

Arctic Icebreaker Coordinating Committee (AICC) Spring Telcon 12 June 2017

Summary-

The AICC held their spring tele-conference on Monday 12 June 2017. The attendance list is in the meeting appendices on the UNOLS web site.

Minutes

Bob Campbell/URI & AICC Chair called the meeting to order at 1 pm EDST. The first order of business was to approve the minutes from the AICC meeting held on November 9-10, 2016 in Seattle. Minutes were approved.

AICC Chair Report

The AICC Chair Report began with a review of recent issues and areas the AICC has been working on. The first item was the debrief from HLY 1603/ Mayer cruise. While 90 % of the cruise objectives were met, there were multibeam issues.

The AICC subcommittee working with STARC on the mapserver is Lee Cooper, Steve Hartz, and Bob Campbell. They held a telcon with STARC on June 7th. STARC reported on recent efforts and a detailed report was given later in the agenda. Intent of the subcommittee is to bring ship's mapserver bring ship back up to full capability.

The AICC submitted comments for the Conflict Avoidance Agreement, (CAA) document and UAF has also separately submitted comments, and AICC sent their comments to UAF as well. The revised CAA has not yet been approved. There is a link for the CAA text on the UNOLS website and also on the *Healy* webpage, along with a recommendation by AICC on engaging with locals in Alaska.

On the new Coast Guard Icebreakers, the AICC sent the Coast Guard several recent science mission requirements documents for new icebreaker as requested. AICC member Mike Lomas was contacted by General Dynamics, they also requested the science requirement documents.

The UNOLS Fleet Improvement Committee (FIC) and FIC Chair Jim Swift/SIO offered to help coordinate science requirements for new heavy icebreaker if requested. Also at UNOLS meeting in Seattle, Bob Campbell during the AICC report brought up issue of MapServer. The UNOLS Council was not fully aware of the capabilities but appeared supportive of taking the system across the UNOLS fleet. STARC will speak more about this later in the meeting. The issues with *Healy* multibeam were also briefed at the UNOLS meeting.

Agency Reports

The NSF Office of Polar Programs, Frank Rack and Renee Crain gave this report. There were no slides. NSF is working to determine budget issues, reviewing proposals and planning outyear projects. Frank Rack is now managing the vessel portfolio.

Coast Guard Report

CDR William Woityra reported from Coast Guard headquarters that Ice Breaker program is very healthy. The *Polar Star* is in Mare Island shipyard, @40% through repairs; expected to be on time for Operation Deep Freeze in December 2017. The current plan is for PSTAR to have a limited service life extension to keep it operational through 2023 until new ice breakers are ready. The *Healy* will have a rolling mid-life maintenance over 3-4 years starting in 2021 or 2022. Current *Healy* ship time requests are taking up 80-90% of available time. *Healy* day rates will drop several thousand dollars/day due to reduced diesel fuel cost. This should be approved by CG soon, and will be distributed when approved. NSF might want to do a “Dear Colleague” letter to let people know about this, so will coordinate with NSF on this when costs are finalized.

Comment: Renee Crain commented that in the Coast Guard letter, they should include the cost of the STARC technicians in the day rate number. The letter should be posted on the Icefloe *Healy* webpage. n the day rate.

The Coast Guard wants to reissue the Memorandum of Understanding (MOU) with the NSF to add STARC costs and include better verbiage about the CG onload policy. CG legal says CG should bear the cost of onload per the day rate paid.

Comment: Renee Crain commented that this is great news! The CG still prefers loading in Seattle as much as possible.

National Ice Center

Kenneth Curry gave the report from NIC. The main change at NIC is standardization of layout of all their products. They have received feedback and have made some changes in the sea ice designations.

Kenneth reinforced that if berths are available on I/Bs, they would still like to be considered for sending an analyst, although they cannot guarantee that funds will permit that. NIC Analyst Jessica Tavernier did go on PSTAR Operation Deep Freeze cruise last year. You can inform NIC about such opportunities by going to:

<http://www.natice.noaa.gov> and clicking on “Services” tab, then go to “Request Special Services.”

