



# UNOLS NEWS

Volume 20, No. 1

Winter 2003

## UNOLS Council

Tim Cowles (OSU), Chair  
 Peter Wiebe (WHOI), Chair Elect  
 Robert Knox (SIO), Immediate Past Chair  
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 Bruce Corliss (Duke)  
 Charlie Flagg (BNL)  
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 Patricia Fryer, DESSC Chair  
 Steve Rabalais, RVOC Chair  
 Joe Ustach, SSC Chair

## Executive Secretary

Michael Prince

## Message from the UNOLS Chair...

Let me begin my first newsletter piece by acknowledging the superb leadership of Dr. Robert Knox during his two terms as Chair of UNOLS. Under his guidance, UNOLS moved forward on several key issues, most notably the initial steps of the Fleet Renewal Plan developed by the Federal Oceanographic Facilities Committee (FOFC). It is with considerable relief that I can begin my term as Chair with Bob just a phone call away.

There are a number of important news items to highlight in this issue of the newsletter.

- The newest vessel in our UNOLS fleet, RV KILO MOANA, began service in Hawaii in the fall of 2002. Those of us who have only gone to sea on monohulls are looking forward to experiencing the advantages of the stable platform provided by the SWATH design of KILO MOANA. Another vessel is scheduled to join the fleet in 2006 as the University of Delaware moves forward on their design of a replacement for RV CAPE HENLOPEN.
- In response to the FOFC's renewal plan, [Charting the Future for the National Academic Research Fleet, December 2001] the UNOLS Fleet Improvement Committee conducted workshops during the summer of 2002 on the Science Mission Requirements (SMRs) for the Regional Class and Ocean Class vessels. Those draft SMRs have been available to the community for review and comment for the past few months. At the UNOLS Council meeting in March 2003, we expect to approve the final versions of those SMRs and forward them to the Federal agencies with our recommendation for adoption. These documents will form the basis for calls for concept design proposals. Stay tuned via the UNOLS website for progress.
- At the September 2002 UNOLS Annual Meeting the membership approved designation of the Center for Interdisciplinary Remotely-Piloted Aircraft Studies (CIRPAS) as a National Oceanographic Aircraft Facility. In turn, the membership also approved the establishment of a "Scientific Committee for Oceanographic Aircraft Research" (SCOAR). The SCOAR will serve as an advisory committee for any aircraft facility designated by UNOLS as a National Oceanographic Aircraft Facility. For additional information about this committee, see page 6 of this newsletter.

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*Chair Message (Continued)...*

- The Oceans Commission will complete its report to the President by mid-2003. Many members of our community have testified at the regional meetings of the Commission and we anticipate a report that supports growth in ocean science research.

While the above items have a positive tone, UNOLS and our ocean community face a number of important challenges in the near future. These include the implementation of the vessel construction schedule outlined in the Fleet Renewal Plan, maximizing the security of our vessels and personnel during research cruises, and addressing the surface vessel and deep submergence needs, as well as the scheduling issues posed by future observing systems. In addition, it is clear that there will be greater scrutiny in the months to come on the use of active acoustic sources in ocean research. These topics will be among the issues discussed at the UNOLS Council meeting in March 2003. I encourage all of you to stay informed about, and become engaged in, the issues before UNOLS. I look forward to working with you over the next two years, and would like to hear your opinions about the items mentioned in this newsletter or regarding any other UNOLS-related issue. You may send your comments directly to me, or to Mike Prince or Annette DeSilva at the UNOLS Office.

Sincerely,

Tim Cowles

## UNOLS Election Results

### ~ Tim Cowles Elected as UNOLS Chair ~

Elections were held at the UNOLS Annual Meeting on 27 September to fill expiring Council terms, including the position of Chair. Tim Cowles from Oregon State University was elected as the new UNOLS Chair. Tim is a Professor and Associate Dean for the College of Oceanic & Atmospheric Sciences. He has been a member of the UNOLS Council from 1998 to present. His activities on the Council have included chairing the subcommittee for UNOLS' Quality of Service Initiative. Tim was co-Chair of the NSF Workshop to Address Future Scientific Needs in Oceanography (August 2000). Research interests include: Plankton ecology-organism distribution, behavior, energetics; timescales of spatial pattern in plankton; energetics of zooplankton swimming and feeding; mesoscale and microscale links between physical, chemical, and biological processes in the sea; development of new instrumentation for biological oceanography.

Tim has extensive cruise experience. Since the mid-70s, he has worked aboard MELVILLE, KNORR, ATLANTIS II, WASHINGTON, REVELLE, THOMPSON, WECOMA, ENDEAVOR and OCEANUS. Cruises have included work in the North Atlantic, North Pacific, off Peru, and in the Southern Ocean. For the past 25 years, approximately 25-30 days per year have been spent at sea, with most of these trips during the past 10-15 years as Chief Scientist.

Other Council election results included:

- UNOLS Chair-Elect (2 year term) - Dr. Peter Wiebe (Woods Hole Oceanographic Institution)
- Operator Representative (3 year term) - Dr. Peter Ortner (University of Miami/Atlantic Oceanographic and Meteorological Laboratories)
- AT-LARGE (3 year term) - Dr. Denis Wiesenburg (University of Southern Mississippi)

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### *Thank You to Departing UNOLS Committee and Council Members*

UNOLS extends its appreciation to those members of the Council and Committees who completed terms in 2002. These individuals are Bill Smethie (FIC), Mark Brzezinski (FIC), Joris Geiskes (DESSC), Marv Lilley (DESSC), Kelly Falkner (AICC), and Dennis Hansell (Council). Their time and contributions to UNOLS activities are greatly appreciated.

