

Clinton's Mixed Broth for R&D

Lots more for technology in the 1994 budget, but biomedical science remains flat and basic research lags inflation. NSF's fate hangs on the filibuster

Every researcher would like to know how science will fare in the federal budget in 1994, but the crystal ball is cloudy. It's never easy to predict from a presidential budget what actually will survive in Congress, but this promises to be a particularly wild and woolly year of budget negotiations, starting with last week's

programs at the National Science Foundation (NSF), spread over 2 years (1993-1994). Within that total, Clinton seeks an increase of \$346 million for NSF research alone. That's more than an 18% rise between now and the end of 1994. But to remain hefty, the hike has to survive a pair of hurdles: \$207 million was

inserted in a supplemental appropriation that would increase the 1993 budget concocted by George Bush and last year's Congress. This late change has become known in the popular press as Clinton's "economic stimulus" bill, still being filibustered by Senate Republicans at this writing.

Unfortunately, this situation puts NSF between a congressional rock and a presidential hard place. If the 1993 funds for NSF have to be trimmed to end the Republican filibuster, it will be difficult—if not impos-

sible—to make up the loss in the 1994 bill. There you'll find the second big NSF budget hike (\$240 million) Clinton wants, but the 1994 request is threatened by the continuing drive to cut federal discretionary spending, particularly if the "big science" projects—the space station and the Superconducting Super Collider (SSC)—survive.

And what of the budgets of the other agencies that support science? In another major divergence from budgetary tradition, the Administration has been releasing its plan in dribs and drabs over the past 7 weeks rather than giving it out all at once. To complicate the picture further, some official documents have been vague. For example, rather than give a dollar figure for the cost of the space station in 1994, the National Aeronautics and Space Administration (NASA) ran the acronym "TBD"—to be determined—keeping its options open. Nonetheless, the big picture is coming into focus.

The big picture

Clinton aims to sustain science and technology across the board at the same level as last year, providing a cost-of-living increase, while giving some extra money to special projects in areas such as transportation (maglev trains and smart highways) and high-performance computing. The total federal R&D figure for 1994, including facilities, comes to \$76 billion, an increase of 3%, equal to the rate of inflation predicted for this year. But it's worse for basic research. In this budget, it would grow at a rate of only 2% (see table). Among the sharpest cuts is the 10% being taken out of the military's basic research programs. The Pentagon's Advanced Research Projects Agency, now under explicit orders to focus on civilian as well as military technology, would receive slightly less under Clinton's budget than in 1993, declining 4%, from \$2.3 billion to \$2.2 billion. These shifts would leave room for a 3% hike in civilian basic research.

Behind all this is an objective articulated by Clinton science adviser Jack Gibbons in a meeting with science writers on 8 April. Gibbons said the 1994 budget "reflects the beginning of a shift in the balance of civilian versus defense R&D expenditures," in which the goal is to move from the present lopsided split (59% military and 41% civilian) to a 50-50 balance in "a few years."

This may be a popular stance with many individual investigators, but not all will be delighted by this budget's civilian numbers.

For example, under Clinton's plan the National Institutes of Health (NIH) would grow by only 3.2%, and much of that goes to breast cancer and AIDS. Over at the Department of Energy (DOE), total R&D would actually shrink by 2%, while general

science and research (including the SSC) would grow by 12%. Yet the applied labs and grants in the jurisdiction of the National Institute of Standards and Technology would grow at a booming rate of 39%. And in multi-agency projects, if Congress goes along with Clinton, there would be a 13% increase for global change research, a 26% raise for "information superhighways," and a 29% growth in R&D on "civil transportation infrastructure."

FEDERAL R&D OVERVIEW				
(millions of \$)	1992	1993	1994 request	% change
Defense	40,083	41,608	41,978	1
Nondefense	27,970	28,695	30,115	5
Facilities	3903	3259	3498	7
TOTAL	71,956	73,562	75,591	3
Basic Research	12,984	13,701	13,940	2
Defense	1146	1395	1252	-10
Civilian	11,838	12,306	12,688	3
Applied R&D	55,069	56,602	58,153	3
Defense	38,937	40,213	40,726	1
Civilian	16,132	16,389	17,427	6

Source: Office of Management and Budget

opening gambit: the release of President Clinton's formal 1994 budget request. The request came 2 months later than usual, setting a record for tardiness—partly because the new administration, unlike its predecessor, had to create a budget from scratch, since the departing Bush forces hadn't bothered to write one. What's more, Congress voted to adopt a budget resolution in March—the earliest they've ever done so—setting their spending limits before laying eyes on Clinton's proposals.

In fact, Congress set limits lower than the president's, setting the stage for some heavy political bargaining in the months to come, as the Clinton team gives up some treasured domestic initiatives to save others. No one can say how science will fare in that high-stakes game. But, as Clinton made his opening bid, his administration's broad plan for science and technology emerged in outline. That plan calls for spending on research as a whole to remain roughly flat, after inflation, over the next year. But within that steady total, basic research is falling behind the cost of living—bad news for all but the programs that stand to win.

