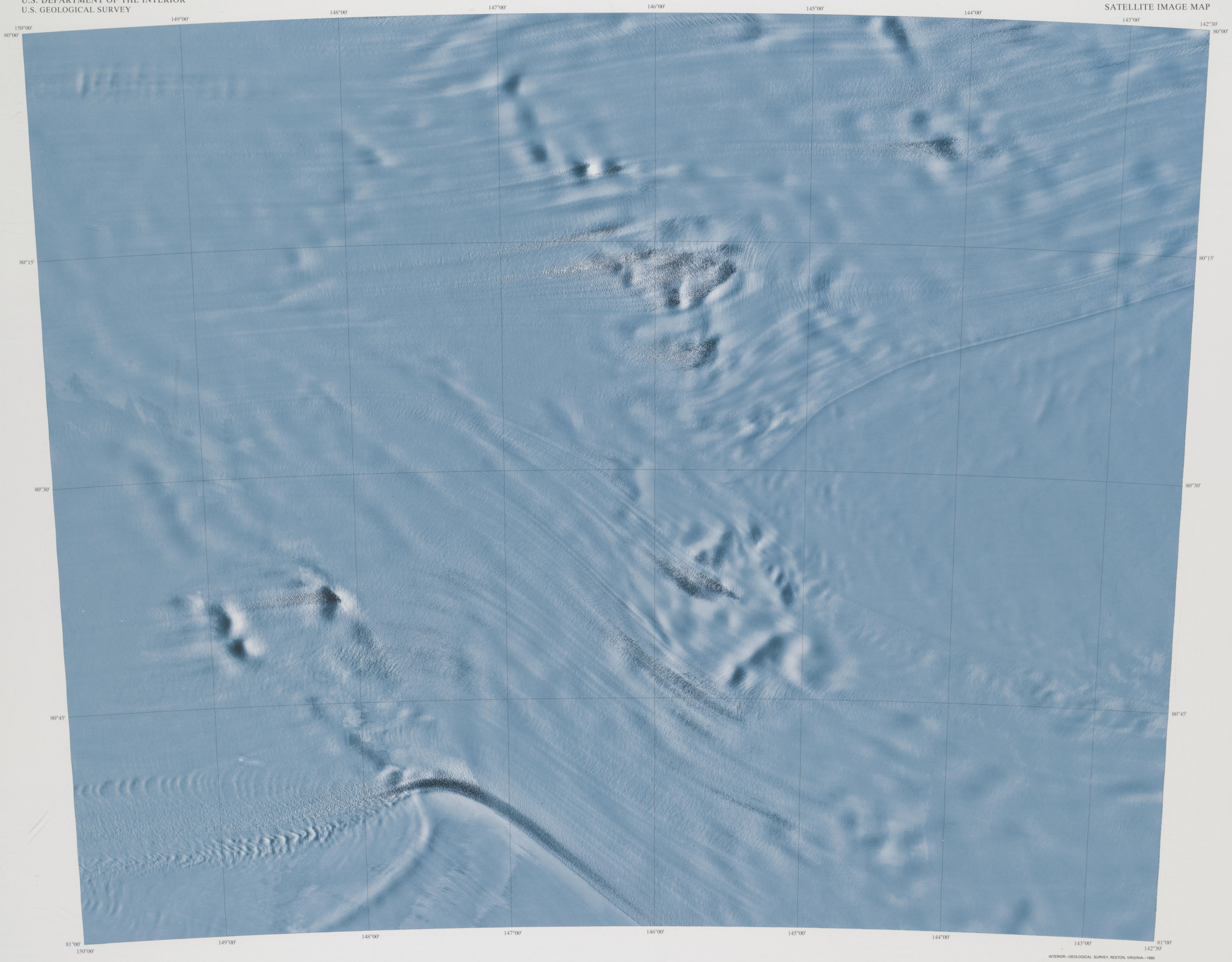
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

SU 6-10/1

ANTARCTICA
SATELLITE IMAGE MAP



INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1993

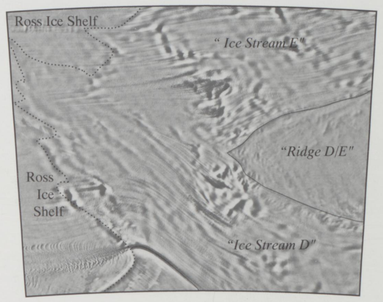
Scale 1:250,000

5 0 5 10 15 20 Statute Miles

5 0 5 10 15 20 25 30 Kilometers

5 0 5 10 15 Nautical Miles

GLACIOLOGICAL FEATURES



Names shown in italics and quotes are used by the scientific community but are not officially approved by the U.S.Board on Geographic Names.

