



## Geospatial Applications: Landsat 5 Satellite Back in Operation

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By John Nowatzki, Geospatial Specialist  
NDSU Extension Service

Landsat 5 is back in operation. Engineers from the U.S Geological Survey (USGS) and National Aeronautics and Space Administration were able to adjust operating procedures to the solar array drive mechanism that allows the solar array to provide enough power for the mission to resume normal operations. Consequently, acquisition operations started over the U.S., and the international stations will be brought online in the coming weeks.

This information was included in a news release from the Landsat Update, which is an informal communication tool prepared periodically and distributed electronically to USGS Landsat partners.

"This is good news for the global science and operational communities," said Jay Feuquay, USGS Land Remote Sensing Program coordinator. "The Landsat Program has a well-established record of more than 30 years of earth observations. The latest developments allow the Landsat user community to continue to rely on Landsat imagery. I am optimistic about the 'fix' applied to the solar array problem and the future operations of Landsat 5. At the same time, we are moving aggressively to develop a Landsat Data Continuity Mission that will provide Landsat data continuity."

The solar array drive mechanism began exhibiting problems in late November 2005. As a precaution, imaging operations were suspended until the problem was identified and potential solutions were evaluated and tested.

Agricultural and natural resource managers use information from Landsat imagery to assist in management decisions in North Dakota. Several North Dakota-based agricultural crop consultants are using this imagery in a number of ways, including to delineate management zones in fields and quantify nitrogen in the crop canopy. Separate management zones in fields allow farmers to vary the amount of crop inputs in each zone, using GPS-controlled applicators to change the quantity applied in each zone.

An example of using satellite imagery to quantify nitrogen in the crop canopy is used by Red River Valley sugar beet producers to determine the amount of residual nitrogen left in the field from the sugar beet tops. The residual nitrogen can be credited to the following year's crop nitrogen needs.

Landsat imagery has been used to develop a cropland use map in North Dakota annually since 1997. The North Dakota cropland use map identifies the type of crop grown or other land use for the entire land area of the state.

This annual land use classification requires remote sensing of the entire state three times during the growing season. The Landsat 5 satellite is ideal for this purpose because it acquires images of the entire Earth's surface every 16 days. North Dakota and the National Agricultural Statistics Service (NASS) are the lead organizations in the partnership that annually develops this digital map. During the past five years, the other partner in this effort has been the North Dakota State University Extension Service.

In 2006, the partnership will expand to include the Upper Midwest Aerospace Consortium in Grand Forks. The annual land use map developed from this project is used by NASS to supplement other tools to report annual crop production. Other North Dakota organizations and

agencies, such as Ducks Unlimited, the Natural Resources Conservation Service, North Dakota Department of Health and U.S. Fish and Wildlife Service, make use of the map

Landsat imagery is particularly important to agricultural and natural resource management because it is the least costly remote-sensed imagery, provides imagery of the entire state every 16 days and its 30-meter image resolution makes it usable on the field level.