

Loss of Japanese satellite deals blow to remote sensing efforts

[TOKYO] Officials at Japan's National Space Development Agency (NASDA) were both surprised and disappointed last week when the agency's US\$1.2-billion environmental monitoring satellite ADEOS — the Advanced Earth Observation Satellite — ran out of power and stopped working.

The satellite, launched less than a year ago, carried sensors not only from Japan but also from the United States and Europe for monitoring changes in the global environment. It is the first of a series of such large satellites planned by the agency.

ADEOS stopped sending signals during the morning of Monday, 30 June. It was subsequently discovered that the satellite's solar panel had ceased to function, and that ADEOS had switched to a low-energy-consumption mode. No immediate cause for the breakdown could be identified, and after several failed attempts to reactivate the satellite, NASDA made the breakdown public.

At a meeting of the Space Advisory Committee the following day, several explanations for the failure of the satellite's power system were suggested, including collision with meteorites or 'space junk'. But there is increasing evidence that the failure was due to a design flaw in the tension-adjustment mechanism of the satellite's solar panel.

According to Tasuku Tanaka, director of NASDA's Earth Observation Research Center, the value of the data gathered during ADEOS's short mission is not yet clear. But

he admits that the seven and a half months of actual observation time — less than a quarter of the scheduled 33 months — may be insufficient to answer the global issues ADEOS was supposed to address.

As one success of ADEOS, Tanaka cites results on Arctic ozone depletion, gathered by a total ozone mapping spectrometer developed by the US National Aeronautics and Space Administration (NASA), which point to a phenomenon similar to the Antarctic 'ozone hole'.

These results appear to have been confirmed by data from the Improved Limb Atmospheric Spectrometer (ILAS) on ADEOS, developed by the Japanese Environmental Agency, which measured the vertical distribution of ozone and various greenhouse gases in the atmosphere. But researchers at the National Institute for Environmental Studies say that the data obtained will now have to be supplemented by ground-based measurements.

Other equipment on board ADEOS included a sensor for measuring the Earth's radiation budget, developed by the French space agency CNES. NASDA officials say they are "surprised" by the accident. But they are confident the loss will not affect the overall development of remote sensing and environmental monitoring capabilities at the agency.

As the first in a series of international environmental monitoring satellites sched-

uled for launch over the next few years, ADEOS is the cornerstone of an ambitious strategy at NASDA to develop indigenous capabilities in remote sensing. Two more environmental monitoring satellites — the Tropical Rainfall Measuring Mission and a successor to ADEOS — are scheduled for launch by 2000.

NASDA's environmental monitoring programme, which consumes almost 25 per cent of Japan's total space budget, is the cornerstone of research on global change in Japan. While universities spend only about ¥1.3 billion (US\$11 million) annually on global environmental research, NASDA's remote-sensing programme consumes almost ¥40 billion. As a consequence, any changes in NASDA's remote-sensing programme would badly affect the state of global-change research in the country, says Akimasa Sumi, a professor of climatology at the University of Tokyo.

Mike Mann, a deputy associate administrator of NASA, described the loss of ADEOS as "a real blow to NASA's science programme". Mann said in a statement that, fortunately, much of the data from ozone monitoring instruments aboard ADEOS could be replaced by those from instruments on other spacecraft. "But the sea-surface wind data provided by the NASA Scatterometer will be harder to replace, and were opening essentially new opportunities for research and operational users worldwide." **Robert Triend**

After 322 years, royal observatory loses out to Scottish rival



Northern lights: The Royal Observatory in Edinburgh, which is to become the seat of a new National Astronomy Technology Centre.

[LONDON] The Royal Greenwich Observatory (RGO), currently based in Cambridge, is to close and merge with the Royal Observatory in Edinburgh, with the loss of up to a hundred jobs from both sites. But British astronomy will gain from savings of at least £2.4 million (US\$4 million) a year for the next four years, and £4 million a year thereafter. The merged site will be renamed the Astronomy Technology Centre.

The decision ends 15 years of uncertainty over the future of the two royal observatories. It was greeted with relief by the Particle Physics and Astronomy Research Council (PPARC), which runs the two sites. The move is expected to take place in July 1998.

But staff at the RGO, as well as the Astronomer Royal, Sir Martin Rees, say they are "devastated" and will "fight the decision all the way". They believe the decision is a huge loss to British science and a blow to Britain's international standing in astron-

omy. Rees, who campaigned for both sites to remain open, says the savings will be heavily outweighed by the loss of both an historic observatory and an "excellent" modern scientific institution.

A survey of Britain's astronomers conducted by the Royal Astronomical Society earlier this year, however, showed that most believed one of the two sites had to go. This was also the view of the directors of both sites, and the society's president, Malcolm Longair, believes the decision was the right one.

Ken Pounds, chief executive of PPARC, says the savings come at a time when British astronomy is going through one of the most cash-starved periods it has known. If the merger had not happened, he says, the research council would have been compelled to make savage cuts to grants to university astronomy research programmes.

Meanwhile the name of the Royal Greenwich Observatory, which was founded in

1675, will almost certainly remain, and could return to its original site next to the Thames in south London, where its former building is now a museum.

