Ensures that usable data are returned and archived for any conceivable usage, now or in the future.

Sam Lawrence (Yesterday)
Agenda/Outline

• What is ISIS?
• Mission Considerations
• Current Mission and Small Bodies Support
• Planned and Future Small Bodies Support
• ISIS Website Update
• Other USGS SB Initiatives
Integrated Software for Imagers and Spectrometers (ISIS)

- USGS Software Package
  - Supported by NASA Cartography Program, Missions, and R&A Proposal Funding
- Radiometric Calibration
- Geometric Calibration
- Creation/Ingestion of Archival Products
- Controlled/Uncontrolled Maps/Mosaics
- DEM generation via interface to BAE Systems SOCET SET
Discovery Mission Capabilities & Considerations

Capabilities
• SPICE data maintenance and distribution
• DEM distribution
• Instrument specific software development
• Data fusion
• Spectroscopy
• Landing Site Selection
• Continued maintenance of software after mission end

Considerations
• Data ingestion
• Geometric sensor calibration and calibration model
• Radiometric sensor calibration and calibration model
• Shape model ingestion
  – Complex issue for irregularly shaped bodies
Small Bodies

Planet-like

- Mercury - MESSENGER
  - Discovery Class Mission
  - Pipeline Processing
  - Cartography and DEM support
- (4) Vesta [PG&G]
  - Cartography and DEM support
- (1) Ceres [Planned – Dawn/JPL]
- (134340) Pluto/Charon [Planned - SwRI]

Irregular Shaped

- (243) Ida [Galileo]
- (433) Eros [NEAR-Shoemaker]
- (253) Mathilde [NEAR-Shoemaker]
- (25143) Itokawa [PMDAP]
- (21) Lutetia [Planned - PMAP]
- (2967) Steins [Planned - PMDAP]
- (101955) Bennu [Planned - UA]
Projections and Topography Support

Projections

- Transverse Cylindrical & Transverse Azimuthal
  - Well suited for some small bodies with the elongated radii perpendicular to the axis of rotation

Topography

- Triaxial or Biaxial Ellipsoids
- Digital Shape Model – Radius
- Direct NAIF Alpha DSK Support – Pending

Image: 2465735909
Raw Camera View

Itokawa
Possible Future Tools/Capabilities

- PDS4 converters
- Support of APL’s SBMT
- Jigsaw and control support for global mapping of irregular bodies
- Investigating formats and processing of point clouds
- Investigate efficient, generic support for TINs (storage and processing) that decouples from the DSK as the only ray intersection technique.
- SSO Funding to incorporate ALMA observations of Ceres into ISIS
  - Will be the first effort to incorporate telescopic data into ISIS
  - Plans are to expand to any observation with WCS information [Unfunded]
CURRENT ISIS RELEASE

- ISIS 3.4.8 (Released November 26, 2014)
- ISIS 3.4.9 (Planned Release March 26, 2015)
- UNIX-based Supported Platform OS’es
  - Mac OSX 10.6 and 10.8 (64 bit Intel)
  - Debian 7 (64 bit)
  - Fedora 18 (64 bit)
  - Redhat Enterprise 6.5 (64 bit) (via SL 6.3)
  - Scientific Linux (SL) 6.5 (64 bit)
  - Ubuntu 12.04 LTS (64 bit)
- Download via Internet
  - Full distribution ~ 300GB
  - Selective download using rsync utility
  - Java client installer

Current Status of ISIS Website
http://isis.astrogeology.usgs.gov/

• Website has been down for several weeks
• The cause – potential security issue
  – A file was discovered to have an embedded script.
• Almost ready to go live
  – Waiting Department of Interior IT Approval
  – No earlier than next week
• R-Sync distribution site never went down
  – isisdist.astrogeology.usgs.gov
SOFTWARE SERVICES

- ISIS
- GDAL (Geospatial Data Abstraction Library)
- OpenLayers Planetary Extensions

INFRASTRUCTURE

- PDS Unified Planetary Coordinates (UPC) database
- Astropedia
- Astro Web Maps

The Astrogeology Planetary Maps and Ancillary Products and Services (PMAPS) system

- Planetary Nomenclature
- Planetary Geologic Mapping
- The Planetary Image LOcator Tool (PILOT)
  - Searches using the UPC
- Map Projection on the Web (POW) service
- Map-a-Planet 2 (MAP2)
- PDS Imaging Node Annex
## Discovery Mission Capabilities & Considerations

### Capabilities
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### Considerations
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What are your questions?