Technical Support

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2010-12-08/09 - UNOLS/AICC Meeting - USCG ISC Seattle

Overview (1)

- Multibeam (replacement)
- ADCPs
- New TSG/PCO_2 plan
- Science Technical Support
- Proposal to revise data policy
- Acoustic Comms (releases and transponders)
- Scoreboard replacement

Overview (2)

- GC-DGPS
- Deck sockets
- Mooring Winch
- Hull temperature probe
- Reference hydrophone interface
- 3/8" winch
- Winch wire monitor

pCO_2/TSG Estimated Costs

Item	Approximate Costs
"ship yard" but done dockside	$20K
science hardware	$25K
technical labor (SIO/ LDEO)	$20-30K

Computer Lab Estimate

Item	Approximate Costs
"ship yard" but done dockside	$20K
science hardware	$20K
technical labor (LDEO)	$20K

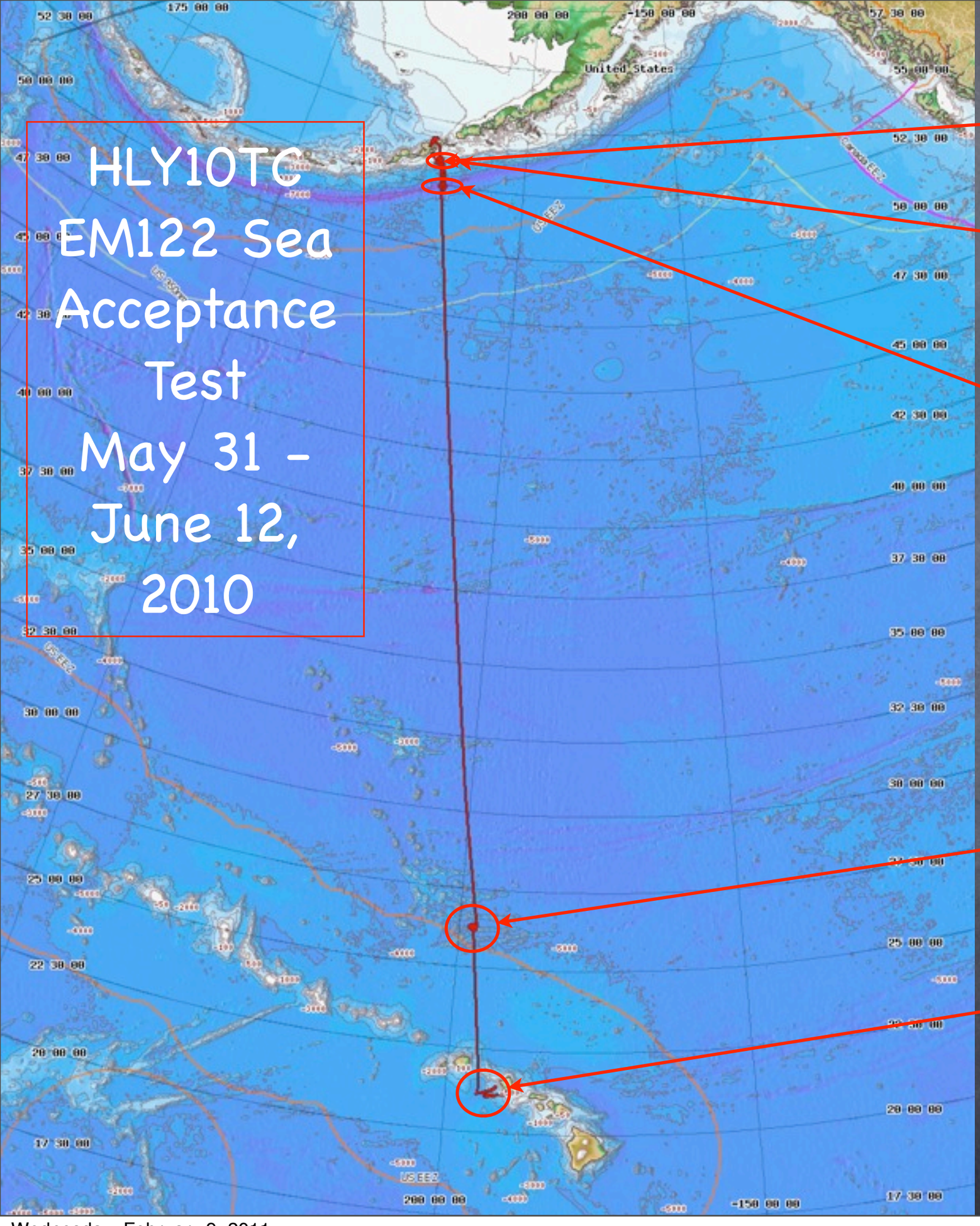
Multibeam Replacement

(Removed SB2112 & Installed EM122)

- Installation completed
- Post shipyard trials
- Shakedown
- Transit to Honolulu
- Sea Acceptance Test (5 days)
- Remaining issues (noise & SIS)

Multibeam Sequence

- [x] Project proposed to AICC (2003)
- [x] Engineering Change Request (ECR) (2003)
- [x] Installation Concept (approach, cost, time)
- [x] Funding
- [x] Detailed engineering (spring/summer '09)
- [x] Install (CY 2009/10 drydock)
- [x] Initial evaluation (March/April 2010
- [x] Acceptance Test (June 2010 - HLY10TC)
- [ ] Performance characterization