Or, you can just email info to: nic_analyst@noaa.gov or PH 301-817-3975, which is NIC Operations office. They need about 1-month advance notice to coordinate getting an analyst on your cruise. In terms of providing imagery for cruises, you may or may not get Radarsat imagery, but if not they will try and get other SAR images like Sentinel-1, or look at all other options. For imagery they like to have 10 days advance notice, and would like you to tell them the type of imagery you want and what it will be used for. Comment: Bob Campbell offered that if NIC sends AICC a document explaining this process they will post it to Ice-floe *Healy* webpage. STARC will post updates to Icefloe.

Comment: Dave Forcucci stated that STARC will post it and you can also send it to me.

One of the operational issues as it relates to ice imagery is that the PIs do not always send a Plan of Intent to NIC. We need to figure out a way to get them to do that more regularly. He keeps telling them to do that, but a lot of times they still don't.

Comment: Bob Campbell asked how should that be done as the AICC does not routinely interact with each cruise PIs.

Comment: Dave Forcucci suggested if the AICC posted a letter on Icefloe stating the importance of providing the cruise plan to NIC, the ice image quality will be improved.

Comment: Carolyn Ruppel: I don't agree with making it more than a recommendation. As a PI you never know how your schedule is going to change.

Dave Forcucci offered that it would be just a recommendation, and it would be good if NIC could acknowledge what to do and how to inform them if there is a change in cruise plans.

The NIC would like 10 days notice, and minimum is 3 days. If <3 days, the costs for imagery run thousands of dollars per image.

LCDR Dan Everette/*Healy* Ops informed us that they had a meeting with NIC recently and have a plan to communicate 24, 48 and 96 hour outlook plans from ship to NIC on a standardized basis, which should help coordinate imagery, and avoid past problems where *Healy* had left an area but was still getting images of the area that were of no use. They will try out this new plan of interaction this coming season, and report back to NIC and AICC on how it worked.

Question: Carolyn Ruppel asked NIC if the new standardized annotations are similar to those of Canadian Ice Service (CIS)?

Kenneth Curry stated that no, but NIC just met with CIS, but they do things differently. Their imagery can be more detailed, and tends to be more linked to coastlines. In US NIC imagery ice conditions are usually indicated as ranges, eg 1-3/10ths ice cover or 6/10ths ice cover, whereas CIS can often give a more precise number.

ONR Report

Tim Schnoor gave the ONR report and shared that ONR continues to support *Healy* & *Sikuluaq* shiptime in 2018, and may also in 2019. Dave Forcucci presented details on the Navy 2017 operations.

Tim reported that he attended the IMO Polar Code meeting in April 2017 at NATO/CMRE along with NOAA and NSF reps, and they reviewed requirements of the Polar Code. Those requirements may not apply to *Healy* as a 'public vessel' but may apply to academic vessels. The Polar Code applies to all waters around Greenland, so this affects NSF since they have used non-I/B ships for operations in Greenland waters in the past. NSF is pursuing Polar Code certification for *Sikuluaq*, and looking into what

effects this will have on non-I/B research vessels. It is still TBD if non-I/B vessels will need certification.

Bob Campbell: How does the Polar Code affect those vessels?

Tim Schnoor: There are various inspection requirements, also how and where you can operate without certification remains to be seen.

Carolyn Ruppel: The *Marcus Langseth* went to the Arctic on Bernie Coakley's cruise, and it is also possible the drill ship *Joides Resolution* might go to the Arctic, so this is an issue that may affect these ships.

Tim Schnoor.: Possibly one can ask for one-time exemptions, but this is not known as yet.

