

# Satellite risks losing sight of Earth

NASA is scrambling to work out what to do with a US\$100-million Earth-science satellite that has been sitting on a sanitized shelf in Greenbelt, Maryland, for nearly eight years.

Last month, President George W. Bush signed a NASA reauthorization bill that, among other things, ordered the agency to come up with a plan for the Deep Space Climate Observatory (DSCOVR), which should have been launched around 2001. The space agency is now in talks with the National Oceanic and Atmospheric Administration (NOAA) and the US Air Force about finally getting the probe off the ground. But the negotiations might mean that the spacecraft loses its Earth-observing instruments and instead goes into orbit with a remit to stare only at the Sun.

Stripping the two Earth-monitoring systems from DSCOVR to save money is an “appalling” idea, says Francisco Valero, the mission’s principal investigator at the Scripps Institution of Oceanography in La Jolla, California. A 2006 NOAA study estimated it would take \$117 million to refurbish and launch the spacecraft; a 2007 study from NASA put that figure at \$205 million.

DSCOVR was meant to be the first Earth-observing mission sent to the Lagrange-1 (L-1) point, a parking place 1.5 million kilometres away from Earth in the direction of the Sun. From there the craft would take measurements that would allow scientists to work out Earth’s energy budget — how much radiation the planet absorbs and re-emits — in one take.

## Sun studies

Satellites in low-Earth orbit make similar energy measurements but can observe only small sections of Earth at a time. DSCOVR would offer a “global, rather than myopic, perspective of the planet”, Valero says. One of its Earth-monitoring instruments, a spectroradiometer, would indirectly measure variables such as ozone levels, aerosols, cloud thickness and water vapour. The other, a radiometer, would measure reflected and emitted radiation for the whole planet.

Yet the Air Force and NOAA seem more interested in studying the Sun, Valero says. Both are responsible for monitoring solar weather and storms, which can damage or knock out communications and global-positioning satellites. The Advanced Composition Explorer (ACE) satellite is currently based at



NASA

An Earth-observing satellite that can see the whole planet is described as ‘crucial’ to climate research.

L-1 to watch for solar eruptions. It sends a one-hour advance warning back to Earth of any impending storms.

The 11-year-old ACE instruments are nearing the end of their designed lifespan, so “we are reviewing a variety of options” to replace them, says Colonel Shawn Barnes of the Air Force Space Command. DSCOVR has three Sun-observing instruments that could perform the ACE observations, and top NASA officials have confirmed that the three agencies are discussing how to use the mothballed craft to monitor solar wind and space weather.

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DSCOVR was originally meant to fly around 2001 aboard the space shuttle. But NASA postponed the launch after Congress demanded an independent review of the probe’s scientific merit. The

satellite is a renamed version of Al Gore’s proposed Earth-watching satellite, called Triana. After the review found that the mission’s science goals were still valid, NASA sought another ride for it. In 2001, the French space agency discussed with NASA the possibility of launching Triana, but funding constraints ruled that out. And the 2003 Columbia disaster meant that the mission was out of luck for a shuttle ride. NASA eventually cancelled

the mission in January 2006.

In May 2007, NASA held a workshop to look at whether NOAA might fly the spacecraft instead. NOAA wanted the launch but “DSCOVR didn’t rise to be NASA’s highest priority”, says Hal Maring, the NASA programme manager who directed the workshop. That’s in part because the 2007 National Research Council decadal survey did not rank the mission among the 17 ‘highest priority’ Earth-observing missions that NASA and NOAA should develop and launch in the next ten years.

Since then the scientific community has showed renewed interest in seeing DSCOVR fly. In March 2008, the Ernst Strüngmann Foundation in Frankfurt, Germany, held an invitation-only forum for 44 top climate scientists. Many participants, none of whom was directly involved with DSCOVR, agreed that satellite observations of Earth from L-1 are essential for assessing changes in cloud cover and climate.

The issue was pushed to the top of the agenda last month after Bush signed the NASA Reauthorization Act, legislation that directs the space agency in its programmes and budget priorities for 2009. NASA has until 13 April next year to report its plans to Congress. ■

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