The current membership of the UNOLS Council and Committees can be found on the UNOLS website at, <http://www.unols.org/currcommittees.html>.



## 2002 UNOLS Annual Meeting Highlights

The UNOLS Annual Meeting was held on September 27<sup>th</sup> at the National Science Foundation (NSF) and was highlighted by keynote speeches from RADM Jay Cohen, Chief of Naval Research, and Dr. Rita Colwell, Director, NSF. Both discussed their respective agency's Fleet Renewal plans.

Dr. Colwell began by explaining that the future of the fleet is directly tied to the success of oceanography. The new ships that are being considered will need to be able to support multi-disciplinary research teams and new technologies. The fleet must be capable of meeting changing research demands. The Federal Oceanographic Facilities Committee (FOFC) has considered these issues in their long-range fleet planning. New technologies are very important and use of fuel cells and corrosion resistant paints should be considered while developing new designs. FOFC is now addressing strategies for implementation of the fleet renewal plan.

NSF has two roles in the fleet renewal: the Alaska Region Research Vessel (ARRV) construction and the Regional Class construction. The Congress appropriated design funds for the ARRV and the design process is well underway. Funds for ARRV construction will need to be considered under NSF's Major Research Equipment (MRE) account. Currently, there are a number of large programs competing for MRE support including a new drill ship and observatory support. The ARRV will need to eventually be added to this list.

To fund the Regional Class construction effort, NSF is considering a mechanism that will use division funding for support of mid-level infrastructure. The cost for the Regional vessel construction would need to be limited to \$25M to qualify for this type of funding. NSF will need to seek approval for this type of funding mechanism before proceeding.

Dr. Colwell remarked that the agencies and community have a huge challenge ahead, but it is exciting times. The entire ocean community needs to get together with one voice.

RADM Cohen began his talk by commenting on the supportive relationship that he has had with Dr. Colwell. He thanked NSF and the community for their patience while KILO MOANA was being built and tested. RADM Cohen reemphasized Dr. Colwell's remarks about the need for the community to work together to renew the fleet. The design process should be innovative and should incorporate new ideas. The need for fleet renewal is well documented.

RADM Cohen introduced Dr. Jane (Zan) Alexander, the new ONR Executive Director, who is replacing Dr. Fred Saalfeld. Dr. Alexander comes to ONR from DARPA.

RADM Cohen is hopeful that NSF will be able to fund the construction of the Regional Class. The Navy would like to be able to support construction of the Ocean Class ships. To keep the process moving while funds are requested, the Navy implemented a Common Hull Study. The purpose of the study was to minimize acquisition costs and maximize technology leverage for new Navy oceanographic ships by examining the feasibility of a common (or similar) hull platform for future AGOR (UNOLS Ocean and Regional Class) and T-AGS ships. The study also included the development of Rough-order-of-magnitude (ROM) designs for each ship class considered. A variety of hull forms were considered and included, the monohull, SWATH, SLICE, Trimaran and catamaran. [The study has since revealed that there is minor commonality of desired capabilities among the Ocean Class and Regional Class vessels and the Navy T-AGS. It would not be a practical option for acquisition of the UNOLS and T-AGS vessels.]

At the Annual meeting, RADM Cohen explained that he would like to expand the scope of the Navy study to examine the feasibility of converting the USNS LITTLEHALES (TAGS-52) to an Ocean Class vessel. The Navy currently uses the ship for hydrographic survey work. It was built by Halter Marine and launched in February 1991. It was not designed as an Ocean Class vessel and it is ten years old. These factors would need to be considered. RADM Cohen was interested in this option as it could potentially result in some cost savings and at the same time brings a ship on line in a shorter time than required by a new construction. These ships are currently fully deployed. The study would examine the extent of the required modifications and the associated cost. [Note – this study was conducted in the fall and it was determined that the conversion of LITTLEHALES to an oceanographic research vessel would be too extensive and costly. However, NOAA has expressed an interest in using the vessel to meet their survey needs.]

Dr Colwell closed the presentation by emphasizing that the two agencies, NSF and ONR will work together throughout the fleet renewal process.



## Bob Knox Completes Term as UNOLS Chair

The Annual Meeting provided an opportunity for the UNOLS membership to thank Bob Knox for his service as UNOLS Chair. He has shown tremendous dedication to the Academic Fleet and representation of the UNOLS community throughout his four years as Chair. Mike Prince presented Bob with a plaque in honor of his service as UNOLS Chair. A ship's whistle was mounted on the plaque. Those who have participated in Council meetings have experienced Bob's distinctive whistling, "call to order." Although Bob's term as Chair is complete, we are pleased to report that he will remain on the Council as Immediate Past Chair.



*Mike Prince (left) is shown presenting Bob Knox with a gift of appreciation for his service as UNOLS Chair.*

***Thank you Bob!***

## UNOLS Bids Farewell to Tim Pfeiffer

At the UNOLS Annual Meeting, Bob Knox, on behalf of the UNOLS membership, presented Tim Pfeiffer with a letter and gift of appreciation for his career of excellent service to seagoing science. Tim retired from the Office of Naval Research at the end of September. Tim's involvement with the UNOLS community started in 1977 as Technical Coordinator for the CAPE HENLOPEN and then as Marine Superintendent for the University of Delaware and finally as program manager for research facilities in the Ocean, Atmosphere and Space Department of ONR. Tim was presented with a framed collage of ship pictures that were a part of Tim's career.



