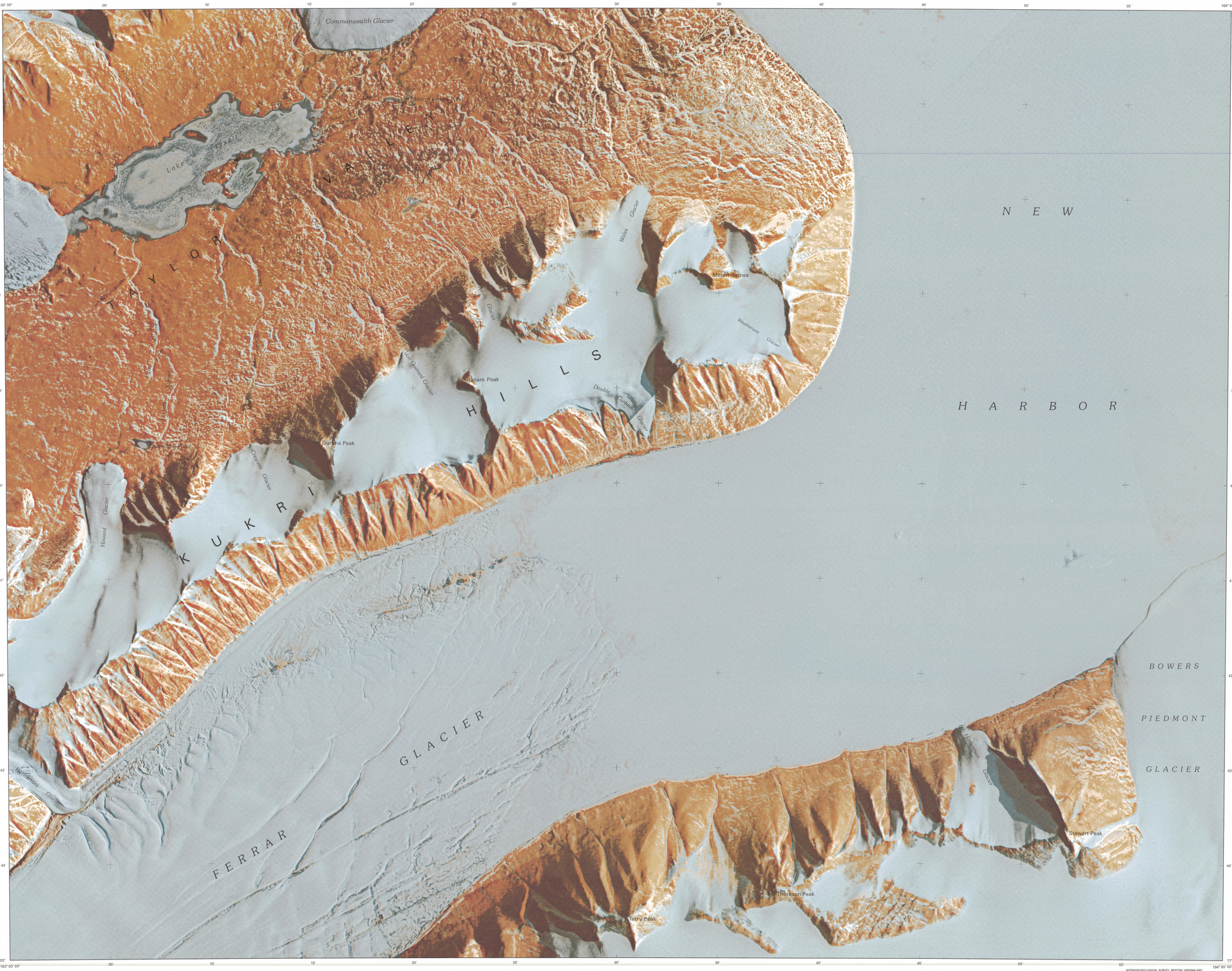
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

LAKE FRYXELL

ANTARCTICA
SATELLITE IMAGE MAP



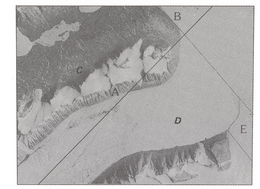
DATA EXPLANATION

The satellite images were recorded by the Landsat thematic mapper in the multispectral mode and are composed of spectral bands 2 (525-605 nanometers, green-yellow), 4 (775-900 nanometers, near-infrared) and 7 (2090-2350 nanometers, middle-infrared) and by SPOT high-resolution visible recorded in the panchromatic mode.