HLY10TC
EM122 Sea Acceptance Test
May 31 - June 12, 2010
Shelf, very shallow
Slope, canyon
Very deep (trench)
Deep "ridge crest"
Pitch, Roll, Heading, & Timing Calibrations aka "patch test"
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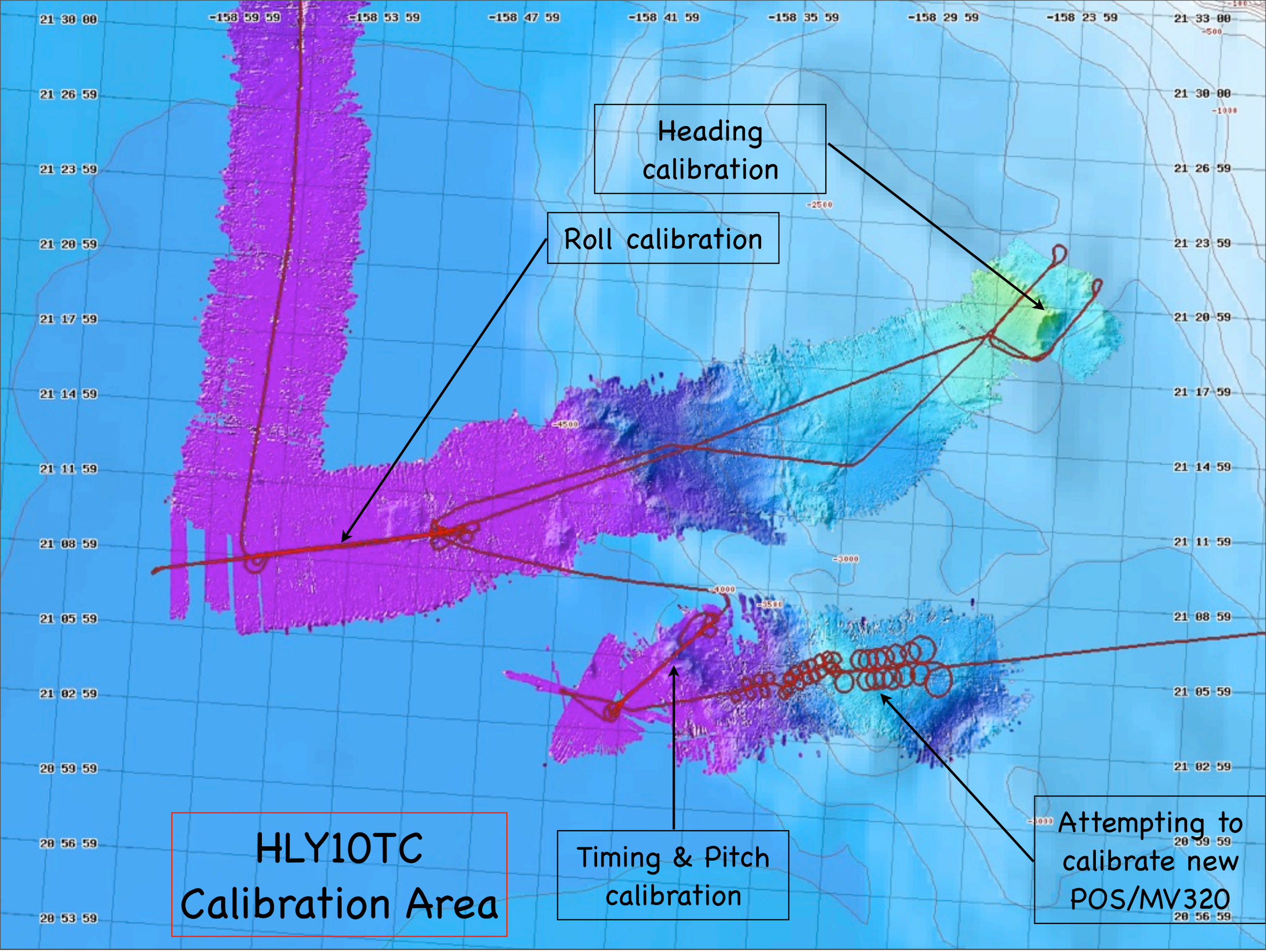
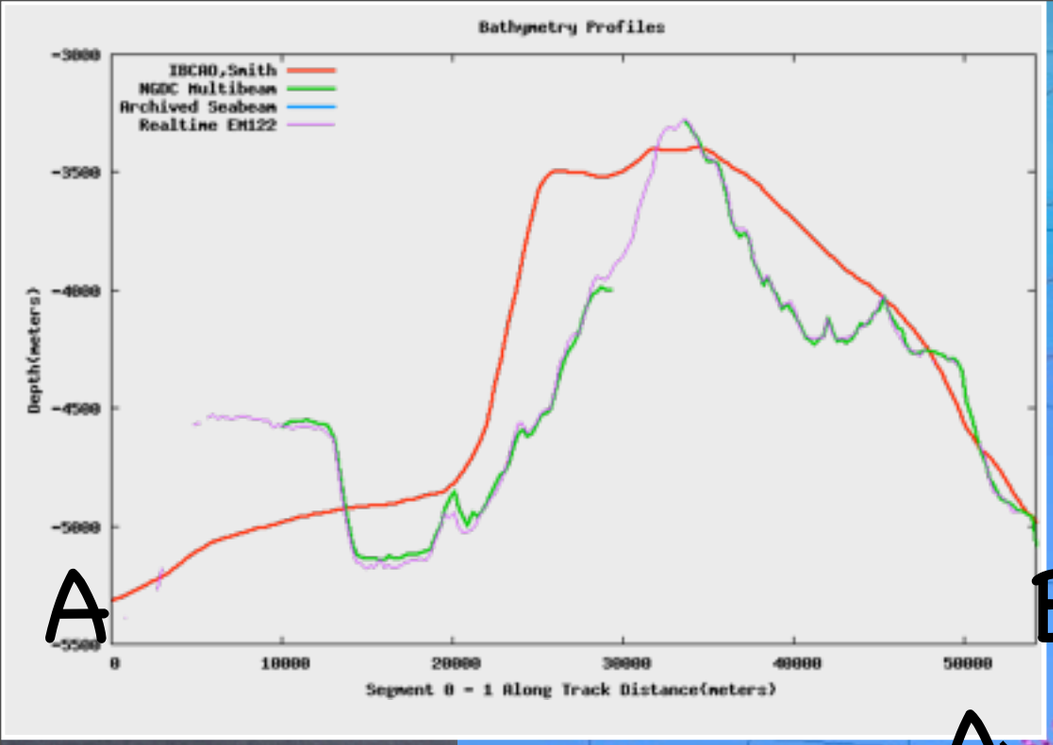
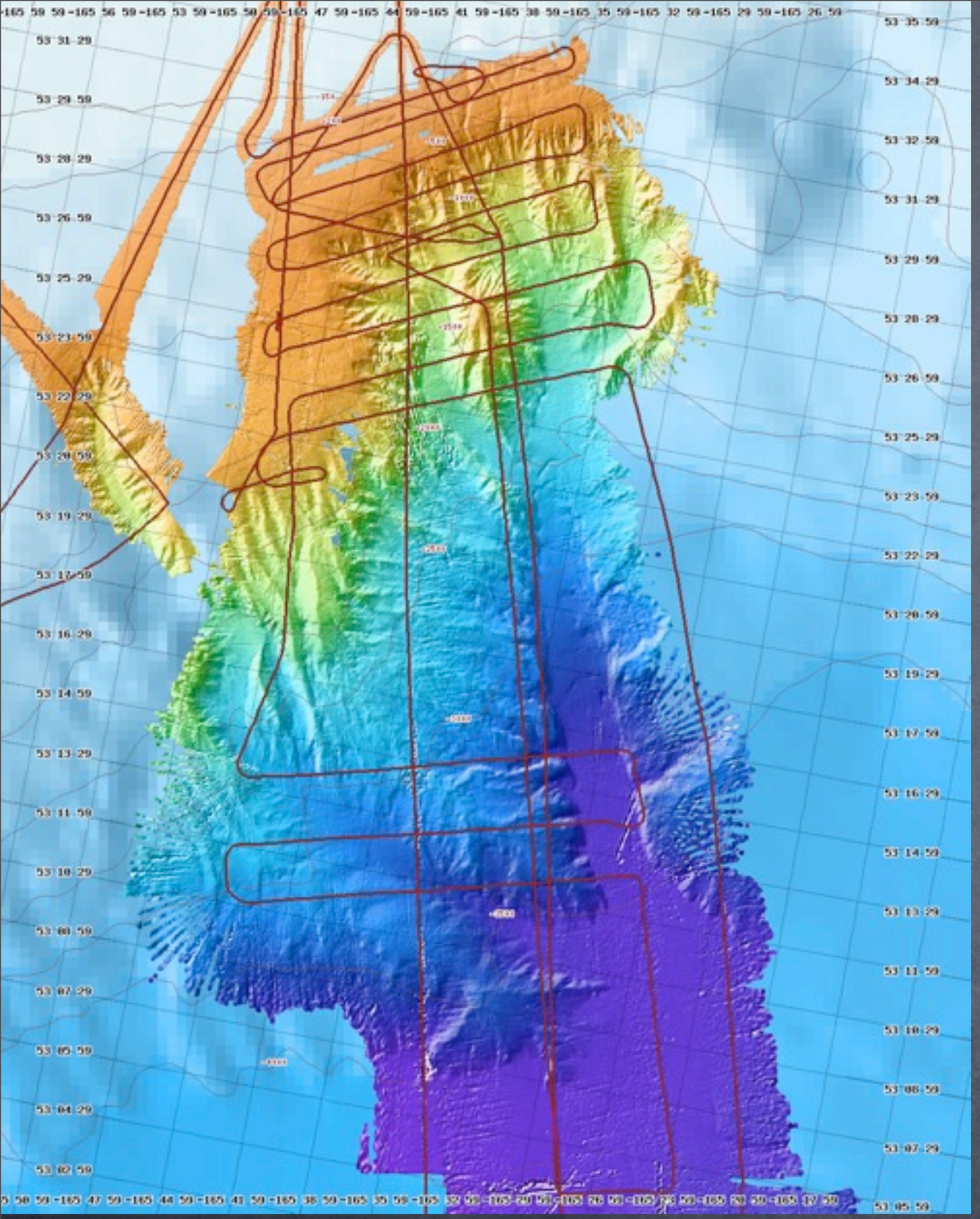
INSTRUMENT LABORATORY