*Bob Knox (left) presents Tim Pfeiffer with a gift from UNOLS.*



## UNOLS Ship Time is Up in 2003

In 2003, the total number of operating days scheduled on UNOLS vessels is 5348. This represents an increase of 476 days from 2002. Large ship scheduled days is basically level from last year; however some programs requesting ship time in 2003 had to be deferred until 2004. This was in part driven by the need for submergence vehicles. All other ship classes have an increase in ship time demand. It should be noted that some of

the 2003 scheduled programs are still pending funding decisions. The comparison by ship class follows:

Class	2002 Days	2003 Days
Large/Global	1770	1718
Intermediate/Ocean	1422.5	1747
Regional	1106	1231
Local/Near-shore	573.5	652

### UNOLS Forms Working Group on Ocean Observatory Facility Needs

In January 2003, the UNOLS Council approved the formation of a working group to address ocean observatory facility needs. The working group will work to identify the ship and submergence facility requirements for emerging national ocean observatory initiatives. The needs of all ocean observatory system types will be considered, ranging from global systems (i.e., moored buoys) to regional-scale and coastal observatories. The focus of their effort will be on defining new demands and requirements evolving from NSF ocean observatory initiatives as well as other agency observatory initiatives that are being developed or in operation.

Members of the working group include: Alan Chave (WHOI), Chair; Andy Bowen (WHOI); Scott Glen (Rutgers); Wes Hill (SIO); Mike Kosro (OSU); Gene Massion (MBARI); Daniel Schwartz (U. Wash); Ken Smith (SIO); Bill Wall (International Telecom Group); Beecher Wooding (WHOI); Peter Worcester (SIO); and Larry Mayer (UNH).

The working group's draft recommendations are expected in the spring at which time they will be available for community review. The UNOLS Office will provide information about this effort on the UNOLS website. Community feedback is encouraged.

### Commission On Ocean Policy ~ Community Input Encouraged ~

The final report from the Commission on Ocean Policy is scheduled for release in spring 2003. Members of the ocean science community are encouraged to review the Commission documents and provide feedback and suggestions on the Commission's proposed recommendations. The Commission documents are available at

<<http://www.oceancommission.gov/documents/welcome.html>>.



## UNOLS COMMITTEE NEWS

### **SCOAR Added as a UNOLS Standing Committee ~CIRPAS Designated as a National Oceanographic Aircraft Facility~**

The UNOLS Membership voted at the 2002 Annual Meeting to designate the Center for Interdisciplinary Remotely-Piloted Aircraft Studies (CIRPAS) as a National Oceanographic Aircraft Facility. The designation defines a National Oceanographic Aircraft Facility as an academic organization or institution that operates one or more aircraft in support of oceanographic research or education and that is made available to qualified scientists from any institution with funding for the use of the facility. The purpose is to provide access to aircraft facilities to scientists that do not operate or otherwise have available the required aircraft facilities.

CIRPAS is a research center at the Naval Postgraduate School, Monterey, California with aircraft owned primarily by the Navy and operated through a contractor, the California Institute of Technology (CALTECH). The facility provides Remotely-Piloted Aircraft (RPA) as

well as manned aircraft services to the science, research, test and evaluation communities. The primary CIRPAS aircraft for oceanographic support is the UV18A 'Twin Otter,' the military version of the DeHavilland DHC-6-300. CIRPAS flight operations and the maintenance facility are located at Marina Municipal Airport in Monterey County, California. CIRPAS missions are almost entirely over the ocean and have supported several oceanographic and atmospheric research projects in recent years. Additional details about CIRPAS are contained on their website at: <http://web.nps.navy.mil/~cirpas/>.

The UNOLS membership also voted to establish a standing committee, the Scientific Committee for Oceanographic Aircraft Research (SCOAR) with responsibility for designated National Oceanographic Aircraft Facilities. This Committee will provide advice and recommendations to facility

managers and supporting federal agencies on aspects of operations, sensor development, fleet composition, utilization and data services as appropriate. In addition, SCOAR and the UNOLS Office will provide the ocean science user community with valuable information and advice concerning experiment design, facility usage, scheduling and capabilities.

Members of SCOAR are:

Carl A. Friehe, Chair (UC Irvine), John M. Bane, Jr. (University of North Carolina), Charles Flagg (Brookhaven National Laboratory), Ken Melville (SIO, MPL) and Daniel D. Riemer (University of Miami). Ex-officio members include Bob Bluth and Hafliði Jonsson, both from CIRPAS, NPS and John Seinfeld of California Institute of Technology. Their first meeting is scheduled for 25-26 February at the CIRPAS Facility.

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### **Research Vessel Technical Enhancement Committee**

The University of Hawaii hosted the RVTEC Annual meeting on November 12-14, 2002 in Honolulu, HI. The agenda was full and included discussions on defining levels of technician/instrumentation support, networking/wireless/communications, isotope procedures and SWAB requirements, Post Cruise Assessment reporting, next generation wire and safe working loads, shipboard science inspections, and STCW and ISM Compliance. Dale Chayes was re-elected to serve another two years as RVTEC Chair.



# Arctic Icebreaker Coordinating Committee News

*Report submitted by Lisa Clough, AICC Chair*

Summer 2002 saw both the USCGC HEALY and POLAR STAR in the western Arctic. Many thanks to the crews for yet another year of successful Arctic science support. We're happy to report the new 75 kHz ADCP on HEALY seems to be working well. For our part, the AICC has been busy too. We had two days of meetings in DC in September. As promised, the meeting started off with an accounting of how well we did completing our action items and recommendations from the previous meeting. Fortunately we had managed to knock off a few items, but the list certainly contained some open items as well. Always plenty to do these days!

