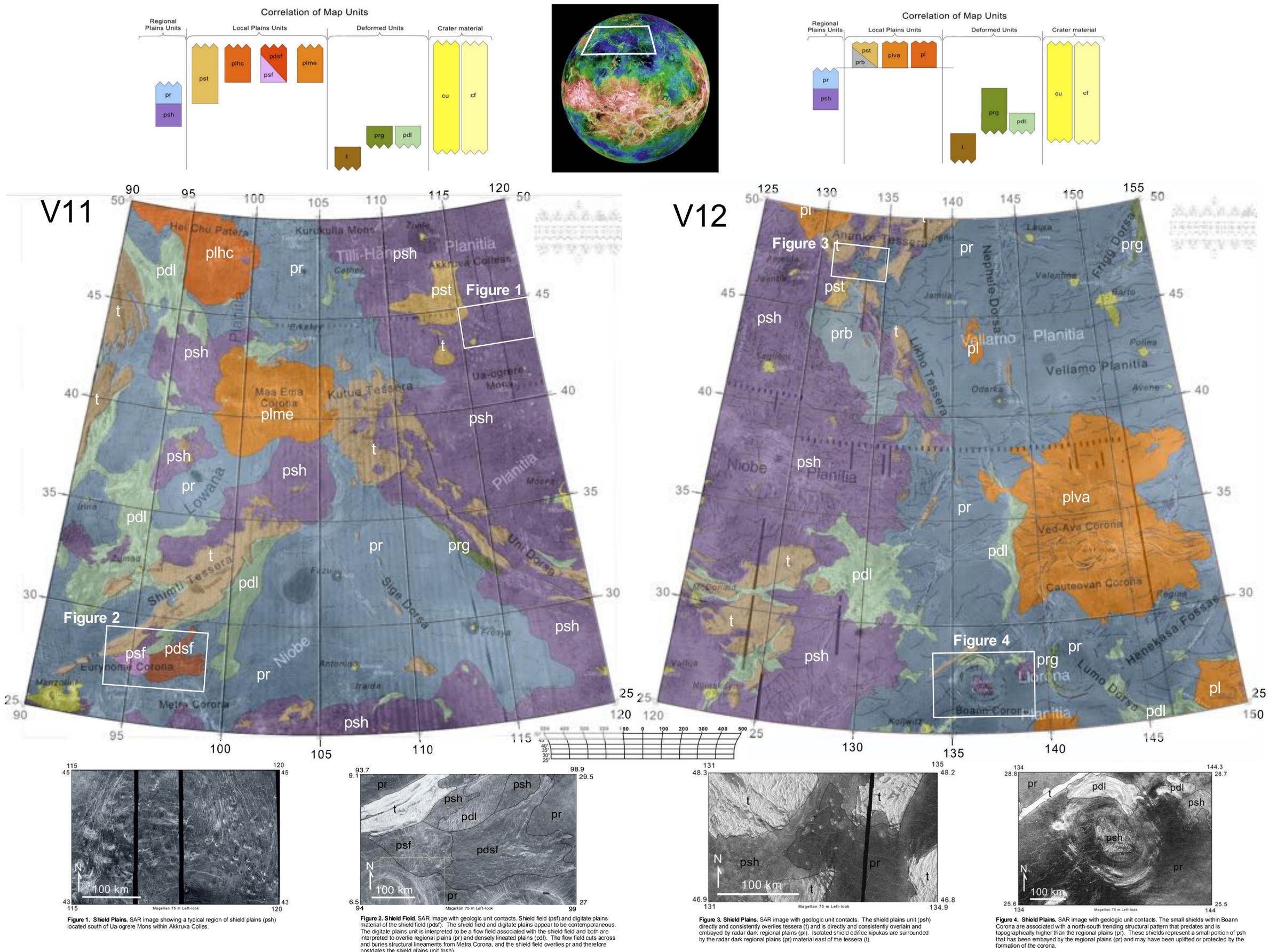


# GEOLOGIC MAPPING of V11-SHIMTI TESSERA AND V12-VELLAMO PLANITIA, VENUS

Abstract 2578

J. C. Aubele, New Mexico Museum of Natural History & Science  
1801 Mountain Rd. NW, Albuquerque, NM 87104; jayne.aubele@state.nm.us

