NOAA's "Arks" Sail Into a Storm

The National Oceanic and Atmospheric Administration has a $2-billion plan to replace its research ships. Several groups say that plan should be sunk

Rough seas are pounding against the National Oceanic and Atmospheric Administration (NOAA) these days, as waves of criticism have battered plans to rejuvenate its aging oceanographic fleet. Over the past 2 years, NOAA and its $1.9-billion blueprint for fleet renewal have taken hits by groups ranging from an advisory committee for the Commerce Department—NOAA's parent department—to Vice President Al Gore's National Performance Review. The latest blast came in April, when a committee of the Marine Board of the National Research Council—in a report written at NOAA's own behest—condemned the plan as unrealistic, misleading, and a potential waste of taxpayer money. "We told the truth. It's just a flawed plan," says oceanographer Donald Walsh of International Maritime Inc., who headed the review panel.

The object of all this scorn is NOAA's Fleet Replacement and Modernization plan (FRAM), potentially the largest shipbuilding program in the history of oceanography. Without replacing aged vessels and updating research equipment, agency officials say, NOAA will soon lose the ability to carry out many of its scientific missions, such as annual studies of U.S. fisheries, numerous ocean and atmospheric circulation investigations of global warming and other climate concerns, and the production of accurate charts for maritime commerce. Even critics like Walsh note these are important tasks. "They do a lot of marine scientific research not done by others," he says.

But critics also say that in its rush to build a new fleet, the agency has ignored other, more cost-effective data-gathering options such as chartering private ships, contracting out research tasks, or using airplane-borne technology. There are growing signs that Congress, which until now has strongly supported NOAA's shipbuilding aspirations, may take heed of these rebukes—and as a result, the agency may be forced to rethink its ambitious plans. In light of current budget realities, "NOAA is going to reassess the number and types of platforms we need," says Admiral William Stubblefield, director of the agency's FRAM office.

One point everybody does agree on is that time is running out on NOAA's ships. "When I came aboard it was clear that NOAA's fleet was in trouble and that Congress was pushing hard to replace the ships," says the University of Rhode Island's John Knauss, director of NOAA from 1989 to 1993. "They don't have enough assets now to fulfill their mission," agrees Walsh. The bulk of the agency's 24-vessel armada (only 18 are currently operational) was built in the 1960s. One ship, a wooden fishing trawler, even dates back to 1950. In 1995, says NOAA, the average age of the active ships in the fleet will exceed 30 years, the typical lifetime of a research vessel. Furthermore, none of the ships has received the kind of major overhaul commonly used to extend a vessel's useful life. As a result, the ships are beginning to fall apart more and more, and there's a grim prospect facing the science agency. "If the FRAM plan is not implemented, there will be essentially no NOAA fleet by the year 2000," the agency warns in the latest version of the plan submitted to Congress in December.