Highlights from the meeting included the good news that the USCG does not anticipate any significant changes to the icebreaker program with the pending shift to the Department of Homeland Security. Dave Forcucci, HEALY's science liaison, gave very nice summaries on each of this summer's science missions. Renee Crain from NSF provided an informative overview on the steps the Office of Polar Programs is taking to facilitate interactions between the native communities in Alaska (who make extensive use of the Arctic Ocean for subsistence hunting) and sea-going scientists. Larry Mayer from UNH presented a very convincing case that high quality SeaBeam data should be collected from HEALY at all times, if at all possible. Margo Edwards from the AICC had concurrently analyzed the quality of some SeaBeam data collected during summer 2001 and showed that even unattended SeaBeam data collected from HEALY seems to be of use. Following these presentations and much additional

deliberation the AICC has formally transmitted a recommendation to the funding agencies that underway data collection from all USCG icebreakers be supported.

Since the meeting we have completed our second round of post-cruise debriefs. With both HEALY and POLAR STAR supporting science this summer we wound up having four separate phone conferences. We thank the chief scientists for taking the time to provide important feedback. Of note, some elected to both complete the UNOLS PCA and participate in the debriefs. Keeping an eye towards the future, a few members of the AICC and USCG icebreaker personnel participated in the Arctic Instrumentation Workshop held at MBARI in October. Finally, several members of the AICC spent time at the UNOLS booth during the December 2002 AGU meeting, listening to concerns Arctic scientists might have, and asking for suggestions as to how we can improve expeditionary planning, for example. The AICC winter meeting was just held in Seattle, February 6<sup>th</sup> and 7<sup>th</sup>, with a few members arriving early to take part in the ARRIV meeting held on the 4<sup>th</sup> of February.

The need for finding ways to improve or promote long term expeditionary planning was further emphasized during presentations regarding Sweden's plans for a Beringia 2005 expedition using the icebreaker ODEN. The Swedish Polar Research Secretariat is very interested in having the HEALY or some other icebreaker join the third leg of this expedition for a trans-Arctic basin transect that crosses the North Pole. Among the ideas being

considered that might allow planning for U.S participation in this expedition while maintaining the principal of having the best peer reviewed science drive the schedules of U.S. vessels is to allow for earlier proposal submission for the 2005 field season. Arctic researchers interested in this expedition or forming one of their own should stay tuned to NSF announcements, the AICC web page and other scientific publications for future announcements regarding proposal deadlines and expeditionary planning efforts.

Finally, a few bits and BERGS of note to the UNOLS community. The HEALY is en route to the southern hemisphere for the first time. The ice conditions down in the Antarctic continue to be challenging due to the presence of a few large icebergs in the vicinity of McMurdo Sound. With POLAR STAR in dry-dock, and POLAR SEA needing a bit of help, the decision was made to send HEALY south during the first part of January. HEALY should be back in Seattle by sometime in April, as such we do not anticipate any changes to the planned Arctic work for HEALY in summer 2003. The AICC is also seeking community input for suggested changes to be included in HEALY's next planned dry-dock in 2004 (changing the science seawater system is number 1 on our list), as well as suggestions for science improvements to be made to the POLAR Class icebreakers as they prepare for midlife refits.

*The AICC can be reached by writing to the Chair: <cloughl@mail.ecu.edu> or to the UNOLS Office <office@unols.org>.*



## Research Vessel Operators' Committee Update

*By Steve Rabalais, RVOC Chair*

The 2002 Research Vessel Operators' Committee Annual meeting was co-sponsored by Moss Landing Marine Labs (MLML) and Monterey Bay Aquarium Research Institute (MBARI), at their facilities in Moss Landing, Ca. Dr. Kenneth Coale, Director of Moss Landing Marine Labs, welcomed the participants to MLML/MBARI, and Rich Muller, Marine Superintendent, MLML, and Steve Etchemendy, Marine Superintendent, MBARI followed with information about their respective Institutions.

Committee and Liaison Reports included a presentation by Tom Althouse on the status of the Research Vessel Safety Standards (RVSS), which are currently under review by the RVOC Safety Committee. The final document will be ready for consideration by RVOC in February 2003, and will be presented to UNOLS for acceptance at their annual meeting later this year. The RVOC liaison to the Fleet Improvement Committee (FIC), Joe Coburn, then gave a brief review of FIC's efforts to develop Science Mission Requirements for the two new UNOLS vessel classes being considered by the community. RVOC has played a major role in this effort through representation on the Regional (Steve Rabalais and Rich Muller) and Ocean Class (Joe Coburn) Steering Committees. An in-depth review of the UNOLS Fleet Renewal program was given by Mike Prince, during the second day of the meeting.

The RVOC representative (Steve Rabalais) to the Ship Operations Cooperative Program (SOCP) gave an overview of issues

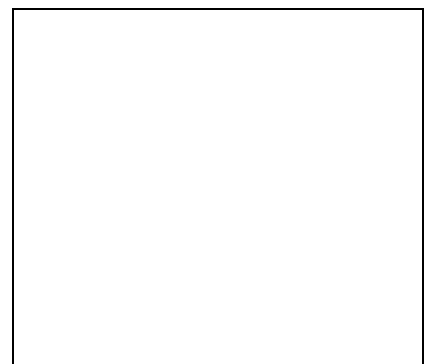
covered at the 2002 SOCP Meeting sponsored by the Naval Sea System Command in Philadelphia, Pa. Full SOCP membership status was granted to RVOC during this meeting. The SOCP and RVOC deal with issues of concern to both groups and it is expected that RVOC will benefit from this union. During the RVOC business meeting it was suggested that RVOC select a designated liaison to SOCP and Paul Ljunggren, LDEO, agreed to serve in this capacity.

