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UNOLS Ad-Hoc Committee to Address the Impact of Budget Reductions on Fleet Operations
May 20, 2005

UNOLS is asked by NSF to provide advice on reducing ship operations costs

Key elements of NSF's request for advice

Larry Clark, acting director of the Ocean Sciences Division at NSF sent a letter to UNOLS seeking advice on how best to implement cost reductions in their ship operations budget. They are projecting the need to cut between $5M and $8M from the ship operations budget below what was spent for FY05. The factors that create this problem include division budgets that were reduced in FY05 and are projected to be flat at that reduced level for the next three or four years; a resulting projected reduction in future demand for NSF ship time; an increase in the cost of operating the academic (UNOLS) research fleet; some historical overcapacity within the fleet; and the requirement to fund renewal efforts for mid-sized infrastructure from the division budget. Recommendations from UNOLS are requested prior to the summer scheduling meeting planned for July 20th.

Committee and tasking

In response, the UNOLS Council formed an ad-hoc committee consisting of Marcia McNutt (chair), Denis Wiesenburg and Eileen Hofmann to formulate draft recommendations for consideration and finalization by the UNOLS community and Council. They recently published their task statement to the community that lays out how they intend to proceed. Working with the ship schedulers, ship operators and funding agency representatives the committee planned to make a best estimate of projected fleet utilization and costs for 2006, compare that to projected budgets, get costs and recommendations for lay-ups, retirements and other cost saving measures and then formulate short and long term recommendations. The committee would seek ship operator and science community input on their recommendations and assumptions. Short term recommendations were to be formulated and sent to the UNOLS Council by June 1st and long term recommendations by August 31st, however, more time may be needed to finalize the short term recommendations.

Update to the community and request for more information

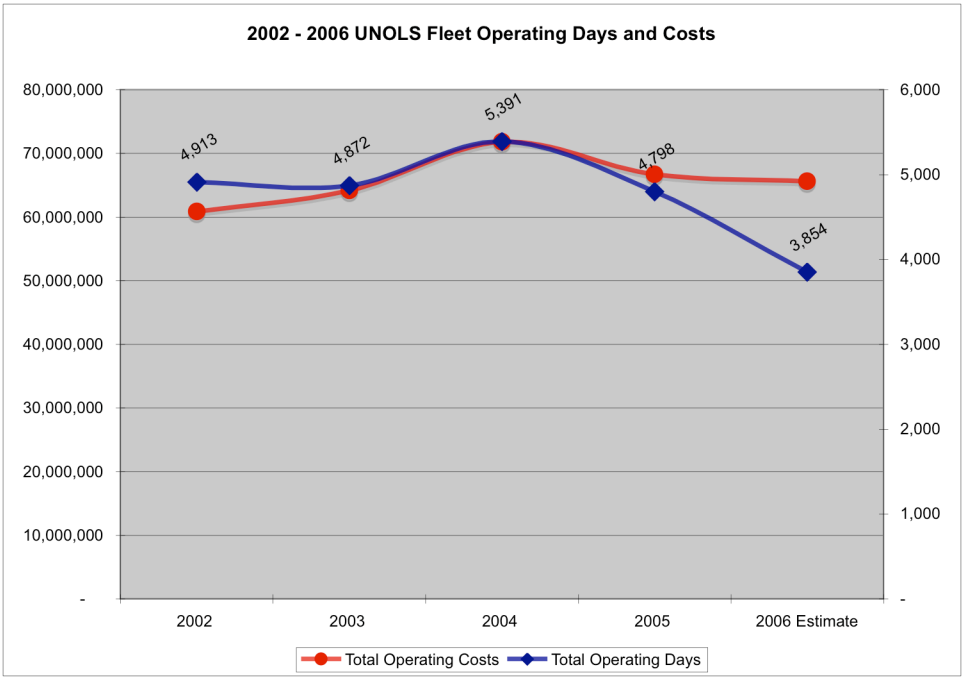
This document presents a status report based on information gathered to this point, primarily from preliminary schedules posted by the UNOLS ship operators. We also identify some specific areas where additional information is required to help formulate UNOLS recommendations. Lastly we lay out some of the major issues and an outline for the recommendations to be made to NSF by UNOLS.

Action taken to date and what we know so far.

Schedulers have posted Letters of Intent (LOI)

2006 Letters of Intent, which are essentially draft schedules have been posted for all UNOLS ships with the exception of the *Gyre* and the *Seward Johnson II.* The *Gyre* will be retired in 2005 and the *Seward Johnson II* will either replace the *Weatherbird II* or not operate. An LOI was just posted for *Alpha Helix*, but it contains only 5 days of funded work and because it was just received it is not included in the numbers presented here. Otherwise, these posted LOIs account for every funded NSF project requesting ship time in 2006 and all funded or budgeted Navy, NOAA and other agency projects that we are aware of. With just a few exceptions, posted LOIs do NOT include any proposals pending in the current NSF Panels and where they are listed, they were not counted in the total days and costs. The total number of days for the entire fleet is estimated at 3,854, which represents a 20% decrease from the 2005 level and a 29% decrease from the peak 2004 schedules. Costs are only marginally lower due to the higher percentage of large ship use in 2006 and the conservative estimates being used for daily rates at this stage. More realistic cost estimates are needed and will be requested from ship operators. (See Figure 1) A synopsis of scheduled work by class of ship and operating area is presented in this section and more complete detail is included in Appendix I.

Figure 1:



Global and Ocean Class

The large Global Class vessels and the one Ocean Class vessel, *Kilo Moana* are generally considered together during the scheduling process as many (but not all) projects can use any of these vessels. Since we still need to determine what projects and which ships will be scheduled the following utilization calculations are based on the optimum operating year for a Global class vessel of 300 days per year. All schedulers have posted one or two versions of their 2006 LOIs representing fairly full schedules in most cases. These LOI's total over 4,400 days, but after removing double bookings,

excess transit and duplicate schedules they only represent about 1,667 days of actual work plus an estimated 148 days of deadhead transit totaling 1,815 days of potential utilization for large ships. This lower number is being used for utilization and cost estimates.

Work in the Atlantic is shown on the *Marcus Langseth, Atlantis* and *Knorr* schedules. The 109 days of non-Alvin/non-seismic work requested for the Atlantic is shown on the *Knorr_2* LOI and represents a little more than 1/3 of a full operating year. Except for *Atlantis* or *Knorr,* covering this work would require a transit from the Pacific or the use of other vessels. *Knorr, Atlantis and Langseth* would all need to transit to the Pacific for full schedules.

Potential funded work in the Pacific for the general purpose Global and Ocean Class vessels is equal to a little more than 4 ships worth of work (1243 days/300 = 4.14 ships). Some of this work requests *Jason II* but could be done with *Alvin.* The *Atlantis_2* LOI with 241 days total is based on this premise leaving 1,219 days or about 305 days of work per ship if scheduled on four ships in the Pacific.

However, these numbers assume that ship operations budgets are adequate to support all the requested work. A first estimate of the costs indicate that at least $4.5M still needs to be cut from NSF costs and this is roughly equal to 180 days of large ship time at $25K per day. This would reduce demand for general purpose large ships in the Pacific to 3.5 ships or about 260 days per ship if scheduled on four ships. Figure 2 shows the full utilization and Figure 3 shows the utilization after cutting 180 days.

