

GEOLOGIC MAPPING OF THE V-36 THETIS REGIO QUADRANGLE: 2008 PROGRESS REPORT. A. T. Basilevsky^{1,2} and J. W. Head², ¹Vernadsky Institute of Geochemistry and Analytical Chemistry, RAS, Moscow, Russia, atbas@geokhi.ru, ²Department of Geological Sciences, Brown University, Providence, RI 02912 USA.

Introduction: This work is a continuation to the photo-geologic mapping of the V-36 quadrangle, that is part of the USGS 1:5M planetary mapping project [1]. Here we report on progress in mapping of this quadrangle. Comparing with the last year results, when the western half of the quadrangle had been mapped, we have now also partly mapped the eastern half (Figures 1, 2, 3).

Mapping Results: As a result of mapping, eleven material stratigraphic units and three structural units have been identified and mapped. The material units include (from older to younger): tessera terrain material (tt), material of densely fractured plains (pdf), material of fractured and ridged plains (pfr), material of shield plains (psh), material of plains with wrinkle ridges (pwr), material of smooth plains of intermediate brightness (psi), material of radar-dark smooth plains (psd), material of lineated plains (pli) material of lobate plains (plo), material of craters having no radar-dark haloes (c1), and material of craters having clear dark haloes (c2).

The morphologies and probably the nature of the material units in the study area are generally similar to those observed in other regions of Venus [2]. The youngest units are lobate plains (plo) which here typically look less lobate than in other areas of the planet. Close to them in age are smooth plains which are indeed smooth and represented by two varieties mentioned above. Lineated plains (pli) are densely fractured in a geometrically regular way. Plains with wrinkle ridges, being morphologically similar to those observed in other regions, here occupy unusually small areas. Shield (psh) plains here are also not abundant. Locally they show wrinkle ridging. Fractured and ridged plains (pfr), which form in other regions, the so called ridge belts, are observed as isolated areas of clusters of ridged plains surrounded by other units. Densely fractured plains (pdf) are present in relatively small areas in association with coronae and corona-like features. Tessera terrain (tt) is dissected by structures oriented in two or more directions. Structures are so densely packed that the morphology (and thus nature) of the precursor terrain is not known.

Structural units include tessera transitional terrain (ttt), fracture belts (fb) and rifted terrain (rt). Tessera transitional terrain was first identified and mapped by [4] as areas of fractured and ridged plains (pfr) and densely fractured plains (pdf) deformed by transverse faults that made it formally resemble tessera terrain (tt). The obvious difference between units tt and ttt is the recognizable morphology of precursor terrain of unit ttt. Fracture belts are probably ancient rift zones [3]. Rifted terrain (rt), as in other regions of Venus, is so saturated with faults that according to the recommendation of [1, 5] it should be mapped as a structural unit.

Conclusions: Our mapping analysis and results show that although the mapped units are generally similar to those observed in other regions of the planet, some of them have unusual areal abundances that imply unique aspects of the geologic history of this region. In particular, the unusu-

ally high abundance of rifted terrain (rt) and tessera transitional terrain (ttt) have interesting implications and demand additional studies.

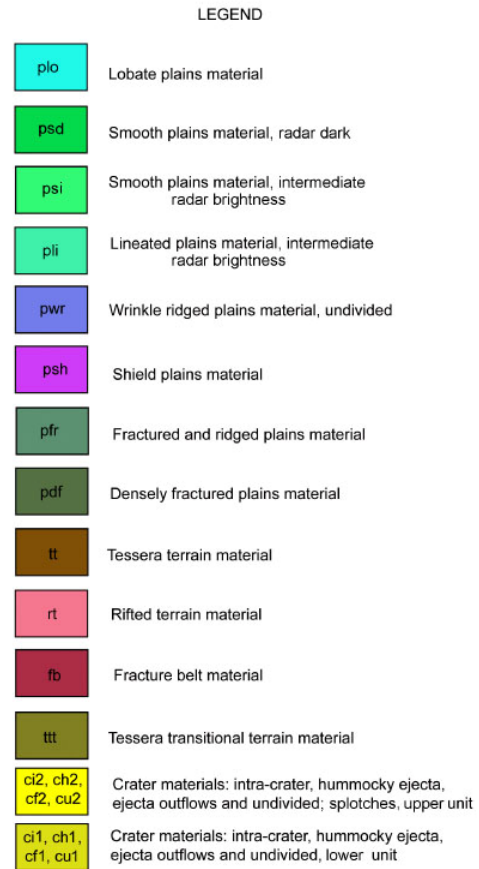


Figure 1. Legend for V-36 Thetis Regio.