Heading calibration
Roll calibration
HLY10TC Calibration Area
Timing & Pitch calibration
Attempting to calibrate new POS/MV320

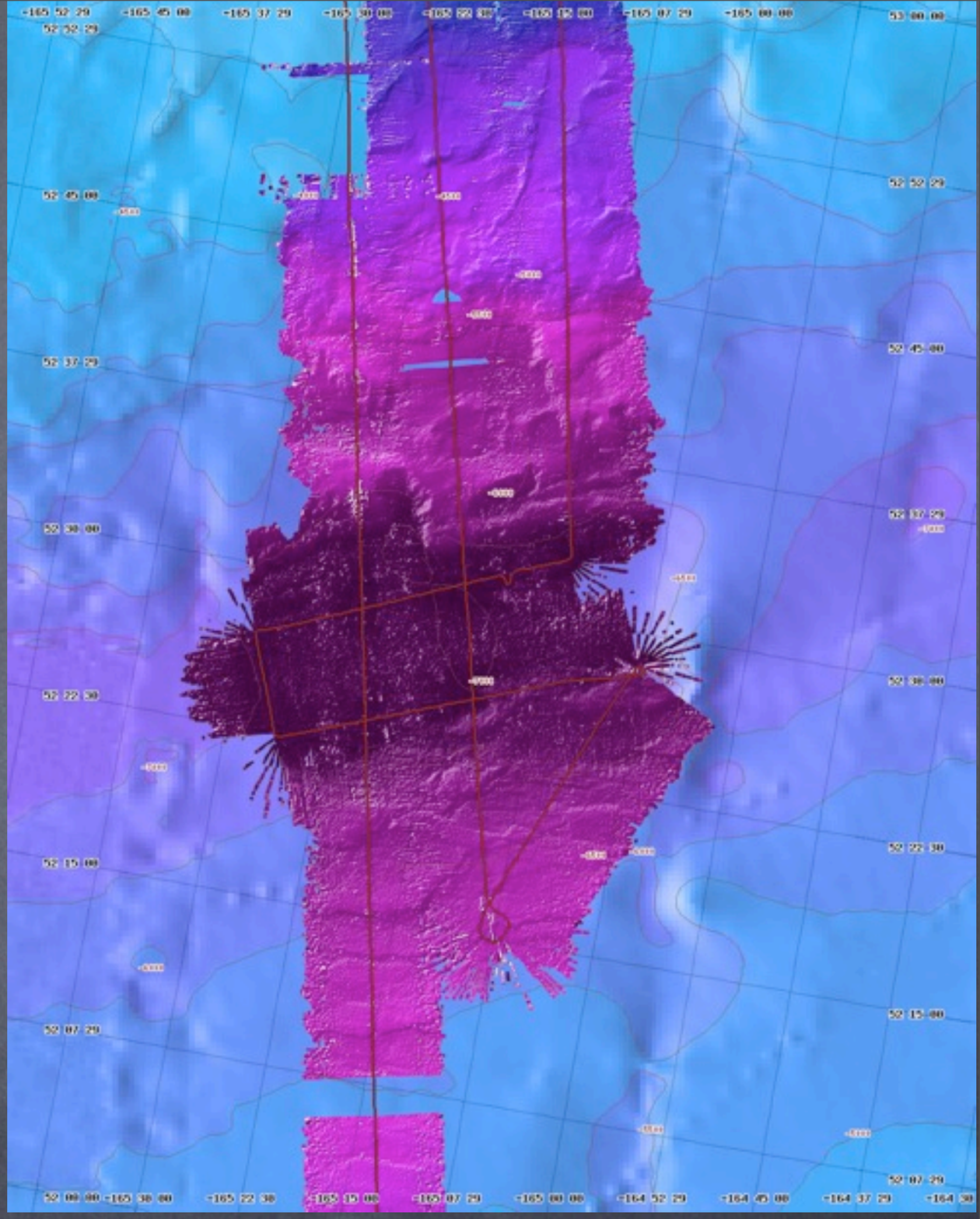
Deep hard bottom site

December





Slope site



Aleutian Trench (7km)

December 9, 2010

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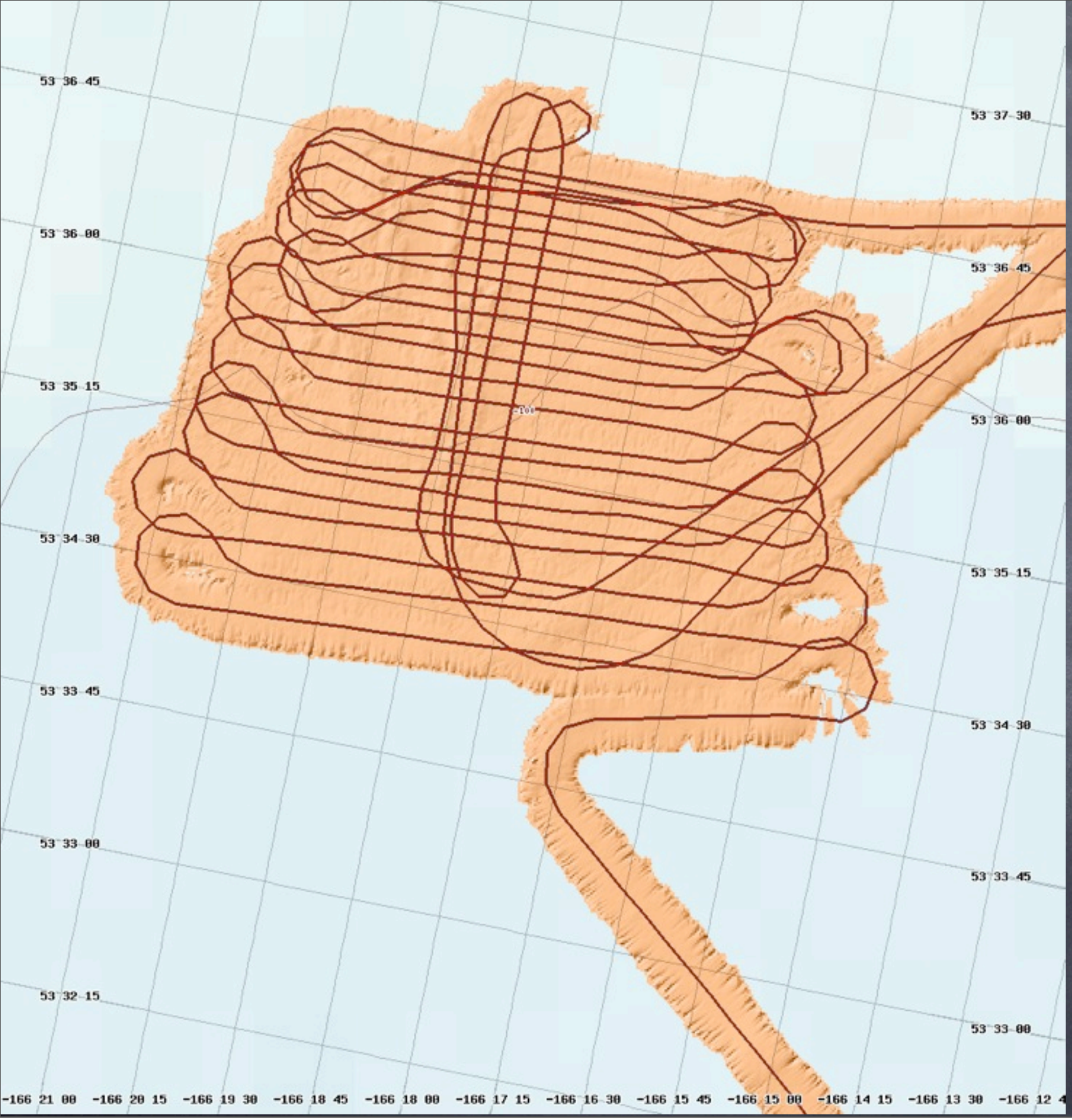

