



UNOLS NEWS

Volume 29, No. 1

December 2013

UNOLS Council

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- Wilford Gardner (TAMU)
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Executive Secretary
Jonathan Alberts



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A Message from the UNOLS Chair...

It will come as no surprise to our membership that 2013 has proved to be an especially challenging year to UNOLS as it has to all of the U.S. scientific community. Within UNOLS we have had to adjust our budget and reduce costs given the unfortunate sequester of “discretionary” federal funding. At the same time, UNOLS programs intended to reach out to the broader community and to engage younger scientists including students were very well received and neither we nor our federal sponsors wanted us to reduce our efforts in those directions. They constitute the future of Ocean Sciences and of UNOLS. We adapted primarily by reducing the number of UNOLS meetings. In October, we experienced the unnecessary and self-destructive government shutdown, which forced us to delay the scheduled UNOLS Annual Meeting. This was particularly disappointing not only because there were a number of pressing issues to discuss with our federal agency sponsors but also because Senator Whitehouse (D-RI) had generously agreed to be our featured speaker. Given the present Continuing Resolution and ongoing budget impasse, we were then forced to entirely cancel the 2013 Annual Members Meeting. UNOLS Members were asked to vote electronically on filling Council vacancies. Both the Council and the Fleet Improvement Committee will have to wait until March 2014 to meet with the federal agencies in Washington. Despite these setbacks, progress was made on a number of fronts.

In early November, four Council members including the Chair were invited to Hawaii to advise the Schmidt Ocean Institute (SOI) at its first research symposium. SOI funded the retrofit of the R/V *Falkor* and is offering its services to the ocean science community. Private vessels and private funding are, and we hope will continue to be, an increasing component of the ocean science enterprise. They will not substitute for but can critically supplement the federal investment. In addition, UNOLS Council and the Consortium of Ocean Leadership strongly recommended NSF commission the National Research Council (NRC) to conduct a Decadal Survey focusing upon future ocean science needs for infrastructure. We were pleased that the Ocean Sciences Division was able to secure support for this effort, a stellar committee was chosen and their second meeting was held in San Francisco on December 5 and 6 prior to the AGU meeting. Your Chair and the UNOLS Executive Secretary were graciously invited to address the committee and emphasized, *inter alia*, the necessity of implementing a robust, defensible and efficient process to renew the aging UNOLS fleet.

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Message from the UNOLS Chair... (continued from page 1)

Lastly, I would be remiss if I did not comment upon the anonymous *Nature* [Vol 501, p 461] editorial of September 26, 2013 entitled “Counting the Costs” which concluded that NSF should delay its construction of the Regional Class Research Vessels in light of present funding woes. The UNOLS Council responded on your behalf and *Nature* published a shortened revision of our written response. The response was included in *Nature*, Vol 504, Dec 12, 2013, p 218 (our full original response is included in this Newsletter on page 10). We stressed the necessity of maintaining a robust fleet capable of supporting present and planned ocean science projects and noted that, even with timely construction of all three Regional vessels, the academic fleet will be markedly shrinking over the coming decades. We also called for an improved funding model integrating construction, operations, and scientific

utilization. Given the increasing pace (and alarming direction) of global environmental change, society desperately needs additional investment in ocean research infrastructure; the discussion should not be entirely focused upon the least harmful way to reduce expenditures. These same points were emphasized to the NRC Committee.



Peter Ornter, UNOLS Chair (Photo by: Laila Borberg-Graham (CIMAS))

About this issue of *UNOLS News*

Regretfully, the 2013 UNOLS Annual Meeting was cancelled due to the Federal Government Shutdown. Senator Whitehouse (D-RI) had generously agreed to be our featured speaker. We hope to reschedule his presentation at a future UNOLS meeting.

This Newsletter includes reports, articles, and updates on many of the topics that would have been presented at the Annual Meeting.

The Annual Meeting offers a venue for recognizing key individuals who served UNOLS and the community. This year, Council Member, John Morrison, completed his second term on the UNOLS Council. Although we couldn't recognize John before the membership, we were fortunate to have the opportunity to present him with a certificate of appreciation during a recent visit to the UNOLS Office.



Caitlin Mandel (left) and Rosemary White (right) present John Morrison with a UNOLS Certificate of Appreciation (Photo by A. DeSilva)

2013 UNOLS Election Results

The 2013 UNOLS Elections were conducted virtually this year by mail (electronic and postal). We are pleased to announce the following results:

- Tammi Richardson (University of South Carolina) was elected to fill the Non-Operator Council Position
- UNOLS Membership Applications were approved for Michigan Technology University and University of Massachusetts Dartmouth
- The proposed revisions to the UNOLS Charter were approved and the Charter was re-adopted.



UNOLS Fleet Renewal Activities

Delivery of R/V *Sikuliaq* Approaches!

by Dan Oliver (UAF)

Excitement is growing as delivery of *Sikuliaq* from the shipyard in Marinette, Wisconsin approaches. The ship has gone through two of four phases of underway trials with three days of successful propulsion grooming in October this year and Builder's Trials in November. Propulsion trials went well enough that the shipyard used tugs to escort *Sikuliaq* down the Menominee River only on the first day of the trials; all subsequent transits up and down the river have been done without any tugs standing by (Figure 1).

In mid-December the shipyard took the ship out for Failure Mode and Effect Analysis testing with the US Coast Guard and to complete a number of Builder's Trial tests that were not accomplished in November. After the holidays, *Sikuliaq* will get underway in mid-January where it should see its first ice when transiting down the Menominee River and out into Green Bay in Lake Michigan as part of Acceptance Trials. Delivery to University of Alaska Fairbanks will follow a number of weeks later. Once the St Lawrence Seaway opens in the spring, *Sikuliaq* will start a series of post-delivery trials in the ice of Baffin Bay and along the eastern seaboard. The post-delivery trials will evaluate the ship's icebreaking capability, fully test the science systems in the ice, the winches and sonars in deep water, and assess the ship's sea keeping characteristics in preparation for starting funded science in September 2014.



Figure 1: R/V *Sikuliaq* heading out for the second day of propulsion trials

Sikuliaq's integrated bridge system and dynamic positioning system is provided by Marine Technologies. There are four control console locations on the ship; the main ship control console in the pilothouse, a port and a starboard bridge wing control console, and the fourth faces aft overlooking the fantail in the Science Control Room. Below (Figure 2) is a picture of the main control console located centerline in the pilothouse. It includes a bridge control chair (complete with coffee cup holder) where the ship can also be controlled in dynamic positioning or autopilot.

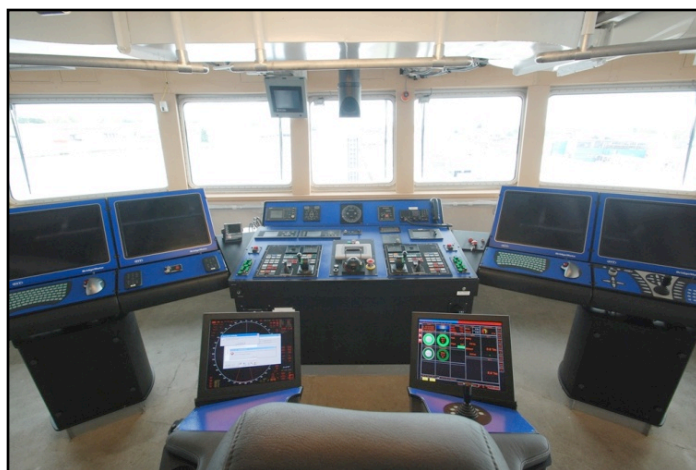


Figure 2: Main control console located centerline in the pilothouse.

All of the ship's over-the-side handling gear has been load tested pier-side and has gone through initial operational testing underway during Builder's Trials. All the winches and over boarding systems will be tested a final time by the shipyard during Acceptance Trials, but because of depth limitations in Lake Michigan all the shipyard provided winch testing will be in shallow water. Part of *Sikuliaq's* post-delivery testing will take place in the Puerto Rico trench where all of *Sikuliaq's* over boarding systems will be tested to below 6,000 meters.

The primary deployment location for the CTD winch is through the starboard side of the ship, out of the Baltic Room using a load handling system boom. In addition to vertical deployments the load handling system can also tow and in this first picture of the boom (Figure 3) you see it rigged up pier side at the shipyard for load testing in a tow configuration. When

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deploying vertically the load handling system provides hands free deployment of a science package down to the water's edge. The next photo (Figure 4) shows the boom deploying a CTD frame during the initial operational testing performed on Builder's Trials.



