

Down, but not out

NASA should work immediately to replace the lost Orbiting Carbon Observatory.

Climate scientists suffered a tremendous loss last week when a failed launch attempt sent the Orbiting Carbon Observatory (OCO) plummeting into the ocean near Antarctica. In conjunction with the Greenhouse Gases Observing Satellite (GOSAT) recently launched by Japan, the OCO could have redefined the way that researchers think about the global carbon cycle, and laid the foundations for a long-term global carbon-monitoring programme. It is an unfortunate testament to the OCO that the reasons to fly such a mission are just as valid today as they were when the idea was put forward a decade ago. NASA should accordingly move with all haste towards an OCO II.

Although small changes to improve the device without significantly extending the schedule are welcome, the goal should be speed. NASA has some spare equipment, including detectors, and the agency should therefore be able to get a replacement into space within a few years. This might even allow the OCO to operate in concert with GOSAT for a time, as originally planned, which would allow scientists to better calibrate and understand the quirks of both machines.

The US\$273-million OCO was designed to test a conceptually simple technique for using reflected sunlight to probe carbon dioxide concentrations in the air column below the satellite. This would have allowed scientists to assess the movement of CO₂ throughout the atmosphere, which is just as important to scientists as it is to

policy-makers who are debating international carbon controls. GOSAT provides less detail but greater context by simultaneously measuring CO₂, methane and water vapour.

If money were the deciding factor, perhaps it would make sense to simply wring everything possible out of GOSAT. The new data could then be integrated into the development of a next-generation carbon-monitoring satellite, which would do everything the OCO could do and more. But now is not the time to be frugal.

Indeed, thanks to the recently passed stimulus bill, it is raining dollars in Washington. NASA has already received \$1 billion from the bill, \$400 million of which is slated for Earth science and climate research. Even after paying for an OCO II — which could be delivered more quickly and for less money than its predecessor — NASA would still have plenty of cash left for other projects. In addition, spending money on a replacement would create as many new jobs as anything else at NASA.

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In the meantime, NASA could improve its ground measurements and expand the use of aircraft, which offer cheaper and faster opportunities to get high-quality data from all over the world. Given the scientific and geopolitical issues at stake, NASA would be wise to develop a long-term strategic plan for assessing global carbon flows. In particular, it should join with the space agencies of the world to develop a coordinated plan for an international network of satellites to monitor greenhouse gases. As an added bonus, such an approach would build in redundancies that would make a similar “mishap”, to use NASA’s lingo, a bit less consequential. ■

Advice needed

The Obama administration should ensure that science informs the US strategy on nuclear waste.

The fall from grace of Yucca Mountain as the site for a giant government nuclear-waste repository has been a long time coming. Ever since it was named as the sole site for the final disposal of high-level waste in 1987, political opposition has been growing, as has the population of nearby Las Vegas.

That opposition found strength in the weakness of the scientific case for the repository. Lawmakers originally chose Yucca Mountain on the basis of Nevada’s low population and political vulnerability, leaving scientists to find a justification after the fact. But much of what the researchers found undercut the decision. The seemingly quiet desert around the mountain went through a spate of volcanic activity as recently as 75,000 years ago, and although the region seems dry, rain seeps surprisingly quickly through fissures in the rock.

These facts have eroded the once-solid political case for Yucca, and, together with questions of data integrity and technical independence, created a climate favourable to its cancellation. This year, with Barack Obama as president and Harry Reid (Democrat, Nevada) as Senate majority leader, the project could well be dealt a final blow.

Obama says that his administration will devise a new strategy for

nuclear-waste disposal. Policy-makers will presumably be looking at various options including geological disposal, reprocessing of spent fuel and long-term storage at reactor sites. Each option has its advantages and drawbacks, but whatever decision is made, the administration must ensure that the scientific rationale is established beforehand, not the other way around.

In particular, the White House should include scientists in its policy discussions from the start. It should allow its ideas to be peer reviewed, both in the open scientific literature and by independent bodies such as the National Academy of Sciences. Finally, it should work with Congress to ensure that whatever legislation is needed to enact its strategy is similarly underpinned by strong science.

None of this means that the government’s nuclear-waste strategy should be determined by science alone. The final decision will have to balance the conflicting commercial, military and public interests in waste disposal — and the political process, not science, is the only way to do that. In striking that balance, US policy-makers could look to Sweden and Finland, which are shepherding their own, scientifically sound proposals for long-term storage facilities through lengthy political and safety reviews.

That process will take those nations years to complete, and it could take even longer in the decentralized US political system. But as the 20-year, \$9.5-billion Yucca Mountain experiment proved, choosing political expedience over scientific integrity will ultimately lead to a solution that satisfies no one. ■