Shallow (100m) site

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ADCPs

- Removed the failed VM150 ADCP from Healy
- Installed "loaner" OS150 (from UAF)
- NSF fund a new OS150 for Sikuliaq
- Switched to UHDAS (need spare computer)
- Need OS150 spares
- Re-routing cables (EMI issues) approval
- Propose to replace the polyurethane ice protection window in CY2012-13 drydock

pCO2/TSG Plan

- Still working on the technical details of the installation plan
- Then seek approval to get the work done
- Commitment of funds will speed approval
- Probably still possible to get this done in time for 2011 field season

Science Technical Support

- NSF STARC solicitation
  - Announced: Aug 9, 2010
  - Deadline: Nov 8, 2010
  - Info session: Sep 21, 2010
  - Award: "March/April 2011"
- LDEO/CU submitted a proposal
- LDEO will work with the awardee, NSF, & Healy on a transition plan

Data (release) policy?

- For underway data routinely collected by the ship's science system.
- Some data (navigation, metadata, TSG, weather) should never be proprietary
- The current strategy for Healy's data policy is to assume that data is proprietary
- I propose to change the sense and require the chief scientist to identify what data they would like to keep proprietary during the cruise planning process

Acoustic Communications

- Save ship time, reduce risk and improve performance of our ability to work with moorings by:

- Permanently installing a transducer in one of our "spare" wells for communicating & ranging to transponders and releases

- Acquiring a deck unit and integrating it into the Healy's real-time science data system so that depth-corrected ranges (range rings) appear in our Mapserver

Acoustic Comms Costs

Item	Approximate Costs
Deck unit	$20K
Transducer	$6K
Mounting and cabling	$5K
technical labor (LDEO)	$5K

Scoreboard Replacement

- The original scoreboards were not suitable for the weather. CG purchased new ones that were not "plug and play"
- LDEO developed a software interface for the new (2nd generation) scoreboards in 2009
- Propose to relocate the "starboard" display
- Mount and wire both

Test display (right)

POS OK

Front Page | Aft Winch | Stbd Winch | POSMV | ADU5 | MK27F

Sign Data

□Z01→AA⏲0b□

String to write
(limited to 19 characters per line)

Write String?
NO

Waypoint
72 44.12 N
157 54.00 W
Waypoint: 1

Time | Met Data | Wind Speed & Direction | Stbd Winch | Aft Winch | Write WPT | SeaWater Data

Port to Write: 0

Update Interval (S): 10.00

Time to Next Update: 1.50

Waypoint to Write: 1

Screen dump of the user interface (software) (left)

