

Appendix 3

UNOLS Committee Reports

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RVTEC Report to UNOLS Council

The 5th annual RVTEC meeting was held October 27th through 29th at the University of Washington South campus facility in Seattle. Approximately 50 technician representatives from UNOLS operator institutions were present. Also present were representatives from Antarctic Support Associates and a delegation of five from the Coast Guard. Following introductions, minutes and reports of ongoing UNOLS committees and business the first discussion of the HEALY science testing program opened. Although we did not begin to formulate an actual testing plan at the meeting, several interested individuals were identified to undertake planning of various portions of the test plan.

Woody Sutherland (SIO) gave a report on the UNOLS/NAVO work. NAVO has been very satisfied with the quality of data and the cooperation received under this program. There will be a continuation of the NAVO work in 1998 with some \$7.5 million of ship time involving several UNOLS Institutions. Dale Chayes (LDEO) and Rex Buddenburg of the Naval Post Graduate School, Monterey reported on the status of SeaNet. New players have come into the loop, there have been technology advances, and various institutions have gone their own way in efforts to achieve connectivity at sea. At this time most of the UNOLS ships are equipped to accomplish some degree of e-mail interchange while at sea. Ellen Kappel of JOI received a \$1.5 mil grant from ONR in September to assemble the infrastructure and place prototype systems on ships. Following a two day work session at the Brookings Institution in September there has been progress toward the implementation of the system.

On day one, the meeting adjourned to the UW dock for a tour of the R/V THOMPSON and a reception hosted by the School of Fisheries and Oceanography.

Tuesday's session began with the meeting's major program, a tutorial on the various aspects of Marine Corrosion given by Mr. Bill Riffe of Marine Environmental Research, Inc. Bill has had many years experience in the field. He covered practical and chemical aspects of the corrosion process and gave anecdotal evidence of how it applies to our work.

Tom Wilson of SUNY presented a report from the On-line Resources subcommittee. The status of the RVTEC "Home Port" Web site was reported and a strawman proposal for the format of an on-line equipment database was discussed and suggestions solicited. A proposed RVTEC logo was also presented. A motion was made by Sandy Shor and seconded by Rich Findley to accept Tom's second design as the official RVTEC logo. The motion passed without dissent.

Rich Findley of University of Miami presented a report from the Long Range Instrumentation Planning Subcommittee. He described present models of data collection and distribution using sensors that are collected by a single computer and then distributed to clients computers on the network.

The afternoon ended with a discussion of the proposed RVTEC salary survey. The primary intent of this survey was to provide managers with an idea of industry averages throughout the UNOLS community and for use as a tool to justify salaries for shipboard technicians. There was some dissent regarding collection of the data and the need for such a survey although the majority clearly favored a survey. In the end it was decided that publication of the data was not a totally accepted idea and that the results would be kept at the UNOLS office and disseminated by request.

The meeting adjourned to Sea Bird for a plant tour and general question/answer session.

The final session on the last day opened with a discussion of the INMARTECH 98 international meeting.

Tom Wilson presented results of a comparison of broadband and narrowband Acoustic Doppler Current Profilers conducted aboard the R/V SEWARD JOHNSON.

John Freitag presented a verbal summary of a report he prepared for NSF on the current state of the market for Vessel mounted Doppler Current Profilers. Copies of the report will be included as an addendum to the RVTEC meeting minutes.

Tom Wilson presented preliminary information regarding beta tests of the SeaTrak GPS attitude/heading sensor. SeaTrak is being developed by Seagull Technology of Los Gatos CA with a planned release date of early 1998.

The final order of business was elections:

- Tony Amos was elected as Vice Chair, term to begin at the adjournment of this meeting and end at adjournment of the 1999 annual meeting.
- Tom Wilson was re-appointed as the chairperson of the On-line Resources subcommittee.
- Steve Poulos was re-appointed as the chairperson of the Data Standards subcommittee.
- Rich Findley was re-appointed as the chairperson of the Long Range Instrumentation planning subcommittee
- Don Moller was re-appointed as the chairperson of the Wire and Cable Specifications

subcommittee.

