

Identification Information:

Citation:

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Originator:

University of South Florida (USF), School of Geosciences

Publication Date: 2014

Title:

Ground-based magnetic data set of Anomaly B, Amargosa Valley, NV

Publication Information:

Publication Place: Tampa, FL

Publisher: Statistics in Volcanology

Description:

Abstract:

Ground-based magnetic data were collected using 2 Geometrics G-858 cesium vapor magnetometer, a high sensitivity “walking” magnetometer and a GlobalSat GPS Data Logger and Receiver to record magnetic-field values and locations in the Amargosa Valley, Nevada. The data are presented as Easting, Northing, Magnetic Anomaly, Observed Magnetic measurement, Drift Corrected Magnetic measurement, Drift, Date, Time and Decimal Hours.

Purpose:

Previous aeromagnetic surveys over the region revealed several reversely and normally magnetized features, termed Anomalies A-Q, which share similar magnetic properties with exposed basaltic cones in the region. Basaltic rocks tend to contain a high percentage of magnetic minerals such as magnetite and as such produce an anomalous signal in comparison to the surrounding sedimentary layers. The previous work (both ground-based and aeromagnetic) revealed the need for a more in depth ground survey over the region to understand better the nature of the anomaly. In this rich dataset, a wealth of subsurface information is revealed in the region of Anomaly B.

Time Period of Content:

Time Period Information:

Range of Dates/Time:

Beginning Date: 20140326

Ending Date: 20140330

Currentness Reference:

Time period indicates date of ground-based survey data collection. Time is expressed in the format YYYYMMDD.

Spatial Domain:

Bounding Coordinates:

West Bounding Coordinate: 551741

East Bounding Coordinate: 556813

North Bounding Coordinate: 4055675

South Bounding Coordinate: 4050986

Keywords:

Theme:

Theme Keyword: geophysical surveys

Theme Keyword: ground-based magnetic survey

Theme Keyword: magnetic surveys

Theme Keyword: total field

Place:

Place Keyword: United States

Place Keyword: Nevada

Place Keyword: NV

Place Keyword: Amargosa Valley

Place Keyword: Anomaly B

Access Constraints: none

Use Constraints:

None. Acknowledgement of the University of South Florida survey through citation of the “High-Resolution Ground-Based Magnetic Survey of a Buried Volcano: Anomaly B, Amargosa Valley, Nevada” paper would be appreciated in products derived from these data

Point of Contact:

Contact information: Ophelia George

Contact Organization: University of South Florida, School of Geosciences

Contact Address:

Address Type: Mailing

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Dataset Credit:

The data presented here were collected, processed and archived by the following persons: Ophelia George, Judy McIlrath, Alexandra Farrell, Elisabeth Gallant, Anita Marshall, Christine McNiff, Mary Njoroge, Samantha Tavares, Charles Connor, and Sarah Kruse.

Native Dataset Environment:

These data were collected with a Geometrics G-858 cesium vapor magnetometer and downloaded to a Windows computer. Further data processing took place using a desktop computer running Open SuSe v 12.3

Cross Reference:

Citation Information:

Originator:

Publication Date:

Title:

Publication Information:

Publication Place:

Publisher:

Other Citation Information:

Online Linkage:

Data Quality Information:

Attribute Accuracy:

Attribute Accuracy Report:

The magnetic data in this file were time stamp matched to the GPS locations recorded during the magnetic survey locations based on their common collection time. The accuracy of these data are limited by the position accuracy of the GlobalSat GPS data logger.

Logical Consistency:

The data presented here were collected with the same instruments (magnetometers, GPS) throughout the entire survey and were collected for a normal length of time with no delays between the survey beginning and end.

Completeness Report:

Position Accuracy:

Horizontal Positional Accuracy:

Horizontal Positional Accuracy Report:

Survey position was verified through the use of a GlobalSat DG100 data logger which has a reported horizontal accuracy of 1-5 m 2D RMS, WAAS corrected

Lineage:

Process step:

Process Description:

Correlation of the measured magnetic values to their geographic position was performed by time stamp matching the GPS and magnetometer collection times using the scripts provided in the supplementary material. Initial position measurements were made in standard map projection and later converted to UTM (zone 11) as part of the processing stream. Data were then drift corrected and despiked.

Process Date: 20140424

Spatial Data Organization Information:

Direct Spatial Reference Method: point Spatial Reference Information:

Horizontal Coordinate System Definition:

Geographic:

Easting Resolution: 1-5 m

Northing Resolution: 1-5 m

Geographic Coordinate Units: UTM (zone 11N)

Geodetic Model:

Horizontal Datum Name: World Geodetic System 1984

Ellipsoid Name:

Semi-major Axis:

Denominator of Flattening Ratio:

Entity and Attribute Information:

Overview Description:

Entity and Attribute Overview:

Ground survey specifications

The items are constant for the entire survey

Project name: Ground-Based Magnetic Survey of a buried volcano

Survey Conducted by: Magnetic Fields Class, Spring 2014

Survey Originator: University of South Florida

Approximate number of line miles:

Survey height: 0 m

Altitude method:

Magnetometer used: Geometrics G-858

Overview Description:

Entity and Attribute Overview:

Each record contains the following 9 attributes:

no abbrev.name contents

1. Easting Easting (UTM)
2. Northing Northing (UTM)
3. MagAn Anomalous magnetic measurement
4. MagOb Observed magnetic measurement
5. MagDc Drift corrected magnetic measurement

6. Drift        Drift correction applied to magnetic measurement
7. Date        Date of measurement reported in DD/MM/YY
8. Time        Time of measurement reported in HH:MM:SS (local time)
9. DHours     Decimal hour of the measurement report in HH.xxx (local time)

Detailed Description

Entity Type:

Entity Type label: record for one magnetic data point

Entity Type Description:

The set of all measurements reported for a magnetic data point having the same location.

Attribute:

Attribute label: Easting

Attribute Definition: Easting - UTM geographic coordinate

Attribute Definition Source: self evident

Attribute Domain Values:

Range Domain:

Range Domain Minimum: 551741

Range Domain Maximum: 556813

Attribute Units of Measurement: meters

Attribute:

Attribute label: Northing

Attribute Definition: Northing - UTM geographic coordinate

Attribute Definition Source: self evident

Attribute Domain Values:

Range Domain:

Range Domain Minimum: 4050986

Range Domain Maximum: 4055675

Attribute Units of Measurement: meters

Attribute:

Attribute label: MagAn

Attribute Definition: Residual magnetic value

A reference magnetic field estimated for northing 4053300, easting 553950 and at an elevation of 796.7 m was subtracted from the drift corrected, despiked observed total magnetic field data to derive the residual (anomalous) magnetic signature of the buried body. Reference geomagnetic field was estimated using the IGRF 2011 model.

Data used in this step were despiked using a filter set to remove any data points in which the slope between subsequent measurements exceeded 75 nanoteslas/meter.

Attribute Definition Source: see Nettleton, L.L., 1971, Elementary Gravity and Magnetism for Geologists and Seismologists: Society of Exploration Geophysicists Monograph Series No. 1, p. 83-87

A description of magnetometers and how they measure the total magnetic field can be found in:

Dobrin, M.B., 1976, Introduction to Geophysical Prospecting: New York, McGraw-Hill Book Company, p. 505-517.

Attribute Domain Values:

Range Domain:

Range Domain Minimum: -1985.333

Range Domain Maximum: 1691.158

Attribute Units of Measurement: nanoteslas

Attribute Value Accuracy Information:

Attribute Accuracy value:

Attribute Value Accuracy Explanation:

The Geomagnetic reference field subtracted from the raw measurements is based on a model which is updated approximately every 5 years. There are varying degrees of accuracy associated with these models in determining the local reference field.

Attribute:

Attribute label: MagOb

Attribute Definition: Total magnetic field value

Raw total magnetic field data recorded during this survey. This column only includes those raw observations which were time stamp matched with the GPS and correspond to the raw values which survey the filtering criteria enforced by the despiking process. The data despiking process was described above.

