GEOLOGIC MAPPING OF V-19, V-28 AND V-53. E. R. Stofan[1,2], P. Martin[3] and J. E. Guest[2], [1]Proxemy Research (20528 Farcroft Lane, Laytonsville, MD 20882, (ellen@proxemy.com), [2]Department of Geological Sciences, University College London, UK, [3]Department Earth Sciences, Durham University, Durham UK DH1 3LE.

Introduction: Geologic maps of Sedna Planitia (V-19), Hecate Chasma (V-28) and Themis Regio (V-53) quadrangles have been completed at the 1:5,000,000 scale as part of the NASA Planetary Geologic Mapping Program. V-53 has been reviewed once and will be resubmitted by fall, V-28 has undergone three reviews and will be resubmitted this summer, and V-19 will be submitted for review by August.

Quadrangle Overviews: V-19: 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, that range from relatively localized, limited extent units (unit pdS, densely fractured Sedna plains) to more regional plains units (unit phS, Sedna homogeneous plains). 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. Six coronae have a total of eighteen associated flow 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 overlain by corona and volcano flow units.

V-28: The Hecate Chasma Quadrangle (V-28) extends from 0°-25° N. latitude, 240°-270° longitude. It contains a portion of the Hecate Chasma rift system, which is over 2000 km long and extends across a lowland region (Hinemoa Planitia). In V-28, we have mapped plains units, corona flow units, moderate and large volcano flow units, edifice field units, and tessera. The intermediate to large volcanoes include Nazit, Wyrd and Polik-mana Montes and Paoro, Nipa and Pajan Yan Tholi. There are fourteen coronae in the quadrangle, the largest of which is the 525 km diameter Taranga Corona. There are eight impact craters in the V-28 quadrangle. The ten plains materials units in V-28 are not very extensive and many are not in contact, resulting in a very horizontal stratigraphic column as we are unable to determine many clear stratigraphic relationships. Of the fourteen coronae in the quadrangle, ten have associated flow deposits, with several having multiple units. As is the convention with volcano units, we map corona flow units by naming them after their source (i.e., unit fT-flows from Taranga Corona). Other mappers have chosen to lump corona flows into a generic unit, which does not allow for as detailed a stratigraphic history for a given region. The other four coronae either deform plains units or are embayed by plains, volcano or other corona units.

The geologic history of V-28 is one of interleaved episodes of plains-forming volcanism, corona formation, and formation of intermediate to large volcanic edifices. The rift system is relatively young, but appears to have formed in stages, generally concurrent with corona formation.

V-53: The Themis Regio Quadrangle (V-53) extends from 25°S - 50°S latitude, 270° - 300° longitude. The quadrangle contains the southernmost portion of Parga Chasmata, the Themis Regio highland and surrounding plains. The topographically lowest points in the quadrangle (about 2 km below MPR) are within the Parga Chasmata rift and in the troughs around several coronae.

Six plains units have been mapped in V-53. The plains farthest from Parga Chasmata are more regional-scale plains units, unlike the more patchy plains units of V-28. Twenty corona materials units are mapped, and as in V-28, are named after their source. Nine units associated with specific named volcanic edifices have been mapped. Many flow units in V-53 are not in contact, or in contact with consistent plains units, making an overall stratigraphy difficult to determine. There are 12 impact craters within the quadrangle.

The geologic history of V-53 is dominated by corona and rift formation, with some coronae predating rifting, and some postdating it. Most coronae are interpreted to have formed synchronously with rifting. No clear progression in volcanism from coronae and volcanoes is observed.

Conclusions: In V-28 and V-53, more plains materials units have been mapped than in our previously mapped quadrangles, V-46 and V-39. V-19 is more comparable to these latter maps in terms of numbers of plains units. In V-28, all of the plains materials units to the south of the rift have an unusually high concentration of volcanic edifices, which both predate and postdate the units. A similar situation is seen in V-53 and V-19, where small edifice formation is not confined to any specific time period.

In the two chasma-related quadrangles, coronae are located along the rift, as well as to the north and the south of the rifts. Coronae in both quadrangles exhibit all forms of corona topographic shapes, including depressions, rimmed depressions, plateaus and domes. Most of the coronae formed synchronously with the rifting, although some predate the rifts and others postdate extensional deformation.

A strong association between volcanism and coronae along rifts has been noted elsewhere on the planet [1]. In V-28 and V-53, some coronae along the rift do not have much associated volcanism; coronae with the most volcanism in these quadrangles are located at least 500 km off the rifts or on the Themis Regio highland. While extension clearly plays a role in the amount of volcanism associated with coronae, it is not the only contributing factor. Coronae at Themis Regio may have greater than average associated volcanism owing to the possible mantle plume beneath the rise [2].

All three quadrangles have very horizontal stratigraphic columns, as limited contact between units prevents clear age determinations. 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: [1] Magee, K.P. and J.W. Head, 1995. *J. Geophys. Res*. **100**, 1527-1552. [2] Stofan, E.R., S.E. Smrekar, D.L. Bindschadler, and D.A. Senske, 1995. *J. Geophys. Res*. 100: 23,317-23,327.