

Healy & Polar Class cruise debrief, held via teleconference (Rev 01/10)

Date of post-cruise teleconference debrief: 8 November 2010

Chief Scientist: Robert S. Pickart

Name of Project: Western Arctic Boundary Current

Name of Ship & Cruise Number: HLY1003

Start and end dates of cruise: 6-27 September 2010

Please provide comments on the topics and questions that are appropriate for your cruise.
NOTE: This form must be submitted as either a *.doc or *.docx file.

Attending this debrief: Steve Hartz (Univ. Alaska), Jon Alberts (UNOLS), Healy CO Capt. Bill Rall, XO Healy, Healy OPS LCDR Eric St. Pierre, Healy MSO LTJG Chris Skapin, David Forcucci (USCG), Hedy Edmonds (NSF), Doug Russell (Univ. Washington), Bob Pickart (WHOI), Dale Chayes (LDEO), Robert Campbell (Univ. Rhode Island), Greg Somers (USCG)

1) Overall Success of Cruise:

a) What percentage of the planned science objectives was met during this cruise?

90%

Overall the cruise was a tremendous success. The only objective not met is that our on-ice meteorological station did not function. This had nothing to do with the ship or science operations; we believe that a polar bear destroyed the met station shortly after deployment.

Bob Pickart: Has proposed to replace the met station and attempt redeployment next year, possibly using a more isolated ice floe for the deployment.

b) Please summarize positive and negative factors that impacted completion of the science objectives (for example, personnel issues, equipment performance, ice and weather conditions).

Positive: The ship's equipment functioned very well; the ship's crew worked diligently and efficiently to accomplish all tasks (including outreach); weather conditions were favorable throughout the cruise; we held informative planning meetings before all new evolutions.

2) Pre-Cruise Planning

a) How beneficial and useful is the cruise planning form and the Icefloe web site?

The cruise planning form is useful from my end because it forces me to outline the entire cruise beforehand and make sure that nothing is falling through the cracks. I like that fact that one can continually update the form.

b) Is it clear what is required to be provided to the ship and the schedule for receipt of that information (schedules, lists, plans, forms)?

Reasonably clear.

c) Were the questions on the pre-cruise questionnaire appropriate and easy to respond to?

I wouldn't call them easy, but for the most part they were fair and sensible questions. Having done the form once, it is much easier to consult your notes the second time.

d) Were you able to submit the questionnaire fairly early in the planning process?

I think so (at least from my perspective). Dave Forcucci is good about sending reminders.

e) Did an operations (cruise?) plan get submitted in a timely manner? Was it useful for you and the ship before and during the cruise?

Yes I was made aware of the cruise plan in a timely fashion.

f) Do you have suggestions for how the website and questionnaire might be improved?

Not at this time.

3) Pre-Cruise Communications

How were pre-cruise communications between the Coast Guard and the Science Party, especially the Chief Scientist? Were points of responsibility easily identified? Were responses to questions and concerns received in a timely manner? How were communications within the science party and did that impact communications between the Chief Scientist and the CG?

In my opinion the communication between the chief scientist and USCG was excellent. I can't recall a single time when I did not receive a prompt reply to a question.

Incidentally, last year I complained about the difficulty of working with BASC in the pre-cruise planning process for staging out of Barrow. This year CPS took over the operation and there was a marked difference in the responsiveness regarding the folks in Barrow. Unlike years past, my concerns and questions were dealt with in timely fashion (except for the community observer, which CPS did not oversee).

Bob Pickart: Communications related to staging out of Barrow have been poor in the past but were greatly improved this year with CH2MHill Polar Services (CPS) handling these operations. Steve Hastings (CPS) has done a great job. The role of

the native community observer needs to be better defined, and feedback provided following the cruise. More lead time than 2 days as to the identity of the observer would help. This cruise's observer - a young woman student - worked out very well.

Robin Muench: We're working on a set of guidelines for dealing with native concerns. The intention is to make this available on the IceFloe site.

4) Communications and Coordination During the Cruise

How were communications and coordination during the cruise? Were lines of responsibility clear? Were the evening planning meetings effective for communicating information between the Coast Guard and the Science Party?

