Scientists hope images from first local satellite will deepen understanding of environment

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The first photographs taken by Singapore’s first locally built satellite, now orbiting in space, may help scientists understand the effect that environmental changes have on the island.

The multi-satellite X-Sat started beaming live images of Tuas in Singapore’s west on May 7, 17 days after it blasted off into space from the Satish Dhawan Space Centre in India.

Four days later, photos of Singapore’s mainland and its surrounding islands were beamed from the 10kg-fridge-size satellite.

The red-and-green photographs—with red denoting vegetation and green representing bodies of water—were taken from 800km above, and are “good enough” to measure soil erosion and environmental changes within an area of 50km by 50km, said Professor Low Say Soon, one of X-Sat’s team leaders.

“You don’t need fine resolution for environmental monitoring,” said Prof Low, who is also director of Nanyang Technological University’s (NTU) Satellite Research Centre, adding that one can “roughly recognise the buildings”.

X-Sat’s Korean-made camera, iris, can also capture forest fires and sea pollution.

Prof Low said that he is in talks with academics in NTU’s School of Environmental Engineering about using the images captured by the X-Sat.

There is also a possibility that Dengue-fitbit images may come on board.

The successful beaming back of images to Singapore capped more than nine years of work by more than 40 scientists and engineers from NTU and Sapiens’ defence research body DSO National Laboratories. The programme had been delayed for four years, and use costs go up from $10 million to $40 million.

The solar-powered X-Sat circles the Earth once in 30 minutes at a speed of 7.5km a second.

In a day, it circles Earth 14 times and passes by Singapore four times—twice between 10am and midnight, and twice between 2pm and midnight.

During these periods, when the satellite comes within a 5,000km radius of the NTU ground station, the 10-man ground crew is able to communicate with and send out commands to X-Sat.

Data and images are beamed back to the National University of Singapore’s Centre for Remote Imaging, Sensing and Processing.

Singapore is one of the first few countries in this region to have their own satellites in space. Only Indonesia and Malaysia also have their own locally built satellites in space, having launched them in 2007 and 2009 respectively.

Trade publication Aerospace Singapore said in 2008 that the X-Sat is able to capture and beam satellite pictures at the same time, allowing for almost real-time sensing. It added that such eye-in-the-sky capabilities can help to fight piracy, as well as spot and track troop deployments.

But Prof Low reiterated that X-Sat is “not for defence purposes”.

Meanwhile, he also hopes the launch will inspire young people to take up science and engineering.

Prof Low, who headed the X-Sat team in 2005, said: “Space science is the pinnacle of science and technology... We hope to reach out to more young people and get them to become scientists and engineers.”