Following a short discussion on topics for next year, thanks were given to Neil Bogue (UW) and Mike Webb (NOAA-PMC) for co-hosting the meeting and the meeting adjourned at noon.

Other RVTEC activities of the past year have included preparations for INMARTECH 98 and coordination of HEALY science system testing:

INMARTECH 98 has been progressing to the point where hotel selection and meeting venues are presently under consideration. The meeting will be in La Jolla, CA. and hosted by Scripps. Present plans call for a four day meeting with one day reserved for UNOLS/RVTEC business and three days devoted to workshops and tours for the international group as well. We plan to follow an agenda similar to our normal RVTEC but offer some options in the workshops through the use of breakout sessions. We anticipate having a keynote speaker at the beginning of the meeting and a reception at the Scripps Aquarium. The meeting is planned for 19-22 October.

RVTEC is becoming involved in the science testing on the new Coast Guard Icebreaker, HEALY. Because HEALY is the first Coast Guard vessel with science written into its mission statement, the Coast Guard asked UNOLS and the AICC to be involved in both the science systems testing and scheduling of the vessel. Several testing proposals are in hand and we are in the process of requesting proposers to refine their documents in preparation for the next phase of the cruise planning. The next meeting is the planning meeting at CRREL in Hanover, NH on the 3-4 of February.

Respectfully submitted,
John Freitag,
Chair RVTEC

Report from the Fleet Improvement Committee - by Larry Atkinson

The FIC under the new Chair, Larry Atkinson, met in Seattle on 7-8 November. The report from that meeting was posted in the Fall 1997 UNOLS newsletter so I will just give highlights and some additional information.

Under the topic of Planning, Analysis and Communication, FIC will work in collaboration with the UNOLS Council to analyze trends in ship needs so we can better plan for the future. The analysis as they are done will be published so that the ship using community can better understand the evolving situation.

The Fleet Improvement Plan will be prepared in draft form by November 1998 and in final form by November 1999. Most importantly FIC members agreed that the report must face the political realities

of the time as we can best interpret them.

Science mission requirements are a vital part of the ship planning process. In times such as these when ships are suddenly and unexpectedly funded by Congress, we must have our requirements in hand. To this end we are involved in three SMR efforts.

1. ALPHA HELIX Replacement - ALPHA HELIX must be replaced in a few years and it seems clear that Alaska must have a research vessel. The SMR committee for the HELIX replacement is chaired by Dr. Tom Weingartner (U.Alaska, Fairbanks). Tom is putting together a committee of volunteers to address not only the oceanographic requirements but they must also address the issues of ice strengthening and fisheries research. We expect the draft report will be ready by the summer of 1998 and a final report will be ready by winter 1999. The committee will have contact with people familiar with ship design so the SMR process will not stray into impossible requirement scenarios.
2. East Coast Vessel - A replacement will be needed for an east coast vessel. The SMR process will utilize the findings of the "Williamsburg Meeting" and other efforts that have occurred recently to address the coastal vessel issue. Dr. Larry Atkinson is chair of that committee.
3. Fisheries Research - Recently there have been discussions of the practicality of combining fisheries and oceanographic research on the same vessel. FIC will address that problem however, since the ALPHA HELIX replacement committee will be examining the problem in detail, this committee will not be formed until information starts to develop from the ALPHA HELIX SMR process.
4. Intermediate Vessel SMR - The SMR process for new intermediate vessels will also be on hold until the ALPHA HELIX replacement SMR is near completion.

FIC is making a determined attempt to include more ship users in the SMR process. To that end we asked for volunteers in the UNOLS newsletter and, surprisingly, got 11 volunteers.