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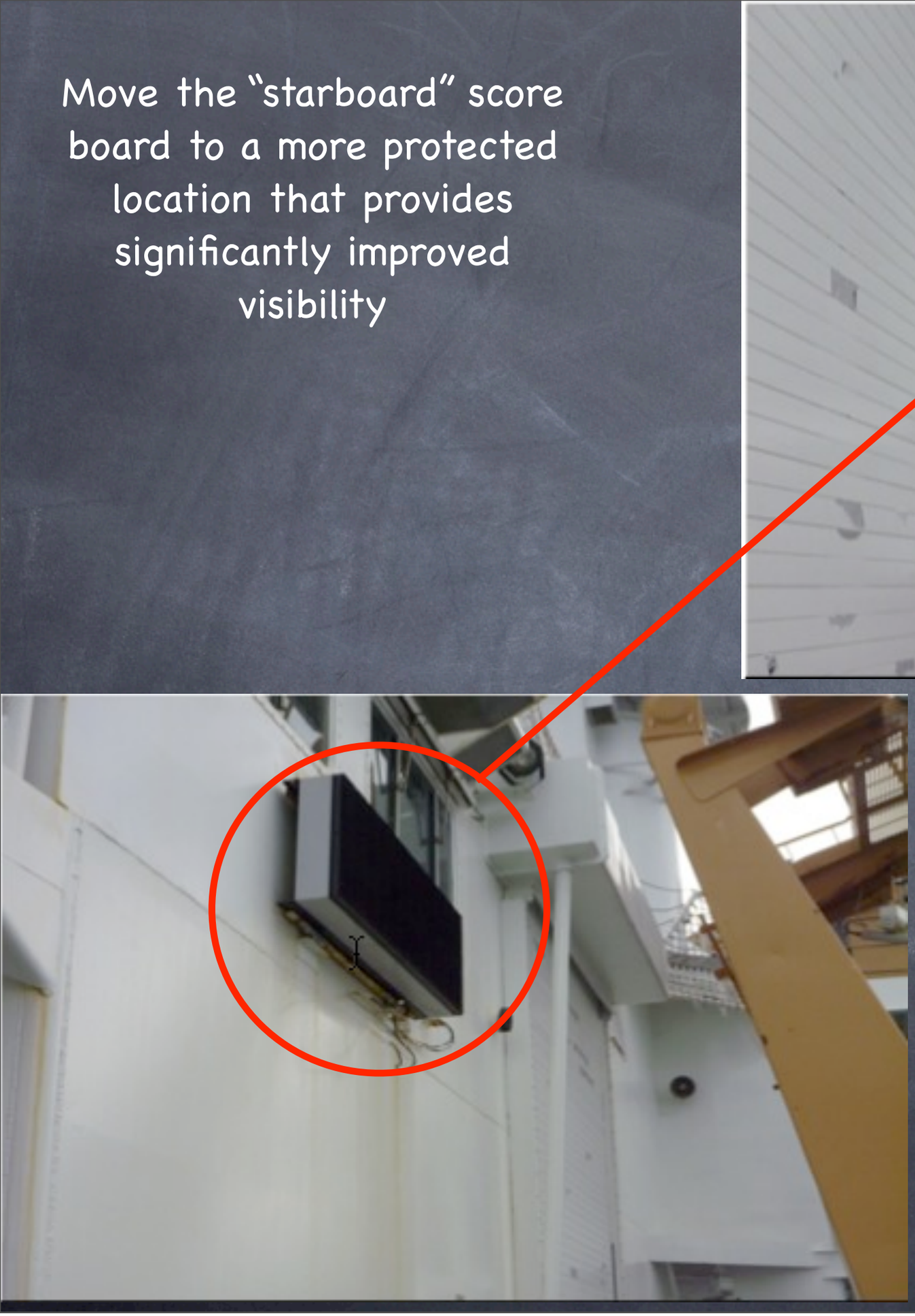
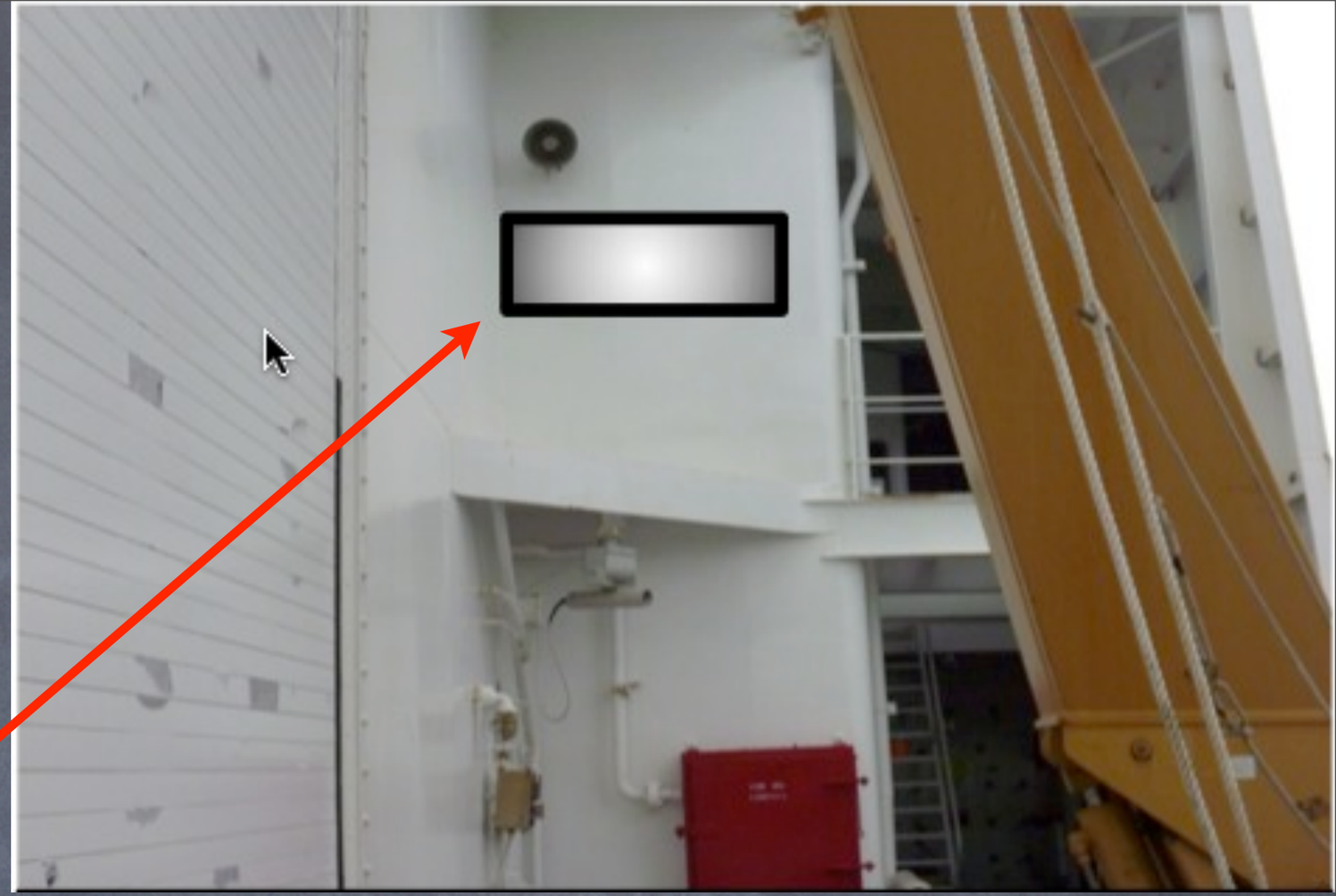
Move the "starboard" score board to a more protected location that provides significantly improved visibility





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GC-DGPS

- Did an "extinction" test in collaboration with C-Nav using their standard hardware during HLY1002
- Discussion of a test during HLY1102 using modified hardware
- Propose to acquire a C-Nav unit for Healy

