

# Criteria and Process for Recommending Non-Operational Periods of Ships in the UNOLS Fleet

## Report of an Ad-Hoc UNOLS Subcommittee

Statement of the Problem: There appear to be insufficient funds to keep all of the designated UNOLS vessels operating at optimal levels in 2007 and perhaps for several more years. The shortfall is now estimated to be about \$12 million, which equates to the operating costs of one of the four general-purpose global class ships plus two of the general-purpose intermediates.

Background: The principle cost driver for oceanographic ships is crew costs, followed by fuel and maintenance. The most effective way to save funding, therefore, is to completely retire a ship, such that it no longer has crew, fuel, or maintenance expenses. However, a retired ship cannot return to the fleet when the funding situation improves, and therefore early retirements should only be considered as a last resort (such as when it is certain that the fleet is at over capacity) or when a replacement ship has already been identified.

Short of retirement, the next most effective way to eliminate cost is a cold lay-up. In this situation, all but one or two essential crewmembers are laid off, the ship does not sail, and maintenance is kept to the barest minimum. For institutions that operate only a single ship, the cold lay-up of that ship for a year results in losing most of the crew and marine operations technicians as they seek other jobs. Those valued staff members may not be available to return to employment on the vessel after the lay-up period, and sufficient expertise might not remain to even train new crew and technicians. Even for institutions that operate multiple vessels, there is an inevitable loss of experienced personnel, and the depth and breadth of training for those who remain is diminished. Looking further ahead, the lay up of a vessel can jeopardize the process of appropriating funding for new vessels, as those outside the oceanographic community, in light of the immediate funding shortfall, might fail to understand the need for modern fleet renewal to tackle the oceanographic problems of the future.

Hot lay-ups, partial lay-ups, and stand-downs are non-operational periods that save little beyond fuel dollars. The ship is typically tied up at the dock and is not supporting science, but most of the crew is retained (although potentially on vacation). Maintenance is current so that the ship is ready to sail. These types of lay-ups, as were chosen to meet the budget shortfall in 2006, are not preferred by the National Science Foundation as they save less funding while continuing support for ships that are not supporting science missions. However, they might make sense when funding has been identified to bring the ship back into operation within a few months, as the added cost of remobilizing and re-staffing a ship that was in cold lay-up negates the cost savings unless the lay-up is for a substantial period of time (e.g., approaching a year). Because the decision of which vessels should be affected by these different forms of non-

operations is a difficult one, UNOLS Council was asked to help define the criteria and a process for helping the Agencies with these decisions.

Charge: Develop a short white paper to focus UNOLS Council discussion and agreement upon an equitable and defensible process to be followed by UNOLS to arrive upon a recommendation by July 2006 as to which UNOLS vessels would be laid up in 2007 or beyond or retired.

Sub-Committee Members: Curtis Collins (Naval Postgraduate School); Wilford Gardner (Texas A&M University), Marcia McNutt (Monterey Bay Aquarium Research Institute, chair), Peter Ortner (RSMAS, University of Miami)

Questions to be addressed:

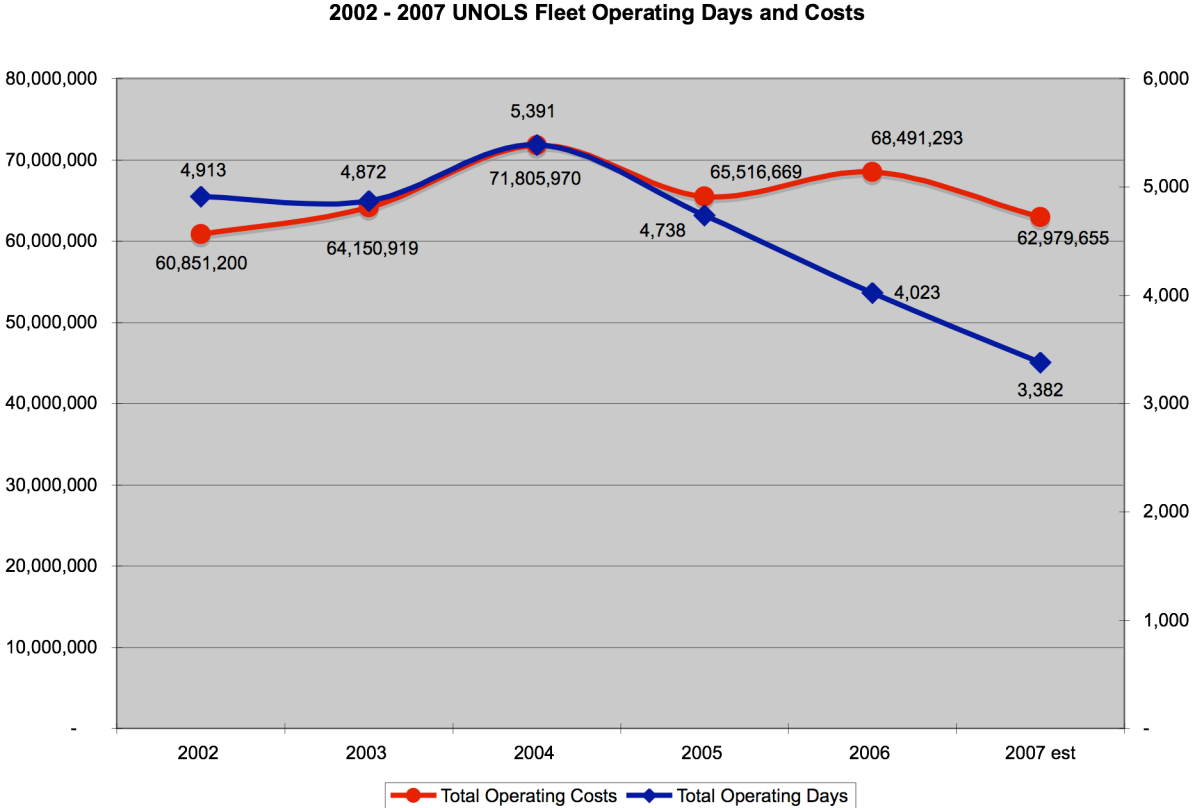
- 1 What values need to be considered in making a recommendation (cost-savings realized; institutional impact; whether a specific vessel is operated by a multiple or single vessel operator, planned retirement date, geographic distribution; class of vessel(s); and number of vessels, etc.);
- 2 What relative weightings of these general values are appropriate in this specific context and why;
- 3 How will out-year recommendations be made (and what is the relevancy of prior year recommendations);
- 4 Who (and how many) should develop the substantive recommendations to UNOLS Council (RVOC subcommittee(s); schedulers; lab directors, others?);
- 5 By what process should the above group settle upon the recommendation it will make to the UNOLS Council (majority; super-majority; consensus; non-veto consensus, randomization, etc.);
- 6 What additional information is relevant to the eventual substantive recommendation and when is the estimate to be available (ORION needs; individual schedules; ship-time request constraints; NOAA lease for DART installation; other agency (NOAA, ONR, USGS, EPA, BLM, state) shiptime requirements)?

Introduction: The UNOLS subcommittee charged with making recommendations on ship lay-ups and retirements to meet the current funding shortfall was constituted to include three UNOLS Council Members who are not currently employed at institutions operating UNOLS ships, so as to avoid conflicts of interest and one Council member affiliated with an operator institution in order to represent that perspective. The subcommittee conducted its business primarily through email, and received substantial support in gathering relevant information from the UNOLS office and the UNOLS operators. Input was requested from the twenty ship operating institutions and was received from four institutions.

