

EXPLANATION OF  
INDEX MAP TO OPTIMUM LANDSAT 1, 2 AND 3 IMAGES OF ANTARCTICA

1. The path and row numbers for Landsat 1, 2, and 3 nominal scene centers follow the Extended Canadian or Worldwide Reference System (WRS) used by the U.S. Geological Survey's EROS Data Center, Sioux Falls, South Dakota 57198 U.S.A., where all Landsat multispectral scanner (MSS) and return beam vidicon (RBV) images of Antarctica are archived. Complete imaging of the Earth's surface between about 90° north and south latitude is achieved with Landsat 1, 2, and 3 MSS and RBV sensors in 251 orbits. These 251 orbits are divided into 119 rows of overlapping 15% percent successive Landsat images acquired along the orbital path. The points of intersection of the orbital paths and the rows are known as nominal scene centers. This index map includes all nominal scene centers which give coverage of Antarctica, beginning at the coast (defined as the boundary between the ocean and either bedrock or glacial ice) or all or parts of 17 rows from Row 10 (top of Antarctic Peninsula) to Row 119 (about 81° S, latitude) and all 251 paths (orbits).

2. Actual Landsat 1, 2, and 3 scene centers can vary up to 40 km from the latitude and longitude coordinates of the nominal scene center depending upon specific orbital path and framing; therefore, the precise area of coverage of each image can also vary.

3. Optimum Landsat 1, 2, and 3 MSS and Landsat 2 RBV images of Antarctica are evaluated on the basis of cloud cover (see Legend below). In the inland regions the optimum image was selected both on the basis of minimum cloud cover and low solar elevation angle to enhance subtle morphologic details on the ice sheet surface.

4. Landsat 3 RBV images are evaluated on the basis of the amount of distinguishable ground features on an image. Only usable (some distinguishable ground features) Landsat 3 RBV image subsections (A, B, C, D) are included.

EVALUATION OF OPTIMUM LANDSAT 1, 2, AND 3 MSS IMAGES OF ANTARCTICA

Assessment Category	Number of Nominal Scenes	Percentage
Excellent image	753	30.0
Good image	367	14.6
Fair to poor image	937	37.3
Unusable image	153	6.0
No image available	252	10.1
<b>Total:</b>	<b>2,514</b>	<b>100</b>

The first two classes, comprising 44.7 percent of the nominal scene centers, have little or no cloud cover, minimum snow cover in areas of exposed rock, or were acquired during times of low solar elevation angle (above the horizon) to maximize morphologic details in the inland areas of the ice-sheet surface. Taking into account both image sidelap and suitability, about 70% of the Antarctic continent, from the coast to about 81° S latitude has high quality Landsat MSS images available.

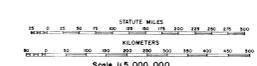
Landsat has the potential for imaging about 1.1 x 10<sup>10</sup> km<sup>2</sup>, or 79% of the area of Antarctica. It cannot image the region around the geographic South Pole, because it is beyond the Landsat orbit. About 70% of the Landsat imaging area (about 7.7 x 10<sup>9</sup> km<sup>2</sup>) or about 29% of the continent now has excellent or good coverage.

Approximate size of area encompassed by 1:5,000,000-scale Landsat MSS image. Landsat 3 RBV subsections encompass slightly more than one overlapping quadrant (A, NW; B, NE; C, SW; D, SE) of an MSS nominal scene.

- LEGEND:
- Excellent image (0% to 45% cloud cover)
  - Good image (45% to 10% cloud cover)
  - Fair to poor image (10% to 100% cloud cover)
  - Unusable image (100% cloud cover)
  - No image available
  - Nominal scene center for a Landsat image which lies beyond the coast of Antarctica.
  - A, B, C, D Usable Landsat 3 return beam vidicon (RBV) scenes (A, B, C, D refer to usable RBV subsections)

Information on cost and available formats of Landsat imagery of Antarctica may be obtained from NOAA, Landsat Customer Services, EROS Data Center, Sioux Falls, South Dakota 57198 U.S.A. (Telephone Number 605-596-6151).

U.S. Geological Survey  
Satellite Image Atlas of Glaciers  
Chapter 2 - Antarctica  
Major overlay map with nominal scene centers (path/row) of Landsat MSS images of glaciated area.  
Map base from American Geographical Society of New York, 1970.  
Polar Stereographic Projection.



INDEX MAP AND TABLE SHOWING OPTIMUM LANDSAT 1,2, AND 3 IMAGES OF ANTARCTICA

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This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards.