

Identification_Information:

Citation:

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Originator: Rossman P. Irwin, III, Smithsonian Institution,
National Air and Space Museum, Geologist
Publication_Date: 20131216
Title: Geologic Map of MTM -15027, -20027, -25027, and -25032
Quadrangles, Margaritifer Terra Region of Mars
Edition: 1
Geospatial_Data_Presentation_Form: vector digital data
Series_Information:
Series_Name: Scientific Investigations Map
Issue_Identification: 3209

Description:

Abstract: Mars Transverse Mercator (MTM) quadrangles -15027, -20027, -25027, and -25032 (lat 12.5-28 S., long 330-335 E. and lat 22.5-28 S., long 324.5-330 E.) in southwestern Margaritifer Terra include diverse erosional landforms, sedimentary deposits, and tectonic structures that record a long geologic and geomorphic history. The northeastern regional slope of the pre-Noachian crustal dichotomy (as expressed along the Chryse trough) and structures of the informally named Middle Noachian or older Holden and Ladon impact basins dominate the topography of the map area. A series of mesoscale outflow channels, Uzboi, Ladon, and Morava Valles, integrated these formerly enclosed basins by overflow and incision around the Noachian/Hesperian transition, although some flooding may have occurred earlier. The area includes excellent examples of Late Noachian to Hesperian valley networks, dissected crater rims, alluvial fans, deltas, and light-toned layered deposits (LTLDs), particularly in Holden and Eberswalde craters. Structural forms include Tharsis-radial grabens, Hesperian wrinkle ridges, floor-fractured impact craters, and severely disrupted chaotic terrains. These well-preserved landforms and sedimentary deposits represent multiple erosional epochs and discrete flooding events, which provide significant insight into the geomorphic processes and climate change on early Mars.

Purpose: Investigation of fluvial landforms and other surface modifications in a map area containing two high-priority rover landing sites.

Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: 20100601

Ending_Date: 20131216

Currentness_Reference: Bounds are in a positive East longitude system.

Status:

Progress: Complete

Maintenance_and_Update_Frequency: None planned

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -39.042431

East_Bounding_Coordinate: -19.980428

North_Bounding_Coordinate: -9.999991

South_Bounding_Coordinate: -30.213008

Keywords:

Theme:
Theme_Keyword_Thesaurus: NASA Glossary
Theme_Keyword: Geologic, Mars, structure, Noachian, Hesperian, Amazonian, photogeologic, mapping
Place:
Place_Keyword_Thesaurus: Gazetteer of Planetary Nomenclature
Place_Keyword: Mars, Margaritifer Terra, Holden, Ladon, Eberswalde
Temporal:
Temporal_Keyword_Thesaurus: None
Temporal_Keyword: Noachian, Hesperian, Amazonian
Access_Constraints: None
Use_Constraints: None
Point_of_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: Smithsonian Institution, National Air and Space Museum
Contact_Person: Rossman P. Irwin, III
Contact_Position: Geologist
Contact_Address:
Address_Type: mailing and physical
Address: MRC 315, Independence Ave at 6th St, SW
City: Washington
State_or_Province: DC
Postal_Code: 20560
Country: US
Contact_Voice_Telephone: 202-633-3632
Contact_Electronic_Mail_Address: irwinr@si.edu
Point_of_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: Smithsonian Institution, National Air and Space Museum
Contact_Person: John A. Grant
Contact_Position: Geologist
Contact_Address:
Address_Type: mailing and physical
Address: MRC 315, Independence Ave at 6th St, SW
City: Washington
State_or_Province: DC
Postal_Code: 20560
Country: US
Contact_Voice_Telephone: 202-633-2474
Contact_Electronic_Mail_Address: grantj@si.edu
Data_Set_Credit: Irwin, Rossman P., III, and John A. Grant, 2013, Geologic Map of MTM -15027, -20027, -25027, and -25032 Quadrangles, Margaritifer Terra Region of Mars, U.S. Geological Survey Scientific Investigations Map 3209, scale 1:1,000,000. Available at <http://pubs.usgs.gov/sim/3209/>
Security_Information:
Security_Classification_System: None
Security_Classification: Unclassified
Security_Handling_Description: N/A
Native_Data_Set_Environment: Esri ArcGIS 9.3

Data_Quality_Information:

Attribute_Accuracy:

Attribute_Accuracy_Report: All attributes were verified by displaying the lines in both the database and the spatial coverage and they are believed to be logically consistent.

Logical_Consistency_Report: Data is good to 1:1M scale. The base map used for mapping was 231 meters per pixel.

