MRD 195a- Global Geologic Map

Data Product Overview

A classic, integrated geological map of the surface of Bennu that incorporates/summarizes all major geomorphological and compositional features.

SBMT Geologic Mapping Test 9-13 July 2018

See MRD 195 Excel File

Overview

Data type

- Map format - ShapeFile format

What does it incorporate at what scale?

- Global imaging and topography
  - Global Mosaic @ 21-cm resolution (MRD-121)
  - Global Topographic Map (MRD-122)
  - Global slope map (MRD-126)
- Major geomorphological features which could include:
  - Linear Features (MRD-139)
  - Boulder (MRD-137)
  - Craters (MRD-136)
  - Regolith (MRD-138)
  - Dust/Plumes (MRD-142)
- Compositional maps which could include:
  - Global Space-weathering Map (MRD-542)
  - Global mineral and chemical maps (MRD-140)
  - Global Bond Albedo Map (MRD-154)
  - Global Reflectance Factor Maps (MRD-154)
  - Global thermal inertia map (MRD-155)

Observational Requirements

This data product incorporates numerous measurements of physical and compositional features at a near-global scale across the asteroid. This product will be produced regardless of mission contingencies or observational completeness and will be produced up to the resolution and completeness of the input data products listed herein.

When in the DRM are the observations that make the data product scheduled to be taken?

- Starting at the Preliminary Survey phase, ending during Detailed Survey.

How long does it take to produce the data product?

- A preliminary geologic map can be produced within three months of sample stowage and a final map within six months of sample stowage. Production of a certified USGS map of Bennu is not in the scope of this data product.

Is this product used for sample site selection, science value, or long-term science?

- Long-term science

Data Product Structure and Organization

What is the structure of the data product?

- Map format - ShapeFile format [ESRI shape files or CSV]

How is the product organized?

- At least one global map that incorporates information of more geologically specific maps, in order to show the most important geologic units across Bennu.

Data Format Descriptions

- Header information (metadata) included with data product Start/End time of observations that makeup data product
- Lat/lon or other geometric parameters
- Map scale/ resolution
- Map projection
- Shape model version
- Input data sets used in creation
- Coordinate System

Detailed Description of data format

- Map format - ShapeFile format [ESRI shape files or CSV]

Data Product Generation

How and by whom is the product generated?

- Co-I's Tim McCoy and Kevin Walsh and generally owned by RDWG

What are the input products needed to produce the product?

- Global Mosaic @ 21-cm resolution (MRD-121)
- Global Topographic Map (MRD-122)
- Global Crater Geology Map (MRD-136)
- Global Boulder Geology Map (MRD-137)
- Global Linear Features Map (MRD-139)
- Global Regolith Geology Map (MRD-138)
- Global Dust and Plume Geology Map (MRD-142)
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- Global Space Weathering Map (MRD-542)
- Global Mineral and Chemical Maps (MRD-140)
- Global Bond Albedo (MRD-154)
- Global Reflectance Factor Maps (MRD-154)
- Global Thermal Inertia Map (MRD-155)

Are there format expectations for the input products?

- All input data should be co-registered map-projections, ShapeFiles or ShapeModel+Ancillary

What algorithms and/or calibration data is used to generate products?

- Drawing boundaries of geologic units and indicating geologic features.

Will multiple versions of the product be generated?

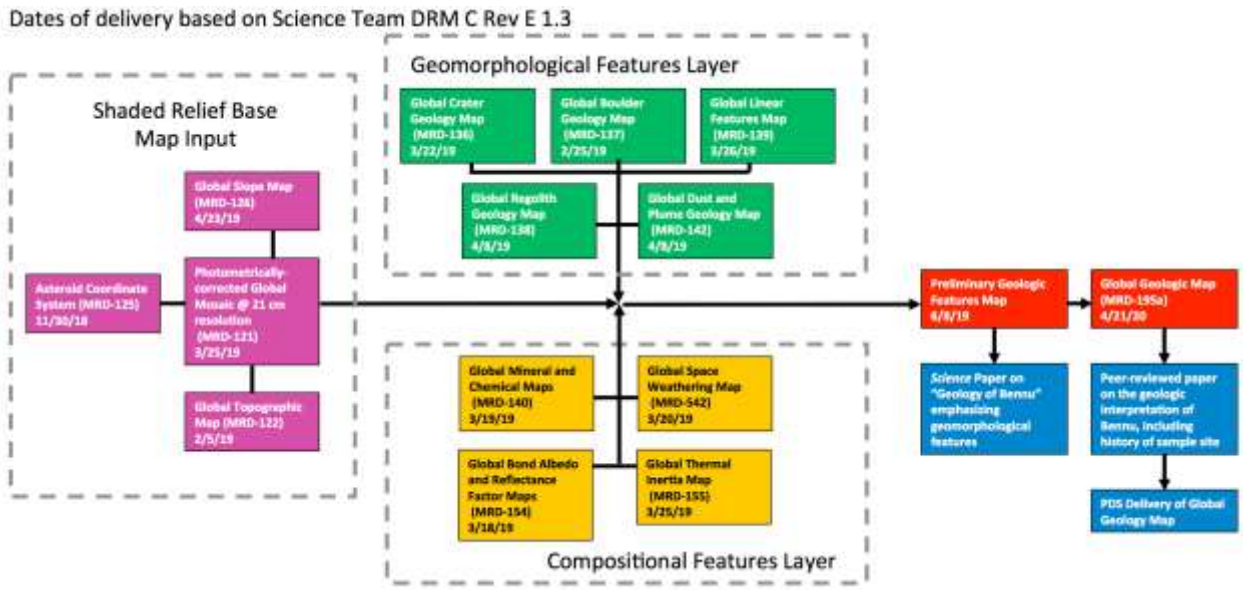
- A single map is the final product, but draft maps will be produced throughout the mission as input data products become available.