The imagery was controlled using geodetic control points identified on aerial photographs held in the U.S. Antarctic Resource Center and supplemented by the field collection of coordinates for clearly identifiable topographic or geologic features. Satellite platform modeling was used during the geocorrections of the satellites data to ensure uniform error distribution through the scenes. The Landsat thematic mapper imagery was resampled in 15-meter cells, and the scenes were mosaicked, tone matched, and filtered using a 21x21 adaptive filter to which 85 percent of the unfiltered data were added back. The SPOT panchromatic imagery was resampled in 5-meter cells, the geocorrected SPOT scenes were tone balanced, mosaicked, and filtered using a 55x55 adaptive filter to which 50 percent of the unfiltered data were added back. The geocorrected Landsat thematic mapper data were then registered to the geocorrected SPOT panchromatic data for each map quadrangle separately, both data sets were merged using the Chavez filter method, and the resulting image was tone enhanced.

Merged bands 7, 4, and 2 are shown in red, green, and blue on the map. The two merged satellites data sets were acquired at two different times and dates, and the sun had two different azimuths and (or) elevations, often creating two different shadows for the same relief.

SATELLITE IMAGE INDEX



A LANDSAT TM
Path 57 / Row 116
of 06 Jan. 1993
Sun elevation: 23 °
Sun azimuth: 88 °
R.m.s.e.: 28 meters

B LANDSAT TM
Path 56 / Row 115
of 04 Jan. 1986
Sun elevation: 25 °
Sun azimuth: 80 °
R.m.s.e.: 24 meters

C ***SPOT HRV P***
K 39 / J 558
of 10 Nov. 1987
Sun elevation: 20 °
Sun azimuth: 66 °
Root mean square error: 6 meters

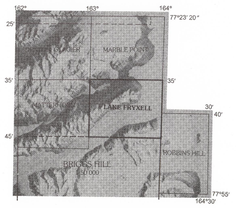
D ***SPOT HRV P***
K 40 / J 558
of 10 Dec. 1989
Sun elevation: 22°
Sun azimuth: 88 °
Root mean square error: 9.7 meters

E LANDSAT TM
Path 55 / Row 116
of 29 Jan. 1989
Sun elevation: 18 °
Sun azimuth: 89 °
R.m.s.e.: 20 meters

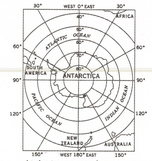
OBLIQUE PHOTOGRAPH

Left oblique photograph, 21 December 1971
(U.S. Antarctic Resource Center)

IMAGE MAP INDEX



LOCATION DIAGRAM



At the image map location, this diagram and the image map are oriented in opposite directions.

SPOT Panchromatic component © CNES 1987.

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Fred Alberts, advisor, Advisory Committee on Antarctic Names, US Board on Geographic Names.

SCALE 1: 25 000

1 0 1 MILES
1 .5 0 1 2 KILOMETERS

FOR SALE BY THE U.S. GEOLOGICAL SURVEY P.O. BOX 25286, DENVER, COLORADO, 80225

Lambert conformal conic projection
Standard parallels 76°40'S and 79°20'S
International Terrestrial Reference Frame 1996

Technical information related to this image map and access to the digital data can be obtained from the Antarctica Resource Center, Mail Stop 515, U.S. Geological Survey National Center, Reston, VA 20192 or www.usarc.usgs.gov.

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USGS Antarctic Program

LAKE FRYXELL, ANTARCTICA
SATELLITE IMAGE MAP