From my end the communication between science and the USCG was excellent throughout the cruise. I enjoyed immensely working with Bill Rahl, John Reeves, and Eric St. Pierre—three of the best (and most communicative) officers I've ever sailed with. The nightly meetings were very effective, and, as mentioned above, so were the planning meetings for the various operations carried out during the mission.

Communications with the MSO were limited. I must admit that I do not understand the role of the MSO on the Healy; it would be nice to clarify his/her role in the future in terms of the science operations.

Bob Pickart: Need to define the Chief Scientist role in communicating with the MSO. This is well defined during onload and offload, but during the cruise itself the MSO role is not well defined.

Eric St. Pierre: Admits he might have done more to communicate roles and responsibilities. He is the focus of most communications from the Chief Scientist, in terms of navigation, track lines and day to day operations. The MSO fills the gap between this level of operations and where the guys out on deck operate. This situation continues to be explored and adjusted. The Chief Scientist felt that he could have had more guidance in his role of communicating with the MSO.

Bob Pickart: Rotation of the MSO is an issue here, since things change from year to year. Perhaps useful to clarify in advance of the cruise, to the Chief Scientist, who will be coming each cruise.

CO Healy: We will look into ways to ensure that communication pathways are better defined, particularly in the case of Chief Scientists who are new to the ship, and also to better inform others about rotations of the MSO.

Robin Muench: Issue will be further discussed at the coming AICC meeting.

Robert Campbell: The situation is strongly dependent on whether MSO is interested in the science or not. The best jobs were done by interested parties.

5) Environmental Permitting

a) Was any environmental permitting required?

No.

b) If so, were these requirements identified at an early date and were there clear means to accomplishing those needs? In other words, how well did it go?

6) Communications with Local Alaskan Native Communities

How well did communications between the CG and science and local Alaska Native communities go during the cruise? (Examples: notifications to local communication centers, communications between Chief Scientists and/or CG and entities such as village tribal governments (e.g. IRAs), village corporations, the Alaska Eskimo Whaling Commission and other appropriate wildlife co-management organizations, village whaling captains' associations, and other locally based interest groups.)

Because the cruise occurred shortly before / during the North Slope's fall whale hunt, I was encouraged (required?) to attend the winter AEWG meeting in Barrow to present the cruise plan. This was worthwhile and in my opinion made the cruise go more smoothly. (This will be even more important for next fall's cruise which occurs during the Barrow whaling season.)

Since we worked in Canadian waters I needed to get clearance via the state department; I would like to thank Dave Forcucci for his help with this. I also needed to get a permit from the Northwest Territories to work along the Canadian North Slope. This was made easier by the fact that I identified a Canadian collaborator who helped guide me through the process. It would probably be helpful for the USCG to be aware of this process in order to help direct the chief scientists in the future (I believe that this is Dave Forcucci's intension).

Bob Pickart: There is some question as to whether attending the AEWG meeting was a requirement for the Chief Scientist, but it seems to me that attendance is important. It will be crucial for the next season because of cruise timing during the whaling season.

Greg Somers: The Coast Guard perspective is that the Chief Scientist should be doing the talking with the Alaskan natives. Approval on the part of the AEWG is necessary for the ship to enter the area.

Bob Pickart: Had to apply for a Canadian permit for this cruise, and related information on IceFloe would be helpful.

Dave Forcucci: Kelly Falkner went through the Canadian participant process in an earlier cruise. Dave will follow through on this issue.

7) Cargo/Hazmat/Materials Handling

a) How did any and all aspects (scheduling, communication, etc.) of the cruise onload and offload go?

All aspects of the on-load and off-load went well. I would like to thank the USCG for their flexibility in the loading process. We loaded equipment in Seattle, Seward, Dutch Harbor, and Barrow. This was a tremendous effort by the USCG to accommodate us (especially allowing us to ship last minute items to Barrow).

Bob Pickart: Healy flexibility with respect to loading sites was appreciated.

b) How did materials handling, including hazmat, go during onload/offload and during the cruise?

