WEB-BASED GIS SUPPORT FOR SELECTION OF THE MARS '01 LANDER SITE. T. M. Hare and K. L. Tanaka, 2255 N. Gemini Dr., U.S. Geological Survey, Flagstaff, AZ, 86001; thare@usgs.gov

Introduction. We have been producing a web-based, user-friendly interface built on a powerful Geographic Information System (GIS) that integrates statistical and spatial relational tools for analyses of planetary datasets. The interface, known as "Planetary Interactive GIS-on-the-Web Analyzable Database" (PIGWAD), provides database support for the research and academic planetary science communities, particularly for geologic mapping and other surface-related investigations. The PIGWAD address is http://webgis.wr.usgs.gov. We are now implementing a Mars '01 Lander page to support that mission's landing-site selection activity.

GIS is an organized collection of computer hardware, software, and geographic data whose operations can be tailored to efficiently capture, store, update, manipulate, analyze, and display all forms of geographically referenced information [1]. Application of GIS in the planetary sciences has grown dramatically over the past few years, as scientists have been able to prepare thematic maps and determine spatial relations among multiple datasets [2-10].

GIS interface. Datasets relevant to the Mars '01 landing-site selection have been incorporated into PIGWAD, including the Viking-based rock abundance map, fine-component thermal inertia, albedo, and USGS topography. The USGS Mars Digital Image Mosaic is used as an image base, and a 5° latitude and longitude grid is included. A key element to the utility of the database is the spatial coregistration of the datasets. This requirement necessitates the adjustment of datasets into a common geodetic framework. In addition, as geodesy is updated based on Mars Orbital Laser Altimeter (MOLA) data, the GIS datasets also will require modification. The Mars map displays a scale bar and measurement of map locations in meters or degrees, depending on projection used.

The first time a user connects to the web-site interface via Netscape or Internet Explorer, a small JAVA applet will be loaded into their machine. Each time the user submits a request with the JAVA applet, the web server will process the request and return either a compressed image or tabular information. This approach allows the user to browse the data as if it were on the user's computer. Subsequent requests will result in a refresh of the map, guaranteeing the most up-to-date version of the database. The user also has the option of downloading the data to use on their own machine. When possible, we will use ESRI's Shape file format, which nearly all GIS packages can recognize.

The Mars '01 interface allows one to view a base image and any number of GIS layers in a common projection (similar to the Mars '98 interface shown in Fig. 1). From this interface, one can navigate, zoom, measure distances, query the datasets, and print maps (e.g., Fig. 2).

Future work. The Mars'01 Lander GIS web site is currently on line. We will be adding the 1:15M-scale geology, a Viking image resolution map, a Viking stereo coverage map, searchable Mars Orbiter Camera (MOC) footprints, MOC imagery, MOLA topographic data, and any other layers that may help with the landing site selection.

References. [1] Environmental Systems Research Institute (1995) *Understanding GIS The ARC/INFO Metho*d, GeoInformation International, United Kingdom, *i*, 1-10. [2] Carr, M.H. (1995) *JGR 10*0, 7,479. [3] Zimbelman, J.R. (1996) *GSA Abs. 2*8, A-128. [4] Lucchitta, B.K. and Rosanova, C.E., (199*7), LPSC Ab. 28*, 839-840. [5] Dohm, J.M., et al. (in press) *USGS Map I-2650 (Thaumasia geologic map).* [6] Tanaka et al. (1998) *JGR 103*, 31,407-31,419. [7] Hare, T.M., et al. (1997) *LPSC Abs. 28, 51*5. [8] Gaddis, L., et al. (1998) *LPSC Ab*s. 29, 1807-1808. [9] Rosanova, C. E. et al. (1999) *LPSC Abs. 30, 1287*. [10] Lias, J. H., et al., (1999) *LPSC Abs. 30, 1074*.

