

SP_CcDcAzimuth_Line.doc
Mars Global Digital Dune Database: MC-30
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T.N. Titus, A. Colaprete, and P.R. Christensen
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(<http://pubs.usgs.gov/of/2012/1259>)

Summary

See Pamphlet.doc, Mars Global Digital Dune Database Purpose.

Description

See Pamphlet.doc, Mars Global Digital Dune Database Abstract.

Credits

There are no credits for this item.

Access and use limitations

There are no restrictions.

ArcGIS Metadata

Resource Identification

Citation Title: Sp_CcDcAzimuth_Line_Geog
Alternate Titles: South Pole CcDcAzimuth Line
Presentation Format: digital map
Collection Title: Mars Global Digital Dune Database
Responsible Party:
Individual's Name: Rosalyn K. Hayward
Organization's Name: USGS, Astrogeology
Contact's Position: Geologist
Contact's Role: Originator
Contact Information:
Phone:
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Publication Information:

Publication Place: Reston, Virginia

Publisher: U.S. Geological Survey

Online_Linkage: <http://pubs.usgs.gov/of/2012/1259>

Themes Or Categories Of The Resource :

geoscientificInformation

Tags For Searching: Dune, Aeolian, Mars, Database, GCM

Discipline Keywords: Planetary Science

Place Keywords: Mars

Theme Keywords: Dune

Theme Keywords: Aeolian

Theme Keywords: Database

Theme Keywords: GCM

Dataset Languages: English (United States)

Dataset Character Set Utf8 - 8 Bit Ucs Transfer Format

Status: Completed

Resource Maintenance:

Update Frequency: Not Planned

Scope Of The Updates: Dataset

Resource Constraints:

Constraints:

Limitations Of Use:

There are no restrictions.

Spatial Representation Type: Vector

* Processing Environment: Microsoft Windows Server 2008 R2 Version 6.1 (Build 7601) Service

Pack 1; Esri Arcgis 10.0.2.3200

Other Extent Information:

Geographic Extent:

Bounding Rectangle:

* Extent Type Extent Used For Searching

* West Longitude -179.991266

* East Longitude 179.598841

* North Latitude -65.024407

* South Latitude -80.194876

* Extent Contains The Resource: Yes

Point Of Contact:

Individual's Name: Rosalyn K. Hayward

Organization's Name: USGS, Astrogeology

Contact's Position: Geologist

Contact's Role: Originator

Contact Information:

Phone:

Voice: (928) 566-7022

Fax: (928) 566-7014

Address:

Delivery Point: 2255 N. Gemini Dr.
City: Flagstaff
Administrative Area: Az
Postal Code:86001
Country: United States
E-Mail Address: rhayward@usgs.gov

Reference System

Reference System Identifier

Value 104905

* Codespace Esri

* Version 10.0.0

Data Quality

Scope Of Quality Information

Resource Level: dataset

Lineage:

Process Step:

See Pamphlet.doc, Mars Global Digital Dune Database Process.

Data Quality Report - Completeness Omission:

See Pamphlet.doc, Mars Global Digital Dune Database – Completeness of Database.

Data Quality Report - Conceptual Consistency

Measure Description:

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

Data Quality Report - Topological Consistency

Measure Description:

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

Data Quality Report - Absolute External Positional Accuracy:

Measure Description:

The horizontal accuracy is derived from the accuracy of the Mars Orbiter Laser Altimeter (MOLA) dataset [Smith and others, 2001]. The globally adjusted MOLA dataset has an absolute horizontal accuracy on the order of 100 m, but individual features in images can probably only be tied to MOLA-derived shaded-relief digital image models with a precision on the order of 200 m. Other bases used included Thermal Emission Imaging System (THEMIS) digital images [Archinal and others, 2003, Christensen and others, 2004]. The digital features were drawn at 20K to 100K scale with a node spacing of approximately 0.3 km to 2 km.

ESRI Metadata and Item Properties

Metadata Properties:

Arcgis: Arcgis1.0

Metadata Style: FGDC CSDGM Metadata
Metadata Standard Or Profile: FGDC
Created In Arcgis: 2012-05-14t13:03:12
Last Modified In Arcgis: 2012-06-03t15:08:05
Automatic Updates:
Last Update: 2012-06-03t15:06:39
Have Been Performed: Yes

Item Properties

Name: Sp_CcDcAzimuth_Geog
Content Type: Downloadable Data

ESRI Spatial Information

Extent In The Item's Coordinate Reference

Bounding Rectangle:

- * West Longitude -179.991266
- * East Longitude 179.598841
- * North Latitude -65.024407
- * South Latitude -80.194876
- * Extent Contains The Resource: Yes

