INCREASING THE VALUE OF PLANETARY DATA ARCHIVES THROUGH STRONG PRODUCER-ARCHIVIST INTERACTION. T. C. Stein[1] and R. E. Arvidson[2], [1]Washington University in St. Louis, 1 Brookings Drive, CB 1169, St. Louis, MO 63130, tstein@wustl.edu, [2] arvidson@wunder.wustl.edu.

Introduction: The quality of planetary data archives is governed largely by data producers and data archivists, together with continued use and validation by the science user community. Because producers and archivists possess a nearly unique domain knowledge, it is important for these two groups to interact in early mission planning phases, and to continue collaboration through the data acquisition phase and beyond. This abstract discusses ways in which early and regular interaction between the Planetary Data System and data producers is beneficial.

Planetary data archiving: NASA's Planetary Data System (PDS)—a federation of discipline and support nodes—provides expertise to guide and assist missions, programs, and individuals to organize and document digital data that can be used to support NASA's goals in planetary science and Solar System exploration. PDS makes mission and ancillary data (including laboratory data) accessible to users in the scientific community, and ensures the long-term preservation of high quality archives.

Data archiving requirements for NASA planetary missions are written into mission announcements of opportunity. PDS provides a pre-proposal briefing on data archiving requirements to potential proposers, and the proposal data archiving section is reviewed by PDS. Further, archive plans are jointly produced by missions and PDS.

Archiving timeline: After a mission is selected, one PDS node is designated the "lead node", i.e., the primary PDS group that interacts with mission personnel. At this point, data archiving working groups are formed, and project data management and archive plans are developed to define data to be archived. Additional documents are created that detail data product and archive volume structure. Archive documents and sample data are peer-reviewed by the science community prior to data acquisition.

During the active data acquisition phase, raw and processed data products, labels (metadata) and documentation are produced by the instrument science team. The best situation is when the PDS products are also

