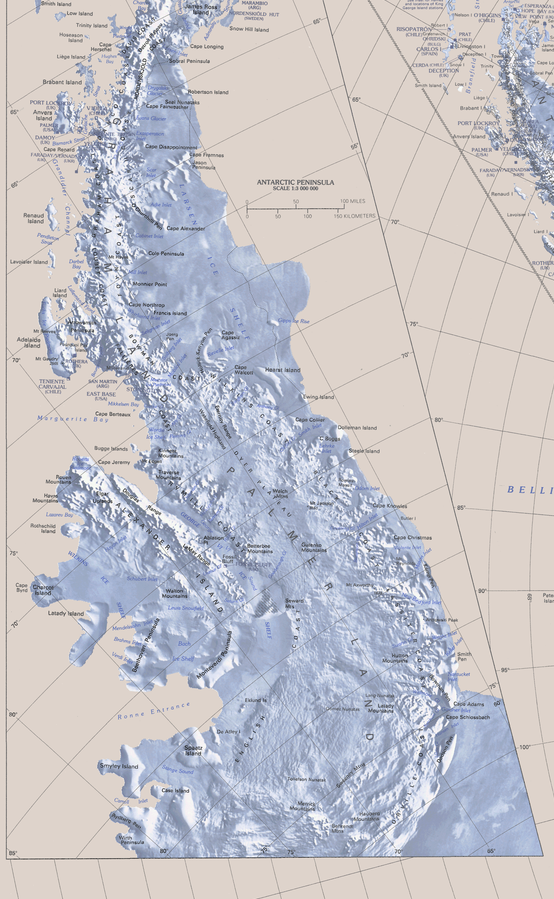
U.S. DEPARTMENT OF INTERIOR
U.S. GEOLOGICAL SURVEY

ANTARCTICA

MISCELLANEOUS INVESTIGATIONS SERIES
MAP I-2560







SATELLITE IMAGE MAP OF ANTARCTICA

By

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1996

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This satellite image map was produced by substantially modifying an earlier image map of Antarctica, U.S. Geological Survey (USGS) Miscellaneous Investigations Series Map I-2284, published in 1991. New data have been added to this earlier image base to replace areas where clouds obscured surface features; as a result, the new map base is a nearly cloud-free mosaic. The image data have been digitally enhanced, and geographic place-names and generalized topographic contours have been added.

The satellite images used in this mosaic were acquired by the Advanced Very High Resolution Radiometer (AVHRR) sensors on the National Oceanic and Atmospheric Administration (NOAA) 6, 7, 9, 10, 11, and 12 satellites during the period 1980-1994. Although the AVHRR scans a 2,400-km-wide swath and can image nearly half of the surface of Antarctica on a single orbit, 63 sectors of 36 different scenes were needed to compile this nearly cloud-free data set. Most of the remaining cloudy areas have been annotated on the map to minimize confusion between clouds and land-surface features.

The digital image base that was used previously was mosaicked, controlled, and geometrically corrected by the National Remote Sensing Center, United Kingdom. Details of the processing can be found in the International Journal of Remote Sensing (1988, v. 10, nos. 4 and 5, p. 669-674). The USGS evaluated the geometric accuracy of the mosaic and estimated a root-mean-square error of 2.5 km. The digital image processing that created this modified image base was done at the USGS Flagstaff Field Center, Flagstaff, Arizona. Areas of cloud cover were identified and masked out of the mosaic. Seams between adjacent scenes were matched using overlapping areas of images. When the entire mosaic was completed, bands 1 (visible, 0.58-0.68 micrometers) and 2 (near-infrared, 0.725-1.10 micrometers) were averaged, and the entire data set was enhanced using a 21 x 21 pixel spatial filter. The results were then contrast stretched. The stretch was designed to expand the mid-tone range of brightness values, where 90 percent of the data were located. Stretching the mid-tones helps to discriminate surface features and optimizes the data for lithographic printing.

Most geographic place-names used on the map for local, regional, and topographic features have been approved by the U.S. Board on Geographic Names. Names in common usage that have not been officially approved by the Board are indicated by an asterisk. Topographic contours were obtained from the Scientific Committee on Antarctic Research (SCAR) Antarctic Digital Database and modified where necessary to fit the image base. Two insets cover areas of significant scientific interest. The Antarctica Peninsula inset uses a NOAA AVHRR image base enlarged to a scale of 1:5,000,000. The McMurdo Sound area inset uses a Landsat multispectral scanner (MSS) image base at a scale of 1:1,000,000.

