

# The Landsat Data Continuity Mission

a guarantee for a continuous Earth observation data set

For nearly 35 years, Landsat satellites have collected data of the Earth's continental surfaces to support global change research and applications, but the continuity is in danger.

The data constitutes the longest continuous record of the Earth's surface as seen from space. Imaging Earth's land environment has happened at a resolution sufficient to record the impacts of human activities. It is very important the data collection from the sensors continue.

However, it is close to reaching a critical phase with regards to the continuity. The last Landsat satellite, Landsat 7, launched in 1999, has continuously collected data many years after the planned lifetime set at five years, but the risk for a gap in the Landsat data row from 1972 poses a problem because of the ageing process in the satellite. In the system Landsat 5 and Landsat 7 are still operational, but Landsat 5 is 22 years old and no redundancy remains for most of its mission's critical subsystem. Landsat 7 has lost use of its instrument Scan Line Corrector and has lost gyro redundancy.

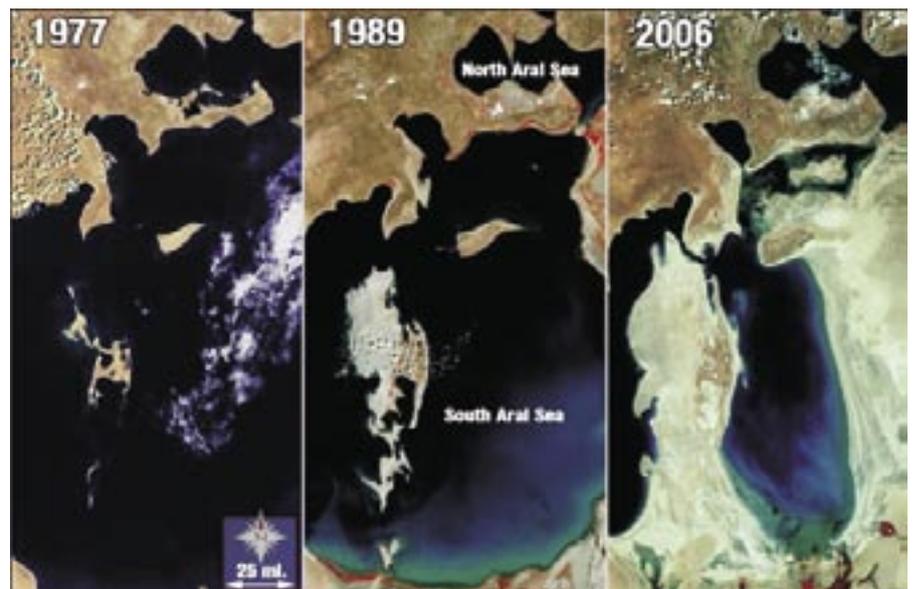
It has become more than clear that a mission to ensure the continuous dataflow is necessary, and it is urgent. Early plans to purchase data from a privately owned and commercially operated system or possibilities to integrating Landsat-type sensors on the NPOESS platform was turned down, and in December 2005 the Office of Science and Technology Policy (OSTP) issued a memorandum adjusting the Landsat Data Continuity Mission strategy. NASA was instructed to acquire a single Landsat continuity mission in the form of a free-flyer spacecraft. The instrument will collect land surface data similar to that of its Landsat predecessors. NASA has selected an industrial company to develop the Operational Land Imager instrument for the Landsat Data Continuity Mission (LDCM). The instrument will capture images in the visible and near-infrared spectra. Under the contract terms,

the company will develop, fabricate and integrate one flight-model Operational Land Imager. The company also will test, deliver and provide post-delivery support and five years of on-orbit support for the instrument.

The Landsat Data Continuity Mission is the successor to Landsat 7. It is scheduled for launch no earlier than July 2011. The following two pictures from Landsat show the very valuable source the satellite is for detecting changes in the landscape over time. Sometimes due to human influence, sometimes due to natural causes.



*Eyjabakkajökull glacier, Iceland. A natural-color Landsat 7 image shows Iceland's Eyjabakkajökull glacier in 2000. The blue outlines indicate where the glacier was in 1991 and 1973. Eyjabakkajökull is an outlet glacier of the Vatnajökull ice cap in south eastern Iceland. It has been retreating since a 2.8-km surge occurred in 1972-1973. This true-color Landsat 7 image shows the glacier terminus in September 2000, by which time it had retreated 1.8 km. The light- and dark-blue outlines show the terminus extent in 1973 and 1991, respectively.*



*The Aral Sea lies between Uzbekistan (to the south) and Kazakhstan (to the north). It was once the fourth largest lake in the world, but the Aral Sea is now less than half of its original size. The Aral Sea is terminal, meaning no water flows out of it. It is fed by the Syr Darya and the Amu Darya Rivers, but former Soviet river diversions for irrigation made over 40 years ago have starved the Aral Sea of water.*