Report from the RVOC Committee Chair - Paul Ljunggren

The 1997 RVOC Meeting was hosted by Woods Hole Oceanographic Institute from 21-23 October. Over 60 people representing 48 organizations were onhand for the meeting. On the agenda were presentations/discussions on:

- The structural problems being experienced by MBARI with their SWATH vessel, WESTERN FLYER, were described and potential corrective measures were discussed.
- Marine Communications. - An over view was provided on the status of current and planned systems for extending the Internet to sea and what these systems will be able to offer. This was followed by a presentation on the recently funded SeaNet Project describing their program, projects, and services they plan to provide for extending the Internet to ships underway.

- Glosten Associates gave a presentation relating to a study they were conducting for UNOLS describing the impact of recent regulatory changes on future new construction of research vessels.

The 1998 RVOC Meeting will be held at the University of Hawaii. The dates for this meeting will be 4, 5, 6 November.

The Ship Inspection Program was resumed in 1997 after the contract for the program was awarded to Jamestown Marine Services. Inspections of seven ships were completed last year. I requested comments from the operators on the new inspection program and responses have been quite favorable. Operators were pleased with the quality of the inspection, the knowledge and experience of the inspectors, and the positive approach of the inspection process.

The following projects are currently ongoing within RVOC:

Safety Committee:

- **Safety Video:** A draft of the safety video script has been prepared and reviewed by the Safety Committee. Recommended changes have been forwarded to Jamestown Marine Services, the script is being revised, and will be reviewed by the committee one more time. Once finalized, shooting will start shortly thereafter. Much of the filming of the video is expected to take place on R/V ENDEAVOR because of the proximity and current out-of-service status. Target date for release of this video is 1 July 1998. The project remains on schedule.
- **RVOC Safety Standards:** Work on the revision/update is underway. Committee members have been assigned responsibility for various sections of the Safety Standards. At this time review of all but one section has been completed. Once compiled the revisions will be submitted to RVOC for review. They intend to have the changes to the Safety Standards approved, printed and distributed by 1 January 1999.

Primer for Small Research Vessels:

David Powell of RSMAS has been coordinating the project. The objective of this publication is to discuss the capabilities and mission requirements for small R/V's. Items to be addressed include regulatory issues, design & construction, stability, safety, outfitting, insurance, and various hull forms.

At the RVOC meeting, David reported that he had received 50% of the material from the contributing authors. Since that time he reports continued progress although input is still required from authors of several sections.

Medical Standards Group:

A Medical Standards work group was established to formulate physical capabilities as they relate to job

performance, medical standards, and medical history questionnaires for crewmembers. Fred Jones of Oregon State University recently assumed the duties of chair for this group.

Report from the Chair of the UNOLS Arctic Icebreaker Coordinating Committee to the UNOLS Council - 29 January 1998 by Jim Swift

The UNOLS Arctic Icebreaker Coordinating Committee (AICC) continues to provide scientific oversight of Arctic polar science support on US vessels, with primary focus on USCGC POLAR STAR, USCGC POLAR SEA, and the new USCGC HEALY.

The AICC accomplishes much of its business through a lively e-mail correspondence. Internal discussions are restricted to a private e-mail list, but all appropriate materials are also copied to an extended e-mail list that includes agency, Coast Guard, and community representatives. Meetings have been about every nine to ten months. The AICC held its most recent meeting 21-22 January 1998 in New Orleans, Louisiana.

The first day the meeting was held at the Avondale shipyard, where USCGC HEALY is under construction, and focused entirely on HEALY.

With respect to HEALY construction, progress has been good. Four AICC representatives and Don Heinrich attended the launch and christening on 15 November. This turned out to be a baptism as well: a major splash-back of water, mud, grease, and debris hit the part of the crowd where most of the UNOLS/NSF party was standing. Most unfortunately a number of people were injured, including 12 hospitalized. For the UNOLS/NSF group, none of whom were hurt, it was a never-to-be-forgotten event.