Figure 3: Boom in a tow configuration.



Figure 4: Boom deploying a CTD Frame.

Sikuliaq's A-frame has been designed for the breaking strength of a 1-inch wire when in one of its stop positions and a luffing capability of 30,000 pounds. To facilitate maintenance on the A-frame and to make it easier to attach rigging to it, the frame will lay forward horizontally in a maintenance position that allows easy access to the cross member. It has a stowed position and a primary deployed position which is what you would normally expect to see for an A-frame, but there is also a secondary deployed position. The secondary position is with the A-frame lying aft horizontally to bring the wire closer to the water's surface to facilitate towing in the ice. Figure 5 is a photo of the A-frame in the secondary deployed position sitting pier-side at the shipyard.



Figure 5: *Sikuliaq's* A-Frame.

The *Sikuliaq* crew is coming together with all but the last few being at the shipyard in December to start shipyard provided familiarization training. The last few crew members arrive in early January to participate in the final phase of shipyard provided training and all will move aboard the ship upon delivery.



News from the Regional Class Research Vessel (RCRV) Project

by Clare Reimers, RCRV Project Scientist

The next major ship acquisition planned for modernizing the Academic Research Fleet is for up to three new NSF-owned Regional Class Research Vessels (RCRVs). In December 2012, NSF selected Oregon State University (OSU) as the Lead Institution for managing a RCRV design refresh, shipyard selection, construction, commissioning, and eventual transitioning to operations as a UNOLS vessel. An OSU team headed by Demian Bailey and supported by Naval Architects, Marine Design Engineers, Systems Engineers, and Acquisition Professionals has delivered to NSF its Conceptual Design Review (CDR) package that underwent panel evaluation in early December 2013. CDR is the project's first major milestone for setting the project baseline for a Major Research Equipment and Facilities Construction (MREFC) budget request to Congress.

The RCRV team receives oversight and guidance from a 12-member Science Oversight Committee (SOC) with regional representation and multidisciplinary expertise in science mission areas supported by the federal agencies that contribute to UNOLS. The design has many enhanced capabilities including:

- Twin azimuthing drives and dynamic positioning
- A retractable centerboard to support integrated acoustic systems
- Large aft deck for operational flexibility and side-by-side 20' laboratory vans
- High bandwidth satellite telecommunications
- Acoustic quietness
- Energy efficient features
- ADA referenced accessible stateroom and labs
- Berths: 28 (16 for science complement)
- Endurance: 21 days
- LOA: ~175 ft, Beam- 40 ft, Draft- 12.5 ft

A 17 ft scaled-model of the design underwent testing at the Centrum Techniki Okretowej (CTO) facility in Gdansk, Poland during October and November of 2013 to

confirm hull performance aspects of ship maneuvering, speed and power characteristics, seakeeping performance, bubble sweep-down, and propeller cavitation. So far the project team is pleased with the test results and looking forward to the next stages of refining the design assuming a successful CDR in December 2013.

To follow the progress of the RCRV Project visit:
<http://www.ceoas.oregonstate.edu/ships/rcrv/>



Figure 1: 3D rendering of the RCRV's starboard profile, prepared by Glosten Associates



Figure 2: RCRV model testing November 2013, Gdansk, Poland



R/Vs *Neil Armstrong* and *Sally Ride* Take Shape

by Annette DeSilva, UNOLS

The Navy's construction of two new Ocean Class Auxiliary General Oceanographic Research (AGOR) ships is well underway. The vessels are taking shape at the Dakota Creek Industries, Inc. shipyard in Anacortes, WA (Figures 1 and 2). At the recent RVTEC meeting in November, Tim Schnoor (ONR) presented details and photographs about the Navy's Ocean Class AGOR Project. His slides are available at:

<http://www.unols.org/meetings/2013/201311rvt/201311rvtap09.pdf>

The first ship (AGOR27) will be operated by Woods Hole Oceanographic Institution and is named *Neil Armstrong*, after the first man to walk on the moon during the 1969 Apollo 11 mission. Scripps Institution of Oceanography will operate the second ship (AGOR 28), which has been named in honor of the first woman in space and former Scripps/UCSD Professor, Dr. Sally Ride.

The key characteristics of the vessels include:

Hull Material	Steel; Aluminum pilothouse
Length	238 ft
Beam (Max)	50 ft
Draft	15 ft
Sustained Speed	12 kts
Range	10,545 nm
Endurance	40 days
Accommodations	20 crew, 24 science berths

Launch of R/V *Neil Armstrong* is planned for February 2014 and launch of R/V *Sally Ride* will follow six months later in August 2014. Delivery of the ships is scheduled for October 2014 and April 2015, respectively. Both ships have been added to the UNOLS Ship Time Request System and can be requested for future science operations.

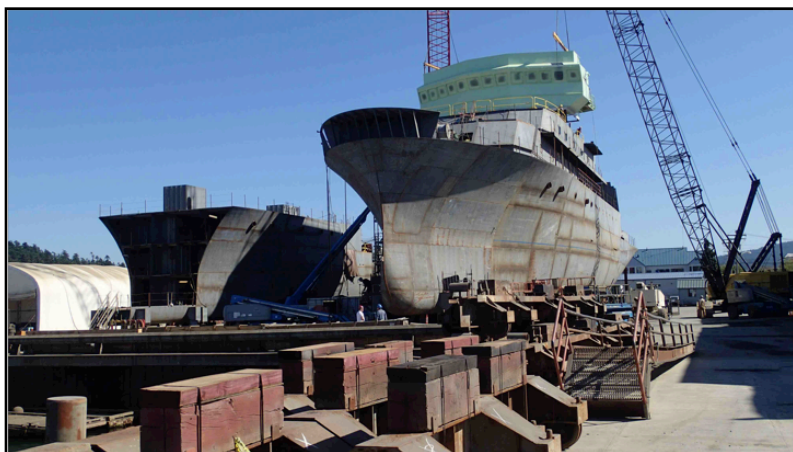


Figure 1: Pilot House being installed on *Neil Armstrong*. (photo courtesy of the Navy)



Figure 2: *Sally Ride* Pilot House fabrication nears completion. (photo courtesy of the Navy)



Future Chief Scientists Receive Hands-On Training in UNOLS Workshop

by Caitlin Mandel (UNOLS) and Clare Reimers (FIC Chair)

On October 22, 2013, fourteen early career scientists departed for the sea above the Hudson Canyon in the Mid Atlantic Bight. This weeklong cruise aboard the R/V *Endeavor* was part of a training workshop, a sort of boot camp experience for early career scientists designed to teach them how to effectively plan and conduct a research cruise as a chief scientist. Their training actually began on land two days prior, as the participants received additional guidance in topics such as how to submit a UNOLS ship time request, how to use deep submergence assets, and a discussion of the science budgeting process by Rose Dufour from NSF.

This was the fourth chief scientist training cruise held since 2011, and the first to occur on the East Coast. The program was created by Dr. Clare Reimers of Oregon State University and is

funded by the National Science Foundation and the Office of Naval Research. This year's workshop participants hailed from twelve different institutions and their disciplines included biological, chemical and physical oceanography, applied ocean science, and marine geology and geophysics. The group's research interests and backgrounds determined the science agenda as the team worked together to design a cruise itinerary. Of course, flexibility is a crucial skill when conducting science at sea; one that was definitely practiced as unfavorable coring locations and foul weather required on the fly changes to the cruise plan, and reorganization of the twelve projects aboard.

Research activities aboard this expedition included testing a CTD-mounted microscopic camera, microbial and geochemical

sampling of sediment cores, and a project aimed at describing the mesoscale effects of coastal organic matter runoff on bacterial carbon processing. To read more about the 2013 Chief Scientist Training Workshop participants and their research, please see their cruise blog at csw.unols.org.

Results from post-workshop surveys have demonstrated that this program is valuable not only for making these early career scientists more comfortable with planning and executing a research cruise, but also for providing a valuable environment for future scientific collaborations.

The program will take a new form in 2014 by taking advantage of a transit cruise available from Barbados to Bermuda on the R/V *Atlantic Explorer* (see announcement on page 8).



