THE GEOLOGY OF THE MAJA VALLES REGION, MARS (MTM 20052). J. W. Rice Jr., Department of Geosciences, Northeast Louisiana University, Monroe, LA 71209.

The geologic map of MTM 20052 (figure 1) in the Maja Valles region is one in a series of maps initiated to investigate areas of Mars that are of major scientific interest. This map includes the mouth of the Maja Valles outflow system and the adjacent area of Chryse Planitia. The Maja Valles Outflow Complex is superposed on the boundary between cratered plateau material of Xanthe Terra to the west, and the relatively uncratered Chryse Planitia ridged plains to the east (1). The outflow system extends 1,600 km northward from Juventae Chasma, a box canyon region with chaotic terrain. MTM 20052 encompasses three major outflow channels. These channels cut eastward across the cratered plateau material of Xanthe Terra and drain into the Chryse Basin (2,3). These channels are from north to south: Vedra Valles, Maumee Valles, and Maja Valles. Xanthe Terra is a region of Hesperian subdued plateau material (Hpls) underlain by heavily cratered Noachian plateau material (Nplc) and Noachian basement (Nb) material. These units comprise some of the oldest mappable material on the planet (4).

The most interesting features in this region are the fan/delta deposits (Hf) at the mouths of the channels. These features are of low to moderate relief and are best observed in the 1:2M scale map sheet (MC-10 NE), which employs moderate resolution and low sun angle. The largest of the fan-shaped deposits is located at the mouth of Maja Vallis, a region thought to have been a lake in the past (3).

The major portion of the map is comprised of Hesperian ridged plains forming (Hr) and smooth plains forming (Hps) materials. The area of the wrinkle ridge forming material contains a multitude of streamlined islands (Hchp) in the wake of the major outflow across the Chryse basin. The large wrinkle ridge systems appear to have impounded the fluid flow, acting as temporary natural land dams. It is possible that large standing bodies of water (lakes) existed behind these large wrinkle ridges (2,3). These wrinkle ridges were eventually breached and dissected as the flow drained to the east in the direction of the Viking 1 lander some 450 km away.

The Maja Valles region is also of interest because it would serve as an excellent landing site for a future rover/sample return mission. One possible landing site is located at 18.9 North, 53.2 West. This site would provide direct access to streamlined islands, wrinkle ridges, fan/delta deposits, ancient basement material, and possible lake deposits. A mission to Maja Valles would help in the understanding of outflow dynamics and channel stratigraphy while at the same time providing in situ samples of Noachian basement material.

© Lunar and Planetary Institute • Provided by the NASA Astrophysics Data System

REFERENCES
1. De Hon, R. A., (1987) Lunar Planet. Sci. XVIII, 227-228.
2. Theilig, E. and R. Greeley, (1979) JGR 84, 7994-8010.
3. Baker, V. R. and R. C. Kochel, (1979) JGR 84, 8183-8204.
4. Scott, D. H. and K. L. Tanaka, (1986) U.S.G.S. Misc. Inves. Map I-1802-A.

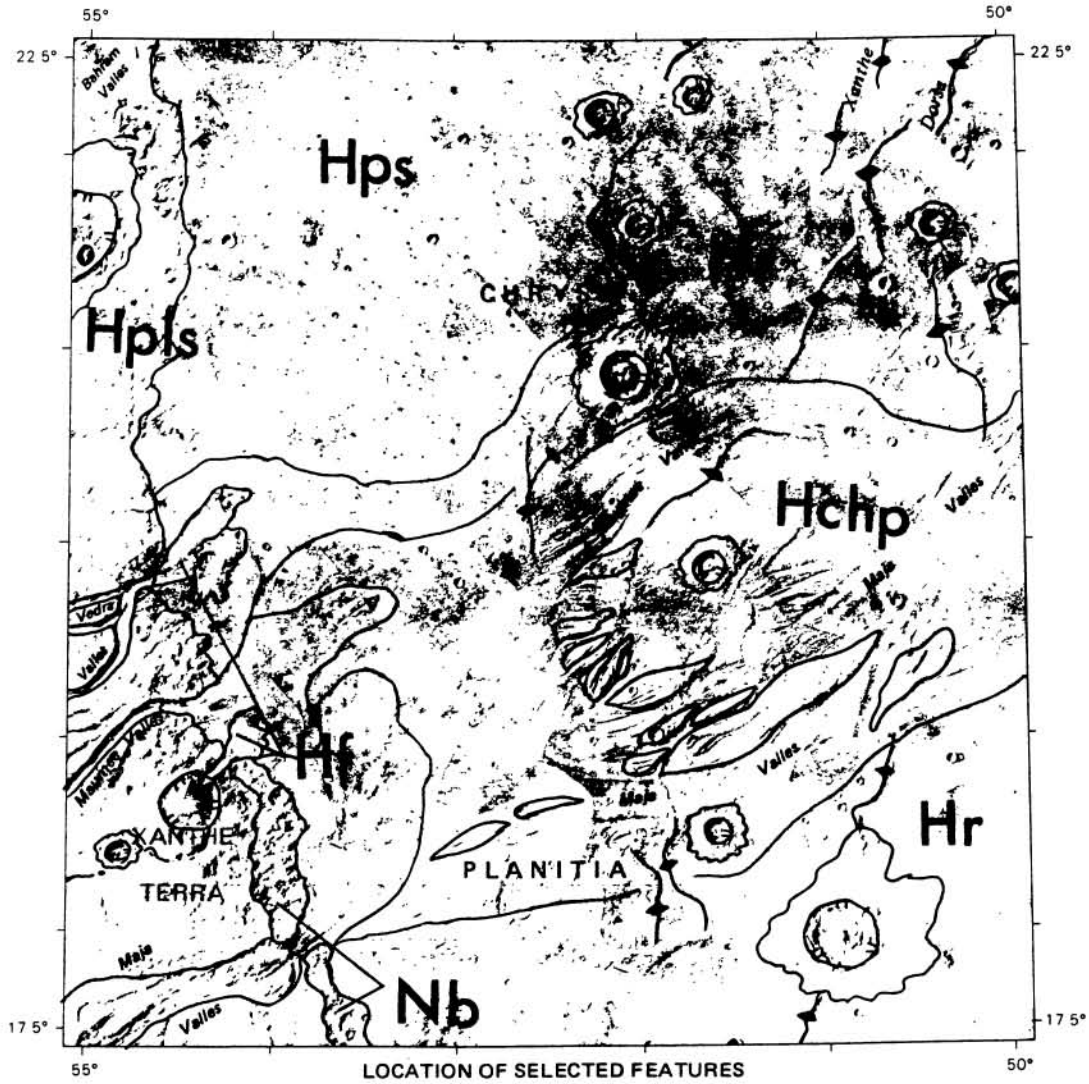

Figure 1. (Simplified version of Maja Valles)

© Lunar and Planetary Institute • Provided by the NASA Astrophysics Data System