The successful completion of this edition of the AVHRR image map is due to the assistance of many individuals. L.G. Utz and L.G. Matheson of the USGS helped with digital plotting. T.A. Scambos of NOAA's National Snow and Ice Data Center and W.G. Gould and R.J. Denyoke of Satellite Systems Applications, Inc. assisted in the search for replacement AVHRR data. P. Skvarca, Instituto Antártico Argentino, and J.W. Thomson, British Antarctic Survey, supplied information on coastal change in the Larsen Ice Shelf area. N.W. Young, Australian Antarctic Division, provided elevation data in the Lambert Glacier basin. In addition, many Antarctic researchers provided formal and informal reviews.

SCALE 1:5 000 000
Polar stereographic projection, standard parallel 71° South
100 0 100 200 300 400 500 MILES
100 0 100 200 300 400 500 600 700 KILOMETERS

EXPLANATION OF MAP SYMBOLS

- 100 — Topographic contours on the ice surface–Dashed where interpolated. Modified from the Antarctic Digital Database (United Kingdom). Datum is mean sea level. Contour interval: 500 m from 0 to 2000 m; 100 m above 2000 m. Some contours omitted in areas of steep slopes.
- *DAY — Spot elevations, in meters above mean sea level
- Stations listed as of 1995
- Permanent
- Summer
- Historic
- Selected major changes in ice shelf and (or) coastal margin since image data were acquired
- Location of clouds obscuring imagery. Not all clouds are shown.

Antarctic Treaty

The land and its fast (attached) ice south of 60° south latitude are governed by the provisions of the Antarctic Treaty, which reserves the region for peaceful purposes and imposes conservation and waste management measures. Some special areas may not be entered without a permit, issued only for compelling scientific purposes. All the treaty's member countries, regardless of whether they participate in it at the end of 1995, administer activities of their citizens in Antarctica. Persons intending to enter Antarctica should be familiar with Antarctic Treaty provisions. The United States implements the treaty and its conservation measures through Public Law 95-541, the Antarctic Conservation Act. For information, or to apply for a permit, contact Permit Officer, Office of Polar Programs, National Science Foundation, Arlington, Virginia 22230.

Any use of trade, product or firm names in this publication is for descriptive purposes only and does not imply endorsement by the U.S. Government.

IMAGE COVERAGE DIAGRAM

IMAGE IDENTIFICATION

Mosaic area	NOAA satellite	Acquisition Date	Acquisition Time (GMT)	Mosaic area	NOAA satellite	Acquisition Date	Acquisition Time (GMT)	Mosaic area	NOAA satellite	Acquisition Date	Acquisition Time (GMT)
1	10	28 Dec 1987	0901	14	9	28 Jan 1987	1343	27	6	17 Jan 1991	2052
2	10	24 Jan 1987	0946	15	9	13 Feb 1990	0243	28	12	05 Jan 1993	1601
3	10	26 Jan 1994	1501	16	9	31 Jan 1993	0022	29	7	12 Feb 1993	0439
4	6	11 Aug 1990	0023	17	12	15 Jan 1994	0043	30	6	12 Nov 1990	1339
5	6	26 Jan 1990	1039	18	12	13 Jan 1994	0126	31	12	08 Dec 1993	1009
6	6	25 Jan 1990	1218	19	9	11 Dec 1990	1043	32	6	04 Nov 1990	1411
7	9	29 Nov 1990	2209	20	9	11 Dec 1990	1043	33	6	04 Nov 1990	1411
8	10	27 Dec 1987	1104	21	7	16 Feb 1993	1039	34	12	08 Jan 1994	1001
9	7	27 Nov 1985	0256	22	7	14 Jan 1986	2256	35	12	08 Jan 1994	0959
10	7	27 Nov 1985	0256	23	7	14 Jan 1986	2256	36	11	13 Jan 1994	0133
11	7	06 Feb 1983	1747	24	7	29 Nov 1983	0750	37	6	13 Jan 1990	0953
12	7	29 Jan 1983	1602	25	11	01 Dec 1992	1010	38	9	04 Feb 1987	2351
13	9	12 Apr 1986	1524	26	6	12 Jan 1990	1036				

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