At the January 1998 meeting, the AICC tour of HEALY found a wild scene of construction and clamor in almost every compartment. The construction schedule may be lagging somewhat, but apparently not to any worrisome degree. HEALY's laboratories and staging areas are impressive. The AICC provided a number of comments to the Coast Guard, including observations that visibility of science operations areas from the bridge appears to be nearly nil, and that grappling with that may become a major ship operation issue for the Coast Guard. There were extensive discussions about provisions for coring, and the AICC recommended that the Coast Guard prepare the facilities so that HEALY can take cores shorter than ca. 20 meters from over the fantail, rather than from the starboard A-frame, so that the starboard area remains free for other activities on typical multi-purpose cruises. Cores longer than ca. 20 meters must be carried out over the starboard side due to ship layout considerations.

Delivery remains late 1998 with 1999 for shakedown and testing. Seattle has been designated as the HEALY home port, much to the relief of the AICC and most of the scientific community.

A special "hats off" to John Freitag, UNOLS RVTEC, and Jack Bash for a great start on preparations from the academic community for the HEALY science systems testing program. Quite simply, academic participation on this program, essential for preparations for HEALY's future mission, would not be coming about if it were not for them. John is overseeing community attendance at a series of test cruise meetings set up by NAVSEA and the Coast Guard. Tech groups have been identified for all primary science systems, and proposals are in progress. This appears to be accomplished in consensus mode; the AICC is not aware of any community dissension. The AICC has made a first cut at designing scientist oversight for the test program, and has recommended that legs be kept short. This will help minimize technical and science group expenses, and help make the objectives of each cruise leg clear to all hands. It was noted that some tests can be carried out in temperate waters, and that other test and oversight activities, such as those relating to the SeaBeam system, should begin at a very early stage.

The AICC has been discussing with the Coast Guard various means to help ensure close ties with the UNOLS technical and scientific communities, for example with an informal (unfunded) or formal (funded) liaison with oceanography technical support at the University of Washington. Discussions continue in a positive atmosphere, though without a specific plan or proposal as yet. The AICC notes as a very positive step that Coast Guard Marine Science Technicians are now including participation on short UNOLS cruises as part of their training.

The Coast Guard has a consultant working on science user manuals for its vessels, including HEALY. These are being directly patterned after various available UNOLS manuals. Jack Bash has noted to the Coast Guard that the way the global maritime community deals with instruction and documentation is changing, and that this may impact such manuals.

In other AICC business, during mid-1997 an announcement of a Science-of-Opportunity (SOO) mission for early summer 1998 on board USCGC POLAR SEA was issued to the community by the AICC, seeking letter proposals for participation. The AICC is charged with assessing these proposals for logistic and overall compatibility with the SOO mission. No decisions are made by the AICC with regard to participation, and AICC comments are specifically not to be used to leverage agency support for any proposal. The AICC has once again "ducked the bullet" because when all is said and done, it appears that everyone will be accommodated one way or the other, and the Coast Guard has yet to face the issue of "well, who do we tell can't go along?". A nine-page SOO assessment document from the AICC was distributed to the AICC (including the UNOLS Office), the Coast Guard science liaison, and all lead investigators. The AICC concurred with the recommendation of Lisa Clough as Chief Scientist for this cruise. The AICC's role in the 1998 POLAR SEA SOO cruise is thus complete, and remaining decision and discussions will be between the Coast Guard, Chief Scientist, and investigators.