Progress with International Safety Management (ISM) compliance on Class I/II vessels was the subject of a group discussion, lead by Joe Coburn, Tom Althouse and Dan Schwartz. All large UNOLS vessels are required to comply with standards established by ISM and were in the process of completing their final audits and certification. ISM compliance in the remainder of the fleet was debated during the RVOC business meeting. It was concluded that all UNOLS Intermediate Class vessels would investigate voluntary compliance with ISM standards and that the UNOLS Office would aid this effort by requesting funding from Federal agencies to support the preliminary vessel surveys.

Woody Sutherland and Sandy O'Brien, both from SIO, reviewed isotope use on UNOLS vessels and difficulties encountered during shipping, storage, handling and disposal of isotopes and contaminated supplies. They have found that many scientists using UNOLS vessels were uninformed about procedures relating to the use of isotopes at sea and in their labs.

RVTEC will discuss isotopes on UNOLS vessels at their annual meeting and may recommend a joint RVOC/RVTEC committee to address this issue.

At the RVOC business meeting, on the final day, a motion was passed to change the by-laws so that the Chair and Vice-Chair were limited to one 3-year term in each position and the Vice-Chair would serve as the Chair Elect. Steve Rabalais was elected to serve a 1-year term as Chair at which time Tim Askew (standing Vice-Chair) would become the new Chair. Other business items included the establishment of an Agenda Committee (Steve Rabalais, Mike King, and Dan Schwartz) and a request to the UNOLS Office to include funding in their next grant to cover the cost for the RVOC Safety Committee to meet one time each year in addition to the annual meeting that coincides with the RVOC Annual meeting.





## Fleet Improvement Committee Activities

The UNOLS Fleet Improvement Committee activities continue to focus on fleet renewal issues. They recently met on 28-29 January at the National Science Foundation. The meeting agenda included discussions on the Science Mission Requirements (SMRs), Agency funding support, conceptual design process, ship design and improvement projects that are in progress, and evaluation of R/V KILO MOANA science operations.

**Science Mission Requirements** – The SMR documents for the Ocean Class and Regional Class vessels are being finalized for presentation to the UNOLS Council in March. Two workshops (one for each ship class) were held in the summer to establish the SMRs. In the fall, the draft SMR documents were available for community review and comment. These comments have been considered and incorporated. After Council endorsement, the SMRs will be available for use in future design efforts. They will be the basis for the conceptual designs.

**Regional Class follow-on design activities** – FIC will work with the Agencies and the Naval Architect, JJMA, to provide input into their study to further refine rough-order-of-magnitude (ROM) design estimates for the Regional Class vessels. The ROM estimates were developed as part of the Navy's Common Hull Study. The material developed during this effort will be used by the agencies in preparation for the ship design and acquisition process.

**KILO MOANA:** The ship began science operations in fall 2002. Members of FIC are conducting phone debrief interviews with PIs who have sailed aboard KILO MOANA. The information from these debriefs is intended to evaluate the SWATH hull as a science platform. The 2003 ship schedule is calling for a diverse range of operations and higher sea states are expected. The FIC will continue the debrief interviews through the year.

**The FIC Chair Position** - In October, Larry Atkinson, will complete his second term as FIC Chair. UNOLS will be seeking nominations for candidates to fill this position. A formal call with the position requirements will be announced later in the year.

## DESSC News: Help for New Submergence Science Technology Development

*By Patricia Fryer, DESSC Chair*

Over the past few years several community workshops have defined the need for specific new sensor and tool technologies in support of submergence science. The recommendations of the UNOLS sponsored DESCEND Workshop can be viewed at: <<http://www.mlml.calstate.edu/unols/dessc/descend/descend.htm>>.

A subsequent UNOLS sponsored community meeting regarding developing submergence technology resulted in several recommendations and can be viewed at:

<<http://www.mlml.calstate.edu/unols/dessc/descend/followon/april04.htm>>.

Recently, attendees at the NOAA/NASA supported LINK Symposium provided a list of specific tools and sensors that they recommended be developed for submergence assets of various kinds. These are included in a recent MTS Journal article [Shepard A., Fryer, P., Bellingham, J., Moore, B., Kelly, M., Zande, J., McCurdy, A., Carless, J., Ward, M., Lemmerman, L., *Link 2002 Symposium*, MTS Journal, Vol 36, No. 2].

The DESSC encourages the development of the tools and sensors recommended by these groups and has a mechanism in place to provide feedback and assist Principal Investigators in their efforts to do so. The existing "Third-Party Tools Policy" of the DESSC can be viewed at <<http://www.unols.org/dessc/tool.html>>. This policy was originally designed in order to assist members of the submergence science community in their efforts to develop either tools specific to a given project or tools that would be of more general use to the marine science community. At the time the DESSC policy was set forth, the emphasis was on tools that were meant to be used on the NDSF vehicles. DESSC is, however, also mandated by UNOLS to enhance multidisciplinary submersible science throughout the academic community. PIs interested in designing and developing tools and sensors for submersible assets are encouraged to contact DESSC for assistance.



## A Progress Report on the Design Study for an ALVIN Replacement

The basic ALVIN design is over 36 years old and although it has been incrementally modified and improved, the scope of these improvements has always remained constrained by the submersible's basic design. These constraints affect the operation (such as ascent/descent speeds) and maintainability (such as battery removal). The Deep Submergence Group of Woods Hole Oceanographic Institution (WHOI) recently completed an evaluation of the available options for improving ALVIN's capabilities, including those resulting from the availability of the DSV SEA CLIFF. The conclusion was that building a new submersible from the keel up would provide the best means for the U.S. to regain the 6000-meter submersible capability previously provided by the U.S. Navy operated SEA CLIFF, and to achieve significant improvements in other areas of importance for a submersible dedicated to scientific research.