Deck Sockets

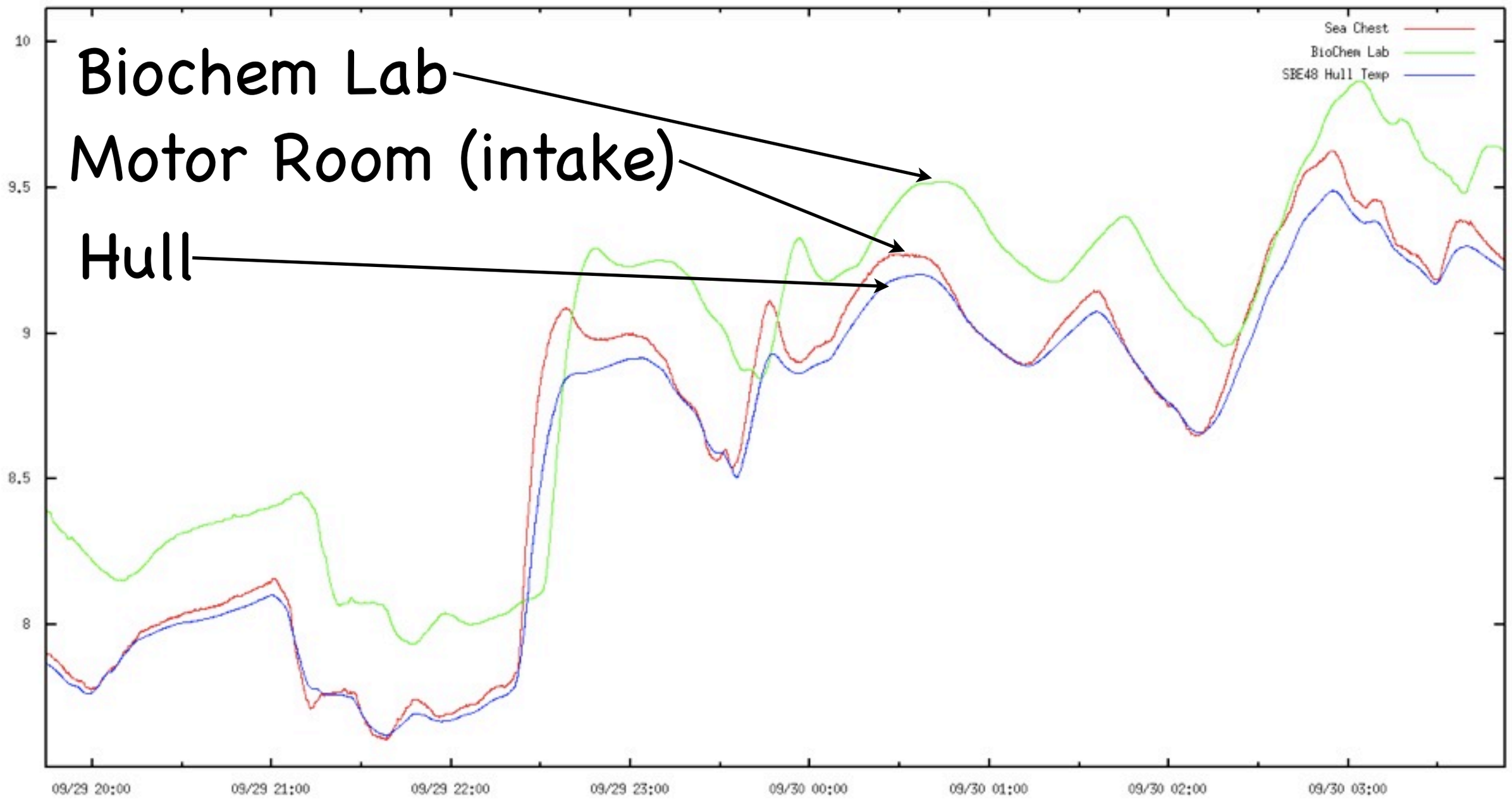
- Deck sockets (1”-8) threaded inserts degrade over time
- Historically have replaced some at each maintenance period
- Need to get back on that plan

Mooring Winch

- Science programs on Healy have required a mooring winch every year for several years
- The mooring winch helps significantly with other evolutions (e.g. glider recovery)
- This type of mooring winch requires maintenance and operation training.
- Consider providing through the STARC award

Hull Temperature Sensor

A robust proxy for sea surface temperature
Installed in fall of 2010



Reference Hydrophone

- A tool to understand and help track down acoustic noise and interference w/ our sonars
- A hydrophone came with the ship
- Hardware and software to provide access to the data is being developed
- Add a higher frequency hydrophone in 2011

VISA resource name

TCPIP::192.168.10.85::INSTR

Channel (0-> Channel 1)

Channel 1 | 0

Vertical Coupling (1: DC)

DC | 1

Maximum Time (ms)

10000

Vertical Range (V/total)

10

Record Length (10: 10k points)

10k points | 10

Vertical Offset (0.0 V)

0

Timebase (0.0005 s)

0.005

Bandwidth (0: FULL)

FULL | 0

Position (10 %)

10

Channel (0: Channel 1) 2

Channel 1 | 0

Trigger Slope (0: Rising)

Rising | 0

Probe Attenuation (1)

1

Trigger Source (0: Channel 1)

Channel 1 | 0

Trigger Level (0.0 V)