One budget item that may become vulnerable as these battles get under way is a proposed \$446 million (16%) increase for all

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—Jack Gibbons

The fine print

NIH. Following a strategy used during the Republican years, Clinton is asking for a modest increase for NIH, anticipating that biomedicine will continue to get strong support in Congress regardless of what the White House recommends. The new budget would give NIH a \$329 million increase (3.2%) over 1993. But of that, AIDS research will grab \$227 million and breast cancer, \$216 million more. That leaves the rest of NIH to cut \$114 million, even before inflation is factored in. The consequences: NIH would support 387 fewer total research grants in 1994, and 58 fewer new and competing grants. The agency-wide success rate—the percentage of grant applications actually funded—would drop from 22.6% to 21.6%, according to NIH estimates.

Why, science journalists asked Gibbons at their recent meeting, had biomedical research been left out of the president's priorities? He said the omission "reflected the feeling that NIH had several good years" recently, and that other science agencies such as NSF had not done as well and needed a boost this year. "I think you ought to look to the 1995 budget," for NIH's return to good fortune, Gibbons said.

NASA. By contrast, the space agency won't have to wait for 1995. Clinton has requested a 6.5% increase for NASA overall, including an 8.7% (\$623 million) increase for research and development. But the biggest news at NASA wasn't what was in this year's budget request; it was what was missing. Hard numbers for the space station were left out. The reason is that, under strict orders from the Clinton team, NASA officials are in the midst of yet another painful redesign of the planned space behemoth. NASA administrator Daniel Goldin told a press conference that there are three options currently on the table: A station that would cost \$9 billion over the next 5 years; one that would cost \$7 billion; and a stripped-down \$5 billion model. These numbers compare to the \$14.6 billion station the Bush team had in mind. To get a cut of this magnitude, all sorts of options are under consideration, including a collaboration with the Russians and an unmanned station. NASA won't show its hand until June.

NASA requested \$40 million to start work on an orbiting gyroscope known as

Gravity Probe B that would test Einstein's General Theory of Relativity. Three projects already under way—the Advanced X-Ray Astrophysics Facility, the Cassini mission to Saturn, and the Earth Observing System series of remote-sensing Earth orbiters—get big increases to move to the next stage of design and construction. But all three projects have also been restructured in the past few months to save a total of \$2,300 million (39%) over the next 5 years.

Some projects at NASA will be eliminated altogether, including the Space Exploration Initiative (SEI) program to send humans to the Red Planet. That doesn't mean that NASA won't someday resurrect the SEI, Goldin said, but "the nation has to solve its economic problems before we're ready to go to the moon and Mars."

USDA. Most of the research at the U.S. Department of Agriculture (USDA) is done at established land-grant universities and government-run agricultural extension centers, and those programs will remain essentially flat in 1994. But a newer aspect of USDA's research—competitive, peer-reviewed research grants—will get a boost. Known as the National Research Initiative, the competitive grants program will climb \$33 million to \$130 million, including \$13

million for the plant genome project.

EPA. The Environmental Protection Agency gets a 5.4% increase to \$7.3 billion, and its R&D budget rises at precisely the same rate. All of that increase and more will go to research that investigates the interconnecting effects of pollution on air, water, and land. Most other research areas, from air quality to hazardous waste remediation, will take a cut.

DOE. While the energy department would get a healthy 7% increase for general science and energy supply research, programs that focus on

clean energy sources would fare better. The big winners in the 1994 budget are solar and renewable energy research (up 27% to \$327 million) and biological and environmental research (up 17% to \$345 million). Meanwhile, nuclear energy research would fall sharply from \$345 million this year to \$184 million in 1994. Basic energy science doesn't do well in the Clinton budget either, dropping 7% from \$861 million to \$802 million.

The bottom line

Relieved? Depressed? Remember that, as Office of Management and Budget chief Leon Panetta made clear when he released the budget, these numbers are just the opening bids in a high-stakes game that will continue for months. The Administration's first task is to reach an agreement with Congress on the economic stimulus bill. If that package is stripped of nonjobs programs (such as NSF funding), the Administration may try to recoup some of the losses in the appropriations bills. Legislators usually begin working on those bills in late April after Congress assigns each major committee a spending limit. The initial legislation begins to appear in May. Then begins the long, hot summer of bargaining, leading to final funding decisions in the fall. It's a brutal process, and congressional staffers predict that 1994 will be as bloody as any year in recent memory. By the end of the year, researchers will know for sure which scientific projects have been wounded in this combat.

—Eliot Marshall & Christopher Anderson

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SELECTED R&D BUDGETS

(millions of \$)	1992 Actual	1993 Enacted	1994 Request	1993-1994 % Change
National Institutes of Health	10,010	10,339	10,668	3
National Science Foundation	2734	2940*	3180*	16*
NSF research	1872	2056	2205	18*
Defense (6.1 science funds)	1146	1324	1256	-5
ARPA	1597	2250	2162	-4
Energy: General Science and Energy Supply R&D	4444	4434	4754	7
Environmental Protection Agency	497	508	547	7
National Aeronautics and Space Administration	6,851	7089	7712	9
National Institute of Standards and Technology	247	384	535	39
National Oceanic and Atmospheric Administration	1998	1716	1924	12
USDA research	1448	1434	1359	-5
USDA competitive grants	98	98	130	32
U.S. Geological Survey	584	579	598	3

*The 1993 figure includes \$207 million the Administration seeks in a mid-year supplemental request; the total 1993-94 increase for NSF would be \$446 million, if that supplemental request is approved.
Source: Office of Management and Budget