Figure 2:

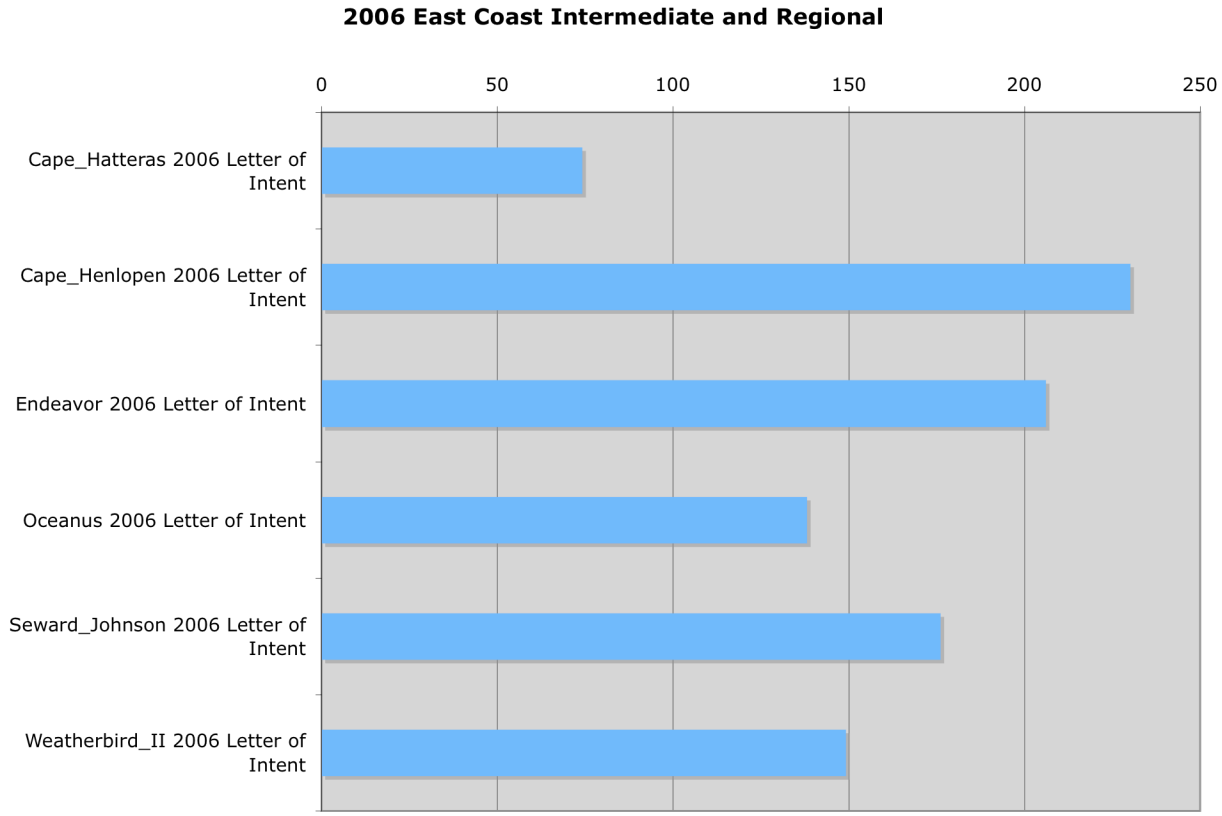
Figure 3:

Additional work may materialize for deploying DART buoys or for Navy projects, which could fill out the fifth schedule, but unless that happens at least one Global or Ocean Class ship may need to be laid-up. If the pending NOAA supported work does not all get funded, then the number of lay-ups may need to be increased. An assessment of how to best manage the uncertainty over NOAA budgets and other funding decisions needs to be factored into the scheduling process.

East Coast (Intermediate, Regional and Local):

Projected Schedules for *Endeavor, Oceanus, Seward Johnson, Cape Hatteras, Cape Henlopen* (replacement) and *Weatherbird II* add up to about 973 days, which is a little less than five ships worth of work for six ships. See Figure 4.

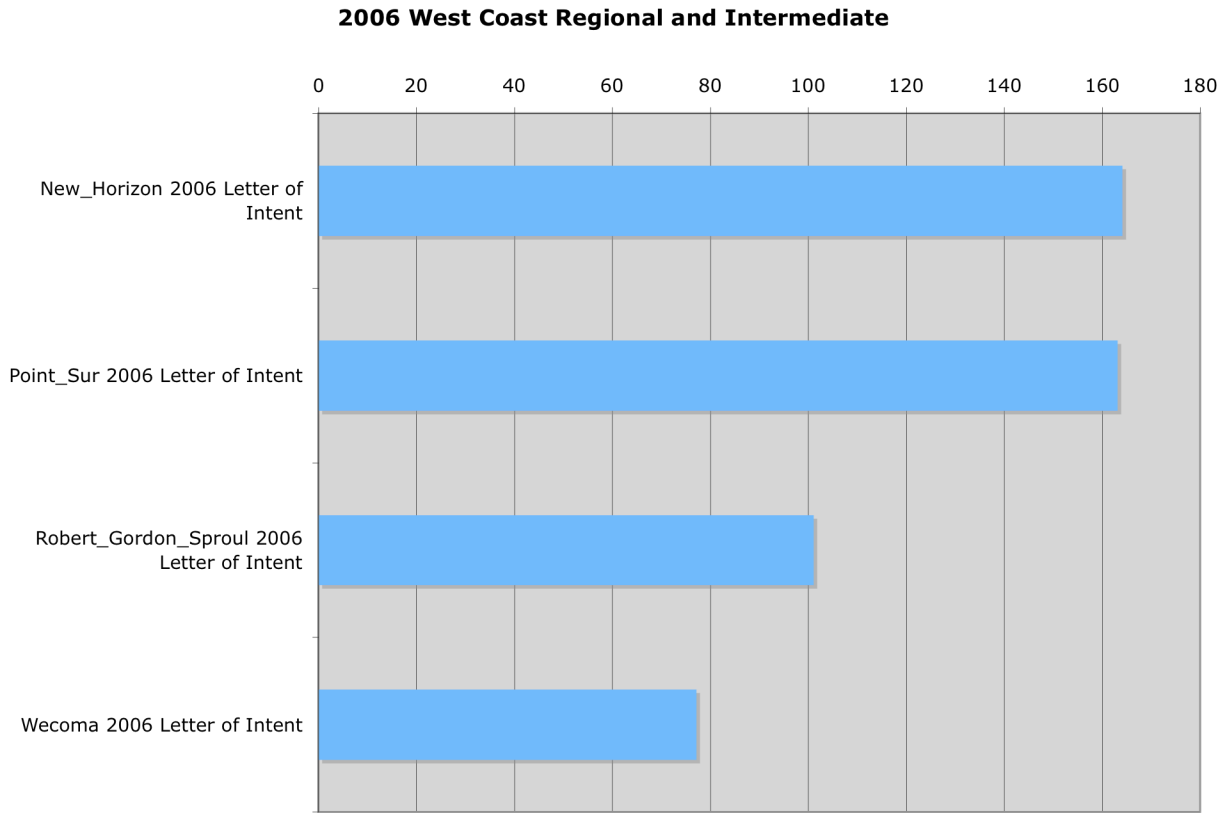
Figure 4:



West Coast (Intermediate, Regional and Local)

All of the west coast intermediate and regional vessels have light schedules. The total number of days shown adds up to 505 days which roughly equals 2.5 ships worth of work for 4 ships. See Figure 5

Figure 5



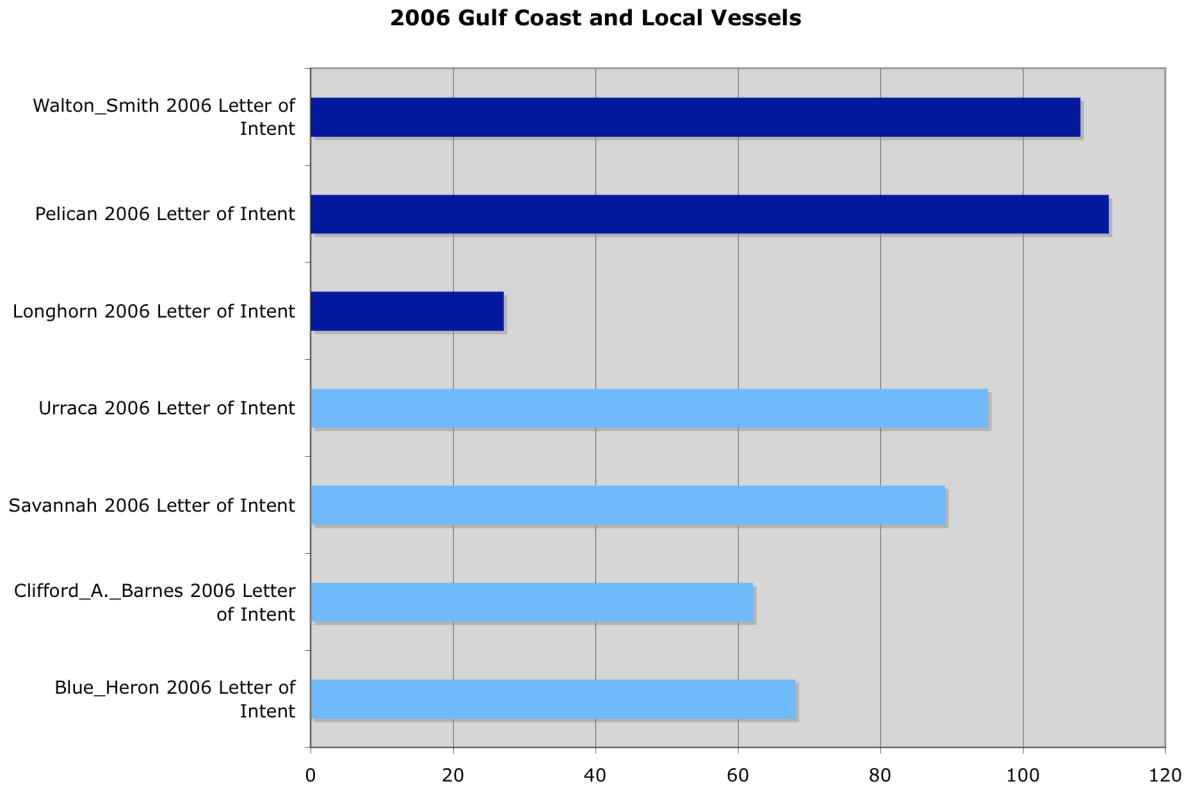
Gulf of Mexico, Florida and Caribbean (Regional and Local)

Schedules for *Walton Smith, Pelican and Longhorn* are all lighter than normal. One request for *Gyre*, which requires an intermediate size vessel is scheduled on the *Seward Johnson.*

Other Local Vessels and *Alpha Helix*

All other Local Class vessels have light schedules, but usually pick up work as the year goes on. See Figure 6 for Gulf Coast and other local vessel demand. A Letter of Intent was just posted for *Alpha Helix* showing 73 days all of which is pending except for 5 days of MMS supported work. This schedule and the associated costs are not included in this analysis, but will be considered on its merits if any more funded work materializes.

Figure 6:



Changes to fleet capacity

Changes to the UNOLS fleet composition/distribution already being planned include the retirement of *Gyre* in 2005, the replacement of *Maurice Ewing* with the *Marcus Langseth* and the potential replacement and retirement of *Weatherbird II* with *Seward Johnson II*. These changes will decrease total capacity for the fleet on paper by about 400 ship days per year. In reality the impact is less because in recent years both *Gyre* and *Seward Johnson II* have operated with fewer than their optimal number of days and *Marcus Langseth* will be a direct exchange for *Ewing*.

Texas A&M has announced that the *Gyre* will be retired in August 2005, which will reduce total fleet costs by about $1.3M and capacity by 250 days in the Intermediate Class.

Bermuda Biological Station for Research (BBSR) is planning to acquire the *Seward Johnson II* from Harbor Branch Oceanographic Institution and to retire the *Weatherbird II*. Since *Seward Johnson II* is not operating in 2005 and does not account for any of the 2005 fleet operating costs, the net budgetary effect of this change will be to increase fleet operating costs in 2006 by about $1M if the *Seward Johnson II* is put into service in 2006. Reduction in capacity depends on whether or not the *Seward Johnson II* accounts for 250 days as an intermediate or just takes over the *Weatherbird II* capacity of 150 days per year.

The *Maurice Ewing* is being retired from service in 2005 to be replaced by the *Marcus Langseth*. The *Marcus Langseth* is scheduled to be ready for service by mid-year 2006. Since *Ewing* only operated for a few months in 2005 the net effect will probably be an increase in operating costs for 2006.

The *Alpha Helix* does not have an operating schedule in 2005 and it appears that it will be difficult to put together a viable schedule in 2006.

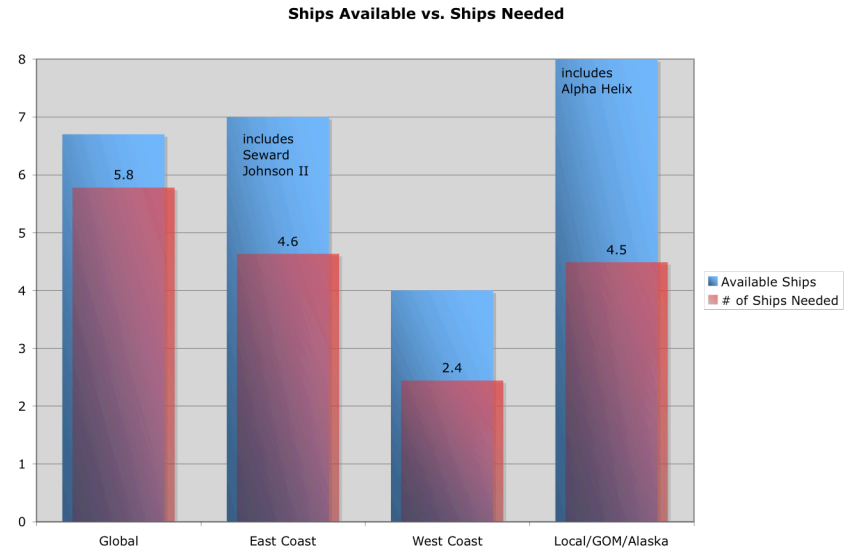
Planned overhauls and refits affecting schedules

The *Alvin* and *Atlantis* are scheduled for overhauls at the beginning of 2006, which will reduce the time available for operations. *Langseth* will complete refit and be ready for operations by June at the earliest and could be later. *Thompson* is due for a required shipyard period sometime during 2006.

Estimated demand versus fleet capacity

Figure 7 provides a summary of the ships available as compared to the 2006 estimated ship time demand after removing 180 days of large ship time to reduce the NSF Ship Operations budget. In this chart, *Alpha Helix* and *Seward Johnson II* are shown to give a true representation of how many ships over the projected 2006 demand there are in the fleet. In the Global Class, *Langseth* is counted as 7/10 of a ship based on starting it's shakedown cruise in May. A later start for *Langseth* would be accompanied by a concurrent decrease in demand for 2006 operations since that work is specific to *Langseth.*

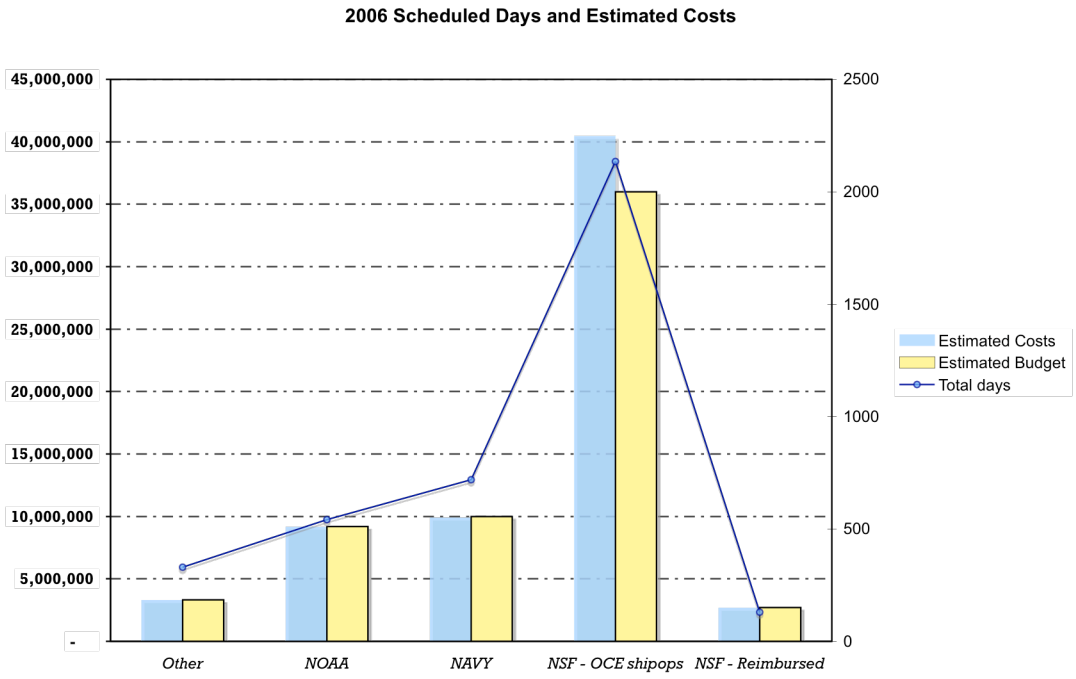
Figure 7:



Cost Estimates based on Schedules

The UNOLS office, Scheduling Committee Chairs and agency program managers assessed budgets and estimated costs based on LOIs after accounting for double bookings and projects deferred due to the availability of other facilities such as OBS. See Figure 8.

Figure 8:



Budgets

Agency budget information has been provided to the extent known.

NOAA

NOAA budget estimates are based on the president's budget request and include several different line items for research vessel charter. A total of a little more $11M appears to be budgeted, however this amount must cover the cost of ship operations, technical services, submersible costs, other non-UNOLS charters and a 4.4% pass through fee for any funds transferred to ship operators through NSF. Careful evaluation of all costs for NOAA cruises must be made before a final determination can be made about the number of days that can be scheduled. For the moment the estimated $9M dollars worth of ship operations costs appears to be close to the proposed budget. Utilization numbers and the NOAA budget does not include any potential funding for the installation and maintenance of DART tsunami warning buoys at this time. The NOAA budget for ship charter is directly affected by Congressional appropriations actions, which provided less than requested in the past year. These uncertainties will make scheduling and utilization decisions more difficult since final budget numbers will not be known for certain until Congress has completed the appropriations process for FY06. If all is funded, this will represent a slight increase over 2005.

Navy

The Navy budget is likely to be level with last year at around $10M. This is roughly equal to the Navy funded work included in the current schedules. There is a possibility that Congress will add funding for additional ONR use of the UNOLS fleet, but that work and funding is not included in the current budget and utilization estimates. Another unknown is the amount of funding that ONR might have to provide to cover costs associated with ship lay-ups. It is assumed that the cost of lay-ups will have to come out of the available funds for ship operations. This is a slight increase over 2005 support for UNOLS operations

NSF

The NSF Ocean Sciences Division budget for ship operations is being decreased in FY06 from FY05 and is estimated to be $37M under the current plan. In addition about $2.7M in ship operations utilization and support will come from the Ocean Drilling Program (ODP), the Office of Polar Programs (OPP) and the Bio-Complexity in the Environment (BE) program, referred to as NSF-reimbursed in figure 8. The total cost of scheduled work for NSF is approximately $43.2M and the amount available is no more than about $39.7M. The cost of ship lay-ups will have to come out of this budget as well. If we assume just $1M to cover lay-ups this amounts to $36M for OCE, $38.9M total and at least a $4.5M shortfall in NSF funding.

Other Funding Sources

Approximately $3.5M in work funded by other sources is included in the posted schedules and it is assumed that this work will be funded for planning purposes. This is a decrease from the last few years, which has been closer to $5.5M. This category is generally the area where work is added during the course of the year, but if ships are laid up, this added work will be harder to accommodate.

Total Budget

This brings the total budget for ship operations to a little over $61M. This is roughly equal to the 2002 cost of ship operations and is about $5.5M less than 2005 costs and about $4.5M less than the estimated cost of scheduled work for 2006. (See Figures 9 & 10)

Figure 9:

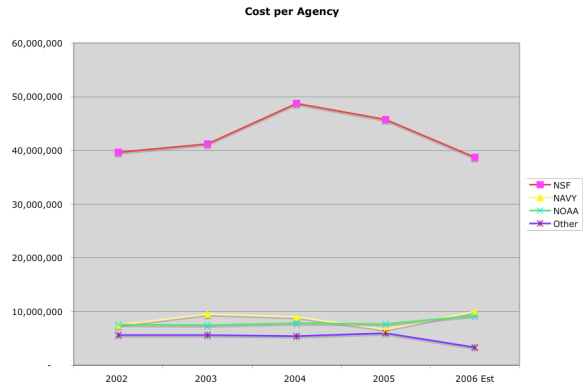
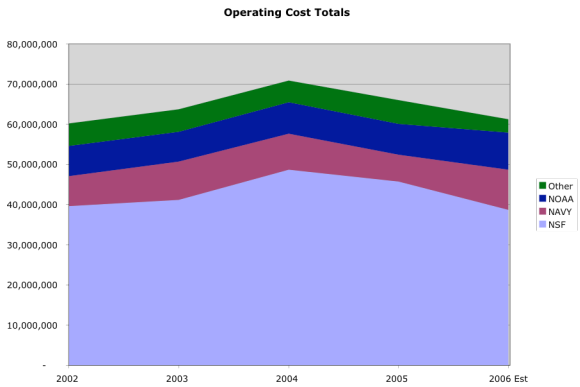


Figure 10:



Fleet Costs

The operating costs for the fleet peaked in 2004 with one of the highest operational demands in years. Demand for the Global Class vessels was particularly strong. Figures 11 & 12 show the decline in total costs under the current budget situation for each class of vessel in the UNOLS fleet and shows how the larger vessels are accounting for a larger percentage of the total costs in the 2006 estimates.

