

To: U.S. Commission on Ocean Policy
From: RDML Craig E. Dorman, USN (Ret)

Subj: Follow-up Questions

1. Question: Please Provide concise statements justifying the need for increased funding to support Arctic Research (note: Same question posed to Mr. George B. Newton, Jr., Chairman, U.S. Arctic Research Commission).

Response (the first two paragraphs below say about the same thing...the slant is just a little different. For added conciseness, choose one):

Over the past decade, we have come to recognize that Arctic processes play a significant if not dominant role in global change, while external environmental and economic influences on the Arctic have created serious challenges to the health and sustainability of the region's ecosystems, cultures, and natural resources. These challenges are circumpolar, and have been forcibly addressed by those nations whose landmasses and population are largely located in Arctic regions. In the US, following the elimination of the strategic submarine threat from Arctic waters after the end of the Cold War, we have tended to treat the Arctic as simply a one-state, special interest issue. Thus neither in research, nor in economic development, nor in national policy, nor in international relations, has our investment of money, talent and attention been commensurate with the global and national significance of the region.

The role of the Arctic in global affairs, and the role of America's Arctic population, resources, and geostrategic location in Alaska and the surrounding waters in our nation's security and economy, suggest that our national attention to the Arctic be enhanced. Our most important national fisheries, plus the reserves of minerals, oil, coal, natural gas and methane hydrates in the region, alone should justify a high place in the nation's priorities for the Arctic. Climate change, the well being of native and rural populations, and sustainable ocean and terrestrial resource management, are issues where American Arctic research can address pressing global problems. By virtue of its location, Alaska is not only a critical node in global logistics, but – once again – is playing a major and increasing role in homeland security and national missile defense.

While changes in both policy and economic and cultural development are vitally important components of increased US attention to the Arctic, they must rest upon the results of a sound and broad base of research in both natural and social sciences. Over the last decade, the investment of NSF's Office of Polar Programs in Arctic research has achieved parity with their investment in the Antarctic. However research funding for Arctic issues from other parts of NSF, as well as DOD, NASA, NOAA, and the other Federal Agencies of the Interagency Arctic Research Policy Committee, has remained static or declined (precipitously in the case of DOD). Thus our overall investment is both inadequate, and badly imbalanced. We urge OMB, OSTP, and Congress to support a multi-agency increase in research funding that addresses the full breadth of Arctic issues.

2. Question: In your testimony you stated that no coherent plan exists for an ability to access the sea by oceanographic vessels and institute a fleet replacement process; there has been zero commitment by various agencies, including the U.S. Navy and NSF, to fund this need. Please submit a recommendation regarding a mechanism for funding fleet replacement, such as multi-agency trust funds or leases, or charter by special taxation schemes.

Response:

In my written and oral testimony, I addressed the problematic status of funding to implement the plan described in “Charting the Future for the National Academic Research Fleet: A Long Range Plan for Renewal”, a December 2001 report of from the Federal Oceanographic Facilities Committee (FOFC) of the National Oceanographic Partnership Program (NOPP) to the National Ocean Research Leadership Council (NORLC) (referred to here as the “FOFC Plan”). However as noted by members of the Commission, there are actually two aspects of the problem of maintaining our national seagoing oceanographic capability, namely

- renewing the Academic or “UNOLS¹” Fleet per the FOFC Plan, and
- providing for an adequate number and quality of oceanographic research and survey capable ships (in the broad sense, to include fisheries, hydrography, high Arctic and Antarctic operations, and some aspects of military survey, etc.) to be operated by the NORLC Agencies themselves.

The FOFC Plan did not address this latter aspect of the problem, albeit there is a patently evident need to balance our national capability between ‘in-house’ assets, UNOLS and other academic (e.g., state and private) capabilities, and other contractual arrangements by which Federal Agencies acquire ship time for research related activities². Indicative of the serious need for such an overall plan are the more than decadal debate over NOAA Fleet replacement, the fact that two of our three polar icebreakers are approaching 30 years of service (jeopardizing availability of *USCGC HEALY* for research) , and the acknowledged scientific value yet problematic future status of regularly scheduled Arctic under-ice research from submarines. While addressing total national fleet requirements is far beyond my remit from this follow-up question, to the degree that funding of non-Academic fleet acquisitions and operations impacts federal research fleet renewal decisions, my comments should pertain.

Past practice has been for the Federal Agencies to individually program and budget for acquisition of ships that they will operate or directly charter or lease, and for Navy or National Science Foundation to fund the acquisition of most of the larger ships in the

¹ UNOLS is the acronym for the University National Oceanographic Laboratory System, see www.unols.org. It should be noted that a Committee of National Science Board reviewed the UNOLS approach to Academic Fleet operations in 2001, and supported its continuation.