Findings: Based on information gathering and analysis, the subcommittee concludes the following:

- A. The shortfall in funding for the UNOLS fleet is not a short-term issue. Highly rated proposals requesting ship time have always exceeded the funds available for science and

facilities. In fact, available agency funds have only supported scientific utilization/demand equal to about 80% of the available ship days for more than 10 years, and the gap has been increasing in the last two years with the added constraint imposed by operational funds that are insufficient to keep up with increased operational costs, especially for fuel and safety/security compliance (Figure 1).



*Figure 1 -Ship operations costs and ship operating days 2002 - 2007.*

B. The under funded situation of the UNOLS fleet is unlikely to be rectified in the near future. The costs of operating the entire fleet have increased by more than 5% per year over the past decade and there is no clear indication that there will be an increase in science or operations funding sufficient to increase fleet utilization.

## UNOLS Fleet Utilization (2000 - 2007)

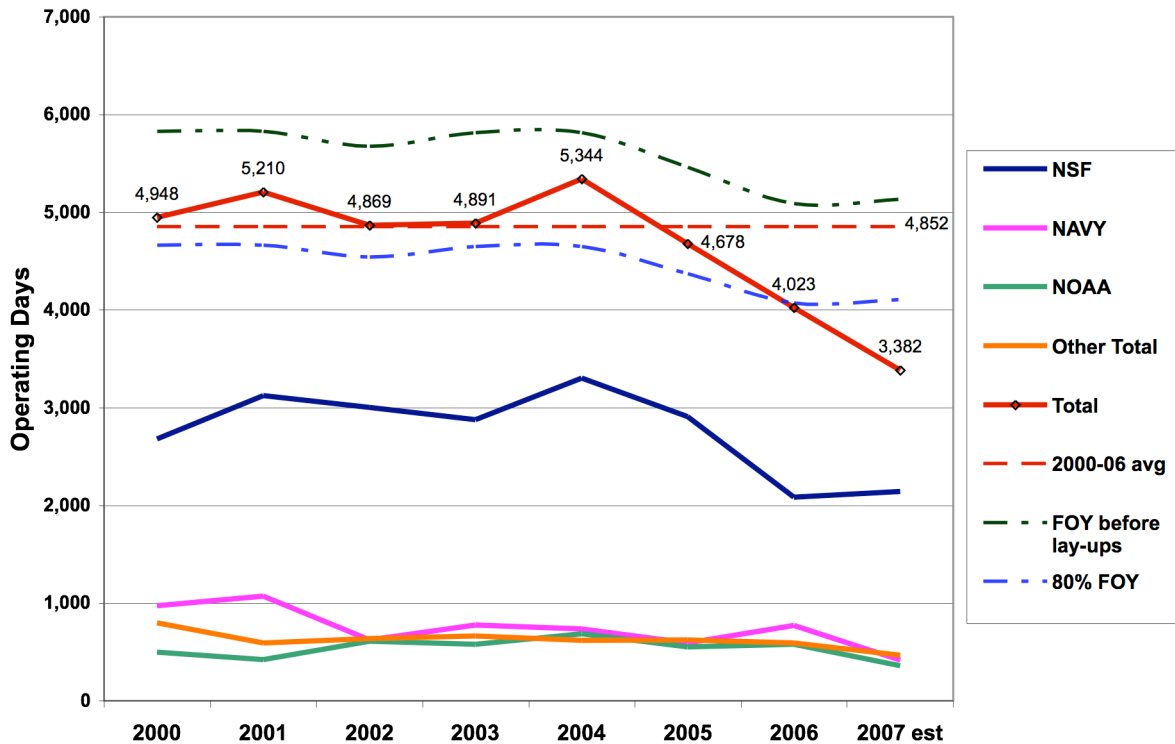


Figure 2 - Total Fleet Utilization and by agency from 2000 - 2007. (2007 days are an estimate based on requests and draft schedules as of 6/30/06. Some Navy and NOAA work is not yet included). FOY = Full Operating Year.