Operations, scheduling, planning for 2017 Summer Season

USCGC *Healy* Schedule

D. Forcucci presented the graphic of 2017 *Healy* schedule. This will be a 4-5 month deployment this year.

The RDC research and development group will be aboard in July & August, then there are three science missions:

- Pickart/WHOI- a NOAA funded program
- Worcester/SIO- an ONR mooring retrieval cruise in September
- CANAPE- an ONR cruise for CANAPE to do shallow mooring retrievals.

Carolyn Ruppel asked why is the ship going to Hawaii?

Dave Forcucci.: The RDC is bringing aboard some Navy divers from Hawaii, and will embark a decompression chamber in Honolulu from Navy there as well. The ship will also be testing the multi-beam on a standardized shallow-to-deep run (and then run it in reverse) there to make sure it is working well.

In terms of the 2018 schedule there are 3 projects with STRs submitted. Pickart is requesting ship time again, but funded by NSF this time for mooring turnaround. Then Pickart also has a NOAA DBO cruise which is a continuation of work in 2017. Then Craig Lee has the ONR SODA project, which will be done in conjunction with *Sikuliaq*. They want that to begin during a period of no ice, and then take place during a period of ice formation, so will be doing that in the Sept. time frame. There is some question as to whether being that late will work with the maintenance schedule however.

Healy Ops: The CANAPE cruise schedule in 2017 caused a shift (delay) in maintenance schedule, so there are some time limits, but don't know where or when the maintenance schedule will be for 2018 yet, so still TBD. Would want ship operational window to be early July-Nov. 1.

Bob Campbell .: Dave, have you gotten any other requests for people to pick up moorings?

Dave Forcucci.: I think ONR is getting all the moorings on their cruises. I haven't gotten any requests for others.

Tim Schnoor: ONR has one participant who has a shallow CANAPE mooring that is different from all the others and wants the *Sikuliaq* to recover it. This is either the Texas A&M ARL mooring or the DC /NRL mooring. All the other moorings will be recovered by *Healy*.

Healy Wire Winding onto winch-

Dave Forcucci provided a picture of *Healy* winches being re-spooled by STARC with Lorenzo McCoy/SIO putting the cable on the Markey winch. STARC did transfer of 3 wires, 9/16", 0.68" and CTD 0.322 cable. Also put new Lebus shells on as those were damaged. The ship purchased the wires from the UNOLS wire pool. Frank Rack handled the STARC expenses.

Bill Woityra: The CG appreciates NSF's support for this evolution. CG is still dealing with paperwork to reimburse NSF for the wires. This is another example of why the MOU needs to be redone, to simplify such transfers of funds. However CG HQ will get this resolved shortly.

Jon Alberts.: The wire pool is a service of UNOLS to all 18 ships.

Murray Stein: Did you say NSF pays for this?

Jon Alberts.: Yes, the wire pools are NSF supported.

Murray Stein: Well we would like to get some wire for their ship.

Jon Alberts.: Contact Jim Holik at NSF, or the wire pool managers directly.

Research Vessel Matrix in the Arctic

Dave Forcucci has compiled the available data of all vessels going to arctic this summer; forwarded that to Jessica Lefevre, counsel for AEWG for distribution. Still waiting on info on Chinese *R/V Xue Long*, which isn't on the list but is supposed to be heading north, but haven't gotten info from DoS yet. There is the issue of the fact that NOAA and CG don't like having schedule info out there publically.

Jon Alberts.: UNOLS has taken to putting out schedules just listing the month, and not dates, and leaving out info on port call locations. This approach could work.

Dave Forcucci: Will bring that info to NOAA and CG and see what they say. The issue however is whaling.

Bob Campbell.: Will any foreign RVs be within the 30-50mi standoff distances from whaling villages?

Dave Forcucci.: I didn't see any evidence of that. Last year *Mirai* did change their track to avoid interaction. There are a half dozen or more cruises with a transect that runs in to Barrow, which is a standard DBO transect.

