

GEOLOGIC MAPPING OF V-19. P. Martin¹, E.R. Stofan^{2, 3} and J.E. Guest³, ¹Durham University, Dept. of Earth Sciences, Science Laboratories, South Road, Durham, DH1 3LE, UK, (paula.martin@durham.ac.uk), ²Proxemy Research, 20528 Farcroft Lane, Laytonsville, MD 20882 USA (ellen@proxemy.com), ³Department of Earth Sciences, University College London, Gower Street, London, WC1E 6BT, UK.

Introduction:

A geologic map of the Sedna Planitia (V-19) quadrangle is being completed at the 1:5,000,000 scale as part of the NASA Planetary Geologic Mapping Program, and will be submitted for review by September 2009.

Overview:

The Sedna Planitia Quadrangle (V-19) extends from 25°N - 50°N latitude, 330° - 0° longitude. The quadrangle contains the northernmost portion of western Eistla Regio and the Sedna Planitia lowlands.

Seven plains materials units have been mapped in V-19: Sedna deformed plains material (unit pdS), Sedna patchy plains material (unit ppS), Sedna composite-flow plains material (unit pcS), Sedna homogeneous plains material (unit phS), Sedna uniform plains material (unit puS), Sedna mottled plains material (unit pmS) and Sedna lobate plains material (unit plS). These seven units range from relatively localized, limited extent units (e.g. unit pdS) to more regional plains units (e.g. unit phS). Similarly to other mapped quadrangles on Venus [1, 2], the quadrangle has a single regional-scale plains unit (unit phS), which dominates the northeastern half of the map; the southwestern half of the map is dominated by the composite plains material (unit pcS). Each of the plains units are composed of many smaller plains units of varying age, which we group together to form a mappable unit. These smaller plains units have been grouped owing to their similarity in appearance and stratigraphic position relative to other plains units. The remaining plains units, units pdS, ppS, puS, pmS and plS, tend to crop out as isolated patches of materials.

Within this quadrangle, sixteen units associated with volcanoes have been mapped, with multiple units mapped at Sif Mons, Sachs Patera and Neago Fluctūs. An oddly textured, radar-bright flow is also mapped in the Sedna plains, which appears to have originated from a several hundred kilometer long fissure. The six coronae within V-19 have a total of eighteen associated flow units. Several edifice fields are also mapped, in which the small volcanic edifices both pre-date and postdate the other units. In addition, impact crater materials and tessera materials are mapped.

Multiple episodes of plains formation and wrinkle ridge formation dominate the geologic history of the V-19 quadrangle, interspersed in time and space with edifice- and corona-related volcanism. The formation of Eistla Regio postdates most plains units, causing them to be deformed by wrinkle ridges and overlaid by corona and volcano flow units.

Conclusions:

V-19 is comparable with two of our previously mapped quadrangles, V-39 and V-46, in terms of the number of plains units [3, 4]. More plains materials units have been mapped in our other two previously mapped quadrangles, V-28 and V-53, than in V-19, V-39 and V-46 [5, 6]. However, V-19 is also comparable with V-28 and V-53, in that the formation of small volcanic edifices in these three quadrangles is not confined to any specific time period. In addition, all three quadrangles (V-19, V-28 and V-53) have very horizontal stratigraphic columns, as limited contact between units prevents clear age de-

terminations. While this results in the appearance that all units formed at the same time, the use of hachured columns for each unit illustrates the limited nature of our stratigraphic knowledge in these quadrangles, allowing for numerous possible geologic histories. The scale of resurfacing in these quadrangles is on the scale of 100s of kilometers, consistent with the fact that they lie in the most volcanic region of Venus.

References:

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- [4] Stofan, E. R. and Guest, J. E., 2003, Geologic Map of the Aino Planitia Quadrangle (V-46), Venus.
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- [6] Stofan, E. R. and Brian, A. W., 2009, Geologic Map of the Themis Regio Quadrangle (V-53), Venus.