The AICC was very recently informed that USCGC POLAR STAR may be able to carry out a Science-of-Opportunity mission off the Alaskan north slope in summer 1998, and the Coast Guard is exploring the possibility of a tie-in to SHEBA, perhaps with a transect close to the ice camp. Coast Guard discussions with the SHEBA Project Office have shown that the SHEBA group may have in mind specific logistical support such as exchanging personnel or removing cargo. Other possibilities mentioned include recovery of moorings and/or drifters. These are different concepts than providing

ship support for a group of scientists from SHEBA or ancillary programs who might not otherwise be provided an opportunity to carry out their program due to prior lack of such support. There is thus some question of exactly what science opportunities might be available. For example, if the primary mission became personnel transfers, then it might well be that no science berths would be available. The Coast Guard science liaison has noted that personnel transfers do not fit the Science-of-Opportunity concept, and specifically that the top priority for SOO cruises is exposing potential future paying customers to the use of the ship for science. The AICC is now debating via e-mail whether or not to issue a short-notice SOO announcement to the community. The announcement has been drafted, and is ready to circulate.

The AICC Chair notes that the committee much enjoys its productive and collegial relationship with the Coast Guard, including both the icebreaker operations group and the HEALY construction group. The attitudes are excellent and communications, while always benefiting from attention, are good.

The AICC has membership issues to resolve in the near future, and these will be attended to via e-mail discussions.

The next scheduled meeting of the AICC will be in New Orleans, probably in late 1998, though perhaps in early 1999. The dates will be set to fit the HEALY schedule so that a grand tour of the completed vessel can be scheduled as a central activity of the meeting. This meeting should provide a good opportunity for agency and community representatives to see HEALY, and learn more about the AICC and future plans. Hence the AICC might solicit and expect larger- and broader-than-usual attendance at this meeting.

Ship Scheduling Committee Report - by Don Moller

1998:

All schedules are locked in. All funded programs are accommodated with the exception of programs requiring ATLANTIS/ALVIN which was over subscribed for 1998 with three cruises deferred. Normal or routine schedule changes are anticipated for most vessels during the year.

Of note are:

1. Actions in response to "El Nino" events. (perhaps Bob Knox can expand on this)
2. Actions in response to recent "Juan de Fuca" event (WECOMA & NEW HORIZON).
3. MELVILLE adds two weeks of NRad time
4. Possible NOAA Mammal monitoring cruise in Pacific, @ 100 days:
 - o Acoustics are an important consideration in choice.
 - o NEW HORIZON and ENDEAVOR have responded.
 - o Other non-UNOLS vessels being considered (US Army, ex-NOAA).

o Decision expected relatively soon. OAR is not in decision loop.

5. USN queries regarding ship availability in NE region on short lead times. Requests through NAVO and ONR. These were fishing expeditions basically asking "can you be of help?". None have been able to be accommodated.

QUESTIONS ON THE SUBJECT: -

Can we expect more inquiries of this general nature from the Navy labs or Navy contractors? If so, need to establish better lines of communication for these labs. (Perhaps Jim Trees and/or Sujata Millick could comment).

1999:

Review of 1999 ship time requests.

I have reviewed the requests for ship time on UNOLS vessels for CY-1999 that are currently available to the schedulers.

Sources of information are:

1. The UNOLS web site.
2. Paper (831) ship requests from UNOLS office, and operators.
3. Abstracts from proposals w/o ship time requests.

As of 0800R 1/28/98, I am aware of a total of approximately 200 individual ship time requests for 1999 of all types and forms. I judge that 100-120 of these requests are viable.

I defined "viable" as falling in the category of:

1. known funded cruises: stand-alone, time-series, GLOBEC-lumped as one cruise;
2. recently submitted proposals/831s, i.e., still subject to review;
3. proposals submitted to November 1997 panels with unknown results.

Large ships requests (non-ALVIN or ROVs) - Total =31 requests:

Atlantic- 7, Pacific- 21, Other (Indian Ocean, Black Sea)- 3

Principle use of ship- 28, Ancillary 3

EWING specific, i.e. MCS- 5

Of these 31 requests, 10 are funded or considered probable. Anticipate that an additional 10-15 ship requests will hit the system for CLASS I/II in the next month.

