Multibeam Advisory Committee

Vicki Ferrini (Lamont-Doherty Earth Observatory)
Paul Johnson (UNH/CCOM-JHC)
Kevin Jerram (UNH/CCOM-JHC)
What is the Multibeam Advisory Committee?

- Initially funded in 2011 for a 3 year period by the National Science Foundation
- Funded for a 2\textsuperscript{nd} time in spring 2015
- Committee is composed of:
  - Vick Ferrini (Lamont)
  - Paul Johnson (UNH)
  - Kevin Jerram (UNH)
- A community-based effort with the goal of ensuring that consistent high-quality multibeam data are collected across the U.S. Academic Research Fleet.
• The vessels of the U.S. Academic fleet are used for many different types of oceanographic work.
• Multibeam systems are just one of many complex sensors on each ship.
• The challenge of “Tribal Knowledge”
• Operation in isolation.
Why Is It Important?

Opportunistic Collection Of Bathymetric Data On Non-Mapping Cruises
Every Ping Counts!

- NSF Workshop in 2010 Identified *a strong need to coordinate operational efforts across the fleet*
- MAC Proposal Funded In 2011 & 2015
SAT - Ensure all hull-mounted multibeam systems are installed, calibrated, and configured properly and consistently (Johnson, Jerram, Flinders Beaudoin, Greenaway, & JHC)

QAT - Ensure multibeam sonar systems are operated in a consistent manner that maximizes data accuracy, precision, and scientific utility (Ferrini, Johnson, Jerram, Beaudoin)

ANT - Perform acoustic noise tests to assess and potentially improve sensor efficiency (coverage) and data quality (Gates)
Multibeam Advisory Committee (MAC)

- ANT – QAT – SAT all have areas of overlap.
- Tools and techniques developed for one area useful for all.
- Begins with good communications with all stakeholders in community
  - Operating Institutes
  - Technicians
  - Scientist
  - Industry
- Working with graduate students, NOAA, and experts in the field.
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<th>Ship</th>
<th>Multibeam System</th>
<th>MAC Technical Team</th>
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- *Italics* – Not funded by MAC
- **Bold** - Planned
MAC – Helping the Multibeam Community

- http://mac.unols.org
- Technical Reports
- Technical Resources
- Help Desk

The Early Days of the MAC
MAC Help Desk

The MAC has established a Help Desk to help address questions and/or operational issues associated with MB sonars. Please email your questions, feedback, requests to us at: mac-help@unols.org

mac-help@unols.org
2015 Activities

- R/V Kilo Moana – April
  - Quality Assessment
- RVIB Palmer – June
  - Shipboard Acceptance
- R/V Kilo Moana – August
  - Follow-up Quality Assessment
R/V Kilo Moana

- 1st visit in April
- Plan:
  - EM710 Patch Test
  - EM122 Patch Test
  - EM122 Accuracy Test
- Reality:
  - Successful EM710 Patch Test
  - Severe apparent acoustic interference affecting the EM122
  - Testing halted
R/V Kilo Moana – August 2015

• Great Team
  • Gates Acoustics
  • UNH
  • MAC
  • Kongsberg

• Splitting Time with ROV Operations

• Multiple “a-ha” moments

• Final solution was a miswired RX module installed in shipyard

• Lucky wiring diagram find.
RVIB Nathaniel B. Palmer

- Kongsberg EM120 -> EM122 Upgrade
- Talcahuano, Chile
- 2014 – EM122 Transceiver SAT
  - suspected array degradation
- 2015 – EM122 TX/RX Array SAT
  - sensor survey in dry dock
  - system geometry review
  - calibration (patch test)
  - accuracy assessment
  - coverage assessment
  - RX noise level tests
  - TX channel BISTs
RVIB Nathaniel B. Palmer

• 2015 – EM122 TX/RX Array SAT
• Results
  • performance improved from 2014
  • increased TX power
  • stronger bottom returns
  • wider swath coverage
  • ship noise unchanged (12 kHz)
• Challenges
  • sea state (bubble interference)
• Moving Forward
  • more data, more BISTs
  • unify sensor reference frames
2016 Activities

• At Sea
  • R/V Neil Armstrong – SAT - Spring
  • R/V Sally Ride – SAT - Spring/Summer
  • R/V Atlantis - QAT - ?
  • R/V Sikuliaq - QAT - ?

• On Land
  • BIST Database and Visualization
  • SVP Editor Installation Package (CCOM building off MAC)
  • Cookbooks (Caris, Qimera, etc.)