- C. While NSF support for the fleet has, until recently, supported a nearly constant number of operating days over the past decade, Navy and NOAA support has been gradually declining. This trend is unlikely to be reversed for the following reasons. Navy funding for basic research (“6.1 funds”) has been severely cut back, meaning that there is not the budget line to support a large amount of UNOLS ship time regardless of the capabilities of the fleet. NOAA needs are not always a good match to the operations of the UNOLS fleet. In addition, NOAA recently acquired a new ship with a remotely operated vehicle and integrated launch and recovery system to serve as a dedicated platform for its Ocean Exploration (OE) program. UNOLS has no ships that are dedicated to ROV operations, and NOAA OE funds that previously were used to support some *Alvin* operations and other uses of the UNOLS fleet are likely now to be used for the new OE ship unless there is an increase in the OE funding level.
- D. The under-funded situation for the UNOLS fleet could potentially become even worse as new larger ships replace the intermediate and regional ships slated for retirement if the total number of available ship operating days remains constant. Even though there will be fewer ships and days available (FOFC Plan), full utilization could still result in costs greater than currently available funding. For example, the new AGORS, despite being younger ships, are

- not less costly to operate than the older global-class ships. The newer ships have more engines and generators, negating any savings in maintenance from being newer, and they use more fuel.
- E. Cold lay-ups (lay-ups with little or no crew support and minimal maintenance costs for vessels with no plan for replacement) and early retirements (for vessels that have a plan for replacement) preserve the most funding for science field programs. Bringing a vessel out of cold lay-up or retirement is likely to be an expensive proposition and should be planned carefully.
  - F. While OOI has funding for installing ocean observatories that is over and above the funds currently budgeted to support UNOLS vessel operations, much of those dollars will be needed for special purpose vessels for cable laying, launching large moorings, etc. Some of that funding might come to the UNOLS fleet, but most likely for global class vessels. There is no “new” money yet identified for OOI science operations and maintenance after the installation phase, but that may indeed materialize (hence another good argument for not retiring any global ships early).

#### Response to Questions:

1. *What values need to be considered in making a recommendation?* Our list of values, presented in order of priority, is as follows:

**Meeting science needs.** The choice of ships to operate should be made such that PIs are not waiting many years to get a ship that can handle the science program on account of the lay-up schedule. The ramification of this value is that the special purpose ships, such as the *Atlantis (Alvin)* and the *Langseth (MCS)* will in all likelihood not be candidates for lay-up, as long as they have reasonable demand for their special-purpose equipment in any given year and that their schedules can be filled out with other programs that might have been accommodated on any of the large ships.

**Geographic availability.** Based on data from the UNOLS office, only the specialized ships (e.g., *Atlantis*) have no bias in their areas of operations imposed by the geographic location of the operator institution. Therefore, when laying up multiple ships in the same class (e.g., two regional ships) in any one year, they should be from different coasts, taking into account the funded scientific demand for each region.

**Cost of operations.** Often science programs could be scheduled on one of several vessels, and depending on how that choice is made, one vessel or another ends up with a light schedule and is a candidate for lay-up. In this situation, we recommend that the choice of which vessel to assign to the funded science be based on which schedule maximizes the use of funding for science, as opposed to transit days or port days. For example, if an Atlantic ship has a full schedule by virtue of spending a month each way transiting to the Pacific to pick up one leg of work there, it might not be a very cost efficient schedule. It does not appear currently that for ships within the same class, there is enough difference, assuming full schedules after lay-ups and retirements are implemented, to make decisions based on day

rates. Efficient and cost effective operations should be encouraged, but cutting costs at the expense of maintenance, safety, effective transit speeds, adequate meals and availability of crew overtime to support science operations should not be encouraged in an effort to reduce day rates and operational costs.

**Quality of operations.** Decisions should be made such that excellent ship operations that consistently meet or exceed the science mission requirements are rewarded, and those operations that consistently disappoint the PIs are penalized. The post-cruise assessments provide some qualitative information on performance, and we recommend that they be taken into account when making decisions, particularly when the criteria above do not lead to a clear decision. Quality of operations can also be used when deciding between laying up or retiring a ship. A vessel that has been problematic in terms of meeting science needs should probably be retired when its turn for lay up comes around.