Ancient mariners

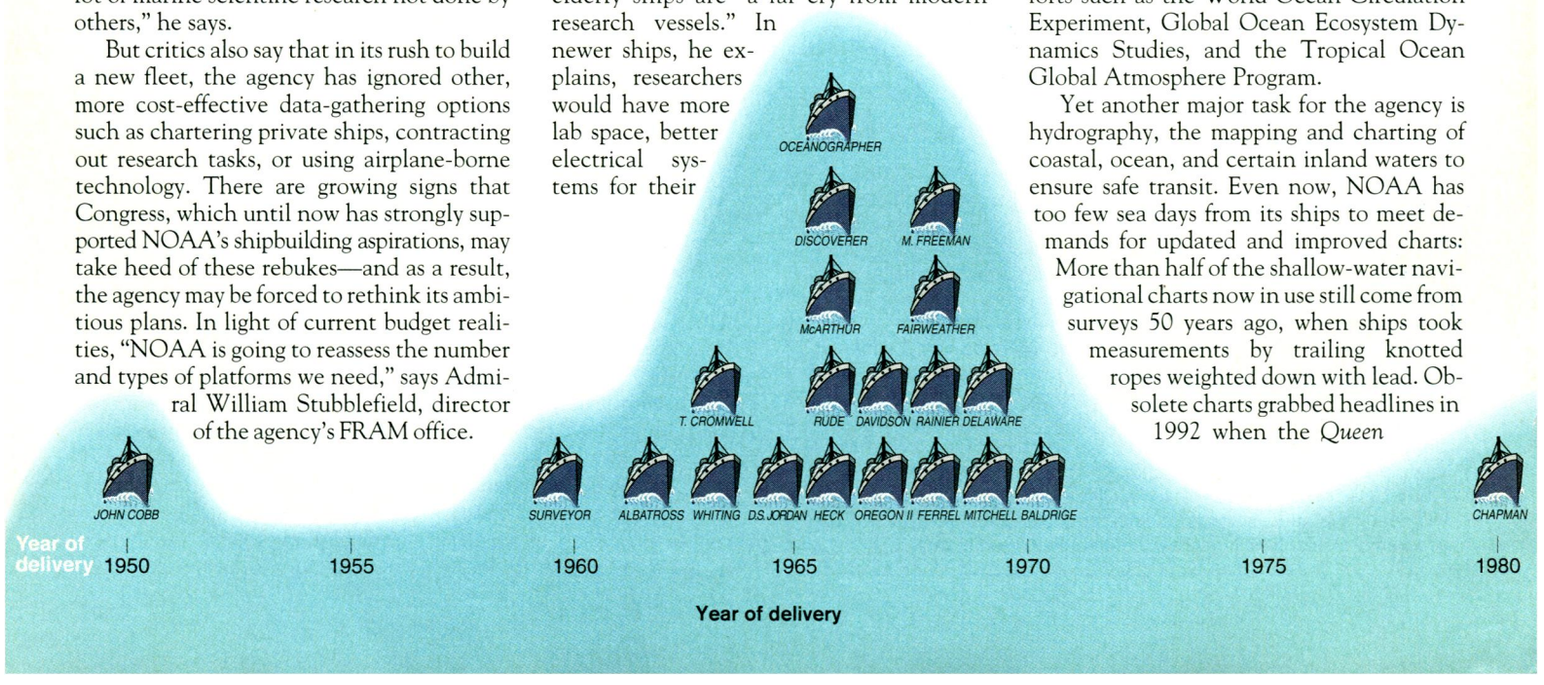
The fleet problems have already begun to affect NOAA programs. "We just have too many occasions where ships break down. We lose days at sea when we need to do research," says Michael Sissenwine, senior scientist in NOAA's National Marine Fisheries Service. What's more, says Sissenwine, NOAA's elderly ships are "a far cry from modern research vessels." In newer ships, he explains, researchers would have more lab space, better electrical systems for their equipment, and a host of other improvements that would boost scientific productivity.

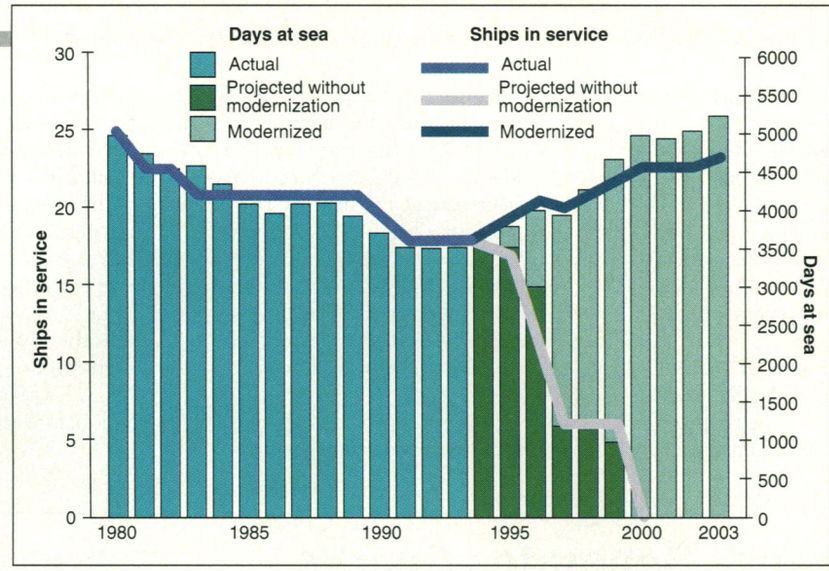
A decaying and obsolete fleet is particularly troubling, say NOAA officials, since the agency's missions have grown in the last decade. "There are a lot of pressures on the program side that we don't have the vessels to support," says Stubblefield. The largest commitment for the NOAA fleet is in marine fisheries research, for which NOAA is the lead federal agency. Its National Marine Fisheries Service surveys U.S. waters every year to determine the size and health of fisheries resources. These data are becoming increasingly important as scientists investigate the collapse of many U.S. fisheries and seek ways to turn the tide (*Science*, 27 May, p. 1252).