Coordinate Reference

Type: Geographic

Geographic Coordinate Reference: GCS_Mars_2000

Coordinate Reference Details

Geographic Coordinate
System

Well-Known Identifier: 104905
X Origin: -399.99999999999989
Y Origin: -399.99999999999989
XY Scale: 1000000000.0000001
Z Origin: -100000
Z Scale: 10000
M Origin: -100000
M Scale: 10000
XY Tolerance: 1.6870604858115214e-008
Z Tolerance: 0.001
M Tolerance: 0.001
High Precision: True
Left Longitude: -180
Well-Known Text
GEOGCS["GCS_Mars_2000",DATUM["D_Mars_2000",SPHEROID
["Mars_2000_IAU_IAG",3396190.0,169.8944472236118]],PRIMEM
["Reference_Meridian",0.0],UNIT["Degree",0.0174532925199433],A
UTHORITY ["ESRI",104905]]

ESRI Feature Class

Feature Class Name: SP_CcDcAzimuth_Line_Geog

- * Feature Type: Simple
- * Geometry Type: Polyline
- * Has Topology: False
- * Feature Count: 288
- * Spatial Index: True
- * Linear Referencing: False

ESRI Fields and Subtypes

SP_CcDcAzimuth_Line_Geog Feature Class

* ROW COUNT 288

DEFINITION

Polylines that extend from crater centroid to the centroid of a dune field within the crater on Mars between lat 65° and 90° S. (~300 records). The polyline version of the CcDcAzimuth shapefile is included because it shows the actual line between centroids. Its length and location may be of interest for some studies. The CcDcAzimuth file is also included as a point shapefile so that it can more easily be visually compared to the Average_Slipface shapefile, which is also plotted using the dune centroid as origin. Note that the term "crater" was used for simplicity, even though a small number of the circular depressions containing dunes may not be impact craters.

FIELD OBJECTID

- * ALIAS OBJECTID
- * DATA TYPE OID
- * WIDTH 4
- * FIELD DESCRIPTION
Internal feature number.
- * DESCRIPTION SOURCE
ESRI
- * DESCRIPTION OF VALUES Sequential unique whole numbers that are automatically generated.

FIELD Shape

- * ALIAS Shape
- * DATA TYPE Geometry
- * FIELD DESCRIPTION
Feature geometry.
- * DESCRIPTION SOURCE
ESRI
- * DESCRIPTION OF VALUES Coordinates defining the features.

FIELD DuneBID

- ALIAS Dune_Lon_Lat_ID
- * DATA TYPE String
- * WIDTH 20
- FIELD DESCRIPTION

Each dune field has a unique ID number constructed after the method used by Barlow (2003) to assign ID numbers to craters. Longitude is listed first and both values are extended to one decimal place. The + or – sign of the latitude is given, indicating the break between the two values. Thus 122.5 east longitude, - 34.5 south latitude, becomes 1225-345. The longitude is always four digits and the latitude is always three digits, filling in with leading zeroes where necessary. The Dune Field ID is listed with every associated image.

FIELD Dune_Lon

ALIAS Dune_Longitude_East

*DATA TYPE Double

*WIDTH 8

FIELD DESCRIPTION

Records the position of the centroid of the dune field in decimal degrees east longitude.

FIELD Dune_Lat

ALIAS Dune_Latitude_Aerocentric

*DATA TYPE Double

*WIDTH 8

FIELD DESCRIPTION

This field records the position of the centroid of the dune field in decimal degrees latitude (aerocentric) of the centroid.

FIELD CcDcAzGeog

ALIAS CcDcAzimuth_Geographic

*DATA TYPE Double

*WIDTH 8

FIELD DESCRIPTION

ArcMap tools were used to create polylines that extend from crater centroid to dune centroid. The azimuth is calculated in decimal degrees in the Geographic coordinate system (for compatibility with the EQ and NP parts of MGD³). Note that the term "crater" was used for simplicity, even though a small number of the circular depressions containing dunes may not be impact craters.

FIELD SF_Az_Geog

ALIAS Slipface_1_Azimuth_Geographic

*DATA TYPE Double

*WIDTH 8

FIELD DESCRIPTION

The azimuth, given in decimal degrees, is the average of individual slipface measurements. In selected areas, where THEMIS VIS, MOC NA, or CTX images of sufficient quality were available, polylines were drawn on slipfaces to measure the direction of wind movement at the time the gross dune morphology formed. The scope of this project did not allow for deciphering detailed slipface morphology or for measuring all slipfaces. We attempted to include enough slipface

measurements to represent the general circulation (as implied by gross dune morphology) and to give a sense of the complex nature of aeolian activity on Mars. The absence of slipface measurements in a given direction should not be taken as evidence that winds in that direction did not occur. When more than one direction was recorded, slipface measurements were grouped and an average for each direction was calculated. Slipface1 is the direction with the greatest number of slipfaces used in the averaging process. Images were projected to ArcMap in the South Polar Stereographic projection using the Mars_2000 datum. Slipface azimuth was calculated in decimal degrees in the Geographic coordinate system (for compatibility with the Equatorial and North Polar parts of MGD³).