LEGEND

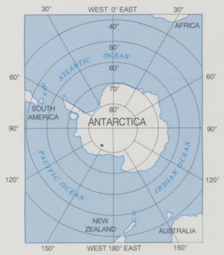
- Distinct ice-stream margins, high shear
- Indistinct ice-stream margins, low shear
- Relict ice-stream margins
- Ice grounding line
- Inter-ice-stream ridge crest

NASA personnel provided annotation of glaciological features. Information on the glaciological features shown may be obtained from the National Aeronautics and Space Administration, Goddard Space Flight Center, Oceans and Ice Branch, Code 971, Greenbelt, MD 20771. See also: Scambos, T.A., and Bindschadler, R.A., 1991, Feature maps of Ice Streams C, D, and E, West Antarctica: Antarctic Journal of the United States, v.26, no. 5, pp 312-314.

The processing steps, while greatly enhancing most of the topographic features, have introduced minor artifacts into some of the image maps in this series. The high-pass filter suppressed the illumination variation, and also tended to 'flatten' the appearance of the larger topographic features, such as the inter-ice-stream ridges and ice domes, relative to the smaller features within the ice streams. Furthermore, for large features where significant changes in regional slope occur, artificial image features may be generated by the filter. For example, a ridge crest or ice grounding line boundary may have additional apparent breaks in slope parallel to the main break in slope.

The images show several features that are highly ephemeral, or which are moving as the ice flows. Ragged edged patches, particularly evident on the inter-ice-stream ridges, mark changes in the reflectance of the surface snow cover. In the image, fresh snow appears as a lighter tone than older snow (firn). The shape and location of these patches may change with every storm in the area. Individual crevasses and snow dunes within the ice streams are in motion at speeds up to 690 m/a, and are no longer in their mapped locations. However, the location and shape of entire crevasse fields, and of larger topographic undulations in the ice streams, are fixed.

LOCATION DIAGRAM



INDEX TO ADJOINING QUADRANGLES

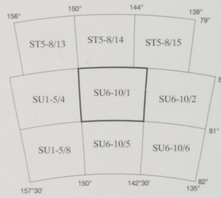
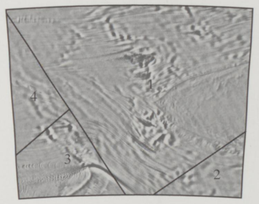


IMAGE COVERAGE



	Path/Row	Image ID	Date	Sun Az	Sun Elev
1	014/118	5105215335	17 JAN 87	98	19
2	007/119	5105114510	16 JAN 87	105	18
3	014/119	4240615472	15 FEB 89	102	10
4	019/118	4276116172	05 FEB 90	95	15

Bands and Wavelengths

Band 2 0.52 - 0.60μm, green
Band 3 0.63 - 0.69μm, red
Band 4 0.76 - 0.90μm, near-infrared

Information on indexing, cost, and availability of Landsat data may be obtained from U.S. Geological Survey, EROS Data Center, Customer Services, Sioux Falls, South Dakota 57198

Produced by the United States Geological Survey in cooperation with the National Aeronautics and Space Administration with support from the National Science Foundation, Interagency Agreements DPP8512516 and DPP9114787

Imagery recorded with Thematic Mapper (TM) on Landsats 4 and 5. Mosaic controlled to photo-identified ground control points. Lambert Conformal Conic Projection with standard parallels 78°40' and 81°20'. World Geodetic System 1984 (WGS 84). The error in position of the topographic features in relation to the graticule and to the satellite observation stations is approximately 300 meters on the ground.

The images for the satellite image mosaic of the area were acquired during the period 1984-1989 by the Thematic Mapper (TM) sensor on Landsats 4 and 5. TM bands 2, 3, and 4 were combined by USGS to improve the signal to noise ratio. The sum of the bands was processed with a combination of high-pass and low-pass filters to remove sensor-related striping present in the data. A separate high-pass filter was applied to suppress the varying response of the sensor to sun illumination across the scene. The processed images were contrast-stretched to reveal subtle topographic features. The images were digitally mosaicked to eliminate as much of the cloud and cloud shadow areas as possible, and to give the best possible gray tone match. The mosaic was transformed to a Lambert Conformal Conic projection using a cubic convolution algorithm with internal image-to-image control points and 10 weighted ground control points. The mosaic was divided into individual 1:250,000-scale map sheets based on latitude and longitude guidelines established by ICAO-IMW map specifications. A geographic graticule was added, and an accuracy test was performed on the resulting image map.

Information on image processing of the Landsat images may be obtained from US Geological Survey, Flagstaff Image Processing Facility, Flagstaff, Arizona 86001

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EXPERIMENTAL EDITION