Chief Scientist Training Cruise Participants, Marine Technicians, and Instructors aboard the R/V *Endeavor* in October 2013. (Photo by Annette DeSilva)



~ Announcement ~

2014 Chief Scientist Training Cruise Opportunity

Application Deadline: January 10, 2014

New to planning oceanographic field work? Wondering how to request research vessel time, or to request a submersible or ROV? Needing samples or wire-time to initiate a research project? If so, take part in the “2014 UNOLS Chief Scientist Training Cruise.”

This cruise, pre-cruise informational phone conferences, and a post-cruise workshop will instruct early career marine scientists, including PhD students and postdocs, on how to effectively plan for, acquire, utilize, and report on time at sea for multi-disciplinary research and education. This is a transit cruise aboard R/V *Atlantic Explorer* beginning in Bridgetown, Barbados on May 30 and ending in Bermuda on June 8, 2014. The cruise will be followed by a 3-day post-cruise workshop at the Bermuda Institute of Ocean Sciences (BIOS). Small stipends are provided for participant travel costs, research supplies and shipping. Space is limited.

To apply you must be an employee or student (US Citizen or permanent resident) at a U.S. institution or a U.S. citizen working abroad. To be considered, applications must be received by January 10, 2014. The application form is available at:

<https://www.surveymonkey.com/s/78BVG3>

Email Maureen Conte with questions <mconte@mbl.edu>

UNOLS Radioisotope Awareness Program

by Alice Doyle, UNOLS

The ability to use UNOLS vessels to collect samples for natural level isotope measurements as well as to conduct experiments requiring the addition of labeled isotopic compounds (enhanced radioisotope work) is important for the ocean science community. Radioisotope solutions used in enhanced radioisotope experiments are 10 to 12 orders of magnitude more concentrated than natural levels. Therefore, even a minute amount of enhanced isotope solution can devastate natural abundance work. This makes collecting samples for natural level studies on ships that have also hosted enhanced radioisotope experiments a precarious business.

Ship Operators are required by State and Federal regulations to keep their vessels clean enough to meet the Health and Safety standards. However, the limits for natural abundance work are much lower. Minimizing or eliminating contamination at these levels takes special effort on the part of the enhanced isotope scientists and the ship operators/technicians. Shipboard radioisotope users must have a heightened awareness to prevent *any* sort of contamination.

The UNOLS Radioisotope Awareness program was developed to promote awareness of potential problems and to give ship operators tools to share with their users in an effort to keep the UNOLS vessels clean for all science. The tools include:

- A one-page statement of the potential issue
- Radioisotope contamination Awareness spreadsheets for both science and crew
- Radioisotope Use Logs for each ship which includes both the
- Checklists for Cruise Planning and Shipboard Briefing Checklist

Visit: www.unols.org/info/RadAwareness.html.

This is a great resource for enhanced radioisotope users to make sure their shipboard crew understands the nuances of using radioisotopes at sea and the Radioisotope Use Logs are a good resource for natural abundance scientists.



New in Print and Video

Gender Climate at Sea

by Jon Alberts, UNOLS

In the UNOLS spirit and dedication to providing the best service to science at sea, we recognize the importance of creating an environment that promotes the best possible workplace for all of us aboard our ships. This includes a safe and harassment-free workplace. This topic has been discussed at several UNOLS meetings over the past few years and with encouragement of the UNOLS Council and our federal partners, the UNOLS Office researched what proactive steps could be taken to ensure we maintain a safe and friendly work environment.

We recognized that personal behavior and interactions sometimes need special consideration when at sea and in my research I discovered a real lack of educational material focusing on the maritime field to address this topic. Materials covering land-based offices would not effectively translate to the maritime field. In January of 2013 I met with Maritime Training Services, (www.maritimetraining.com) in Seattle to discuss whether they would develop such a film which would apply to both the academic research fleet as well as the commercial shipping sector. They saw there was a need and they agreed to produce and market this film. As UNOLS Executive Secretary, I agreed to work with them on this project and to be interviewed for the film.

“Sexual Harassment Prevention- For the Maritime Industry” was released in June of 2013 and is available for purchase through Maritime Training Services. This is a short twenty minute video which gives a good overview of the topic.

This training is intended to expose the issue of sexual harassment and promote an ethic of shared understanding and responsibility in our approach to gender issues at sea. Recognizing that each UNOLS organization covers this in their employee orientation and training, it is my hope this film will augment what they already have and provide good background information on this topic for both our permanent and relief crews, as well as our technicians and science parties.

Special thanks to NSF and ONR for supporting my participation in this and for allowing us to film from the R/V *Thomas G. Thompson* and the R/V *Pelican*. Thank you as well to the Univ. of Washington’s Doug Russell, Bill Rall and crew of the R/V *Thompson* and to LUMCON’s Joe Malbrough and the crew of the R/V *Pelican*.

UNOLS Safety Video is Released

by Jon Alberts, UNOLS

In the spring of 2013, the National Science Foundation (NSF) and the Office of Naval Research (ONR) funded the UNOLS Office to develop a new research vessel safety and orientation film. The previous film which had been produced in the mid-nineties has served us well, but we needed a fresh film to highlight marine safety improvements, changes in the UNOLS safety program, and advancements in marine technology. With input from the Research Vessel Operators’ Committee, (RVOC) and the RVOC Safety Committee, we developed a list of topics that needed to be covered in the new film. This list included:

- Embarking a Ship,
- Lab safety,
- Working on deck and other work areas,
- Fire-safety,
- Personnel and physical condition issues,
- Medical issues,
- Zero tolerance drug policy,
- Securing science equipment,
- Emergency stations and bunk cards,
- Emergency drill protocol,
- Life rafts,
- EPIRB,
- Life rings,
- Immersion suits, and
- Stability.

After a thorough review of maritime safety training film companies, we chose John Sabella and Associates of Port Townsend, WA to script, film and produce this production. The filming was conducted aboard the Research Vessel *Thomas G. Thompson* operated by the University of Washington. The video was designed to stay within about 20 minutes duration. It will be shown at all orientation and fire and boat drills. Initial filming aboard the vessel was done on August 27, 2013 and continued during a student cruise on *Thompson* from October 2-4, 2013.

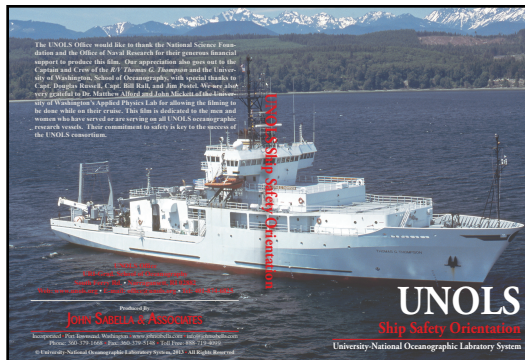
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Safety Video *(continued from page 9)*

The film is complete and has been shipped to the UNOLS Office. The UNOLS Office is distributing copies to each UNOLS ship operator institution.

The UNOLS Office would like to thank NSF and ONR for funding support as well as for allowing the filming aboard the R/V *Thompson*. We also extend our appreciation to the University of Washington port office, ship's crew and technicians, as well as the science party who made the filming possible during the student cruise.



To request a copy of the video, please contact the UNOLS Office at <office@unols.org>.

UNOLS Response to *Nature* Editorial

The 26 September 2013 issue of *Nature* [Vol 501, p 461] included an editorial titled “Counting the Costs” which concluded that NSF should delay its construction of the Regional Class Research Vessels in light of present funding woes [<http://www.nature.com/news/counting-the-cost-1.13804>]. The UNOLS Council responded and *Nature* published a shortened revision of the Council’s written response. The Council’s shortened response was included in *Nature*, Vol 504, 12 Dec 2013, p 218 [<http://www.nature.com/nature/journal/v504/n7479/full/504218a.html>]

Below is a copy of the full Council response that was initially submitted to *Nature* on November 5, 2013:

Submitted to: Editor-in-Chief, *Nature*

“The editorial ‘Counting the costs’ (Sept. 25, 2013) emphasizes the value of the Integrated Ocean Drilling Program which has been very successful over its 45 year history. It also questions past decisions made by the U.S. National Science Foundation Ocean Sciences Division to invest in the R/V *Sikuliaq* and the Ocean Observatories Initiative (OOI). While the editorial recognizes the importance of investing with an eye to the future, it concludes that NSF should delay its replacement of the academic research fleet, apparently to maintain sufficient funding for IODP.