As part of the feasibility study for building a new research submersible, NSF and NOAA funded the National Deep Submergence Facility (NDSF) to undertake a concept development. This first step in the process of constructing a new ALVIN will convert rough requirements and initial concepts into a detailed engineering specification. This specification defines the submersible and its sub-systems in sufficient detail to allow development of the detailed design required for construction. The performance requirements and principal system characteristics will be defined based upon past and current input from the science community and the collective experience of WHOI NDSF personnel. Optimal design concepts will be chosen from the identified alternatives and specified as necessary to insure meeting the cost and performance goals. Science input to this process is being implemented through a special advisory committee formed in collaboration with the Deep Submergence Science Committee (DESSC) so that science requirements will be implemented into the design.

The planned capabilities and features of a new ALVIN will include:

### 1. *Improved Science Capabilities*

- **Increased Bottom Time** - This would be achieved through improved hydrodynamics and possibly increased descent weight. Bottom times could be increased by as much as ~2 hours at mid-ocean ridge depths.
- **Increased Energy Capacity** - A lighter buoyancy material will allow for larger energy payload. Additionally switching to NiCd or Lithium based batteries

or fuel cells will further increase capacity.

- **Improved Fields of View** - A new personnel sphere design will allow moving the observer viewports forward and overlapping their viewing area with that of the pilot. The views from ALVIN's ports do not overlap, a long-standing deficiency in the original ALVIN design; correcting this will provide better observational capabilities and will improve pilot/observer synergy and efficiency of operations.
- **Increased Access to the Seafloor** - The actual depth capability of the new submersible will be based on engineering and cost trade-offs with the underlying requirements of obtaining a vehicle having the general size, weight and performance characteristics that have made ALVIN an effective science tool over the years.
- **Improved Interior Ergonomics** - The ergonomics in ALVIN are far from optimal, especially when compared to the newer Russian, French, and Japanese 6000+ meters submersibles. Improved viewport access and general interior arrangement of the new ALVIN will be achieved by increasing the personnel sphere interior diameter (from 78" to 83") and by relocating the viewports.
- **Increased Interior Electronics and Science Payload** - This will be achieved by increasing the interior diameter and will result in an increase of 18% or 27 cubic feet compared to ALVIN.
- **Reduced Physical and Chemical Disturbances to Science Study Areas** - This will be accomplished by the design of an ascent/descent weight system using seawater instead of the steel weights currently used. For simplicity this system could be combined with a variable ballast and trim system. This improvement is deemed particularly important for science missions that will be required to install and maintain seafloor observatories where repeat dives to specific areas are required.

2. **Improved Operational and Maintenance Features** - The following listing provides the key technical areas where improvements will lead to more efficient and cost-effective operational maintenance and increased reliability with the attendant direct benefits to science productivity.

- **Improved Battery Access** - The current ALVIN system requires flat seas to change or inspect a battery. Typically, if repairs are required, it means the ship must return to port, which can result in lost dives and science. A new battery installation and handling system will be



designed that will allow inspection and replacement under normal at-sea working conditions.

- **Reduction in Cabling and Number of Personnel Sphere Penetrators** - Aggressive use of distributed control systems, and fiber optic penetrators will reduce the numbers of cables and penetrators (points of failure), in addition to increasing through-hull bandwidth to take advantage of state-of-the-art imaging systems and recording formats.
- **Elimination of Hazards Associated with a Mercury Trim System** - The replacement of the Hg trim system by a water based system integrated with the variable ballast system will eliminate both the potential health threat to the ALVIN technicians and the material hazard associated with carrying Hg on a ship with copper alloyed piping.

The Concept Development phase is a combined effort of the Deep Submergence Group at WHOI, the deep submergence community, and several outside engineering contractors. The final product will be a package ready for obtaining bids (Request for Proposals) for the detailed design and construction of the submersible. The following areas are included in this phase:

a. Community Input -

A New ALVIN Design Advisory Committee (NADAC) has been formed to provide additional input and review from the deep submergence science community. They have formulated the functional mission requirements, are currently reviewing functional specifications and will be reviewing viewport issues and science equipment layout in the future.

b. Certification -

A determination will be made concerning the certification agency and therefore construction rules for the new submersible. U.S. Navy and American Bureau of Shipping (ABS) are viable alternatives. This is currently being studied by the contractors as well as the Naval Sea Systems Command.

c. Viewport Number, Location and Sizing -

This matter is being studied to determine if better arrangements, larger viewports, and/or more viewports might be feasible and desirable. Modeling and eventually a full-scale mockup will be used to assist in this area as well as the ergonomics of the interior arrangement.

d. Engineering Support -

This will include a refinement of requirements based on a revised set of functional specifications, a detailed

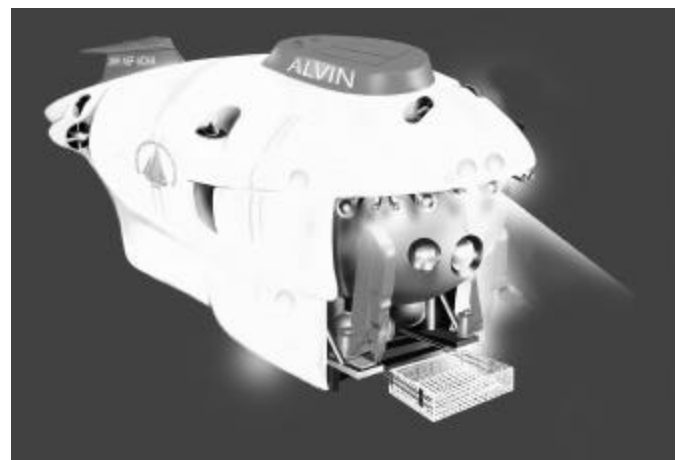
engineering feasibility study of personnel sphere construction based on selected construction rules as well as viewport window arrangements, a power source review, drag studies, vehicle and system level designs, and development of a bid package.