0

rent time

:48:28.539
/9/10

Output File

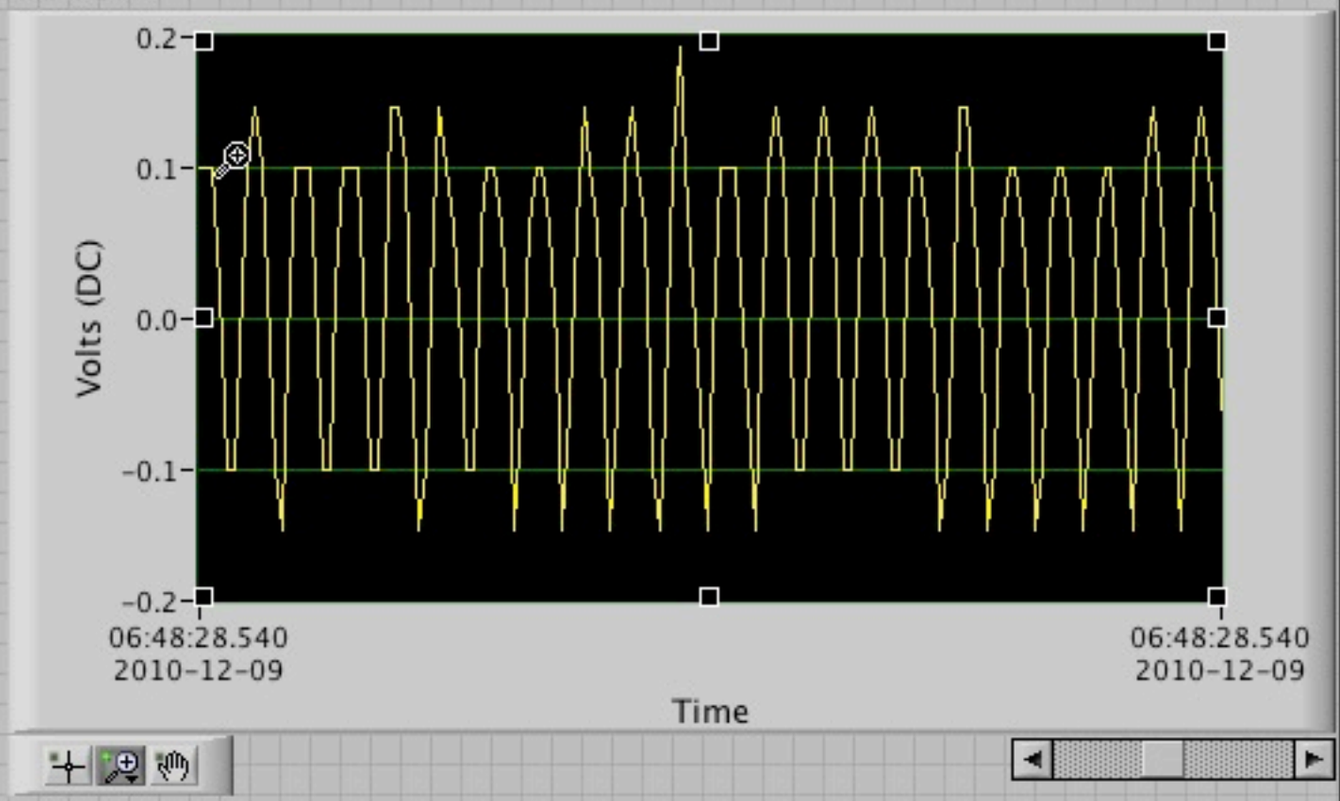
Think5:Users:dale:
src:lab-view:
scope-spectrum:

Append to file? (new file:F)

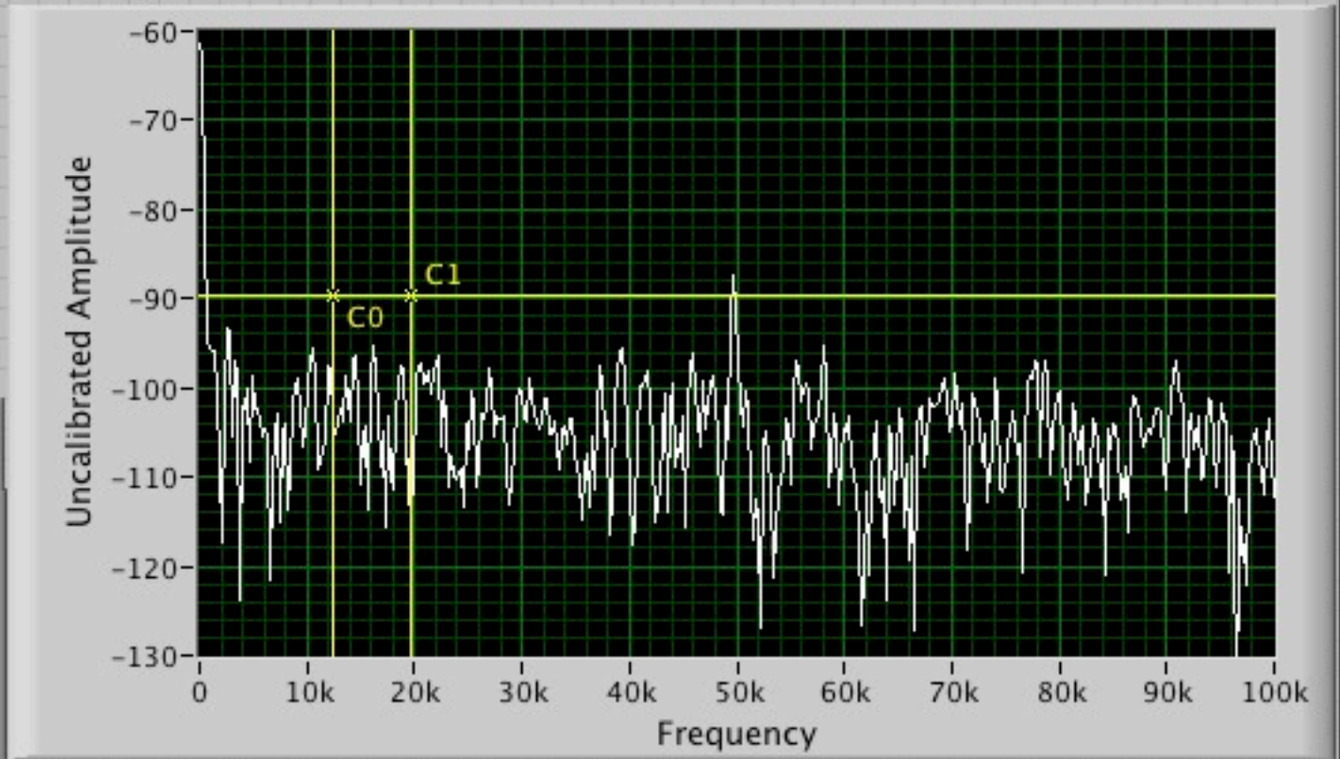
new file

Cursors:	X	Y
C0	12k	-89.67
C1	20k	-89.67

Waveform



Power Spectrum



Screen shot of evolving software

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Reference Hydrophone (bottom left), interface hardware and junction box in Potable Water Pump Room (right)

3/8" Winch

- Useful for some ("shallow") over the side operations which don't require a conducting cable

- There was one of dubious provenance that fell into disrepair

- A quote to overhaul and certify it was developed but expensive

Winch wire monitor

- UNOLS has adopted a new specification for wire monitoring:

  www.unols.org/publications/manuals/saf_stand/RVSS09-Ap-A.html

- The Healy's existing system needs to be replaced to be in compliance

- NSF will fund the work through an existing (OCE) award

- The "engineering change" process is moving forward. Try to get it in place for 2011 season.