STARC : AICCC Report
June 2017
Pre-Season, Dockside, Shakedown
PRESEASON: GENERAL

- STARC Techs spent roughly 2 weeks per month Jan – May aboard Healy
  - Including Underway time Jan 2017 – Multibeam evaluation
- All freshly calibrated MET and SCIENCE SEA WATER sensors reinstalled
  - Repairs and improvements made to forward jack-staff installation
- Cruise Planning Telecons for each science mission held
  - Utilized new ‘cruise planning telecon agenda’ format
    - Supplement to Cruise Planning Material on ICEFLOE.NET
    - Allows for more detailed explanation of operations and Coast Guard Policies
- Van relocation project completed – water services installed
- Documentation and Diagram Project initiated
- Ongoing organization and Inventory of STARC equipment, consumables, spares
SCIENCE SYSTEMS

MET

• New wire run on Forward Jackstaff
• New Primary and Spare Computers
  • Updated Acquisition Software
• New Humidity Sensor
• Additional Spares Acquired
  • PAR, Radiometers x2

SCIENCE SEA WATER

• Flushed and Cleaned all tubing
• Oil Detection Fluorometer Installed as Primary (Turner Designs C3)
  • Required repair of oil sensor
  • Suggest upgrading spare turner to oil detection model in future
SCIENCE SYSTEMS

PC02

- Site Visit by technician, system check out
- Provided training to new StARC Techs
  - Updated documentation
    - How To’s, Start Up/Shutdown, Troubleshooting tips
- Gas Bottle Replenishment
- Operating on Windows XP
  - Removed from Healy Network – Security Requirement
  - Data transferred to directly to pCO2 computer over Copper Wire
  - Needs Update to newer Windows OS

GRAVIMETER

- Platform and Deck Unit serviced at WHOI
  - Spares updated/repaired
- Reinstalled May 2017 – Randy Herr
- System check out and report available
- Improved rack layout
  - Fixed vulnerable power cord
- Gravity tie performed
- Data verified by B. Coakley after Shakedown
SCIENCE SYSTEMS

Ultra Pure Water Milli Q

- 2017 spares purchased and on board
- New filters installed and tested
- System check by Millipore Field Tech
  - Small repairs made – fittings, tubing
  - Reports Available
- Academic Model (Wet Lab) – no longer supported - replacement advised
- A10 Advantage (Main Lab) soon to be superseeded by newer model

Uninterruptible Power Supplies – (UPS)

- New batteries for all 8 Eaton UPS
  - Computer Lab Racks
- Replaced faulty unit in Aft Con (APC)
- New Batteries installed (APC/DRS)
  - Aft Con, IC Gyro, HCO, Computer Lab
- Complete inventory update and maintenance schedule completed
- Portable UPS tested and available
- Developing plan to add network monitoring
SCIENCE SYSTEMS

Knudsen Chirp 3260 Echosounder

- New Computer - Lifespan Replacement
- 2016 display issues resolved
- New 12KHz Transducer awaiting install
  - Requires coordination with Coast Guard for 2018 Dockside or next Dry Dock
- Complete set of Chirp 3260 spares aboard
- Considering spare 3260

ADCP - UHDAS

- OS150 deck unit relocated to evaluate possible EMI noise issues
  - OS75 kept in place for comparison
  - Ongoing experiment coordinated with Jules Hummon
- New Primary and Spare Computers Installed
  - Version 16.04 verified
- Jules Hummon sailed shakedown cruise to evaluate install and observe noise experiment
- Discussing plan to permanently relocate ADCP deck units to more accessible location / rack
### Science Systems

#### CTD
- 2x New Computers – Lifespan Replacements
- All Niskin Bottles refurbished and inventoried
- New Altimeter – Valeport VA500
- Cables inventoried and replacements purchased to complete spares supply
- For 2017 season, borrowing Polar Star 24 place rosette as back-up to primary Healy system
  - Refurbished bottles and carousel

#### XBT
- Launcher and Cable relocated to safer storage location in aft staging bay
- Tested ok on deck and verified during shakedown
- Updated inventory of all probe types, quantities
- New Probes brought on for 2017
- SVP Editor software updated and verified during shakedown
MULTIBEAM

