

## ACCESSING MER MOSAIC IMAGE DATA USING PDS ANALYST'S NOTEBOOK MOSAIC VIEWER.

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**Introduction:** The PDS Analyst's Notebook (<http://an.rsl.wustl.edu>) [1] provides access to Mars Exploration Rover (MER) [2] data archives by integrating sequence information, engineering and science data, observation planning and targeting, and documentation into web-accessible pages to facilitate "mission replay".

The Mosaic Viewer (<http://an.rsl.wustl.edu/my>) is a new tool within the Analyst's Notebook for viewing MER traverse maps and image mosaics.

**MER Mosaics:** Roughly 10,000 image mosaics have been created from Spirit and Opportunity Panoramic Camera and Navigation Camera images by the MER science team. Each mosaic is made up of two or more source frames—individual images taken by one of the rover cameras stitched together into a cylindrical, cylindrical perspective, vertical perspective, or polar projection. Details of the mosaicking process are given in the Camera Experiment Data Record (EDR) and Reduced Data Record (RDR) Operations and Science Data Products imaging products specification that is available when downloading a mosaic, or from the Resources tab of the MER Analyst's Notebook.

Because of their size—ranging from 25 MB to greater than 1 GB per file—locating, accessing, and

viewing mosaics of interest in a timely fashion is impractical without a dedicated software tool. Using the Mosaic Viewer, users can zoom and pan around a mosaic without first downloading the data.

The Mosaic Viewer, developed by the PDS Geosciences Node (<http://pds-geosciences.wustl.edu/>) [3], allows users to begin with a base map of each rover's traverse on Mars (fig. 1). As users zoom into the map, higher resolution map tiles in the area of interest are read from a data base, streamed in real time to the client, and seamlessly displayed. Pop up windows display available mosaics at a given location on the user's request. In turn, the user can select an individual mosaic for further inspection.

When displaying a mosaic, a listing of the source frames is available that shows a thumbnail image and the archive product ID of each source frame along with a link to further details available in the Analyst's Notebook (fig. 2). Users also can display "footprints" of the source frames on the mosaic. These footprints show the location of individual frames within the mosaic. Finally, users can download mosaic and source frame data and documentation from a simple order form (fig. 3).

**Requirements:** The Mosaic Viewer is not an archive product per se, but is a powerful tool that adds

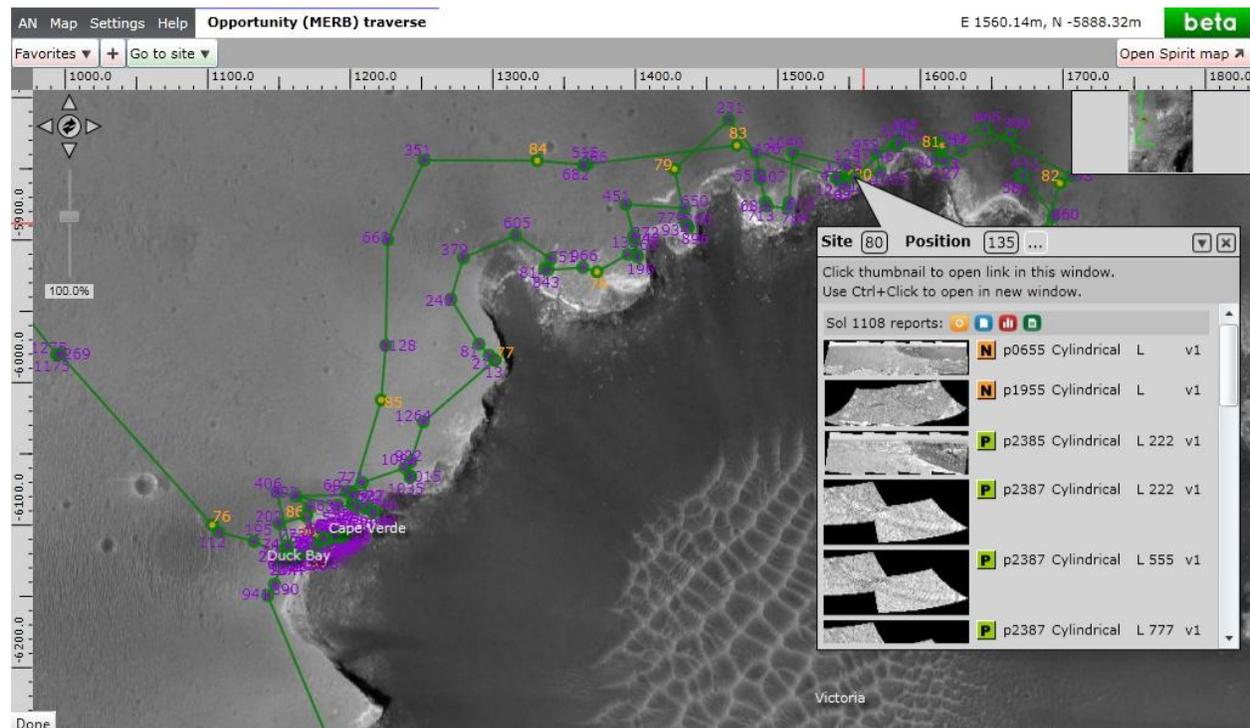


Fig. 1. Mosaic Viewer tool showing traverse map for Opportunity rover.