The decision to close the Cambridge site was announced last week by the science minister, John Battle, and was taken on the advice of PPARC (see *Nature* 387, 646; 1997). Pounds says the council could not afford to maintain two institutions essentially performing the same function — providing technical support to Britain's telescopes in the Canary Islands and Hawaii.

PPARC's predecessor, the Science and Engineering Research Council, had wanted to merge the observatories at Edinburgh 15 years ago. But this was considered too politically sensitive at the time, says Pounds. A later panel voted to move the RGO to Cambridge in 1990 on the strength of possible collaboration between the RGO and the University of Cambridge's highly regarded astronomy facilities.

In 1995 a review panel on UK millimetre, optical and infrared astronomy again decided to merge the centres. That review was chaired by James Hough, head of the department of physical sciences at the University of Hertfordshire. But its plans were put on hold when the previous Conservative government launched its 'prior options' initiative inviting competitive bids from the private sector to manage UK research facilities.

A new panel was convened after the May general election, this time chaired by Brian Eyre, deputy chairman of AEA Technology plc. This panel unanimously came to essentially the same conclusion. Eyre says there was little to choose between the two sites. Edinburgh was chosen because it offered the right mix of skills for PPARC programmes.

But RGO staff strongly disagree. David Carter, who runs the RGO's telescope design consultancy jointly with Liverpool John Moores University, says Edinburgh does not have the same expertise in telescope design as

Cambridge. He fears these skills will be lost overseas. He doubts whether staff will want to relocate to Edinburgh given the recent move to Cambridge from the RGO's former home in East Sussex.

Andy Lawrence, professor of astronomy at the University of Edinburgh and a member of the management board at the Royal Observatory in Edinburgh, agrees that Cambridge possesses superior design skills. But he says that PPARC chose Edinburgh because its superior instrumentation skills will be more useful now that the United Kingdom's last big telescope project that needed design input, the twin 8-metre Gemini, is nearing completion.

The RGO left its Greenwich site 50 years ago, moving to East Sussex after the Second World War to escape the streetlights and smog of London, then to Cambridge. It won the race to fix longitude at sea, established the meridian, and set Greenwich Mean Time as the international standard. **Ehsan Masood**

'Political interference skewed scientific advice on fish stocks'

[MONTREAL] Three Canadian scientists claim that political and bureaucratic interference in fisheries science has compromised the government's efforts to sustain stocks of Atlantic cod and Pacific salmon.

Jeffrey A. Hutchings of Dalhousie University's biology department, Carl Walters of the University of British Columbia's fisheries centre, and Richard L. Haedrich of the biology department at Memorial University of Newfoundland claim that the administrative framework linking science with management suppresses scientific uncertainty and obscures scientists' differences of opinion.

They propose replacing it with a politically independent organization of fisheries scientists. They also suggest that all scientific information about fish stocks should be released to the public at the same time as it is presented to the fisheries department, so that the public can evaluate management decisions based on that information.

But the scientists' ideas have been dismissed by officials from the fisheries department. The department's deputy director, William Rowat, claims that the comments are based on innuendo and misrepresentation, and are part of a vendetta against the department, its scientists and its managers.

The scientists' arguments appeared last month in the *Canadian Journal of Fisheries and Aquatic Sciences*, published by the National Research Council of Canada, under the title "Is scientific inquiry incompatible with government information control?"

To back up their claims that a political 'spin' is being placed on scientific results, the authors refer to several incidents in which they allege that government fisheries reports excluded scientific information contrary to



the official line. They claim that the government, which denies that overfishing is the primary cause of present stock collapses, omitted references to conclusions that overfishing had caused stock decline in a 1995 report for Newfoundland groundfish.

Scientific information was also selectively excluded in the 1995 Stock Status Report on Gulf of St Lawrence groundfish, say the scientists. The original draft of the document said that seal predation or environmental conditions were unlikely to be responsible for cod mortality trends from 1985–87. But this statement was removed from the published version, contrary to scientific advice, the authors claim.

They also allege that scientists have been ordered not to discuss politically sensitive matters — such as overfishing — in public, "irrespective of the scientific basis, and publication status, of the scientist's concerns".

One scientist who admitted in an interview with a journalist in 1995 that east coast fish stocks had collapsed from overfishing

and "had nothing to do with the environment, nothing to do with seals" — as some fishermen had claimed — was officially reprimanded for not giving a balanced perspective and for disagreeing with the Newfoundland Stock Status Report. Yet "these comments were consistent with much of the research that had been ... published in peer-reviewed journals", the authors say.

The authors claim that inappropriate government influence on fisheries science also extended to testimony given by scientists in the courts. They quote one scientist who described his confusion when told how to behave as an expert witness in a case involving salmon affected by a dam built by the aluminium smelting company Alcan.

The scientist wrote in 1986 that at the meeting the director-general in the fisheries department had instructed staff to support the minister's position, while adhering to the scientific advice. "I find it impossible to do both," he wrote.

William Doubleday, director-general, science, in the fisheries department, has criticized the comments as "not the usual scientific debate" but "an attack on an organization and the people that were working in it".

Doubleday says the article contains "factual errors, misrepresentations, and very selective quotes". He says the department is preparing a rebuttal, but that the authors have also been invited to participate in an open forum to debate the management of science later this summer.

But the former editor of the journal, David Cook, who gave up the post last month, defended publication of the article by suggesting it would lead to "broad exposure" and "candid debate". **David Spurgeon**