² Examples of the latter include NSF’s commercial build-and-charter arrangement for the *Nathaniel Palmer* for support of its Antarctic operations, and NOAA’s charter of a Russian fishing vessel for research in the Southern Ocean

national academic research fleet, and the majority of the operating costs of all of them. All users of the academic fleet schedule services through UNOLS, and pay identical rates. Over the last decade or so, Navy has funded most of the acquisition, and NSF most of the operating costs. Acquisition is funded with single-year appropriations to ensure that construction costs can be fully supported (barring overruns). Smaller vessels that operate as part of this fleet (most of those under 40m, as well as a few somewhat larger ones) have been procured and are owned by states or private research institutions. At issue is whether past practice will apply to fleet renewal.

In the following discussion, I adopt the FOFC Plan's proposed schedule for new construction as the most reasonable basis for analysis and discussion (see the chart on p.21 of the FOFC report; although at this point the dates, at least the early dates, are unrealistic, this plan remains the common denominator from which alternatives must be derived). At this moment, just as at the time of my testimony, there is no firm plan for the acquisition of any of these ships (past the Kilo Moana which was built by Navy with R&D funds). The conceptual approach being discussed by the NORLC agencies, as I understand it, is that NSF would procure the ARRV and the Regional Vessels, and Navy would be responsible for the Ocean Class ships.

A ship in the price range of the ARRV (~\$75M) would normally be funded from NSF's Major Research Equipment and Facilities Construction (MREFC) account. NSF has stated publicly that they will bring this ship forward through their MREFC decision process for acquisition "after FY04", with an implied intent to strive for FY05. However, the MREFC line and associated rules and mechanisms are in a strong state of flux, and until the future of that account is settled the ARRV acquisition is problematic, in spite of NSF's verbal commitment to the ship. Also depending on MREFC decisions, NSF may be able to fund the regional ships (nominally \$25M each) with program (R&RA) funds under the oceanography (OCE) account of the Geosciences Directorate (GEO). These ships could be either fully funded, or cost shared with the states and regions that would operate them (the competitive process is yet to be determined). As I understand it, NSF GEO personnel intend to pursue this opportunity if the rules governing capital acquisitions below some cost threshold permit them to do so. Navy is investigating design alternatives for the ocean class vessels, but has indicated no intent to budget for their acquisition, through either SCN or R&D accounts. Thus, the major change since my testimony is that NSF is proposing funding the smaller, regional vessels from program funds. This will have an obvious impact on resources available for operations and research, but the expectation is that the proposed doubling of the NSF budget will provide sufficient resources to enable this investment in essential infrastructure without significant adverse impact on science programs.

From my discussions with representatives of the UNOLS community as I developed a response to this follow-up question, there is a clear desire to preserve, as much as possible, the past approaches to fleet acquisition and operation. If alternate approaches are required, an overriding concern is to maintain the UNOLS method of operation, namely that the ships would be operated by the research universities and institutions, where the research faculty are directly involved in the process of defining science

requirements, instrumentation, operational procedures, etc. As noted above, a recent NSB review of academic fleet operations validated this approach; indeed any substantial deviation from it would likely have a major adverse impact on the nation's oceanographic research productivity. There obviously is no clear way to prove this contention, but the feeling of 'ownership' and control of the science that is associated with University operation is a powerful motivating factor that is intrinsic to the way oceanographic research has been performed, and psychology and perceptions are extremely powerful factors in any research enterprise.

Another concern expressed by the academic research community is the need for a degree of equity in determining which institutions serve as operators. For example, a system whereby the major ships would be acquired and owned by individual states or regions, or even private institutions, and then rented or leased to the government agencies for research, would disenfranchise a large number of participants, and introduce competitive or market forces that could undercut the current approach to scheduling and allocation of ship time, that has worked so well under the UNOLS system. There is a strong belief that, as in other aspects of research, the competition for operation should be based upon quality and other desirable characteristics (e.g., being in the region for which a ship is designed), rather than richness. The same argument applies to any approach that rests principally upon congressional earmarks. This is one of the major concerns about the apparent current posture of Navy/ONR, which has indicated (albeit unofficially) a willingness to construct the ships if so directed by Congress. There is no desire on the part of the scientific community to precipitate a 'pork' fight, whereby the ships would go to those states with the most powerful congressional delegations. It is recognized that politics has played and will continue to play a significant role in ship acquisition decisions, but by and large the community recognizes the wisdom of adhering to a national plan, such as that proposed by FOFC, or modifications to such as proposed by UNOLS as a group. Otherwise, the fleet will rapidly become unbalanced in both location and composition, and could easily be unaffordable to operate in any coherent fashion. Fundamentally, then, there is an aversion to any basic structural change in the principles and mechanisms that have served the nation so well for the past several decades.