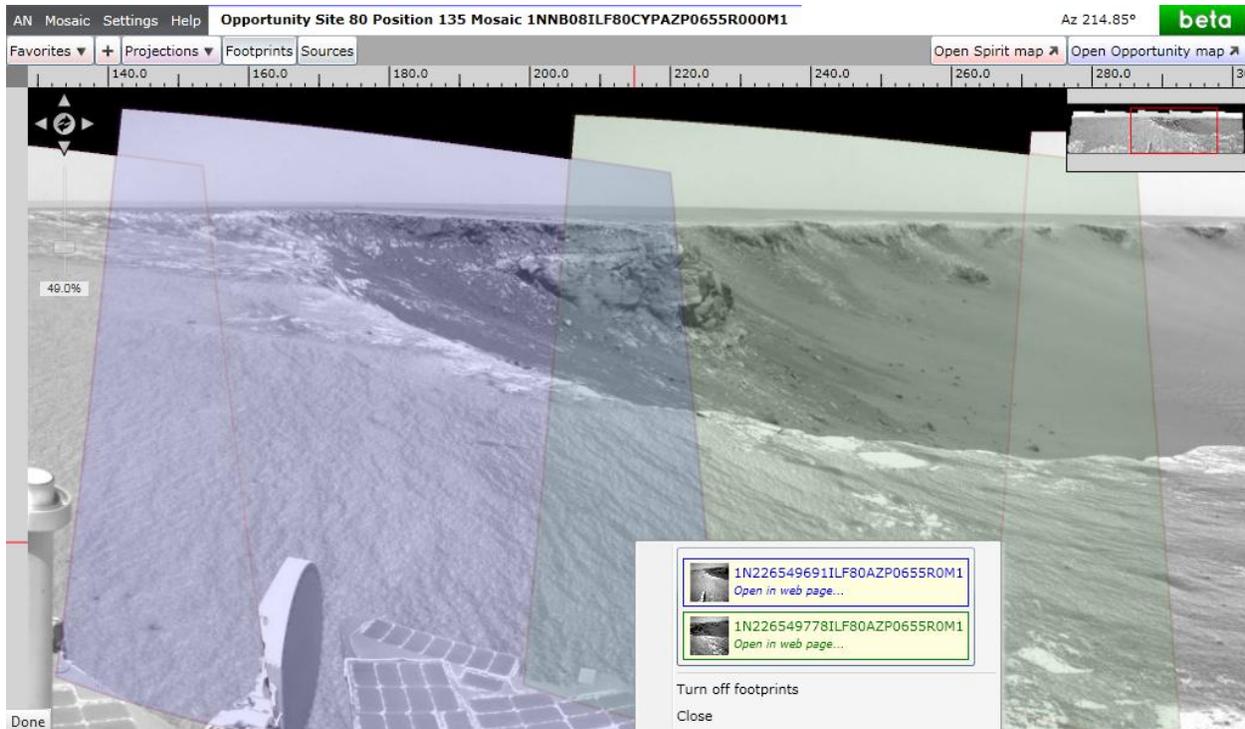


Fig. 2. Mosaic Viewer tool showing source frames used to create one of the Opportunity mosaic images.

value to the MER archives. The tool runs within a web browser on almost all Windows and Mac OS platforms. The load time is minimal, response time is quick, and the interface uses common metaphors that are highly intuitive for most users.

To achieve high usability with minimal develop-

ment resources, the Mosaic Viewer is based on the Microsoft Silverlight browser plug-in. As a result, the Mosaic Viewer is not available on tablet or Linux platforms. Prior to implementation of the tool, a user community survey found this limitation acceptable.

**Future work:** The PDS Geosciences Node is working to add value to the MER data and to maintain the functionality of specialized science team tools used to work with the data. Decisions are pending with regard to the balance among end user requirements and program functionality and longevity.

The Mosaic Viewer and Analyst's Notebook concepts will be carried forward for use with science returns from the Mars Science Laboratory mission.

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**References:** [1] Stein, T.C. et al. (2010), LPS XLI, Abstract #1414. [2] J.A. Crisp, M. Adler, J.R. Matijevic, S.W. Squyres, R.E. Arvidson, and D.M. Kass: Mars Exploration Rover mission, JGR, 108(E12), 8061, doi:10.1029/2002JE002038, 2003. [3] Slavney, S. et al. (2011), LPS XLII, Abstract #1895.

**Mosaic download**

Select the component(s) of this mosaic to request. Then enter your email address in order to be notified when data are ready for download.

Mosaic 1PP390ILF47CYL00P2286L777M2	
<input checked="" type="checkbox"/> PDS .IMG file	47 MB
<input type="checkbox"/> Browse JPEG file	3 MB
<input type="checkbox"/> Browse PNG file	12 MB
Documentation	
<input checked="" type="checkbox"/> External PDS label (.LBL)	4 KB
<input checked="" type="checkbox"/> Source product listing (.LIS)	
<input checked="" type="checkbox"/> Navigation parameters (.NAV)	35 KB
<input type="checkbox"/> Imaging products specification (.PDF)	4.6 MB
Source files	
<input type="checkbox"/> PDS .IMG files (24 files)	51 MB

Email address

OK Cancel

Fig. 3. Order form within Mosaic Viewer to provide users with download access.