REMOTE SENSING

ERS-1 data still in the works

London

MANY of the researchers chosen as principal investigators (PIs) for the European Space Agency (ESA)'s ERS-1 remote sensing satellite are getting impatient. More than five months after the satellite's launch, PIs are still waiting to begin receiving data on a regular basis.

ERS-1 is considered by many to be the most advanced remote sensing satellite yet flown, and is expected to provide a huge volume of oceanographic data, which will help to improve current climate prediction models. The PIs, who number more than 270, were hoping to begin receiving regular instalments of ERS-1 data late last year. But most have so far only been given a tantalizing taste of ERS-1's potential, in the form of single batches of test data.

PIs and officials from the ESA member states alike are confused about the reasons for the delay. We are beginning to get concerned," says Trevor Guymer, a PI from the James Rennell Centre for Ocean Circulation in Southampton. David Williams, an official responsible for remote sensing at the British National Space Centre, says that the issue was raised by many national officials at a meeting in Paris earlier this month. Everybody had the same concern," he says: "Why have the data not gone open? "

ERS-1 carries a range of microwave remote sensing equipment which, unlike instruments operating in the visual spectrum, can detect the Earth's surface even through heavy cloud cover. Its centrepiece is the Active Microwave Instrument (AMI), which can operate as a Synthetic Aperture Radar (SAR), producing high quality radar images of a 100-km-wide strip of the Earth's surface. These images will be used in land use surveys, to monitor the movement of ice or oil slicks at sea, and may even allow oceanographers to locate ocean fronts, where bodies of warm and cooler water meet. Alternatively, the AMI can be switched to work as a scatterometer, measuring the backscatter from radar beams angled at 45 degrees to the sea surface—data that can be used to calculate wind speed and direction. ERS-1 also carries the Along Track Scanning Radiometer, which will measure the water content of the atmosphere and the sea surface temperature, and a radar altimeter, to measure the height of ice sheets and variations in sea level.

Some ERS-1 data are intended to be used within a few hours of collection, mostly by Europe's meteorological agencies. Distribution of these fast-delivery products seems to have begun without problems. (The European Centre for Medium-Range Weather Forecasts in Berkshire, for example, began receiving fast-delivery products in August last year, although staff at the centre are still experimenting with their use, and are not yet ready to use ERS-1 data in operational weather forecasting.) But most of the PIs are interested in so called 'off-line' data from the satellite. These are high quality data products, including SAR images and oceanographic measurements calculated from raw ERS-1 data.

"Maybe there has been some delay" in supplying PIs with off- line data, concedes Stefano Bruzzi, ESA's deputy mission manager for ERS-1. But he says that the agreement between ESA and the PIs was that each PI must return a report on the use of a test data set, before receiving regular instalments of data. So far, ESA has received very few of these reports, says Bruzzi. But Meric Srocosz, from the James Rennell Centre, says that many of the test data sets were not sent out until mid-December, and there simply has not been time to complete the reports. ESA originally said that test data would be issued by 15 October, he says. "It's tricky to send a report on data we hadn't received."

Other researchers are more sympathetic towards ESA. Stephen Briggs, from the Institute of Terrestrial Ecology at Monks Wood in Cambridgeshire, acknowledges his colleagues' concerns, but believes the problem will soon be resolved. ESA originally estimated that it would take three months to calibrate the instruments on board ERS-1, and to validate the algorithms used to calculate the off-line data products, by comparing ERS-1 data with 'real' measurements taken from ships, buoys and aircraft. In the event, this process took some five months, says Briggs.

"ESA have set themselves very ambitious targets," agrees David Llewellyn-Jones, from the Rutherford Appleton Laboratory in Oxfordshire, who heads the team which built the Along Track Scanning Radiometer. He believes that ESA and the PIs simply underestimated the logistics of handling the data. The distribution network is complex: raw data beamed down to ground stations throughout the world are first transmitted to ESA's data handling centre at Frascati in Italy. To produce the off-line data products, data are then relayed to three Processing and Archival Facilities, in Britain, France and Germany (a fourth, in Italy, is not yet fully operational). With ERS-1 churning out prodigious quantities of information MD the SAR produces data at a faster rate than any instrument flown previously on a civilian satellite MD the distribution network always faced a formidable task.

Despite the disappointment over the delays, most PIs agree that, once the data start flowing, ERS-1 should give ESA a world lead in microwave remote sensing. The field was pioneered by the US National Aeronautics and Space Administration (NASA), which flew a SAR instrument on board the short-lived Seasat mission in 1978 (the satellite failed after only three months in orbit, but its data are still being analysed by oceanographers). NASA has since failed to consolidate on this early lead, carrying SAR instruments only on two brief space shuttle flights.

Peter Aldhous

UNIVERSITY POLICY

Yale to cut departments

A YALE University faculty committee, in what may be the wave of a painful future, last week concluded that, in order to maintain academic strength in most disciplines, Yale should eliminate some departments and consolidate others during the next few years.

The 12-member faculty committee, which spent the past year examining the university against what is called "the financial situation at Yale", has called for the elimination of the departments of linguistics and operations research. Neither department is sufficently strong and neither attracts enough students to justify continued existence as a full department, the committee says.

It also argued for the elimination of Yale's Institution for Social and Policy Studies on grounds that its activities "have not been commensurate with the resources devoted" to it. A reduction in the size of the sociology department was also proposed.

Engineering research also made the list of departments that do not quite meet the test in a financially tight era. The recommendation is to merge chemical engineering, electrical engineering and mechanical engineering into a single Engineering department, with a somewhat reduced number of faculty positions. The merger of physics and applied physics is also called for. Cumulatively, these consolidations would result in a reduction of 49 faculty positions if the Yale's governing board accepts the faculty committee's recommendations.

In conducting its analysis, the faculty committee was asked to consider the gradual elimination or consolidation of departments, rather than a percentage cut in funding for departments across the university. Final action on the restructuring plan is expected sometime within the next year.

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