There were some issues with hazmat. One of the teams doing chemistry gave me this report:

“The hazmat handling was not smooth. Our group's hazmat package, 125 g of mercuric chloride, was loaded in Seattle, but was neither in the hazmat locker when we boarded Healy nor was it ever retrieved during our cruise. It is possible that another group used these materials during a previous mission or it was incorrectly offloaded in Seward prior to our boarding in Barrow.

It would be beneficial to have a standard operating procedure for hazardous materials in particular areas, such as using hazmat in the CTD bay. Experiments may require the use of hazardous materials at the moment of sample collection, e.g. addition of mercuric chloride to water samples. Discussion of the logistics regarding these experiments during cruise planning with the scientists involved and the hazardous materials officer on Healy would be helpful. One suggestion may be a sign on the door into the CTD bay notifying personnel that hazardous materials are being used and the proper precaution, training, or personal protective equipment is required to enter when the sign is posted.”

Bob Pickart: This could be more of an issue with future cruises involving more hazmats, e.g., next years NASA cruise. The CO was unaware of the issue, although the hazmat officer had been notified. Some mercuric chloride was completely missing, and the stated issue was to make sure it didn't happen again. The Chief Scientist admits fault in not letting ship personnel know about this. Ship will try to track this down. Not clear whether substance made it to base or onto the ship.

Be more formal in the future about how to handle such items (e.g. in starboard staging or under the fume hood?).

Phil McGillivray: UNOLS requires fume hoods for Hg chloride on their vessels.

Steve Hartz: How does chemical handover from scientists to ship take place? It seems hard to keep track of all incoming items.

Dale Chayes: There was a request from a scientist on the previous leg about whether he could use some of the mercuric chloride that was aboard (in the hazmat locker) for this leg. A relatively large amount (125 mg) had been put aboard (in Seattle) for this cruise. I told him (in the presence of one or more MSTs) that he had to work that out with the scientist who put it aboard before he used any.

Hedy Edmonds: Doesn't know whether this is an NSF issue, and notes that stocking of larger quantities than required may reflect what is provided by suppliers in original packaging.

Healy CO: Issues with both tracking and storage are factors here, and existing rules and regulations need to be researched and followed. These might cover issues such as briefing among science party and cruise, nature of hazards, etc.

Jon Alberts: Does the Coast Guard require inventory and safety sheets for hazardous materials? The answer is "Yes."

Dale Chayes: A hazmat briefing needs to happen months before the cruise and not the day before.

Dave Forcucci: Is there a place on the cruise planning for for hazmats?

Dale Chayes: Suggests increasing the visibility of hazmat (needs and procedures) on the *Healy* planning form.

Robin Muench: This issue will be further discussed at the December AICC meeting.

8) Laboratory and Other Vans

This question is not applicable to the cruise.

a) Did you use vans from the UNOLS van pool or from another source (specify)?

b) How did the procurement go?

c) Were lines of responsibility clear for obtaining appropriate vans and for setting up and maintaining the vans on board?

d) Was adequate time available to obtain the vans?

e) *How well did the vans perform?*

f) *Were they appropriately equipped with ship connections?*

g) *How well did load and offload go?*

9) Lab and Your Science Equipment Setup/Installation

a) *How well did set-up of the labs and science equipment go? For example, were you able to have the lab counters and unistrut adjusted appropriately to fit your needs?*

It is important to note that our work area begins right outside of Barrow (several hours away). This leaves us very little time to set up our mooring gear and prep our instrumentation after retrieving them from the various science holds. Last year this was not an issue because two of our mooring techs made the steam from Dutch to Barrow and were able to do the necessary prep work. This year (since we followed the ECS cruise) we had no such option. Consequently, we were unable to operate at complete efficiency during the first part of the cruise. Please note that I am not complaining, there was nothing that could be done about this. However, I would like to request that when we do have the chance to put techs on early, that this be allowed. For example, we would like to put two techs aboard the ship in Providenya this year prior to our leg.

