foundation," says Anne Petersen, NSF's deputy director and chief financial officer.

To compound these problems, NSF didn't flesh out its approach to GPRA program assessment until December, when the STC review was nearing completion, and it opted for a less quantitative approach than it originally proposed. That made the highly quantitative STC study less relevant as a model for the more sweeping GPRA review. "When the STC evaluation began, we thought there might be a way to do things in a more quantitative way," says Petersen. "But now I think the pitfalls outweigh any benefits." While it is useful to collect detailed information about such aspects of the program as the publication citation rates of scientists, the number of students trained, and the extent of industrial partnerships, says Petersen, GPRA requires agencies "to look at the big picture."

Stephen Fitzsimmons, a vice president at Abt and principal associate on the study, agrees that GPRA is a tall order for agencies. "The government can say, 'Thou shalt have a set of indicators [to measure research outcomes].' But that doesn't mean you'll get them. It will take some time to develop a sound approach to assessing fundamental research," he says. "I don't know how to do it."

Petersen says she empathizes with the center directors, who felt that they were being used as guinea pigs for an experiment whose methodology had not been worked out. But NSF has come away with one important lesson from the exercise: "From now on, our GPRA reviews will be done in-house, through an expanded use of existing committees," says Petersen.

–Jeffrey Mervis

JAPAN'S R&D BUDGET

Proposed Increases Follow 5-Year Plan

TOKYO—Three months ago, the Japanese government adopted a plan to spend $170 billion on science and technology over the next 5 years—an investment that would double, by 2000, what was being spent in 1992 (*Science*, 28 June, p. 1868). Last week various government ministries unveiled their budget proposals for the upcoming fiscal year, and the double-digit increases being requested for many R&D programs are a clear downpayment on that investment.

If the Diet approves these proposals later this year, Japanese graduate students and young scientists will find it easier to make ends meet, neuroscience will get a major new research institute, and research-industry ties will proliferate. The proposals "are a great step toward realizing the [targeted spending]" proposed earlier this year, says Masaki Tanaka, director for budget planning at the Science and Technology Agency (STA).

Just how much of a step won't be clear until later this month, however, when the STA compiles government-wide data on proposed R&D spending for the 1997 fiscal year that begins 1 April. And the actual amount in the 1997 budget is likely to be less than what has been proposed once negotiations are completed with the Ministry of Finance and the budget is submitted to the Diet for approval later this year. However, officials say that R&D programs are sure to get increases that outstrip the overall growth in government spending, now slated for an 8.4% increase. The difference, they add, is a clear sign that the government is committed to higher R&D spending.

One of the biggest proposed percentage jumps is for neuroscience, which would increase nearly 300% to $95.4 million. Part of that rise would fund a new neuroscience institute, under Masao Ito, at the Institute of Physical and Chemical Research (RIKEN), outside Tokyo. A variety of programs sponsored by the Ministry of International Trade and Industry to foster cooperation among national research labs, universities, and private industry would also get a big boost as the nation seeks new technologies to shore up economic growth.

Other significant increases would fund such emerging programs as the drive to create 10,000 postdoctorate positions by 2000, almost triple the number that existed last year (*Science*, 8 September 1995, p. 1335). Michiyasu Takahashi, deputy director of the science division at the Ministry of Education, Science, Sports, and Culture (Monbusho), says the new budget proposal would add about 1300 new postdoc positions to the 4600 positions at Monbusho-affiliated labs. Other ministries with fewer postdoc slots are also anticipating major growth in their programs.

"This isn't the end," Takahashi says. "We're intending further increases [in future years], but we think it is a good number for this stage of the program."

STA's Tanaka warns that the budget requests still face "intense discussions" with the Finance Ministry, which has agreed in principle to increase R&D spending but is also responsible for reining in Japan's ballooning budget deficit. A 4-year recession that is just ending has left Japan with the largest debt, in proportion to its economy, of any major industrialized nation. Many scientists are concerned that this rising tide of red ink could scuttle the 5-year spending plan.

"A budget crunch will be coming," warns Akito Arima, RIKEN's president. While he predicts that significant budget increases are likely for next year and the year after that, he is less certain about the odds for sustained growth. "I don't know what will happen in 3 years," he says.

–Dennis Normile

JAPAN'S PROPOSED R&D BUDGET: LOOKING UP
(selected programs, in millions of dollars)

Agency/Program	'97 Request	% increase
MONBUSHO (education and science)		
Graduate school programs	$226	27%
Grants-in-aid (research grants)	$1087	12%
Postdocs and research assistantships	$188	49%
University-industry cooperation	$962	15%
SCIENCE AND TECHNOLOGY AGENCY		
Neuroscience (including new institute)	$95	300%
Global climate change	$544	35%
New building materials	$26	(new)
Next-generation supersonic aircraft	$19	(new)
Oceanographic science and technology	$228	20%
Postdocs and STA fellowships	$106	40%
Regional research activities	$135	66%
Large facilities (including SPring-8 and computer networks and databases)	$561	22%
Public safety and disaster mitigation	$471	24%
MITI (international trade and industry)		
R&D for new creative industries	$3770	17%
Information technologies	$105	42%

SOURCE: JAPAN GOVERNMENT MINISTRIES