R/V *Sikuliaq* Report

Murray Stein/UAF presented the *Sikuliaq* schedule. They are now supporting the Danielson cruise off Wales, Alaska. The *Sikuliaq* responded to a distress call this weekend about two men missing in rowboat from Saint Lawrence Island. They are

working with the USCG search and rescue and the *Sikulialq* was diverted but weather has not been good. Update: The Coast Guard called off the search and the missing men were not found.

After Danielson cruise the *Sikulialq* will be back in Seward for 25 days, and will be doing work required to meet Polar Code certification, including Ice Navigation training. In August they will be supporting a cruise for Juranek and Sipler, then a cruise for Ashjian out of Nome. They will then head south to Newport, OR to carry out the Dever cruise, and then south to San Diego for the Angle program.

Question was asked about the interactions with Saint Lawrence Island.

Murray Stein reported that the Danielson cruise issued a press release to the Alaska Eskimo Whaling Commission (AEWC). The AEWK representatives requested a presentation on the cruise at their meeting in Fairbanks in July 2017, however UAF pointed out that the Danielson cruise was in fact leaving the next day, and that they had already presented to AEWK twice before. The AEWK will want information on the 2018 schedule when the schedules are available.

AEWK has appointed Brenda Konar/UAF as their Research Representative for AEWK. She will serve as a single point of contact for researcher to send a 1-2 page description of their research to. Brenda will advise them if it meets the format and information requirements AEWK wants, and whether it addresses their concerns. This should help the process.

Bob Campbell asked how researchers not using *Sikulialq* will know about this approach?
Murray Stein: The best thing to do right now is talk to Brenda Konar about this, and see how she wants to handle things like *Healy* cruises.

Bob Campbell.: Did this approach with AEWK work to resolve conflicts?

Murray Stein: Yes, they thought it worked well. The natives want to know about cruises, and to be able to contact the PIs directly, and be sure they know where the sensitive areas are. So UAF is still figuring out how best to comply.

Bob Campbell: Did you have to make changes in cruise plans?

MurrayStein: No, not really. AEWK just wanted to have real-time ability to communicate with ship, so they can notify them if they are hunting nearby. The contact is the key thing. It could change cruises in future, but hasn't yet.

Dave Forcucci asked Murray when he is retiring? Murray replied it will be mid-July when Doug Baird/UAF will take over as interim marine superintendent.

STARC Report

Brett Hembrough/SIO, Lee Ellett/SIO and Andrew Woogen/OSU gave an extensive update with a series of STARC slides on the group's activities over the past six months. They have also filed a STARC report on their activities.

Since January of 2017 the STARC technicians have been on *Healy* at least 2 weeks of each month. They also got underway in January 2017 to do multibeam testing. They also reinstalled and calibrated all the weather sensors, and worked on the met tower

(jack-staff). They also conducted teleconferences with all the upcoming *Healy* PIs, and used a form for the teleconference that is interactive and more extensive than the STR form. PIs thought that was useful, so will continue using that.

The Van relocation work was done and water connections were installed. STARC also did a 3D model of where all the science systems were located, and tested all the fiber optic network connections. STARC folks will be underway again on *Healy* in a few weeks.

STARC Update on various science systems on the ship:

The cable on the meteorological jack staff were damaged by water coming over the bow and they reinstalled the cables more secure to avoid damage. It would be beneficial to have kick-pipes installed in the deck to fully resolve the issue.

Installed new met computers, and are testing a new humidity sensor to address problems with the current humidity sensor in heavy fog and icing conditions.

New spares for radiometers and surface PAR sensors have been purchased.

The Turner fluorometer is working fine, but the oil sensor was broken and needed repair. It was fixed, but there are two Turner fluorometers onboard and they only fixed the oil sensor on one of them. It may be that CG may want an oil sensor on both of them in future.

For the pCO₂ system, STARC had the company techs come test it and now have better procedures for the documentation to maintain and test it. However, it now operates on Windows XP software that the Coast Guard does not allow for security reasons. There has to be a protocol to move the data off the system via an intermediate computer, which is awkward. It would be better to migrate the system to new software.