Bob Pickart: The Coast Guard is strongly encouraged to continue to allow techs to work on preparations aboard ship prior to the formal start of the cruise leg, since this greatly enhances efficient use of the ship time during the cruise.

b) *Did installation of science equipment outside of the ship's equipment go well? Were there any unexpected surprises in terms of needs or ability to support such scientific equipment? How clearly were special requirements for science equipment defined prior to the cruise?*

No issues here.

c) *Was anything identified during your cruise that should be recommended as a permanent addition to the ship's science equipment?*

The TSE mooring winch. This was discussed during last year's de-brief as well, and we provided a quote to the USCG.

Bob Pickart: Kemp did put together a plan and budget for a mooring winch that had been previously requested, but no action has yet been taken on this. The budget needs to include annual maintenance costs as well as purchase.

Greg Somers: Wasn't this discussed with the NSF?

Dave Forcucci: This had been discussed with NSF as more of a UNOLS pool type of equipment. Since the science support funding hasn't been finalized, the idea is to use a UNOLS item rather than having the Coast Guard purchase it.

Bob Pickart: This winch needs to be a standard, full-time item on the ship.

Doug Russell: Such a winch is indispensable on research vessels.

Jon Alberts: UNOLS is currently assembling a winch pool, so this might simply involve having more than one such winch in the pool.

10) Information Technology On Board and On Shore

a) Communications (Local and remote E-mail, account set-up, internet access, data transfer on/off and within ship or between ships, Inmarsat and Iridium, radio). Were you satisfied with the capabilities? Were there computing resources or communications enhancements that you could have used but that were not available on board?

I was completely satisfied with the IT support both ashore and onboard. Prior to the cruise the science party was given explicit information on what to expect and how to prepare for connecting to the ship's network. The IT tech on our cruise deserves special mention for his proactive method of helping the science party. We relied heavily on the internet/email for our outreach efforts, and I commend the Healy for helping us carry this out successfully.

Bob Pickart: their shipboard tech was excellent.

b) How did the shipboard data collection, management, and archiving go? Were these services provided efficiently and made available in ways that promote rapid transfer of data to users?

This was excellent. The science party was able to share data readily amongst themselves. The data collected from the ship's systems (e.g. CTD, bathymetry, vessel-mounted ADCP) were easily and quickly accessible.

c) How well did operational technology work? (Map Server, board of lies, web cameras on board, monitors for changing among closed-circuit cameras, functionality of the closed-circuit cameras on board, winch display on back deck)

This is what I said last year, which still applies:

“MapServer is simply brilliant. Kudos to Lamont and the USCG for implementing it. It had a huge influence on our ability to effectively carry out our operations. In fact, it enhanced our science. Steve Roberts was once again helpful beyond belief (e.g. with imagery, bathymetry, Linux programming, etc.)”

I would also like to add that, using multibeam data collected on the previous leg as well as during the first part of our leg, Steve Roberts helped me determine the optimal location for one of my moorings. See below about Steve's contributions regarding ice imagery. I also want to acknowledge Dale Chayes, who is always responsive. Finally, the data transfer at the end of the cruise went seamlessly as always.

11) Shipboard Science Systems

a) How well did these perform? This includes deionized water, multibeam, winches, environmental chambers, freezers, refrigeration, science seawater, underway data acquisition systems, ADCPs, depth sounders, etc.)

The vessel-mounted ADCPs have their issues. Many are related to the hull requirements of an ice breaker and are difficult to change. The recent replacement of the BB150 unit with an OS150 ADCP on a re-routed transducer cable provided a significant improvement. We strongly hope that the OS150, currently on loan from the University of Alaska, will remain on the ship. The performance of the second ADCP (OS75) would presumably also benefit from re-routing its transducer cable. We also appreciate the switch to the UHDAS acquisition software.

Bob Pickart: The replacement instrument seems to be working well. The cable rerouting seemed to help.

Dale Chayes: The 150 kHz ADCP will be left installed on *Healy*, and a new one will be purchased for the *Sikuliaq*.

Dale Chayes: The ship is now working on the details and scheduling to reroute the OS 175 cabling. We expect this work to be completed before the 2011 shakedown.

