

Mars Geologic Landform Atlas and Reference Source (MGLARS): A Stand-alone Hypermedia Program Designed for Geologic Research, Education and Map/image/data Dissemination

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The Mars Geologic Landform Atlas and Reference Source (MGLARS) is an interactive, multimedia, computer-graphical geologic landform atlas, geologic map, and literature database that can be distributed on CD-ROM, diskettes, or by Internet. The atlas is a stand-alone program created using SuperCard software for Macintosh computers; it will run on Macintosh and Windows-based PC systems having at least 8MB of RAM. The atlas is designed to show images of type geologic features on Mars and provides a link between these images and the literature database. A demonstration version of the atlas has been developed that includes the following features: (1) A shaded-relief base map including nomenclature, screen buttons and menus to access Viking image data and digital movies; (2) a geologic map and correlation chart of Mars (digitized version of formal 1:15,000,000-scale Viking-based map); (3) annotated black-and-white and false-color images and movies of Mars, showing scale, landforms, terrains, and landing sites; (4) a comprehensive literature database (with key-word search and, from these, point and click access to associated images.)

The ease of use and utility of this program are largely a function of the point and click access capabilities provided by the hypermedia programming, which links images and text. A description of how to use this program, and how to navigate through its informational database is found in a help or "Overview" window that can be accessed from a menu selection at any time within the program.

The Atlas "home" screen, to which the user is returned after accessing other information, is a shaded relief map of Mars. This map, divided into a western and eastern hemisphere, contains numbered icons showing image site locations. A floating window, which is linked to the map, contains a scrolling click-list of key words describing images contained within the program. This list can be sorted by key word descriptions of the image, by image number, or by hemisphere. A click on an image icon (on the shaded relief map) scrolls the click-list to a key word description of that image. A command-click on the icon will bring up the image; closing the image window returns the user to shaded relief map. Likewise, a command-click on the click-list brings up the given image, while a simple click locates image on the shaded relief map. In addition, Quick-time movies have been included, and can be accessed by clicking on the movie icons found on the shaded relief map.

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The shaded relief map also contains nomenclature of major geologic features and provinces. A menu selection lets the user display a click-list of nomenclature, which can be used to locate features on the shaded relief map. Once chosen, a button found on the shaded relief map transforms the given hemisphere into a geologic map. This geologic map contains image icons showing type areas for global geologic units. Type areas can be located on the geologic map by clicking on the corresponding unit box in the Correlation of Map Units window. A click on the image icon found at that location will bring up an image of the type area.

All images contain labels and figure captions that can be made invisible; the non-linear access capability will allow for different captions to be viewed depending on user-level selected. A floating window associated with a given image contains an appropriate scale. All maps and images in the program can be saved to Pict format files for use outside the program.

A 372 kilobyte reference list on the geology of Mars can be displayed in a window accessed from a menu selection; this window includes a search and find capability for text. Where pertinent articles refer to a type feature on an image contained within the program, the key word link for the image is included. A click on the key word in the reference list calls up the image. When viewing an image, a click on a "Search References" button of that image will open the reference list window and search for key words in the list. The reference list can be added to, as the literature grows, provided the program is stored as an unlocked disk file. The reference list can be saved to an ASCII text file for use outside of program and single references can be copied to clipboard for insertion to manuscripts.

The non-linear access capabilities of hypermedia programs, such as MGLARS, enable them to reach a wide range of audiences, from the student to the research scientist. These capabilities allow the user to pick and choose what to view without wading through unwanted information, a task made easier by programming that allows the user to pre-set the level of information displayed by the program. Two other map and data-base resources, based on similar SuperCard applications are in preparation: one focuses on the Springerville volcanic field in east-central Arizona and is to be published by GSA; the other, being constructed for NOAA, will explore the Florida Keys National Marine Sanctuary. The strength of these applications is that they are stand-alone programs, and that basic data (maps, text, images, bibliography, etc.) can be easily updated or modified by individual users to reflect their needs and interests. With increasing data, accompanied by diminishing money for research, and the pressing need to bring accurate and interesting science to the public, hypermedia programs offer a solution that allows a single publication to serve a wide range of users.