Programs with ROV operations (Jason, ARGO-II, DSL-120) not associated with ALVIN, i.e., can be run from a vessel other than ATLANTIS:

Total of 13

Atlantic- 3, NoPac- 8, Black Sea plus Indian Ocean- 2

Of these 13 requests, 4 are funded and the balance are pending. One funded program in each: Juan de Fuca, Mid-Atlantic Ridge, Indian O., Black Sea.

Notes:

- a. Only Van Dover in Indian Ocean is potential work for BROWN
- b. Ballard in Black Sea on C. CHOUEST is time constrained, June/July.
- c. Additional 3 funded joint ALVIN/ROV-ops cruises should be run in 1999. (Sinton-SoEPR, Karson-Hess Deep, Blackman-MAR)
- d. Vehicle scheduling complexities will exist in 1999 as existed in 1997. Likely the vehicles will be on 3 ships in 1999. Transitioning vehicles between ships will be a major time sink. Weather/timing constraints exist.

INTERMEDIATES (w/ MOANA WAVE and SEWARD JOHNSON):

Estimate 30-35 viable ship requests

Atlantic- 10, Pacific- 20-25

GLOBEC is considered 1 request and likely to be 300+days, 2 ships, 1st half.

ECOHAB: No east coast work in 1999. West coast program is viable but no feel yet for # days.

Estimate 10 requests are funded or have high probability of funding. Anticipate 20-25 requests for this class, both oceans, from 15 Feb NSF proposal deadline.

SMALLER VESSELS:

Number of requests seem to be at the norm.

BIG UNKNOWNNS:

- NAVO - no input yet. Optimistic - same as 1998, Pessimistic - 1/3 of 1998.
- NOAA - academic ship needs to be identified by end February 1998. Likely 200 days to
- Academic RVs including ECOHAB but not GLOBEC
- NSF- 15 February deadline will produce more requests. How many?????

UNOLS DEep Submergence Science Committee Notes for UNOLS Council meeting Feb 2, 1998 - by Mike Perfit

The new ATLANTIS has been on line since last Spring and has proved to be an excellent support vessel for ALVIN and the tethered vehicles. Demand for ATLANTIS and all deep submergence vehicles has been heavy which made scheduling very difficult for 1997-98. Nonetheless we were able to accommodate many of the programs on Juan de Fuca in the fall that had originally been scheduled for

THOMPSON, very few days were lost to weather and the 98 schedule now is now quite full. Some nagging problems still exist with ATLANTIS (e.g. thruster noise), but many will be fixed or improved during the current PSA (Post Shipyard Availability) and drydock in San Diego (Dick Pittenger will give details later).

Scheduling problems that nagged us last year seem to have abated for now. Potential problems still exist in accommodating expedition-type science to distant parts of the oceans as well as many established time-series programs in the traditional "Yo-yo" areas (MAR-EPR-JdF). Working together with DESSC, NSF has initiated internal actions to review their role in the selection of scientific projects and scheduling priorities. They will also review the process and focus of multi-year planning and strategic thinking. A management team of Don Heinrichs, Dolly Dieter, Dave Epp, Phil Taylor, and Bruce Malfait has been established to address this issue. (NSF rep. may elaborate)

Last Summer and Fall, DESSC requested that the Navy provide SEACLIFF and ATV for science use when they are decommissioned. WHOI plans to submit a proposal to perform an engineering study to evaluate the feasibility of integrating SEACLIFF and/or its components into the National deep submergence facility. As of the DESSC meeting in December, the Navy had not finalized their disposition plans for SEACLIFF and ATV. (Sujata Millick can hopefully provide some updates on this).

During the past few years, DESSC has been consumed in the planning activities associated with bringing a new support platform on line, and integrating ROV operations with the ALVIN operations. For the most part, the combined operations are working very well. Now DESSC is ready to start looking ahead at long-term facility needs. DESSC together with the community has begun to examine the types of deep submergence research that will be conducted into the 21st century and the facilities required to meet these science objectives. During the December DESSC meeting at the San Francisco AGU Meeting, there was a lot of lively discussion regarding future facilities and it appears the community is supportive of developing a new, robust ROV for science.