Try it out. The PIGWAD web site can be found at the following address: http://webgis.wr.usgs.gov

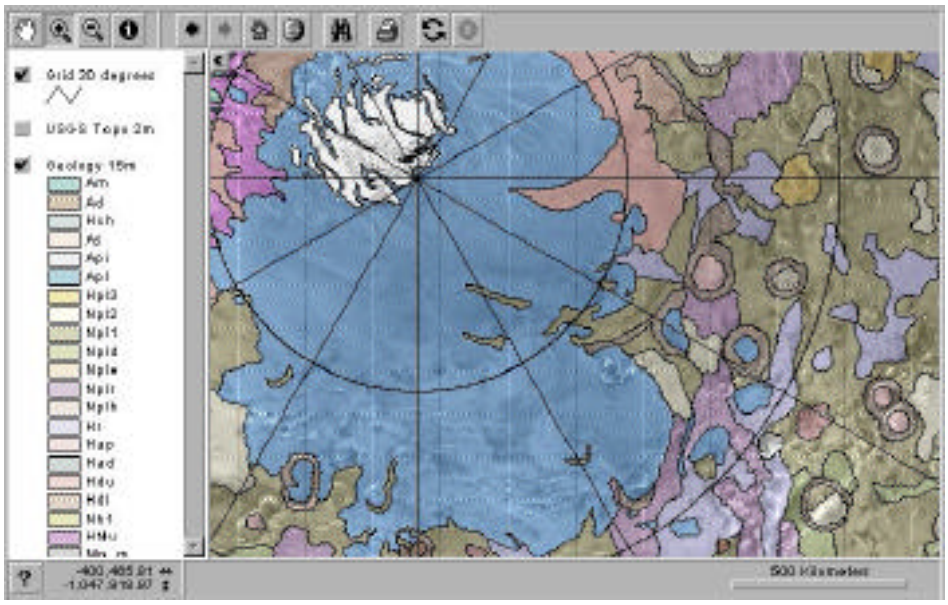

Figure 1. The beginner PIGWAD interface showing the South Polar region of Mars, which is being designed to help with the 1998 Mars Lander site selection.

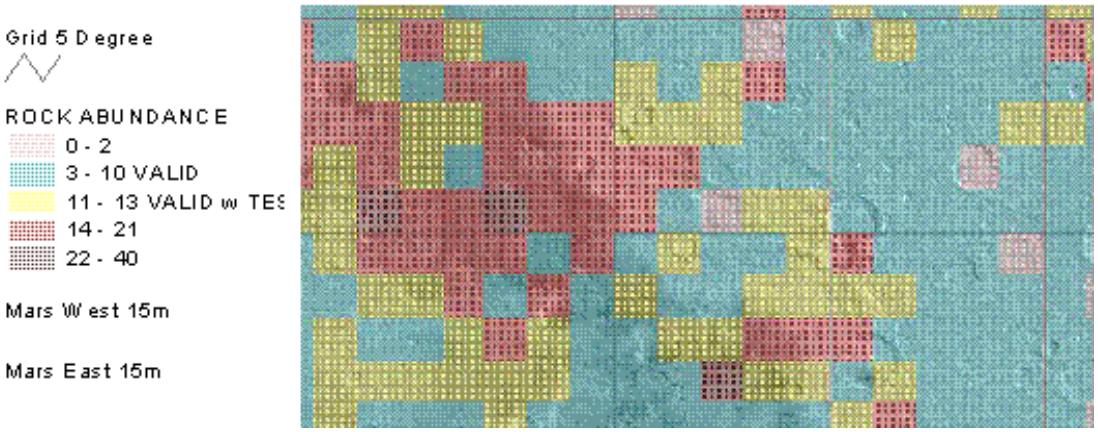

Figure 2. Amenthes region of Mars showing Mars Digital Image Mosaic (black-and-white background), rock abundance, in percent (1° X 1° colored pixels), and 5° X 5° coordinate grid.