On the gravimeter, the ship replaced the gyro, and STARC is working with the Potential Fields Pool Equipment (PFPE) group and sent the gravimeter to them for inspection. Randy Herr of PFPE came and reinstalled it. The gravimeter is plugged into the wall, not a UPS, since it has its own internal UPS. They also did a gravity tie point and sent the data to Bernie Coakley/UAF.

Bob Campbell asked if Bernie Coakley looked at the gravimeter data from last year. The question is whether it was working last year or not. Bob Pickart thought it wasn't working and Brett Hembrough thought this may be an issue with the fact that the "not good data" light that comes on takes about 8 minutes to go off when anything happens. We think the data is good, although the gravimeter did go through a lot more than normally expected spare parts installations last year, which is one of the reasons they sent it to PFPE for examination.

Bob Campbell.: Bernie said he was going to look at the data, but we don't know that he did.

Brett Hembrough: Probably one of the problems was the formatting of the data doesn't match the format Bernie uses to review the data with his software. So they have changed the format for collection of new data so that he can review the new data with his software. Having Randy Herr come out to the ship helped them a lot.

The Milli-Q water system factory reps came to service it, and noted that the Academic model is no longer serviced. The other A10 system will also be phased out soon. So there will be a need to replace and upgrade these.

The UPS all had the batteries changed in these, and cataloged the serial numbers of the batteries so they have a good schedule for when they need to be changed out. They had a request for a portable UPS, and they got one of those which is now available to PIs. They also want to add a network-wide check tool for UPS, so they can tell where and when there are power outages on the ship.

The Knudsen 3260 now has a new computer. They had complaints about its screen display, so fixed that. Now have two 3260 Knudsens, and an old unsupported 320 BR Knudsen. They have space for the new systems, but need to replace the old system.

The ADCP was worked on by Jules Hummon/UH to solve interference issues. They moved the units and redid their cabling, and Jules came out in January during the shakedown cruise. There is not enough data yet to tell if the move fixed or helped fix the problem, but Jules is monitoring it. If the move helped they will move the other ADCP as well. Both the primary and spare ADCP computer were replaced, and new ADCP system operation software was installed.

The CTD computer was also replaced, and all the bottles were refurbished, and a complete list of spare parts was coordinated. A Valeport altimeter was also installed since it is known that that model performs better than the previous Benthos altimeter. The *Healy* system previously had RMC cables, these were now converted to new cables.

For the DBO cruise, while the *Healy* usually has a (12) 30-liter bottle rosette they didn't want this, so they took the (24) 10-liter bottle rosette from *Polar Star* so that DBO cruise could have two of those.

The XBT system used for sound source profiles for multibeam calibration was moved out of the weather some, and they received new XBT probes.

The multibeam has had issues and STARC is working on it. They checked the ice window, which showed only minor chipping at the edges but nothing serious. They then proceeded with impedance testing in a manner more extensive than done by the system self-test. The results were sent to Kongsberg in Norway for review. Kongsberg said that although some of the transducers were a little off they were all within spec, so it should be working correctly.

Bob Campbell: Larry Mayer didn't think it was working while at sea. There may be a difference in at-sea performance from lab bench testing.

Healy Ops: The *Healy* will be doing testing of the system for a deep (4000m) to shallow transect. However it may be an issue of water temperature, that cold water could make it not work to spec. The impact is on swath width. This is what needs to be tested.

Brett Hembrough stated that in January they got underway Kongsberg rep on the ship to check on the system. They checked all the spare parts and some were too old and they were replaced. They also found a UPS specific to the multibeam that hadn't been serviced so they sent it off for service and then re-installed it.

Also serviced SeaPath motion reference unit: checked the calibration test and sent it off to Kongsberg for recalibration.

