
Geologic mapping of the southern and central portions of Mangala Valles has been carried out as part of the Mars Geologic Mapping program. Three adjacent geologic maps have been prepared at a scale of 1:500,000 by researchers at NASM and at Arizona State University (1,2); the work presented here concerns the northernmost of the three maps (MTM sheet -10147). Physiography around the central reaches of Mangala Valles is dominated by exposures of ancient Noachian material severely disrupted by lobate scarps (Fig. 1). The scarps are interpreted to be faults within the oldest materials, similar to what is observed around southern Mangala Valles (1,2). The scarps in MTM -10147 lack the km-scale vertical relief of some scarps to the south (3,4) but they are still major topographic features. The orientation of the scarps in MTM -10147 changes from a north-south trend prominent to the south (1,2) to a northeast-southwest trend (Figs. 1,2). Both trends are likely due to an ancient impact basin in Daedalia Planum (5). Amazonian-Hesperian Mangala Valles materials embay the western margin of the Noachian materials (Fig. 2). Hesperian intercrater plains north of the Mangala Valles materials are scoured by overland flow likely associated with Mangala Valles flood events. Amazonain-Hesperian Tharsis plains embay the Noachian materials on the east (Fig. 2).


Fig. 1. Scarps in MTM -10147. a) Viking frame 639A10; box shows location of part b. b) Viking frame 454801.
Fig. 2. Simplified geologic map of MTM-10147. Scarps are prominent in the Noachian and Hesperian materials, in places deflecting the flow of younger Amazonian-Hesperian materials from Mangala Valles and Tharsis. [Supported by NASA grant NAGW-1390]