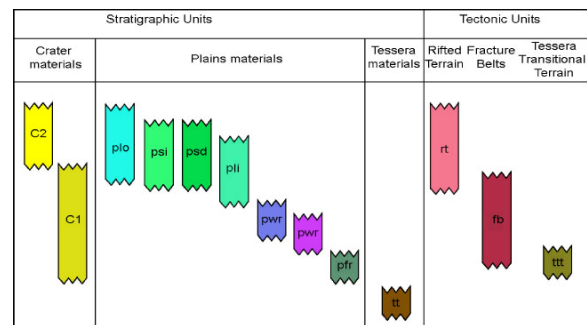


Figure 2. Correlation chart for V-36 Thetis Regio.

References: [1] Tanaka, K. L. (1994) USGS Open File Report 94-438. [2] Basilevsky, A. T. & Head, J. W. (2000) *Planet. Space Sci.*, 48, 75-111. [3] Banerdt et al. (1997) in *Venus II*, U. Arizona Press, 901-930. [4] Ivanov, M. A. & Head, J. W. (2001) *JGR*, 106, 17,515-17,556. [5] Wilhelm, D. (1990) in *Planetary Mapping*, NY, 208-260.

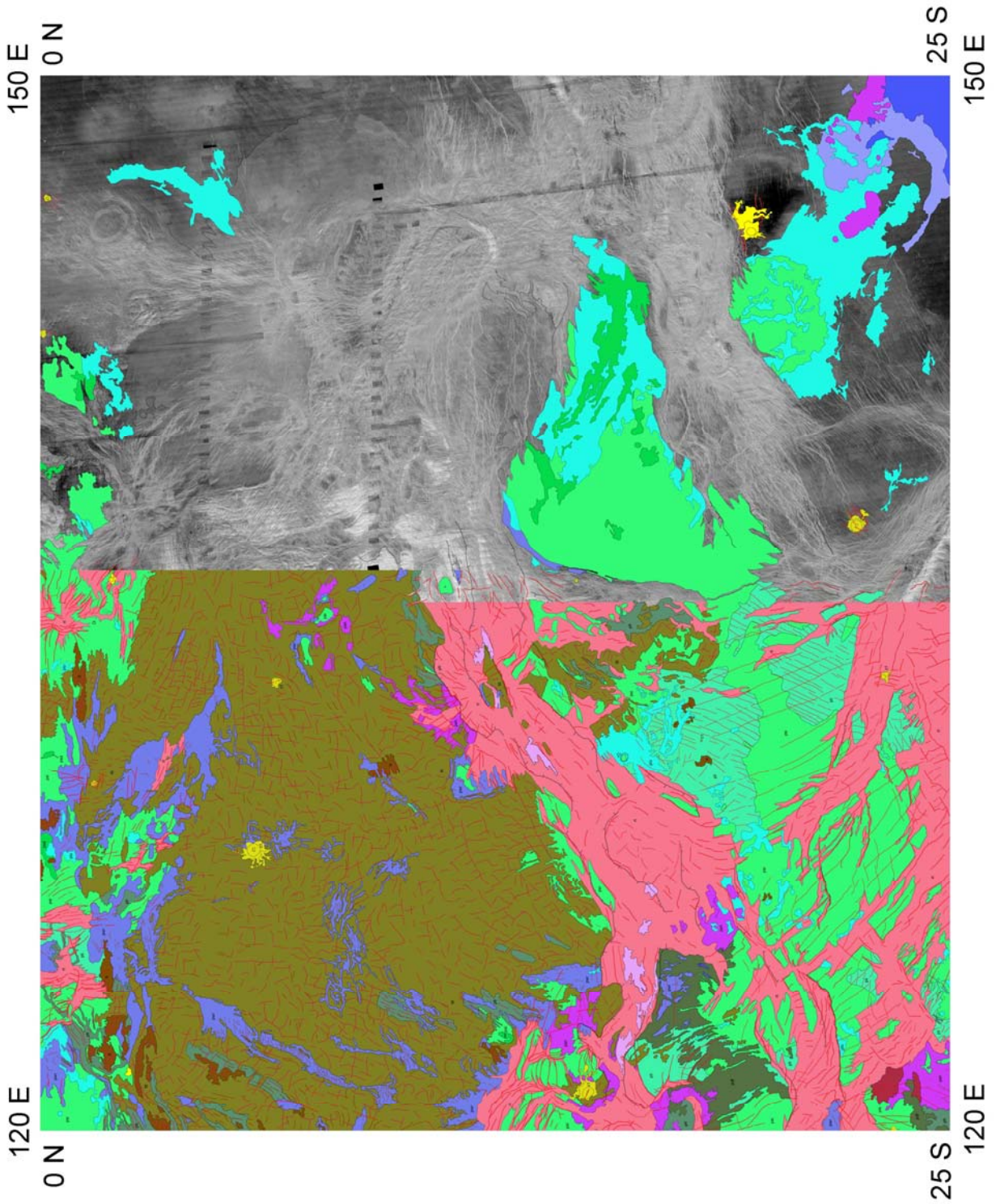


Figure 3. Geologic map of the V-36 Thetis Regio quadrangle. Status on May 29, 2008.