STARC has been working with the Multibeam Advisory Committee (MAC), including Vicky Ferrini. They did a POS M/V test once they were underway and had Kongsberg tech onboard and did a patch test calibration. They also tried to check for engine interference but running the system with the engine on and off. MAC is going to do a report on those results shortly, but is currently waiting for the Honolulu multibeam test data first.

Bob Campbell asked who will look at this year's multibeam data?

Brett Hembrough said they can give it to Larry Mayer to look at. As a result of the work with MAC and Kongsberg STARC now also has detailed service requirements for the system.

Bob Campbell: OK, I will ask Larry if he will consent to review the data.

Brett Hembrough: They also serviced the Kongsberg K-SYNC. The Kongsberg synchronizing unit, K-SYNC, is designed to solve the acoustic interference problems by proper timing of the instruments and by controlling the triggering of each instrument's transmission. The Kongsberg tech helped with that. They did get a shallow and deep test of the K-SYNC.

MAC did find the ship bridge sonar, (bridge depth sounder) does interfere with multibeam, so have to figure out whether to synch the systems or what to do.

Finally they did shoot all the fiber optic cables on the ship. They all worked and they got rid of the unused fiber optic cables which were just confusing to techs. And started using a webpage that allows anyone authorized to update any changes to cabling.

In regards to the MapServer, the STARC held a tele-conference on June 7, 2017. Recall that Steve Roberts developed the system, and it was using processed data to make maps, and not storing the raw data. The main problem with the system is that the software was not documented, and ran on multiple computers. The ships' system computers have thus been updated, but the MapServers have not. There was a "power event" on the ship that damaged one of the computers, and there is thus now a need to replace it. STARC is

looking at a 75% solution just to get access to currently incoming multibeam data. Accessing the historical multibeam data will still be a problem.

STARC went to the *R/V Sikuliaq* to see MapServer-2 system. There is still a need to see if that can be used on other UNOLS ships as well. STARC met with both Steve Hartz and Steve Roberts to discuss. They would hope to standardize the system, but that is still under discussion. Meanwhile STARC has also engaged ArcGIS folks as well. MapServer is actually based on an earlier software system that uses some additional custom software to generate a product. MapServer-2 does not have a lot of the functionality of MapServer on *Healy* which has a lot of customized layers that were in some cases cruise specific. In trying to configure MapServer want to focus on ice mapping, planning tools, and multibeam displays. Will see what can be done on the next cruise.

Carolyn Ruppel asked STARC if they have you looked at whether CARIS can handle the legacy multibeam data? Lee Cooper offered that the MapServer was using processed data, not raw data. But they have talked with CARIS about this, and it does require raw data, but CARIS does have an Internet [data] transfer capability for data input.

Carolyn Ruppel: We store all our raw data.

Brett Hembrough: QPS and HyPac Max software will be used this year for data management.

Bob Campbell.: How will know where the historical multibeam tracklines are?

Lee Cooper: Will need to work more to make MapServer work to do that. Could work with the R2R folks to make tiles for showing that data, but it would require a lot of processing to do that; beyond what STARC can do. STARC would have to have help from others.

Carolyn Ruppel: On UNOLS vessels they all have access to all the data from previous cruises. There are different user communities with different uses and needs for multibeam data, so it depends what NSF wants to pay for.

Bob Campbell.: When Steve was aboard they had access to the data, and having the data meant they would take different cruise tracks to collect new data and fill data gaps.

Carolyn Ruppel: Having old data is great. But to get legacy access it may require a big investment.

Frank Rack (NSF): NSF cannot address this issue at this time

Bob Campbell.: He did present an update on this topic at the UNOLS Council meeting, and they were interested in developing MapServer capabilities for the entire UNOLS fleet, and there were NSF people at those meetings.

Lee Cooper: It should be recalled that the initial MapServer was an experiment; it was not designed to scale up.

As regards to IceFloe, STARC has done a lot of updates to it, including having the site assessed by external reviewers. The site is now up to date and all broken links have been fixed. The Arctic Waterways updated document has been posted. STARC will keep working on the website as needed.

