



# Agencies of change

A new president could bring radical shifts to America's major research entities. *Nature* profiles some of the agencies in need of a makeover.

## Going for the stars — or going broke?

When NASA's rockets shot astronauts to the Moon, the Apollo programme had the backing of a nation — and its chequebook. At its peak in 1966, NASA was spending just under \$6 billion a year. That was 4% of the federal budget at the time, and nearly \$38 billion in today's money.

Some things are similar today. Four years ago, President George W. Bush revived the notion of a Moon shot with his Vision for Space Exploration. And although it's not quite the space race of the 1960s, international competition is heating up again, thanks to heightened tensions with Russia over the Georgia conflict plus nascent competition with China, which plans to conduct its first spacewalk shortly.

But the main difference is money. Today, NASA's budget is \$17.3 billion, less than 0.6% of federal spending. NASA is now in a squeeze as it tries to develop its next Moon rockets, a programme called Constellation that is scheduled to lift astronauts into orbit by 2015, and to the Moon by 2020. When either John McCain or Barack Obama takes office next year, he will have simple alternatives, says Len Fisk of the University of Michigan in Ann Arbor. "You've got two choices: more money or less programme," says Fisk, a former NASA science chief and former chair of the National Academies' Space Studies Board.

NASA administrator Mike Griffin has tried to find more money for Constellation by holding firm to a 2010 retirement for the space shuttle fleet, which costs more than \$3 billion annually. From 2010 until 2015, when the Constellation rocket would theoretically be ready, NASA would have to buy rides aboard Russia's Soyuz spacecraft to ferry astronauts to the International Space Station. The gap — already deemed "unseemly" by Griffin — has become even more prominent in an election year in



A new rocket, called Ares, is under development in the Constellation programme.

which Florida, a crucial swing state, has thousands of shuttle-related jobs at stake.

Obama has said he would support additional shuttle flights, and a \$2-billion boost to NASA's budget to that end. McCain, along with two other senators, recently sent a letter to the White House imploring the Bush administration to leave open the option of extending shuttle flights beyond 2010.

But if campaign promises don't materialize in congressional spending bills, the agency will have to find other ways to squeeze more out of a budget that has remained roughly flat in real terms for the past two decades. One way would be to improve accountability in its contracts, suggests planetary scientist Alan Stern, who left NASA in March after a one-year stint as science chief.

Within the science mission directorate alone, which receives roughly a quarter of

NASA's budget, 10 missions had collectively been delayed by 85 months and run up \$430 million in unanticipated costs within the past two years. "We have weather satellites that cost \$3.5 billion. This is absurd. We have Mars missions that have tripled in cost and no one blinks an eye," says Stern. "You reward those who do not show discipline at the expense of those who did."

Eric Hand

## Curing the country

The 2008 presidential election comes at a critical juncture for the **National Institutes of Health** (NIH). From 1998 to 2003, the biomedical agency's budget doubled to \$27 billion; in the five years since, its purchasing power has eroded as congressional increases have failed to keep pace with inflation. The transition from rapid growth to freeze has shaken the nation's biomedical enterprise, causing senior people to face odds as low as one in ten of getting funding.

Elias Zerhouni, the NIH director, this month singled out funding difficulties as hampering the agency's long-term planning. Like all federal agencies, the NIH gets its money through annual congressional appropriations, and the numbers cannot be depended on from year to year. "The way the process works does not allow us to do good medium- and long-term capital investments," Zerhouni told a congressional subcommittee.

A new president won't be able to change the way Congress funds agencies, but he might have something to say about increasing the total bottom line for the NIH. Both leading candidates have come out in favour of biomedical research spending, with subtle but possibly important differences between the two.

In a 2007 questionnaire by advocacy group Research!America, Barack Obama wrote: "I strongly support increasing funding for the NIH." John McCain responded to the same question with the ever so slightly different words: "I strongly support funding for the NIH."

NASA/MSFC



**Elias Zerhouni wants predictable funding levels.**

J. WATSON/AFP/GETTY IMAGES

To NIH supporters, the writing on the wall seems, if not crystal clear, at least legible. “It’s clear that Senator Obama will act to increase funding for the NIH. We do not see that in the McCain response,” says Mary Woolley, president of Research!America, which is based in Alexandria, Virginia. Woolley nonetheless believes that the force of public opinion is so strongly in favour of medical research that McCain will deliver on an NIH increase.

Other NIH advocates are similarly positive. “We are very optimistic that a new administration, regardless of which party is elected, will support renewed investment in the NIH and other science agencies,” says Richard Marchase, president of the Federation of American Societies for Experimental Biology and vice-president of research at the University of Alabama, Birmingham.