LPSC 50, 2019



**References.** [1] Aubele (2019) USGS Geol Map, in review; Aubele (2006) Abstr. 37th LPSC; Aubele (1997) GSA Abstr. 29, no. 6, A-138; Aubele (1996) LPSC 27, 49; Aubele (1995) LPSC 26, 59; Aubele (1994) LPSC 25, 45; Aubele (1993) GSA Abstr. 25, A-221. [2] Kumar & Head (2013) USGS Geol Map; Lang & Hansen (2010) USGS Geol Map; Hansen (2009) USGS Geol Map; Lopez & Hansen (2008) USGS Geol Map; Ivanov & Head (2008, 2005, 2004, 2001) USGS Geol Maps; McGill (2004, 2000) USGS Geol Maps; Bridges & Mercer (2002) Abstr. 33rd LPSC. [3] Guest & Stofan (1999) Icarus, v. 139; Stofan et al (2004) 35th LPSC; [4] Hansen (2005) GSA Bull. 117, no. 5/6. [5] Basilevsky & Head (1998) JGR v. 103; Basilevsky & Head (2000) PI & Sp Sci v. 48; Basilevsky & Head (2002) Geol. v. 30; Ivanov & Head (2013) Plan & Sp Sci, v. 34. [6] Barsukov et al (1986) JGR v. 91; Basilevsky et al (1986) JGR v. 91; Aubele & Slyuta (1990) EMP v. 50/51; Garvin & Williams (1990) GRL v. 17; Guest et al (1992) JGR v. 97; Head et al (1992) JGR v. 97. [7] Aubele & Crumpler (1992) Abstr. LPI Contrib. #789; Aubele et al (1992) Abstr. 23rd LPSC. [8] Crumpler & Aubele (2000) in Encyclopedia of Volcanoes; Crumpler et al (1997) in Venus II; Addington (1999) Abstr. 30th LPSC; (2001) Icarus, v. 149; Ivanov and Head (2004) JGR v. 109. [9] Crumpler et al (1997) in Venus II. [10] Campbell (1999) GRL v. 104. [11] Basilevsky & Head (1996) GRL v. 23. [12] Ivanov & Head (2004) JGR v. 109. [13] Shervais et al (2002) in Idaho Geol. Surv. Bull. 30; Malde (1991) GSA Decade N. Am. Geol. v. K-2. [14] Ernst & Desnoyers (2004) Phys Earth & Plan Int v. 146. [15] Basilevsky & Head (2002) Geol v. 30; Ivanov and Head (2013) PI & Sp Sci v. 84; Hansen (2005) GSA Bull. 117, no. 5/6.

**Acknowledgements:** The initial mapping was funded by NASA. I thank Sarah Noble, Jim Skinner, and the U.S.G.S. Planetary Mapping Group.

## Summary

- Adjoining quadrangles Shimti Tessera (V-11) and Vellamo Planitia (V-12) were partially mapped in the mid-90s to early 2000s. Initial results included description and interpretation of a new terrain unit named shield plains, or Akkriva shield plains, consisting of widespread small shield volcanoes and associated lava flows [1].
- Following the initial study, many other mapped Venus quads also identified a shield plains or shield terrain unit [2]. Two end-member interpretations of areas of small shields have been debated over the years: (a) they represent a local or regional stratigraphic unit [3,4]; or (b) they represent a global stratigraphic unit [5]. Attempts to test the two hypotheses have focused on inconsistencies in stratigraphic relationships between the clusters of small volcanoes and the surrounding regional plains.
- Revised geologic maps of V-11 and V-12 have now been completed using GIS map standards and submitted to the planetary mapping program. The new maps provide better stratigraphic control on small shield volcanoes. Mapping has identified both younger shield fields and an extensive area of older shield plains.
- Globally, shield fields occur that are younger than or older than the regional plains [7,8,9]. They can be compared to terrestrial volcanic fields; melt areas of limited extent and low magma rates delivered to the surface and occurring locally throughout Venus geologic history. Shield plains are substantially different in number and density of shields and show consistent stratigraphic relationships. They may be more analogous to the Snake River Plains shield volcanoes [13] or terrestrial seamounts [14]; that is, volcanism associated with widespread melt sources and formed during a restricted and specific geologic time.
- Stratigraphic relationships in V-11 and V-12 are evidence for a major peak of small shield volcanic activity after the formation of tessera and prior to the emplacement of the regional plains. The question remains whether the surface is produced in a punctuated, catastrophic or continuous formation [10,11]. It may be that shield plains are produced by accumulation of individual shield fields; however, evidence in V-11 and V-12 indicates that this accumulation occurred at a specific period in Venus geologic time.