

CONVERSION OF SEVEN COMPLETED MAPS INTO ARCGIS FOR PUBLICATION. R. C. Anderson, T. J. Parker and J. F. Schroeder, Jet Propulsion Laboratory, California Institute of Technology, Robert.c.anderson@jpl.nasa.gov, timothy.j.parker@jpl.nasa.gov, jeffrey.f.schroeder@jpl.nasa.gov.

Introduction: Seven completed geologic quadrangles for Mars previously funded by the Planetary Geology and Geophysics program (PGG) and awarded to Tim Parker have been compiled in various formats (e.g. Canvas, Claris Draw, Photoshop, etc.) These maps need to be converted into ArcGIS and submitted to the United States Geological Survey (USGS) for final review and map publication. Parker completed each of these maps in these older programs prior to the USGS switch to standard ArcGIS format. Each of the Mars base maps are compiled from older Viking Orbiter data in west areographic latitude/longitude coordinates. The USGS has since replaced the Viking based maps and coordinate system with the newer Themis daytime IR global mosaic and MOLA 2000 areocentric system. Because there were no requests for additional funds to meet these new requirements by the PI, the maps became inactive. With the recent push by NASA and the USGS to get all previously awarded maps completed or returned back to the queue, our goal is to get these completed maps into production for access by the science community.

We plan to complete conversion of the seven 1:500,000 scale maps of East Acidalia and Argyre Planitia as two 1:1,000,000 scale maps of these regions in two-years. East Acidalia will be converted the first year, and Argyre will be converted during the second year.

We emphasize that the goal of this project is not to start from scratch and remap these seven quadrangles, but to retrace and adapt these seven completed quadrangles into two 1:1,000,000-scale new maps based on the mapping completed Parker onto the newer Themis IR base maps, produce these new maps through the USGS, and make them accessible to the greater planetary science community for use.

East Acidalia Planitia/West Deuteronilus Mensae: To create a single map for East Acidalia Planitia/West Deuteronilus Mensae, the following three USGS quadrangles will be joined and seamlessly combined at their shared borders: MTM-45357, MTM-45352, and MTM-45347 (Figure 1). We are proposing to import into ArcGIS three 1:500,000-scale geologic maps of east Acidalia Planitia and convert them into a single digital map on a new 1:1,000,000-scale photomosaic base map. This set of maps has already gone through Phase 1 of the external review by the USGS (J. Plescia and J. Moore, reviewers). The review comments are being incorporated into each quadrangle and the DOMU for all three maps.

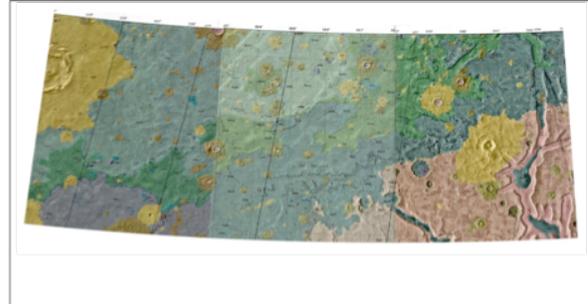


Figure 1 Completed East Acidalia Planitia/West Deuteronilus Mensae map by T. Parker.

Components Necessary to Complete East Acidalia Planitia Map: In order to get this map ready for USGS production, the map will require:

1. Assuring that all corrections/comments from the previous USGS review have been incorporated into the maps.
2. Converting all geologic mapping units and symbols digitally in an ArcGIS database and reference to THEMIS Day IR base map. This includes creating in ArcGIS: GeoContacts, GeoUnits, Location Features, Linear Features, Surface Features, and Nomenclature. These digital attributes will then be used to create a digital map layout following USGS standards using GIS software (Figure 2). Minimal effort will be required to adapt the original three quadrangles to the new 1:1,000,000-scale map.
3. Creating a Description of Map Units (DOMU) section describing each of the GeoUnits represented on the map. A hard copy of the DOMU also exists for this map and will require transcribing digitally. The DOMU will be formatted into a chart following USGS guidelines.

Central and Southeast Argyre Planitia: To create a single map for Central and Southeast Argyre Planitia, the following four USGS quadrangles will be joined seamlessly at their corresponding borders: MTM-50036, MTM-50043, MTM-55036, and MTM-55043 (Figure 2). Four 1:500,000-scale geologic maps of central and southern Argyre were produced in the early to mid 90s, and received a preliminary (non formal) review at that time. We are proposing to import the four quadrangles into ArcGIS and convert them into a single, new 1:1,000,000-scale photomosaic base map.

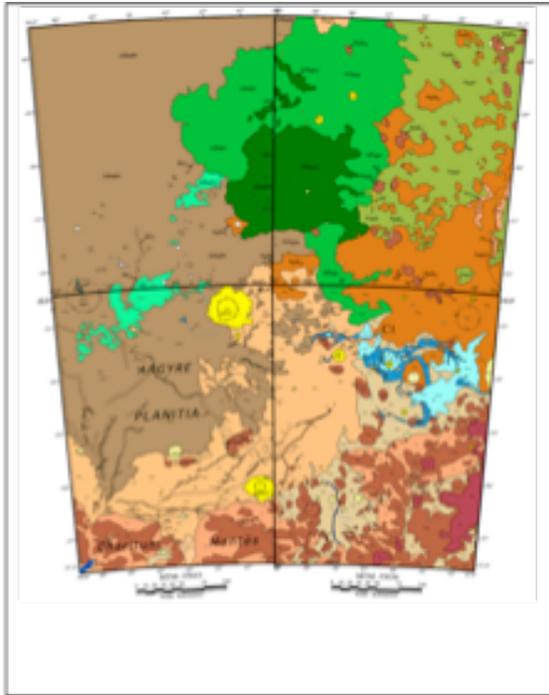


Figure 2 Completed Central and Southeast Argyre Planitia map by T. Parker. All four quadrangles are mapped and completed.

The Following Components are Necessary to complete the Central and Southeast Argyre Planitia Map: In order to get this map properly formatted for production, this map will require:

1. Minor amounts of time to verify the units across boundaries and reference Viking-based contacts to the THEMIS Day IR base map.

2. Converting all geologic mapping components digitally in a GIS database. This includes creating in ArcGIS: GeoContacts, GeoUnits, Location Features, Linear Features, Surface Features, and Nomenclature. These digital attributes will then be used to create a digital map layout following USGS standards using GIS software (Figure 5). As can be seen from Figure 5, there is excellent correlation between the original map units defined by Parker on the Viking mosaics to those same units project through ArcGIS onto the new THEMIS IR base map. Minimal remapping effort will be required to adapt Tim Parker's four Argyre quadrangles to the new 1:1,000,000-scale map.

3. Creating a Description of Map Units (DOMU) section describing each of the GeoUnits. A hand written hard copy of the DOMU exists for this map and will require transcribing digitally. The DOMU will need to be formatted into a chart following new USGS guidelines.

4. Creating a Correlation of Map Units (COMU) section describing the time period and classification of the GeoUnits does currently exists for this map (Figure 2). The COMU will be formatted into a chart following new USGS guidelines (Figure 6).

Creating an Explanation of Map Symbols (EOMS) section defining all map symbols used in this map does not currently exists for this map. Just like the DOMU, a hand written hard copy of the EOMS does exist and will require transcribing digitally into ArcGIS format. The EOMS will be formatted into a chart following new USGS guidelines.