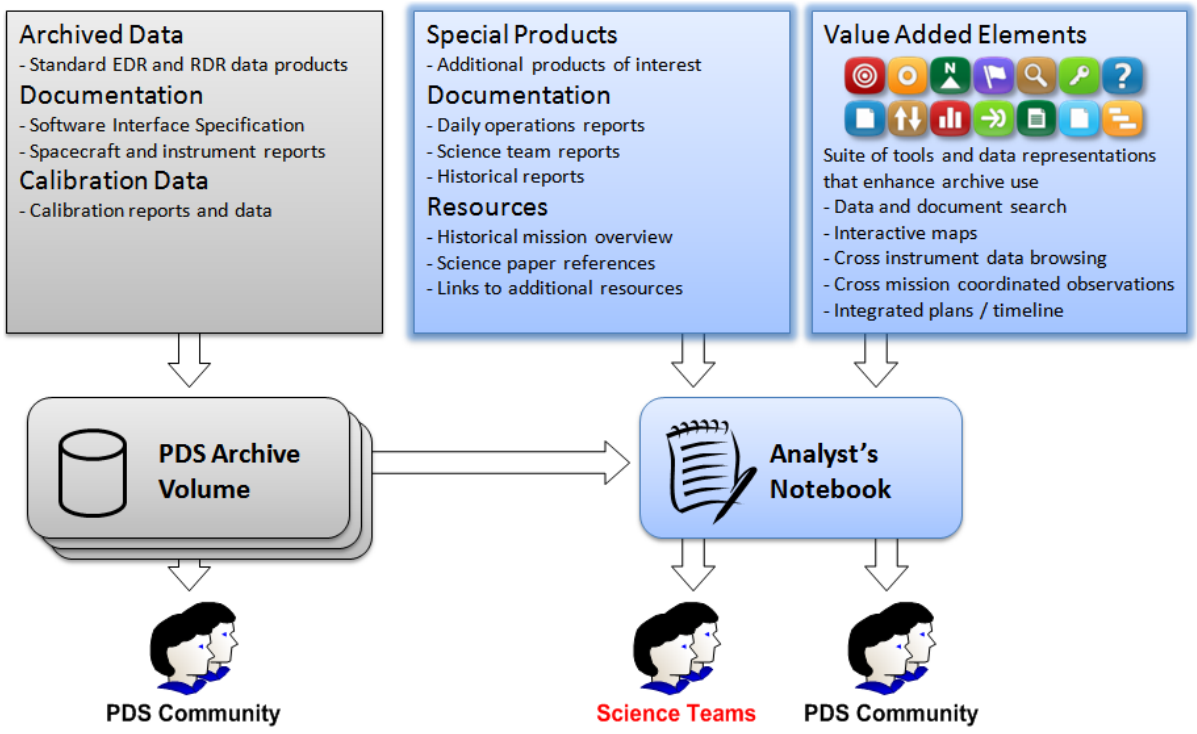

Fig. 1 Comparison of standard PDS archive volume contents (gray) with value added components (blue) resulting from strong prodcer-archivist interaction.

used for scientific analysis by the instrument teams, leading to a thorough vetting of the formats and contents. Preliminary and quick-look data often are made accessible via project and PDS web pages. Data products submitted for archiving are validated by PDS. Liens found at this stage—typically few, due to previous work carried out between the data producer and PDS—are corrected prior to public release.

At public release, data products are added to the PDS archive and are made available online. These data are maintained by means of periodic media refreshes. PDS provides data, documentation, and science expertise to users. In addition, PDS works with data providers to make available new and updated data products.

Data searches from the PDS web site (http://pds.jpl.nasa.gov) provide a high-level description of related data sets, along with links to other resources. However, tools developed and hosted at individual PDS Nodes facilitiate searches for individual data products and documents. For example, the PDS Geosciences Node (http://pds-geosciences.wustl.edu/) [1] has two such tools: the Analyst's Notebook and the Orbital Data Explorer (ODE). The Analyst's Notebook (http://an.rsl.wustl.edu) is a web-based interface for accessing the Mars Exploration Rover (MER), Phoenix Lander, Apollo, and LCROSS mission data archives by integrating sequence information, science data, and documentation [2]. ODE (http://ode.rsl.wustl.edu) is a cross-mission and isntrument tool for locating and retrieving orbital data of Mars, Mercury, and the Moon [3].

Producer-archivist interaction: One example of the effectiveness of this approach is the Phoenix Mars Lander mission. The PDS Geosciences Node served as the lead archiving node for this mission. During the mission proposal phase, PDS provided an explanation of data archiving requirements. After the mission was selected, PDS and the Phoenix science team collaborated to produce the archive and data management plan that guided the mission's data archiving process. A data archive working group was formed to assist the mission science team with the archive process.

During the prelaunch mission phase for Phoenix the PDS worked with members of the science team to create archive-ready data products that supported the mission objectives and the needs of the science community. At the same time, PDS used input from the science team when creating the Analyst's Notebook for Phoenix.

The Phoenix science team invited PDS to be involved in a number of science team meetings before launch and during the cruise phase. PDS-formatted products were used by the instrument teams for analysis during the mission, except for one case which led to problems in the archives that required correction post-mission.

In addition, the Analyst's Notebook was used by the mission science team during operations. Feedback from the team was incorporated into updates and enhancements within the Analyst's Notebook prior to its public release. Futhermore, producer-archivist interactions led to the development and inclusion of value added elements in the Notebook beyond the scope of standard archives, including historical reports, cross-instrument data browsing, cross-mission coordinated observations, and integrated plans (Fig. 1).

Summary: The importance of end to end producer-archivist interaction is evident in the archives of the Phoenix and other missions with similar strong collaborations, such as Mars Exploration Rovers, Mars Reconnaissance Orbiter, and Mars Global Surveyor. Continued scrutiny by the science user community provides feedback for increasing the value of current and future archives.

Acknowledgement: The Orbital Data Explorer is developed through funding provided by the PDS Geosciences Node. The Analyst's Notebook development received additional funding provided by the Mars Exploration Rovers Mission and the Phoenix Mission. Cooperation of mission science and operations teams is greatly appreciated.

References: [1] Slavney, S. et al. (2011), LPS XLII, Abstract #1895. [2] Stein, T.C. et al. (2010), LPS XLI, Abstract #1414. [3] Wang, J. et al. (2011), LPS XLII.