

Landsat

DATA USERS NOTES



SUPPLEMENTAL ISSUE

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COLOR BALANCE FOR THEMATIC MAPPER: AN IMPROVED IMAGE ARCHIVE

The increased availability of Thematic Mapper (TM) data from Landsat 5 has resulted in multiple orders for TM color products using bands 2, 3, and 4. Since this combination is more compatible in spectral range to MSS bands 1, 2, and 4, the standard TM false-color composite provided by NOAA will now be made using TM bands 2, 3, and 4 with new photographic look-up tables. This report traces the evolution of the methods used to achieve the color products now available to Landsat users. Its purpose is to in-

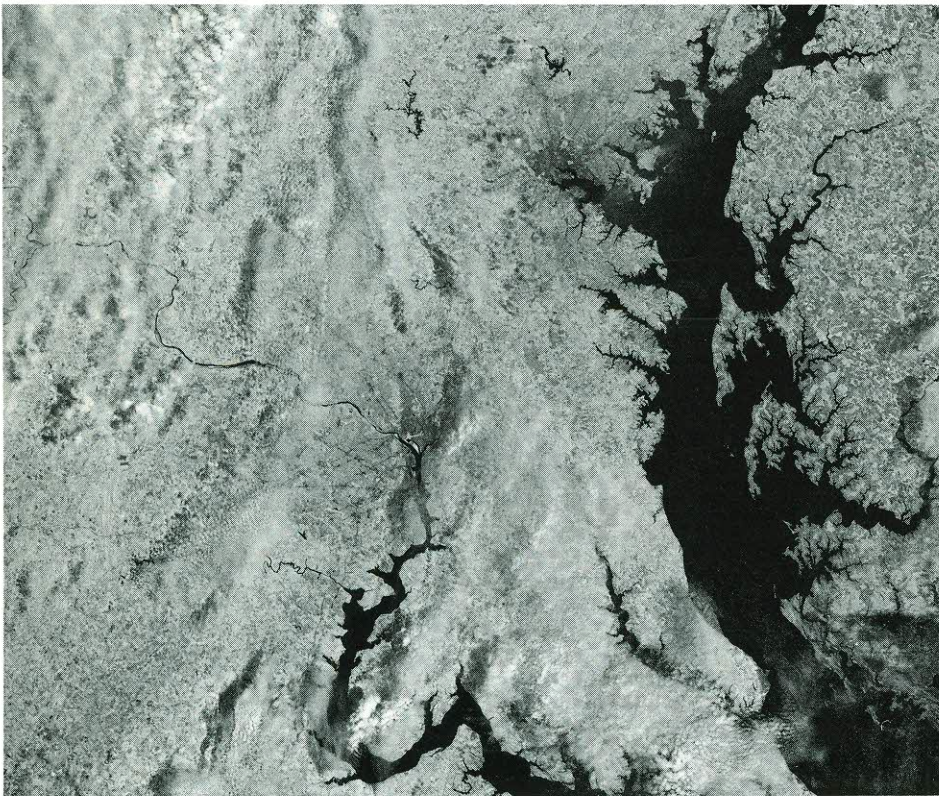
form TM data users of NOAA's progress in establishing a compatible TM/MSS color balance characterization. This color balance scheme will be applied to all archival photographic products produced after July 1, 1985.

Background

The TM was conceived by NASA as a second-generation instrument relative to the Multispectral Scanner System (MSS). As such it was principally designed to observe vegetation cover and provide a better measure of crop acreages in regions or countries with small fields. To aid in this assessment, a 30-meter spatial resolution was adopted along with some "sharpening" of the spectral bands.

The objective of early TM image evaluations using data acquired from Landsat 4 was designed to characterize sensor response and verify the utility of the TM for special applications. These studies were carried out by principal investigators funded by the NASA Science Office. Most principal investigators performed digital analyses using single scene data acquired over predetermined areas of the Earth's surface. Scientific results for each scene were categorized using digital data analysis techniques for the single acquisition received. A series of applications results were derived by these investigators. All results were taken from Landsat 4 acquisitions in the fall of 1982. When color composites were required to illustrate a point, they were generated through the use of special photoprocessing techniques to enhance specific features in each scene.

Multitemporal investigations were also planned and funded. However, the priority of these investigations was reduced when the Landsat 4 TM was effectively lost February 14, 1983 (approximately 7 months after launch) due to a combination of the loss of the X-band transmission capability and the eventual failure of two of the four solar array panels. Prior to this time, 11,000 TM scenes had been acquired worldwide. Approximately 8,000 of these covered the USA and were candidates for processing. However, due to the lack of a high volume production facility at the time of launch, the data on hand were processed on an alternate system capable of only one full scene each day of operation. This limitation resulted in very selective image processing. Furthermore, since there were no TM scenes available from Landsat 4 that were acquired during the spring and early summer growing seasons, the film look-up tables (see September 1983 Landsat Data



Landsat 5 Thematic Mapper scene of Washington, D.C. area generated using the new photographic look-up table (Band 4). Scale, approximately 1:1,500,000. Displayed is the central portion of scene 80099-18143 (Engineering roll 8811923), acquired in June 1984.