Under the Marine Mammal Protection Act and the Endangered Species Act, the agency is also responsible for monitoring and developing a variety of marine animal recovery plans. In addition, NOAA has scientists that do long-term environmental monitoring, study tsunamis, and conduct oil spill research; NOAA, for instance, directed the cleanup of the *Exxon Valdez* disaster.

NOAA is also placing increased emphasis on integrating its oceanographic studies into global change research. NOAA's Office of Oceanic and Atmospheric Research (OAR), for example, participates in a large number of multiagency international endeavors to understand Earth's waters and atmosphere, efforts such as the World Ocean Circulation Experiment, Global Ocean Ecosystem Dynamics Studies, and the Tropical Ocean Global Atmosphere Program.

Yet another major task for the agency is hydrography, the mapping and charting of coastal, ocean, and certain inland waters to ensure safe transit. Even now, NOAA has too few sea days from its ships to meet demands for updated and improved charts: More than half of the shallow-water navigational charts now in use still come from surveys 50 years ago, when ships took measurements by trailing knotted ropes weighted down with lead. Obsolete charts grabbed headlines in 1992 when the *Queen*





SOURCE: NOAA

Ebbing sea time. Without an elaborate program of ship replacement and repair, NOAA expects to spend little time on the oceans by the end of this century.

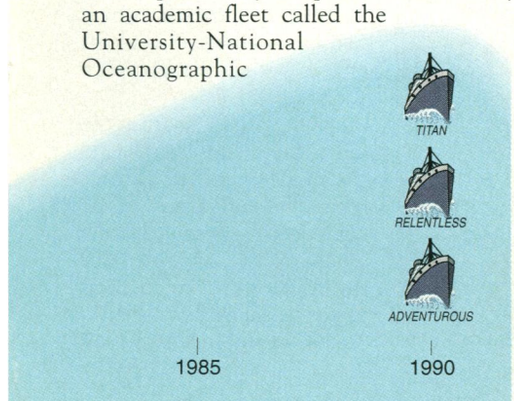
Elizabeth II ran aground off Martha's Vineyard in waters that had not been mapped for decades.

A plan on the rocks

After looking at its fleet problems and its plan for the next few decades, NOAA came up with its first FRAM plan in 1991, which at that time called for an investment of $1.4 billion over 15 years for new ships and so-called repairs-to-extend on current ships to ease the transition. In the latest version of the plan, submitted to Congress in 1993, the price tag jumped to $1.9 billion, money that would buy 18 new ships and convert six others built originally for the Navy. This massive recapitalization would give NOAA's fleet more than 5700 days at sea, far above its current level of around 3400 days.

Waves of complaints began to roll in as soon as the FRAM plan was launched. The first review was done by a subcommittee of the Commerce Department's Oceanic and Atmospheric Management Advisory Committee (OAMAC) in 1992. Among its many complaints, the panel harshly criticized NOAA for not more fully considering the charter of private ships, a common practice among many other federal agencies. Compared to buying a large new fleet, this "outsourcing" could be "infinitely cheaper to the taxpayer," says Charles Hollister of the Woods Hole Oceanographic Institution (WHOI), an OAMAC member.

One of most blistering OAMAC attacks centered on the NOAA Corps, a quasi-military uniform service of about 400 members that runs the agency's vessels. The Corps' military organization, critics argue, adds unnecessary bureaucracy to fleet operations. The Corps is "anachronistic, its methods inefficient, and its costs excessive," concluded one OAMAC report, noting that NOAA's ships are staffed at much higher levels than those operated by the private sector or by an academic fleet called the University-National Oceanographic Laboratory System (UNOLS). Some OAMAC members have gone even further, accusing the Corps of pushing hard for a new fleet, rather than out-sourcing, in order to save its jobs. Will Connelly, an OAMAC member and a former ship industry executive, wrote an op-ed article this February claiming the FRAM plan's main purpose is "to protect, preserve, and expand the NOAA Corps."



SOURCE: NOAA ILLUSTRATION: DIANA DEFRANCESCO

Time and tide wait for no ship. Most of NOAA's research vessels are moving beyond their expected lifetimes—30 years—and may not last much beyond that.

NOAA has vigorously challenged those accusations. "The Corps is a convenient target," says Stubblefield, rejecting the notion that the Corps overstaffs its ships and citing what he calls an "impressive" safety record for the agency's fleet. Stubblefield argues that Connelly—whom he describes as a "broker" for private research vessels—would like to scuttle NOAA's fleet completely to increase outside chartering. D. James Baker, who succeeded Knauss in 1993 as head of NOAA, has also publicly come to the defense of the Corps.