We believe that the analysis as presented fails to recognize the degree to which the academic fleet continues to be one of the most vital elements of oceanographic infrastructure (which also includes *inter alia* OOI, the D/V *JOIDES Resolution*, and the R/V *Sikuliaq*). The increasing complexity of present large-scale globally integrated programs such as CLIVAR, GEOTRACES and GeoPRISMS and past programs such as WOCE, GLOBEC, Ridge2000, MARGINS and JGOFS requires modern vessels that can host large scientific parties using sophisticated shipboard sampling and processing equipment. In addition, many individual high-impact NSF core projects depend heavily upon the academic research fleet as do our disciplinary graduate education programs. These vessels are also required to operate and maintain the observing system assets as well as to ground-truth remotely sensed data from satellites and to launch and recover the gliders and other autonomous underwater and airborne vehicles increasingly used by the ocean research community. The daunting reality is that the replacement strategy that was criticized in the editorial is in fact less than what is necessary to replace an outdated U.S. research fleet whose increasing age and operational/maintenance costs and degraded capabilities have rendered it barely capable of providing the infrastructure support required by the ocean science community. This will be true even if all three regional research vessels are constructed as planned.

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The problem we face is how to best provide infrastructure which takes many years to decades to design and build, within a budgetary system that has time scale perturbations of one year (or even less as seen all too recently). Additionally we need a new business model under which funding, not only for construction but also for the maintenance and operation of major community research infrastructure, is separated from core science budgets. Increased investments in core science and infrastructure are both necessary and must be complementary not competitive. That is why UNOLS strongly supports the recently initiated National Research Council's Decadal Survey of Ocean Sciences, which will include an analysis of the research infrastructure needed to address priority research questions.

Understanding how our planetary system operates is one of the most urgent and complex scientific problems facing humanity, and requires measurements of a myriad of Earth-Ocean-Atmosphere system processes on a daunting range of geographical and temporal scales. A primary goal of the ocean scientists relying upon the infrastructure under discussion (and currently at risk) is to identify and quantify earth system processes to understand and model their interconnections, enabling the implementation of effective adaptation and mitigation strategies in light of the rapid pace at which our world is changing. Properly informed, science-based policies and strategies will save the country far more money than the cost of the infrastructure needed to provide it. We argue that now is the time to spend more on our facilities, not less, and there is little time to waste.

Sincerely,



Peter B. Ortner, UNOLS Chair

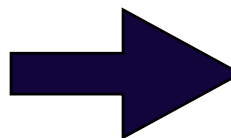
This response represents the consensus of the University-National Oceanographic Laboratory System (UNOLS) Council, the operating and governing body of UNOLS - an organization of 59 U.S. academic oceanographic institutions working in cooperation with federal agencies to ensure broad access to modern, well-operated, state-of-the-art research vessels, aircraft, submersibles, and facilities required to support a healthy and vigorous research and education program in the ocean sciences.

The UNOLS Website and Logo will get a new Look in 2014!

2014 will bring a new look to the UNOLS website and logo! A long overdue redesign of the website will soon get underway. A web designer has been contracted and we are excited to kick off our first meeting in early January.

We welcome your web-related suggestions and ask for your patience during the upcoming transition phase.

Here is a preview of the new UNOLS logos:



UNOLS Committee News

Fleet Improvement Committee (FIC) - 2013 Report of Activities

by Clare Reimers, FIC Chair

Fleet Improvement Committee (FIC) activities in 2013 have focused on facilitating community feedback to the Federal agencies that support the UNOLS Fleet, outreach to early career scientists, and gathering information to inform Fleet renewal plans. Early in the year the committee endorsed plans to invest up to \$30 million in mid-life refits for the Navy-owned AGOR 23-25 hulls; R/Vs *Thompson*, *Revelle* and *Atlantis*. These Global Class vessels are essential to the fleet because they can carry large payloads and science parties, support Remotely Operated Vehicles (ROVs) and Human Occupied Vehicles (HOVs), and collect data with a broad complement of acoustic sensors. The FIC deemed that mid-life investments will be cost-effective and are needed to improve the reliability and efficiency of basic vessel propulsion and power distribution systems. After refit, the AGORs are expected to have another 20 years or more of service.

The R/V *Thompson* or R/V *Revelle* was also recommended as the best candidate vessels for carrying the Long Corer after the

R/V *Knorr's* retirement in 2014. This recommendation was issued on 10 April 2013 as part of a community-wide report generated after a well-attended webinar to discuss the future of the Woods Hole Oceanographic Institution (WHOI) Long Core System. Many members of the Marine Geology and Geophysics community and the FIC came together and made compelling arguments for retaining the WHOI Long Core as a unique and valuable sampling tool in marine geoscience. The National Science Foundation (NSF) continues to advise that the fate of the Long Core will depend on proposal pressure, and difficult programmatic trade-offs. They also favor further evaluations of the R/V *Marcus Langseth* as the vessel most likely to support future WHOI Long Corer operations.

The UNOLS Early Career Investigator Chief Scientist Training Program has continued and received 44 applications in 2013. NSF and ONR generously support this program that is designed to teach cruise leadership and strategies to enhance the extent that planned science objectives are met at sea. In October, the fourth

informational short course and participant-led multi-disciplinary cruise of the program was held. Fourteen participants from 12 institutions gathered at the University of Rhode Island's Narragansett Bay Campus then sailed on the R/V *Endeavor*.

FIC is approaching fleet renewal planning from several directions. First to better understand true trends in fleet capacity, operators were asked to complete a survey to identify optimal ranges for each vessel to conduct work at sea annually. These numbers are being combined with numbers of science berths and Projected Service Life timelines to quantify available person-days for science at sea. These considerations are also being developed for a new web-based Fleet Improvement Plan that when released in 2014 will be linked to supporting documents and updated annually. A critical area of recommendation is expected to be the fate of the Coastal/Local class of UNOLS vessels. There are presently six vessels in this class, but three are due to be removed from service by 2020.

Scientific Committee for Oceanographic Aircraft Research (SCOAR) Report

by Daniel S. Schwartz, SCOAR Chair

About 230 years ago, as Captain James Cook's exploring vessel approached the Hawaiian Islands, he was depending upon the eyes of a lookout perched high in the rigging. The effective horizon of that ship, for spotting a target on the sea's surface, was about 12 miles. A research vessel in the first decade of the twenty-first Century

has nearly the same circle of observation around it at sea, extended maybe fifteen to fifty percent through the use of electro-magnetic and acoustic sensors. However, the confluence of new technology, lightweight advanced sensors, and 100 year old heavier-than-air aircraft evolution, now offers an extension

of a research ship's effective horizon by a couple orders of magnitude.

Since the 1970s, satellite instruments have offered a phenomenal big-picture view of the world ocean and many ocean processes from internal waves, to coastal zone color and biological productivity, to discovery of new

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SCOAR Report (*continued from page 12*)

seamounts. The temporal and spatial scales at which satellites provide ocean observations make them best thought of as strategic rather than tactical tools, and, depending upon the RF and electro-optical wavelengths employed by their sensors, night, cloud cover, and solar sea surface glare can limit their effectiveness. Manned aerial platforms, operated from the littorals, such as CIRPAS's Twin Otter, NOAA's Gulfstream, or USCG's C130s have long endurance and can embark a significant payload of sensors, the technicians to operate them, and expendables such as droppable XCTDs or other buoys. Occasionally, these have been tasked to work in coordination with surface ship platforms, but operating costs, timing issues, and the distance to a research site from adequate supporting airfields makes allocation of these resources an uncommon event. Additionally, some studies -- such as collection of aerosols near the air/sea boundary -- require sustained, accurate low-level flight near the surface, far offshore. Such operations may be deemed fatiguing and high risk to aircraft and aircrew.

Vertical take-off and landing (VTOL) aircraft (i.e. helicopters and more recently, tilt-rotors) have been operated from ship decks since the 1940s. Whether embarking sensors, ferrying scientists between ship and shore or ice stations, or reconnoitering leads in the ice, helicopters have repeatedly demonstrated their utility. However, rotor-wing aircraft are expensive to operate, and considerable deck "real estate" and infrastructure (for fueling, maintenance, fire-fighting, etc.) limits their carriage to Ocean or Global Class ships -- or larger.

