

BASIC OCEAN RESEARCH: STEAMING FORWARD

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Good afternoon.

For the past year, we've been hearing a lot about "American competitiveness."

Before this term became the mantra in economic and policy circles, NSF had a long history of supporting research -- and researchers -- that led directly to successes in society and in the marketplace. Our record includes everything from Doppler radar to the Internet to targeted drug delivery.

NSF is charged with stewardship of the nation's science and engineering enterprise.

As we re-position ourselves for an interconnected, globally oriented future, our stewardship is more crucial than ever to maintaining America's economic strength and way of life, and addressing global problems.

The oceans -- and basic ocean science -- are critical elements in meeting these national goals. Today I would like to review NSF's efforts to help keep the ocean sciences healthy and steaming toward a competitive, and collaborative, U.S. position.

Everyone with a stake in science -- from an undergraduate in oceanography to the President's science adviser -- knows that the oceans play a role in climate, and that healthy oceans contribute to biodiversity and a steady supply of critical natural resources.

We understand that bio-geochemical cycles in the air, on land, and in the sea weave together in a matrix of ecosystems, each of which has implications for sustainability and human health.

These realities are reinforced through information, education, and a national commitment to ongoing research. NSF, with the help of other federal agencies and the scientific community, continues to reiterate these critical messages and will do so until the entire population understands that neglect of the oceans represents a threat to our very existence.

While we continue to raise awareness of the issues, we are continuing the research. One without the other could have devastating consequences.

NSF, through its Division of Ocean Sciences, provides approximately 70 percent of the federal support for basic ocean research performed at U.S. colleges and universities. During FY2007, the division funded 443 new awards, ranging from single-investigator projects to teams involving multiple researchers, institutions, and disciplines.

Interdisciplinary collaboration is an increasing theme in our awards. Another theme is developing technologies for sensing, sampling, data management, modeling, and visualization. And, of course, the ocean science community has an outstanding record of educating and training the nation's current and future researchers.

For FY2008, the President's budget includes a total of \$6.43 billion for NSF. At this time, NSF is waiting for final Congressional action on that budget.

If we are funded at the level of the President's request, funding for the Division of Ocean Sciences will enjoy a healthy increase of \$17 million, for a total of \$329 million. However, if a continuing resolution remains in place, as it did last year, the situation is more tenuous for new projects and programs; and our ability to maintain even our current commitments is at risk.

As always, NSF works closely with other federal agencies, states, and institutions to promote cooperation in planning and conducting ocean research, and to seek partnerships that leverage resources.

The Ocean Research Priorities Plan, released by the White House in January, provides direction for NSF and other federal investments in research and facilities, by steering resources to answer the most deep-seated questions and address the most pressing national needs.

The plan incorporated input from many constituencies -- in government, industry, and academia. At NSF, where we count on a "bottoms-up" process to identify the highest priorities for federal investments in science and engineering, we really appreciate the scientific community's participation in the workshops and comment periods for this plan.

I know that, for many of you, your interest centers primarily on the future of the research fleet and other facilities, so let me spend a few minutes reviewing our present course.

One of NSF's most important tasks, as a steward of federal investments, is to balance funding for *research* with funding for the *facilities and infrastructure* needed to support that research.

NSF has an even larger responsibility -- to weigh the needs of *every* scientific discipline, and to consider those needs in the context of greater national priorities and overall research strength.

In this context, NSF commits approximately 28% of its budget to facilities, infrastructure, and instrumentation -- the framework that gives scientists and engineers the latest technologies and research platforms to make discoveries that surprise us and conduct experiments that break new ground. At times when new facilities are coming online, this percentage can temporarily rise.

The infrastructure for every area of science is constantly evolving. New capabilities emerge that offer more productivity, efficiency, and opportunity for discovery. Inevitably, this means that older facilities must be retired to make way for new ones.

This is a natural step as plans proceed for funding the highest priorities for each science community. This process, in most cases, means shifting federal resources to the latest frontiers of both research and research capability.

The ideal framework for frontier ocean science includes networks of observations from air, land, and sea; sophisticated vessels and instrumentation; and advanced methods for accessing the marine environment -- from coastlines to currents to black smokers.

Because the oceans contribute so much to our ability to live sustainably on Earth, the availability of these advanced research capabilities is among our highest national priorities.

NSF's focus is on support of the academic research fleet, sampling capabilities, ocean observatories that will be integrated into larger Earth observing systems, and the cyberinfrastructure that promotes the convergence of data into useful models.

Thanks to Congressional action that gave NSF a better-than-expected outcome from the continuing resolution of FY2007, we have made considerable progress in funding the infrastructure that keeps us at the frontiers of research and understanding.

This afternoon you'll be hearing about the status of construction and scientific operation for the planned equipment upgrades. We are pleased with our success in securing full NSF funding to convert and outfit the *Marcus Langseth* and to upgrade the *JOIDES Resolution* drill ship, both of which are nearing completion.

NSF is also committed to funding a hybrid Remotely-Operated Vehicle capable of reaching full ocean depths, and an exceptional human-occupied submersible to replace *Alvin*.

The Ocean Observatories Initiative and Alaska Regional Research Vessel are working their way through the process. And the Division of Ocean Sciences has committed initial funds for a regional-class research vessel.

I am "cautiously optimistic" that we will get a positive outcome from the current budget deliberations -- and that these projects will continue to move forward in the coming year.

In our role of responsible steward, NSF must continually balance the costs of facilities with the costs of doing science.

We appreciate the input of the scientific community, including your organization, in determining that balance. The choices become increasingly difficult, and the input more valuable, as we upgrade to frontier capabilities that are badly needed but require more resources to build and operate.

The White House pledge to double the NSF budget will improve that equation over time. Nonetheless, budget realities dictate that we consider, even in the proposal and design stage, how we can leverage our investments in facilities with other resources.

We appreciate your organization's efforts to develop partnerships among states, organizations, and institutions that allow research vessels to operate more frequently and for longer seasons. Carrying out the charge in the UNOLS charter to collaborate internationally is particularly important as the questions to be answered grow in cost and scope.

The powerful planetary forces of wind and current, and the geochemical cycles of air, land, and sea continue daily, weekly, immutably -- oblivious to budget cycles or national boundaries.

The sooner we collect and process data from the oceans, and integrate it with the collective findings of other disciplines, the sooner we will find solutions for global concerns such as greenhouse gases and encroaching disease.

We can all be proud of our role in keeping the U.S. ocean sciences on the crest of discovery and contributing to America's economy and way of life. With careful choices and continued cooperation, we can accomplish these even loftier goals.

Thank you again for your contributions to this critical enterprise.