



FRONTISPIECE. First satellite mosaic of the conterminous U.S. consisting of 595 cloud-free ERTS-1 satellite images compiled for NASA/GSFC by USDA Soil Conservation Service. Original is 10 x 16 feet at a scale of 1:1,000,000.

Photogrammetric Brief

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First ERTS-1 Mosaic of the U.S.

THE FIRST base-controlled, precision photo-image mosaic of the conterminous United States — 7,984,445 km² (3,082,809 mi²) — has been compiled using imagery from the Earth Resources Technology Satellite (ERTS-1). The mosaic consists of 595 cloud-free, Multispectral Scanner System (MSS) band 5 (0.6 μm to 0.7 μm) images obtained during 42 of the spacecraft orbits at the same altitude and lighting angle. The images were obtained during the period from July 25 through October 31, 1972, and were compiled by the Soil Conservation Service (S.C.S.) for the Earth Resources Branch of Goddard Space Flight Center. Each image was rectified and scaled according to the latitude and longitude of the particular image prior to mosaic assembly. The initial scale of

compilation was 1:1,000,000 on an Albers Equal Area Projection in six panels. A similar mosaic was simultaneously made using MSS band 7 (0.8 μm to 1.1 μm) imagery.

If composed of conventional aircraft photography, the mosaic would have consisted of 1.76 million frames, or if done by high-altitude U-2 aircraft photography, it would have required over 50,000 photographs. Furthermore, either method would take many years to duplicate a mosaic such as that assembled from ERTS imagery.

The Albers Equal Area Projection was chosen to produce the ERTS mosaic because it also was used for the National Atlas that contains overlays and maps of roads, drainage, land use, vegetation, and other features, which can be superimposed on the U.S.

mosaic. Also, the imagery itself, using the Albers Projection, is especially suited to mosaicking such a large area. The method used was explained in a paper presented at the March 1974 ASP Convention entitled, "A Practical Method to Transform ERTS-1 Imagery for Mosaicking on Albers Equal-Area Projection," by Ralph M. Hooper of S.C.S.

In addition to the two U.S. mosaics, NASA/Goddard asked S.C.S. to compile two similar ones (now in progress) for the period from December 1, 1972, through March 30, 1973, for in-house work in geological and hydrological research. These mosaics will:

- Provide a precise data base on which the individual ERTS investigative results can be compiled for examination on a regional or national basis,
- Provide the first synoptic view of the entire United States for scientific examination of lineaments and faults on a subcontinental basis,
- Enable the construction of a national surface water inventory base which will include the number and area of lakes in categories of both greater than and less than 10 km² (6.2 mi²),

- Provide a base for a national vegetation cover and continuous land classification inventory,
- Provide an accurate assessment of the national drainage networks in the various physiographic regions,
- Identify the national land use areas for 1972, such as agriculture, forest, and urban, as a future physiographic frame of reference, and
- Provide an educational tool for geography and geology courses.

In addition, the S.C.S. previously produced a similar mosaic of Alaska using MSS band 7 for the period from July 25 through November 3, 1972. Some very minor segments have only the base planimetric detail due to the limited amount of ERTS coverage at this period and during the time of compilation.

This type of mosaic is already proving useful to geologists, hydrologists, planners, and others. A brochure is available that contains information on scales and prices of the entire mosaic and individual sections of the mosaic. Inquiries should be directed to U.S.D.A. Soil Conservation Service, Cartographic Division, Federal Center Building No. 1, Hyattsville, Maryland 20782.

Symposium Proceedings Available

	<i>Price per copy to Members</i>	<i>Price per copy to Nonmembers</i>
Annual March Meetings	\$ 2.50	\$ 5.00
1972—636 pages		
1973—660 pages		
1974—620 pages		
Fall Technical Meetings	2.50	5.00
Denver, Colorado, 1970, 542 pages		
Columbus, Ohio, 1972, 482 pages		
Disney World, Florida, 1973, 475 pages		
Washington, D.C., 1974, 455 pages		
International Symposium on Photography and Navigation, 1970	5.00	5.00
Operational Remote Sensing, 1972	5.00	10.00
Symposium on Coastal Mapping, 1972	5.00	10.00
Fourth Biennial Workshop on Color Aerial Photography in the Plant Sciences, 1973	5.00	10.00
Remote Sensing in Oceanography, 1973	5.00	10.00
Management and Utilization of Remote Sensing Data, 1973	7.50	12.50
Coherent Optics in Mapping, 1975	10.00	10.00
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