**Sharing the pain.** We recommend that in any one-year, no one institution should be asked to fully lay up two ships, as the impact on the marine operations is likely to be disastrous and negate any of the advantages that the UNOLS fleet currently reaps from having multi-ship operators. Likewise, single-ship institutions should not be asked to lay up a ship for more than one year.

**Diversity of operators.** Arguments were submitted from the operating institutions supporting arguments both for diversifying operators and for concentrating the operations in fewer institutions. The issue is clearly not black and white, but overall the benefits to graduate education of having ship operations at a large number of institutions tend to carry the day. Therefore, we recommend that diversity of operators be valued, but not at the top of the list.

2. *What relative weightings of these general values are appropriate in this specific context and why?* We believe that the criteria should be weighted in the order given above. The agencies and subcommittee making these recommendations should have the option, however, for slightly modifying the order in exceptional circumstances, as long as they justify the reasoning.
3. *How will out-year recommendations be made?* We believe that the fairest mechanism for the out-year recommendations is to rotate the lay-ups among the operating institutions and their ships. The upshot of this recommendation would mean that the ships laid up the year before would be removed from consideration, and the same criteria listed above would be applied until all ships were affected. Institutions that operate several ships in the same class (e.g., *Melville* and *Revelle* at SIO) should be given the option of taking the lay-ups for these two ships on the same ship (e.g., two years of *Melville* as opposed to one year each for the two ships) and in consecutive rather than alternate years, if those scenarios produce less impact on staffing or other factors. Obviously ships that are given early retirement would not be brought out of retirement. Early retirements mean that fewer ships need to be laid up, because the latter choice is more costly.
4. *Who (and how many) should develop the substantive recommendations?*  
The substantive recommendations, using the above criteria, should be made by the Agencies to a subcommittee of UNOLS Council consisting only of members from non-ship-operating institutions. This subcommittee should consist of at least three members, and the UNOLS

Chair may appoint past Council members or other UNOLS committee members if necessary. The subcommittee will share the draft recommendations from the Agencies with UNOLS ship operators, the Council, and any other interested parties (e.g., the UNOLS office, users, etc.) Based on input from those affected groups, the subcommittee will provide balanced, fair, and un-conflicted feedback to the Agencies on the adequacy of the recommendations and possible alternative scenarios to consider.

5. By what process should the above group settle upon the response it will make to the Federal agencies?

The response to the Agencies from the subcommittee should be approved by the subcommittee by simple majority. Minority opinions in the case of less than unanimous consent should be transmitted as well.

**Within 30 days of receiving lay-up and/or retirement recommendations from the Federal agencies, the subcommittee will conduct their review and then provide a response back to agencies after vetting their response through the full Council.**

Recommendations regarding partial lay-ups, stand-downs, lay-up rotations in subsequent years and potential early ship retirements should also be considered by the subcommittee.

6. *What additional information is relevant to the eventual substantive recommendation and when is the estimate to be available?*

**The recommendations need to consider the impact on experienced technical staff, crewmembers and shore support personnel and the potential for alternative methods for retaining their services. Investments in training and experience are significant.**

**Information is needed on the potential for alternative sources of ship utilization that are not yet firm.** The uncertainty in the budgets for NOAA and Navy for use of requested UNOLS ship time is an issue to consider in making recommendations. NSF decisions are generally known by early July. Navy decisions are reached in the time period between late July to early September. NOAA has typically only made a firm commitment after the President signs the NOAA appropriation, and recently the appropriation has been less than the President's request. UNOLS might choose to discount programs for which funding decisions are not yet known, and fit them in later if possible when and if they are funded, especially in cases where losing the program would have a major impact on the efficiency and viability of a schedule.