New unmanned aerial platforms operated remotely by pilots on shore or on a ship, or flown in an autonomous mode, are becoming available as an increasingly accessible asset in the oceanographer's "toolbox." The rapid emergence of unmanned aerial systems (UAS) has been widely reported, and their commonplace utilization for ship-based ocean observations and data-collection is on the horizon. Modest sized ships can launch and recover these platforms, and recent projects on UNOLS vessels illustrate the evolution -- and increasing maturity, reliability and effectiveness -- of UAS during at-sea science operations.

The UNOLS SCOAR continues to monitor new developments in aerial platforms, sensors, launch and recovery systems, and applications, in the context of their utility to investigators in our community. A number of teams of engineers and scientists employing and experimenting with UAS have emerged recently at several of our member institutions. Some have expressed an interest in standing up shared-use facilities, accessible to funded investigators in a mode similar to our coordination of the academic fleet vessels. Also, several UNOLS member institutions are partnering with other entities in responding to a FAA solicitation for the establishment of designated airspace areas (most of which are over water) for experimentation and demonstration projects with UAS. Meanwhile, the pace of innovation in aerial platform design, lightweight and ever more capable sensors, increased battery energy density, and missions and applications, is rapid.

In recent meetings, SCOAR has taken on several tasks:

1.) A draft chapter for the UNOLS Research Vessel Safety Standards

(RVSS) has been written and is in review by the committee and the UNOLS Office, outlining safe operational procedures and standards for the use of aircraft off the UNOLS vessels -- akin to those promulgated for over-the-side and human-occupied undersea vehicle operations. Once the review is completed within SCOAR, it will be sent to the RVOC Safety Committee for its input.

2.) A draft letter of procedural guidance for member institutions seeking designation as UNOLS aircraft-operating institutions has been written and edited and discussion of this topic will be a requested agenda item for the next in-person Council meeting.

3.) Operations manuals and procedures publications for use of UAS (and other autonomous systems) aboard the ships of the Navy, the Coast Guard, NOAA, and the International Research Ship Operators organization (IRSO) have been acquired and are under study. This will lead to a best practices document for ship-based UAS deployments, oriented to the vessels of the UNOLS academic fleet. When completed by SCOAR, a draft will be circulated for broader input.

4.) Regulatory constraints on operation of UAS within national airspace and over the near-shore areas complicates utilization of unmanned aerial platforms by coastal science investigators. The FAA is laying out a "roadmap" for integration of UAS into United States airspace, with a possible release date sometime in 2015. SCOAR will continue to monitor the national and international dialog regarding the operation of UAS in shared use airspace, and the committee will forward any information it acquires to our community through the SCOAR_plus UNOLS list serve.

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SCOAR Report (continued from page 13)

5.) Finally, SCOAR applied to the conveners of the Ocean Sciences 2014 meeting for a session, under the leadership of SCOAR member Luc Lenain PhD (SIO), on oceanographic aircraft, manned and unmanned. Eight abstracts had been submitted with at least two more committed. However, the meeting's organizers have pulled the session citing the scheduling of too many OS-2014 sessions with many more papers. The papers committed to this session have been reassigned to other sessions and will still be presented.

In an era likely to be characterized by increasingly austere budgets for conducting at-sea field research, the integration of inexpensive, capable aerial platforms into the traditional roles of the UNOLS research fleet in conducting science operations offers a promising way to provide a cost-effective expansion of the ships' observational and data-collecting "footprint." This is a time of rapid change in platforms and technologies and the members of SCOAR look forward to sharing their excitement for new airborne oceanography mission capabilities with the broader UNOLS community.



The SCOAR Committee examines an unmanned aerial system (UAS) at the 2013 SCOAR Meeting held at Woods Hole Oceanographic Institution (Photo by A. DeSilva)

U. Maryland hosted 2013 Research Vessel Operators' Committee (RVOC) Meeting

by Annette DeSilva, UNOLS

The University of Maryland Center for Environmental Science Chesapeake Biological Laboratory hosted this year's RVOC meeting in Solomons, MD on April 23 - 25, 2013. Joe Malbrough, RVOC Chair, presided over the three-day meeting which included a very full agenda. Some of the major discussion topics and reports included:

- Group Purchase updates of Shipboard Scientific Support Equipment items
- Agency reports
- UNOLS wire & wires
- Post cruise assessments
- Satellite Communication Systems
- Handling system update
- Medical service update
- The UNOLS ship inspection program

The meeting included a variety of informative presentations. UNOLS Risk Manager, Dennis Nixon, provided his annual update on Admiralty Law & Insurance, "Ship Happens." International ship operators participated in the meeting and provided reports. Guest speaker, Dr. Carlos Comperatore of USCG-Office of Safety & Occupational Health, gave a talk titled "Managing the Effects of Crew Endurance Degradation on Operational Hazard Exposure."

RVOC participants enjoyed a tour of U. Maryland's R/V *Rachel Carson* –

In other RVOC news, Doug Russel (U. Washington) moved into the RVOC Chair position in September. Joe Malbrough was recognized for his generous service as the RVOC Chair.

The 2014 RVOC meeting will be hosted by Skidaway Institute of Oceanography in Georgia.



Figure: 2013 RVOC Meeting participants, Solomons Island, MD



2013 was a Busy Year for the Research Vessel Technical Enhancement Committee (RVTEC)

by Annette DeSilva, UNOLS

2013 was a busy year for RVTEC with “two” Annual Meetings. The 2012 RVTEC meeting was postponed due to the damage caused by Hurricane Sandy. As luck would have it, the 2012 meeting was rescheduled for February 2013, just in time for Winter Storm Nemo! RVTEC members braved the storm and traveled to Lamont-Doherty Earth Observatory (LDEO) in Palisades, NY. Despite the weather challenges, there was record attendance with close to 100 participants. The meeting was a great success with many hands-on break-out sessions and informative presentations.

In November, Texas A&M University (TAMU) hosted the actual 2013 Annual Meeting at College Station, TX. The meeting was well attended and again a big success. David Fisichella chaired the meeting. Participants were actively engaged in the technical break-out sessions that included topics such as:

- Cable Care & Maintenance, and Spooling
- Multibeam Advisory Committee (MAC)
- Acoustic Workshop
- Ship/Shore Communications
- Dual FBB Antenna Configuration
- R2R & Data Management
- Cruise Planning App
- Ship-to-Shore Real-Time File Transfer
- Gravimeters
- Appendix A & B
- Transducer Testing
- Precision Timing
- Uncontaminated Seawater

Tours of the TAMU facilities were offered and included: the Geochemical and Environmental Research Group (GERG) Facility, the Coastal Engineering Lab, the Offshore Technology Research Center (OTRC), and the Integrated Ocean Drilling Program (IODP).

In 2014, the RVTEC annual meeting will consist of a one-day meeting the day before the start of the International Marine Technicians’ (INMARTECH) Symposium (see the INMARTECH announcement below).



RVTEC Members participate in the Arduino break-out session at the RVTEC meeting hosted by LDEO (photo by Annette DeSilva)



Announcement: INMARTECH Symposium - November 18-21, 2014

The 9th INMARTECH Symposium will be held on November 18-21, 2014 in Corvallis, Oregon (USA) at the LaSells Stewart Center and the CH2M HILL Alumni Center at Oregon State University.

The INMARTECH Symposium provides a forum for (operational) marine technicians to meet and exchange knowledge and experiences. These exchanges provide useful information that helps to foster the improvement of equipment performance and operational techniques during scientific cruises on research vessels.

Marine technicians from the US and International communities are encouraged to attend. Registration will open soon

For additional details about the Symposium, visit <http://inmartech2014.com/>



Arctic Icebreaker Coordinating Committee (AICC) - Activities Report

by Lee Cooper, AICC Chair

The AICC held a telephone meeting coordinated by the UNOLS Office on June 18, 2013. Among the topics of discussion were meeting reports from the industry-oriented Open Water Meeting in Anchorage in March, practical problems related to providing National Ice Center analysts berth space on *Healy* and associated travel costs, and an update on the construction status of R/V *Sikuliaq*. Reports from agencies with missions to undertake or support arctic research were received, and the Coast Guard provided information on mission readiness for *Polar Star* and the support she will provide for Operation Deep Freeze in Antarctica this austral summer.