They showed a pix of the teleconference agenda form, which does show CG requirements from/for scientists as well. In addition to having the MAC personnel along on the shakedown cruise, also had NSF inspection – everything went well, but so far there is only a preliminary report from them to that effect, although NSF said that all the systems seemed to be working as they should, and properly maintained. There will be some returning, but also some new STARC techs on *Healy* this year.

Miscellaneous Issues:

Bob Campbell that for the *Healy* Change of Command Ceremony, AICC member Ola Perrson will represent AICC at the ceremony. AICC wants to be sure Captain Hamilton gets the word that AICC wants to greatly thank him for his service.

Bill Woityra stated the new CO is Capt. Greg Tilman. He was previously XO on *Healy* and a 225 ft Icebreaker in Alaska, so knows the area.

The new I/B program is moving forward with plans. The POTUS spoke at Coast Guard Academy graduation saying US will build I/Bs. In the budget they have \$175M through the Navy budget and some from DHS. They are doing industrial studies, and now have 5 contracts let to evaluate current ship hull designs for the new heavy I/B. Their report is due in September. The CG is currently doing hull design tests in New Brunswick, Canada. They are looking at straight shaft and potted shaft designs. This work will be ongoing till the end of July. The ships requirements documents were stripped of all science requirements per the request of NSF. What was left in was a multibeam and CTD capability per request of NOAA. But trawling and coring requirements were dropped. In FY19 they expect to sign a contract to begin ship build, with the hull done in 2023. The Coast Guard Commandant has requested them to see if this could be accelerated, but not sure there is much that can be done there. So expect to take delivery in 2023 and then begin ice trials. After the ice trials some additional gear will then be installed, and the ship will begin operations in 2024. CG is also doing requirements documents for ‘medium’ I/Bs, i.e. ships with a little less capability than *Healy*. The big change in the requirements would be because those are intended to work in the Great Lakes, and they need to specifically fit through the canals there, i.e. be < 80’ wide, and a draft to fit the locks. This is not a CG program of record as yet, so this is just an internal discussion.

Bob Campbell asked about the space onboard for science, if not science gear per se?

Bill Woityra stated they are talking about more than 400’ vessel, so there will be plenty of space, and the space will be designed as modular, so it could be used for science. The

plan is now for 3 new I/Bs; as they are constructed there could be more, in which case the need for medium I/Bs could diminish.

Bob Campbell stated we know there is a National Academy study on the I/Bs and their costs coming out. That report also looked at and includes report on the cost of science equipment on the new I/B. What is the purpose of this study if a decision has already been made in this regard?

Bill Woityra.: The CG did meet with Nat. Acad., but this was before CG got the request from Kelly Faulkner at NSF to remove all science requirements from the new I/B. The Nat. Acad. Report on I/Bs to Congress is due next month (July). The timing of the report may preclude decisions on science gear.

Bob Campbell.: I heard NOAA put in science requirements for the CTD and multibeam, but not other gear.

Renee Crain stated the idea was to have the heavy I/B cut a path for another ship with research capabilities if needed.

Bill Woityra stated the heavy I/B is really for the McMurdo break-in, and there hasn't been any science done during that evolution since the *Polar Star* was re-activated for that mission.

Closing Comments

Bob Campbell reviewed the AICC membership, Chris Polashenski and Mike Lomas would be up to rotate off in August, but both could serve another 3-year term. Bob will ask them if they would like to run for a second term.

As for a date for the next meeting, Thanksgiving is early this year on Nov. 23, 2017. The *Healy* returns to homeport on Nov. 21, 2017. The UNOLS Council meeting is Nov. 28-Dec. 1, and that is shortly followed by the AGU meeting in New Orleans, Dec. 11-15. So really the next AICC meeting will have to be in Seattle in early January of 2018. Presentations from this meeting will be posted with meeting minutes on the AICC webpage shortly.