Figure 11:

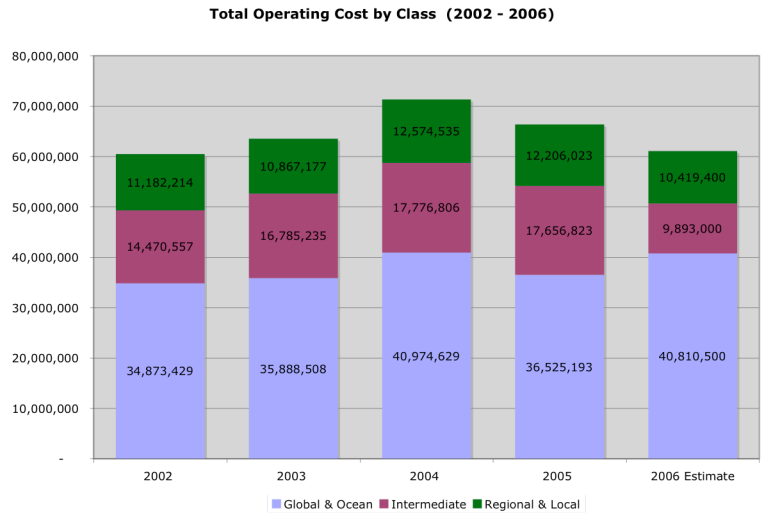
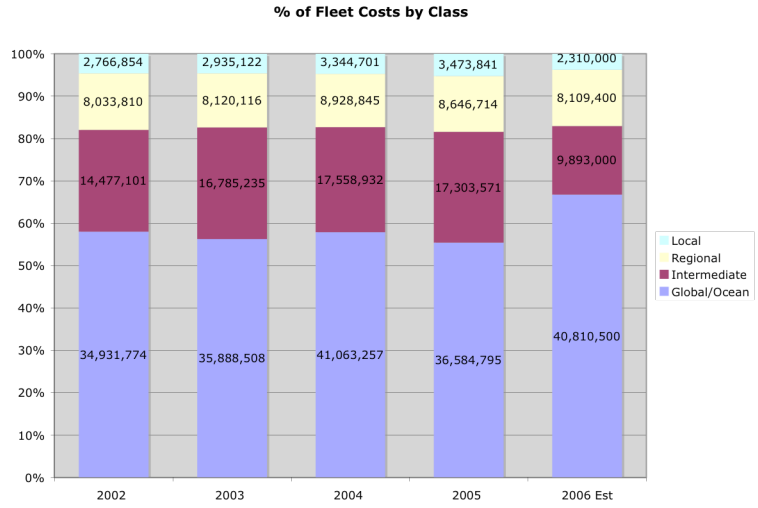
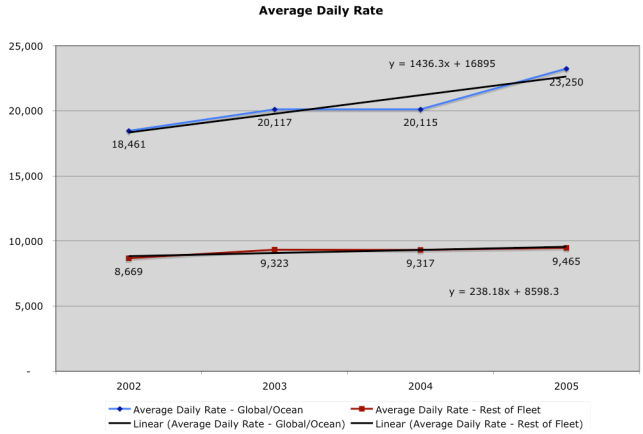


Figure 12:

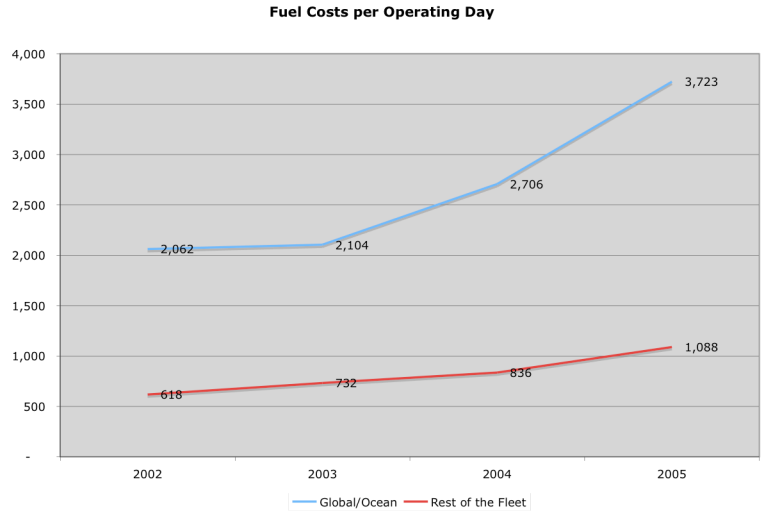


Several factors account for this phenomenon. Average daily rates for the Global and Ocean Class vessels have been increasing steadily over the last four years (Figure 13) and we have been using an even higher estimate of $25K per day for the Global Class, except for *Langseth* where we are using $27K per day. Secondly, most of the work that was deferred from 2005 to 2006 was for large ships, which contributes to the higher percentage of days for these ships. Lastly, no new work for the smaller vessels is expected from the May NSF panels and a few Navy funded projects were shifted from Intermediate or Regional class vessels to large vessels.

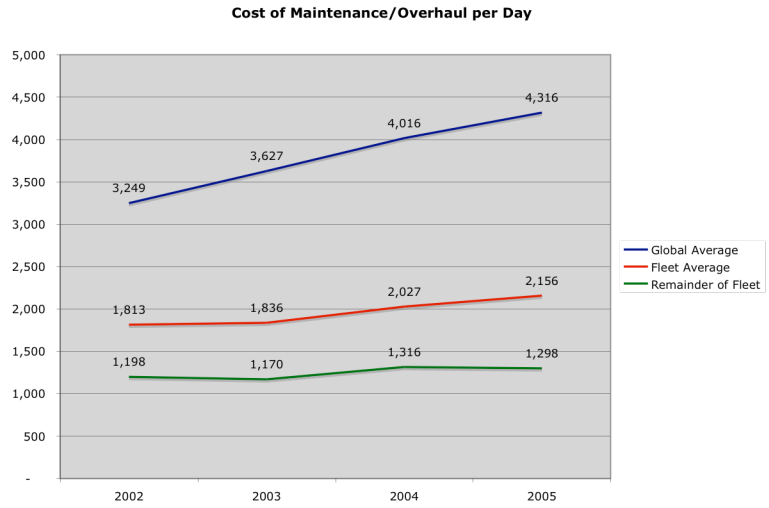
Figure 13:



Major factors in operating costs for the UNOLS fleet and the Global Class vessels in particular are Salaries, Maintenance and Fuel. Fuel costs per day have risen dramatically in recent years (Figure 14).