Another topic of discussion was the evaluation of risks associated with the logistics of scientific party exchange stops in Barrow. Barrow is geographically logical for many of the *Healy* science team exchanges for work the ship often does in the Chukchi and Beaufort Seas, but the lack of any port facilities necessitate logistical assistance onshore and typically the use of helicopters for personnel transport. Poor visibility and other weather problems have in the past impacted these transfers. In 2013, the Division of Polar Programs of the National Science Foundation (NSF), through its logistical contractors in Barrow, Umiaq, Inc. and Polar Field Services provided critical assistance for support for three of the four *Healy* cruises that used Barrow for embarkation and disembarkation. One innovation this year was use of a commercial landing craft (Figure 1), in addition to the contracted helicopter support. As a result, the offload of *Healy* 12-01 and partial on-load of *Healy* 12-02 by the landing craft was very efficient relative to helicopter-based support. All three *Healy* research cruises this year undertook work in the Chukchi and Beaufort Seas; one was supported by the Bureau of Ocean Energy Management, and two were supported by NSF. A fourth short cruise for demonstrating unmanned aircraft systems and unmanned underwater vehicles for oil spill applications, was supported by the Coast Guard, NOAA, the Bureau of Safety and Environmental Enforcement, and the Department of Homeland Security's Science and Technology unit.

The Ship-Based Science Technical Support in the Arctic (STARC) program has taken over maintenance of the Icefloe.net icebreaker cruise planning site <<http://icefloe.net/>>, and the AICC has been active in suggesting improvements and identifying problems. STARC has been active in planning and implementing

other science data collection, and laboratory improvements aboard *Healy* and the AICC has been engaged in information exchange with STARC personnel at Scripps and Oregon State to implement those improvements.

Another completed Committee effort, in coordination with the Coast Guard, was implementation of a new, more detailed berthing policy for *Healy* (<http://icefloe.net/berthing-policy-healy>), including how to provide opportunities for unaffiliated scientists, journalists, artists with outreach missions, and other individuals who might benefit from occupying unused scientific berth space aboard the ship during missions on a not-to-interfere basis. A new web-based form to request berth space is now available at <http://icefloe.net/non-science-request-sail-healy-0>

The next AICC meeting will be held in Arlington, Virginia on January 14-15, 2014.



Figure 1. Transfer of approximately 50 scientists from USCGC *Healy* by commercial landing craft to Barrow, Alaska on August 19, 2013. (Photo by Phil Alatalo, Woods Hole Oceanographic Institution.)



An Update from the Deep Submergence Science Committee (DeSSC) Chair

by Peter R. Girguis, DeSSC Chair

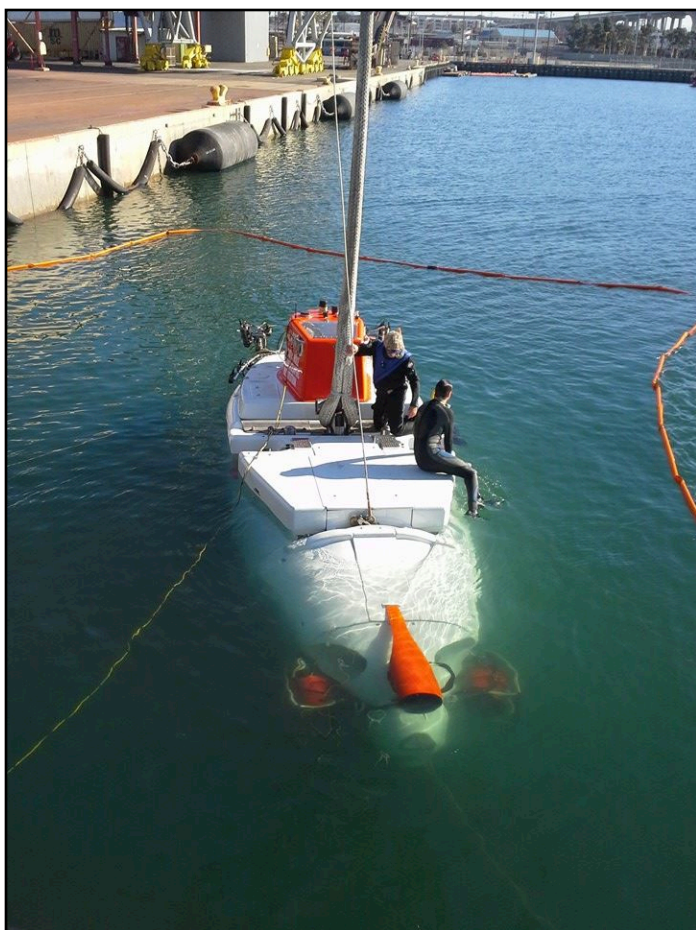


Figure 1. DSV *Alvin* during Sea Trials (Photo courtesy of Woods Hole Oceanographic Institution.)

Dear Colleagues,

Three years ago, in a UNOLS newsletter, I talked about DeSSC's desire to advance the capabilities of our deep submergence assets via existing and new programs, to grow our community user base through education and outreach activities, and to promote the availability of state-of-the-art sensors and samplers to the scientific community. The last three years have been a watershed in all these areas, and I am pleased to share a summary of these developments in the following paragraphs.

The NDSF has seen major developments in its human occupied vehicle, remotely operated vehicle, and autonomous underwater vehicle programs. The upgraded DSV *Alvin* was completed this summer, and underwent her sea trails this fall (Figure 1). NAVSEA certification has been a long and, at times, challenging

process, though naturally any program of this magnitude will most certainly be subject to challenges as new technologies are vetted and new protocols are established. Regardless, we are grateful that the process appears to be reaching an end, at which time the DSV *Alvin* will be taken to sea by a group of scientists who will evaluate its efficacy in completing scientific activities prior to the commencement of routine science operations. It is also very encouraging to see that the DSV *Alvin*'s schedule is on its way to being full, and it appears that proposal demand for the vehicle is up as well. I have spoken with many members of our community who are looking forward to using the new *Alvin* submersible, and I am optimistic that her newest features –from the amazing field of view through the new viewports to the added basket capacity- will ensure that she remains in demand for many years.

The ROV *Jason* has forged new ground as the team continues to equip the vehicle with new major and minor components that make it easier, quicker, and safer to complete science operations. One of the major changes is the incorporation of a new motion compensated crane that enables the ROV team to launch and recover the vehicle with less risk to the ROV team and ship's crew (Figure 2). It also prevents the translation of movement to the vehicles, enabling the ROV *Jason* and *Medea* to position major instruments, e.g. observatory nodes, with great precision. Also, new LED lights around the vehicle do a spectacular job of illuminating the seafloor, making it possible to generate even higher-resolution photomosaics of the seafloor with the existing and upcoming camera systems. Finally, the addition of a Reson Seabat 7125 multibeam sonar provides unprecedented fine-scale mapping capabilities that are of greatest value when studying mode to small-scale features on the seafloor.

The AUV *Sentry* came into the NDSF after the loss of the AUV *ABE* in 2010. The *Sentry* has really lived up to its promise over the last three years, playing a major role in operations studying the Deepwater Horizon accident, and continuing to advance science through autonomous surveys down to 6 km water depths. The combination of the DSV *Alvin* and AUV *Sentry* has proven to a potent one, as the *Sentry* generates maps that are used to direct subsequent *Alvin* operations. The provision of new geochemical sensors, from Eh meters to mass spectrometers, makes the AUV *Sentry* a

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DeSSC Report *(continued from page 17)*

very potent tool for science and exploration in the deep sea (Figure 3).

Today, via these assets, the average user will generate several terabytes (TB) of data as video, stillframes, audio, and metadata during each dive. As a consequence, each year the NDSF assets will together generate about as much data as is found in the Library of Congress –not just their books, but their images, audio and video. In anticipation, DeSSC and the NDSF have been working together to scope out various models of how we might manage these data. To date, there is broad recognition that the NDSF is not currently well poised to handle this datastream, though the solution to this issue remains to be determined. To this end, NDSF and DeSSC representatives are developing a plan and it is our hope to solicit your input and ideas so that we may provide the NSF and NDSF with informed recommendations.