FIELD CcDcAzMerc

ALIAS CcDcAzimuth_Mercator

*DATA TYPE Double

*WIDTH 8

FIELD DESCRIPTION

ArcMap tools were used to create polylines that extend from crater centroid to dune centroid. The azimuth is calculated in decimal degrees in the Mercator projection. We recommend that numerical comparisons be made in the Mercator projection because the Mercator projection preserves direction. Note that the term "crater" was used for simplicity, even though a small number of the circular depressions containing dunes may not be impact craters.

FIELD SF_Az_Merc

ALIAS Slipface_1_Azimuth_Mercator

*DATA TYPE Double

*WIDTH 8

FIELD DESCRIPTION

The azimuth, given in decimal degrees, is the average of individual slipface measurements. In selected areas, where THEMIS VIS, MOC NA, or CTX images of sufficient quality were available, polylines were drawn on slipfaces to measure the direction of wind movement at the time the gross dune morphology formed. The scope of this project did not allow for deciphering detailed slipface morphology or for measuring all slipfaces. We attempted to include enough slipface measurements to represent the general circulation (as implied by gross dune morphology) and to give a sense of the complex nature of aeolian activity on Mars. The absence of slipface measurements in a given direction should not be taken as evidence that winds in that direction did not occur. When more than one direction was recorded, slipface measurements were grouped and an average for each direction was calculated. Slipface1 is the direction with the greatest number of slipfaces used in the averaging process. Images were projected to ArcMap in the South Polar Stereographic projection using the Mars_2000 datum. Slipface azimuth was calculated in

decimal degrees in the Mercator projection for comparison with the CcDcAzimuth in the Mercator projection. We recommend that numerical comparisons be made in the Mercator projection because the Mercator projection preserves direction.

FIELD CcDcAzSter

ALIAS CcDcAzimuth_Stereographic

*DATA TYPE Double

*WIDTH 8

FIELD DESCRIPTION

The azimuth of the line connecting the crater centroid to dune centroid, calculated in decimal degrees in the South Polar Stereographic projection. This value is provided so that the user can correctly display the point version of the CcDcAzimuth in South Polar Stereographic projection. It should not be used for comparison to azimuths in these tables that were calculated using the Geographic coordinate system or Mercator projection. We recommend that numerical comparisons be made in the Mercator projection because the Mercator projection preserves direction.

FIELD CraterBID

ALIAS Crater_“BarlowID”

*DATA TYPE String

*WIDTH 20

FIELD DESCRIPTION

A unique ID number constructed after the method used by Barlow (2003) to assign ID numbers to craters. Longitude is listed first and both values are extended to one decimal place. The + or – sign of the latitude is given, indicating the break between the two values. Thus 122.5 east longitude,-34.5 south latitude, becomes 1225-345. The longitude is always four digits and the latitude is always three digits, filling in with leading zeroes where necessary. Note that the term "crater" was used for simplicity, even though a small number of the circular depressions containing dunes may not be impact craters.

FIELD Crater_Lon

ALIAS Crater_Longitude_East

*DATA TYPE Double

*WIDTH 8

FIELD DESCRIPTION

Position of the centroid of the crater in decimal degrees east longitude.

FIELD Crater_Lat

ALIAS Crater_Latitude_Aerocentric

*DATA TYPE Double

*WIDTH 8

FIELD DESCRIPTION

Position of the centroid of the crater in decimal degrees latitude (aerocentric).

FIELD Shape_Length

* ALIAS Shape_Length
* DATA TYPE Double
* WIDTH 8
* FIELD DESCRIPTION
Length of feature in internal units.
* DESCRIPTION SOURCE
ESRI
* DESCRIPTION OF VALUES Positive real numbers that are automatically generated.

Metadata Details

Metadata Language: English
Metadata Character Set: Utf8 - 8 Bit Ucs Transfer Format
Scope Of The Data Described By The Metadata: Dataset
* Scope Name: Dataset
Metadata Contact:
Individual's Name: Rosalyn K. Hayward
Organization's Name: USGS, Astrogeology
Contact's Position: Geologist
Contact's Role: Originator
Contact Information:
Phone:
Voice: (928) 566-7022
Fax: (928) 566-7014
Address:
Delivery Point: 2255 N. Gemini Dr.
City: Flagstaff
Administrative Area: Az
Postal Code: 86001
Country: United States
E-Mail Address: rhayward@usgs.gov

* Last Update: 2012-06-03

Maintenance:

Update Frequency: Not Planned
Scope Of The Updates: Dataset