That may be wishful thinking in an era of blooming US budget deficits and growing pressure on Congress to curb spending. Even with presidential backing, cooperative lawmakers — including NIH advocates and purse-string holders Senator Tom Harkin (Democrat, Iowa) and Representative David Obey (Democrat, Wisconsin) — may not be able to deliver NIH increases in the face of multiple, competing priorities.

And McCain has floated the idea of a one-year spending freeze across the board for all agencies to help cope with the ballooning federal deficit.

Adding to the morose budgetary atmosphere is a ban on federal funding for research done on human embryonic stem cells lines generated after 9 August 2001. US researchers have watched their international colleagues push ahead in what is arguably one of the most promising areas of biomedical research.

In the most recent fiscal year, only \$42 million of the \$650 million spent by the NIH on stem-cell research went to work on human embryonic lines. And although many expect the ban, put in place by President Bush, to be lifted no matter who is elected — McCain and Obama have both voted in favour of lifting the ban in the past — the choice of conservative Sarah Palin as McCain’s running mate has some researchers wondering what that might signal (see page 442).

Meredith Wadman

**Cleaning up the mess**

Environmentalists and scientists alike are hoping that the next president will set the **Environmental Protection Agency (EPA)** on a new course.

Under President Bush, the agency has struggled against accusations of political interference in scientific decisions dating back to 2002 when the White House reportedly meddled with the EPA’s assessments on global warming. By July this year, things at the agency had deteriorated to the point that leading Senate Democrats were calling on its chief, Stephen Johnson, to resign.

The main fight is over global warming. In 2007, the US Supreme Court ruled that the EPA had authority to regulate carbon dioxide pollution from vehicles. Johnson, though, denied California its application to separately regulate CO<sub>2</sub>, saying the problem should be addressed at the federal, not local, level. In that decision he overruled his staff, reportedly after receiving pressure from the White House to do so. He then followed up in July by delaying action on

the agency’s own regulatory proposal, insisting the issue of regulating greenhouse gases was better left to Congress.

Many experts agree that Congress is the only real forum for a deal between environmental and industrial interests, but environmentalists and some politicians say that the EPA should take action while that debate is under way. Indeed, some see EPA regulations as a tool to force action in Congress, because industry interests would rather have an open debate about legislation. Moving forward, the question is how either presidential candidate would work with Congress, the legislative body, and the EPA, the regulatory body, to set up a greenhouse-gas programme.

Obama’s advisers are quick to suggest their candidate would use both legislative and regulatory approaches to help control emissions. “If the circumstances are not right to get that legislation passed quickly, then I think the regulatory authority would come to the fore,” says Robert Sussman, a Democratic adviser who served as deputy EPA administrator under Bill Clinton. McCain’s campaign has been quiet on the issue, but many experts say the Republican would be less likely to take the regulatory route.

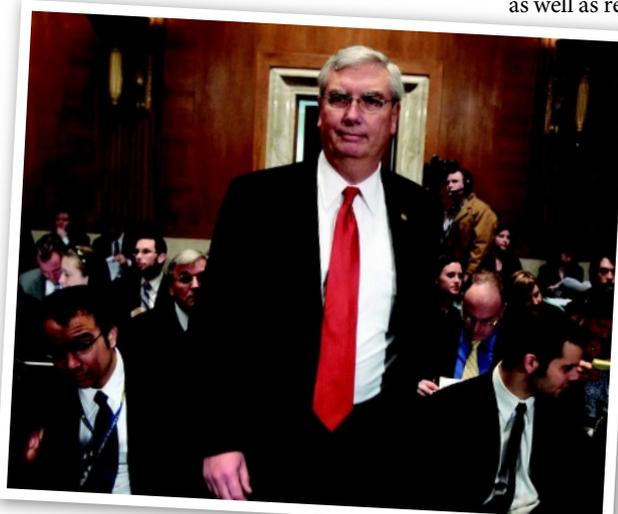
Regardless, the next EPA administrator may find his or her hand forced by lawsuits. Just last month, New York and 11 other states sued the EPA for failing to regulate CO<sub>2</sub> emissions from oil refineries.

But the alleged problems run much deeper than any given policy position. Reports of political interference in agency decisions are widespread, and many say they have contributed to morale problems throughout the agency. Union leaders representing EPA scientists blasted Johnson earlier this year, criticizing the agency’s proposal to close several libraries as well as regulatory decisions regarding pes-

ticides, drinking-water standards and mercury emissions from power plants.

Jeff Ruch, executive director of Public Employees for Environmental Responsibility in Washington DC, says it’s not yet clear what kind of management style either Obama or McCain would bring to the agency. “The question is the extent to which a president will pledge to let the scientists talk,” he says. “I have not yet heard that pledge by either candidate.” ■

Jeff Tollefson



**EPA chief Stephen Johnson, under fire.**

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