Growing our user base through education and outreach has been a major activity on the DeSSC. Over the last two years, we have developed an early career program that introduces participants to the relevance and excitement of deep sea research, as well as the logistical and technical aspects of working in the deep. The program includes introductions from key personnel, e.g. agency representatives and NDSF staff, short courses on specific topics, and a free dinner / evening lecture. This year's Early Career Scientist workshop was held on Saturday, December 7th 2013 (the Saturday before the DeSSC meeting and AGU Fall meeting), and included detailed presentations from prominent members of the scientific community as well as agency representatives and, of course, the perennially popular free dinner and evening lecture. This year's class will bring the total number of ECS participants to over a hundred, and I'm proud to say that many of these participants have gone on to write proposals and receive NSF awards that involve deep submergence assets. Frankly speaking, the caliber and drive of these participants makes me very confident that demand for deep submergence assets will continue well into the future. It is ultimately my hope that these activities, as well as those of associated organizations such as the OOI, NOAA, and the Ocean Exploration Trust, will nurture burgeoning deep sea scientists and heighten awareness about the significance of deep sea research to the broader oceanographic community, as well as the public.

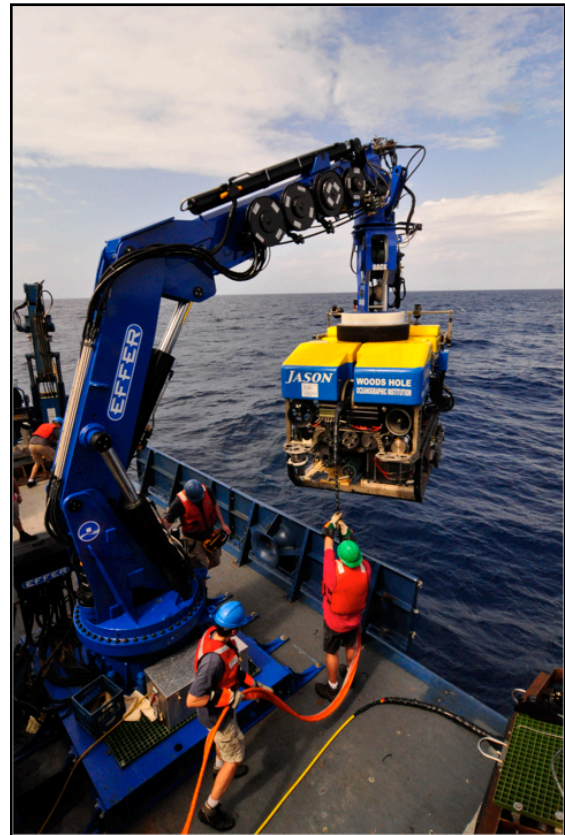


Figure 2. ROV *Jason*'s new launch and recovery system (Photo courtesy of Woods Hole Oceanographic Institution.)



Figure 3. AUV *Sentry* (Photo courtesy of Woods Hole Oceanographic Institution.)



UNOLS Ship Scheduling Committee (SSC) News

by Elizabeth Brenner, SCC Chair

In late January 2013 a subset of the Ship Scheduling Committee met in Narragansett at the University of Rhode Island Graduate School of Oceanography to kick off the 2014 UNOLS ship schedule development process. The group included Global and Ocean class ship schedulers with federal agency and UNOLS representatives. Additionally in attendance were representatives from the Ocean Bottom Seismograph Instrument Pool (OPSIP), Oregon State University (OSU) Coring Group (via telephone), Woods Hole Oceanographic Institution (WHOI) Winch Pool and Ocean Observatory Initiative (OOI) personnel from WHOI, University of Washington and OSU via telephone.

Separate scheduling discussions are conducted for each class of research vessel (Global, Ocean/Intermediate, Regional and Coastal/Local). Normally the Global and Ocean Class schedulers begin planning a year in advance, meeting in person in January to discuss cruises that will begin the following January. This is followed with conference calls as often as weekly for up to 9 months, or until the schedules are ready to be made available to individual ship users and sponsoring agencies.

Following the first Global/Ocean class meeting, the Intermediate ship schedulers will conference as an entire group.

Subsequent meetings will be broken down by coast, East and West. A series of regular conference calls separated by ship class will follow, until all conflicts are resolved and the schedules are ready to post to the UNOLS Ship Scheduling site. Regional and Local ship schedulers hold an initial annual conference as an entire group, but normally do not need to re-convene unless a conflict between vessels is recognized.

The meetings provide schedulers the opportunity to propose schedule options among their peers, while providing a forum for friendly competition and discussion to determine which ship is best suited to carry out proposed cruises, taking into account scientific capability, efficiency and economy. Economy is generally realized by creating schedules with fewer transit days, and by mobilizing and demobilization cruises in home port (where costs are lower). Agency representatives attend most if not all of the conference calls, as they provide current funding information and guidance for any conflicts as they arise. Normally the funding agencies are the ultimate decision makers when determining which ship should carry out a specific cruise.

In 2013 ten Global/Ocean Class conference calls took place followed by four Intermediate Class conferences and finally one

Region/Local Class meeting. Many additional conversations took place between individual schedulers and agency representatives.

In the last five years, the scheduling process has become more difficult with declining budgets for ship operations and associated reduction in scientific research cruises. Schedulers are now faced with the challenge of crafting efficient schedules from a restricted pool of funded ship days.

In 2013 the UNOLS ship scheduling process was more streamlined than years past, although not without several conflicts that were eventually sorted out. As a result of the Committee's dedicated work, the 2014 UNOLS Ship Schedules were published on the UNOLS secure web site by 23 September 2013. This timing is critical, because operating institutions need firm schedules upon which to base their annual NSF Ship Operations proposals, which have a target submittal date of 15 November.

Plans for developing 2015 ship schedules are being arranged. A 2015 Ship Scheduling in-person meeting will be held on January 30-31, 2014 in San Diego. Global and Ocean/Intermediate ship schedulers will participate in the meeting. Tele-conferences will begin in spring 2014 for the smaller vessels in the Fleet.



Data News - R2R & GMRT

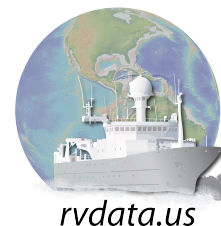
Rolling Deck to Repository (R2R) Update

by Bob Arko, L-DEO

The Rolling Deck to Repository (R2R) program provides stewardship of underway data from the US academic fleet, and publishes a standard suite of cruise products and services. The R2R Catalog added over 500 new cruises from 22 vessels in the last year, and launched a new Quality Assessment Web Dashboard (www.rvdata.us, click on "QA Dashboard") where users may view QA results for selected data types. The R2R Event Logger has been deployed on over 50 cruises to date, and the SAMOS program has recruited 10 new academic R/Vs to date, producing quality-controlled near-real-time MET/TSG data. R2R and the UNOLS Office worked together to develop and deploy a new Cruise Personnel Manifest, as well as to synchronize vessel equipment inventories, and R2R team members contributed to the UNOLS Chief Scientist training program hosted on R/V *Endeavor* at URI in October. R2R joined two new initiatives this past year - the

Ocean Data Interoperability Platform (ODIP) and the NSF EarthCube "OceanLink" project - to build new cyberinfrastructure that connects underway data from the academic fleet with global syntheses and science journals.

Contact info@rvdata.us with questions or feedback.



rvdata.us

Global Multi-Resolutional Topography (GMRT) Synthesis Update

by Vicki Ferrini, L-DEO

The Global Multi-Resolution Topography (GMRT) Synthesis (<http://gmrt.marine-geo.org>) is a dynamically maintained compilation of seafloor elevation data merged with terrestrial elevation data that is available to the research community as both images & gridded data values. The synthesis includes cleaned and edited multibeam bathymetry data from throughout the global and coastal oceans. GMRT can be quantitatively accessed through a variety of interfaces including GMRT MapTool and GeoMapApp, both of which can be used to create custom maps and grids. The GMRT Synthesis is also accessible through web services, and is broadly disseminated as part of the Google

Ocean basemap and the GEBCO world map.

High-resolution ocean content included in GMRT is derived from multibeam sonar data collected by scientists and institutions worldwide dating back to the 1980s. To build the GMRT, multibeam data are assessed, cleaned, edited and gridded by the GMRT team, with two scheduled releases annually. Data curation services also include infrastructure to provide for full attribution to original data providers. Working with both the Rolling Deck to Repository (R2R) Program (<http://www.rvdata.us>) and Multibeam Advisory Committee (<http://mac.unols.org>) we also provide

feedback information about sonar system performance.