At the completion of the Concept Development phase we expect that the following will have been accomplished:

- The operational depth will have been established based upon available buoyancy materials, hull structural considerations, and auxiliary design system issues. Present information supports a goal of 6500 meters.
- The science requirements will have been fully integrated into the conceptual design.
- The feasibility of the functional specifications will have been demonstrated.
- A system level conceptual design will have been completed.
- The cost estimate updated.
- A detailed package will be ready for submission to contractors as a “Request for Proposals” for the design and construction of a new ALVIN.

This phase is the next step required to assure that the science community has a new ALVIN within five years. It will be followed by the detailed design and construction phase which will result in a new submersible with increased scientific and operational capabilities including greatly improved access to the majority of the abyssal regions of the world’s oceans.

ALVIN users and potential users are invited to submit recommendations for the new ALVIN to the NADAC at rbrown@whoi.edu.



Artist's and engineering concept for a new 6500-m ALVIN. E. Paul Oberlander, artist – WHOI.



## Ocean Studies Board to Form Committee on Future Needs in Deep Submergence Science

The Ocean Studies Board (OSB) will convene a committee to address future requirements for conducting deep submergence research. Issues related to the continued need for human occupied vehicles and, in particular, the replacement of ALVIN will be considered. OSB expects to name the committee by the first week of March. A twenty-day period will follow when the community will have the opportunity to comment on the committee membership.

The statement of task for the Committee on Future Needs in Deep Submergence Science is:

*“Recognizing the likely retirement of the submersible ALVIN, this study will evaluate the future directions and facility requirements for deep submergence science and examine the range of potential applicable technologies that can support basic research in deep sea and seafloor areas.*

*Specifically, the Committee will:*

- 1. Assess the continued role of human occupied vehicles in deep submergence science, within the context of current and projected capabilities of remotely operated and autonomous vehicles, telepresence, seafloor observatories, and other non-human occupied technologies;*
- 2. Make recommendations regarding the mix of new facilities needed to continue to carry out world-class deep submergence science; and*
- 3. Discuss innovative design concepts and technological advances that should be incorporated into any new submersibles to support current and future research needs.*

*Recommendations will be made within the constraints (established by NSF) that total construction costs (including related costs such as modifications to support ships) shall not exceed the upper practical limit for the Division of Ocean Sciences' "mid-sized infrastructure" (roughly 10 percent of the division's annual budget or approximately \$25M) and total operating costs shall be similar to the operating costs for ALVIN. If multiple types of vehicles are deemed necessary, suggestions will be made concerning the optimal phasing of implementation over several years. Cost estimates will be supplied by the National Deep Submergence Facility, other submersible owners and operators, or outside companies if needed.”*

The focus of the first committee meeting will be to clarify the meaning of the statement of task and to evaluate the feasibility of the task. This meeting will be open and community input is welcome. Any concerns about the statement of task can be voiced at the meeting. The committee can recommend changes to the statement; however, any changes would require the endorsement by the National Research Council and the sponsoring agency (NSF).

Information about this OSB project and the committee's meeting schedule will be posted on their website <<http://www.nas.edu/osb/>>. UNOLS will also announce the meeting dates to the community when they become available. The committee report is expected in September 2003.

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Input from the marine science community regarding the membership and work of this committee is important and is needed now. Over recent years, the community has addressed the issues of future deep submergence facility needs and the continued need for human occupied vehicles. Their recommendations are documented in the reports from two meetings dedicated to submergence technology concerns, the SEA CLIFF Working Group Report, <<http://www.mlml.calstate.edu/unols/dessc/desmt708/desmt708.html>>, and the DESCEND Workshop Proceedings, <<http://www.mlml.calstate.edu/unols/dessc/descend/descend.htm>>. DESSC has made recommendations regarding this issue in several recent publications (Public comments to the Ocean Science Commission in May and in July, and the EOS article *Being There*, which can be viewed as a pdf at [http://www.unols.org/dessc/papers/being\\_there.pdf](http://www.unols.org/dessc/papers/being_there.pdf)>). Comments regarding this issue have also been provided by some individuals in the community (message from D. Fornari 11/26: <[http://www.unols.org/dessc/papers/DJF\\_commun\\_letter\\_final.pdf](http://www.unols.org/dessc/papers/DJF_commun_letter_final.pdf)>).

Those in the marine science community who are interested in these issues should provide input to the process by contacting Dan Walker at the National Academies Ocean Studies Board, <[dwalker@nas.edu](mailto:dwalker@nas.edu)>.



## SHIP NEWS

### CAPE HENLOPEN Replacement Vessel (CHRV) -

The CHRV design effort is progressing. The basic model-testing program has been complete. Tank tests were completed in early November at the Vienna Model Basin. Improvements made to the design as a result of the testing include the addition of a bulbous bow. A stern extension is also being considered to improve flow from the Z-drives. Propeller cavitation tests are scheduled for late February.

The target date for completion of a construction bid package is March 31, 2003. The “Final” design phase with science review will follow the yard selection in late 2003. They expect to begin cutting steel in mid-2004 with delivery/sea trials in 2005. For more information about the CHRV design, visit their web site: [www.ocean.udel.edu](http://www.ocean.udel.edu).

**PELICAN Mid-Life** - The PELICAN Mid-life improvement effort is underway. The improvements include replacement of electrical wiring and piping. The ship’s cabinetry is also being replaced. The ship will be extended 10 feet. The dry lab will be increased by 200 sq ft. and two new science bunks will be added. Total science accommodations will be 15 berths.