There seem to have been some issues regarding the underway oxygen sensor. I got this report from one of the chemists on board:

“During the cruise I noticed that the underway SBE 43 O2 sensor was reading way off. The CTD tech said he thought it was the cal sheets probably being incorrectly entered and would investigate. I have a mini-report on the underway T/S/O2 that I wrote before leaving the ship and wanted to send around but had to wait for the O2 processing to be sorted before sharing. If the cal sheets were incorrectly entered then this needs to be sorted out before we start interpreting the data.

One observation: no one seemed to be looking at the underway O2 data for sensibility. That is not uncommon because, unlike T and S, there are usually no other sensors/measurements to compare to. The easiest and most reliable approach to this is to put in a second sensor and a software 'red flag' that alerts when the difference between the sensors becomes significant. This also helps eliminate errors in configuration and setup after sensor swap-outs.

I would encourage a change in software to include a realtime mapper button for O2 saturation level. Presently there is a button for biological O2 demand, but it is important to plot raw O2 saturation level to QA the O2 probe output. When I plotted it after various manipulations of the raw data I found a problem with the sensor reading too low compared to the rosette CTD O2 sensor.”

Dale Chayes: A redundant O2 sensor would make a lot of sense. In addition, care is also needed to keep track of calibration coefficients. The cause of this difference was an error with the installation of calibration data into the O2 sensor. The difference should have been picked up during the HLY10-01 cruise by comparing it to the O2 values from the CTDs, but this was not done.

Dave Forcucci: The Coast Guard will send a copy of the report on the O2 instrument.

Dale Chayes: There is an issue with different people having different expectations for the data. More work on managing expectations may help. Redundant instruments would also help.

Dave Forcucci: Clarification is needed on what is being referred to here with respect to the realtime mapper.

b) Do you think anything needs to be upgraded?

12) Deck Operations and Deployment/Recovery of Science Gear

a) How well did the planning, understanding of responsibilities and approaches, and implementation go for both science and crew?

I would like to note that it is a considerable amount of effort for our lead mooring technician to create the mission planning forms for each of the evolutions that we do. We hope that they are useful for the USCG, and I hope that the statements filed to date can be used as a basis for future cruises (i.e. so that we don't have to start again from scratch each cruise). Regarding the mooring briefs, early in the cruise I felt that these were not terribly useful in that the USCG tech running the brief would essentially read the mission planning form verbatim to the group. This was rectified early on by the captain who directed the tech to present the basic outline of the plan while on the bridge, and save the details for the pre-evolution walk-through on the fantail. I believe that this is the most effective strategy for mooring operations, and we should strive for this in the future.

Bob Pickart: The mission planning forms from WHOI were very useful. Briefings on the bridge have been discussed with the captain, and decided to save the details for the walk through on the fantail rather than going through all details on the bridge.

Healy CO: appreciates the briefings and is working on formalizing their distribution and treatment, further institutionalizing the process.

b) Was appropriate and appropriately sized safety equipment available?

Yes. This is much appreciated.

c) Were operations safe? Did everyone comply with safety requirements? Were any unexpected safety issues identified and were they dealt with?

No issues here.

d) Was there enough assistance as needed and/or requested with deployments and recoveries?

Yes. The mooring deployments and recoveries went very smoothly, including the ship handling, use of the small boat to attach to the top floats, and the help on deck by the MSTs. A great job all around; we are greatly appreciative.

e) Were communications effective with the bridge and winch control during deployments?

Yes.

g) Other

Bob Pickart: Year-to-year continuity in shipboard personnel is an ongoing issue, particularly at present where we have all senior officers rotating out before next season. This issue is being addressed by the AICC and NSF.

CO Healy: Procedural writeups produced on this cruise (by John Kemp) were very helpful, and the ship is formalizing these into ship's instructions to help out with the turnover.

13) Ice Conditions

How well was information about the ice conditions in the area of operations provided to the ship and to the scientific party?

