**DESCRIPTION OF THE DIGITAL DATABASE FOR GEOLOGIC MAP OF OLYMPUS MONS CALDERA, MARS**

U.S. GEOLOGICAL SURVEY SCIENTIFIC INVESTIGATIONS MAP 3470

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INTRODUCTION

The volcano Olympus Mons is probably the best known extraterrestrial volcano. The summit comprises a nested caldera with six overlapping collapse pits which collectively measure ~65 x ~80 km in diameter. Numerous wrinkle ridges and graben occur on the caldera floor, and topographic data indicate that there has been >1.2 km of elevation change since the formation of the floor as a series of lava lakes. The paths of lava flows on the south and southeast flanks do not conform to present day topography. Mapping at a scale of 1:200,000 shows that the summit area displays a complex volcanic history, with numerous similarities with terrestrial shield volcanoes. Pangboche crater is a large (~10 km diameter) crater of impact origin that lies on the south flank of the caldera and, because of the elevation and lack of volatiles, displays numerous features more similar to fresh lunar craters than impact craters on Mars.

All GIS data are in Transverse\_Mercator projection using the Mars 2000 geographic coordinate system (GCS\_Mars\_2000\_Sphere, 3396190.0 radius). Units are in meters.

Scale Factor = 1.0

Center Longitude = -150.0

Standard Parrallel (Center Lat) = 0.0

GEOLOGIC CONTENT (contents of "ESRI\_FileGeodatabase" Folder, SIM3470\_OlympusMonsCaldera\_200K.gdb)

This ArcGIS geodatabase contains one feature dataset

(SIM3470\_feature\_dataset) with the following features:

SIM3470\_GeoContacts - Line feature class, geologic unit and map boundaries including symbol types: certain, approximate, facies.

SIM3470\_GeoUnits - Polygon feature class, geologic unit polygon feature class. Contains a "Unit\_type" field denoting the unit symbol.

SIM3470\_LinearFeatures - Line feature class, denoting structural features.

SIM3470\_SurfaceFeatures – Dark-colored ejecta and wrinkle ridge features.

BASE MAP CONTENT

The primary data set used for the mapping came from Context Camera (CTX) images, with the base image derived from the High Resolution Stereo Camera (HRSC). HRSC data at 25 m/pixel cover all of the mapped area at uniform lighting geometry and therefore provide a more uniform image base than the CTX data. The map also includes contours derived from the Mars Orbiter Laser Altimeter (MOLA) instrument and are shown with 100-m intervals.

DIGITAL DATABASE AND METADATA PACKAGE (SIM3470\_database.zip)

The geologic map files, basemaps, and supportive files are included in the database package, as described below:

"SIM\_3470\_GIS" directory

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Files Description

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SIM3470\_README.txt This readme file.

SIM3470\_metadata.txt Text-format FGDC-style metadata for the

 database package

SIM3470\_metadata.xml XML-format FGDC-style metadata for the

 database package

SIM3470\_ArcMap10.mxd ArcGIS (version 10) project for the database package

"Rasters" basemap directory

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olympus\_nd\_TMerc\_II.jp2 - HRSC basemap.

"ESRI\_FileGeodatabase" directory

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"SIM3470\_OlympusMons\_200K.gdb" - ArcMap 9.3 versioned geodatabase

"ESRI\_Shapefiles" -

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This directory contains GIS shapefiles exported from the ArcGIS geodatabase described above. The names and descriptions for each shapefile are identical to the content of the included geodatabase. See above "GEOLOGIC CONTENT" for details.

Users of the database package may wish to download the PDF version of the map for the Description of Map Units.

The material described above is available on the World Wide Web at http:/dx.doi.org/10.3133/sim3470

ZIP FILES

The files described above are packaged within a ZIP file. Utilities to uncompress ZIP files are available for most operating systems and may be found readily with a simple web search.

DIGITAL DATABASE FORMAT

The digital information compiled in this report used v 10, a commercial Geographic Information System produced by Environmental Systems Research Institute, Redlands, California.

OBTAINING HARD-COPY OF SIM 3470

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