Data Product Validation

How will the product be vetted to ensure contents and format are correct?

- Through a consensus opinion of the science team in 'real' time. Further validation will occur later with the long-term goal of publishing the science behind the maps and that will also be peer reviewed.

Data Flow



Describe the sources, destinations, and transfer procedures for data products. State the size of an individual data product and the total size of all the data products generated over the course of each mission phase.

- The size and transfer of the data product is dependent on the input data products, and should not exceed the resolution/size of the basemap - Global Mosaic @ 21-cm resolution (MRD-121). In general shape files are not very large, where ~5000 shapes make a file size on order ~1Mb.

Standards used to generate data product

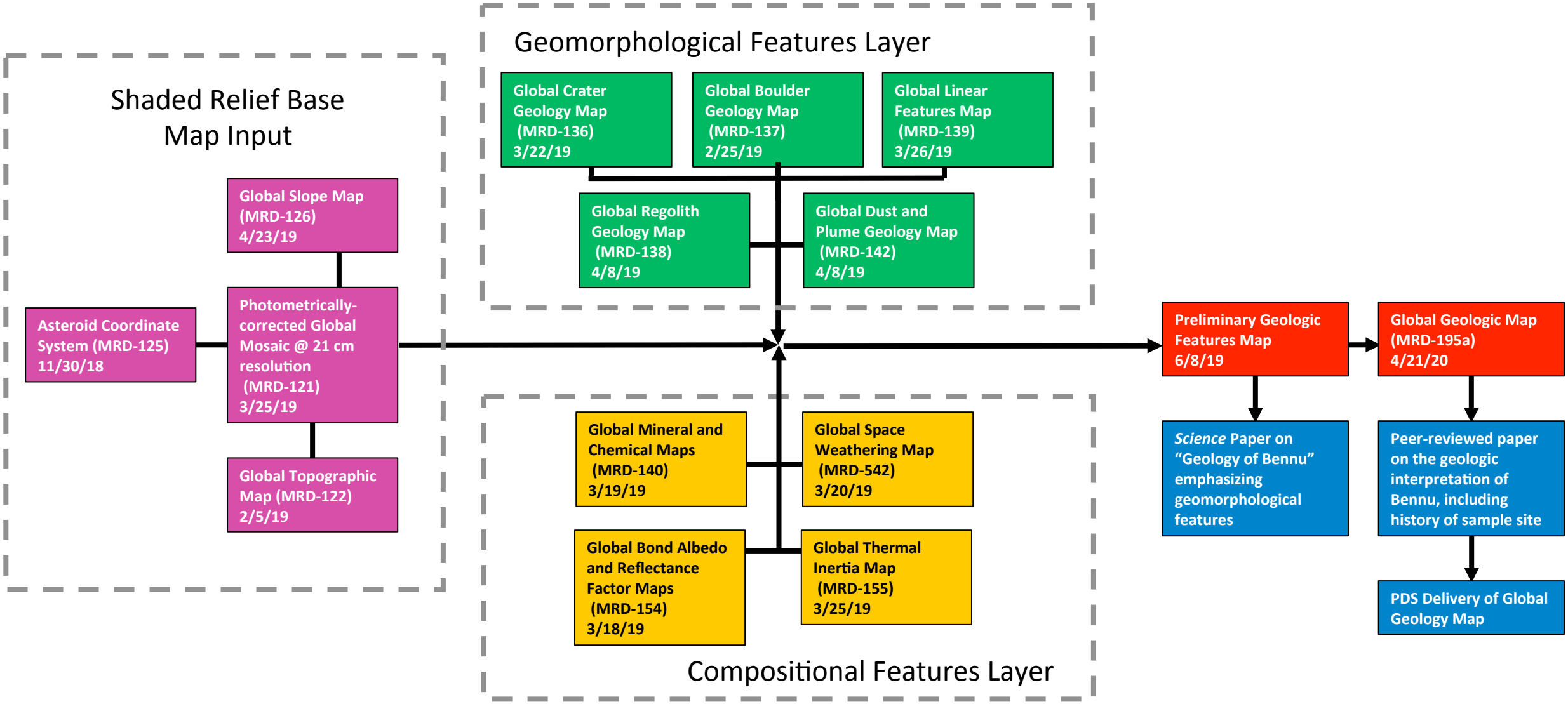
Time

- As determined by each input map.

Coordinate System

- Asteroid coordinate system (MRD-125)

Data Storage Conventions

- Little Endian with either PackBits or LZW compression

Dates of delivery based on Science Team DRM C Rev E 1.3