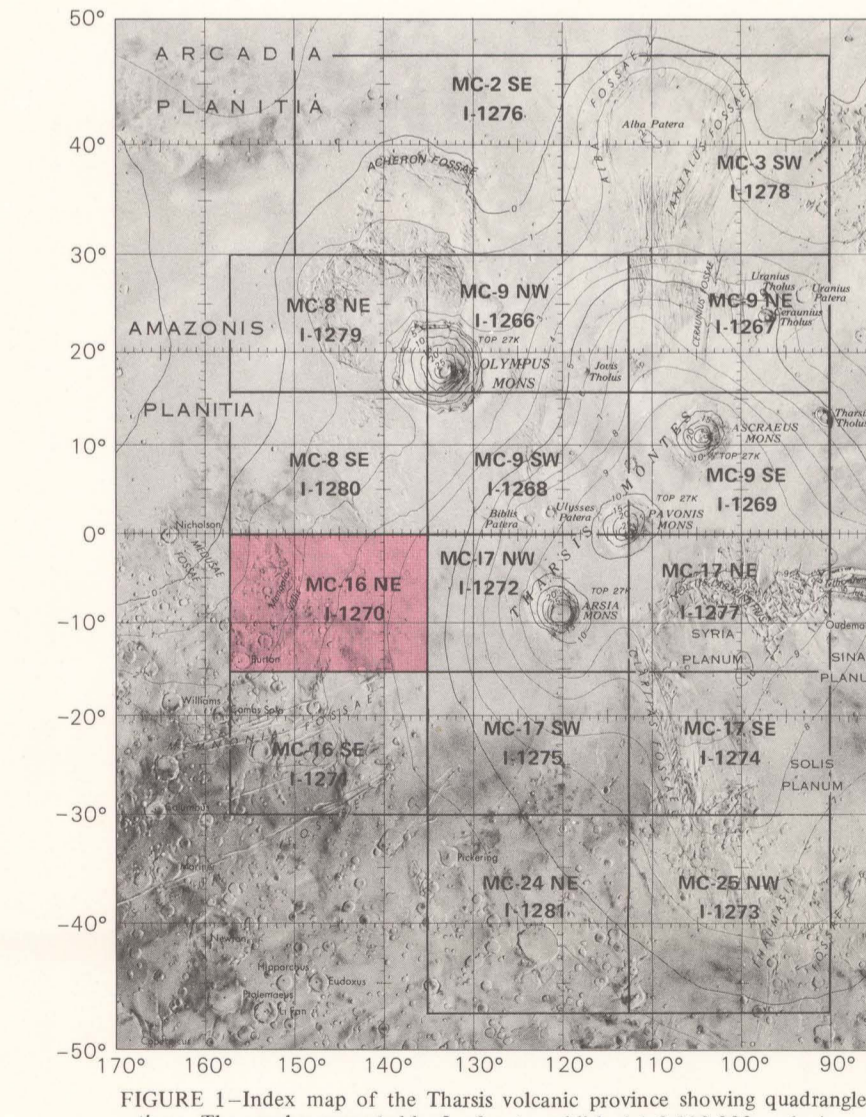
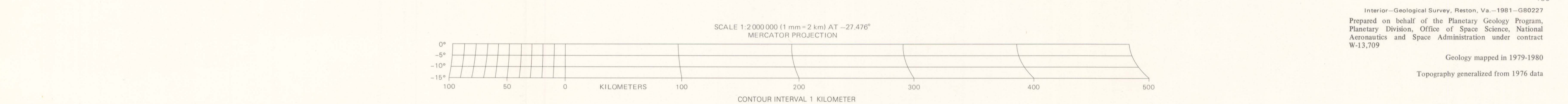


- DESCRIPTION OF MAP UNITS
Crater populations on individual map units are indicated by the letter N, which refers to the number of craters counted larger than 1.0 km in diameter, normalized to an area of 1 million km².
- VOLCANIC FLOWS
OLYMPUS PLAINS FLOWS - Occur around basalt scarp of Olympus Mons. Surfaces relatively smooth with many lobate scarps; crater density very low (N=50). Overlap all adjacent units including flows from Olympus Mons units (Aom1, Aom2).
- SLIDE CHANNEL AND FLOOD-PLAIN MATERIALS
SLIDE CHANNEL UNDIVIDED - Occurs on northeast slopes of Arisa Mons, Arisa Mons, Pavonis Mons, and within Noctis Labyrinthus. Forms large thin lobes having many concentric ridges and fault scarps. Lava flows clearly visible from the scarp at some places but partly cover side material elsewhere.
- PLAINS AND EOLIAN DEPOSITS
SMOOTH PLAINS MATERIAL - Occurs chiefly in low areas and forms light, relatively flat surfaces. In places textural characteristics of substrate visible on high-resolution images.
- TECTONIC EPISODES
Minor faulting, crest of Tharsis Montes
Formation of basal scarp of Olympus Mons
Minor faulting, Arisa Mons
Moderate faulting, Ceramius Fosse and Alba Patera
Major faulting declines
Intense faulting in aureole deposits of Olympus Mons
Major faulting, Alba Patera and Syria Planum
Major regional faulting



INTRODUCTION
The systematic mapping of lava flow units in the Tharsis region has been compiled into a series of 16 maps at 1:2,000,000 scale. This provides information on the sources and axial extent of the lava flows, on their eruptive sequences and relative ages, and on relations between the flows and geologic structure in the largest, most active tectonic and volcanic province on Mars.

Geologic Summary
Marsian lava flows are similar in morphology to those on Earth and the Moon. They commonly exhibit overlapping, lobate, and crumpled margins and occur chiefly as short flows or as channel- and lobate flows (Carr and others, 1977). Sheet flows are more common on the plains and on the lower, more gentle slopes of volcanoes. Their surfaces appear flat and smooth at moderate resolution, but at high resolution they exhibit characteristic patterns of ridges and troughs. Channels and table flows are more prevalent on the steeper slopes around volcanoes such as Olympus Mons and Arisa Mons, but also occur on relatively low-relief surfaces at Alba Patera and Ceramius Fosse.

Basement and Nonvolcanic Units
Basement rocks (unit HNht) are undivided. They consist of both rough and smooth, highly fractured terrain hills and cratered material and craters and plains materials that form a large part of the ancient martian highlands (Scott and Carr, 1978). They occur mostly as relatively large blocks embayed and partly buried by younger flows. Around the periphery of Olympus Mons, however, these older rocks may be exposed in the basal scarp and at uplifted blocks projecting above the lava flows in places. Some of this material may also represent segments of overlapping aureoles that formerly covered the present site of this volcano and Olympus Mons flows that produce the basal tectonism.

TECTONIC, as expressed by fractures and faults, culminated before the bulk of the lava flows in the Tharsis region were extruded. It did not cease altogether, however, but continued with diminishing intensity into the period of the youngest flows (Scott and Tanaka, 1980). Early episodes of major faulting were responsible for the highly disrupted surfaces at Claritas, Achernon, Ceramius, and Memnonia Fosse. Faulting continued in these areas at lower scales and also at Alba Patera, on the Olympus plains, and on the flanks of Arisa Mons. The density of faults associated with individual flow units, like crater density, reflects their relative ages. A summary of tectonic episodes as they relate to major volcanic events is shown in the Correlation of Map Units.

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FIGURE 1 - Index map of the Tharsis volcanic province showing quadrangle locations. The number preceded by the letter V refers to published 1:2,000,000 geologic maps.

MAP SHOWING LAVA FLOWS IN THE NORTHEAST PART OF THE MEMNONIA QUADRANGLE OF MARS

By
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1981