The storm worsens

While OAMAC's 1992 reports barely raised a ripple at NOAA, they did cause a few waves elsewhere, says Hollister. Even though Congress authorized NOAA to go ahead with FRAM in 1992, it ordered the Commerce Department to conduct semiannual reviews of NOAA's progress. Those audits have echoed many of OAMAC's criticisms. And last year, both the General Accounting Office and the Vice President's National Performance Review chided NOAA for not experimenting more with out-sourcing.

The big blow, however, came this April from the Marine Board. "The NOAA FRAM plan is flawed and requires major revisions," Walsh's panel concluded, and it "will not buy for the nation the most effective and efficient means of conducting ocean-based science, marine resource assessment, and charting." The panel even called on NOAA to suspend further acquisitions, conversions, and modernizations until FRAM's blueprint was reviewed.

Walsh's group added to that harsh summary a host of specific criticisms. They challenged the apparent overall goal of the FRAM plan—increasing NOAA's days at sea—as unjustified. "It is not a measure of scientific productivity. It does not tell you anything," says Walsh, suggesting that NOAA should concentrate more on developing the best way to collect its essential data, not the best way to replace a fleet. NOAA also came under fire for treating its shiptime as a "free good" for its programs. Since the Corps is paid in a separate budget allocation, explains Walsh, a NOAA research program doesn't get charged for NOAA shiptime, even though the agency ultimately pays for it. This "artificial barrier," says Walsh, makes it cheaper for NOAA program managers to use NOAA ships and discourages them from trying UNOLS or private vessels, whose charter fees are charged directly to their program budgets.

In the report's litany of criticism, Walsh's panel reserved its harshest words for an economic model that NOAA had developed to compare the costs and benefits of buying a new ship versus other alternatives. "As currently designed and applied, the model... misleadingly gives the appearance of thoroughness and rigor," the panelists bluntly write in the report. Simply put, "it's stacked against" using non–NOAA-owned platforms, says James Broadhaus, director of WHOI's Marine Policy Center and a member of Walsh's panel. The panel also pointed out that NOAA does not even have the operating funds to sail all its ships today, let alone to fully operate the planned new fleet.

Distress signals received?

These blistering words have apparently been harder to ignore than past criticisms. Certainly Congress seems to have heard them. Previously, Congress had been a strong force pushing NOAA's FRAM plan, giving the agency more than $130 million for the effort over the last three budgets, even though the agency had—under White House instructions—requested only $25 million during that period. In the 1995 budget now

under consideration, however, sources in Congress say legislators have no plans to bump up NOAA's $23-million FRAM request. These sources also say Congress will seek tighter control on how the agency can spend that money and will call for an outside review of the Corps' role within the agency. "Being cautious now will pay off," says one congressional staff member reviewing the budget bill.

There are some indications that NOAA itself is finally getting the message. "We need to experiment more with contracting and chartering," acknowledges Stubblefield, noting that NOAA has requested proposals from the private sector for mapping around Long Island. NOAA has also created a task force, headed by John Carey, associate deputy undersecretary at the agency, to review and respond to the Marine Board report.

Publicly, however, the agency isn't backing away from its overall FRAM blueprint yet. "There's a lot of work the agency has put into developing this plan. I don't think you can take all that and throw it out the window," says Carey.

Still, many observers outside NOAA, and a few sources inside the agency as well, have told *Science* they believe Baker, who took the helm after the FRAM program had been designed and who does not have his reputation invested in the plan, may be willing to scuttle it and develop a more modest plan. The Marine Board report, which Baker had requested, would offer a convenient justification for that move, they say. "The situation has gotten sufficiently critical that the status quo is untenable," asserts one high-ranking NOAA official. If so, then NOAA's plans to buy a large new fleet may sink before its aging ships do.