The cost of maintenance and overhaul has also been a big cost driver in the daily rate for the Global Class vessels. (Figure 15)



It will be important to determine if there are any ways to decrease or mitigate these rising costs. The costs per day are a function of the total expenditures and the number of operating days. Fleet wide - costs per day can be controlled somewhat by ensuring ships operate with full schedules and by finding ways to cut actual expenditures.

Resulting preliminary conclusions and issues to resolve.

Initial assessment of demand and need for lay-ups

Without any additional demand for the use of the UNOLS fleet in 2006 over what is currently scheduled on the Letters of Intent it will be necessary to consolidate some schedules and lay-up ships in order to stay within projected budgets. At first cut it appears two or three Global/Ocean ships will operate with a partial schedule due to overhaul or refit and that at least one Global/Ocean vessel should be laid-up.

On the East Coast the schedules of the regional and intermediate class vessels should be consolidated as much as possible. In addition to the *Weatherbird II (or Seward Johnson II)* being retired/laid-up it appears that one additional vessel should be laid-up.

On the West Coast, Alpha Helix should be considered for lay-up. The other schedules should be consolidated as much as possible and the possibility of laying up one other vessel should be considered.

Schedules for the Gulf Coast and other local vessels are spread out in time and location and may be hard to consolidate or reschedule. Schedulers should examine whether or not any consolidations or partial lay-ups would help. For the most part these vessels have a very small impact on the agency budgets and decisions about whether or not they operate full, partial or any schedule at all should be left to the ship operators.

Recommendations for deciding which vessels to lay-up should take into account the type of work that can be consolidated such that the least impact to scientific requirements takes place. Schedulers should experiment with creating consolidated schedules to help identify any problems created or projects that would be left unscheduled or poorly scheduled. A goal of not laying up or creating weak schedules for more than one ship at an institution should also be a consideration.

Potential impacts of unknown or unaccounted for information.

DART Moorings

At the end of February 2005, NOAA held a buoy deployment summit at which they assessed their potential requirements for deploying new Tsunami Warning Buoys (DART) as well as maintaining existing DART buoys in Alaska. Other buoy deployment and maintenance requirements such as the Ocean Reference Station moorings off Peru and Hawaii and expanded equatorial arrays in the Pacific, Atlantic and Indian oceans were also presented. At the time there appeared to be a clear need for assistance from UNOLS to deploy and maintain all of these buoys if they received the funding to build and deploy them. As of this week, the final authorization for building the DART moorings has not been given by Congress and so real plans for deployment schedules cannot be made yet. It also seems highly likely that the NWS, which is responsible for the DART mooring deployments will attempt to find the most cost effective means for this work and may only use UNOLS vessels when it is most cost effective or other solutions are not available.

If authorization for building the DART moorings is received then the likelihood that some deployment work will come to UNOLS is somewhat increased. Estimates as high as 300 days per year have been made, however this is probably optimistic. Any work of this type would help utilization and some reasonable strategy for being able to respond to requests for ship time to support this work should be developed.

NOAA has been asked to make ship requests and funding decisions as early as possible and UNOLS should continue to work with them to make these commitments in time to mesh with the scheduling process.

NOAA Funding status

A similar argument can be made for the entire NOAA ship charter allocation process. If funding commitments cannot be made then decisions about lay-ups of ships will have to be made based on uncertain assumptions about the NOAA funded projects. A conservative approach would leave these projects to be scheduled on ships that would otherwise be laid-up. This would most likely result in inefficient schedules for all concerned.

Navy Funding

There is a potential for Congress to add funding for use of the UNOLS fleet by certain Navy programs. The status of this funding and how it will be used is still an unknown at this time and we do not know when it might materialize to the point where it would impact scheduling decisions.

NSF budget and program priorities

NSF Program managers are busy with May panels. There are many proposals with pending requests for ship time in 2006. However, since the estimated cost of sending projects already funded to sea exceeds the projected NSF ship operations budget it is highly un-likely that many, if any, projects will be approved for 2006 ship time from these panels. If they are, it will be at the expense of projects already funded.

Given that NSF costs must still be reduced by not scheduling some projects, it will be important for the NSF program managers to set some priorities for which projects to consider for deferral. The process of scheduling will help to identify prime candidates as well.

Better Cost Estimates

This initial assessment is based on rough (and somewhat conservative) cost estimates for each of the UNOLS ships. It will be important to obtain better estimates of costs for full schedules and for partial schedules (80% utilization or as posted). These cost estimates will help make better decisions about how many days actually need to be deferred and whether or not any new projects can be approved for 2006 ship time. It will also be necessary to get good cost estimates for technical services and submersibles in order to determine how many days will fit within the NOAA and other budgets.

Lay-Up Costs

Since lay-up costs will come off the top of ship-operations budgets and will have a direct impact on how many operating days can be funded, it will be necessary to create accurate cost estimates associated with different ship lay-up scenarios. The assumptions about which agency will cover the cost of lay-up for each ship or whether any agency will cover costs for an institutionally owned ships should be settled

definitively as this will have an impact on overall costs and subsequent recommendations regarding lay-ups.

Underlying or overarching issues

Balance between facilities and science budgets

The balance between facilities budgets and science budgets should be examined in order to make recommendations about whether or not the current plan is the right approach. The budget submission states that for the Ocean Science Division, facilities represent 41% of the budget, however another way to examine the balance is to view research fleet operations budgets as a percentage of research and education budgets. The table below shows that science funding was cut drastically in 2005 (partly to pay for 2004 fleet operations) resulting in a higher ratio between fleet operations and science. In 2006 an equally dramatic cut is being applied to fleet operations resulting in a lower ratio than in 2004. What should the balance between these two components be and should changes be made quickly to arrive at a new balance. For example, a more gradual reduction of ship operations costs might make more sense in bringing about a stable balance in this era of reduced and flat budgets.
References: NSF 2006 Geo-Sciences Budget and NSF 2006 Facilities Budgets
For a list of recent NSF Budget submissions and appropriations go to: http://www.nsf.gov/about/budget/

Fiscal Year	2004	2005	2006
Research Fleet Operations (includes ship ops, tech, etc.)	72.5	72.2	66.9
Research and Education Grants	194.85	181.64	190.61
Research Fleet Operations as a percentage of Science Funding	37%	40%	35%

Facilities Renewal versus current science and operations budgets

From examining the NSF budget submission for ocean science facilities support it is clear that within a budget that is flat from FY05 to FY06 ($83.2M), money is being shifted from current operations and maintenance to "new infrastructure." This $5.3M dollar shift in funds pays for the design efforts for new Regional Class research vessels and other renewal projects such as the *Langseth* and replacement Human Occupied Vehicle (HOV). This "mid-size infrastructure" was programmed to be funded from the Ocean Sciences division (OCE) funds during a period when NSF and OCE budgets were increasing and this new infrastructure would not come at the expense of existing science or facilities operations budgets. That is no longer the case and it is now necessary to take funding from either science budgets or current operations and maintenance. The community and UNOLS, in particular, have been a strong voice for fleet renewal efforts and have supported the leadership and progress being made by NSF and the Navy in this area. At the same time, budget realities make it necessary to examine the assumptions regarding the allocation of funds for these efforts versus current operations and science funding. Several members of the community voiced strong opposition to the plan to use ONR science funding for new infrastructure and the same arguments may well apply to the NSF budget plans. The following table from the NSF Budget Submission shows the plan for Fleet Renewal and Operations funding over the next few years.

