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Introduction: Lunar and planetary spatial data continue to rapidly increase in volume and complexity. Maintaining these data using accessible formats and standards for all scientists is essential for the success of past, present, and future lunar and planetary missions. As an update to the lunar community, we describe here the Mapping and Planetary Spatial Infrastructure Team. MAPSIT is a group of planetary community members tasked by the Planetary Science Subcommittee and NASA Headquarters to identify and prioritize the infrastructural spatial data needs for research and analysis for NASA's past, current, and future lunar and planetary science and exploration missions, but with science-exploration-commercial synergies as well.

Planetary Spatial Data and MAPSIT: The extraction of scientific knowledge from lunar and planetary mission data relies on several steps of refinement of the raw data from instruments. Creating scientifically useful information is often a major research and development effort in itself. To complete this process, goals need identified, missions need to be properly designed, and instruments need to be appropriately developed and calibrated. The models, software tools and content distribution platforms required for scientists to obtain, process, and analyze planetary mission data need continuing development and maintenance. For these reasons, community coordination and strategic planning for the use of lunar and planetary spatial data are essential for the success of planetary exploration, as well as the commercial development of space.

To this end, MAPSIT has been established with a mission to ensure that lunar and planetary spatial data are readily available for any scientific investigations, now and in the future. Some of its functions include the following: provide community findings, in the form of a roadmap, or Planetary Geospatial Strategic Plan, concerning the scientific rationale, objectives, technology, and long-range strategic priorities for accessing and using planetary spatial data, and engaging in software development (e.g., [2]) and mapping [1]; encourage the development of standards for present and future lunar and planetary missions and research activities; help define community needs for critical research and planetary mission infrastructure [e.g., 3]; provide findings on the accuracy and precision required for spatial technologies and products; and coordinate and promote the registration of data sets from international missions and US missions to optimize their combined utility.

MAPSIT will help enable the broad spectrum of planetary spatial data and programmatic capabilities required to effectively achieve robotic precursor and human exploration of the Solar System. These include (but are not limited to) the analysis of planetary surfaces, the identification of safe landing sites, the down-selection of sample acquisition locations, hazard assessment, and the spatial characterization of in-situ resources [4, 5, 6]. In particular it will help address the issues raised in the lunar Strategic Knowledge Gaps.

Planetary Geospatial Strategic Plan: To build a roadmap, MAPSIT will solicit broad stakeholder input through community surveys and town hall meetings. A goal is to recommend and prioritize the needed data products and infrastructural developments, following a process much like that of the Lunar Exploration Roadmap. A Planetary Spatial Data Infrastructure (PSDI) has been created as a theoretical scaffold [7] which outlines and defines all aspects of planetary spatial data and lays out the needs, capabilities and tasks of the community. This builds on a similar document for the U.S., the National SDI [8]. A knowledge inventory, communication with the community about goals, and the initial development of a plan for realizing a lunar SDI is now needed. It is envisioned that the roadmap will be a living document that evolves as milestones are met and the state of the art advances.

For the Moon in particular, the roadmap will consider previous documents such as the Lunar Exploration Roadmap, to see where key recommendations regarding PSDI can best advance lunar science, exploration and commercial development. This will include recommendations for mission planning, standards, identifying current foundational data products, and what data and products are needed in the future.

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