1:1 MILLION-SCALE GEOLOGIC MAPS OF MARS' THARSIS MONTES. D.H. Scott[1], J.R. Zimbelman[2], and J. M. Dohm[1]; [1]U.S. Geological Survey, 2255 N. Gemini Dr., Flagstaff, AZ 86001; [2]CEPS/NASM, Smithsonian Institution, Washington, D.C. 20560.

Geologic maps of selected areas on Mars are being compiled at 1:500,000 scale by investigators in NASA's Mars Geologic Mapping Program. As originally planned, these maps were to be published at full scale as U.S. Geological Survey Miscellaneous Investigations Series I-Maps. Although there is an advantage in mapping the geology on large-scale bases, many of the maps could be published at half scale (1:1,000,000) without sacrificing geologic detail; moreover, although several map sheets may be required to cover a particular area at 1:500,000 scale, the same area can often be shown on one sheet at 1:1,000,000 scale (e.g. Fig. 1). The reduced-scale version is more readily displayed, and the geologic relations can be better appreciated when viewed on one map rather than on several larger scale maps. We have just completed the geologic mapping of six contiguous quadrangles of Mars' Arsia Mons region at 1:500,000 scale. We then reduced the scale of these maps to 1:1,000,000 and combined them on one sheet. As a result, relations between geologic features can be more easily compared, such as in the enigmatic fan-shaped deposits on Arsia's western flank and lava flows of the Tharsis Montes Formation elsewhere in the map area. Another important result is the savings in time and production cost. A similar approach will be used for publishing the geologic maps of the other Tharsis volcanoes, Pavonis and Ascraeus Montes.

The three shield volcanoes of the Tharsis Montes have interested planetary scientists since their discovery during the Mariner 9 mission [1-7]. These volcanoes have been shown as a single geologic unit on most maps of the region, regardless of the scale [2,8-10]. Olympus Mons and its aureole deposits also have received considerable attention by many investigators [e.g. 11-21], and the volcano has been generally thought to be a larger version of its smaller Tharsis neighbors to the southeast. However, our detailed mapping (in progress) of Arsia and Pavonis, along with previous investigations of Ascraeus [22] and Pavonis [23], has revealed striking differences as well as similarities among the four large shield volcanoes.

Fourteen individual Mars Transverse Mercator (MTM) quadrangles cover the three Tharsis volcanoes and their fan-shaped deposits (Fig. 1). Scott has concentrated on the fan-shaped deposits while Zimbelman has focused on the volcanic constructs. During the Arsia mapping, Scott recommended that the six individual MTM quadrangles be reduced to make a single map. This plan has proven to be both time and cost efficient. Future mappers should consider combining adjacent maps when, as here, such a combination does not compromise the science results.

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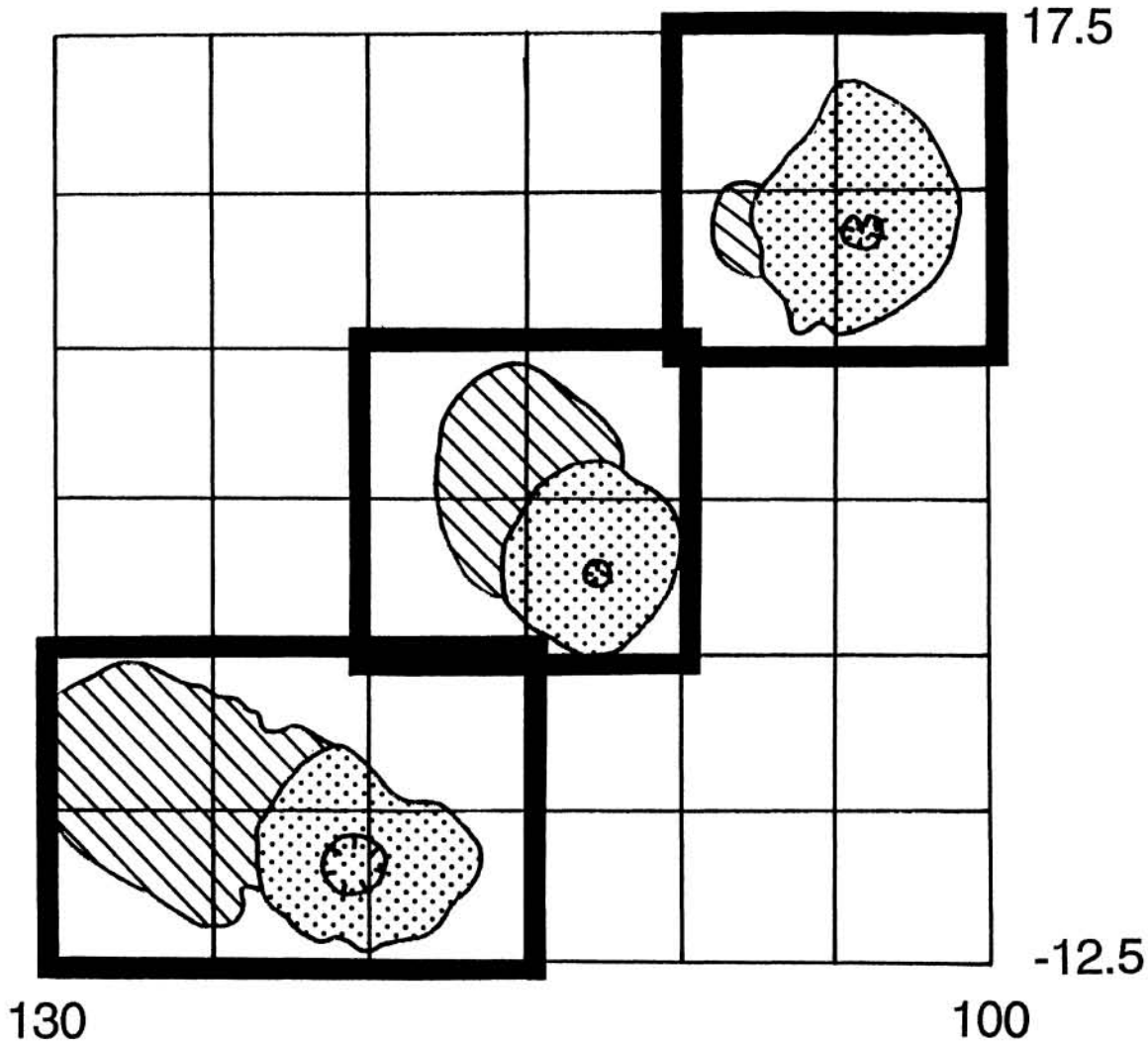

Figure 1. Sketch map of the Tharsis Montes region showing major volcanoes, boundaries of individual MTM 5° quadrangles (thin lines), and boundaries of areas covered by the three composite maps (heavy lines). Volcanoes shown by dot pattern; associated fan-shaped deposits by line pattern.