Academic Research Fleet Funding Profile			
(Dollars in Millions)			
Fiscal Year	Implementation (Fleet Renewal)	Current Operations & Maintenance	Total Academic Fleet
FY 2001	2.30	56.60	$58.90
FY 2002	2.30	59.60	$61.90
FY 2003	3.00	62.20	$65.20
FY 2004	10.00	72.50	$82.50
FY 2005 Current Plan	**11.00**	**72.20**	**$83.20**
FY 2006 Request	**16.30**	**66.90**	**$83.20**
FY 2007 Estimate	19.50	71.00	$90.50
FY 2008 Estimate	19.80	73.90	$93.70
FY 2009 Estimate	20.80	75.50	$96.30
FY 2010 Estimate	21.47	77.39	$98.85
NOTE: Operations estimates for FY 2007 and beyond have been developed based on current cost profiles and are not intended to reflect actual budget requirements. They will be updated as new information becomes available.			

The effects of lay-ups and retirements on future budgets, operations and scheduling flexibility.

Decisions about lay-ups and retirements will affect the current and future budgets. Lay-ups leave capacity in the fleet that allow for dealing with fluctuating demand, but come at a cost. Vessels need to be maintained so they are safe and effective when brought back into service, retain their inspection and classification certifications and retain their capability for science support. A key element in being able to bring a ship back into service is the availability of experienced and qualified crew. Lay-ups that involve letting crew go run the risk of losing these experienced personnel to other jobs. To some extent this can be mitigated by utilizing crew on other ships within the fleet through cooperation by the ship operators, but extensive lay-ups will always place a burden on our crews and technicians that they may not be able to sustain for long. On the other hand, retirement of vessels will result in the permanent loss of capability in terms of both the ship and its crew. Fewer ships will mean less flexibility in scheduling cruises during periods of peak demand within a year or during a year of high demand. So even if we are in a period of extended low demand, certain times of year or in certain areas fewer ships will reduce our ability to effectively schedule some projects as required or requested. Decisions about lay-ups and retirements should be made taking into consideration these longer term impacts.

Cost reductions in fleet operations

An examination of costs and operating procedures should be made in an effort to find other ways to maintain existing capabilities and capacity within existing budgets. The cost of fuel, crew, maintenance and new regulations all have an impact on the number of days at sea that can be afforded within the budget. Losing ships and funding to other expenses will have a direct impact on our technicians and crewmembers and they should be consulted about solutions to these budget problems. Looking for ways to mitigate some of the current cost increases such as fuel prices and new regulations should be examined. Supplemental funding for high fuel costs have been received in the past, the use of Navy fuel

sources and other solutions may all help keep operating costs down. Relief from some regulatory requirements and costs might be possible and should be examined. Recommendations to NSF and ONR to work with NOPP to find solutions to some of these budget issues will be considered.

Additional information is needed to finalize recommendations

From Ship Operators

Better estimates of daily rates for 2006 assuming full schedule and 80% and/or projected schedule.

Ship operators are requested to provide estimated daily rates for 2006 that will be used in cost estimates and economic models for the various utilization options being considered. Estimates should be provided for a full operating schedule based on the assumption that the ship will operate at or near its optimal schedule. A second estimate should be based on a schedule that is around 80% of optimal (i.e., 240 to 250 days for a Global, 200 days for an Intermediate, 145 to 150 days for a Regional, etc.). A third estimate can be given in addition to or instead of the second estimate that is based on the posted or best guess schedule for 2006. Give the number of days and daily rate for each of these estimates by filling in the attached spreadsheet or in an email message to the UNOLS office. Please make reasonable estimates that are conservative but not overly inflated. These will be used to estimate the number of days that can be supported by each agencies budget. The attached spreadsheet contains the estimated daily rate that has been used for the current cost estimates.

Recommendations of types of lay-ups that make sense and save money.

Ship operators are requested to make recommendations regarding what type of lay-ups should be recommended that would save money and maintain future capacity. What major cost elements should be included in each lay-up scenario that you recommend?

Rough cost estimates for different types of lay-ups.

Ship operators are also requested to give a rough order of magnitude estimate of laying up each ship in 2006. If a planned overhaul, shipyard or contribution to the Major Overhaul Stability Account (MOSA) is included, please specify that cost as a separate line item. Multi-ship operators should assume that only one ship would be laid-up and single ship operators should assume that they would receive assistance from other operators in employing crew members on a temporary basis.

Recommendations or comments for deciding which ships to lay-up and regarding retirement of vessels.

Ship operators are invited to provide any recommendations or comments they feel should be considered regarding decisions about ship lay-ups, about how to decide which ships to lay-up and about retirements versus lay-ups.

Recommendations regarding fleet wide cost savings

Ship operators are requested to seek input from their personnel, crews and technicians regarding cost saving measures that could be applied on a fleet wide basis and are invited to provide that feedback.

Request for information regarding the costs and impacts of new security regulations and other regulatory mandates.

There is a general sense that new regulatory requirements are placing an increasing burden on ship operators that may or may not have a direct impact on the cost of fleet operations, but at the very least have resulted in a greater workload and perhaps a need to increase personnel. There is some possibility that UNOLS operators or their supporting agencies could seek some relief from these regulatory requirements and/or seek supplemental funding to offset the costs. Therefore we are requesting a brief description of factors (direct and hidden/indirect such as crew time spent in training, etc.) associated with Security regulations, ISM and other regulations that have increased the cost of operations along with an estimate of those costs. UNOLS might consider raising this issue with NOPP through NSF and ONR to seek relief from some of these regulatory requirements and/or financial mitigation.

From Funding Agencies

Best estimate of operations and maintenance budgets for 2006 and beyond.

Agency ship operations program mangers are requested to review the assumptions regarding their budgets and update this information as appropriate.

Best estimate of out-year science demand for ship use by type of ship

UNOLS will seek assistance in estimating future utilization research vessels by class and/or region based on current budget estimates for science funding.

Funding status and prioritization of field work for 2006.

UNOLS requests that timely information on the funding status and prioritization of projects be provided to ship schedulers so that schedules and cost estimates can be further refined. Prioritization of NSF projects and information on any new projects to be scheduled will be particularly important in revising schedules. Schedulers may ask for input on specific projects that require long lead times for permitting and clearances that need to be scheduled for early 2006.

Identification of any potential additional work including prospects for funding.

Agency program managers (and schedulers) are requested to identify any additional work to be scheduled as soon as this information is known.

From the community/Council

Members of the UNOLS community, committees and Council are requested to provide any comments or thoughts that should be considered on the issues listed below or others we have not listed that would assist in formulating the UNOLS recommendations to NSF.

- Thoughts on cost savings, prioritization of cost cutting measures (i.e. lay-ups vs retirements)
- Thoughts on future demand and facility requirements.
- Thoughts on the current balance between science funding, current ops and maintenance and future facility development.
- Whether or not renewal activities should proceed as planned.

Planned areas to address in the recommendations:

Short term (2006) recommendations

Short term recommendations will address the following areas:

- Recommendations regarding the allocation of OCE funds for current ship operations.
- How many ships to take out of service to meet the budget projections.
- How to deal with uncertain budgets for NOAA and others.
- Which ships to recommend for lay-up
- The type of lay-up to be recommended.

Longer term recommendations based on level funding

Long term recommendations will address the following areas:

- Whether or not to retire ships to meet the budget projections.
- Should new ships and facilities be built if there is no new additional money and they would come at the expense of current operations and science funding.
- What should the balance between facilities and science funding be for ocean sciences.

Appendix I - Scheduling details

Global and Ocean Class (*Kilo Moana*)

This section covers the work for the large Global Class vessels and the one Ocean Class vessel, *Kilo Moana.* Since we still need to determine what projects and which ships will be scheduled this discussion assumes utilization calculations based on the optimum operating year for a Global class vessel of 300 days per year even though the number for an Ocean class vessel may be less. All schedulers have posted two versions of their 2006 LOIs representing full schedules except for the version of the *Knorr* schedule that is entirely in the Atlantic, which only shows 109 days of general purpose Global work. One cruise is early in the year and the rest start in July and later.

The posted schedules are all full because there are many double bookings and some excessive transits. These have been removed in making the cost estimates.

- Potential funded work in the Pacific for the general purpose Global and Ocean Class vessels is equal to a little more than 4 ships worth of work (1243 days/300 = 4.14 ships), however one version of the Atlantis schedule covers 24 days of the ROV work with Alvin leaving about 305 days of work for each of four ships. This still leaves the 109 days of general purpose work in the Atlantic, which is equal to less than 1/2 of a ship year. However, these numbers assume full budgets to cover all funded work. In order to bring NSF costs down enough to stay within the projected budget, about 180 days would need to be cut, which reduces demand for general purpose large ships in the Pacific to 3.5 ships or about 260 days per ship if scheduled on four ships.
- The *Lanseth* has enough funded work to keep busy for the next couple of years and its schedule will be determined by when it is ready to start work, availability of OBS for some projects and successful permit and clearance requests for others. We are proceeding under the assumption that the *Langseth* will begin operations mid-year and that the OCE ship operations budget will also pay for about a thirty day shakedown/sea trials cruise, which is included in the utilization totals.
- *Alvin* and *Atlantis* begin the year in overhaul. The assumption is that *Alvin* will be ready for sea trials in mid-April and will begin ops in the Gulf of Mexico in May. Other work for *Alvin* is all in the Pacific, mostly on the East Pacific Rise (EPR). Specific requests for *Alvin* result in a fairly light schedule, however there are several cruises that could use either *Alvin* or an ROV. Since there are more requests for the *Jason II* than can be accommodated, the *Alvin* could cover several ROV requests along the west coast of California and on the Juan de Fuca (JDF). This could result in a full schedule for *Atlantis* and *Alvin* for the last 3/4 of the year. *Atlantis* could be available for non-*Alvin* work earlier in the year in the Atlantic, but the only cruise currently funded is for Toole off of Bermuda in February, which is currently shown on *Knorr*. All other Atlantic non- *Alvin* work is later in the year.
- There are some cruises that have specific requirements for the Pinkel SONAR on *Revelle* and several others (primarily OBS and large mooring deployments) that require Global class vessels.

- HOTS cruises will continue to be monthly cruises of 4 days and there are several other periodic cruises to the HOTS station. These have not all been effectively scheduled but are included in the cost and day estimates.
- Additional work may materialize for deploying DART buoys or for Navy projects, which could fill out the fifth schedule, but unless that happens at least one Global or Ocean Class ship may need to be laid-up. If the pending NOAA supported work does not all get funded, then the number of lay-ups may need to be increased. An assessment of how to best manage the uncertainty over NOAA and other funding decisions needs to be factored into the scheduling process.

East Coast (Intermediate, Regional and Local):

Projected Schedules for *Endeavor, Oceanus, Seward Johnson, Cape Hatteras, Cape Henlopen* (replacement) and *Weatherbird II* add up to about 973 days, which is a little less than five ships worth of work for six ships.

- *Weatherbird II* has a fairly normal 150 day schedule, which is local and crucial to the BATS program.
- *Seward Johnson II* does not have a posted LOI and may replace *Weatherbird II*. For planning purposes one or the other will operate from Bermuda and the other will not operate.
- *Cape Hatteras* has one of the weaker schedules with 74 days after removing the double booking for the Navy multi-ship operation.
- *Cape Henlopen* has a strong schedule of work specifically requesting that ship.
- There is one three-ship and one four-ship Navy program planned during the summer and early fall of 2006. *Oceanus, Endeavor*, and *Cape Henlopen* are slated for these Navy cruises plus *Knorr* is requested for the four ship cruise.

West Coast (Intermediate, Regional and Local)

Alpha Helix does not have a posted schedule and schedules for all the other west coast intermediate and regional vessels are light. The total number of days shown adds up to 505 days which roughly equals 2.5 ships worth of work for 4 ships.

- *Wecoma* has a very weak schedule
- *Sproul* is traditionally light and picks up work as the year goes on.
- There are a couple of multi-ship operations including a two-ship operation for Barbara Hickey off of the Columbia River (*Point Sur*, *Wecoma*) and a four ship Navy operation off Monterey Bay (*Point Sur, Wecoma, Revelle* and another Global Class vessel).

Gulf of Mexico (Regional and Local)

Schedules for *Walton Smith, Pelican and Longhorn* are all lighter than normal. One request for *Gyre*, which requires an intermediate size vessel is scheduled on the *Seward Johnson.*

- *Gyre* will be retired in 2005.

- *Longhorn* does not have any federally funded work scheduled.
- *Walton Smith and Pelican* both have lighter than normal schedules and at least on double booking.

Other Local Vessels

All Local Class vessels have light schedules, but usually pick up work as the year goes on.

- *Barnes* has a light schedule and includes some pending NSF work, which should be removed.
- *Savannah* and *Blue Heron* have light schedules and *Savannah* has included several pending NSF cruises, which should be removed.
- *Urraca* does not have any federally funded work scheduled.

Alpha Helix

- There are no funded requests for work in Alaska on vessels smaller than *Kilo Moana. Alpha Helix* just posted an LOI with 5 days of funded work and 68 days pending. These numbers are not included in the analysis presented in this document.

Appendix II - Cost estimates

A spreadsheet showing the daily rates used in cost estimates and requesting updated daily rate estimates for 2006 and estimates for lay-up costs is at:
http://www.unols.org/_Projects/Fleet_Cost_Estimates.xls

Ship operators are requested to download this spreadsheet and fill in the requested information for ship ops daily rates, technician rates and where applicable, submersible rates. The second sheet requests estimates for the cost of lay-ups. These should be rough order of magnitude estimates and not detailed proposals costs.