One of our objectives was to deploy a meteorological station on the ice. This was challenging because we had to identify an appropriate floe using satellite data (and there was not a lot of ice in the area). Steve Roberts worked diligently on this in the days leading up to the evolution, and indeed found an appropriate floe. I am thankful to NIC for providing SAR imagery, and to the USCG for enabling this to happen. I can't thank Steve Roberts enough for his expert interpretation of the images and his advice. I also want to commend the ship handling during the deployment of the met station. The bridge worked hard to find a multi-year floe embedded within the first year pack, then expertly wedged the ship against the (very small) floe in a manner that allowed easy access.

It is worth mentioning that we requested fast-response imagery from NIC for our area of interest just prior to the deployment of the met station (which happened to be during a weekend). NIC responded, but unfortunately there was a mix-up in identifying the appropriate region. In hindsight, we also made the request too late. But we at least determined that, in theory, this is doable, and it may be useful in the future. I would like to thank Dale Chayes for his help in making this happen.

Dale Chayes: It was a Terrasar-X image: sufficient practice should make it come out right.

14) Small Boat Operations

If appropriate, please comment on:

- a) Adequacy of boat briefs*
- b) Provision and availability of appropriate safety equipment*
- c) Identification of science needs and requirements*
- d) How well the operations went*
- e) Other*

We used the small boat on every mooring recovery to attach a messenger line to the top float of the mooring. The crewmembers doing this were skilled and communicative, and helped make this process go very smoothly.

15) Helicopter Operations

If appropriate, please comment on:

- a) Adequacy of flight briefs*
- b) Provision and availability of appropriate safety equipment*
- c) Identification of science needs and requirements.*
- d) Other*

We used a commercial helicopter service for the personnel transfer onto the ship, which went very well. A new aspect this year was that we mustered at BASC for the safety briefing, and transferred the personnel and cargo in stages to the Barrow SAR facility. I think this procedure was quite effective.

Bob Pickart: Hopes the option is available in 2011 for use of a helo out of Nome.

16) Food Service

- a) How well were special dietary requirements (vegetarian, vegan, low-fat, etc.) identified and met?*

- b) How was the quality of service and food, including outside of the three main meals of the day (e.g., (quality and availability of food/experience for those working overnight)?*
- c) Other*

The food and the food service were excellent. Please offer my sincerest thanks to the galley department. The mid-rats this year offered a full breakfast during much of the cruise, which was a big hit with the science party. The only disappointment was having to limit the milk consumption part way through the cruise (cereal is a big staple for in between meals).

17) Berthing and shared spaces (science conference room, gyms, laundry)

- a) How did all aspects of housekeeping go?*
- b) How did the berth assignments go?*
- c) How were the check-in/check-out processes?*
- d) Other*

All aspects of the berthing were great, including the communication beforehand. As chief scientist I appreciated being able to participate in assigning staterooms. The gym facilities on the Healy are the best of any ship I've been on, and the science party always raves about it.

18) Medical

- a) Were needs, if any, met?*

We had two instances where medical attention was required (removing stitches and dealing with a concussion). I was very impressed with how these were handled.

b) Medical history questionnaires

- i) Could the forms be improved?*
- ii) How did the submission process go? (timing, acknowledgement of receipt, etc.)*

The entire process went very smoothly. I have no recommendations.

19) Other comments (if any)

Thank you for a very successful and enjoyable cruise. I realize that we were at the tail end of a long field season and that there was no port call before our leg. I greatly appreciate the high energy level and hard work despite these circumstances.

Appendix – Additional Questions for Specific Activities or Instruments. Answer only if appropriate for your cruise.

1) Multibeam

a) How much real-time watchstander effort was required?

b) How much onboard ping editing was done in the post-processing?

c) In both cases, who provided the people? Who was responsible for training the people?

d) Other Multi -Beam issues?

We relied on the multibeam to help place our moorings, and to improve the overall bathymetric coverage of the Barrow Canyon region. Regarding the latter, I would like to acknowledge Steve Roberts for designing the survey to fill in some of the gaps in Barrow Canyon, and also for processing the data quickly and updating the multibeam chart of the region (which aids my interpretation of the data and also helps us model the canyon flow).

2) Diving

If you conducted scientific diving on your cruise, how did it go?

There were no diving operations.