GMRT version 2.5 was released in October 2013, and includes multibeam data from a total of ~2.3 million miles of ship track from 731 individual research expeditions. The next release is scheduled for April 2014. Raw multibeam data being made publicly available as a result of the R2R Program are an important source of new content from the US Academic Fleet. We also welcome data from the science community and encourage scientists to contact us about contributing data at info@marine-geo.org.



2013 UNOLS Fleet Highlights

In 2013, the UNOLS Fleet of research vessels supported science operations that spanned the globe from the Antarctic to Greenland. In the pages that follow, operational highlights are provided for each ship along with their estimated planned days for 2014.

Global Class Ships:

R/V *Atlantis*- Woods Hole Oceanographic Institution

2013- 229 op days

2014- 269 op days estimated



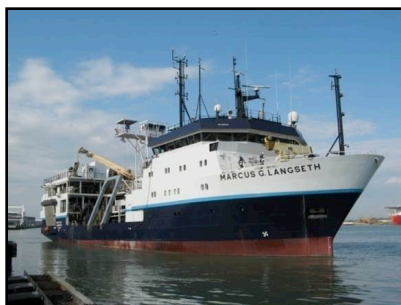
Highlights:

- Overhauled and Upgraded the *Alvin* Handling System
- Completed several *Jason* programs
- Continued towards *Alvin* Certification

R/V *Marcus Langseth*-Lamont-Doherty Earth Observatory

2013- 186 op days

2014- 119 op days estimated



Highlights:

- Operations in the Atlantic Ocean to Vigo,
- Spain Multibeam survey south of Iceland

R/V *Melville*-Scripps Institution of Oceanography

2013- 307 op days

2014- 123 op days estimated



Highlights:

- Operations in the Pacific including Ocean Observatory Initiative cruise, CLIVAR- P2 line

R/V *Knorr*- Woods Hole Oceanographic Institution

2013- 253 op days

2014- 248 op days estimated



Highlights:

- Operations from Cape Town to Uruguay to Greenland
- Supported AUV *Sentry*, towcam, and UAV programs

R/V *Thompson*- University of Washington

2013- 260 op days

2014- 288 op days estimated



Highlights:

- Returned to operation after 6 month Z-drive repair.
- Deployed three major ROV cruises
- Supported Ocean Observatory cruises
- Planning underway for a mid-life refit.

R/V *Revelle*- Scripps Institution of Oceanography

2013- 266 op days

2014- 211 op days estimated



Highlights:

- Installed new CTD handling system.
- Supported ROV cruises
- Successful humanitarian aid in Palau
- Operating in Pacific & Indian Ocean, San Diego to Colombo



Ocean Intermediate Class Ships:

R/V *Kilo Moana*- University of Hawaii

2013- 251 op days
2014- 240 op days estimated



- Highlights:
- Operations in the Pacific- 22 expeditions,
 - Support for HOTS & C-More

R/V *Endeavor*-University of Rhode Island

2013- 221 op days
2014- 169 op days estimated



- Highlights:
- Operating in the Atlantic, general oceanographic research.
 - Rescued wave glider.
 - Chief Scientist Training cruise.
 - Drydock scheduled for December 2013

R/V *New Horizon*-Scripps Institution of Oceanography

2013- 164 op days
2014- 158 op days estimated



- Highlights:
- Operations in the Pacific
 - 23 Expeditions including a Chief Scientist Training Cruise.

R/V *Oceanus*- Oregon State University

2013- 167 op days
2014- 211 op days estimated



- Highlights:
- Operations in the Pacific, general oceanographic support, including Cascadia Project.

R/V *Atlantic Explorer*-Bermuda Institute of Ocean Sciences

2013- 152 op days
2014- 167 op days estimated



- Highlights:
- BATS & Hydro Station S support, including a BATS validation leg Bermuda to Puerto Rico
 - CTD Transect Sargasso to Labrador Sea

Regional Class Ships:

R/V *Point Sur*- Moss Landing Marine Lab

2013- 197 op days
2014- 105 op days estimated



- Highlights:
- Successful voyage to Palmer Station, Antarctica
 - Work off Pacific Northwest coast



**R/V Cape Hatteras- retired,
Duke /UNC**
Final UNOLS Voyage January 30,
2013



- Now in operation by Cape Fear Community College
- Cape Fear Community College Training Cruise- September 2013

**R/V Hugh Sharp- Univ. of
Delaware**
2013- 212 op days
2014- 179 op days estimated



- Highlights:
- NOAA Scallop Survey- 6th year
 - Covered over 1000 nm with HabCam

**Coastal/Local Class
Ships:**

**R/V Robert G. Sproul – Scripps
Institution of Oceanography**
2013- 30 op days
2014- 27 op days estimated



- Highlights:
- Working off Pacific Coast.

R/V Pelican- LUMCON
2013- 202 op days
2014- 144 op days estimated



- Highlights:
- Working in the Gulf of Mexico
 - On display at ASLO Conference
 - Completed USGS high resolution 2-D seismic cruise

**R/V F. G. Walton Smith – Univ. of
Miami**
2013- 115 op days
2014- 131 op days estimated



- Highlights:
- Chemical Ecology cruises in the Caribbean and Bahamas coral reefs
 - Studies in the Gulf of Mexico on bacterial growth.

**R/V Savannah- Skidaway
Institute of Oceanography**
2013- 111 op days
2014- 191 op days estimated



- Highlights:
- Installed new anchor handling system and chain locker.
 - Supported cruise in the southeast US.
 - Acquired 1800 sq. ft. building for staging marine operations.



R/V Blue Heron- Univ. of Minnesota

2013- 69 op days
 2014- 49 op days estimated



R/V Clifford A. Barnes- Univ. of Washington

2013- 95 op days
 2014- 44 op days estimated



Highlights:

- Operations in the Great Lakes, including dye studies in Lake Michigan.
- Instituted “Science Friday”, open house for the community with guest lectures.

Highlights:

- Busy year of operation in Puget Sound
- Completed successful NSF inspection
- Ramping up efforts to raise funds for a replacement vessel



R/V Point Sur in Antarctica going further than any other UNOLS Regional Class ship has gone before! (photo credit: Sean Bonnette)



Guidance for NSF on National Ocean Science Research Priorities: Decadal Survey for Ocean Sciences

At the request of the National Science Foundation, the Ocean Studies Board of the National Research Council has initiated a study: Guidance for NSF on National Ocean Science Research Priorities: Decadal Survey for Ocean Sciences

A committee has been formed and is co-chaired by Dr. Shirley A. Pomponi of Florida Atlantic University and Dr. David W. Tittley, USN (Ret.) of Pennsylvania State University.

The committee for the Decadal Survey of Ocean Sciences 2015 (DSOS) will develop a list of the top ocean science priorities for the next decade in the context of the current state of knowledge, ongoing research activities, and resource availability.

Details about the study tasks, meetings, and committee membership is available at: <http://dels.nas.edu/Study-In-Progress/Guidance-National-Ocean/DELS-OSB-12-03>

Your input to the study is important. Feedback can be provided at: <http://nas-sites.org/dsos2015/>



UNOLS 2014 Calendar of Meetings

Meeting	Dates	Location
AICC Winter Meeting	January 14-15	Arlington, VA
Global & Ocean/Intermediate Ship Scheduling meeting	January 30-31	San Diego, CA
Ocean Sciences Meeting & UNOLS Booth	February 24-28	Honolulu, HI
FIC Winter Meeting	March 11-12	Arlington, VA
Council Winter Meeting	March 12-13	Arlington, VA
RVOC Annual Meeting	April 23-25	Savannah, GA
RVTEC Annual Meeting	November 17.	Corvallis, OR
2014 INMARTECH Symposium	November 18-21	Corvallis, OR



BEST WISHES FOR THE NEW YEAR!

From the staff of the UNOLS Office



“First Ice”

R/V *Sikuliaq* in Builders Trials on Green Bay of Lake Michigan
(photo by Steve Hartz)

I would like to thank all who contributed information and articles for this issue of UNOLS News. Articles are always welcome and encouraged. Copy can be submitted by e-mail to <office@unols.org>. The next issue of UNOLS News is planned for Spring 2014

Thank you,
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