MAPPING AND SPATIAL INFRASTRUCTURE TEAM: CONNECTING MEPAG GOALS

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What this presentation is and is not

- **IS** intended to:
  - Ensure MEPAG aware of MAPSIT
  - Discuss how MAPSIT goals strengthen MEPAG goals
  - Examine products (data capabilities) needed for Mars research
    - This is "infrastructure"
  - Propose preparation of traceability matrix
    - Link AG goals to geospatial data products (capabilities)

- **IS NOT** intended to be:
  - USGS tasks or services
  - Geologic Mapping
  - Data archiving

MAPSIT: Membership

- Open to all community members

- Scientists and geospatial data experts

- Steering Committee
  - Jani Radebaugh (**Chair**), Brigham Young University, Provo, UT
  - Brad Thomson (**Vice-Chair**), University of Tennessee, Knoxville
  - Members from:
    - ASU, DLR, NASA/Goddard, NASA/Marshall, PSI, SETI Institute/NASA Ames, UA, USGS

MAPSIT: Goals

- "Ensure that planetary data are usable"
  - Community has **easy**, **dependable** access to requisite data
    - Scientists, engineers, program managers, policy makers, general public
    - As easy as possible … as dependable as possible
  - Infrastructure creation (and maintenance) is strategically planned
  - Maximize NASA investment by minimizing <u>cost</u> of access and use
  - Limit the need to:
    - Create data
    - Register data
    - Normalize data
    - Promote policy

Current Questions

- Does infrastructure exists to meet MEPAG goals?
  - Does data exist?
  - Is it spatially reliable?
  - Does it enable future activities?
  - Can it be readily found and accessed?
  - Can it move between analytical platforms?
  - Does it have a longer shelf-life than modern applications?
- What is needed to address the MEPAG Goals document?
  - What = Data products + discovery mechanisms + interoperability + personnel + …

MEPAG Goals to Infrastructure

- MAPSIT tasked by NASA with prioritizing community needs with respect to spatial data infrastructure
  - Ensure NASA investments achieve maximum return (long and short term)

- MAPSIT is coordinating "traceability matrix" for MEPAG goals
  - Match community goals with spatial data needs
  - Use MEPAG Goals Document

- All AGs are being targeted for priorities (goals → products)

Example 1: Document the geologic record

- <u>Goal III, Investigation A2.3:</u> "Identify and characterize the distribution, nature, and age relationships of rocks, faults, strata, and other geologic features via comprehensive and topical <u>geologic mapping</u>."

  - "Global, regional, or local issues" [**SCALE, POLICY**]

  - "Data required includes correlated high-resolution topographic, compositional and morphologic data and data products" [**CONTROL, INTEROPERABILITY, STANDARDS, POLICY**]

  - "Linked by common cartographic standards to enable accurate correlation" [**STANDARDS, POLICY**]

Example 2: Sustained human presence

- <u>Goal IV, Investigation D1.2:</u> "Prepare high spatial resolution maps of at least one high-priority <u>water resource</u> deposit…"

  - "depth-concentration relationship of the water-bearing phase(s)" **[CONTROL, TOPOGRAPHY, POLICY]**

  - "map-view spatial relationships" **[USE, STANDARDS]**

Example products

- Controlled THEMIS VIS color mosaics @ 18 m/p
- **Controlled CTX Mosaic @ 6m/p**
- Controlled HiRISE Mosaics 0.25m/p
  - Will likely require topography from HiRISE or CTX stereo
- Controlled mosaics for change detection
  - Global/regional, from M9, Viking, MOC, HRSC, THEMIS IR
  - Local, from THEMIS VIS, CTX, HiRISE, CaSSIS
- Systematic geologic mapping for proposed landing sites
- **Integrated global topography** – (MOLA, HRSC, Viking, CTX, HiRISE)
- Composition maps focusing on (CRISM, etc.)
- Integration of all Phobos and Deimos datasets
  - Consistent registration (geodetic control) across all data
  - Improved mosaic, shape, and composition models

To be prioritized for funding opportunities like PDART

Summary and Paths Forward

- MAPSIT = AG level community group tasked with ensuring community has what it needs w.r.t. spatial data
  - Conduct science (targeting Goals-based investigations)
  - Make sound programmatic and policy decisions
- Identifying infrastructural needs in Mars community
  - Coordinating a traceability matrix
- Requesting input from all AGs to define community needs
  - AGs: Goals → Data products (specifics)
  - MAPSIT: Data products → Standards (access and use)
  - NASA: Standards → Policy (priority and requirements)

Conclusions

- Spatial data should "just work" for the non-geospatial data expert

- We are losing effort and resources due to duplication

- MAPSIT aims to bridge this divide by improving data use

- Not replacing favorite applications but making them better

- Implore MEPAG for input regarding tracing goals to infrastructure

Backup

Earth-based Spatial Data Infrastructure (SDI)

- This concept is federally recognized (and mandated)
- National Spatial Data Infrastructure (NSDI)
  - The **technology**, **policies**, **standards**, and **human resources**
  - Data is a national asset and resource

    - *(Executive Order 12906 (1994), OMB Circular A-16 Revised 2002)*

- Cross-discipline data themes
  - Biological Resources, Cadastral, **Digital Orthoimagery**, **Topography**, Buildings and Facilities, **Geodetic Control**, Geographic Names, Geology, Mineral Resources, Hazards, Soils
  - **Foundational data** v. Framework data

Spatial Data Infrastructure (SDI)