Attribute Definition Source: see Nettleton, L.L., 1971, Elementary Gravity and Magnetism for Geologists and Seismologists: Society of Exploration Geophysicists Monograph Series No. 1, p. 83-87

A description of magnetometers and how they measure the total magnetic field can be found in:

Dobrin, M.B., 1976, Introduction to Geophysical Prospecting: New York, McGraw-Hill Book Company, p. 505-517.

Attribute Domain Values:

Range Domain:

Range Domain Minimum: 47066.327

Range Domain Maximum: 50743.128

Attribute Units of Measurement: nanoteslas

Attribute Value Accuracy Information:

Attribute Accuracy value:?

Attribute Value Accuracy Explanation:

Measurement accuracy are on the order of 10 nanoteslas.

Attribute:

Attribute label: MagDc

Attribute Definition: Total magnetic field value

Drift corrected magnetic data. Ground-based measurements were drift corrected using a combination of diurnal variations recorded at the Boulder, Co and Fresno, Ca permanent magnetic stations. Variations ranged from approximately -2 to 52 nanoteslas and were removed from the raw data based on the common time. Drift values used in this process are defined in the following column.

Attribute Definition Source: see Nettleton, L.L., 1971, Elementary Gravity and Magnetism for Geologists and Seismologists: Society of Exploration Geophysicists Monograph Series No. 1, p. 83-87

A description of magnetometers and how they measure the total magnetic field can be found in:

Dobrin, M.B., 1976, Introduction to Geophysical Prospecting: New York, McGraw-Hill Book Company, p. 505-517.

Attribute Domain Values:

Range Domain:

Range Domain Minimum: 47098.167

Range Domain Maximum: 50774.658

Attribute Units of Measurement: nanoteslas

Attribute Value Accuracy Information:

Attribute Accuracy value:

Attribute Value Accuracy Explanation:

Measurement accuracy are on the order of 10 nanoteslas.

Attribute:

Attribute label: Drift

Attribute Definition: Magnetic drift values used in performing drift corrections

Attribute Definition Source: Correction values were determined from diurnal variations measured at permanent magnetic stations in Boulder, CO and Fresno, CA.

Attribute Domain Values:

Range Domain:

Range Domain Minimum: -1.13

Range Domain Maximum: 52.26

Attribute:

Attribute label: Date

Attribute Definition: Date of measurement

Attribute Definition Source: self evident

Attribute Domain Values:

Range Domain:

Range Domain Minimum: 03/26/2014

Range Domain Maximum: 03/30/2014

Attribute:

Attribute label: Time

Attribute Definition: Local time of measurement expressed as HH:MM:SS

Attribute Definition Source: self evident

Attribute Domain Values:

Range Domain:

Range Domain Minimum: Varies daily

Range Domain Maximum: Varies daily

Attribute:

Attribute label: DHours

Attribute Definition: Decimal hour. Same as time column but expressed as HH.ddd

Attribute Definition Source: self evident

Attribute Domain Values:

Range Domain:

Range Domain Minimum: Varies daily

Range Domain Maximum: Varies daily

Distribution Information:

Distributor:

Contact information: Ophelia George

Contact Organization: University of South Florida, School of Geosciences

Contact Address:

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Resource Description: High-Resolution Ground-Based Magnetic Survey of a Buried Volcano: Anomaly B, Amargosa Valley, Nevada.

Distribution Liability: Accuracy of the data and related materials are not guaranteed by the distributors.

Standard Order Process:

Digital Form:

Format Name: ASCII

Format Specification:

Each line contains tab delimited data in the order described above.

File Compression Technique: gunzip

Format Version Number: 1.0

Digital Transfer Option:

Online Option:

Computer Contact Information:

Network Address:

Network Resource Name:

ftp://

Metadata Reference Information:

Metadata Date: 20150202

Metadata Contact: Ophelia George

Contact information:

Contact Organization: University of South Florida, School of Geosciences

Contact Address:

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Metadata Standard Name: FGDC Content Standards for Digital Geospatial Metadata

Metadata Standard Version: FDGC-STD-001-1998