–John Travis

SOROS FOUNDATION

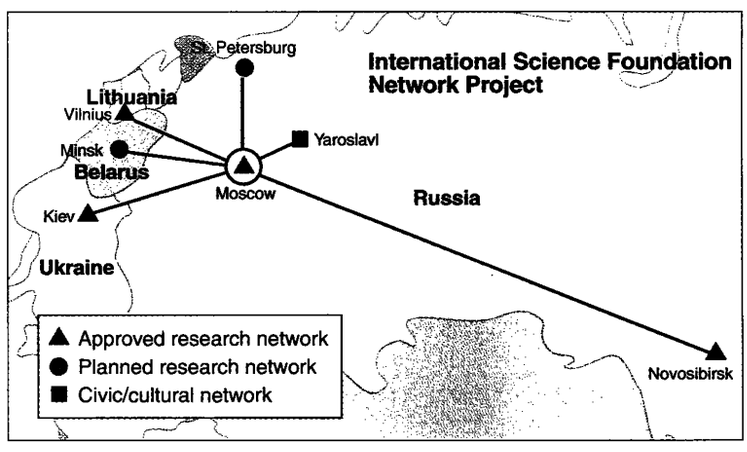
Russian Network Generates Sparks

Last week, the board of billionaire financier George Soros' International Science Foundation (ISF) approved an ambitious plan to create an array of computer networks for scientists and others in the former Soviet Union. But ISF's efforts to put former Soviet scientists on the cyberspace frontier has stirred opposition from commercial enterprises, which have charged that Soros may be trying to corner the emerging telecommunications market in the newly independent states. Those fears, combined with nationalistic opposition to other Soros-backed initiatives in the region and some fallout from recent turmoil within ISF, could delay construction of the first leg of the network and its expansion later this year.

The network has become a major activity for ISF, an organization Soros set up in 1992 to aid the research community in the former Soviet Union. The foundation has already started construction of a fiber-optic "backbone" network connecting science institutions across Moscow, and it plans to extend networks to other major science cities in the region (see map). But in recent months Soros has begun sketching out far more ambitious plans, expanding on the research networks to create a $50-million civic network, starting in Yaroslavl, some 150 kilometers northeast of Moscow.

Ultimately, says ISF networking project director Alex Goldfarb, the Yaroslavl project will connect more than 100 schools, three institutes of the Russian Academy of Sciences, monasteries, newspapers, a radio and television station, and even a mosque. After that, Soros plans to launch similar networks in other towns. "The aim," says Goldfarb, "is to coordinate the telecommunication infrastructure in the former Soviet Union with a substantial amount of seed money from Soros." Last week in Moscow, the ISF board of directors approved a total of $4 million to begin the Yaroslavl project, complete the next step of the Moscow backbone, and start work on research networks in Kiev, Novosibirsk, and Vilnius.

But the expansion plan has caused quite a stir within the telecommunications industry. Last week Gordon Cook, editor of the Trenton, New Jersey–based *COOK Report on the Internet->NREN*, devoted a special issue to Russian networking that described the battle between other Russian network providers and ISF. The *COOK Report* quotes officials from Relcom, a commercial consortium that is Russia's largest network provider, and from other network companies accusing ISF of breaking deals and alleging that the ISF plan may actually be a front for Soros' commercial networking ambitions in the region. Alexi Platonov, director of The Institute for the Development of Public Networks in Russia, which is part of the Relcom consortium, complained to *Science* that ISF is "trying to create some parallel infrastructure, and without any doubt they will try to 'buy' the Relcom teams in regions."



SOURCE: ISF ILLUSTRATION: C. FABER SMITH

Busy signal? ISF's board approved this computer network last week.

ISF officials deny that they—or Soros—have any commercial intentions. "Soros has stated quite unequivocally that he doesn't want to make a profit," says Goldfarb. "When the time comes that the [ISF network] becomes profitable, his aim is to transfer it to the users, who will be able to sell the services on the market."

Goldfarb says he understands why Russian communications companies may feel threatened by the ISF network. But he contends Relcom "has a record of squeezing tremendous fees from the academic community" and that ISF wants to provide a cheaper alternative. Platonov denies that Relcom acts like a monopoly; indeed, he says, its members are often in competition with each other.

While ISF and Relcom trade blows over the next step, disarray within ISF has already delayed elements of the network project. The Moscow backbone was originally planned to be finished last autumn. But in October, Harley Balzer, a Georgetown University Russian studies expert who during his tenure as executive director of ISF ran the telecommunications project, was forced out in what Balzer describes as a "philosophical dispute" over ISF strategy. In the ensuing management vacuum, ISF withheld money for key elements of the backbone project, halting the effort and alienating some of its Russian partners. The disarray also caused the National Science Foundation, which had provided a staff consultant, to withdraw support for the project.

Now, with Goldfarb at the helm, the board has released the money, and ISF can attempt to mend fences. "If the controversy is resolved," says Goldfarb, "we hope to have the [Moscow] backbone completed by the end of 1994."

–Christopher Anderson