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## Academic Fleet Renewal- Two Years Later

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## Editorial

**Larry Atkinson, Center for Coastal Physical Oceanography, Old Dominion University**

# Academic Fleet Renewal—Two Years Later

In November 2000, I wrote a Soapbox article on fleet renewal for *Sea Technology*. It is a little unsettling to see how slowly ideas move towards implementation. Nevertheless, we are making progress. In this editorial I will note a bit of that progress and try to guess where we will be in two more years.

Two years ago SWATH ships in the academic fleet were coming. Now the RV *Kilo Moana* is operating routinely in the Pacific. As you read this during the summer, the *Kilo Moana* will be working in the North Pacific. Assessments by chief scientists of *Kilo Moana* cruises are being conducted by the UNOLS Fleet Improvement Committee (FIC). Initial results indicate considerable satisfaction with the ship. The key attribute of a SWATH design vessel is sea kindliness, and the *Kilo Moana* is proving that to be true. The science users appreciated the ability to work in higher sea states with overall less motion than they were accustomed. In the coming year, more assessments of the *Kilo Moana* will be made.

One of those assessments will be careful measurement of ship motion so that we can make quantitative comparisons between various ships, both monohull and SWATH. FIC will continue surveys of the science users. How the performance of the *Kilo Moana* will affect the design of future Regional or Ocean class ships remains to be seen. The limitations of SWATH vessels, such as payload, compared to monohulls will be assessed, as will the comparative costs. Rest assured that these two hull forms are considerably different relative to scientific use. While there probably will not be a wholesale move to SWATH design in the coming decades, we will probably see a few more built as the technology is further tested. The seakeeping attributes of SWATHs will put pressure on designers to increase the seakeeping qualities of monohulls.

The Science Mission Requirements (SMRs) of the Ocean and Regional class ships are now complete. This is the first step of the ship construction process. Scientists are asked to reach a consensus on the desirable attributes of these ships within size, construction and cost constraints. This was accomplished by a collaboration of seagoing scientists and engineers acquainted with ship design. The result was a very practical set of SMRs. The article in this issue by Annette DeSilva and Mike Prince (p. 35) describes this process and the results of it in more detail.

The actual construction of new ships in the coming decades involves the interagency Federal Oceanographic Facilities Committee (FOFC). FOFC, with input from UNOLS, has a time schedule for replacement. This interagency effort is proving to be effective in coordinating National Science Foundation (NSF) and U.S. Navy funding priorities. At this time the NSF appears prepared to support the construction of Regional class vessels, and the Navy is preparing to support the Ocean class vessels. As with all federal budget processes, "it isn't over until it is over," but I am optimistic that construction will rather closely match the needs of fleet renewal. This summer NSF hopes to make an announcement regarding concept designs for the Regional class vessels. Renewal will also no doubt occur in unplanned fashion through congressional interest. At least with the renewal plan and the SMRs we are prepared for any opportunity that arises.

While renewal must be accomplished—and it occupies our long-term attention—other ships must have mid-life renovations. During the past few years the Louisiana Universities Marine Consortium RV *Pelican* and the Duke/UNC RV *Cape Hatteras* have both undergone mid-life refits. The University of Delaware is well along on its way to constructing a replacement for the RV *Cape Henlopen*. Lamont Doherty Earth Observatory has conducted studies and is exploring options to enhance the technical capabilities of the RV *Ewing*.

Beneath the surface there is also activity. The debate continues on what the mix of funding should be to put robots or humans in the ocean. The increasing capability of unmanned vehicles in the ocean seems to call for a focus on them over the manned vehicles. However, just as NASA has learned that humans in space are important for the overall program, the same may be the case for the ocean as well. Perhaps we need to get more clever about making unmanned adventure just as exciting as manned adventure.

Meanwhile, the manned *Alvin*, the only U.S. manned research deep submersible, continues to support submergence science, and the new unmanned *Jason II* has entered service. Also, of course, many types of underwater vehicles ranging from gliders to ROVs and AUVs are being tested and operated.

So where will we be in two more years? The FOFC process will have proven to be successful with agency responsibilities taken and a rational replacement plan put in place. The first Regional class vessel will be in the pre-construction phase, and Ocean class vessels will be in the concept design phase.

Perhaps most importantly, I think we will see an increased need for research ships. The questions posed by new observing systems, such as those related to the NSF Ocean Observing Initiative and the national Integrated Ocean Observing System, the need to determine the mechanisms of global climate change and the need to service new observing systems will all require more assets at sea. We will see new types of ships for servicing observing systems and new ways to operate them.

The vision of a highly capable research ship at sea with packs of roving AUVs scouting out swarms of organisms and scanning their DNA, benthic tractors microprobing the minerals on the bottom and satellites reporting from above is what I think will come to pass in the coming years. It will be exciting. /st/