The most logical and straightforward alternative to simply directly funding construction with single year appropriations, is to spread costs over time through some federally authorized and funded 'leasing' type mechanism, e.g., through debt financing whereby a federal agency agrees to a Chartering Agreement that provides for a multi-year, sum-certain payment stream to a Contracting Party (e.g., public and private universities, or research foundations). This type of mechanism has been used several times in the relatively recent past, both with universities and with commercial operators. Examples include NSF's support of LDGO's acquisition of the *Maurice Ewing*, and their build-and-charter agreement with Edison Chouest Offshore (ECO) for the *Nathaniel Palmer*. Navy has used a similar approach for other vessels built and operated by ECO.

To examine this option within the context of UNOLS and the academic fleet in some detail, I asked John Dickinson, Assistant VP for Financial Services at UA Statewide, to conduct an analysis of debt financing for replacement of the Academic Fleet, based upon

the FOFC plan (to repeat, see the chart on p.21 of the plan;). We have focused on universities, institutes and foundations because of their eligibility for tax-exempt financing, and our belief that there are significant advantages to permitting the research community to continue to operate the fleet. The NSB review found no reason to suggest a change from this practice, and GAO has expressed some concerns with past Navy commercial leasing practices³. Mr. Dickinson's analysis is attached (a word document and a number of PDF files containing the spread sheets). To somewhat simplify the calculations, we have assumed that each of the seven Ocean Ships called for by the plan has an after-design, debt-financing cost of \$71.6M, and that each of the four Regional Ships has a cost of \$23.6M. We have modified the construction dates slightly from those shown in the FOFC Plan, to produce a new fully deployed fleet of eleven vessels by 2011. The design and construction schedule used for the calculations is shown on page 13 of the analysis. Calculations and comparisons to cash appropriations are shown for a range of interest rates, debt terms, and approaches to interest capitalization. To cite just one example (the base case), see page 15, with tax-exempt bond financing at interest rates of 6%, 15 year term, and no capitalized interest, total construction costs would be approximately \$889M, compared to direct cash appropriation costs of \$595.6M, while peak aggregate annual payments under the debt financing approach would be only \$59.3M, versus \$166.8M. The total cost increment associated with this approach could obviously be lowered through the shorter term bonds, lower interest rates, etc. The analysis displays a number of these options.

In addition to providing a comparison of a number of financing options, Mr. Dickinson's analysis provides an important yet succinct discussion of many of the conditions that would pertain to this approach. Of particular note, Congressional authorization of a program of this nature – for one or a number of ships – could enable an agency to fund the debt financing as part of its overall operational budget, rather than being detailed in a special line item, or as in the case of NSF, being supported by the MREFC account. The model for this is the Army Section 801 housing program. This approach would maintain Congressional oversight while providing for the financing of the ships from program funds as proposed by NSF for the Regional Class, and spreading costs. Further, as discussed by Mr Dickinson on Page 7, this same approach could be applicable to situations where the intended operator of the vessel is the federal agency itself rather than a 'contracting party' (e.g., university), although in such a case debt would be taxable and interest rates thus a percent or two higher. Further, the suggested approach could be used by a number of agencies, thus spreading the costs of acquisition among several member agencies of NORLC, and it obviously need not apply to the fleet as a whole.

While the approach suggested here does not address all of the potential problems and concerns associated with funding academic (or federal) research fleet acquisition, I believe that it does offer a realizable option that could be implemented in whole or in part, by a number of NORLC agencies individually or in partnership, and that preserves

³ See GAO report number T-NSIAD-99-141, "Defense Acquisition: Historical Insights Into Navy Ship Leasing". While some of the GAO findings are applicable to any leasing arrangement, we believe that terms and conditions that are possible by confining academic fleet leasing arrangements to universities and comparable research entities ameliorate many of the concerns.

many of the most important characteristics of the practices that have made US ocean research a world leader, and a model for other nations. It does not, of course, solve the fundamental problem that we seem to face at the moment, namely the commitment by NORLC agencies to maintain an academic fleet. Congressional action to this end will likely be required; what I have argued for here is that we do our best to structure an option that preserves balance and equity, and would enable the nation to proceed on the basis of rational planning.