



Geospatial Applications: Technical Difficulties with Landsat Satellite

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Technical problems onboard the Landsat 5 Earth imaging satellite may mean the end of a valuable remote sensing product.

"The backup solar array drive on Landsat 5 began exhibiting unusual behavior on Nov. 26," said Ron Beck, U.S. Geological Survey, in a Nov. 30, 2005, news release.

The solar array drive maintains the proper pointing angle between the solar array and the sun. The rotation of the solar array drive became sporadic and the solar array was not able to provide the power needed to charge the batteries. Maintaining power to the batteries is critical to sustain proper operation of the spacecraft. The primary solar array drive failed under similar circumstances last January. Because of this situation, imaging operations will be suspended for at least the next two weeks or until attempts to solve the problems have been resolved.

Landsat 5 and 7 provided full global coverage of the Earth's surface every eight days. Even though Landsat images have only a 30-meter resolution, they are extensively used remote sensing products in agricultural and natural resource management because they have provided regular images of the entire surface of the Earth for more than 20 years. The satellites are particularly useful for identifying current land use and land use change over time. Landsat imagery has been used extensively during the last few years in sugar beet crop management in the Red River Valley.

"How it could get fixed is going to be the subject of much discussion with our engineers over the next few weeks," said Jay Feuquay, coordinator of the land remote sensing program at the U.S. Geological Survey, in a Nov. 28 interview. "We're cautiously optimistic we will be able to resume some sort of operations, but we don't know that for sure, and we don't know how close to full operations we'd be able to get."

It is possible Landsat 5 still will be able to operate for more limited use, but details on how that could happen still are unclear, according to Feuquay.

Losing Landsat 5, which launched in March 1984, would be particularly significant to agriculture because the relatively low cost of Landsat images allows this product to be used on low-value crops.

The government's other remote sensing satellite, Landsat 7, also is experiencing problems. A main sensor on Landsat 7 malfunctioned in 2003, causing it to deliver degraded data since then. Only the center sections of each Landsat 7 image is clearly focused, making most of each image unusable.

U.S. government agencies are weighing alternatives to the Landsat 5 and 7 satellites. One option is to put an imaging camera similar to the ones on the Landsat satellites on the National Polar-orbiting Operational Environmental Satellite System (NPOESS). Another option is to launch a replacement Landsat satellite. It is unlikely that either option will occur in time for the 2006 growing season.