



MAPSIT @ SBAG 21

J. Laura, J. Radebaugh (Chair), B. Thomson (Vice Chair), & MAPSIT Steering
Committee
USGS Astrogeology

Warning: Findings presentations do not make for good visual heavy material...Sorry!

Who is MAPSIT?

- Collection of spatial data experts, technical experts, and research scientists
- Focus on spatial data collection, discoverability, and usability
- Similar to SBAG in that we are an AG (PoC is Sarah Noble)
- Different from SBAG in that we focus on all bodies in the Solar System
- With a focus on (for this meeting): Phobos and Deimos, the dwarf planet Pluto, Pluto's moon Charon, the dwarf planet (1) Ceres, and asteroids (4) Vesta, (21) Lutetia, (243) Ida, (253) Mathilde, (433) Eros, (951) Gaspra, (2,867) Steins, (4,179) Toutatis, (5,535) Annefrank, (9,969) Braille, and (25,143) Itokawa, and comets 1P/Halley, 81P/Wild 2, 9P/Tempel 1, and 67P/Churyumov-Gerasimenko (67P/C-G). As the nominal missions of Hayabusa-2 and OSIRIS-REx are still underway, we have not yet added (162,173) Ryugu or (101,955) Bennu.

Thank You

- First time at SBAG and it is great to see all of places where your hard work is aligning with what MAPSIT is working on:
- OSIRIS-Rex data collection plan and site selection (looks like an awesome proto-Planetary Spatial Data Infrastructure)
- NHATS looks like a wonderful discovery interface that has wide adoption (and an API!)
- Phobos Project is a great first step to being able to build a PSDI
- And...

“SBAG encourages NASA to support preparatory work dedicated to maximizing planetary science from both ground-based and space-based assets, including analysis tools and specialized workshops, and to identify the programs in which such efforts will be supported.”

- Findings from SBAG 20 #5

What are we doing currently?

- MAPSIT:
 - Finalizing the Draft roadmap
 - Engaging the AGs to help with cross group prioritization
 - Identifying our role in supporting PSDI creation for the community
- USGS Astrogeology:
 - A knowledge inventory of foundational data products for the solar system
 - Foundational: Geodetic reference frame (usually lidar is used as a proxy product), topography (or shape), ortho-imagery.
 - Precursor to multi-group PSDIs
 - Identifies knowledge gaps and opportunities for high value data product creation

Sample Knowledge Inventory (Truncated)

Body	Product Name	Product Type	Source (Producer)	Horizontal Positional Accuracy	Vertical Positional Accuracy	Spatial Resolution	Temporal Quality	Fit for Use Cases	Not Fit for Use Cases
Phobos	Mars Express SRC Mosaic	Semi-controlled Orthorectified Base	DLR			12 mpp	Current		
Phobos	Mars Express HRSC DEM Global 100m	Topography	DLR			100 mpp	Current		
Phobos	Unnamed? (Oberst et al., 2014)	Geodetic Control	DLR	13.7 m			Current		
Phobos	Duxbury and Callahan (1989)	Geodetic Control					Current		
Phobos	Burmeister et al. (2017) (in review)	Geodetic Control	DLR						

Draft Finding I: NASA missions should be encouraged to obtain high-quality data that can be incorporated into existing foundational data products, or create new foundational data products for unseen territory, and thus maximize the value of the NASA science return.

MAPSIT Findings (Draft)

Draft Finding II: NASA-funded projects, including missions and R&A projects, that obtain or create spatial data should be encouraged to deliver data in formats that are easily usable and that conform to standards agreed upon by the community.

Draft Finding III: Existing and new planetary spatial data should be easily discoverable and accessible, and data access tools must evolve with the technology.

Draft Finding IV: MAPSIT should coordinate with community representatives and groups, such as other NASA Assessment and Analysis Groups (AGs), to ensure that foundational data products are produced and that PSDIs are developed and maintained for each planetary body in the Solar System to best enable NASA exploration and mission goals.

Where can MAPSIT be supportive?

- Compile a listing of available foundational data products
- Provide expertise in how to take proto-PSDs (single mission team/institution) and expand them to support a broader community
- Standards - what makes heterogeneous data interoperable?
- Policies - what are the roles of participants in PSDs and what policies are supportive of long-lived, high value PSDs?
- Users - how best can PSDI creators engage with their user bases?

How can SBAG help MAPSIT?

- Continue to identify the need for discoverable, accessible, and interoperable data as a priority for the data that supports your science.
- Consider that data are of long term use and tools are transient. How does this impact your more recent findings?
- Help prioritize identified gaps in foundational data products.

Resources

- <https://www.lpi.usra.edu/mapsit/>
- Laura, J., M. T. Bland, R. L. Fergason, T. M. Hare, and B. A. Archinal (2018). Framework for the development of Planetary Spatial Data Infrastructures: A Europa case study. *Earth and Space Science*, 5(9), 486-502, doi:10.1029/2018EA000411.
- Laura, J., T. Hare, L. Gaddis, R. Fergason, J. Skinner, J. Hagerty, and B. Archinal (2017), Towards a Planetary Spatial Data Infrastructure, *ISPRS International Journal of Geo-Information*, 6(6), 181, doi:10.3390/ijgi6060181.