Facilities News

ALVIN battery power improvements have been made and are working well. There is approximately an 18% increase in power which results in approximately 30 minutes of extra bottom time per dive. A new deep submergence vehicle systems upgrade proposal has been funded by NSF which WHOI is presently working on. Many items are included in the upgrade the principal ones are: datalogging and video systems, additional buoyance for science sensors, vehicle systems upgrades, scanning sonar, inductive couple linked data transmission and temperature sensors and development of a virtual ALVIN which will serve as a training tool for pilots and can also be used for planning efficient power usage during operations.

WHOI is also addressing staffing plans for ROV flyaway operations will be hiring two new people to the Deep Submergence Operator's Group. The WHOI operators also plan to enhance operator/user communication by identifying a science liaison to oversee cruise planning/facilities use.

Archiving scientific data:

An Internal WHOI committee, Scientific Data Advisory Committee (SDAC), was set up in September to review all WHOI scientific data archiving policies and issues, including the National Deep Submergence Facility Archives. The committee along with the WHOI Marine Operations group recognized that the existing policy needs revision. There was much discussion about the policy and it was recognized that the community needs to know who holds the data and how to access it. WHOI hopes to be able to complete the archiving policy revisions and submit to DESSC and federal agencies for review and approval in the late Spring.

1998 Schedule:

The year begins with ATLANTIS in San Diego for its PSA period. From there, ALVIN operations are planned for off San Diego. This will be followed by Jason operations off Guaymas. ALVIN operations are planned for the Northern EPR to be followed by ALVIN operations at Juan de Fuca. In August, ALVIN operations are planned again off San Diego. For the remainder of the year ATLANTIS and ALVIN will be at the Southern East Pacific Rise for a series of programs, one of which will also require DSL-120. "Fly-away" ROV operations include one program in March in the Southern EPR using DSL-120 from MELVILLE. Three programs are scheduled from THOMPSON in August through October using Jason, ARGO-II and DSL-120 at Juan de Fuca and then off of Hawaii. (Dick or Annette might have a map of planned 1998 work sites.)

SUPPLEMENTAL INFORMATION

Long Range Planning (Operations)

Time-series vs. Expedition: It is clear that there will be a problem accommodating both time series work in addition to expeditionary type programs. PIs need to determine if their work can be carried out using ROVs. It was questioned whether it is the feasible to make ROVs usable for all time series programs.

New Deep Submergence Vehicle Construction and Facilities Upgrades: It appears that a suite of vehicles will be needed to accommodate future needs. There are a variety of issues which need to be addressed, such as, the operational limits and required support personnel. Substantial input and justification from the community is needed on whether or not a science dedicated ROV should be pursued. The community also needs to look at other types of vehicles such as AUVs as rapid response tools. Should these vehicles be included in the suite of science vehicles?

There was a discussion on how to approach long term needs and whether a workshop would be effective. It was suggested that perhaps a group of time series scientists could meet to discuss their facility needs. This group could produce a white paper with their recommendations. For the short term, an ROV system is likely to best suited to meet the varied needs of multidisciplinary researchers for both

expeditionary and time-series science We also need to look at what can be done to increase the current capabilities of ROVs. All viable ROV options should be carefully assessed. Additionally, the community needs to be educated on how to effectively and efficiently utilize our deep submergence assets. The community needs to make decisions about upgrades to the existing facilities. It appears that a science dedicated ROV could bridge the gap between short-term and long-term needs.

The community and operator needs to explore funding strategies to implement required long-term new facility construction and short-term upgrade to existing vehicles. Agency, WHOI and private funding sources, or a combination, should be investigated.