

VIII. RECOMMENDATIONS

The fundamental recommendation is implicit in the preceding section: THE AGENCIES SHOULD URGENTLY SEEK A SUBSTANTIAL INCREMENT OF SHIP OPERATIONS FUNDS, AND SHOULD COORDINATE THIS WITH APPROPRIATE SUPPORT OF WELT-REVIEWED SEAGOING RESEARCH PROPOSALS. This is not simply another forgettable "we want more" recommendation. Cutbacks in operating funds in the current year have already affected some PI's, and we also find instances of ships being asked to take on jobs which may be beyond their capability unless weather and sea conditions are extraordinarily favorable (use of intermediate ships in the Greenland Sea). The fleet is being stretched hard; the case for relief is there. However, in the absence of such an increase in funds, the following recommendations become inescapable:

1. The immediate 1989 situation will demand large numbers of layoffs or retirements. Clearly, retirements are preferable, since they cut costs more efficiently than layoffs. Efforts to identify and plan 1989 retirements and layoffs must start right away.
- Layup criteria should include soft schedules and the potential to accomplish useful repairs and upgrades during the layup period. Retirement criteria should include the condition of the ship, prospects for rising maintenance and repair costs, the recent record of soft schedules or underutilization, and duplication of capability by other more effective ships
2. Advance work on layoffs and retirements for 1990 and 1991 also should be started now, using the same criteria as in #1. The sooner such planning begins, the more orderly and less painful will be the inevitable retrenchment.
3. We should be skeptical about adding new capacity. Any new capacity proposed should replace existing ships, not add to fleet operating costs. It would be best if inclusion of any new ships were linked to retirement of more than equal capacity.
4. Because the total mismatch picture is so bleak, considerations of regional or size distribution of ships and changes thereof are really luxuries. Any opportunity to reduce the fleet will be needed, and whether that opportunity comes in a particular size or region is beside the point. Scientific programs will have to adjust to the size and regional distribution that exists and/or will have to wait for availability of preferred ships.

The second point is that perceptions of increases to "scientific demand" in consequence of impending major programs may be overly optimistic. WOCE, one of the largest such programs, affords an example. The U.S. WOCE Implementation Plan first draft of May 1988 calls for only 120 days per year of ship use in the major WOCE component, the global hydrographic survey (pp. 36-37). If this is indicative of WOCE and other large programs as a whole, we can expect only modest increases in demand at best. This is particularly so since the scientists who will lead such cruises are the same individuals who in other years might be proposing seagoing programs of their own; their WOCE or GOF S efforts may replace, not add to, their "normal" demands for ship time.

In the work above we have referred to "fleet capacity," which is not the same thing as "scientific demand." The former term means the amount of seagoing work that the fleet could support if operated full-time. The latter represents the amount of ship time that would be needed to support all the well-reviewed, fundable science. Though our subcommittee was not supposed to concern itself with the factor of scientific demand, and has not done so in the calculations given above, we feel obliged to make two observations on this matter. The first is that the demand is there; it is the lack of funds for the research programs themselves and/or the ship support for those programs, in some hard-to-calibrate mixture, that leads to the excess capacity. If the funds were available, the ships would be booked up.

**VII. TWO NOTES ON "SCIENTIFIC DEMAND"**

Given this situation, it is difficult to justify the addition of new capacity to the fleet unless it is linked to the retirement of at least equal, and preferably greater, capacity in the near term. We seem to be faced with inescapable financial pressure to decrease the size of the fleet.

Overall, the results are gloomy. The situation is substantially out of balance in the unfavorable sense, in all cases and in all years. In short, we must secure substantial new funding for ship operations, or else we must face the need for substantial layoffs and/or retirements over the three-year period. In the latter case the only unresolved question is the extent of the reductions needed. This depends on the imprecision in the input data; as seen above there is a considerable variance, particularly in 1989.

