

LEWIS AND GREGORY GLACIERS, 1:2,500, KENYA

(Aerial photogrammetric maps)

S. Hastenrath, Department of Meteorology
University of Wisconsin/Madison

The construction and evaluation of this map is fully documented in Hastenrath and Rostom (1990), while a brief summary must suffice here.

Surveys were flown by the Kenya Air Force on 13 February 1978 at a flight level of 18,400 feet, by Geosurveys. Ltd., Nairobi, on March 1986 at approximately 22,00 feet, and by Photomap International (Kenya), Nairobi, on 1 March 1990, likewise at 22,000 feet. Stereoplotting was performed at the University of Nairobi by the same photogrammetrist, on the Thompson-Watts First Order Plotter for the Lewis in 1978, and the Wild A8 First Order Plotter for the Gregory in 1978, and the Lewis-Gregory glaciers in 1986 and 1990. The 1990 map was compiled from two frames.

The mappings of the Lewis Glacier for 1974, 1978, 1982 and 1986 (Caukwell and Hastenrath 1977, 1983; Hastenrath and Caukwell 1979, 1987) had been based on a network of ground control points established by the IGY Mount Kenya Expedition (Charnley 1959). Although these aerial photographs also covered the Gregory Glacier, it could not be mapped at that time for lack of a suitable ground control point below the glacier. However, a mark established previously just below the Gregory Glacier for the purposes of tape measurements of terminus variations was surveyed on 30 December 1986 (Hastenrath et al. 1989a). This was used for the present 1990 mapping of the Lewis-Gregory glaciers. Moreover, using this additional Gregory control point, it proved possible to map the topography and extent of the Gregory Glacier from the 1978 and the 1986 photographs, but not from the 1974 and 1982 flights. On 1 March 1990, the Lewis and Gregory Glaciers were covered by fresh snow, which obliterated many of the smaller crevasses, although the overall photo quality was adequate for mapping purposes.

Over the 1978-86 and 1986-90 intervals the Lewis and Gregory Glaciers

experienced changes in length ΔL (m), thickness Δh (m), and volume ΔV (10^3 m^3), as indicated below:

	1978/86	1986/90
LEWIS		
ΔL	- 32.0	- 48.0
Δh	- 8.2	- 3.1
ΔV	-2260.0	- 770.0
GREGORY		
ΔL	- 25.0	- 25.0
Δh	- 10.1	- 5.3
ΔV	- 811.0	- 367.0

* * *