"VENUS DEMENTIA" REVISITED: PRESERVATION OF SCIENTIFICALLY AND HISTORICALLY SIGNIFICANT DATA.

T. J. Austin[1]*, J. G. O'Rourke[1]. [1]Arizona State University, Tempe, AZ. *t.austin@asu.edu

Background: Relative to other planetary science communities (i.e., Mars, the Moon, icy worlds), the Venus community has been small and underfunded. At least in America, this is largely because no dedicated missions have flown to Venus for over three decades. The lack of funding has created unique issues. A staggering volume of scientifically useful and historically significant datasets are not readily accessible to researchers or the general public. Many datasets are not useable with modern software or are not present on any internet archives. Several datasets are at risk of going "extinct" entirely if action is not taken. We have termed this crisis "Venus dementia" — a term pulled from McKinnon et al. (1997, *Venus II*).

Ongoing Work: We have assembled a number of geospatial datasets (mostly radar) and are preparing them for public release. In varying degrees this has involved converting file formats, mosaicking, co-registering data to the Magellan basemaps, cleaning up/reprocessing images, and digitizing physical copies of images. We summarize the status of these efforts in Table 1. Some of the most significant datasets we are working on include the Venera 15/16 radar mosaics (Figure 1), the Pioneer Venus radar datasets, and early Earth-based radar astronomy datasets from the 1960s. Many of these datasets were collected at unique radar wavelengths and incidence angles, or cover areas that weren't imaged by Magellan. We aim to have most of these published online in 2024.

Dataset	Status
Magellan doppler centroid map	**Complete.**
Venera 15/16 radar backscatter	11 / 27 quadrangles complete. Two quads are downscaled resolution.
Venera 15/16 altimetry & radiometry	**Complete.**
Pioneer Venus radar backscatter & altimetry	**Complete.**
Galileo NIMS-derived surface emissivity	In-progress. Data needs cleaned up and georeferenced.
Venera 9/10 bistatic radar	In-progress. Need to digitize scans, then georeference.
Arecibo radar ('67, '69, '75/77, '83, '88)	**Complete.** Higher resolution scans of the
	'75/77 mosaic may be found.
Arecibo radar ('99, '01)	In-progress. Need to improve georeferencing.
Goldstone radar & altimetry ('67, '69, '72, '74, '75, '77, '80, '83, '86, '88)	Mosaics & individual looks complete for '67, '72-'77.
Goldstone radar ('93)	In-progress. Needs to be reprocessed and georeferenced.
Haystack-Westford radar ('67, '69, '72)	**Complete.**

Future Work: Many of the datasets we have could potentially be improved if other versions of the data are found. For example, the only version of the 1972 Haystack-Westford observation we could find is a sketch of the data. The Soviet Venera 15/16 quadrangle maps, while competently made for their time, could be vastly improved by modern techniques — if the raw orbital swaths are ever found. Notably, we have been unable to find any versions of the 1972, 1980, or 2004 Arecibo observations. Beyond geospatial data, we have assembled an extensive list of missing datasets that can be preserved with future efforts. These datasets include in-situ surface, in-situ atmosphere, and remotely-sensed atmosphere observations.
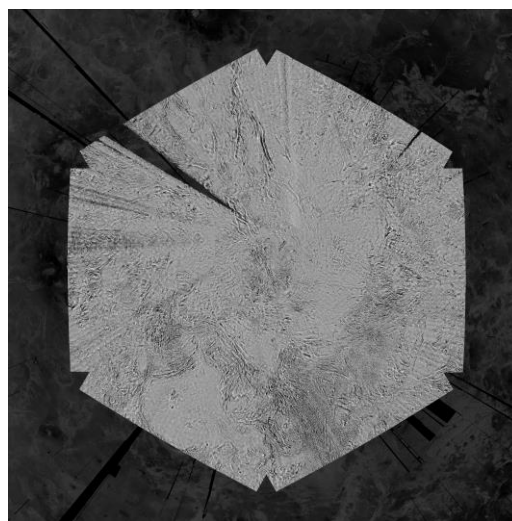

Figure 1: North polar projection of the work-in-progress Venera 15/16 global SAR mosaic, quadrangles 1-7. Magellan data is in the background for context. The Venera data is derived from map sheets. To our knowledge, the Soviets never produced a global mosaic or distributed any GIS-compatible data products.