Completeness_Report: These data are believed to be logically consistent. Line geometry is topologically clean.

Lineage:

Process_Step:

Process_Description:

Detailed mapping was based on THEMIS visible images at 18 m/pixel and Mars Reconnaissance Orbiter (MRO) Context Camera images at 5 m/pixel. Where available, Mars Orbiter Camera (MOC) images at ~2-5 m/pixel, MRO High Resolution Imaging Science Experiment (HiRISE) visible images at 25 cm/pixel, and Compact Reconnaissance Imaging Spectrometer for Mars (CRISM) products facilitated local interpretations of within-unit 2 stratigraphy. Topographic measurements were based on the 128 pixel/degree MOLA Mission Experiment Gridded Data Record. Using ArcGIS 9.3, we drafted line work at 1:250,000 scale for publication at 1:1,000,000 scale.

Unit contacts have a stream-digitized vertex spacing of ~500 m and are attributed as definite or approximate. Linear features include faults, crater rims, and small valleys.

Process_Date: 20100701

Process_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization: Smithsonian Institution, National Air and Space Museum

Contact_Person: Rossman P. Irwin, III

Contact_Position: Geologist

Contact_Address:

Address_Type: mailing and physical

Address: MRC 315, Independence Ave at 6th St, SW

City: Washington

State_or_Province: DC

Postal_Code: 20560

Country: US

Contact_Voice_Telephone: 202-633-3632

Contact_Electronic_Mail_Address: irwinr@si.edu

Spatial_Data_Organization_Information:

Direct_Spatial_Reference_Method: Vector

Point_and_Vector_Object_Information:

SDTS_Terms_Description:

SDTS_Point_and_Vector_Object_Type: Entity point

Point_and_Vector_Object_Count: 46

SDTS_Terms_Description:

SDTS_Point_and_Vector_Object_Type: String

Point_and_Vector_Object_Count: 629

SDTS_Terms_Description:

SDTS_Point_and_Vector_Object_Type: Entity point

Point_and_Vector_Object_Count: 163

SDTS_Terms_Description:
SDTS_Point_and_Vector_Object_Type: GT-polygon composed of chains
Point_and_Vector_Object_Count: 160
SDTS_Terms_Description:
SDTS_Point_and_Vector_Object_Type: String
Point_and_Vector_Object_Count: 4
SDTS_Terms_Description:
SDTS_Point_and_Vector_Object_Type: String
Point_and_Vector_Object_Count: 1829
Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Planar:
Map_Projection:
Map_Projection_Name: Mars Holden
Transverse_Mercator:
Scale_Factor_at_Central_Meridian: 1.0
Longitude_of_Central_Meridian: -30.0
Latitude_of_Projection_Origin: 0.0
False_Easting: 0.0
False_Northing: 0.0
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: coordinate pair
Coordinate_Representation:
Abscissa_Resolution: 0.0001
Ordinate_Resolution: 0.0001
Planar_Distance_Units: meter
Geodetic_Model:
Horizontal_Datum_Name: D Mars 2000
Ellipsoid_Name: Mars 2000 IAU IAG
Semi-major_Axis: 3396190.0
Denominator_of_Flattening_Ratio: 169.8944472236118
Distribution_Information:
Distributor:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: U. S. Geological Survey
Contact_Person: USGS Publications
Contact_Address:
Address_Type: mailing
Address: Box 25286, Federal Center
City: Denver
State_or_Province: CO
Postal_Code: 80225-0046
Country: US
Contact_Voice_Telephone: 1-888-ASK-USGS
Contact_Electronic_Mail_Address: usgsstore@usgs.gov
Distribution_Liability: None
Standard_Order_Process:
Digital_Form:
Digital_Transfer_Option:
Online_Option:
Computer_Contact_Information:
Network_Address:
Network_Resource_Name: <http://pubs.usgs.gov/sim/3209/>

Ordering_Instructions: Download digital map
Available_Time_Period:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 20131216
Metadata_Reference_Information:
Metadata_Date: 20131213
Metadata_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: USGS
Contact_Person: Trent Hare
Contact_Position: Cartographer
Contact_Address:
Address_Type: mailing and physical
Address: 2255 North Gemini Drive
City: Flagstaff
State_or_Province: AZ
Postal_Code: 86001
Country: US
Contact_Voice_Telephone: 928-556-7100
Contact_Electronic_Mail_Address: thare@usgs.gov
Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial
Metadata
Metadata_Standard_Version: FGDC-STD-001-1998
Metadata_Time_Convention: local time
Metadata_Use_Constraints: None