**Alaska Region Research Vessel (ARRV)** – The ARRV is in the last part of the preliminary design phase. The open water model test results have been received which include calm water resistance and sea-keeping characteristics. In general, the open water model test results show that the vessel will provide an excellent ride in seas up through Sea State 5.

An acoustic survey of R/V REVELLE was made in November. This acoustic survey was needed in order to establish the baseline for the ARRV underwater noise characteristics. The ARRV design committee and consultants held a preliminary design review meeting in Seattle on 4 and 5 February 2003 and discussed the radiated noise test results and open water model tests. Testing indicates that radiated noise levels are high. Options for reducing the estimated noise levels are being considered. This might include changing the propulsion system to z drives from Azipods.

**Ewing Mid-Life Refit Plans** - Lamont-Doherty Earth Observatory (LDEO) hosted a meeting on October 22-23, 2002 to discuss mid-life upgrades of R/V MAURICE EWING. The meeting was attended by 51 scientists, marine technicians, marine engineers, and marine operators from the U.S. marine research community.

EWING provides the academic community with a multichannel seismic (MCS) and refraction source capability within the UNOLS fleet. More than 50% of the programs accomplished required use of MCS.

To facilitate the workshop discussions, a series of “Technical Option” papers were prepared in advance of the meeting. These papers address:

- Dynamic Positioning
- Multibeam/sidescan/acoustic capabilities
- Lab layout/vans/science berths/storage
- Airgun array
- Multiple streamers
- New design for 2-D system
- Computer/infrastructure
- Deck layout/winches/cranes/coring and over-the-side handling
- Estimates of magnitude of future needs for 2-D, 3-D and Hi-Res Seismic Reflections
- Contracting Commercial 3-D
- Replacement Vessel
- Technical Support Services

The Technical Options papers are available on the EWING website at: <http://www.ldeo.columbia.edu/Ewing/Home.html> under “Midlife Refit Workshop”.

**CAPE HATTERAS Mid-Life** - CAPE HATTERAS is undergoing mid-life improvements. The improvements began in October 2002 and are expected to be complete by 1 June 2003. The major improvements include:

- Renovation of main lab, wet lab, galley, mess, all cabins;
- Relocation of deck crane from main deck to 01 deck;
- Creation of one 2-person stateroom; and
- Replacement of HVAC and water piping.



## UNOLS Scenes – December 2002

UNOLS ended 2002 with the December DESSC Meeting and a UNOLS booth at the fall AGU Meeting in San Francisco. Here are a few scenes from December...

The DESSC Meeting was held on 5 December and was well attended with close to 80 participants. At the meeting, Dan Fornari was presented with a print from the UNOLS/DESSC community in recognition of his dedicated service to the community in his role as Chief Scientist for the National Deep Submergence Facility. *From left to right: Patty Fryer (DESSC Chair), Dan Fornari, and Mike Perfit (DESSC Past Chair).*



The group picture of current and past UNOLS Chairs has become a tradition at the UNOLS booth during the AGU fall meetings. *From right to left: Tim Cowles, OSU (Chair - 2002-2004); Bob Knox, SIO (Chair - 1998-2002); Ken Johnson, MBARI (Chair - 1994-1998), Garry Brass, ARC (Chair - 1990-1994), Richard "Dick" Dugdale, SFSU (Advisory Council Chair - 1974-1977).*

Members of the UNOLS Council and Committees volunteered their time to help out in the UNOLS Booth. *Shown from left to right: Back row: Tom Shipley, U. Texas (Council); Dale Chayes, LDEO (RVTEC Chair); Garry Brass, ARC (UNOLS Past Chair), Mike Prince, (UNOLS Office); Bob Knox, SIO (UNOLS Immediate Past Chair); front row: Larry Atkinson, ODU (FIC Chair), Annette DeSilva, (UNOLS Office); Hedy Edmonds, (AICC); and Tim Cowles, OSU (UNOLS Chair).*



## 2003 UNOLS CALENDAR OF MEETINGS

Committee	Meeting	Start Date	End Date	Location/Notes
Council	Winter Meeting	March 5	March 6	USCD-SIO - La Jolla, CA
Council	Summer Meeting	TBD	TBD	Location TBD
DESSC	Spring Meeting	June 11	June 12	WHOI, Woods Hole, MA
Scheduling	Summer	July 23		NSF
Scheduling	Fall	Sep 17*		NSF
FIC	Fall Meeting	Sep 17*		NSF
Council	Fall Meeting	Sep 18*		NSF
UNOLS	Annual Meeting	Sep 19*		NSF
RVOC	Annual Meeting	Oct 8	Oct 10	U Minnesota, Large Lakes Observatory, Duluth, Minnesota
RVTEC	Annual Meeting	TBD	TBD	Location TBD
AICC	Fall Meeting	Nov.		Seattle
DESSC	Fall Meeting	TBD		San Francisco, CA (Location TBD)

\* These dates are tentative

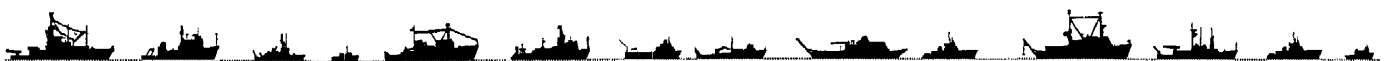


*I would like to thank all who contributed information and articles for this issue of the Newsletter. Articles are always welcome and encouraged. Copy can be submitted via mail, FAX or e-mail.*

*Thank you, Annette DeSilva - Editor, UNOLS News*

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