**VI. DISCUSSION AND INTERPRETATION**

-5,511

Difference

33,500  
39,011

Funding  
Fleet capacity = 38,411 + 600 =

1991 Best Case

<p><b>1988 Best Case</b></p> <p>Funding 34,170</p> <p>Fleet capacity (equals funded capacity plus unfunded capacity, 34,170 + 4,241 38,411</p>	<p>Difference</p> <p>-4,241</p>
<p><b>1989 Worst Case</b></p> <p>Funding 26,086</p> <p>Fleet capacity = 38,479 - 4,373 = 34,106</p>	<p>Difference</p> <p>-8,020</p>
<p><b>1989 Best Case</b></p> <p>Funding 29,940</p> <p>Fleet capacity = 38,411 - 4,373 = 34,038</p>	<p>Difference</p> <p>-4,098</p>
<p><b>1990 Worst Case</b></p> <p>Funding 31,740</p> <p>Fleet capacity = 38,479 - 2,886 = 35,593</p>	<p>Difference</p> <p>-3,853</p>
<p><b>1990 Best Case</b></p> <p>Funding 33,500</p> <p>Fleet capacity = 38,411 - 2,886 = 35,525</p>	<p>Difference</p> <p>-2,025</p>
<p><b>1991 Worst Case</b></p> <p>Funding 31,740</p> <p>Fleet capacity = 38,479 + 600 = 39,079</p>	<p>Difference</p> <p>-7,339</p>



33,806	Funding
38,479	Fleet capacity (equals funded capacity
	plus unfunded capacity, 33,806 + 4,673)
-4,673	Difference

1988 Worst Case

Combining the funding changes data from section III with the fleet capacity change data from section IV we have a tabulation of the present and future shortfall, with a range between best and worst cases.

V. THE MISMATCH

1991	THOMPSON	-1,400	AGOR-23	+2,000	Total	+600
1990	KNORR/MELVILLE	-1,486	THOMPSON	-1,400	Total	-2,886
1989	KNORR/MELVILLE	-2,973	THOMPSON	-1,400	Total	-4,373

In summary, the list of changes to fleet capacity in the three future years is:

3. AGOR-23 activation. ONR estimates 8 months of operation in 1991 and full operations thereafter. Operating costs are not yet known, of course, but assuming this to be a \$3,000K per year ship, we have an increase of \$2,000K in 1991.

2. THOMPSON deactivation. The 1988 operating costs will be saved in 1989-91. This is a reduction of \$1,400K (source 3).

1. KNORR/MELVILLE refit. This will remove the equivalent of one of these ships full-time from 1989 funding, and half-time from 1990 funding. Both should be back in full service during 1991. Taking 1988 KNORR NSF and ONR costs from sources 1 and 3 as a guide, we can therefore estimate reductions of \$2,973K in 1989, \$1,486K in 1990, and \$0 in 1991.

Other predictable changes to the capacity of the fleet are:

4. Continue to use numbers from D. Heinrichs Telemail of 6/8/88 despite the fact that operator proposals/requests in the current year total \$1,553K more, per W. Barbee tabulation of 7/5/88.
  5. D. Heinrichs Telemail of 6/30/88, with range of possible 1989 reductions of the "deficit" incurred in 1988.
  6. Knox conversation with Kaulum at SIO, 6/8/88.
  7. Corresponds to erasing the remaining "deficit" fully in this year.
  8. Corresponds to carrying remaining "deficit" forward without any change.
- Thus 1989 poses a severe funding reduction, between \$4,230,000 and \$7,720,000. The large spread between the best and worst cases is due primarily to the differing estimates of ONR funding, and secondarily to the range of guesses as to how far NSF will seek to "repay" the "deficit" incurred in 1988. In 1990 and 1991 the funding levels recover, but remain significantly below the 1988 totals.