- Ice Windows inspection Dec 2016
- Impedance test results evaluated by Kongsberg
- Pre-underway system check by Kongsberg Jan 2017
  - New PC board battery installed
  - Firmware flashed for compatibility
  - Underway evaluation ~8 days Jan 2017
  - BISTS conducted and provided to Kongsberg
- ACumentrics UPS sent to manufacturer for repair and recertification

- Spares inventory updated
- Multibeam Advisory Committee and Kongsberg Tech on board for shakedown
  - System configuration verified
    - PosMV calibrated - GAMS
    - Seapath MRU calibration by Kongsberg
    - Parameter settings for Seapath and PosMV confirmed and preserved
- Patch test / calibration
- Self noise/RPM and machinery diagnostics
- Awaiting full report
KSYNC

- **KSYNC re-install during Shakedown Cruise**
- **Configuration confirmed by Kongsberg Technician**
  - Currently syncing Multibeam, Knudsen Echosounder and ADCP 150 & 75
  - Discussions in progress to add bridge sonars
  - May allow simultaneous operation of science and bridge sonars with reduced impact to EM122.
  - Currently configured for 2 depth profiles (<2000m and <5000m)
  - Will continue to add more profiles as time and environmental conditions allow
DIAGRAMMING AND DOCUMENTATION

- **Complete wire trace and diagram of every science system and space - ongoing**
- **Clean up and detailed labeling convention of all documented wires**
  - Removal of old cabling
- **Every fiber and fiber panel shot with laser**
- **IP addresses, Port #,**
- **LucidChart web-ware**
  - Tracks changes by date, user, and revision history
  - Shareable link, remote editing
- **Posted in science spaces on rack and PDF available on server**
MAPSERVER

Past

- Developed by Steve Roberts who frequently sailed on science missions to support in real time
  - GIS Specialist is a unique discipline
  - Processed datasets to display historical data
- Customized features based on requests from science parties
  - Requires in-depth knowledge of multi-agency models and manual updating of data to maintain
- Useful situational awareness tool
  - Science users have become accustomed to MAPSERVER and rely on it

Present

- Undocumented, custom written, web of scripts spread across multiple computers that only original developer complete understanding of.
- Significant annual efforts to keep MAPSERVER in a functional state have been ongoing. As personnel have changed institutional knowledge of configurations that worked are no longer available.
- Resides on old Dell hardware circa 2005
  - All attempts to migrate to new computers resulted in broken scripts and reduced functionality.
  - March 2017 – Power event damaged MAP3 hardware
  - As Healy sensors and data acquisition systems have been improved/changed MAPSERVER has lost features
  - Incompatible with newer operating systems and data formats
MAPSERVER – WHAT NEXT?

COMMERCIAL HYDROGRAPHIC TOOLS

- Regular Updates and Support
- Highly Documented
- Online and in-person training for sailing technicians

MAPSERVER 2 ON R/V SIKULIAQ

- Customized for science fleet
- Use of an orchestration utility could provide standardized installations
- STARC interested in collaboration with UAF

NEW DEVELOPMENT EFFORT

- ESRI/ARCgis
- NASA World Wind
- Geoserver
- QGIS
- Minnesota Mapserver
ICEFLOE.NET

- Content corrections, updates, and formatting ongoing
- Updated to newer version of Drupal – unable to update to latest without breaking functionality
  - Updated backup of site
- Survey of broken links, CMS statistics analysis and website traffic underway
- Currently working on:
  - Upgrading CMS, improving UI, Mobile Responsiveness, Optimizing page load times
- Decision was made to focus on ship preparation and cruise planning with current icefloe status rather than implement changes or risk reduced functionality during preseason
- Once Healy is underway for the season more effort will be redirected to icefloe
## Cruise Planning Telecon Agenda

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**NSF INSPECTION**

- **Ted Colburn from JMS aboard May 20-22 during Shakedown**
- **Overall a successful inspection – Systems Evaluated**
  - **Science overboarding equipment – Cranes, Winches, A-Frames**
    - App A compliance evaluation and discussion
  - **Installed Science Systems – CTD, XBT, MET, SSW, Sonars, etc**
  - **Laboratory Spaces, Reefers/Freezers, Climate Controlled Spaces**
    - Fume Hoods, HazMat policy, Sinks, Rinse Stations, Spill Response
- **Preliminary Report Received June 2017 – full report forthcoming**
  - “The USCGC HEALY oceanographic systems are being maintained in a condition which meets or exceeds the standards typically expected of a research vessel of this size and service”
THANK YOU