**IV. FLEET CAPACITY DATA**

In 1988, the "base year" for this discussion, most ships were fairly fully utilized, as shown in source 1. Three important exceptions were MOORE and OSPREY, which were out of service, and GYRE which operated but not with significant ONR or NSF funding. We calculate the financial size of this unfunded (by NSF and ONR) capacity as follows. We have obtained estimates from the respective operators of the day rates or range of day rates that would apply now if the ships were in reasonably full utilization. For MOORE this is the ship-only cost, not the ship-plus-MCS cost. We have then applied this day rate to a "full" schedule, defined as the cutoff number of days for layup consideration under the RVOC formula. For GYRE and MOORE this is 200 days (Class III); for OSPREY it is 216 days (Class II). The result is:

<b>"Full Year" Operating Cost</b>		
	<b>Low</b>	<b>High</b>
GYRE	1,113	same
OSPREY	1,728	2,160
MOORE	1,400	same
<b>Total</b>	<b>4,241</b>	<b>4,673</b>

III. FUNDING DATA

Here we identify the amounts of funding likely to be available in the period of interest. The following table gives the available estimates and the sources thereof, sorted by best-case and worst-case. There is a considerable spread in the results, and this translates directly into a considerable spread in the estimated severity of funding/fleet capacity mismatch in section V. Units are K\$.

TABLE OF ESTIMATED AVAILABLE FUNDS, NSF/ONR

Notes & sources		Notes & sources		Notes & sources	
Best		Worst		Best	
1988	ONR	5,636	1	28,170	3
	NSF				
	Total	33,806		34,170	
1989	ONR	1,946	1	4,300	6
	NSF	24,140	3,5	25,640	3,5
	Total	26,086		29,940	
	Change from 1988 level	-7,720		-4,230	
1990	ONR	6,300	6	same as worst	8
	NSF	25,440	5,7	27,200	
	Total	31,740		33,500	
	Change from 1988 level	-2,066		-670	
1991					
	(Same as 1990 throughout)				

Notes and sources:

1. W. Barbee tabulation of 7/5/88.
2. W. Barbee Telemail of 6/3/88 quoting information discussed with K. Kaulum.
3. D. Heinrichs Telemail of 6/8/88.





Our method is to calculate the future as changes from the 1988 situation. This has the virtues that the 1988 data on available funds and on operating days funded are reasonably closely known at this time, and that by definition the available funds cover the funded operating days. From this initial condition future changes in expected funding and in fleet capacity for ship days can readily be projected. It must be borne in mind that the 1988 situation includes substantial unfunded fleet capacity (GYRE, OSPREY, MOORE), and this exacerbates the funding shortfall as explained below. Throughout the discussion we estimate funding, fleet capacity, and shortfall solely with respect to NSF and ONR, for these are the only sources for which we have any ability to forecast future budgets. Ship funding from other sources is a welcome, but imponderable, means by which the resultant shortfall could be reduced.

## II. METHOD OF CALCULATION

These guidelines were reaffirmed in discussion of the draft report at the July 1988 meeting of the Advisory Council in Woods Hole.

4. Treat any inputs about increases in research demand for ship time as interesting but irrelevant; the driving factors are projected funding and fleet capacity.
3. Give advice on how to cope with any mismatch.
2. Gauge the degree of match between this funding and the capacity of the fleet, accounting for changes in the fleet due to retirements, overhauls, and new arrivals.
1. Take stock of the likely funding for UNOLS ships during 1989, 90 and 91.

This subcommittee (R. Knox (chairman), R. Dinsmore, T. Johnson) was established at the March 1988 meeting of the Advisory Council in Fort Pierce, Florida. Verbal instructions at that time were to consider the short term (1989, 90 and 91) balance of ship availability and funding, taking into account retirement or extended overhaul of some ships, and possible acquisition or full activation of others during the time period. Subsequent statements of the charge to the subcommittee were given in a letter from D. Heinrichs on May 26, 1988 (attached) and in Knox/Heinrichs phone conversations and Telemail exchanges. The subcommittee thus understood its business to be:

## I. INTRODUCTION

REPORT AND RECOMMENDATIONS - 8/10/88

UNOLS ADVISORY COUNCIL  
SUBCOMMITTEE ON SHORT-TERM FLEET NEEDS AND MANAGEMENT

UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM